Siemens Business Services

Colledia™

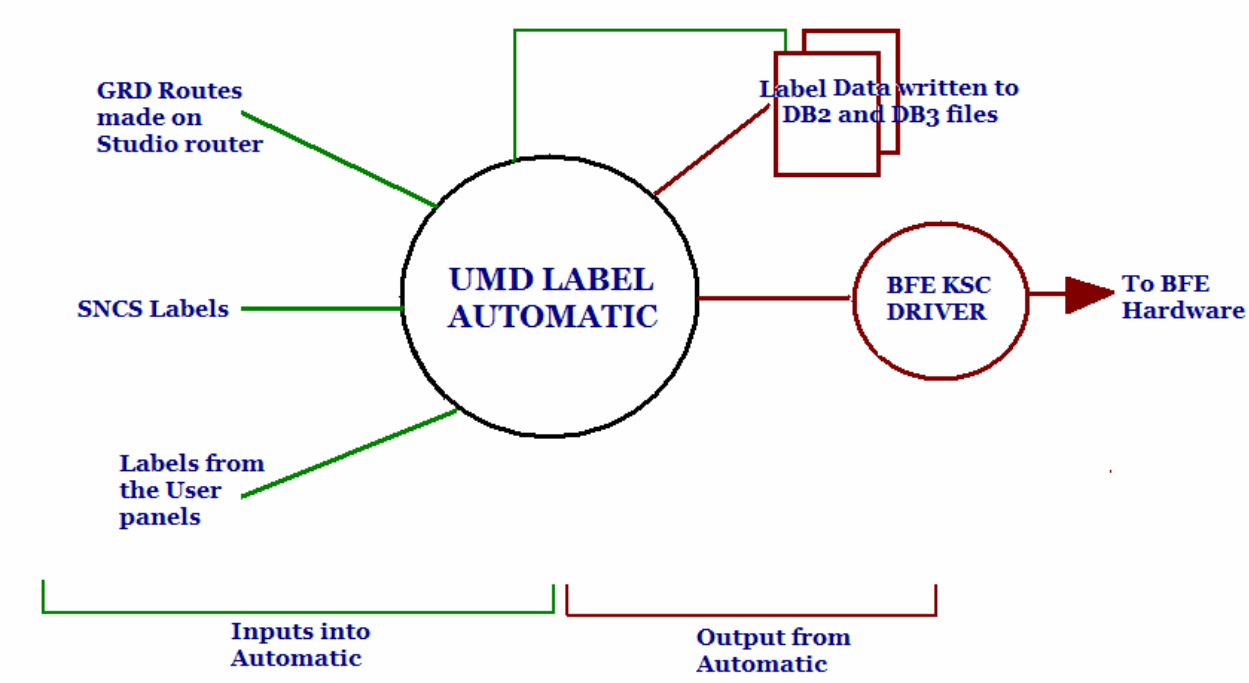
PQ TV

Source Labels to UMD System

December 2007

Overview

This Colledia UMD Labelling system has been designed for use as part of the Colledia Control PQ TV system. There are 3 components to this labelling system – (1) User panels and Studio SDI GRD provide input to (2) the Colledia UMD Automatic process which in turn outputs the final labels to (3) the Colledia KSC driver to be displayed on the BFE Umds.



Schematic overview of the Colledia UMD label system.

There are 2 separate UMD labelling systems in use at PQ – one for each Studio. The labels used and displayed are unique to that studio as are the device ini files and required settings used by each system.
The Colledia device numbers for the two systems are :

Studio A

Automatic	device	903	DB2 and DB3 files used, also Object_Settings and Instances.xml
Router	device	885	DB2 file used
SNCS Infodriver	device	341	(even slots 2-40)
Colledia KSC Driver	device	902	DB2 and DB3 files (read in on application start)

Studio C

Automatic	device	905	DB2 and DB3 files used, also Object_Settings and Instances.xml
Router	device	895	DB2 file used
SNCS Infodriver	device	341	(even slots 202-240)
Colledia KSC Driver	device	904	DB2 and DB3 files (read in on application start)

UMD Label Automatic

The core of the Label to UMD system is the BFEUMDLabel Automatic. This piece of software processes inputs from a number of sources and outputs the UMD labels for all of the router sources to the Colledia BFE driver which in turn sends these UMD labels to the BFE hardware for display on the BFE UMDs – as outlined in the schematic diagram above.

Initialisation Data required by the Automatic (and the User panels) :
The automatic requires 4 key pieces of data to be present for the application to function correctly :

(a) Config/system/Dev_xxx.ini settings:
A device number is required as a parameter for the automatic (903 for Studio A and 905 for Studio C). Entries in the config/system/dev_903.ini, for Studio A are - the config/system/dev_905.ini, for Studio C are -

[BFEUMDLabelAuto]
DebugMode=1
LogMode=0
WhichStudio=sta

[BFEUMDLabelAuto]
DebugMode=1
LogMode=0
WhichStudio=stc

The automatic uses the value given for the "WhichStudio" entry as a basis for the data to be read from Object_Settings and Instances xml files.
Theses xml files are used as the same data is required and read in by the user panels too.

(b) Config/Object_Settings.xml :
Object settings provides the automatic with the data for the SDI router name, the SNCS infodriver slots the automatic registers with for SNCS data, and the 3 special types of sources on the SDI router.
The automatic will provide labels for all 128 sources on the SDI router for a studio, but there are 3 special types of sources treated differently by both the automatic and the user panels. These sources are the 8 cameras for each studio (also known as **local** sources), the external sources coming into a studio – notably the OS lines and REP. The 3rd group are re-enterant sources on the router, eg ISOs and Previews.

