

AVP Family (AVP 2000, AVP 3000)

Software Version 9.8.x

REFERENCE GUIDE



**ENGLISH (UK) - READ THIS FIRST!**

If you do not understand the contents of this manual. DO NOT OPERATE THIS EQUIPMENT. Also, translation into any EC official language of this manual can be made available, at your cost.

ITALIANO - LEGGERE QUESTO AVVISO PER PRIMO!

Se non si capisce il contenuto del presente manuale. NON UTILIZZARE L'APPARECCHIATURA.. È anche disponibile la versione italiana di questo manuale, ma il costo è a carico dell'utente.

SVENSKA - LÄS DETTA FÖRST!

Om Ni inte förstår informationen i denna handbok. ARBETA DÅ INTE MED DENNA UTRUSTNING. En översättning till detta språk av denna handbok kan också anskaffas, på Er bekostnad.

NEDERLANDS - LEES DIT EERST!

Als u de inhoud van deze handleiding niet begrijpt. STEL DEZE APPARATUUR DAN NIET IN WERKING. U kunt tevens, op eigen kosten, een vertaling van deze handleiding krijgen.

PORTUGUÊS - LEIA O TEXTO ABAIXO ANTES DE MAIS NADA!

Se não comprehende o texto deste manual. NÃO UTILIZE O EQUIPAMENTO. O utilizador poderá também obter uma tradução do manual para o português à própria custa.

SUOMI - LUE ENNEN KÄYTTÖÄ!

Jos et ymmärrää käsikirjan sisältöä. ÄLÄ KÄYTÄ LAITETTA. Käsikirja voidaan myös suomentaa asiakkaan kustannuksella.

FRANÇAIS - AVANT TOUT, LISEZ CE QUI SUIT!

Si vous ne comprenez pas les instructions contenues dans ce manuel. NE FAITES PAS FONCTIONNER CET APPAREIL. En outre, nous pouvons vous proposer, à vos frais, une version française de ce manuel.

DANSK - LÆS DETTE FØRST!

Udstyret må ikke betjenes. MEDMINDRE DE TIL FULDE FORSTÅR INDHOLDET AF DENNE HÅNDBOG. Vi kan også for Deres regning levere en dansk oversættelse af denne håndbog.

DEUTSCH - LESEN SIE ZUERST DIESEN HINWEIS!

Sollte Ihnen der Inhalt dieses Handbuches nicht klar verständlich sein, dann. BEDIENEN SIE DIESE GERÄTE NICHT! Eine Übersetzung des Handbuches in diese Sprache ist gegen Berechnung lieferbar.

ΕΛΛΗΝΙΚΑ - ΔΙΑΒΑΣΤΕ ΠΡΩΤΑ ΑΥΤΟ!

Αν δεν καταλάβετε το περιεχόμενο αυτού του βιοθήματος/εγχειρίδιου. ΜΗΝ ΛΕΙΤΟΥΡΓΗΣΕΤΕ ΑΥΤΟΝ ΤΟΝ ΕΞΟΠΛΙΣΜΟ. Επίσης, αυτό το εγχειρίδιο είναι διαθέσιμο σε μετάφραση σε αυτή τη γλώσσα και μπορείτε να το αγοράσετε.

ESPAÑOL - LEA ESTE AVISO PRIMERO!

Si no entiende el contenido de este manual. NO OPERE ESTE EQUIPO. Podemos asimismo suministrále una traducción de este manual al (idioma) previo pago de una cantidad adicional que deberá abonar usted mismo.

Copyright

© Copyright Ericsson AB 2013-2014. All rights reserved. No part of this document may be reproduced in any form without the written permission of the copyright owner.

Disclaimer

No part of this document may be reproduced in any form without the written permission of the copyright owner.

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Ericsson shall have no liability for any error or damage of any kind resulting from the use of this document.

Contents

Chapter 1: Introduction

This chapter identifies the equipment versions covered by this manual, describes the purpose of the equipment in a typical system and lists the available options.

Chapter 2: Installing the Equipment

This chapter provides product specific installation information including rack mounting, ventilation and pin-out details of the external connectors.

Chapter 3: Getting Started

This chapter provides a guide to powering up the unit, setting up the IP address and using the unit.

Chapter 4: Front Panel Control

This chapter describes the front panel display menus and options and details any operating procedures.

Chapter 5: Web GUI Control

This chapter describes the configuration of the unit using the Web Graphical User Interface.

Chapter 6: Advanced Video Processing & Networking

This chapter describes the principles and techniques used in the design of the equipment to aid in understanding its operation and function.

Chapter 7: Options, Licensing and Upgrades

This chapter provides details of option cards that may be fitted to this equipment.

Chapter 8: Preventive Maintenance and Fault-finding

This chapter details routine maintenance tasks, servicing advice and information regarding warranty and maintenance. It also lists error and error messages that may occur and recommends the action to be taken.

Annex A: Glossary

Annex B: Technical Specification

Annex C: Audio Coding Standards

Annex D: Differences for Contribution Encoder and Voyager II

Annex E: Alarms List

Annex F: Logo Creator

Introduction

The AVP is a flexible platform consisting of a base unit or chassis into which various option cards can be plugged. The base unit provides an Ethernet control interface, Ethernet data interfaces, and basic transport stream processing functionality. Other functionalities such as video encoding, audio encoding, and additional input or output interfaces are provided by the addition of option cards.

The AVP is designed for flexibility, modularity, multi-codec capabilities, and multiple independent outputs. Please ensure that you are familiar with the operation of the unit by reading this guide carefully.

This Reference Guide should be kept in a safe place for reference for the life of the equipment. It is not intended that this Reference Guide will be amended by the issue of individual pages. Any revision will be by a complete reissue. Further copies of this Reference Guide can be ordered from the address listed in *Customer Services*. If passing the equipment to a third party, also pass the relevant documentation.

The information in this Reference Guide also applies to the Contribution Encoder and Voyager II products. Any differences are described in *Annex D*.

Revision History

Issues of this Reference Guide are listed below:

Issue	Date	Software Version	Comments
A	Jan 2013	9.2.x	Separate online help files combined for AVP 2000 (1553-FGC 101 1788 Uen B), AVP 3000 (1553-FGC 101 1789 Uen B) and AVP 4100 (1553-FGC 101 1790 Uen B). Updated to software version 9.2.x
B	April 2013	9.4.x	Updated to software version 9.4.x New supported features added
C	July 2013	9.5.x	Updated to software version 9.5.x New supported features added Included details of support for Contribution Encoder and Voyager II
D	November 2013	9.6.x	Updated for software version 9.6.x New supported features added
E	January 2014	9.7.x	Updated for software version 9.7.x New supported features added Section added to introduce Voyager GUI
F	April 2014	9.8.x	Updated for software version 9.8.x AVP 4100 removed



Associated Documents

The following manuals/guides are also associated with this equipment:

Ericsson Document Identity	Title
1/1424-EN/LZT 790 0038	Video Processing/Stream Processing Products – Generic Product Information - Quick Guide
1424-EN/LZT 790 0030	Installation, Safety and Compliance Information Generic Product Information - Reference Guide

Useful Links:

Installation, Safety and Compliance Information – Generic Product Information - Reference Guide can be viewed at:

<http://archive.ericsson.net/service/internet/picov/get?DocNo=17402-FGB101348&Lang=EN&HighestFree=Y>

Product Guide downloads are available for all Product Families:

<http://www.ericsson.com/ourportfolio/products/television-and-video>

Trademarks

All best endeavors have been made to acknowledge registered trademarks and trademarks used throughout this Reference Guide. Any notified omissions will be rectified in the next issue of this Reference Guide. Some trademarks may be registered in some jurisdictions but not in others.

Registered trademarks and trademarks used are acknowledged below and marked with their respective symbols. However, they are not marked within the text of this Reference Guide.

Registered Trademarks

Dolby®	Registered trademark of Dolby Laboratories.
DTS®	Registered trademark of Digital Theater Systems Inc.
Ethernet®	Registered trademark of Xerox Corporation.
GuideBuilder®	Registered trademark of Triveni Digital Inc.

Trademarks

Ethafoam™	Trademark of Dow Chemical Company.
Pozidriv™	Trademark of European Industrial Services.
Reflex™	Trademark of Ericsson Television.
Stratocell™	Trademark of the Sealed Air Corporation.

Patents

The feature “Phase Aligned Audio” is patented Ericsson functionality.

Warnings, Cautions and Notes

Heed Warnings

All warnings on the product and in the operating instructions should be adhered to. The manufacturer can not be held responsible for injuries or damage where warnings and cautions have been ignored or taken lightly.

Read Instructions

All the safety and operating instructions should be read before this product is operated.

Follow Instructions

All operating and use instructions should be followed.

Retain Instructions

The safety and operating instructions should be retained for future reference.



Warning!

Warnings give information which, if strictly observed, will prevent personal injury or death, or damage to property or the environment. They are highlighted for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.



Caution!

Cautions give information which, if strictly followed, will prevent damage to equipment or other goods. They are highlighted for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.

Note: Notes provide supplementary information. They are highlighted for emphasis, as in this example, and are placed immediately after the relevant text.



EMC Compliance

This equipment is certified to the EMC requirements detailed in the Installation, Safety and Compliance Information for Ericsson Compression Products Reference Guide supplied with your product. To maintain this certification, only use the leads supplied or if in doubt contact Customer Services.

Contact Information

Support Services

Our primary objective is to provide first class customer care that is tailored to your specific business and operational requirements. All levels are supported by one or more service performance reviews to ensure the perfect partnership between Ericsson and your business.

Warranty

All Ericsson products and systems are designed and built to the highest standards and are covered under a comprehensive 12 month warranty.

Levels of Continuing Ericsson Service Support

For standalone equipment, then Ericsson **BASIC Essential support** is the value for money choice for you. **BASIC** provides you with year-by-year Service long after the warranty has expired.

For systems support you can choose either **Gold Business Critical support** or **Silver Business Advantage**. These packages are designed to save you costs and protect your income through enlisting the help of Ericsson support specialists.

Call Ericsson Sales for more details.

Customer Services

Europe, Middle East and Africa	Tel: +44 (0) 23 8048 4455 Fax: +44 (0) 23 8048 4467 Email: tvsupportemea@ericsson.com	
Americas	Tel: +888 671 1268 Tel: +678 812 6255 Fax: +678 812 6262 Email: tvsupportamericas@ericsson.com	US and Canada International
Asia	Tel: +852 2590 3820 Fax: +852 2590 9550 Email: tvsupportapac@ericsson.com	Hong Kong Hong Kong
Australia and New Zealand	Tel: +61 (0) 2 9111 4080 Fax: +61 (0) 2 9111 4949 Email: tvsupportanz@ericsson.com	
Internet Address	www.ericsson.com	

Technical Training

Ericsson provides a wide range of training courses on the operation and maintenance of our products and on their supporting technologies. Ericsson can provide both regularly scheduled courses and training tailored to individual needs. Courses can be run either at your premises or at one of our dedicated training facilities.

International

Tel: +44 (0) 23 8048 4229
Fax: +44 (0) 23 8048 4161
Email: tvglobaltraining@ericsson.com

Customer Services and Technical Training Postal Address

Ericsson
Unit 2
Strategic Park
Comines Way
Hedge End
Southampton
Hampshire
SO30 4DA
United Kingdom

Return of Equipment

If you need to return equipment for repair please contact your local Ericsson Customer Services Department.

Please refer to the Customer Services Contact Information on Page viii.

You will then be directed to return the faulty equipment to a repair centre with the appropriate facilities for that equipment. A tracking number will be issued that should be used if you need to enquire about the progress of the repair. The equipment should be properly packed and the tracking number should be clearly marked on the outside of the packaging.

Technical Publications

If you need to contact Ericsson Technical Publications regarding this publication, e-mail: tvttechpubs@ericsson.com.



Introduction

Chapter 1

Contents

1.1	Introduction	1-3
1.1.1	Who Should Use this Reference Guide	1-3
1.1.2	Software Version	1-3
1.1.3	New Features in this Release.....	1-3
1.1.4	What Equipment is Covered by this Reference Guide	1-4
1.1.4.1	AVP 2000 Base Chassis Options	1-4
1.1.4.2	AVP 2000 Option Cards	1-5
1.1.4.3	AVP 3000 Base Chassis Options	1-7
1.1.4.4	AVP 3000 Option Cards	1-8
1.2	Advanced Video Processor (AVP) Overview.....	1-10
1.3	Front Panel	1-11
1.3.1	Power Switch.....	1-11
1.3.2	Confidence Monitor	1-11
1.3.3	Light Bar	1-12
1.3.4	USB Connector.....	1-12
1.3.5	Rotary Knob.....	1-12
1.3.6	Main Display	1-12
1.3.7	Keypad	1-12
1.4	Base Chassis Options	1-12
1.4.1	AVP****/BAS/1AC 1U Base Chassis	1-13
1.4.2	AVP****/BAS/2AC 1U Base Chassis	1-13
1.4.3	AVP****/BAS/2ACFL 1U Base Chassis.....	1-13
1.5	License Keys	1-13

List of Figures

Figure 1.1	Front Panel	1-11
Figure 1.2	Confidence Monitor	1-11
Figure 1.3	AVP****/BAS/1AC Rear Panel with Six Option Cards Fitted	1-13
Figure 1.4	AVP****/BAS/2AC Rear Panel with One CE-x Option Card Fitted	1-13
Figure 1.5	AVP****/BAS/2ACFL Rear Panel with Two Option Cards Fitted	1-13

List of Tables

Table 1.1	AVP 2000 Base Chassis Options	1-4
Table 1.2	AVP 2000 Base Chassis Software Options	1-4

Table 1.3	AVP 2000 Base Chassis Software Upgrades	1-4
Table 1.4	AVP 2000 Option Cards	1-5
Table 1.5	AVP 2000 Option Card Software Options	1-5
Table 1.6	AVP 2000 Option Card Software Upgrades	1-6
Table 1.7	AVP 2000 Option Card Hardware Upgrades.....	1-6
Table 1.8	AVP 3000 Base Chassis Options.....	1-7
Table 1.9	AVP 3000 Base Chassis Software Options.....	1-7
Table 1.10	AVP 3000 Base Chassis Software Upgrades	1-8
Table 1.11	AVP 3000 Option Cards	1-8
Table 1.12	AVP 3000 Option Card Software Options	1-8
Table 1.13	AVP 3000 Option Card Software Upgrades	1-9
Table 1.14	AVP 3000 Option Card Hardware Upgrades.....	1-10

1.1 Introduction

1.1.1 Who Should Use this Reference Guide

This Reference Guide is written for operators / users of the Advanced Video Processor (AVP), Contribution Encoder and Voyager. It describes the unit's functions and operation. The Reference Guide is written to assist in the installation and day-to-day operation and care of the unit. Maintenance information requiring the covers to be removed is not included.



Warning!

Do not remove the top cover of this equipment. Hazardous voltages are present within this equipment and may be exposed if the top cover is removed. Only Ericsson television trained and approved service engineers are permitted to service this equipment.



Caution!

Unauthorized maintenance or the use of non-approved replacements may affect the equipment specification and invalidate any warranties.

1.1.2 Software Version

This Reference Guide covers the functions of software **version 9.8 and later**.

To verify the installed version either:

- Access the front panel, see *Chapter 4, Front Panel Control*.
- Access the Web Browser screens, see *Chapter 5, Web GUI Control*.

This manual continues to be relevant to subsequent build versions where the functionality of the equipment has not changed. Where the build standard changes the functionality, a new issue of this manual will be provided. The appropriate number should be quoted in all correspondence with Ericsson.

1.1.3 New Features in this Release

There are no new features in this release:



1.1.4

What Equipment is Covered by this Reference Guide

This Reference Guide covers the following three main units and options listed in the following tables:

- AVP 2000 Contribution Encoder
- AVP 3000 Voyager

In addition, the general contents apply to the Ericsson Contribution Encoder and Voyager II products. Any exceptions are described in *Annex D*.

1.1.4.1

AVP 2000 Base Chassis Options

The base chassis options available for the AVP 2000 Contribution Encoder are described in the following table.

Table 1.1 AVP 2000 Base Chassis Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP2000/BAS/1AC	FAZ 101 0196/2	KDU 137 910/1	AVP 2000 Contribution Encoder with single AC input
AVP2000/BAS/2AC	FAZ 101 0196/28	KDU 137 910/2	AVP 2000 Contribution Encoder with dual AC input
AVP2000/BAS/2ACFL	FAZ 101 0196/33	KDU 137 910/3	AVP 2000 Contribution Encoder with dual AC Flying Leads

The functionality of the AVP 2000 Contribution Encoder can be augmented by purchasing software licensing keys (software options) described in the following table.

Table 1.2 AVP 2000 Base Chassis Software Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP/SWO/PROFEC	FAZ 101 0119/12	FAT 102 0230	ProMPEG FEC (SMPTE 2022) upgrade license for single SPTS/MPTS output
AVP/SWO/BISS	FAZ 101 0119/9	FAT 102 0394	Single BISS Modes 0,1 and BISS E encryption expansion license
AVP/SWO/REMUX	FAZ 101 0196/6	FAT 102 1862	Internal REMUX option

Further software upgrades are available for the base chassis after the equipment has been shipped via the field upgradable options described in the following table.

Table 1.3 AVP 2000 Base Chassis Software Upgrades

Marketing Code	Price Object Number	Supply Object Number	Description
AVP/UPG/SWO/PROFEC	FAZ 101 0119/15	FAT 102 0231	ProMPEG FEC (SMPTE 2022) upgrade license for single SPTS/MPTS output
AVP/UPG/SWO/BISS	FAZ 101 0119/21	FAT 102 0395	Single BISS Modes 0,1 and BISS E encryption expansion license
AVP/UPS/REMUX	FAZ 101 0196/8	FAT 102 1864	Internal REMUX option

1.1.4.2 AVP 2000 Option Cards

The option cards, which are available to purchase with the AVP 2000 Contribution Encoder, are described the following table.

Table 1.4 AVP 2000 Option Cards

Marketing Code	Price Object Number	Supply Object Number	Description
CE/HWO/CE-a	FAZ 101 0196/11	ROA 128 5359	MPEG Encoder Module
CE/HWO/CE-a/J2K	FAZ 101 0119/79	ROA 128 5164	J2K Encoder Module
CE/HWO/CE-x	FAZ 101 0196/10	ROA 128 5358	MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/HWO/CE-xA	FAZ 101 0196/12	ROA 128 5360	Analog input MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/HWO/G703	FAZ 101 0119/76	ROA 128 5138	G.703 Transceiver Card
CE/HWO/ASI/2IN2OUT	FAZ 101 0119/2	ROA 128 3811	ASI Input/Output Card
CE/HWO/ASI/EXTSYNC	FAZ 101 0119/7	ROA 128 3810	External Sync Module
CE/HWO/GPI	FAZ 101 0119/80	ROA 128 5165	GPI/RS-232 Module
CE/HWO/BLNK	FAZ 101 0119/3	SXA 215 2475/1	Blanking plate

The functionality of the option cards in the AVP 2000 Contribution Encoder can be augmented by purchasing software licensing keys (software options) described the following table.

Table 1.5 AVP 2000 Option Card Software Options

Marketing Code	Price Object Number	Supply Object Number	Description
CE/SWO/M1L2	FAZ1010119/11	FAT 102 0232	1x extra pair of M1L2 audio
CE/SWO/AAC	FAZ 101 0119/47	FAT 102 0717	Enables AAC and HE-AAC audio encoding (for one pair)
CE/SWO/DOLBY/AC3	FAZ1010119/8	FAT 102 0233	Dolby Digital AC-3 audio encoding (for one pair)
CE/SWO/3D	FAZ 101 0119/48	FAT 102 0718	Enables synchronization signaling for 3D operation
CE/SWO/MCTF	FAZ 101 0119/44	FAT 102 0714	1x MCTF noise reduction license
CE/SWO/PAA	FAZ 101 0119/45	FAT 102 0715	Enables 6 or 8 channel MPEG-1 Layer II Phase Aligned Audio
CE/SWO/CE-x/H264	FAZ 101 0196/16	FAT 102 1866	License for H.264 encoding
CE/SWO/CE-x/422	FAZ 101 0196/17	FAT 102 1867	License for 4:2:2 sampling
CE/SWO/CE-x/HD	FAZ 101 0196/21	FAT 102 1871	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-x/H264 is present)
CE/SWO/CE-a/H264	FAZ 101 0196/22	FAT 102 1872	License for H.264 encoding
CE/SWO/CE-a/HD	FAZ 101 0196/20	FAT 102 1870	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-a/H264 is present)



Marketing Code	Price Object Number	Supply Object Number	Description
CE/SWO/CE-a/HDJ2K	FAZ 101 0119/85	FAT 102 1587	License for HD JPEG 2000 encoding
CE/SWO/CE-x/1080p	FAZ 101 0196/30	FAT 102 1983	License for 1080p encoding in HD H.264
CE/SWO/DPI	FAZ 101 0119/87	FAT 102 2474	License for splice point insertion
CE/SWO/CE-x/STRIPE	FAZ 101 0119/89	FAT 102 2616	License for H.264 Stripe Refresh low latency buffer mode on CE-x option card.

Further software upgrades are available for the option cards after the equipment has been shipped via the field upgradable options described in the following table.

Table 1.6 AVP 2000 Option Card Software Upgrades

Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/SWO/M1L2	FAZ 101 0119/18	FAT 102 0235	1x extra pair of M1L2 audio
CE/UPG/SWO/AAC	FAZ 101 0119/52	FAT 102 0722	Enables AAC and HE-AAC audio encoding (for one pair)
CE/UPG/SWO/DOLBY/AC3	FAZ 101 0119/17	FAT 102 0236	Dolby Digital AC-3 audio encoding (for one pair)
CE/UPG/SWO/3D	FAZ 101 0119/53	FAT 102 0723	Enables synchronization signaling for 3D operation
CE/UPG/SWO/MCTF	FAZ 101 0119/49	FAT 102 0719	1x MCTF noise reduction license
CE/UPG/SWO/PAA	FAZ 101 0119/50	FAT 102 0720	Enables 6 or 8 channel MPEG-1 Layer II Phase Aligned Audio
CE/UPG/SWO/CE-x/H264	FAZ 101 0196/18	FAT 102 1868	License for H.264 encoding
CE/UPG/SWO/CE-x/422	FAZ 101 0196/19	FAT 102 1869	License for 4:2:2 sampling
CE/UPG/SWO/CE-x/HD	FAZ 101 0196/24	FAT 102 1874	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-x/H264 is present)
CE/UPG/SWO/CE-a/H264	FAZ 101 0196/25	FAT 102 1875	License for H.264 encoding
CE/UPG/SWO/CE-a/HD	FAZ 101 0196/23	FAT 102 1873	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-a/H264 is present)
CE/UPG/SWO/CE-a/HDJ2K	FAZ 101 0119/86	FAT 102 1588	License for HD JPEG 2000 encoding
CE/UPG/SWO/CE-x/1080p	FAZ 101 0196/31	FAT 102 1984	License for 1080p encoding in HD H.264
CE/UPG/SWO/DPI	FAZ 101 0119/88	FAT 102 2475	License for splice point insertion
CE/UPS/CE-x/STRIPE	FAZ 101 0119/90	FAT 102 2617	License for H.264 Stripe Refresh low latency buffer mode on CE-x option card.

The functionality of the option cards in the AVP 2000 Contribution Encoder can be augmented by purchasing hardware upgrades described in the following table.

Table 1.7 AVP 2000 Option Card Hardware Upgrades

Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/HWO/BLNK	FAZ 101 0119/78	SXA 215 2475/2	Customer-fitble Blanking plate



Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/HWO/ASI/2IN2OUT	FAZ 101 0119/75	ROA 128 4952	Customer-fitble ASI Output Module
CE/UPG/HWO/EXTSYNC	FAZ 101 0119/74	ROA 128 4951	Customer-fitble External Sync Module
CE/UPG/HWO/G703	FAZ 101 0119/77	ROA 128 5139	Customer-fitble G.703 Transceiver Card
CE/UPG/HWO/CE-a/J2K	FAZ 101 0119/81	ROA 128 5166	Customer-fitble J2K Encoder Module
CE/UPG/HWO/CE-a	FAZ 101 0196/14	ROA 128 5362	Customer-fitble MPEG Encoder Module
CE/UPG/HWO/CE-x	FAZ 101 0196/13	ROA 128 5361	Customer-fitble MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/UPG/HWO/CE-xA	FAZ 101 0196/15	ROA 128 5363	Customer-fitble Analog input MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/UPG/HWO/GPI	FAZ 101 0119/82	ROA 128 5167	GPI/RS-232 Module

1.1.4.3 AVP 3000 Base Chassis Options

The base chassis options available for the AVP 3000 Voyager are described in the following table.

Table 1.8 AVP 3000 Base Chassis Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP3000/BAS/1AC	FAZ 101 0196/3	KDU 137 911/1	AVP 3000 Voyager with single AC input
AVP3000/BAS/2AC	FAZ 101 0196/29	KDU 137 911/2	AVP 3000 Voyager with dual AC input
AVP3000/BAS/2ACFL	FAZ 101	KDU 137 911/3	AVP 3000 Voyager with dual AC Flying Leads

The functionality of the AVP 3000 Voyager can be augmented by purchasing software licensing keys (software options) described the following table.

Table 1.9 AVP 3000 Base Chassis Software Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP/SWO/PROFEC	FAZ 101 0119/12	FAT 102 0230	ProMPEG FEC (SMPTE 2022) upgrade license for single SPTS/MPTS output
AVP/SWO/BISS	FAZ 101 0119/9	FAT 102 0394	Single BISS Modes 0,1 and BISS E encryption expansion license
VOY/SWO/DVBDSNG	FAZ 101 0154/7	FAT 102 0759	Enables DVB-DSNG 8PSK and 16QAM modulation
VOY/SWO/DVBS2	FAZ 101 0154/8	FAT 102 0760	Enables DVB-S2 QPSK and 8PSK modulation
VOY/SWO/DVBS2/HOM	FAZ 101 0154/9	FAT 102 0761	Enables DVB-S2 QPSK, 8PSK, 16APSK and 32APSK modulation
VOY/SWO/HSYM	FAZ 101 0154/10	FAT 102 0762	Enables extended symbol rate range
AVP/SWO/REMUX	FAZ 101 0196/6	FAT 102 1862	Internal REMUX option

Further software upgrades are available for the base chassis after the equipment has been shipped via the field upgradable options described in the following table.

Table 1.10 AVP 3000 Base Chassis Software Upgrades

Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/SWO/PROFEC	FAZ 101 0119/15	FAT 102 0231	ProMPEG FEC (SMPTE 2022) upgrade license for single SPTS/MPTS output
CE/UPG/SWO/BISS	FAZ 101 0119/21	FAT 102 0395	Single BISS Modes 0,1 and BISS E encryption expansion license
VOY/UPG/SWO/DVBDSNG	FAZ 101 0154/13	FAT 102 0765	Enable DVB-DSNG 8PSK and 16QAM modulation
VOY/UPG/SWO/DVBS2	FAZ 101 0154/14	FAT 102 0766	Enable DVB-S2 QPSK and 8PSK modulation
VOY/UPG/SWO/DVBS2/HOM	FAZ 101 0154/15	FAT 102 0767	Enable DVB-S2 QPSK, 8PSK, 16APSK and 32APSK modulation
VOY/UPG/SWO/HSYM	FAZ 101 0154/16	FAT 102 0768	Enable extended symbol rate range
AVP/UPS/REMUX	FAZ 101 0196/8	FAT 102 1864	Internal REMUX option

1.1.4.4 AVP 3000 Option Cards

The option cards, which are available to purchase with the AVP 3000 Voyager, are described in the following table.

Table 1.11 AVP 3000 Option Cards

Marketing Code	Price Object Number	Supply Object Number	Description
CE/HWO/CE-a	FAZ 101 0196/11	ROA 128 5359	MPEG Encoder Module
CE/HWO/CE-a/J2K	FAZ 101 0119/79	ROA 128 5164	J2K Encoder Module
CE/HWO/CE-x	FAZ 101 0196/10	ROA 128 5358	MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/HWO/CE-xA	FAZ 101 0196/12	ROA 128 5360	Analog input MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/HWO/G703	FAZ 101 0119/76	ROA 128 5138	G.703 Transceiver Card
CE/HWO/ASI/2IN2OUT-a	FAZ 101 0119/2	ROA 128 3811	ASI Input/Output Card
CE/HWO/ASI/EXTSYNC	FAZ 101 0119/7	ROA 128 3810	External Sync Module
CE/HWO/GPI	FAZ 101 0119/80	ROA 128 5165	GPI/RS-232 Module
CE/HWO/BLNK	FAZ 101 0119/3	SXA 215 2475/1	Blanking plate

The functionality of the option cards in the AVP 3000 Voyager can be augmented by purchasing software licensing keys (software options) described in the following table.

Table 1.12 AVP 3000 Option Card Software Options

Marketing Code	Price Object Number	Supply Object Number	Description
CE/SWO/M1L2	FAZ1010119/11	FAT 102 0232	1x extra pair of M1L2 audio
CE/SWO/AAC	FAZ 101 0119/47	FAT 102 0717	Enables AAC and HE-AAC audio encoding (for one pair)
CE/SWO/DOLBY/AC3	FAZ1010119/8	FAT 102 0233	Dolby Digital AC-3 audio encoding (for one pair)



Marketing Code	Price Object Number	Supply Object Number	Description
CE/SWO/3D	FAZ 101 0119/48	FAT 102 0718	Enables synchronization signaling for 3D operation
CE/SWO/MCTF	FAZ 101 0119/44	FAT 102 0714	1x MCTF noise reduction license
CE/SWO/PAA	FAZ 101 0119/45	FAT 102 0715	Enables 6 or 8 channel MPEG-1 Layer II Phase Aligned Audio
CE/SWO/CE-x/H264	FAZ 101 0196/16	FAT 102 1866	License for H.264 encoding
CE/SWO/CE-x/422	FAZ 101 0196/17	FAT 102 1867	License for 4:2:2 sampling
CE/SWO/CE-x/HD	FAZ 101 0196/21	FAT 102 1871	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-x/H264 is present)
CE/SWO/CE-a/H264	FAZ 101 0196/22	FAT 102 1872	License for H.264 encoding
CE/SWO/CE-a/HD	FAZ 101 0196/20	FAT 102 1870	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-a/H264 is present)
CE/SWO/CE-a/HDJ2K	FAZ 101 0119/85	FAT 102 1587	License for HD JPEG 2000 encoding
CE/SWO/CE-x/1080p	FAZ 101 0196/30	FAT 102 1983	License for 1080p encoding in HD H.264
CE/SWO/DPI	FAZ 101 0119/11	FAT 102 0232	License for splice point insertion
CE/SWO/CE-x/STRIPE	FAZ 101 0119/89	FAT 102 2616	License for H.264 Stripe Refresh low latency buffer mode

Further software upgrades are available for the option cards after the equipment has been shipped via the field upgradable options described in the following table.

Table 1.13 AVP 3000 Option Card Software Upgrades

Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/SWO/M1L2	FAZ 101 0119/18	FAT 102 0235	1x extra pair of M1L2 audio
CE/UPG/SWO/AAC	FAZ 101 0119/52	FAT 102 0722	Enables AAC and HE-AAC audio encoding (for one pair)
CE/UPG/SWO/DOLBY/AC3	FAZ 101 0119/17	FAT 102 0236	Dolby Digital AC-3 audio encoding (for one pair)
CE/UPG/SWO/3D	FAZ 101 0119/53	FAT 102 0723	Enables synchronization signaling for 3D operation
CE/UPG/SWO/MCTF	FAZ 101 0119/49	FAT 102 0719	1x MCTF noise reduction license
CE/UPG/SWO/PAA	FAZ 101 0119/50	FAT 102 0720	Enables 6 or 8 channel MPEG-1 Layer II Phase Aligned Audio
CE/UPG/SWO/CE-x/H264	FAZ 101 0196/18	FAT 102 1868	License for H.264 encoding
CE/UPG/SWO/CE-x/422	FAZ 101 0196/19	FAT 102 1869	License for 4:2:2 sampling
CE/UPG/SWO/CE-x/HD	FAZ 101 0196/24	FAT 102 1874	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-x/H264 is present)
CE/UPG/SWO/CE-a/H264	FAZ 101 0196/25	FAT 102 1875	License for H.264 encoding
CE/UPG/SWO/CE-a/HD	FAZ 101 0196/23	FAT 102 1873	License for HD MPEG-2 encoding (and for HD H.264 encoding if CE/SWO/CE-a/H264 is present)

Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/SWO/CE-a/HDJ2K	FAZ 101 0119/86	FAT 102 1588	License for HD JPEG 2000 encoding
CE/UPG/SWO/CE-x/1080p	FAZ 101 0196/31	FAT 102 1984	License for 1080p encoding in HD H.264
CE/UPG/SWO/DPI	FAZ 101 0119/88	FAT 102 2475	License for splice point insertion
CE/UPS/CE-x/STRIPE	FAZ 101 0119/90	FAT 102 2617	License for H.264 Stripe Refresh low latency buffer mode

The functionality of the option cards in the AVP 3000 Voyager can be augmented by purchasing hardware upgrades described in the following table.

Table 1.14 AVP 3000 Option Card Hardware Upgrades

Marketing Code	Price Object Number	Supply Object Number	Description
CE/UPG/HWO/BLNK	FAZ 101 0119/78	SXA 215 2475/2	Blanking plate
CE/UPG/HWO/ASI/2IN2OUT	FAZ 101 0119/75	ROA 128 4952	ASI Output Module
CE/UPG/HWO/EXTSYNC	FAZ 101 0119/74	ROA 128 4951	External Sync Module
CE/UPG/HWO/G703	FAZ 101 0119/77	ROA 128 5139	G.703 Transceiver Card
CE/UPG/HWO/CE-a/J2K	FAZ 101 0119/81	ROA 128 5166	J2K Encoder Module
CE/UPG/HWO/CE-a	FAZ 101 0196/14	ROA 128 5362	MPEG Encoder Module
CE/UPG/HWO/CE-x	FAZ 101 0196/13	ROA 128 5361	MPEG Encoder Module (Pre-processor and Encoder Card pair)
CE/UPG/HWO/CE-xA	FAZ 101 0196/15	ROA 128 5363	Analog input MPEG Encoder module (Pre-processor and Encoder Card pair)
CE/UPG/HWO/GPI	FAZ 101 0119/82	ROA 128 5167	GPI/RS-232 Module

1.2 Advanced Video Processor (AVP) Overview

The AVP is a flexible platform consisting of a base unit or chassis in to which various option cards can be plugged. The base unit provides an Ethernet control interface for configuration, an Ethernet data interfaces for data routing between the host and the option cards, and basic transport stream processing functionality. Other functionalities such as video encoding, audio encoding, or other input or output interfaces are provided by option cards through various interfaces.

The following is a summary of the features of the base chassis:

- 19 inch 1 'RU' rack mount chassis.
- Front panel main display and keypad for control and status reporting.
- Power switch.
- Tri-color light bar to indicate chassis health.
- Dual redundant Ethernet control ports.
- Dual redundant Ethernet ports for data input and output.

- Option card slots (the number of option cards that may be fitted is different for each base unit).
- Option cards are ‘hot swappable’.
- Confidence monitor for monitoring input video stream.

1.3 Front Panel

The front panel of the unit consists of a power switch, a confidence monitor, a light bar, an USB Connector, a rotary knob, a main display and a keypad.

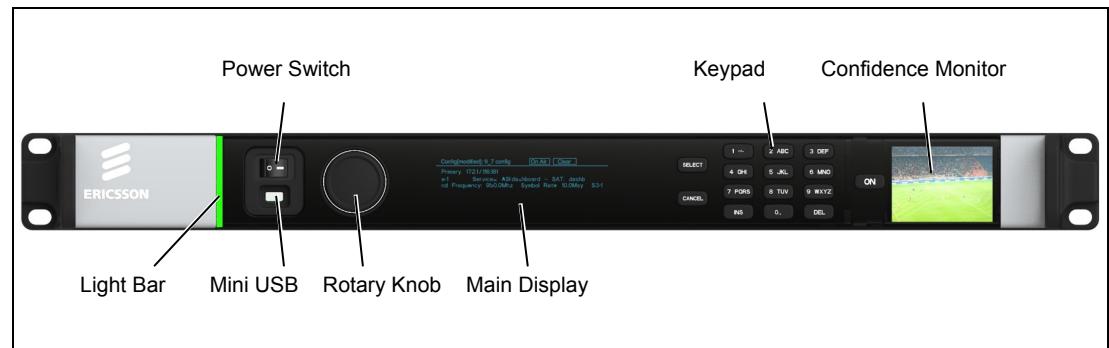


Figure 1.1 Front Panel

1.3.1 Power Switch

The mains switch is recessed to prevent accidental switch-off.

1.3.2 Confidence Monitor

The confidence monitor allows the user to monitor the selected input video signal.



Figure 1.2 Confidence Monitor

The confidence monitor is a 1.8 inch TFT LCD. The On key on the confidence monitor turns the monitor on or off. By pressing and holding the **On** key, operation related data is shown. The first line displays the total number of hours the monitor has been operating; the second line displays the software version. The source of the video to be displayed, the sleep timeout time and the monitor brightness can be set up through the front panel or the web user interface. For details on how to configure the settings for the confidence monitor see *Chapter 3, Getting Started*.

1.3.3 Light Bar

The light bar is green when there are no active alarms or warnings and red if there is a critical alarm. The light bar is yellow if there is an active warning, minor or major alarm.

1.3.4 USB Connector

The USB connector provides an interface for saving or exporting configurations to, and loading or importing configuration from an USB stick. Moreover, by applying an USB-Ethernet adaptor, the Ethernet port of a control computer can be connected to the USB connector on the Front Panel of the unit.

1.3.5 Rotary Knob

The rotary knob is used for scrolling through and selecting the menu items.

1.3.6 Main Display

Control and status information is displayed on a graphic VFD display.

1.3.7 Keypad

Select and Cancel keys, as well as a numeric keypad is provided for interaction.

1.4 Base Chassis Options

The AVP chassis consists of a base chassis, single or dual AC mains input and up to six option cards. The base chassis is a 1RU 19 inch rack mount chassis that contains control interfaces and two pairs of dual redundant Ethernet ports for data output.

Additionally, the AVP3000 includes a Satellite Modulator option card as standard.

Option cards are responsible for video, audio and data processing, and for producing output through various interfaces. The option cards are ‘Hot Swappable’, that is, they can be inserted or removed while the chassis is powered on, within the limitations described in *Chapter 7, Options, Licenses and Upgrades*.

1.4.1

AVP**/BAS/1AC 1U Base Chassis**

This chassis option provides a single mains input and slots for up to six option cards.



*Figure 1.3 AVP****/BAS/1AC Rear Panel with Six Option Cards Fitted*

1.4.2

AVP**/BAS/2AC 1U Base Chassis**

This chassis option provides a dual mains input and slots for up to four option cards.



*Figure 1.4 AVP****/BAS/2AC Rear Panel with One CE-x Option Card Fitted*

1.4.3

AVP**/BAS/2ACFL 1U Base Chassis**

This chassis option provides dual mains input via flying leads and slots for up to six option cards.



*Figure 1.5 AVP****/BAS/2ACFL Rear Panel with Two Option Cards Fitted*

1.5

License Keys

Licenses control the availability of some of the features accessible from the unit.

A License Key consists of a feature, and the number of instances of this feature that are allowed within the chassis or option card.

License Keys are allocated on a ‘first configured first served’ basis. If an attempt is made to enable a feature, but the required license key is not available then the feature is not enabled, and a log message is generated.

BLANK



Installing the Equipment

Chapter 2

Contents

2.1	Read This First!	2-3
2.2	Mounting and Ventilation	2-3
2.2.1	Fixing and Rack Mounting	2-3
2.2.2	Ventilation.....	2-3
2.3	Signal Connections.....	2-4
2.3.1	Rear Panel Signal Connectors	2-4
2.3.2	Data Ethernet Connector.....	2-5
2.3.3	Control Ethernet Connector.....	2-6
2.3.4	CE Option Modules	2-7
2.3.4.1	Digital Video Input (All CE Option Modules).....	2-7
2.3.4.2	Analogue Video Input via the CVBS Interface (CE-xA)	2-8
2.3.4.3	Digital Audio Input Connector (All CE and EN VCM Option Modules) .	2-8
2.3.4.4	Analogue Audio Input via the 15-way D-type Connector (CE-xA)	2-10
2.3.5	Satellite Modulator Option Card Connectors	2-12
2.3.6	ASI I/O Option Card Connectors	2-13
2.3.7	G.703 Transceiver Option Card Connectors	2-14
2.3.8	External Sync Input Option Card Connector.....	2-14
2.3.9	GPI Option Card Connectors.....	2-15
2.3.10	Mini USB Connector	2-16

List of Figures

Figure 2.1	Air-Flow through the Equipment	2-3
Figure 2.2	Rear Panel With CE-x VCM, SatMod and ASI I/O Options Fitted	2-4
Figure 2.3	Satellite Modulator Option Card Rear Panel	2-12
Figure 2.4	ASI I/O Option Card.....	2-13
Figure 2.5	G.703 Option Card Rear Panel	2-14
Figure 2.6	External Sync Input Option Card	2-14
Figure 2.7	Mini USB Connector	2-16

List of Tables

Table 2.1	Data Ethernet Connector.....	2-5
Table 2.2	Link Speed: Left (Green) LED	2-5
Table 2.3	Link Activity: Right (Yellow) LED	2-5
Table 2.4	Control Ethernet Connector.....	2-6
Table 2.5	Port Status: Left (Green) LED	2-6



Table 2.6 Link Activity: Right (Yellow) LED	2-7
Table 2.7 Digital Video Input via the SDI/HD-SDI Interface	2-7
Table 2.8 Lock LED State Descriptions.....	2-7
Table 2.9 Analogue Video Input via the CVBS Interface.....	2-8
Table 2.10 CVBS LED State Descriptions	2-8
Table 2.11 Audio Breakout Cables.....	2-8
Table 2.12 Breakout Cable Detection Criteria.....	2-9
Table 2.13 Digital Audio Input (Balanced).....	2-9
Table 2.14 Digital Audio Input (Unbalanced).....	2-10
Table 2.15 Audio Breakout Cables.....	2-10
Table 2.16 Breakout Cable Detection Criteria.....	2-11
Table 2.17 Analogue Audio Input (Balanced).....	2-11
Table 2.18 Analogue Audio Input (Unbalanced)	2-12
Table 2.19 Satellite Modulator Option Card Connectors.....	2-13
Table 2.20 ASI I/O Option Card Connectors	2-13
Table 2.21 G.703 Transceiver Option Card Connectors	2-14
Table 2.22 External Sync Input Option Card Connector	2-14
Table 2.23 GPI Data In Connector (Not supported in this release).....	2-15
Table 2.24 GPI Alarm Contact Closure Connector	2-15
Table 2.25 Data Input Connector Pin-out.....	2-16



2.1

Read This First!

Please refer to the *Installation, Safety and Compliance Information for Ericsson Compression Products Reference Guide* supplied with your product for full details of installation requirements. This guide only contains additional product specific information where required.

2.2

Mounting and Ventilation

2.2.1

Fixing and Rack Mounting

The equipment is designed for fixed use only and has been shipped with fixing brackets suitable for a standard 19-inch rack. When installed in a rack, it should be secured using the fixing brackets. In addition, support shelves must be used to reduce the weight on the brackets. Ensure it is firmly and safely located and it has an adequate free-flow of air.

Slide the unit onto the chassis supports and affix to the rack by means of an M6 x 18 mm panhead screw in each corner.

A freestanding unit should be installed on a secure horizontal surface where it is unlikely to be knocked or its connectors and leads disturbed.

2.2.2

Ventilation

Side openings in the unit, as well as side-mounted cooling fans, are provided for ventilation. They ensure reliable operation of the product and protect it from overheating. The openings of the fans must not be blocked or covered.



Figure 2.1 Air-Flow through the Equipment

2.3 Signal Connections

2.3.1 Rear Panel Signal Connectors



Caution!

It is strongly recommended that the terminal marked $\frac{1}{\square}$ at the rear panel of the equipment is connected to a site Technical Earth before any external connections are made and the equipment is powered. This limits the migration of stray charges.

Signal connections are made via the rear panel. The rear panels, which are available are shown below. Full technical specifications for the connections are given in *Annex B*.

Only the Data and Control Ethernet connectors and the PSU connectors are mounted on the chassis. All other connections at the rear panel are provided with the option modules that may be fitted. Examples are shown below.

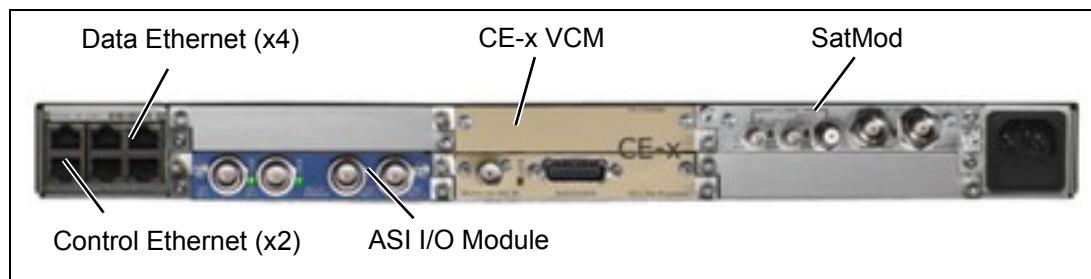


Figure 2.2 Rear Panel With CE-x VCM, SatMod and ASI I/O Options Fitted



2.3.2

Data Ethernet Connector

The unit has four Ethernet ports - two for data input, and two for data output and will respond to ARPs, pings and other low-level Ethernet traffic. The ports are accessible via RJ-45 connectors on the rear panel of the chassis. These are labeled Ge 1, Ge 2, Ge 3 and Ge 4. Ge 1 and Ge 2 are used for data input, while Ge 3 and Ge 4 are data output.

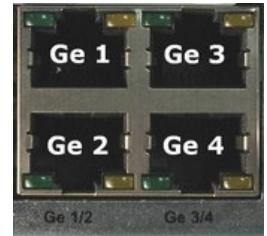


Table 2.1 Data Ethernet Connector

Item	Specification
Connector type	RJ-45 (100/1000 Base T)
Connector designation	Ge 1 (data input) Ge 2 (data input) Ge 3 (data output) Ge 4 (data output)
Pin outs (Unused pins are not connected)	Pin 1 - Tx Out (+) Pin 2 - Tx Out (-) Pin 3 - Rx In (+) Pin 6 - Rx In (-)

Status and Activity Indication

Each Ethernet Data Port has a rear panel mounted status LED associated with it to indicate link status, activity and speed as follows:

Table 2.2 Link Speed: Left (Green) LED

Link Speed	LED Status	
No Link	Off	-----
100 Mbps	Flash Off x 2	— [green] — [green] [green] [green] [green] — [green] — [green] [green] [green] [green]
1000 Mbps	Flash Off x 3	— [green] — [green] — [green] [green] [green] — [green] — [green] — [green] [green] [green]

The left LED flash sequence period is 1 s, with a short flash duration of 100 ms.

Table 2.3 Link Activity: Right (Yellow) LED

Link Speed	LED Status	
No Link	Off	-----
Link	On	[yellow]
Activity	Flash	— [yellow] — [yellow] — [yellow] [yellow] [yellow] — [yellow] [yellow] — [yellow] [yellow]



2.3.3

Control Ethernet Connector

The Ethernet control ports are used to connect the equipment to a PC for access with a web browser. Both connectors share the same IP address, CTL 1 is the Primary control port, and is by default the active control port. Control Port CTL 2 should be considered as the secondary control network as it will not respond to the Control Port IP Address unless control has been passed to it either as a result of a redundancy switch, or via a user command. The active control port switches when CTL 1 has no link (e.g. carrier), and CTL 2 has the link.



Table 2.4 Control Ethernet Connector

Item	Specification
Connector type	RJ-45 (100/1000 Base T)
Connector designation	CTL 1 CTL 2
Pin outs (Unused pins are not connected)	Pin 1 - Tx Out (+) Pin 2 - Tx Out (-) Pin 3 - Rx In (+) Pin 6 - Rx In (-)

Status and Activity Indication

Each Ethernet Control Port has rear panel mounted status LEDs to indicate link status, activity and speed as follows:

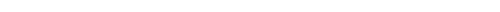
Table 2.5 Port Status: Left (Green) LED

Port Status	Link Speed	LED Status
Active Port	No Link	Off
	100 Mbps	Flash Off x 2
	1000 Mbps	Flash Off x 3
Spare Port	No Link	Off
	100 Mbps	Flash On x 2
	1000 Mbps	Flash On x 3

The left LED flash sequence period is 1 s, with a short flash duration of 100 ms.



Table 2.6 Link Activity: Right (Yellow) LED

Link Speed	LED Status	
No Link	Off	-----
Link	On	
Activity	Flash	

2.3.4

CE Option Modules

The following connectors are provided on the CE Video Compression Modules.

2.3.4.1

Digital Video Input (All CE Option Modules)

Standard and High Definition digital video can be input via the $75\ \Omega$ female BNC connector (labeled 3G/HD/SD-SDI) on the rear panel. The figure shows the SDI/HD-SDI type $75\ \Omega$ female BNC video input connector located on the rear panel of the module. The LED (labeled LOCK) next to the connector shows the lock status of the input video signal.



Table 2.7 Digital Video Input via the SDI/HD-SDI Interface

Item	Specification	
Connector types		75 Ω female BNC
Connector designation		3G/HD/SD SDI IN
Pin-outs	Centre Shield	Input Ground/Chassis

Table 2.8 Lock LED State Descriptions

Item	Description
Off	The SDI/HD-SDI Input is not active.
Red	The SDI/HD-SDI Input is active, but not locked.
Green	The SDI/HD-SDI Input is active and is locked.
Alternate Red and Green	The SDI/HD-SDI Input is active, but video with the wrong line standard is being received.



2.3.4.2

Analogue Video Input via the CVBS Interface (CE-xA)

Analogue composite video can be input via the 75Ω female BNC connector (CVBS) on the rear panel.



Table 2.9 Analogue Video Input via the CVBS Interface

Item		Specification
Connector types		75Ω female BNC
Connector designation		CVBS
Pin-outs	Centre Shield	Input Ground/Chassis

Table 2.10 CVBS LED State Descriptions

Item	Description
Off	The CVBS input is not active.
Red	The CVBS input is active, but not locked.
Green	The CVBS input is active and is locked.
Alternate Red and Green	The CVBS input is active, but video with the wrong.

2.3.4.3

Digital Audio Input Connector (All CE and EN VCM Option Modules)

Digital audio may be input via the 15-way D-type connector labeled AUDIO/DATA. The connector supports both balanced and unbalanced digital audio signals, though not at the same time. The connector does not support simultaneous analogue and digital input. The digital audio can either be balanced (AES3) or unbalanced (AES3-id) depending on the audio breakout cable used.



Table 2.11 Audio Breakout Cables

Marketing Code	Part Number	Supported Audio Mode
AVP/CAB/BAL	S14936 Audio Breakout Cable	Balanced Audio: 4 XLRs in + 1 BNC for Audio Reference Output
AVP/CAB/UNBAL	S14937 Audio Breakout Cable	Unbalanced Audio: 4 BNCs in + 1 BNC out for Audio Reference Output

Note: An audio breakout cable is NOT supplied as standard with the chassis, and must be ordered separately.

The chassis detects which cable is fitted (balanced or unbalanced) and makes the necessary selection.

*Table 2.12 Breakout Cable Detection Criteria*

Item	AES3	AES-3id
Interface	Balanced	Unbalanced
Connector	XLR-3	BNC
Impedance	110 Ω	75 Ω
Input Level	2-7 V peak to peak	1 V peak to peak
Max Input	7 V peak to peak	1.2 V peak to peak
Max Current	64 mA	1.6 mA
Min Input	0.2 V	0.32 V
Cable	Shielded Twisted Pair	Coax
Interface	Balanced	Unbalanced

Balanced Audio (AVP/CAB/BAL)

With this option four balanced AES3 audio channels can be connected to the Audio/Data D-Type connector on an option card.

An XLR socket is provided for each of the four digital inputs, and a 75 Ω BNC plug for an AES3 reference signal at 3.072 Mbps. The reference signal contains a 1 kHz tone at -6 dBFS at a sample rate of 48 kHz.

Table 2.13 Digital Audio Input (Balanced)

Item	Specification		
Connector types	15-way D-Type		
Connector designation	AUDIO/DATA		
Pin Outs	Digital 1 – 1 Digital 1 – 2 Digital 1 – 3 Digital 2 – 1 Digital 2 – 2 Digital 2 – 3 Digital 3 – 1 Digital 3 – 2 Digital 3 – 3 Digital 4 – 1 Digital 4 – 2 Digital 4 – 3 Ref – 1 Ref – Shell	Shell 1 9 11 10 3 Shell 4 12 Shell 13 6 7 15	Screen Digital 1 Line Digital 1 Return Screen Digital 2 Line Digital 2 Return Screen Digital 3 Line Digital 3 Return Screen Digital 4 Line Digital 4 Return AES3 Reference (48 kHz) Screen



Unbalanced Audio (AVP/CAB/UNBAL)

With this option four unbalanced AES-3id audio channels can be connected to the Audio/Data D-Type connector on an option card.

A BNC plug is provided for each of the four digital inputs, and a $75\ \Omega$ BNC plug for an AES3 reference signal at 3.072 Mbps. The reference signal contains a 1 kHz tone at -6 dBFS at a sample rate of 48 kHz.

Table 2.14 Digital Audio Input (Unbalanced)

Item	Specification		
Connector types	15-way D-Type		
Connector designations	AUDIO/DATA		
Pin Outs	Digital 1 – 1 Digital 1 – Shell Digital 2 – 1 Digital 2 – Shell Digital 3 – 1 Digital 3 – Shell Digital 4 – 1 Digital 4 – Shell Ref – 1 Ref – Shell	1 9 10 3 4 12 13 6 7 15	Digital 1 Line Screen Digital 2 Line Screen Digital 3 Line Screen Digital 4 Line Screen AES3 Reference (48 kHz) Screen

2.3.4.4

Analogue Audio Input via the 15-way D-type Connector (CE-xA)

Two stereo pairs of analogue audio may be input via the 15-way D-type connector labeled AUDIO/DATA. The analogue audio can either be balanced or unbalanced depending on the audio breakout cable used.



Table 2.15 Audio Breakout Cables

Marketing Code	Part Number	Supported Audio Mode
AVP/CAB/BAL	S14936 Audio Breakout Cable	Balanced Audio: 4 XLRs in + 1 BNC for Audio Reference Output
AVP/CAB/UNBAL	S14937 Audio Breakout Cable	Unbalanced Audio: 4 BNCs in + 1 BNC out for Audio Reference Output

Note: An audio breakout cable is NOT supplied as standard with the chassis, and must be ordered separately.

The chassis detects which cable is fitted (balanced or unbalanced) and makes the necessary selection.

**Table 2.16 Breakout Cable Detection Criteria**

Item	AES3	AES-3id
Interface	Balanced	Unbalanced
Connector	XLR-3	BNC
Impedance	110 Ω	75 Ω
Input Level	2-7 V peak to peak	1 V peak to peak
Max Input	7 V peak to peak	1.2 V peak to peak
Max Current	64 mA	1.6 mA
Min Input	0.2 V	0.32 V
Cable	Shielded Twisted Pair	Coax

Balanced Audio (AVP/CAB/BAL)

With this option four balanced analogue audio channels can be connected to the Audio/Data D-Type connector on a VCM option card.

An XLR socket is provided for each of the four analogue inputs, and a 75 Ω BNC plug for an AES3 reference signal. The reference signal contains a 1 kHz tone at -6 dBFS at a sample rate of 48 kHz.

Table 2.17 Analogue Audio Input (Balanced)

Item	Specification		
Connector types	15-way D-Type		
Connector designation	AUDIO/DATA		
Pin Outs	Analogue 1 – 1	Shell	Screen
	Analogue 1 – 2	1	Audio in 1 +
	Analogue 1 – 3	9	Audio in 1 -
	Analogue 2 – 1	11	Screen
	Analogue 2 – 2	10	Audio in 2 +
	Analogue 2 – 3	3	Audio in 2 -
	Analogue 3 – 1	Shell	Screen
	Analogue 3 – 2	4	Audio in 3 +
	Analogue 3 – 3	12	Audio in 3 -
	Analogue 4 – 1	Shell	Screen
	Analogue 4 – 2	13	Audio in 4 +
	Analogue 4 – 3	6	Audio in 4 -
	Ref – 1	7	AES3 Reference (48 kHz)
	Ref – Shell	15	Screen



Unbalanced Audio (AVP/CAB/UNBAL)

With this option four unbalanced audio channels can be connected to the Audio/Data D-Type connector on a VCM option card. A BNC plug is provided for each of the four analogue inputs, and a 75 Ω BNC plug for an AES3 reference signal at 3.072 Mbps. The reference signal contains a 1 kHz tone at -6 dBFS at a sample rate of 48 kHz.

Table 2.18 Analogue Audio Input (Unbalanced)

Item	Specification		
Connector types	15-way D-Type		
Connector designation	AUDIO/DATA		
Pin Outs	Analogue 1 – 1	1	Audio 1 Line
	Analogue 1 – Shell	9	Screen
	Analogue 2 – 1	10	Audio 2 Line
	Analogue 2 – Shell	3	Screen
	Analogue 3 – 1	4	Audio 3 Line
	Analogue 3 – Shell	12	Screen
	Analogue 4 – 1	13	Audio 4 Line
	Analogue 4 – Shell	6	Screen
	Ref – 1	7	AES3 Reference (48 kHz)
	Ref - Shell	15	Screen

2.3.5

Satellite Modulator Option Card Connectors

The Satellite Modulator Option Card takes MPEG Transport Streams on its input and provides a modulated output either in L-band (950 – 2150 MHz) or in IF band (80 – 150 MHz) according to the DVB-S, DVB-DSNG or DVB-S2 specification.

The output signal can be fed to an up-converter for mixing the signal to the appropriate satellite channel. The module is also capable of powering the downstream up-converter. The module can take two input Transport Streams and encode and modulate one of them at a time. If the Transport Stream being modulated is lost for some reason, the module can switch automatically to the other Transport Stream input and continue the transmission using that. The L-band input can be used for inputting a modulated L-band signal to the module. The module then can combine the input and its own modulated output and feed a common up-converter with the combined signal.



Figure 2.3 Satellite Modulator Option Card Rear Panel

**Table 2.19 Satellite Modulator Option Card Connectors**

Item		Specification
Connector types		50 Ω female SMA L-Band (L-BAND IN and L-BAND OUT MAIN) 75 Ω female SMA L-Band F-type (L-BAND OUT MON) 75 Ω female BNC (IF OUT MAIN and IF OUT MONITOR)
Connector designation		L-BAND IN L-BAND OUT MAIN L-BAND OUT MON IF OUT MAIN IF OUT MONITOR
Pin-outs	Centre Shield	Input/Output/Monitor Ground/Chassis

2.3.6 ASI I/O Option Card Connectors

The ASI I/O Option Card rear panel provides two ASI inputs and two ASI outputs.

**Figure 2.4 ASI I/O Option Card****Table 2.20 ASI I/O Option Card Connectors**

Item		Specification
Connector types		75 Ω female BNC
Connector designation		ASI IN 1 ASI IN 2 ASI OUT 1 ASI OUT 2
Pin-outs	Centre Shield	Input Ground/Chassis

The input connectors are used for feeding the unit with external Transport Streams for external data insertion.

The output connectors can be configured as a mirrored output pair (with the same Transport Stream on both outputs) or two independent outputs (with different Transport Streams on each output).



2.3.7

G.703 Transceiver Option Card Connectors

The G.703 Transceiver card provides one PDH (Plesiochronous Digital Hierarchy) output interface that can be used for interfacing Transport Streams to PDH networks. The interface is G.703 compliant, and can provide support for E carriers, namely E31 (E3) and E32 (DS3) as specified in ITU-T Rec. G.703.

Note: The G.703 Transceiver Card has an input interface, but the G.703 input is not supported in this release.



Figure 2.5 G.703 Option Card Rear Panel

Table 2.21 G.703 Transceiver Option Card Connectors

Item		Specification
Connector types		75 Ω female BNC
Connector designation		OUT
Pin-outs	Centre Shield	Input Ground/Chassis

2.3.8

External Sync Input Option Card Connector

The External Sync Option Card rear panel connector is used for connecting a 10 MHz 1 V_{pp} reference signal or an analogue video signal.



Figure 2.6 External Sync Input Option Card

Table 2.22 External Sync Input Option Card Connector

Item		Specification
Connector types		75 Ω female BNC
Connector designation		SYNC IN
Pin-outs	Centre Shield	Input Ground/Chassis



2.3.9

GPI Option Card Connectors

The General Purpose Interface (GPI) Option Card provides the following interfaces.

Table 2.23 GPI Data In Connector (Not supported in this release)

Item	Specification
Connector types	9-way D-type female (not supported in this release)
Connector designation	DATA IN

Table 2.24 GPI Alarm Contact Closure Connector

Item	Specification																																																																											
Connector types	25-way D-type female																																																																											
Connector designation	GPI/ALARM																																																																											
Pin-outs	<table> <tbody> <tr><td>1</td><td>14</td><td>GPI Pin 1</td></tr> <tr><td>2</td><td>15</td><td>GPI Pin 2</td></tr> <tr><td>3</td><td>16</td><td>GPI Pin 3</td></tr> <tr><td>4</td><td>17</td><td>GPI Pin 4</td></tr> <tr><td>5</td><td>18</td><td>GPI Pin 5</td></tr> <tr><td>6</td><td>19</td><td>GPI Pin 6</td></tr> <tr><td>7</td><td>20</td><td>GPI Pin 7</td></tr> <tr><td>8</td><td>21</td><td>GPI Pin 8</td></tr> <tr><td>9</td><td>22</td><td>GPI Pin 9</td></tr> <tr><td>10</td><td>23</td><td>GPI Pin 10</td></tr> <tr><td>11</td><td>24</td><td>GPI Pin 11</td></tr> <tr><td>12</td><td>25</td><td>GPI Pin 12</td></tr> <tr><td>13</td><td></td><td>GPI Pin 13</td></tr> <tr><td></td><td></td><td>GPI Pin 14</td></tr> <tr><td></td><td></td><td>GPI Pin 15</td></tr> <tr><td></td><td></td><td>GPI Pin 16</td></tr> <tr><td></td><td></td><td>Reset</td></tr> <tr><td></td><td></td><td>Fail (NO)</td></tr> <tr><td></td><td></td><td>Fail (COM)</td></tr> <tr><td></td><td></td><td>Fail (NC)</td></tr> <tr><td></td><td></td><td>Alarm (NO)</td></tr> <tr><td></td><td></td><td>Alarm (COM)</td></tr> <tr><td></td><td></td><td>Alarm (NC)</td></tr> <tr><td></td><td></td><td>GND</td></tr> <tr><td></td><td></td><td>Sync/10 MHz</td></tr> </tbody> </table>	1	14	GPI Pin 1	2	15	GPI Pin 2	3	16	GPI Pin 3	4	17	GPI Pin 4	5	18	GPI Pin 5	6	19	GPI Pin 6	7	20	GPI Pin 7	8	21	GPI Pin 8	9	22	GPI Pin 9	10	23	GPI Pin 10	11	24	GPI Pin 11	12	25	GPI Pin 12	13		GPI Pin 13			GPI Pin 14			GPI Pin 15			GPI Pin 16			Reset			Fail (NO)			Fail (COM)			Fail (NC)			Alarm (NO)			Alarm (COM)			Alarm (NC)			GND			Sync/10 MHz
1	14	GPI Pin 1																																																																										
2	15	GPI Pin 2																																																																										
3	16	GPI Pin 3																																																																										
4	17	GPI Pin 4																																																																										
5	18	GPI Pin 5																																																																										
6	19	GPI Pin 6																																																																										
7	20	GPI Pin 7																																																																										
8	21	GPI Pin 8																																																																										
9	22	GPI Pin 9																																																																										
10	23	GPI Pin 10																																																																										
11	24	GPI Pin 11																																																																										
12	25	GPI Pin 12																																																																										
13		GPI Pin 13																																																																										
		GPI Pin 14																																																																										
		GPI Pin 15																																																																										
		GPI Pin 16																																																																										
		Reset																																																																										
		Fail (NO)																																																																										
		Fail (COM)																																																																										
		Fail (NC)																																																																										
		Alarm (NO)																																																																										
		Alarm (COM)																																																																										
		Alarm (NC)																																																																										
		GND																																																																										
		Sync/10 MHz																																																																										

NO, NC and COM label normally open, normally closed and common alarm or fail relay contacts respectively.



GPI Data Input Connector (Not supported in this release)

The Data Input provides an asynchronous serial data communications interface conforming to the IEC-232 (RS-232) standard.

The DATA IN connector is a 9-way D-type female connector on the rear panel. The pin connections are shown in *Table 2.25*.

Table 2.25 Data Input Connector Pin-out

Remote (DTE) Male			Option Card (DTE) Female	
Signal Name	Pin	Signal Direction	Pin	Signal Name
	1		1	Not Connected
Received Data	2	←	2	Received Data
Transmit Data	3	→	3	Transmit Data
	4		4	Not Connected
Signal Ground	5	—	5	Signal Ground
	6		6	Not Connected
	7		7	Not Connected
	8		8	Not Connected
	9		9	Not Connected

2.3.10 Mini USB Connector

The mini USB connector on the front panel of the AVP chassis provides an interface for remote web access and update from a computer, and for saving or exporting configurations to, and loading or importing configurations from a USB stick.



Figure 2.7 Mini USB Connector

For details on using the mini USB connector, see *Chapter 4, Front Panel Control*.



Getting Started

Chapter 3

Contents

3.1	Introduction	3-5
3.2	How to Connect Up the Unit	3-5
3.3	How to Power Up the Unit	3-6
3.4	How to Set the Unit IP Address	3-6
3.5	How to Configure Ethernet Control Ports	3-8
3.6	How to Configure Ethernet Data Ports	3-10
3.7	How to Configure the AVP Using the Web GUI.....	3-12
3.7.1	Voyager II and AVP 3000	3-12
3.7.1.1	Assumed Workflow	3-12
3.7.1.2	What to Expect	3-13
3.7.1.3	Voyager Dashboard Summary	3-14
3.7.1.4	General Voyager Dashboard Limitations.....	3-18
3.7.2	General AVP Configuration	3-19
3.7.3	How to Configure Advanced Video Processor Settings.....	3-19
3.7.3.1	General Advanced Video Processor Settings.....	3-19
3.7.3.2	Configure Option Card Output Parameters	3-21
3.7.4	How to Configure Output Transport Streams	3-22
3.7.5	How to Configure to Use a Separate PCR	3-25
3.7.6	How to Set Up Pass-through Transport Streams	3-26
3.7.6.1	Configuration	3-26
3.7.7	How to Set Up Remux	3-27
3.7.7.1	Configuration	3-27
3.7.7.2	Remux of External Tables	3-29
3.7.8	How to Set Up Internal PSIP Data Insertion.....	3-29
3.7.9	How to Configure the Front Panel Video Confidence Monitor	3-31
3.7.10	How to Configure VLAN Tagging	3-31
3.7.11	How to Copy and Move Transport Streams and Services.....	3-32
3.7.12	How to Customize the Quick Set-up Menu to Quickly Access Required Features	3-33
3.8	How to Configure the AVP Using the Front Panel.....	3-34
3.8.1	How to Configure Video Parameters	3-34
3.8.2	How to Configure Audio Parameters	3-35
3.8.3	How to Set Up a Transport Stream	3-36
3.8.4	How to Add More Transport Streams	3-39
3.8.5	How to Remove a Component from a Service	3-39
3.9	How to Configure Video (Recommendations)	3-39
3.10	How to Set up Bit Rate Tracking	3-41



3.11	How to Return to Default Settings from the GUI	3-43
3.12	How to Set Up Audio Pass-through.....	3-43
3.13	How to Set Up Phase Aligned Audio Encoding.....	3-44
3.14	How to Set Up Input for 3/2L (5.1 Surround) Encoding.....	3-45
3.15	How to Set Up BISS Encryption for Services	3-46
3.15.1	BISS and Stored Configurations	3-50
3.16	Digital Programme Insertion (DPI)	3-50
3.16.1	Splice Point Operation.....	3-50
3.16.2	SCTE104 Over IP.....	3-52
3.16.3	How to Configure Splicing	3-52
3.17	How to Configure GPI Triggered Splicing	3-53
3.17.1	How to Set Up a GPI Card	3-53
3.17.2	How to Set Up a VCM to Use GPI Inputs.....	3-54
3.18	How to Control Temperature/Fan Speed	3-54
3.19	How to Get and Apply Additional Licenses	3-56
3.19.1	Verifying Which Licenses Are Present in the Unit	3-56
3.19.2	Ordering Additional Licenses	3-56
3.19.3	Entering License Keys.....	3-57
3.20	Alarm Monitoring	3-58
3.21	Simple Network Management Protocol.....	3-58
3.21.1	Supported Protocols.....	3-58
3.21.2	Operation	3-59

List of Figures

Figure 3.1	AVP Connections	3-5
Figure 3.2	Ethernet Control Port Numbering	3-8
Figure 3.3	Ethernet Data Port Numbering	3-10
Figure 3.4	Voyager Dashboard - Pop-Up Display When the Output is not Configured.....	3-13
Figure 3.5	Voyager Dashboard Web Page.....	3-14
Figure 3.6	Voyager Dashboard - Immediate Action Banner.....	3-14
Figure 3.7	Voyager Dashboard - Configuration Changes Requiring Apply Button.....	3-15
Figure 3.8	Voyager Dashboard - Modifying Component Configuration.....	3-15
Figure 3.9	Voyager Dashboard - Configuring Carrier ID and Encryption Key	3-16
Figure 3.10	Voyager Dashboard - Alarm List	3-16
Figure 3.11	Voyager Dashboard - Tools	3-17
Figure 3.12	Switching between Voyager Dashboard and Advanced Configuration GUI	3-17
Figure 3.13	Carrier ID Setup	3-20
Figure 3.14	Setting the Parameters for Satellite Transmission	3-21
Figure 3.15	Service Configuration Web Page – Adding a Transport Stream	3-22
Figure 3.16	Service Configuration Web Page – Adding a Service	3-23
Figure 3.17	Service Configuration Web Page – Adding a Component	3-24
Figure 3.18	Video Component Output.....	3-25
Figure 3.19	Setting PCR PID Value	3-26
Figure 3.20	Configuring a Pass-through Transport Stream.....	3-26
Figure 3.21	Properties Panel view of Pass-through Transport Stream	3-27
Figure 3.22	Drag and Drop service from ASI input to Output Transport Stream.....	3-28
Figure 3.23	Remux Configuration Wizard	3-28

Figure 3.24 Setting Internal PSIP Data Insertion on the GUI	3-30
Figure 3.25BISS Enabling and Key Selection	3-48
Figure 3.26 Setting BISS Key value	3-48
Figure 3.27 Editing a BISS Key	3-49
Figure 3.28 Fan Control.....	3-55
Figure 3.29 Finding the Host Card Chip ID for License Generation.....	3-57
Figure 3.30 Finding the Option Card Chip ID for License Generation	3-57
Figure 3.31 Alarm Monitoring	3-58

List of Tables

Table 3.1 IP Address Restrictions	3-7
Table 3.2 Ethernet Control Port Parameters	3-8
Table 3.3 Ethernet Data Port Parameters	3-10
Table 3.4 VLAN Creation Options	3-31
Table 3.5 VLAN Tag Sharing Options	3-32
Table 3.6 Video Parameter Settings.....	3-34
Table 3.7 Audio Input Settings	3-35
Table 3.8 Audio Encode Settings	3-36
Table 3.9 Transport Stream Parameters	3-36
Table 3.10 IP Related Parameters	3-37
Table 3.11 Component and Service Parameters	3-38
Table 3.12 GOP Length.....	3-40
Table 3.13 Bit Rate Weighting Parameters	3-43
Table 3.14 License Requirements for PAA Encoding	3-44
Table 3.15 Embedded Stereo Channel Pairs	3-46
Table 3.16 Example Multiple Operation SCTE104 Message Structure.....	3-51
Table 3.17 DPI PID Index Value.....	3-52
Table 3.18 Splicing Control Options	3-53
Table 3.19 SNMP Interface Parameters	3-59



BLANK



3.1 Introduction

Due to the number of different ways the Advanced Video Processor (AVP) Series can be used, it is impossible to give precise setting up instructions for every possible working scenario. This chapter, therefore, gives general guidance and principles on how to power up and set up your unit for operation and describes the more common operations you will want to perform.

For details of all Front Panel menus and controls, see *Chapter 4, Front Panel Control*. For details of all Web Graphical User Interface (GUI) menus and controls, see *Chapter 5, Web GUI Control*.

For more information on possible networking scenarios, see *Chapter 6, Advanced Video Processing and Networking*.

3.2 How to Connect Up the Unit

See *Chapter 2, Installing the Equipment* for all connector details.

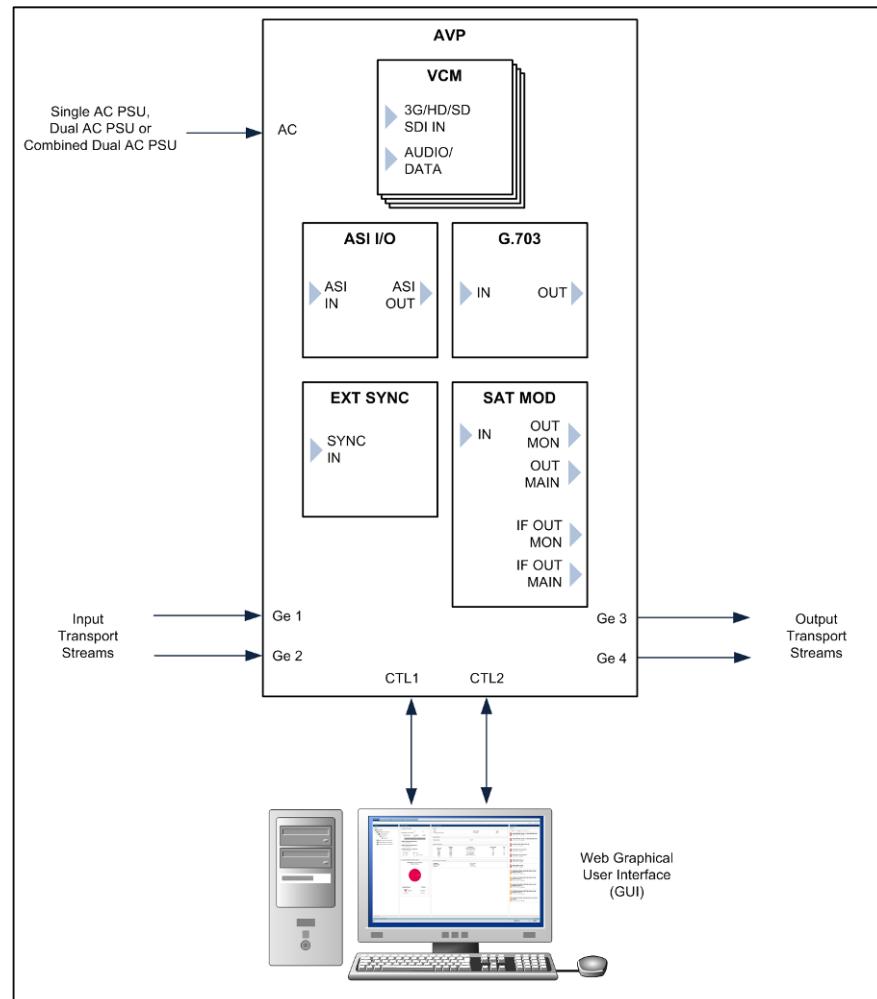


Figure 3.1 AVP Connections



To connect up the unit(s):

1. Connect signal input connectors Ge 1 and Ge 2 (for your input Transport Streams) to your local area network if IP inputs are to be used.
2. Connect signal output connectors Ge 3 and Ge 4 (for your output Transport Streams) to your local area network if IP outputs are to be used.
3. Connect computer control connectors CTL1 and CTL2 (for Web GUI Control) to your local area network. Both connectors share the same IP address, Ctrl1 is the Primary control port, and is by default the active control port. Control Port Ctrl2 should be considered as the secondary control network as it will not respond to the Control Port IP Address unless control has been passed to it either as a result of a redundancy switch, or via a user command. The active control port switches when Ctrl1 has no link (e.g. carrier), and Ctrl2 has the link.
4. Connect single or dual AC or DC power connectors, depending on the option purchased, to the power supply.
5. Connect your signal cables to/from your option cards, depending on which options are fitted to your unit, as required.

3.3

How to Power Up the Unit

To power up the unit(s):

1. With all signal and power cables connected as required, switch on unit using the front panel switch.
2. Wait for unit initialisation to complete.



Caution!

This equipment should not be operated unless the cooling fans are working and there is free-air flow around the unit.

3.4

How to Set the Unit IP Address

Setting the IP address of a unit is accomplished using the front panel menus. For a full description of these menus, see *Chapter 4, Front Panel Control*.

To set the IP address of the unit(s):

1. Ensure the unit is fully powered up.
2. On the AVP front panel, using the rotary knob, scroll down to the **Unit Config > Remote Control Setup** option.
3. Press knob to select.

4. Using the keys on the keypad, set the IP address, subnet mask and gateway address.
5. Press the **Select** button to save or **Cancel** to discard the changes.

Note: It may be necessary to set the IP address, gateway address and Virtual IP address to 0, and to set a subnet mask in order to allow the IP address to be changed.

IP Addresses on the unit must adhere to RFC3330 range of restrictions as listed in the following table of allocated IP addresses.

Table 3.1 IP Address Restrictions

Block	Present Use	Reference
0.0.0/8	This Network	[RFC1700, p4]
10.0.0.0/8	Private-Use Networks	[RFC1918]
14.0.0.0/8	Public-Data Networks	[RFC1700, p181]
24.0.0.0/8	Cable Television Networks	---
39.0.0.0/8	Reserved but subject to allocation	[RFC1797]
127.0.0.0/8	Loopback	[RFC1700, p5]
128.0.0.0/16	Reserved but subject to allocation	---
169.254.0.0/16	Link Local	---
172.16.0.0/12	Private-Use Networks	[RFC1918]
191.255.0.0/16	Reserved but subject to allocation	---
192.0.0.0/24	Reserved but subject to allocation	---
192.0.2.0/24	Test-Net	---
192.88.99.0/24	6to4 Relay Anycast	[RFC3068]
192.168.0.0/16	Private-Use Networks	[RFC1918]
198.18.0.0/15	Network Interconnect Unit Benchmark Testing	[RFC2544]
223.255.255.0/24	Reserved but subject to allocation	---
224.0.0.0/4	Multicast	[RFC3171]
240.0.0.0/4	Reserved for Future Use	[RFC1700, p4]

Notes: The control network and data networks should not conflict.

It is suggested that the ranges for these networks are in the Private-Use Networks as listed in the summary Table.

IP Address range 192.168.10.x (subnet 255.255.255.0) is used for internal unit communications, so should not be used for external communications.

3.5 How to Configure Ethernet Control Ports

Overview

The Base Chassis has two Ethernet control ports that support IEEE 802.3 100BaseTX and 1000BaseT protocols. The control ports are accessible via RJ-45 connectors mounted on the rear panel of the unit.



Figure 3.2 Ethernet Control Port Numbering

The Ethernet control ports are used to connect the unit to a control computer for control through a web browser or to a control system for control through nCompass Control.

Ethernet Control Port Parameters

A single IP port is defined for all Ethernet control traffic to and from the chassis. The physical ports used for Ethernet control are by default the control Ethernet ports. The control ports can raise an alarm during abnormal operational conditions.

The parameters defining the control Ethernet port are as shown in the following table.

Table 3.2 Ethernet Control Port Parameters

Parameter	Values	Description	Comments
Network Mode	Same Network [default]	The interface pair is on the same subnet.	Read only parameter
	Different Network	The interface pair is on different subnet.	
IP Redundancy Mode	Active-Active	The same traffic is present on both interfaces all the time.	Read only parameter.
	Active-Standby [default]	The secondary interface is active only if the primary is down.	
Autorevert	Auto-revert to Primary [default]	Defines which of the interface group will be used when connection is lost	
	Auto-revert to Secondary		
Autorevert delay		The delay in seconds before a redundancy switch occurs, after the interface link is up. If this is set to 0 then switching happens immediately.	



Parameter	Values	Description	Comments
Active Interface	Primary, Secondary	The currently active interface	Read only parameter
Line Speed	Auto [default]	The connection speed	
	100 Mbps		
	1 Gbps		
Duplex Mode	Auto [default]	Auto negotiate the mode	
	Full Duplex	Simultaneously transmit and receive	
	Half Duplex	Transmit and receive in a time division manner	
Default MAC Address	aa:bb:cc:dd:ee:ff	The virtual MAC address of the Gex interface.	Read only parameter
IP Address	aaa.bbb.ccc.ddd	Virtual IP address of the control interface group	IP address used for control and configuration of the unit. Should not be set to 0.0.0.0
Subnet Mask	0.0.0.0 [default] aaa.bbb.ccc.ddd	Subnet mask for the control interface group	
Default Gateway	0.0.0.0 [default]	No defined gateway	
	aaa.bbb.ccc.ddd	Gateway address for packets outside the defined subnet	
IGMP mode selection	IGMP v3	Uses version 3 of the IGMP protocol	
	IGMP v2 [default]	Uses version 2 of the IGMP protocol	
Physical Control Interface <n>			
Default MAC Address	aa:bb:cc:dd:ee:ff	The MAC address of the Gex interface.	Read only parameter
Link Status	Link Up (1000)	Link is up and the link speed is 1000 Mbps.	
	Link Up (100)	Link is up and the link speed is 100 Mbps.	
	Link Down	Link is down.	
Link Up Time	days : hours : mins : secs	The length of time that the link has been up. If the link goes down this value is reset to 0.	Read only parameter
TX Packets		Number of IP packets transmitted	Read only parameter
RX Packets		Number of IP packets received	Read only parameter
IP Address	aaa.bbb.ccc.ddd	IP address of the physical control interface	If set to 0.0.0.0 control interfaces will only respond to virtual IP address Setting the physical IP address allows the interface to be pinged to validate the connection. This is not intended not be used as the IP address for configuration and control. Must be on the same subnet and gateway as the virtual interface.

3.6 How to Configure Ethernet Data Ports

Overview

Four gigabit Ethernet ports are provided for data input and output.



Figure 3.3 Ethernet Data Port Numbering

Ethernet Data Port Parameters

The data Ethernet ports Ge 1 and Ge 2 are bonded together, as are Ge 3 and Ge 4. Each port of a pair transmits the same IP traffic. If the IP address, or subnet mask of a secondary port is set to 0.0.0.0, then it will be assumed that it is operating in a mirrored redundancy configuration with the primary port, and therefore has the same IP address and subnet mask.

VLAN Tagging

VLAN tagging is supported on the Data Output interfaces. To configure VLAN, browse to **Device Configuration > Advanced Setup** and select **Vlan Group** in the appropriate output under the **Vlan Tags** folder. Alternatively, you can also use the front panel to set up VLANs. The settings can be found under **Advanced/System/Base Unit/Vlan Tags**.

The data Ethernet ports are configured by the parameters listed in the following table.

Table 3.3 Ethernet Data Port Parameters

Parameter	Values	Description	Comments
Network Mode	Same Network [default]	The interface pair is on the same subnet.	
	Different Network	The interface pair is on different subnet.	
IP Redundancy Mode	Active-Active	The same traffic is present on both interfaces all the time.	Data Inputs Ge 1/2 Active – Active only (read only parameter) Data Outputs GE 3/4 are configurable
	Active-Standby	The secondary interface is active only if the primary is down.	
Active Interface	Primary, Secondary	The currently active interface	Read only parameter
Line Speed	Auto	The connection speed	



Parameter	Values	Description	Comments
	100 Mbps 1 Gbps		
Duplex Mode	Auto [default] Full Duplex Half Duplex	Auto negotiate the mode Simultaneously transmit and receive Transmit and receive in a time division manner	
Default Virtual MAC Address	aa:bb:cc:dd:ee:ff	The virtual MAC address of the Gex interface.	Read only parameter
IP Address	aaa.bbb.ccc.ddd	Virtaul IP address of the data interface group	Must be unique Will be used as source address for multicast output.
Subnet Mask	0.0.0.0 [default] aaa.bbb.ccc.ddd	Subnet mask for the data interface group	
Default Gateway	0.0.0.0 [default] aaa.bbb.ccc.ddd	No defined gateway Gateway address for packets outside the defined subnet	
IGMP mode selection	IGMP v3 IGMP v2 [default]	Uses version 3 of the IGMP protocol Uses version 2 of the IGMP protocol	
Physical Data Interface <n>			
Default MAC Address	aa:bb:cc:dd:ee:ff	The MAC address of the Gex interface.	Read only parameter
Link Status	Link Up (1000) Link Up (100) Link Down	Link is up and the link speed is 1000 Mbps. Link is up and the link speed is 100 Mbps. Link is down.	Read only parameter
Link Up Time	days : hours : mins : secs	The length of time that the link has been up. If the link goes down this value is reset to 0.	Read only parameter
TX Packets		Number of IP packets transmitted	Read only parameter
RX Packets		Number of IP packets received	Read only parameter
IP Address	aaa.bbb.ccc.ddd	Physical IP address of the data interface	Can remain set to 0.0.0.0 Must be unique if set Setting the physical IP address allows the interface to be pinged to validate the connection. Must be on the same subnet and gateway as the virtual interface.



Data Input (Ge1 and Ge2)

The unit has two Ethernet ports that can be used for data input, and responds to ARPs and pings. Currently input data is not supported.

Data Output (Ge3 and Ge4)

The unit can generate one or more output Transport Streams from the components produced by the option cards fitted. The IP output Transport Stream packets are encapsulated in IP packets prior to being transmitted via the Ethernet Data ports. The base unit does not provide any other interface through which Transport Streams can be output.

3.7 How to Configure the AVP Using the Web GUI

The unit is configured using the web browser Graphical User Interface (GUI). For details of all the GUI screens and options, see *Chapter 5, Web GUI Control*.

For details of supported Web Browsers please refer to the release notes accompanying the software release.

3.7.1 Voyager II and AVP 3000

Units fitted with a Satellite Modulator option card will default to the new Voyager Dashboard.

For units with no Satellite Modulator fitted, skip this section and go to *3.7.2 General AVP Configuration*.

The Voyager Dashboard is aimed at providing a single page, quick and easy-to-use, user interface for the day-to-day operation of DSNG units. It is NOT a replacement for the existing advanced user interface and does NOT support full configuration of the unit. It provides access to the primary settings that an operator may need access to in order to make minor adjustments to frequently used parameters, and to easily perform a line-up procedure ready for a broadcast.

3.7.1.1 Assumed Workflow

The workflow is based on the use of existing configurations which are already loaded onto the unit. These configurations are created and stored on the unit using the original advanced user interface which is still accessible via a link on the dashboard.

Once the configuration is loaded the frequently used parameters become available on the Voyager Dashboard.



3.7.1.2

What to Expect

The Voyager Dashboard requires the Satellite Modulator output to be configured with a Transport Stream containing one service, with a video component, before parameters will be displayed.

Following a software upgrade to version 9.7 (or manually clearing the device configuration) the Satellite Modulator output is not configured. In this case when opening a browser session to the unit, a pop-up box is displayed informing you that there is no output service configured.

The box provides a link to access and load a stored configuration (which, if stored in an earlier version of software, must be converted to match the release version) or a link to go to the Advanced Configuration pages and manually configure the output as required.

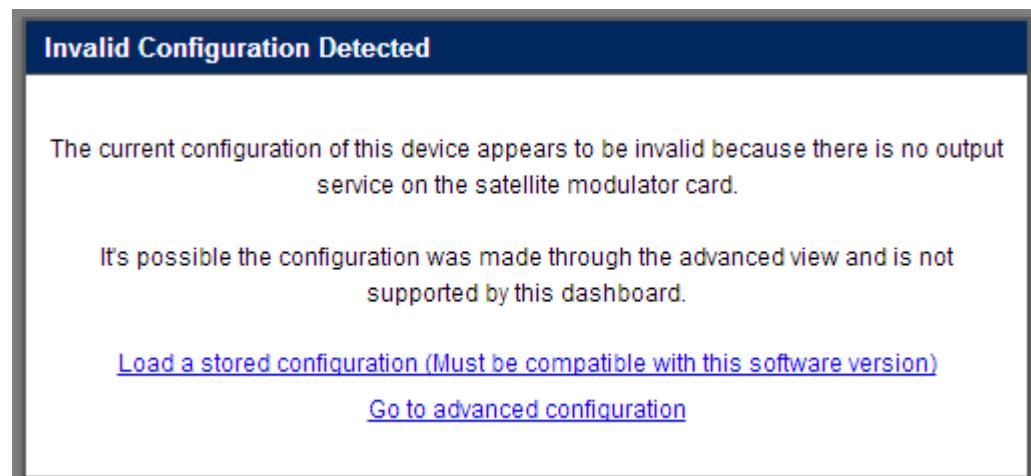


Figure 3.4 Voyager Dashboard - Pop-Up Display When the Output is not Configured.

Note: New units may be supplied with a default basic configuration that has configured the output with a Transport Stream. The contents of the Transport Stream or parameters of the service and components in the Transport Stream can be modified as required.

Once the Satellite Modulator output is configured the Voyager Dashboard is displayed.

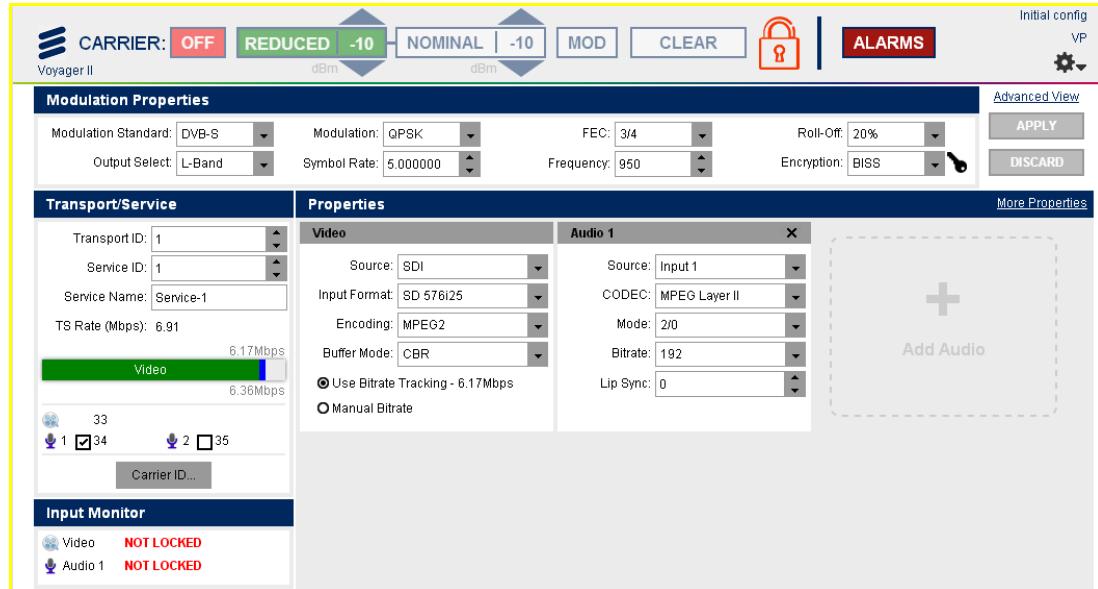


Figure 3.5 Voyager Dashboard Web Page

3.7.1.3

Voyager Dashboard Summary

3.7.1.3.1

Immediate Action Banner - Output Configuration

The parameters, shown in the header banner, are immediately actioned on the unit, when adjusted, without the need for an additional **Apply**. The parameters in this banner are protected by the padlock to help prevent accidental changes to the output configuration.

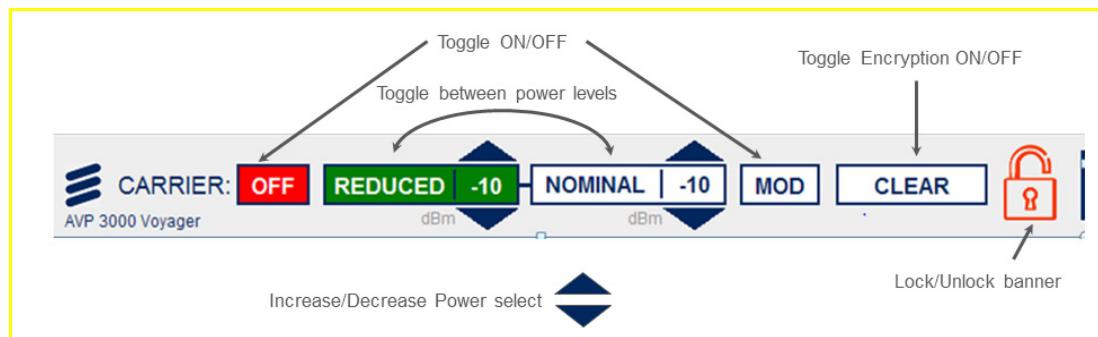


Figure 3.6 Voyager Dashboard - Immediate Action Banner

3.7.1.3.2

Configurable Parameters Requiring Apply Button

The remaining configurable parameters available on the Voyager Dashboard operate in the same way as before, in that multiple changes can be made which are not loaded onto the unit until the **Apply** button is pressed.

As before, changes that have not been applied are highlighted, and the **Apply** and **Discard** buttons become active.

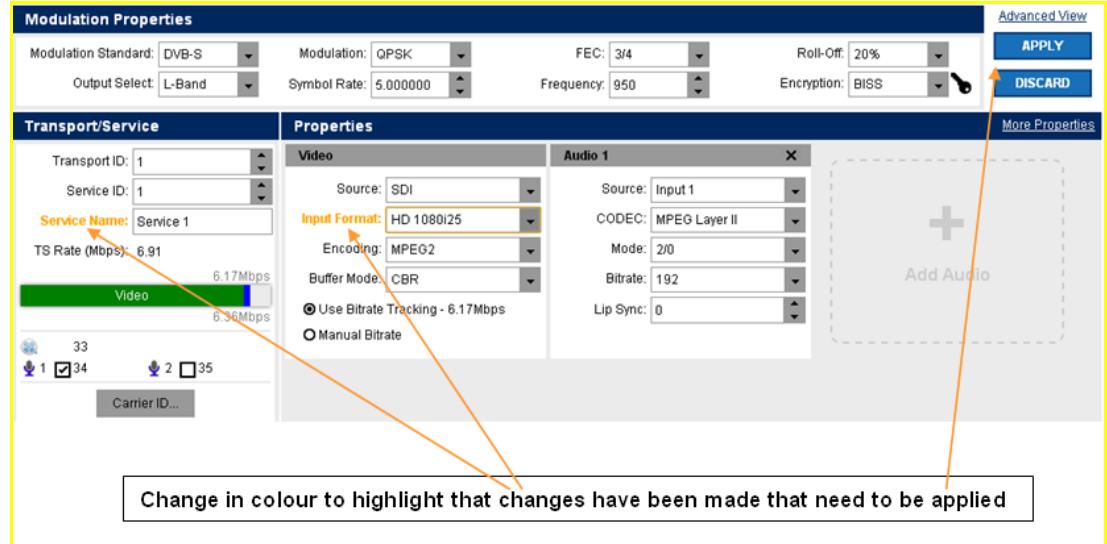


Figure 3.7 Voyager Dashboard - Configuration Changes Requiring Apply Button

3.7.1.3.3 Service Configuration

The Voyager Dashboard provides the ability to modify the configuration of the output Transport Stream Service Information, Carrier ID information, encryption mode and key (RAS or BISS if licensed) as well as the ability to add or remove available audio components.

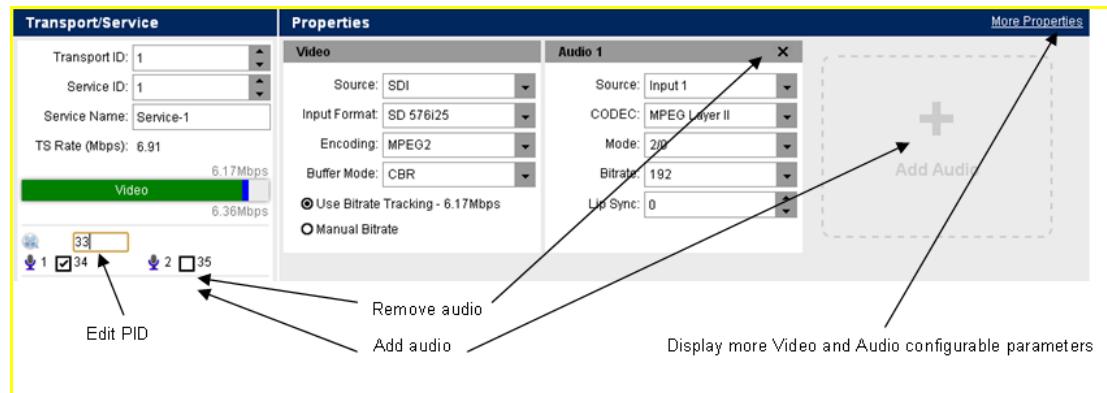


Figure 3.8 Voyager Dashboard - Modifying Component Configuration

Note: The number of audio components available is determined by the number of audio components included in the service (up to a maximum of 8). If more are required, the user should go to the advanced view and add the required audio components.

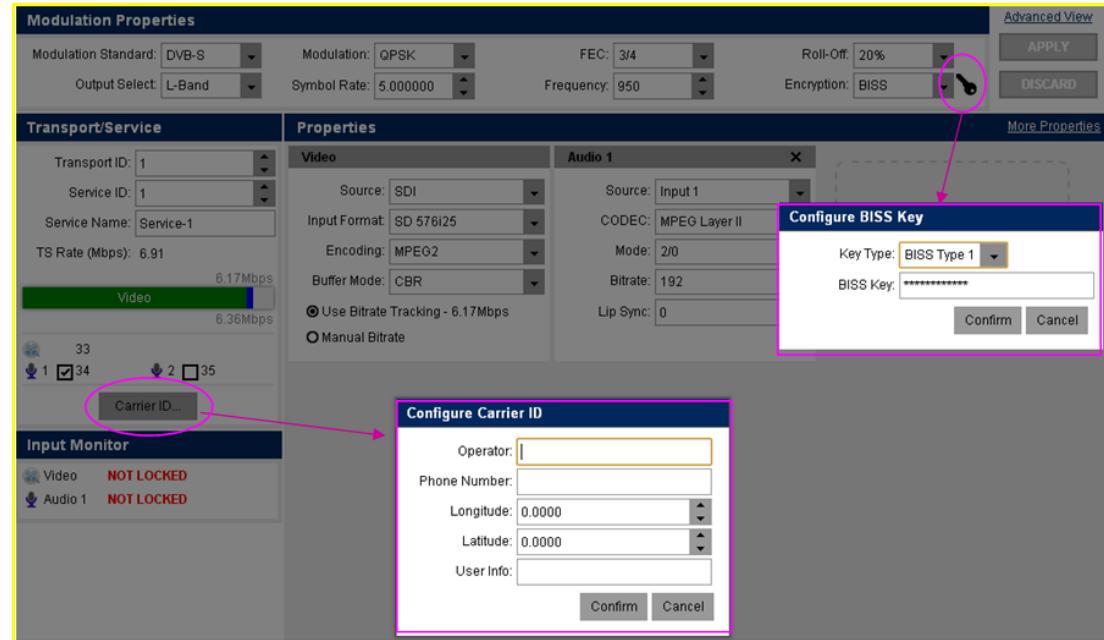


Figure 3.9 Voyager Dashboard - Configuring Carrier ID and Encryption Key

3.7.1.3.4 Alarm Status Information

The color of the alarm button indicates the highest level alarm. Selecting the button displays a pop-up listing the current active alarms.