These settings are
Studio A :

```
<object id="sta_bfeumdlabel_auto">
    <setting id="router" value="sta_sdi"/>
    <setting id="sncs_infodriver_slots" value="2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40"/>
    <setting id="sources_external value="11,12,13,14,15,16,17,18,21,22,23,24,25,26,27,28,41,42,43,44"/>
    <setting id="sources_cameras" value="1,2,3,4,5,6,7,8"/>
    <setting id="sources_looped" value="61,62,65,68,95,95,97,98,99,100,101,102,103,104,110"/>
</object>
```

Studio C :

```
<object id="stc_bfeumdlabel_auto">
    <setting id="router" value="stc_sdi"/>
    <setting id="sncs_infodriver_slots"value="202,204,206,208,210,212……etc up to…….,236,238,240"/>
    <setting id="sources_external value="11,12,13,14,15,16,17,18,21,22,23,24,25,26,27,28,41,42,43,44"/>
    <setting id="sources_cameras" value="1,2,3,4,5,6,7,8"/>
    <setting id="sources_looped" value="61,62,65,68,95,95,97,98,99,100,101,102,103,104,110"/>
</object>
```

(c) Config/Instances.xml
The router name values given in the object settings are resolved from looking in instances so sta_sdi will return a value of 885 and stc_sdi a value of 895. The SNCS interface infodriver will return a value of device 341 for the automatic to register with for the list of slots in object settings.

(d) Config/system/ DB2 and DB3 device files:

These files provide a backup of the current SNCS labels (DB2) and Router Source labels (DB3) and are read in at start up of the automatic, and are also written back to by the automatic as required when changes occur. These files should never be read-only, and should, always be the same on both the workstation the automatic runs on and the Colledia server config/system directory. The automatic uses RM (router modify) to update these files – so CSI on the Server should see these messages and update its copies of these files to keep all in sync.

There are a maximum of 200 entries in DB2, as the user panels and automatic assume there will not be more than this number of SNCS labels in use at any one time. There are currently 128 entries in the DB3 file – for the number of sources on each SDI router.

Both these files use a peculiar syntax for each entry :

DB2 sncs default entry is ~<$NAME>~< >~< >~<AUTO>~<TEMP>~< >
Where each portion is <SNCS label> < Auto Alias > < Manual Alias > < Which Alias Used > <Alias Status >

DB3 source default entry is ~<0001>~< >~< >~<AUTO>~<TEMP>~< >
Where each portion is <src number> < Auto Alias > < Manual Alias > < Which Alias Used > <Alias Status >

This may seem cumbersome in its structure but provides for flexibility and both groups of sncs and source labels are handled by the same mechanisms.

Some discussion of how alias or labels are used is now required:

For a given SNCS label or Router Source there are two possible aliases/labels – an automatic (AUTO by default) one or a manual (MANU) one. There are buttons on the user panels (discussed below) which enable whether the manual alias is used as opposed to the default automatic alias.

Each entry can also have its status assigned as either a Temporary (TEMP by default) or Permanent (PERM) alias/label. Again there are buttons on the user panels which enable this state to be toggled.
Permanent aliases/labels cannot be cleared or removed from the lists, whereas temporary ones can be.

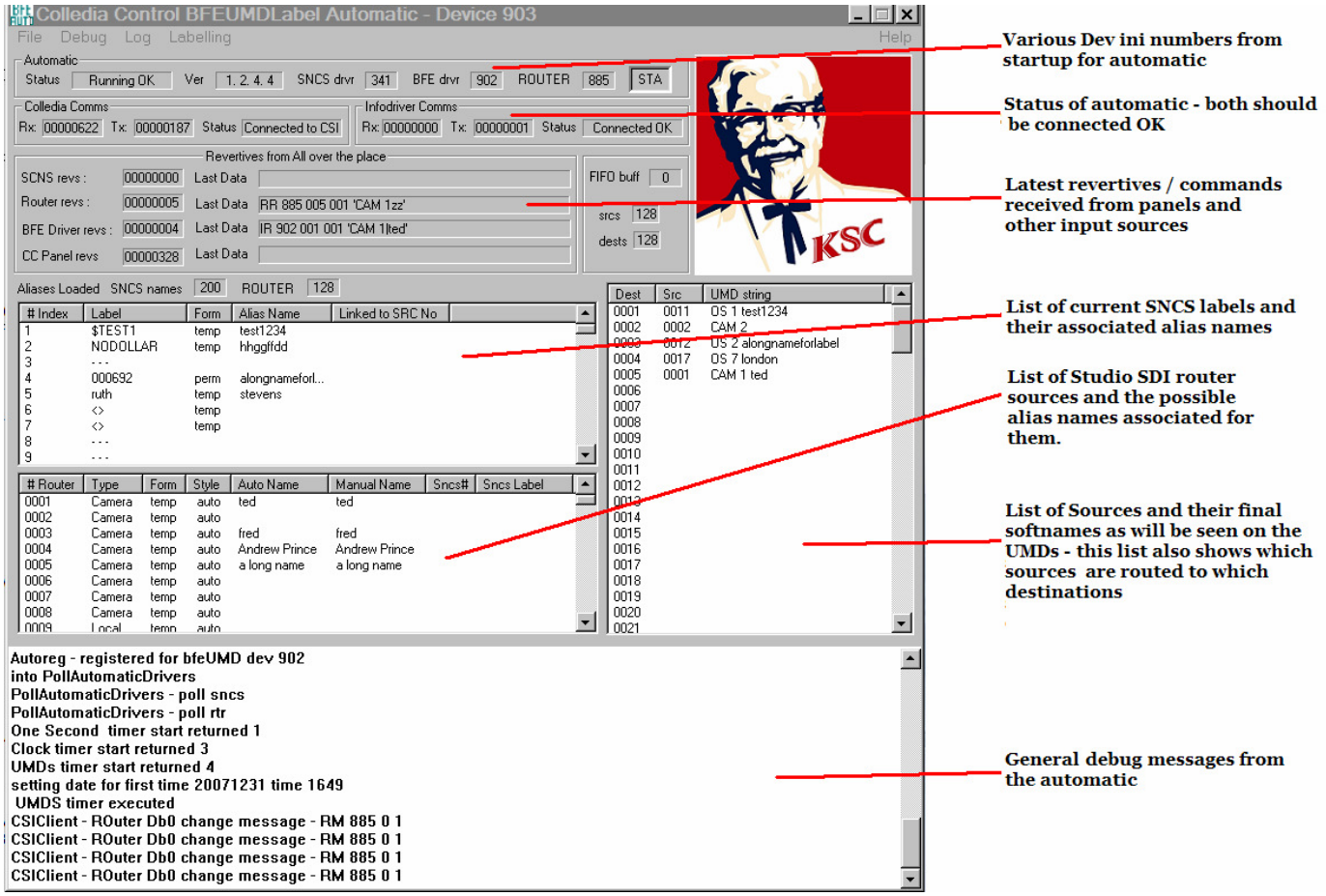
The user panels and Label Automatic pass between themselves these special strings as data for each alias/label via the automatic's external infodriver.
Slots 1..128 for the Router Source labels data and
Slots 2001..2200 for SNCS Labels data.