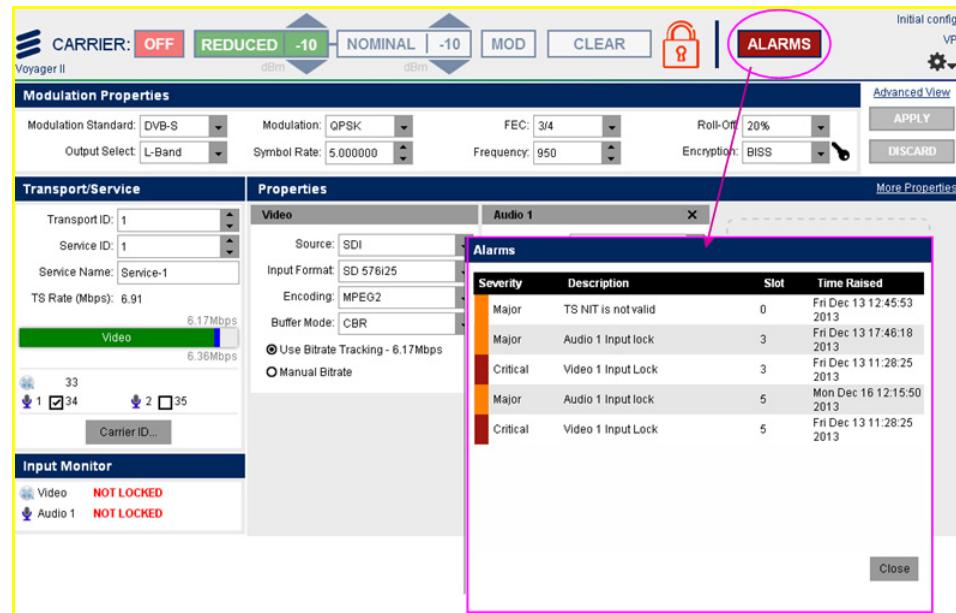


Figure 3.10 Voyager Dashboard - Alarm List



3.7.1.3.5 Additional Support Tools

The drop-down list accessed from the tools icon provides the user with access to some additional useful information or tools. The licenses available on the unit can be viewed, access to the stored configurations list (to either load or save a configuration) is provided as well as the ability to reset the unit.

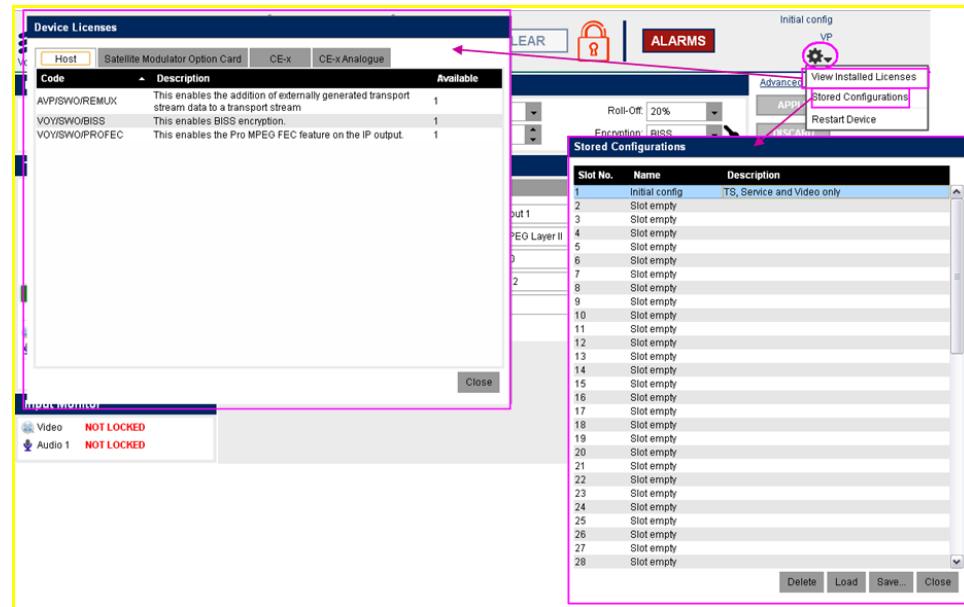


Figure 3.11 Voyager Dashboard - Tools

3.7.1.3.6 Switching Between Voyager and Advanced GUI

Links are provided on both the Voyager Dashboard and the Advanced View to allow the user to switch between the pages to access parameters that are not supported by the Voyager Dashboard.

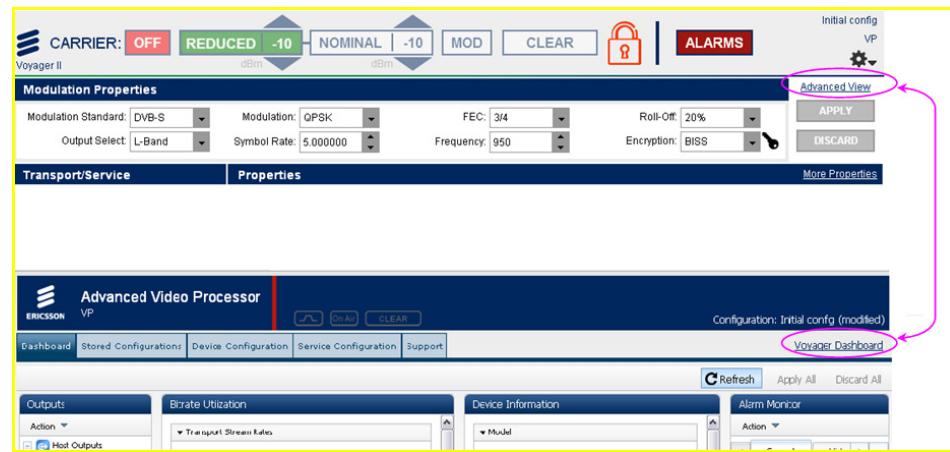


Figure 3.12 Switching between Voyager Dashboard and Advanced Configuration GUI



3.7.1.4

General Voyager Dashboard Limitations

The following is a list of limitations which should be observed when using the Voyager Dashboard.

1. Only the Satellite Modulator Output is available on the Voyager Dashboard. This means that:
 - Any other required outputs need to be controlled via the advanced configuration pages (advanced view).
 - For monitoring outputs it is recommend that they are a “copy as mirror” of the Satellite Modulator output so that changes are automatically reflected in all outputs.
2. The Satellite Modulator output MUST be configured with a TS containing a service with video and audio components. This means that:
 - The Transport Stream must be set online.
 - Only a single service with one video and up to eight audio components is supported on the Voyager Dashboard.
 - All required components must be initially added to the service using the advanced pages.
 - Additional services and video components need to be controlled using the advanced view.
 - Any VBI or ANC requirements must be configured using the advanced view.
3. A Remux service must NOT be the first service in the Satellite Modulator output TS as:
 - The Voyager Dashboard will reject a Remux service as a non-supported configuration. Ensure that the first service contains components encoded in the box.
 - A Remux service can be the second service, but there is no visibility or access to this service from the Voyager Dashboard.
4. An ASI to Satellite Modulator pass-through transport stream is not recognised as a supported output configuration for the Voyager Dashboard. The advanced view needs to be used for this configuration.
5. Current alarm status is reported on the Voyager Dashboard but alarm masking needs to be performed using the advanced view.
6. A browser refresh may be needed to update the display to show some changes made using other interfaces (e.g. via front panel). This applies to both Voyager Dashboard and the advanced view.
7. Some unlicensed features are displayed but an attempt to configure the feature will result in an error message pop-up stating **not enough licenses** and the configuration will be rejected.



8. Limited Video Profiles. The Voyager Dashboard only supports configuring MPEG-2 Main profile (main level for SD or high level for HD) and H.264 High (level 3.1 for SD or level 4.1 for HD) profiles. This means:
 - It is not possible to configure SD H264 Main Level 3.0, SD H264 High Level 3.0 or HD H264 Main level 4.0, which are available on the Advanced view.
 - Down conversion of HD to SD is not configurable using the Voyager Dashboard and if it has been set using the advanced pages the Voyager Dashboard does not display the configuration.

3.7.2

General AVP Configuration

Units that do not have a Satellite Modulator option card fitted default to the standard Advanced View user interface, as in previous software releases.

The configuration consists of two phases. First, the general parameters of the base unit and the option cards are configured through the **Device Configuration** web page. Then, the output streams can be configured through the **Service Configuration** web page.

To save any changes made, click on the **Apply All** button located at the right side of the user interface below the page tabs.

Note: To save time, save the changes only after each parameter has been altered. When trying to leave a page without saving the changes, a dialog is displayed which allows saving or discarding the changes or abandoning the page.

The modified folders in the **Advanced Video Processor Settings** widget and the corresponding parameters in the **Properties** widget are highlighted in orange. Moreover, the changes are also listed on the **Changes** tab of the **Information** widget. To undo a change, simply click on it in the **Information** widget. The appropriate item shows up in the **Properties** widget and its original value can be restored manually.

3.7.3

How to Configure Advanced Video Processor Settings

3.7.3.1

General Advanced Video Processor Settings

To configure the General **Advanced Video Processor Settings**:

1. Navigate to the **Device Configuration** page and click on the **Advanced Setup** tab.

Note: The **Advanced Video Processor Settings** widget displays all the unit parameters organized into different folders in a tree view. The folders can be expanded and collapsed by clicking on the plus or minus sign next to them or by selecting a node, right clicking on it, then choosing **Expand Selected** or **Collapse Selected** from the context menu.



2. General parameters such as Unit Name, UTC and SNTP Server are configured by navigating to **Encoder > Base Unit**
3. Configure the IP output parameters by navigating to **Encoder > Network Configuration > Data Interface Group 3-4.**

Note: There is no actual output until a Transport Stream is created and its **Status of Service** parameter is set to **Online**.

4. Optionally, the redundancy mode for the unit can be set up in the **Encoder > MGP Support** folder

3.7.3.1.1 Set the Unit Time and Date

The UTC time and date can be set manually or the unit can obtain the current time from a network time server using SNTPv4 (RFC 4330) and is capable of working with Microsoft Windows Time, (SNTP as defined in RFC 1769).

SNTP Time Server

If an SNTP Time Server is selected, and communications are established with it, then the unit uses the time obtained to correct the system's real time clock, and the user cannot set the clock.

If a time server has been configured, but it fails to respond, then an 'SNTP Server Failed To Respond' alarm is generated.

Note: SNTP always uses port 123.

3.7.3.1.2 Setting up the Carrier ID

To set up the Carrier ID parameters (primarily used in AVP 3000), navigate to the **Encoder > Base Unit > Carrier ID Setup** folder.

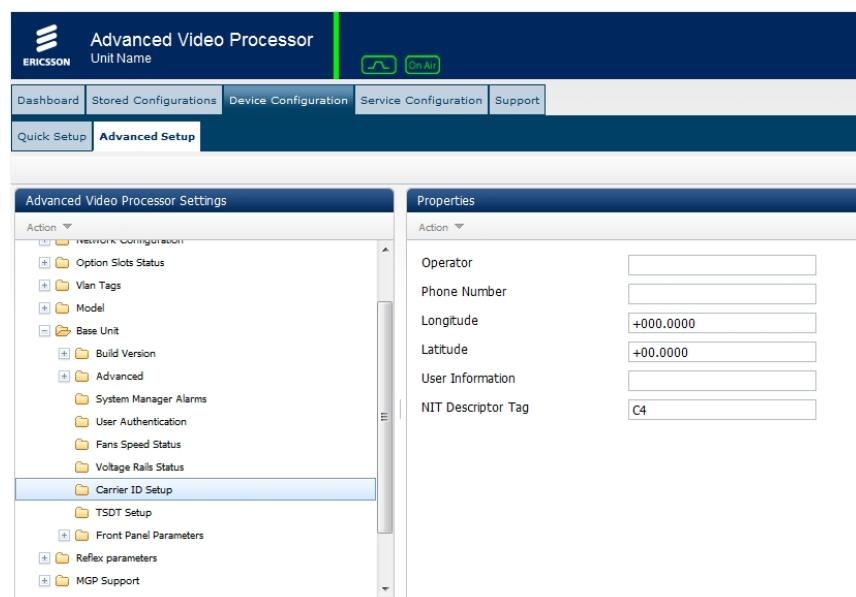


Figure 3.13 Carrier ID Setup



Fill in the **Operator**, the **Phone Number**, the **Longitude** and the **Latitude** fields in the **Properties** widget. Optionally, you can also fill in the **User information** field.

Note: The **NIT Descriptor Tag** field already contains the default descriptor tag used for transmitting carrier ID information in the **Network Information Table**. Usually, there is no need to change this value.

3.7.3.2 Configure Option Card Output Parameters

Note: An output MUST have a Transport Stream created and set to **Online** before the output signal will be present.

To configure the **Option Card Output Parameters**:

1. Configure the parameters for satellite transmission by navigating to **Encoder > Slots > Slot n – Satellite Modulator Option Card > Satellite Modulator Option Card**. The input, modulation and output parameters can be set up by selecting the Input Parameters, Modulation Parameters and Output Parameters folder and entering the required information, as shown on the picture below. To enable the output ensure that a Transport Stream has been created (this can be an empty Transport Stream if just a signal test is required). Set the Transport Stream status to **Online**. Set the **Output State** to either **On (Reduced Power)** or **On (Nominal Power)**, and when required set **Modulation State** to **On**.

Property	Value	Description
Modulation Standard	DVB-S	Modulation standard for the transport stream.
Modulation State	On	Output state of the modulator.
FEC Rate	3/4	FEC rate for the modulation.
Modulation	QPSK	Modulation type.
NCR Stamping PID	8191	PID for NCR stamping.
Symbol Rate	27.000000	Symbol rate in Msymbol/s.
Roll-off Factor	20 percent	Roll-off factor for the modulation.
Bandwidth	32.400000	Bandwidth in MHz.

Figure 3.14 Setting the Parameters for Satellite Transmission

2. There are no configurable parameters for the ASI outputs
3. The format of the G703 Output is configured by navigating to **Encoder > Slots > Slot n – G>703 Transceiver Card > G.703 Transceiver Card > G.703 I/O Port 1**.



3.7.4

How to Configure Output Transport Streams

To configure a Transport Stream for an AVP, follow the steps below. Here, the Satellite Modulator output is taken as example. Transport Streams also can be easily configured on other outputs using the same procedure.

Note: The unit can be configured to simultaneously provide either the same TS over multiple outputs (e.g. where additional output option cards are fitted) or different TS and the various available outputs. See section 3.7.11 for information on copying a TS.

1. Navigate to the **Service Configuration** web page.
2. Expand the Host Outputs node in the **Outputs** widget, and click on **the required output**. A blue box is drawn around the selected item and the properties associated with it are displayed in the **Transport Stream** accordion panel of the **Properties** widget.

Note: The **Satellite Modulator Output Stream 1** and **Satellite Modulator Output Stream 2** outputs behave somewhat differently than the other outputs. When selected, the parameters from the **Device Configuration > Advanced Video Processor Settings > Encode > Slot n – Satellite Modulator Option Card > Satellite Modulator Option Card > Modulation Parameters, Output Parameters and Input Parameters** are shown to ease access and reduce the time needed for setting up the unit. The **Input Parameters** tab is shown to allow easy access to the RAS encryption setting. All other parameters on this tab should be left at their default values. For other outputs, an empty page is shown in the **Properties** widget if no Transport Stream exists under them. Otherwise, the Transport Stream properties are displayed.

3. Create a Transport Stream by right clicking on the required output and selecting the **Add Transport Stream** command from the context menu, as shown in *Figure 3.15*. The properties of the newly created Transport Stream appear in the **Properties** widget.

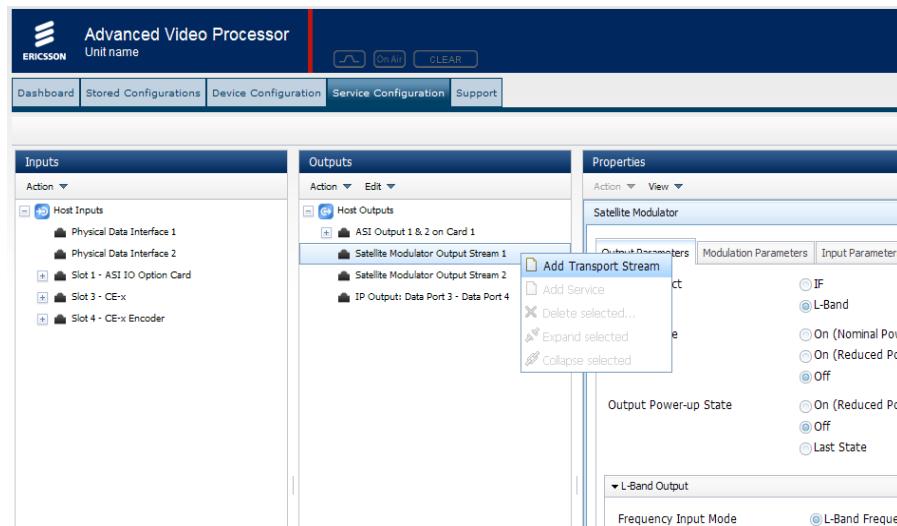


Figure 3.15 Service Configuration Web Page – Adding a Transport Stream



4. Adjust the Transport Stream properties as required.

Note: It is good practice to configure a Transport Stream by setting the **Bit rate tracking mode** to **Maximize Video**. In this way, any changes in the Transport Stream bit rate will be reflected in the video component bit rates. Moreover, on the Satellite Modulator output, the Transport Stream bit rate is determined by the modulation parameters. Any change in the modulation parameters will also be reflected in the bit rate of the video component.

5. To set up internally generated ATSC tables, see *Chapter 5, Web GUI Control*.
6. To create a service in the newly created Transport Stream, make sure the Transport Stream is selected. Right click on it and select **Add Service** from the context menu, as shown in *Figure 3.16*. The properties of the newly created service shall appear in the **Service** accordion panel of the **Properties** widget. Adjust the service properties as required.

Figure 3.16 Service Configuration Web Page – Adding a Service

Note: Transport Streams and services can also be added through the **Action** menu in the **Outputs** widget.

7. Expand the nodes in the **Inputs** widget and select the video stream to be included in the Transport Stream.
8. Hold down the left mouse button and drag it over the newly created service. Once the component is over the service, the color of the dragging box changes to green indicating that the component is now over a valid dropping position.



Figure 3.17 Service Configuration Web Page – Adding a Component

9. Release the left mouse button. The component is added to the newly created service and its parameters are shown on separate tabs in the **Video Component** accordion panel of the **Properties** widget.
10. Adjust the video properties as required.
11. Add all the required components (audio, VBI...) from the **Inputs** widget to the Transport Stream as above. Adjust the component parameters in the respective accordion panel of the **Properties** widget.

Note: To identify the source of a certain component in the **Outputs** widget, click on the component. The source of the component is highlighted in grey in the **Inputs** widget. You may have to scroll in the **Inputs** widget to actually see the highlighted component.

12. Modifying the same parameter for different items of the same type (for instance, the bit rate of two or more audio components) can be carried out by selecting all the items, navigating to the property to be changed, and changing the value. If the values for the selected items are different, then the string **[Mixed]** is shown in the respective field.
13. If you want to create another service or Transport Stream, repeat the steps above.
14. Turn the Transport Streams online by selecting the Transport Stream and clicking on the **Online** button in the **Properties** widget.

Note: Turning the Transport Stream online does not turn the modulator output on. The additional steps below are needed.

15. The modulator state can be configured either from the **Service Configuration > Satellite Modulator** tabs or the **Device Configuration > Quick Set-up > Line Up** menu.



16. Here the option to set up the output in controlled steps is available (output on at configured reduced power level, output on at nominal power level, modulation on/off, etc.).
17. The status of the modulator output is indicated by the icons in the banner at the top of the user interface.

Note: All Transport Streams can be set online in one go by selecting all of them and clicking on the **Online** button.

3.7.5

How to Configure to Use a Separate PCR

By default, the unit will use PCR embedded in the video. If a separate PCR is required the following steps are necessary:

1. Turn off embedded PCR in the **Video Component Output Properties** panel.

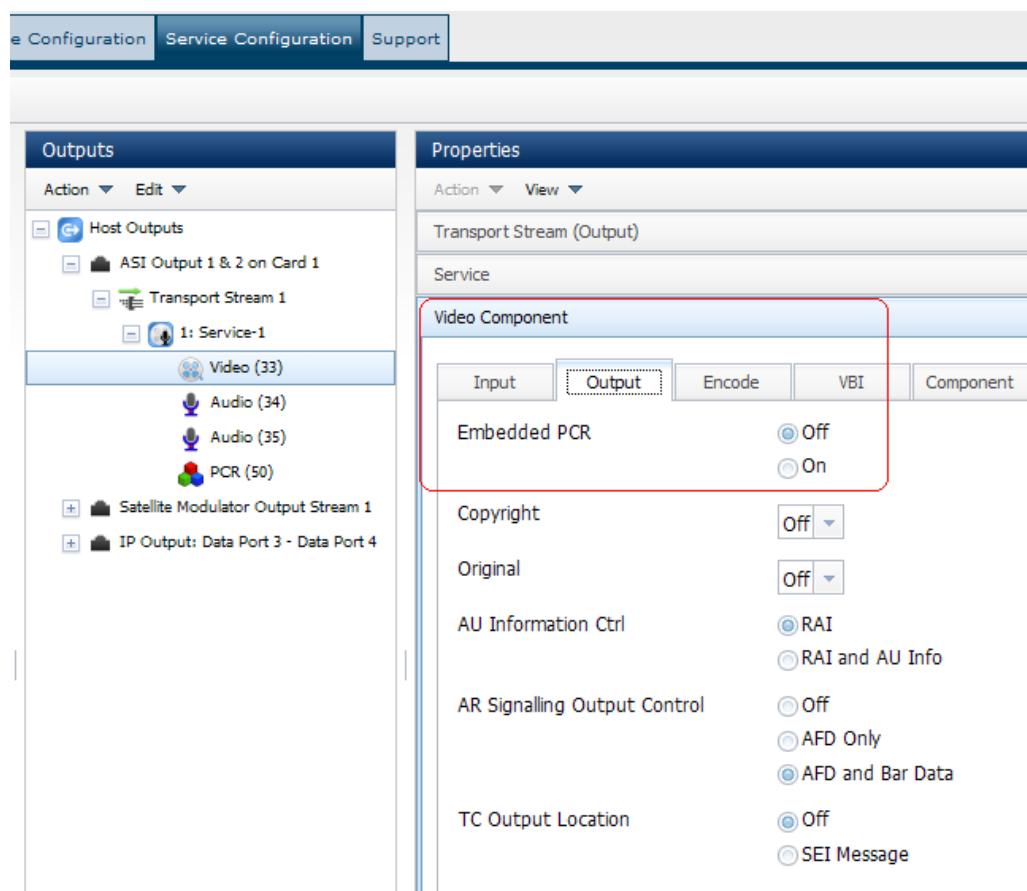


Figure 3.18 Video Component Output

2. Select the **Video PCR Stream** from the video input list and drag and drop it into the output service.
3. Configure the required **PCR PID** on this component.



4. Select **Outputs >Service – n** and set the **PCR PID** to the same value as that set for the component.

The screenshot shows the Service Configuration page with the 'Service' tab selected. In the 'Properties' section, under 'Service', the 'PCR PID' field is highlighted with a red box. The value '50' is entered in this field. Other fields like 'Service ID' (1), 'PMT PID' (32), and 'SDT Parameters' are also visible.

Figure 3.19 Setting PCR PID Value

3.7.6

How to Set Up Pass-through Transport Streams

The AVP3000 supports Transport Stream content pass-through. That means that a Transport Stream on an ASI input interface can be passed through to the Satellite Modulator output interface in a content preserving mode.

3.7.6.1

Configuration

To configure a Transport Stream pass-through, select the ASI Transport Stream in the **Input** widget on **Advanced** tab of the **Service Configuration** page, and simply drag and drop to the Satellite Modulator Output Stream in the **Output** widget. When the cursor is above the output an information pop up is displayed indicating that a pass-through Transport Stream will be created.

The screenshot shows the Service Configuration page with the 'Service' tab selected. In the 'Properties' section, under 'Transport Stream (Input)', the 'Create PassThrough Transport Stream' option is checked. This triggers a tooltip 'Create PassThrough Transport Stream' which states: 'PassThrough transport streams are passed from the input to the output unmodified.' The 'Output' section shows an ASI Stream being dragged from the 'Inputs' section to the 'Satellite Modulator Output Stream 1' in the 'Outputs' section.

Figure 3.20 Configuring a Pass-through Transport Stream



The **Properties** widget shows that a pass-through Transport Stream has been configured and there are no configurable parameters.

The screenshot shows the 'Service Configuration' tab of the Advanced Video Processor interface. The 'Properties' section displays a 'Transport Stream (Output) (Pass-Through)' configuration. It lists 'Host Outputs' (ASI Output 1 & 2 on Card 1) and 'Transport Stream' (ASI Stream 1 on Slot 1). A note states: 'This is a pass-through transport stream on a card, it has no configuration options.' The 'Transition 1 transport stream' status is set to 'Online'.

Figure 3.21 Properties Panel view of Pass-through Transport Stream

3.7.6.1.1

Front Panel Configuration

To configure a Transport Stream pass-through on the front panel, select **Add Existing Transport Stream** in the menu of the appropriate output, and choose the required incoming Transport Stream from the list.

3.7.6.1.2

Limitations

If the bit rate of an input stream is too high for the Satellite modulator output to handle, the output is unusable, and alarms for too high data rate or buffer overflow are issued.

3.7.7

How to Set Up Remux

Services from a Transport Stream can be remuxed from an ASI input to any output that can produce a Transport Stream.

3.7.7.1

Configuration

In order to remux a service from an input to an output, first ensure there is a Transport Stream already configured with an existing service on the output you wish to add the remuxed service to. Once the Transport Stream has been created, drag one or more required services to from their input to the target Transport Stream.

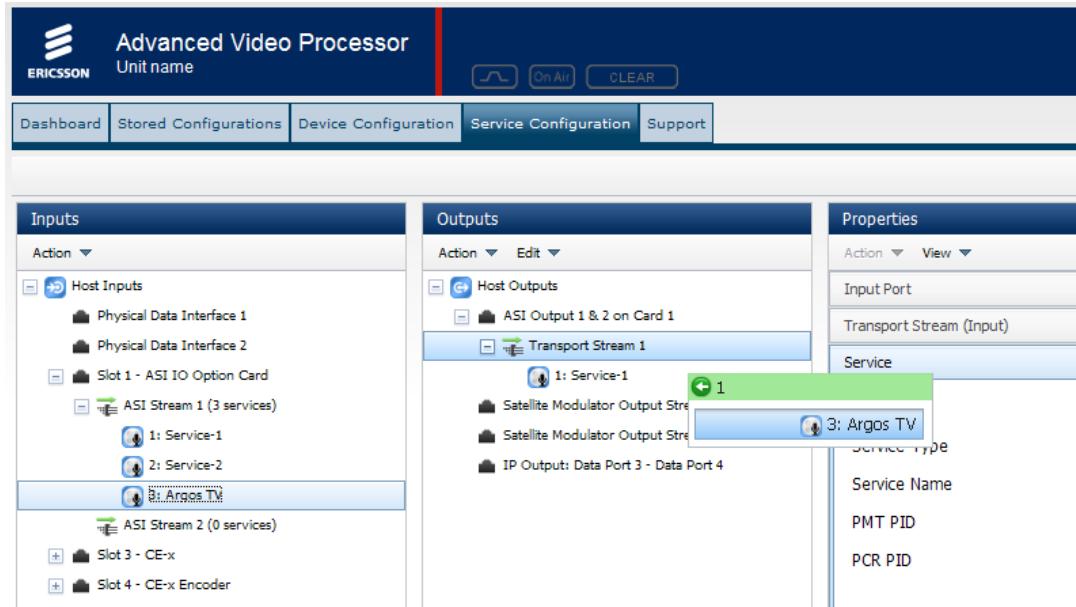


Figure 3.22 Drag and Drop service from ASI input to Output Transport Stream

Note: The Remux Configuration wizard will start when the service has been dropped onto the Transport Stream.

The Remux Configuration wizard will prompt you to select which components you want to remux. By default, all components from all services dragged across will be selected. Once you have confirmed the components you want to remux, click on **Finish**.

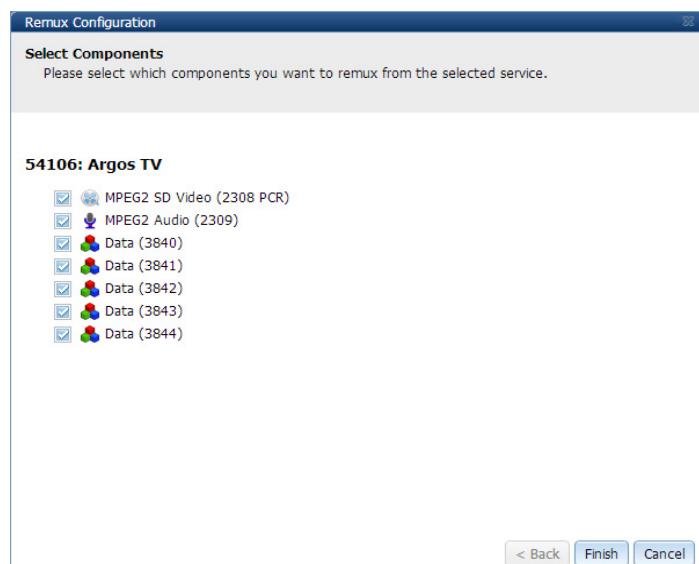


Figure 3.23 Remux Configuration Wizard

The remuxed services will appear in the target Transport Stream, one for each service that was dragged across. All remuxed components will have a blue R badge to denote a remuxed component displayed in the Transport Stream tree in the **Outputs** widget.



Remuxed components cannot be configured, although their PID can be altered. The resulting services can be configured as normal.

It is not possible for the device to know in advance what the bitrates of any remuxed components are, so it is necessary to add an upper value of their combined bitrates into the **Reserved bit rate** field of the Transport Stream. This bit rate will be put aside for remuxed services and bit rate tracking will take it into account when allocating bitrates of encoded components.

3.7.7.2

Remux of External Tables

A simple form of remux is also available without a license. This is intended for adding SI/PSI tables in to a Transport Stream.

Configuration

First click on the input that you are using, and in the **Properties** window, use the **Max Reserved Bandwidth** field to enter the data rate of the incoming data. Next, ensure there is a Transport Stream already configured with an existing service on the output you wish to add the data to.

When the Transport Stream has been created, drag the input (e.g. ASI Stream 1) to the target Transport Stream. All Transport Stream packets received on that input port will now be included in selected Transport Stream output.

It should be noted, that as this feature is intended for the insertion of SI/PSI tables, it is expected that the internal SI/PSI generation is turned off (Select the output Transport Stream, and in the **Properties** window, switch off all tables).

3.7.8

How to Set Up Internal PSIP Data Insertion

The Internal Program and System Information Protocol (PSIP) Data Insertion feature allows the user to insert internally generated MPEG Program Specific Information (PSI) and ATSC PSIP data into any of the internally created Transport Streams.

The PSI information includes the following MPEG tables:

- Program Association Table (PAT)
- Program Map Table (PMT)

The internally generated PSIP data includes the following ATSC tables:

- Conditional Access Table (CAT)
- Master Guide Table (MGT)
- System Time Table (STT)
- Terrestrial/Cable Virtual Channel Table (T/C)VCT
- Event Information Table (EIT)



Operation

To set up PSIP data insertion, follow the steps below.

1. On the **Service Configuration** page, create the Transport Stream you want to add the PSIP information to.
2. Add the required services and components, and adjust the Transport Stream and component settings.
3. In the **Outputs** widget, select the Transport Stream you want to add the PSIP data to. In the **Properties** widget, set **Syntax** to **ATSC** and the **External Generation** to **Off**. The **Program Specific Information** and the **PSIP Information** accordion panels are now displayed.

Note: If external table generation is enabled, the unit does not produce tables internally.

4. By setting a table **On**, the appropriate parameters are displayed. To configure PSIP data, set **PAT/PMT** to **On**. Set **PMT Repetition Period** as required. The default value is 500 ms.
5. Conditional Access Table can be activated by setting **CAT** parameter to **On**.
6. By setting **STT On**, **GPS UTC Offset** and **Daylight Saving** can be configured.
7. By setting **(T/C)VTC On**, the following parameters can be configured: **Delivery (Terrestrial/Cable)**, **Major Channel Number**, **Modulation Mode**, **Carrier Frequency**.
8. By turning **EIT On**, **EIT Base PID** and the number of the Event information Tables can be set.

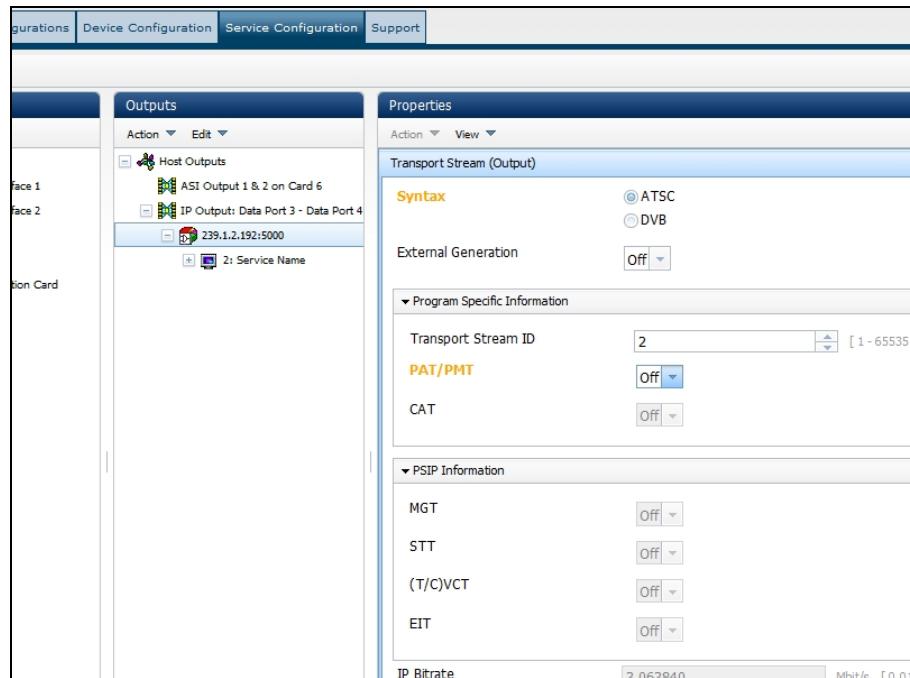


Figure 3.24 Setting Internal PSIP Data Insertion on the GUI



3.7.9

How to Configure the Front Panel Video Confidence Monitor

The confidence monitor on the front panel can be configured to monitor the video input on any VCM fitted to the chassis, from either the GUI or the front panel.

From the GUI go to **Device Configuration > Advanced Setup > Base Unit > Front Panel Parameters > Video Monitor Setup > Video Monitor Video Select**. The **Properties** panel will provide a drop down box listing all available sources with the relevant slot number (in many cases this will be only a single VCM). Select the required source.

There is a preview time for the confidence monitor that sets the time the monitor display is active from the time the **ON** button is pressed. This is to help maximize the life of the monitor. If a longer preview time is required, from the GUI go to **Device Configuration > Advanced Setup > Base Unit > Front Panel Parameters** and set the **Video Monitor Preview Time** to the required value (in seconds).

From the front panel navigate to **Unit Config > Display Setup > Video Monitor Input** and select the required source.

3.7.10

How to Configure VLAN Tagging

VLAN tagging can be used to segregate IP packets from data interfaces.

VLAN Creation

A VLAN is created by specifying the VLAN ID, IP address and the Netmask. All Transport Streams which are tagged to this VLAN use the VLAN IP address as its source IP address. Hence the VLAN and VLAN ID must be created before it can be used to tag a Transport Stream.

To create VLANs, on the **Advanced Setup** tab of the **Device Configuration** page navigate to the **Device > Vlan Tags** folder, select the output you want to assign the VLAN tag to, and click **Add** in the **Properties** pane and configure the IP settings as required. Alternatively, on the front panel navigate to **Advanced/System/Vlan Tags** and set up the VLANs as required.

Alternatively VLANs can be created via the **Service Configuration** page by clicking on the **Manage** button next to the **Vlan Tag** parameter.

The available options are listed in the following table.

Table 3.4 VLAN Creation Options

Parameter	Values	Description
Vlan ID (Create)	2-4094	New VLAN ID to create.
Vlan IP	xxx.xxx.xxx.xxx	VLAN IP Address (VLAN tagged Transport Stream will have this as its source IP address).
Vlan Netmask	yyy.yyy.yyy.yyy	VLAN Netmask.
Vlan Gateway	zzz.zzz.zzz.zzz	VLAN gateway address for the current VLAN.



Note: The VLAN Id and its IP address must be unique across all Ethernet interfaces.

VLAN Tag Sharing

Once the VLANs are created, they can be assigned to IP Transport Streams. To do that, navigate to *Service Configuration* page, and create a Transport Stream for the appropriate IP output. Then, click on the newly created Transport Stream, and in the *Properties* widget select the required VLAN tag. VLANs can also be assigned to Transport Streams in the **Outputs/IP Output <m>/Data Interface Group <n>/Transport Stream ID: <id>/Destination List/Destination <k>/Vlan Tag** front panel menu. The following options can be set:

Table 3.5 VLAN Tag Sharing Options

Parameter	Values	Description
Vlan Tag	None, existing VLAN tag	Disables VLAN tagging or assigns the selected VLAN tag to the current Transport Stream.
Vlan Priority	0-7	Priority that can be used to support QoS.

It is also possible to group multiple Transport Streams under the same VLAN. To do this, assign the same VLAN tag to all of them.

Note: On the web user interface, VLANs can be managed through the Service Configuration page by clicking on the Manage button next to the Vlan Tag parameter.

VLAN Deletion

A VLAN can be removed from the Transport Stream by changing the VLAN Tag parameter under the Transport Stream to None. If a VLAN tag used by any Transport Stream is deleted from the **VLAN Tags** folder, the **VLAN Tag** parameter is set to **None** in the respective Transport Streams.

3.7.11 How to Copy and Move Transport Streams and Services

To copy or move a previously created Transport Stream or service, or an existing component from one output to the other, proceed as follows:

1. Select the Transport Stream, service or component.

Note: More items can be highlighted by holding down the *Ctrl* or *Shift* key while clicking.

2. To move the selected items, drag them over another valid dropping location and release the mouse button. For Transport Streams, valid dropping positions are the outputs, for services, the Transport Streams and for components, the services.
3. To copy the item instead of moving, hold the *Ctrl* key while dragging. The item is moved or copied to the specified location.



The commands in the **Edit** menu of the **Properties** widget can also be used for copying or moving items. To use these, proceed as follows:

1. Highlight the item or items you want to copy or move, then choose **Edit > Copy** or **Edit > Cut**.
2. Then, highlight the location where you want to paste the items. Select **Paste** from the **Edit** menu. The items will be copied or moved to the new location.
3. There is also an option to create an identical mirror of an existing Transport Stream such that any changes made to the original Transport Stream are automatically applied to the mirrored Transport Stream. To create a mirrored Transport Stream highlight the Transport Stream to be copied, chose **Edit > Copy**, highlight the output where the mirrored TS is to be applied to and chose **Edit > Paste as Mirror**
4. To save your changes, click the **Apply All** button located at the right side of the user interface below the page tabs.

Note: A component can be included in more than one Transport Stream as an instance of an input component. Therefore, any change to it, be it automatic by the bit rate tracking algorithm or manually applied by the user, is reflected in all instances.

3.7.12

How to Customize the Quick Set-up Menu to Quickly Access Required Features

The quick set-up menu provides a means for the user to customize access to frequently used parameters:

1. Open the **Customize Items** dialog by selecting **Actions > Customize Items**.
2. In the **Configuration Items** widget of the **Customize Items** dialog, select the **Quick Setup Items** node, and select **Actions > Add Folder**.
3. Double-click on the newly created node, and rename it to a more descriptive name.
4. Expand the Encoder tree and scroll down to the item you want to add to your custom list in the **Advanced Video Processor Settings** widget.
5. By holding down the left mouse button, drag the item over the new folder in the **Configuration Items** widget.
6. Add the item to the new folder by releasing the mouse button. The item cannot be added to the **Quick Setup Items** node. Any valid drop position is indicated by the dragging rectangle changing into green.
7. Repeat the process for any additional items you want to add. You can create as many folders as you wish or you can use any previously created one. The created folders can be reordered by the drag-and-drop technique used for adding the item. The added items can also be relocated through drag-and-drop. To delete a folder or an item, select it then choose **Action > Remove Item**.



8. When ready, click **Save** to save the changes. The new items are added to the **Quick Setup** menu.

Notes: The list of added items can be exported by selecting **Action > Export** and can be imported on another unit by **Action > Import**

Parameters associated with Transport Stream creation and configuration cannot be added to the quickset-up items.

3.8 How to Configure the AVP Using the Front Panel

The unit is fully configurable via the front panel. The most important parameters are available under the dedicated menu items, while the full functionality of an option card can be found under the **Advanced** menu. For the details of the interaction with the front panel and the menu system, see Front Panel Control.

The configuration consists setting the general parameters of the base unit and the option cards. Then, the output streams can be configured through the **Output** menu.

3.8.1 How to Configure Video Parameters

To configure the video parameters, select the AVP Encoder n menu and set the parameters as listed in *Figure 3.15*.

Table 3.6 Video Parameter Settings

Parameter	Setting	Comment
Video Input Locked	True, False.	Read only parameter.
Video Bit rate	0.5 – 80 Mbps.	Range and limits depends on video profile.



Parameter	Setting	Comment
Video Profile	Off SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 4:2:2 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit. SD J2K Profile Level 1 4:2:2 10 bit HD J2K Profile Level 2 4:2:2 10 bit HDp50/59.94 H.264 High Profile Level 4.2 4:2:0 8 bit HDp50/59.94 H.264 Hi422 Profile Level 4.2 4:2:2 8 bit HDp50/59.94 H.264 Hi422 Profile Level 4.2 4:2:2 10 bit	The availability of a profile depends on the option card and the presence of a certain license.
Buffer Mode	CBR, Low Delay, Mega Low Delay, Compatibility, Ultra Low Delay, Stripe Refresh, Stripe Refresh (+ Audio Encode)	Available options depend upon the option card and licenses.
Source	Analogue, SDI, Color Bars, Black, Moving Object, Slate.	Configures the input source, which can be an external video signal through the SDI connector or the analogue CVBS connector on the back of the VCM, or an internally generated test pattern.

3.8.2 How to Configure Audio Parameters

Audio Input Parameters

To configure the audio input parameters, select the **AVP Encoder /Audio Module/Audio n /Input** menu and set the parameters as listed in *Table 3.7*.

Table 3.7 Audio Input Settings

Parameter	Settings
Input Format	Uncompressed (LPCM), Dolby Digital, Dolby E,
Input Source	Off, Mute, Test Tone, Embedded 1-8, Input 1-4. Analogue 1-2.
Output on Audio Loss	Silence, No PID

Audio Encode Parameters

To configure the audio encode parameters, select the **AVP Encoder /Audio Module/Audio n /Encode** menu and set the parameters as listed in *Table 3.8*.

**Table 3.8 Audio Encode Settings**

Parameter	Settings
Coding Standard	MPEG Layer II, Dolby Digital, AAC, Pass-through (Options depend on licenses)
Bitrate	Range depends upon selected coding standard
Coding Mode	Available options depend on selected coding standard.

The parameters of the encoding can be configured in a sub menu whose name depends on the Coding Standard chosen. Set up the encoding as needed.

Note: The number of audios available for configuration will depend upon the number of licenses.

3.8.3 How to Set Up a Transport Stream

A Transport Stream is made up from one or more services. A service is made up from one or more components. To build a Transport Stream to be sent to the output, proceed as follows:

1. Select the **Output** menu.
2. Select the output to which the Transport Stream is to be sent.
3. Select **Transport Stream ID: 1** if available, otherwise Select **Add Transport Stream**
4. Check that the parameter settings are correct.

Table 3.9 Transport Stream Parameters

Parameter	Description	
Service List	Select to manage services in the Transport Stream. (Next step.)	
Current State	Read Only – displays current output state (online, offline)	
Change State	Online, Offline. Controls the actual presence of the Transport Stream in the output.	
Transport Stream Bit rate	0.04 – 200 Mbps.	
Reserved Bit rate	The amount of bit rate in the Transport Stream that cannot be allocated to any of the transmitted components.	
Bit rate Tracking Mode	Off, Maximize Video.	
Auto Enable	false, true. Specifies whether or not to automatically re-enable the Transport Stream (set its Setmode state to Online) when the condition set in the Auto Disable field is not met.	
Auto Disable	Never, Audio Lost, Video Lost, Audio or Video lost, Any UPSTREAM critical alarm, Any critical alarm. Specifies the condition on which the Transport Stream has to be disabled. Audio lost and video lost means that the audio or video lock of any of the components in the Transport Stream is lost, UPSTREAM critical alarm is an alarm that is triggered by any of the components that contribute to producing the elementary streams carried by the Transport Stream.	
Syntax	DVB, ATSC	
Program Specific Information	Transport Stream ID	A new ID can be assigned to the Transport Stream.
	PAT-PMT	On, Off



Parameter	Description		
	PAT-PMT Parameters	PMT Repetition Period	100 ms, 400 ms, 500 ms. Specifies how often (in ms) the PMT shall be transmitted.
		Dolby Digital Descriptor	DVB, ATSC, DVB & ATSC
	CAT	On, Off	
	TSDT	On, Off	
Service Information			
Original Network ID			
NIT	On, Off		
NIT Parameters	Network Name	Set Network Name	
	Network ID	Set network ID.	
	Generate LCN	Off, IEC 62216, NorDig v1, DTG Default	
	Send extended NIT (SIRG)	On, Off. If PSI/SI Level is set to On (PAT/PMT/SDT/CAT/NIT) make sure the Send extended NIT (SIRG) is On so that the Carrier ID is sent.	
	Insert NIT into PAT	True, False	
SDT	On, Off		

5. For an IP Transport Stream set up the IP related parameters as shown in *Table 3.10*.

Table 3.10 IP Related Parameters

Parameter	Description	
TS Packets per IP Packet	Specifies how many Transport Stream packets to encapsulate in one IP packet.	
IP Encapsulation	Specifies what higher layer to encapsulate in IP packets. UDP and RTP is self explanatory and means that the Transport Stream is first encapsulated in UDP or RTP packets, then an IP header is added. If RTP FEC column or RTP FEC Columns and Row is selected one (Column) or two (Column and Row) RTP streams are output in addition to the RTP streams that carry the Transport Stream.	
IP Configuration/Destination 1		
Destination IP Address	The destination IP address to use in the IP packet header of the IP packets that carry the Transport Stream.	
Destination UDP Port	The destination UDP port to use in the IP packet header of the IP packets that carry the Transport Stream.	
Source IP Address	The source IP address to use in the IP packet header of the IP packets that carry the Transport Stream.	
Source MAC Address	Read only parameter, not yet supported.	
Source UDP Port	The source UDP port to use in the IP packet header of the IP packets that carry the Transport Stream	

6. Select the **Service List** menu in order to add one or more services to the Transport Stream.
7. Select **Add Service**. A new service by the name **Service Name** appears in the list.



8. Select **Service Name**.
9. Check that the parameter settings are correct.

Table 3.11 Component and Service Parameters

Parameter	Description	
Component List	Select to manage components in the service. (Next step.)	
Service ID	Set Service ID	
PMT PID	A new PMT PID can be assigned to the service.	
PCR PID	<p>The PID to be used for the PCR. NOTE: If PCR on separate PID is enabled, this value must match the PID given to the PCR component in the output service.</p>	
SDT Parameters	Service Provider	Set service provider name.
	Service Name	Set service name. After setting the service name the service will be listed accordingly.
	Service ID	A new ID can be assigned to the service.
	Service Type	Digital TV, Digital Radio, Teletext, Mosaic, Data Broadcast, Off, BISS Mode-1, BISS Mode-E.
NIT Service Parameters	LCN	0 - 1023
BISS KEY	0 – 31 Selects the location in the BISS key table to use for BISS scrambling	

10. Select the **Component List** menu in order to add one or more components to the service.
11. Select **Add Component**. A new component identified by its PID appears in the list.
12. Select the component just added (it will display **none on PIDnn** until a valid component is selected).
13. Select the required **Elementary Stream** from the appropriate VCM and assign an input to be handled as the component.
14. Adjust PID or Bit rate weighting if necessary.
15. Move up to the **Component List** menu and repeat steps 9-12 to add more components to the service.
16. Move up to the **Service List** menu and repeat steps 5-13 to add more services to the Transport Stream.
17. After the Transport Stream has been created, move up to the **Transport Stream ID: 1** menu. Select the **Change State** option and set it to **Online**.

Note: As the output has not been enabled in the Line-up menu, at this point the unit will not produce an output through the RF connectors.

3.8.4

How to Add More Transport Streams

To add more Transport Streams to other outputs, follow the procedure detailed in *Section 3.8.3.* by first selecting the **Outputs** menu, then repeating the Transport Stream creation process. Alternatively, an existing Transport Stream can be copied to another (or in case of IP output to the same) output by proceeding as follows:

1. Select **Outputs**.
2. Navigate to the output to which a Transport Stream is to be added.
3. Select **Add Existing Transport Stream**.
4. Select the Transport Stream you want to copy.
5. The selected Transport Stream will be copied to the output.
6. Select the newly copied Transport Stream.
7. Select **Change State** and set it to **Online**.

3.8.5

How to Remove a Component from a Service

To remove Components from a Service, proceed as follows:

1. Select the **Output** menu.
2. Select the **Output** containing the Transport Stream.
3. Select the Transport Stream.
4. Select **Service List**.
 - a Select the required Service (not Add Service).
5. Select **Component List**.
 - b Scroll to the Component to be removed.
 - c Press the **DEL** button on the keypad and confirm by pressing select (as instructed on the display).

3.9

How to Configure Video (Recommendations)

Buffer Mode

CBR is the recommended mode of operation for all Profiles and Bit rates.

Low Delay Buffer modes, combined with the GOP Structure set to **IP** will achieve the lowest possible delay. These modes should only be used in applications where the end to end Delay is important, and will create a tradeoff between the Delay and the Video quality.



GOP Structure

For best picture quality the following GOP structures are recommended:

In SD and HD 1080i H.264 operation the GOP structure should be set to **IBBBP**.

In HD 720p H.264 use **IBBBBBBP**

In SD and HD MPEG-2 the GOP structure should be set to **IBBP**

To achieve the lowest possible encoding delays, the **Low Delay Buffer** mode can be used. In this case, the recommended GOP structure is still **IBBBP**. To achieve even smaller delays, a smaller number of B pictures can be used. The IBP GOP structure is the best compromise between latency and picture quality and the IP GOP structure gives the lowest possible delay, but may impact on video quality.

Table 3.12 GOP Length

Video Quality	GOP Length
1080i 29.97 Hz	32
720p 59.94 Hz	60
1080i 25 Hz	24
720p 50 Hz	52

Profile

High@Level 4.0 is recommended for 4:2:0 mode and bit rates below 20 Mbps

High@Level 4.1 will achieve the same performance, but allows higher bit rates up to 62.5 Mbps

Hi422-10bit@Level 4.1 is recommended for better quality performance and allows bit rates up to 80 Mbps

Bit Rates

The recommended bit rate depends on the Profile and Level chosen.

H.264 HDTV 4:2:0 Recommendation

For Main@Level 4.0 profile the typical bit rate is around 15 Mbps.

High@Level 4.0 profile is used at the same bit rates as the main profile, but more tools are available to provide better quality.

High@Level 4.1 is supported by professional STB's and allows higher bit rates to be used. Typically this profile is used for bit rates above 25 Mbps.



H.264 HDTV 4:2:2 Recommendation

On video with strong color content on 4:2:2 H.264 HDTV the bit rate should be set at 12 Mbps or higher. At a bit rate below 12 Mbps the video quality is likely to be better in the 4:2:0 format. Video content with less color, e.g. film material, the bit rate can also be used at a lower bit rate in 4:2:2 format.

H.264 HDTV 10-bit Recommendation

The 10 bit format can be used at the same bit rate as in 8 bit even at low bit rates. There is no cross-over in video quality between 8 bit and 10 bit. Even at a low bit rate of 6 Mbps for example, the 10 bit format can remove contour artifacts on flat areas or on fade changes.

Horizontal Bandwidth:

Always set to 100% for Contribution and Distribution applications

Inloop Filter:

The default (recommended) setting is **Normal**. Setting the Inloop Filter to **Low** can be used to improve sharpness (e.g., in grass in sports sequences) at the expense of increased blocking artifacts.

Auto mode is designed to be adaptive and alter the filter strength on a per-picture basis, and will generally lower the filter strength on sports content to improve the sharpness in grass, albeit at the expense of increased blocking artefacts on the crowd and players perhaps, but will revert back to normal or higher filter strength on other content.

3.10 How to Set up Bit Rate Tracking

Overview

The bit rate tracking feature ensures that the output TS rate is automatically fully utilized. In case of a bandwidth change the tracked components change their bit rate accordingly.

The bandwidth can be influenced typically by the bit rate of the Transport Stream but other factors can also trigger a change.

In order to activate bit rate tracking the Transport Stream has to be configured to **Maximize video** and a video component in the Transport Stream has to have a weight value assigned other than **Fixed** or **Minimum**.

Weighting is used to proportionally distribute the change in bandwidth among the components. The bit rate of **Fixed** weight components do not change and **Minimum** will result in the video component bit rate being configured at the lowest bit rate allowed by its video profile. Otherwise a weight value between 2 and 20 can be assigned to a video component and so the component becomes a tracked component whose bit rate is influenced by the Transport Stream.



As individual components can be included in multiple Transport Streams a **Master TS** has to be specified which will be the driver of the component. This master Transport Stream determines the bit rate of the tracked component which will be reflected in all Transport Streams it is included in.

Notes: A Transport Stream becomes overrated when the sum of the component bit rates exceeds the Transport Stream bit rate. This can occur when the master Transport Stream increases the bit rate of a component that is included in another Transport Stream and that other Transport Stream cannot compensate the increase by the decreasing of the null packets bit rate.

As long as IP and ASI outputs are also configured with bit rate tracking set to maximize video, they will automatically increase their bit rate in line with the **Satellite Modulator** (or **Master TS**) output in order to avoid being overrated.

Activate Bit Rate Tracking

Select the Transport Stream for which bit rate tracking is required.

Notes: If the Transport Stream is not yet created, build it by following the steps in Manual Configuration via the Web Pages or in Manual Configuration via the Front Panel.

Bit rate tracking mode is set to **Maximize video** by default, but this step is included in the process to ensure success.

In the web browser navigate to **Configure > System** and click the **TS** in the left panel. Set the **Bit rate tracking mode** to **Maximise video**.

Alternatively on the front panel navigate to **Bit rate Tracking** and select the Transport Stream. Set the **Enable Bit rate Tracking** to **Maximize video**.

Set Weight of Component

There is also a weighting parameter for each video component. This provides the user with control over how the available bit rate should be shared between the video components.

The weighting parameter is accessible in the component's menu. In the web browser click the component in the left panel. On the front panel navigate to **Bit rate Tracking/Components/<component>**.

*Table 3.13 Bit Rate Weighting Parameters*

Weighting	Comment
Fixed	This will result in the user configured video bit rate to be used and the video component bit rate will not automatically be adjusted.
Minimum	This will result in the video component bit rate being configured at the lowest bit rate allowed by its video profile.
2 - 20	A numerical entry to determine what proportion of the available TS bit rate should be allocated to the video component.

Note: The weight of the video in the Transport Stream is set to 20 by default.

3.11

How to Return to Default Settings from the GUI

All settings are retained through a power cycle. If the unit seems to be behaving strangely or you just want to erase all settings then the default settings can be restored. To restore the default settings navigate to **Support > General > Clear Device Configuration** and select the **Reset Configuration** button. The configuration will be reset and the device will reboot.

3.12

How to Set Up Audio Pass-through

When configuring the audio module to pass audio without encoding, it is necessary to set the audio encode coding standard to **Pass-through** before selecting the audio input format to the pre-compressed format to be passed.

Note: If an attempt is made to select a pre-compressed input format while the module is configured to encode audio, an error message referring to **no more licenses...** will be displayed, and the configuration cannot be applied.

When configured for audio pass-through, the user is provided with the ability to select the bit rate or bit depth of the incoming stream. This helps ensure that there is not an excessive bit rate allocated to the audio component when bit rate tracking is enabled. However, there is no monitoring to ensure that the input matches the configured value and, if the configured value is set lower than the actual incoming bit rate, the output Transport Stream can be over-rated causing problems with the output.

Table 3.14 Audio Pass-through Bit Rate Configuration

Audio Input	Configurable Options	
LPCM pass-through	Bit Depth	16 bit (1960 kbps) 20 bit (2340 kbps) 24 bit (2728 kbps)
Dolby-E passthrough	Bit Depth	16 bit (1960 kbps) 20 bit (2340 kbps) 24 bit (2728 kbps)
Dolby Digital pass-through	Bitrate	Range 96 kbps to 640 kbps

3.13 How to Set Up Phase Aligned Audio Encoding

About Phase Aligned Encoding

Note: “Phase Aligned Audio” is patented Ericsson functionality.

Phase Aligned Audio (PAA) is a proprietary feature of Ericsson Television Contribution Encoders that uses multiple MPEG-1 Layer II encoders operating at 384 kbps to carry each channel pair in the group of phase aligned audio channels. Phase aligned encoding is supported only by CE-x and CE-xA VCMs if the appropriate number of CE/SWO/PAA licenses are present (1 for single PAA, and 2 for dual PAA) combined with additional CE/SWO/M1L2 licenses.

PAA is available on SDI inputs as long as the upstream embedder provides DIDs on the same video line and in a fixed sequence. It is only guaranteed to be aligned if the audio channel status blocks are aligned at the input of the encoder.

Table 3.14 License Requirements for PAA Encoding

	Number of additional licenses required			
	6 channel	8 channel	Dual 6 channel	Dual 8 channel
CE/SWO/M1L2	1	2	4	6
CE/SWO/PAA	1	1	2	2

When configured in MPEG-1 Layer II 6 or 8 Channel Aligned Encoding, each pairing is identified by the use of ISO_639_language descriptors. The languages are encoded using two language codes per component as follows:

- First instance on Audio Module 1:
 - aaa, aab for first dual mono
 - aac, aad for second dual mono
 - aae, aaf for third dual mono
 - aag, aah for fourth dual mono
- Second instance on Audio Module 2:
 - bba, bbb for first dual mono
 - bbc, bbd for second dual mono
 - bbe, bbf for third dual mono
 - bbg, bbh for fourth dual mono

When adding PAA to an output Transport Stream service each audio component that makes up the PAA must be manually added to the service before configuring the components for PAA.

Configuration

To set up PAA or dual PAA audio streams for a service on the **Service Configuration** page, proceed as follows:

Note: This procedure assumes that a service has already been created. If not, one must be created before continuing. See section 3.8.3.

1. In the **Inputs** widget, select **Audio 1- Audio 3** (for 6 channel aligned) or **Audio 1 - Audio 4** (for 8 channel aligned) by first selecting **Audio 1**, holding down the **Shift** key, then clicking on **Audio 3** (for 6 channel aligned) or **Audio 4** (for 8 channel aligned).
2. Drag the selected components to a service in the **Outputs** widget.
3. If you are setting up dual PAA encoding, repeat steps 1-2 for **Audio 9 - Audio 11** (for 6 channel aligned) or **Audio 9 - Audio 12** (for 8 channel aligned).
4. In the **Outputs** widget, click on the audio component corresponding to **Audio 1**.

Note: If you click on **Audio Stream 1** in the **Inputs** widget, the corresponding audio stream will be highlighted in grey in the **Outputs** widget.

5. In the **Properties** widget, click on the **Input** tab.
6. Set the **Input Format** to **Uncompressed LPCM**.
7. Set the **Input Source** to **Embedded 1 (SDI 1)**.
8. Click on the **Encode** tab.
9. Set the **Coding Standard** to **MPEG Layer II**.
10. Set the **Coding Mode** to either **6 Channel Aligned** or **8 Channel Aligned**.

The unit will automatically set the other input sources and the necessary languages and dual phase aligned audio output can now be produced.

3.14

How to Set Up Input for 3/2L (5.1 Surround) Encoding

Overview

The unit can only de-embed stereo channel pairs (groups) from the SDI/HD-SDI input signal. Therefore, to set up 5.1 encoding, three groups have to be de-embedded from the SDI/HD-SDI input signal, and routed to the audio encoder.

The embedded groups have to be consecutive. That is, they have to carry the different channels as detailed in *Table 3.15 (SMPTE 320M)*.



Table 3.15 Embedded Stereo Channel Pairs

Group	Description
Embedded n	Left Front, Right Front
Embedded n+1	Center, LFE
Embedded n+2	Left Rear, Right Rear

Configuration

Note: This procedure assumes that a service has already been created. If not, one must be created before continuing.

1. In the **Inputs** widget, select **Audio Stream 1**.
2. Drag the selected component to a service in the **Outputs** widget.
3. In the **Outputs** widget, click on the audio component.

Note: If you click on the **Audio component** in the **Outputs** widget, the corresponding audio stream will be highlighted in grey in the **Inputs** widget.

4. In the **Properties** widget, click on the **Input** tab.
5. Set the **Input Format** to **Uncompressed (LPCM)**
6. Set the **Input Source** to **Embedded n (SDI 1)**, the embedded stream that contains the left front and right front channels.
7. In the **Properties** widget, click on the **Encode** tab.
8. Select the required **Coding Standard**.
9. Select **3/2L (5.1 Surround)** for **Coding Mode**.

Your 5.1 encoding is now set up.

3.15 How to Set Up BISS Encryption for Services

When the CE/SWO/BISS license is enabled the encoder can use the Basic Interoperable Scrambling System (BISS) to scramble services in the outgoing Transport Stream. Both BISS Mode-1 and BISS Mode-E are supported.

Improvements have been made to the security of the BISS encrypted stream, so there are now two security levels available: normal BISS encryption (the previous implementation) and Advanced BISS encryption (new, higher security). By default, the normal BISS Encryption security level is enabled. If the higher security level is required this can be configured either from the GUI by browsing to **Device Configuration > Advanced Setup > Base Unit** or navigating to **Advanced > System > Base Unit** on the front panel and setting **BISS Security Level** to **Advanced BISS** encryption.

The unit supports the use of 31 keys for BISS, which are now stored in a memory table on the unit, with the location identified as BISS Key 1 to BISS Key 31.

Each required key must be entered into a table by the user, and once entered, the key value is not visible and there is no means of reading the value. The key may be entered or edited via the browser when applying BISS to an output service, or the table can be edited by browsing to **Device Configuration > Advanced Setup > Base Unit > BISS Keys table**. From the front panel it is necessary to navigate to **Advanced>System>Base Unit > BISS keys table** to enter the key value.

To set up BISS encryption for a service, proceed as follows:

1. If you want to use **BISS Mode-E**, browse to the **Device Configuration > Advanced Setup** tab, open the **Encode > Base Unit** node in the **Advanced Video Processor Settings** widget, and add the injected ID in the **BISS injected ID (14 hex digits)** field or navigate to **Advanced>System>Base Unit** on the front panel and set the **BISS injected ID (14 hex digits)** using the keypad.
2. If you have not already done so, create a Transport Stream and a service as described in *Section 3.7.4*.

To set up BISS encryption service from the GUI:

1. Go to the **Outputs** widget of the **Service Configuration** page, and select the service for which you want to apply BISS encryption.
2. In the properties tab select the drop down option against **BISS Key**, which will show the list of 31 keys. Select the required key location.

Note: If **None** is selected BISS will not be enabled.

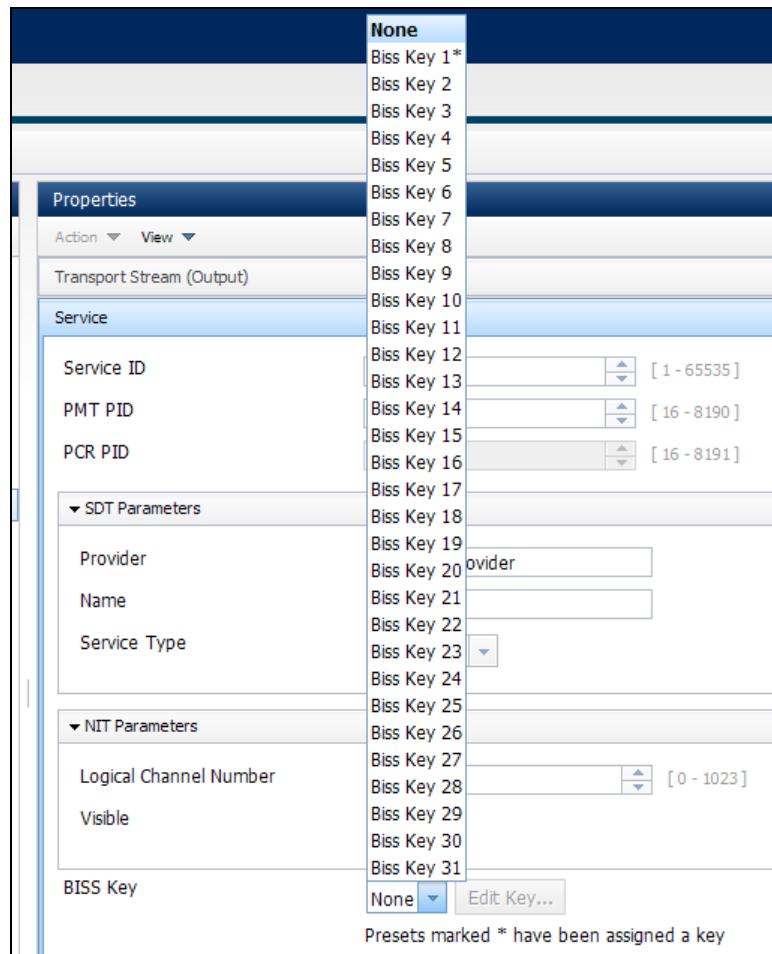


Figure 3.25 BISS Enabling and Key Selection

3. If a key is selected that has not had its key word set, a pop-up box provides the user definable fields for this key. Select the required **key type (Mode-1 or Mode-E)** and enter the **New Key value (12 bits for Mode-1 and 16 bits for Mode-E)**

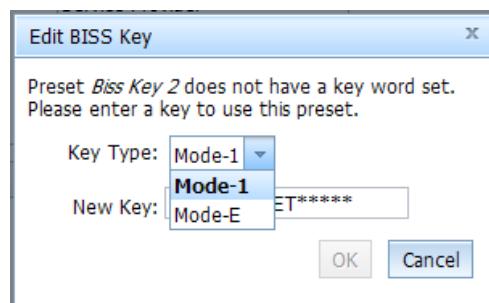


Figure 3.26 Setting BISS Key value

If a key has already been set, an asterisk is displayed in the drop down list next to the label. If this key is selected the pop-up box will not appear. The user can modify the key by selecting the Edit Key box.

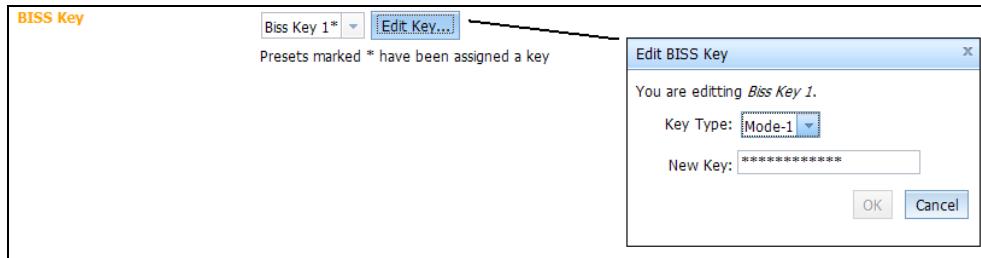


Figure 3.27 Editing a BISS Key

Note: Although the BISS technical specification (Tech 3292 rev. 2.) states that BISS Mode-E shall work with shorter BISS Mode-1 keys, this is not supported in the unit. The Encrypted Session Word field only accepts 16-digit keys.

4. When BISS has been enabled on a service a padlock will appear in the outputs tree next to the service name and in Voyager units the **Clear** indicators on the GUI banner and front panel will change to **Scrambled**

To set up BISS encryption service from the front panel:

Note: When a value needs to be changed using the front panel, the existing value needs to be deleted using the **Del** key, before a new value can be entered using the keypad.

1. Navigate to the required output service (**Output > Transport Stream ID > Service List > Service n** and scroll down to **BISS Key**). Enter the required key location (1 to 31).

Note: Selecting **0** configures the key to **None** and BISS will not be enabled.

2. If a key is selected that has not had its key word set, a message is displayed telling the user that a key needs to be set. In this case navigate back to **Advanced > System/Base Unit > BISS Keys Table** and select the required key. Select the required **key type (Mode-1 or Mode-E)** and enter the **New Key value (12 bits for Mode-1 and 16 bits for Mode-E)**. Go back to the Service Menu and enable BISS by selecting the required key.
3. When BISS has been enabled on a service the **Clear** indicators on the GUI banner and front panel will change to **Scrambled**.

Both an xml and stored configuration will contain an entry for a BISS key, if a key had been set for the service on the unit that the configuration was saved from. To comply with the specification that requires the value of keys that are not available on external interfaces and cannot be retrieved, this uses the name of the table location (BISS Key n).



3.15.1

BISS and Stored Configurations

Loading an xml or stored configuration with BISS enabled will successfully configure the unit, resulting in a Transport Stream output and service configured, with BISS enabled using the same BISS Key n setting as for the original configuration. The contents of the BISS key table are NOT transferred, so unless the same key has already been entered the key will either be not set or a previously entered different key might be applied. To ensure the correct key is set the user can edit the key stored in the table as described above.

Loading an xml that contains a BISS key entry onto a unit that has never had BISS enabled will not enter any keys. *****NOTSET***** will still be displayed on the user interface and the output WILL NOT be encrypted. A key needs to be manually entered.

Once a BISS key has been set for a service, switching BISS off does not affect the storage of the key. The key is maintained and used when BISS is re-enabled. If a different key is required it needs to be manually updated, or a different key from the table selected. The entered keys are maintained over a power cycle.

Note: Deleting the unit configuration does not delete the contents of the BISS key table.

3.16

Digital Programme Insertion (DPI)

Splicing is used to insert Digital Programme (DPI), e.g. advertisements, into an MPEG-2 Transport Stream. DPI is available when the DPI license is purchased. One licence is required for each video component.

3.16.1

Splice Point Operation

The VCM is capable of storing up to 10 splice events, which can be inserted up to 13 hours before the event is due, but no less than 4 seconds to the splice point. If splicing is disabled all stored pending splice events will be deleted.

Splice point insertion can be controlled from SCTE104 messages, either in VANC or from the IP input, or from GPI triggers (see *Section 3.17* for GPI details)

Table 3.16 Example Multiple Operation SCTE104 Message Structure

Data	Comment
0xFF, 0xFF	reserved
0x00, 0x27	message size = 39 bytes
0x00	SCTE-104 protocol version
0xAA	AS index
0xBB	message number
0x01, 0x01	DPI PID index (slot 1, channel 1) ¹
0x00	SCTE-35 protocol version
0x00	timestamp type = zero (no timestamp)
0x02	number operations...(2)
0x01, 0x01	op ID = splice request data
0x00, 0x0E	data length = 14 bytes
0x01	splice insert type - splice start normal
0x12, 0x34, 0x56, 0x78	splice event ID
0x66, 0x99	unique program ID
0x0F, 0xA0	pre-roll time = 4000ms
0x00, 0x64	break duration = 10s
0x01	avail num
0x01	avails expected
0x01	auto return flag
0x01, 0x0A	op ID = insert avail descriptor request data
0x00, 0x05	data length = 5 bytes
0x01	number of avails = 1
0xA1, 0xB2, 0xC3, 0xD4	avail ID = 0xA1B2C3D4

¹The DPI_PID_index value contained within the SCTE-104 message is not a PID. It provides a way of addressing a particular VCM within a multi-module unit to ensure that the SCTE104 messages are received by the specific encoder. It is a 2 byte value.



Table 3.17 DPI PID Index Value

Bit	Description
15..8	The option card slot number (1 to 6)
7..0	The encoder channel on the option card (Note: All option cards referenced in this manual support only 1 channel of video. If the channel is set to 0 or 1 the encoder will have splice points inserted.)

If the option card slot number or the encoder channel does not exist the Video Processor will return a splice failure message.

It is not possible to insert splice points into the video which are closer than 1 second apart. Any messages received with a splice time within 1 second of another splice point and with the same splice_event_id will be treated as a duplicate of the initial splice request and deleted.

Any messages received with a splice time within 1 second of another splice point and with a different splice_event_id will be aligned to the initial splice request. This will result in 2 SCTE35 messages being generated containing the same PTS value but different splice_event_ids and 1 splice point inserted into the video, unless the auto return is set to 1 and the duration is populated, in which case the video PID will be conditioned for two splice points.

3.16.2 SCTE104 Over IP

SCTE 104 messages can also be sent to the unit over the control port. The DPI TCP Port on the unit is 5167 by default. This parameter can be accessed on the GUI through **Device Configuration > Advanced Setup > Base Unit**.

3.16.3 How to Configure Splicing

1. If you have not already done so, create a Transport Stream and a service as described in *Chapter 5, Web GUI Control*.
2. Go to the **Inputs** widget of the **Service Configuration** page and select the **Video SCTE 35 Stream** from the VCM inputs tree and drag it into the required output service.
3. Select the required source from the **Splicing Control** drop down box in the **Properties** widget (see *Section 3.17* for additional requirements for GPI triggered splicing)

**Table 3.18 Splicing Control Options**

Option	Description
Off	No splice operation
On VANC message only	SCTE104 messages in VANC will be passed through as SCTE35 messages that can then be added as a component in the output transport stream. No splice points will be inserted in the video bitstream.
On VANC	SCTE104 messages in VANC will trigger the insertion of splice points
On IP	SCTE104 messages in IP will trigger the insertion of splice points
On GPI	Splice point insertion will be triggered by GPI card inputs (see section 3.17)

3.17

How to Configure GPI Triggered Splicing

The GPI option card can be configured for triggered splicing by sending SCTE-104 messages to the encoders of the VCM cards fitted in the unit.

Note: To enable splicing, splice point insertion license (CE/SWO/DPI) is required.

The triggers are realized by closing and opening the general purpose input pins (GPI pins 1-16) with a common GND; for the pin connections see *Chapter 2, Installing the Equipment*. The configuration process has two parts:

- Setting up the GPI Card
- Setting up the VCMs

The connections between the configured pins of the GPI card and the destination encoders are represented by virtual SCTE-104 channels. Each GPI card has 16 channels, labeled from ChannelA to ChannelP.

3.17.1

How to Set Up a GPI Card

To configure General Purpose Interface (GPI) input pins for splicing, proceed as follows.

1. Select the **Advanced Setup** tab on the **Device Configuration** page on the GUI.
2. Expand **Encoder > Slots > Slot n Data & GPI Card > GPI Input Pin n Setup** folders in the **Advanced Video Processor Settings** widget.
3. Set up the GPI input pins. For a detailed parameter list, see *GPI Triggered Splicing* in *Chapter 5, Web GUI Control*.
4. Configure splicing options by expanding the appropriate **GPI Input Pin n Setup** folder and selecting **Splicing Setup**. For a detailed parameter list, see *GPI Triggered Splicing* in *Chapter 5, Web GUI Control*.

Note: A **Splicing Setup** folder is shown only if the GPI input pin mode has already been set up in the respective **GPI Input Pin n Setup** folder.

3.17.2

How to Set Up a VCM to Use GPI Inputs

To set up a Video Compression Module (VCM) for using GPI inputs, proceed as follows:

1. From the web browser navigate to **Device Configuration** page and select the **Advanced Setup** tab.
2. Expand the **Encoder > Slots** folders and the folder for the slot containing the appropriate encoder card.
3. Select **Video > Video 1 > Video > Main Video > Video Encoder > Splicing**.
4. Set **Splicing Control** to **On GPI**. An **SCTE-104 Input** folder appears in the settings tree and provides a list displaying all usable SCTE-104 channels. A channel is usable if there is at least one GPI pin configured on the source end of the channel (as described above).
5. Choose an input channel for the VCM encoder core. The configuration of the VCM is now complete and the encoder waits for SCTE-104 messages on the selected channel.

Combinations and Limitations

With the SCTE-104 channels a many-to-many relationship can be set up between the GPI pins and the encoder cores of VCMs, as follows.

- More pins of the same GPI card can be configured to send messages to the same set of encoder cores. This is achieved with selecting the same channel for them on the GPI Input Pin Setup panel.
- More encoder cores (of the same VCM or different VCMs) can be configured to get messages from the same set of pins of a GPI card. This is achieved by selecting the same channel for them on the **SCTE-104 Input > Encoder** folder.
- Different GPI cards fitted in the same unit can not send messages to the same encoder core, because one encoder core can only use one channel for SCTE-104 input.

3.18

How to Control Temperature/Fan Speed

Temperatures are reported to the user in degrees Celsius (° C) and degrees Fahrenheit (° F).

Host Card Monitoring

The die temperature of the main components on the Host card are monitored, and reported to an accuracy of ±2 °C.

A host card temperature alarm threshold can be set that, if exceeded, causes a **System Over Temperature** Alarm to be generated.

Note: It is recommended that the default threshold settings are not adjusted.



Option Card Monitoring

Option cards monitor the die temperature of their main components, and report these temperatures to an accuracy of ± 2 °C. If an option card reports die temperatures, it allows an alarm threshold to be defined for each temperature, which if exceeded causes an alarm to be generated.

Note: It is recommended that the default threshold settings are not adjusted.

VCMs

The controlling processor monitors the core temperatures of the main components and passes this information back to the host card via the back plane for monitoring.

Temperature thresholds can be set to cause a warning or an alarm. The warning level is configurable by the user, whereas the alarm level is hard coded.

Note: It is recommended that the default threshold settings are not adjusted.

Fans

The fans fitted to the chassis are speed controllable, providing a limited range of operating conditions.

To control temperature/fan speed:

1. Go to the **Device Control > Advanced Setup > Base Unit** page.
2. Using the slide bar control, set to **Lowest Noise, Quiet, Cool or Best Cooling**, as required.

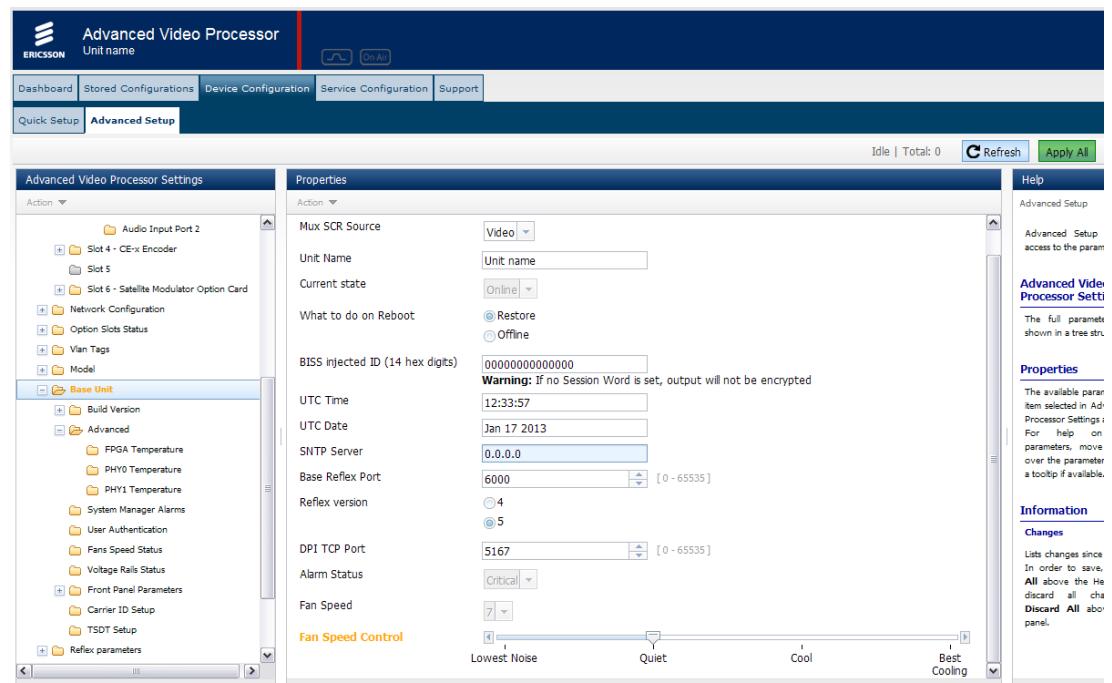


Figure 3.28 Fan Control



The internal temperature of the unit will vary according to the fan speed, but the unit will attempt to maintain the unit within safe operating limits. If it cannot do this and the temperature increases above the set alarm thresholds, over temperature warnings or alarms will be raised and appropriate action is needed.

3.19 How to Get and Apply Additional Licenses

The unit comes with the option cards and licenses, which were ordered, already installed.

For AVP 2000 and AVP 3000 units, general licenses are stored on the host, while video and audio related licenses are stored on the VCM option cards and modulator related licenses are stored on the Satellite Modulator Card.

3.19.1 Verifying Which Licenses Are Present in the Unit

Access to the web pages is necessary to verify the licenses that are enabled on the unit.

Navigate to **Support > Licenses**. This page displays a tab for each card that contains licenses. Each tab contains the marketing code, number of each license and a description of the feature enabled by the license.

Note: Short term licenses are not supported.

The number of licenses can be extended and new licenses ordered after the unit has been shipped.

To get and upload additional licenses, proceed as follows.

3.19.2 Ordering Additional Licenses

When ordering additional licenses for existing units the following information is needed:

- **Unique Chip ID of the unit** to enable licenses stored on the base chassis. To retrieve the Chip ID, go to **Support > Versions**, and in the **Modules** widget of the **General** tab click on the **Host** tab.



The screenshot shows the 'Support' tab selected in the top navigation bar. Below it, the 'Versions' tab is highlighted with a red circle. The 'Host' section of the 'Build' table shows the chip ID as 2F 70 36 E3 A2 22. The 'Modules' table shows detailed information for Slot 3, with the 'Host' tab selected, and the 'Chip Id' field also highlighted with a red circle.

System	Host	Slot 1	Slot 3	Slot 4
		Actual Version	Expected Version	
System	9.4.0.Build83	Version OK		

System	Host	Slot 1	Slot 3	Slot 4
		Actual Version	Expected Version	
System	9.4.0.Build83	Version OK		

Model	Host	Slot 1	Slot 3	Slot 4
Chip Id	2F 70 36 E3 A2 22			
Host Controller Card Id	1260			
Software Date	27 Mar 2013 22:26:33			
Software Version	9.4.0.110543			
Hardware Version	6.1			
S Number	S15980			
Serial Number	11212			
BSP Software Version	9.4.0.107658			
Boot FPGA Firmware Version	3.0.4			
Clock FPGA Firmware Version	1.0.7			

Figure 3.29 Finding the Host Card Chip ID for License Generation.

- The unique Chip ID of the option card to enable licenses stored on the card. To retrieve the Chip ID, go to **Support > Versions**, and in the **Modules** widget of the **General** tab click on the tab for the slot the option card is fitted in.
- The corresponding slot number MUST also be provided.

The screenshot shows the 'Support' tab selected in the top navigation bar. Below it, the 'Versions' tab is highlighted with a red circle. The 'Host' section of the 'Build' table shows the chip ID as 37 39 33 20 6b 0c. The 'Modules' table shows detailed information for Slot 3, with the 'Slot 3' tab selected, and the 'Chip Id' field highlighted with a red circle.

System	Host	Slot 1	Slot 3	Slot 4
		Actual Version	Expected Version	
System	9.4.0.Build83	Version OK		

System	Host	Slot 1	Slot 3	Slot 4
		Actual Version	Expected Version	
System	9.4.0.Build83	Version OK		

Model	Host	Slot 1	Slot 3	Slot 4
Chip Id	37 39 33 20 6b 0c			
Card Id	1264			
Name	CE-x Pre-Processor			
Software Version	v0.0.0.1			
Hardware Version	4.0			
CPLD Version	0			
Hardware S Number	S14793			
S Number	S14945			
Backend Software				
PreProcessor Software				
Rate Control Software				
Backend Firmware				
Coding Firmware				
ME Firmware				

Figure 3.30 Finding the Option Card Chip ID for License Generation

- The **TOTAL FINAL** number of licenses required (including licenses already enabled on the unit) needs to be provided.

Based on the above information, a license key file will be generated and provided to the customer.

3.19.3 Entering License Keys

The keys are saved in an XML (e.g. newlicensedetail.xml) ready to be entered onto the unit via the web page.

1. Open **Support > Licenses**. Click the **Browse** button to locate the license key file.
2. Click on the **Upload** button.



3. If licenses are required for both the base chassis and VCM option card then multiple files will be provided which all need to be loaded onto the specific unit.
4. Reboot the unit for the changes to take effect.

Note: The Front Panel CANNOT be used to upload license keys.

3.20 Alarm Monitoring

Alarms are reported on the GUI and Front Panel LED indication. Alarm trap handling is also supported through SNMP.

The severity of an alarm can be changed or the alarm can be masked if required. This can be performed on active alarms on the GUI dashboard or on any alarms by browsing to the **Support > Device Management** page.

Alarms			
Action			
Current	History	Base Unit	Slot 1: CE-a Pre-Processor
Slot 1: CE-a Pre-Processor	Video 1 Input Lock	No valid video found on video input. Please check source connection.	Critical
Slot 2: ASI IO Option Card	ASI Output-1 Error	An error has occurred in ASI Output 1. See the log for more details.	Mask
Slot 2: ASI IO Option Card	ASI Output-2 Error	An error has occurred in ASI Output 2. See the log for more details.	Warning
Slot 2: ASI IO Option Card	ASI Input-1 TS Lock Error	No valid Transport Stream found on ASI Input 1. ASI input possibly corrupt	Minor
Slot 2: ASI IO Option Card	ASI Input-2 TS Lock Error	No valid Transport Stream found on ASI Input 2. ASI input possibly corrupt	Major
Slot 3: CE-x Pre-Processor	Video 1 Input Lock	No valid video found on video input. Please check source connection.	Critical
Slot 6: Satellite Modulator Card	Primary Stream MPEG Sync Fail	Primary Stream MPEG sync fail	Critical
Base Unit: Network Alarm Configuration	Ethernet Interface Ctrl2 link down on Control network	Ethernet Interface Ctrl2 link down on Control network	Major
Base Unit: Network Alarm Configuration	Ethernet Interface Data4 link down in Data Interface Group 3-4	Ethernet Interface Data4 link down in Data Interface Group 3-4	Major
Base Unit: Network Alarm Configuration	Ethernet Interface Data1 link down in Data Interface Group 1-2	Ethernet Interface Data1 link down in Data Interface Group 1-2	Major
Base Unit: Network Alarm Configuration	Ethernet Interface Data2 link down in Data Interface Group 1-2	Ethernet Interface Data2 link down in Data Interface Group 1-2	Major
Base Unit: Network Alarm Configuration	Data Interface Group 1-2: Data Network Lost	Data Interface Group 1-2: Data Network Lost	Critical

Figure 3.31 Alarm Monitoring

3.21 Simple Network Management Protocol

Simple Network Management Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite and is defined in a set of standards (RFC 1065 - RFC 1067, RFC 1155 - RFC 1157, RFC 1213, RFC 1441 - RFC 1452, RFC 1901 - RFC 1910, RFC 2576, RFC 3411 - RFC 3418) published by the Internet Engineering Task Force (IETF).

3.21.1 Supported Protocols

SNMP versions 1, 2c and 3 are supported, primarily for alarm trap handling. The General Ericsson Television MIB is also supported.

Note: The unit does not support control via SNMP, all remote control is via HTTP or HTTPS.

3.21.2

Operation

SNMP traps are a way of reporting status information to a control system. The unit's SNMP functionality can be enabled or disabled, with up to five IP addresses assigned for any SNMP Trap message to be sent. The default is 000.000.000.000, which causes the SNMP traps to be sent to the last SNMP master. The SNMP community name can also be set.

The user can control which SNMP traps are generated. The options are:

- **All traps** – traps sent for all failure alarms, warnings and start messages.
- **Start Msgs, warning – critical** – traps sent for start messages or alarms raised of severity warning to critical.
- **Start Msgs, minor – critical** – traps sent for start messages or alarms raised of severity minor to critical.
- **Start Msgs, major – critical** – traps sent for start messages or alarms raised of severity major to critical.
- **Start Msgs, critical** – traps sent for start messages or critical alarms.
- **Start Msgs only** – traps sent for start messages only.

Table 3.19 SNMP Interface Parameters

Parameter	Description
SNMP Read Community	The SNMP community name for read access. default = public
SNMP Location	Textual description of the location of the unit
SNMP Contact	Name of the person responsible for this unit
SNMP Trap Community	The SNMP community name for read access. default = private
SNMP Trap Destination	The destination IP address for SNMP trap messages. Up to five destinations can be defined, but by default none are assigned
SNMP Trap Alarm Level	Defines what events trigger the generation of an SNMP trap message. The options are: Start Messages Only, i.e. only system start up events. Fail and Start Messages only i.e. start-up events and critical alarms. All traps i.e. start-up events and all alarms and warnings.



BLANK



Front Panel Control

Chapter 4

Contents

4.1	Introduction.....	4-3
4.2	Using the Front Panel Controls	4-3
4.2.1	Light Bar	4-3
4.2.2	Power Switch.....	4-3
4.2.3	Mini USB.....	4-3
4.2.3.1	Web Access and Update from Computer through the Mini USB	4-4
4.2.3.2	Configuration Handling through USB	4-4
4.2.3.3	Loading a Configuration from USB	4-5
4.2.3.4	Saving a Configuration to USB	4-5
4.2.3.5	Importing Configurations from USB	4-5
4.2.3.6	Exporting Configurations to USB	4-5
4.2.4	Rotary Knob.....	4-5
4.2.5	Keypad	4-6
4.2.6	Confidence Monitor On Key	4-6
4.2.7	Keyboard Lock.....	4-6
4.3	Front Panel Display	4-7
4.3.1	Appearance and General Features	4-7
4.4	Front Panel Menus	4-9
4.4.1	Main Menu	4-9
4.4.1.1	Manage Configuration Menu	4-10
4.4.1.2	Line Up Menu	4-11
4.4.1.3	Modulation Parameters Menu	4-12
4.4.1.4	Bit Rate Tracking Menu	4-13
4.4.1.5	A/V Encoder Menu	4-13
4.4.1.6	Output Menu	4-14
4.4.1.7	Alarms Menu	4-21
4.4.1.8	Shortcuts Menu	4-21
4.4.1.9	Unit Config Menu.....	4-21
4.4.2	Advanced Menu.....	4-22
4.4.2.1	CE-a, CE-x, CE-xA Pre-Processor Advanced Menu	4-29
4.4.2.2	CE-x, CE-xA Encoder Advanced Menu	4-43
4.4.2.3	CE-a J2K Advanced Menu	4-43
4.4.2.4	Satellite Modulator Option Card Advanced Menu (AVP 3000)	4-46
4.4.2.5	ASI I/O Option Card Advanced Menu.....	4-50
4.4.2.6	G.703 Transceiver Card Advanced Menu	4-51
4.4.2.7	GPI Card Advanced Menu.....	4-53

List of Figures

Figure 4.1 Advanced Video Processor Front Panel	4-3
Figure 4.2 Front Panel Mini USB.....	4-4
Figure 4.3 Typical Screen Displayed on Power-Up (AVP 3000 shown).....	4-7
Figure 4.4 Audio Input Monitor Screen.....	4-9
Figure 4.5 Main Menu Navigational Overview.....	4-9

List of Tables

Table 4.1 Ethernet Interface Settings.....	4-4
Table 4.2 Keypad Description	4-6
Table 4.3 Main Screen Icons.....	4-8
Table 4.4 Main Menu Options	4-10
Table 4.5 Manage Configuration Menu	4-10
Table 4.6 Line Up Menu.....	4-11
Table 4.7 Modulation Parameters Menu	4-12
Table 4.8 Bit Rate Tracking Menu.....	4-13
Table 4.9 A/V Encoder Menu	4-13
Table 4.10 Output Menu	4-14
Table 4.11 Unit Config Menu	4-21
Table 4.12 Advanced Menu	4-22
Table 4.13 CE-a, CE-x, CE-xA Pre-Processor Advanced Menu.....	4-29
Table 4.14 CE-x, CE-xA Encoder Advanced Menu.....	4-43
Table 4.15 CE-a J2K Advanced Menu	4-43
Table 4.16 Satellite Modulator Option Card Advanced Menu (AVP 3000).....	4-46
Table 4.17 ASI I/O Option Card Advanced Menu	4-50
Table 4.18 G.703 Transceiver Card Advanced Menu	4-51
Table 4.19 GPI Card Advanced Menu	4-53



4.1 Introduction

This chapter describes the features and options provided by the Front Panel menus for controlling the Advance Video Processor Series.

Note: After powering up (see *Chapter 3, Getting Started*), wait for initialization to complete (approximately 1.5 to 3 minutes, depending on the number of options fitted in the chassis) before attempting to use the front panel menus and controls.

4.2 Using the Front Panel Controls

The user interface for the Front Panel consists of an ON/OFF power switch, light bar, mini USB, rotary knob alphanumeric keypad, pushbuttons, main display and confidence monitor that are used to set-up, control and monitor the unit.

The unit can be controlled through the front panel by the rotary knob and the keypad. In a given state only the illuminated keys are functional.

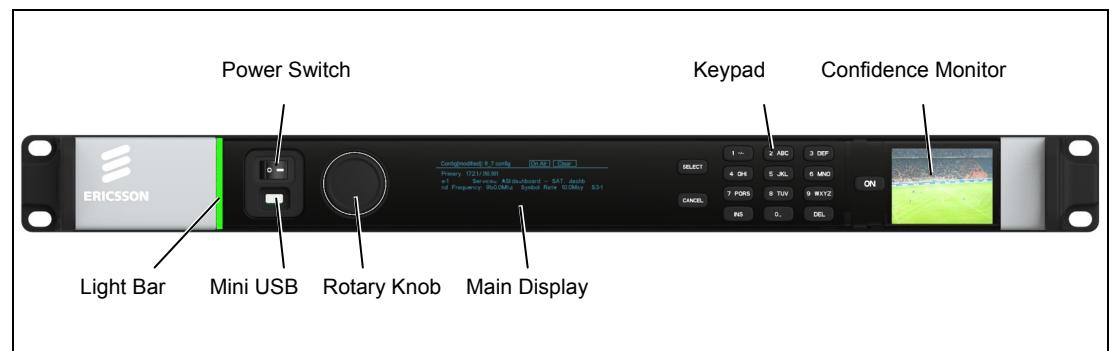


Figure 4.1 Advanced Video Processor Front Panel

4.2.1 Light Bar

The light bar indicates the alarm state of the unit.

4.2.2 Power Switch

The power switch is used for turning the unit **On** or **Off**. The switch is recessed to prevent the unit from being accidentally switched off.

4.2.3 Mini USB

The mini USB connector provides an interface for remote web access and update from a computer, and for saving or exporting configurations to, and loading or importing configurations from a USB stick.



Figure 4.2 Front Panel Mini USB

4.2.3.1

Web Access and Update from Computer through the Mini USB

The Mini USB port on the front panel of the unit can be used as a virtual IP connector through an USB-to-Ethernet adaptor. A computer connected through an USB-to-Ethernet adaptor to the front panel USB connector can provide the same functions as a computer connected to the control Ethernet interface of the unit. In this way the USB port can be used for unit upgrade and control. To access the unit from a computer through the USB connector, proceed as follows:

1. Connect an USB-to-Ethernet adaptor to the front panel USB connector with a USB cable.
2. Connect one of the Ethernet ports of the control computer to the Ethernet port on the USB-to-Ethernet adaptor through an UTP cable.
3. Set up the Ethernet interface of the control computer connected to the USB-to-Ethernet adaptor as detailed in *Table 4.1*.

Table 4.1 Ethernet Interface Settings

Parameter	Setting
IP Address	192.168.20.[2-255]
Gateway Address	192.168.20.1
Subnet Mask	255.255.255.0

Note: The USB interface uses the IP address 192.168.20.20, so this address cannot be assigned to the control computer.

4.2.3.2

Configuration Handling through USB

Configurations can be loaded or imported from, and saved or exported to a USB stick connected to the front panel USB connector.

Notes: Only configurations saved from, or converted to, the same software version as that running on the unit should be loaded or imported onto the unit.

If a configuration file is loaded onto a unit that has a different hardware configuration to that of the original unit, not all parameters will be configured and operation of the unit cannot be guaranteed.

The USB stick must be pre-formatted to FAT32 file system prior to use. The **Unit Config/USB Control/Format USB Stick** command on the front panel



does not format the attached USB stick; it only clears its content and recreates the directory structure required by the unit, 64 empty “slots” ready to take configurations. This means that any data already on the USB stick will be lost.

4.2.3.3 Loading a Configuration from USB

To load a configuration from the connected USB stick, select **Manage Configuration/Load Configuration from USB**.

Note: The selected configuration is applied but not stored on the unit.

4.2.3.4 Saving a Configuration to USB

To save the current configuration of the unit to the connected USB stick, select **Manage Configuration/Save Configuration to USB**.

Note: Entries already containing a stored configuration cannot be overwritten. Choose an entry with <empty slot> label to save the configuration.

4.2.3.5 Importing Configurations from USB

To import all the configurations stored on the USB stick, select **Manage Configuration/Import Configuration/Import All Configurations**.

To choose some configurations on the USB stick to import, select **Manage Configuration/Import Configuration>Select Configuration to Import**. The selected items are marked with '>', and can be imported by selecting the **Import Selected Configurations** command.

Configurations can also be imported one by one by selecting **Manage Configuration/Import Configuration/USB Config <n>**.

4.2.3.6 Exporting Configurations to USB

To export all of the configurations stored on the unit, select **Manage Configuration/Export Configuration/Export All Configurations**.

To choose some configurations on the unit to export, select **Manage Configuration/Export Configuration>Select Configuration to Export**.

The selected items are marked with '>', and can be imported by selecting **Export Selected Configurations**.

Configurations can also be imported one by one by selecting **Manage Configuration/Export Configuration/Device Config <n>**.

4.2.4 Rotary Knob

The rotary knob is used for scrolling in the menu system, moving the cursor or stepping attribute values. The knob also serves as a push button and performs the same function as the **Select** key.



The current position on the menu is indicated by a diamond next to the text. The diamond is solid if the parameter is configurable or outline if the text is for information (read only).

The menu option is selected by either pressing the rotary knob or pressing the select key.

Selecting an item will either take you to the next level in the menu tree or will provide you with the configurable options. These are either a pre-defined list that can be scrolled through and selected, or user entry from the alphanumeric keypad. When changes are made, pressing the knob or the **Select** key will activate and save the change. If you do not want to apply or save the change then press the **Cancel** key

4.2.5 Keypad

The main keys provided on the keypad are detailed in *Table 4.2*

Table 4.2 Keypad Description

Key	Description
Select	Used for selecting a menu item or accepting attribute value input.
Cancel	Used for exiting a menu or cancelling attribute value input.
Ins	Used for creating a link in a menu or inserting a character during text input.
Del	Used for deleting an item in a list or deleting a character during parameter input.
Alphanumeric Keys	Used for entering numerical or textual values. Different characters are invoked by multiple presses within a short interval.

4.2.6 Confidence Monitor On Key

The **On** key on the confidence monitor turns the monitor on or off. By pressing and holding the **On** key operation related data is shown. The first line displays the total number of hours the monitor has operated, the second line displays the software version.

For details on how to configure the settings for the confidence monitor, see *Chapter 3 Getting Started*.

4.2.7 Keyboard Lock

The controls are locked after a time of inactivity. In order to set the key lock time, navigate to **Unit Config/Display Setup/Menu Display And Keypad**. The keys can be unlocked by pressing the **Ins**, then the **Select** keys in this sequence as instructed on the front panel.



It is possible to configure the time before the keyboard becomes locked. This is available in the **Unit Config / Display Setup / Menu Display and Keypad** menu of the front panel or, from the GUI, go to **Device Configuration > Advanced Setup > Base Unit > Front Panel Parameters** and set the **Key Lock Time** in the **Properties** panel.

4.3 Front Panel Display

The parameters of the main display can be configured through the **Unit Config/Display Setup** menu of the front panel.

4.3.1 Appearance and General Features

The parameters of the main displays for all models of the AVP are similar in content and can be configured through the **Unit Config/Display Setup** menu of the front panel.

When the power-up sequence is complete, a main screen is displayed showing the following features, see *Figure 4.3*.