Please note that as the "~", "<" and ">" characters are used as delimiters in these data strings, these particular characters should not be used within the alias or label names – as this would break the structure of the data lines.

Starting the Automatic:
The automatic requires an infodriver to be running before starting up this application. It is also recommended to have the SNCS infodriver, SDI Router GRD and Colledia BFE driver running prior to starting the automatic. This is already the case workstations running this auto, as listed in config/launch.xml for the PQ_TV system.

On first starting the automatic will read in the relevant entries from config/object_settings.xml and config/instances.xml already discussed. The process then reads in all entries from the DB2 and DB3 files for the device number passed as parameter to the application. These entries will form the basis of the labels assigned to each router source and the external infodriver slots are written to. The labels will then all be calculated and passed to the BFE driver. The automatic will then respond to router revertives, infodriver writes from the appropriate user panels, and router source name changes. The automatic will re-calculate any new labels as required and pass them to the BFE driver.
When a label changes, the automatic will return revertives via its own infodriver (slots 1..128; 2001..2200) and update the appropriate DB2 or DB3 device files in order that the correct labels be stored should the workstation or process be restarted in any way.

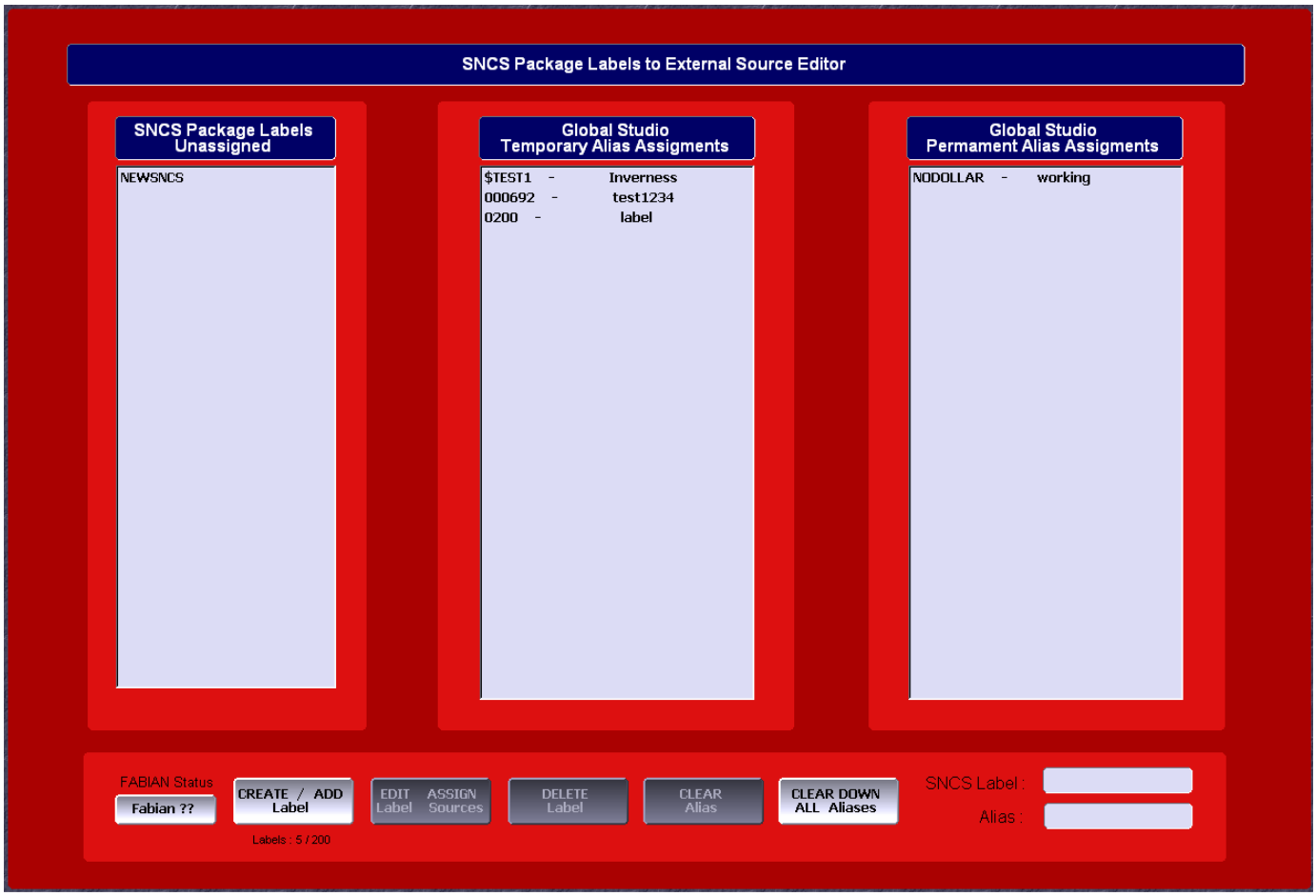
The automatic application window:



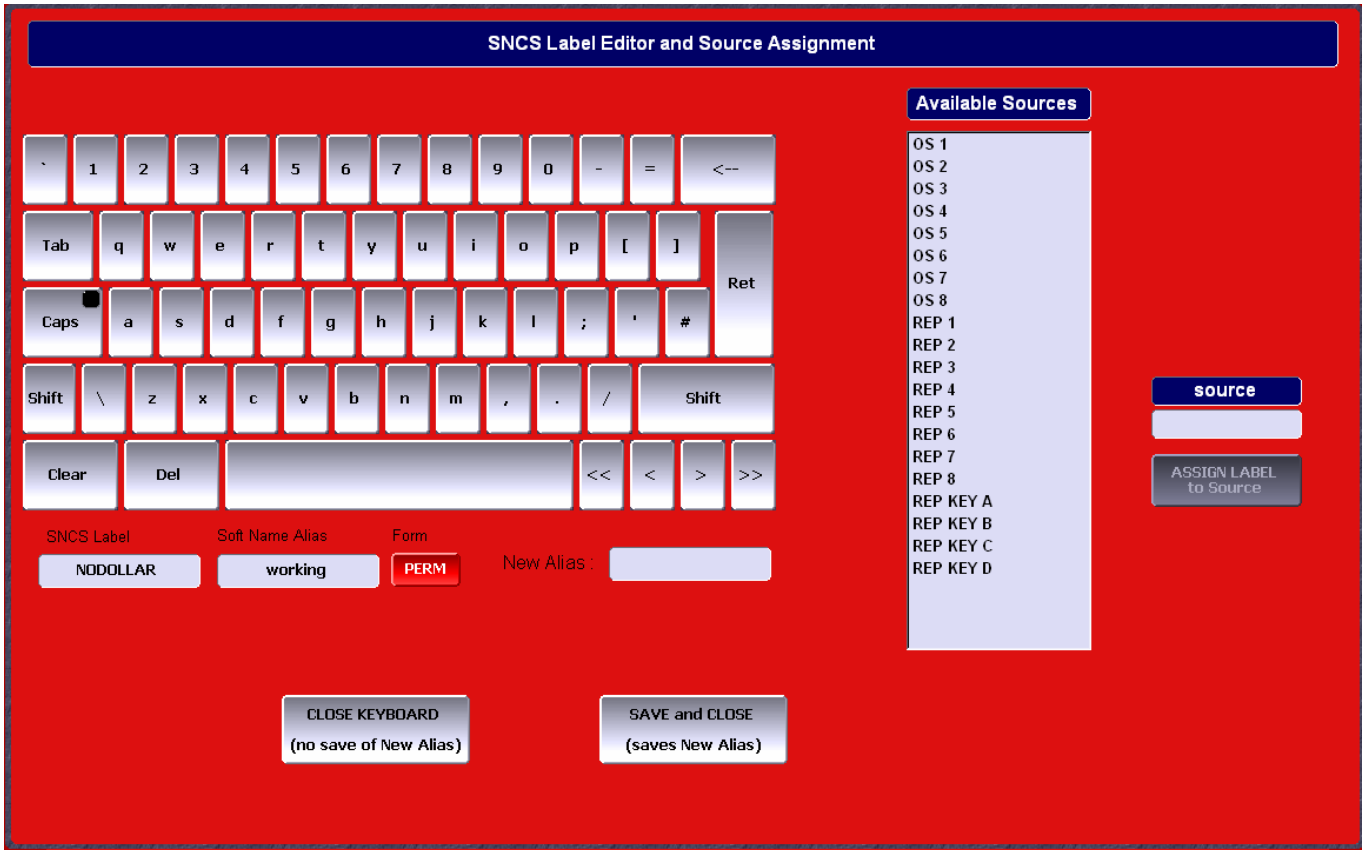
User Panels

There are four user panels which enable softnames / labels to be linked to the SDI router sources.

(1) SNCS Alias Label Panel



This panel enables users to assign softnames to SNCS and associate SNCS Labels to external sources on the router.
The three list boxes list SNCS labels according to their status. The left column lists labels that have no alias linked to them. New Labels can be created using this panel though for the most part new labels will come from the SNCS system via the infodriver number 341. (Even slot numbers 2-40 are used for Studio A, 202-240 for Studio C).
The central listbox has labels that do have aliases assigned, and the status of the Alias is TEMP(orary). Those aliases that have a PERM(anent) status set.
Selecting an entry in a listbox will let users select an action from the buttons at the base of the panel. The selected entry will be listed at the bottom right of the panel.
Pressing “Create/ADD” or “EDIT ASSIGN” will bring up a second panel with a keyboard to enter aliases, labels or assign a SNCS Label to any of the external sources.
Selected Labels can be deleted or the alias cleared. If deleted the alias is removed from the system altogether. If cleared the alias will be listed in the left hand listbox awaiting reassignment.
Any Aliases whose status is permanent cannot be cleared or deleted. To change its status, select the label and press EDIT. Change its status by pressing the RED PERM button on the keyboard panel. The button will change to BLUE TEMP. Then close the keyboard panel and the alias will have moved from the right to the central listbox.



The Keyboard panel for editing SNCS and assigning labels.

In this picture, the SNCS label “NODOLLAR” has be selected for editing. Its current alias is “working”, and has a PERM status / form. This status can be toggled between TEMP or PERM by pressing the Form button.

To enter a new alias use the keyboard, and it will be shown in the New Alias box.

To assign a label to an external source (all of which are listed in the right hand listbox), select a source and press ASSIGN LABEL.

Changing the status (Temp/Perm) or assigning a label to an external source happens immediately on pressing those buttons.

Pressing “SAVE and CLOSE” button will save what ever is in the New Alias box above this button. If that box is blank (as will be the case on just opening this keyboard panel) it will save “ “ to that label – effectively clearing the current alias.

Press “CLOSE KEYBOARD” to exit this panel when no change in the alias is required. This button would be pressed if, say, the only actions taken were to change the status/form or assign the label to an external source, or to return to the main SNCS panel.

Note: The SNCS panel allows for up to 200 SNCS labels to be in use at any one time.

(2) The Local Sources Name Editor panel

Local sources are defined as basically any source not treated as an external source on the router. This panel enables users to add softnames / labels to a source. Source 1 – Cam 1 – will be used as an example here.