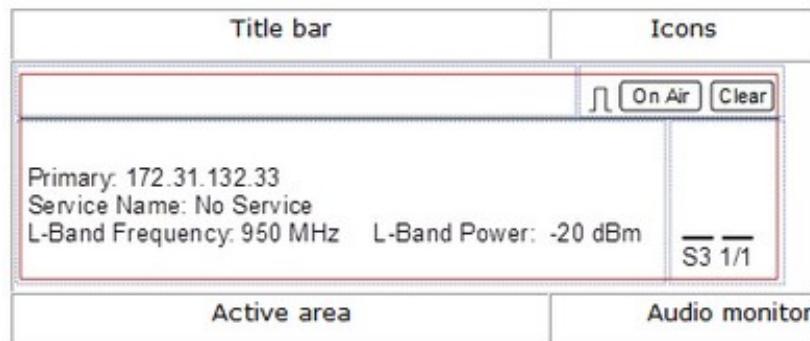


Figure 4.3 Typical Screen Displayed on Power-Up (AVP 3000 shown)

4.3.1.1 Title Bar

Alternately displays the current location within the menu tree and the recently loaded configuration. If the loaded configuration was changed in any way, the '(changed)' string is appended to the name.

4.3.1.2 Icons

The icons allow the user to determine the current state of the AVP 3000 at a glance. The icons available on the main screen are shown in *Table 4.3*.



Table 4.3 Main Screen Icons

Icon	Description		
	Output Power	Modulation State	Output State
	Irrelevant	Irrelevant	Off
	Moderate	Off	On
	High	Off	On
	Moderate	On	On
	High	On	On
Off Air	Either of Output State or Modulation State is Off or the Current State of the satellite modulator Transport Stream is not Online.		
On Air	Both Output State and Modulation State are On and the Current State of the satellite modulator Transport Stream is Online.		
CLEAR	No service in an enabled Modulator Transport Stream output is BISS or RAS encrypted		
SCRAMBLED	At least one service in an enabled Modulator Transport Stream output is BISS or RAS encrypted		

4.3.1.1.3

Active Area

The active area is used for:

- Displaying the IP address and status information about the active streams
- Displaying the Satellite Modulator parameters (AVP 3000 only)
- Displaying the menu system
- Displaying parameter setting

4.3.1.1.4

Audio Monitor

A selected audio input can be monitored. To select an audio input for constant monitoring, navigate to **Unit Config/Display Setup/Audio Monitor Input** and set the slot and channel parameters.

4.3.1.1.5

Audio Input Monitor

On the Audio Input Monitor Screen, see *Figure 4.4*, all the encoded channels from an option card can be displayed.

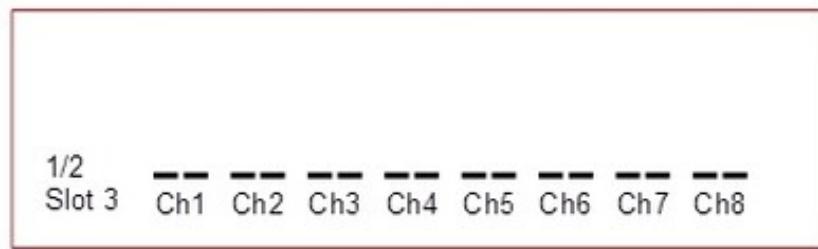


Figure 4.4 Audio Input Monitor Screen

The entire audio input range for an encoder card can be monitored by selecting the **AV Encoder/Audio Monitor menu**. The rotary knob can be used to switch between Channels 1-8 and Channels 9-16 on each card.

4.4 Front Panel Menus

4.4.1 Main Menu

Shortly after power-up the title bar of this screen displays the current location within the menu tree and the recently loaded configuration. The main area of the screen may also display either the current IP Address or Service Name, if one has been set.

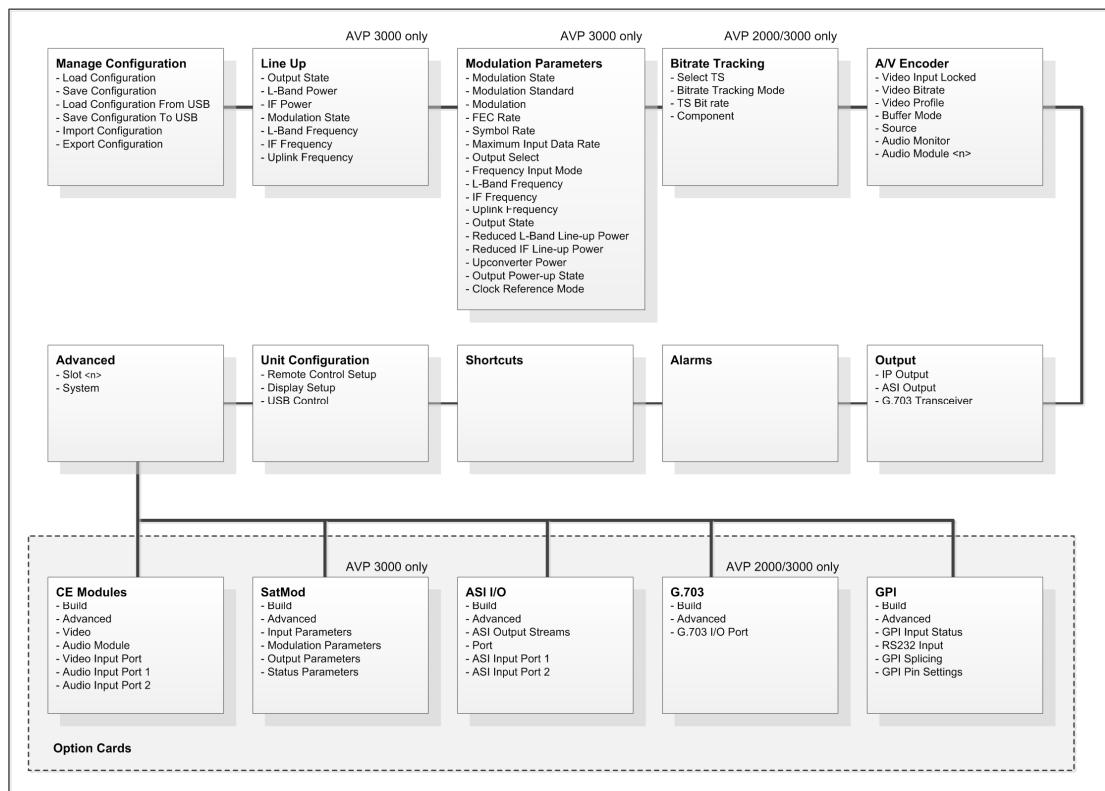


Figure 4.5 Main Menu Navigational Overview

The front panel provides a menu structure which is extended by the installed option cards. Menu navigation is achieved by the front panel controls. The menu is organized in such a way that frequently used items are easily accessible, while all the functionality is still made available through the front panel.

The menu items are described in *Table 4.4*.

Table 4.4 Main Menu Options

Menu Item	Description	AVP 2000	AVP 3000
Manage Configuration	Saving, loading, exporting, importing configurations	✓	✓
Line Up	Carrier signal power and frequency settings	✗	✓
Modulation Parameters	Carrier signal modulation settings	✗	✓
Bit Rate Tracking	Transport Stream Bit Rate settings	✓	✓
A/V Encoder	Audio/Video encoding settings, VCM specific	✓	✓
Output	Building a Transport Stream on a specific output	✓	✓
Alarms	Viewing alarms and setting alarm masks	✓	✓
Shortcuts	User-defined links to menu items	✓	✓
Unit Config	Device settings	✓	✓
Advanced (AVP2000/3000)	Access to full functionality of the AVP and the installed option cards	✓	✓

Sub Menus are listed in the following tables.

4.4.1.1 Manage Configuration Menu

The Manage Configuration Menu is used for saving, loading, exporting and importing configurations. The menu structure is shown in *Table 4.5*.

Table 4.5 Manage Configuration Menu

Manage Configuration	
Load Configuration	
Delete All Configurations from device	Deletes all the configurations previously saved on the unit.
Config <n>: <config name>	Selects the configuration to load from the configurations saved on the unit.
Save Configuration	
Config <n>: <name>	Saves the current configuration to the unit. Only slots labeled <empty slot> can be selected. Other slots are read only. Note: If an individual stored configuration needs to be deleted, Select the required memory slot and press the Del key.
Load Configuration from USB ¹	
Delete All Configurations from USB	Deletes all the configurations stored on the USB stick.



	Config <n>: <name>	Lists the configurations stored on the USB stick connected to the front panel. The selected configuration is loaded and becomes the current configuration, but is not stored in any of the slots in the unit.
	Save Configuration to USB ¹	
	Config <n>: <name>	The list of configurations stored on the unit. The selected configuration is saved to the USB stick connected to the front panel.
	Import Configuration ¹	
	Import All Configurations	Imports all the configurations stored on the USB stick and saves them on the unit. None of the configurations becomes active.
	Select Configurations to Import	
	Import Selected Configurations	Imports the selected configurations and stores them on the unit. None of the configurations becomes active, they are only stored on the unit.
	USB config <n>: <name>	The list of configurations stored on the USB stick. The configurations to be imported can be selected by pressing the Select button on the keypad.
	USB Config <n>: <name>	Imports one particular configuration from a USB stick. The imported configuration does not become active.
	Export Configuration ¹	
	Export All Configurations	Exports all the configurations stored on the unit to a USB stick.
	Select Configurations to Export	
	Export Selected Configurations	Exports the selected configurations and stores them on the USB stick attached to the front panel.
	Device Config <n>: <name>	The list of configurations stored on the USB stick. The configurations to be exported can be selected by pressing the Select button on the keypad.
	Device Config <n>: <name>	Exports one particular configuration to USB stick.

¹ Visible only when a USB drive is detected.

4.4.1.2 Line Up Menu

The Line Up Menu displays the Satellite modulator line up settings. The menu options are shown in *Table 4.6*.

Table 4.6 Line Up Menu

Line Up	
Output State	On (Nominal Power), On (Reduced Power), Off. Turns off or turns on the carrier signal with the selected power as set by the relevant parameter.
Nominal L-Band Power ¹	-40 – 5 dBm
Reduced L-Band Power ¹	
Nominal IF Power ²	-30 – 5 dBm
Reduced IF Power ²	
Modulation State	On, Off



L-Band Frequency ^{1,3}	950 – 2150 MHz. The center frequency of the signal output through the L-Band output.
IF Frequency ^{2,3}	50 – 180 MHz. The center frequency of the signal output through the IF output.
Uplink Frequency ⁴	The frequency the signal is converted to by the up-converter fed from the Voyager II. Its valid range changes depending upon other parameters.

1 Applies to L-Band output only.

2 Applies to IF output only.

3 Accessible if Frequency Input Mode is set to other than Uplink Frequency in the Modulation Parameters menu.

4 Accessible if Uplink Frequency is set for Frequency Input Mode in the Modulation Parameters menu.

4.4.1.3

Modulation Parameters Menu

The Modulation Parameters Menu displays the Satellite Modulation settings. The menu options are shown in *Table 4.7*.

Table 4.7 Modulation Parameters Menu

Modulation Parameters	
Modulation State	On, Off. The values are read only here and can only be changed in the Line Up or in the Advanced/Satellite Modulator Option Card/Output Parameters menu. The state is also reflected by icons, see Front Panel Screens.
Modulation Standard	DVB-S, DVB-DSNG, DVB-S2. The used modulation standards are defined by ETSI EN 300 421, ETSI 301 210 or ETSI EN 302 307, respectively.
Modulation	QPSK, 8PSK, 16QAM, 16APSK, 32APSK. It is . The availability of the constellations used for modulating the carrier is subject to the availability of licenses and the value set for the Modulation Standard parameter.
FEC Rate	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8, 8/9, 9/10. Indicates the ratio of the useful information to the useful information plus the redundant information used for error correction. The availability of the options is subject to the value set for the Modulation Standard parameter.
Symbol Rate	0.132 – 45 MSym/s (or 0.132 - 66 MSym/s if the VOY/SWO/HSYM license is available)
Maximum Input Data Rate	The maximum data rate of the transport stream the modulator can accept for the given modulation settings. Read-only parameter.
Output Select	L-Band, IF. The RF output used for sending the signal from the Voyager to the Up-converter. Depending on the choice made here the availability of related menu items changes.
Frequency Input Mode	L-Band Frequency ¹ , IF Frequency ² , Uplink Frequency. The mode the frequency is treated. For L-Band Frequency ¹ or IF Frequency ² the RF center frequency of the respective output is directly entered. For Uplink Frequency, the RF center frequency is calculated from the Uplink Frequency and the Up-converter Frequency.
L-Band Frequency ^{1,3}	950 – 2150 MHz. The center frequency of the signal output through the L-Band output.
IF Frequency ^{2,3}	50 – 180 MHz. The center frequency of the signal output through the IF output.
Uplink Frequency ⁴	The frequency the signal is converted to by the up-converter fed from the Voyager II.
Output state	On, Off. Read only parameter that reflects the output state set in the Line-up or in the Advanced/Satellite Modulator Option Card/Output Parameters menu. The state is also reflected by icons, see Front Panel Screens.
Reduced L-Band Line-up Power ¹	-40 – 5 dBm. The L-Band output power set when the satellite modulator Output State is changed to On during boot-up or when rebooted with the Output State allowed to stay on after reboot.
Reduced IF Line-up Power ²	-30 – 5 dBm. The IF output power set when the satellite modulator Output State is changed to On during boot-up or when rebooted with the Output State allowed to stay on after reboot.
Up-converter	Off, 15V, 24V. Turns on or off a DC voltage to supply the up-converter fed by the Voyager II. The presence of DC



Power ¹	power is also confirmed by an LED on the modulator card.
Output Power-up State	On, Off, Last State. The Output State set after the unit is booted. By Last State the unit keeps the Output State set before reboot.
Clock Reference Mode	Internal, [External]. External mode is not supported by the current hardware configuration.

- 1 Applies to L-Band output only.
- 2 Applies to IF output only.
- 3 Accessible if Frequency Input Mode is set to other than Uplink Frequency.
- 4 Accessible if Uplink Frequency is set for Frequency Input Mode.

4.4.1.4 Bit Rate Tracking Menu

The Bit Rate Tracking Menu displays the Transport Stream Bit Rate settings. The menu options are shown in *Table 4.8*.

Table 4.8 Bit Rate Tracking Menu

Bit Rate Tracking		
Select TS		Selects the Transport Stream the modifications in this menu apply to.
Enable Bit Rate Tracking		Off, Maximize video. Enables or disables Bit Rate tracking for the selected Transport Stream.
TS Bit Rate		Sets the Bit Rate of the selected Transport Stream.
Components		Selects the component within the Transport Stream selected.
	Component <n>	The components within the selected Transport Stream.
	Bit Rate	The Bit Rate of the component with Fixed weighting. For components with weighting other than Fixed, the parameter is read only.
	Bit Rate weighting	Fixed, Minimum, 2-20. Applies only for video components contained within a Transport Stream with Enable Bit Rate Tracking set to Maximise video. A component with Fixed weighting does not respond to changes in the Transport Stream Bit Rate. If Minimum is set for a component, it will always use the minimum Bit Rate defined for the video profile it is encoded with. A value 2-20 determines how much a component is changed when the Transport Stream Bit Rate is changed relative to other components with Bit Rate weighting other than Minimum.
	Master TS	The Transport Stream whose Bit Rate directly controls the Bit Rate of the component if it has a weighting other than Fixed.

4.4.1.5 A/V Encoder Menu

The A/V Encoder Menu displays the VCM specific audio/video encoder settings. The menu options are shown in *Table 4.9*.

Table 4.9 A/V Encoder Menu

A/V Encoder	
Video Input Locked	Yes, No. Read only parameter. Indicates whether a video lock is achieved for the SDI streams. For internal streams, its value is always Yes.
Video Bit Rate	Bit Rate of the video component encoded by the encoder card.
Video Profile	The video profile and level to use for encoding the source.



Buffer Mode	CBR, Seamless, Low Delay, Mega Low Delay.
Source	SDI, Bars, Black, Moving Object, Slate ¹ . External SDI source or internal source to be encoded.
Audio Monitor	Displays the levels for the channels associated with audio modules on the VCM card. To select between the audio modules, turn the rotary knob.
Audio Module <n>	For a full list of the menu items in the Audio Module <n> menu.

¹ Slate is not implemented in this release.

4.4.1.6 Output Menu

The Output Menu is used for building a Transport Stream on a specific output. The menu options are shown in *Table 4.10*.

Table 4.10 Output Menu

Output	
IP Output <n>	The IP output is either a physical interface or a bond of physical interfaces.
Data Interface Group <m>	Selects interface group <m> to modify its parameters.
Network Mode	Same-Network, Different-Network. If set to Different-Network, the two ports in the group can belong to different subnets. In Different-Network mode only the Active-Active Redundancy mode is supported.
IP Redundancy Mode	Active-Active, Active-Standby. Read only parameter. Describes the behavior of the spare interfaces. Currently, data output pairs that make up the data interface group are mirrored outputs.
Active Interface	Read only parameter. In Active - Active redundancy mode both interfaces are active.
Line Speed	Auto, 100 Mpbs, 1 Gbps. The transmission speed of the link.
Duplex Mode	Auto, Full Duplex, Half Duplex. Determines whether data are to be transmitted and received in a time divided manner (Half Duplex) or transmission and reception can happen at the same time over the same link (Full Duplex). Auto is for automatic configuration.
Default Virtual MAC Address	Virtual MAC address assigned to the Data Interface Group.
IP Address	The IP address associated with the interface group.
Subnet Mask	The subnet mask associated with the interface group.
Gateway Address	The gateway address associated with the interface group.
IGMP mode Selection	IGMP v2, IGMP v3
Physical Data Interface <k>	The physical data interface labeled as Ge <k> of the current data interface group.
Default MAC Address	The hardware address of the Ge <k> interface.
Link Status	Link Down, Link Up. The status of the current physical data interface.
Link Up Time	The time in days, hours, minutes and seconds the link is established. Read only parameter.



			TX Packets	Packets transmitted since the link is up.
			RX Packets	Packets received since the link is up.
			IP Address	The IP address of the physical data interface.
			Add New Transport Stream	Creates a new Transport Stream for the current output.
			Add Existing Transport Stream	Creates a copy of an existing Transport Stream for the current output.
			Transport Stream <I>	The list of the Transport Streams to copy to the current output.
			Transport Stream ID <id>	Selects the Transport Stream with ID <id> to modify its parameters.
			Service List	The list of services in the current Transport Stream.
			Add Service	Adds a new service to the current Transport Stream.
			Service <name>	Selects the service with <name> already added to the current Transport Stream.
			Component List	List of components in the current service.
			Add Component	Adds a new component to the current service.
			<Component name> on <pid>	Selects the component with <component name> and <pid> already added to the current service.
			Elementary Stream	The elementary stream associated with the component produced by one of the CE VCM modules in the unit.
			PID	The Packet Identifier that identifies the TS packets carrying the current component.
			Bit Rate Weighting	Fixed, Minimum, 2-20. The weighting associated to the current component. A component with Fixed weighting does not respond to changes in the Transport Stream Bit Rate. If Minimum is set for a component, it will always use the minimum Bit Rate defined for the video profile it is encoded with. A value 2-20 determines how much a component is changed when the Transport Stream Bit Rate is changed relative to other components with Bit Rate weighting other than Minimum.
			Master TS	Information only – master TS for Bitrate tracking
			Service ID	The unique identifier of the current service within the current Transport Stream.
			PMT PID	PID assigned to the PMT that describes the current service.
			PCR PID	The PID of the TS packets that carry the clock reference for the current service. If the service has a component with the Embedded PCR parameter set to On, this field contains the PID of that particular video stream and it is read only.
			SDT Parameters	
			Service Provider	The name of the service provider as appears in the NIT.
			Service Name	The name of the service as appears in the NIT.
			Service Type	Digital TV, Digital Radio, Teletext, Mosaic, Data Broadcast.
			NIT Service Parameters	
			LCN	0 - 1023



			BISS Key	Off, 1 – 32 Enables BISS using key stored in selected location.
			BISS SW	The 12 hexadecimal digit clear session word used for scrambling the current service. Visible only if BISS-1 is selected for Scrambling.
			BISS ESW	The 16 hexadecimal digit encrypted session word used for scrambling the current service. Visible only if BISS-E is selected for Scrambling. The key entered here is encrypted by the BISS Injected ID found under Advanced/System/Base Unit.
		Current State		The Setmode state of the Transport Stream. Read only parameter.
		Change State		Sets the Setmode state of the Transport Stream. The options available depends on the value set for MGP Mode under Advanced/System/MGP Support.
		Transport Stream Bit Rate		The Bit Rate of the Transport Stream.
		Bit Rate Tracking Mode		Off, Maximise video. Enables or disables Bit Rate tracking for the current Transport Stream.
		Auto Enable		If set to true, it automatically re-enables the Transport Streams when all the specified error conditions are cleared.
		Auto Disable		Never, Audio Lost, Video Lost, Any Upstream CRITICAL Alarm, Any CRITICAL alarm. Disables the output when the set condition is met. The Transport Stream can be set to be re-enabled at the Auto Disable option.
		Syntax		DVB, ATSC
		Program Specific Information		
		Transport Stream ID		A new ID can be assigned to the Transport Stream.
		PAT-PMT		On, Off
		PAT-PMT Parameters		
		PMT Repetition Period		100 ms, 400 ms, 500 ms. Specifies how often (in ms) the PMT shall be transmitted.
		Dolby Digital Descriptor		DVB, ATSC, DVB & ATSC
		CAT		On, Off
		TSTD		On, Off
		Service Information		
		Original Network ID		
		NIT		On, Off
		NIT Parameters		
		Network Name		Set Network Name
		Network ID		Set network ID.
		Generate LCN		Off, IEC 62216, NorDig v1, DTG Default
		Send Extended NIT - SIRG		On, Off. If PSI/SI Level is set to On (PAT/PMT/SDT/CAT/NIT) make sure the Send extended NIT (SIRG) is On so that the Carrier ID is sent.



		Insert NIT into PAT	True, False
		SDT	On, Off
		IP Bit Rate	Specifies the Bit Rate of the IP output and includes the overhead added by IP encapsulation. Read only parameter.
		TS Packets per IP Packet	1 - 7. Specifies how many Transport Stream packets to encapsulate in one IP packet.
		IP Encapsulation	UDP, RTP, RTP FEC Column, RTP FEC Column and Row. Specifies what higher layer to encapsulate in IP packets. UDP and RTP is self explanatory and means that the Transport Stream is first encapsulated in UDP or RTP packets, then an IP header is added. If RTP FEC column or RTP FEC Columns and Row is selected one (Column) or two (Column and Row) RTP streams are output in addition to the RTP streams that carry the Transport Stream.
		FEC Rows	The number of rows used in FEC encoding.
		FEC Columns	The number of columns used in FEC encoding..
		FEC Alignment	Block Aligned, Non Block Aligned. The aligned method used for Pro MPEG FEC..
		IP Output Configuration	
		Destination 1	Selects Destination 1.
		Destination IP Address	The destination IP address to use in the IP packet header of the IP packets that carry the Transport Stream
		Destination UDP Port	The destination UDP port to use in the IP packet header of the IP packets that carry the Transport Stream
		Source IP Address	The source IP address to use in the IP packet header of the IP packets that carry the Transport Stream
		Source UDP Port	The source UDP port to use in the IP packet header of the IP packets that carry the Transport Stream
		Vlan ID Tag	
		Time To Live	TTL value for inclusion in the IP header
		Type Of Service	ToS value for inclusion in the IP header
		ASI Output <n> (Slot <m>)	Selects ASI Output <n> on the ASI option card in slot <m>. If the ASI output is mirrored, then there is only 1 output per card.
		Add New Transport Stream	Adds a new Transport Stream to the output. Displayed only if no Transport Stream is defined for the ASI output.
		Add Existing Transport Stream	Creates a copy of an existing Transport Stream at the current output. Displayed only if no Transport Stream is defined for the ASI output.
		Transport Stream ID: <id>	Selects the Transport Stream with id <id> to modify its parameters.
		Service List	The list of services in the current Transport Stream.
		Add Service	Adds a service to the current Transport Stream.
		Service <name>	Selects the service with <name> already added to the current Transport Stream.



			Component List	Lists the components in the current service.
			Add Component	Adds a new component to the current service.
			<Component name> on pid <pid>	Selects the component with <component name> and <pid> already added to the current service.
			Elementary Stream	The elementary stream associated with the component produced by one of the VCM modules in the unit.
			PID	The Packet Identifier that identifies the TS packets carrying the current component.
			Bit Rate Weighting	Fixed, Minimum, 2-20. The weighting associated to the current component. A component with Fixed weighting does not respond to changes in the Transport Stream Bit Rate. If Minimum is set for a component, it will always use the minimum Bit Rate defined for the video profile it is encoded with. A value 2-20 determines how much a component is changed when the Transport Stream Bit Rate is changed relative to other components with Bit Rate weighting other than Minimum.
			Service Provider	The name of the service provider as appears in the NIT.
			Service Name	The name of the service as appears in the NIT.
			Service ID	The unique identifier of the current service within the current Transport Stream.
			Service Type	Digital TV, Digital Radio, Teletext, Mosaic, Data Broadcast.
			PMT Pid	PID assigned to the PMT that describes the current service.
			Logical Channel	Appears in the NIT and provides a default channel number label for the current service.
			PCR PID	PID of the TS packets that carry the clock reference for the current service. If the service has a component with the Embedded PCR parameter set to On, this field contains the PID of that particular video stream and it is read only.
			Scrambling	Off, BISS-1, BISS-E. Disables or enables the scrambling of the current service by the Basic Interoperable Scrambling System with or without encrypted keys.
			BISS SW	The 12 hexadecimal digit clear session word used for scrambling the current service. Visible only if BISS-1 is selected for Scrambling.
			BISS ESW	The 16 hexadecimal digit encrypted session word used for scrambling the current service. Visible only if BISS-E is selected for Scrambling. The key entered here is encrypted by the BISS Injected ID found under Advanced/System/Base Unit.
			Current State	The Setmode state of the Transport Stream. Read only parameter.
			Change State	Sets the Setmode state of the Transport Stream. The options available depends on the value set for MGP Mode under Advanced/System/MGP Support.
			Transport Stream ID	The label to identify the current Transport Stream from any other multiplex within a network.
			Network Name	The network name as used in the NIT.
			Network ID	The network ID as used in the NIT.
			Mode	CBR, VBR.



	PSI-SI Level	Off, On (PAT, PMT only), On (PAT/PMT/SDT/CAT/NIT). Sets which tables are inserted into the Transport Stream.
	Send Extended NIT (SIRG)	On, Off. Determines whether Carrier ID is to be inserted in the NIT. Available only when the PSI-SI Level is set so that NIT is generated.
	PMT Repetition Period	The repetition interval of the PMT table expressed in ms.
	Transport Stream Bit Rate	The Bit Rate of the Transport Stream.
	Bit Rate Tracking Mode	Off, Maximise video. Enables or disables Bit Rate tracking for the current Transport Stream.
	Auto Enable	If set to true, it automatically re-enables the Transport Streams when all the specified error conditions are cleared.
	Auto Disable	Never, Audio Lost, Video Lost, Any Upstream CRITICAL Alarm, Any CRITICAL alarm. Disables the output when the set condition is met. The Transport Stream can be set to be re-enabled at the Auto Disable option.
	G.703 Transceiver (Slot <m>)	Selects the G.703 Transceiver card.
	Add New Transport Stream	Adds a new Transport Stream to the output. Displayed only if no Transport Stream is defined for the ASI output.
	Add Existing Transport Stream	Creates a copy of an existing Transport Stream at the current output. Displayed only if no Transport Stream is defined for the ASI output.
	Transport Stream ID <id>	Selects the Transport Stream with ID <id> to modify its parameters.
	Service List	The list of services in the current Transport Stream.
	Add Service	Adds a new service to the current Transport Stream.
	Service <name>	Selects the service with <name> already added to the current Transport Stream.
	Component List	List of components in the current service.
	y Add Component	Adds a new component to the current service.
	<Component name> on <pid>	Selects the component with <component name> and <pid> already added to the current service.
	Elementary Stream	The elementary stream associated with the component produced by one of the VCM modules in the unit.
	PID	The Packet Identifier that identifies the TS packets carrying the current component.
	Bit Rate Weighting	Fixed, Minimum, 2-20. The weighting associated to the current component. A component with Fixed weighting does not respond to changes in the Transport Stream Bit Rate. If Minimum is set for a component, it will always use the minimum Bit Rate defined for the video profile it is encoded with. A value 2-20 determines how much a component is changed when the Transport Stream Bit Rate is changed relative to other components with Bit Rate weighting other than Minimum.
	Service Provider	The name of the service provider as appears in the NIT.
	Service Name	The name of the service as appears in the NIT.
	Service ID	The unique identifier of the current service within the current Transport Stream.



			Service Type	Digital TV, Digital Radio, Teletext, Mosaic, Data Broadcast.
			PMT Pid	PID assigned to the PMT that describes the current service.
			Logical Channel	Appears in the NIT and provides a default channel number label for the current service.
			PCR PID	The PID of the TS packets that carry the clock reference for the current service. If the service has a component with the Embedded PCR parameter set to On, this field contains the PID of that particular video stream and it is read only.
			Scrambling	Off, BISS-1, BISS-E. Disables or enables the scrambling of the current service by the Basic Interoperable Scrambling System with or without encrypted keys.
			BISS SW	The 12 hexadecimal digit clear session word used for scrambling the current service. Visible only if BISS-1 is selected for Scrambling.
			BISS ESW	The 16 hexadecimal digit encrypted session word used for scrambling the current service. Visible only if BISS-E is selected for Scrambling. The key entered here is encrypted by the BISS Injected ID found under Advanced/System/Base Unit.
			Current State	The Setmode state of the Transport Stream. Read only parameter.
			Change State	Sets the Setmode state of the Transport Stream. The options available depends on the value set for MGP Mode under Advanced/System/MGP Support
			Transport Stream ID	The label to identify the current Transport Stream from any other multiplex within a network.
			Network Name	The network name as used in the NIT.
			Network ID	The network ID as used in the NIT.
			Mode	CBR, VBR.
			PSI-SI Level	Off, On (PAT, PMT only), On (PAT/PMT/SDT/CAT/NIT). Sets which tables are inserted into the Transport Stream.
			Send Extended NIT (SIRG)	On, Off. Determines whether Carrier ID is to be inserted in the NIT. Available only when the PSI-SI Level is set so that NIT is generated.
			PMT Repetition Period	The repetition interval of the PMT table expressed in ms.
			Transport Stream Bit Rate	The Bit Rate of the Transport Stream.
			Bit Rate Tracking Mode	Off, Maximise video. Enables or disables Bit Rate tracking for the current Transport Stream.
			Auto Enable	If set to true, it automatically re-enables the Transport Streams when all the specified error conditions are cleared.
			Auto Disable	Never, Audio Lost, Video Lost, Any Upstream CRITICAL Alarm, Any CRITICAL alarm. Disables the output when the set condition is met. The Transport Stream can be set to be re-enabled at the Auto Disable option.



4.4.1.7 Alarms Menu

The Alarms Menu displays the alarm settings available on the unit.

4.4.1.8 Shortcuts Menu

The Shortcuts menu displays the shortcuts available on the unit.

4.4.1.9 Unit Config Menu

The Unit Config Menu displays the device settings. The menu options are shown in *Table 4.11*.

Table 4.11 Unit Config Menu

Unit Config	
Remote Control Setup	
IP Address	The IP address of the unit for upgrade or web control.
Subnet Mask	The subnet mask associated to the IP address set.
Gateway Address	The gateway through which the unit can be accessed.
Display Setup	
Video Monitor Input	Provides list of available sources
Video Monitor Parameters	
Video Monitor Brightness	0 – 8 Adjusts the brightness of the monitor
Video Monitor Usage Time	Information Only
Video Monitor Preview Time	Duration that the monitor will be active from the time the “on” button is pressed
Audio Monitor Input	
Audio Slot Select	Selects the slot from which to monitor a channel on the front panel.
Audio Channel Select	Selects the channel from the slot selected in <i>Audio Slot Select</i> and the module set in <i>Audio Module Select</i> for displaying on the front panel.
Audio Module Select	Selects the module from the slot selected in <i>Audio Slot Select</i> .
Menu Display and Keypad	
Keypad Lock Time	The timeout time in seconds after which the keyboard gets locked.
Keypad LED Brightness	The brightness of the keys in the keypad.
Display Test	Starts a test sequence on the display to verify correct operation.
USB Control ¹	
Format USB Stick	Recreates the default directory structure on the USB stick connected to the front panel. Any existing data on the USB stick will be lost.

¹ Visible only when a USB drive is detected.



4.4.2 Advanced Menu

The **Advanced** menu allows access to all of the **Advanced** menus for the installed option cards. Selecting the option card (the parameters of which you wish to edit) from the **Slot <n>** option will give access to the required menu.

Note: The availability of some options depends upon the hardware fitted or licenses available.

If no option card is selected, the System menu is displayed as shown below.

Table 4.12 Advanced Menu

Advanced	
Slot <n>	See the menu of the installed card: CE-a, CE-x, CE-xA Pre-Processor Advanced Menu CE-x, CE-xA Encoder Advanced Menu CE-a J2K Advanced Menu Satellite Modulator Option Card Advanced Menu (AVP 3000) ASI I/O Option Card Advanced Menu G.703 Transceiver Card Advanced Menu GPI Option Card Advanced Menu
System	
Network Configuration	
Check Duplicate IP Address	Enable, Disable. If enabled, the unit checks whether there is another unit with the same IP address within the network by sending out ARP messages.
Control Interface Group	
Network Mode	Same-Network, Different-Network. Read only parameter for the control interface, and is set to Same-Network.
IP Redundancy Mode	Active-Active, Active-Standby. Describes how the spare interfaces will behave. For the control port, it is set to Active-Standby and is read only.
Index	Identifier of the interface group. Read only parameter.
Autorevert	Auto-revert to Primary, Auto-revert to Secondary. Shown only if the <i>IP Redundancy mode</i> is set to Active-Standby. Determines what to do when connection is lost.
Autorevert Delay	The delay in seconds before automatic redundancy switching takes place. Shown only if the <i>IP Redundancy mode</i> is set to Active-Standby.
Active Interface	Read only parameter. Displays which interface is active. In Active -Active redundancy mode both interfaces are active.
Line Speed	Auto, 100 Mbps, 1 Gbps. The transmission speed of the link.
Duplex Mode	Auto, Full Duplex, Half Duplex. Determines whether data should be transmitted and received in a time divided manner (Half Duplex) or transmission and reception can happen at the same time over the same link (Full Duplex). Auto is for automatic configuration.
Default MAC Address	Virtual MAC address assigned to the Control Interface Group.
IP Address	The IP address associated with the interface group.



	Subnet Mask	The subnet mask associated with the interface group.
	Gateway Address	The gateway address associated with the interface group.
	Physical Data Interface <n>	The physical data interface labelled as Ge <n> of the current control interface group.
	Port Type	Ethernet. Read only parameter.
	Direction	Output. Read only parameter.
	Index	Identifier of the physical data interface. Read only parameter.
	Default MAC Address	The hardware address of the Ge <n> interface.
	Link Status	Link Down, Link Up. The status of the current physical data interface.
	Link Up Time	The time in days, hours, minutes and seconds the link is established. Read only parameter.
	TX Packets	The packets transmitted since the link is up.
	RX Packets	The packets received since the link is up.
	IP Address	The IP address of the physical data interface.
	Data Interface Group <n>	
	Network Mode	Same-Network, Different-Network. If set to Different-Network, the two ports in the group can belong to different subnets. In Different-Network mode only the Active-Active Redundancy mode is supported.
	IP Redundancy Mode	Active-Active, Active-Standby. Describes how the spare interfaces will behave. For a data interface group only Active/Active is supported. Read only parameter.
	Index	Identifier of the interface group. Read only parameter.
	Autorevert	Auto-revert to Primary, Auto-revert to Secondary. Shown only if the IP Redundancy mode is set to Active-Standby. Determines what to do when connection is lost.
	Autorevert Delay	The delay in seconds before automatic redundancy switching takes place. Shown only if the <i>IP Redundancy mode</i> is set to Active-Standby.
	Active Interface	Read only parameter. Displays which interface is active. In Active -Active redundancy mode both interfaces are active.
	Line Speed	Auto, 100 Mpbs, 1 Gbps. The transmission speed of the link.
	Duplex Mode	Auto, Full Duplex, Half Duplex. Determines whether data should be transmitted and received in a time divided manner (Half Duplex) or transmission and reception can happen at the same time over the same link (Full Duplex). Auto is for automatic configuration.
	Default Virtual MAC Address	Virtual MAC address assigned to the current Data Interface Group.
	IP Address	The IP address associated with the interface group.
	Subnet Mask	The subnet mask associated with the interface group.
	Gateway Address	The gateway address associated with the interface group.
	Physical Data Interface <m>	The physical data interface labelled as Ge <m> of the current data interface group.
	Port Type	Ethernet. Read only parameter.
	Direction	Output. Read only parameter.



			Index	Identifier of the physical data interface. Read only parameter.
			Default MAC Address	The hardware address of the Ge <n> interface.
			Link Status	Link Down, Link Up. The status of the current physical data interface. Read only parameter.
			Link Up Time	The time in days, hours, minutes and seconds the link is established. Read only parameter.
			TX Packets	Packets transmitted since the link is up. Read only parameter.
			RX Packets	Packets received since the link is up. Read only parameter.
			IP Address	The IP address of the physical data interface.
	Model			
			Unit Name	The name of the current unit for displaying on the web user interface.
			Build Version	
			Assembly Date	The time and date when the current unit was assembled. Read only parameter.
			Software Version	The version of the software currently installed on the unit. Read only parameter.
			Serial Number	The serial number of the unit. Read only parameter.
	Chassis Type			The type of the chassis. Read only parameter.
			PSU A Option	The voltage level provided by PSU A. Read only parameter.
			PSU B Option	The voltage level provided by PSU B. Read only parameter.
			Inlet A	AC, DC, none. The type of the power through inlet A of the current unit. Read only parameter.
			Inlet B	AC, DC, none. The type of the power supply through inlet B of the current unit. Read only parameter.
			Inlet Mode	Supply mode of the inlets. Read only parameter.
			Number of Usable Slots	The number of slots in the current unit. Single PSU units have 6 slots, dual PSU units have 4 slots. Read only parameter.
	Base Unit			
			Build Version	
			Host Controller Id	The Card Id of the host controller card. Read only parameter.
			Software Date	The date the host software was compiled. Read only parameter.
			Software Version	The version of the software running on the host controller card. Read only parameter.
			Hardware Version	The hardware version of the host controller card. Read only parameter.
			S Number	The BOM assembly number of the host card. The S number specifies the available software and firmware features of the card. Read only parameter.
			Serial Number	The serial number of the host card. Read only parameter.
			Software/Firmware	
			BSP Software Version	The software version of the board support package. Read only parameter.



			Application Software Version	The version of the application that runs on the host controller card. Read only parameter.
			Boot FPGA Firmware Version	The firmware version of the boot FPGA. Read only parameter.
			Main FPGA Firmware Version	The firmware version of the main FPGA. Read only parameter.
			Clocks FPGA Firmware Version	The firmware version of the clocks FPGA. Read only parameter.
	Advanced			
			Chip Id	The unique identifier of the host controller card. Read only parameter.
			FPGA Temperature	
			FPGA Warning Temperature	The temperature in degrees centigrade of the host FPGA at which the unit issues a warning.
			FPGA Over Temperature	The temperature in degrees centigrade of the host FPGA at which the unit issues a critical alarm.
			FPGA Temperature	The current temperature in degrees centigrade of the host FPGA.
	PHY0 Temperature			
			PHY0 Warning Temperature	The temperature in degrees centigrade of the Ethernet PHY0 at which the unit issues a warning.
			PHY0 Over Temperature	The temperature in degrees centigrade of the Ethernet PHY0 at which the unit issues a critical alarm.
			PHY0 Temperature	The current temperature in degrees centigrade of Ethernet PHY0.
	PHY1 Temperature			
			PHY1 Warning Temperature	The temperature in degrees centigrade of the Ethernet PHY1 at which the unit issues a warning.
			PHY1 Over Temperature	The temperature in degrees centigrade of the Ethernet PHY1 at which the unit issues a critical alarm.
			PHY1 Temperature	The current temperature in degrees centigrade of the Ethernet PHY1.
	Mux SCR Source			Internal, Video. The source of the system clock reference used for timing.
	Status of Service			The Setmode state of the unit.
	Change State			Changes the Setmode state of the unit. The available options depend on the settings in Advanced/System/Base Unit/MGP Support/MGP Mode.
	IP Input system Compensation			0 – 5000 ms
	What to Do on Reboot			Restore, Offline. Determines whether the streams remain offline after reboot or their Setmode state is to be restored.
	TS Source IP Redundancy			Non-Transparent, Transparent
	BISS Mode			BISS Security option (Normal or Advanced)
	BISS Injected ID (14 hex digits)			BISS injected ID used for transmitting the Encrypted Session Word used for BISS-E encoding.
	BISS Keys table			Table locations for BISS key storage and selection



	UTC Time	The UTC time set on the unit.
	UTC Date	The UTC date set on the unit.
	SNTP Server	The IP address of a time server in the network.
	Reflex Version ¹	Selects the Reflex version to use for statistical multiplexing. Not supported in the current release.
	DPI TCP Port	The port for the SCTE104 Slice messages to be transmitted.
	Alarm Status	The overall alarm status of the unit. The same as indicated by the light pipe on the front panel.
	User Authentication	
	Enable	On, Off. Determines whether authentication is required for controlling the unit.
	User Name	The user name used for authentication if user authentication is enabled.
	Password	The password used for authentication if user authentication is enabled.
	Fan Speed	Information Only
	Fans Speed Control	Lowest Noise, Quiet, Cool or Best Cooling. Sets the fan speed to achieve the required operation whilst maintaining a safe operating temperature within the unit.
	Fans Speed Status	Lists the speed of the respective fans in rpm.
	Fan 1	
	Fan 2	
	Fan 3	
	Fan 4	
	Fan 5	
	Voltage Rails Status	Lists the actual voltage or current levels of the respective nominal outputs.
	0.9V A	
	0.9V B	
	1.0V	
	1.0V GTP	
	1.2V GTP	
	1.2V	
	1.5V	
	1.8V	
	2.5V	
	2.5V Vcc Aux	
	3.0V	
	3.3V	
	3.6V	



Front Panel Parameters		
	LED Brightness Control	0-7. The brightness of the keys and the rotary knob.
	Video Monitor Preview Time	The time in seconds after which the TND is to be turned off automatically. If 0 is given as value, the TND does not turn out automatically.
	Video Monitor Usage Time	The cumulative time the TND was switched on.
	Video Monitor Brightness	0-7. Sets the brightness of the TND (CMU) display.
	Key Lock Time	The time in seconds after which the keyboard gets locked to prevent accidental key presses.
	Default Screen on Key Lock	When set to on the menu will return to default screen. Set to off to remain on current screen after timeout lock.
	Default Screen Type	Classic – enables the scrolling status information Alternative disables the scrolling status
	Carrier ID Setup	The UDP port on the current unit to which PCR Exchange Messages are sent.
	Operator	
	Phone Number	
	Longitude	
	Latitude	
	User Information	
	NIT Descriptor Tag	
	TSTD Setup	
	Usual Station Code	
	SNG HQ	
	SNG Provider	
	Reflex Parameters	
	PCR Port	The UDP port on the current unit to which PCR Exchange Messages are sent.
	Command port	The UDP port on the current unit to which Set Rate Messages are sent.
	Status Port	The UDP port on the multiplexer to which Status Messages are sent from the current unit.
	PCR Exchange Timeout Port	The maximum time between PCR Exchange Messages. If exceeded, PCR Exchange Timeout Alarm is triggered.
	Reflex TTL	The time to live value to be applied to all Reflex v5 messages transmitted from the current unit.
	Set Rate Timeout Period	The maximum number of video frames between set rate messages. If exceeded, Set Rate Message Timeout Alarm is triggered.
	Output Stream List	Lists the output reflex streams. Empty in this release as Reflex is not supported.
	MGP Support	
	Supported MGP Version	The MGP version supported by the unit. Read only parameter.



	MGP Mode	Off, Module Level, Unit Level. Determines if MGP is enabled or not, or if it is enabled, then the unit is controlled as a whole or on a module level basis.
	Transmission Interval	Period for steady-state transmission of MSM packets in units of ms.
	R0 Playout Period	Duration of the MSM burst emitted on entering MGP state R0 in units of ms.
	S1 Playout Period	Duration of the MSM burst emitted on entering MGP state S1 in units of ms.
	Control Contact Timeout	Period of time in ms the system waits before assuming loss of contact with the control system after the control link goes down.
	MSM Destination Port	UDP port for sending MGP packets.
	MGP Settings ¹	¹ Only available when MGP is enabled
	MSM Multicast Address	The destination IP Address of the MSM packets.
	MGP State	The current state of the MGP implementation.
	MGP Spares	
	Spare Device Configuration	Selects a spare device to set up its parameters.
	Spare IP Address	The IP address of another unit that is acting as a spare for this unit/service.
	Vlan Tags	
	Output <n>: Data Port <m> - Data Port <k>	Selects output <n> for adjusting its VLAN settings.
	Add Vlan tag	Adds a new VLAN tag to the current output.
	Vlan ID: <id>	The ID associated with the VLAN tag. Allows the user to change the ID.
	Vlan ID (Create)	Modifies the VLAN ID for the current tag.
	Vlan IP	Assigns an IP address to the VLAN.
	Vlan Netmask	Specifies the network mask for the current VLAN.
	Vlan Gateway	Specifies the gateway address for the current VLAN.
	SNMP	
	System Contact	Contact to the team providing support for this unit.
	System Name	The name to identify the current unit.
	System Location	The location where the current unit is installed.
	Will This Unit Be SNMP Polled	True, False. Determines whether the unit is polled for SNMP information or not.
	Time Elapsed Before Control Assumed Lost	The amount of time between sysUpTime requests before the connection with the control system is assumed to be down.
	Currently in Contact with Control System	Determines if a connection has been established with the trap server.
	SNMP Trap Server	Configures the Trap Server destinations.
	Community	The community name for all trap messages.
	SNMP Version	The version of SNMP used for the trap messages.
	Trap Sequence Index	The reference number of the last alarm trap sent.



	Config Trap Wait	The minimum time in seconds between each configuration change message sent.
	Config Event Index	The reference number of the last configuration change trap sent.
	Trap Level	Start Msgs, warning-critical; Start Msgs, minor-critical; Start Msgs, major-critical; Start Msgs, critical; Start Msgs only. Configures the levels of the alarm and the start traps sent from the current unit.
	Accept Configuration	Accepts the changes in hardware configuration if there are any.

4.4.2.1 CE-a, CE-x, CE-xA Pre-Processor Advanced Menu

Note: The availability of some options depends upon the hardware fitted or licenses available.

Table 4.13 CE-a, CE-x, CE-xA Pre-Processor Advanced Menu

Build		
	Card Id	
	Name	
	Software Version	
	Hardware Version	
	CPLD Version	
	Hardware S Number	
	S Number	
Advanced		
	Chip Id	
	Requested Air Flow	
	PCR Interval	
	FrontEnd FPGA Temperature	
		Temperature
		Temperature Alarm Threshold
		Over Temperature Threshold
	BackEnd FPGA Temperature	
		Temperature
		Temperature Alarm Threshold
		Over Temperature Threshold
VideoGroup		
	Video 1	
		Input



				Video Input Lock
				Source
				Input Detection
				Detected Video Standard
				Video Input Format
				Pedestal
				Output on Video Loss
				Ident Text
				MCTF
				Adaptive Pre-processing
				Bandwidth
				Half Line Removal
			logo	
				Upload New Logo File
				Logo file
				Logo insertion
				A fixed logo position?
				The X position of the logo
				The Y position of the logo
				HD to SD Video Down-conversion
				Default Aspect Ratio Conversion
				Use Input AFD
				Action on AFD lost
				Action on AFD code 0000
				VBI Extraction
				Descriptor Control
				VBI Descriptor Mode
				VBI Data Descriptor Insertion
				VBI Teletext Descriptor Insertion
				Teletext Descriptor Insertion
				Proprietary Descriptor Insertion
				Aspect Ratio (AR) Signalling
				Video Index



					Video Index Field 1
					Video Index Field 2
					Video Index Field 1
					Video Index Field 2
					SMPTE 2016
					AFD Sustain
					AFD Sustain Timeout
					AFD Action on Reserved Codes
					Closed Captions
					Closed Captions Source
					Timecode
					TC Mode
					TC External Source
					TC Dropframes
					Broadcaster ID
					Reception Timeout
					Insertion Timeout
					Broadcaster ID Mode
					Default Servicename
					Broadcaster ID Source
					Broadcaster ID
					Generic ANC
					Generic ANC Extraction
					Max ANC Bit Rate
					Teletext
					Teletext Source
					Teletext Packetisation
					SMPTE2031 Max. No. Teletext Lines
					SMPTE2031 Teletext Present
					Min # Teletext Packets
					PTS on Teletext
					Teletext Descriptor Page List
					Teletext Descriptor Page



							Teletext Page Type
							Teletext Page Number
							Teletext Page Language
						Teletext Descriptor Page	
							Teletext Page Type
							Teletext Page Number
							Teletext Page Language
						Teletext Descriptor Page	
							Teletext Page Type
							Teletext Page Number
							Teletext Page Language
					VBI Line Control		
				Field 1			
					VBI Line 9		
					VBI Line 10		
					VBI Line 11		
					VBI Line 12		
					VBI Line 13		
					VBI Line 14		
					VBI Line 15		
					VBI Line 16		
					VBI Line 17		
					VBI Line 18		
					VBI Line 19		
					VBI Line 20		
					VBI Line 21		
					VBI Line 22		
				Field 2			
					VBI Line 272		



				VBI Line 273
				VBI Line 274
				VBI Line 275
				VBI Line 276
				VBI Line 277
				VBI Line 278
				VBI Line 279
				VBI Line 280
				VBI Line 281
				VBI Line 282
				VBI Line 283
				VBI Line 284
				VBI Line 285
				Field 1
				VBI Line 6
				VBI Line 7
				VBI Line 8
				VBI Line 9
				VBI Line 10
				VBI Line 11
				VBI Line 12
				VBI Line 13
				VBI Line 14
				VBI Line 15
				VBI Line 16
				VBI Line 17
				VBI Line 18
				VBI Line 19
				VBI Line 20
				VBI Line 21
				VBI Line 22
				VBI Line 23
				Field 2



				VBI Line 319
				VBI Line 320
				VBI Line 321
				VBI Line 322
				VBI Line 323
				VBI Line 324
				VBI Line 325
				VBI Line 326
				VBI Line 327
				VBI Line 328
				VBI Line 329
				VBI Line 330
				VBI Line 331
				VBI Line 332
				VBI Line 333
				VBI Line 334
				VBI Line 335
				VBI Line 336
				VBI in Picture
				VBI in Picture
			Video	
			Main Video	
			Video Encoder	
			Profile	
			Profile for SD input	
			Profile for HD input	
			Resolution	
			Video Bit Rate	
			Buffer Mode	
			Look Ahead	
			Aspect Ratio	
			GOP Length	
			GOP Structure	



					Closed GOPs
					Scene Cut Detection
					Delay
					Target Quality
					Buffer Delay
					Min Seamless Bit Rate
					Lookahead Delay
					Peak Max Bit Rate
					Stills Detection
					Film Mode
					Inloop Filter
					Max CABAC Bit Rate
					SEI Encapsulation Mode
					Frame Sync. Delay in SEI (3D Mode)
					Splicing
					Splicing Control
					Splice Null Insertion
					Audio Splicing
					AS Index Control
					DPI PID Index Control
					AS Index 1
					AS Index 2
					DPI PID Index 1
					DPI PID Index 2
					Splice Status
					Scte104 Messages In
					Scte104 Message Error
					Scte35 Messages Out
					Pending Splices.
					Splice Event Info
					Splice <n>
					Splice Type
					Out of Network



						Unique Program ID
						Event ID
						Time to splice (H)
						Time to splice (M)
						Time to splice (S)
						Time to splice (F)
					Stream Output	
						Embedded PCR
						Copyright
						Original
						PES Packet Per
						AU Information Ctrl
						Elementary Stream Stuffing
						AR Signalling Output Control
						AR Signalling Location
						TC Output Location
					Reflex	
						Reflex Configuration
						Enable Reflex
						Media SetMode
						Source IP Addr
						Mux Multicast Addr
						Spare Mux Source IP Addr
						Enc Multicast Addr
						Tracking Encoder Source IP Addr
						Tracking Encoder Control IP Addr
						Tracking Encoder Module ID
						Video PID
						PCR PID
						Reflex Transport Stream ID
						TS Source IP Address
					Reflex Status	
						Received Reflex Msg



					Device Rx Counter
					Device Tx Counter
					Socket Rx Counter
					Socket Tx Counter
					PCR Excg Rx Counter
					PCR Excg Tx Counter
					Set Rate Src IP Addr
					PCR Exchange Src IP Addr
					SCR diff to be applied to ClocksFPGA
Audio Module					
		Advanced			
			AC-3 PMT / Descriptor Syntax		
		Audio <n>			
			Input		
				Input Format	
				Input Source	
				Output On Audio Loss	
				Source Switchout	
				PCM Bypass	
				Dolby E Program	
				Operation Mode	
				Downmix Parameters	
					Downmix Type
					Downmix metadata override
					Downmix metadata reversion mode
					Center mix level
					Surround mix level
			Audio Status		
					Compressed Audio Locked
					Downmix Active
					Level (L)
					Level (R)
					PCM Bypass Active



				Switchout Active
				Input Buffer Level
				Input Bit Rate
				Input Coding Mode
				Dolby E
				Dolby E Program Config
				Dolby E Frame Rate
				Dolby E Bit Depth
				Resync Count
				Dropped Frames
				Repeated Frames
				Bad RC Packets
				Delay
				Audio Loudness Status
				Integrated Loudness
				Short Term Loudness
				Current Adjustment
			Encode	
				Coding Standard
				Bit Rate
				Coding Mode
				Metadata Controls Coding Mode
				Metadata source type
				Metadata override type
				Metadata reversion mode type
				Metadata preset type
				Embedded PCR
				AU Information Ctrl
				Pass-through
				Channel Mode
				Bit Depth
				Channel Identification
				Encapsulation



			TNS (Temporal Noise Shaping)
			PNS (Perceptual Noise Substitution)
			SBR Signalling
			Automatic Loudness Control
			Operating Mode
			Target Level
			Time Period
			Peak Limit
			Maximum Boost
			Maximum Attenuation
			Preset
			Reset Statistics
			Advanced
			Lip Sync Offset
			Analogue audio reference level
			Gain
			Language
			Language (Left)
			Language (Right)
			User Defined Language 1
			User Defined Language 2
			MPEG Version
			Copyright
			Original
			De-emphasis
			Audio description
			Action on control track Loss
			Action when silence detected
			Silence Threshold
			Silence Period
		Dolby Metadata Presets	
		Dolby Metadata Preset <n>	
		Preset name	



		Dialogue normalization level
		Bitstream mode
		Line mode compression profile
		RF mode compression profile
		RF overmodulation protection
		Center mix level
		Surround mix level
		Dolby Surround mode
		Audio production information exists
		Mixing level
		Room type
		Copyright flag
		Original bitstream flag
		Enable extended bitstream information
		Preferred downmix mode
		Lt/Rt center mix level
		Lt/Rt surround mix level
		Lo/Ro center mix level
		Lo/Ro surround mix level
		Dolby Surround EX mode
		A/D converter type
		Digital de-emphasis
		DC high pass filter enable
		Bandwidth low-pass filter enable
		Low-frequency effects low pass filter enable
		Surround attenuation enable
		Surround phase shift enable
	Metadata Status	
		Audio Node
		Input Metadata Status
		Dialogue normalization level
		Coding mode
		LFE channel enable



		Bitstream mode
		Line mode compression profile
		RF mode compression profile
		RF overmodulation protection
		Center mix level
		Surround mix level
		Dolby Surround mode
		Audio production information exists
		Mixing level
		Room type
		Copyright flag
		Original bitstream flag
		Preferred downmix mode
		Lt/Rt center mix level
		Lt/Rt surround mix level
		Lo/Ro center mix level
		Lo/Ro surround mix level
		Dolby Surround EX mode
		A/D converter type
		DC high pass filter enable
		Bandwidth low-pass filter enable
		Low-frequency effects low pass filter enable
		Surround attenuation enable
		Surround phase shift enable
		Output Metadata Status
		Dialogue normalization level
		Coding mode
		LFE channel enable
		Bitstream mode
		Line mode compression profile
		RF mode compression profile
		RF overmodulation protection
		Center mix level



		Surround mix level
		Dolby Surround mode
		Audio production information exists
		Mixing level
		Room type
		Copyright flag
		Original bitstream flag
		Preferred downmix mode
		Lt/Rt center mix level
		Lt/Rt surround mix level
		Lo/Ro center mix level
		Lo/Ro surround mix level
		Dolby Surround EX mode
		A/D converter type
		DC high pass filter enable
		Bandwidth low-pass filter enable
		Low-frequency effects low pass filter enable
		Surround attenuation enable
		Surround phase shift enable
Video Input Port		
	ioPortType	
	ioDirection	
	ioPortIndex	
Audio Input Port 1		
	ioPortType	
	ioDirection	
	ioPortIndex	
Audio Input Port 2		
	ioPortType	
	ioDirection	
	ioPortIndex	



4.4.2.2 CE-x, CE-xA Encoder Advanced Menu

Table 4.14 CE-x, CE-xA Encoder Advanced Menu

Build	
	Card Id
	Name
	Software Version
	Hardware Version
	S Number
	Serial Number
	Versions
Advanced	
	Chip Id
	Requested Air Flow
	Motion FPGA Temperature
	Temperature
	Temperature Alarm Threshold
	Over Temperature Threshold
	Coding FPGA Temperature
	Temperature
	Temperature Alarm Threshold
	Over Temperature Threshold
	Backend FPGA Temperature
	Temperature
	Temperature Alarm Threshold
	Over Temperature Threshold

4.4.2.3 CE-a J2K Advanced Menu

Table 4.15 CE-a J2K Advanced Menu

Build	
	Card Id
	Name
	Software Version
	Hardware Version



	CPLD Version						
	Hardware S Number						
	S Number						
	Serial Number						
Advanced							
	Chip Id						
	Requested Air Flow						
	PCR Interval						
	FrontEnd FPGA Temperature						
		Temperature					
		Temperature Alarm Threshold					
		Over Temperature Threshold					
	BackEnd FPGA Temperature						
		Temperature					
		Temperature Alarm Threshold					
		Over Temperature Threshold					
Video							
	Video 1						
		Input					
			Video Input Lock				
			Source				
			Input Detection				
			Detected Video Standard				
			Video Input Format				
			Output on Video Loss				
			VBI Extraction				
				Generic ANC			
					Generic ANC Extraction		
						Max ANC Bit Rate	
						VBI in Picture	
							Enable VBI in Picture
			Video				
			Main Video				



				Video Encoder
				Profile
				Profile for SD input
				Profile for HD input
				Resolution
				Video Bit Rate
				Buffer Mode
				Delay
				Stream Output
				Embedded PCR
				Copyright
				Original
				Reflex
Audio Module				
	Audio <n>			
		Input		
			Input Format // LPCM, Dolby E	
			Input Source	
			Output On Audio Loss	
			Audio Status	
				Input Bit Rate
				Delay
		Encode		
			Coding Standard	
			Bit Rate	
			Coding Mode	
			Embedded PCR	
			Passthru	
				Channel Mode
				Bit Depth
				Channel Identification
			Advanced	
				Lip Sync Offset



				Language
				Language (Left)
				Language (Right)
				User Language 1
				User Language 2
Video Input Port				
		ioPortType		
		ioDirection		
		ioPortIndex		
Audio Input Port 1				
		ioPortType		
		ioDirection		
		ioPortIndex		
Audio Input Port 2				
		ioPortType		
		ioDirection		
		ioPortIndex		

4.4.2.4 Satellite Modulator Option Card Advanced Menu (AVP 3000)

This section provides the advanced menu options for the Satellite Modulator card.

Table 4.16 Satellite Modulator Option Card Advanced Menu (AVP 3000)

Build				
	Satellite Modulator Card ID			
	Name			
	Software Version			
	Hardware Version			
	S Number			
Advanced				
	FPGA Temperature			
		Backend FPGA Warning Temperature Threshold		
		FPGA Over Temperature Threshold		
		FPGA Temperature		
	Card Id			



Input Parameters	
	Primary Input Source
	Secondary Input Source
	Input Select
	Input Mode
	Input Format
	Rate Adaptation
	Input Buffer Size
	Clock Reference Mode
	RAS Scrambling
	RAS Key
	RAS Scrambling for TS2 (Only available when DVB-S2 Mode is set to VCM.)
	RAS Key for TS2 (Only available when DVB-S2 Mode is set to VCM.)
	RAS Version
Modulation Parameters	
	Modulation Standard
	Modulation State
	DVB-S2 Mode
	Stream Synchronization Mode
	Null Packet Deletion
	FEC Rate
	Frame Size
	Modulation
	Pilots
	Stream Synchronization Mode or TS2
	Null Packet Deletion for TS2
	FEC Rate for TS2
	Frame Size for TS2
	Modulation for TS2
	Pilots for TS2
	NCR Stamping PID
	Symbol Mapping Mode
	PL Scrambling Sequence Number



	Symbol Rate
	Roll-off Factor
	Bandwidth
Output Parameters	
	Output Select
	Output State
	Output Power-up State
	IF Output
	Frequency Input Mode
	IF Frequency
	Uplink Frequency
	Reduced IF Line-up Power
	Nominal IF Power
	IF Spectrum Sense
	Spectrum Sense
	IF Tilt
	IF Up-converter Frequency
	L-Band Output
	Frequency Input Mode
	L-Band Frequency
	Uplink Frequency
	Reduced L-Band Line-up Power
	Nominal L-Band Power
	L-Band Spectrum Sense
	L-Band Tilt
	L-Band Up-converter Frequency
	Up-converter Power
	Up-converter Reference
Status Parameter	
	Primary Stream Bit Rate
	Secondary Stream Bit Rate
	Input Stream Buffer Level
	TS2 Buffer Level



	Maximum Input Data Rate
	Up-converter Voltage
	Up-converter Current
	Beacon Receiver Voltage
	PL Efficiency
	Symbol Rate Offset
	MODCOD Statistics Table
	Reset MODCOD Statistics
	0 Dummy PL Frame
	1 QPSK 1/4
	2 QPSK 1/3
	3 QPSK 2/5
	4 QPSK 1/2
	5 QPSK 3/5
	6 QPSK 2/3
	7 QPSK 3/4
	8 QPSK 4/5
	9 QPSK 5/6
	10 QPSK 8/9
	11 QPSK 9/10
	12 8PSK 3/5
	13 8PSK 2/3
	14 8PSK 3/4
	15 8PSK 5/6
	16 8PSK 8/9
	17 8PSK 9/10
	18 16APSK 2/3
	19 16APSK 3/4
	20 16APSK 4/5
	21 16APSK 5/6
	22 16APSK 8/9
	23 16APSK 9/10
	24 32APSK 3/4



		25 32APSK 4/5
		26 32APSK 5/6
		27 32APSK 8/9
		28 32APSK 9/10
		29 Reserved
		30 Reserved
		31 Reserved

4.4.2.5 ASI I/O Option Card Advanced Menu

The front panel provides full access to the ASI option card's capabilities. The advanced menu is listed in the table below.

Table 4.17 ASI I/O Option Card Advanced Menu

Build		
	ASI IO Option Card Id	
	Name	
	Build Date	
	Software Version	
	Hardware Version	
	S Number	
Advanced		
	Requested Air Flow	
	FPGA Temperature	
		Temperature
		Temperature Alarm Threshold
		Over Temperature Threshold
	Card Id	
ASI Output Streams		
	ASI Output <n>	
		Output Enabled
		Time Stamp Filter Enabled
		Advanced
		Byte Mode Output
		Good Average



		Average Interpacket time
		Good Values
		Force Dump
	Output Mode	
port		
	Port Type	
	Direction	
	Index	
port		
	Port Type	
	Direction	
	Index	
ASI Input Port 1		
	Port Type	
	Direction	
	Index	
ASI Input Port 2		
	Port Type	
	Direction	
	Index	

4.4.2.6 G.703 Transceiver Card Advanced Menu

The front panel provides full access to the G.703 transceiver card capabilities. The advanced menu is listed in the table below.

Table 4.18 G.703 Transceiver Card Advanced Menu

Build	
	Common Processor Option Card Id
	Name
	Build Date
	Software Version
	Hardware Version
	S Number
Advanced	



	Requested Air Flow				
	Backend FPGA Temperature				
		Temperature			
		Temperature Alarm Threshold			
		Over Temperature Threshold			
	Card ID				
G.703 I/O Ports					
	G.703 I/O Port 1				
		Autodetection			
		Autodetection Status			
		PDH Carrier			
		Framing			
		Unidirectional Mode			
		Transmitter			
		Status			
			Null Packet Ratio		
			Stuff Packet Ratio		
			TS Bit Rate		
		ATM Configuration			
			ATM Mode		
			VPI		
		DVB Configuration			
			Randomization		
			RS Encoding		
			Interleaving		
	Monitoring Control				
		Performance Monitoring			
		Defect Monitoring			
		Reset Current Registers			
			Reset		
			PPT-NES (15 minute)		
			PPT-NSES (15 minute)		
			PPT-NBBE (15 minute)		



			PPT-FES (15 minute)
			PPT-FSES (15 minute)
			PPT-FBBE (15 minute)
			MPI-NES (15 minute)
			MPI-NSES (15 minute)
			MPI-NBBE (15 minute)
			Defect Counters (15 minute)
			PPT-NES (24 hour)
			PPT-NSES (24 hour)
			PPT-NBBE (24 hour)
			PPT-FES (24 hour)
			PPT-FSES (24 hour)
			PPT-FBBE (24 hour)
			MPI-NES (24 hour)
			MPI-NSES (24 hour)
			MPI-NBBE (24 hour)
			Defect Counters (24 hour)
		G.703 Input Port	
			Port Type
			Direction
			Index
		G.703 Output Port	
			Port Type
			Direction
			Index

4.4.2.7 **GPI Card Advanced Menu**

The front panel provides full access to the capabilities of the GPI card. The advanced menu is listed in the table below.

Table 4.19 GPI Card Advanced Menu

Build	
	Data & GPI Card Id
	Name



	Build Date
	Software Version
	Hardware Version
	S Number
Advanced	
	Requested Air Flow
	Backend FPGA Temperature
	Temperature
	Temperature Alarm Threshold
	Over Temperature Threshold
	Card ID
GPI Input Status	
	GPI Streams
	GPI Data Stream
	Source Unique ID
	Stream Type
	Stream Subtype
	Stream Port
	Stream Device
	Stream Destination List
	Output Stream
	Source Unique ID
	Stream Type
	Stream Subtype
	Stream Port
	Stream Device
	Stream Destination List
	Last GPI Input
	Last Input Time
	External Reset Input
RS232 Input	
	PES Streams
	RS232 Data Stream



		Source Unique ID
		Stream Type
		Stream Subtype
		Stream Port
		Embedded PCR
		Bit Rate
		DVB Mode
		ATSC Mode
		Descriptor Group
		Stream Device
		Stream Destination List
	Input Data Rate	
	Output Data Rate	
	Enabled	
	Encoding	
	Baud rate	
	Buffer Mode	
	Component Tag	
GPI Splicing		
	SCTE104 Streams	
		SCTE-104 ChannelX
		Source Unique ID
		Stream Type
		Stream Subtype
		Stream Port
		Stream Destination List
GPI Pin Settings		
	GPI Input Pin n Setup	
		GPI Input Pin Mode
		Splicing Setup
		SCTE-104 Channel
		GPI Pin Trigger Polarity
		Out Pre-roll



			Return Pre-roll
			Return to Network
			Splice Duration
			Fixed Delay
			Splice ID Increment Mode
			Avail Descriptor
			Provider Avail Id
			GPI Input Pin State



Web GUI Control

Chapter 5

Contents

5.1	Using the Web Graphical User Interface	5-9
5.1.1	Appearance and General Features	5-9
5.1.1.1	Header.....	5-9
5.1.1.2	Navigation Area	5-10
5.1.1.3	Widgets.....	5-10
5.1.1.4	Footer	5-11
5.1.2	Pages	5-12
5.1.3	Supported Actions and Features	5-12
5.2	Dashboard Page.....	5-12
5.2.1	Widgets.....	5-13
5.2.1.1	Outputs Widget.....	5-13
5.2.1.2	Bit Rate Utilization widget.....	5-14
5.2.1.3	Device Information Widget	5-14
5.2.1.4	Alarm Monitor Widget	5-15
5.2.2	Using the Dashboard Page	5-15
5.2.2.1	Accessing the Properties of Transport Streams, Services or Components Associated with an Output	5-15
5.2.2.2	Checking the Bit Rates of the Different Components in a Transport Stream.....	5-16
5.2.2.3	Checking the Bit Rates of the Different Components in a Transport Stream.....	5-17
5.2.2.4	Accepting Hardware Configuration Changes	5-17
5.3	Stored Configurations Page	5-17
5.3.1	Widgets.....	5-18
5.3.1.1	Stored Configurations Widget.....	5-18
5.3.1.2	Configuration Workbench Widget.....	5-18
5.3.1.3	Help Widget	5-19
5.3.2	Using the Stored Configuration Page	5-19
5.3.2.1	Storing the Current Configuration.....	5-19
5.3.2.2	Restoring a Configuration.....	5-20
5.3.2.3	Exporting a Configuration	5-20
5.3.2.4	Importing a Configuration	5-21
5.4	Device Configuration Page.....	5-21
5.4.1	Quick Setup Tab.....	5-22
5.4.1.1	Configurations Items Widget	5-22
5.4.1.2	Properties Widget	5-23
5.4.1.3	Help Widget	5-23



5.4.1.4	Information Widget	5-24
5.4.2	Advanced Setup Tab.....	5-24
5.4.2.1	Advanced Video Processor Settings Widget.....	5-24
5.4.2.2	Properties Widget.....	5-25
5.4.2.3	Help Widget.....	5-26
5.4.2.4	Information Widget	5-26
5.4.3	Using the Device Configuration Page	5-26
5.4.3.1	Customizing the Quick Setup menu	5-26
5.4.4	Configuring Option Cards Using the Device Configuration Page.....	5-27
5.4.4.1	ASI Option Card	5-27
5.4.4.2	G.703 Transceiver Card	5-28
5.4.4.3	GPI Option Card.....	5-29
5.4.4.4	External Sync Input Option Card.....	5-36
5.4.4.5	Satellite Modulator Option Card (AVP 3000 Voyager Only).....	5-36
5.5	Service Configuration Page.....	5-40
5.5.1	Widgets	5-40
5.5.1.1	Inputs Widget	5-40
5.5.1.2	Outputs Widget	5-41
5.5.1.3	Properties Widget.....	5-42
5.5.1.4	Help Widget.....	5-43
5.5.1.5	Information Widget	5-43
5.5.2	Using the Service Configuration Page	5-43
5.5.2.1	Adding a Transport Stream to an Output	5-43
5.5.2.2	Adding a Service to a Transport Stream	5-43
5.5.2.3	Adding a Component to a Transport Stream.....	5-44
5.5.2.4	Deleting Transport Streams, Services or Components	5-44
5.5.2.5	Manually Changing the Setmode State of a Transport Stream.....	5-45
5.5.2.6	Copying Transport Streams, Services or Components	5-45
5.5.2.7	Moving Transport Streams, Services or Components.....	5-46
5.5.2.8	Cloning Transport Streams	5-47
5.5.2.9	Disabling a Transport Stream if Audio or Video Lock is Lost	5-47
5.5.2.10	Disabling a Transport Stream if a Critical Alarm or an Upstream Critical Alarm is Raised	5-48
5.5.2.11	Restoring a Transport Stream if the Auto Disable Condition is not Met	5-48
5.5.2.12	Reserving Bandwidth for Transport Streams	5-48
5.5.2.13	Providing More Space for Configuration Items in the Properties Widget	5-48
5.5.3	Configuring Option Cards Using the Service Configuration Page.....	5-49
5.5.3.1	CE-a VCM (Video Compression Module).....	5-49
5.5.3.2	CE-a J2K VCM	5-70
5.5.3.3	CE-x VCM	5-77
5.5.3.4	CE-x Analogue VCM	5-99
5.5.4	Configuring Transport Streams	5-121
5.5.4.1	Transport Stream Configuration	5-121
5.5.4.2	Internal PSIP Data Insertion.....	5-125
5.5.4.3	Basic Interoperable Scrambling System (BISS).....	5-126
5.5.4.4	ProMPEG FEC	5-127
5.5.4.5	VLAN Tagging	5-129
5.6	Support Page	5-131
5.6.1	General Tab	5-131
5.6.1.1	Import and Export Widget.....	5-131



5.6.1.2	Log Files Widget.....	5-132
5.6.2	Version Tab	5-132
5.6.3	Licenses Tab	5-132
5.6.4	Device Management Tab	5-133

List of Figures

Figure 5.1	Main Components of the GUI	5-9
Figure 5.2	Header.....	5-10
Figure 5.3	Navigation Area	5-10
Figure 5.4	Example of a Widget	5-11
Figure 5.5	Example of an Accordion Panel	5-11
Figure 5.6	Footer	5-11
Figure 5.7	Dashboard Page.....	5-13
Figure 5.8	Outputs Widget.....	5-13
Figure 5.9	Bit Rate Utilization Widget	5-14
Figure 5.10	Device Information Widget	5-15
Figure 5.11	Alarm Monitor Widget	5-15
Figure 5.12	Component Bit Rates per Transport Stream Accordion Panel	5-16
Figure 5.13	Stored Configurations Page	5-17
Figure 5.14	Stored Configuration Widget	5-18
Figure 5.15	Configuration Workbench Widget.....	5-18
Figure 5.16	Help Widget	5-19
Figure 5.17	Quick Setup Tab	5-22
Figure 5.18	Configuration Items Widget	5-22
Figure 5.19	Properties Widget	5-23
Figure 5.20	Help Widget	5-23
Figure 5.21	Information Widget	5-24
Figure 5.22	Advanced Setup Tab	5-24
Figure 5.23	Advanced Video Processor Settings Widget	5-25
Figure 5.24	Properties Widget	5-25
Figure 5.25	Help Widget	5-26
Figure 5.26	GPI Pin Setting via GUI	5-29
Figure 5.27	Load Stored Configurations	5-30
Figure 5.28	GPI Input Pin Splicing Setup	5-31
Figure 5.29	VCM Splicing Control	5-33
Figure 5.30	VCM SCTE 104 Input Selection	5-33
Figure 5.31	Alarm Severity Configuration	5-34
Figure 5.32	Data Input Configuration	5-35
Figure 5.33	Service Configuration Video Page	5-40
Figure 5.34	Inputs Widget.....	5-41
Figure 5.35	Outputs Widget.....	5-42
Figure 5.36	Properties Widget	5-42
Figure 5.37	Add Service Menu	5-44
Figure 5.38	Deleting a Service	5-45
Figure 5.39	Dragging a Transport Stream or Service	5-46
Figure 5.40	Setting Internal PSIP Data Insertion on the GUI	5-126
Figure 5.41	Support Page > General Tab.....	5-131
Figure 5.42	Support Page > Versions Tab	5-132
Figure 5.43	Support Page > Licenses Tab	5-133
Figure 5.44	Support Page > Device Management Tab	5-133



List of Tables

Table 5.1	Setmode State Color Codes.....	5-16
Table 5.2	Stored Configuration Parameters.....	5-20
Table 5.3	ASI Output Configuration Parameters.....	5-28
Table 5.4	Transmitter Configuration Parameters	5-28
Table 5.5	GPI Input Pin Configuration.....	5-29
Table 5.6	Splicing Set Up Options	5-32
Table 5.7	Data Input Configuration Options	5-35
Table 5.8	Satellite Modulator Input Configuration Parameters.....	5-36
Table 5.9	Satellite Modulator Modulation Configuration Parameters	5-37
Table 5.10	Satellite Modulator Output Configuration Parameters.....	5-38
Table 5.11	Video Input and Pre-Processing Parameters	5-49
Table 5.12	Video Encoding Parameters.....	5-51
Table 5.13	Video Output Parameters.....	5-53
Table 5.14	Video Component Parameters	5-53
Table 5.15	Vertical Blanking Interval / Ancillary Data Parameters	5-54
Table 5.16	Input Options Parameters	5-56
Table 5.17	Encode Options Parameters	5-56
Table 5.18	Audio Input Parameters.....	5-58
Table 5.19	Audio Encoding Standards.....	5-58
Table 5.20	MPEG Layer 2 Parameters	5-58
Table 5.21	Dolby Digital Parameters.....	5-59
Table 5.22	AAC-LC Parameters.....	5-60
Table 5.23	HE-AAC Parameters	5-61
Table 5.24	Pass-through Parameters	5-61
Table 5.25	Audio Description Service Parameters.....	5-62
Table 5.26	Audio Component Parameters	5-62
Table 5.27	Dolby Metadata Preset Parameters	5-63
Table 5.28	Splicing Parameters	5-64
Table 5.29	Slicing Component Parameters.....	5-65
Table 5.30	Teletext Parameters	5-66
Table 5.31	Teletext Component Parameters	5-66
Table 5.32	VBI and Ancillary Data Parameters.....	5-67
Table 5.33	ANC Component Parameters.....	5-69
Table 5.34	PCR Stream Configuration Parameters	5-69
Table 5.35	Video Input and Pre-Processing Parameters	5-70
Table 5.36	Video Encoding Parameters.....	5-71
Table 5.37	Video Output Parameters.....	5-71
Table 5.38	Video Component Parameters	5-72
Table 5.39	VBI Stream and ANC/DVB Subtitle Stream Parameters.....	5-72
Table 5.40	Input Options Parameters	5-73
Table 5.41	Encode Options Parameters	5-73
Table 5.42	Audio Input Parameters.....	5-75
Table 5.43	Audio Encoding Standards.....	5-75
Table 5.44	Pass-through Parameters	5-75
Table 5.45	Audio Component Parameters	5-76
Table 5.46	VBI and Ancillary Data Parameters	5-76
Table 5.47	ANC Component Parameters.....	5-76
Table 5.48	PCR Stream Configuration Parameters	5-77
Table 5.49	Video Input and Pre-Processing Parameters	5-77



Table 5.50 Video Encoding Parameters	5-79
Table 5.51 Video Output Parameters	5-82
Table 5.52 Video Component Parameters	5-82
Table 5.53 Vertical Blanking Interval / Ancillary Data Parameters	5-83
Table 5.54 Input Options Parameters	5-85
Table 5.55 Encode Options Parameters	5-86
Table 5.56 Audio Input Parameters	5-87
Table 5.57 Audio Encoding Standards	5-88
Table 5.58 MPEG Layer 2 Parameters	5-88
Table 5.59 Dolby Digital Parameters	5-89
Table 5.60 AAC-LC Parameters	5-89
Table 5.61 HE-AAC Parameters	5-90
Table 5.62 Pass-through Parameters	5-91
Table 5.63 Audio Description Service Parameters	5-91
Table 5.64 Audio Component Parameters	5-92
Table 5.65 Dolby Metadata Preset Parameters	5-92
Table 5.66 Splicing Parameters	5-94
Table 5.67 Slicing Component Parameters	5-94
Table 5.68 Teletext Parameters	5-95
Table 5.69 Teletext Component Parameters	5-96
Table 5.70 VBI and Ancillary Data Parameters	5-96
Table 5.71 ANC component Parameters	5-98
Table 5.72 PCR Stream Configuration Parameters	5-99
Table 5.73 Video Input and Pre-Processing Parameters	5-99
Table 5.74 Video Encoding Parameters	5-101
Table 5.75 Video Output Parameters	5-104
Table 5.76 Video Component Parameters	5-104
Table 5.77 Vertical Blanking Interval / Ancillary Data Parameters	5-105
Table 5.78 Input Options Parameters	5-107
Table 5.79 Encode Options Parameters	5-107
Table 5.80 Audio Input Parameters	5-109
Table 5.81 Audio Encoding Standards	5-109
Table 5.82 MPEG Layer 2 Parameters	5-110
Table 5.83 Dolby Digital Parameters	5-111
Table 5.84 AAC-LC Parameters	5-111
Table 5.85 HE-AAC Parameters	5-112
Table 5.86 Pass-through Parameters	5-113
Table 5.87 Audio Description Service Parameters	5-113
Table 5.88 Audio Component Parameters	5-114
Table 5.89 Dolby Metadata Preset Parameters	5-114
Table 5.90 Splicing Parameters	5-116
Table 5.91 Slicing Component Parameters	5-116
Table 5.92 Teletext Parameters	5-117
Table 5.93 Teletext Component Parameters	5-117
Table 5.94 VBI and Ancillary Data Parameters	5-118
Table 5.95 ANC Component Parameters	5-120
Table 5.96 PCR Stream Configuration Parameters	5-121
Table 5.97 General Transport Stream Settings	5-122
Table 5.98 Additional Settings for IP Output Transport Streams	5-123
Table 5.99 Service Settings	5-124



Table 5.100	FEC Parameters	5-127
Table 5.101	Column FEC.....	5-129
Table 5.102	Column and Row FEC	5-129
Table 5.103	VLAN Creation Options.....	5-130
Table 5.104	VLAN Tag Sharing Options.....	5-130

BLANK



5.1

Using the Web Graphical User Interface

The Advanced Video Processor (AVP) is designed to be configured and controlled by its own web graphical user interface (GUI).

The Graphical User Interface uses widget based architecture. This section describes the functions and elements of the GUI.

5.1.1

Appearance and General Features

Notes: AVP 3000 and Voyager II units will default to a specific Voyager Dashboard for simplified user operation. This is described separately in *Chapter 3, Getting Started* (section 3.7.1).

Access to the general configuration pages described below is easily accessible from the Voyager Dashboard through the **Advanced View** link.

The appearance and the main components of the Graphical User Interface are shown in *Figure 5.1*.

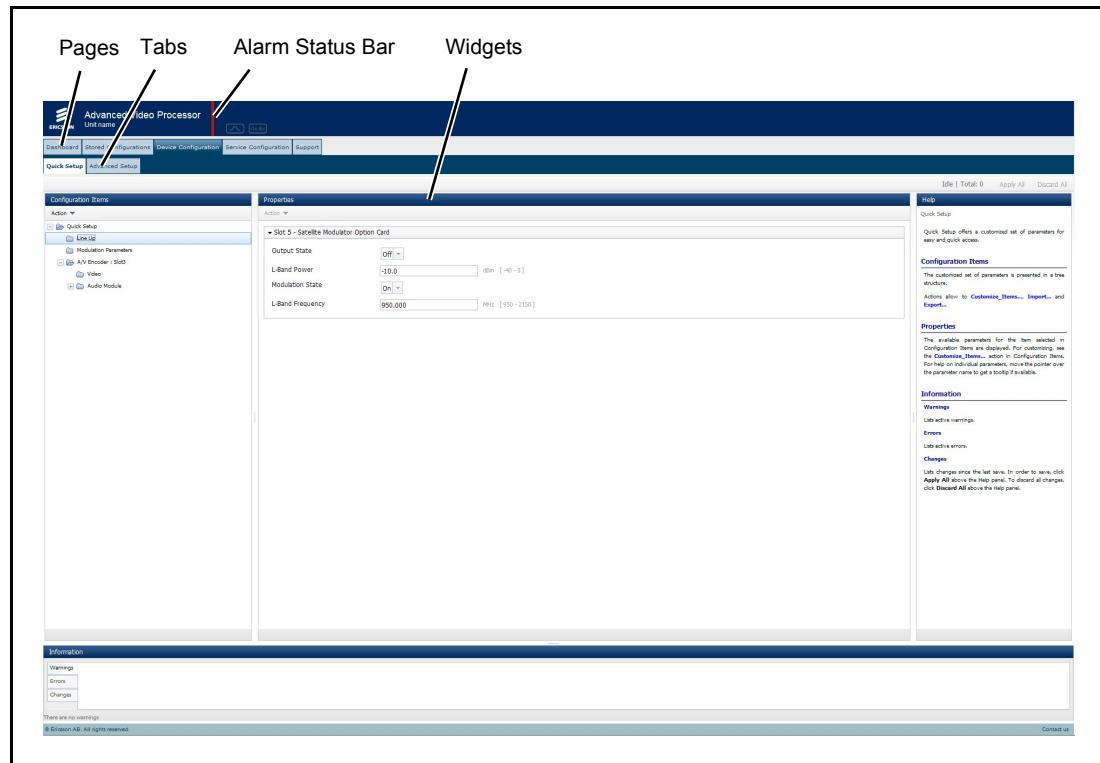


Figure 5.1 Main Components of the GUI

5.1.1.1

Header

The header contains the **Company Logo**, the **Model Name** and the **Unit Name**, the **Alarm Status Bar**, the **Output Status Indicators**, and the name of the recently loaded configuration, if any.



Figure 5.2 Header

The unit can be easily identified by the **Unit Name** when browsing remotely. The name can be changed by double clicking on it.

The color of the **Alarm Status Bar** indicates the highest actual alarm severity. The bar is red in case of an alarm with critical severity, orange if an alarm or warning with any severity other than critical and no alarm with critical severity is issued, and green otherwise.

5.1.1.2 Navigation Area

The unit is controlled through five different *web pages* (or *tabs*), each of them responsible for a well-defined control task. The pages can be accessed through the top menu in the Navigation area. Where appropriate, control tasks are further broken down into smaller subtasks. Each subtask has its own tab.



Figure 5.3 Navigation Area

The area below the tabs serves as a toolbar with two buttons on it. The **Apply All** button allows the user to commit the changes made to any of the parameters on the displayed page or tab. With the **Discard All** button the changes can be revoked and the state prior to the modifications can be recalled. Modified parameters are highlighted in orange. If the user first modifies some parameters and then tries to navigate away from the page or tab, a warning dialog is displayed. The buttons do not appear on every page.

The information next to the buttons displays the number of running tasks and the processing status of them.

5.1.1.3 Widgets

Widgets are containers that allow the user to perform specific actions or display relevant information. Widget can be resized by dragging the splitters between them. By double clicking on the splitters the widgets can be collapsed to provide more room for neighboring widgets. Double clicking on a splitter again redisplays the previously hidden element.

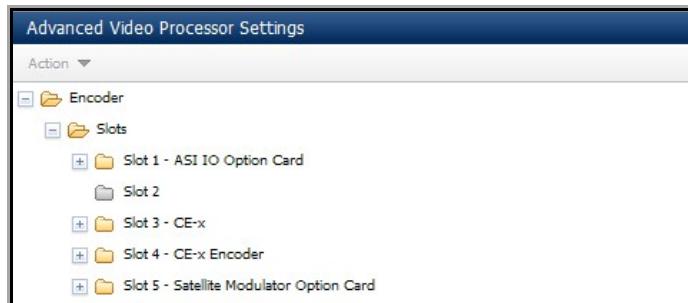


Figure 5.4 Example of a Widget

Where relevant, objects can be manipulated by drag and drop within or between the widgets.

Note: Avoid sudden moves with the mouse while dragging and dropping.

5.1.1.3.1

Accordion Panels

Accordion panels are separate areas within widgets which can be collapsed and expanded by clicking on the small arrow on the top left hand of the panel.

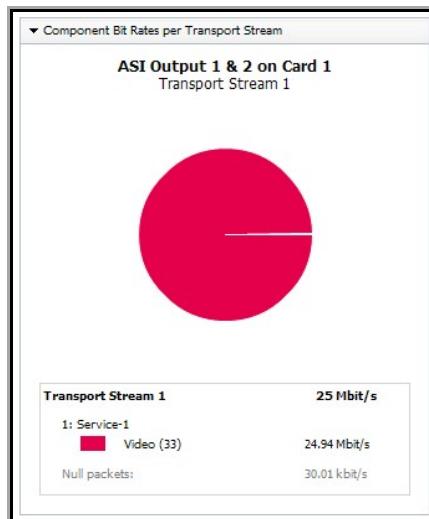


Figure 5.5 Example of an Accordion Panel

5.1.1.4

Footer

The footer on the page displays copyright information and contains a link through which Ericsson can be contacted. Moreover, the color of the footer indicates the status of the link to the unit being controlled through the web user interface. Orange color indicates that the link to the unit is down; navy blue indicates that the link is up.

Figure 5.6 Footer

5.1.2

Pages

The control options of the unit are grouped into five categories. Each of the categories is represented by a page. They are as follows:

- Dashboard
- Stored Configurations
- Device Configuration
- Service Configuration
- Support

Each page is described in the following sections and the descriptions are followed by tasks that can be performed on these pages.

5.1.3

Supported Actions and Features

- **Drag and Drop** – The web GUI supports **drag and drop**, for example in the **Configuration > Services** page, to enables you to quickly copy services and profiles. Additionally, when selecting services and profiles, the web GUI supports **Shift-Click** operation to enables you to select multiple adjacent items, and **Ctrl-Click** operation when selecting multiple non-adjacent items.
- **Drop-Down Menus** – Some web GUI pages provide drop-down menus to enables you to select from the available options.
- **Right-Click/Context Menus** – Some web GUI pages provide right-click menus for speedier configuration.
- **Parameter Highlighting** – When you modify service and profile properties, any changes you make will be highlighted as **orange text**. These changes will not be carried out until they are confirmed, by clicking the **Apply All** green button.
- **Web Page Resizing and Collapsing** – To enable you to view just the information that you need, the panes displayed on some web pages may be resized by dragging the pane boundary, or collapsed by clicking on the ◀ symbol in the pane boundary. If your monitor screen width is less than 1300 pixels, panes may be collapsed automatically.

5.2

Dashboard Page

The **Dashboard** page provides detailed information about the device and the Transport Streams.

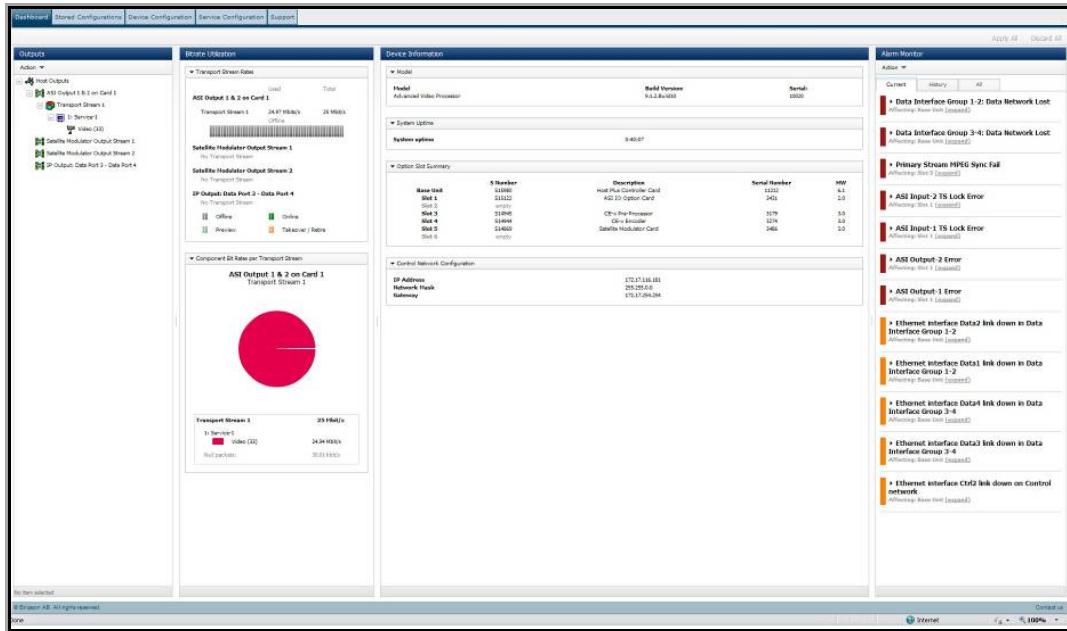


Figure 5.7 Dashboard Page

5.2.1 Widgets

5.2.1.1 Outputs Widget

The **Outputs** widget lists the items within the Transport Streams set up for the different outputs. If you want to quickly edit the properties of an item (other than the output itself), select it by clicking on its name with the left mouse button, then either select the **Edit Properties** option from the Actions menu, or right click on the item and select the same option from the context menu. You will be directed to the **Service Configuration** page with the respective item selected in the **Outputs** widget there.

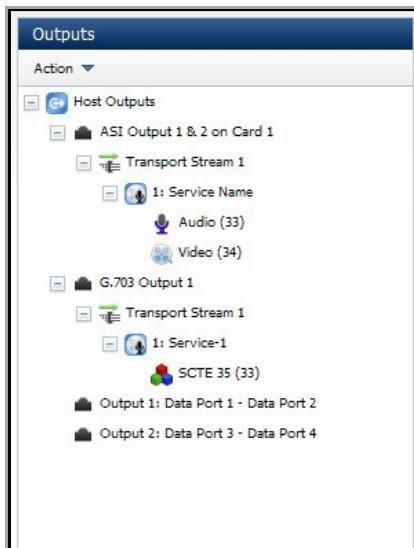


Figure 5.8 Outputs Widget

5.2.1.2 Bit Rate Utilization widget

The **Bit Rate Utilization** widget provides status information about the different Transport Streams by color coding them according to the legend shown at the bottom of the **Transport Stream Rates** accordion panel. (For the meaning of the respective states and colors refer to Bit Rate Tracking.) Moreover, the useful and total bit rates of each Transport Stream are also shown. Click on a Transport Stream here and a pie chart will be displayed in the **Component Bit Rates per Transport Stream** accordion panel with the bit rates of the individual services and components.

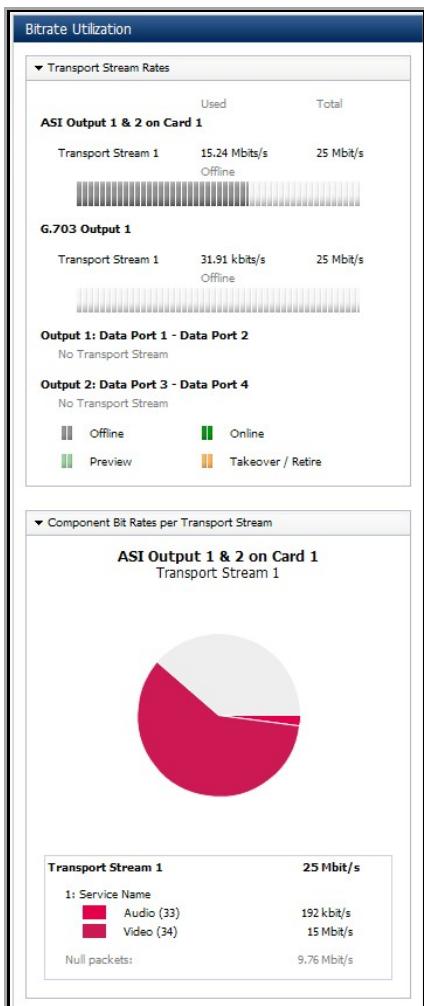
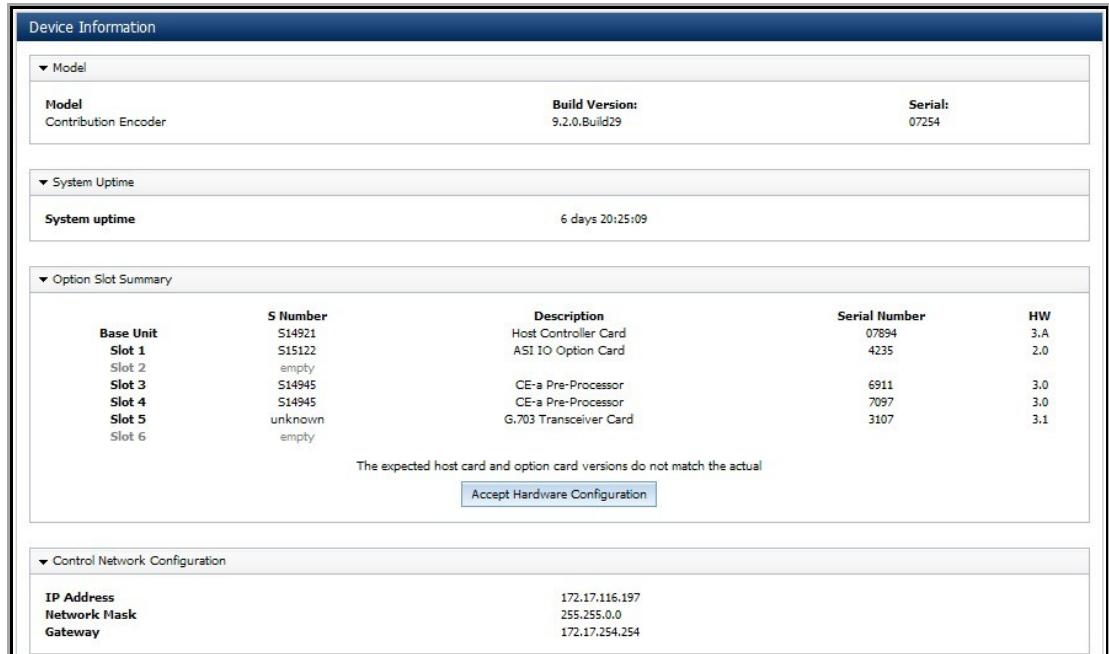


Figure 5.9 Bit Rate Utilization Widget

5.2.1.3 Device Information Widget

The **Device Information** widget provides information on the unit, the option cards and the network configuration. If there is a configuration mismatch in one of the slots, an alarm is raised and displayed in the **Alarm Monitor** widget. In this case, the **Accept Hardware Configuration** button is shown below the slot information. By clicking on the button, the current configuration can be accepted. After accepting the hardware configuration, the alarm is ceased.



Device Information

Model: Contribution Encoder **Build Version:** 9.2.0.Build29 **Serial:** 07254

System Uptime: 6 days 20:25:09

Option Slot Summary:

Base Unit	S Number	Description	Serial Number	HW
Slot 1	S14921	Host Controller Card	07894	3.A
Slot 2	S15122	ASI IO Option Card	4235	2.0
Slot 3	empty			
Slot 4	S14945	CE-a Pre-Processor	6911	3.0
Slot 5	S14945	CE-a Pre-Processor	7097	3.0
Slot 6	unknown	G.703 Transceiver Card	3107	3.1
	empty			

The expected host card and option card versions do not match the actual

Accept Hardware Configuration

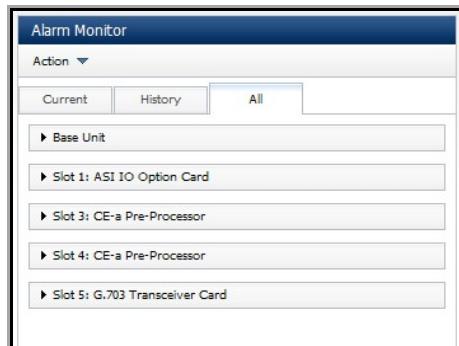
Control Network Configuration:

IP Address	172.17.116.197
Network Mask	255.255.0.0
Gateway	172.17.254.254

Figure 5.10 Device Information Widget

5.2.1.4 Alarm Monitor Widget

The **Alarm Monitor** widget displays the current alarms and an alarm history sorted by severity. The alarms can be expanded or collapsed by clicking on the arrow next to their name.



Action ▾

Current **History** **All**

- ▶ Base Unit
- ▶ Slot 1: ASI IO Option Card
- ▶ Slot 3: CE-a Pre-Processor
- ▶ Slot 4: CE-a Pre-Processor
- ▶ Slot 5: G.703 Transceiver Card

Figure 5.11 Alarm Monitor Widget

5.2.2 Using the Dashboard Page

This section describes the tasks that can be completed on the Dashboard page.

5.2.2.1 Accessing the Properties of Transport Streams, Services or Components Associated with an Output

To directly access the properties of a Transport Stream, service or component from the **Dashboard**, do the following:

1. In the **Outputs** widget, select the Transport Stream, service or component whose parameters you want to access.
2. Right click on the selected item, and choose **Edit Properties** from the context menu.
3. The view will change to the **Service Configuration** page with the item selected in the **Outputs** widget.