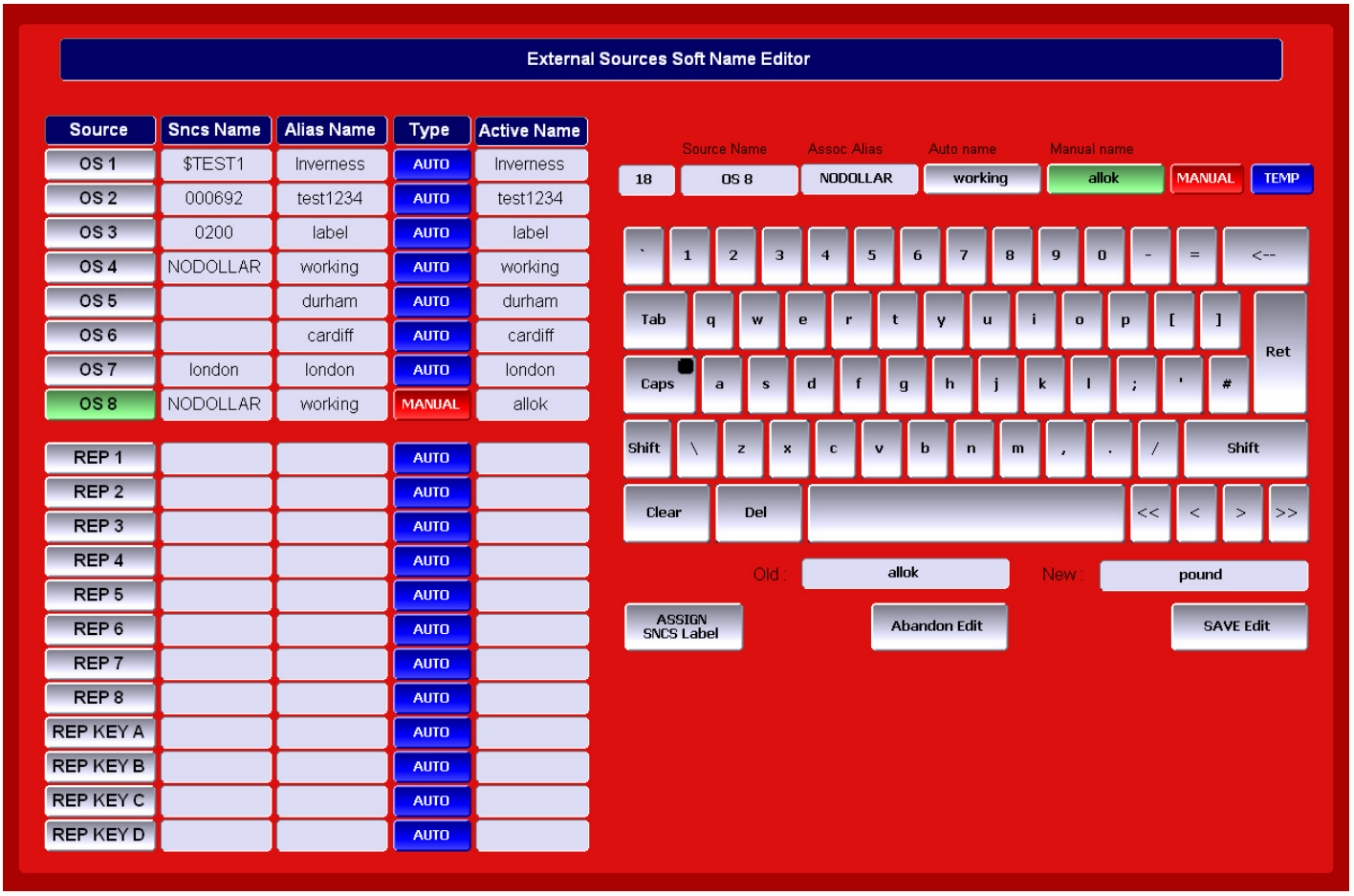
When a source is selected the details of the softname and its status appear in the box below the listbox. Currently CAM1 has a softname of “bob” and its status is a temporary label assignment – shown by the blue button.

The right hand part of the panel lists the current label as bob, and via the keyboard a new softname of “fred” has been typed in. Pressing the SAVE button will do just that resulting in the listbox being updated. This panel will save its new name to the Label Automatic which in turn will result in the new softname appearing on any relevant UMDs that have this source routed.

The two “Clear” buttons will, as the text on the buttons suggest, clear all local softnames (provided they have a “TEMP” status) or clear just the source selected in the listbox.

The “CAMERAS – quick edit” changes the list box to limit the source selection to just the 8 camera sources. (The panel makes use of the list of sources from object settings.xml - “*sources_cameras” etc – see page 4*.)

(3) The External Sources Name Editor panel



Similar in concept to the Local Sources Names panel, this panel enables users to enter softnames for sources for those listed as external sources from the section headed "*sources_external" in Object_Settings.xml – see page 4.*

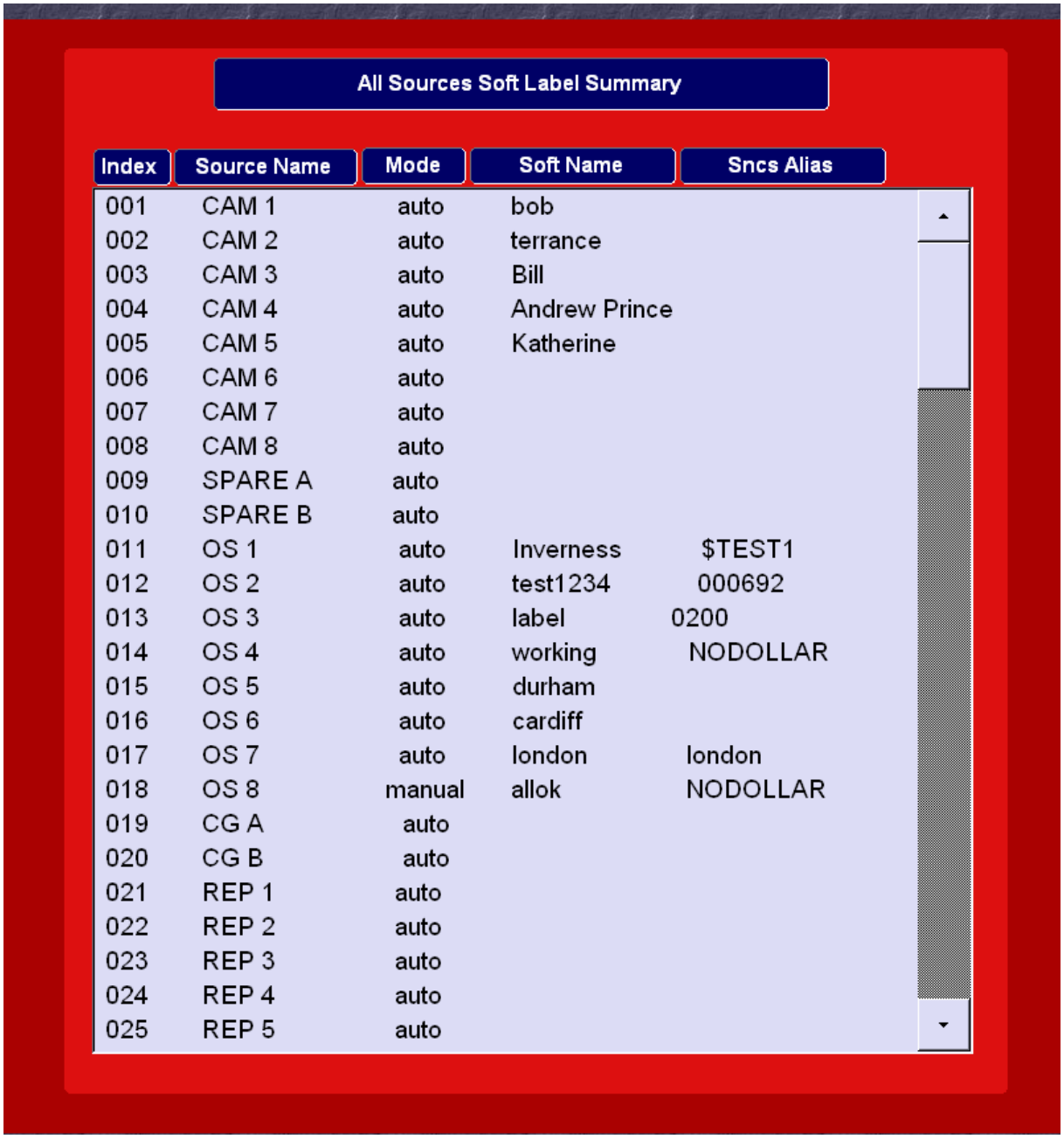
In the picture above OS8 has been selected and it currently has the SNCS Label "NODOLLAR" assigned to it. Softnames for External sources can have both a PERM/TEMP status and make use of a further type setting of AUTO or MANUAL. – that is an external source can have 2 softnames assigned to it and depending its type status will dictate which label will be seen on the UMDs.
So in the above example NODOLLAR has the Auto softname of "working" and a Manual name of "allok", and as its type is MANUAL the "Active Name" is listed as "allok".

When a SNCS label is assigned a softname on the SNCS panel – see (1) above – this softname is by default the Automatic name. This panel allows a user to assign an alternative manual name if it is required for that specific external source. This is shown by the assignment of the SNCS Label NODOLLAR to OS4 as well as OS8.
The OS4 assignment is using the automatic name whereas OS8 is using the manual name.

A chosen source will have all its associated details listed in the area above the keyboard.
There are 2 buttons to change the AUTO/MANUAL and TEMP/PERM statuses. Similarly the AUTO/MANUAL type can be changed by toggling the Type buttons in the left portion of the panel.

This panel also enables users to assign SNCS labels to the chosen specific external source. In this case the keyboard is replaced by a list box containing all SNCS labels allowing the user to choose one and assign it to that source.