The **Setmode** state is reflected how the Transport Streams are color coded in the **Transport Stream Rates** accordion panel of the **Bit Rate Utilization** widget. The color codes are shown in *Table 5.1*.

Table 5.1 Setmode State Color Codes

State	Color
Online	green
Offline	grey
Preview	light green
Retire	orange

5.2.2.2

Checking the Bit Rates of the Different Components in a Transport Stream

To check the bit rates of services and components in a Transport Stream, do the following:

1. In the **Transport Stream Rates** accordion panel of the **Bit Rate Utilization** widget, click on the Transport Stream whose components you want to check.
2. The bit rates are shown in a table in the **Component Bit Rates per Transport Stream** accordion panel. The bit rates of the components are also shown if the mouse is hovered over a component in the pie chart.

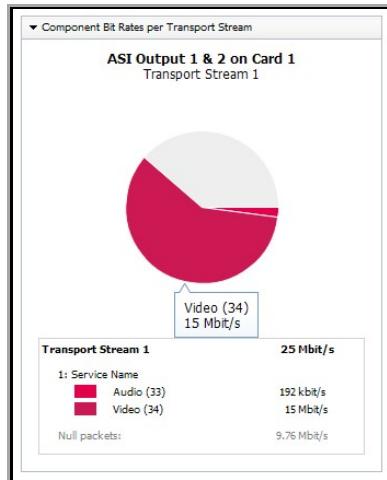


Figure 5.12 Component Bit Rates per Transport Stream Accordion Panel



5.2.2.3

Checking the Bit Rates of the Different Components in a Transport Stream

To set the severity of any of the current alarms or any alarms raised since power up, do the following:

1. On the **Current** or **History** tab in the **Alarm Monitor** widget, click on the arrow next to the alarm whose severity you want to modify.
2. In the **Severity** drop down list, set the required severity level.

5.2.2.4

Accepting Hardware Configuration Changes

When the persistent store is cleared, the hardware configuration settings are also deleted. After the unit is rebooted an alarm will be raised to signify that the hardware configuration has been changed. This is normal and does not indicate any malfunction. To clear the alarm, do the following:

1. In the **Option Slot Summary** accordion of the **Device Configuration** widget, click on the **Accept Hardware Configuration**.
2. The respective alarms are cleared.

5.3

Stored Configurations Page

The **Stored Configuration** page allows saving the current configuration to or restoring a stored configuration from the unit. To load or save a configuration through the front panel, select **Manage Configuration**.

Figure 5.13 Stored Configurations Page

5.3.1 Widgets

This section describes the tasks that can be completed on the Stored Configurations page.

5.3.1.1 Stored Configurations Widget

The **Stored Configurations** widget lists 64 slots to which configurations can be saved or from which configurations can be restored. If you click on an entry, the corresponding information is shown in the **Configuration Workbench** widget.

Stored Configurations		
No.	Name	Description
01.	<empty slot>	
02.	<empty slot>	
03.	<empty slot>	
04.	<empty slot>	
05.	<empty slot>	
06.	<empty slot>	
07.	<empty slot>	
08.	<empty slot>	
09.	<empty slot>	
10.	<empty slot>	
11.	<empty slot>	
12.	<empty slot>	
13.	<empty slot>	
14.	<empty slot>	
15.	<empty slot>	
16.	<empty slot>	
17.	<empty slot>	
18.	<empty slot>	
19.	<empty slot>	
20.	<empty slot>	

Figure 5.14 Stored Configuration Widget

5.3.1.2 Configuration Workbench Widget

The **Configuration Workbench** widget displays the information about the slot selected in the **Stored Configurations** widget. Moreover, it lets the user overwrite, restore, delete or export the configuration in the selected slot.



The Configuration Workbench interface shows a single store named "Store 1" (Unchanged). It includes fields for "Name" (containing "<empty slot>") and "Description". Below these are buttons for "Save Config", "Restore", "Delete", and "Export". At the bottom, there is an "Import" section with a "Browse" button and an "Import" button. A note at the bottom states: "NOTE: The format of files exported through the 'Stored Configurations' page is not compatible with the format of the configurations saved on the 'Support' page."

Figure 5.15 Configuration Workbench Widget

Note: The format of the files exported through the **Stored Configurations** page is not compatible with the format of the configurations saved on the **Support** page.



5.3.1.3 Help Widget

The **Help** widget provides help information on the items in the corresponding page.

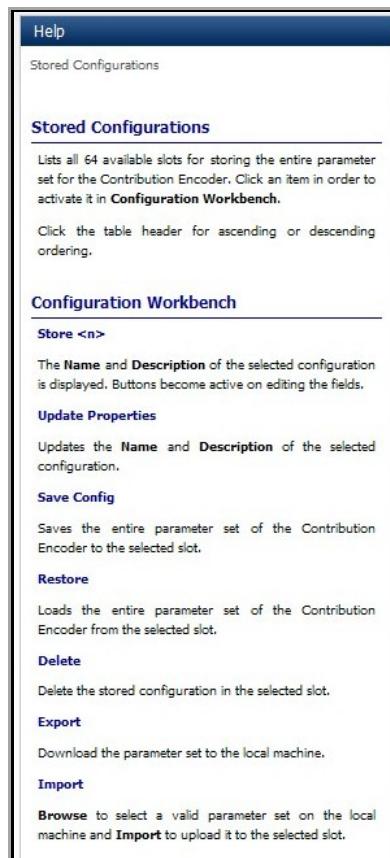


Figure 5.16 Help Widget

5.3.2 Using the Stored Configuration Page

This section describes the tasks that can be completed on the Stored Configuration Page.

5.3.2.1 Storing the Current Configuration

The unit provides 64 configuration slots for storing different configurations. Configurations can be saved at any time. To save the current configuration, do the following:

1. In the **Stored Configurations** widget, select the slot you want to use for storing the configuration. If the slot is not empty, it will be overwritten.
2. In the **Name** field in the **Configuration Workbench** widget, enter a name for the configuration.
3. You can also add a description in the **Description** field if you wish. The description can help identifying the configuration in the future.

4. Click on the **Save Config** button within the **Configuration Workbench** widget.
5. A confirmation dialog will appear. Choose **Yes** to save the configuration in the selected slot.

Once stored the configuration is available to be recalled and used at any time. The table below describes each main action associated with the stored configurations.

Table 5.2 Stored Configuration Parameters

Parameter	Description
Restore	Restores the configuration from the selected stored onto the unit. Select required stored number and press Restore
Save Config	Saves the current unit configuration into the selected store location. Select required store number, enter Name and Description and press Save Config
Edit	Allows Store Name and Description to be changed. Select required store, modify the Name and/or Description as required and press Edit to save the modified text only. The stored configuration data will not be affected
Delete	Delete contents, name and description of selected store. Select required store number and press Delete
Import	Imports a configuration from file to selected store location. Browse to required file and select Import. This does not affect unit configuration. The file being imported must be in the same format (ie exported from the stored configurations function rather than the save-load XML)
Export	To export the selected configuration to a file, move the mouse pointer over the link, right click and select Save target as... or Save link as..., dependent on the browser you are using. You will then be prompted for a filename and a place to store the file. Give the file a .xml extension.
Update Properties	Refreshes the contents of the list and the workbench from the unit.

5.3.2.2 Restoring a Configuration

The unit provides 64 configuration slots for storing different configurations. Configurations can be restored at any time. To restore a previously stored configuration, do the following:

1. In the **Stored Configurations** widget, select the configuration you want to restore.
2. The **Configuration Workbench** widget will display the properties of the selected stored configuration.
3. To restore the configuration, click the **Restore** button in the **Configuration Workbench** widget.

5.3.2.3 Exporting a Configuration

The unit provides 64 configuration slots for storing different configurations. The content of any of the slots can be exported. Exported configurations from a previous version of the unit can be fed to the **Configuration Converter Tool** and converted to the current version. To export a previously stored configuration, do the following:

1. In the **Stored Configurations** widget, select the configuration you want to restore.



2. The **Configuration Workbench** widget will display the properties of the selected stored configuration.
3. To export the configuration, click the **Export** button in the **Configuration Workbench** widget.
4. In the popup window, select the **Save file** option.
5. By default, the file will be saved in the **Downloads** folder on your computer.

Note: The format of files exported from a **Stored Configurations** page is not compatible with the files saved on the **General** tab of the **Support** page. Similarly files saved on the **Support** page cannot be imported into stored configurations.

5.3.2.4

Importing a Configuration

The unit provides 64 configuration slots for storing different configurations. The content of any of the slots can be exported. Exported configurations from a previous version of the unit can be fed to the **Configuration Converter Tool** and converted to the current version. To import a converted configuration, do the following:

1. In the **Stored Configurations** widget, select the slot you want to use to store the imported configuration.
2. Click on the **Browse** button within the **Configuration Workbench** widget.
3. In the popup window, browse to the file you want to import, and click **Open**.
4. The file name will be populated into the text box next to the **Browse** button.
5. Click on the **Import** button.
6. Answer **Yes** to the confirmation message.

Note: The format of files exported from the **Stored Configurations** page is not compatible with the files saved on the **General** tab of the **Support** page. Similarly files saved on the **Support** page cannot be imported into stored configurations.

5.4

Device Configuration Page

The **Device Configuration** page provides setup options for the device and provides access to the following tabs:

- Quick Setup Tab
- Advanced Setup Tab

5.4.1

Quick Setup Tab

The **Quick Setup** tab provides access to the most commonly used parameters. The list of parameters displayed here can be customized and even exported. The tab contains the **Configuration Items**, the **Properties**, the **Help**, and the **Information** widgets.

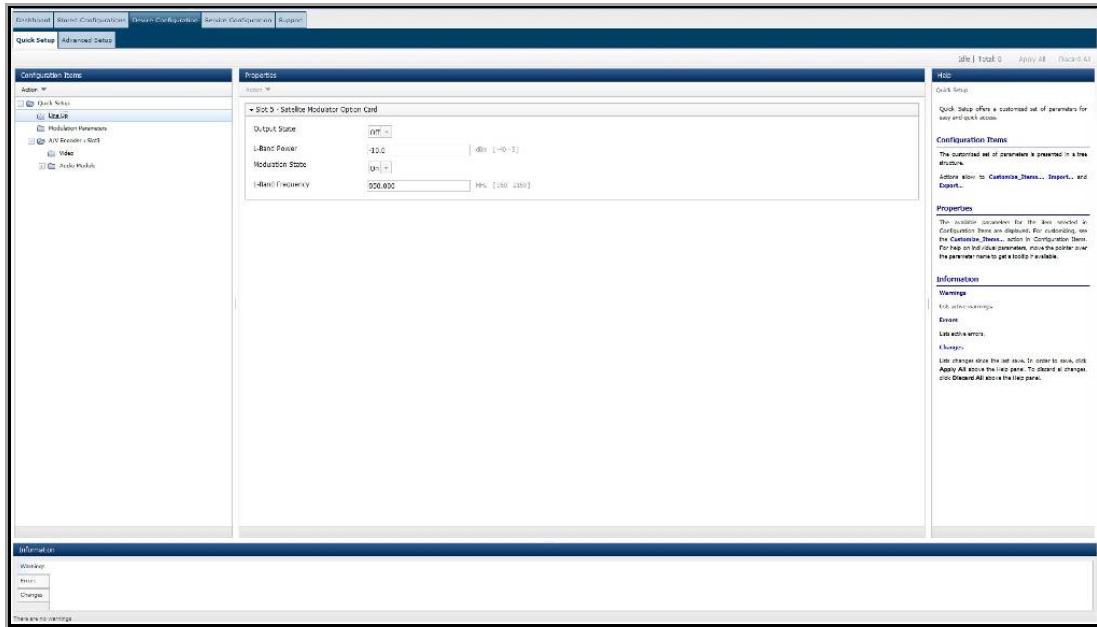


Figure 5.17 Quick Setup Tab

5.4.1.1

Configurations Items Widget

The **Configuration Items** widget displays the **Quick Setup** menu as a tree. The tree contains the most commonly used parameters. These include default parameters as well as the parameters added by the user.

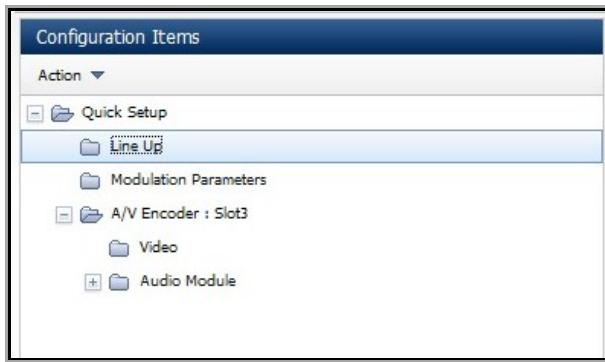


Figure 5.18 Configuration Items Widget

For information on how to add your own parameters to the tree, go to 5.4.3.1:



5.4.1.2 Properties Widget

The **Properties** widget displays the properties of the items selected in the **Configuration Items** widget. When a value of a property is changed its label is highlighted in orange and remains highlighted until the change is committed or abandoned by clicking on the **Apply All** or **Discard All** buttons on the taskbar, respectively.

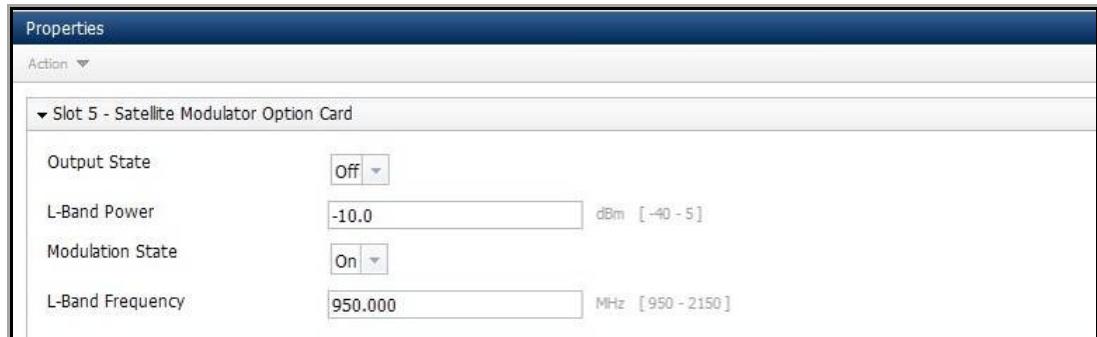


Figure 5.19 Properties Widget

5.4.1.3 Help Widget

The **Help** widget provides help information on the items in the tab.

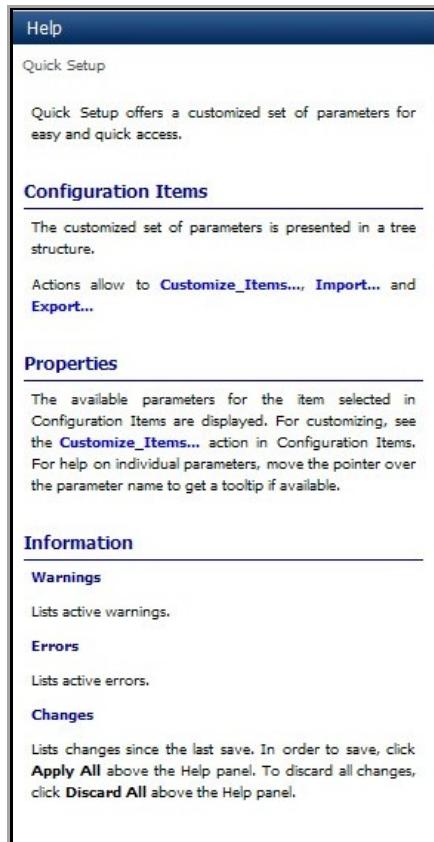


Figure 5.20 Help Widget

5.4.1.4

Information Widget

The **Information** widget contains the **Changes**, **Warnings** and **Errors** tab pages for displaying changes, warnings and errors. By clicking on a change the corresponding item is displayed in the **Properties** widget and the change can be revoked by manually resetting the parameter to its original value.



Figure 5.21 Information Widget

Note: The original value is shown in a tooltip by hovering the mouse pointer over the item in the **Changes** tab.

5.4.2

Advanced Setup Tab

The **Advanced Setup** tab provides access to all configuration options of the unit and consists of the **Advanced Video Processor Settings**, the **Properties**, the **Help**, and the **Information** widgets.

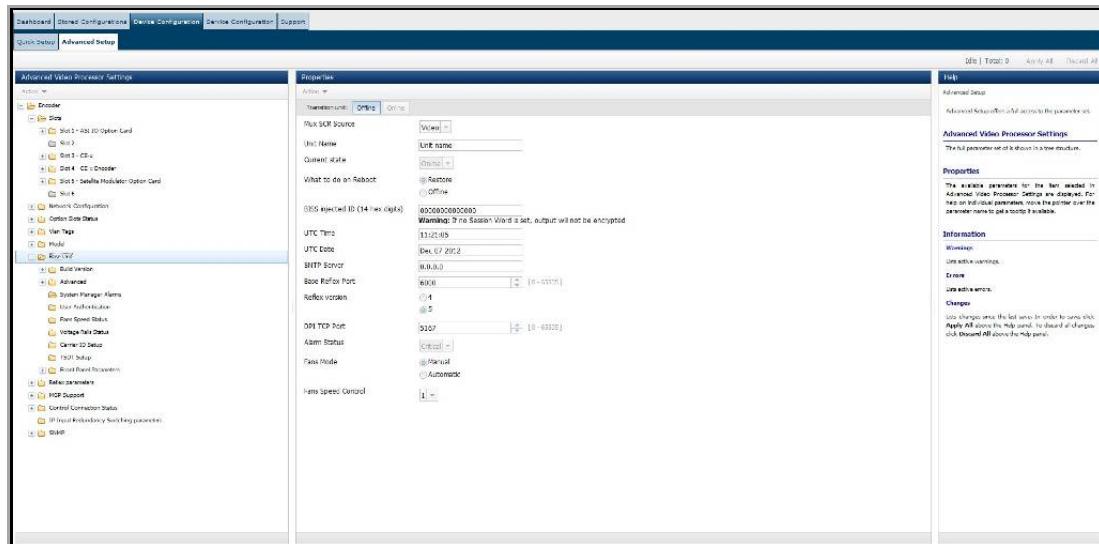


Figure 5.22 Advanced Setup Tab

5.4.2.1

Advanced Video Processor Settings Widget

The **Advanced Video Processor Settings** widget displays a tree view of all configuration items available on the unit organized into different folders for easier navigation. The properties of the selected node (if any) are displayed in the **Properties** widget.

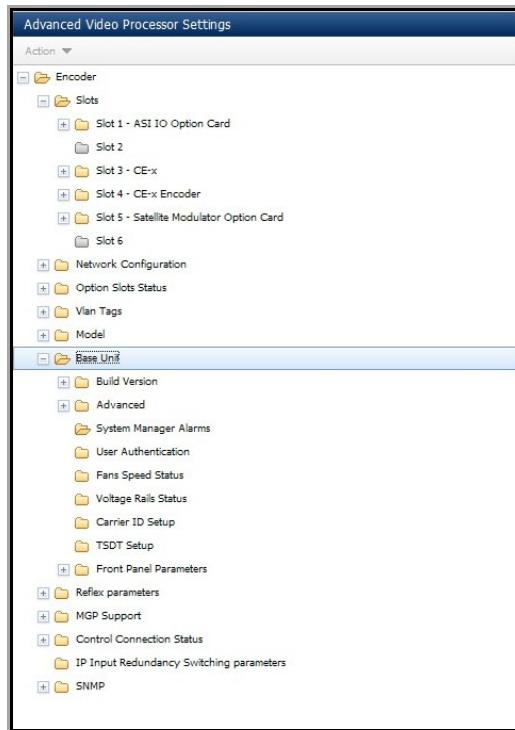


Figure 5.23 Advanced Video Processor Settings Widget

5.4.2.2 Properties Widget

The **Properties** widget displays the properties of the items selected in the **Advanced Video Processor Settings** widget. When a value of a property is changed, its label is highlighted in orange and remains highlighted until the change is committed or abandoned by clicking on the **Apply All** or **Discard All** buttons on the taskbar, respectively. Fan speed may be controlled by adjusting the slider to the appropriate setting.

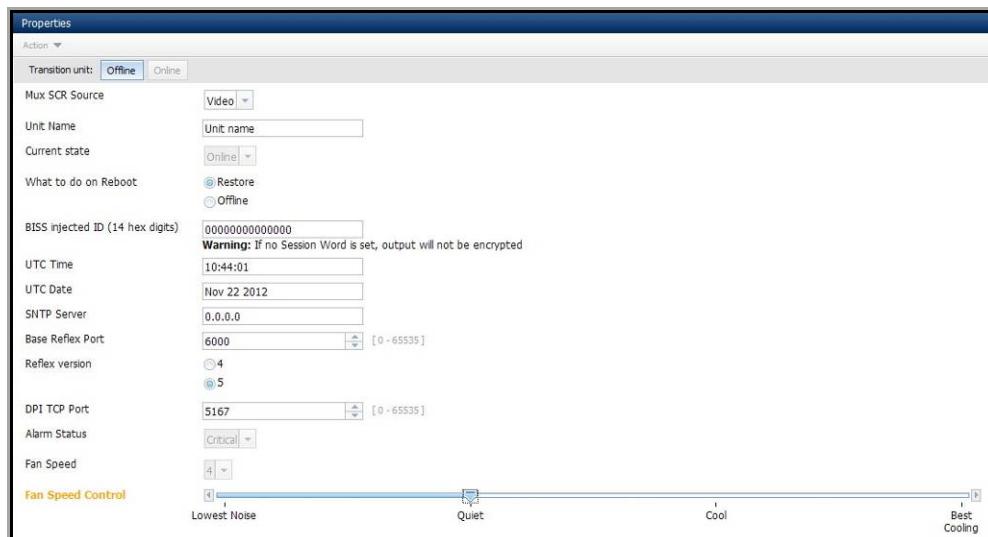


Figure 5.24 Properties Widget

5.4.2.3

Help Widget

The **Help** widget provides help information on the items in the tab.

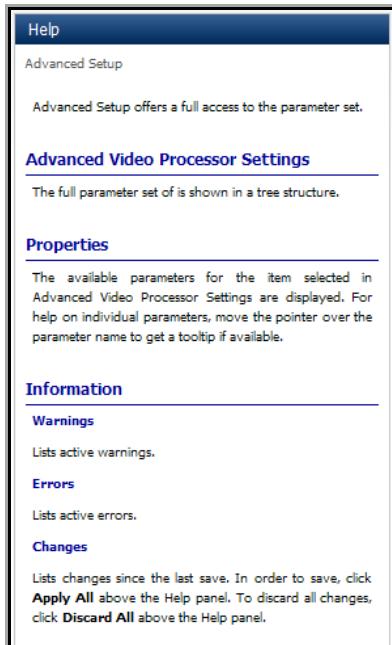


Figure 5.25 Help Widget

5.4.2.4

Information Widget

The **Information** widget contains the **Changes**, **Warnings** and **Errors** tab pages for displaying changes, warnings and errors. By clicking on a change, the corresponding item is displayed in the **Properties** widget and the change can be revoked by manually resetting the parameter to its original value. For details of the Information Widget see *Figure 5.21*.

Note: The original value is shown in a tooltip by hovering the mouse pointer over the item on the **Changes** tab.

5.4.3

Using the Device Configuration Page

This section describes the tasks that can be completed on the Device Configuration page.

5.4.3.1

Customizing the Quick Setup menu

The **Configuration Items** widget displays the **Quick Setup** menu as a tree. The tree contains the most commonly used parameters. These include default parameters as well as the parameters added by the user. To add your own parameters to the tree, do the following:

1. Open the **Customize Items** dialog by selecting **Actions > Customize Items**.



2. In the **Configuration Items** widget of the **Customize Items** dialog, select the **Quick Setup Items** node, and select **Actions > Add Folder**.
3. Double click on the newly created node, and rename it to a more descriptive name.
4. Scroll down to the item you want to add to your custom list in the **Advanced Video Processor Settings** widget.
5. By holding down the left mouse button, drag the item over the new folder in the **Configuration Items** widget.
6. Add the item to the new folder by releasing the mouse button. The item cannot be added to the **Quick Setup Items** node. Any valid drop position is indicated by the dragging rectangle changing into green.
7. Repeat the process for any additional items you want to add. You can create as many folders as you wish or you can use any previously created one. The created folders can be reordered by the drag and drop technique used for adding the item. The added items can also be relocated through drag and drop. To delete a folder or an item, select it then choose **Action > Remove Item**.
8. When ready, click **Save** to save the changes. The new items are added to the **Quick Setup** menu.

Note: The list of added items can be exported by selecting **Action > Export** and can be imported on another unit by **Action > Import**.

The **Settings** widget of the **Customize Items** dialog displays all the options available to be set regardless of the visibility of the individual items. (Normally, some items might be hidden depending on the settings selected for other parameters.) When such an item is added to the **Configuration Items** list and the list is saved, the item will only show up on the **Quick Setup** list if the other parameters controlling its visibility are changed to the correct value.

5.4.4 Configuring Option Cards Using the Device Configuration Page

This section gives the tables of parameters available for configuring the option cards using the **Device Configuration** Web Page.

5.4.4.1 ASI Option Card

The ASI Option module provides ASI outputs for the transmission of MPEG-2 Transport Streams. When an ASI option module is fitted in a base chassis the host detects its presence and adds the option to configure a Transport Stream to be output over ASI.

5.4.4.1.1 ASI Output Configuration

The following parameters are available through the **Advanced Setup** tab of the **Device Configuration** page under **Slots > Slot <n> - ASI IO Option Card > ASI IO Option Card > ASI Output Streams**. The same parameters can be accessed through the **Advanced/ASI/ASI Output Streams** menu on the front panel.

Table 5.3 ASI Output Configuration Parameters

Parameter	Values	Description
Output Mode	Mirrored, Independent	Specifies whether the two outputs output the same Transport Stream or they operate independently. If set to Mirrored, only one output will be accessible.

5.4.4.2 G.703 Transceiver Card

The section describes the options available to set up the G.703 output through the web user interface or the front panel. When a G.703 Transceiver card is fitted in a base chassis the host detects its presence and adds the option to configure a Transport Stream to be output over it.

5.4.4.2.1 Transmitter Configuration

The following parameters are available through the **Advanced Setup** tab of the **Device Configuration** page under **Slots > Slot <n> - G.703 Transceiver Card > G.703 Transceiver Card > G.703 I/O Ports > G.703 I/O Port 1**. The same parameters can be accessed through the **Advanced/ G.703 Transceiver Card/G.703 I/O Ports/G.703 I/O Port 1** menu on the front panel.

Table 5.4 Transmitter Configuration Parameters

Parameter	Values	Description
PDH Carrier	E3, DS3	Specifies which E carrier to use. E3 is equivalent to E31 (which supports an output bit rate of 34368 kbps), DS3 is equivalent to E32 (which supports an output bit rate of 44736 kbps) as defined by ITU-T Rec. G.703.
Framing	None, M13, C-bit	Specifies the framing used in DS3 operation.
Transmitter/ATM Configuration		
ATM Mode	Off, On	Enables or disables ATM encapsulated transmission as per ETSI ETS 300 813. Available only if Framing is set to C-bit.
VPI	1 – 255	Virtual Path Identifier. Should not normally be changed.
Transmitter/DVB Configuration		
G.703 Stuffing	Off, On	Controls whether only G.703 packets are inserted into the output transport stream. On [default] = G.703 packets only included in the output transport stream. The output bitrate can be manually configured as required. Off = nulls will be inserted as well as G.703 packets and the output bitrate is determined by the G.703 configuration.
Randomization	Off, On	Enables spectral shaping by data randomization as per ETSI EN 300 429.



Parameter	Values	Description
RS Encoding	Off, On	Enables or disables Reed-Solomon forward error correction as per ETSI EN 300 429.
Interleaving	Auto, Off	Enables interleaving as per ETSI EN 300 429. If set to Auto, interleaving will be enabled if RS Encoding is applied.

5.4.4.3 GPI Option Card

This section describes the options available to set up the GPI option card through the web user interface or the front panel.

5.4.4.3.1 GPI Input Configuration

To configure GPI input pins for splicing, select the **Advanced Setup** tab on the **Device Configuration** page on the GUI. Expand **Encoder > Slots > Slot n Data & GPI Card > GPI Input Pin n Setup** folders in the **Advanced Video Processor Settings** widget.

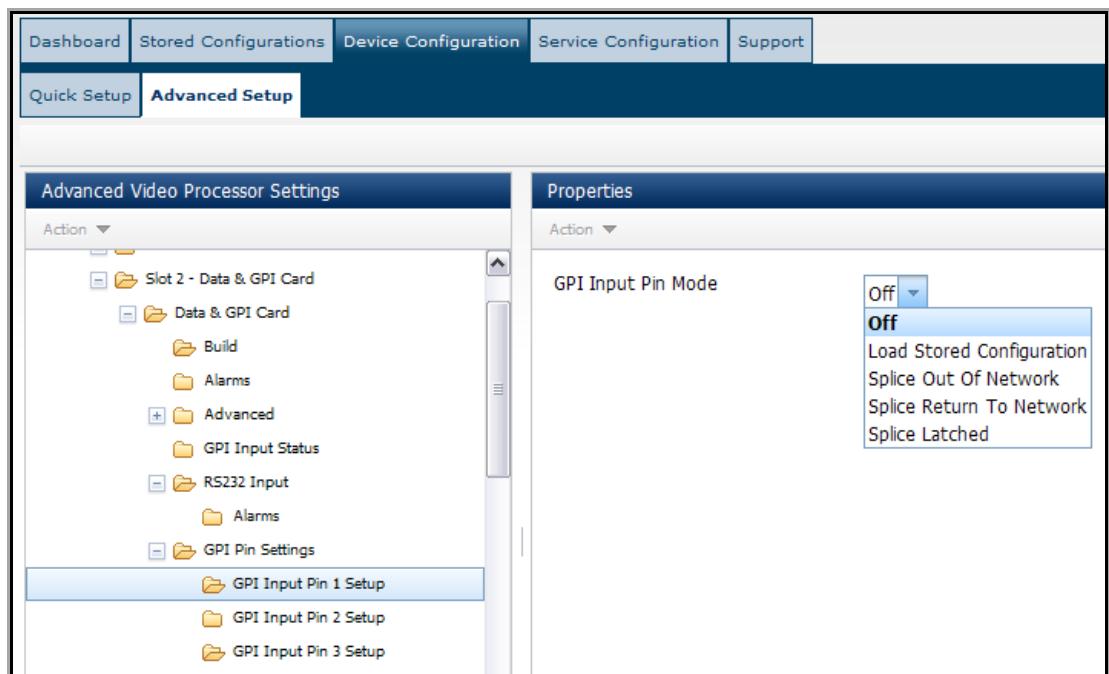


Figure 5.26 GPI Pin Setting via GUI

The parameters for each input pin are listed below.

Table 5.5 GPI Input Pin Configuration

Parameter	Values	Description
GPI Input Pin Mode	Off (Default)	
	Load Stored Configuration	Only available for pins 1 to 10.
	Splice Out of Network	When selected and the GPI pin changes state, an Out of network splice point is signaled to be inserted into the Transport Stream. Further setting determines how and when the splice point is inserted.

Parameter	Values	Description
	Splice Return to Network	When selected and the GPI pin changes state, a Return to network splice point is signaled to be inserted into the Transport Stream. Further setting determines how and when the splice point is inserted.
	Splice Latched	When selected and the GPI pin changes state, an Out of network splice point is signaled to be inserted into the Transport Stream. A return to network splice point is signalled when either the GPI pin polarity changes state again or when the splice duration is reached. Further setting determines how and when the splice point is inserted.

5.4.4.3.2 Load Stored Configurations (Not Supported in this Release)

It is possible to use the GPI input pins to trigger the loading of any of the 64 stored configurations on the unit. The selection of the stored configuration is made by configuring 6 of the GPI input pins as a binary representation of the store number while a 7th pin provides the toggle to action the loading of the configuration.

When a **GPI Input Pin Mode** is set to **Load Stored Config** the next 6 pins are automatically configured to the same setting. The lowest pin number (originally selected) is the LSB of the store number. The highest pin number is the GPI trigger to load the selected configuration.

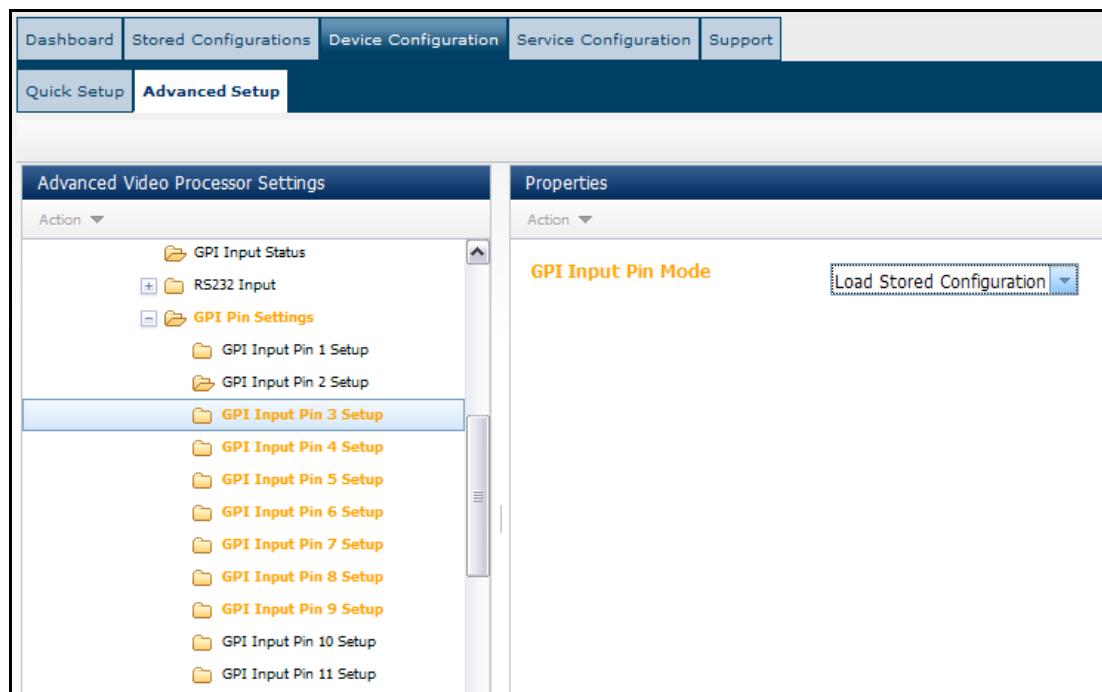


Figure 5.27 Load Stored Configurations

For example: If 'GPI Input Pin 3' is set to 'Load Stored Config' and the following pins are set as follows

- GPI Input Pin 3 0 LSB
- GPI Input Pin 4 0



- GPI Input Pin 6 1
- GPI Input Pin 7 0
- GPI Input Pin 8 1 MSB

When GPI Input Pin 9 is toggled the configuration in store 40 is loaded.

When a GPI input pin mode is selected, the splicing setup options become available by expanding the appropriate **GPI Input Pin n Setup** folder. The parameters are listed below.

5.4.4.3.3

Splicing Configuration

The card can be configured to send SCTE 104 messages to encoders of VCMs fitted in the unit.

The closure (or opening) of the general purpose input pins (GPI Pin 1 – 16) with the common GND can trigger these SCTE 104 messages. The configuration can be divided into two parts:

- Setting up the GPI card (pins and messages)
- Setting up the VCMs

5.4.4.3.4

GPI Card Splicing Configuration

When any of the **Splice** options are selected a further set of configurable options are available if the GPI Input Pin n Setup is expanded further to show **Splicing Setup**

Properties	
Action	SCTE-104 Channel None
GPI Pin Trigger Polarity	<input checked="" type="radio"/> Open <input type="radio"/> Closed
Out pre-roll	0 s
Return pre-roll	0 s
Return to network	<input checked="" type="radio"/> Automatic <input type="radio"/> External Control
Splice Duration	0 s [0 - 10000]
Fixed Delay	0 ms [0 - 1000]
Splice ID increment mode	<input checked="" type="radio"/> For each Avail <input type="radio"/> For each Msg
Avail_descriptor	<input checked="" type="radio"/> Off <input type="radio"/> Present

Figure 5.28 GPI Input Pin Splicing Setup

Table 5.6 Splicing Set Up Options

Parameter	Values	Description
SCTE 104 Channel	None, ChannelA to ChannelP	Virtual SCTE 104 channel used to route messages to encoders. Different pins can share same channel. Different encoders can share same channel.
GPI Pin Triggered Polarity	Open, Closed (Default)	When the parameter is set to Open a message is sent when the pin goes from Closed state to open state. When the parameter is set to closed a message is sent when the pin goes from open state to closed state. Splice latched mode defines the trigger for the Out of network message.
Out Pre-roll	0, 4 to 100(s)	0 (default value) indicates immediate and a value less than 4 will be treated as immediate. A splice point is inserted at the earliest possible opportunity. If a value is set for the pre-roll, a splice point shall be inserted that many seconds after the GPI pin contact change has been signalled.
Return Pre-roll	0, 4 to 100(s)	0 (default value) indicates immediate and a value less than 4 will be treated as immediate.
Return to Network	Automatic External Control	If set to Automatic a Return to network splice shall automatically be inserted after the time set for the Splice Duration has elapsed from when the Out of Network splice was signalled.
Splice Duration	1 to 10000 (s)	
Fixed Delay	0 to +1000 (ms)	Added to both Out and Return pre-roll.
Splice ID Increment Mode	For each Avail, For each Msg	
Avail_Descriptor	Off (Default), Present	If set to Present, the value in the Provider Avail Id is inserted into the output SCTE 35 message
Provider Avail Id	0 to 424967295	Used as a reference to identify a specific Transport Stream that the splice point is to be associated with.
GPI Input Pin State		Read only.

5.4.4.3.5 Setting Up the VCM to Use GPI Inputs

The example given here shows setting up a CE-x in slot 3.

To set Up the VCM to use GPI inputs, select the **Advanced Setup** tab on the **Device Configuration** page on the GUI. Expand **Encoder > Slots > Slot 3 > CE-x > Video > Video 1 > Video > Main Video > Video Encoder > Splicing** folders in the **Advanced Video Processor Settings** widget.

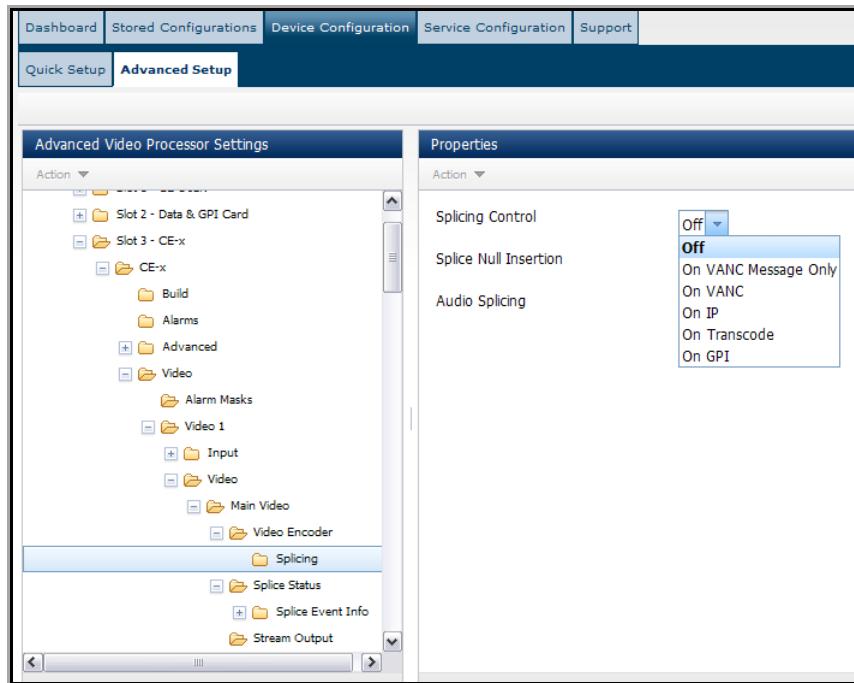


Figure 5.29 VCM Splicing Control

When Splicing Control is set to **On GPI** the **SCTE 104 Input** node appears in the settings tree. This provides a list displaying all usable SCTE 104 channels. A channel is usable if there is at least one GPI pin configured on the source end of the channel. After choosing an input channel for the VCM encoder core, the configuration of the VCM is complete, it now waits for messages on selected channel for SCTE 104 messages.

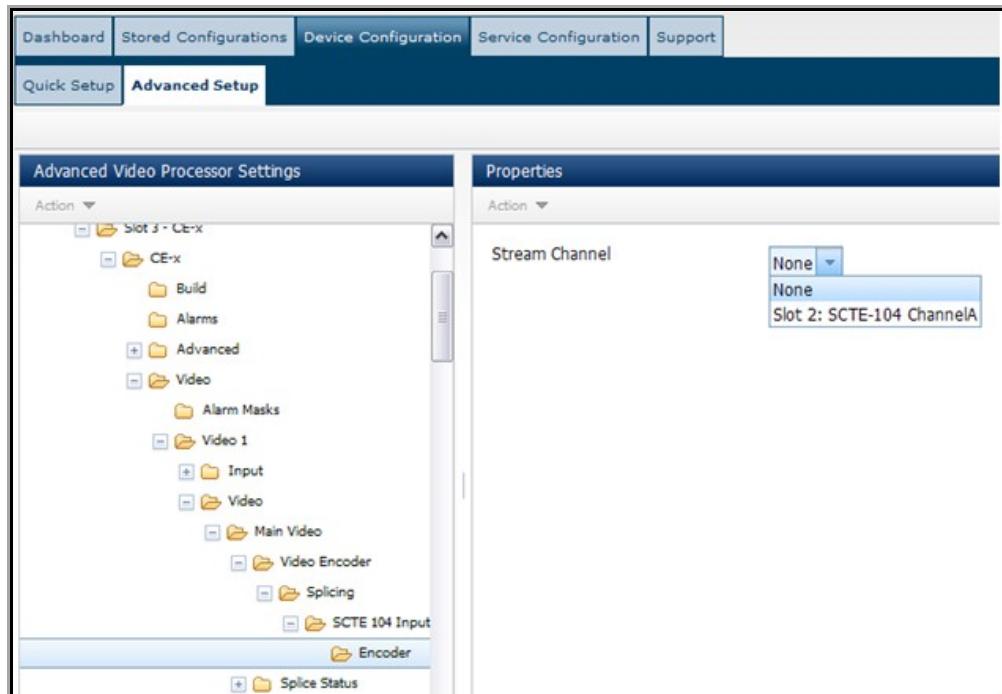


Figure 5.30 VCM SCTE 104 Input Selection

Combinations and Limitations

With the SCTE 104 Channels a many-to-many relation can be set up between the GPI pins and the encoder cores of VCMs. This means:

- More pins of the same GPI card can be configured to send messages to the same set of encoder cores. This is achieved with selecting the same channel for them on the GPI Input Pin Setup panel.
- More encoder cores (of the same VCM or different VCMs) can be configured to get messages from the same set of pins of a GPI card. This is achieved with selecting the same channel for them on the SCTE 104 Input / Encoder panel.

Different GPI cards fitted in the same unit can not send messages to the same encoder core. This is because channels belong to GPI cards and one encoder core can use only one channel for SCTE 104 input.

5.4.4.3.6 Alarm Relay

The alarm relay function is initiated by an alarm relay and a fail relay. The alarm relay is energized when there is no active alarm condition and de-energized when an alarm with the severity Major is raised or cleared by the unit. The fail relay is energized when there is no active fail condition and de-energized when an alarm with the severity Critical is raised by the unit. A loss of power is signaled as both an alarm and a fail condition.

The alarm relay function is not configurable. At the same time, it is possible to configure the severities of the unit alarms. To do so, browse to the **Dashboard** page and select the **All** tab in the **Alarm Monitor** widget. An expandable box is displayed for the host, and one for each card inserted in the chassis. By expanding a box, the individual alarms can be selected and the appropriate severity level can be set.

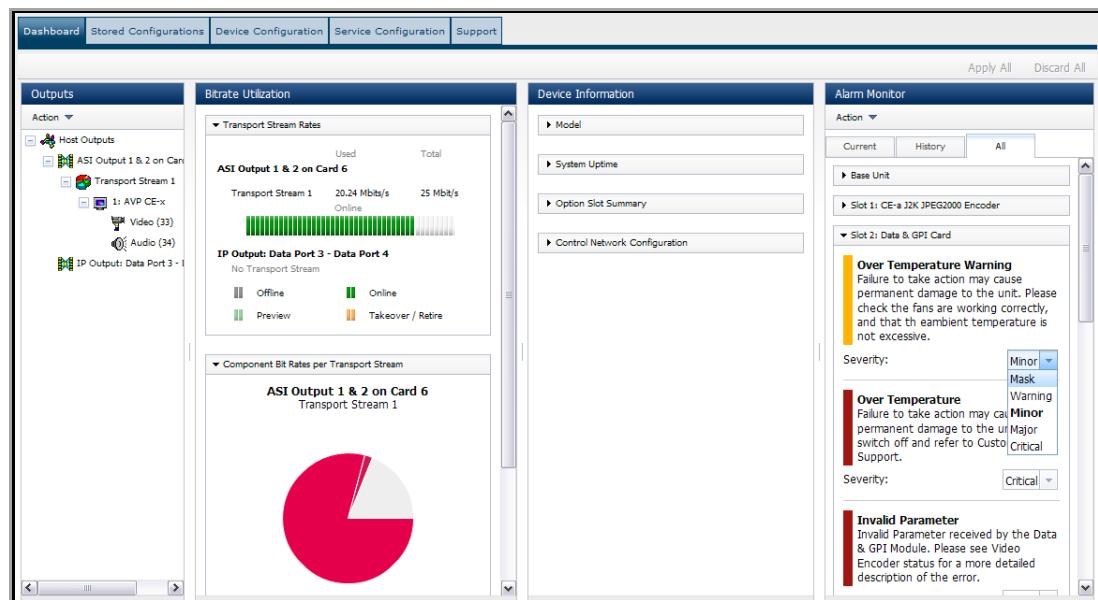


Figure 5.31 Alarm Severity Configuration



5.4.4.3.7

Data Input Configuration (Not Supported in this Release)

To configure the Data Input Pins using the GUI, select the **Advanced Setup** tab on the **Device Configuration** page on the GUI. Expand **Encoder > Slots > Slot n > Data & GPI Card > RS232 Input** options in the **Advanced Video Processor Settings** widget.

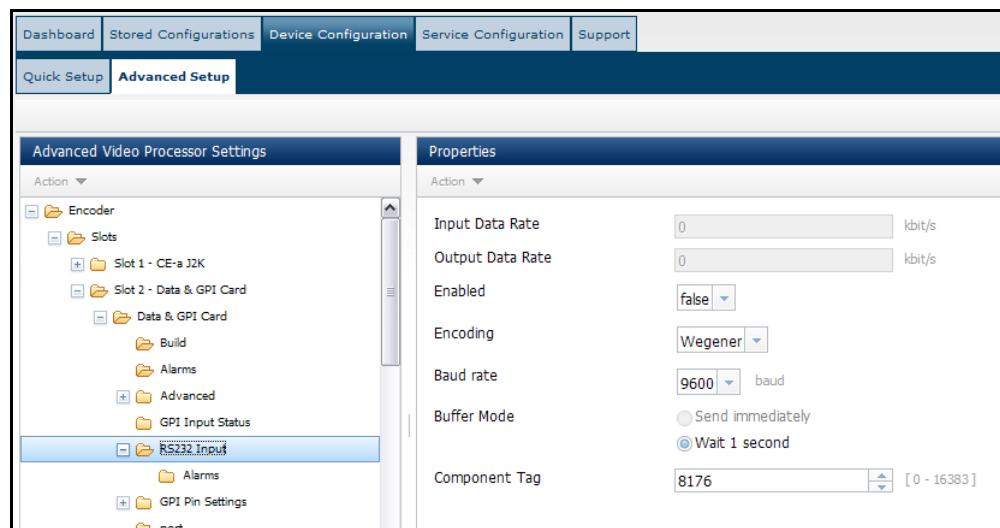


Figure 5.32 Data Input Configuration

Table 5.7 Data Input Configuration Options

Parameter	Options	Description
Enabled	True False	Data Channel enable/disable
Encoding	Wenger	<p>Identified in the PMT as a component of type 0xC1 with no descriptors.</p> <p>Wegener ASYNC data are transmitted as private stream 2 type data. This stream conforms to ISO13818. The adaptation field is used to add stuffing bytes if needed to complete a TS packet. Stuffing bytes are set to a value of 0xFF. Payload data bytes follow the packet length field and do not include a CRC field.</p>
	Motorola	<p>Identified in the PMT as a component of type 0xC0 with no descriptors.</p> <p>The IEC-232 data are encapsulated directly into the full 184 payload bytes of the transport packets (i.e. no PES layer).</p> <p>The IEC-232 data-stream is expected to contain complete DCIIText packets. These packets must be preceded by the sequence (0x7F, 0xFE, 0x7F, 0xFE) followed by 2 bytes which contain the length of the DCIIText packet. If this sequence is not detected, the card shall raise an alarm to indicate that it is not locked to the data stream.</p>
	DVB	Format as specified by DVB
	Ericsson	Ericsson proprietary format
Baud Rate	1200 2400 4800 9600 (Default) 19200 38400	Sets the baud rate of the IEC-232 asynchronous data channel (Baud/s)

Buffer Mode	Send Immediately	Only available in Ericsson encoding mode. If selected, whenever data is available at the Data Input port it is sent in the output Transport Stream. This can result in wasted bandwidth due to low packet occupancy. It also results in a higher packet rate, which may cause some receivers to overflow
	Wait 1s	Data is buffered until enough have arrived to fill a transport packet or 1 second elapses, whichever occurs first
Component Tag	0 to 16383	Defines the optional component tag to be assigned to the data stream

5.4.4.4 External Sync Input Option Card

The External Sync Input Option Card has no configurable parameters. To configure the external sync input to be used as the clock source, from the web interface, browse to **Device Configuration > Advanced Setup** and under Base Unit set the MUX SCR Source to External. Alternatively, on the front panel use the External option under **Advanced/System/Base Unit/MUX SCR Source**.

5.4.4.5 Satellite Modulator Option Card (AVP 3000 Voyager Only)

The section describes the operation and control of the Satellite Modulator.

5.4.4.5.1 Satellite Modulator Input Configuration

The following parameters are available through the **Advanced Setup** tab of the **Device Configuration** page under **Slots > Slot <n> - Satellite Modulator Option Card > Satellite Modulator > Input Parameters**. The same parameters can be accessed through the Advanced/Satellite Modulator/Input Parameters menu on the front panel.

Table 5.8 Satellite Modulator Input Configuration Parameters

Parameter	Values	Description
Primary Input Source	Stream 1, Stream 2, Null Packets, PRBS	The source of the primary input of the Satellite Modulator card.
Secondary Input Source	Stream 1, Stream 2, Null Packets, PRBS	The source of the secondary input of the Satellite Modulator card.
Input Select	Primary, Secondary	Specifies the Transport Stream on which input to feed to the satellite modulator.
Input Mode	Manual, Semi-automatic, Fully Automatic	Specifies how to switch over to the other input in case the current input fails. In Manual mode no automatic switch over is done. In Semi-automatic mode the switch-over to the other input is automatic, if the a Transport Stream on current input is not detected, but there is no automatic switch back to the original input if the Transport Stream is restored. In fully automatic mode the even switch back to the original input is automatic once the Transport Stream on that input is restored.
Input Format	MPEG TS, BB Frames	The format of the input data stream. BB Frames are currently not supported.
Rate Adaptation	Off, On	Allows the modulator to be used at a fixed symbol rate, asynchronously with its transport stream input data rate. The recommended setting is for Rate Adaptation to be ON , allowing the modulator to either insert or drop null packets in the input stream to match that expected by the modulator according to the selected modulation, FEC rate and other relevant parameters. In this mode the modulator card's symbol rate is held constant at a value nominally equal to the



Parameter	Values	Description
		user-defined symbol rate setting. When rate adaptation is disabled, the modulator card tries to lock its symbol rate to the input data rate, but it can only do so if the configured input data rate is within the tracking range of the input rate control PLL (approximately ±122 ppm). If this does not match, errors will be seen at the output.
Input Buffer Size	512 bytes to 4096 bytes	The size of the input buffer.
Clock Reference Mode	Internal, External	The source of the 10 MHz reference clock used by the satellite modulator. External mode is not supported by the current hardware configuration.
RAS Scrambling	Off, On	Specifies whether to use RAS scrambling.
RAS Key		The 7-byte key used for RAS scrambling.
RAS version		The version of the RAS implemented on the satellite modulator.

5.4.4.5.2 Satellite Modulator Modulation Configuration

The following parameters are available through the **Advanced Setup** tab of the **Device Configuration** page under **Slots > Slot <n> - Satellite Modulator Option Card > Satellite Modulator > Modulation Parameters** or on the **Modulation Parameters** tab in the **Properties** widget of the **Service Configuration** page if one of the **Satellite Modulator Output Stream** is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/Satellite Modulator/Modulation Parameters** menu on the front panel.

Table 5.9 Satellite Modulator Modulation Configuration Parameters

Parameter	Values	Description
Modulation Standard	DVB-S, DVB-DSNG, DVB-S2	Specifies the modulation standard to use for satellite transmission.
Modulation State	Off, On	Turns on or off the modulation of the carrier. If the output is enabled and modulation is turned off, an unmodulated carrier is output.
DVB-S2 Mode ¹	CCM, VCM, ACM	Specifies whether Continuous Coding and Modulation (CCM), Variable Coding and Modulation (VCM) or Adaptive Coding and Modulation (ACM) is used. In VCM mode, the modulator can be fed by two Transport Streams for which different modulation parameters can be set. In ACM mode the modulation parameters are set adaptively. ACM mode is currently not supported.
Stream Synchronization Mode ¹	Disabled, Short, Normal	Specifies whether to transmit ISSY and if so, whether to use a two or three-byte ISSY field in the BB header.
Stream Synchronization Mode ¹ for TS2	Disabled, Short, Normal	Same as above for the 2nd Transport Stream in VCM mode.
Null Packet Deletion ¹	Off, On	If set to On, null packets will be deleted from the incoming Transport Stream.
FEC Rate	1/4 ¹ , 1/3 ¹ , 2/5 ¹ , 1/2, 3/5 ¹ , 2/3, 3/4, 4/5 ¹ , 5/6, 7/8 ^{2,3} , 8/9 ^{1,2} , 9/10 ¹	The code rate of the Reed-Solomon encoder (DVB-S and DVB-DSNG mode) or the BCH – LDPC encoder (DVB-S2 mode)

Parameter	Values	Description
FEC Rate for TS2	1/4 ¹ , 1/3 ¹ , 2/5 ¹ , 1/2, 3/5 ¹ , 2/3, 3/4, 4/5 ¹ , 5/6, 7/8 ^{2,3} , 8/9 ^{1,2} , 9/10 ¹	Same as above for the 2nd Transport Stream in VCM mode.
Frame Size ¹	Normal, Short	The size of the BB frames in DVB-S2 mode.
Frame Size ¹ for TS2	Normal, Short	Same as above for the 2nd Transport Stream in VCM mode.
Modulation	QPSK, 8PSK ^{1,2} , 16QAM ² , 16APSK ¹ , 32APSK ¹	The modulation mode and order used for the transmission.
Modulation for TS2	QPSK, 8PSK ^{1,2} , 16QAM ² , 16APSK ¹ , 32APSK ¹	Same as above for the 2nd Transport Stream in VCM mode.
Pilots ¹	Off, On	Toggles the insertion of pilot symbols into the transmitted signal on and off.
Pilots ¹ for TS2	Off, On	Same as above for the 2nd Transport Stream in VCM mode.
NCR Stamping PID ^{1,2}	0 - 8191	The PID used for packets transmitting Network Clock Reference.
Symbol Mapping Mode ^{1,2}	Peak Power, Mean Power	Specifies what to use for power normalization.
PL Scrambling Sequence Number ¹	0 to 26141	The sequence number used for physical layer scrambling.
Symbol Rate	0.132000 Msymbol/s to 45.000000 Msymbol/s (standard) 0.132000 Msymbol/s to 66.000000 Msymbol/s (with VOY/SWO/HSYM license)	The symbol rate used for modulation.
Roll-off Factor	20, 25, 35 %	The roll-off factor of the filter used for pulse shaping

1 Applies to DVB-S2

2 Applies to DVB-DSNG

3 Applies to DVB-S

5.4.4.5.3 Satellite Modulator Output Configuration

The following parameters are available through the Advanced Setup tab of the Device Configuration page under Slots > Slot <n> - Satellite Modulator Option Card > Satellite Modulator > Output Parameters or on the Output Parameters tab in the Properties widget of the Service Configuration page if one of the Satellite Modulator Output Stream is selected in the Outputs widget. The same parameters can be accessed through the **Advanced/Satellite Modulator/Output Parameters** menu on the front panel.

Table 5.10 Satellite Modulator Output Configuration Parameters

Parameter	Values	Description
Output Select	L-band, IF	Specifies which output to use.
Output State	On (Reduced Power), On (Nominal Power), Off	Turns the output of the Satellite Modulator on at the specified power level or off. Note that to enable the output, the Transport Stream through the satellite modulator output has to be set to Online Setmode state.
L-Band Output		
Frequency Input Mode	L-Band Frequency, Uplink Frequency	The mode how the frequency is treated. For L-Band Frequency the RF center frequency of the respective output is directly entered. For Uplink Frequency, the RF center frequency is calculated from the Uplink Frequency and the Up-



Parameter	Values	Description
		converter Frequency.
L-Band Frequency	950.000 MHz to 2150.000 MHz	The center frequency of the signal output through the L-Band output.
Uplink Frequency		The frequency the signal is converted to by the up-converter fed from the AVP 3000 Voyager through the L-Band output. Uplink Frequency = Up-converter Frequency ± IF Frequency. ± depends on the Spectrum Sense.
Nominal L-Band Power	-40.0 dBm to 5.0 dBm	The Nominal signal power output through the L-Band output applied when the output is set to On (Nominal Power)
Reduced L-Band Power	-40.0 dBm to 5.0 dBm	The Reduced signal output power applied when the output is set to On (Reduced Power) when the output frequency is changed or after a reboot if the Output State is allowed to stay on.
L-Band Spectrum Sense	Normal, Inverted	Specifies whether the spectrum is inverted or not inverted. It has an effect on the Up-converter Frequency calculation.
L-Band Tilt	-0.040 dB/MHz to 0.040 dB/MHz	The tilt applied in the L-band.
L-Band Up-converter Frequency	2500.000 MHz - 100000.000 MHz	The oscillator frequency of the up-converter fed by the AVP 3000 Voyager through the L-Band output.
Up-converter Power	Off, 15V, 24V	The voltage level to feed a downstream up-converter device.
Up-converter Reference	Off, On	Specifies whether to produce a 10-MHz reference for the downstream up-converter device.
IF Output		
Frequency Input Mode	IF Frequency, Uplink Frequency	The mode how the frequency is treated. For IF Frequency the RF center frequency of the respective output is directly entered. For Uplink Frequency, the RF center frequency is calculated from the Uplink Frequency and the Up-converter Frequency.
IF Frequency	50.000 MHz to 180.000 MHz	The center frequency of the signal output through the IF output.
Uplink Frequency		The frequency the signal is converted to by the up-converter fed from the AVP 3000 Voyager through the IF output. Uplink Frequency = Up-converter Frequency ± IF Frequency. ± depends on the Spectrum Sense.
Nominal IF Power	-30.0 dBm to 5.0 dBm	The Nominal signal power output through the IF output applied when the output is set to On (Nominal Power).
Reduced IF Line-up Power	-30.0 dBm to 5.0 dBm	The Reduced IF output power level applied when the output is set to On (Reduced Power), when the output frequency is changed or after a reboot if the Output State is allowed to stay on.
IF Spectrum Sense	Normal, Inverted	Specifies whether the spectrum is inverted or not inverted. It has an effect on the Up-converter Frequency calculation.
IF Tilt	-0.040 dB/MHz to 0.040 dB/MHz	The tilt applied to the IF output signal.
IF Up-converter Frequency	500.000 MHz to 100000.000 MHz	The oscillator frequency of the up-converter fed by the AVP 3000 Voyager through the IF output.

5.5 Service Configuration Page

The **Service Configuration** page provides setup options for the outputs of the device.

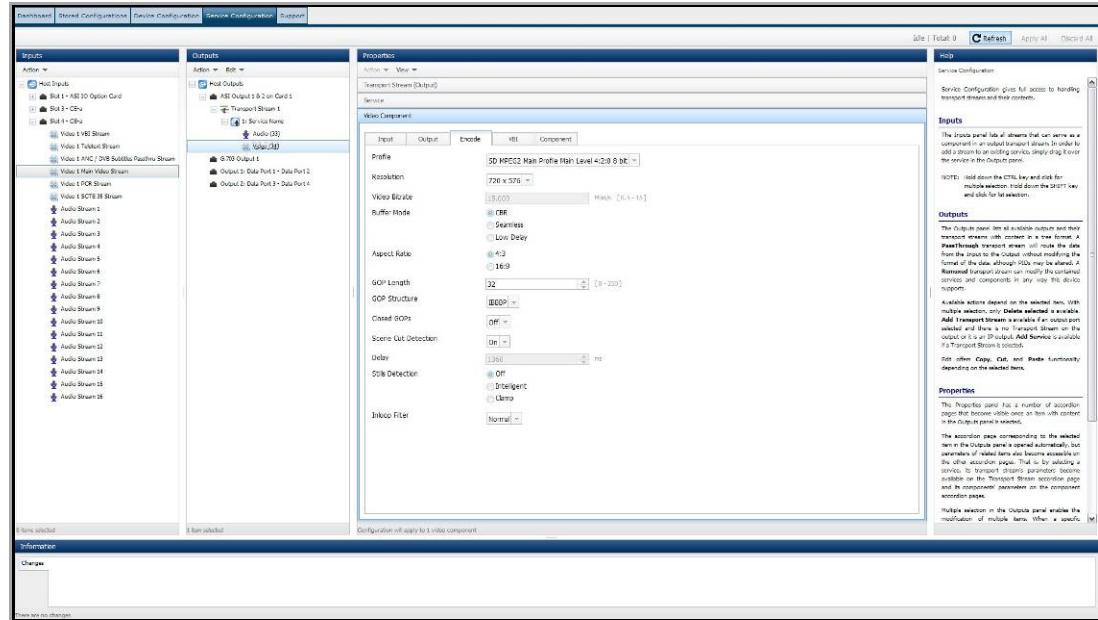


Figure 5.33 Service Configuration Video Page

5.5.1 Widgets

5.5.1.1 Inputs Widget

The **Inputs** widget shows the available components sorted by input. Any component on this list can be added to the outputs provided that there is a valid license to do so or the number of times a component can be reused has not been exceeded.

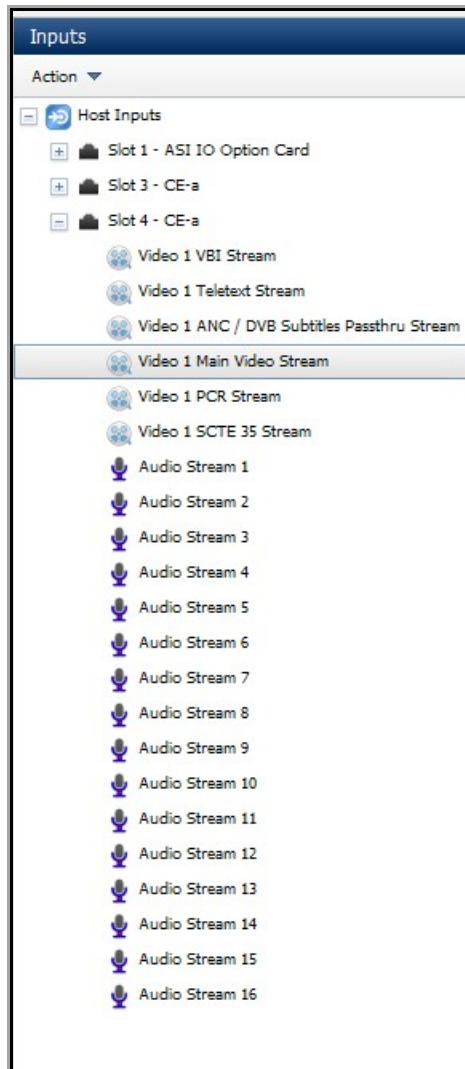


Figure 5.34 Inputs Widget

5.5.1.2 Outputs Widget

The **Outputs** widget lists the inputs and outputs of the device, respectively. The **Edit** menu of the **Outputs** widget provides **Copy**, **Cut** and **Paste** commands to copy or move Transport Streams, services, and components. Components can be dragged and dropped from the **Inputs** widget to the services listed in the **Outputs** widget, and can also be dragged and dropped within the **Outputs** widget. Drag and drop moves the item, *Ctrl* + drag and drop copies the item. Items cannot be dropped arbitrarily: components can only be dropped on services, services on Transport Streams, and Transport Streams on outputs. A valid drop location is indicated by a green rectangle.

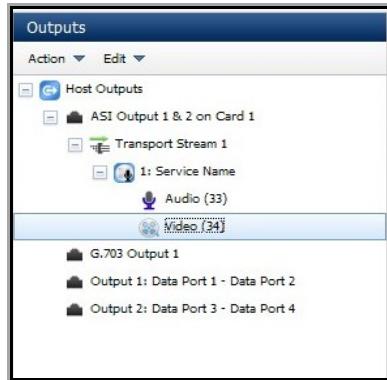


Figure 5.35 Outputs Widget

5.5.1.3 Properties Widget

The **Properties** widget displays the properties of the items selected either in the **Inputs** or in the **Outputs** widget. When a value of a property is changed, its label is highlighted in orange and remains highlighted until the change is committed or abandoned by clicking on the **Apply All** or **Discard All** buttons on the taskbar, respectively. Depending on which item is selected in the **Inputs** and **Outputs** widget, the properties are displayed in different accordion panels in the **Properties** widget.

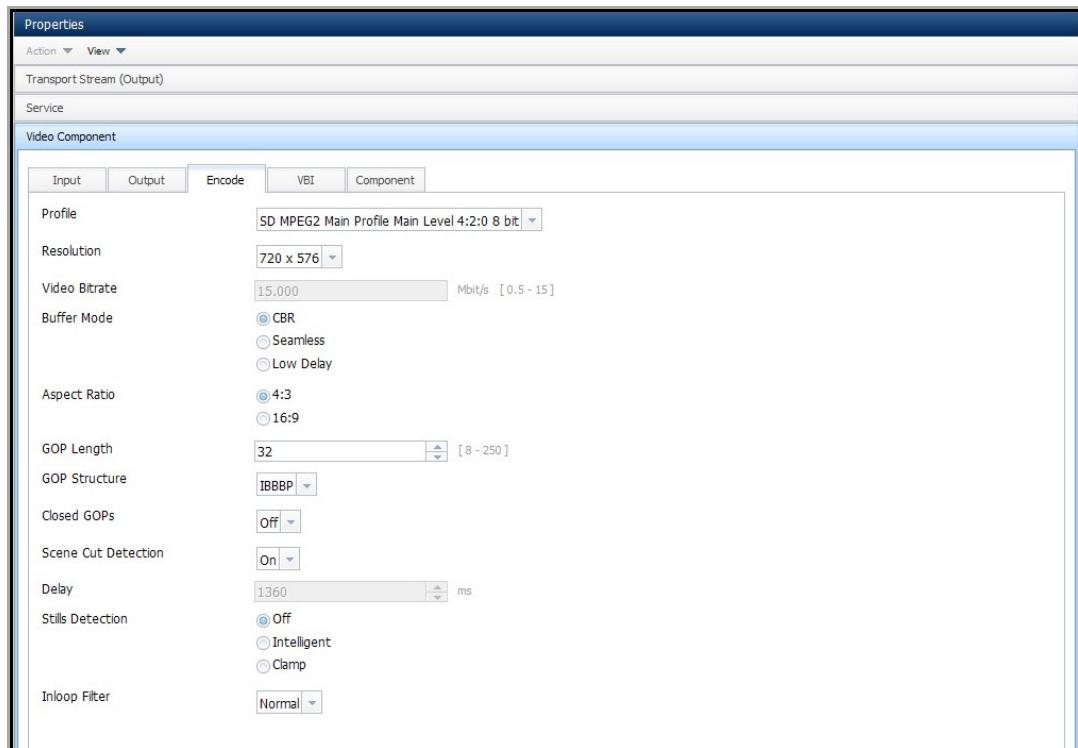


Figure 5.36 Properties Widget

Note: If a component is selected in the **Outputs** widget, its source is also highlighted in the **Inputs** widget and the other way around. This makes it easy to identify corresponding components.



5.5.1.4

Help Widget

The **Help** widget provides help information on the items in the page.

5.5.1.5

Information Widget

The **Information** widget contains the **Changes**, **Warnings** and **Errors** tab pages for displaying changes, warnings and errors. By clicking on a change the corresponding item is displayed in the **Properties** widget and the change can be revoked by manually resetting the parameter to its original value. For details of the Information Widget, see *Figure 5.21*.

Note: The original value is shown in a tooltip by hovering the mouse pointer over the item in the **Changes** tab.

5.5.2

Using the Service Configuration Page

This section describes the tasks that can be completed on the Service Configuration page.

5.5.2.1

Adding a Transport Stream to an Output

To add a Transport Stream to an output, do the following:

1. In the **Outputs** widget, select the output you want to add a Transport Stream to.
2. Right click on the selected output.
3. Select **Add Transport Stream** from the context menu.

OR

1. In the **Outputs** widget, select the output you want to add a Transport Stream to.
2. Click **Action > Add Transport Stream**.

OR

1. In the **Outputs** widget, select the output you want to add a Transport Stream to.
2. Right click on the selected output and choose **Add Transport Stream** from the context menu.

Note: Outputs other than the IP outputs cannot have more Transport Streams associated to them.

5.5.2.2

Adding a Service to a Transport Stream

To add a service to a Transport Stream, do the following:

1. In the **Outputs** widget, select the Transport Stream you want to add a service to.
2. Right click on the selected Transport Stream.

3. Select **Add Service** from the context menu.

OR

1. In the **Outputs** widget, select the Transport Stream you want to add a service to.
2. Click **Action > Add Service**.

OR

1. In the **Outputs** widget, select the Transport Stream you want to add a service to.
2. Right click on the selected Transport Stream, and choose **Add Service** from the context menu.

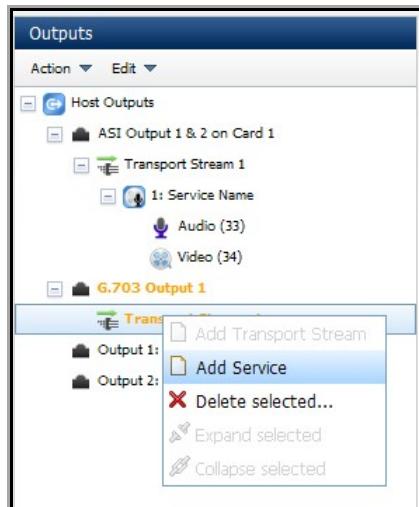


Figure 5.37 Add Service Menu

5.5.2.3

Adding a Component to a Transport Stream

To add a component to a service, do the following:

1. In the **Inputs** widget select the component you want to add to a service in the **Outputs** widget.
2. Drag the component over the desired service in the **Outputs** widget.

Note: To select more components to add, press and hold the **< Ctrl** key then click on the appropriate components in the **Inputs** widget. To select consecutive items, select the first item, press and hold the **Shift** key, then select the last item.

5.5.2.4

Deleting Transport Streams, Services or Components

To delete a Transport Stream, service or component, do the following:

1. In the **Outputs** widget, select the Transport Stream, service or component you want to delete.
2. Press the **Del** key.



3. Answer **Yes** to the confirmation message.

OR

1. In the **Outputs** widget, select the Transport Stream, service or component you want to delete.
2. Click **Action > Delete Selected**.

OR

1. In the Outputs widget, select the Transport Stream, service or component you want to delete.
2. Right click on the selected item, and choose Delete Selected from the context menu.

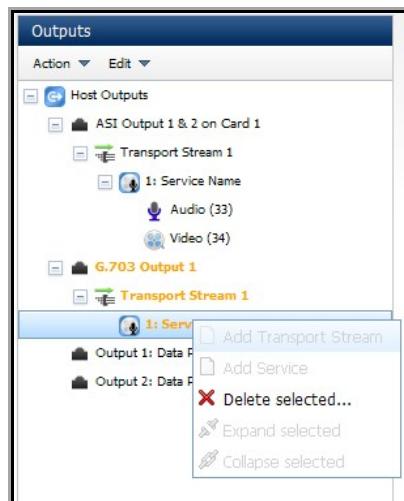


Figure 5.38 Deleting a Service

Note: **Ctrl** key then click on the appropriate items. To select consecutive items, select the first item, press and hold the **Shift** key, then select the last item.

5.5.2.5

Manually Changing the Setmode State of a Transport Stream

To change the **Setmode** state of a Transport Stream, do the following:

1. In the **Outputs** widget, select the Transport Stream for which you want to change the **Setmode** state.
2. In the **Properties** widget, click on the **Online** or Offline button.

5.5.2.6

Copying Transport Streams, Services or Components

To copy a Transport Stream, do the following:

1. In the **Outputs** widget, select the Transport Stream, service or component you want copy.

2. Drag the selected Transport Stream, service or component over another output (when copying a Transport Stream), another Transport Stream (when copying a service) or another service (when copying a component).

OR

1. In the **Outputs** widget, select the Transport Stream, service or component you want copy.
2. Select **Edit > Copy** from the widget menu bar.
3. Select the output (when copying a Transport Stream), the Transport Stream (when copying a service) or the service (when copying a component) you want to copy the selected item to.
4. Select **Edit > Paste** from the widget menu bar.

Note: To select more Transport Streams, services or components, press and hold the **Ctrl** key then click on the appropriate items. To select consecutive items, select the first item, press and hold the **Shift** key, then select the last item.

5.5.2.7 Moving Transport Streams, Services or Components

To move a Transport Stream, do the following:

1. In the **Outputs** widget, select the Transport Stream, service or component you want move.
2. While holding down the **Ctrl** key, drag the selected Transport Stream, service or component over another output (when moving a Transport Stream), another Transport Stream (when moving a service) or another service (when moving a component).

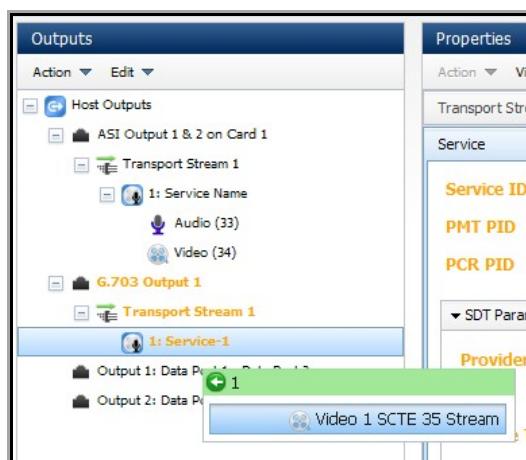


Figure 5.39 Dragging a Transport Stream or Service

OR

1. In the **Outputs** widget, select the Transport Stream, service or component you want to move.



2. Select **Edit > Cut** from the widget menu bar.
3. Select the output (when moving a Transport Stream), the Transport Stream (when moving a service) or the service (when moving a component) you want to move the selected item to.
4. Select **Edit > Paste** from the widget menu bar.

Note: To select more Transport Streams, services or components, press and hold the **Ctrl** key then click on the appropriate items. To select consecutive items, select the first item, press and hold the **Shift** key, then select the last item.

5.5.2.8 Cloning Transport Streams

Transport Stream cloning allows the user to create a mirror of an existing Transport Stream. Mirrored Transport Streams are only references to the original one. Thus, any change in the original Transport Stream will be automatically applied in the mirrored Transport Stream.

Note: No external Transport Streams, services, or components will show up under a mirrored Transport Stream in the **Outputs** widget of the **Service Configuration** page. Furthermore, when a mirrored Transport Stream is selected, the **Properties** widget will display a link to the original one, and will not display any parameters.

Although the content of the mirrored and the original Transport Stream is the same, the physical output streams will not be identical bit-by-bit. This is due to the mechanism the Transport Streams are played out through the different outputs.

To create a clone of an existing Transport Stream, do the following:

1. In the **Outputs** widget, select the Transport Stream you want to clone.
2. Select **Copy** from the **Edit** menu on the menu bar of the **Outputs** widget.
3. Select the output you want to insert the clone to.
4. Choose **Edit > Paste as Mirror**. The Transport Stream will be pasted as a mirror at the selected Transport Stream.

5.5.2.9 Disabling a Transport Stream if Audio or Video Lock is Lost

To disable the output when the input lock is lost for a component in a Transport Stream, do the following:

1. In the **Outputs** widget, select the Transport Stream you want to disable when the lock of any of its components is lost.
2. In the **Properties** widget, set the **Auto Disable to Audio Lost, Video Lost**, or **Audio or Video Lost** depending on what shall trigger turning the output off.
3. In the **Outputs** widget, select the video component whose lock state shall influence the Transport Stream output.

4. In the **Properties** widget, click on the **Input** tab, and set the **Output On Video Loss** to **No PID**.
5. In the **Outputs** widget, select the audio component whose lock state shall influence the Transport Stream output.
6. In the **Properties** widget, click on the **Input** tab, and set the **Output On Audio Loss** to **No PID**.

5.5.2.10

Disabling a Transport Stream if a Critical Alarm or an Upstream Critical Alarm is Raised

An upstream CRITICAL alarm is an alarm raised by a module that has direct influence on the Transport Stream.

To disable the output when a critical alarm or an upstream CRITICAL alarm is raised, do the following:

1. In the **Outputs** widget, select the Transport Stream you want to disable when a CRITICAL alarm or an upstream CRITICAL alarm is raised.
2. In the **Properties** widget, set the **Auto Disable** to **Any Critical Alarm or Any Upstream CRITICAL Alarm**.

5.5.2.11

Restoring a Transport Stream if the Auto Disable Condition is not Met

To restore the output when the **Auto Disable** condition is cleared, do the following:

1. In the **Outputs** widget, select the Transport Stream whose **Online** state you want to restore.
2. In the **Properties** widget, set the **Auto Enable** to true.

5.5.2.12

Reserving Bandwidth for Transport Streams

Bandwidth reservation allows the user to reserve a configurable amount of bandwidth in the output Transport Streams. The reserved amount will always be preserved even if bit rate tracking is enabled. To specify the amount of bandwidth to reserve, do the following:

1. Select a Transport Stream in the **Outputs** widget.
2. In the **Properties** widget, set the **Reserved Bit Rate** to the required value.

5.5.2.13

Providing More Space for Configuration Items in the Properties Widget

When a service has many components of different types, the **Properties** widget might get crowded with accordion panels that belong to the different components. To preserve space, some of the components (based on their types) can be hidden. To show or hide a component type, do the following:

1. Select a Transport Stream in the **Outputs** widget.
2. In the **Properties** widget, choose **View > Visibility Control > Show x** or **View > Visibility Control > Hide y**, where x and y is the type you want to show or hide.



5.5.3

Configuring Option Cards Using the Service Configuration Page

This section gives the tables of parameters available for configuring the option cards using the **Service Configuration** Web Page.

5.5.3.1 CE-a VCM (Video Compression Module)

5.5.3.1.1 Video and VBI Stream Configuration

Video Input and Pre-Processing

The parameters listed below are available on the **Input** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video1/Input** menu on the front panel.

Table 5.11 Video Input and Pre-Processing Parameters

Parameter	Values	Description
Video Input Lock	Yes, No	Shows whether there is a video lock to the format specified through the parameters below. Read only parameter.
Source	SDI	The video will be sourced from the SDI/HD-SDI input on the rear panel.
	Bars	An internally generated color bars test pattern will be used as the video source.
	Black	An internally generated black test pattern will be used as the video source.
	Moving Object	An internally generated moving object test pattern will be used as the video source.
	Slate	An internally generated slate test pattern will be used as the video source.
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Controls whether the format of the SDI input shall be automatically detected or what actions to take if a change is detected in the Input Video Format.
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.
Video Input Format	SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	Defines the expected video format on the SDI input or the video format used for encoding the test patterns. A change in the Video Input Format might result in a change in the Video Profile used for encoding. As from the current release down-conversion is supported, SD profiles can be selected for HD input formats.
Output On Video Loss	Freeze Frame, Freeze with text overlay	Repeats the last good video frame on loss of video input.
	Black, Black with text overlay	Switches to a black test pattern on loss of video input.
	Color Bars, Bars with text overlay	Switches to a color bars test pattern on loss of video input.
	No PID	The video PID shall no longer be transmitted. The SI is not updated.
	Slate, Slate with text overlay	An internally generated slate test pattern will be used as the video source.

Parameter	Values	Description
Ident Text		Overlay text to display on top of images when with text option is selected in Output on Video Loss.
MCTF	Off, Default, Strong, Stronger	The amount of Motion Compensated Temporal Filtering done to improve image quality.
Adaptive Preprocessing	Off, On	Increases the video quality by performing preprocessing operations. Available only if Video Input Format is set to SD 480i29.97 or SD 576i25.
Bandwidth	30 to 100 %	Sets the video horizontal bandwidth filter.
Half Line Removal	Off, On	Enables or disables the removal of black half lines at the top of the picture by substituting video data from adjacent lines. The option is available when Video Input Format is set to SD 576i25.
Logo		
Logo insertion	Off, On	Controls if logos are displayed or not. The file to use can be selected under Logo file.
Logo file		The file to use as a logo. The selected file can be uploaded by selecting the Upload option. Not supported in this release.
A fixed logo position?	On, Off	Controls whether to use the default position for overlaying the logo on the video. Not supported in this release.
The X position of the logo		The position relative to left of the screen 0 (number of pixels per video line - logo width - 1). If an invalid position is specified, a logo display alarm will be generated. Displayed only if A fixed logo position? is set to Off. Not supported in this release.
The Y position of the logo		The position relative to top of screen 0 (number of video lines - logo height - 1). If an invalid position is specified, a logo display alarm will be generated. Displayed only if A fixed logo position? is set to Off. Not supported in this release.
HD to SD Video Down-conversion		
Default Aspect Ratio Conversion	Anamorphic, Center Cut, Letterbox	The down-conversion to apply when AFD is lost or AFD code 000 is received.
Use Input AFD	true, false	Specifies whether to attempt to use AFD code at input for format conversion or always apply the default.
Action on AFD lost	Convert as anamorphic and put AFD code 1000 out, Convert as specified in Default and put AFD code out	Specifies what to do if AFD is lost.
Action on AFD code 0000	Convert as anamorphic and put AFD code 1000 out, Convert as specified in Default and put AFD code out	Specifies what to do if AFD code 0000 is received.

Video Encoding

The parameters listed below are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Video/Main Video/Video Encoder** menu on the front panel.

**Table 5.12 Video Encoding Parameters**

Parameter	Values	Description
Video Profile	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit	Sets the encoder profile. The profile will also affect the allowed bit rate range.
Profile for SD input	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit	The profile to set when an SD input is detected on the SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Profile for HD input	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit	The profile to set when an HD input is detected on the HD-SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Resolution	352 x 576, 480 x 576, 528 x 576, 544 x 576, 640 x 576, 704 x 576, 720 x 576, 352 x 480, 480 x 480, 528 x 480, 544 x 480, 640 x 480, 704 x 480, 720 x 480, 1280 x 720, 1440 x 1080, 1920 x 1080	Defines the horizontal and vertical resolution of the encoded video. The available options depend on the values set for Video Input Format and Video Profile.
Video Bit Rate	The valid bit rate range depends on the selected video profile.	Defines the Transport Stream bit rate to be used by the compressed video component. If Bit Rate Tracking Mode is set to Maximize Video for the Transport Stream that contains the video component and the Bit Rate Weighting of the component is set to other than Fixed or Minimal, this field is read only.
Buffer Mode	CBR	Constant Bit Rate operation.
	Seamless	Sets a mode in which a change in video parameters does not cause an interruption in the output stream.
	Low Delay	Reduced encode delay (typically 350ms) achieved by removing pre-processing functions. Bit Rate, GOP structure and GOP length impact the delay. The IP GOP structure will give lowest delay, but with reduced quality.
	Mega Low Delay	Encode delay reduced further by removing frame-sync in pre-processing. Bit Rate, GOP structure and GOP length impact the delay. The IP GOP structure will give lowest delay, but with reduced quality.
Aspect Ratio	16:9, 4:3	Does not affect the video encoding but rather indicates what the desired aspect ratio for the decoded picture (not the pixel). If no other mechanism such as WSS in the VBI is used, the video output image will use this aspect ratio.
GOP Length	4 to 250	Defines the nominal distance in steps of video frames between two consecutive I frames in the encoded bit-stream.

Parameter	Values	Description
GOP Structure	IP, IBP, IBBP, IBBBP, IBBBBBBB	Sets the number of B frames between reference frames. IBBBBBBB can only be used for 720p video format encoded with a H.264 video profile.
Closed GOPs	Off, On	Enables or disables the usage of Group of Pictures in which the predicted frames can have their reference from outside the group.
Scene Cut Detection	On, Off	When enabled, minimizes the negative effect the scene changes have on the bit rate by inserting an I-Frame when a change is detected. It also affects the GOP length.
Delay		Displays the actual video encoding delay. Read only parameter.
Target Quality	30 to 100	Sets the video quality for Reflex controlled video encoding. Not supported in this release.
Buffer Delay	50 to 5000	Specifies the buffer delay in seamless mode. Available only if Buffer Mode is set to Seamless.
Min Seamless Bit Rate	1.5 -	The minimum bit rate in seamless buffer mode. the value must be less than the video bit rate. Available only if Buffer Mode is set to Seamless.
Lookahead Delay	360 to 1000	Allows extra delay to be added into the encoding path to allow remote reflex operation. Not supported in this release.
Stills Detection	Off, Intelligent, Clamp	Detects if the video is a still picture, and adjusts the encoded video bit rate accordingly when operating in VBR mode.
Film Mode	Off, On	Sets encoding parameters that give better image quality for film like sources.
Inloop Filter	High, Normal, Low, Very Low, Auto	Sets the characteristics of the filter placed in the feedback loop of the encoder. Applying the filter to the picture can increase picture sharpness.
Max CABAC Bit Rate	Depends on the Video Profile set.	Controls the bit rate at which the encoder switches from CABAC to CAVLC entropy coding.
SEI Encapsulation Mode	Combined, Mediарoom	Defines how the SEI messages are formatted in the picture header for H264. For combined, all the different types of messages (for example AFD) are bundles into one NAL packet. For Mediарoom each type of message is put into its own NAL packet. This was done for STB compatibility issues

Video Output

The following parameters are available on the **Output** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Video/Main Video/Stream Output** menu on the front panel.

**Table 5.13 Video Output Parameters**

Parameter	Values	Description
Embedded PCR	Off, On, On (Picture Header)	Sets if the PCR is embedded within the video. If it is set to other than Off, the PCR PID field of a service will become read only and will contain the PID of the current component.
Copyright	Off, On	Sets the copyright flag in the elementary stream header.
Original	Off, On	Sets the original flag in the elementary stream header.
PES Packet Per	GOP, Picture	Determines how PES packets shall be generated. The Picture option is only available if MPEG 2 encoding is used.
AU Information Ctrl	RAI, RAI and AU Info, RAI, AU Info and TC	Controls insertion of Private Data in the TS Adaptation Field for video Access Units (AU) with the following values: Random Access Indicator (RAI), ETSI 101 154 (AU info), and Time Code (TC).
AR Signalling Output Control	Off, AFD Only, AFD and Bar Data	Controls what Aspect Ratio signaling will get embedded in the video as user data. AFD sources are: SMPTE 2016, Video Index, WSS-AFD/WSS, user set Aspect Ratio. Bar Data is only SMPTE 2016.
TC Output Location	Off, SEIMsg	Defines how timecode is put into the output video stream.

Video Component

The parameters listed in are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <x> Video Stream on PID <y>** menu on the front panel.

Table 5.14 Video Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed, Minimum, 2 to 20	Specifies the weight associated to the component in the Bit Rate Tracking algorithm..
Master TS	Off, On	Sets the master Transport Stream for the component..

Vertical Blanking Interval / Ancillary Data

The parameters listed in the table below are available on the **VBI tab** of the **Properties** widget on the **Service Configuration** page when a video stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.15 Vertical Blanking Interval / Ancillary Data Parameters

Parameter	Values	Description
Enable VBI Pass-through Mode	Off, On	Enable pass-through of VBI, ANC and Teletext data from specified PIDs, instead of extracting them from SDI. Read only parameter. Not supported in this release.
Description Control		
VBI Descriptor Mode	Standard, Legacy, Philips, User	The source for Closed Captions data encoded as part of the Video Stream (only applicable when Video Frame Rate is 29.97 Hz)
VBI Data Descriptor Insertion	Off, On	Controls if the VBI Data Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
VBI Teletext Descriptor Insertion	Off, On	Controls if the VBI Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Teletext Descriptor Insertion	Off, On	Controls if the Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Proprietary Descriptor Insertion	Off, On	Controls if the Legacy Proprietary Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Aspect Ratio (AR) Signaling		
Video Index	Off, On (Default), On (User)	Controls the extraction of Video Index (and thus whether Video Index can be used as source of AR info). Default: The default lines will be set to decode Video Index (11/324 in 25Hz, 14/277 in 29.97 Hz) User: The User defines the lines used to decode Video Index.
Video Index Field 1	10 to 22	Specifies which line contains the video index in field 1.
Video Index Field 2	10 to 22	Specifies which line contains the video index in field 2.
SMPTE 2016	Off, On	Controls whether SMPTE 2016 data can be used as a source for AR info.
AFD Sustain	Indefinitely, Default after Timeout, Off after Timeout	Control what AFD code goes out when AFD is lost at input. Indefinitely: Maintains previously received AFD code indefinitely. Default after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then drop to default, i.e. code 1000. Off after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then switch AFD off.
AFD Sustain Timeout	0 to 5,10, 20, 50, 100, 120	Control how long previous AFD code is maintained. Zero means drop to default immediately on loss.
AFD Action on Reserved Codes	Pass Through, Code as 0000	Specify what code is passed to the output when reserved AFD codes are received at the input. Pass Through: Passes code through unchanged. Code as 0000: Changes code to 0000.
Closed Captions		
Closed Captions Source	Off, VBI lines, SMPTE334	The source for Closed Captions data encoded as part of the Video Stream. Only applicable when frame rate is 29.97 Hz.
Timecode		



Parameter	Values	Description
TC Mode	Off, External, Zero on Loss, External, Freewheel on Loss, Internal	Controls what mode the Time code (TC) is working in, either Off, external source or internally generated. Also sets what happens on loss of external source (zero or freewheel).
TC External Source	Auto, ANC VITC1, ANC VITC2, ANC LTC, VBI VITC	Controls the external source of Time Code. Auto will select the first source present in order of the drop down list.
TC Dropframes	Off, On, Auto	Only in 525 line operation controls if Time Code takes account of drop frames or not. Auto configures to external source, or to ON for internal source.
Broadcaster ID		
Reception Timeout		Timeout in seconds for reception of Source ID from input (RP207).
Insertion Timeout		Timeout in seconds for insertion of default source ID.
Broadcaster ID Mode	Off, Auto, Default Only, Source Only	Gives what to insert as a broadcaster ID.
Default Servicename		The default service name to be used.
Broadcaster ID Source	No, Input, Default	Indicates if the Broadcaster ID is derived from the input, the default or is invalid.
Broadcaster ID		The Broadcaster ID that is currently being inserted into the output stream.
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.
Field 1		
VBI Line 9 - VBI Line 22	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 6 - VBI Line 23	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext. Visible for 576i (625-line) input streams.
Field 2		
VBI Line 272 - VBI Line 285	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 319 - VBI Line 336	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signalling, WSS-AFD for Active Format Detection and Teletext System B for Teletext.

Input Detection

Overview

The CE-a VCM is capable of detecting if there is a valid video stream available at the SDI/HD-SDI input. The VCM can be set up to report whenever it detects a format change in the input video stream, or it can even modify encoding parameters.

Input Detection Configuration

In order to set the input detection, navigate to **Device Configuration > Advanced Setup and select Slots > Slot <n> - CE-a > CE-a > Video > Video 1 > Input and Slots > Slot <n> - CE-a > CE-a > Video > Video 1 > Video > Main Video > Video Encoder** in the **Advanced Video Processor Settings** widget.

Note: Once a video component has been added to an output Transport Stream on the **Service Configuration** page, input detection options can be set up on the **Input** and **Encode** tabs for the respective video in the **Properties** widget.

Alternatively, on the front panel browse to **Advanced/CE-a/Video/Video 1/Input and Advanced/CE-a/Video/Video 1/Video/Main Video/Video Encoder** and modify the required settings. The parameters related to input detection are summarized in .

Input Options

Table 5.16 Input Options Parameters

Parameters	Values	Description
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Specifies what to do when the input video format has been changed.
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.

Encode Options

Table 5.17 Encode Options Parameters

Parameters	Values	Description
Profile for SD	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit,	The profile to set when a change to an SD format has been detected. Available only if Input Detection is set to Auto Detect and Configure.
Profile for HD	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit	The profile to set when a change to an HD format has been detected. Available only if Input Detection is set to Auto Detect and Configure



Input Detection is Set to Off

If **Input Detection** is turned off, the input video format is not monitored by the VCM. No action is taken when there is a change in the format of the incoming native video through the SDI/HD-SDI input.

Input Detection is Set to Auto Detect and Report

If **Input Detection** is set to **Auto Detect and Report**, a video lock alarm is raised if the video lock is lost on the SDI/HD-SDI input. If no source is connected or the input source is not recognized then **Not Detected** is reported.

Input Detection is Set to Auto Detect and Configure

The **Video Input Format** and **Video Profile** will be modified according to the detected input format and the input detection settings. A change in the input format will first trigger a change in the **Video Input Format** parameter. Then the **Video Profile** will be changed if there is a change from SD to HD or vice versa. For newly detected SD profiles the new video profile will be the one set in the **Profile for SD** field. For HD, it will be the one set in the **Profile for HD** field.

If the video is embedded in a Transport Stream for which **Bit Rate Tracking Mode** is set to **Maximize Video**, and the **Bit Rate Weighting** for the video component is set to other than **Fixed** or **Minimal**, then the **Video Bit Rate** might also get updated. For more information, see Operation and Control > Bit Rate Tracking. Some examples are also given below:

- **Source changed from HD to SD**, and **Profile for SD** input is set to **SD MPEG-2 Main Profile Main Level 4:2:0 8 bit**: The new encoding profile is SD MPEG-2 Main Profile Main Level 4:2:0 8 bit. The bit rate is limited to 15 Mbps (maximum allowed by profile) if it was higher than 15 Mbps before the change. Otherwise the bit rate is not affected.
- **Source changed from SD to HD**, and **Profile for HD** input is set to **HD H.264 Main Profile Level 4.0 4:2:0 8 bit**: The new encoding profile is HD H.264 Main Profile Level 4.0 4:2:0 8 bit. If there is a room to increase the video bit rate to a value higher than the maximum set for the previously used SD profile, then the bit rate is increased.

Note: Changes to the source that result in a change of configuration will result in a loss of video for a short time. This outage time varies depending on the configuration change.

5.5.3.1.2

Audio Stream Configuration

Audio Input

The parameters listed in the table below are available on the Input tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Audio Module/Audio <n>/Input** menu on the front panel.

Table 5.18 Audio Input Parameters

Parameter	Values	Description
Input Format	Uncompressed (LPCM), MPEG Layer II, Dolby Digital, Dolby E, AAC	Sets the input format used by the audio encoder.
Input Source	Off, Mute, Test Tone, Embedded 1 to 8, Input 1 - 4	Sets the source used by the audio encoder. No input is fed to the encoder if Off is selected. Mute mutes the incoming audio and encodes silence. Test Tone encodes an 1 kHz test tone, Embedded 1 to 8 sets the source to an SDI embedded audio stream. Input 1-4 are for the digital inputs.
Output On Audio Loss	No PID, Silence	Specifies the action to take when input is Lost. No PID is for dropping the audio PID from the stream, Silence is for encode silence. When No PID is selected, the reference to the PID is not removed from the Program Map Table, so a Transport Stream analyzer will indicate a ghost PID in the output Transport Stream.
Source Switchout	Off, Mute, Test Tone, Embedded 1 to 8, Input 1 - 4	Specifies which input to output to the reference output on the 15-way D-type audio connector.

Audio Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Audio Module/Audio <n>/Encode** menu on the front panel.

Table 5.19 Audio Encoding Standards

Parameter	Options	Description
Coding Standard	MPEG Layer 2	MPEG Layer 2 Encode(More than two channel pairs require the /SWO/M1L2 license)
	Dolby Digital	Dolby Digital encode, requires CE/SWO/DOLBYAC3 license..
	AAC-LC	AAC-LC encoding, requires CE/SWO/AAC license.
	HE-AAC	HE-AAC or HE-AAC v2encoding, requires CE/SWO/AAC license.
	Pass-through	Pass-through of the input
	Audio Description Service	MPEG-1 Layer II encode of a mono audio track that describes action in the video plus a control track.

Table 5.20 MPEG Layer 2 Parameters

Parameter	Values	Description
Bit Rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384	Bit rate of the audio stream
Coding Mode	1/0 (Left - input), 1/0 (Right - input), 1/0 (L+R)/2, 1+1 (L/Ch1, R/Ch2), 2/0, 2/0 (Joint), Phase Aligned Audio (6 Channels), Phase Aligned Audio (8 Channels)	Specifies what channel configuration to use for encoding..



Parameter	Values	Description
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6 dB	Sets the gain in dB for the audio stream.
Language		The language of the stream when not in dual mono (1+1) mode.
Language (Left)		The language of the left channel when in dual mono (1+1) mode.
Language (Right)		The language of the right channel when in dual mono (1+1) mode.
User Language 1		A custom three-character language code when User Language 1 is set in any of the language fields.
User Language 2		A custom three-character language code when User Language 2 is set in any of the language fields.
MPEG Version	MPEG1, MPEG2	Configures if MPEG-1 or MPEG-2 to be signaled.
Copyright	Off, On	Indicates if the material is copyright protected.
Original	Off, On	Indicates if source is the original or a copy
De-emphasis	Off, 50/15us, CCITT J.17	To meet the MPEG-1 Layer 2 encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.

Table 5.21 Dolby Digital Parameters

Parameter	Values	Description
Bit Rate	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576, 640	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Metadata Controls Coding Mode	Off, On	Override default coding mode with coding mode indicated in decoder program configuration or live metadata (if present).
Metadata source type	Embedded/Decoded Auto, Serial Port (Program 1 to 8)	Selects where live metadata comes from.
Metadata override type	None, All, Compression Profile, Dialogue Normalization, Comp Profile and Dial Norm	Defines which metadata parameters to override.
Metadata Reversion Mode	Last Used, Preset	Determines which metadata is used upon loss of live metadata.
Metadata preset type	1 to 8	Defines which metadata preset to use if Preset is selected for Metadata Reversion Mode.

Parameter	Values	Description
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.22 AAC-LC Parameters

Parameter	Values	Description
Bit Rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Encapsulation	MPEG2 ADTS, MPEG4 LATM/LOAS	Specifies the encapsulation used for transmitting AAC content. It can be either MPEG-2 Audio Data Transport Stream or MPEG-4 Low Overhead Audio Stream based on MPEG4 Low Overhead Audio Transport Multiplex.
TNS (Temporal Noise Shaping)	Off, On	Turns noise shaping on or off.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

**Table 5.23 HE-AAC Parameters**

Parameter	Values	Description
Bit Rate	16, 24, 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Encapsulation	MPEG2 ADTS, MPEG4 LATM/LOAS	Specifies the encapsulation used for transmitting AAC content. It can be either MPEG-2 Audio Data Transport Stream or MPEG-4 Low Overhead Audio Stream based on MPEG-4 Low Overhead Audio Transport Multiplex.
TNS (Temporal Noise Shaping)	Off, On	Turns noise shaping on or off.
SBR Signaling	Explicit, Implicit	Specifies how Spectral Band Replication is signaled.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.24 Pass-through Parameters

Parameter	Values	Description
Input Bit rate	16 – 640 kbps	Dolby Digital pass-through only
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio.
Pass-through (LPCM and Dolby E pass-through only)		
Bit Depth	16-bit, 20-bit, 24-bit	
Channel Identification	0 – 255	
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.

Parameter	Values	Description
User Language 1		A custom three-character language code when User Language 1 is set the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.25 Audio Description Service Parameters

Parameter	Values	Description
Bit Rate	64	Bit Rate of the audio stream.
Coding Mode	1/0 (Left – input)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Audio Component

The parameters listed in the table below are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.26 Audio Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.



Dolby Metadata Presets

Four custom Dolby Metadata Presets can be configured in the **Advanced Setup tab of the Device Configuration** page. To set the preset options, in the **Advanced Video Processor Settings** drill down to **Encoder > Slots > Slot <n> - CE-a >CE-a > Audio Module > Dolby Metadata Presets**, and select the preset you want to modify. Alternatively, the settings can be reached through the front panel under **Advanced/CE-a/Audio Module/Dolby Metadata Presets**. Any of these presets can then be applied to any audio channel encoding audio in the Dolby Digital format. The table below lists the parameters for each preset.

Table 5.27 Dolby Metadata Preset Parameters

Parameter	Values	Description
Preset name		Name of the preset (for user information)
Dialogue normalization level	-31 to -1 dB	Used by a decoder to determine the level of adjustment required to achieve this set level.
Bitstream mode	Main audio service: complete main, music and effects, Associated service: visually impaired, Associated service: hearing impaired, Associated service: dialogue, Associated service: commentary, Associated service: emergency, Associated service: visually impaired, Associated service: karaoke/voiceover	Flags the type of service in the bitstream.
Line mode compression profile	None, Film Standard, Film Light, Music Standard, Music Light, Speech	Alters the dynamic range for line output.
RF mode compression profile	None, Film Standard, Film Light, Music Standard, Music Light, Speech	This alters the dynamic range for RF output. The overall level is raised by 11 dB.
Center mix level	0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB)	Indicates the downmix level when there is no centre speaker. This is applied to left and right channels only.
Surround mix level	0.707 (-3.0 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Surround downmix level for the front left and right channels when consumer has no surround speakers.
Dolby Surround mode	Not Indicated, Not Encoded, Encoded	Flags if a two channel encoded stream contains information for a Dolby Pro-logic decode (Lt/Rt)
Audio production information exists	Off, On	This indicates whether the Mixing Level and Room Type parameters exist within the bit-stream.
Mixing level	80 to 111 dB	Indicates the acoustic sound pressure level of the dialogue level during the final audio mixing session.
Room type	Not indicated, Large room X curve monitor, Small room flat monitor	Type and calibration of the mixing room used for the final audio mixing session.
Copyright flag	Off, On	Indicates if the material is copyright protected
Original bitstream flag	Off, On	Indicates if source is the original or a copy
Enable extended bitstream information	Off, On	Flags if additional information is available for downmixing.
Preferred downmix mode	Not indicated, Lt/Rt downmix preferred, Lo/Ro downmix preferred	Indicates if the producer would prefer a Lt/Rt or a Lo/Ro downmix. Can be over-ridden by the decoder.
Lt/Rt center mix level	1.414 (+3.0 dB), 1.189 (+1.5 dB), 1.000 (0 dB), 0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed with the L& R channels for a Lt/Rt downmix. Similar to 'Center mix level'.
Lt/Rt surround mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the surround channels when mixed for a Lt/Rt downmix. Similar to 'Surround mix level'.

Parameter	Values	Description
Lo/Ro center mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed with the L& R channels for a Lo/Ro downmix. When present this replaces the value set for the 'Center mix level'
Lo/Ro surround mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed for Lo/Ro downmix. When present this replaces the value set for the 'Surround mix level'.
Dolby Surround EX mode	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Flags if the stream has been encoded in 'Surround Ex'. Only used if surround channels are present.
A/D converter type	Standard, HDCD	Indicates type of A/D conversion used.
Digital de-emphasis	Off, Auto, On	To meet the Dolby Digital encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.
DC high pass filter enable	Off, On	Removing the DC component can lead to more efficient encoding, but there is a risk that signals that do not reach 100% PCM may exceed this after filtering and therefore must be clipped.
Bandwidth low-pass filter enable	Off, On	Remove high frequency signals before encoding. The filter removes frequencies that would not normally be encoded.
Low-frequency effects low pass filter enable	Off, On	Apply a 120 Hz low pass filter prior to an encode. Should only be switched off if it is known that there are no frequencies above 120 Hz.
Surround attenuation enable	Off, On	Attenuate surround channels by 3 dB before encoding. Theatrical and consumer mixing rooms use different levels for the surround channels, and this can be used to compensate.
Surround phase shift enable	Off, On	Apply a phase shift of 90 degrees to the surround channels. This simplifies the decode process for producing a 'Lt/Rt' downmix.

5.5.3.1.3 Splicing Stream Configuration

Splicing

The parameters listed in the table below are available on the **Splicing** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Video/Main Video/Splicing** menu on the front panel.

Table 5.28 Splicing Parameters

Parameter	Values	Description
Splicing Control	Off, On VANC Message Only, On VANC, On IP	Enables splice points to be set in the video stream upon reception of a SCTE 104 message and determines the insertion point. To enable splicing, a splice point insertion license (CE/SWO/DPI) is needed.
Splice Null Insertion	Off, On	Used to determine the insertion of NULL SCTE 35 messages into the output stream if no messages have been sent for 500ms.



Parameter	Values	Description
Audio Splicing	Off, On	Used to determine if audio is manipulated at the point that the video splice occurs.
AS Index Control	Don't Care, Use 1, Use 1 + 2	Determines how many values of AS Index are compared against the incoming SCTE 104 message. Available only when Splicing Control is set to On VANC Message Only.
DPI PID Index Control	Don't Care, Use 1, Use 1 + 2	Determines how many values of DPI PID Index are compared against the incoming SCTE 104 message. Available only when Splicing Control is set to On VANC Message Only.
AS Index 1	0 to 255	The AS index used if AS Index Control is set to Use 1 or Use 1 + 2.
AS Index 2	0 to 255	The AS index used if AS Index Control is set to Use 1 + 2.
DPI PID Index 1	0 to 255	The DPI PID index used if DPI PID Index Control is set to Use 1 or Use 1 + 2.
DPI PID Index 2	0 to 255	The DPI PID index used if DPI PID Index Control is set to Use 1 + 2.

Splicing Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.29 Slicing Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.1.4 Teletext Stream Configuration

This section describes the parameters for setting up Teletext.

Teletext

This section gives the parameters that have an effect on how Teletext is transmitted.

The parameters listed are available on the **Teletext** tab of the **Properties** widget on the **Service Configuration** page when a Teletext stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Input/VBI Extraction/Teletext** menu on the front panel.

Table 5.30 Teletext Parameters

Parameter	Values	Description
Teletext Source	Off, OP-47 (Max 300kb/s), VANC Teletext	Controls whether Teletext is extracted from VANC or not and if it extracted, which encapsulation method (OP-47 or SMPTE 2031) to use.
Teletext Packetisation	Normal (ETS 300-472) - Data on Teletext Component, Legacy (ETS 301-775) - Data on VBI Component	Controls how the Teletext data is packetized in to a component data stream.
SMPTE2031 Max. No. Teletext	3, 7, 11, 15, 36	Defines the maximum number of Teletext lines inserted. Available only if VANC Teletext is selected for Teletext Source.
SMPTE2031 Teletext Present	Yes, No	Displays whether Teletext is found in the SDI stream. Available only if VANC Teletext is selected for Teletext Source. Read only parameter.
Min # Teletext Packets	0 to 3	Defines the minimum number of Teletext packets generated per field, even if there is no Teletext data.
PTS On Teletext	Off, On	Controls whether a PTS value is included in the output Teletext packets.
Teletext Descriptor Page List / Teletext Descriptor Page		
Teletext Page Type	Off, Initial Page, Subtitle Page, Additional Information Page, Programme Schedule Page, Heading Impaired Subtitle Page	The page type of the Teletext descriptor.
Teletext Page Number		The page number for the page to be set.
Teletext Page Language	List of languages	The language set for the Teletext descriptor.

Teletext Component

This section describes the parameters associated with the component carrying Teletext data.

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a Teletext stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.31 Teletext Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.1.5 VBI and ANC Stream Configuration

This section describes the parameters available for setting up VBI and ANC streams.



VBI and Ancillary Data

This section gives the parameters that have an effect on what ancillary data is extracted and how the data is transmitted.

The following parameters are available on the **VBI** tab of the **Properties** widget on the **Service Configuration** page when an ANC stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.32 VBI and Ancillary Data Parameters

Parameter	Values	Description
Enable VBI Pass-through Mode	Off, On	Enable pass-through of VBI, ANC and Teletext data from specified PIDs, instead of extracting them from SDI. Read only parameter. Not supported in this release.
Description Control		
VBI Descriptor Mode	Standard, Legacy, Philips, User	The source for Closed Captions data encoded as part of the Video Stream (only applicable when Video Frame Rate is 29.97 Hz)
VBI Data Descriptor Insertion	Off, On	Controls if the VBI Data Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
VBI Teletext Descriptor Insertion	Off, On	Controls if the VBI Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Teletext Descriptor Insertion	Off, On	Controls if the Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Proprietary Descriptor Insertion	Off, On	Controls if the Legacy Proprietary Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Aspect Ratio (AR) Signalling		
Video Index	Off, On (Default), On (User)	Controls the extraction of Video Index (and thus whether Video Index can be used as source of AR info). Default: The default lines will be set to decode Video Index (11/324 in 25Hz, 14/277 in 29.97 Hz) User: The User defines the lines used to decode Video Index.
Video Index Field 1	10 to 22	Specifies which line contains the video index in field 1.
Video Index Field 2	10 to 22	Specifies which line contains the video index in field 2.
SMPTE 2016	Off, On	Controls whether SMPTE 2016 data can be used as a source for AR info.
AFD Sustain	Indefinitely, Default after Timeout, Off after Timeout	Control what AFD code goes out when AFD is lost at input. Indefinitely: Maintains previously received AFD code indefinitely. Default after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then drop to default, i.e. code 1000. Off after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then switch AFD off.
AFD Sustain Timeout	0 to 5,10, 20, 50, 100, 120	Control how long previous AFD code is maintained. Zero means drop to default immediately on loss.

Parameter	Values	Description
AFD Action on Reserved Codes	Pass Through, Code as 0000	Specify what code is passed to the output when reserved AFD codes are received at the input. Pass Through: Passes code through unchanged. Code as 0000: Changes code to 0000.
Closed Captions		
Closed Captions Source	Off, VBI lines, SMPTE 334	The source for Closed Captions data encoded as part of the Video Stream. Only applicable when frame rate is 29.97 Hz.
Timecode		
TC Mode	Off, External, Zero on Loss, External, Freewheel on Loss, Internal	Controls what mode the Time code (TC) is working in, either Off, external source or internally generated. Also sets what happens on loss of external source (zero or freewheel).
TC External Source	Auto, ANC VITC1, ANC VITC2, ANC LTC, VBI	Controls the external source of Time Code. Auto will select the first source present in order of the drop down list.
TC Dropframes	Off, On, Auto	Only in 525 line operation controls if Time Code takes account of drop frames or not. Auto configures to external source, or to ON for internal source.
Broadcaster ID		
Reception Timeout		Timeout in seconds for reception of Source ID from input (RP207).
Insertion Timeout		Timeout in seconds for insertion of default source ID.
Broadcaster ID Mode	Off, Auto, Default Only, Source Only	Gives what to insert as a broadcaster ID.
Default Servicename		The default service name to be used.
Broadcaster ID Source	No, Input, Default	Indicates if the Broadcaster ID is derived from the input, the default or is invalid.
Broadcaster ID		The Broadcaster ID that is currently being inserted into the output stream.
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.
Field 1		
VBI Line 9 - VBI Line 22	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 6 - VBI Line 23	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext. Visible for 576i (625-line) input streams.



Parameter	Values	Description
Field 2		
VBI Line 272 - VBI Line 285	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 319 - VBI Line 336	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signalling, WSS-AFD for Active Format Detection and Teletext System B for Teletext.

ANC Component

This section describes the parameters associated with the component carrying ancillary data.

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an ANC stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.33 ANC Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.1.6 PCR Stream Configuration

The video encoding module can generate a separate PCR stream. The PCR stream contains timing reference that can be used for decoding the elementary streams included in the same service as the PCR stream itself. To use the PCR stream as a timing reference for decoding, set the PCR PID parameter associated with the service to the PID assigned to the PCR stream.

The following parameters are available in **Properties** widget on the **Service Configuration** page when a PCR Stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <m> Video 1 PCR stream on PID <n>** menu on the front panel.

Table 5.34 PCR Stream Configuration Parameters

Parameters	Values	Description
PID	16 - 8190	The packet identifier assigned to packets carrying the program clock reference values.
Bit Rate Weighting	Fixed	Not relevant for the PCR component. Read only parameter.

5.5.3.2 CE-a J2K VCM

5.5.3.2.1 Video and VBI Stream Configuration

Video Input and Pre-Processing

The following parameters are available on the Input tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a J2K/Video/Video1/Input** menu on the front panel.

Table 5.35 Video Input and Pre-Processing Parameters

Parameter	Values	Description
Video Input Lock	Yes, No	Shows whether there is a video lock to the format specified through the parameters below. Read only parameter.
Source	SDI	The video will be sourced from the SDI/HD-SDI input on the rear panel.
	Bars	An internally generated color bars test pattern will be used as the video source.
	Black	An internally generated black test pattern will be used as the video source.
	Moving Object	An internally generated moving object test pattern will be used as the video source.
	Slate	An internally generated slate test pattern will be used as the video source.
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Controls whether the format of the SDI input shall be automatically detected or what actions to take if a change is detected in the Input Video Format.
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.
Video Input Format	SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	Defines the expected video format on the SDI input or the video format used for encoding the test patterns. A change in the Video Input Format might result in a change in the Video Profile used for encoding. As from the current release down-conversion is supported, SD profiles can be selected for HD input formats.
Output On Video Loss	Freeze Frame, Freeze with text overlay	Repeats the last good video frame on loss of video input.
	Black, Black with text overlay	Switches to a black test pattern on loss of video input.
	Color Bars, Bars with text overlay	Switches to a color bars test pattern on loss of video input.
	No PID	The video PID shall no longer be transmitted. The SI is not updated.



Video Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a J2K/Video/Video 1/Video/Main Video/Video Encoder** menu on the front panel.

Table 5.36 Video Encoding Parameters

Parameter	Values	Description
Video Profile	Profile Off, SD J2K Profile Level 1 4:2:2 10 bit, HD J2K Profile Level 2 4:2:2 10 bit	Sets the encoder profile. The profile will also affect the allowed Bit Rate range.
Profile for SD input	Profile Off, SD J2K Profile Level 1 4:2:2 10 bit, HD J2K Profile Level 2 4:2:2 10 bit	The profile to set when an SD input is detected on the SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Profile for HD input	Profile Off, SD J2K Profile Level 1 4:2:2 10 bit, HD J2K Profile Level 2 4:2:2 10 bit	The profile to set when an HD input is detected on the HD-SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Resolution	720 x 576, 720 x 480, 1280 x 720, 1920 x 1080	Defines the horizontal and vertical resolution of the encoded video. The available options depend on the values set for Video Input Format and Video Profile.
Video Bit Rate	The valid bit rate range depends on the selected video profile.	Defines the Transport Stream bit rate to be used by the compressed video component. If Bit Rate Tracking Mode is set to Maximize Video for the Transport Stream that contains the video component and the Bit Rate Weighting of the component is set to other than Fixed or Minimal, this field is read only.
Buffer Mode	Compatibility	Compatibility with the JPEG 2000 standard, usually means a delay no more than 160 ms.
	Ultra low delay	Very low delay brought by the JPEG 2000 encoding.
Delay		Displays the actual video encoding delay. Read only parameter.

Video Output

The following parameters are available on the **Output** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a/Video/Video 1/Video/Main Video/Stream Output** menu on the front panel.

Table 5.37 Video Output Parameters

Parameter	Values	Description
Embedded PCR	Off, On, On (Picture Header)	Sets if the PCR is embedded within the video. If it is set to other than Off, the PCR PID field of a service will become read only and will contain the PID of the current component.
Copyright	Off, On	Sets the copyright flag in the elementary stream header.

Original	Off, On	Sets the original flag in the elementary stream header.
PES Packet Per	GOP, Picture	Determines how PES packets shall be generated. The Picture option is only available if MPEG 2 encoding is used.
AU Information Ctrl	RAI, RAI and AU Info, RAI, AU Info and TC	Controls insertion of Private Data in the TS Adaptation Field for video Access Units (AU) with the following values: Random Access Indicator (RAI), ETSI 101 154 (AU info), and Time Code (TC).
AR Signaling Output Control	Off, AFD Only, AFD and Bar Data	Controls what Aspect Ratio signaling will get embedded in the video as user data. AFD sources are: SMPTE 2016, Video Index, WSS-AFD/WSS, user set Aspect Ratio. Bar Data is only SMPTE 2016.
TC Output Location	Off, SEIMsg	Defines how timecode is put into the output video stream.

Video Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <x> Video Stream on PID <y>** menu on the front panel.

Table 5.38 Video Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed, Minimum, 2 to 20	Specifies the weight associated to the component in the Bit Rate Tracking algorithm.
Master TS	Off, On	Sets the master Transport Stream for the component.

Vertical Blanking Interval / Ancillary Data Configuration

VBI Stream and ANC/DVB Subtitle Stream

The following parameters are available on the VBI tab of the **Properties** widget on the **Service Configuration** page when a video stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.39 VBI Stream and ANC/DVB Subtitle Stream Parameters

Parameter	Values	Description
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.
VBI in Picture		
Enable VBI in picture	Off, Closed Caption	



Input Detection

Overview

The CE-a J2K VCM is capable of detecting if there is a valid video stream available at the SDI/HD-SDI input. The VCM can be set up to report whenever it detects a format change in the input video stream, or it can even modify encoding parameters.

Input Detection Configuration

In order to set the input detection, navigate to **Device Configuration > Advanced Setup and select Slots > Slot <n> - CE-J2K > CE-J2K > Video > Video 1 > Input and Slots > Slot <n> - CE-a J2K > CE-a > Video > Video 1 > Video > Main Video > Video Encoder** in the **Advanced Video Processor Settings** widget.

Note: Once a video component has been added to an output Transport Stream on the **Service Configuration** page, input detection options can be set up on the **Input** and **Encode** tabs for the respective video in the **Properties** widget.

Alternatively, on the front panel browse to **Advanced/CE-x/Video/Video 1/Input** and **Advanced/CE-x/Video/Video 1/Video/Main Video/Video Encoder** and modify the required settings. The parameters related to input detection are summarized below.

Input Options

Table 5.40 Input Options Parameters

Parameters	Values	Description
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Specifies what to do when the input video format has been changed.
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.

Encode Options

Table 5.41 Encode Options Parameters

Parameters	Values	Description
Profile for SD	Profile Off, SD J2K Profile Level 1 4:2:2 10 bit	The profile to set when an a change to an SD format has been detected. Available only if Input Detection is set to Auto Detect and Configure.
Profile for HD	Profile Off, SD J2K Profile Level 1 4:2:2 10 bit, HD J2K Profile Level 1 4:2:2 10 bit	The profile to set when an a change to an HD format has been detected. Available only if Input Detection is set to Auto Detect and Configure.

Input Detection is Set to Off

If Input Detection is turned off, the input video format is not monitored by the VCM. No action is taken when there is a change in the format of the incoming native video through the SDI/HD-SDI input.

Input Detection is Set to Auto Detect and Report

If **Input Detection** is set to **Auto Detect and Report**, a video lock alarm is raised if the video lock is lost on the SDI/HD-SDI input. If no source is connected or the input source is not recognized then **Not Detected** is reported.

Input Detection is Set to Auto Detect and Configure

The **Video Input Format** and **Video Profile** will be modified according to the detected input format and the input detection settings. A change in the input format will first trigger a change in the **Video Input Format** parameter. Then the **Video Profile** will be changed if there is a change from SD to HD or vice versa. For newly detected SD profiles the new video profile will be the one set in the **Profile for SD** field. For HD, it will be the one set in the **Profile for HD** field.

If the video is embedded in a Transport Stream for which Bit Rate Tracking Mode is set to Maximise Video, and the Bit Rate Weighting for the video component is set to other than Fixed or Minimal, then the **Video Bit Rate** might also get updated. For more information, see Operation and Control > Bit Rate Tracking. Some examples are also given below:

- Source changed from HD to SD, and Profile for SD input is set to SD J2K Profile Level 1 4:2:2 10 bit: The new encoding profile is SD J2K Profile Level 1 4:2:2 10 bit. The bit rate is limited to 50 Mbps (maximum allowed by profile) if it was higher than 50 Mbps before the change. Otherwise the bit rate is not affected.
- Source changed from SD to HD, and Profile for HD input is set to HD J2K Profile Level 2 4:2:2 10 bit: The new encoding profile is HD J2K Profile Level 2 4:2:2 10bit. If there is a room to increase the video bit rate to a value higher than the maximum set for the previously used SD profile, then the bit rate is increased.

Note: Changes to the source that result in a change of configuration will result in a loss of video for a short time. This outage time varies depending on the configuration change.

5.5.3.2.2

Audio Stream Configuration

Audio Input

The following parameters are available on the **Input** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a J2K/Audio Module/Audio <n>/Input** menu on the front panel.

**Table 5.42 Audio Input Parameters**

Parameter	Values	Description
Input Format	Uncompressed (LPCM), Dolby E	Sets the input format used by the audio encoder.
Input Source	Off, Mute, Test Tone, Embedded 1 to 8, Input 1 - 4	Sets the source used by the audio encoder. No input is fed to the encoder if Off is selected. Mute mutes the incoming audio and encodes silence. Test Tone encodes a 1 kHz test tone, Embedded 1 to 8 sets the source to an SDI embedded audio stream. Input 1-4 are for the digital inputs.
Output On Audio Loss	No PID, Silence	Specifies the action to take when input is Lost. No PID is for dropping the audio PID from the stream, Silence is for encode silence. When No PID is selected, the reference to the PID is not removed from the Program Map Table, so a Transport Stream analyzer will indicate a ghost PID in the output Transport Stream.

Audio Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a J2K/Audio Module/Audio <n>/Encode** menu on the front panel.

Table 5.43 Audio Encoding Standards

Parameter	Options	Description
Coding Standard	Pass-through	Pass-through of the input

Table 5.44 Pass-through Parameters

Parameter	Values	Description
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Audio Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.45 Audio Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.2.3 VBI and ANC Stream Configuration

VBI and Ancillary Data

The following parameters are available on the VBI tab of the **Properties** widget on the **Service Configuration** page when an **ANC stream** is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-a J2K/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.46 VBI and Ancillary Data Parameters

Parameter	Values	Description
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
VBI in Picture		
Enable VBI in picture	Off, Closed Caption	

ANC Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an **ANC stream** is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.47 ANC Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.



5.5.3.2.4

PCR Stream Configuration

The video encoding module can generate a separate PCR stream. The PCR stream contains timing reference that can be used for decoding the elementary streams included in the same service as the PCR stream itself. To use the PCR stream as a timing reference for decoding, set the PCR PID parameter associated with the service to the PID assigned to the PCR stream.

The following parameters are available in **Properties** widget on the **Service Configuration** page when a PCR Stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <m> Video 1 PCR stream on PID <n>** menu on the front panel.

Table 5.48 PCR Stream Configuration Parameters

Parameter	Values	Description
PID	16 - 8190	The packet identifier assigned to packets carrying the program clock reference values.
Bit Rate Weighting	Fixed	Not relevant for the PCR component. Read only parameter.

5.5.3.3 CE-x VCM

5.5.3.3.1 Video and VBI Stream Configuration

Video Input and Pre-Processing

The following parameters are available on the **Input** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video1/Input** menu on the front panel.

Table 5.49 Video Input and Pre-Processing Parameters

Parameter	Values	Description
Video Input Lock	Yes, No	Shows whether there is a video lock to the format specified through the parameters below. Read only parameter.
Source	SDI	The video will be sourced from the SDI/HD-SDI input on the rear panel.
	Bars	An internally generated color bars test pattern will be used as the video source.
	Black	An internally generated black test pattern will be used as the video source.
	Moving Object	An internally generated moving object test pattern will be used as the video source.
	Slate	An internally generated slate test pattern will be used as the video source.
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Controls whether the format of the SDI input shall be automatically detected or what actions to take if a change is detected in the Input Video Format.

Parameter	Values	Description
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.
Video Input Format	SD 567i25, SD 480i29.97, HD 720p50, HD 9.94, HD 1080i25, HD 1080i29.97	Defines the expected video format on the SDI input or the video format used for encoding the test patterns. A change in the Video Input Format might result in a change in the Video Profile used for encoding. As from the current release down-conversion is supported, SD profiles can be selected for HD input formats.
Output On Video Loss	Freeze Frame, Freeze with text overlay	Repeats the last good video frame on loss of video input. Text overlay is not supported in this release.
	Black, Black with text overlay	Switches to a black test pattern on loss of video input. Text overlay is not supported in this release.
	Color Bars, Bars with text overlay	Switches to a color bars test pattern on loss of video input. Text overlay is not supported in this release.
	No PID	The video PID shall no longer be transmitted. The SI is not updated.
	Slate, Slate with text overlay	An internally generated slate test pattern will be used as the video source.
Ident Text		Overlay text to display on top of images.
MCTF	Off, Default, Strong, Stronger	The amount of Motion Compensated Temporal Filtering done to improve image quality.
Adaptive Preprocessing	Off, On	Adaptive PreProcessing analyses the incoming video to tries and identify areas of noise contained within the picture. A filter is then applied to those areas of the picture to remove the noise. Applying the filter may remove detail from the picture and may make edges of objects appear soft or slightly blurred. For normal operation with high quality input video feeds it is recommended that this option is set to OFF.
Bandwidth	30 to 100 %	Sets the video horizontal bandwidth filter.
Half Line Removal	Off, On	Enables or disables the removal of black half lines at the top of the picture by substituting video data from adjacent lines. The option is available when Video Input Format is set to SD 576i25.
Logo		
Logo insertion	Off, On	Controls if logos are displayed or not. The file to use can be selected under Logo file.
Logo file		The file to use as a logo. The selected file can be uploaded by selecting the Upload option. Not supported in this release.
A fixed logo position?	On, Off	Controls whether to use the default position for overlaying the logo on the video. Not supported in this release.
The X position of the logo		The position relative to left of the screen 0 (number of pixels per video line - logo width - 1). If an invalid position is specified, a logo display alarm will be generated. Displayed only if A fixed logo position? is set to Off. Not supported in this release.



Parameter	Values	Description
The Y position of the logo		The position relative to top of screen 0 (number of video lines - logo height - 1). If an invalid position is specified, a logo display alarm will be generated. Displayed only if A fixed logo position? is set to Off. Not supported in this release.
HD to SD Video Down-conversion		
Default Aspect Ratio Conversion	Anamorphic, Center Cut, Letterbox	The down-conversion to apply when AFD is lost or AFD code 000 is received.
Use Input AFD	true, false	Specifies whether to attempt to use AFD code at input for format conversion or always apply the default.
Action on AFD lost	Convert as anamorphic and put AFD code 1000 out, Convert as specified in Default and put AFD code out	Specifies what to do if AFD is lost.
Action on AFD code 0000	Convert as anamorphic and put AFD code 1000 out, Convert as specified in Default and put AFD code out	Specifies what to do if AFD code 0000 is received.

Video Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video 1/Video/Main Video/Video Encoder** menu on the front panel.

Table 5.50 Video Encoding Parameters

Parameter	Values	Description
Video Profile	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	Sets the encoder profile. The profile will also affect the allowed bit rate range.
Profile for SD input	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit,	The profile to set when an SD input is detected on the SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.

Parameter	Values	Description
Profile for HD input	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit	The profile to set when an HD input is detected on the HD-SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Resolution	352 x 576, 480 x 576, 528 x 576, 544 x 576, 640 x 576, 704 x 576, 720 x 576, 352 x 480, 480 x 480, 528 x 480, 544 x 480, 640 x 480, 704 x 480, 720 x 480, 1280 x 720, 1440 x 1080, 1920 x 1080	Defines the horizontal and vertical resolution of the encoded video. The available options depend on the values set for Video Input Format and Video Profile.
Video Bit Rate	The valid bit rate range depends on the selected video profile.	Defines the bit rate to be used by the compressed video component. If Bit Rate Tracking Mode is set to Maximize Video for the Transport Stream that contains the video component, and the Bit Rate Weighting of the component is set to other than Fixed or Minimal, this field is read only.
Buffer Mode	CBR	Constant Bit Rate operation.
	Seamless	Sets a mode in which a change in video parameters does not cause an interruption in the output stream.
	Low Delay	Reduced encode delay (typically 350ms) achieved by removing pre-processing functions. Bit Rate, GOP structure and GOP length impact the delay. The IP GOP structure will give lowest delay, but with reduced quality.
	Mega Low Delay	Encode delay reduced further by removing frame-sync in pre-processing. Bit Rate, GOP structure and GOP length impact the delay. The IP GOP structure will give lowest delay, but with reduced quality.
	Stripe Refresh	Available if the AVP/SWO/CE-x/Stripe license is enabled. Provides sub 100ms end to end latency for H.264 operation when combined with the appropriate Ericsson RX8200.
	Stripe Refresh (+ Audio Encode)	Available if the AVP/SWO/CE-x/Stripe license is enabled. Allows MPEG-1 LayerII audio encode in Stripe Refresh. This increases the latency by 1 frame compared to Stripe Refresh.
Aspect Ratio	16:9, 4:3	Does not affect the video encoding but rather indicates what the desired aspect ratio for the decoded picture (not the pixel). If no other mechanism such as WSS in the VBI is used, the video output image will use this aspect ratio.
GOP Length	4 to 250	Defines the nominal distance in steps of video frames between two consecutive I frames in the encoded bit-stream.
GOP Structure	IP, IBP, IBBP, IBBBP, IBBBBBBB	Sets the number of B frames between reference frames. IBBBBBBB can only be used for 720p video format encoded with a H.264 video profile.



Parameter	Values	Description
Closed GOPs	Off, On	Enables or disables the usage of Group of Pictures in which the predicted frames can have their reference from outside the group.
Scene Cut Detection	On, Off	When enabled, minimizes the negative effect the scene changes have on the bit rate by inserting an I-Frame when a change is detected. It also affects the GOP length.
Delay		Displays the actual video encoding delay. Read only parameter.
Target Quality	30 to 100	Sets the video quality for Reflex controlled video encoding. Not supported in this release.
Buffer Delay	50 to 5000	Specifies the buffer delay in seamless mode. Available only if Buffer Mode is set to Seamless.
Min Seamless Bit Rate	1.5 -	The minimum bit rate in seamless buffer mode. the value must be less than the video bit rate. Available only if Buffer Mode is set to Seamless.
Lookahead Delay	360 to 1000	Allows extra delay to be added into the encoding path to allow remote reflex operation. Not supported in this release.
Stills Detection	Off, Intelligent, Clamp	Detects if the video is a still picture, and adjusts the encoded video bit rate accordingly when operating in VBR mode.
Film Mode	Off, On	Sets encoding parameters that give better image quality for film like sources. Available only for frame rates of 29.97 or 59.94 Hz when the resolution is set to other than SIF.
Inloop Filter	High, Normal, Low, Very Low, Auto	Sets the characteristics of the filter placed in the feedback loop of the encoder. Applying the filter to the picture can increase picture sharpness.
Max CABAC Bit Rate	Depends on the Video Profile set.	Controls the bit rate at which the encoder switches from CABAC to CAVLC entropy coding.
SEI Encapsulation Mode	Combined, Mediroom	Defines how the SEI messages are formatted in the picture header for H264. For combined, all the different types of messages (for example AFD) are bundles into one NAL packet. For Mediroom each type of message is put into its own NAL packet. This was done for STB compatibility issues
3D Mode	Off, Side by Side Frame Packing, Top and Bottom Frame Packing; Frame Sync Delay in SEI	Configures output to include 3D related information in the SEI messages. The frame sync delay in SEI message is only available for CE-x with CE/SWO/CE-x/H264, CE/SWO/CE-x/HD and CE/SWO/CE-x/3D licenses.

Video Output

The following parameters are available on the **Output** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/Video/Video 1/Video/Main Video/Stream Output** menu on the front panel.

Table 5.51 Video Output Parameters

Parameter	Values	Description
Embedded PCR	Off, On, On (Picture Header)	Sets if the PCR is embedded within the video. If it is set to other than Off, the PCR PID field of a service will become read only and will contain the PID of the current component.
Copyright	Off, On	Sets the copyright flag in the elementary stream header.
Original	Off, On	Sets the original flag in the elementary stream header.
PES Packet Per	GOP, Picture	Determines how PES packets shall be generated. The Picture option is only available if MPEG 2 encoding is used.
AU Information Ctrl	Off, RAI, RAI and AU Info	Controls insertion of Private Data in the TS Adaptation Field for video Access Units (AU). This can be: Random Access Indicator (RAI), ETSI 101 154 (AU info), Time Code (TC) and Additional Info (Encoding info and BroadcasterID).
Elementary Stream Stuffing	Off, On	Control for the Elementary stream level to maintain the configured bit rate.
AR Signaling Output Control	Off, AFD Only, AFD and Bar Data	Controls what Aspect Ratio signaling will be put into video user_data. AFD sources are: SMPTE 2016, Video Index, WSS-AFD/WSS, user set Aspect Ratio. Bar Data is only SMPTE 2016.
AR Signalling Location	Sequence Hdr, Picture Hdr, Seq And Pic Hdrs	Specifies which header shall contain the aspect ratio signaling information.
TC Output Location	SeqHdr, SeqAndPicHdr, Off, SEIMsg	Determines the locations used to transmit Time code information in the stream. Time code can be carried by the sequence header, the sequence and picture headers for MPEG-2 or a SEI message for H.264.

Video Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <x> Video Stream on PID <y>** menu on the front panel.

Table 5.52 Video Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed, Minimum, 2 to 20	Specifies the weight associated to the component in the Bit Rate Tracking algorithm.
Master TS	Off, On	Sets the master Transport Stream for the component..



Vertical Blanking Interval / Ancillary Data

The following parameters are available on the **VBI** tab of the **Properties** widget on the **Service Configuration** page when a video stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.53 Vertical Blanking Interval / Ancillary Data Parameters

Parameter	Values	Description
Enable VBI Pass-through Mode	Off, On	Enable pass-through of VBI, ANC and Teletext data from specified PIDs, instead of extracting them from SDI. Read only parameter. Not supported in this release.
Description Control		
VBI Descriptor Mode	Standard, Legacy, Philips, User	The source for Closed Captions data encoded as part of the Video Stream (only applicable when Video Frame Rate is 29.97 Hz)
VBI Data Descriptor Insertion	Off, On	Controls if the VBI Data Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
VBI Teletext Descriptor Insertion	Off, On	Controls if the VBI Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Teletext Descriptor Insertion	Off, On	Controls if the Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Proprietary Descriptor Insertion	Off, On	Controls if the Legacy Proprietary Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Aspect Ratio (AR) Signaling		
Video Index	Off, On (Default), On (User)	Controls the extraction of Video Index (and thus whether Video Index can be used as source of AR info). Default: The default lines will be set to decode Video Index (11/324 in 25Hz, 14/277 in 29.97 Hz) User: The User defines the lines used to decode Video Index.
Video Index Field 1	10 to 22	Specifies which line contains the video index in field 1.
Video Index Field 2	10 to 22	Specifies which line contains the video index in field 2.
SMPTE 2016	Off, On	Controls whether SMPTE 2016 data can be used as a source for AR info.
AFD Sustain	Indefinitely, Default after Timeout, Off after Timeout	Control what AFD code goes out when AFD is lost at input. Indefinitely: Maintains previously received AFD code indefinitely. Default after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then drop to default, i.e. code 1000. Off after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then switch AFD off.
AFD Sustain Timeout	0 to 5,10, 20, 50, 100, 120	Control how long previous AFD code is maintained. Zero means drop to default immediately on loss.

Parameter	Values	Description
AFD Action on Reserved Codes	Pass Through, Code as 0000	Specify what code is passed to the output when reserved AFD codes are received at the input. Pass Through: Passes code through unchanged. Code as 0000: Changes code to 0000.
Closed Captions		
Closed Captions Source	Off, VBI lines, SMPTE334	The source for Closed Captions data encoded as part of the Video Stream. Only applicable when frame rate is 29.97 Hz.
Timecode		
TC Mode	Off, External, Zero on Loss, External, Freewheel on Loss, Internal	Controls what mode the Time code (TC) is working in, either Off, external source or internally generated. Also sets what happens on loss of external source (zero or freewheel).
TC External Source	Auto, ANC VITC1, ANC VITC2, ANC LTC, VBI VITC	Controls the external source of Time Code. Auto will select the first source present in order of the drop down list.
TC Dropframes	Off, On, Auto	Only in 525 line operation controls if Time Code takes account of drop frames or not. Auto configures to external source, or to ON for internal source.
Broadcaster ID		
Reception Timeout		Timeout in seconds for reception of Source ID from input (RP207).
Insertion Timeout		Timeout in seconds for insertion of default source ID.
Broadcaster ID Mode	Off, Auto, Default Only, Source Only	Gives what to insert as a broadcaster ID.
Default Servicename		The default service name to be used.
Broadcaster ID Source	No, Input, Default	Indicates if the Broadcaster ID is derived from the input, the default or is invalid.
Broadcaster ID		The Broadcaster ID that is currently being inserted into the output stream.
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.
Field 1		
VBI Line 9 - VBI Line 22	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 6 - VBI Line 23	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext. Visible for 576i (625-line) input streams.
Field 2		



Parameter	Values	Description
VBI Line 272 - VBI Line 285	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 319 - VBI Line 336	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext.

Input Detection

Overview

The CE-x VCM is capable of detecting if there is a valid video stream available at the SDI/HD-SDI input. The VCM can be set up to report whenever it detects a format change in the input video stream, or it can even modify encoding parameters.

Input Detection Configuration

In order to set the input detection, navigate to **Device Configuration > Advanced Setup and select Slots > Slot <n> - CE-x > CE-x > Video > Video 1 > Input and Slots > Slot <n> - CE-x > CE-x > Video > Video 1 > Video > Main Video > Video Encoder** in the **Advanced Video Processor Settings** widget..

Note: Once a video component has been added to an output Transport Stream on the **Service Configuration** page, input detection options can be set up on the **Input** and **Encode** tabs for the respective video in the **Properties** widget.

Alternatively, on the front panel browse to **Advanced/CE-x/Video/Video 1/Input** and **Advanced/CE-x/Video/Video 1/Video/Main Video/Video Encoder** and modify the required settings. The parameters related to input detection are summarized below.

Input Options

Table 5.54 Input Options Parameters

Parameters	Values	Description
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Specifies what to do when the input video format has been changed.
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.

Encode Options

Table 5.55 Encode Options Parameters

Parameters	Values	Description
Profile for SD	Profile Off SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit.	The profile to set when a change to an SD format has been detected. Available only if Input Detection is set to Auto Detect and Configure.
Profile for HD	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit, HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	The profile to set when a change to an HD format has been detected. Available only if Input Detection is set to Auto Detect and Configure

Input Detection is Set to Off

If **Input Detection** is turned off, the input video format is not monitored by the VCM. No action is taken when there is a change in the format of the incoming native video through the SDI/HD-SDI input.

Input Detection is Set to Auto Detect and Report

If **Input Detection** is set to **Auto Detect and Report**, a video lock alarm is raised if the video lock is lost on the SDI/HD-SDI input. If no source is connected or the input source is not recognized then **Not Detected** is reported.

Input Detection is Set to Auto Detect and Configure

The **Video Input Format** and **Video Profile** will be modified according to the detected input format and the input detection settings. A change in the input format will first trigger a change in the **Video Input Format** parameter. Then the **Video Profile** will be changed if there is a change from SD to HD or vice versa. For newly detected SD profiles the new video profile will be the one set in the **Profile for SD** field. For HD, it will be the one set in the **Profile for HD** field.



If the video is embedded in a Transport Stream for which **Bit Rate Tracking Mode** is set to **Maximize Video**, and the **Bit Rate Weighting** for the video component is set to other than **Fixed** or **Minimal**, then the **Video Bit Rate** might also get updated. For more information, see Operation and Control > Bit Rate Tracking. Some examples are also given below:

- **Source changed from HD to SD**, and **Profile for SD input** is set to **SD MPEG-2 Main Profile Main Level 4:2:0 8 bit**: The new encoding profile is SD MPEG-2 Main Profile Main Level 4:2:0 8 bit. The bit rate is limited to 15 Mbps (maximum allowed by profile) if it was higher than 15 Mbps before the change. Otherwise the bit rate is not affected.
- **Source changed from SD to HD**, and **Profile for HD input** is set to **HD H.264 Main Profile Level 4.0 4:2:0 8 bit**: The new encoding profile is **HD H.264 Main Profile Level 4.0 4:2:0 8 bit**. If there is a room to increase the video bit rate to a value higher than the maximum set for the previously used SD profile, then the bit rate is increased.

Note: Changes to the source that result in a change of configuration will result in a loss of video for a short time. This outage time varies depending on the configuration change.

5.5.3.3.2 Audio Stream Configuration

Audio Input

The following parameters are available on the **Input** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Audio Module/Audio <n>/Input** menu on the front panel.

Table 5.56 Audio Input Parameters

Parameter	Values	Description
Input Format	Uncompressed (LPCM), MPEG Layer II, Dolby Digital, Dolby E, AAC	Sets the input format used by the audio encoder.
Input Source	Off, Mute, Test Tone, Embedded 1 to 8, Input 1 - 4	Sets the source used by the audio encoder. No input is fed to the encoder if Off is selected. Mute mutes the incoming audio and encodes silence. Test Tone encodes an 1 kHz test tone, Embedded 1 to 8 sets the source to an SDI embedded audio stream. Input 1-4 are for the digital inputs.
Output On Audio Loss	No PID, Silence	Specifies the action to take when input is Lost. No PID is for dropping the audio PID from the stream, Silence is for encode silence. NOTE: When No PID is selected, the reference to the PID is not removed from the Program Map Table, so a Transport Stream analyzer will indicate a ghost PID in the output Transport Stream.
Source Switchout	Off, Mute, Test Tone, Embedded 1 to 8, Input 1 - 4	Specifies which input to output to the reference output on the 15-way D-type audio connector.

Audio Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Audio Module/Audio <n>/Encode** menu on the front panel.

Table 5.57 Audio Encoding Standards

Parameter	Options	Description
Coding Standard	MPEG Layer 2	MPEG Layer 2 Encode(More than two channel pairs require the /SWO/M1L2 license)
	Dolby Digital	Dolby Digital encode, requires CE/SWO/DOLBYAC3 license.
	AAC-LC	AAC-LC encoding, requires CE/SWO/AAC license.
	HE-AAC	HE-AAC or HE-AAC v2encoding, requires CE/SWO/AAC license.
	Pass-through	Pass-through of the input
	Audio Description Service	MPEG-1 Layer II encode of a mono audio track that describes action in the video plus a control track.

Table 5.58 MPEG Layer 2 Parameters

Parameter	Values	Description
Bit Rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384	Bit Rate of the audio stream
Coding Mode	1/0 (Left - input), 1/0 (Right - input), 1/0 (L+R)/2, 1+1 (L/Ch1, R/Ch2), 2/0, 2/0 (Joint), Phase Aligned Audio (6 Channels), Phase Aligned Audio (8 Channels)	Specifies what channel configuration to use for encoding..
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream when not in dual mono (1+1) mode.
Language (Left)		The language of the left channel when in dual mono (1+1) mode.
Language (Right)		The language of the right channel when in dual mono (1+1) mode.
User Language 1		A custom three-character language code when User Language 1 is set in any of the language fields.
User Language 2		A custom three-character language code when User Language 2 is set in any of the language fields.



Parameter	Values	Description
MPEG Version	MPEG1, MPEG2	Configures if MPEG-1 or MPEG-2 to be signaled.
Copyright	Off, On	Indicates if the material is copyright protected.
Original	Off, On	Indicates if source is the original or a copy
De-emphasis	Off, 50/15us, CCITT J.17	To meet the MPEG-1 Layer 2 encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.

Table 5.59 Dolby Digital Parameters

Parameter	Values	Description
Bit Rate	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576, 640	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Metadata Controls Coding Mode	Off, On	Override default coding mode with coding mode indicated in decoder program configuration or live metadata (if present).
Metadata source type	Embedded/Decoded Auto, Serial Port (Program 1 to 8)	Selects where live metadata comes from.
Metadata override type	None, All, Compression Profile, Dialogue Normalization, Comp Profile and Dial Norm	Defines which metadata parameters to override.
Metadata Reversion Mode	Last Used, Preset	Determines which metadata is used upon loss of live metadata.
Metadata preset type	1 to 8	Defines which metadata preset to use if Preset is selected for Metadata Reversion Mode.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.60 AAC-LC Parameters

Parameter	Values	Description
Bit Rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512	Bit Rate of the audio stream. The available options depend on the selected coding mode.

Parameter	Values	Description
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Encapsulation	MPEG2 ADTS, MPEG4 LATM/LOAS	Specifies the encapsulation used for transmitting AAC content. It can be either MPEG-2 Audio Data Transport Stream or MPEG-4 Low Overhead Audio Stream based on MPEG-4 Low Overhead Audio Transport Multiplex.
TNS (Temporal Noise Shaping)	Off, On	Turns noise shaping on or off.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.61 HE-AAC Parameters

Parameter	Values	Description
Bit Rate	16, 24, 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Encapsulation	MPEG2 ADTS, MPEG4 LATM/LOAS	Specifies the encapsulation used for transmitting AAC content. It can be either MPEG-2 Audio Data Transport Stream or MPEG-4 Low Overhead Audio Stream based on MPEG-4 Low Overhead Audio Transport Multiplex.
TNS (Temporal Noise Shaping)	Off, On	Turns noise shaping on or off.
SBR Signalling	Explicit, Implicit	Specifies how Spectral Band Replication is signaled.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.



Parameter	Values	Description
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.62 Pass-through Parameters

Parameter	Values	Description
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.63 Audio Description Service Parameters

Parameter	Values	Description
Bit Rate	64	Bit Rate of the audio stream.
Coding Mode	1/0 (Left – input)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Audio Component

The parameters listed in the table below are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.64 Audio Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

Dolby Metadata Presets

Four custom Dolby Metadata Presets can be configured in the **Advanced Setup** tab of the **Device Configuration** page. To set the preset options, in the **Advanced Video Processor Settings** drill down to **Encoder > Slots > Slot <n> - CE-x >CE-x > Audio Module > Dolby Metadata Presets**, and select the preset you want to modify. Alternatively, the settings can be reached through the front panel under **Advanced/CE-x/Audio Module/Dolby Metadata Presets**. Any of these presets can then be applied to any audio channel encoding audio in the Dolby Digital format. The table lists the parameters for each preset.

Table 5.65 Dolby Metadata Preset Parameters

Parameter	Values	Description
Preset name		Name of the preset (for user information)
Dialogue normalization level	-31 to -1 dB	Used by a decoder to determine the level of adjustment required to achieve the set level.
Bitstream mode	Main audio service: complete main, music and effects, Associated service: visually impaired, Associated service: hearing impaired, Associated service: dialogue, Associated service: commentary, Associated service: emergency, Associated service: visually impaired, Associated service: karaoke/voiceover	Flags the type of service in the bitstream.
Line mode compression profile	None, Film Standard, Film Light, Music Standard, Music Light, Speech	Alters the dynamic range for line output.
RF mode compression profile	None, Film Standard, Film Light, Music Standard, Music Light, Speech	This alters the dynamic range for RF output. The overall level is raised by 11dB.
Center mix level	0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB)	Indicates the downmix level when there is no centre speaker. This is applied to left and right channels only.
Surround mix level	0.707 (-3.0 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Surround downmix level for the front left and right channels when consumer has no surround speakers.
Dolby Surround mode	Not Indicated, Not Encoded, Encoded	Flags if a two channel encoded stream contains information for a Dolby Pro-logic decode (Lt/Rt)
Audio production information exists	Off, On	This indicates whether the Mixing Level and Room Type parameters exist within the bit-stream.



Parameter	Values	Description
Mixing level	80 to 111 dB	Indicates the acoustic sound pressure level of the dialogue level during the final audio mixing session.
Room type	Not indicated, Large room X curve monitor, Small room flat monitor	Type and calibration of the mixing room used for the final audio mixing session.
Copyright flag	Off, On	Indicates if the material is copyright protected
Original bitstream flag	Off, On	Indicates if source is the original or a copy
Enable extended bitstream information	Off, On	Flags if additional information is available for downmixing.
Preferred downmix mode	Not indicated, Lt/Rt downmix preferred, Lo/Ro downmix preferred	Indicates if the producer would prefer a Lt/Rt or a Lo/Ro downmix. Can be over-ridden by the decoder.
Lt/Rt center mix level	1.414 (+3.0 dB), 1.189 (+1.5 dB), 1.000 (0 dB), 0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed with the L & R channels for a Lt/Rt downmix. Similar to 'Center mix level'.
Lt/Rt surround mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the surround channels when mixed for a Lt/Rt downmix. Similar to 'Surround mix level'.
Lo/Ro center mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed with the L & R channels for a Lo/Ro downmix. When present this replaces the value set for the 'Center mix level'
Lo/Ro surround mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed for Lo/Ro downmix. When present this replaces the value set for the 'Surround mix level'.
Dolby Surround EX mode	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Flags if the stream has been encoded in Surround Ex. Only used if surround channels are present.
A/D converter type	Standard, HCD	Indicates type of A/D conversion used.
Digital de-emphasis	Off, Auto, On	To meet the Dolby Digital encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.
DC high pass filter enable	Off, On	Removing the DC component can lead to more efficient encoding, but there is a risk that signals that do not reach 100% PCM may exceed this after filtering and therefore must be clipped.
Bandwidth low-pass filter enable	Off, On	Remove high frequency signals before encoding. The filter removes frequencies that would not normally be encoded.
Low-frequency effects low pass filter enable	Off, On	Apply a 120 Hz low pass filter prior to an encode. Should only be switched off if it is known that there are no frequencies above 120 Hz.
Surround attenuation enable	Off, On	Attenuate surround channels by 3 dB before encoding. Theatrical and consumer mixing rooms use different levels for the surround channels, and this can be used to compensate.
Surround phase shift enable	Off, On	Apply a phase shift of 90 degrees to the surround channels. This simplifies the decode process for producing a 'Lt/Rt' downmix.

5.5.3.3.3 Splicing Stream Configuration

Splicing

The following parameters are available on the **Splicing** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video 1/Video/Main Video/Splicing** menu on the front panel.

Table 5.66 Splicing Parameters

Parameter	Values	Description
Splicing Control	Off, On VANC Message Only, On VANC, On IP	Enables splice points to be set in the video stream upon reception of a SCTE 104 message and determines the insertion point. To enable splicing, a splice point insertion license (CE/SWO/DPI) is needed.
Splice Null Insertion	Off, On	Used to determine the insertion of NULL SCTE 35 messages into the output stream if no messages have been sent for 500ms.
Audio Splicing	Off, On	Used to determine if audio is manipulated at the point that the video splice occurs.
AS Index Control	Don't Care, Use 1, Use 1 + 2	Determines how many values of AS Index are compared against the incoming SCTE 104 message. Available only when Splicing Control is set to On VANC Message Only.
DPI PID Index Control	Don't Care, Use 1, Use 1 + 2	Determines how many values of DPI PID Index are compared against the incoming SCTE 104 message. Available only when Splicing Control is set to On VANC Message Only.
AS Index 1	0 to 255	The AS index used if AS Index Control is set to Use 1 or Use 1 + 2.
AS Index 2	0 to 255	The AS index used if AS Index Control is set to Use 1 + 2.
DPI PID Index 1	0 to 255	The DPI PID index used if DPI PID Index Control is set to Use 1 or Use 1 + 2.
DPI PID Index 2	0 to 255	The DPI PID index used if DPI PID Index Control is set to Use 1 + 2.

Splicing Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.67 Slicing Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.



5.5.3.3.4 Teletext Stream Configuration

This section describes the parameters for setting up Teletext.

Teletext

This section gives the parameters that have an effect on how Teletext is transmitted.

The following parameters are available on the **Teletext** tab of the **Properties** widget on the **Service Configuration** page when a Teletext stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video 1/Input/VBI Extraction/Teletext** menu on the front panel.

Table 5.68 Teletext Parameters

Parameter	Values	Description
Teletext Source	Off, OP-47 (Max 300 kb/s), VANC Teletext	Controls whether Teletext is extracted from VANC or not and if it extracted, which encapsulation method (OP-47 or SMPTE 2031) to use.
Teletext Packetisation	Normal (ETS 300-472) - Data on Teletext Component, Legacy (ETS 301-775) - Data on VBI Component	Controls how the Teletext data is packetized in to a component data stream.
SMPTE2031 Max. No. Teletext	3, 7, 11, 15, 36	Defines the maximum number of Teletext lines inserted. Available only if VANC Teletext is selected for Teletext Source.
SMPTE2031 Teletext Present	Yes, No	Displays whether Teletext is found in the SDI stream. Available only if VANC Teletext is selected for Teletext Source. Read only parameter.
Min # Teletext Packets	0 to 3	Defines the minimum number of Teletext packets generated per field, even if there is no Teletext data.
PTS On Teletext	Off, On	Controls whether a PTS value is included in the output Teletext packets.
Teletext Descriptor Page List / Teletext Descriptor Page		
Teletext Page Type	Off, Initial Page, Subtitle Page, Additional Information Page, Programme Schedule Page, Heading Impaired Subtitle Page	The page type of the Teletext descriptor.
Teletext Page Number		The page number for the page to be set.
Teletext Page Language	List of languages	The language set for the Teletext descriptor.

Teletext Component

This section describes the parameters associated with the component carrying Teletext data.

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a Teletext stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.69 Teletext Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.3.5 VBI and ANC Stream Configuration

This section describes the parameters available for setting up VBI and ANC streams.

VBI and Ancillary Data

This section gives the parameters that have an effect on what ancillary data is extracted and how the data is transmitted.

The following parameters are available on the **VBI** tab of the **Properties** widget on the **Service Configuration** page when an ANC stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.70 VBI and Ancillary Data Parameters

Parameter	Values	Description
Enable VBI Pass-through Mode	Off, On	Enable pass-through of VBI, ANC and Teletext data from specified PIDs, instead of extracting them from SDI. Read only parameter. Not supported in this release.
Description Control		
VBI Descriptor Mode	Standard, Legacy, Philips, User	The source for Closed Captions data encoded as part of the Video Stream (only applicable when Video Frame Rate is 29.97 Hz)
VBI Data Descriptor Insertion	Off, On	Controls if the VBI Data Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
VBI Teletext Descriptor Insertion	Off, On	Controls if the VBI Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Teletext Descriptor Insertion	Off, On	Controls if the Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Proprietary Descriptor Insertion	Off, On	Controls if the Legacy Proprietary Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Aspect Ratio (AR) Signalling		
Video Index	Off, On (Default), On (User)	Controls the extraction of Video Index (and thus whether Video Index can be used as source of AR info). Default: The default lines will be set to decode Video Index (11/32, 25Hz, 14/277 in 29.97 Hz) User: The User defines the lines used to decode Video Index.



Parameter	Values	Description
Video Index Field 1	10 to 22	Specifies which line contains the video index in field 1.
Video Index Field 2	10 to 22	Specifies which line contains the video index in field 2.
SMPTE 2016	Off, On	Controls whether SMPTE 2016 data can be used as a source info.
AFD Sustain	Indefinitely, Default after Timeout, Off after Timeout	Control what AFD code goes out when AFD is lost at input. Indefinitely: Maintains previously received AFD code indefinitely. Default after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then drop to default, i.e. code 1000. Off after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then switch AFD off.
AFD Sustain Timeout	0 to 5,10, 20, 50, 100, 120	Control how long previous AFD code is maintained. Zero means to default immediately on loss.
AFD Action on Reserved Codes	Pass Through, Code as 0000	Specify what code is passed to the output when reserved AFD codes are received at the input. Pass Through: Passes code through unchanged. 0: Changes code to 0000.
Closed Captions		
Closed Captions Source	Off, VBI lines, SMPTE334	The source for Closed Captions data encoded as part of the Video Stream. Only applicable when frame rate is 29.97 Hz.
Timecode		
TC Mode	Off, External, Zero on Loss, External, Freewheel on Loss, Internal	Controls what mode the Time code (TC) is working in, either using an external source or internally generated. Also sets what happens if loss of external source (zero or freewheel).
TC External Source	ITC1, ANC VITC2, ANC LTC, VBI VITC	Auto, Controls the external source of Time Code. Auto will select the source present in order of the drop down list.
TC Dropframes	Off, On, Auto	Only in 525 line operation controls if Time Code takes account of drop frames or not. Auto configures to external source, or to Off for internal source.
Broadcaster ID		
Reception Timeout		Timeout in seconds for reception of Source ID from input (RP2016)
Insertion Timeout		Timeout in seconds for insertion of default source ID.
Broadcaster ID Mode	Off, Auto, Default Only, Source Only	Gives what to insert as a broadcaster ID.
Default Servicename		The default service name to be used.
Broadcaster ID Source	No, Input, Default	Indicates if the Broadcaster ID is derived from the input, the default is invalid.
Broadcaster ID		The Broadcaster ID that is currently being inserted into the output stream.

Parameter	Values	Description
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.
Field 1		
VBI Line 9 - VBI Line 22	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 6 - VBI Line 23	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signalling, WSS-AFD for Active Form Detection and Teletext System B for Teletext. Visible for 576i (625-line) input streams.
Field 2		
VBI Line 272 - VBI Line 285	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 319 - VBI Line 336	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Form Detection and Teletext System B for Teletext.

ANC Component

This section describes the parameters associated with the component carrying ancillary data.

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an ANC stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.71 ANC component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.



5.5.3.3.6

PCR Stream Configuration

The video encoding module can generate a separate PCR stream. The PCR stream contains timing reference that can be used for decoding the elementary streams included in the same service as the PCR stream itself. To use the PCR stream as a timing reference for decoding, set the PCR PID parameter associated with the service to the PID assigned to the PCR stream.

The following parameters are available in **Properties** widget on the **Service Configuration** page when a PCR Stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <m> Video 1 PCR stream on PID <n>** menu on the front panel.

Table 5.72 PCR Stream Configuration Parameters

Parameters	Values	Description
PID	16 - 8190	The packet identifier assigned to packets carrying the program clock reference values.
Bit Rate Weighting	Fixed	Not relevant for the PCR component. Read only parameter.

5.5.3.4 CE-x Analogue VCM

5.5.3.4.1 Video and VBI Stream Configuration

Video Input and Pre-Processing

The following parameters are available on the **Input** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Video/Video1/Input** menu on the front panel.

Table 5.73 Video Input and Pre-Processing Parameters

Parameter	Values	Description
Video Input Lock	Yes, No	Shows whether there is a video lock to the format specified through the parameters below. Read only parameter.
Source	SDI	The video will be sourced from the SDI/HD-SDI input on the rear panel.
	Bars	An internally generated color bars test pattern will be used as the video source.
	Black	An internally generated black test pattern will be used as the video source.
	Moving Object	An internally generated moving object test pattern will be used as the video source.
	Slate	An internally generated slate test pattern will be used as the video source.
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Controls whether the format of the SDI input shall be automatically detected or what actions to take if a change is detected in the Input Video Format..

Parameter	Values	Description
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.
Video Input Format	SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	Defines the expected video format on the SDI input or the video format used for encoding the test patterns. A change in the Video Input Format might result in a change in the Video Profile used for encoding. As from the current release down-conversion is supported, SD profiles can be selected for HD input formats.
Output On Video Loss	Freeze Frame, Freeze with text overlay	Repeats the last good video frame on loss of video input. Text overlay is not supported in this release.
	Black, Black with text overlay	Switches to a black test pattern on loss of video input. Text overlay is not supported in this release.
	Color Bars, Bars with text overlay	Switches to a color bars test pattern on loss of video input. Text overlay is not supported in this release.
	No PID	The video PID shall no longer be transmitted. The SI is not updated.
	Slate, Slate with text overlay	An internally generated slate test pattern will be used as the video source.
Ident Text		Overlay text to display on top of images.
MCTF	Off, Default, Strong, Stronger	The amount of Motion Compensated Temporal Filtering done to improve image quality.
Adaptive Preprocessing	Off, On	Adaptive Preprocessing analyses the incoming video to tries and identify areas of noise contained within the picture. A filter is then applied to those areas of the picture to remove the noise. Note applying the filter may remove detail from the picture and may make edges of objects appear soft or slightly blurred. For normal operation with high quality input video feeds it is recommended that this option is set to OFF.
Bandwidth	30 to 100 %	Sets the video horizontal bandwidth filter.
Half Line Removal	Off, On	Enables or disables the removal of black half lines at the top of the picture by substituting video data from adjacent lines. The option is available when Video Input Format is set to SD 576i25.
Logo		
Logo insertion	Off, On	Controls if logos are displayed or not. The file to use can be selected under Logo file.
Logo file		The file to use as a logo. The selected file can be uploaded by selecting the Upload option. Not supported in this release.
A fixed logo position?	On, Off	Controls whether to use the default position for overlaying the logo on the video. Not supported in this release.
The X position of the logo		The position relative to left of the screen 0 .. (number of pixels per video line - logo width - 1). If an invalid position is specified, a logo display alarm will be generated. Displayed only if A fixed logo position? is set to Off. Not supported in this release.



Parameter	Values	Description
The Y position of the logo		The position relative to top of screen 0 .. (number of video lines - logo height - 1). If an invalid position is specified, a logo display alarm will be generated. Displayed only if A fixed logo position? is set to Off. Not supported in this release.
HD to SD Video Down-conversion		
Default Aspect Ratio Conversion	Anamorphic, Center Cut, Letterbox	The down-conversion to apply when AFD is lost or AFD code 000 is received.
Use Input AFD	true, false	Specifies whether to attempt to use AFD code at input for format conversion or always apply the default.
Action on AFD lost	Convert as anamorphic and put AFD code 1000 out, Convert as specified in Default and put AFD code out	Specifies what to do if AFD is lost.
Action on AFD code 0000	Convert as anamorphic and put AFD code 1000 out, Convert as specified in Default and put AFD code out	Specifies what to do if AFD code 0000 is received.

Video Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Video/Video 1/Video/Main Video/Video Encoder** menu on the front panel.

Table 5.74 Video Encoding Parameters

Parameter	Values	Description
Video Profile	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	Sets the encoder profile. The profile will also affect the allowed bit rate range.

Parameter	Values	Description
Profile for SD input	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit,	The profile to set when an SD input is detected on the SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Profile for HD input	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit	The profile to set when an HD input is detected on the HD-SDI input. Visible only if Input Detection is set to Auto Detect and Configure. If this option is visible, the Video Profile cannot be set manually.
Resolution	352 x 576, 480 x 576, 528 x 576, 544 x 576, 640 x 576, 704 x 576, 720 x 576, 352 x 480, 480 x 480, 528 x 480, 544 x 480, 640 x 480, 704 x 480, 720 x 480, 1280 x 720, 1440 x 1080, 1920 x 1080	Defines the horizontal and vertical resolution of the encoded video. The available options depend on the values set for Video Input Format and Video Profile.
Video Bit Rate	The valid bit rate range depends on the selected video profile.	Defines the bit rate to be used by the compressed video component. If Bit Rate Tracking Mode is set to Maximize Video for the Transport Stream that contains the video component, and the Bit Rate Weighting of the component is set to other than Fixed or Minimal, this field is read only.
Buffer Mode	CBR	Constant Bit Rate operation.
	Seamless	Sets a mode in which a change in video parameters does not cause an interruption in the output stream.
	Low Delay	Reduced encode delay (typically 350ms) achieved by removing pre-processing functions. Bit Rate, GOP structure and GOP length impact the delay. The IP GOP structure will give lowest delay, but with reduced quality.
	Mega Low Delay	Encode delay reduced further by removing frame-sync in pre-processing. Bit Rate, GOP structure and GOP length impact the delay. The IP GOP structure will give lowest delay, but with reduced quality.
Aspect Ratio	16:9, 4:3	Does not affect the video encoding but rather indicates what the desired aspect ratio for the decoded picture (not the pixel). If no other mechanism such as WSS in the VBI is used, the video output image will use this aspect ratio.
GOP Length	4 to 250	Defines the nominal distance in steps of video frames between two consecutive I frames in the encoded bit-stream.
GOP Structure	IP, IBP, IBBP, IBBBBB, IBBBBBBB	Sets the number of B frames between reference frames. IBBBBBBB can only be used for 720p video format encoded with a H.264 video profile.
Closed GOPs	Off, On	Enables or disables the usage of Group of Pictures in which the predicted frames can have their reference from outside the group.



Parameter	Values	Description
Scene Cut Detection	On, Off	When enabled, minimizes the negative effect the scene changes have on the bit rate by inserting an I-Frame when a change is detected. It also affects the GOP length.
Delay		Displays the actual video encoding delay. Read only parameter.
Target Quality	30 to 100	Sets the video quality for Reflex controlled video encoding. Not supported in this release.
Buffer Delay	50 to 5000	Specifies the buffer delay in seamless mode. Available only if Buffer Mode is set to Seamless.
Min Seamless Bit Rate	1.5 -	The minimum bit rate in seamless buffer mode. the value must be less than the video bit rate. Available only if Buffer Mode is set to Seamless.
Lookahead Delay	360 to 1000	Allows extra delay to be added into the encoding path to allow remote reflex operation. Not supported in this release.
Stills Detection	Off, Intelligent, Clamp	Detects if the video is a still picture, and adjusts the encoded video bit rate accordingly when operating in VBR mode.
Film Mode	Off, On	Sets encoding parameters that give better image quality for film like sources. Available only for frame rates of 29.97 or 59.94 Hz when the resolution is set to other than SIF.
Inloop Filter	High, Normal, Low, Very Low, Auto	Sets the characteristics of the filter placed in the feedback loop of the encoder. Applying the filter to the picture can increase picture sharpness.
Max CABAC Bit Rate	Depends on the Video Profile set.	Controls the bit rate at which the encoder switches from CABAC to CAVLC entropy coding.
SEI Encapsulation Mode	Combined, Mediaroom	Defines how the SEI messages are formatted in the picture header for H264. For combined, all the different types of messages (for example AFD) are bundles into one NAL packet. For Mediaroom each type of message is put into its own NAL packet. This was done for STB compatibility issues
3D Mode	Off, Side by Side Frame Packing, Top and Bottom Frame Packing	Configures output to include information in the SEI message depending on the 3D mode. Frame Sync Delay in SEI is only available for CE-x with CE/SWO/CE-x/H264, CE/SWO/CE-x/HD and CE/SWO/CE-x/3D licenses.

Video Output

The following parameters are available on the **Output** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Video/Video 1/Video/Main Video/Stream Output** menu on the front panel.

Table 5.75 Video Output Parameters

Parameter	Values	Description
Embedded PCR	Off, On, On (Picture Header)	Sets if the PCR is embedded within the video. If it is set to other than Off, the PCR PID field of a service will become read only and will contain the PID of the current component.
Copyright	Off, On	Sets the copyright flag in the elementary stream header.
Original	Off, On	Sets the original flag in the elementary stream header.
PES Packet Per	GOP, Picture	Determines how PES packets shall be generated. The Picture option is only available if MPEG 2 encoding is used.
AU Information Ctrl	RAI, RAI and AU Info, RAI, AU Info and TC	Controls insertion of Private Data in the TS Adaptation Field for video Access Units (AU) with the following values: Random Access Indicator (RAI), ETSI 101 154 (AU info), and Time Code (TC).
AR Signalling Output Control	Off, AFD Only, AFD and Bar Data	Controls what Aspect Ratio signalling will get embedded in the video as user data. AFD sources are: SMPTE 2016, Video Index, WSS-AFD/WSS, user set Aspect Ratio. Bar Data is only SMPTE 2016.
TC Output Location	Off, SEIMsg	Defines how timecode is put into the output video stream.

Video Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a video component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <x> Video Stream on PID <y>** menu on the front panel.

Table 5.76 Video Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed, Minimum, 2 to 20	Specifies the weight associated to the component in the Bit Rate Tracking algorithm.
Master TS	Off, On	Sets the master Transport Stream for the component..

Vertical Blanking Interval / Ancillary Data

The following parameters are available on the **VBI** tab of the **Properties** widget on the **Service Configuration** page when a video stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Video/Video 1/Input/VBI Extraction** menu on the front panel.

**Table 5.77 Vertical Blanking Interval / Ancillary Data Parameters**

Parameter	Values	Description
Enable VBI Pass-through Mode	Off, On	Enable pass-through of VBI, ANC and Teletext data from specified PIDs, instead of extracting them from SDI. Read only parameter. Not supported in this release.
Description Control		
VBI Descriptor Mode	Standard, Legacy, Philips, User	The source for Closed Captions data encoded as part of the Video Stream (only applicable when Video Frame Rate is 29.97 Hz)
VBI Data Descriptor Insertion	Off, On	Controls if the VBI Data Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
VBI Teletext Descriptor Insertion	Off, On	Controls if the VBI Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Teletext Descriptor Insertion	Off, On	Controls if the Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Proprietary Descriptor Insertion	Off, On	Controls if the Legacy Proprietary Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Aspect Ratio (AR) Signaling		
Video Index	Off, On (Default), On (User)	Controls the extraction of Video Index (and thus whether Video Index can be used as source of AR info). Default: The default lines will be set to decode Video Index (11/324 in 25Hz, 14/277 in 29.97 Hz) User: The User defines the lines used to decode Video Index.
Video Index Field 1	10 to 22	Specifies which line contains the video index in field 1.
Video Index Field 2	10 to 22	Specifies which line contains the video index in field 2.
SMPTE 2016	Off, On	Controls whether SMPTE 2016 data can be used as a source for AR info.
AFD Sustain	Indefinitely, Default after Timeout, Off after Timeout	Control what AFD code goes out when AFD is lost at input. Indefinitely: Maintains previously received AFD code indefinitely. Default after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then drop to default, i.e. code 1000. Off after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then switch AFD off.
AFD Sustain Timeout	0 to 5,10, 20, 50, 100, 120	Control how long previous AFD code is maintained. Zero means drop to default immediately on loss.
AFD Action on Reserved Codes	Pass Through, Code as 0000	Specify what code is passed to the output when reserved AFD codes are received at the input. Pass Through: Passes code through unchanged. Code as 0000: Changes code to 0000.
Closed Captions		
Closed Captions Source	Off, VBI lines, SMPTE334	The source for Closed Captions data encoded as part of the Video Stream. Only applicable when frame rate is 29.97 Hz.

Parameter	Values	Description
Timecode		
TC Mode	Off, External, Zero on Loss, External, Freewheel on Loss, Internal	Controls what mode the Time code (TC) is working in, either Off, external source or internally generated. Also sets what happens on loss of external source (zero or freewheel).
TC External Source	Auto, ANC VITC1, ANC VITC2, ANC LTC, VBI	Controls the external source of Time Code. Auto will select the first source present in order of the drop down list.
TC Dropframes	Off, On, Auto	Only in 525 line operation controls if Time Code takes account of drop frames or not. Auto configures to external source, or to ON for internal source.
Broadcaster ID		
Reception Timeout		Timeout in seconds for reception of Source ID from input (RP207).
Insertion Timeout		Timeout in seconds for insertion of default source ID.
Broadcaster ID Mode	Off, Auto, Default Only, Source Only	Gives what to insert as a broadcaster ID.
Default Servicename		The default service name to be used.
Broadcaster ID Source	No, Input, Default	Indicates if the Broadcaster ID is derived from the input, the default or is invalid.
Broadcaster ID		The Broadcaster ID that is currently being inserted into the output stream.
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.
Field 1		
VBI Line 9 - VBI Line 22	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 6 - VBI Line 23	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext. Visible for 576i (625-line) input streams.
Field 2		
VBI Line 272 - VBI Line 285	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 319 - VBI Line 336	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext.



Input Detection

Overview

The CE-x Analogue VCM is capable of detecting if there is a valid video stream available at the SDI/HD-SDI input. The VCM can be set up to report whenever it detects a format change in the input video stream, or it can even modify the encoding parameters.

Input detection does not work for the analogue input.

Input Detection Configuration (SDI only)

In order to set the input detection, navigate to **Device Configuration > Advanced Setup and select Slots > Slot <n> - CE-x Analogue > CE-x Analogue > Video > Video 1 > Input and Slots > Slot <n> - CE-x Analogue > CE-x Analogue > Video > Video 1 > Video > Main Video > Video Encoder** in the **Advanced Video Processor Settings** widget.

Note: Once a video component has been added to an output Transport Stream on the **Service Configuration** page, input detection options can be set up on the **Input** and **Encode** tabs for the respective video in the **Properties** widget.

Alternatively, on the front panel browse to **Advanced/CE-x/Video/Video 1/Input** and **Advanced/CE-x/Video/Video 1/Video/Main Video/Video Encoder** and modify the required settings. The parameters related to input detection are summarized below.

Input Options

Table 5.78 Input Options Parameters

Parameters	Values	Description
Input Detection	Off, Auto Detect and Report, Auto Detect and Configure	Specifies what to do when the input video format has been changed.
Detected Video Standard	Not Detected, SD 567i25, SD 480i29.97, HD 720p50, HD 720p59.94, HD 1080i25, HD 1080i29.97	The detected video standard if Input Detection is set to other than Off. If the format is not detected or Input Detection is set to Off, it is set to Not Detected. Read only parameter.

Encode Options

Table 5.79 Encode Options Parameters

Parameters	Values	Description
Profile for SD	Profile Off SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit.	The profile to set when a change to an SD format has been detected. Available only if Input Detection is set to Auto Detect and Configure.

Profile for HD	Profile Off, SD MPEG2 Main Profile Main Level 4:2:0 8 bit, SD MPEG2 422 Profile Main Level 4:2:2 8 bit, SD H.264 Main Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.0 4:2:0 8 bit, SD H.264 High Profile Level 3.1 4:2:0 8 bit, SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit, SD H.264 High Profile Level 3.1 4:2:2 10 bit, HD MPEG2 Main Profile High Level 4:2:0 8 bit, HD MPEG2 4:2:2 Profile High Level 4:2:2 8 bit, HD H.264 Main Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.0 4:2:0 8 bit, HD H.264 High Profile Level 4.1 4:2:0 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit, HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit, HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit.	The profile to set when a change to an HD format has been detected. Available only if Input Detection is set to Auto Detect and Configure
----------------	---	---

Input Detection is Set to Off

If **Input Detection** is turned off, the input video format is not monitored by the VCM. No action is taken when there is a change in the format of the incoming native video through the SDI/HD-SDI input.

Input Detection is Set to Auto Detect and Report

If **Input Detection** is set to **Auto Detect and Report**, a video lock alarm is raised if the video lock is lost on the SDI/HD-SDI input. If no source is connected or the input source is not recognized then **Not Detected** is reported.

Input Detection is Set to Auto Detect and Configure

The **Video Input Format** and **Video Profile** will be modified according to the detected input format and the input detection settings. A change in the input format will first trigger a change in the **Video Input Format** parameter. Then the **Video Profile** will be changed if there is a change from SD to HD or vice versa. For newly detected SD profiles the new video profile will be the one set in the **Profile for SD** field. For HD, it will be the one set in the **Profile for HD** field.

If the video is embedded in a Transport Stream for which **Bit Rate Tracking Mode** is set to **Maximise Video**, and the **Bit Rate Weighting** for the video component is set to other than **Fixed** or **Minimal**, then the **Video Bit Rate** might also get updated. For more information, see Operation and Control > Bit Rate Tracking. Some examples are also given below:

- **Source** changed from **HD to SD**, and **Profile for SD** input is set to **SD MPEG-2 Main Profile Main Level 4:2:0 8 bit**: The new encoding profile is **SD MPEG-2 Main Profile Main Level 4:2:0 8 bit**. The bit rate is limited to 15 Mbps (maximum allowed by profile) if it was higher than 15 Mbps before the change. Otherwise the bit rate is not affected.



- **Source changed from SD to HD, and Profile for HD input is set to HD H.264 Main Profile Level 4.0 4:2:0 8 bit:** The new encoding profile is **HD H.264 Main Profile Level 4.0 4:2:0 8 bit**. If there is a room to increase the video bit rate to a value higher than the maximum set for the previously used SD profile, then the bit rate is increased.

Note: Changes to the source that result in a change of configuration will result in a loss of video for a short time. This outage time varies depending on the configuration change.

5.5.3.4.2 Audio Stream Configuration

Audio Input

The following parameters are available on the **Input** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Audio Module/Audio <n>/Input** menu on the front panel.

Table 5.80 Audio Input Parameters

Parameter	Values	Description
Input Format	Uncompressed (LPCM), MPEG Layer II, Dolby Digital, Dolby E, AAC	Sets the input format used by the audio encoder.
Input Source	Off, Mute, Test Tone, Input 1-4, Analogue 1-2, Embedded 1 to 8	Sets the source used by the audio encoder. No input is fed to the encoder if Off is selected. Mute mutes the incoming audio and encodes silence. Test Tone encodes an 1 kHz test tone. Embedded 1 to 8 are for digital input embedded in the SDI/HD-SDI stream. Input 1-4 are for the digital input and Analogue 1-2 are for analogue input. Analogue and digital inputs cannot be used at the same time.
Output On Audio Loss	No PID, Silence	Specifies the action to take when input is Lost. No PID is for dropping the audio PID from the stream, Silence is for encode silence. NOTE: When No PID is selected, the reference to the PID is not removed from the Program Map Table, so a Transport Stream analyzer will indicate a ghost PID in the output Transport Stream.
Source Switchout	Off, Mute, Test Tone, Embedded 1 to 8, Input 1 - 4	Specifies which input to output to the reference output on the 15-way D-type audio connector.

Audio Encoding

The following parameters are available on the **Encode** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Audio Module/Audio <n>/Encode** menu on the front panel.

Table 5.81 Audio Encoding Standards

Parameter	Options	Description
Coding Standard	MPEG Layer 2	MPEG Layer 2 Encode(More than two channel pairs require the /SWO/M1L2 license)
	Dolby Digital	Dolby Digital encode, requires CE/SWO/DOLBYAC3 license.

AAC-LC	AAC-LC encoding, requires CE/SWO/AAC license.
HE-AAC	HE-AAC or HE-AAC v2encoding requires CE/SWO/AAC license.
Pass-through	Pass-through of the input
Audio Description Service	MPEG-1 Layer II encode of a mono audio track that describes action in the video plus a control track.

Table 5.82 MPEG Layer 2 Parameters

Parameter	Values	Description
Bit rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384	Bit Rate of the audio stream
Coding Mode	1/0 (Left - input), 1/0 (Right - input), 1/0 (L+R)/2, 1+1 (L/Ch1, R/Ch2), 2/0, 2/0 (Joint), Phase Aligned Audio (6 Cannels), Phase Aligned Audio (8 Cannels)	Specifies what channel configuration to use for encoding..
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream when not in dual mono (1+1) mode.
Language (Left)		The language of the left channel when in dual mono (1+1) mode.
Language (Right)		The language of the right channel when in dual mono (1+1) mode.
User Language 1		A custom three-character language code when User Language 1 is set in any of the language fields.
User Language 2		A custom three-character language code when User Language 2 is set in any of the language fields.
MPEG Version	MPEG1, MPEG2	Configures if MPEG-1 or MPEG-2 to be signaled.
Copyright	Off, On	Indicates if the material is copyright protected.
Original	Off, On	Indicates if source is the original or a copy
De-emphasis	Off, 50/15us, CCITT J.17	To meet the MPEG-1 Layer 2 encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.

**Table 5.83 Dolby Digital Parameters**

Parameter	Values	Description
Bit Rate	56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 576, 640	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Metadata Controls Coding Mode	Off, On	Override default coding mode with coding mode indicated in decoder program configuration or live metadata (if present).
Metadata source type	Embedded/Decoded Auto, Serial Port (Program 1 to 8)	Selects where live metadata comes from.
Metadata override type	None, All, Compression Profile, Dialogue Normalization, Comp Profile and Dial Norm	Defines which metadata parameters to override.
Metadata Reversion Mode	Last Used, Preset	Determines which metadata is used upon loss of live metadata.
Metadata preset type	1 to 8	Defines which metadata preset to use if Preset is selected for Metadata Reversion Mode.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.84 AAC-LC Parameters

Parameter	Values	Description
Bit Rate	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Encapsulation	MPEG2 ADTS, MPEG4 LATM/LOAS	Specifies the encapsulation used for transmitting AAC content. It can be either MPEG-2 Audio Data Transport Stream or MPEG-4 Low Overhead Audio Stream based on MPEG-4 Low Overhead Audio Transport Multiplex.

Parameter	Values	Description
TNS (Temporal Noise Shaping)	Off, On	Turns noise shaping on or off.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.85 HE-AAC Parameters

Parameter	Values	Description
Bit Rate	16, 24, 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256	Bit Rate of the audio stream. The available options depend on the selected coding mode.
Coding Mode	1/0 (Left – input), 1/0 (Right – input), 1/0 (L+R)/2, 2/0, 3/2L (5.1 Surround)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Encapsulation	MPEG2 ADTS, MPEG4 LATM/LOAS	Specifies the encapsulation used for transmitting AAC content. It can be either MPEG-2 Audio Data Transport Stream or MPEG-4 Low Overhead Audio Stream based on MPEG-4 Low Overhead Audio Transport Multiplex.
TNS (Temporal Noise Shaping)	Off, On	Turns noise shaping on or off.
SBR Signalling	Explicit, Implicit	Specifies how Spectral Band Replication is signaled.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

**Table 5.86 Pass-through Parameters**

Parameter	Values	Description
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio.
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Table 5.87 Audio Description Service Parameters

Parameter	Values	Description
Bit Rate	64	Bit Rate of the audio stream.
Coding Mode	1/0 (Left – input)	Specifies what channel configuration to use for encoding.
Embedded PCR	On, Off	Controls whether PCR is to be embedded in the audio PES.
Au Information Cont	Off, AU Info	Controls the insertion of private data in the adaptation unit of the audio access units (AU). AU Info is defined in ETSI TR 101 154. Only AU_PTS is present for audio
Advanced		
Lip Sync Offset	-500 to 500 ms	Configures a delay to the audio to improve A/V synchronization.
Gain	-6 to 6dB	Sets the gain in dB for the audio stream.
Language		The language of the stream.
User Language 1		A custom three-character language code when User Language 1 is set in the Language field.
User Language 2		A custom three-character language code when User Language 2 is set in the Language field.

Audio Component

The parameters listed in *Table 5.88* are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an audio component is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.88 Audio Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

Dolby Metadata Presets

Four custom Dolby Metadata Presets can be configured in the **Advanced Setup** tab of the **Device Configuration** page. To set the preset options, in the **Advanced Video Processor Settings** drill down to **Encoder > Slots > Slot <n> - CE-x Analogue >CE-x Analogue > Audio Module > Dolby Metadata Presets**, and select the preset you want to modify. Alternatively, the settings can be reached through the front panel under **Advanced/CE-x Analogue/Audio Module/Dolby Metadata Presets**. Any of these presets can then be applied to any audio channel encoding audio in the Dolby Digital format. The table lists the parameters for each preset.

Table 5.89 Dolby Metadata Preset Parameters

Parameter	Values	Description
Preset name		Name of the preset (for user information)
Dialogue normalization level	-31 to -1 dB	Used by a decoder to determine the level of adjustment required to achieve the set level.
Bitstream mode	Main audio service: complete main, music and effects, Associated service: visually impaired, Associated service: hearing impaired, Associated service: dialogue, Associated service: commentary, Associated service: emergency, Associated service: visually impaired, Associated service: karaoke/voiceover	Flags the type of service in the bitstream.
Line mode compression profile	None, Film Standard, Film Light, Music Standard, Music Light, Speech	Alters the dynamic range for line output.
RF mode compression profile	None, Film Standard, Film Light, Music Standard, Music Light, Speech	This alters the dynamic range for RF output. The overall level is raised by 11dB.
Center mix level	0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB)	Indicates the downmix level when there is no centre speaker. This is applied to left and right channels only.
Surround mix level	0.707 (-3.0 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Surround downmix level for the front left and right channels when consumer has no surround speakers.
Dolby Surround mode	Not Indicated, Not Encoded, Encoded	Flags if a two channel encoded stream contains information for a Dolby Pro-logic decode (Lt/Rt)
Audio production information exists	Off, On	This indicates whether the Mixing Level and Room Type parameters exist within the bit-stream.
Mixing level	80 to 111 dB	Indicates the acoustic sound pressure level of the dialogue level during the final audio mixing session.
Room type	Not indicated, Large room X curve monitor, Small room flat monitor	Type and calibration of the mixing room used for the final audio mixing session.
Copyright flag	Off, On	Indicates if the material is copyright protected
Original bitstream flag	Off, On	Indicates if source is the original or a copy



Parameter	Values	Description
Enable extended bitstream information	Off, On	Flags if additional information is available for downmixing.
Preferred downmix mode	Not indicated, Lt/Rt downmix preferred, Lo/Ro downmix preferred	Indicates if the producer would prefer a Lt/Rt or a Lo/Ro downmix. Can be over-ridden by the decoder.
Lt/Rt center mix level	1.414 (+3.0 dB), 1.189 (+1.5 dB), 1.000 (0 dB), 0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed with the L & R channels for a Lt/Rt downmix. Similar to 'Center mix level'.
Lt/Rt surround mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the surround channels when mixed for a Lt/Rt downmix. Similar to 'Surround mix level'.
Lo/Ro center mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed with the L & R channels for a Lo/Ro downmix. When present this replaces the value set for the 'Center mix level'
Lo/Ro surround mix level	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Indicates the required level reduction of the center channel when mixed for Lo/Ro downmix. When present this replaces the value set for the 'Surround mix level'.
Dolby Surround EX mode	0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)	Flags if the stream has been encoded in 'Surround Ex'. Only used if surround channels are present.
A/D converter type	Standard, HDCCD	Indicates type of A/D conversion used.
Digital de-emphasis	Off, Auto, On	To meet the Dolby Digital encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.
DC high pass filter enable	Off, On	Removing the DC component can lead to more efficient encoding, but there is a risk that signals that do not reach 100% PCM may exceed this after filtering and therefore must be clipped.
Bandwidth low-pass filter enable	Off, On	Remove high frequency signals before encoding. The filter removes frequencies that would not normally be encoded.
Low-frequency effects low pass filter enable	Off, On	Apply a 120 Hz low pass filter prior to an encode. Should only be switched off if it is known that there are no frequencies above 120 Hz.
Surround attenuation enable	Off, On	Attenuate surround channels by 3 dB before encoding. Theatrical and consumer mixing rooms use different levels for the surround channels, and this can be used to compensate.
Surround phase shift enable	Off, On	Apply a phase shift of 90 degrees to the surround channels. This simplifies the decode process for producing a 'Lt/Rt' downmix.

5.5.3.4.3 Splicing Stream Configuration

Splicing

The following parameters are available on the **Splicing** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x** **Analogue/Video/Video 1/Video/Main Video/Splicing** menu on the front panel.

Table 5.90 Splicing Parameters

Parameter	Values	Description
Splicing Control	Off, On VANC Message Only, On VANC, On IP	Enables splice points to be set in the video stream upon reception of a SCTE 104 message and determines the insertion point. To enable splicing, a splice point insertion license (CE/SWO/DPI) is needed.
Splice Null Insertion	Off, On	Used to determine the insertion of NULL SCTE 35 messages into the output stream if no messages have been sent for 500ms.
Audio Splicing	Off, On	Used to determine if audio is manipulated at the point that the video splice occurs.
AS Index Control	Don't Care, Use 1, Use 1 + 2	Determines how many values of AS Index are compared against the incoming SCTE 104 message. Available only when Splicing Control is set to On VANC Message Only.
DPI PID Index Control	Don't Care, Use 1, Use 1 + 2	Determines how many values of DPI PID Index are compared against the incoming SCTE 104 message. Available only when Splicing Control is set to On VANC Message Only.
AS Index 1	0 to 255	The AS index used if AS Index Control is set to Use 1 or Use 1 + 2.
AS Index 2	0 to 255	The AS index used if AS Index Control is set to Use 1 + 2.
DPI PID Index 1	0 to 255	The DPI PID index used if DPI PID Index Control is set to Use 1 or Use 1 + 2.
DPI PID Index 2	0 to 255	The DPI PID index used if DPI PID Index Control is set to Use 1 + 2.

Splicing Component

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.91 Slicing Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.4.4 Teletext Stream Configuration

This section describes the parameters for setting up Teletext.

Teletext

This section gives the parameters that have an effect on how Teletext is transmitted.



The following parameters are available on the **Splicing** tab of the **Properties** widget on the **Service Configuration** page when an SCTE 35 stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Video/Video 1/Video/Main Video/Splicing** menu on the front panel.

Table 5.92 Teletext Parameters

Parameter	Values	Description
Teletext Source	Off, OP-47 (Max 300kb/s), VANC Teletext	Controls whether Teletext is extracted from VANC or not and if it extracted, which encapsulation method (OP-47 or SMPTE 2031) to use.
Teletext Packetisation	Normal (ETS 300-472) - Data on Teletext Component, Legacy (ETS 301-775) - Data on VBI Component	Controls how the Teletext data is packetized in to a component data stream.
SMPTE2031 Max. No. Teletext	3, 7, 11, 15, 36	Defines the maximum number of Teletext lines inserted. Available only if VANC Teletext is selected for Teletext Source.
SMPTE2031 Teletext Present	Yes, No	Displays whether Teletext is found in the SDI stream. Available only if VANC Teletext is selected for Teletext Source. Read only parameter.
Min # Teletext Packets	0 to 3	Defines the minimum number of Teletext packets generated per field, even if there is no Teletext data.
PTS On Teletext	Off, On	Controls whether a PTS value is included in the output Teletext packets.
Teletext Descriptor Page List / Teletext Descriptor Page		
Teletext Page Type	Off, Initial Page, Subtitle Page, Additional Information Page, Programme Schedule Page, Heading Impaired Subtitle Page	The page type of the Teletext descriptor.
Teletext Page Number		The page number for the page to be set.
Teletext Page Language	List of languages	The language set for the Teletext descriptor.

Teletext Component

This section describes the parameters associated with the component carrying Teletext data.

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when a Teletext stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.93 Teletext Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.4.5 VBI and ANC Stream Configuration

This section describes the parameters available for setting up VBI and ANC streams.

VBI and Ancillary Data

This section gives the parameters that have an effect on what ancillary data is extracted and how the data is transmitted.

The following parameters are available on the **VBI** tab of the **Properties** widget on the **Service Configuration** page when an ANC stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Advanced/CE-x Analogue/Video/Video 1/Input/VBI Extraction** menu on the front panel.

Table 5.94 VBI and Ancillary Data Parameters

Parameter	Values	Description
Enable VBI Pass-through Mode	Off, On	Enable pass-through of VBI, ANC and Teletext data from specified PIDs, instead of extracting them from SDI. Read only parameter. Not supported in this release.
Description Control		
VBI Descriptor Mode	Standard, Legacy, Philips, User	The source for Closed Captions data encoded as part of the Video Stream (only applicable when Video Frame Rate is 29.97 Hz)
VBI Data Descriptor Insertion	Off, On	Controls if the VBI Data Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
VBI Teletext Descriptor Insertion	Off, On	Controls if the VBI Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Teletext Descriptor Insertion	Off, On	Controls if the Teletext Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Proprietary Descriptor Insertion	Off, On	Controls if the Legacy Proprietary Descriptor is inserted into the PMT. Available only if VBI Descriptor Mode is set to User.
Aspect Ratio (AR) Signaling		
Video Index	Off, On (Default), On (User)	Controls the extraction of Video Index (and thus whether Video Index can be used as source of AR info). Default: The default lines will be set to decode Video Index (11/324 in 25Hz, 14/277 in 29.97 Hz) User: The User defines the lines used to decode Video Index.
Video Index Field 1	10 to 22	Specifies which line contains the video index in field 1.
Video Index Field 2	10 to 22	Specifies which line contains the video index in field 2.
SMPTE 2016	Off, On	Controls whether SMPTE 2016 data can be used as a source for AR info.



Parameter	Values	Description
AFD Sustain	Indefinitely, Default after Timeout, Off after Timeout	Control what AFD code goes out when AFD is lost at input. Indefinitely: Maintains previously received AFD code indefinitely. Default after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then drop to default, i.e. code 1000. Off after Timeout: Maintains previously received AFD code for period specified in Sustain Timeout, then switch AFD off.
AFD Sustain Timeout	0 to 5,10, 20, 50, 100, 120	Control how long previous AFD code is maintained. Zero means drop to default immediately on loss.
AFD Action on Reserved Codes	Pass Through, Code as 0000	Specify what code is passed to the output when reserved AFD codes are received at the input. Pass Through: Passes code through unchanged. Code as 0000: Changes code to 0000.
Closed Captions		
Closed Captions Source	Off, VBI lines, SMPTE334	The source for Closed Captions data encoded as part of the Video Stream. Only applicable when frame rate is 29.97 Hz.
Timecode		
TC Mode	Off, External, Zero on Loss, External, Freewheel on Loss, Internal	Controls what mode the Time code (TC) is working in, either Off, external source or internally generated. Also sets what happens on loss of external source (zero or freewheel).
TC External Source	Auto, ANC VITC1, ANC VITC2, ANC LTC, VBI	Controls the external source of Time Code. Auto will select the first source present in order of the drop down list.
TC Dropframes	Off, On, Auto	Only in 525 line operation controls if Time Code takes account of drop frames or not. Auto configures to external source, or to ON for internal source.
Broadcaster ID		
Reception Timeout		Timeout in seconds for reception of Source ID from input (RP207).
Insertion Timeout		Timeout in seconds for insertion of default source ID.
Broadcaster ID Mode	Off, Auto, Default Only, Source Only	Gives what to insert as a broadcaster ID.
Default Servicename		The default service name to be used.
Broadcaster ID Source	No, Input, Default	Indicates if the Broadcaster ID is derived from the input, the default or is invalid.
Broadcaster ID		The Broadcaster ID that is currently being inserted into the output stream.
Generic ANC		
Generic ANC Extraction	Off, On	Controls whether Generic ANC is extracted from the SDI stream or not as per SMPTE 2038-2008.
Max ANC Bit Rate	100 to 2000 kbps	The maximum data rate of the Generic ANC data output.

Parameter	Values	Description
Field 1		
VBI Line 9 - VBI Line 22	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 6 - VBI Line 23	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signaling, WSS-AFD for Active Format Detection and Teletext System B for Teletext. Visible for 576i (625-line) input streams.
Field 2		
VBI Line 272 - VBI Line 285	Off, Closed Caption	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, Closed Caption for closed caption information. Visible for 480i (525-line) input streams.
VBI Line 319 - VBI Line 336	Off, VITC, WSS, WSS-AFD, Teletext System B	Specifies the content in the respective VBI lines. Set to Off if the line in the incoming video does not carry any information, VITC for Time Code, WSS for Wide Screen Signalling, WSS-AFD for Active Format Detection and Teletext System B for Teletext.

ANC Component

This section describes the parameters associated with the component carrying ancillary data.

The following parameters are available on the **Component** tab of the **Properties** widget on the **Service Configuration** page when an ANC stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/<component name>** menu on the front panel.

Table 5.95 ANC Component Parameters

Parameter	Values	Description
PID	32 to 8190	Sets the packet identifier associated with the component.
Bit Rate Weighting	Fixed	Specifies the weight associated to the component in the Bit Rate Tracking algorithm. For audio stream, this is Fixed and read only.

5.5.3.4.6 PCR Stream Configuration

The video encoding module can generate a separate PCR stream. The PCR stream contains timing reference that can be used for decoding the elementary streams included in the same service as the PCR stream itself. To use the PCR stream as a timing reference for decoding, set the PCR PID parameter associated with the service to the PID assigned to the PCR stream.



The following parameters are available in **Properties** widget on the **Service Configuration** page when a PCR Stream is selected in the **Outputs** widget. The same parameters can be accessed through the **Output/<output name>/Transport Stream ID: <n>/Service List/<service name>/Component List/Slot <m> Video 1 PCR stream on PID <n>** menu on the front panel.

Table 5.96 PCR Stream Configuration Parameters

Parameters	Values	Description
PID	16 - 8190	The packet identifier assigned to packets carrying the program clock reference values.
Bit Rate Weighting	Fixed	Not relevant for the PCR component. Read only parameter.

5.5.4 Configuring Transport Streams

The section describes the parameters available for Transport Stream configuration.

5.5.4.1 Transport Stream Configuration

The Transport Streams generated by the unit are fully compliant with the MPEG-2 Transport Stream specification (ISO/IEC 13818-1), and consists of services that carry one or more components.

The unit can form up to 18 output Transport Streams and output them through the Transport Stream output interfaces.

A total of 256 services can be allocated between the output Transport Streams. Each service can contain a maximum of 24 elementary streams. The elementary streams that make up a service can be selected from the elementary streams available from the option cards. The only restriction is that the elementary streams in a service must all reference the same 27 MHz clock.

An elementary stream can be included in up to four services. Only one video elementary stream can be assigned to a service, and the audio delay of audio services should be matched to that video. Only one PCR can be associated with a service.

Settings for IP and non-IP output Transport Streams differ slightly. The following three sections define the general Transport Stream settings, the settings that are related to the IP output, and the settings for the various services within the IP or non-IP output Transport Streams.

5.5.4.1.1 General Transport Stream Settings

The general Transport Stream parameters are available in the **Properties** widget on the **Service Configuration** page if a Transport Stream is selected in the **Outputs** widget. The same settings are also available through the front panel under **Output/<interface name>/<Transport Stream name>**.

Table 5.97 General Transport Stream Settings

Parameter	Values	Description
Status of Service	Online, Offline, Preview, Retire	Determines the output (Setmode) state of the Transport Stream.
Transport Stream ID	1 to 65535	The ID of the Transport Stream as appears in the NIT. Visible only if the NIT is transmitted.
Network Name	Text string of up to 32 characters	The name of the network, as used in the NIT. Visible only if the NIT is transmitted.
Network ID	1 to 65535	The ID of the network, as used in the NIT. Visible only if the NIT is transmitted.
Mode	CBR, VBR	Specifies whether to smooth the output bit rate by inserting null packets (CBR) or produce a variable bit rate output.
Syntax	ATSC	
	DVB	
Send extended NIT	On, OFF	Specifies whether or not to send or Carrier ID information as required by the Satellite Interference Reduction Group.
PMT Repetition Period	100, 400, 500	Specifies how often (in ms) the PMT shall be transmitted.
Bit Rate	0.04 - 200	Transport Stream rate in Mbps with a resolution of 10 kbps
Reserved Bit Rate		The amount of bit rate in the Transport Stream that cannot be allocated to any of the transmitted components.
Bit Rate tracking mode	Off, Maximise Video	Enables or disables bit rate tracking for the Transport Stream..
Auto Enable	false, true	Specifies whether or not to automatically re-enable the Transport Stream (set its Status of Service to Online) when the condition set in the Auto Disable field is not met.
Auto Disable	Never, Audio Lost, Video Lost, Audio or Video lost, Any UPSTREAM critical alarm, Any critical alarm	Specifies the condition on which the Transport Stream has to be disabled. Audio lost and video lost means that the audio or video lock of any of the components in the Transport Stream is lost, UPSTREAM critical alarm is an alarm that is triggered by any of the components that contribute to producing the elementary streams carried by the Transport Stream.
ATSC		
PAT/PMT	On, Off	Specifies whether Program Association Table and Program Map Table are generated or not.
PMT Repetition Period	100, 400, 500 ms	Specifies the repetition period for the Program Map Table.
CAT	On, Off	Specifies whether Conditional Access Table is generated or not.
MGT	On, Off	Specifies whether Master Guide Table is generated or not.
STT	On, Off	Specifies whether System Time Table is generated or not.
GPS UTC Offset	0 to 255 s	Specifies the offset between GPS time and UTC.
Daylight Saving	On, Off	Turns daylight saving on and off.
(T/C)VCT	On, Off	Specifies whether Terrestrial/Cable Virtual Channel table is generated or not.
Delivery	Terrestrial, Cable	Specifies the delivery mode.
Major Channel Number	1 - 99	Specifies the Major Channel Number for (T/C)VCT.