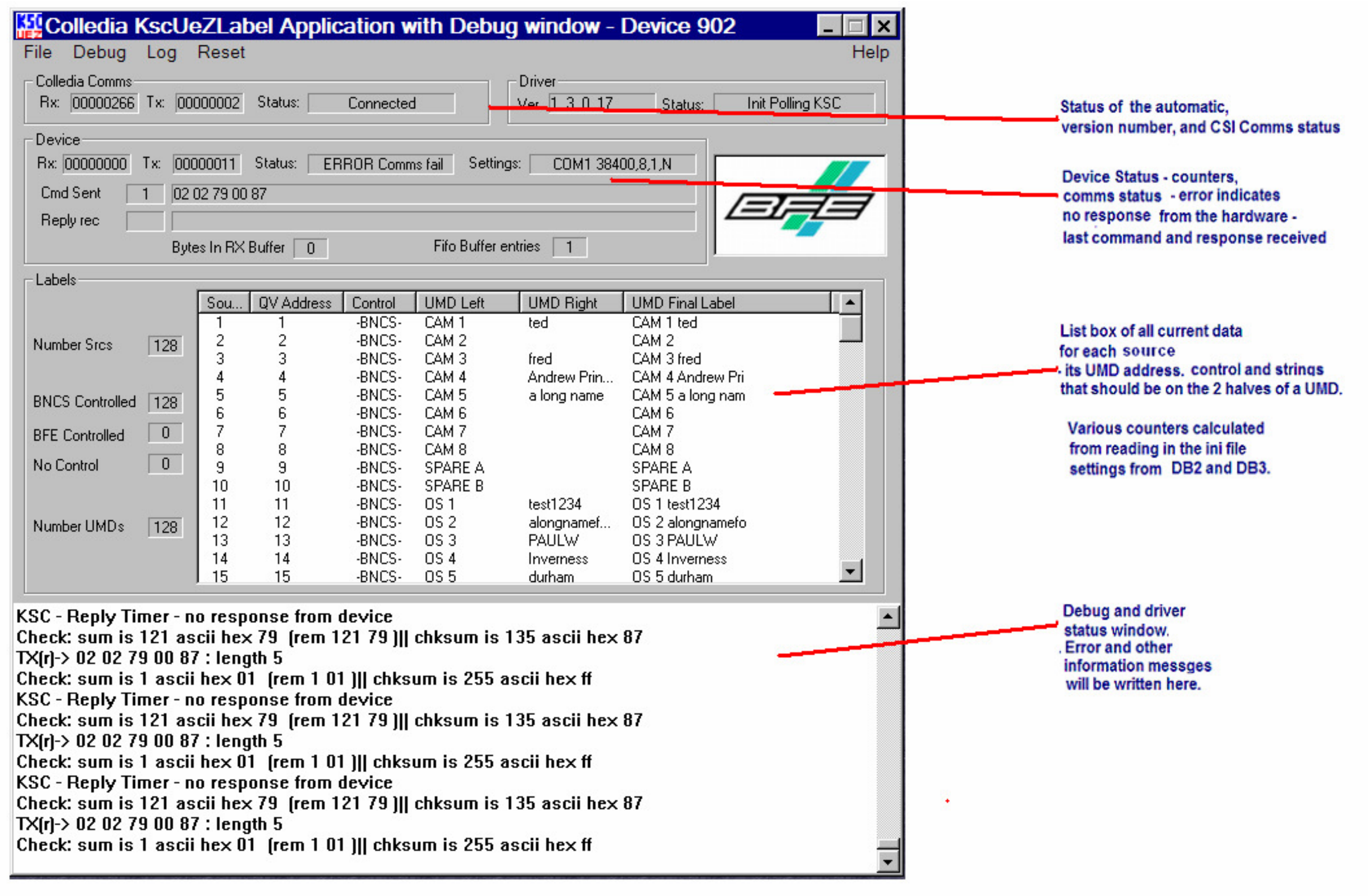
(4) Summary Panel



This panel simply lists all of the sources on the Studio SDI router and any softnames / SNCS Labels and its AUTO/MANUAL mode for that source.

Colledia KSC Driver

The final piece in the process is the KSC driver. This receives the final labels for each source on the Studio SDI router and passes the 16 character label, via a serial connection, to the BFE KSC hardware for storing in their database and display on their UMDs.
The full driver documentation makes up Appendix 1 below, but a brief summary is covered here.



The diagram shows the driver application window with the central listbox showing all the data received for each source and the final UMD label that is sent to the BFE hardware.
This driver, on starting up, will read in from its device DB2 and DB3 ini files according to the external infodriver number given as a parameter. In Studio A it is dev_902 and Studio C dev_904.
The DB2 file lists the mapping of source number to BFE hardware QV Address. Currently this is a straight forward 1 to 1 mapping, source 1 is QV number 1 etc.
The DB3 file lists how a source is controlled – either by Colledia/BNCS or by BFE. This is somewhat redundant as all sources are listed as under Colledia control (designated by a 1 in the db3 file) – so this driver will provide to the BFE hardware, all the labels for all 128 sources to be displayed on the UMDs.

The Label Automatic writes the 16 character UMD label to the appropriate infodriver slot for the source in question. This is on a 1:1 basis – slot 1 will be the label for source 1 (Camera 1).

Appendix 1 - Colledia UMD Driver Documentation

Introduction

Ini file settings

Infodriver slot usage

Driver Application and error messages

Introduction

This Colledia Control driver has been written to send and retrieve UMD labels from the B.F.E KSC UMD hardware. This equipment was first installed in the TV Studios at Pacific Quay in Glasgow.

The driver makes use of an external infodriver and uses a serial interface to communicate with the hardware. The hardware can be configured to use either RS232 or RS422 with a range of speeds (default is 38400).

The KSC UMDs have up to 16 characters in two blocks of 8, treated as left side and right side of the UMD by the driver. In the PQ TV Studios, the left side is used for a fixed name of the source, and the right side for dynamic parts of the label.

The protocol is a simple hex byte based one, with a small number of commands to send and retrieve data to and from the hardware.

Ini File Settings

The driver on start-up will read in required entries from its appropriate device ini file. The number of this dev_ini file must be passed to the driver as part of the start-up command, and is the number of an external infodriver, that as a process must already be running.

The entries from the dev_xxx.ini file are read in from the section headed KscUeZLabel – and denote the comms parameters for the hardware.

[KscUeZLabel]
DebugMode=1
LogMode=0
Port=1 -- port number on the PC – will most likely need to be correctly set
Speed=38400 -- default speed etc for BFE hardware
DataBits=8
StopBits=1
Parity=N

The driver then reads in as many entries that exist in dev_xxx.db2 and dev_xxx.db3 files.

The dev_ini DB2 file holds the mapping between the router source number (index number) to the QV Address of the UMD,
It is now known that there is a 1:1 mapping of source number and BFE database entry / QV Address – so entries in this db file need to be set 0001=1, 0002=2 etc for the number of sources on the router concerned.

The dev_ini DB3 file holds the settings of who has "control" over the labelling of the UMD.
Settings are : 1 = BNCS Controlled source
2 = BFE Controlled source
0 = no control – source ignored – no data sent to / retrieved from UMD for this source

e.g. 0001=1 -- source is under Colledia control and the driver will send the label data to the BFE hardware.
e.g 0002 =2 -- the driver will NOT send data to BFE hardware, but will request label data from the hardware.

SET ALL entries in this file to 1 –as default – ie source is under BNCS control

Note – at present all sources are under Colledia control and so all entries in the DB3 file will have a "1".