Parameter	Values	Description
Modulation Mode	8, 16 VSB	Specifies the modulation mode for the transmission.
Carrier Frequency		Specifies carrier frequency.
EIT	On, Off	Specifies whether Event Information Table is generated or not.
EIT Base PID	32 - 8190	Specifies the starting PID for the Event Information Tables.
Number of EITs	0 - 4	Specifies the number of the Event Information Tables.
DVB		
PAT/PMT	On, Off	Specifies whether Program Association Table and Program Map Table are generated or not.
PMT Repetition Period	100, 400, 500 ms	Specifies the repetition period for the Program Map Table.
Dolby Digital Descriptor	DVB, ATSC, DVB & ATSC	Specifies the descriptor for Dolby Digital
CAT	On, Off	Specifies whether Conditional Access Table is generated or not.
TSDT	On, Off	Specifies whether Transport Stream Description Table is generated or not.

5.5.4.1.2 Additional Settings for IP Output Transport Streams

The IP related Transport Stream parameters are available in the **Properties** widget on the **Service Configuration** page if an IP output Transport Stream is selected in the **Outputs** widget.

Table 5.98 Additional Settings for IP Output Transport Streams

Parameter	Values	Description
IP Bit Rate		Specifies the bit rate of the IP output and includes the overhead added by IP encapsulation. Read only parameter.
TS Packets per IP Packet	1 to 7	Specifies how many Transport Stream packets to encapsulate in one IP packet.
IP Encapsulation	UDP, RTP, RTP FEC Column, RTP FEC Column and Row	Specifies what higher layer to encapsulate in IP packets. UDP and RTP is self explanatory and means that the Transport Stream is first encapsulated in UDP or RTP packets, then an IP header is added. If RTP FEC column or RTP FEC Columns and Row is selected one (Column) or two (Column and Row) RTP streams are output in addition to the RTP streams that carry the Transport Stream.
Number of Rows		The number of rows used in FEC encoding.
Number of Columns		The number of columns used in FEC encoding.
Alignment	Block Aligned, Non Block Aligned	The aligned method used for ProMPEG FEC.
IP Configuration/Destination 1		
Destination IP Address	aaa.bbb.ccc.ddd	The destination IP address to use in the IP packet header of the IP packets that carry the Transport Stream
Destination UDP Port	0 to 65535	The destination UDP port to use in the IP packet header of the IP packets that carry the Transport Stream

Parameter	Values	Description
Source IP Address	aaa.bbb.ccc.ddd	The source IP address to use in the IP packet header of the IP packets that carry the Transport Stream
Source MAC Address		Read only parameter, not yet supported.
Source UDP Port	0 to 65535	The source UDP port to use in the IP packet header of the IP packets that carry the Transport Stream
Vlan Header	Disabled, Enabled.	
Vlan ID Tag		
Vlan Tag		The VLAN tag to use for the current IP stream.
Vlan Priority	0 to 7	The priority to be used by the switches to prioritize different services.
Time To Live	0 to 240	TTL value for inclusion in the IP header
Type Of Service	0 to 255	ToS value for inclusion in the IP header
Actual source IP address, calculated by a rule	aaa.bbb.ccc.ddd	The source IP address. Read only parameter
Actual source MAC address, calculated by a rule		The source MAC address. Read only parameter.

Service Settings

The service parameters are available in the **Properties** widget on the **Service Configuration** page if a service is selected in the **Outputs** widget. The same settings are also available through the front panel under **Output/<IP interface name>/<Transport Stream name>/Service List/<service name>**.

Table 5.99 Service Settings

Parameter	Values	Description
Name		The service name as it appears in the PMT.
ID		
Type	Digital TV, Digital Radio, Teletext, Mosaic, Data Broadcast	The type of service as transmitted in the PMT.
PMT PID	32 to 8190	The PID assigned to the Program Map Table for the service.
Logical Channel		The channel number as used in the Logical Channel Descriptor.
PCR PID		The PID of the packetized elementary stream that transmits the PCR for the current service.
Scrambling Control	Off, BISS Mode-1, BISS Mode-E	Specifies whether to use scrambling for the current service, and if so, which scrambling method (BISS-1 or BISS-E) to use. Note that although BISS-E supports session words with 12 bytes (BISS-1 mode session words), in the current release, the BISS-E session words have to be 16 bytes long. Visible only if there are available BISS licenses.
Session Word		The session word used for scrambling the current service. Visible only if BISS Mode-1 is selected for Scrambling Control.



Parameter	Values	Description
Encrypted Session Word		The session word used for scrambling the current service. The session word itself is encrypted with a 14-byte BISS Injected ID that can be set under Base Unit on the Advanced Setup tab of the Device Configuration page. Visible only if BISS Mode-1 is selected for Scrambling Control.

5.5.4.2 Internal PSIP Data Insertion

The Internal Program and System Information Protocol (PSIP) Data Insertion feature allows the user to insert internally generated MPEG Program Specific Information (PSI) and ATSC PSIP data into any of the internally created Transport Streams.

The PSI information includes the following MPEG tables:

- Program Association Table (PAT)
- Program Map Table (PMT)

The internally generated PSIP data includes the following ATSC tables:

- Conditional Access Table (CAT)
- Master Guide Table (MGT)
- System Time Table (STT)
- Terrestrial/Cable Virtual Channel Table (T/C)VTC
- Event Information Table (EIT)

5.5.4.2.1 Operation

To set up PSIP data insertion, follow the steps below.

1. On the **Service Configuration** page, create the Transport Stream you want to add the internal PSIP information to.
2. Add the required services and components, and adjust the Transport Stream and component settings.
3. In the **Outputs** widget, select the Transport Stream you want to add the PSIP data to. In the **Properties** widget, set **Syntax** to **ATSC** and the **External Generation** to **Off**. The **Program Specific Information** and the **PSIP Information** accordion panels are now displayed.

Note: If external table generation is enabled, the unit does not produce tables internally.

4. By setting a table **On**, the appropriate parameters are displayed. To configure PSIP data, set **PAT/PMT** to **On**. Set **PMT Repetition Period** as required. The default value is 500 ms.
5. Conditional Access Table can be activated by setting **CAT** parameter to **On**.
6. By setting **STT On**, **GPS UTC Offset** and **Daylight Saving** can be configured.

7. By setting **(T/C)VTC On**, the following parameters can be configured: **Delivery (Terrestrial/Cable)**, **Major Channel Number**, **Modulation Mode**, **Carrier Frequency**.
8. By turning **EIT On**, **EIT Base PID** and the number of the Event information Tables can be set.

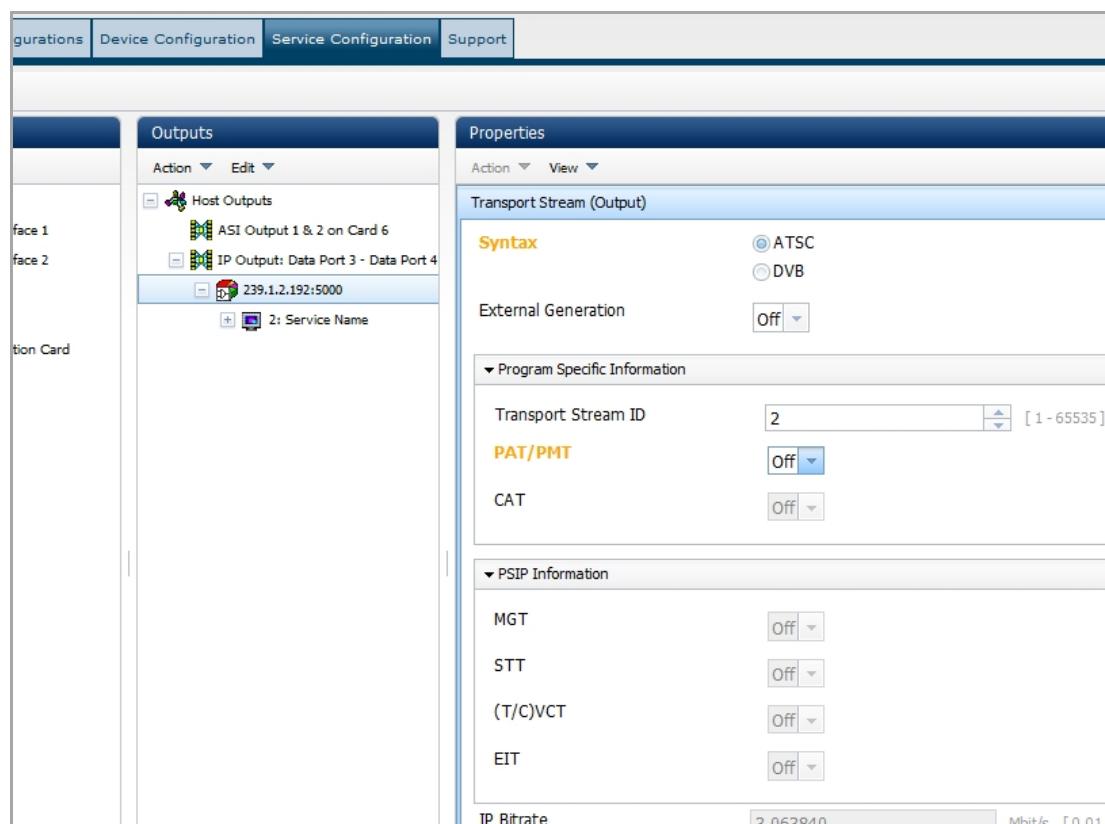


Figure 5.40 Setting Internal PSIP Data Insertion on the GUI

5.5.4.3

Basic Interoperable Scrambling System (BISS)

When the CE/SWO/BISS license is enabled the encoder can use the Basic Interoperable Scrambling System (BISS) to scramble services in the outgoing Transport Stream.

BISS Mode 1 operation uses a fixed value for the control word to scramble the service in the Transport Stream from the encoder. To descramble the transmission, the decoder needs to have the matching control word value.

BISS is configured by browsing to the service in the Transport Stream configuration for the output. Each service can be encrypted using a different key, with up to 31 keys being available.

BISS Mode E operation additionally requires the entry of an Injected ID. This value is associated with the unit rather than an individual service, so a single entry is made by browsing to **Device Configuration > Advanced Setup**, and selecting **Base Unit** in the **Advanced Video Processor Settings** widget or by **Advanced/System/Base Unit/BISS Injected ID (14 hex digits)** on the front panel.



Improvements have been made to improve the security of the BISS encrypted stream, so there are now two modes available (referred to as BISS security level) which are Normal BISS Encryption (as in the previous implementation) and Advanced BISS encryption. By default, Normal BISS Encryption is enabled.

If Advanced BISS Encryption is required this can be configured by browsing to **Device Configuration > Advanced Setup > Base Unit** and setting **BISS Security Level** to **Advanced BISS** encryption.

5.5.4.4 ProMPEG FEC

5.5.4.4.1 FEC Parameters

FEC is set up on a per-Transport Stream basis. The following description applies to the graphical user interface.

If the user has the appropriate license installed to use FEC then below are the parameters which can be set (with itemised lists of available values where appropriate).

Table 5.100 FEC Parameters

Parameter	Values	Description
IP Encapsulation	UDP	UDP encapsulation of TS packets
	RTP	RTP encapsulation of TS packets
	RTP/FEC Column	UDP/RTP encapsulation of RTP Packets with added one-dimensional FEC
	RTP/FEC Column and Row	UDP/RTP encapsulation of RTP Packets with added two-dimensional FEC
Number of Rows	4 - 20	An integer between 4 and 20. See FEC constraints section for allowable ranges.
Number of Columns	1 - 20	An integer between 1 and 20. See FEC constraints section for allowable ranges.
Alignment	Block Aligned	
	Non Block Aligned	

If the user does not have a license to use FEC then the available IP Encapsulation options become UDP, RTP, RTP/FEC Column (No License) and RTP/FEC Column and Row (No License). If either of the '(No License)' options is selected then IP Encapsulation will be set to RTP and FEC will not be enabled. If subsequently the license is enabled for FEC then the '(No License)' suffix will be removed from the displayed value of IP Encapsulation

Constraints on FEC Parameters

To promote interoperability and simplify implementation, limits are specified for values of the L (number of columns) and D (number of rows) parameters. ProMPEG FEC requires equipment manufacturers to support all combinations of values of L and D within these limits. The specified limits are:

Columns Only: $(L \times D \leq 100)$ and $(1 \leq L \leq 20)$ and $(4 \leq D \leq 20)$

Rows and Columns: $(L \times D \leq 100)$ and $(4 \leq L \leq 20)$ and $(4 \leq D \leq 20)$

Background

Forward Error Correction or FEC, enables packets lost during transmission over IP networks to be recovered by adding extra information to the transmitted data. The particular type of FEC used on the unit is that specified by SMPTE 2022 1/2.

The key features of ProMPEG FEC are:

- Open standard FEC scheme.
- Increased robustness of transmission.
- Increases network reach through FEC on high loss links.
- Highly configurable depending on bandwidth vs. robustness.
- FEC transmitted separately to media stream.
- Independent of video compression standard (MPEG-2, MPEG-4).

ProMPEG FEC can help to solve the problems caused by missing packets. It is an open standard for protection of contribution broadcast real-time transmissions over IP networks by facilitating real-time lost packet recovery at the receive units. It permits flexible configurations for optimization requirements.

The scheme uses an RTP layer which adds timing information for sequence correction. FEC packets are transmitted in separate IP packets. The FEC packets are calculated by arranging the media packets into a matrix. The matrix size defined by columns (L) and rows (D).FEC packets are calculated along columns and rows using the XOR function. FEC can be 1D (Column Only) or 2D (Column and Row).

Media and FEC packets are transmitted on separate IP streams with the Column FEC stream offset from media stream and have a UDP port number which is the media port number +2. The Row FEC stream is offset from Media stream and has UDP port number which is the media port number +4. This arrangement means that non-enabled FEC receivers can simply ignore FEC streams and decode the media packets.

The FEC data stream is off-set from the media stream to protect against burst error loss and jitter. At the receiver, lost packets recovered using the FEC data packets. The Column FEC protects against burst errors and the Row FEC protects against random errors. ProMPEG FEC recovers lost packets using column and (optionally) row FEC packets using the XOR function on the remaining packets. Depending on the distribution and severity of the pack loss not all errors are recoverable.

Overhead

The overhead which results from ProMPEG FEC transmitting extra packets depends on whether column or column and row FEC is selected and how many columns and rows there are. (Note that L = number of columns, D = number of rows.)

**Table 5.101 Column FEC**

Overhead	$(L + (D \times L)) / (D \times L) = 1 / D + 1$
Worst case	4 rows = 25%
Best case	20 rows = 5%

Table 5.102 Column and Row FEC

Overhead	$(L + (D \times L)) / (D \times L) = 1 / D + 1$
Worst case	4 rows = 25%
Best case	20 rows = 5%

Block Alignment

FEC offers two methods of block alignment (also referred to as FEC linearisation) for use when generating FEC packets: Non Block Aligned and Block Aligned. Both are guaranteed of being able to correct L errors, sometimes more. The Block Aligned method can however correct 2L+2 errors; this never happens with Non-Block Aligned.

Non-Block Aligned can in theory have a lower latency at the decoder if it can be guaranteed that the mode of operation will never change.

Block Aligned linearization is dealt with in Annex B of the ProMPEG Code of Practice. In Block Aligned column FEC packets are sent every D'th frame and the L Column FEC packets are played out every D slot. They are therefore evenly spread over the D*L matrix period.

Non Block Aligned linearization is dealt with in Annex A of the ProMPEG Code of Practice. In Non Block Aligned the matrix is 'skewed' for the column calculation. The L column FEC packets are played out at the end of every column plus a constant. For 'square' matrices (diamonds) where $L = D$ then these column packets will emerge at regular intervals. For 'rectangular' diamonds they will not. In the case of a 4 column by 20 row matrix the 4 FEC packets will emerge within 16 slots, followed by a gap of 64 slots before the next 4. It therefore produces a less linear spread of packets.

Receivers which do not have FEC capability can simply ignore the FEC packets and just make use of the media packets.

5.5.4.5

VLAN Tagging

VLAN tagging can be used to segregate IP packets from data interfaces.

5.5.4.5.1

VLAN Creation

A VLAN is created by specifying the VLAN ID, IP address and the Netmask. All Transport Streams which are tagged to this VLAN use the VLAN IP address as its source IP address. Hence the VLAN and VLAN ID must be created before it can be used to tag a Transport Stream.

To create VLANs, on the **Advanced Setup** tab of **Device Configuration** page navigate to the **Encoder > Vlan Tags** folder, select the output you want to assign the VLAN tag to, and click **Add** in the **Properties** pane. Alternatively, on the front panel navigate to **Advanced/System/Vlan Tags** and set up the VLANs as required. The available options are listed in the following table.

Table 5.103 VLAN Creation Options

Parameter	Values	Description
Vlan ID (Create)	2-4094	New VLAN ID to create.
Vlan IP	xxx.xxx.xxx.xxx	VLAN IP Address (VLAN tagged Transport Stream will have this as its source IP address).
Vlan Netmask	yyy.yyy.yyy.yyy	VLAN Netmask.
Vlan Gateway	zzz.zzz.zzz.zzz	VLAN gateway address for the current VLAN.

Note: The VLAN Id and its IP address must be unique across all Ethernet interfaces.

VLAN Tag Sharing

Once the VLANs are created, they can be assigned to IP Transport Streams. To do that, navigate to **Service Configuration** page, and create a Transport Stream for the appropriate IP output. Then, click on the newly created Transport Stream, and in the **Properties** widget select the required VLAN tag. VLANs can also be assigned to Transport Streams in the **Outputs/IP Output <m>/Data Interface Group <n>/Transport Stream ID: <id>/Destination List/Destination <k>/Vlan Tag** front panel menu. The following options can be set:

Table 5.104 VLAN Tag Sharing Options

Parameter	Values	Description
Vlan Tag	None, existing VLAN tag	Disables VLAN tagging or assigns the selected VLAN tag to the current Transport Stream.
Vlan Priority	0-7	Priority that can be used to support QoS.

It is also possible to group multiple Transport Streams under the same VLAN. To do this, assign the same VLAN tag to all of them.

Note: On the web user interface, VLANs can be managed through the Service Configuration page by clicking on the Manage button next to the Vlan Tag parameter.

VLAN Deletion

A VLAN can be deleted by changing the VLAN Tag parameter under the Transport Stream to **None**. If a VLAN tag used by any Transport Stream is deleted, the VLAN Tag parameter is set to **None** in the respective Transport Streams.



5.6

Support Page

The **Support** page provides information and access to functions that help in maintenance tasks.

The page consists of the following tabs:

- General tab
- Versions tab
- Licenses tab
- Device Management tab

5.6.1

General Tab

The General tab contains the **Import and Export** and the **Log Files** widgets.

Import and Export

Save Configuration

To save the current (running) configuration, click on the button below.
You will then be prompted for a filename and where to store the file.

[Save standard configuration]

NOTE: This config may be suitable for other similar encoders
Care should be taken when applying config to other encoders. By default the control port IP information will not change but if the config selected from the following button is used, the encoder may become unresponsive.

[Save configuration including control parameters]

NOTE: Please use with care. The config will change IP control port information when used on other encoders.
NOTE: the method using this method is not compatible with the 'stored configurations'. It can only be used to load configurations onto a unit using the 'Restore Configuration from file' option on the 'Stored Load' page.

Restore Configuration

Restore Configuration Including Control Parameters

Upgrade Encoder

Log Files

Message Log

This lists various events and would be required to debug any problems encountered.

[Log since power on]

Download logs & status

Depending upon how long the encoder has been on, this may include information from before the last power-on.

Version

None

Figure 5.41 Support Page > General Tab

5.6.1.1

Import and Export Widget

The **Import and Export** widget lets the user import and export the current configuration in different formats. Moreover, it enables the user to upgrade the encoder through the **Upgrade Encoder** accordion panel.

Note: The format of the files saved through the **Support** page is not compatible with the format of the configurations exported on the **Stored Configurations** page.

5.6.1.2 Log Files Widget

The **Log Files** widget provides a way to export message logs, basic version information and error messages for debug purposes.

5.6.2

Version Tab

The **Version** tab displays detailed version information. The information is organized into panel tabs. By clicking a tab in the **Build** widget, the very same tab is displayed in the **Host** and **Modules** widgets. In case of a version mismatch on the host or on any of the option cards, it is clearly indicated in the **System** tab and on the tab corresponding to the failing slot.

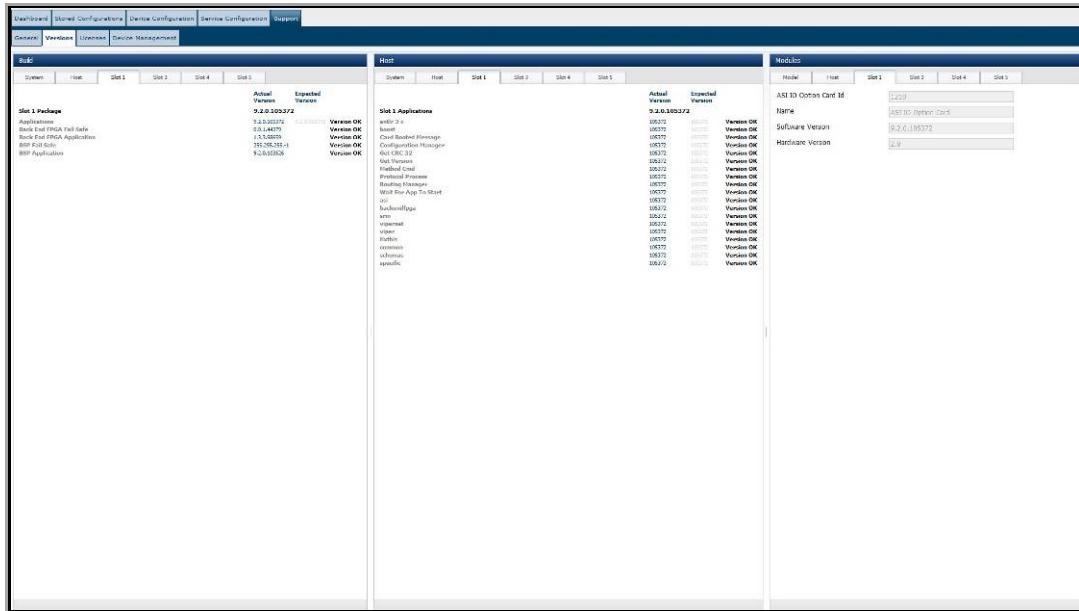


Figure 5.42 Support Page > Versions Tab

5.6.3

Licenses Tab

The **Licenses** tab allows for license key file management. License key files can be uploaded in the **Licenses** widget. Installed and unavailable licenses for each option slot are listed in separate sections.



Figure 5.43 Support Page > Licenses Tab

5.6.4

Device Management Tab

The **Device Management** tab allows the user to reset the device.

Figure 5.44 Support Page > Device Management Tab

On delivery all store locations are empty. When the user has configured the unit with a complete set of parameters the configuration can be saved to a store location.

BLANK



Advanced Video Processing and Networking

Chapter 6

Contents

6.1	Introduction to Transport Streams	6-3
6.1.1	IP Encapsulation of MPEG Transport Streams	6-3
6.1.2	Mapping of MPEG-2 TS Packets.....	6-3
6.1.3	MPEG Layer	6-4
6.1.4	RTP Layer	6-4
6.1.5	UDP Layer.....	6-5
6.1.6	IP Layer	6-5
6.1.7	Ethernet Layer.....	6-5
6.1.8	IP Overhead	6-5
6.2	Data Network Redundancy.....	6-6
6.2.1	Redundancy	6-6
6.3	Data Routing.....	6-7
6.3.1	Packet Processing	6-7
6.3.2	Handling Processed Packets.....	6-7
6.4	Setmode	6-7
6.4.1	Overview.....	6-7
6.4.2	Operation States.....	6-7
6.4.2.1	Offline Mode	6-8
6.4.2.2	Retire Mode	6-8
6.4.2.3	Preview Mode.....	6-8
6.4.2.4	Takeover Mode.....	6-8
6.4.2.5	Online Mode	6-8
6.4.3	Configuring Setmode	6-8
6.4.3.1	Configuring Setmode on Unit Level.....	6-9
6.4.3.2	Configuring Setmode on Media Level	6-9
6.5	XPO	6-9
6.6	User Access	6-9
6.6.1	User Authentication	6-9
6.7	VCM Video Encoding Functionality	6-10
6.7.1.1	Overview.....	6-10
6.7.1.2	Functional Description for VCMs	6-10
6.7.1.3	Video Compression Functionality	6-11
6.7.1.4	VCM Supported Profiles, Bit Rates and Modes.....	6-12
6.7.1.5	Test Patterns	6-13
6.7.1.6	Impairment Reduction	6-13
6.8	VCM Video Operating Modes	6-14
6.8.1	Seamless Mode	6-14



6.8.1.1	Non-seamless Modes (CBR, Low Delay, Mega Low Delay, Compatibility, Ultra Low Delay or Stripe Refresh)	6-14
6.8.1.2	Typical Delay Performance	6-16
6.8.1.3	Audio Compatibility in Low Delay, Mega Low Delay, Ultra Low Delay and Compatibility Modes.....	6-19
6.9	VCM Audio Encoding Functionality	6-19
6.9.1	Audio Input Interfaces	6-20
6.9.2	HD-SDI Input.....	6-20
6.9.3	SDI Input	6-20
6.9.4	Digital Input	6-21
6.9.5	Analogue Input (CE-xA)	6-21
6.10	Vertical Blanking Interval (VBI) and Ancillary (ANC) Data	6-21
6.10.1	Ancillary Data	6-21
6.10.1.1	Closed Captions	6-21
6.10.1.2	Time Code.....	6-22
6.10.1.3	OP-47	6-22
6.10.1.4	AFD	6-22
6.10.1.5	Generic ANC	6-22
6.10.2	VBI Data	6-22
6.10.2.1	VBI Lines	6-22
6.10.2.2	VBI Data	6-22
6.10.2.3	VBI Data on a Separate PID	6-23
6.10.2.4	Timing	6-23

List of Figures

Figure 6.1	Mapping of MPEG-2 TS Packets	6-3
Figure 6.2	Mapping of MPEG-2 TS Packets	6-4
Figure 6.3	Mapping of MPEG-2 TS Packets	6-5
Figure 6.4	Data Network Redundancy	6-6
Figure 6.5	CE VCM Functional Diagram	6-10

List of Tables

Table 6.1	IP Overhead	6-6
Table 6.2	VCM Compression Profiles and Levels.....	6-11
Table 6.3	VCM Supported Profiles, Bit Rates and Modes	6-12
Table 6.4	Test Patterns	6-13
Table 6.5	Impairment Reduction Details	6-14
Table 6.6	Low Delay 25/50 Hz	6-16
Table 6.7	Mega Low Delay 25/50 Hz	6-17
Table 6.8	Compatibility Mode 25/50 Hz	6-17
Table 6.9	Ultra Low Delay 25/50 Hz.....	6-17
Table 6.10	Low Delay 29.97/59.94 Hz	6-18
Table 6.11	Mega Low Delay 29.97/59.94 Hz	6-18
Table 6.12	Compatibility Mode 29.97/59.94 Hz	6-18
Table 6.13	Ultra Low Delay 29.97/59.94 Hz.....	6-18
Table 6.14	VCM Input Interfaces and Audio Encoding Methods.....	6-19
Table 6.15	VBI Data Types	6-23



6.1 Introduction to Transport Streams

6.1.1 IP Encapsulation of MPEG Transport Streams

An MPEG Transport Stream has the following format.

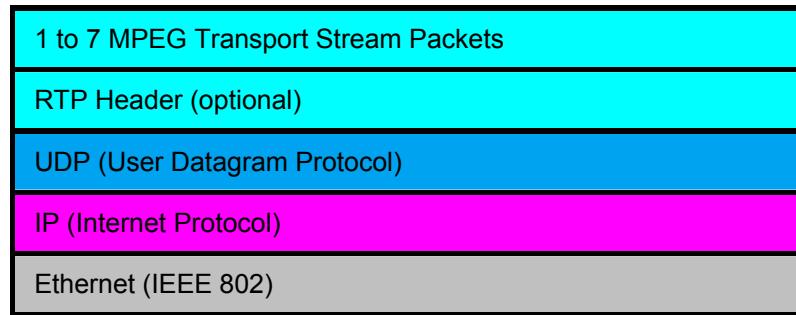


Figure 6.1 Mapping of MPEG-2 TS Packets

Between one and seven MPEG transport stream packets are carried in a UDP packet.

The UDP packet may optionally also contain an Real Time Protocol (RTP) header, which adds additional information such as a sequence number and a timestamp, which can help in the detection of packet loss across a network. The RTP header is 12 bytes long.

The UDP header is 8 bytes long.

The network layer protocol is IPV4, which adds a 20 byte header to every packet.

The physical link layer is then Ethernet at either 100 Mbps or 1000 Mbps.

6.1.2 Mapping of MPEG-2 TS Packets

The mapping of MPEG-2 TS packets into IP data frames is done according to the protocol stack shown in the following illustration.

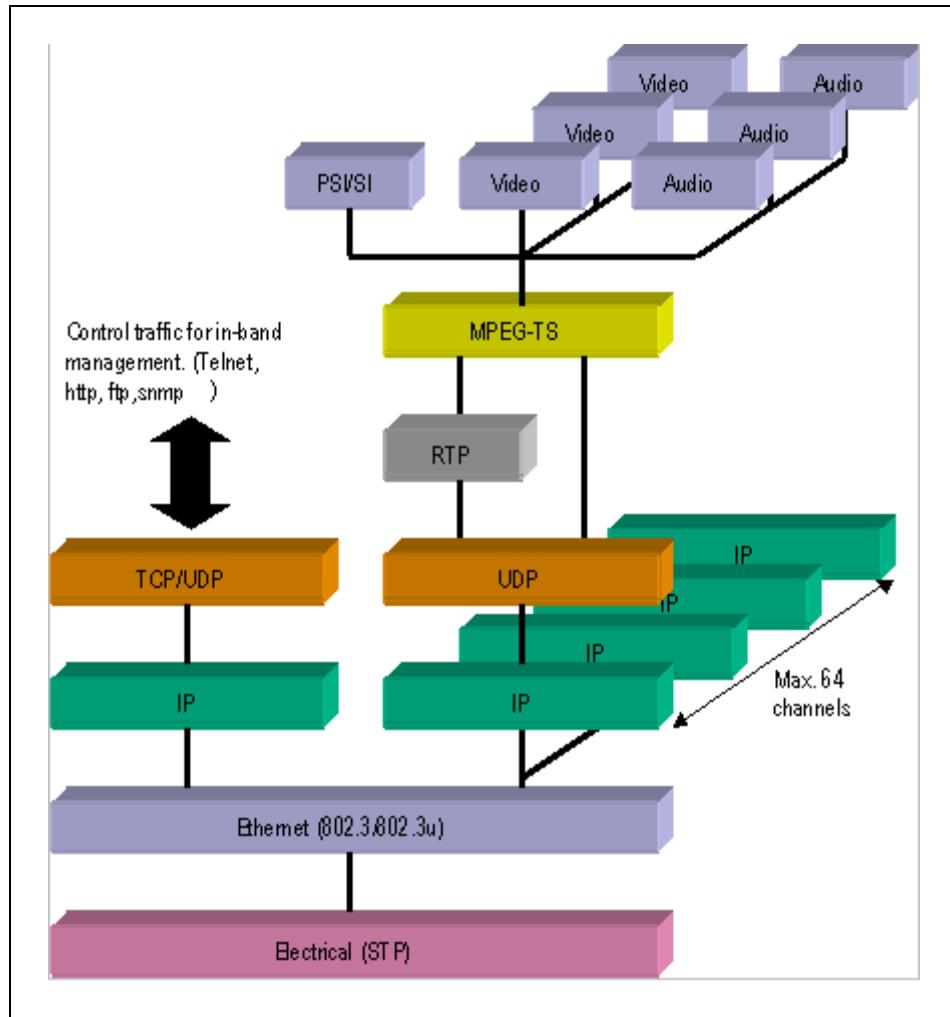


Figure 6.2 Mapping of MPEG-2 TS Packets

6.1.3 MPEG Layer

The MPEG-2/DVB layer is specified in ISO/IEC IS 13818 Generic Coding of Moving Pictures and Associated Audio. The main functionality of this layer is to transform MPTS (Multi-Program Transport Streams) into a number of SPTS (Single-Program Transport Streams). A Transport Stream carrying multiple programs is in this way split into a number of mini Transport Streams, each carrying a single program. This ensures that the video can be passed through limited bandwidth links such as ADSL further down the transmission path.

6.1.4 RTP Layer

The RTP layer is optional, and will add an 8-byte RTP header to the new packet. This header contains a sequence number and a time stamp.



6.1.5 UDP Layer

The UDP layer is according to RFC768 User Datagram Protocol. The user can control the target UDP port number for the MPEG-2 stream. A configurable number of 188-byte long MPEG-2 TS packets are mapped straight into an UDP frame with no additional overhead. The MTU for Ethernet is usually 1500 bytes. This limits the number of MPEG-2 TS packets per UDP frame to lie within 1 to 7. The following illustration shows the mapping of MPEG-2 Transport Streams into UDP packets.

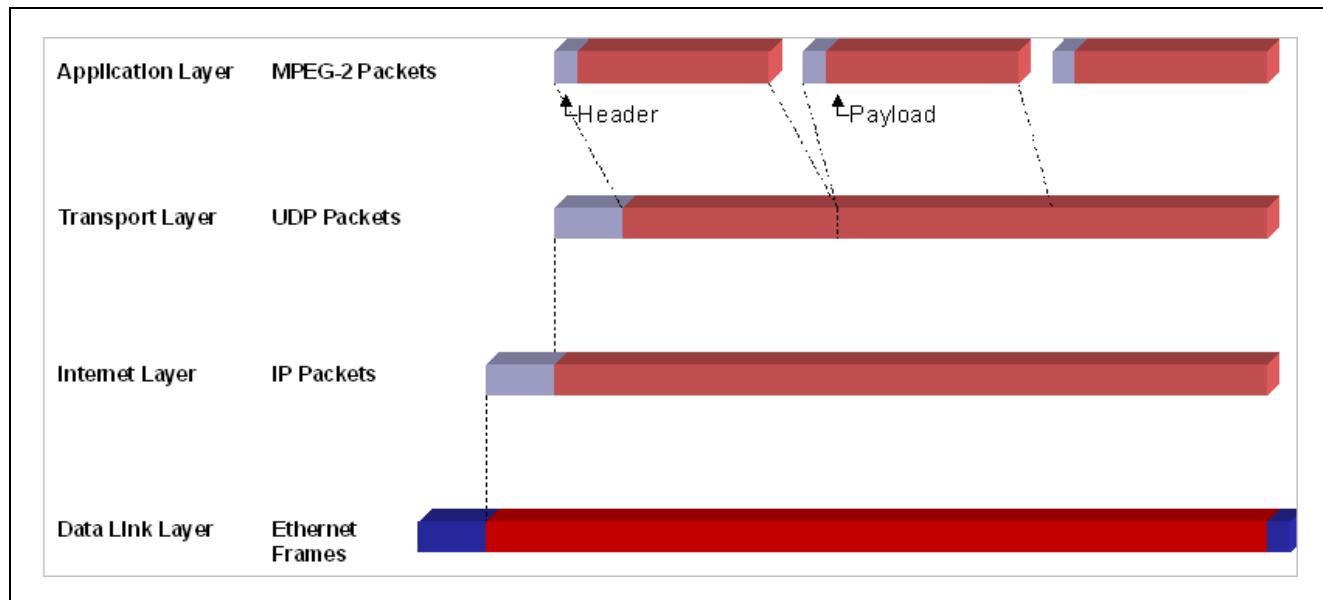


Figure 6.3 Mapping of MPEG-2 TS Packets

6.1.6 IP Layer

The IP layer is according to RFC791 Internet Protocol Specification. The user is allowed access to the following IP header fields: IP source address, IP destination address, Time-To-Live field, Type-Of-Service field. Performing static mapping between class-D IP addresses and the corresponding Ethernet multicast MAC addresses supports limited IP Multicasting (Type 1).

6.1.7 Ethernet Layer

The data link layer is Ethernet according to IEEE 802.3/802.3u (auto sensing 10/100 Mbps, Twisted Pair, RJ-45 connector).

6.1.8 IP Overhead

The IP overhead calculation when mapping MPEG-2 TS packets into IP frames is shown in *Table 6.1*.

**Table 6.1 IP Overhead**

Item	Overhead factor	Comments
MPEG-2 TS	1.0	
UDP	$1324/1316 = 1.006$	UDP header=8 bytes
IP	$1344/1324 = 1.015$	IP header=20 bytes
Ethernet	$1358/1344 = 1.010$	Eth header=14 bytes

Total overhead factor becomes: $1.006 \times 1.015 \times 1.010 = 1.031$ or 3.1% overhead.

Note: The number of MPEG-2 TS packets one can map down into each UDP frame is variable (between 1 and 7). Usually 7 is used for minimum overhead. This is also used in the above calculation.

6.2 Data Network Redundancy

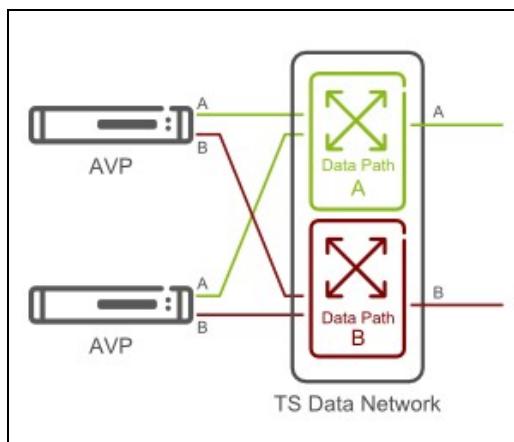
6.2.1 Redundancy

Note: Both outputs of a pair are active at the same time; therefore the use of primary and secondary ports is meaningless in this configuration.

The four Ethernet data ports operate as two redundant pairs. Data 1 and 2 (Ge1 with Ge2) are inputs and Data 3 and 4 (Ge3 with Ge4) are outputs.

When an output transport stream is defined, it is assigned by the user to Data 3 and 4.

Both ports are independent of each other i.e. the IP address, MAC address, subnet mask and default gateway can have different settings. Both ports are active at the same time and transmit the same data. If both ports are configured to be on the same subnet, only one port will respond to ICMP messages.

**Figure 6.4 Data Network Redundancy**

The data ports can raise an alarm during abnormal operational conditions.



6.3 Data Routing

6.3.1 Packet Processing

Every received packet is examined and based on a routing table, determines where the packet should be routed, or whether the packet should be dropped.

The only received packets that need to be processed are:

- ARP
- ICMP
- Reflex PCR Exchange Messages (UDP)

The only possible destinations for received packets are:

- The Reflex PCR Exchange Message Handler
- The Host Processor

6.3.2 Handling Processed Packets

Packets are routed or dropped based on the following fields:

- MAC destination address
- Source IP address and mask
- Destination IP address and mask
- EtherType (to allow filtering of ARP ICMP STP etc)
- UDP and TCP Destination UDP Port Number

6.4 Setmode

6.4.1 Overview

The Setmode function enables the switch of the operation states of the services or of the whole device.

6.4.2 Operation States

The Setmode function is available on two levels: media and unit level. The function provides five states on both of the levels.



6.4.2.1

Offline Mode

In offline mode, the entity does not enable the emissions and the input related alarms.

6.4.2.2

Retire Mode

In retire mode, the entity coordinates its going offline with a stand-by entity taking over the media transmission.

6.4.2.3

Preview Mode

In preview mode, the entity attempts to transmit a transport stream, but not the associated emissions. This mode can be used for monitoring an output or for pre-configuring a unit or transport stream output for fast redundancy switching.

6.4.2.4

Takeover Mode

Takeover mode is applied only for entities requiring external synchronization. The device waits for the correct synchronization in this state, and transmits only when the synchronization is correct.

6.4.2.5

Online Mode

In online mode, the entity transmits a transport stream output and other emissions for online operations. The input related alarms are enabled.

Note: The redundancy switch coordination is supported by the Multicast Guard Protocol (MGP). If MGP is disabled, retire, preview and takeover modes are not available.

The following setmode transitions are not supported: offline to retire, retire to preview, and preview to retire.

6.4.3

Configuring Setmode

To set up Multicast Guard Protocol (MGP), browse to **Device Configuration > Advanced Setup**, select **MGP Support** and set the **MGP Mode** parameter in the **Properties** widget. When using the front panel menu, select **Advanced/System/MGP Support/MGP Mode**.

In off state, only offline or online mode can be set for both the unit and the media.

In module level state, only offline or online mode can be set for the unit, but any of the five possible modes for the media.

In unit level state, any of the five possible modes can be set for the unit, but only offline or online mode for the media.



6.4.3.1

Configuring Setmode on Unit Level

By browsing to **Device Configuration > Advanced Setup** and selecting **Base Unit**, the Setmode can easily be configured by **Offline** and **Online** buttons and by the **Current State** Parameter in the **Properties** widget. On the front panel, select **Advanced/System/Base Unit/Change State**.

6.4.3.2

Configuring Setmode on Media Level

By browsing to **Service Configuration** and selecting the appropriate **Transport Stream** in the **Outputs** widget, Setmode can easily be configured by **Offline** and **Online** buttons and by the **Status of Service** parameter in the **Properties** widget under the **Transport Stream** accordion panel. On the front panel, select **Output/Slot n/ Transport Stream ID: n/Change State**.

6.5

XPO

The unit supports an HTTP/HTTPS interface that is XPO2 compliant for configuration and status monitoring. At least three simultaneous HTTP/HTTPS sessions can be supported. HTTP access can be enabled or disabled.

Individual parameters can be controlled via XPO2. It does not require the complete XML configuration to be sent to change a single parameter.

Note: The legacy XPO standard is not supported.

The web pages provide a service orientated control menu structure.

6.6

User Access

6.6.1

User Authentication

The unit supports user authentication as defined in the XPO Specification. By default, user authentication is turned off. When set to **On**, a user name and password is required to access the web pages. The default user name (engineer) and password (password) can be changed by the user under the **Encoder > Base Unit > User Authentication node in Device Configuration > Advanced Setup** through the web user interface or in the **Advanced/System/Base Unit/User Authentication** menu through the Front Panel.



6.7 VCM Video Encoding Functionality

6.7.1.1 Overview

The VCMs process the video input signal into a compressed encoded bit stream in accordance with the appropriate specification (ITU-T H.264 or ISO/IEC MPEG-4 AVC, MPEG-2 specification (ISO/IEC 13818) or JPEG 2000 specification (ITU-T Rec. T.802 or ISO/IEC 15444-3)).

6.7.1.2 Functional Description for VCMs

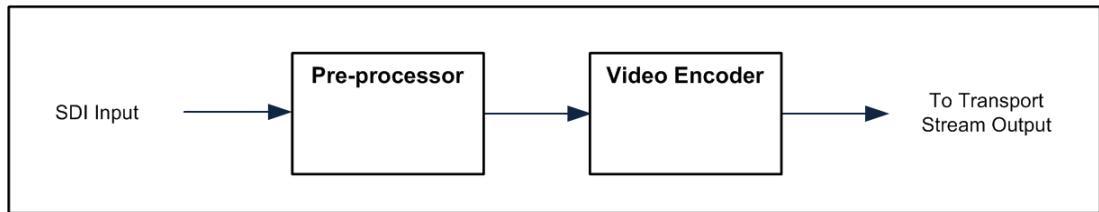


Figure 6.5 CE VCM Functional Diagram

The 3G/HD/SD-SDI Video Input can be configured to accept either 25 Hz or 29.97 Hz video. The Pre-processor has a video frame re-synchronizer which allows the video frame rate to be locked to the Unit 27 MHz clock, or to a 27 MHz clock locked to an external sync input if an External Sync Input option card (HWO/EXTSYNC) is fitted. If the unit is configured to be locked to video, then the frame re-synchronizer is inactive.

The Pre-processor can perform horizontal and vertical scaling and bandwidth filtering on the video prior to passing it on to the Video Encoder. It can also generate a test pattern or repeat the last frame received if the video input is not valid.

The Video Encoder processes the video from the Pre-processor into a compressed encoded bit-stream in accordance with the relevant specification.

It can produce a constant bit rate (CBR) output, which can be set in the range 1 Mbps to 200 Mbps depending upon encoder and profile.

The Video Encoder can be configured for CBR, Low Delay, Mega Low Delay (available only for CE-x VCM variants), Ultra Low Latency (CE-a/J2K only), Stripe Refresh or a Seamless buffer mode. The available modes are dependent upon VCM type and available licenses.

CBR is the recommended buffer mode for optimum video quality, while the Low Delay buffer modes give lower video encoding delay, where video quality may be impacted. In non seamless buffer modes, the compressed video output will glitch if the video bit rate is changed.

Seamless mode is used for internal Reflex operation and the video output will not glitch when the video bit rate is changed.



6.7.1.3

Video Compression Functionality

Table 6.2 summarizes the compression profiles and levels. The availability of each depends upon the type of VCM and the available licenses.

Table 6.2 VCM Compression Profiles and Levels

Profile and Level	Supported Buffer Modes (dependant on VCM type and license)
HD H.264	
HD H.264 Main Profile Level 4.0 4:2:0 8 bit	CBR, Seamless, Low Delay, Mega Low Delay, Stripe Refresh, Stripe Refresh (+ Audio Encode)
HD H.264 High Profile Level 4.0 4:2:0 8 bit	
HD H.264 High Profile Level 4.1 4:2:0 8 bit	
HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit	
HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit	
HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit	Low Delay, Mega Low Delay
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit	
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	
HD MPEG-2	
HD MPEG-2 Main Profile High Level 4:2:0 8 bit	CBR, Seamless, Low Delay, Mega Low Delay,
HD MPEG-2 High Profile High Level 4:2:2 8 bit	
SD H.264	
SD H264 Main Profile Level 3.0 4:2:0 8 bit	CBR, Seamless, Low Delay, Mega Low Delay, Stripe Refresh, Stripe Refresh (+ Audio Encode)
SD H264 High Profile Level 3.0 4:2:0 8 bit	
SD H264 High Profile Level 3.1 4:2:0 8 bit	
SD H264 High 422 Profile Level 3.1 8 bit	
SD H264 High 422 Profile Level 3.1 10 bit	
SD MPEG-2	
SD MPEG-2 Main Profile @ Main Level 4:2:0 8 bit	CBR, Seamless, Low Delay, Mega Low Delay,
SD MPEG-2 422 Profile @ Main Level 4:2:2 8 bit	
JPEG2000	
SD J2K Profile Level 1 4:2:2 10 bit	Compatibility Mode, Ultra Low Delay Mode
HD J2K Profile Level 1 4:2:2 10 bit	



6.7.1.4

VCM Supported Profiles, Bit Rates and Modes*Table 6.3 VCM Supported Profiles, Bit Rates and Modes*

	CE-x CE-xA	CE-a	CE-a/J2K			
	Bit rate Range (Mbit/s)					
PROFILE						
HD H.264						
HD H.264 Main Profile Level 4.0 4:2:0 8 bit	1 - 20	1 - 20				
HD H.264 High Profile Level 4.0 4:2:0 8 bit	1 - 25	1 - 25				
HD H.264 High Profile Level 4.1 4:2:0 8 bit	1 - 62.5	1 - 50				
HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit	1 - 80					
HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit	1 - 80					
HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit	5 - 62.5					
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit	10 - 80					
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	10 - 80					
HD MPEG-2						
HD MPEG-2 Main Profile High Level 4:2:0 8 bit	2 - 80	2 - 50				
HD MPEG-2 High Profile High Level 4:2:2 8 bit	2 - 80					
SD H.264						
SD H264 Main Profile Level 3.0 4:2:0 8 bit	0.5 - 10	0.5 - 10				
SD H264 High Profile Level 3.0 4:2:0 8 bit	0.5 - 12.5	0.5 - 12.5				
SD H264 High Profile Level 3.1 4:2:0 8 bit	0.5 - 17.5	0.5 - 17.5				
SD H264 High 422 Profile Level 3.1 8 bit	0.5 - 25					
SD H264 High 422 Profile Level 3.1 10 bit	0.5 - 25					
SD MPEG-2						
SD MPEG-2 Main Profile @ Main Level 4:2:0 8 bit	1.5 - 15	1.5 - 15				
SD MPEG-2 422 Profile @ Main Level 4:2:2 8 bit	1.5 - 50					
JPEG2000						
SD J2K Profile Level 1 4:2:2 10 bit						
HD J2K Profile Level 1 4:2:2 10 bit						



	CE-x CE-xA	CE-a	CE-a/J2K
BUFFER MODE			
Seamless			
CBR	YES	YES	
Low Delay	YES	YES	
Mega Low Delay	YES		
Compatibility Mode			YES
Ultra Low Delay Mode			YES
Stripe Refresh	YES		
Stripe Refresh (+ Audio Encode)	YES		

Notes: When configured in Stripe Refresh buffer mode (only available with H.264 encoding) the bit rate range is limited to 4 Mbps to 10 Mbps in SD, and 8 Mbps to 40 Mbps in HD.

When configured in Stripe Refresh (+ Audio Encode) (only available with H.264 encoding) the bit rate range is limited as above and the delay is increased from <100 ms to <150 ms to allow for the audio encode process.

6.7.1.5 Test Patterns

The video pre-processor can generate the test patterns listed in *Table 6.4*.

Table 6.4 Test Patterns

Test Pattern
Black
Color bars
Moving object
Slate

Notes: On loss of video the VCM can be configured to select freeze frame, test pattern, or turn off video PID.

If the PID is removed from the output, a Transport Stream analyzer device will report the removed PID as a ghost PID, because the reference to it is still transmitted in the Program Map Table of the MPEG Program Specific Information.

6.7.1.6 Impairment Reduction

The video pre-processor provides a motion adaptive temporal noise reduction option.

**Table 6.5 Impairment Reduction Details**

Impairment Reduction	Comments
Spatial Filtering	The amount of filtering is configurable.

6.7.1.6.1

InLoop Filter

For H.264 encoding, the perceived image quality is further enhanced by utilizing a de-blocking filter in the feedback loop. This filters the frames after decoding, but before they are stored in the decoded picture buffer, in order to try and remove block edge artefacts.

6.7.1.6.2

Temporal Noise Reduction

When the CE/SWO/MCTF license is enabled the pre-processor can provide temporal noise reduction which is motion adaptive (backs-off the filtering with motion) to the sub-frame level.

6.7.1.6.3

Stills Detection Control

Setting this to other than **Off** will override the in-built intelligent stills detection. This saves bit rate but has undesired video quality effects on complex stills.

6.7.1.6.4

Film Mode

The pre-processor identifies 3:2 pull-down sequences. Based on this information the encoding engine identifies the appropriate fields as repeated. Film Mode can only be used for SD inputs with a frame rate of 29.97 Hz.

6.8

VCM Video Operating Modes

Note: The output of the VCM may contain a discontinuity when the operating mode (profile, buffer mode etc.) is changed.

6.8.1

Seamless Mode

In Seamless buffer mode, a change in the video bit rate will result in no glitches in the encoded video. As a tradeoff for the glitch free output video the video quality will be somewhat reduced.

Any audio configuration is supported when the video is configured for seamless buffer mode.

6.8.1.1

Non-seamless Modes (CBR, Low Delay, Mega Low Delay, Compatibility, Ultra Low Delay or Stripe Refresh)

When operating in a non-seamless mode, the output of the module may be discontinuous when the bit rate is changed.



6.8.1.1.1

Constant Bit Rate (CBR) Mode (CE-x, CE-xA, and CE-a)

The module supports a CBR constant bit rate mode (standard delay).

Any audio configuration is supported when the video is configured for CBR buffer mode.

6.8.1.1.2

Low Delay Buffer Mode (CE-x, CE-xA, and CE-a)

The module supports a Low Delay buffer mode. Depending on video encoding parameters, this can reduce the encode delay to 350 ms (for performance summary see table below), but will have an impact on video quality.

Parameters that primarily impact both delay and quality are the GOP Structure and the Scene Cut Detection. Setting up low bit rates can increase the delay.

When configured in Low Delay buffer mode the supported audio is limited to MPEG-1 Layer II encode, Dolby Digital Encode, LPCM pass-through, Dolby Digital pass-through and Dolby E pass-through.

6.8.1.1.3

Mega Low Delay Mode (CE-x and CE-xA)

The module supports a Mega Low Delay buffer mode. Depending on video encoding parameters, this can reduce the encode delay further (see table below), but will have an impact on video quality. Parameters that primarily impact both delay and quality are GOP structure and scene cut detection. Low bit rates can increase the delay.

Note: When a VCM is configured for Mega Low Delay buffer mode the system Clock Source (Mux SCR Source available under the Base Unit node in the **Device Configuration > Advanced Setup > Advanced Video Processor Settings** widget) MUST be set to **Video**.

When configured in Mega Low Delay buffer mode the supported audio is limited to MPEG-1 Layer II, LPCM pass-through, Dolby Digital pass-through and DolbyE pass-through.

6.8.1.1.4

Compatibility Mode (CE-a J2K)

In compatibility mode the end-to-end delay introduced by the JPEG2000 encoding and decoding the maximum delay remains below 160 ms, as set forth in the ITU-T.802 or ISO/IEC 15444-3 specification.

Audio encoding is not supported in JPEG 2000. Only LPCM Pass-through or Dolby E audio pass-through operation is supported.

6.8.1.1.5

Ultra Low Delay Mode (CE-a J2K)

The CE-a J2K module supports an Ultra Low Delay buffer mode. Depending on the video encoding parameters, this can reduce the encode delay to as low as 100 ms (see table below).



Audio encoding is not supported in JPEG 2000. Only audio Only LPCM Pass-through or Dolby E pass-through operation is supported.

6.8.1.1.6

Stripe Refresh (CE-x, CE-xA)

When the AVP/SWO/CE-x/STRIPE license is enabled, and the unit configured for H.264 encoding, a Stripe Refresh buffer mode becomes available which can provide an end to end latency of sub 100 ms when combined with the Ericsson RX8200.

This mode has a limited set of configurable parameters to ensure that minimum latency is achieved. This, however does make this mode more suited to “talking heads” content rather than action, fast moving or frequent scene changes.

When configured in Stripe Refresh buffer mode the bit rate range is limited as follows:

- 4 Mbps to 10 Mbps in SD
- 8 Mbps to 40 Mbps in HD

Audio encoding is not supported in Stripe Refresh mode. Only LPCM Pass-through or Dolby E Pass-through operation is supported.

6.8.1.1.7

Stripe Refresh (+ Audio Encode) (CE-x, CE-xA)

This mode adds support for MPEG-1 Layer II audio encode to Stripe Refresh. The same license, configuration and bit rate limitations apply.

In order to support Audio Encode, the delay in this mode is increased from <100 ms to <150 ms compared to the Stripe Refresh mode.

6.8.1.2

Typical Delay Performance

The typical performance of each type of delay is shown in the tables below.

Note: The delay figures provided in the table assumes a GOP Structure set to IP, Scene Cut Detection to Off for H.264, On for MPEG-2, and a HD 1080i video format.

6.8.1.2.1

25/50 Hz

Table 6.6 Low Delay 25/50 Hz

	Video Encoding	Encode Delay	Applicable Bit Rate Range ¹	Notes
CE-x and CE-xA	HD H.264	350 ms	10 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 15 Mbps
	SD H.264	350 ms	3 Mbps – 25 Mbps	Recommended minimum bit rate for contribution = 3 Mbps
	HD MPEG-2	430 ms	12 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 30 Mbps
	SD MPEG-2	430 ms	4 Mbps – 37 Mbps	Recommended minimum bit rate for contribution = 6 Mbps



	Video Encoding	Encode Delay	Applicable Bit Rate Range¹	Notes
CE-a	HD H.264	720 ms	7 Mbps – 50 Mbps	Recommended minimum bit rate for contribution = 15 Mbps
	SD H.264	720 ms	3 Mbps – 17.5 Mbps	Recommended minimum bit rate for contribution = 3 Mbps
	HD MPEG-2	<800 ms	7 Mbps – 50 Mbps	Recommended minimum bit rate for contribution = 30 Mbps
	SD MPEG-2	<800 ms	3 Mbps – 15 Mbps	Recommended minimum bit rate for contribution = 6 Mbps

¹ Bit rates lower than the range specified result in larger encode delay.

Table 6.7 Mega Low Delay 25/50 Hz

	Video Encoding	Encode Delay	Applicable Bit Rate Range¹	Notes
CE-x and CE-xA	HD H.264	290 ms	10 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 15 Mbps
	SD H.264	290 ms	4 Mbps – 25 Mbps	Recommended minimum bit rate for contribution = 3 Mbps
	HD MPEG-2	370 ms	12 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 30 Mbps
	SD MPEG-2	370 ms	4 Mbps – 37 Mbps	Recommended minimum bit rate for contribution = 6 Mbps

Table 6.8 Compatibility Mode 25/50 Hz

	Scan	Encode Delay	Applicable Bit Rate Range	Notes
CE-a J2K	Interlaced	<160 ms	1 Mbps - 50 Mbps	
	Progressive	<140 ms	1 Mbps - 50 Mbps	

Table 6.9 Ultra Low Delay 25/50 Hz

	Scan	Encode Delay	Applicable Bit Rate Range	Notes
CE-a J2K	Interlaced	<116 ms	1 Mbps - 50 Mbps	
	Progressive	<101 ms	1 Mbps - 50 Mbps	



6.8.1.2.2 29.97/59.94 Hz

Table 6.10 Low Delay 29.97/59.94 Hz

	Video Encoding	Encode Delay	Applicable Bit Rate Range ¹	Notes
CE-x and CE-xA	HD H.264	333 ms	10 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 15 Mbps
	SD H.264	333 ms	3 Mbps – 25 Mbps	Recommended minimum bit rate for contribution = 3 Mbps
	HD MPEG-2	400 ms	12 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 30 Mbps
	SD MPEG-2	400 ms	4 Mbps – 37 Mbps	Recommended minimum bit rate for contribution = 6 Mbps
CE-a	HD H.264	667 ms	7 Mbps – 50 Mbps	Recommended minimum bit rate for contribution = 15 Mbps
	SD H.264	667 ms	3 Mbps – 17.5 Mbps	Recommended minimum bit rate for contribution = 3 Mbps
	HD MPEG-2	<700 ms	7 Mbps – 50 Mbps	Recommended minimum bit rate for contribution = 30 Mbps
	SD MPEG-2	<700 ms	3 Mbps – 15 Mbps	Recommended minimum bit rate for contribution = 6 Mbps

Table 6.11 Mega Low Delay 29.97/59.94 Hz

	Video Encoding	Encode Delay	Applicable Bit rate Range ¹	Notes
CE-x and CE-xA	HD H.264	290 ms	10 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 15 Mbps
	SD H.264	290 ms	4 Mbps – 25 Mbps	Recommended minimum bit rate for contribution = 3 Mbps
	HD MPEG-2	370 ms	12 Mbps – 80 Mbps	Recommended minimum bit rate for contribution = 30 Mbps
	SD MPEG-2	370 ms	4 Mbps – 37 Mbps	Recommended minimum bit rate for contribution = 6 Mbps

Table 6.12 Compatibility Mode 29.97/59.94 Hz

	Scan	Encode Delay	Applicable Bit rate Range	Notes
CE-a J2K	Interlaced	<140 ms	1 Mbps - 50 Mbps	
	Progressive	<120 ms	1 Mbps - 50 Mbps	

Table 6.13 Ultra Low Delay 29.97/59.94 Hz

	Scan	Encode Delay	Applicable Bit rate Range	Notes
CE-a J2K	Interlaced	<100 ms	1 Mbps - 50 Mbps	
	Progressive	<88 ms	1 Mbps - 50 Mbps	



6.8.1.3

Audio Compatibility in Low Delay, Mega Low Delay, Ultra Low Delay and Compatibility Modes

Only MPEG-1 Layer II encode, Dolby Digital Pass-through, Dolby E Pass-through and Linear PCM Pass-through audio modes are supported in Low Delay and Mega Low Delay buffer modes. Additionally, Dolby Digital Encode is supported in Low Delay mode. Other audio encoding modes are available (if licensed) but lipsync and buffer compliance cannot be guaranteed with them.

The CE-a J2K only supports Dolby E Pass-through and Linear PCM Pass-through audio modes. It does not support audio encoding, so there are no implications in Ultra Low Delay and Compatibility modes.

6.9

VCM Audio Encoding Functionality

The VCMs support a wide variety of input audio signals, and can encode them in various formats or pass them as they are received (Pass-through mode). *Table 6.14* describes the different input interfaces, the number of audio channel pairs that can be fed to the unit using the appropriate interfaces, and the encoding methods supported by the various option cards in the CE VCM family.

Table 6.14 VCM Input Interfaces and Audio Encoding Methods

	Format	Audio Channel Pairs	License	Note
Input Interfaces	SD-SDI	Up to 8 embedded		CE-a/J2K up to 4
	HD-SDI	Up to 8 embedded		CE-a/J2K up to 4
	Digital (AES/EBU)	4		
	Analog	0		2 on CE-xA only
Encoding	MPEG-1 Layer II	2 free, 2 per additional license	CE/SWO/MP1L2	Max licenses = 8 per VCM
	Dolby Digital	1 per license	CE/SWO/DOLBY/AC3	Max licenses = 6 per VCM 3 required for 5.1
	AAC LC	1 per license	CE/SWO/AAC	Max licenses = 6 per VCM 3 required for 5.1
	HE-AAC	1 per license	CE/SWO/AAC	Max licenses = 6 per VCM 3 required for 5.1
	Dolby Digital Pass-through	8		
	Dolby E Pass-through	8		Except CE-a/J2K = 4
	LPCM Pass-through	8		Except CE-a/J2K = 4



Note: Although there are more sources from the physical inputs, the maximum number of input streams supported is 8 for CE-x, CE-xA and CE-a, and 4 for CE-a J2K, which can be from either of the input sources.

Any audio input can be associated with the video being processed, and the audio encoding delay will be matched to the video encoding delay so that audio/video synchronization (lipsync) is maintained.

All audio components are configurable on a per channel basis. Parameters include the source of the audio, its encoding configuration and output PID.

6.9.1 Audio Input Interfaces

The Pre-processor function on the different VCMs accepts digital audio input from either de-embedding from the HD/SD-SDI input or as a balanced ($110\ \Omega$) or unbalanced AES/EBU input ($75\ \Omega$) from the D type back panel connector. Additionally, on a CE-xA, analogue audio can be input through a $20\ k\Omega$ balanced or unbalanced input.

6.9.2 HD-SDI Input

The VCM can receive four groups of audio streams embedded in the HD serial digital interface (HD-SDI) feed. Each group contains two channel pairs. Hence the HD-SDI feed can carry up to a maximum of $2 \times 4 = 8$ pairs, or 16 mono channels.

Each group has an associated Data Identifier (DID). The Did's are set to the SMPTE 299M defaults for audio group 1 to group 4:

- Group 1 = 0x2E7
- Group 2 = 0x1E6
- Group 3 = 0x1E5
- Group 4 = 0x2E4

The Did's are located in ancillary packets in the data stream. They are fixed at the SMPTE 299M defaults.

6.9.3 SDI Input

The VCM can receive four groups of audio streams embedded in the serial digital interface (SDI) feed. Each group contains two channel pairs. Hence the SDI feed can carry up to a maximum of $2 \times 4 = 8$ pairs, or 16 mono channels.

Each group has an associated Data Identifier (DID). The Did's are set to the SMPTE 272M defaults for audio group 1 to group 4:

- Group 1 = 0x2FF
- Group 2 = 0x1FD



- Group 3 = 0x1FB
- Group 4 = 0x2F9

The DIDs are located in ancillary packets in the data stream. They are fixed at the SMPTE 272M defaults. DID 1F4 is reserved for EDH error packets. Refer to the SMPTE 272M specification for more details.

6.9.4 Digital Input

The digital input of the VCM accepts four EBU/AES-3 streams that can carry uncompressed or compressed audio. Digital input is provided by the 15-pin D-Sub connector located on the backplane of the VCM.

6.9.5 Analogue Input (CE-xA)

The CE-xA option card provides two stereo analogue audio inputs through the 15-pin D-Type Audio connector. The inputs can be balanced or unbalanced with an input impedance of 20 kΩ.

6.10 Vertical Blanking Interval (VBI) and Ancillary (ANC) Data

The video stream ingested through the SDI/HD-SDI input on the VCM can carry additional data associated with the video stream. These data are either inserted in the horizontal or vertical blanking region (ANC) or in the non-active television lines (VBI).

6.10.1 Ancillary Data

There are two positions in the video stream where ANC packets are allowed. The first is the horizontal blanking interval of the video line, called the horizontal ANC space (HANC). The second is the active portion of the video lines in the vertical blanking interval, called the vertical ANC space (VANC). HANC and CANC of the SDI signal can carry specific ancillary (ANC) data. The encoder then can be set up to extract and re-packetize the data carried in the HANC or VANC based on the ANC data type.

6.10.1.1 Closed Captions

Closed Caption data and any user data embedded in the SDI/HD-SDI according to SMPTE 334, is extracted and inserted into the picture user data of the video stream in accordance with ATSC A/72 part 1.

Information regarding the closed captions is carried in PSI as per ATSC A/72 part 2.



6.10.1.2 Time Code

Time code is extracted from HANC of the incoming video and carried in the transport stream adaptation layer as described in Annex E of ETSI TS 101 154 (AU_information).

6.10.1.3 OP-47

Teletext subtitles can be extracted from ANC in accordance with OP-47 and carried in a Teletext PID.

6.10.1.4 AFD

As part of the ANC Data, Active Format Description codes can also be transmitted. These codes provide information to video devices about where in the coded picture the active video is. The codes are defined by ETSI TS 101 154 V1.7.1 Annex B, ATSC A/53 Part 4 and SMPTE 2016-1-2007.

Active Format Descriptor (AFD) uses three bits of video index to define the video format. This information is encoded into user data and can then be used by a Decoder for wide-screen switching.

6.10.1.5 Generic ANC

Up to 2 Mbps of generic data can be extracted from ANC of the incoming video and encapsulated in accordance with SMPTE 2038 (Carriage of Ancillary Data Packets in an MPEG-2 Transport Stream).

6.10.2 VBI Data

The extraction of VBI types can be enabled or disabled individually. The video line from which the VBI is extracted can also be configured. The default is set according to the relevant standard for the VBI type.

6.10.2.1 VBI Lines

Up to 8 VBI lines per field can be extracted. Unless otherwise stated, all VBI data are formed into one VBI transport stream packet that conforms to ETSI EN 301 775 or SCTE 127.

6.10.2.2 VBI Data

Data can be extracted from the vertical blanking interval of the incoming video stream, processed, and then included in the output transport stream. The following table summarizes the VBI data types supported by the VCM module.

**Table 6.15 VBI Data Types**

Component	Comments
Video Index	It is possible to extract video index and another VBI type from the same line.
Closed Captions	Via line 21 & 284 (CEA-608C).
Monochrome 4:2:2	Up to 3 lines can be extracted per frame.
Teletext	Up to 18 lines can be extracted per field.
Aspect Ratio Signaling	WSS/WSS-AFD

6.10.2.3**VBI Data on a Separate PID**

The VBI data is packetized into MPEG-2 PES packets according to ETSI ETS 300-472 for Teletext and ETSI EN 301 775 or SCTE 127 for all other VBI data types. Closed caption data and aspect ratio signaling can also be inserted into the compressed video elementary stream.

6.10.2.4**Timing**

The VCM aligns the VBI data and the compressed video frames, i.e. it uses the same PTS for the video and the VBI data if they are from the same frame.



BLANK



Options, Licensing and Upgrades

Chapter 7

Contents

7.1	Introduction.....	7-3
7.2	Option Cards Available at this Release	7-3
7.3	Option Card Combinations	7-4
7.4	Video Compression Modules.....	7-5
7.4.1	CE-a VCM	7-5
7.4.2	CE-a J2K VCM	7-8
7.4.3	CE-x VCM.....	7-10
7.4.4	CE-xA VCM	7-14
7.5	ASI I/O Option Card.....	7-17
7.5.1	General.....	7-17
7.5.2	Interfaces.....	7-17
7.6	G.703 Transceiver Card	7-18
7.6.1	General.....	7-18
7.6.2	Interfaces.....	7-18
7.7	External Sync Input Option Card	7-19
7.7.1	General.....	7-19
7.7.2	Interfaces.....	7-19
7.8	GPI Option Card	7-19
7.8.1	General.....	7-19
7.8.2	GPI Triggered Splicing	7-20
7.8.3	Alarm Relay	7-20
7.8.4	Load Stored Configurations (Not supported in this Release).	7-20
7.8.5	Data Input (Not supported in this Release).	7-20
7.8.6	Interfaces.....	7-20
7.9	Satellite Modulator Option Card (AVP 3000 Voyager Only)	7-21
7.9.1	General.....	7-21
7.9.2	Interfaces.....	7-21
7.9.3	Modulation	7-22
7.9.4	Encryption.....	7-22
7.10	Software and Firmware Upgrades	7-22
7.11	Removal and Replacement of Modules.....	7-22
7.11.1	Handling Modules	7-23
7.11.2	Electrostatic Discharge	7-23
7.11.3	Installing a New Module	7-24
7.11.4	Removing a Module	7-25
7.11.5	Replacing (Hot-Swapping) a Module	7-25
7.11.6	Option Card Plug-and-Play.....	7-26



List of Figures

Figure 7.1 Option Card Slot Numbering – 1AC Chassis	7-4
Figure 7.2 CE-a VCM	7-5
Figure 7.3 CE-a J2K VCM	7-8
Figure 7.4 CE-x VCM	7-10
Figure 7.5 CE-xA VCM	7-14
Figure 7.6 ASI I/O Option Card	7-17
Figure 7.7 G.703 Transceiver Card	7-18
Figure 7.8 External Sync Input Option Card.....	7-19
Figure 7.9 Satellite Modulator Option Card	7-21
Figure 7.10 Inserting and Withdrawing Modules	7-23

List of Tables

Table 7.1 Option Cards Available at this Release.....	7-3
Table 7.2 Option Card Combinations	7-4
Table 7.3 CE-a Encoder Licenses and Supported Encoder Modes.....	7-5
Table 7.4 CE-a Encoder Video Profiles and Bit Rate Ranges	7-5
Table 7.5 CE-a VCM Audio Encoding Licenses.....	7-6
Table 7.6 Other CE-a VCM Licenses	7-6
Table 7.7 CE-a J2K Licenses.....	7-8
Table 7.8 CE-x Encoder Licenses and Supported Encoder Modes.....	7-10
Table 7.9 CE-x Encoder Video Profiles and Bit Rate Ranges.....	7-10
Table 7.10 CE-x VCM Audio Encoding Licenses	7-11
Table 7.11 Other CE-x VCM Licenses	7-11
Table 7.12 CE-xA Encoder Licenses and Supported Encoder Modes.....	7-14
Table 7.13 CE-xA Encoder Video Profiles and Bit Rate Ranges	7-14
Table 7.14 CE-xA VCM Audio Encoding Licenses.....	7-15
Table 7.15 Analogue Video Standard Parameters.....	7-16



7.1 Introduction

This chapter describes the options that may be used with the Ericsson Advanced Video Processor (AVP) Family, and the removal and replacement of options. It also describes the procedure for obtaining licenses and how to upgrade your unit.

7.2 Option Cards Available at this Release

Table 7.1 lists the option cards that are supported at this release.

Table 7.1 Option Cards Available at this Release

Marketing Code	Name	Description	Supported in
CE/HWO/CE-x	CE-x	CE-x dual card video encoder module	AVP 2000, AVP 3000
CE/HWO/CE-xA	CE-xA	CE-xA analogue input dual card video encoder module	AVP 2000, AVP 3000
CE/HWO/CE-a	CE-a	CE-a single card video encoder module	AVP 2000, AVP 3000
CE/HWO/CE-a/J2K	CE-a J2K	CE-a single card JPEG 2000 video encoder module	AVP 2000, AVP 3000
CE/HWO/ASI/2IN2OUT VP/HWO/ASI/2IN2OUT	ASI IO Option Card	ASI Input/Output Option Card	AVP 2000, AVP 3000
CE/HWO/G703	G.703 Transceiver Card	G.703 Transceiver Card	AVP 2000, AVP 3000
CE/HWO/EXTSYNC VP/HWO/EXTSYNC	External Sync Input Card	This provides a synchronization input that will accept either a video signal or a 10 MHz reference input.	AVP 2000, AVP 3000
CE/UPG/HWO/CE-x	CE-x	UPGRADE: Customer-fitble CE-x Module	AVP 2000, AVP 3000
CE/UPG/HWO/CE-xA	CE-xA	UPGRADE: Customer-fitble CE-xA Analogue Module	AVP 2000, AVP 3000
CE/UPG/HWO/CE-a	CE-a	UPGRADE: Customer-fitble CE-a Module	AVP 2000, AVP 3000
CE/UPG/HWO/CE-a/J2K	CE-a J2K	UPGRADE: Customer-fitble CE-a J2K Module	AVP 2000, AVP 3000
CE/UPG/HWO/ASI/2IN2OUT VP/UPG/HWO/ASI/2IN2OUT	ASI IO Option Card	UPGRADE: Customer-fitble ASI I/O Module	AVP 2000, AVP 3000
CE/UPG/HWO/G703	G.703 Transceiver Card	UPGRADE: Customer-fitble G.703 module	AVP 2000, AVP 3000
CE/UPG/HWO/EXTSYNC VP/UPG/HWO/EXTSYNC	External Sync Input Card	UPGRADE: Customer-fitble External Sync Module	AVP 2000, AVP 3000

7.3

Option Card Combinations

Table 7.2 lists the option cards that are available for the AVP family and the recommended slots for fitting.

Table 7.2 Option Card Combinations

Option Card	AVP 2000	AVP 3000
CE-a	6 max (Any Slot)	5 max (Any Slot)
CE-a J2K	6 max (Any Slot)	5 max (Any Slot)
CE-x	1 or 2 pair* 1(P)/2(E) or 3(P)/4(E)	1 or 2 pair* 1(P)/2(E) or 3(P)/4(E)
CE-xA	1 or 2 pair* 1(P)/2(E) or 3(P)/4(E)	1 or 2 pair* 1(P)/2(E) or 3(P)/4(E)
SAT MOD		1 (Slot 6 or 2)
ASI	1 (Any slot)	1 (Any slot)
G.703	1 (Any slot)	1 (Any slot)
Ext SYNC	1 (Any slot)	1 (Any slot)

Notes: CE-x and CE-xA option cards must be correctly fitted in pairs, e.g. 1(P)/2(E) = Slot 1 (Pre-processor)/Slot 2 (Encoder)

If 2 CE-x or CE-xA modules are fitted in a chassis then no other VCMs can be fitted.

Thermic restrictions may apply if more than four VCM option cards are fitted in a unit.

The numbered option card slots available on the AVP are shown in *Figure 7.1*.



Figure 7.1 Option Card Slot Numbering – 1AC Chassis

Note: In a 4-slot dual AC PSU chassis, slots numbers 5 and 6 are not available.

The features of the available Video Compression Modules (VCMs) and other Option Cards are described in the following paragraphs.



7.4 Video Compression Modules

7.4.1 CE-a VCM

7.4.1.1 Overview

The CE-a Video Compression Module (VCM) is a single card that can encode a single video input. By default the basic card supports encoding SD MPEG-2 video and MPEG-1 Layer II Audio. Video and audio encoding functionality is extended by the purchase of feature licenses.



Figure 7.2 CE-a VCM

The available CE-a encoder licenses and the encoding modes they support are listed in *Table 7.3*.

Table 7.3 CE-a Encoder Licenses and Supported Encoder Modes

Marketing Code	Feature Enabled
No license	SD MPEG-2
CE/SWO/CE-a/HD	Adds support for HD encoding to available options
CE/SWO/CE-a/H264	Adds support for H.264 encoding to available options
CE/SWO/CE-a/422	Adds support for 422 10bit encoding to available options

Table 7.4 CE-a Encoder Video Profiles and Bit Rate Ranges

Video Encode Profiles	Bit Rate Range (Mbps)	Licenses Required
SD MPEG-2 Main Profile @ Main Level 4:2:0 8bit	0.5 - 15	None
HD MPEG-2 Main Profile High Level 4:2:0 8bit	2.0 - 50	CE/SWO/CE-a/HD
SD H.264 Main Profile Level 3.0 4:2:0 8bit SD H.264 High Profile Level 3.0 4::0 8bit SD H.264 High Profile Level 3.1 4:2:0 8bit	0.5 - 10 0.5 - 12.5 0.5 - 17.5	CE/SWO/CE-a/H264
HD H.264 Main Profile Level 4.0 4:2:0 8-bit HD H.264 High Profile Level 4.0 4:2:0 8-bit HD H.264 High Profile Level 4.1 4:2:0 8-bit	1.0 - 20 1.0 - 25 1.0 - 50	CE/SWO/CE-a/H264 and CE/SWO/CE-a/HD

Notes: Up to 6 CE-a modules can be fitted in the unit, but limitations due to operational temperature may apply.



VCM identification and video licensing changed in the 9.2.x release as compared to pre-9.2.x releases of code. The transition from the old licensing scheme to the new one is completely automatic, and will not result in feature loss.

The available audio encoding licenses are listed in *Table 7.5*.

Table 7.5 CE-a VCM Audio Encoding Licenses

Marketing Code	Audio Encode		Notes
No license	MPEG-1 Layer II	2 pairs	
CE/SWO/M1L2	MPEG-1 Layer II	1 pair	Up to 16 pairs total
CE/SWO/PAA	Phase Aligned MPEG-1 Layer II	1 instance	Up to 2
CE/SWO/DOLBY/AC3	Dolby Digital	1 pair	Up to 6 pairs 3 pairs required for 5.1 encode
CE/SWO/AAC	AAC/HE-AAC	1 pair	Up to 6 pairs 3 pairs required for 5.1 encode

If the appropriate licenses are available, up to 16 channel pairs of audio can be encoded using the MPEG-1 Layer II algorithm, 6 audio channel pairs can be encoded in Dolby Digital or 6 channel pairs in (HE-)AAC.

There is also an option to configure the unit to pass-through pre-encoded Dolby Digital, Dolby-E or Linear PCM audio.

Audio decode is not supported.

Table 7.6 lists other encoding related licenses that are available on the VCM.

Table 7.6 Other CE-a VCM Licenses

Marketing Code	Feature Enabled
CE/SWO/MCTF	Motion compensated temporal filtering
CE/SWO/DPI	Splice Point Insertion

7.4.1.2 Inputs

This module provides the following inputs:

- SD/HD-SDI Input via a 75 Ω BNC female connector.
- Audio Input via a 15-way D-Type male connector for audio and (see *Chapter 2 Installing the Equipment*).

7.4.1.3 Video

- SD/HD-SDI video input.
- Frame re-synchronization.



- Programmable bandwidth filter.
- SD & HD H.264, 4:2:0 Video Encoding (Depending upon purchased licenses).
- SD & HD MPEG-2 4:2:0 Video Encoding (Depending upon purchased licenses).
- Vertical resolution: 720 or 1080 (HD), 567 or 480 (SD).
- Horizontal Resolution: 1920 or 1280 (HD), 720 (SD). Reduced horizontal resolutions are configurable on the VCM but are not recommended for contribution feeds. If selected, the reduced resolution must also be supported by the decoder.
- Scene cut detection.
- Low Delay.
- Bit rate tracking.

7.4.1.4

Input Detection

The VCM is capable of detecting if there is a valid video stream available at the SDI input. See *Chapter 5, Web GUI Control* for configuration details.

7.4.1.5

Ancillary Data

- Closed Captions: EIA-608, EIA-708 via SMPTE 334.
- Time Code.
- OP-47 (Subtitles).
- Generic ANC extraction.

7.4.1.6

VBI

- Video Index.
- Closed Captions: EIA-608, EIA-708 via SMPTE 334, or line 21.
- World Standard Text (WST – ETS300472) (625 line only).
- Wide Screen Signaling (WSS or WSS-AFD).
- SMPTE 2016-3 AFD and Bar Data.

7.4.1.7

Audio Compression

- Eight channels AES/EBU digital audio input either de-embedded from SD/HD-SDI or via the Audio/Data input connector.
- Supported audio coding modes:
 - MPEG-1 Layer II (32 kbps to 384 kbps) (additional pairs available with CE/SWO/M1L2 software option).



- MPEG-1 Layer II Phase Aligned Audio (384 kbps) (software option CE/SWO/PAA).
- Dolby Digital (56 kbps to 640 kbps) (software option CE/SWO/DOLBY/AC3).
- AAC LC/HE-AAC (32 kbps to 192 kbps) (software option CE/SWO/AAC).
- Pass-through of pre-encoded Dolby Digital (1 – 5.1 channel).
- Pass-through of pre-encoded Dolby E.
- Pass-through of uncompressed audio (Linear PCM – SMPTE 302M).

7.4.1.8

Indications

An LED is provided to indicate Lock Status.

7.4.2

CE-a J2K VCM

7.4.2.1

Overview

The CE-a J2K Video Compression Module (VCM) is a single card that can encode a single video input.



Figure 7.3 CE-a J2K VCM

The available CE-a J2K encoder licenses and the encoder modes they support are listed in *Table 7.7*.

Table 7.7 CE-a J2K Licenses

Marketing Code	JPEG 2000	
	SD 4:2:2 10 bit	HD 4:2:2 10 bit
No license	YES	
CE/SWO/CE-a/H264	YES	YES

Note: Up to 6 CE-a J2K modules can be fitted in the unit, but limitations due to operational temperature may apply.

The CE-a J2K VCM cannot decode or encode audio input streams. However, it can pass-through linear PCM or Dolby E encoded streams embedded in the SDI signal.

The VCM is also capable of processing Ancillary Data (ANC) but only in HD mode.



7.4.2.2

Inputs

This module provides the following inputs:

- SD/HD-SDI Input via a $75\ \Omega$ BNC female connector.
- Audio Input via a 15-way D-Type male connector for audio and (see *Chapter 2 Installing the Equipment*).

7.4.2.3

Video

- SD/HD-SDI video input.
- SD & HD JPEG 2000, 4:2:2 10 bit video encoding.
- Vertical resolution: 720 or 1080 (HD), 567 or 480 (SD).
- Horizontal Resolution: 1920 or 1280 (HD), 720 (SD).
- Ultra Low Latency.
- Bit rate tracking.

7.4.2.4

Input Detection

The CE-a J2K VCM is capable of detecting if there is a valid video stream available at the SDI input. See *Chapter 5, Web GUI Control* for configuration details.

7.4.2.5

Ancillary Data

The CE-a J2K VCM is capable of extracting up to 2 Mbps of the following ANC data from the SDI output in HD mode:

- Generic ANC in accordance with SMPTE 2038-2008.

7.4.2.6

VBI

In SD mode, the CE-a J2K VCM is capable of encoding the VBI lines as part of the picture.

7.4.2.7

Audio Compression

- Four channels AES/EBU digital audio input either de-embedded from SD/HD-SDI or via the Audio/Data input connector.
- Supported audio coding modes:
 - Pass-through of pre-encoded Dolby E
 - Pass-through of uncompressed audio (Linear PCM – SMPTE 302M).

7.4.2.8

Indications

An LED is provided to indicate SDI lock Status.



7.4.3 CE-x VCM

7.4.3.1 Overview

The CE-x VCM is a two-card solution that can encode a single video input. By default the basic card supports encoding SD MPEG-2 video and MPEG-1 Layer II Audio. Video and audio encoding functionality is extended by the purchase of feature licenses, summarized in *Table 7.8 to Table 7.11*.



Figure 7.4 CE-x VCM

Notes: VCM identification and video licensing in 9.2.x releases has been changed as compared to pre-9.2.x releases of code. The transition from the old licensing scheme to the new one is completely automatic, and will not result in feature loss.

Two CE-x modules can be fitted in slots 3/4 and 1/2.

Table 7.8 CE-x Encoder Licenses and Supported Encoder Modes

Marketing Code	Feature Enabled
No license	SD MPEG-2
CE/SWO/CE-x/HD	Adds support for HD encoding to available options
CE/SWO/CE-x/H264	Adds support for H.264 encoding to available options
CE/SWO/CE-x/422	Adds support for 422 10bit encoding to available options
CE/SWO/CE-x/1080p	Adds support for 1080p encoding in HD H.264
AVP/SWO/CE-x/STRIPE	Adds support for Stripe Refresh low delay mode in H.264

Table 7.9 CE-x Encoder Video Profiles and Bit Rate Ranges

Video Encode Profiles	Bit Rate Range (Mbps)*	Licenses Required
SD MPEG-2 Main Profile @ Main Level 4:2:0 8 bit	0.5 - 15	None
SD MPEG-2 422 Profile @ Main Level 4:2:2 8 bit	0.5 - 50	CE/SWO/CE-x/422
HD MPEG-2 Main Profile High Level 4:2:0 8 bit	2.0 - 80	CE/SWO/CE-x/HD
HD MPEG-2 4:2:2 Profile High Level 4:2:2 8 bit	2.0 - 80	CE/SWO/CE-x/HD and CE/SWO/CE-x/422



Video Encode Profiles	Bit Rate Range (Mbps)*	Licenses Required
SD H.264 Main Profile Level 3.0 4:2:0 8 bit	0.5 – 10	CE/SWO/CE-x/H264
SD H.264 High Profile Level 3.0 4:2:0 8bit	0.5 – 12.5	
SD H.264 High Profile Level 3.1 4:2:0 8 bit	0.5 – 17.5	
SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit	0.5 – 25	CE/SWO/CE-x/H264 and CE/SWO/CE-x/422
SD H.264 Hi422 Profile Level 3.1 4:2:2 10 bit	0.5 – 25	
HD H.264 Main Profile Level 4.0 4:2:0 8 bit	2.0 – 20	CE/SWO/CE-x/H264 and CE/SWO/CE-x/HD
HD H.264 High Profile Level 4.0 4:2:0 8 bit	2.0 – 25	
HD H.264 High Profile Level 4.1 4:2:0 8 bit	1.0 – 62.5	
HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit	1.0 – 80	CE/SWO/CE-x/H264 and CE/SWO/CE-x/HD and CE/SWO/CE-x/422
HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit	1.0 – 80	
HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit	5.0 – 62.5	CE/SWO/CE-x/H264 and CE/SWO/CE-x/HD and CE/SWO/CE-x/422 and CE/SWO/CE-x/1080p
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit	10.0 – 80	
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	10.0 – 80	

* The full bit rate range is not available when configured in Stripe Refresh mode.

Table 7.10 CE-x VCM Audio Encoding Licenses

Marketing Code	Audio Encode		Notes
No license	MPEG-1 Layer II	2 pairs	
CE/SWO/M1L2	MPEG-1 Layer II	1 pair	Up to 16 pairs total
CE/SWO/PAA	Phase Aligned MPEG-1 Layer II	1 instance	Up to 2 Only supported in HD operation.
CE/SWO/DOLBY/AC3	Dolby Digital	1 pair	Up to 6 pairs 3 pairs required for 5.1 encode
CE/SWO/AAC	AAC/HE-AAC	1 pair	Up to 6 pairs 3 pairs required for 5.1 encode

If the appropriate licenses are available, up to 16 channel pairs of audio can be encoded using the MPEG-1 Layer II algorithm, 6 audio channel pairs can be encoded in Dolby Digital or 6 channel pairs in (HE-)AAC.

There is also an option to configure the unit to pass-through pre-encoded Dolby Digital, Dolby-E or Linear PCM audio.

Audio decode is not supported.

Table 7.11 lists other encoding related licenses that are available on the VCM.

Table 7.11 Other CE-x VCM Licenses

Marketing Code	Feature Enabled
CE/SWO/MCTF	Motion compensated temporal filtering



CE/SWO/DPI	Splice Point Insertion
------------	------------------------

The VCM is also capable of processing Vertical Blanking Interval (VBI) and Ancillary ANC Data.

7.4.3.2

Inputs

This module provides the following inputs:

- 3G/HD/SD-SDI Input via a $75\ \Omega$ BNC female connector.
- Audio Input via a 15-way D-Type male connector for audio and (see *Chapter 2 Installing the Equipment*).

7.4.3.3

Video

- SDI video input.
- Frame re-synchronization.
- Programmable bandwidth filter.
- SD & HD H.264, 4:2:0 & 4:2:2 Video Encoding (depending on purchased licenses).
- SD & HD MPEG-2 4:2:0 & 4:2:2 Video Encoding (depending on purchased licenses).
- HD H264 1080p Video Encoding (depending on purchased licenses).
- Vertical resolution: 720 or 1080 (HD), 567 or 480 (SD).
- Horizontal Resolution: 1920 or 1280 (HD), 720 (SD). Reduced horizontal resolutions are configurable on the VCM but are not recommended for contribution feeds. If selected, the reduced resolution must also be supported by the decoder.
- Scene cut detection.
- Low Delay/Mega Low Delay.
- Stripe Refresh H.264 low delay mode (dependent on purchased license)
- Bit rate tracking.

7.4.3.4

Input Detection

The CE-x VCM is capable of detecting if there is a valid video stream available at the SDI input. See *Chapter 5, Web GUI Control* for configuration details.

7.4.3.5

Ancillary Data

- Closed Captions: EIA-608, EIA-708 via SMPTE 334.
- Time Code.



- OP-47 (Subtitles).
- Generic ANC extraction.

7.4.3.6

VBI

- Video Index.
- Closed Captions: EIA-608, EIA-708 via SMPTE 334, or line 21.
- World Standard Text (WST – ETS300472) (625 line only).
- Wide Screen Signaling (WSS or WSS-AFD).
- SMPTE 2016-3 AFD and Bar Data.

7.4.3.7

Audio Compression

- Up to eight channels AES/EBU digital audio input either de-embedded from SD/HD-SDI or via the Audio/Data input connector.
- Supported audio coding modes:
 - MPEG-1 Layer II (32 kbps to 384 kbps) (additional pairs available with CE/SWO/M1L2 software option).
 - MPEG-1 Layer II Phase Aligned Audio (384 kbps) (software option CE/SWO/PAA).
 - Dolby Digital (56 kbps to 640 kbps) (software option CE/SWO/DOLBY/AC3).
 - AAC LC/HE-AAC (32 kbps to 192 kbps) (software option CE/SWO/AAC).
 - Pass-through of pre-encoded Dolby Digital (1 – 5.1 channels).
 - Pass-through of pre-encoded Dolby E.
 - Pass-through of uncompressed audio (Linear PCM – SMPTE 302M).

7.4.3.8

Indications

An LED is provided to indicate SDI lock Status.



7.4.4 CE-xA VCM

7.4.4.1 Overview

The CE-xA VCM is a two-card solution that adds support for analogue video and audio inputs to the CE-x.

By default the basic card supports encoding SD MPEG-2 video and MPEG-1 Layer II Audio. Video and audio encoding functionality is extended by the purchase of feature licenses, summarized in *Table 7.12*.



Figure 7.5 CE-xA VCM

Note: Two CE-xA modules can be fitted in slots 3/4 and 1/2.

Table 7.12 CE-xA Encoder Licenses and Supported Encoder Modes

Marketing Code	Feature Enabled
No license	SD MPEG-2
CE/SWO/CE-x/HD	Adds support for HD encoding to available options
CE/SWO/CE-x/H264	Adds support for H.264 encoding to available options
CE/SWO/CE-x/422	Adds support for 422 10 bit encoding to available options
CE/SWO/CE-x/1080p	Adds support for 1080p encoding in HD H.264
AVP/SWO/CE-x/STRIPE	Adds support for Stripe Refresh low delay mode in H.264

Table 7.13 CE-xA Encoder Video Profiles and Bit Rate Ranges

Video Encode Profiles	Bit Rate Range (Mbps)*	Licenses Required
SD MPEG-2 Main Profile @ Main Level 4:2:0 8 bit	0.5 - 15	None
SD MPEG-2 422 Profile @ Main Level 4:2:2 8 bit	0.5 - 50	CE/SWO/CE-x/422
HD MPEG-2 Main Profile High Level 4:2:0 8 bit	2.0 - 80	CE/SWO/CE-x/HD
HD MPEG-2 4:2:2 Profile High Level 4:2:2 8 bit	2.0 - 80	CE/SWO/CE-x/HD and CE/SWO/CE-x/422
SD H.264 Main Profile Level 3.0 4:2:0 8 bit	0.5 – 10	CE/SWO/CE-x/H264
SD H.264 High Profile Level 3.0 4:2:0 8 bit	0.5 – 12.5	
SD H.264 High Profile Level 3.1 4:2:0 8 bit	0.5 – 17.5	
SD H.264 Hi422 Profile Level 3.1 4:2:2 8 bit	0.5 – 25	CE/SWO/CE-x/H264 and CE/SWO/CE-x/422
SD H.264 Hi422 Profile Level 3.1 4:2:2 10 bit	0.5 – 25	



Video Encode Profiles	Bit Rate Range (Mbps)*	Licenses Required
HD H.264 Main Profile Level 4.0 4:2:0 8 bit HD H.264 High Profile Level 4.0 4:2:0 8 bit HD H.264 High Profile Level 4.1 4:2:0 8 bit	3.0 – 20 3.0 – 25 1.0 – 62.5	CE/SWO/CE-x/H264 and CE/SWO/CE-x/HD
HD H.264 Hi422 Profile Level 4.1 4:2:2 8 bit HD H.264 Hi422 Profile Level 4.1 4:2:2 10 bit	2.0 – 80 2.0 – 80	CE/SWO/CE-x/H264 and CE/SWO/CE-x/HD and CE/SWO/CE-x/422
HD p50/60 H.264 High Profile Level 4.2 4:2:0 8bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8bit HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10bit	5.0 – 62.5 10.0 – 80 10.0 – 80	CE/SWO/CE-x/H264 and CE/SWO/CE-x/HD and CE/SWO/CE-x/422 and CE/SWO/CE-x/1080p

Table 7.14 CE-xA VCM Audio Encoding Licenses

Marketing Code	Audio Encode	Notes	
No license	MPEG-1 Layer II	2 pairs	
CE/SWO/M1L2	MPEG-1 Layer II	1 pair	Up to 16 pairs total
CE/SWO/PAA	Phase Aligned MPEG-1 Layer II	1 instance	Up to 2 Only supported in HD operation.
CE/SWO/DOLBY/AC3	Dolby Digital	1 pair	Up to 6 pairs 3 pairs required for 5.1 encode
CE/SWO/AAC	AAC/HE-AAC	1 pair	Up to 6 pairs 3 pairs required for 5.1 encode

Note: Two CE-x Analogue modules can be fitted in slots 3/4 and 1/2.

If the appropriate licenses are available, up to 8 channel pairs of audio can be encoded using the MPEG-1 Layer II algorithm, 3 audio channel pairs can be encoded in Dolby Digital or 6 channel pairs in AAC LC or HE-AAC. There is also an option to configure the unit to pass-through pre-encoded Dolby Digital, Dolby-E or Linear PCM audio.

The VCM is also capable of processing VBI from the analogue input and ANC and VBI from the SDI input.

7.4.4.2 Inputs

This module provides the following inputs:

- HD/SD SDI Input via a 75 Ω BNC female connector.
- Analogue video input via a 75 Ω BNC female connector.
- Digital audio input via a 15-way D-Type male connector (see *Chapter 2 Installing the Equipment*)
- Analogue audio input via a 15-way D-Type male connector (see *Chapter 2 Installing the Equipment*).
- Video.

**Table 7.15 Analogue Video Standard Parameters**

Standard	Number of Lines	Frame Rate	Video Bandwidth
NTSC - M (without pedestal)	525	29.97 frames/s	4.2 MHz
NTSC - M (with pedestal)	525	29.97 frames/s	4.2 MHz
PAL - B	625	25 frames/s	5.0 MHz
PAL - G	625	25 frames/s	5.0 MHz
PAL - H	625	25 frames/s	5.0 MHz
PAL - I	625	25 frames/s	5.0 MHz
PAL - D	625	25 frames/s	5.0 MHz

Note: Reduced horizontal resolutions are configurable on the VCM but are not recommended for contribution feeds. If selected, the reduced resolution must also be supported by the decoder.

7.4.4.3

Input Detection

When encoding analogue video source, the unit is not able to automatically detect the input video format. Instead, the user must set the correct format through the user interface and the unit will update the locked state accordingly.

Input auto detection works for digital video input through the SDI/HD-SDI connector.

7.4.4.4

Ancillary Data

The following ancillary data is supported only when the unit is fed by a digital video

- Closed Captions: EIA-608, EIA-708 via SMPTE 334.
- Time Code.
- OP-47 (Subtitles).
- Generic ANC extraction.

7.4.4.5

VBI

- Video Index.
- Closed Captions: EIA-608, EIA-708 via SMPTE 334, or line 21.
- World Standard Text (WST – ETS300472) (625 line only).
- Wide Screen Signaling (WSS or WSS-AFD).
- SMPTE 2016-3 AFD and Bar Data.

7.4.4.6

Audio Compression

- Up to eight channels of audio input either de-embedded from SD/HD-SDI or via the 15-way D-type input connector that accepts four stereo pairs of AES/EBU or two stereo pairs of analogue audio signals.



- Supported audio coding modes:
 - MPEG-1 Layer II (32 kbps to 384 kbps) (additional pairs available with CE/SWO/M1L2 software option).
 - MPEG-1 Layer II Phase Aligned Audio (384 kbps) (software option CE/SWO/PAA).
 - Dolby Digital (56 kbps to 640 kbps) (software option CE/SWO/DOLBY/AC3).
 - AAC LC/HE-AAC (32 kbps to 192 kbps) (software option CE/SWO/AAC).
 - Pass-through of pre-encoded Dolby Digital (1 – 5.1 channels).
 - Pass-through of pre-encoded Dolby E.
 - Pass-through of uncompressed audio (Linear PCM – SMPTE 302M).

7.4.4.7

Indications

An LED is provided to indicate digital and analogue video input Lock Status.

7.5

ASI I/O Option Card

7.5.1

General

The ASI I/O option card provides two asynchronous serial input and two asynchronous serial output interfaces which conform to Part 9 of CENELEC EN 50083-9, subclause 4.3 and can transmit DVB/MPEG-2 Transport Streams up to a rate of 270 Mbps.

The ASI option card uses the 27 MHz System Clock Reference (SCR) signal from the base chassis as its frequency reference. The output bit rate of the ASI Card is configurable up to 150 Mbps. The module automatically configures Burst or Byte Mode. For a Transport Stream rate less than 70 Mbps, packets are sent in Byte Mode. Above 70 Mbps Burst Mode is used.



Figure 7.6 ASI I/O Option Card

7.5.2

Interfaces

The ASI I/O option card has the following interfaces:

- Two 75 Ω female BNC input connectors.



- Two 75Ω female BNC output connectors.

The input connectors are used for feeding the unit with external Transport Streams .

The output connectors can be configured as a mirrored output pair (with the same Transport Stream on both outputs) or two independent outputs (with different Transport Streams on each output).

7.6 G.703 Transceiver Card

7.6.1 General

The G.703 Transceiver card provides one PDH (Plesiochronous Digital Hierarchy) output interface that can be used for interfacing Transport Streams to PDH networks. The interface is G.703 compliant and provides support for E carriers, namely E31 (E3) and E32 (DS3) as specified in ITU-T Rec. G.703. The input interface is not supported in this release.

The G.703 Transceiver Card uses the 27 MHz System Clock Reference (SCR) signal from the base chassis as its frequency reference. The output bit rate of the card can be 34 384 kbps (E31) or 44 736 kbps (E32). For the E3 carrier no framing is supported. For the DS3 carrier M13 and C-bit frame structures are supported. If C-bit framing is selected the output can be encapsulated in ATM packets.

Notes: M13 is the same as M23, C-bit is the same as C-bit Parity.

E3 is the same as E31, DS3 is the same as E32.



Figure 7.7 G.703 Transceiver Card

7.6.2 Interfaces

The G.703 Transceiver option card has the following interfaces for connecting to a PDH network:

- One 75Ω female BNC input connector (not supported in this release).
- One 75Ω female BNC output connectors.



7.7 External Sync Input Option Card

7.7.1 General

With the External Sync Input option card the internal 27 MHz System Clock Reference of the unit can be locked to an external clock source. The synchronizing signal is input via a 75Ω female BNC connector on the rear panel. The unit can be configured to lock to either a PAL or NTSC black burst signal, or a 1 V peak to peak 10 MHz reference.

If the input is a black burst signal, the horizontal sync information is extracted and passed to the Host Controller Card. If the input is a 10MHz clock signal, it is directly passed to the Host Controller card.

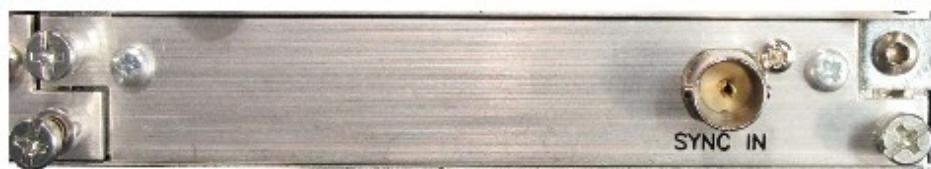


Figure 7.8 External Sync Input Option Card

7.7.2 Interfaces

The External Sync Input option card has the following interface:

- One 75Ω female BNC input connector for connecting a 10 MHz $1V_{pp}$ reference signal or an analogue video signal.

7.8 GPI Option Card

7.8.1 General

The GPI option card supports the following functions:

- GPI triggered splicing.
- Alarm relay.
- GPI Loading of stored configurations (Not supported in this Release).
- IEC-232 (RS-232) Data Input (Not supported in this Release).



7.8.2 GPI Triggered Splicing

The GPI card provides an option for splicing triggered by GPI pin state change. When configured, the card sends SCTE-104 messages to the encoders of the VCMs fitted in the unit by closing and opening general purpose input pins.

7.8.3 Alarm Relay

The GPI card provides an alarm and a fail relay on the 25-way D-type interface.

The GPI inputs allow various specific Encoder functions to be controlled using 16 contact closure inputs. The controlled functions are software assigned.

The alarm/fail relay contacts provide alarm relay interfaces that can be used to send a signal to remote equipment on an alarm condition.

7.8.4 Load Stored Configurations (Not supported in this Release).

The GPI input pins can be used to trigger the loading of any of the 64 stored configurations on the unit. The selection of the stored configuration is made by configuring 6 of the GPI input pins as a binary representation of the store number while a 7th pin provides the toggle to action the loading of the configuration.

7.8.5 Data Input (Not supported in this Release).

The Data Input provides an asynchronous serial data communications interface conforming to the IEC-232 (RS-232) standard.

7.8.6 Interfaces

The GPI option card has the following interfaces:

- One 9-way D-type female connector labeled as DATA IN (not supported in this release).
- One 25-way D-type female connector labeled as GPI/ALARM.



7.9

Satellite Modulator Option Card (AVP 3000 Voyager Only)

7.9.1

General

The satellite modulator option card is a module that takes MPEG Transport Streams on its input and provides a modulated output either in L-band (950 – 2150 MHz) or in IF band (50 – 180 MHz) according to the DVB-S, DVB-DSNG or DVB-S2 specification. The output signal can be fed to an up-converter for mixing the signal to the appropriate satellite channel. The module is also capable of powering the downstream up-converter.



Figure 7.9 Satellite Modulator Option Card

To increase reliability, the satellite modulator option card can take two input Transport Streams and encode and modulate one of them at a time. If the Transport Stream being modulated is lost for some reason, the module can switch automatically to the other Transport Stream input and continue the transmission using that.

7.9.2

Interfaces

The Satellite Modulator option card has the following connectors:

- One 50 Ω female SMA L-Band input connector.
- One 50 Ω female SMA L-Band main output connector.
- One 75 Ω female F-type L-Band output connector for monitoring purposes.
- One 75 Ω female BNC IF main output connectors.
- One 75 Ω female BNC IF output connector for monitoring purposes.

The L-Band input can be used for inputting a modulated L-Band signal to the module. The module then can combine the input and its own modulated output and feed a common up-converter with the combined signal.

Note: It is the responsibility of the operator to set up the two modulators so that the signals produced by them do not interfere with each other (that is, they do not overlap in any way in the frequency band).



7.9.3

Modulation

The satellite modulator is capable of the following modulations:

- QPSK modulation in accordance with EN 300 421 (DVB-S).
- 8PSK and 16QAM modulation in accordance with EN 301 210 (DVB-DSNG).
- QPSK, 8PSK, 16APSK and 32APSK in accordance with EN 302 307 (DVB-S2).

7.9.4

Encryption

The Transport Stream can be encrypted using RAS algorithm. Individual services in a Transport Stream can be BISS encrypted.

7.10

Software and Firmware Upgrades

A single Upgrade Wizard is available for the unit and all option cards that can be fitted for upgrading the unit software and firmware through the Ethernet control port.

To install software upgrade, navigate to the folder where the Upgrade Wizard is saved, and run the executable file.

Notes: Follow instructions provided with the software upgrade wizard to reduce the risk of upgrade failure.

The upgrade process needs approximately 50 minutes to finish. The unit automatically reboots during the process.

Following an upgrade, the unit configuration is lost and any stored configurations may no longer be compatible with the new software. A configuration converter tool is available to convert existing configurations so that they can be re-used. Refer to instructions provided with the converter tool for more information.

To recover the unit from a failed upgrade, refer to the instructions provided with the Upgrade Wizard.

7.11

Removal and Replacement of Modules

This section gives information relating to the handling of option modules as they are inserted or removed from the unit.



7.11.1

Handling Modules



Caution!

Care must be taken to when inserting or withdrawing modules to avoid damage to underside components.

Modules must be kept orthogonal, i.e. at 90 degrees to the unit, to avoid catching underside components on the chassis.

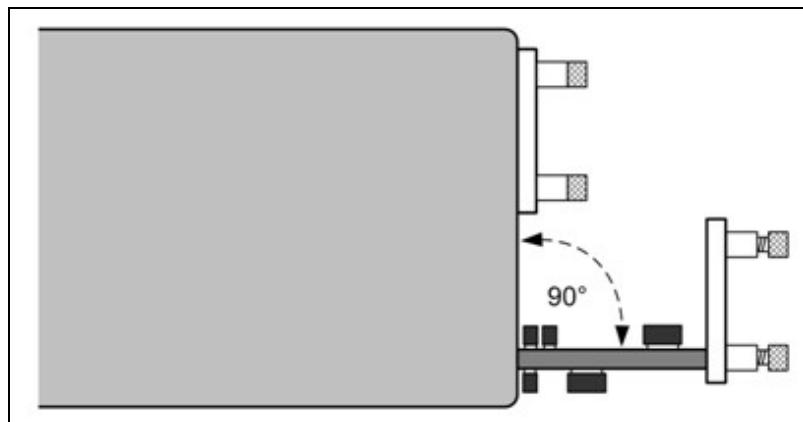


Figure 7.10 Inserting and Withdrawing Modules



Caution!

Do not plug in modules with excessive force as this may result in damage to the module connector or other components. If any significant resistance to inserting a module is felt, withdraw the module slightly and check for obstructions.

7.11.2

Electrostatic Discharge



Warning!

Static electricity can damage electronic components. To avoid damage, keep modules in their static-protective package until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Where possible ensure that antistatic protection is worn (for example an earthed antistatic wrist strap, an ankle or heel strap).



- Handle modules carefully, holding them by edges or rear panels.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the modules where others can handle and possibly damage them.
- While the module is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body).
- Remove the module from its package and install it directly into your base chassis without setting it down. If it is necessary to set the module down, place it in its static-protective package.
- Take additional care when handling modules during cold weather, because heating reduces indoor humidity and increases static electricity.

7.11.3

Installing a New Module

A new module can be inserted when the unit is powered off or on. When inserted and powered, the unit will determine the module capabilities and make it available for configuration. Initially a default set of parameters will be in place. As long as there are licenses available for the features required, the module can then be configured and used immediately.



Caution!

To avoid damaging the module, always handle carefully (see section 7.11.1) and avoid electrostatic discharge (see section 7.11.2).

To install a new module:

1. Remove the blanking plate from the module slot in which the new module is to be fitted.
2. Carefully remove the new module from its anti-static package, and insert it in to the base unit, slotting the module edges in to the module guides.
3. Push the module home, so that the rear panel is flush with the rear of the base unit.
4. Tighten the two captive retaining screws.
5. When the chassis detects a new card fitted, it will be displayed on the **Dashboard**, and an alarm will be raised. If all options are reported correctly, the **Accept Hardware Configuration** needs to be applied. This will accept the new hardware configuration and clear the alarm.



7.11.4

Removing a Module



Caution!

To avoid damaging the module, always handle carefully (see *Section 7.11.1*) and avoid electrostatic discharge (see *Section 7.11.2*).

To remove a module:

1. Loosen the two captive screws that retain the module in the base unit.
2. Holding the captive screws, pull the module from the unit and place it in suitable anti-static packaging.
3. Fit a blanking panel in place of the removed module.
4. When the unit detects a card is no longer present, it will be displayed on the **Option Slots** web page, and an alarm will be raised. If all options are reported correctly, the **Accept Option Slot Configuration** needs to be applied. This will accept the new hardware configuration and clear the alarm.

7.11.5

Replacing (Hot-Swapping) a Module

A module can be replaced on a like-for-like basis without powering down the base unit, i.e. can be ‘hot-swapped’. This will cause services to be allocated to other modules, if available, enabling the removal of the module in question. In this way, essential maintenance can be carried out with minimum disruption.

The replacement module must be of the same type and at the same software version as the original. The replacement module must be fitted into the same option slot as the module it is replacing.

To perform a hot-swap, the modules should only be unplugged or inserted when the unit is fully booted and configured.

Only ONE module should be ‘hot-swapped’ at a time, to prevent problems due to inrush current, and to ensure that the host recognizes and configures the new module. A wait time of at least 5 seconds is recommended between removing the module and replacing or inserting a new module.

Note: It could take between 2 and 4 minutes from inserting the module for it to be recognized, configured and producing video output, following a hot-swap operation.



Caution!

To avoid damaging the module, always handle carefully (see *section 7.11.1*) and avoid electrostatic discharge (see *section 7.11.2*).



Dual Slot Modules

If the failed card is one of a module pair (i.e., CE-x or CE-xA), both cards must be unplugged and replaced in the following sequence:

1. Remove the Pre-processor (bottom) card first then the Encoder (top) card.
2. Wait for at least 5 seconds.
3. Replace the Pre-processor (bottom) card.
4. Replace the Encoder (top) card.

If the software or firmware version on the newly inserted card is different from the software or firmware version on the replaced card, then the Upgrade Wizard has to be run again to resolve the version conflicts. The conflict is reported on the **Dashboard** in the **Model** accordion of the **Device Information** widget and on the **Versions** tab of the **Support** page.

To replace an option card:

1. Disconnect all cables from the option card to be replaced.
2. Loosen the two captive screws that retain the option card in the base chassis.
3. Holding the captive screws, pull the option card from the unit, (observe the handling precautions and advice for module pairs where applicable).
4. Carefully remove the replacement option card from its anti-static package, and insert it in to the base chassis, slotting the card edges in to the card guides.
5. Push the card home, so that the rear panel is flush with the rear of the base chassis (observe the handling precautions and advice for module pairs where applicable).
6. Tighten the two captive retaining screws.
7. Connect all external cables to the replacement option card.

Note: If the replacement card is of the same type as the failed card, i.e. if it has the same capabilities (licenses), is at the same software version and is fitted in the same slot, then it will be automatically configured to the same settings as the failed card. If the replacement card is of a different type, then an alarm will be generated.

7.11.6

Option Card Plug-and-Play

The unit is designed around a plug-and-play concept to make it as easy as possible to add new option cards and functionality. This means that the chassis and Host controller card provide a base level of functionality, while any specific functionality associated with an option card is contained on the option card itself.



A good example of this is MPEG SI generation. The Host controller provides the functionality to generate and play out the SI required by a Transport Stream. However a VCM is required to provide any descriptors required for any elementary stream types that it generates.



BLANK



Preventive Maintenance and Fault-finding

Chapter 8

Contents

8.1	Introduction.....	8-3
8.2	Preventive Maintenance	8-3
8.2.1	Routine Inspection.....	8-3
8.2.2	Cleaning	8-3
8.2.3	Servicing	8-3
8.2.3.1	Damage Requiring Service.....	8-3
8.2.3.2	Replacement Parts	8-4
8.2.3.3	Checks on Completion of Servicing.....	8-4
8.3	Maintenance and Support	8-4
8.3.1	Introduction.....	8-4
8.3.2	Warranty	8-4
8.3.3	Levels of Continuing Ericsson Service Support.....	8-4
8.4	Alarms	8-5
8.4.1	Alarms - Control Port	8-5
8.4.2	Alarms - Data Port	8-5
8.4.3	Alarm Monitor Widget	8-6
8.4.4	Satellite Modulator Alarms.....	8-6
8.4.5	VCM Alarms	8-7
8.5	Fault-finding	8-8
8.5.1	Fault-finding Philosophy	8-8
8.5.2	Preliminary Checks.....	8-8
8.5.3	Power Supply Problems/Unit Not Working	8-9
8.5.3.1	Fuse Replacement	8-9
8.5.3.2	Lithium Battery.....	8-10
8.5.4	Fan(s) Not Working/Overheating	8-10
8.5.5	Cannot Access Web GUI.....	8-10
8.5.6	Unit Cannot Be Pinged	8-11
8.5.7	General Operation Problems	8-12
8.5.7.1	Parameters Slow to Load	8-12
8.5.7.2	Problems Adding Program Clock Reference (PCR).....	8-12
8.5.7.3	MPEG-2 Video PES per GOP Option Removed	8-12
8.5.7.4	Ancillary Timecode (ATC) Not Extracted and Placed into the VBI Data PES	8-12
8.5.7.5	Video Recovery Delay When Switching MPEG-2 to H.264	8-12
8.5.7.6	No VITC Control of Timecode	8-12
8.5.7.7	Video Index Operation and Active Format Description (AFD) Problems	8-13



8.5.7.8	No RF Output (Voyager II and AVP3000 only).....	8-13
8.6	Unit XML	8-14
8.7	Log Files.....	8-14
8.8	Saved and Exported Configurations.....	8-15
8.8.1	Exported Configuration.....	8-15
8.8.2	Saved Configuration.....	8-16
8.9	Calling a Service Engineer.....	8-17

List of Tables

Table 8.1	Alarms - Control Port.....	8-5
Table 8.2	Alarms - Data Port.....	8-5
Table 8.3	Status LED Unlit Fault-finding	8-9
Table 8.4	Fans Not Working/Overheating.....	8-10
Table 8.5	Cannot Access Web GUI	8-10
Table 8.6	Unit Cannot be Pinged	8-11
Table 8.7	Effect of Alarms That Can Turn Off RF Outputs.....	8-13



8.1 Introduction

This chapter details the schedules and instructions, where applicable, for routine inspection, cleaning and maintenance of the equipment which should be performed by an operator. It also details basic fault-finding procedures.

8.2 Preventive Maintenance

8.2.1 Routine Inspection

Check cooling fan operation regularly. The fans are temperature controlled so may not be on if the ambient temperature is low. Refer to *Annex B, Technical Specification* for more information.

Note: Failure to ensure a free flow of air around the unit may cause overheating. This condition is detected by a temperature sensor and causes an alarm to be raised.

8.2.2 Cleaning



Caution!

Do not use liquid cleaners or aerosol cleaners.

Unplug the unit from the wall outlet before cleaning the exterior with a damp cloth. Do not use liquid cleaners or aerosol cleaners.

Note: Only the exterior of the case should be cleaned.

8.2.3 Servicing

8.2.3.1 Damage Requiring Service



Warning!

Do not remove the top cover of this equipment. Hazardous voltages are present within this equipment and may be exposed if the top cover is removed. Only Ericsson trained and approved service engineers are permitted to service this equipment.

Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:



- When the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instructions.
- If the product has been dropped or the case has been damaged.
- When the product exhibits a distinct change in performance.

8.2.3.2

Replacement Parts

When replacement parts are required, be sure the service technician has used parts specified by the manufacturer or which have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

8.2.3.3

Checks on Completion of Servicing

Upon completion of any service or repairs to this product, ask the service technician to perform electrical safety checks to determine that the product is in a safe operating condition. Also, performance and EMC checks may be required.

8.3

Maintenance and Support

8.3.1

Introduction

Ericsson is a leader in the design, integration and implementation of digital broadcasting products and systems. It has a large team dedicated to keeping our customers on-air 24 hours a day, 365 days a year.

With regional offices worldwide, and ultra-modern specialist service facilities in the US, UK, and Asia, Ericsson covers the world. There is a customer service centre open round the clock, every day of the year.

Years of design and support experience enable it to offer a range of service options that will meet your needs at a price that makes sense.

8.3.2

Warranty

All Ericsson products and systems are designed and built to the highest standards and are covered under a comprehensive 12 month warranty.

8.3.3

Levels of Continuing Ericsson Service Support

For standalone equipment, then Ericsson **BASIC Essential support** is the value for money choice for you. **BASIC** provides you with year-by-year Service long after the warranty has expired.



For systems support you can choose either **Gold Business Critical** support or **Silver Business Advantage**. These packages are designed to save you costs and protect your income through enlisting the help of Ericsson support specialists.

Call Ericsson Sales for more details.

8.4 Alarms

See *Annex E, Alarm Lists* for further details of possible alarm messages.

8.4.1 Alarms - Control Port

The control ports can raise an alarm during abnormal operational conditions.

Table 8.1 Alarms - Control Port

Alarm	Description
Ethernet interface Ctrlx link down on Control network	No link has been established on Ethernet Control Port Ctrl x
Ethernet interface Ctrl1 on Control network: duplicate IP detected	Another device has responded to an ARP request for this Control port IP address
Control Network Lost	Control Network Lost
Virtual IP address on Control network: duplicate IP detected	Virtual IP address on Control network: duplicate IP detected
Primary Ethernet interface not in use on Control Network	Primary Ethernet interface not in use on Control Network
Network Configuration failed	Failed to configure Network setting. Using default network configuration

8.4.2 Alarms - Data Port

The data ports can raise an alarm during abnormal operational conditions.

Table 8.2 Alarms - Data Port

Alarm	Description
Ethernet interface Data z link down in Data Interface Group x-y	Data interface in data interface group x-y has gone down.
Ethernet interface Data z in Data Interface Group x-y: duplicate IP detected	Another device has responded to an ARP request for the IP address set for Data z interface in data interface group x-y.
Virtual IP address on Data Interface Group x-y: duplicate IP detected	The virtual IP address assigned to data interface group 1-2 or 3-4 is already in use.
Primary Ethernet interface not in use on Data Interface Group x-y	Primary interface is not in use in data interface group x-y or 3-4.
Data x: Duplicate IP Address	Duplicate IP Address Detected; Another device has responded to an ARP request for the IP address of this port



Alarm	Description
Data Interface Group x-y: Data Network Lost	The connection with data interface group x-y has been lost.
Network Configuration failed	Failed to configure Network setting. Using default network configuration.

8.4.3 Alarm Monitor Widget

Current Tab

The alarm status of the chassis is available on the Current tab of the Alarm Monitor widget on the Dashboard. All currently active alarms will be displayed, along with details of the time and date that the alarm was raised, the severity and description of the alarm and which module the alarm is associated with.

Alarm History

A complete history of all alarms raised and cleared since the last power cycle is displayed on the History tab of the Alarm Monitor widget on the Dashboard.

Masking Alarms

The severity of the currently active alarms and those displayed on the History tab can be edited if required. For this, open the required alarm, and change the severity to be a warning, minor, major, critical or masked.

Note: If the alarm is masked it will not be displayed on any of the reporting interfaces, and will not produce an SNMP trap message.

8.4.4 Satellite Modulator Alarms

Alarm Handling

The Satellite Modulator provides the following alarms back to the Host Card:

- Loss of FPGA PLL lock.
- Loss of reference clock.
- Loss of Clock PLL lock.
- OCXO fault
- PSU failure.
- Host SCR Sync failure.
- Load of calibration data failure.
- Over temperature (including a warning level as well as a critical level).



All masking of alarms is handled by the Host Card.

Self-monitoring

The Satellite Modulator self-monitors for correct operation and corrects any inconsistencies it finds. This includes the resetting of malfunctioning sub-systems or the whole card if necessary. The module attempts to maintain correct operation to minimize the effects of faults. All such actions are reported through the alarms/status/logging back to the Host Card.

Module Responses

The Host Card monitors all responses back from the module and resets the module if appropriate. All actions are logged by the Host Card.

8.4.5

VCM Alarms

Alarm Handling

The VCM provides the following alarms back to the Host Card:

- Loss of video (from any source).
- Loss of audio (from any source).
- Loss of VBI data.
- Invalid parameter (indicating which area video/audio/VBI/ANC data).
- Critical alarm (card has malfunctioned; internal log holds nature of failure).
- Over temperature (including a warning level as well as a critical level).

All masking of alarms is handled by the Host Card.

Self-monitoring

The VCM self-monitors for correct operation and correct any inconsistencies it finds. This includes the resetting of malfunctioning sub-systems or the whole card if necessary. The module attempts to maintain correct operation to minimize the effects of faults. All such actions are reported through the alarms/status/logging back to the Host Card.

Module Responses

The Host Card monitors all responses back from the module and resets the module if appropriate. This includes initiating redundancy switches if this results in limiting the error period. All actions are logged by the Host Card.



8.5 Fault-finding

8.5.1 Fault-finding Philosophy

It is the objective of this section to provide sufficient information to enable you to rectify apparent faults or else to identify the suspect module, where possible. Some basic procedures are provided to follow in the event of a suspected failure. It is assumed that fault-finding has already been performed at a system level and that other equipment units have been eliminated as the possible cause of the failure.



Warning!

Do not remove the top cover of this equipment. Hazardous voltages are present within this equipment and may be exposed if the top cover is removed. Only Ericsson trained and approved service engineers are permitted to service this equipment.



Caution!

Do not remove the top cover of this equipment as this may invalidate any warranties. Unauthorised maintenance or the use of non-approved replacements may affect the equipment specification and invalidate any warranties.

This Reference Guide does not include any maintenance information or procedures that would require the removal of the top cover.

If the following information fails to clear the abnormal condition, call a Service Engineer or contact Customer Services using the information given in the preliminary pages of this Reference Guide.

8.5.2 Preliminary Checks

Always investigate the failure symptoms fully, prior to taking remedial action. Fault diagnosis for the equipment operator is limited to the following tasks, since the operator should **NOT** remove the top cover of the equipment:

1. Check the front panel alarm/status LED. If this is not lit:
 - a Confirm that the power switch is turned on (I). See *Chapter 1, Introduction* for location of the power switch.
 - b Replace the fuse in the power connector at the rear panel.

Note: Only replace the fuse once. If it blows again contact Ericsson Customer Services.



- c Replace external equipment, power source and cables by substitution to check their performance.
2. Confirm that the equipment hardware configuration is suitable for the purpose and has been correctly installed and connected (see *Chapter 2, Installing the Equipment*).
 3. Confirm that inappropriate operator action is not causing the problem, and that the equipment software set-up is capable of performing the task being asked of it. If the validity of the configuration, set-up or operation is in doubt, check it (see *Chapter 3, Getting Started*).
 4. Check that the fans are unobstructed and working correctly.

When the failure condition has been fully investigated, and the symptoms are known, proceed with fault-finding according to the observed symptoms. If the fault persists, and cannot be rectified using the instructions given in this Reference Guide, contact Customer Services. Switch off the equipment if it becomes unusable, or to protect it from further damage.

8.5.3

Power Supply Problems/Unit Not Working

If the unit Status LED is unlit, fault-find the problem as detailed in *Table 8.3*.

Table 8.3 Status LED Unlit Fault-finding

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Is the LED/LCD display inactive but the unit still working?	If the unit is clearly working normally then the LED/LCD Display itself is probably at fault. Call a Service Engineer.	Proceed to next step.
2	Check Power Source. Connect a known-working piece of equipment to the power source outlet. Does it work?	The problem lies within the unit or power cable. Proceed to next step.	The problem lies with the power source. Check building circuit breakers, fuse boxes, etc. If problem persists, contact the electricity supplier.
3	Check Power Cable and Fuse. Unplug the power connector from the unit and try it in another piece of equipment. Does it work?	The problem lies within the unit. Proceed to next step.	The problem lies with either the cable itself, or with the fuse in the plug. Replace the fuse or try to substitute another cable.
4	Check PSU Module(s) and Fuse(s). Ensure the power connector is unplugged. Remove the fuse from the rear panel connector and inspect it. Has the fuse blown?	Replace the fuse with one of the correct type and rating (see <i>Annex B Technical Specification</i>). If the PSU still does not work, unplug the power cable and call a Service Engineer.	Possible problem with the PSU module. Call a Service Engineer.

8.5.3.1

Fuse Replacement

Please refer to the *Installation, Safety and Compliance Information for Ericsson Compression Products Reference Guide* supplied with your product for full details of how to replace the fuse in your product.



8.5.3.2

Lithium Battery

The lithium battery fitted within this product is not user replaceable and as such should only be replaced by qualified service personnel.

8.5.4

Fan(s) Not Working/Overheating

The fan speed can be reduced (set to lowest noise) at low temperatures to allow the unit to quickly attain operational temperature. In the event of overheating problems, refer to *Table 8.4*.

Note: Failure to ensure a free air-flow around the unit may cause overheating. This condition is detected by a temperature sensor; it may be used to trigger an automatic alarm.

Table 8.4 Fans Not Working/Overheating

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check Fan Rotation. Inspect the fans located at the sides of the enclosure. Are the fans rotating? Check Base Board temperature and fan (see nCompass information).	Check that the unit has been installed with sufficient space allowed for air-flow (see <i>Chapter 2, Installing the Equipment</i>). If the ambient air is too hot, additional cooling may be required.	Possible break in the DC supply from the PSU module to the suspect fan(s). Call a Service Engineer.

8.5.5

Cannot Access Web GUI

In the event that you cannot access the web GUI, refer to *Table 8.5*.

Table 8.5 Cannot Access Web GUI

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check whether the unit can be pinged.	Proceed to next step.	Follow the instructions given in <i>Unit Cannot Be Pinged</i> .
2	If the loading of the unit control interface is stuck with a warning message "Use of this browser configuration is not officially supported by Ericsson TV", check whether the Internet Explorer 8 is used in compatibility mode. Is it?	Turn off the compatibility mode in Internet Explorer 8 by following the steps below: 1. Press the Alt key, then select the Tools menu. 2. Select Compatibility View Settings . 3. Make sure that all the three checkboxes at the bottom are unchecked. 4. Click Close . 5. Re-open the browser.	Proceed to next step.
3	Does a dialogue appear after accessing the interface requesting the user name and password?	Give the credentials set before. (The default user name is "engineer", the default password is "password".) Not remembering the user name or the password, contact the customer services.	If the procedures given here cannot solve the problem, contact the customer services.



8.5.6

Unit Cannot Be Pinged

Pinging a computer is a method of checking if a computer is on the network. Pings send a network request to a computer asking it to respond (ICMP ECHO_REQUEST).

To ping a computer from a Windows/PC machine, use the MSDOS prompt and type the command: **ping <IP address>**

A successful 'ping' consists of receiving back a copy of a short transmitted test message. The reply will display 'ping statistics' (number of packets sent and received and the time taken, in ms, to receive back those packets).

In the event that you cannot ping your unit, refer to *Table 8.6*.

Table 8.6 Unit Cannot be Pinged

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check that the network cable is connected to one of the control ports on the back panel of the unit. Is the green LED lit?	The problem probably lies with the network settings. Proceed to next step.	<p>Check the cable connection between the unit and the computer or between the unit and the network device.</p> <p>Note: In case of a direct connection between the unit and the control computer a cross Ethernet cable needs to be used. If connecting between the unit and the network device such as a switch or a hub a cross cable is not required.</p> <p>For more information, see <i>Ethernet Control Port</i>.</p>
2	Ensure that the IP control port address of the device is within the same subnet as your PC, then check the settings for the control IP port on the Front Panel. Does the used IP address belong to the unit to be accessed?	The problem probably lies with the gateway or subnet mask settings. Proceed to next step.	Set the correct IP address.
3	Check the subnet mask and gateway settings. For more information, see <i>Ethernet Control Port</i> . Are they correctly set up?	The problem probably lies with the firewall settings. Proceed to next step.	Set up the subnet mask and gateway correctly.
4	Check the firewall settings. Are they correct?	Proceed to next step.	<p>Set the firewall correctly. If you are unsure, turn the firewall off completely.</p> <p>Note: By turning the firewall off, your computer may be exposed to virus threats.</p>
5	Restart the unit. Can it be now pinged?		Contact the customer services.

8.5.7 General Operation Problems

8.5.7.1 Parameters Slow to Load

Parameters may take up to 10 seconds to be applied. Please wait 10 seconds for the configuration to be applied before rebooting the box after a configuration change.

8.5.7.2 Problems Adding Program Clock Reference (PCR)

A separate PCR component can be added to the service. The PID at the service level must be selected to match the PID of the PCR component. See *Chapter 3, Getting Started* for further details.

8.5.7.3 MPEG-2 Video PES per GOP Option Removed

MPEG-2 video PES per GOP may be removed from the GUI as it is not recommended by DVB and PES per picture is mandatory for ATSC (see extract below).

Extract from ETSI TS 101 154 V1.11.1 (2012-11). Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream.

4.1.6.9 Multiple video pictures per PES packet

For MPEG-2 video Bitstreams, while there is no restriction against multiple video pictures in a single PES packet, there may be some MPEG-2 decoders that do not support this.

Encoding: The encoder should not put multiple video pictures in a single PES packet.

Decoding: The IRD may be able to accept and decode bitstreams which contain multiple video pictures in a single PES.

8.5.7.4 Ancillary Timecode (ATC) Not Extracted and Placed into the VBI Data PES

The ATC is not a VBI component and is not part of the VBI in separate PID (VBI in PES). The ATC is only present in the MPEG-2 Sequence/GOP header in MPEG-2 or the H.264 SEI message in H.264.

8.5.7.5 Video Recovery Delay When Switching MPEG-2 to H.264

It can take up to 30 seconds for the encoder to switch its output from MPEG-2 to H.264. We recommend the configuration is not changed during this period.

8.5.7.6 No VITC Control of Timecode

The TC mode on the VBI page controls the timecode mode on the Video PES and does not control the output on a separate VBI PID (VBI on PES). The only control for VBI on PES is the presence of the VBI component and the selection of the appropriate VBI line as **VITC**.



8.5.7.7

Video Index Operation and Active Format Description (AFD) Problems

For Video Index operation a difference may be observed in AFD operation between VBI PES and AFD in the SEI. For pass through of the Video Index line in PES, both the 1995 (3 bit AFD code) and 2008 (4-bit AFD code) versions are supported, i.e. the relevant 4 data bits are passed through unmodified and can be interpreted as either specification. For extraction of AFD code information from Video Index to SEI message/Video User Data, the assumption is made that the 1995 specification is in use in the encoder/decoder chain (3 bit AFD code only).

8.5.7.8

No RF Output (Voyager II and AVP3000 only)

8.5.7.8.1

Configuration

There are a number of possible reasons why a unit might not produce an RF output. The output must be turned on to enable the L-band or IF output, and (depending on the Output Power-up State setting) these actions may have to be repeated after a power outage.

If a transport stream has been successfully created and can be monitored on the front panel confidence monitor, check for these satellite modulator settings:

- Output Select must be set to **IF** or **L-band** as required (Modulation Parameters menu).
- Output State must be **On** (Line-up menu).
- The transport stream must be set to **Online**.

8.5.7.8.2

Error Conditions

The satellite modulator option includes a number of internal health monitoring features that can turn off the RF outputs. The purpose of these features is to prevent the unit from outputting a bad signal that would interfere with the service of other users of the satellite. If a fault is detected that would result in an output signal that is outside the expected frequency band, then the RF output is turned off and an alarm is generated. You cannot prevent these alarms from turning off the RF output, but you can determine how they are reported on the user interface. Masking these alarms does not stop the RF outputs being turned off.

The effects of alarms that can turn off the RF outputs are shown in the table below.

Table 8.7 Effect of Alarms That Can Turn Off RF Outputs

Alarm Name	IF output turned off?	L-band output turned off?
OCXO Fault	Yes	Yes
Clock PLL Unlocked	Yes	Yes
L-band Carrier Frequency Unlocked	No	Yes



If one of these alarms is present, then powering the unit down, waiting for at least 10 seconds and then re-powering the unit might recover it to normal operation, depending on the alarm's cause. Don't forget that you may need to enable the output after the power cycle.

If power cycling does restore operation after a persistent alarm, we still recommend that you return the unit for service at the next convenient opportunity

8.6 Unit XML

Overview

The Unit XML records the current configuration in a file. Configuration parameters provide the minimum information required for fault diagnosis.

Saving Configuration

When sending reporting bugs, it is required to attach the configuration to the bug report. To save the current configuration, do the following:

1. Navigate to the **Support** page.
2. In the **Import and Export** widget on the **General** tab, click on the **Save standard configuration** or **Save configuration including control parameters** button depending on whether you want to include the IP information of the unit in the saved xml file.
3. In the popup window, select the **Save file** option.
4. By default, the unit will save the configuration file to the **Downloads** folder on your computer.

8.7 Log Files

Overview

The log file records the events on the unit. Extracted from the unit, the log file may contain important information that can facilitate tracking down problems.

Log Operation

The event log is stored on the Host Controller Card (HCC). A log file is generated with a file format as defined by RFC3164. Once the log has filled the space allocated to it, the oldest entries in the log file are overwritten.

Events that are logged include power-on, power on self test (POST) results, warning and alarm assertions and de-assertions, user log ins and log outs. Any changes to the time and date are also recorded in the system log. Each event has a UTC time and date stamp appended to it, with a time resolution of one second.



The various system log files are accessible from the web pages. The system log can be exported as a comma separated list, so that it is easy to import it in to a spreadsheet, where it can be easily filtered or sorted.

Saving Logs

When sending reporting bugs, it is required to attach the log files extracted from the unit. To save all necessary log files and information required from the unit, do the following:

1. Navigate to the **Support** page.
2. In the **Log files** widget on the **General** tab, click on the **Download Logs and Status**.
3. In the popup window, select the **Save file** option.
4. By default, the unit will save the log file to the **Downloads** folder on your computer.

8.8

Saved and Exported Configurations

The configurations can be extracted from the unit in two xml formats:

- One format is obtained from the unit by exporting from the **Stored Configurations** page. This is often referred to as Exported Configuration.
- The other format can be saved from the Support page. This is often referred to as a Saved Configuration.

8.8.1

Exported Configuration

The exported configuration has a format that is used by the unit to efficiently store unit settings among the pre-stored configurations. This is a compact description in xml format, and contains only the most important attributes.

Getting the Exported Configuration from the Unit

To get the exported configuration, do the following:

1. Navigate to the **Stored Configurations** page.
2. In the **Stored Configurations** widget, select the configuration you want to export. Its name and description will appear in the **Configuration Workbench** widget.
3. Click on the **Export** button, and save the configuration to the local disk of the control computer.

Reloading an Exported Configuration to the Unit



Any configuration exported can be easily reloaded to the unit from the **Stored Configurations** page.

Note: Only an exported configuration can be reloaded to the unit using this method.

For this, do the following:

1. Navigate to the **Stored Configurations** page.
2. Select an empty slot in the **Stored Configurations** widget.
3. In the **Configuration Workbench** widget, click on the **Browse** button next to the **Import** field. A dialog box shall appear.
4. Browse to the exported configuration file, select it and then click **Open**.
5. To import the file, click on the **Import** button.

8.8.2

Saved Configuration

The saved configuration gives a full description of the unit including attributes useful for debugging purposes. This is the format that shall be sent to Customer Support when reporting a bug.

Getting a Saved Configuration from the Unit

To get the saved configuration from the unit, do the following:

1. Navigate to the **Support** page.
2. In the **Import and Export** widget on the **General** tab, click on the **Save standard configuration** or **Save configuration including control parameters** button depending on whether you want to include the IP information of the unit in the saved xml file.
3. In the popup window, select the **Save file** option.
4. By default, the unit will save the configuration file to the **Downloads** folder on your computer.

Reloading a Saved Configuration to the Unit

Any previously saved configuration can be easily reloaded to the unit from the Support page.

Note: Only a saved configuration can be reloaded to the unit using this method.

To reload a saved configuration, do the following:

1. Navigate to the **Support** page.



2. In the **Import and Export** widget, open the **Restore Configuration or Restore Configuration including Control Parameters** accordion depending on whether you saved the configuration without or with control information.
3. Click on the **Browse** button and browse to the converted configuration file, select it and then click **Open**.
4. Click on the **Upload** button and a pop-up box **Confirm Restore** will appear. Click on the **Yes** button to upload the file.

Note: Configurations saved from units running previous releases of code may not be fully compatible with newer code releases. A configuration converter tool is available to convert these configurations.

8.9 Calling a Service Engineer

If you cannot resolve a problem with your equipment using the information provided in this chapter, or if you experience technical or operational difficulties, please do not hesitate to contact us to request assistance.

There is a lot of information you can give us that will enable us to diagnose your problem swiftly. When contacting us please provide the following:

- Serial number. To obtain this, click the **About** button on any web GUI page.
- Software version number. To obtain this, click the **About** button on any web GUI page or view the front panel **System > Versions** screen.
- Configuration, both hardware and software. To obtain a copy of your current configuration, go to the **Configure > Save-Load** web page and obtain an XML file.
- Unit logs, if relevant. To obtain these, go to the **Support > View Logs** web page.
- System architecture and environment.
- Description of the symptoms and what diagnosis and tests have already been attempted.
- Any external events that may be related as triggers of the symptoms. If so, at what local time?
- Wireshark IP captures, if relevant.
- System logs from any controlling application software, if relevant.

In addition to the above, please do not forget to provide us with your contact details to enable us to get in touch with you swiftly:

- Name(s).
- Telephone and fax numbers.



- Email address.
- Business address.



Glossary

Annex A

The following list covers most of the abbreviations, acronyms and terms as used in Ericsson Manuals, User and Reference Guides. All terms may not be included in this Reference Guide.

µm	Micrometer (former name - micron): A unit of length equal to one millionth (10^{-6}) of a meter.
1000BaseT	The term for the Electrical Gigabit Ethernet interface. This is the most common interface for Gigabit Ethernet. Most Gigabit-enabled PCs and equipment use this interface.
3:2 pull-down	A technique used when converting film material (which operates at 24 pictures per second) to 525-line video (operating at 30 pictures per second).
4:2:0	Digital video coding method in which the color difference signals are sampled on alternate lines at half the luminance rate.
4:2:2	Digital video coding method in which the color difference signals are sampled on all lines at half the luminance rate.
422P@ML	422 Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 50 Mbps over various mediums. Used for Contribution and Distribution applications.
8b10b	8-bit data mapped to 10-bit symbols.
ABR	Adaptive Bit Rate.
ADPCM	Adaptive Differential Pulse Code Modulation: An advanced PCM technique that converts analogue sound into digital data and vice versa. Instead of coding an absolute measurement at each sample point, it codes the difference between samples and can dynamically switch the coding scale to compensate for variations in amplitude and frequency.
ACC	Authorization Control Computer.
ADT	Audio, Data And Teletext.
AFC	Automatic Frequency Control.
AFS	Automation File Server.
AGC	Automatic Gain Control.



ALC	Automatic Loudness Control: ALC is an audio processing mode for measuring and modifying audio amplitude with the aim of changing the perceived loudness level. It uses a measurement based upon the new standards for measuring audio loudness defined in ITU-R BS.1770-2, this standard forms the measurement basis of the guidelines in EBU R128 and ATSC/A85.
AMOL I and II	Automatic Measure of Line-ups I and II: Used by automated equipment to measure programme-viewing ratings.
ARP	Address Resolution Protocol. A protocol used to "resolve" IP addresses into underlying Ethernet MAC addresses.
ASI	Asynchronous Serial Interface.
ASIC	Application-Specific Integrated Circuit: A customized chip designed to perform a specific function.
Async	Asynchronous.
ATM	Asynchronous Transfer Mode: A connection orientated, cell based, data transport technology designed for Broadband ISDN (B-ISDN). It provides a circuit-switched bandwidth-on-demand carrier system, with the flexibility of packet switching. It offers low end-to-end delays and (negotiable on call set up) Quality of Service guarantees. Asynchronous refers to the sporadic nature of the data being transmitted. Cells are transmitted only when data is to be sent, therefore the time interval between cells varies according to the availability of data.
ATSC	Advanced Television Standards Committee: An organization founded in 1983 to research and develop a digital TV standard for the U.S.A. In late 1996, the FCC adopted the ATSC standard, the digital counterpart of the NTSC standard.
AVP	Advanced Video Processor.
B3ZS	Bipolar with Three Zero Substitution: A method of eliminating long zero strings in a transmission. It is used to ensure a sufficient number of transitions to maintain system synchronization when the user data stream contains an insufficient number of 1s to do so. B3ZS is the North American equivalent of the European HDB3.
Backward Compatibility	Refers to hardware or software that is compatible with earlier versions.
BAT	Bouquet Association Table: Part of the service information data. The BAT provides information about bouquets. It gives the name of the bouquet and a list of associated services.
baud rate	The rate of transfer of digital data when the data comprises information symbols that may consist of a number of possible states. Equivalent to bit rate when the symbols only have two states (1 and 0). Measured in Baud.
BER	Bit Error Rate: A measure of transmission quality. The rate at which errors occur in the transmission of data bits over a link. It is generally shown as a negative exponent, (e.g., 10^{-7} means that 1 in 10,000,000 bits are in error).

BISS	Basic Interoperable Scrambling System: Non-proprietary encryption from EBU (Tech3290).
Bit rate	The rate of transfer of digital data when the data comprises two logic states, 1 and 0. Measured in bit/s.
Block; Pixel Block	An 8-row by 8-column matrix of luminance sample values, or 64 DCT coefficients (source, quantized, or de-quantized).
Bouquet	A collection of services (TV, radio, and data, or any combination of the three) grouped and sold together, and identified in the SI as a group. A single service may be in several bouquets.
B-Picture; B-Frame	Bi-directionally Predictive Coded Picture/Frame: A picture that is coded using motion-compensated prediction from previous I or P frames (forward prediction) and/or future I or P frames (backward prediction). B frames are not used in any prediction.
BPSK	Binary Phase Shift Keying: A data modulation technique.
Buffer	A memory store used to provide a consistent rate of data flow.
BW	Bandwidth: The transmission capacity of an electronic line such as (among others) a communications network, computer bus, or broadcast link. It is expressed in bits per second, bytes per second or in Hertz (cycles per second). When expressed in Hertz, the frequency may be a greater number than the actual bits per second, because the bandwidth is the difference between the lowest and highest frequencies transmitted. High bandwidth allows fast transmission or high-volume transmission.
Byte-mode	Each byte is delivered separately in the ASI transport stream, with stuffing data added between the Bytes to increase the data rate to 270 Mbps. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
CA	Conditional Access: The technology used to control the access to viewing services to authorized subscribers through the transmission of encrypted signals and the programmable regulation of their decryption by a system such as viewing cards.
CAT	Conditional Access Table: Part of the MPEG-2 Program Specific Information (PSI) data. Mandatory for MPEG-2 compliance if CA is in use.
C-Band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 4 GHz to 6 GHz. Used by communications satellites. Preferred in tropical climates because it is not susceptible to fading.
CCIR	See: ITU-R.
CCITT	See: ITU-T.
Channel	a narrow range of frequencies, part of a frequency band, for the transmission of radio and television signals without interference from other channels. In the case of OFDM, a large number of carriers spaced apart at precise frequencies are allocated to a channel.

Channel Coding	A way of encoding data in a communications channel that adds patterns of redundancy into the transmission path in order to improve the error rate. Such methods are widely used in wireless communications.
Chrominance	The color part of a TV picture signal, relating to the hue and saturation but not to the luminance (brightness) of the signal. In a composite-coded color system, the color information (chrominance, often referred to as chroma) is modulated onto a high frequency carrier and added to the monochrome-format video signal carrying the luminance (Y). In a component-coded color system, the two color-difference signals (R-Y)(B-Y) usually referred to as C_{RC_B} (digital) or P_{RP_B} (analogue), are used to convey color information. When C_{RC_B} (P_{RP_B}) is added to the luminance (Y), the complete picture information is conveyed as YC_{RC_B} (YP_{RP_B}).
Closed Captioning	A TV picture subtitling system used with 525-line analogue transmissions.
CODE	Create Once Distribute Everywhere.
Codec	The combination of an Encoder and a complementary Decoder located respectively at the input and output of a transmission path.
COFDM	Coded OFDM: COFDM adds forward error correction to the OFDM transmission consisting of Reed-Solomon (RS) coding followed by convolutional coding to add extra bits to the transmitted signal. This allows a large number of errors at the receive end to be corrected by convolutional (Viterbi) decoding followed by RS decoding.
Composite	CVBS Video Signal, 1 V pk-pk
Compression	Reduction in the number of bits used to represent the same information. For the purposes of a broadcast system, it is the process of reducing digital picture information by discarding redundant portions of information that are not required when reconstituting the picture to produce viewing clarity. Compression allows a higher bite-rate to be transmitted through a given bandwidth.
Compression System	Responsible for compressing and multiplexing the video / audio / data bitstreams, together with the authorization stream. The multiplexed data stream is then ready for transmission.
C_{RC_B}	Digital Color difference signals. These signals, in combination with the luminance signal (Y), define the color and brightness of each picture element (pixel) on a TV line. See: Chrominance
CRC	Cyclic Redundancy Check: A mathematical algorithm that computes a numerical value based on the bits in a block of data. This number is transmitted with the data and the receiver uses this information and the same algorithm to ensure the accurate delivery of data by comparing the results of algorithm and the number received. If a mismatch occurs, an error in transmission is presumed.
CVBS	Chroma Video Burst and Sync: An analogue Video SD resolution signal, such as NTSC or PAL.

dB	Decibels: A ratio of one quantity to another using logarithmic scales to give results related to human aural or visual perception. dB is a ratio whereas dBm, for example, is an absolute value, quoted as a ratio to a fixed point of 0 dBm. 0 dBm is 1 mW at 1 kHz terminated in 600 Ω. 0 dBmV is 1 mV terminated in 75 Ω.
DCE	Data Communications Equipment: Typically a modem. It establishes, maintains and terminates a session on a network but in itself is not the source (originator) or destination (end receiving unit) of signals (e.g. a computer, see DTE). A DCE device may also convert signals to comply with the transmission path (network) format.
DCT	Discrete Cosine Transform: A technique for expressing a waveform as a weighted sum of cosines. Raw video data is not readily compressible. DCT is not in itself a compression technique but is used to process the video data so that it is compressible by an encoder. DCT processes the picture on an 8x8-pixel block basis, converting the data from an uncompressible X Y form (as displayed by an oscilloscope) to a compressible frequency domain form (as displayed by a spectrum analyzer). Can be forward DCT or inverse DCT.
DDS	Direct Digital Synthesiser.
Decoder	The unit containing the electronic circuitry necessary to decode encrypted signals. Some Decoders are separate from the receiver but in satellite TV broadcasting, the term is often used interchangeably as a name for an Integrated Receiver Decoder (IRD). The term IRD, or IRD / Decoder, is usually associated with satellite TV broadcasting while Cable systems are based on Converters or on Set-Top Boxes / Converters.
Decoding Time stamp	A field that may be present in a PES packet header that indicates the time that an access unit is to be decoded in the system target Decoder.
DENG	Digital Electronic News Gathering
DID	Data Identifier.
Differential Coding	Method of coding using the difference between the value of a sample and a predicted value.
DiffServ	Differentiated Services. A mechanism used on layer 3 - e.g. the IP layer - to differentiate between traffic of various types. DiffServ is based on the ToS field and provides a mechanism for the network to give e.g. video traffic higher priority than other traffic (for example Internet traffic).
DIL	Dual In Line: The most common type of package for small and medium scale integrated circuits. The pins hang vertically from the two long sides of the rectangular package, spaced at intervals of 0.1 inch.
DIN	Deutsches Institut für Normung: German Standards Institute.
Downlink	The part of the satellite communications circuit that extends from the satellite to an Earth station.

Downconvert	The process by which the frequency of a broadcast transport stream is shifted to a lower frequency range.
DPCM	Differential Pulse Code Modulation: An audio digitization technique that codes the difference between samples rather than coding an absolute measurement at each sample point.
DSNG	Digital Satellite News-Gathering.
DSP	Digital Signal Processor.
DTE	Data circuit Terminating Equipment: A communications device that originates (is the source) or is the end receiving unit (destination) of signals on a network. It is typically a terminal or computer.
DTH	Direct-To-Home. The term used to describe uninterrupted transmission from the satellite directly to the subscriber, that is, no intermediary cable or terrestrial network utilized.
DTMF	Dual-Tone MultiFrequency
DVB	Digital Video Broadcasting: A European project which has defined transmission standards for digital broadcasting systems using satellite (DVB-S), cable (DVB-C) and terrestrial (DVB-T) medium, created by the EP-DVB group and approved by the ITU. Specifies modulation, error correction, etc. (see EN 300 421 for satellite, EN 300 429 for cable and EN 300 744 for terrestrial).
DVB SI	Digital Video Broadcasting Service Information.
DVB-PI	DVB-Professional Interfaces
DWDM	Dense Wavelength Division Multiplexing. A mechanism to utilize existing fiber with even more bandwidth by adding extra signals using other wavelengths/colors
Earth	<p>Technical Earth: Ensures that all equipment chassis within a rack are at the same potential, usually by connecting a wire between the Technical earth terminal and a suitable point on the rack. This is sometimes known as a Functional earth.</p> <p>Protective Earth: Used for electric shock protection. This is sometimes known as a safety earth.</p>
EBU	European Broadcast Union.
ECM	Entitlement Control Message.
EDI	Ethernet Data Input
EIA	Electronics Industries Association (USA).
EIT	<p>Event Information Table: Equipment: A component of the DVB-Service Information (SI) stream generated within an Encoder, containing information about events or programmes such as event name, start time, duration, etc.</p> <p>System: EIT (Present/Following) contains the name of the current and next event. It may include an optional descriptor (synopsis) giving brief details of content. EIT (Schedule) is used to produce a full EPG. The EIT is the only DVB-SI table, which can be encrypted.</p>
Elementary Stream	A generic term for a coded bitstream, be it video, audio or other.

EMC	Electromagnetic Compatibility.
EMM	Entitlement Management Message.
Encryption	Encoding of a transmission to prevent access without the appropriate decryption equipment and authorization.
EPG	Electronic Programme Guide: On-screen programme listing using thumbnail pictures and/or text.
Ethernet	The most widely used local area network (LAN) defined by the IEEE as the 802.3 standard. Transmission speeds vary according to the configuration. Ethernet uses copper or fiber-optic cables.
ETS	European Telecommunications Standard.
ETSI	European Telecommunications Standards Institute.
FBAS	German for CVBS
FCC	Federal Communications Commission.
FDM	Frequency Division Multiplex: A common communication channel for a number of signals, each with its own allotted frequency.
FEC	Forward Error Correction: A method of catching errors in a transmission. The data is processed through an algorithm that adds extra bits and sends these with the transmitted data. The extra bits are then used at the receiving end to check the accuracy of the transmission and correct any errors.
FFT	Fast Fourier Transformation: A fast algorithm for performing a discrete Fourier transform.
FIFO	First In, First Out: A data structure or hardware buffer from which items are taken out in the same order they were put in. Also known as a shelf from the analogy with pushing items onto one end of a shelf so that they fall off the other. A FIFO is useful for buffering a stream of data between a sender and receiver that are not synchronized - i.e. they not sending and receiving at exactly the same rate.
FM	Frequency Modulation: Analogue modulation procedure
Footprint	The area of the Earth's surface covered by a satellite's downlink transmission. Also (generally) the area from which the satellite can receive uplink transmissions.
FTP	File Transfer Protocol: A protocol used to transfer files over a TCP/IP network (Internet, UNIX, etc.). For example, after developing the HTML pages for a Web site on a local machine, they are typically uploaded to the Web server, using FTP. Unlike e-mail programs in which graphics and program files have to be attached, FTP is designed to handle binary files directly and does not add the overhead of encoding and decoding the data.
G.703	The ITU-T standard which defines the physical and electrical characteristics of hierarchical digital interfaces.

GOP	Group of Pictures: MPEG video compression works more effectively by processing a number of video frames as a block. The Ericsson AB Encoder normally uses a 12 frame GOP; every twelfth frame is an I frame.
GUI	Graphical User Interface: The use of pictures rather than just words to represent the input and output of a program. A program with a GUI runs under a windowing system and has a screen interface capable of displaying graphics in the form of icons, drop-down menus and a movable pointer. The on-screen information is usually controlled / manipulated by a mouse or keyboard.
HDTV	High Definition Television.
HPA	High Power Amplifier: Used in the signal path to amplify the modulated and up-converted broadcast signal for feeding to the uplink antenna.
HSYNC	Horizontal (line) SYNCs.
HTTP	HyperText Transfer Protocol. The fundamental protocol used on the Internet for transmission of WEB pages and other data between servers and PCs
HU	Height Unit
Hub	A device in a multi-point network at which branch nodes interconnect.
ICAM	Integrated Conditional Access Module: Embedded in the IRD and responsible for descrambling, plus packet filtering and reception. It also contains the physical interface to the subscriber's viewing card.
ICMP	Internet Control Message Protocol. ICMP messages, delivered in IP packets, are used for out-of-band messages related to network operation or mis-operation
IGMP	Internet Group Management Protocol. IGMP is a protocol used to manage multicasts on the Internet. For a host (receiver unit) to receive a multicast, it needs to transmit IGMP "join" messages on the right format. Three versions exist. IGMPv2 is common today but IGMPv3 is the next step.
IDU	Indoor unit
IEC	International Electrotechnical Committee.
IF	Intermediate Frequency: Usually refers to the 70 MHz or 140 MHz output of the Modulator in cable, satellite and terrestrial transmission applications.
Interframe Coding	Compression coding involving consecutive frames. When consecutive frames are compared, temporal redundancy is used to remove common elements (information) and arrive at difference information. MPEG-2 uses B and P frames, but since they are individually incomplete and relate to other adjacent frames, they cannot be edited independently.

Intraframe Coding	Compression coding involving a single frame. Redundant information is removed on a per frame basis. All other frames are ignored. Coding of a macroblock or picture that uses information only from that macroblock or picture. Exploits spatial redundancy by using DCT to produce I frames; these are independent frames and can be edited.
IP	Internet Protocol: The IP part of TCP/IP. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or sub-network. IP accepts packets from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a datagram to the layer 2 data link protocol. It may also break the packet into fragments to support the Maximum Transmission / Transfer Unit (MTU) of the network.
I-picture; I-frame	Intracoded Picture/Frame: A picture / frame, which is coded using purely intracoding with reference to no other field or frame information. The I frame is used as a reference for other compression methods.
IPPV	Impulse Pay Per View: One-time events, purchased at home (on impulse) using a prearranged SMS credit line.
IRD	Integrated Receiver Decoder: The Receiver with an internal MPEG Decoder, which is connected to the subscriber's TV. The IRD is responsible for receiving and de-multiplexing all signals. The unit receives the incoming signal and if CA is active, decodes the signal when provided with a control word by the viewing card. Domestic IRDs are also known as Set-Top Units or Set-Top Boxes.
IRE	Institute of Radio Engineers: No longer in existence but the name lives on as a unit of video amplitude measurement. This unit is 1% of the range between blanking and peak white for a standard amplitude signal.
ISDN	Integrated Services Digital Network: The basic ISDN service is BRI (Basic Rate Interface), which is made up of two 64 kbps B channels and one 16 kbps D channel (2B+D). If both channels are combined into one, called bonding, the total data rate becomes 128 kbps and is four and a half times the bandwidth of a V.34 modem (28.8 kbps). The ISDN high speed service is PRI (Primary Rate Interface). It provides 23 B channels and one 64 kbps D channel (23B+D), which is equivalent to the 24 channels of a T1 line. When several channels are bonded together, high data rates can be achieved. For example, it is common to bond six channels for quality videoconferencing at 384 kbps. In Europe, PRI includes 30 B channels and one D channel, equivalent to an E1 line.
ISO	International Standards Organisation.
ISOG	Inter-union Satellite Operations Group.
ITS	Insertion Test Signal: A suite of analogue test signals placed on lines in the VBI. Also known as VITS.
ITT	Invitation To Tender.
ITU-R	International Telecommunications Union - Radiocommunications Study Groups (was CCIR).



ITU-T	International Telecommunications Union - Telecommunications Standardization Sector (was CCITT).
JPEG	Joint Photographic Experts Group: ISO/ITU standard for compressing still images. It has a high compression capability. Using discrete cosine transform, it provides user specified compression ratios up to around 100:1 (there is a trade-off between image quality and file size).
kbps	1000 bits per second.
Kbit	1024 bits, usually refers to memory capacity or allocation.
Ku-band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 12 GHz to 14 GHz. Used by communications satellites. Preferred for DTH applications because this range of frequency is less susceptible to interference.
LAN	Local Area Network: A network, which provides facilities for communications within a defined building or group of buildings in close proximity.
L-band	The frequency band from 950 MHz to 2150 MHz, which is the normal input-frequency-range of a domestic IRD. The incoming signal from the satellite is down-converted to L-band by the LNB.
LED	Light Emitting Diode.
LNB	Low Noise Block Down-Converter: The component of a subscriber satellite transmission receiving dish which amplifies the incoming signal and down-converts it to a suitable frequency to input to the IRD (typically 950 MHz - 1600 MHz).
LO	Local Oscillator.
lsb	Least significant bit.
Luminance	The television signal representing brightness, or the amount of light at any point in a picture. The Y in YC _R C _B .
LVDS	Low Voltage Differential Signal: LVDS is a generic multi-purpose Interface standard for high speed / low power data transmission. It was standardized in ANSI/TIA/EIA-644-1995 Standard (aka RS-644).
Macroblock	A 16x16-pixel area of the TV picture. Most processing within the MPEG domain takes place with macro blocks. These are converted to four 8x8 blocks using either frame DCT or field DCT. Four 8 x 8 blocks of luminance data and two (4:2:0 chrominance format), four (4:2:2) or eight (4:4:4) corresponding 8 x 8 blocks of chrominance data coming from a 16 x 16 section of the luminance component of the picture. Macroblock can be used to refer to the sample data and to the coded representation of the sample values and other data elements.
Mbps	Million bits per second.
MCC	Multiplex Control Computer: A component of a System 3000 compression system. The MCC sets up the configuration for the System 3000 Multiplexers under its control. The MCC controls both the main and backup Multiplexer for each transport stream.

MCPC	Multiple Channels Per Carrier.
Meta-data	Meta-data is descriptive data that is "tagged" to a movie or audio clip. Meta-data is essential for the broadcaster.
MMDS	Multichannel Microwave Distribution System: A terrestrial microwave direct-to-home broadcast transmission system.
Motion Compensation	The use of motion vectors to improve the efficiency of the prediction of sample values. The prediction uses motion vectors to provide offsets into the past and/or future reference frames or fields containing previously decoded sample values that are used to form the prediction error signal.
Motion Estimation	The process of estimating motion vectors in the encoding process.
Motion Vector	A two-dimensional vector used for motion compensation that provides an offset from the coordinate position in the current picture or field to the coordinates in a reference frame or field.
MP@ML	Main Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 15 Mbps over various mediums.
MP@HL	Main Profile at High Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 80 Mbps over various mediums.
MPEG	Moving Pictures Experts Group: The name of the ISO/IEC working group which sets up the international standards for digital television source coding.
MPEG-2	Industry standard for video and audio source coding using compression and multiplexing techniques to minimize video signal bit rate in preparation for broadcasting. Specified in ISO/IEC 13818. The standard is split into layers and profiles defining bit rates and picture resolutions.
MPLS	Multi-protocol Label Switching. A Quality of Service mechanism for IP networks that allow IP packets to flow along a predefined path in a network, improving the reliability and robustness of the transmission.
MPM	Media Processing Module.
MPTS	Multi-Program Transport Streams. Transport Streams that carry multiple TV/Radio services.
msb	Most significant bit.
Msymbol/s	(Msym/s) Mega (million) Symbols per second (10^6 Symbols per second).
Multiplex	A number of discrete data streams (typically 8 to 12), from encoders, that are compressed together in a single DVB compliant transport stream for delivery to a Modulator.



Multicast	An IP mechanism that allows transmission of data to multiple receivers. A multicast can also have several transmit sources simultaneously. In video applications, multicast is typically used to distribute a video signal from a central source to multiple destinations.
MUSICAM	Masking pattern adapted Universal Sub-band Integrated Coding And Multiplexing: An audio bit rate reduction system relying on sub-band coding and psychoacoustic masking.
Mux	Multiplexer: Transmission Multiplexer: receives EMMs from the ACC, ECMs from the BCC, video/audio data from the encoders, and the SI stream from the SIC. It then multiplexes them all into a single DVB-compliant transport stream, and delivers the signal to the uplink after modulation. The Multiplexer also contains the cipher card, which scrambles the services according to the control words supplied by the BCC.
Network	In the context of broadcasting: a collection of MPEG-2 transport stream multiplexes transmitted on a single delivery system, for example, all digital channels on a specific cable system.
NICAM	Near Instantaneously Companded Audio Multiplex: Official name is NICAM 728. Used for digital stereo sound broadcasting in the UK employing compression techniques to deliver very near CD quality audio. 728 refers to the bit rate in kbps.
NIT	Network Information Table: Part of the service information data. The NIT provides information about the physical organization of each transport stream multiplex, and the characteristics of the network itself (such as the actual frequencies and modulation being used).
nm	Nanometer: a unit of length equal to one thousand millionth (10^{-9}) of a meter.
NMS	Network Management System: A system used to supervise elements in an IP network. When a device reports an alarm, the alarm will be collected by the NMS and reported to the operator. NMS systems typically collect valuable statistics information about the network performance and can warn the operator early.
NTSC	National Television Systems Committee: The group, which developed analogue standards used in television broadcast systems in the United States. Also adopted in other countries (e.g. Mexico, Canada, Japan). This system uses 525 picture lines and a 59.97 Hz field frequency.
NVOD	Near Video On-Demand: Method of offering multiple showings of movies or events. The showings are timed to start at set intervals, determined by the broadcaster. Each showing of a movie or event can be sold to subscribers separately.
NVRAM	Non-volatile Random Access Memory: Memory devices (permitting random read / write access) that do not lose their information when power is removed. Stores the default configuration parameters set by the user.
ODU	Outdoor Unit

OFDM	Orthogonal Frequency Division Multiplex: A modulation technique used for digital TV transmission in Europe, Japan and Australia; more spectrally efficient than FDM. In OFDM, data is distributed over a large number of carriers spaced apart at precise frequencies. The carriers are arranged with overlapping sidebands in such a way that the signals can be received without adjacent channel interference.
OPPV	Order ahead Pay Per View: An advance purchase of encrypted one-time events with an expiry date.
OSD	On-screen display: Messages and graphics, typically originating from the SMS, and displayed on the subscriber's TV screen by the IRD, to inform the subscriber of problems or instruct the subscriber to contact the SMS.
Packet	A unit of data transmitted over a packet switching network. A packet consists of a header followed by a number of contiguous bytes from an elementary data stream.
PAL	Phase Alternating Line: A color TV broadcasting system where the phase of the R-Y color-difference signal is inverted on every alternate line to average out errors providing consistent color reproduction.
PAT	Program Association Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. The PAT points (maps) to the PMT.
PCM	Pulse Code Modulation: A process in which a signal is sampled, each sample is quantized independently of other samples, and the resulting succession of quantized values is encoded into a digital signal.
PCR	Program Clock Reference: A time stamp in the transport stream from which the Decoder timing is derived.
PDC	Program Delivery Control: A Teletext service allowing simple programming (i.e. VideoPlus) of VCR recording times. If the desired program is rescheduled, PDC updates the programming information in the VCR.
Pel	Picture Element: Also known as a pixel. The smallest resolvable rectangular area of an image either on a screen or stored in memory. On-screen, pixels are made up of one or more dots of color. Monochrome and grey-scale systems use one dot per pixel. For grey-scale, the pixel is energized with different intensities, creating a range from dark to light (a scale of 0-255 for an eight-bit pixel). Color systems use a red, green and blue dot per pixel, each of which is energized to different intensities, creating a range of colors perceived as the mixture of these dots. If all three dots are dark, the result is black. If all three dots are bright, the result is white.



PES	Packetized Elementary Stream: A sequential stream of data bytes that has been converted from original elementary streams of audio and video access units and transported as packets. Each PES packet consists of a header and a payload of variable length and subject to a maximum of 64 kbytes. A time stamp is provided by the MPEG-2 systems layer to ensure correct synchronization between related elementary streams at the Decoder.
PID	Packet Identifier: the header on a packet in an elementary data stream, which identifies that data stream. An MPEG-2 / DVB standard.
PIN	Personal Identification Number: A password used to control access to programming and to set purchase limits. Each subscriber household can activate several PINs and may use them to set individual parental rating or spending limits for each family member.
Pixel	PIX (picture) Element: The digital representation of the smallest area of a television picture capable of being delineated by the bit-stream. See Pel for more information.
pk-pk	peak to peak: Measurement of a signal or waveform from its most negative point to its most positive point.
PLL	Phase-Locked Loop. A phase-locked loop is a control system which controls the rotation of an object by comparing its rotational position (phase) with another rotating object as in the case of a sine wave or other repeating signal. This type of control system can synchronize not only the speed, but also the angular position of two waveforms that are not derived from the same source.
PMT	Program Map Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. Each service has a PMT, which lists the component parts (elementary streams of video, audio, etc.) for the various services being transmitted.
P-picture/P-frame	A picture / frame produced using forward prediction. It contains predictions from either previous I frames or previous P frames. The P frame is used as a reference for future P or B frames.
ppm	Parts per million.
PPV	Pay Per View: A system of payment for viewing services based on a usage / event basis rather than on on-going subscription. Subscribers must purchase viewing rights for each PPV event that they wish to view. PPV events may be purchased as IPPV or OPPV.
Program	PC - A sequence of instructions for a computer. TV - A concept having a precise definition within ISO 13818-1 (MPEG-2). For a transport stream, the timebase is defined by the PCR. The use of the PCR for timing information creates a virtual channel within the stream.
Programme	A linking of one or more events under the control of a broadcaster. For example, football match, news, film show. In the MPEG-2 concept, the collection of elementary streams comprising the programme, have a common start and end time. A series of programmes are referred to as events.

P_RP_B	Analogue Color difference signals. Refer to C _R C _B for an explanation.
PS	Program Stream: A combination of one or more PESs with a common timebase.
PSI	Program Specific Information: Consists of normative data, which is necessary for the de-multiplexing of transport streams and the successful regeneration of programs (see also: SI).
PSIP	Program System Information Protocol: The ATSC equivalent of SI for DVB.
PSK	Phase Shift Keying: A method of modulating digital signals particularly suited to satellite transmission.
PSR	Professional Satellite Receiver: See also: IRD.
PSU	Power Supply Unit.
QAM	Quadrature Amplitude Modulation: A method of modulating digital signals, which uses combined techniques of phase modulation and amplitude modulation. It is particularly suited to cable networks.
QoS	Quality of Service. A common term for a set of parameters describing the quality you get from an IP network: Throughput, availability, delay, jitter and packet loss.
QPSK	Quadrature Phase Shift Keying: A form of phase shift keying modulation using four states.
QSIF	Quarter Screen Image Format.
Quantise	A process of converting analogue waveforms to digital information. 8-bit quantization as set out in ITU-R Rec. 601. Uses 256 levels in the range 0 – 255 to determine the analogue waveform value at any given point. The value is then converted to a digital number for processing in the digital domain.
RAM	Random Access Memory: A volatile storage device for digital data. Data may be written to, or read from, the device as often as required. When power is removed, the data it contains is lost.
RAS	Remote Authorization System: An Ericsson AB proprietary public-key encryption system used to prevent unauthorized viewing of a TV programme or programmes.
Reflex™	An Ericsson AB proprietary system to provide efficient use of bandwidth by a set of encoders without sacrificing picture quality. A group bit rate is allocated to a set of Encoders and the bit rate for each encoder is allocated according to the requirements of the picture encoding process. The bit rate allocation can be performed externally by a multiplexer, or internally in a unit fitted with multiple VCM's.
RF	Radio Frequency.
RGB	Red, Green, Blue: The Chroma information in a video signal.
RIP2	Routing Information Protocol v2. A protocol used between network routers to exchange routing tables and information.

ROM	Read Only Memory: A non-volatile storage device for digital data. Data has been stored permanently in this device. No further information may be stored (written) there and the data it holds cannot be erased. Data may be read as often as required.
RS	Reed-Solomon coding: An error detection and correction, coding system. 16 bytes of Reed-Solomon Forward Error Correction code are appended to the packet before transmission bringing the packet length to 204 bytes. The 16 bytes are used at the receiving end to correct any errors. Up to eight corrupted bytes can be corrected.
RSVP	ReSerVation Protocol. A Quality-of-service oriented protocol used by network elements to reserve capacity in an IP network before a transmission takes place.
RTP	Real-time Transfer Protocol. A protocol designed for transmission of real-time data like video and audio over IP networks. RTP is used for most video over IP transmissions.
RLC	Run Length Coding: Minimization of the length of a bit-stream by replacing repeated characters with an instruction of the form 'repeat character x y times'.
SBR	Spectral Band Replication.
SCPC	Single Channel Per Carrier.
Spectral Scrambling	A process (in digital transmission) used to combine a digital signal with a pseudo-random sequence, producing a randomized digital signal that conveys the original information in a form optimized for a broadcast channel.
Scrambling	Alteration of the characteristics of a television signal in order to prevent unauthorized reception of the information in clear form.
SDI	Serial Digital Interface.
SDT	Service Description Table: Provides information in the SI stream about the services in the system; for example, the name of the service, the service provider, etc.
SDTI	Serial Data Transport Interface. A mechanism that allows transmission of various types of data over an SDI signal. This may be one or more compressed video signals or other proprietary data types. The advantage of SDTI is that existing SDI transmission infrastructure can be used to transport other types of data.
SELV	Safety Extra Low Voltage (EN 60950).
SFP	Small Form-factor Pluggable module. A standardized mechanism to allow usage of various optical interfaces for Gigabit Ethernet. Several types of SFP modules exist: Single-mode fiber modules for long-distance transmission and multi-mode fiber modules for shorter distances. SFP is also known as "mini-GBIC".
SIP	Session Initiation Protocol. A common acronym for the ongoing effort to standardize signaling over IP networks, i.e. connection set-up and tear-down. SIP makes it possible to "dial" a remote receiver of data and set-up the connection in this way.

STB	Set-Top Box: A box that sits on top of a television set and is the interface between the home television and the cable TV company. New technologies evolving for set-top boxes are video-on-demand, video games, educational services, database searches, and home shopping. The cable equivalent of the IRD.
SFN	Single Frequency Network: The SFN technique allows large geographic areas to be served with a common transmission multiplex. All transmitters in the network are synchronously modulated with the same signal and they all radiate on the same frequency. Due to the multi-path capability of the multi-carrier transmission system (COFDM), signals from several transmitters arriving at a receiving antenna may contribute constructively to the total wanted signal. The SFN technique is not only frequency efficient but also power efficient because fades in the field strength of one transmitter may be filled by another transmitter.
SI	Service Information: Digital information describing the delivery system, content and scheduling (timing) of broadcast data streams. DVB-SI data provides information to enable the IRD to automatically demultiplex and decode the various streams of programmes within the multiplex. Specified in ISO/IEC 13818[1]. (DVB)
Single Packet Burst Mode	A burst of ASI bytes (either 188 or 204, depending on packet length) is contiguously grouped into an MPEG-2 transport stream packet. Stuffing data is added between the packets to increase the data rate to 270 Mbps. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
Smart Card	A plastic card with a built-in microprocessor and memory used for identification, financial transactions or other authorizing data transfer. When inserted into a reader, data is transferred to and from the host machine or a central computer. It is more secure than a magnetic stripe card and it can be disabled if the wrong password is entered too many times. As a financial transaction card, it can be loaded with digital money and used in the same way as cash until the balance reaches zero. The file protocol is specific to its intended application.
SMATV	Satellite Mast Antenna Television: A distribution system, which provides sound and television signals to the households of a building or group of buildings, typically used to refer to an apartment block.
SMPTE	Society of Motion Picture and Television Engineers.
SMS	Subscriber Management System: A system which handles the maintenance, billing, control and general supervision of subscribers to conditional access technology viewing services provided through cable and satellite broadcasting. An SMS can be an automatic (e.g. Syntellect) system where subscribers order entitlements by entering information via a telephone. Alternatively, an SMS can be a manual system, which requires subscribers to speak with an operator who then manually enters their entitlement requests. Some systems support multiple SMSs.
SNG	Satellite News-Gathering.
SNMP	Simple Network Management Protocol.

SNTP	Simple Network Time Protocol is an Internet protocol used to synchronize the clocks of computers to some time reference. It is a simplified version of the protocol NTP protocol which is too complicated for many systems.
Spatial Redundancy	Information repetition due to areas of similar luminance and/or chrominance characteristics within a single frame. Removed using DCT and Quantization (Intra-Frame Coding).
SPI	Synchronous Parallel Interface.
Statistical Redundancy	Data tables are used to assign fewer bits to the most commonly occurring events, thereby reducing the overall bit rate. Removed using Run Length Coding and Variable Length Coding.
TCP / IP	Transmission Control Protocol/Internet Protocol: A set of communications protocols that may be used to connect different types of computers over networks.
TDM	Time Division Multiplex: One common, communications channel carrying a number of signals, each with its own allotted time slot.
TDT	Time and Date Table: Part of the DVB Service Information. The TDT gives information relating to the present time and date.
Temporal Redundancy	Information repetition due to areas of little or no movement between successive frames. Removed using motion estimation and compensation (Inter-Frame Coding).
Time stamp	A term that indicates the time of a specific action such as the arrival of a byte or the presentation of a presentation unit.
TNS	Temporal Noise Shaping.
TOT	Time Offset Table: This optional SI table supports the use of local offsets as well as the UTC time/date combination. The purpose of the table is to list by country the current offset from UTC and the next expected change to that offset (to track when daylight saving occurs). The offset resolution is to within 1 minute over a range of ±12 hours from UTC.
Transport Stream	A set of packetized elementary data streams and SI streams, which may comprise more than one programme, but with common synchronization and error protection. The data structure is defined in ISO/IEC 13818-1 [1] and is the basis of the ETSI Digital Video Broadcasting standards.
Transport Stream Packet Header	A data structure used to convey information about the transport stream payload.
TS	Transport Stream.
TSDT	Transport Stream Descriptor Table: A component of the MPEG-2 PSI data. This table describes which type of Transport stream it is in (i.e. DVB, ATSC etc.). It may also contain other descriptors.
TSP	Transport Stream Processor.
U	44.45 mm (rack height standard).

UART	Universal Asynchronous Receiver Transmitter: A device providing a serial interface for transmitting and receiving data.
UDP	User Datagram Protocol. A protocol above the IP layer that provides port multiplexing in addition. In essence, you can transmit IP data packets to several receiving processes in the same unit/device.
Unicast	Point-to-point connection, i.e. the "opposite" of multicast which is one to many (or many to many). In this mode, a transmit unit sends video data direct to a unique destination address.
Upconvert	The process by which the frequency of a broadcast transport stream is shifted to a higher frequency range.
Uplink	The part of the communications satellite circuit that extends from the Earth to the satellite.
UPS	Uninterruptable Power Supply: A method of supplying backup power when the electrical power fails or drops to an unacceptable voltage level. Small UPS systems provide battery power for a few minutes; enough to power down the computer in an orderly manner. This is particularly important where write back cache is used. Write back cache is where modified data intended for the disk is temporarily stored in RAM and can be lost in the event of a power failure. Sophisticated systems are tied to electrical generators that can provide power for days. UPS systems typically provide surge suppression and may provide voltage regulation.
UTC	Universal Time Coordinated: The Coordinated Universal Time and is synonymous with Greenwich Mean Time (GMT).
VCM	Video Compression Module.
VITC	Vertical Interval Time Code.
VITS	Vertical Interval Test Signal: See: ITS.
VLAN	Virtual LAN, a network of units that behave as if they are connected to the same wire even though they may actually be physically located on different segments of a LAN.
VPS	Video Programming System: A German precursor to PDC
WSS	Wide Screen Switching: Data used in wide-screen analogue services, which enables a receiver to select the appropriate picture display mode.
WST	World System Teletext: System B Teletext. Used in 625 line / 50 Hz television systems (ITU-R 653).
XLR	Audio connector featuring three leads, two for signal and one for GND.
XML	eXtensible Markup Language. A very common self-describing text-based data format. Used for many purposes: Meta-data, configuration files, documents, etc. The readability of the format has made it very popular and is now the fundament for many types of WEB services.



XPO	The name given to the second generation Ericsson standard for web pages and additional supporting interfaces.
Y (Luminance)	Defines the brightness of a particular point on a TV line. The only signal required for black and white pictures.
Y/C	Broadcast video with separate color, Y (luminance) and C (Chroma) (sometimes called S-Video).
YUV	Y: Luminance component (Brightness), U and V: Chrominance (Color difference)



Technical Specification

Annex B

Contents

B.1	Control Ethernet Specification	B-3
B.1.1	Overview.....	B-3
B.1.2	IP Parameters.....	B-3
B.1.3	MAC Address	B-3
B.2	Data Ethernet Specification	B-3
B.2.1	Overview.....	B-3
B.2.2	Data Port Parameters.....	B-4
B.2.3	IP Parameters.....	B-4
B.2.4	MAC Address	B-4
B.3	CE VCM Specification	B-5
B.3.1	SDI.....	B-5
B.3.2	HD-SDI	B-5
B.3.3	CVBS Input.....	B-6
B.3.4	Digital Audio Input	B-6
B.3.5	Analog Audio Input.....	B-7
B.3.6	Power Consumption	B-7
B.3.7	Vertical Blanking Interval (VBI) and Ancillary (ANC) Data.....	B-8
B.3.8	Video	B-10
B.3.8.1	Pre-Processor Metrics	B-10
B.3.8.2	HD Video Formats	B-10
B.3.8.3	SD Video Formats	B-12
B.3.8.4	Impairment Reduction	B-13
B.3.8.5	Operating Times	B-14
B.3.8.6	Test Pattern	B-14
B.3.9	Audio	B-15
B.3.9.1	Encoding Stereo	B-15
B.3.9.2	MPEG-1 Layer II Encoding	B-15
B.3.9.3	Dolby Digital Encoding	B-17
B.3.9.6	Audio Test Tone	B-19
B.3.9.7	Maximum Audio Encode Capability	B-19
B.3.10	Satellite Modulator Option Card	B-20
B.3.10.1	IF Output.....	B-20
B.3.11	ASI I/O Option Card	B-24
B.3.12	G.703 Transceiver Card	B-24
B.3.13	External Sync Input Option Card	B-25
B.3.14	GPI Option Card	B-26
B.4	Environmental.....	B-27

B.4.1	Environmental Conditions	B-27
-------	--------------------------------	------

List of Tables

Table B.1	IP Parameters (Control Port).....	B-3
Table B.2	IP Parameters (Data Port).....	B-4
Table B.3	SDI Specification	B-5
Table B.4	HD-SDI Specification.....	B-5
Table B.5	CVBS Input Specification	B-6
Table B.6	DID Associated With Each Group	B-6
Table B.7	Audio Digital Input Specification.....	B-6
Table B.8	Audio Digital Reference Tone Out Specification	B-7
Table B.9	Analog Audio Input Specification.....	B-7
Table B.10	Power Consumption Specification.....	B-7
Table B.11	VBI Data Specification.....	B-9
Table B.12	Video Resizing (HD) Specification	B-10
Table B.13	Video Profiles (HD) Specification	B-11
Table B.14	Video Resizing (SD) Specification.....	B-12
Table B.15	Video Profiles (SD) Specification	B-13
Table B.16	Test Pattern.....	B-14
Table B.17	Encoding Stereo Specification	B-15
Table B.18	MPEG-1 Layer II Supported Modes	B-15
Table B.19	MPEG-1 Layer II Supported Bit Rates	B-16
Table B.20	Dolby Digital Specification.....	B-17
Table B.21	Advanced Audio Encoding Specification.....	B-18
Table B.22	Weighting Points for Audio Encoding Modes	B-20
Table B.23	Satellite Modulator IF Output Specification	B-20
Table B.24	Satellite Modulator L-band Output Specification	B-22
Table B.25	Reference Frequency Output Specification.....	B-23
Table B.26	DC Power Output Specification.....	B-23
Table B.27	ASI I/O Specification	B-24
Table B.28	G.703 Transceiver Specification	B-24
Table B.29	External Sync Input Specification.....	B-25
Table B.30	External Sync Input (Analog Video) Specification	B-25
Table B.31	External Sync Input (10 MHz Reference) Specification	B-25
Table B.32	GPI Specification.....	B-26
Table B.33	Data Input Specification	B-26
Table B.34	Environmental Conditions	B-27



B.1 Control Ethernet Specification

B.1.1 Overview

The system has two Ethernet control ports that support IEEE 802.3 100Base-TX and 1000Base-T Ethernet protocols. The Control ports are accessible via RJ-45 connectors on the rear panel of the chassis and support IEEE 802.3u auto-negotiation and parallel detection. Also, the ports support Auto-MDIX.

See *Chapter 2, Installing the Equipment* for connector details.

B.1.2 IP Parameters

It is possible to configure the following IP parameters for the Control Port.

Table B.1 IP Parameters (Control Port)

Parameter	Specification
IP Address	xxx.xxx.xxx.xxx (Ipv4)
Network Mask	xxx.xxx.xxx.xxx (Ipv4)
Gateway Address	xxx.xxx.xxx.xxx (Ipv4)

Note: The front panel always provides a way of changing these settings to prevent all control interfaces being disabled.

B.1.3 MAC Address

The MAC address of each Ethernet Control port can be assigned via the Static Parameters table.

B.2 Data Ethernet Specification

B.2.1 Overview

The Ethernet Data ports support IEEE 802.3u auto-negotiation and parallel detection. The auto-negotiation function can be disabled to force the line speed to be either 100 Mbps or 1000 Mbps.

These ports support Auto-MDIX. This function can be disabled

See *Chapter 2, Installing the Equipment* for connector details.

B.2.2

Data Port Parameters

The Transport Streams output via the IP Outputs contains 188 byte long Transport Stream packets.

The time that a port has had a link established is recorded to an accuracy of ± 1 second, and the information made available to the user.

The Ethernet Data Ports always respond to ICMP Echo requests to any source IP address assigned to an output Transport Stream currently being transmitted on that port.

The Ethernet Data Ports respond to all ARP requests

There is hardware filtering of received packets (i.e. a hardware ‘firewall’) to protect the ports from malicious interference.

B.2.3

IP Parameters

It is possible to configure the following IP parameters for the Data Port.

Table B.2 IP Parameters (Data Port)

Parameter	Specification
IP Address	xxx.xxx.xxx.xxx (Ipv4)
Network Mask	xxx.xxx.xxx.xxx (Ipv4)
Gateway Address	xxx.xxx.xxx.xxx (Ipv4)

The default values for source IP address, subnet mask are those assigned to the ethernet port, or in the case of mirrored mode, those assigned to the primary IP port.

B.2.4

MAC Address

The MAC address of each Ethernet Control port can be assigned via the Static Parameters table. It is not possible to set the MAC addresses of each of the Ethernet Data ports to the same value.



B.3 CE VCM Specification

B.3.1 SDI

Table B.3 SDI Specification

Item	Specification
Safety Status	SELV
Connector Designation	SD-SDI IN
Connector Type	75 Ω BNC female socket
Input Standard (UK/EC)	ITU-R RECMN BT.656-3 Interfaces for Digital Component Video Signals in 525-Line and 625-Line Television Systems Operating at the 4:2:2 Level of Recommendation ITU-R BT.601 (Part A).
Input Standard (USA)	ANSI / SMPTE 259M Television 10-Bit 4:2:2 Component and 4 fsc Composite Digital Signals -Serial Digital Interface (module only supports Component). Level C - 270 Mbps, 525/625 component.
Cable length	250m maximum from a source with an output level 800 mV pk-pk nominal ±10%
Recommended cable type	Belden 1694A or Canford Audio BBC 1/3 PSF
Input Level	800 mV pk-pk nominal ±10%
Return Loss	Better than 15 dB, 10 MHz - 270 MHz
Input Impedance	75 Ω (powered-down impedance = 75 Ω)

B.3.2 HD-SDI

Table B.4 HD-SDI Specification

Item	Specification
Safety Status	SELV
Connector Designation	HD-SDI IN
Connector Type	75 Ω BNC female socket
Input Standard	ANSI / SMPTE 292M
Cable length	150m maximum from a source with an output level 800 mV pk-pk nominal ±10%
Recommended cable type	Belden 1694A
Input Level	800 mV pk-pk nominal ±10%
Return Loss	Better than 15 dB, 5 MHz - 1.5 GHz
Input Impedance	75 Ω (powered-down impedance = 75 Ω)

B.3.3 CVBS Input

A common 75Ω BNC female socket is used for CVBS input. The following table defines the parameters for the CVBS connector.

Table B.5 CVBS Input Specification

Signal Format		Specification
Supported Standards	625-line	PAL-B, -D, -G, -H, -I, -N, -Nc
	525-line	NTSC-M
Connector type		75 Ω BNC female socket
Input level		1 V pk-pk nominal $\pm 5\%$
Return loss		Better than 30 dB up to 6 MHz
Recommended cable type		Belden 1694A
Input impedance		75 Ω
Connector designation		CVBS

B.3.4 Digital Audio Input

The digital audio input of the VCM accepts four stereo pairs of AES/EBU digital audio. The available encoding options depend upon the licenses enabled.

The SDI/HD-SDI input of the VCM can be used for audio input, where eight stereo pairs can be extracted from four groups of embedded audio. The DID associated with each group is set when the unit leaves the factory.

Table B.6 DID Associated With Each Group

Group	HD-SDI	SD-SDI
GROUP 1	0x2E7	0x2FF
GROUP 2	0x1E6	0x1FD
GROUP 3	0x1E5	0x1FB
GROUP 4	0x2E4	0x2F9

Table B.7 Audio Digital Input Specification

Item	Specification	
Safety Status	SELV	
Connector Designation	AUDIO/DATA	
Connector Type	15-way D-Type male connector	
	AES3	AES-3id
Interface	Balanced	Unbalanced
Connector	XLR-3	BNC



Item	Specification	
Impedance	110 Ω	75 Ω
Input Level	2 V -7 V peak-to-peak	1 V peak-to-peak
Max Input	7 V peak-to-peak	1.2 V peak-to-peak
Max current	64 mA	1.6 mA
Min Input	0.2 V	0.32 V
Cable	Shielded Twisted Pair	Coax

Table B.8 Audio Digital Reference Tone Out Specification

Item	Specification
Standard	AES/EBU digital
Termination	75 Ω
Sampling rate	48 kHz

B.3.5 Analog Audio Input

The analogue audio input of the CE-xA VCM accepts two stereo pairs of analogue audio through a breakout cable attached to the 15-way D-type backplane connector of the CE-xA VCM. The VCM accepts two stereo pairs of analogue audio and samples them at a frequency of 48 kHz.

The same inputs can be used for inputting digital audio as described in *Digital Audio Input*.

Table B.9 Analog Audio Input Specification

Item	Specification
Interface	balanced or unbalanced
Impedance	20 kΩ
Clip level	18 dBu or 24 dBu

B.3.6 Power Consumption

The option cards do not exceed the following total power requirements.

Table B.10 Power Consumption Specification

Item	Specification
Power Consumption	CE-x does not exceed 120 Watts. CE-a does not exceed 40 Watts.
Heat Dissipation	All VCM modules have been thermally modeled to minimize any potential issues with heat dissipation.

B.3.7

Vertical Blanking Interval (VBI) and Ancillary (ANC) Data

The video stream ingested through the SDI/HD-SDI input on the VCM can carry additional data associated with the video stream. These data are either inserted in the horizontal or vertical blanking region (ANC) or in the non-active television lines (VBI).

Ancillary Data

There are two positions in the video stream where ANC packets are allowed. The first is the horizontal blanking interval of the video line, called the horizontal ANC space (HANC). The second is the active portion of the video lines in the vertical blanking interval, called the vertical ANC space (VANC). HANC and CANC of the SDI signal can carry specific ancillary (ANC) data. The encoder then can be set up to extract and repacketize the data carried in the HANC or VANC based on the ANC data type.

Closed Captions

Closed Caption data and any user data embedded in the SDI/HD-SDI according to SMPTE 334, is extracted and inserted into the picture user data of the video stream in accordance with ATSC A/72 part 1.

Information regarding the closed captions is carried in PSI as per ATSC A/72 part 2.

Time Code

Time code is extracted from HANC of the incoming video and carried in the Transport Stream adaptation layer as described in Annex E of ETSI TS 101 154 (AU_information).

OP-47

Teletext subtitles can be extracted from ANC in accordance with OP-47 and carried in a Teletext PID.

AFD

As part of the ANC Data, Active Format Description codes can also be transmitted. These codes provide information to video devices about where in the coded picture the active video is. The codes are defined by ETSI TS 101 154 V1.7.1 Annex B, ATSC A/53 Part 4 and SMPTE 2016-1-2007.

Active Format Descriptor (AFD) uses three bits of video index to define the video format. This information is encoded into user data and can then be used by a Decoder for wide-screen switching.

Generic ANC

Up to 2 Mbps of generic data can be extracted from ANC of the incoming video and encapsulated in accordance with SMPTE 2038 (Carriage of Ancillary Data Packets in an MPEG-2 Transport Stream).



VBI Data

The extraction of VBI types can be enabled or disabled individually. The video line from which the VBI is extracted can also be configured. The default is set according to the relevant standard for the VBI type.

VBI Lines

Up to 8 VBI lines per field can be extracted. Unless otherwise stated, all VBI data are formed into one VBI Transport Stream packet that conforms to ETSI EN 301 775 or SCTE 127.

VBI Data

Data can be extracted from the vertical blanking interval of the incoming video stream, processed, and then included in the output Transport Stream. The following table summarizes the VBI data types supported by the VCM module.

Table B.11 VBI Data Specification

Component	Comments
Video Index	It is possible to extract video index and another VBI type from the same line.
Closed Captions	Via line 21 & 284 (CEA-608C).
Monochrome 4:2:2	Up to 3 lines can be extracted per frame.
Teletext	Up to 18 lines can be extracted per field.
Aspect Ratio Signaling	WSS/WSS-AFD

VBI Data on a Separate PID

The VBI data is packetized into MPEG-2 PES packets according to ETSI ETS 300-472 for Teletext and ETSI EN 301 775 or SCTE 127 for all other VBI data types. Closed caption data and aspect ratio signaling can also be inserted into the compressed video elementary stream.

Timing

The VCM aligns the VBI data and the compressed video frames, i.e. it uses the same PTS for the video and the VBI data if they are from the same frame.

B.3.8 Video

B.3.8.1 Pre-Processor Metrics

Production

The VCM pre-processor, in conjunction with the first stage ME, analyzes the video on a macroblock by macroblock basis and produces Pre-Processor Metrics on:

- Activity - spatially
- Complexity
- Motion (vectors and SAD results)
- Luminance level
- Frame size information

Scene Cuts

Using the VCM Pre-Processor Metrics listed above, the pre-processor determines scene cuts in the input video. This should cause the encoding engine to minimise the effect of the scene change. This can shorten or lengthen the GOP. It is configurable.

B.3.8.2 HD Video Formats

Active Video

The active video has either 1080 lines (interlaced) or 720 lines (progressive).

Video Resizing

The unit supports the input of video at 1920 x 1080i (25 Hz and 29.97 Hz) and 1280 x 720p (50 Hz and 59.94 Hz). The following sub-sampling of any input format is supported.

Table B.12 Video Resizing (HD) Specification

25 Hz input format	29.97 Hz input format	Process	Comment
1080x1920@25 (pass-through)	1080x1920@29.97 (pass-through)	Scale 1/1	
1080x1440@25	1080x1440@29.97		Not available for the CE-a J2K option card
720x1920@50 (pass-through)	720x1920@59.94 (pass-through)	Scale 1/1	Not available for the CE-a J2K option card
720x960@50	720x960@59.94		Not available for the CE-a J2K option card



Video Profiles

Depending on the option module fitted, the following video profiles are supported.

Table B.13 Video Profiles (HD) Specification

Profile	Available on Option Module	Profile
H.264		CE/SWO/CE-x/H264 on a CE-x or a CE-xA CE/SWO/CE-a/H264 on a CE-a
HD Main Profile Level 4.0 4:2:0 8 bit	CE-x, CE-xA, CE-a	CE/SWO/CE-x/HD on a CE-x or a CE-xA CE/SWO/CE-a/HD on a CE-a
HD High Profile Level 4.0 4:2:0 8-bit	CE-x, CE-xA, CE-a	CE/SWO/CE-x/HD on a CE-x or a CE-xA CE/SWO/CE-a/HD on a CE-a
HD High Profile Level 4.1 4:2:0 8 bit	CE-x, CE-xA, CE-a	CE/SWO/CE-x/HD on a CE-x or a CE-xA CE/SWO/CE-a/HD on a CE-a
HD Hi422 Profile Level 4.1 4:2:2 8 bit	CE-x, CE-xA	CE/SWO/CE-x/HD and CE/SWO/CE-x/422
HD Hi422 Profile Level 4.1 4:2:2 10 bit	CE-x, CE-xA	CE/SWO/CE-x/HD and CE/SWO/CE-x/422
HD p50/60 H.264 High Profile Level 4.2 4:2:0 8 bit	CE-x, CE-xA	CE/SWO/CE-x/HD CE/SWO/CE-x/422 CE/SWO/CE-x/1080p
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 8 bit	CE-x, CE-xA	CE/SWO/CE-x/HD CE/SWO/CE-x/422 CE/SWO/CE-x/1080p
HD p50/60 H.264 High422 Profile Level 4.2 4:2:2 10 bit	CE-x, CE-xA	CE/SWO/CE-x/HD CE/SWO/CE-x/422 CE/SWO/CE-x/1080p
MPEG-2		
HD High Profile High Level 4:2:0 8 bit	CE-x, CE-xA, CE-a	CE/SWO/CE-x/HD on a CE-x or a CE-xA CE/SWO/CE-a/HD on a CE-a
HD 422 Profile High Level 4:2:2 8 bit	CE-x, CE-xA	CE/SWO/CE-x/HD and CE/SWO/CE-x/422
JPEG 2000		
HD J2K Profile Level 2 4:2:2 10 bit	CE-a J2K	CE/SWO/CE-a/HDJ2K



B.3.8.3

SD Video Formats

Active Video Start Line

The active video starts on line 23 for both the 525-line and the 625-line system (SMPTE RP 202-2000).

Video Input

When encoding into SD resolution, the unit supports the input of video at 720x576 25 Hz, 1280x720 50 Hz, 1920x1080 25 Hz, 720x480 29.97 Hz, 1280x720 59.94 Hz, and 1920x1080 29.97 Hz.

Video Resizing

The following re-sampling of any input format is supported on the VCM cards.

Table B.14 Video Resizing (SD) Specification

25 Hz format	29.97 Hz format	Process	Comment
1920x1080	1920x1080		
1280x720	1280x720		
720x576@25 (pass-through)	720x480@29.97 (pass-through)	Scale 1/1	
704x576@25	704x480@29.97	Scale 1/1 and blank 8 pixels at left and right edges	
640x576@25	640x480@29.97	Scale 8/9	
544x576@25	544x480@29.97	Scale 3/4 and add 2 blank pixels to left and right edges	
528x576@25	528x480@29.97	Scale 3/4 and blank 6 pixels at left and right edges in scaled image	
480x576@25	480x480@29.97	Scale 2/3	
352x576@25	352x480@29.97	Scale 1/2 and blank 4 pixels at left and right edges in scaled image	

If the output resolution is changed, the pre-processor ensures the change occurs at a GOP boundary and that the previous GOP is closed.



Video Profiles

Depending on the option module fitted the following video profiles are supported.

Table B.15 Video Profiles (SD) Specification

Profile	Available on Option Module	Profile
H.264		CE/SWO/CE-x/H264 on a CE-x or a CE-xA CE/SWO/CE-a/H264 on a CE-a
SD Main Profile Level 3.0 4:2:0 8 bit	CE-x, CE-xA, CE-a	
SD High Profile Level 3.0 4:2:0 8 bit	CE-x, CE-xA, CE-a	
SD High Profile Level 3.1 4:2:0 8 bit	CE-x, CE-xA, CE-a	
SD High 422 Profile Level 3.1 8 bit	CE-x, CE-xA	CE/SWO/CE-x/422
SD High 422 Profile Level 3.1 10 bit	CE-x, CE-xA	CE/SWO/CE-x/422
MPEG-2		
SD Main Profile Main Level 4:2:0 8 bit	CE-x, CE-xA, CE-a	CE/SWO/CE-x/422
SD 422 Profile Main Level 4:2:2 8 bit	CE-x, CE-xA	CE/SWO/CE-x/422
JPEG 2000		
SD J2K Profile Level 1 4:2:2 10 bit	CE-a J2K	

B.3.8.4

Impairment Reduction

Spatial Filtering through De-blocking

For H.264 encoding, the perceived image quality is further enhanced by utilizing a de-blocking filter in the feedback loop.

Temporal Noise Reduction

When the CE/SWO/MCTF license is enabled the pre-processor can provide temporal noise reduction which is motion adaptive (backs-off the filtering with motion) to the sub-frame level.

Stills Detection Control

Setting this to other than **Off** will override the in-built intelligent stills detection. This saves bit rate but has undesired video quality effects on complex stills.

Film Mode

The pre-processor identifies 3:2 pull-down sequences. Based on this information the encoding engine identifies the appropriate fields as repeated. Film Mode can only be used for SD inputs with a frame rate of 29.97 Hz.

B.3.8.5 Operating Times

Boot Time

The module has a complete boot time (from release of reset to generating valid Transport Streams) of typically 2 minutes. This time is dependent on a valid configuration being available when the module requires it to complete its boot process.

Configuration/Mode Changes

Configuration

The VCM, when in the same operating mode, changes configuration within **two seconds** plus the video delay. This means that the visible glitch period is two seconds. This includes most coding parameter changes including GOP size, resolution changes and filter settings.

Mode

For mode changes (profile changes, frame rate, VBR modes and delay modes), the configuration is complete within **ten seconds** (to include the time to reset the buffer). The change time is defined as the time from the configuration change being received on the module to the module outputting a changed bit stream.

Audio/VBI

The module changes the configuration of the audio and VBI data within 1 second plus the video delay. On the audio, the audible glitch period is 1 second plus the video delay as the buffer will be cleared. The change time is defined as the time from the configuration change being received on the module to the module outputting a changed bit stream.

B.3.8.6 Test Pattern

The video pre-processor can generate the following test patterns.

Table B.16 Test Pattern

Test Pattern	Compatibility Matrix			
	CE-a	CE-a J2K	CE-x	CE-xA
Black	YES	YES	YES	YES
Color bars	YES	YES	YES	YES
Moving object	YES	YES	YES	YES
Slate	YES		YES	YES

Loss of Video

On loss of video the VCM can be configured to select freeze frame, test pattern, or turn off output.

**B.3.9****Audio****B.3.9.1****Encoding Stereo**

Depending upon licenses each audio module on the VCMs can encode the following listed coding standards.

Table B.17 Encoding Stereo Specification

Coding Standard	Maximum Number	Description	Comments
Dolby Digital	3	AC-3 or Encode	Only available when CE/SWO/DOLBY/AC3 has been purchased - 1 license required per channel pair.
MPEG Layer 2	8	MPEG -1 Layer II / Musicam Encode	Stream type MPEG-1 or MPEG-2 (user selectable), more than two channels are only available with additional CE/SWO/M1L2 or VP/SWO/M1L2 licenses - 1 license required per channel pair.
Advanced Audio Coding	6	AAC-LC, HE-AAC, HE-AACv2	Only available when CE/SWO/AAC or VP/SWO/AAC has been purchased - 1 license required per channel pair.

B.3.9.2**MPEG-1 Layer II Encoding**

The VCMs support the following coding modes for MPEG-1 Layer II.

Table B.18 MPEG-1 Layer II Supported Modes

Coding Mode	Implementation	Comments
Mono (left)	1/0 (L – input)	
Mono (right)	1/0 (R – input)	
Dual mono	1 + 1 (L/ch1, R/ch2)	Left and right are coded separately, referenced as two services/languages
Stereo	2/0	Coded as two mono signals, only referenced as one language/service in SI, output as stereo at the receiver
Joint Stereo	2/0 joint	Coded as a stereo pair, coding takes advantage of them being stereo, only referenced as one language/service in SI, output as stereo at the receiver
6/8 Channel Aligned	1 + 1	

Mono [1/0 (L - input) or 1/0 (R - input)]

This mode has a single audio channel that is encoded independently. It is seldom used in broadcast as most viewing devices now have stereo speakers or headphones.



Dual Mono [1 + 1 (L/ch1, R/ch2)]

This was introduced to allow two mono channels to be carried in the same bandwidth as stereo signal. The main use for this mode is for multi-lingual transmission where the decoder selects which language to decode on left or right.

Joint Stereo [2/0 joint]

This option is available for MPEG-1 Layer II only. This applies a technique called intensity coding. The human ear is not as good at locating higher frequencies as it is lower ones. The use of this mode may introduce more artifacts than stereo.

Stereo [2/0]

This mode treats the incoming audio signal as a left and right channel that the viewer will listen to simultaneously. Practically, these stereo signals can be uncorrelated where they are coded separately or related where they combined into a sum and difference channel and each is coded separately.

6/8 Channel Phase Aligned Audio

For a description of the Phase Aligned Audio (PAA) mode, see *Chapter 3, Getting Started*.

Bit Rates

The following table gives the coding modes and bit rates for MPEG-1 Layer II.

Table B.19 MPEG-1 Layer II Supported Bit Rates

Bit Rate (kbps)	Mono (Left or Right)	Dual Mono	Stereo	Joint Stereo	6/8 Channel Aligned
32	YES				
48	YES				
56	YES				
64	YES	YES	YES	YES	
80	YES				
96	YES	YES	YES	YES	
112	YES	YES	YES	YES	
128	YES	YES	YES	YES	
160	YES	YES	YES	YES	
192	YES	YES	YES	YES	
224		YES	YES	YES	
256		YES	YES	YES	
320		YES	YES	YES	
384		YES	YES	YES	YES

**B.3.9.3****Dolby Digital Encoding**

The VCMs support the following coding modes for Dolby Digital encoding:

- Mono 1/0 (center, from left).
- Mono1/0 (center, from right).
- Mono 1/0 (center, from left and right).
- Stereo 2/0 (left, right).
- Multi-channel 3/2L (front left, front right, rear left, rear right, center, LFE).

Dolby Digital (AC-3) components by default use the descriptor defined by the DVB in the PMT. The following table gives the coding modes and bit rates for Dolby Digital encoding.

Table B.20 Dolby Digital Specification

Bit Rate (kbps)	Single Channel Mono (1/0) (Left or Right)	Dual Channel Stereo (2/0)	Multi-Channel Stereo (3/2)
32	YES		
40	YES		
48	YES		
56	YES		
64	YES		
80	YES		
96	YES	YES	
112	YES	YES	
128	YES	YES	
160	YES	YES	
192	YES	YES	
224	YES	YES	YES
256	YES	YES	YES
320	YES	YES	YES
384	YES	YES	YES
448	YES	YES	YES
512	YES	YES	YES
576	YES	YES	YES
640	YES	YES	YES

B.3.9.4 Advanced Audio Encoding

The VCMs support the following coding modes for AAC encoding:

- Stereo 2/0 (left, right)

The following table gives the coding modes and bit rates for AAC encoding.

Table B.21 Advanced Audio Encoding Specification

Bit Rate (kbps)	AAC-LC Stereo (2/0)	AAC-LC Multi-Channel Stereo (3/2L)	HE-AAC Stereo (2/0)	HE-AACv2	HE-AAC Multi-Channel Stereo (3/2L)
32				YES	
48			YES		
56			YES		
64	YES		YES		
80	YES		YES		
96	YES		YES		
112	YES				
128	YES		YES		YES
160	YES	YES			YES
192	YES	YES			YES
224		YES			YES
256		YES			YES
320		YES			
384		YES			
448		YES			
512		YES			

B.3.9.5 Pass-through Modes

Clocking

For the best performance when passing through compressed audio the video and audio coming into the unit must be locked together, and the system clock locked to **Video** or **Ext SYNC**. When set to **Ext SYNC**, the audio and video must also be locked to this source.

Dolby Digital

The audio module can pass through pre-encoded Dolby Digital audio (up to 5.1).



Linear PCM

For passing through 2 channels (1 channel pair) of uncompressed data the audio module complies with SMPTE 302M standard. The module supports 24, 20 and 16 bit word sizes on the input and output. The bit-depth option defines the output word size and is independent of the input. Only 2 channels are supported per PID.

Dolby E

The audio module can pass-through pre-encoded Dolby E audio. The input word size is automatically detected, and this is applied to the output. Only 1 Dolby E stream is supported per PID. Complies with SMPTE 302M, SMPTE 337M and SMPTE 338M.

- SMPTE 302M: Mapping of AES3 Data into MPEG-2 Transport Stream.
- SMPTE 337M: Format for Non-PCM Audio and Data in AES3 Serial Digital Audio Interface.
- SMPTE 338M: Format for Non-PCM Audio and Data in AES3 - Data Types.

B.3.9.6

Audio Test Tone

The module is able to generate a test tone on any audio channel at 1 kHz, with a level of -18 dBFS.

Note If there is no source connected to the SDI input then **Input Detection** must be set to **Off** otherwise the resulting test tone can “warble”.

B.3.9.7

Maximum Audio Encode Capability

It is possible to configure any combination of audio coding modes within the constraints of available processing power for each audio module. Each audio coding mode requires a definitive amount of CPU resource so is allocated an associated points weighting. The sum of the weighting for the configured audio encodes cannot exceed 100 for each audio module. There are 2 audio modules available on the VCM. The first takes audio 1 to 8 and the second takes audio 9 to 16. A single audio coding instance cannot use resources from both modules. If a warning informs you that there is insufficient resource available, the configuration needs to be changed so that the other module is used.

The following is a summary weighting points for each Audio Encoding mode.

Table B.22 Weighting Points for Audio Encoding Modes

Function	Available Coding Modes	Weighting (points)
MPEG-1 Layer II audio encoding	Mono 1.0 (center, from left) Mono 1.0 (center, from right) 1+1 Dual Mono Stereo (2.0) Joint Stereo (2.0)	10
Phase Aligned MPEG-1 Layer II audio encoding	6 Channel Aligned	30
Phase Aligned MPEG-1 Layer II audio encoding	8 Channel Aligned	40
Dolby Digital encoding	Mono 1.0 (center, from left) Mono 1.0 (center, from right) Stereo (2.0)	30
	Multi-Channel Stereo (3/2L)	50
AAC-LC, HE-AAC, HE-AACv2 encoding	Stereo (2.0)	15
	Multi-Channel Stereo (3/2L)	40
Dolby Digital pass-through (Dolby Digital AC-3)	All Dolby Digital coding modes up to 5.1 and up to 640 kbps supported for pass-through.	5
Dolby-E pass-through	Dolby-E pass-through only	25
LPCM pass-through	2-channel Linear PCM pass-through only	25

B.3.10 Satellite Modulator Option Card

The Satellite Modulator Option Card is only available for the AVP 3000 Voyager.

B.3.10.1 IF Output

Table B.23 Satellite Modulator IF Output Specification

Item	Specification
Safety status	SELV
Connector designation	IF OUT MAIN
Connector type	BNC female 75 Ω
Output impedance	75 Ω
Return loss	>20 dB, 50 -180 MHz
Output power	-30 to +5 dBm in 0.1 dB steps
Output power ramp rate	16 dB/s over operational power level range
Power level stability	±0.5 dB
Modulation Standard	DVB-S, DVB-DSNG, DVB-S2
Modulation	QPSK, 8PSK ^{1,2} , 16QAM ² , 16APSK ¹ , 32APSK ¹



Item	Specification
FEC Rate	1/4 ¹ , 1/3 ¹ , 2/5 ¹ , 1/2, 3/5 ¹ , 2/3, 3/4, 4/5 ¹ , 5/6, 7/8 ^{2,3} , 8/9 ¹ , 9/10 ¹
Symbol Rate	1 to 45 Msymbol/s (Standard) 0.132 to 66 Msymbol/s (Extended symbol rate option)
Spectrum roll-off factor	20 %, 25%, 35 %
Spectrum sense	Selectable Normal/Inverted
Transmission modes	Modulation on/off Carrier on/off
Carrier frequency	50 -180 MHz, in 1 kHz steps
Carrier frequency stability	< ±0.02 ppm versus temperature < ±0.0002 ppm/day ageing after 30 days continuous operation < ±0.05 ppm/year ageing after 30 days continuous operation
Carrier frequency initial setting accuracy (ex factory)	±0.1 ppm max
Carrier suppression	>40 dB
Carrier ON/OFF ratio	>60 dB
Phase noise	< -46 dBc at 10 Hz offset < -66 dBc at 100 Hz offset < -76 dBc at 1 kHz offset < -86 dBc at 10 kHz offset < -96 dBc at 100 kHz offset < -120 dBc at 1 MHz offset
Spurious outputs, (modulated carrier)	< -60 dBc/4 kHz over the frequency range 0 – 500 MHz but excluding the frequency range of the wanted signal (equal to ±1.06 x Symbol Rate about the carrier frequency, as defined by the spectrum mask Figure A.1 in EN 300 421)
Spurious outputs, (unmodulated carrier)	< -50 dBc < -55 dBc typical 0 < f < 500 MHz, each component
Noise floor (N ₀ /C)	< -120 dBc/Hz
Monitor output power level	-30 dB ±3 dB relative to IF Main output (Main output terminated in 75 Ω)

1 Applies to DVB-S2

2 Applies to DVB-DSNG

3 Applies to DVB-S



L-band Output

Table B.24 Satellite Modulator L-band Output Specification

Item	Specification
Safety status	SELV
Connector designation	L-BAND OUT MAIN
Connector type	SMA female
Output impedance	50 Ω
Return loss	>14 dB, 950 – 2150 MHz
Output power	-40 dBm to +5 dBm in 0.1 dB steps
Output Power Ramp Rate	16 dB/s over operational power level range
Power level stability	±0.5 dB
Modulation Standard	DVB-S, DVB-DSNG, DVB-S2
Modulation	QPSK, 8PSK ^{1,2} , 16QAM ² , 16APSK ¹ , 32APSK ¹
FEC Rate	1/4 ¹ , 1/3 ¹ , 2/5 ¹ , 1/2, 3/5 ¹ , 2/3, 3/4, 4/5 ¹ , 5/6, 7/8 ^{2,3} , 8/9 ¹ , 9/10 ¹
Symbol Rate	1 to 45 Msymbol/s (Standard) 0.132 to 66 Msymbol/s (Extended symbol rate option)
Spectrum roll-off factor	20 %, 25%, 35 %
Spectrum sense	Selectable Normal/Inverted
Transmission modes:	Modulation on/off Carrier on/off
Carrier frequency	950 MHz - 2150 MHz in 1 kHz steps
Carrier frequency stability	< ±0.02 ppm versus temperature < ±0.0002 ppm/day ageing after 30 days continuous operation < ±0.05 ppm/year ageing after 30 days continuous operation
Carrier frequency initial setting accuracy (ex factory)	±0.1 ppm max
Carrier ON/OFF ratio	>60 dB
Carrier suppression	>35 dB
Phase noise (continuous)	<-46 dBc at 10 Hz offset <-66 dBc at 100 Hz offset <-76 dBc at 1 kHz offset <-86 dBc at 10 kHz offset <-96 dBc at 100 kHz offset <-120 dBc at 1 MHz offset
Phase Noise (discrete sidebands)	<-70 dBc
Spurious outputs (modulated carrier)	<-60 dBc/4 kHz over the frequency range 500 MHz - 2500 MHz but excluding the frequency range of the wanted signal (equal to ±1.06 x Symbol Rate about the carrier frequency, as defined by the spectrum mask Figure A.1 in EN 300 421)



Item	Specification
Spurious outputs (Unmodulated Carrier)	<-55 dBc over the frequency range 500 – 2500 MHz, each component
Noise floor (No/C)	-120 dBc/Hz for output power levels > -30 dBm
Monitor output power level	-30 dB ±3 dB relative to L-band Main output (Main output terminated in 50 Ω)

- 1 Applies to DVB-S2
2 Applies to DVB-DSNG
3 Applies to DVB-S

Reference Frequency Output

A reference frequency output is provided via the L-BAND OUT MAIN connector, intended for use by an external frequency up-converter.

Table B.25 Reference Frequency Output Specification

Item	Specification
Output power	0 dBm ±3 dB sine-wave into 50 Ω load Switchable on/off
Frequency	10 MHz
Frequency stability	< ±0.02 ppm versus temperature < ±0.0002 ppm/day ageing after 30 days continuous operation < ±0.05 ppm/year ageing after 30 days continuous operation
Initial frequency setting accuracy (ex factory)	±0.1 ppm max
Phase noise	-120 dBc/Hz at 10 Hz offset -140 dBc/Hz at 100 Hz offset -150 dBc/Hz at 1 kHz offset

DC Power Output

A DC power output is provided via the L-BAND OUT MAIN connector, intended for powering an external frequency up-converter.

Table B.26 DC Power Output Specification

Item	Specification
Voltage (open circuit)	Off, +15 V, +24 V (switchable)
Output resistance	<1 Ω
Ripple	<20 mV pk-pk
Rated current	500 mA max
Short-circuit current	800 mA max (protected by electronic circuit-breaker)

B.3.11 ASI I/O Option Card

The ASI I/O option card provides a means of outputting an MPEG-2 Transport Stream over an ASI connection. Two outputs are provided which can be configured as "mirrored", such that the same TS is output from each connection, or independent, such that a different TS is output from each.

Two input BNC connectors and associated "lock" LED's are available for feeding the unit with external Transport Streams.

Table B.27 ASI I/O Specification

Item	Specification
Standard	CENELEC EN50083-9 2002
Safety Status	SELV
Connector Designation	ASI IN 1 / ASI IN 2 / ASI OUT 1 / ASI OUT 2
Connector Type	75 Ω BNC
Input Impedance: (Resistive termination)	75 Ω

B.3.12 G.703 Transceiver Card

The G.703 Transceiver card provides one PDH (Plesiochronous Digital Hierarchy) output interface that can be used for interfacing Transport Streams to PDH networks. The interface is G.703 compliant, and can provide support for E carriers, namely E31 (E3) and E32 (DS3) as specified in ITU-T Rec. G.703. The input interface is not supported in this release.

Note: The G.703 Transceiver Card has an input interface, but the G.703 input is not supported in this release.

Table B.28 G.703 Transceiver Specification

Item	Specification
Standard	ITU-T Rec. G.703
Safety Status	SELV
Connector Designation	OUT
Connector Type	75 Ω BNC
Input Impedance: (Resistive termination)	75 Ω

**B.3.13****External Sync Input Option Card**

The External Sync Option card provides a means of inputting a system reference either from an external, 10 MHz clock or analog video source. Only one reference source may be connected at any time, and the single BNC connector caters for either input signal type.

Table B.29 External Sync Input Specification

Item	Specification
Safety Status	SELV
Connector Designation	SYNC IN
Connector Type	75 Ω BNC
Input Impedance: (Resistive termination)	75 Ω

Input (Analog Video)

The input is capable of accepting a wide range of analogue video input voltage levels and is also capable of accepting various color standards. Requirements for the video input signal are defined in the following table.

Table B.30 External Sync Input (Analog Video) Specification

Item	Specification
Nominal Video level: (AC Coupled)	0.5 to 2.0 Volts peak-to-peak
Applicable Video Standards:	PAL, NTSC
Input Video Interfaces:	Composite (CVBS), S-Video (Y/C), and Component Video (YPBPR/GBR)
Chroma Filter	Always present

Input (10 MHz Reference)

A 10 MHz input can be applied via the BNC connector which may be sinusoidal or square in shape. The required characteristics for the input signal are defined in the following table.

Table B.31 External Sync Input (10 MHz Reference) Specification

Item	Specification
Input Level (AC Coupled)	1 Volt peak-to-peak
Input waveform:	Sinusoidal or Square

B.3.14 GPI Option Card

The GPI option card provides means for GPI triggered splicing and alarm or fail relay.

Table B.32 GPI Specification

Item	Specification
GPI/Alarm	
Safety Status	SELV
Connector Designation	GPI/ALARM
Connector Type	25-way D-type female
GPI Input	1: Open-circuit 0: Pulled low to between 0.8 V and 0.0 V Limit over-voltage, under-voltage and excess current
Input function	Application-specific, tailored by software. Contacts are debounced to eliminate false transitions due to contact bounce in external relays

The 9-way D-type interface is not supported in this release.

Table B.33 Data Input Specification

Item	Specification
Safety status	SELV
Connector designation	DATA IN
Connector type	D-type, 9-way, Female
GPI Input	1200, 2400, 4800, 9600, 19200, 38400 baud



B.4 Environmental

B.4.1 Environmental Conditions

The AVP is for use in non-hostile environments, (i.e. designed for indoor use only with no protection against dust or water ingress).

Table B.34 Environmental Conditions

Operational	Specification
Temperature	-10°C to +50°C (14°F to 122°F) ambient with free air-flow. It may require a 10 minute warm-up period before all clocks are within specification if the ambient temperature is less than 0°C
Humidity	0% to 90% (non-condensing)
Cooling Requirements	Cool air input from left side of unit, exhaust from right side of unit.
Handling Movement	Designed for stationary or fixed use when in operation.
Transportation (Packaged)	
Temperature	-40°C to +70°C (-40°F to +158°F)
Humidity	0% to 90% (non-condensing)
Storage	
Temperature	-25°C to +70°C (-13°F to +158°F)
Humidity	0% to 90% (non-condensing)

The product requires no special handling or packaging other than normal procedures for Ericsson equipment and is suitable for lifting by one person.



BLANK



Audio Coding

Annex C

Contents

C.1	A Brief Introduction to Audio Coding Standards	C-3
C.1.1	MPEG	C-3
C.1.2	MPEG-1 Layer I/II	C-3
C.1.3	Dolby Digital	C-3
C.1.4	SMPTE 302M: Mapping of AES3 Data into an MPEG-2 Transport Stream	C-4
C.1.5	Dolby E	C-4
C.1.6	AAC (Advanced Audio Coding)	C-4
C.1.7	HE AAC	C-5
C.2	Audio Coding Modes	C-5
C.2.1	E.2.1 Mono	C-5
C.2.2	E.2.2 Stereo	C-5
C.2.3	E.2.3 Joint Stereo	C-5
C.2.4	E.2.4 Dual Mono	C-6
C.2.5	E.2.5 Surround Sound/5.1	C-6
C.2.6	E.2.6 Phase Aligned	C-6

BLANK



C.1

A Brief Introduction to Audio Coding Standards

Where appropriate, the output Transport Stream can be made compliant with ATSC A53(E) ATSC Digital Television Standard and DVB 101-154 v1.7.7.

C.1.1

MPEG

The Moving Pictures Experts Group (MPEG) was formed in 1988 to generate compression techniques for audio and video. In the first version, ISO/IEC 11172-3 MPEG-1 audio, has a selection of two separate algorithms. MPEG-1 Layer I and II were implementations of the MUSICAM algorithm and MPEG-1 Layer III (mp3) was an implementation of the ASPEC algorithm. The algorithms have since been improved and extended with other versions of MPEG.

C.1.2

MPEG-1 Layer I/II

This algorithm is similar to MUSICAM and only really differs in the structure of the frame headers. Layer I is a restricted version of the full algorithm to allow a reduced decoder to be developed. Hence, over time as the processing power of decoders have increased by orders of magnitude, Layer I is no longer used for broadcast.

The algorithm creates 3 frames of 384 samples. Each small frame is divided into sub-bands and these sub-bands can be coded for each frame or for all 3. There is limited ability to allocate bits to different bands and there is no entropy coding of the encoded samples so a relatively high bit rate is required to obtain a reasonable quality.

C.1.3

Dolby Digital

Dolby Digital is an algorithm from Dolby that forms part of both the ATSC and DVB standard for digital broadcasting. It is marketed under the name of Dolby Digital.

The encoder includes a psychoacoustic model to improve the quality. The signal is divided into 32 multiple sub-bands, which correspond to the critical bands of the human ear. The number of bits is fixed for each sub-band but there are additional bits that can be allocated to any sub-band where encoding quality has suffered. Dolby recommends stereo signals may be coded at 192 kbps, and 5.1 at 448 kbps but other rates can be used if required.

The encoders have the ability to encode stereo and equivalent modes, and will also pass through pre-compressed Dolby Digital (both stereo and multi-channel).

When in Dolby Digital Pass-through mode, glitch suppression is supported, where the coding module monitors the encoded bitstream and if the framing structure is incorrect, a valid silence frame or the last good frame is inserted in its place. If this state occurs for more than a second, the encoder signals that the Dolby Digital bitstream is corrupted.

C.1.4

SMPTE 302M: Mapping of AES3 Data into an MPEG-2 Transport Stream

Though not specifically a coding standard, this does define a method of carrying AES3 uncompressed audio streams in an MPEG-2 transport stream. The AES stream can contain non-audio data as well as uncompressed audio. This mechanism can be used to carry Linear PCM audio, or Dolby E data.

C.1.5

Dolby E

Dolby E was developed by Dolby Laboratories. It allows up to 8 channels of Dolby E compressed audio to be distributed over an existing 2 channel digital infrastructure. The compression applied is less than that for consumer codecs (i.e. Dolby Digital), so is better quality and the audio can be decompressed and re-compressed several times. The Dolby E stream can also include metadata and timecode.

Dolby E frame duration is either equal to or double the duration of a video frame. For interlaced formats the duration matches a video frame, but is double the frame duration for progressive formats. This facilitates easier editing of video and audio in the digital domain. Dolby E frames are generally aligned to video frames.

C.1.6

AAC (Advanced Audio Coding)

AAC was designed to be non-backwards-compatible to be able to achieve high audio quality at a rate of 64 kbps/channel for 5.1 systems.

AAC consists of several tools other than those shown in the basic model:

- Pre-processing – signal split into 4 equally sized frequency bands and their level adjusted.
- Filter bank – MDCT filter is used.
- Temporal Noise Shaping (TNS) – pre-echo removal.
- Intensity stereo coding / coupling stereo coding.
- Prediction – intensity difference between the previous and current frames coding.

There are three profiles (or versions) available:

- **Main (MP)** - includes all of the tools that improve encoding efficiency.
- **Low Complexity (LC)** - used for broadcast, which allows the pre-processing and prediction tools to be discarded and the TNS complexity to be reduced. Some tools are not allowed and others are restricted to enable this algorithm to fit into the broadcast space.
- **Scalable Sample Rate (SSR)** - maximises temporal resolution (getting the high frequency sounds at the right time) at the expense of coding efficiency.



AAC has specifically been designed to leave behind the baggage of Layers I and II so that it can be more efficient. The time it takes to encode audio differs between the profiles, MP being the most intensive and SSR the least.

C.1.7

HE AAC

This standard builds on the AAC. Some of the existing tools have been improved and new ones added. All AAC objects (including the error robust modes) contain the Perceptual Noise Substitution (PNS) tool. PNS detects noise in the signal and in the final bit-stream a noise flag is raised and the power level of the noise stored. The decoder generates a random noise of the level indicated, and inserts this into the audio signal.

HE-AAC Formats

HE-AAC audio may be stored and streamed in many formats, which are described in the standard. These include:

- **ADTS** - This format places a header at the start of every audio frame, and provides enough information for each frame to be independently decoded. It contains a fixed and a variable header.
- **LATM/LOAS** - As for ADTS this also places a header at the front of each audio frame in such a way that each audio frame can be independently decoded. This is the required format for compliant DVB streams (ETSI TS 101-154 v1.7.7) and is available on the Encoder.

C.2

Audio Coding Modes

C.2.1

E.2.1 Mono

This mode has a single audio channel that is encoded independently. It is seldom used in broadcast as most viewing devices now have stereo speakers or headphones.

C.2.2

E.2.2 Stereo

This treats the incoming signal as separate left and right signals. Some coding algorithms will look at the left and right signals and, depending on the correlation of these will combine the signal into a mid and side channel to save on bits.

C.2.3

E.2.3 Joint Stereo

This option is available for MPEG 1 layer 2 only. This applies a technique called intensity coding. The human ear is not as good at locating higher frequencies as it is lower ones. The use of this mode may introduce more artefacts than stereo.

C.2.4

E.2.4 Dual Mono

Used if the left and right channels are carrying separate services. The encoder knows that it must treat the two channels independently. The main use for this mode is for multilingual transmission where decoder selects which language to decode on left or right.

C.2.5

E.2.5 Surround Sound/5.1

A stereo signal produces a very focused audio field so unless the viewer is sitting in the correct position, the audio reproduction suffers. More audio channels are required to generate a larger audio field in which the viewer can listen.

The encoder expects the signal to arrive as:

- **AES 0** - Left, right (coded as a stereo pair).
- **AES 1** - Centre, Low Frequency Effect (coded as a mono channel with restricted frequency on the LFE channel).
- **AES 2** - Left surround, right surround.

C.2.6

E.2.6 Phase Aligned

Note: The feature “Phase Aligned Audio” is patent pending. An application for patent has been filed in the Patent and Trademark Office.

This option is a proprietary feature of Ericsson Television, only available for MPEG1 Layer 2. It provides the capability of carrying 5.1 surround sound channels. This is achieved by dual mono encoding of 3 pairs of audio channels.

In order to preserve the 5.1 surround image, phase alignment is critical, so audio timing is much more tightly tolerated, with the audio timing between the surround channels being sample accurate.



Differences For Contribution Encoder and Voyager II

Annex D

Contents

D.1	Introduction	D-3
D.2	Contribution Encoder	D-3
D.2.1	Front Panel	D-3
D.2.2	Chassis Variants	D-3
D.2.3	Features	D-3
D.3	Voyager II	D-4
D.3.1	Chassis Variants	D-4
D.3.2	Features	D-4
D.4	CE-* VCM Identity Reporting	D-4

List of Figures

Figure D.1	Contribution Encoder Front Panel	D-3
------------	--	-----

List of Tables

Table D.1	CE-* Option Card Identity and License Translation	D-4
-----------	---	-----



BLANK



D.1 Introduction

This release of software and the details in this Reference Guide include support for the Ericsson Contribution Encoder and Voyager II products.

This Annex describes differences between these products and the AVP family, and details any AVP features that are not supported on the Contribution Encoder or Voyager II products.

D.2 Contribution Encoder

D.2.1 Front Panel

The Contribution Encoder only supports the Basic Front Panel, shown below. There is no option for the Enhanced Front Panel.

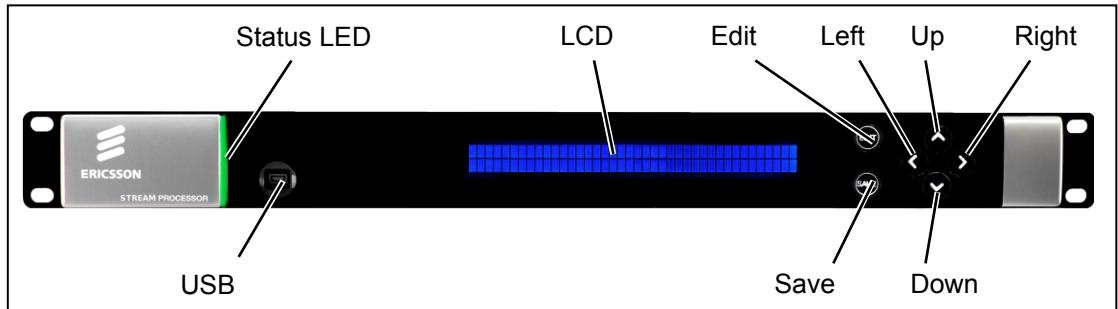


Figure D.1 Contribution Encoder Front Panel

D.2.2 Chassis Variants

There is not an option for a Dual AC Flying Lead, 6-slot variant of the Contribution Encoder.

D.2.3 Features

IP Data Ports.

IP input is not supported in the Contribution Encoder. All data ports are available for outputs.



D.3 Voyager II

D.3.1 Chassis Variants

There is not an option for a Dual AC Flying Lead, 6-slot variant of Voyager II.

D.3.2 Features

IP Data Ports.

IP input is not supported in Voyager II. All data ports are available for outputs.

D.4 CE-* VCM Identity Reporting

To help maintain consistency across CE, Voyager II and AVP products, existing CE and Voyager II units licensed using the previous scheme (e.g. CE-x/H42) automatically have an internal license translation scheme applied when upgraded to v9.x software, so will report and display the relevant new license.

Table D.1 details the automatic translation. All features should be maintained through this translation.

Table D.1 CE- Option Card Identity and License Translation*

Legacy Identity	Legacy BoardID	v9.x Identity	V9.x BoardID	Automatically Enabled Licenses	Features Enabled
CE-a/S20	1243	CE-a	1265	None	SD MPEG-2 ^[1]
CE-a/S40	1241			CE/SWO/CE-a/H264	SD MPEG-2 ^[1] SD H.264
CE-a/H20	1242			CE/SWO/CE-a/HD	SD MPEG-2 ^[1] HD MPEG-2
CE-a/H40	1240			CE/SWO/CE-a/H264 CE/SWO/CE-a/HD	SD MPEG-2 ^[1] SD H.264 HD MPEG-2 HD H.264
CE-x/S20	1238 1239	CE-x	1264 1266	None	SD MPEG-2 ^[1]
CE-x/S40	1234 1235			CE/SWO/CE-x/H264	SD MPEG-2 ^[1] SD H.264
CE-x/H20	1230 1231			CE/SWO/CE-x/HD	SD MPEG-2 ^[1] HD H.264
CE-x/H40	1226 1227			CE/SWO/CE-x/H264 CE/SWO/CE-x/HD	SD MPEG-2 ^[1] SD H.264 HD MPEG-2 HD H.264
CE-x/S22	1236 1237			CE/SWO/CE-x/422	SD MPEG-2 ^[1] SD MPEG-2 4:2:2



Legacy Identity	Legacy BoardID	v9.x Identity	V9.x BoardID	Automatically Enabled Licenses	Features Enabled
CE-x/S42	1232 1233			CE/SWO/CE-x/H264, CE/SWO/CE-x/422	SD MPEG-2 ^[1] SD H.264 SD MPEG-2 4:2:2 SD H.264 4:2:2 & 10 bit
CE-x/H22	1228 1229			CE/SWO/CE-x/422 CE/SWO/CE-x/HD	SD MPEG-2 ^[1] SD MPEG-2 4:2:2 HD MPEG-2 HD MPEG-2 4:2:2
CE-x/H42	1224 1225			CE/SWO/CE-x/HD, CE/SWO/CE-x/H264, CE/SWO/CE-x/422	SD MPEG-2 ^[1] HD MPEG-2 SD H.264 HD H.264 SD MPEG-2 4:2:2 HD MPEG-2 4:2:2 SD H.264 4:2:2 10 bit HD H.264 4:2:2 10 bit

^[1] Feature available as standard for CE-a and CE-x

The actual license stored on the cards is not changed, so if the unit is downgraded to pre v9 code the original licenses and identities will be reported.



BLANK



Alarm Lists

Annex E

Contents

E.1	Alarms List – Base Chassis	E-3
E.2	Alarms List – CE-a, CE-x Pre-Processor VCMs	E-8
E.3	Alarms List – CE-a J2K VCM	E-20
E.4	Alarms List – CE-xA VCM	E-24
E.4.1	CE-xA Pre-Processor Module	E-24
E.4.2	CE-x and CE-xA (Encoder Module).....	E-35
E.5	Alarms List – Satellite Modulator	E-36
E.6	Alarms List – ASI I/O Option Card.....	E-38
E.7	Alarms List – G.703 Transceiver Card	E-39
E.8	Alarms List – GPI Card	E-41

List of Tables

Table E.1	Alarm List – Base Unit	E-3
Table E.2	Alarm List – CE-a, CE-x Pre-Processor VCMs	E-8
Table E.3	Alarm List – CE-a J2K VCM	E-20
Table E.4	Alarm List – CE-xA VCM (CE-x Pre-Processor Module)	E-24
Table E.5	Alarm List – CE-x and CE-xA (Encoder Module).....	E-35
Table E.7	Alarm List – Satellite Modulator	E-36
Table E.8	Alarm List – ASI I/O Option Card.....	E-38
Table E.9	Alarm List – ASI I/O Option Card.....	E-39
Table E.10	Alarm List – GPI Card.....	E-41

BLANK



E.1 Alarms List – Base Chassis

The following table lists the alarm and failure identifiers generated within the Host Controller of the unit.

Table E.1 Alarm List – Base Unit

Alarm	Description	Port Number	Alarm ID	Source	Severity
Ethernet interface Ctrl1 link down on Control network	Ethernet interface Ctrl1 link down on Control network	5	00000401	Base Unit	major
Ethernet interface Ctrl1 on Control network: duplicate IP detected	Ethernet interface Ctrl1 on Control network: duplicate IP detected	5	0000040C	Base Unit	major
Ethernet interface Ctrl2 link down on Control network	Ethernet interface Ctrl2 link down on Control network	6	00000402	Base Unit	major
Ethernet interface Ctrl2 on Control network: duplicate IP detected	Ethernet interface Ctrl2 on Control network: duplicate IP detected	6	0000040D	Base Unit	major
Control Network Lost	Control Network Lost		00000410	Base Unit	critical
Virtual IP address on Control network: duplicate IP detected	Virtual IP address on Control network: duplicate IP detected		00000407	Base Unit	major
Ethernet interface Data3 link down in Data Interface Group 3-4	Ethernet interface Data3 link down in Data Interface Group 3-4	3	00000405	Base Unit	major
Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	3	0000040A	Base Unit	major
Ethernet interface Data4 link down in Data Interface Group 3-4	Ethernet interface Data4 link down in Data Interface Group 3-4	4	00000406	Base Unit	major
Ethernet interface Data4 in Data Interface Group 3-4: duplicate IP detected	Ethernet interface Data4 in Data Interface Group 3-4: duplicate IP detected	4	0000040B	Base Unit	major
Data Interface Group 3-4: Data Network Lost	Data Interface Group 3-4: Data Network Lost		00000411	Base Unit	critical
Virtual IP address on Data Interface Group 3-4: duplicate IP detected	Virtual IP address on Data Interface Group 3-4: duplicate IP detected		0000040E	Base Unit	major
Ethernet interface Data1 link down in Data Interface Group 1-2	Ethernet interface Data1 link down in Data Interface Group 1-2	1	00000403	Base Unit	major
Ethernet interface Data1 in Data Interface Group 1-2: duplicate IP detected	Ethernet interface Data1 in Data Interface Group 1-2: duplicate IP detected	1	00000408	Base Unit	major
Ethernet interface Data2 link down in Data Interface Group 1-2	Ethernet interface Data2 link down in Data Interface Group 1-2	2	00000404	Base Unit	major
Ethernet interface Data2 in Data Interface Group 1-2: duplicate IP detected	Ethernet interface Data2 in Data Interface Group 1-2: duplicate IP detected	2	00000409	Base Unit	major
Data Interface Group 1-2: Data Network Lost	Data Interface Group 1-2: Data Network Lost		00000412	Base Unit	critical



Alarm	Description	Port Number	Alarm ID	Source	Severity
Virtual IP address on Data Interface Group 1-2: duplicate IP detected	Virtual IP address on Data Interface Group 1-2: duplicate IP detected		0000040F	Base Unit	major
Primary Ethernet interface not in use on Control Network	Primary Ethernet interface not in use on Control Network		00000413	Base Unit	major
Primary Ethernet interface not in use on Data Interface Group 3-4	Primary Ethernet interface not in use on Data Interface Group 3-4		00000414	Base Unit	major
Primary Ethernet interface not in use on Data Interface Group 1-2	Primary Ethernet interface not in use on Data Interface Group 1-2		00000415	Base Unit	major
Network Configuration failed	Failed to configure Network setting. Using default network configuration		00000418	Base Unit	critical
Network Configuration failed	Failed to configure Network setting. Unit reboot might rectify it		00000419	Base Unit	critical
Option card failed to boot	The card did not boot. It may be faulty.	0	01000421	Base Unit	critical
Option card failed to boot	The card did not boot. It may be faulty.	0	02000421	Base Unit	critical
Option card failed to boot	The card did not boot. It may be faulty.	0	03000421	Base Unit	critical
Option card failed to boot	The card did not boot. It may be faulty.	0	04000421	Base Unit	critical
Option card failed to boot	The card did not boot. It may be faulty.	0	05000421	Base Unit	critical
Option card failed to boot	The card did not boot. It may be faulty.	0	06000421	Base Unit	critical
Option Card Comms Failure in slot	An option card failed to respond to the host.	0	01000422	Base Unit	critical
Option Card Comms Failure in slot	An option card failed to respond to the host.	0	02000422	Base Unit	critical
Option Card Comms Failure in slot	An option card failed to respond to the host.	0	03000422	Base Unit	critical
Option Card Comms Failure in slot	An option card failed to respond to the host.	0	04000422	Base Unit	critical
Option Card Comms Failure in slot	An option card failed to respond to the host.	0	05000422	Base Unit	critical
Option Card Comms Failure in slot	An option card failed to respond to the host.	0	06000422	Base Unit	critical
HW Configuration Mismatch in slot	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	0	01000440	Base Unit	critical
HW Configuration Mismatch in slot	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	0	02000440	Base Unit	critical



Alarm	Description	Port Number	Alarm ID	Source	Severity
HW Configuration Mismatch in slot	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	0	03000440	Base Unit	critical
HW Configuration Mismatch in slot	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	0	04000440	Base Unit	critical
HW Configuration Mismatch in slot	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	0	05000440	Base Unit	critical
HW Configuration Mismatch in slot	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	0	06000440	Base Unit	critical
Unrecognized Option Card in slot	The id prom of the option could not be read correctly.	0	01000439	Base Unit	minor
Unrecognized Option Card in slot	The id prom of the option could not be read correctly.	0	02000439	Base Unit	minor
Unrecognized Option Card in slot	The id prom of the option could not be read correctly.	0	03000439	Base Unit	minor
Unrecognized Option Card in slot	The id prom of the option could not be read correctly.	0	04000439	Base Unit	minor
Unrecognized Option Card in slot	The id prom of the option could not be read correctly.	0	05000439	Base Unit	minor
Unrecognized Option Card in slot	The id prom of the option could not be read correctly.	0	06000439	Base Unit	minor
Referenced Output Stream Unavailable from slot 1	An option card is not installed in the specified slot or it cannot provide the requested output stream.	0	01000461	Base Unit	critical
Referenced Output Stream Unavailable from slot 2	An option card is not installed in the specified slot or it cannot provide the requested output stream.	0	02000461	Base Unit	critical
Referenced Output Stream Unavailable from slot 3	An option card is not installed in the specified slot or it cannot provide the requested output stream.	0	03000461	Base Unit	critical
Referenced Output Stream Unavailable from slot 4	An option card is not installed in the specified slot or it cannot provide the requested output stream.	0	04000461	Base Unit	critical
Referenced Output Stream Unavailable from slot 5	An option card is not installed in the specified slot or it cannot provide the requested output stream.	0	05000461	Base Unit	critical
Referenced Output Stream Unavailable from slot 6	An option card is not installed in the specified slot or it cannot provide the requested output stream.	0	06000461	Base Unit	critical
Fan Failure	Permanent damage may be caused by running the unit whilst the fans are not working.	0	00000441	Base Unit	major



Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	00000442	Base Unit	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	0	00000443	Base Unit	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	00000444	Base Unit	minor
+12V A Failed	+12V A rail has failed. Please check supply or contact Customer Support.	0	00000445	Base Unit	warning
+12V B Failed	+12V B rail has failed. Please check supply or contact Customer Support.	0	00000446	Base Unit	warning
Real Time Clock	The Real-time clock has failed. The time/date will not be stored between power-ups.	0	00000447	Base Unit	minor
NTP Server Response Timeout	The unit could not contact the NTP Server. The time/date will drift over time.	0	00000448	Base Unit	warning
Internal Hardware Issue	An Internal Hardware Issue has occurred. The system may not function properly.	0	00000449	Base Unit	minor
Host Build Version Mismatch	Host software is not at an officially released version. Host function may not be affected.	0	0000044A	Base Unit	minor
System Clock Not Locked	The system 27 MHz VCXO is not locked. Check if the Mux SCR Source is valid.	0	0000044B	Base Unit	minor
Chassis Identity Not Programmed	The chassis identity of the host could not be read correctly.	0	0000044C	Base Unit	minor
Selected Mux SCR Source is not present	Selected Mux SCR Source could not be detected. Check if the Sync Card is plugged in.	0	0000044D	Base Unit	minor
Host Identity Not Programmed	The host identity could not be read correctly.	0	0000044E	Base Unit	major
Uncontrolled release	This combination of host and option card software is not officially supported. This may lead to unexpected behavior.	0	0000044F	Base Unit	minor
No identity license	This unit has not been licensed with an identity.	0	00000450	Base Unit	critical
TS NIT is not valid	At one or more TS the Send extended NIT (SIRG) parameter is switched On, and one or more of the parameters Operator, Longitude or Latitude have invalid values.	0	00000680	Base Unit	major
Unsupported Option Card	The Option Card in Slot 1 is not supported with this software release. This may lead to unexpected behaviour.	0	00000451	Base Unit	major



Alarm	Description	Port Number	Alarm ID	Source	Severity
Unsupported Option Card	The Option Card in Slot 2 is not supported with this software release. This may lead to unexpected behaviour.	o	00000452	Base Unit	major
Unsupported Option Card	The Option Card in Slot 3 is not supported with this software release. This may lead to unexpected behaviour.	o	00000453	Base Unit	major
Unsupported Option Card	The Option Card in Slot 4 is not supported with this software release. This may lead to unexpected behaviour.	o	00000454	Base Unit	major
Unsupported Option Card	The Option Card in Slot 5 is not supported with this software release. This may lead to unexpected behaviour.	o	00000455	Base Unit	major
Unsupported Option Card	The Option Card in Slot 6 is not supported with this software release. This may lead to unexpected behaviour.	o	00000456	Base Unit	major
Unsupported Software on Option Card	The Option Card in Slot 1 has unsupported software. Considering updating with the latest supported software. Otherwise it may lead to unexpected behaviour.	0	00000457	Base Unit	warning
Unsupported Software on Option Card	The Option Card in Slot 2 has unsupported software. Considering updating with the latest supported software. Otherwise it may lead to unexpected behaviour.	0	00000458	Base Unit	warning
Unsupported Software on Option Card	The Option Card in Slot 3 has unsupported software. Considering updating with the latest supported software. Otherwise it may lead to unexpected behaviour.	0	00000459	Base Unit	warning
Unsupported Software on Option Card	The Option Card in Slot 4 has unsupported software. Considering updating with the latest supported software. Otherwise it may lead to unexpected behaviour.	0	0000045A	Base Unit	warning
Unsupported Software on Option Card	The Option Card in Slot 5 has unsupported software. Considering updating with the latest supported software. Otherwise it may lead to unexpected behaviour.	0	0000045B	Base Unit	warning
Unsupported Software on Option Card	The Option Card in Slot 6 has unsupported software. Considering updating with the latest supported software. Otherwise it may lead to unexpected behaviour.	0	0000045C	Base Unit	warning
PCR Exchange message timeout	PCR exchange message has not arrived.	0	00000690	Reflex controller	warning
Status message timeout	Status message has not arrived.	0	00000691	Reflex controller	warning
Reflex StatMux algorithm failed.	Reflex statistical multiplexing algorithm returned with an error.	0	00000692	Reflex controller	warning

Alarm	Description	Port Number	Alarm ID	Source	Severity
MGP Failure	Failed to go online, previous online device preventing transmission	0	00000491	Base Unit	major
MGP Collision	Potential duplicate transmission detected	0	00000492	Base Unit	major
MGP Spurious	Spurious MSM packet detected	0	00000493	Base Unit	minor
CSM Contact lost	No CSMs received from Control System	0	00000680	Base Unit	minor
Datagram loss is greater than 0	The datagram loss rate for the Transport Stream is greater than 0.	1	000006B0 – 0000073F	Base Unit	major
Sequence number errors in Transport Stream	There are sequence number errors in the Transport Stream.	1	000007B0 – 0000083E	Base Unit	major
No data available for Input Transport Stream	Both Primary and Backup Input Transport Streams have failed.	1	00000500 – 0000057F	Base Unit	critical
Input Transport Stream running on Backup	Primary Input Transport Stream has failed.	1	00000580 – 000005FF	Base Unit	warning
Input Transport Stream missing	Input Transport Stream has failed.	1	00000601 – 0000067F	Base Unit	major

E.2 Alarms List – CE-a, CE-x Pre-Processor VCMs

The following table lists the alarm and failure identifiers generated by the Encoding VCM.

Note: The first two bits of the AlarmID specify the slot number that the card raising the alarm is fitted in (01 to 06)

Table E.2 Alarm List – CE-a, CE-x Pre-Processor VCMs

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	010C0000	VCM Module	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	0	010C0001	VCM Module	critical
Invalid Parameter	Invalid Parameter received by the Video/Audio Module. Please see Video Encoder status for a more detailed description of the error.	0	010C0002	VCM Module	critical
Video/Audio Module Error	Video/Audio Module Error. Please see Video Encoder status for a more detailed description of the error.	0	010C0003	VCM Module	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	010C0004	VCM Module	critical



Alarm	Description	Port Number	Alarm ID	Source	Severity
Video Processor Warning	A minor error occurred on the Video processor but services are not affected. See log for more details	0	010C0005	VCM Module	warning
Invalid Configuration	An invalid configuration has been applied. Check Video Standard and Profile selection.	0	010C0006	VCM Module	minor
Option Card Build Version Mismatch	The software on this option card is not an officially released version.	0	010C0007	VCM Module	minor
Video Processor Error	An error has been detected on the Video Processor. This will affect services and the error is being recovered. See log for more details.	1	010C0008	VCM Module	critical
Video Processor Failure	An unrecoverable failure has occurred on the Video Processor. The services are affected and intervention is required. See log for more details	1	010C000A	VCM Module	critical
Internal Packetizer Error	A packetizer error has occurred on at least one stream.	1	010C0009	VCM Module	warning
Video Processor Boot Failure	At least one video processor has not booted	1	010C7FE0	VCM Module	critical
Video Processor Alive Count Failure	At least one video processor has not incremented its alive count	1	010C7FE1	VCM Module	critical
Video 1 Input Lock	No valid video found on video input. Please check source connection.	1	010C4000	VCM Module	critical
Video 1 Logo display error	There has been a problem when attempting to display the logo. Please check the logo file that has been uploaded and X,Y position.	1	010C4001	VCM Module	minor
VBI teletext not detected on input	Unable to find teletext data on all of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C4008	VBI	minor
VBI video index not detected on input	Unable to find video index data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C4009	VBI	minor
VBI CC608 closed captions not detected on input	Unable to find closed caption data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400A	VBI	minor
VBI ANC334 closed captions not detected on input	Unable to find closed caption data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400B	VBI	minor
VBI WSS not detected on input	Unable to find WSS (ETSI or AFD) data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400C	VBI	minor

Alarm	Description	Port Number	Alarm ID	Source	Severity
VITC not detected on input	Unable to find VITC data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400D	VBI	minor
Selected Time code source not detected	For the selected Time code source no Time code was found. If in auto mode no source was found on any input. Make sure that the correct source is configured.	1	010C400E	VBI	minor
ANC Bar not detected on input	ANC Bar data extraction is on but no ANC Bar data is present	1	010C400F	VBI	minor
OP-47 not detected on input	OP-47 data extraction is on but no OP-47 data is present	1	010C4010	VBI	minor
Max ANC Data Rate Exceeded	The maximum bit-rate of the generic ANC data output is exceeded. A lower input ANC data rate is required.	1	010C4011	VBI	warning
VPS not detected on input	Unable to find VPS data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page	1	010C4012	VBI	minor
Video 1 Encode Invalid Configuration	An invalid configuration has been applied to Main Channel. Check Video Standard and Profile selection.	0	010C4018	VCM Module	minor
Reflex PCR Exchange Timeout	PCR Exchange message not received within timeout period	1	010C4020	VCM Module	warning
Reflex SetRate Msg Timeout	Set Rate message not received within timeout period	1	010C4021	VCM Module	warning
Reflex Apply-Time out of range	Set Rate message received that is too late to be applied, or is more than 5 seconds early. The alarm is cleared by the reception of a valid Set Rate message, or Reflex being disabled	1	010C4022	VCM Module	warning
Reflex Source Identifier Unstable	The online source identifier has changed twice in the last three messages received	1	010C4023	VCM Module	warning
Reflex Source Identifier Mismatch	The online source identifier in the set rate messages does not match the source identifier in the pcr exchange messages. (The alarm is only raised if this has occurred in two consecutive PCR exchange messages)	1	010C4024	VCM Module	warning
Reflex Tracking PCR Exchange Timeout	PCR Exchange message not received from online encoder within timeout period	1	010C4025	VCM Module	warning
Audio Module Error	The audio module reported an unexpected status value.	0	010C3FE0	Audio Module 1	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio Module CPU loading	The audio module CPU load is too high to support the current audio configuration.	0	010C3FE1	Audio Module 1	major
Audio DSP Failed to Boot	The audio DSP has failed to boot	0	010C3FE2	Audio Module 1	major
Audio 1 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2000	Audio 1	major
Audio 1 TS input error	Incoming transport stream error. Please check source TS.	0	010C2001	Audio 1	major
Audio 1 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2002	Audio 1	minor
Audio 1 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2003	Audio 1	minor
Audio 1 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2004	Audio 1	minor
Audio 1 Dolby E program not present	Program not present in Dolby E stream.	0	010C2005	Audio 1	minor
Audio 1 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2006	Audio 1	minor
Audio 1 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2007	Audio 1	minor
Audio 1 ADS control track	Control track for audio description not present.	0	010C2008	Audio 1	minor
Audio 1 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2009	Audio 1	minor
Audio 1 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C200a	Audio 1	minor
Audio 2 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2020	Audio 2	major
Audio 2 TS input error	Incoming transport stream error. Please check source TS.	0	010C2021	Audio 2	major
Audio 2 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2022	Audio 2	minor
Audio 2 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2023	Audio 2	minor
Audio 2 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2024	Audio 2	minor
Audio 2 Dolby E program not present	Program not present in Dolby E stream.	0	010C2025	Audio 2	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 2 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2026	Audio 2	minor
Audio 2 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2027	Audio 2	minor
Audio 2 ADS control track	Control track for audio description not present.	0	010C2028	Audio 2	minor
Audio 2 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2029	Audio 2	minor
Audio 2 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C202A	Audio 2	minor
Audio 3 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2040	Audio 3	major
Audio 3 TS input error	Incoming transport stream error. Please check source TS.	0	010C2041	Audio 3	major
Audio 3 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2042	Audio 3	minor
Audio 3 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2043	Audio 3	minor
Audio 3 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2044	Audio 3	minor
Audio 3 Dolby E program not present	Program not present in Dolby E stream.	0	010C2045	Audio 3	minor
Audio 3 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2046	Audio 3	minor
Audio 3 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2047	Audio 3	minor
Audio 3 ADS control track	Control track for audio description not present.	0	010C2048	Audio 3	minor
Audio 3 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2049	Audio 3	minor
Audio 3 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C204A	Audio 3	minor
Audio 4 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2060	Audio 4	major
Audio 4 TS input error	Incoming transport stream error. Please check source TS.	0	010C2061	Audio 4	major
Audio 4 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2062	Audio 4	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 4 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2063	Audio 4	minor
Audio 4 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2064	Audio 4	minor
Audio 4 Dolby E program not present	Program not present in Dolby E stream.	0	010C2065	Audio 4	minor
Audio 4 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2066	Audio 4	minor
Audio 4 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2067	Audio 4	minor
Audio 4 ADS control track	Control track for audio description not present.	0	010C2068	Audio 4	minor
Audio 4 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2069	Audio 4	minor
Audio 4 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C206A	Audio 4	minor
Audio 5 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2080	Audio 5	major
Audio 5 TS input error	Incoming transport stream error. Please check source TS.	0	010C2081	Audio 5	major
Audio 5 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2082	Audio 5	minor
Audio 5 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2083	Audio 5	minor
Audio 5 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2084	Audio 5	minor
Audio 5 Dolby E program not present	Program not present in Dolby E stream.	0	010C2085	Audio 5	minor
Audio 5 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2086	Audio 5	minor
Audio 5 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2087	Audio 5	minor
Audio 5 ADS control track	Control track for audio description not present.	0	010C2088	Audio 5	minor
Audio 5 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2089	Audio 5	minor
Audio 5 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C208A	Audio 5	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 6 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C20A0	Audio 6	major
Audio 6 TS input error	Incoming transport stream error. Please check source TS.	0	010C20A1	Audio 6	major
Audio 6 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C20A2	Audio 6	minor
Audio 6 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C20A3	Audio 6	minor
Audio 6 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C20A4	Audio 6	minor
Audio 6 Dolby E program not present	Program not present in Dolby E stream.	0	010C20A5	Audio 6	minor
Audio 6 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C20A6	Audio 6	minor
Audio 6 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C20A7	Audio 6	minor
Audio 6 ADS control track	Control track for audio description not present.	0	010C20A8	Audio 6	minor
Audio 6 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C20A9	Audio 6	minor
Audio 6 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C20AA	Audio 6	minor
Audio 7 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C20C0	Audio 7	major
Audio 7 TS input error	Incoming transport stream error. Please check source TS.	0	010C20C1	Audio 7	major
Audio 7 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C20C2	Audio 7	minor
Audio 7 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C20C3	Audio 7	minor
Audio 7 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C20C4	Audio 7	minor
Audio 7 Dolby E program not present	Program not present in Dolby E stream.	0	010C20C5	Audio 7	minor
Audio 7 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C20C6	Audio 7	minor
Audio 7 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C20C7	Audio 7	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 7 ADS control track	Control track for audio description not present.	0	010C20C8	Audio 7	minor
Audio 7 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C20C9	Audio 7	minor
Audio 7 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C20CA	Audio 7	minor
Audio 8 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C20E0	Audio 8	major
Audio 8 TS input error	Incoming transport stream error. Please check source TS.	0	010C20E1	Audio 8	major
Audio 8 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C20E2	Audio 8	minor
Audio 8 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C20E3	Audio 8	minor
Audio 8 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C20E4	Audio 8	minor
Audio 8 Dolby E program not present	Program not present in Dolby E stream.	0	010C20E5	Audio 8	minor
Audio 8 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C20E6	Audio 8	minor
Audio 8 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C20E7	Audio 8	minor
Audio 8 ADS control track	Control track for audio description not present.	0	010C20E8	Audio 8	minor
Audio 8 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C20E9	Audio 8	minor
Audio 8 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C20EA	Audio 8	minor
Audio 9 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2100	Audio 9	major
Audio 9 TS input error	Incoming transport stream error. Please check source TS.	0	010C2101	Audio 9	major
Audio 9 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2102	Audio 9	minor
Audio 9 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2103	Audio 9	minor
Audio 9 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2104	Audio 9	minor
Audio 9 Dolby E program not present	Program not present in Dolby E stream.	0	010C2105	Audio 9	minor

Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 9 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2106	Audio 9	minor
Audio 9 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2107	Audio 9	minor
Audio 9 ADS control track	Control track for audio description not present.	0	010C2108	Audio 9	minor
Audio 9 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2109	Audio 9	minor
Audio 9 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C210A	Audio 9	minor
Audio 10 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2120	Audio 10	major
Audio 10 TS input error	Incoming transport stream error. Please check source TS.	0	010C2121	Audio 10	major
Audio 10 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2122	Audio 10	minor
Audio 10 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2123	Audio 10	minor
Audio 10 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2124	Audio 10	minor
Audio 10 Dolby E program not present	Program not present in Dolby E stream.	0	010C2125	Audio 10	minor
Audio 10 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2126	Audio 10	minor
Audio 10 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2127	Audio 10	minor
Audio 10 ADS control track	Control track for audio description not present.	0	010C2128	Audio 10	minor
Audio 10 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2129	Audio 10	minor
Audio 10 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C212A	Audio 10	minor
Audio 11 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2140	Audio 11	major
Audio 11 TS input error	Incoming transport stream error. Please check source TS.	0	010C2141	Audio 11	major
Audio 11 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2142	Audio 11	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 11 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2143	Audio 11	minor
Audio 11 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2144	Audio 11	minor
Audio 11 Dolby E program not present	Program not present in Dolby E stream.	0	010C2145	Audio 11	minor
Audio 11 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2146	Audio 11	minor
Audio 11 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2147	Audio 11	minor
Audio 11 ADS control track	Control track for audio description not present.	0	010C2148	Audio 11	minor
Audio 11 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2149	Audio 11	minor
Audio 11 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C214A	Audio 11	minor
Audio 12 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2160	Audio 12	major
Audio 12 TS input error	Incoming transport stream error. Please check source TS.	0	010C2161	Audio 12	major
Audio 12 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2162	Audio 12	minor
Audio 12 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2163	Audio 12	minor
Audio 12 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2164	Audio 12	minor
Audio 12 Dolby E program not present	Program not present in Dolby E stream.	0	010C2165	Audio 12	minor
Audio 12 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2166	Audio 12	minor
Audio 12 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2167	Audio 12	minor
Audio 12 ADS control track	Control track for audio description not present.	0	010C2168	Audio 12	minor
Audio 12 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2169	Audio 12	minor
Audio 12 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C216A	Audio 12	minor

Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 13 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2180	Audio 13	major
Audio 13 TS input error	Incoming transport stream error. Please check source TS.	0	010C2181	Audio 13	major
Audio 13 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2182	Audio 13	minor
Audio 13 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2183	Audio 13	minor
Audio 13 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2184	Audio 13	minor
Audio 13 Dolby E program not present	Program not present in Dolby E stream.	0	010C2185	Audio 13	minor
Audio 13 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2186	Audio 13	minor
Audio 13 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2187	Audio 13	minor
Audio 13 ADS control track	Control track for audio description not present.	0	010C2188	Audio 13	minor
Audio 13 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2189	Audio 13	minor
Audio 13 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C218A	Audio 13	minor
Audio 14 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C21A0	Audio 14	major
Audio 14 TS input error	Incoming transport stream error. Please check source TS.	0	010C21A1	Audio 14	major
Audio 14 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C21A2	Audio 14	minor
Audio 14 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C21A3	Audio 14	minor
Audio 14 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C21A4	Audio 14	minor
Audio 14 Dolby E program not present	Program not present in Dolby E stream.	0	010C21A5	Audio 14	minor
Audio 14 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C21A6	Audio 14	minor
Audio 14 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C21A7	Audio 14	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 14 ADS control track	Control track for audio description not present.	0	010C21A8	Audio 14	minor
Audio 14 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C21A9	Audio 14	minor
Audio 14 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C21AA	Audio 14	minor
Audio 15 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C21C0	Audio 15	major
Audio 15 TS input error	Incoming transport stream error. Please check source TS.	0	010C21C1	Audio 15	major
Audio 15 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C21C2	Audio 15	minor
Audio 15 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C21C3	Audio 15	minor
Audio 15 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C21C4	Audio 15	minor
Audio 15 Dolby E program not present	Program not present in Dolby E stream.	0	010C21C5	Audio 15	minor
Audio 15 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C21C6	Audio 15	minor
Audio 15 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C21C7	Audio 15	minor
Audio 15 ADS control track	Control track for audio description not present.	0	010C21C8	Audio 15	minor
Audio 15 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C21C9	Audio 15	minor
Audio 15 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C21CA	Audio 15	minor
Audio 16 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C21E0	Audio 16	major
Audio 16 TS input error	Incoming transport stream error. Please check source TS.	0	010C21E1	Audio 16	major
Audio 16 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C21E2	Audio 16	minor
Audio 16 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C21E3	Audio 16	minor
Audio 16 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C21E4	Audio 16	minor
Audio 16 Dolby E program not present	Program not present in Dolby E stream.	0	010C21E5	Audio 16	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 16 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C21E6	Audio 16	minor
Audio 16 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C21E7	Audio 16	minor
Audio 16 ADS control track	Control track for audio description not present.	0	010C21E8	Audio 16	minor
Audio 16 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C21E9	Audio 16	minor
Audio 16 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C21EA	Audio 16	minor

E.3 Alarms List – CE-a J2K VCM

The following table lists the alarm and failure identifiers generated by the CE-a J2K VCM.

Table E.3 Alarm List – CE-a J2K VCM

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	010C0000	CE-a J2K Module	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	0	010C0001	CE-a J2K Module	critical
Invalid Parameter	Invalid Parameter received by the Video/Audio Module. Please see Video Encoder status for a more detailed description of the error.	0	010C0002	CE-a J2K Module	critical
Video/Audio Module Error	Video/Audio Module Error. Please see Video Encoder status for a more detailed description of the error.	0	010C0003	CE-a J2K Module	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	010C0004	CE-a J2K Module	critical
Video Processor Warning	A minor error occurred on the Video processor but services are not affected. See log for more details	0	010C0005	CE-a J2K Module	minor
Invalid Configuration	An invalid configuration has been applied. Check Video Standard and Profile selection.	0	010C0006	CE-a J2K Module	minor
Option Card Build Version Mismatch	The software on this option card is not an officially released version.	0	010C0007	CE-a J2K Module	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Video Processor Error	An error has been detected on the Video Processor. This will affect services and the error is being recovered. See log for more details.	0	010C0008	CE-a J2K Module	critical
Internal Packetizer Error	A packetizer error has occurred on at least one stream.	1	010C0009	CE-a J2K Module	warning
Video Processor Failure	An unrecoverable failure has occurred on the Video Processor. The services are affected and intervention is required. See log for more details	1	010C000A	CE-a J2K Module	critical
Video Processor Boot Failure	At least one video processor has not booted	1	010C0FE0	CE-a J2K Module	critical
Video Processor Alive Count Failure	At least one video processor has not incremented its alive count	1	010C0FE1	CE-a J2K Module	critical
Video 1 Input Lock	No valid video found on video input. Please check source connection.	1	010C4000	CE-a J2K	critical
Max ANC Data Rate Exceeded	The maximum bit-rate of the generic ANC data output is exceeded. A lower input ANC data rate is required.	1	010C4011	VBI	warning
Video 1 Encode Invalid Configuration	An invalid configuration has been applied to Main Channel. Check Video Standard and Profile selection.	0	010C4018	CE-a J2K	minor
Audio Module Error	The audio module reported an unexpected status value.	0	010C3FE0	Audio Module 1	minor
Audio Module CPU loading	The audio module CPU load is too high to support the current audio configuration.	0	010C3FE1	Audio Module 1	major
Audio DSP Failed to Boot	The audio DSP has failed to boot	0	010C3FE2	Audio Module 1	major
Audio 1 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2000	Audio 1	major
Audio 1 TS input error	Incoming transport stream error. Please check source TS.	0	010C2001	Audio 1	major
Audio 1 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2002	Audio 1	minor
Audio 1 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2003	Audio 1	minor
Audio 1 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2004	Audio 1	minor
Audio 1 Dolby E program not present	Program not present in Dolby E stream.	0	010C2005	Audio 1	minor
Audio 1 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2006	Audio 1	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 1 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2007	Audio 1	minor
Audio 1 ADS control track	Control track for audio description not present.	0	010C2008	Audio 1	minor
Audio 1 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2009	Audio 1	minor
Audio 1 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C200a	Audio 1	minor
Audio 2 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2020	Audio 2	major
Audio 2 TS input error	Incoming transport stream error. Please check source TS.	0	010C2021	Audio 2	major
Audio 2 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2022	Audio 2	minor
Audio 2 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2023	Audio 2	minor
Audio 2 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2024	Audio 2	minor
Audio 2 Dolby E program not present	Program not present in Dolby E stream.	0	010C2025	Audio 2	minor
Audio 2 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2026	Audio 2	minor
Audio 2 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2027	Audio 2	minor
Audio 2 ADS control track	Control track for audio description not present.	0	010C2028	Audio 2	minor
Audio 2 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2029	Audio 2	minor
Audio 2 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C202A	Audio 2	minor
Audio 3 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2040	Audio 3	major
Audio 3 TS input error	Incoming transport stream error. Please check source TS.	0	010C2041	Audio 3	major
Audio 3 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2042	Audio 3	minor
Audio 3 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2043	Audio 3	minor
Audio 3 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2044	Audio 3	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 3 Dolby E program not present	Program not present in Dolby E stream.	0	010C2045	Audio 3	minor
Audio 3 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2046	Audio 3	minor
Audio 3 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2047	Audio 3	minor
Audio 3 ADS control track	Control track for audio description not present.	0	010C2048	Audio 3	minor
Audio 3 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2049	Audio 3	minor
Audio 3 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C204A	Audio 3	minor
Audio 4 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2060	Audio 4	major
Audio 4 TS input error	Incoming transport stream error. Please check source TS.	0	010C2061	Audio 4	major
Audio 4 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2062	Audio 4	minor
Audio 4 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2063	Audio 4	minor
Audio 4 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2064	Audio 4	minor
Audio 4 Dolby E program not present	Program not present in Dolby E stream.	0	010C2065	Audio 4	minor
Audio 4 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2066	Audio 4	minor
Audio 4 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2067	Audio 4	minor
Audio 4 ADS control track	Control track for audio description not present.	0	010C2068	Audio 4	minor
Audio 4 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2069	Audio 4	minor
Audio 4 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C206A	Audio 4	minor

E.4 Alarms List – CE-xA VCM

The following table lists the alarm and failure identifiers generated by the CE-xA VCM.

E.4.1 CE-xA Pre-Processor Module

Table E.4 Alarm List – CE-xA VCM (CE-x Pre-Processor Module)

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	010C0000	CE-x Analogue Module	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	0	010C0001	CE-x Analogue Module	critical
Invalid Parameter	Invalid Parameter received by the Video/Audio Module. Please see Video Encoder status for a more detailed description of the error.	0	010C0002	CE-x Analogue Module	critical
Video/Audio Module Error	Video/Audio Module Error. Please see Video Encoder status for a more detailed description of the error.	0	010C0003	CE-x Analogue Module	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	010C0004	CE-x Analogue Module	critical
Invalid Configuration	An invalid configuration has been applied. Check Video Standard and Profile selection.	0	010C0006	CE-x Analogue Module	minor
Option Card Build Version Mismatch	The software on this option card is not an officially released version.	0	010C0007	CE-x Analogue Module	minor
Video Processor Error	An error has been detected on the Video Processor. This will affect services and the error is being recovered. See log for more details.	1	010C0008	CE-x Analogue Module	critical
Internal Packetizer Error	A packetizer error has occurred on at least one stream.	1	010C0009	CE-x Analogue Module	warning
Video Processor Failure	An unrecoverable failure has occurred on the Video Processor. The services are affected and intervention is required. See log for more details	1	010C000A	CE-x Analogue Module	critical
Video Processor Boot Failure	At least one video processor has not booted	1	010C7FE0	Video Module	critical
Video Processor Alive Count Failure	At least one video processor has not incremented its alive count	1	010C7FE1	Video Module	critical
Video 1 Input Lock	No valid video found on video input. Please check source connection.	1	010C4000	CE-x Analogue	critical



Alarm	Description	Port Number	Alarm ID	Source	Severity
Video 1 Logo display error	There has been a problem when attempting to display the logo. Please check the logo file that has been uploaded and X,Y position.	1	010C4001	CE-x Analogue	minor
VBI teletext not detected on input	Unable to find teletext data on all of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C4008	VBI	minor
VBI video index not detected on input	Unable to find video index data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C4009	VBI	minor
VBI CC608 closed captions not detected on input	Unable to find closed caption data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400A	VBI	minor
VBI ANC334 closed captions not detected on input	Unable to find closed caption data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400B	VBI	minor
VBI WSS not detected on input	Unable to find WSS (ETSI or AFD) data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400C	VBI	minor
VITC not detected on input	Unable to find VITC data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page.	1	010C400D	VBI	minor
Selected Time code source not detected	For the selected Time code source no Time code was found. If in auto mode no source was found on any input. Make sure that the correct source is configured.	1	010C400E	VBI	minor
ANC Bar not detected on input	ANC Bar data extraction is on but no ANC Bar data is present	1	010C400F	VBI	minor
OP-47 not detected on input	OP-47 data extraction is on but no OP-47 data is present	1	010C4010	VBI	minor
Max ANC Data Rate Exceeded	The maximum bit-rate of the generic ANC data output is exceeded. A lower input ANC data rate is required.	1	010C4011	VBI	warning
VPS not detected on input	Unable to find VPS data on any of the configured lines. Please check the video input. For more details on the type of VBI, see the VBI status page	1	010C4012	VBI	minor
Video 1 Encode Invalid Configuration	An invalid configuration has been applied to Main Channel. Check Video Standard and Profile selection.	0	010C4018	CE-x Analogue	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Reflex PCR Exchange Timeout	PCR Exchange message not received within timeout period	1	010C4020	CE-x Analogue Module	warning
Reflex SetRate Msg Timeout	Set Rate message not received within timeout period	1	010C4021	CE-x Analogue Module	warning
Reflex Apply-Time out of range	Set Rate message received that is too late to be applied, or is more than 5 seconds early. The alarm is cleared by the reception of a valid Set Rate message, or Reflex being disabled	1	010C4022	CE-x Analogue Module	warning
Reflex Source Identifier Unstable	The online source identifier has changed twice in the last three messages received	1	010C4023	CE-x Analogue Module	warning
Reflex Source Identifier Mismatch	The online source identifier in the set rate messages does not match the source identifier in the pcr exchange messages. (The alarm is only raised if this has occurred in two consecutive PCR exchange messages)	1	010C4024	CE-x Analogue Module	warning
Reflex Tracking PCR Exchange Timeout	PCR Exchange message not received from online encoder within timeout period	1	010C4025	CE-x Analogue Module	warning
Audio Module Error	The audio module reported an unexpected status value.	0	010C3FE0	Audio Module 1	minor
Audio Module CPU loading	The audio module CPU load is too high to support the current audio configuration.	0	010C3FE1	Audio Module 1	major
Audio DSP Failed to Boot	The audio DSP has failed to boot	0	010C3FE2	Audio Module 1	major
Audio 1 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2000	Audio 1	major
Audio 1 TS input error	Incoming transport stream error. Please check source TS.	0	010C2001	Audio 1	major
Audio 1 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2002	Audio 1	minor
Audio 1 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2003	Audio 1	minor
Audio 1 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2004	Audio 1	minor
Audio 1 Dolby E program not present	Program not present in Dolby E stream.	0	010C2005	Audio 1	minor
Audio 1 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2006	Audio 1	minor
Audio 1 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2007	Audio 1	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 1 ADS control track	Control track for audio description not present.	0	010C2008	Audio 1	minor
Audio 1 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2009	Audio 1	minor
Audio 1 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C200a	Audio 1	minor
Audio 2 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2020	Audio 2	major
Audio 2 TS input error	Incoming transport stream error. Please check source TS.	0	010C2021	Audio 2	major
Audio 2 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2022	Audio 2	minor
Audio 2 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2023	Audio 2	minor
Audio 2 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2024	Audio 2	minor
Audio 2 Dolby E program not present	Program not present in Dolby E stream.	0	010C2025	Audio 2	minor
Audio 2 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2026	Audio 2	minor
Audio 2 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2027	Audio 2	minor
Audio 2 ADS control track	Control track for audio description not present.	0	010C2028	Audio 2	minor
Audio 2 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2029	Audio 2	minor
Audio 2 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C202A	Audio 2	minor
Audio 3 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2040	Audio 3	major
Audio 3 TS input error	Incoming transport stream error. Please check source TS.	0	010C2041	Audio 3	major
Audio 3 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2042	Audio 3	minor
Audio 3 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2043	Audio 3	minor
Audio 3 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2044	Audio 3	minor
Audio 3 Dolby E program not present	Program not present in Dolby E stream.	0	010C2045	Audio 3	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 3 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2046	Audio 3	minor
Audio 3 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2047	Audio 3	minor
Audio 3 ADS control track	Control track for audio description not present.	0	010C2048	Audio 3	minor
Audio 3 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2049	Audio 3	minor
Audio 3 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C204A	Audio 3	minor
Audio 4 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2060	Audio 4	major
Audio 4 TS input error	Incoming transport stream error. Please check source TS.	0	010C2061	Audio 4	major
Audio 4 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2062	Audio 4	minor
Audio 4 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2063	Audio 4	minor
Audio 4 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2064	Audio 4	minor
Audio 4 Dolby E program not present	Program not present in Dolby E stream.	0	010C2065	Audio 4	minor
Audio 4 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2066	Audio 4	minor
Audio 4 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2067	Audio 4	minor
Audio 4 ADS control track	Control track for audio description not present.	0	010C2068	Audio 4	minor
Audio 4 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2069	Audio 4	minor
Audio 4 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C206A	Audio 4	minor
Audio 5 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2080	Audio 5	major
Audio 5 TS input error	Incoming transport stream error. Please check source TS.	0	010C2081	Audio 5	major
Audio 5 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2082	Audio 5	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 5 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2083	Audio 5	minor
Audio 5 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2084	Audio 5	minor
Audio 5 Dolby E program not present	Program not present in Dolby E stream.	0	010C2085	Audio 5	minor
Audio 5 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2086	Audio 5	minor
Audio 5 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2087	Audio 5	minor
Audio 5 ADS control track	Control track for audio description not present.	0	010C2088	Audio 5	minor
Audio 5 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2089	Audio 5	minor
Audio 5 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C208A	Audio 5	minor
Audio 6 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C20A0	Audio 6	major
Audio 6 TS input error	Incoming transport stream error. Please check source TS.	0	010C20A1	Audio 6	major
Audio 6 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C20A2	Audio 6	minor
Audio 6 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C20A3	Audio 6	minor
Audio 6 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C20A4	Audio 6	minor
Audio 6 Dolby E program not present	Program not present in Dolby E stream.	0	010C20A5	Audio 6	minor
Audio 6 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C20A6	Audio 6	minor
Audio 6 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C20A7	Audio 6	minor
Audio 6 ADS control track	Control track for audio description not present.	0	010C20A8	Audio 6	minor
Audio 6 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C20A9	Audio 6	minor
Audio 6 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C20AA	Audio 6	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 7 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C20C0	Audio 7	major
Audio 7 TS input error	Incoming transport stream error. Please check source TS.	0	010C20C1	Audio 7	major
Audio 7 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C20C2	Audio 7	minor
Audio 7 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C20C3	Audio 7	minor
Audio 7 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C20C4	Audio 7	minor
Audio 7 Dolby E program not present	Program not present in Dolby E stream.	0	010C20C5	Audio 7	minor
Audio 7 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C20C6	Audio 7	minor
Audio 7 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C20C7	Audio 7	minor
Audio 7 ADS control track	Control track for audio description not present.	0	010C20C8	Audio 7	minor
Audio 7 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C20C9	Audio 7	minor
Audio 7 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C20CA	Audio 7	minor
Audio 8 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C20E0	Audio 8	major
Audio 8 TS input error	Incoming transport stream error. Please check source TS.	0	010C20E1	Audio 8	major
Audio 8 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C20E2	Audio 8	minor
Audio 8 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C20E3	Audio 8	minor
Audio 8 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C20E4	Audio 8	minor
Audio 8 Dolby E program not present	Program not present in Dolby E stream.	0	010C20E5	Audio 8	minor
Audio 8 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C20E6	Audio 8	minor
Audio 8 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C20E7	Audio 8	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 8 ADS control track	Control track for audio description not present.	0	010C20E8	Audio 8	minor
Audio 8 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C20E9	Audio 8	minor
Audio 8 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C20EA	Audio 8	minor
Audio 9 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2100	Audio 9	major
Audio 9 TS input error	Incoming transport stream error. Please check source TS.	0	010C2101	Audio 9	major
Audio 9 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2102	Audio 9	minor
Audio 9 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2103	Audio 9	minor
Audio 9 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2104	Audio 9	minor
Audio 9 Dolby E program not present	Program not present in Dolby E stream.	0	010C2105	Audio 9	minor
Audio 9 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2106	Audio 9	minor
Audio 9 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2107	Audio 9	minor
Audio 9 ADS control track	Control track for audio description not present.	0	010C2108	Audio 9	minor
Audio 9 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2109	Audio 9	minor
Audio 9 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C210A	Audio 9	minor
Audio 10 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2120	Audio 10	major
Audio 10 TS input error	Incoming transport stream error. Please check source TS.	0	010C2121	Audio 10	major
Audio 10 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2122	Audio 10	minor
Audio 10 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2123	Audio 10	minor
Audio 10 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2124	Audio 10	minor
Audio 10 Dolby E program not present	Program not present in Dolby E stream.	0	010C2125	Audio 10	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 10 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2126	Audio 10	minor
Audio 10 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2127	Audio 10	minor
Audio 10 ADS control track	Control track for audio description not present.	0	010C2128	Audio 10	minor
Audio 10 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2129	Audio 10	minor
Audio 10 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C212A	Audio 10	minor
Audio 11 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2140	Audio 11	major
Audio 11 TS input error	Incoming transport stream error. Please check source TS.	0	010C2141	Audio 11	major
Audio 11 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2142	Audio 11	minor
Audio 11 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2143	Audio 11	minor
Audio 11 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2144	Audio 11	minor
Audio 11 Dolby E program not present	Program not present in Dolby E stream.	0	010C2145	Audio 11	minor
Audio 11 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2146	Audio 11	minor
Audio 11 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2147	Audio 11	minor
Audio 11 ADS control track	Control track for audio description not present.	0	010C2148	Audio 11	minor
Audio 11 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2149	Audio 11	minor
Audio 11 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C214A	Audio 11	minor
Audio 12 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2160	Audio 12	major
Audio 12 TS input error	Incoming transport stream error. Please check source TS.	0	010C2161	Audio 12	major
Audio 12 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2162	Audio 12	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 12 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2163	Audio 12	minor
Audio 12 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2164	Audio 12	minor
Audio 12 Dolby E program not present	Program not present in Dolby E stream.	0	010C2165	Audio 12	minor
Audio 12 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2166	Audio 12	minor
Audio 12 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2167	Audio 12	minor
Audio 12 ADS control track	Control track for audio description not present.	0	010C2168	Audio 12	minor
Audio 12 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2169	Audio 12	minor
Audio 12 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C216A	Audio 12	minor
Audio 13 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C2180	Audio 13	major
Audio 13 TS input error	Incoming transport stream error. Please check source TS.	0	010C2181	Audio 13	major
Audio 13 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C2182	Audio 13	minor
Audio 13 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C2183	Audio 13	minor
Audio 13 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C2184	Audio 13	minor
Audio 13 Dolby E program not present	Program not present in Dolby E stream.	0	010C2185	Audio 13	minor
Audio 13 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C2186	Audio 13	minor
Audio 13 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C2187	Audio 13	minor
Audio 13 ADS control track	Control track for audio description not present.	0	010C2188	Audio 13	minor
Audio 13 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C2189	Audio 13	minor
Audio 13 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C218A	Audio 13	minor

Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 14 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C21A0	Audio 14	major
Audio 14 TS input error	Incoming transport stream error. Please check source TS.	0	010C21A1	Audio 14	major
Audio 14 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C21A2	Audio 14	minor
Audio 14 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C21A3	Audio 14	minor
Audio 14 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C21A4	Audio 14	minor
Audio 14 Dolby E program not present	Program not present in Dolby E stream.	0	010C21A5	Audio 14	minor
Audio 14 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C21A6	Audio 14	minor
Audio 14 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C21A7	Audio 14	minor
Audio 14 ADS control track	Control track for audio description not present.	0	010C21A8	Audio 14	minor
Audio 14 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C21A9	Audio 14	minor
Audio 14 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C21AA	Audio 14	minor
Audio 15 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C21C0	Audio 15	major
Audio 15 TS input error	Incoming transport stream error. Please check source TS.	0	010C21C1	Audio 15	major
Audio 15 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C21C2	Audio 15	minor
Audio 15 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C21C3	Audio 15	minor
Audio 15 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C21C4	Audio 15	minor
Audio 15 Dolby E program not present	Program not present in Dolby E stream.	0	010C21C5	Audio 15	minor
Audio 15 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C21C6	Audio 15	minor
Audio 15 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C21C7	Audio 15	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
Audio 15 ADS control track	Control track for audio description not present.	0	010C21C8	Audio 15	minor
Audio 15 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C21C9	Audio 15	minor
Audio 15 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C21CA	Audio 15	minor
Audio 16 Input lock	No valid audio detected on selected input. Please check source connection.	0	010C21E0	Audio 16	major
Audio 16 TS input error	Incoming transport stream error. Please check source TS.	0	010C21E1	Audio 16	major
Audio 16 Compressed audio not detected	Compressed audio not detected on input. Please check source connection and source format.	0	010C21E2	Audio 16	minor
Audio 16 Input frame CRC failure	CRC error in compressed input frame. Output is muted.	0	010C21E3	Audio 16	minor
Audio 16 Unsupported sample rate	Unsupported sample rate at decoder output.	0	010C21E4	Audio 16	minor
Audio 16 Dolby E program not present	Program not present in Dolby E stream.	0	010C21E5	Audio 16	minor
Audio 16 Dolby E alignment	Dolby E frames not properly aligned to video frames. May glitch on frame drop/repeat and video may not be aligned to audio.	0	010C21E6	Audio 16	minor
Audio 16 Dolby E metadata frame rate mismatch	Frame rate indicated in Dolby E metadata does not match current video frame rate.	0	010C21E7	Audio 16	minor
Audio 16 ADS control track	Control track for audio description not present.	0	010C21E8	Audio 16	minor
Audio 16 ADS silence	Silent period detected. Valid only for Audio Description Service encoding.	0	010C21E9	Audio 16	minor
Audio 16 Clipping	Audio output is clipping. Audio gain value or input amplitude should be reduced.	0	010C21EA	Audio 16	minor

E.4.2 CE-x and CE-xA (Encoder Module)

Table E.5 Alarm List – CE-x and CE-xA (Encoder Module)

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	010D0000	Encoder Module	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	0	010D0001	Encoder Module	critical

Alarm	Description	Port Number	Alarm ID	Source	Severity
Invalid Parameter	Invalid Parameter received by the Video/Audio Module. Please see Video Encoder status for a more detailed description of the error.	0	010D0002	Encoder Module	critical
Video/Audio Module Error	Video/Audio Module Error. Please see Video Encoder status for a more detailed description of the error.	0	010D0003	Encoder Module	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	010D0004	Encoder Module	critical
Internal HW Information	HW reported an unexpected status value. This does not affect normal operation of the unit.	0	010D0005	Encoder Module	minor
Option Card Build Version Mismatch	The software on this option card is not an officially released version.	0	010D0007	Encoder Module	minor
Video DSP Not Alive	Video DSP alive count not incremented	1	010D0008	Encoder Module	critical
Failed to Configure Device	FPGA load failed	1	010D0009	Encoder Module	critical
Inter-card Link Error	See logs for further information	1	010D000D	Encoder Module	critical
Lookahead Data Error	See logs for further information	1	010D000E	Encoder Module	critical
Video Buffer Error	See logs for further information	1	010D000F	Encoder Module	critical

E.5 Alarms List – Satellite Modulator

The following table lists the alarm and failure identifiers generated within the Media Processing Module (MPM).

Table E.6 Alarm List – Satellite Modulator

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive	0	060F0001	Satellite Modulator	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support	0	060F0002	Satellite Modulator	critical
Option Card Build Version Mismatch	The software on this option card is not an officially released version	0	060F0008	Satellite Modulator	minor
FPGA PLL Unlocked	FPGA PLL unlocked	0	060F000A	Satellite Modulator	critical



Alarm	Description	Port Number	Alarm ID	Source	Severity
Reference Clock Unlocked	10 MHz reference clock PLL unlocked when Clock Reference set to external	0	060F000B	Satellite Modulator	minor
Clock PLL Unlocked	Clock generator PLL unlocked. This alarm automatically turns off the IF and L-band outputs	0	060F000C	Satellite Modulator	critical
PSU Failed	12V power supply failed	0	060F001B	Satellite Modulator	critical
Host SCR Sync Failed	Host SCR Sync Failed	0	060F0026	Satellite Modulator	critical
Un-calibrated	Failed to load calibration data. Using default data set. The RF output is still present, but performance may be degraded below published specifications. For data recovery please contact Customer Support	0	060F0027	Satellite Modulator	major
Stream Input Data Rate Low	Stream input data rate low	0	060F000D	Satellite Modulator	critical
Stream Input Data Rate High	Stream input data rate high	0	060F000E	Satellite Modulator	critical
Primary Stream MPEG Sync Fail	Primary Stream MPEG sync fail	0	060F000F	Satellite Modulator	critical
Secondary Stream MPEG Sync Fail	Secondary Stream MPEG sync fail	0	060F0010	Satellite Modulator	critical
Primary Stream BBFRAME Sync Fail	Primary Stream BBFRAME sync fail	0	060F0011	Satellite Modulator	critical
Secondary Stream BBFRAME Sync Fail	Secondary Stream BBFRAME sync fail	0	060F0012	Satellite Modulator	critical
Input Buffer Overflow	Input buffer overflow	0	060F0013	Satellite Modulator	critical
Input Buffer Underflow	Input buffer Underflow	0	060F0014	Satellite Modulator	critical
Primary Input Not Selected	Primary input not selected when Input Mode is set to automatic	0	060F001F	Satellite Modulator	major
Primary Stream BB Frame Illegal MODCOD	Primary Stream BB Frame Illegal MODCOD	0	060F0015	Satellite Modulator	critical
Secondary Stream BB Frame Illegal MODCOD	Secondary Stream BB Frame Illegal MODCOD	0	060F0016	Satellite Modulator	critical
Primary Stream BB Header Error	Primary Stream BB Header Error	0	060F0017	Satellite Modulator	critical
Secondary Stream BB Header Error	Secondary Stream BB Header Error	0	060F0018	Satellite Modulator	critical
Numeric Overflow I	I channel numeric overflow	0	060F001D	Satellite Modulator	major
Numeric Overflow Q	Q channel numeric overflow	0	060F001E	Satellite Modulator	major
DVB-S2 TS1 buffer overflow	DVB-S2 TS1 buffer overflow	0	060F0020	Satellite Modulator	critical



Alarm	Description	Port Number	Alarm ID	Source	Severity
DVB-S2 TS2 buffer overflow	DVB-S2 TS2 buffer overflow	0	060F0021	Satellite Modulator	critical
DVB-S2 BB1 buffer overflow	DVB-S2 BB1 buffer overflow	0	060F0022	Satellite Modulator	critical
DVB-S2 BB2 buffer overflow	DVB-S2 BB2 buffer overflow	0	060F0023	Satellite Modulator	critical
DVB-S2 BB multiplex buffer overflow	DVB-S2 BB multiplex buffer overflow	0	060F0024	Satellite Modulator	critical
L-Band Carrier Frequency Unlocked	L-band carrier frequency synthesizer unlocked. This alarm automatically turns off the L-band output.	0	060F0019	Satellite Modulator	critical
Up-converter Power Shutdown	Up-converter Power Shutdown	0	060F001A	Satellite Modulator	major
OCXO Fault	The satellite modulator's on-board precision oscillator has malfunctioned. This alarm automatically turns off the IF and L-band outputs. Contact Ericsson Service personnel as the unit should be returned for repair.	0	060F0028	Satellite Modulator	critical

E.6 Alarms List – ASI I/O Option Card

Table E.7 Alarm List – ASI I/O Option Card

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	01110001	ASI IO Module	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	0	01110002	ASI IO Module	critical
Invalid Parameter	Invalid Parameter received by the ASI IO Module. Please see Video Encoder status for a more detailed description of the error.	0	01110003	ASI IO Module	critical
Module Error	Option Card Error. Please see log for a more detailed description of the error.	0	01110004	ASI IO Module	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	01110006	ASI IO Module	critical
Internal HW Information	HW reported an unexpected status value. This does not affect normal operation of the unit.	0	01110007	ASI IO Module	minor
Option Card Build Version Mismatch	The software on this option card is not an officially released version.	0	01110008	ASI IO Module	minor



Alarm	Description	Port Number	Alarm ID	Source	Severity
ASI Output-1 Error	An error has occurred in ASI Output 1. See the log for more details.	0	01110020	ASI Output	critical
ASI Output-2 Error	An error has occurred in ASI Output 2. See the log for more details.	0	01110120	ASI Output	critical
ASI Input-1 TS Lock Error	No valid Transport Stream found on ASI Input 1. ASI input possibly corrupt	0	01110030	ASI Input 1	critical
ASI Input-1 Error	An error has occurred on ASI Input 1. See the log for more details.	0	01110040	ASI Input 1	minor
ASI Input-2 TS Lock Error	No valid Transport Stream found on ASI Input 2. ASI input possibly corrupt	0	01110130	ASI Input 2	critical
ASI Input-2 Error	An error has occurred on ASI Input 2. See the log for more details.	0	01110140	ASI Input 2	minor

E.7 Alarms List – G.703 Transceiver Card

The following table lists the alarm and failure identifiers generated by the G.703 Transceiver card.

Table E.8 Alarm List – ASI I/O Option Card

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	01120001	G.703 I/O	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch it off and refer to Customer Support.	0	01120002	G.703 I/O	critical
Invalid Parameter	Invalid parameter received by the Transceiver Card. Please see G.703 I/O Status for a more detailed description of the error.	0	01120003	G.703 I/O	critical
Option Card Build Version Mismatch	The software on this option card is not an officially released version.	0	01120008	G.703 I/O	minor
CLAD Loss Of Lock failure	SCT Clock Rate Adapter PLL not locked to internal clock reference (hardware error). Please refer to Customer Support.	1	01120010	G.703 I/O	critical
Loss Of Signal (LOS) failure	No input or input signal level is too low (>24dB below nominal). Please check the G.703 Input port. Cable might be faulty or too long.	1	01120020	G.703 I/O	major
Alarm Indication Signal (AIS) failure	Malfunction of far-end G.703 terminal. Please see FEAC indication (if available) under G.703 I/O Status for details.	1	01120021	G.703 I/O	major

Alarm	Description	Port Number	Alarm ID	Source	Severity
Loss of Frame (LOF) failure	DS3 frame synchronization loss. Framing might have been disabled in the transmission.	1	01120022	G.703 I/O	major
Remote Alarm Indication (RAI) failure	Defects (LOS, LOF or AIS) detected at far-end G.703 terminal input. Please see FEAC indication (if available) under G.703 I/O Status for details.	1	01120023	G.703 I/O	warning
Loss of Cell Delineation (LCD) failure	Indefinite ATM cell boundaries. ATM encapsulation might have been disabled in the transmission.	1	01120024	G.703 I/O	major
Corrupt Payload failure	ATM FEC schemes error correction capability exceeded. Too many ATM cell losses and/or too long errored blocks in the transmission.	1	01120025	G.703 I/O	major
Corrupt Payload failure	DVB FEC scheme's error correction capability exceeded. Too long errored blocks in the transmission.	1	01120026	G.703 I/O	major
Sequence Number Invalid (SNI) failure	Garbled AAL1 SAR-PDU headers. Far-end terminal equipment might be configured erroneously (non-standard transmission parameters).	1	01120027	G.703 I/O	major
Lost Or Misinserted Cells (LMC) failure	Inconsistent ATM cell stream. Network ATM switching functionality might be unreliable.	1	01120028	G.703 I/O	major
TS Sync Loss Error (TSLE) failure	TS synchronization loss. Transmission might not contain a valid MPEG-2 Transport Stream.	1	01120029	G.703 I/O	major
Loss Of Lock (LOL) failure	Receive clock recovery PLL not locked. Transmission PDH carrier (E3/DS3) might have changed.	1	0112002A	G.703 I/O	major
DS3 Framing Format Mismatch (DS3FM) failure	Wrong DS3 framing format. Transmission framing format (M13/C-bit) might have changed.	1	0112002B	G.703 I/O	major
Unsupported Transmission Format failure	Transmission Format Auto detection (TFA) timed out. Input signal might not be valid or supported.	1	0112002C	G.703 I/O	major
Transmit Driver Overload failure	Short circuit detected on the output. Please check the G.703 Output port. Cable might be faulty.	1	01120030	G.703 I/O	major



E.8 Alarms List – GPI Card

The following table lists the alarm and failure identifiers generated by the GPI option card.

Table E.9 Alarm List – GPI Card

Alarm	Description	Port Number	Alarm ID	Source	Severity
Over Temperature Warning	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	0	00130001	Data & GPI Module	minor
Over Temperature	Failure to take action may cause permanent damage to the unit. Please switch it off and refer to Customer Support.	0	00130002	Data & GPI Module	critical
Invalid Parameter	Invalid Parameter received by the Data & GPI Module. Please see Video Encoder status for a more detailed description of the error.	0	00130003	Data & GPI Module	critical
Module Error	Option Card Error. Please see log for a more detailed description of the error.	0	00130004	Data & GPI Module	critical
Power On Self Test Failure	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	0	00130005	Data & GPI Module	critical
Internal HW Information	HW reported an unexpected status value. This does not affect normal operation of the unit.	0	00130006	Data & GPI Module	minor
Option Card Build Version Mismatch	The software on this Card is not an officially released version.	0	00130007	Data & GPI Module	minor
SCR CRC Error	A CRC error has been found in the SCR clock.	0	00130008	Data & GPI Module	critical
Input Error	An error has occurred in RS232 Input. See the log for more details.	0	00130020	Data & GPI Module	critical

BLANK



Logo Creator

Annex F

Contents

F.1	Logo Creation	F-3
F.2	Logo Creator Installation	F-3
F.3	Using Logo Creator	F-3
F.4	Loading a File	F-4
F.5	Create Logo Tab.....	F-4
F.5.1	Creating Transparency	F-4
F.5.2	Adding Transparency Manually	F-4
F.5.3	Adding Transparency Using a Key File	F-5
F.5.4	Editing the Palette	F-5
F.5.5	Palette Reallocation.....	F-5
F.5.6	Downsampling	F-6
F.6	Logo Position Tab...	F-6
F.6.1	Positioning	F-6
F.6.2	Resolution.....	F-6
F.6.3	Fade	F-6
F.6.4	Image Validation	F-7
F.6.5	Saving the OSD File	F-7

BLANK

F.1 Logo Creation

Logo Creator is an application for creating OSD-format files from bitmap files and modifying previously saved OSD files. It has the facility to introduce a transparency component into the image so that some areas appear transparent when the image is superimposed onto video. This transparency can be added manually or by loading a separate Key File. The application also includes the facility to downsample the image to the desired size. It can then be used to position the image on a screen of the specified resolution and select if the image should fade in. The application runs under Windows XP, Windows Vista or Windows 7 on an ordinary PC.

F.2 Logo Creator Installation

The application runs under Windows XP, Windows Vista or Windows 7 on an ordinary PC.

The PC requires the .NET framework to be installed, this is available from the following location:

<https://www.microsoft.com/en-gb/download/details.aspx?id=17718>

To install Logo Creator:

1. Double-click the Logo Creator Installer.msi file.
2. If required at the prompt, click **Run**.
3. Click **Next** at the prompt.
4. Select **Browse** to change the default installation location.
5. Click **Next** to complete the installation.

F.3 Using Logo Creator

The steps for creating an OSD file are:

1. Load a .BMP file.
2. Downsample to the desired size.
3. Create transparency in the desired areas.
4. Select the screen resolution it is to be displayed in.
5. Select if the image should fade in.
6. Position the image on the screen.
7. Save as an .OSD file.

F.4 Loading a File

Logo creator can load bitmap file or OSD files.

To load a bitmap file Select **File > Open** from the menu and choose a bitmap file (.BMP extension). The application will not accept compressed bitmaps or multi-planed bitmaps.

To load an OSD file **Select File > Open** from the menu and choose an OSD file (.OSD extension). The application will accept version 2, 3, 4, 5 and 6 OSD files.

The application will then display the image from the bitmap and the palette used in the image.

F.5 Create Logo Tab

When the logo is first loaded the **Create Logo** tab is shown, this allows the image appearance to be changed.

F.5.1 Creating Transparency

We shall call the area of the image that is to be made transparent the inactive area. The rest is the active area.

Transparency can be added manually or by using a Key File.

A Key File is a bitmap image with the same size as the OSD image. In this file the inactive areas should be colored white, the active areas should be colored black and the parts with an intermediate level of transparency should be intermediate levels of grey.

The settings for changing transparency manually are located on the toolbar at the top.

F.5.2 Adding Transparency Manually

Firstly, change the background color so that it contrasts sharply with the whole of the source image, using the black, red, green or blue buttons on the toolbar. This will make it easier to spot mistakes.

The left button is used to make an area transparent (transparency 0), the right button makes it opaque (transparency 255). Different transparency levels can be selected by entering different values in the transparency boxes in the toolbar.

The brush size determines the size of the area that is changed. Small brush size colors individual pixels, medium brush size colors a circle with a 5 pixel diameter, large brush size colors a circle with a 9 pixel diameter.

If the **Changes Affect Palette** button is selected, changing the transparency of a pixel on the image will also change the palette entry on which the pixel is based and all the pixels that share that palette entry.

If the inactive area is mainly one color, check the **Changes Affect Palette** button and click in the inactive area. All pixels of that color will become transparent and you will see the background. Repeat until the whole of the inactive area is transparent. If parts of the active area have become transparent, uncheck the **Changes Affect Palette** box and paint the areas opaque again. Zoom in if necessary.

If there is no general color for the inactive area, uncheck the **Changes Affect Palette** button and paint the inactive area manually. Use the left button to set the area to the desired transparency and the right button to correct mistakes. Trace around the edge of the area with a medium brush then use the large brush for wide areas. Then zoom in and use the small brush to do the fine corrections for individual pixels.

F.5.3

Adding Transparency Using a Key File

Create the Key File using a drawing package. Color the active area white, the inactive area black and intermediate areas as shades of grey. Save as a .BMP file.

Click the **Apply Key File** toolbar button and select the file to be used as a Key File. The areas that were black in the Key File are now transparent (background-colored) and the areas that were white in the Key File are now opaque.

Change the background color to verify that the correct areas are transparent.

F.5.4

Editing the Palette

The palette is displayed to the right of the image.

The palette will contain at most 256 colors in it. This is the largest number of colors allowed in an OSD file.

The transparency of each palette entry may be altered in the same way as the image itself, using the left and right mouse buttons. Changes to the palette are shown immediately on the image.

F.5.5

Palette Reallocation

When the level of transparency of a pixel in the image is changed, a new color is effectively created. Whenever the image is downsampled or saved the palette is rebuilt to reflect the actual colors in the image. The number of colors will also be reduced to 256 colors if necessary.

As part of this process, pixels which have a transparency value of zero are mapped to palette entry zero, which is defined as Red = Green = Blue = Transparency = 0. The original color information is lost and the right mouse button will not change the pixel back to its original color.

To rebuild the palette during editing, click the **Reallocate Palette** toolbar button.

F.5.6 Downsampling

If the image loaded is too large, then the image can be downsampled. This reduces the size of the image to between 1 and 1/8th of its original size.

A dialog box will allow the new size to be specified either as a new size or as a ratio of the current size.

After clicking on **OK** the image will be downsampled. Anti aliasing will be performed to soften the boundary between the active and inactive area.

F.6 Logo Position Tab

When the **Logo Position** tab is selected, the current image is displayed in a grey rectangle that represents a screen of the currently selected resolution.

F.6.1 Positioning

The position of the image defaults to X=0, Y=0.

To change the image position on the screen you can either drag the image about in the grey area or manually enter the coordinates.

When dragging the image, the coordinates will be updated in real time. It cannot be positioned wholly or partially outside of the grey area.

When updating the coordinates in the toolbar, the position on the screen will be displayed after each key press. Entering a value above the maximum allowed will reset the position to the maximum.

F.6.2 Resolution

The resolution defaults to **Any**. This can be changed using the drop down menu and the grey area will immediately change to show the new size of the screen.

F.6.3 Fade

The fade setting defaults to not fade. This can be set to fade by clicking on the fade button.

The fade setting does not affect the current image. It will only be used when saving OSD 5 and OSD 6 files when it will be stored in the file for later use.

F.6.4

Image Validation

The size and position of the image is validated on loading, each time the resolution is changed and each time the position is changed.

If the image is too large for the resolution then a warning will be displayed and the resolution will be reset to the previous setting except on file loading.

If the image is off screen due to the changes, then a warning will be displayed and (unless the image has just been loaded) the changed setting will be reset to the previous setting.

F.6.5

Saving the OSD File

Select **File > Save As** from the menu and select the version of OSD file you wish to save as from the drop down menu.

OSD 4 files do not contain position, resolution or fade information. They are a legacy file format and only included to be backward compatible with older versions of other software

OSD 5 files contain all the information on the screen in a readable format. This is the default file type selected when saving bitmaps and legacy OSD formats.

OSD 6 files contain all the information on the screen in a binary format. This means that the files will be smaller and take up less space.

Saving is possible at any time, and it is advisable to save the image often while editing is in progress. You may also save the file in BMP format, but this file will not contain transparency information.

BLANK