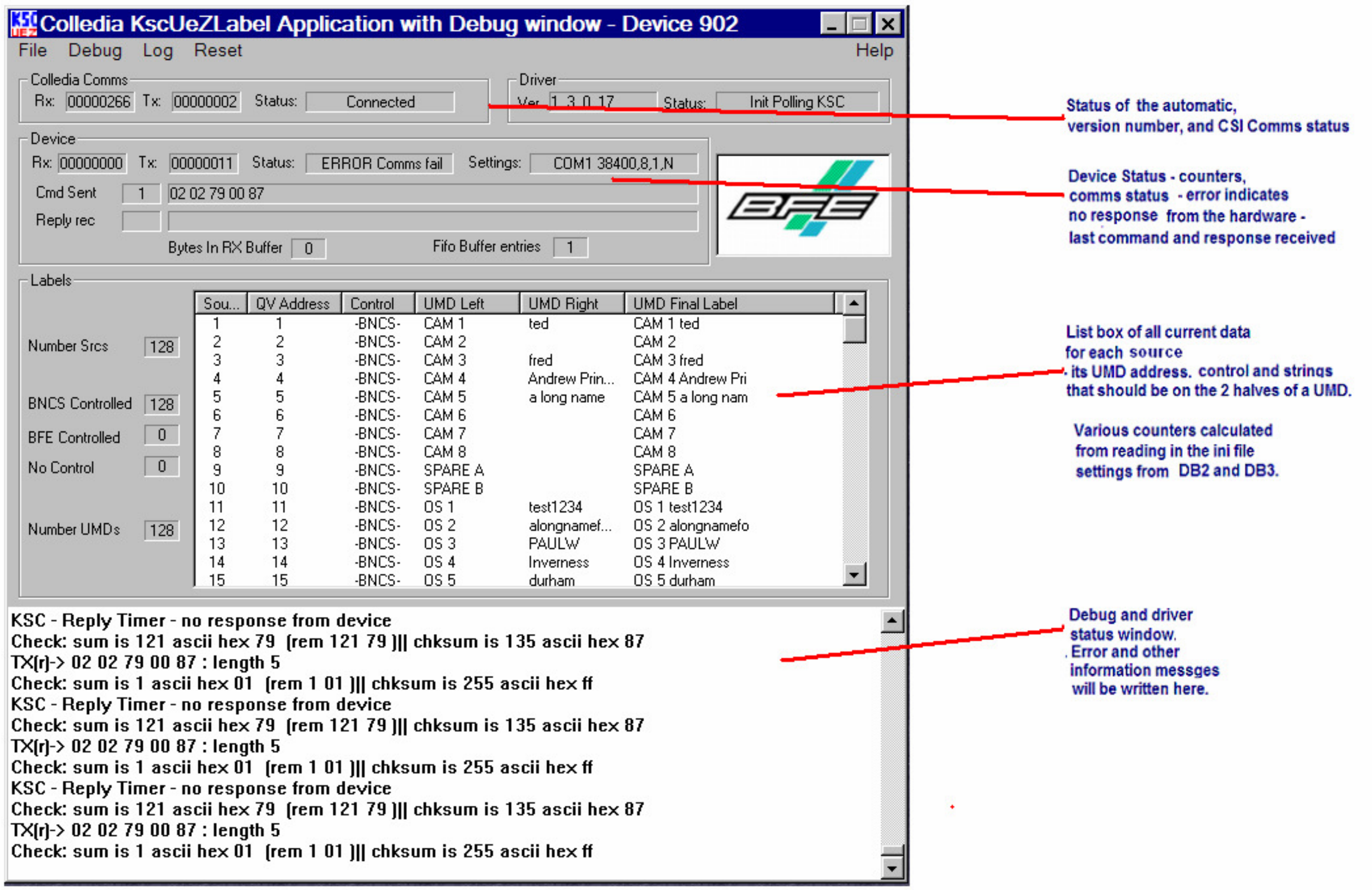
The driver reads all this data in at start-up and displays its findings in the driver application window for verification.

Infodriver Slot Usage

Slots 1 to 4000 are reserved and tied to sources and hold the string data that will be displayed on UMDs, as per the ini file settings already described. The format of the string data is divided into the left and right data for each half of a UMD. A vertical pipe "|" delimits the two halfs, eg " OS_1 | Glasgow" will result in OS_1 on the left side of the UMD and Glasgow on the right side of the UMD. Each half is limited to 8 characters. If no | character is given as part of the string, the driver will make best efforts to place the string on the two parts of the UMD.

Slot 4001 denotes comms OK (1) or comms FAIL (0) to the hardware. Comms failure could be a result of missing, incorrectly wired or disconnected cables, de-powered hardware, or comms port missing, comms port already in use, or comms port failure within the PC.

Driver Application and error messages



Appendix 2 - BFE Hardware Protocol

Protocol between UeZ and BFE-KSC

State: 01.06.2006
2.0 21.08.2007 16-character-Labels added

Content

1. Physical Layer

KSC9000 as used at PQ
RS422 or RS232, Transferrate 38,4 kBaud maximum, 8,N,1
Transferrate can be modified according to project.
Connector at KSC9000: RJ45, 8-pol

RS422:
Pin Name Function
1 Gnd Ground
2 Gnd Ground
3 TC transwith-Ground
4 TA transwith (-)
5 TB transwith (+)
6 RC receive-ground
7 RA receive (-)
8 RB receive (+)

RS232:
Pin Name Function
1
2
3 Gnd Ground
4
5 TxD transwith data
6
7 RxD receive data
8

2. Logical Layer

1 2 3..n m
STX Data Byte, Count Data Bytes, max 252, Check Sum
with:
STX = 02 hex
Data Byte = Count Number of Databytes
Data Bytes = Databytes (incl.. messageidentifier)
Check Sum 2s Complement of Sum of all Databytes – sum of data bytes + checksum = 00.

Following Answers can occur:

ACK = 06 hex positiv Acknowledge
NAK = 15 hex negative Acknowledge

3. Command and Response Messages

Message 0x79 MC_STARTED
Direction From UeZ to KSC
Coding 0x79 * Status
Description of Parameters
Status 0x00..0xFF

Databytes 2
Notes Is to send after each reboot of UeZ
Answer ACK

Message 0x01 GET_DEVICE_STATUS
Direction From UeZ to KSC
Coding 0x01
Description of Parameters
Databytes 1
Notes Ask for Device-Status. Can be used as a Polling
Answer ACK
DEVICE_STATUS

Message 0x02 DEVICE_STATUS
Direction From KSC to UeZ
Coding 0x02 * Status
Description of Parameters
Status 0x00 Databytes 2
Notes No reall Status-Info, Status-Byte is always 0x00
Answer ACK

Message 0x7B SET_SOURCE_LABEL
Direction From KSC to UeZ and From UeZ to KSC
Coding 0x7B * QV-No * Label
Description of Parameters
QV-No Label
0..9, Number of Crosslink, 4 Bytes
Video-Label of Crosslink, 8 Bytes
Databytes 13
Notes Transmission of a Video-Sourcelabel
Answer ACK

Message 0x77 GET_SIGNAL_LABEL
Direction From UeZ to KSC
Coding 0x77 * Mode * QV-No
Description ofParameters
Mode QV-No
0x00 0..9, Number of Crosslink, 4 Bytes
Databytes 6
Notes Question for a Video-Sourcelabel
Answer ACK
SET_SIGNAL_LABEL

Message 0x78 SET_SIGNAL_LABEL
Direction From UeZ to KSC
Coding 0x78 * Mode * QV-No * <Label>
Description of Parameters

Mode QV-No Label
0x00 0..9, Number of Crosslink, 4 Bytes Video-Label of Crosslink, 8 Bytes
Databytes 14
Notes 1. As a spontaneous Message after Labelchange 2. As Answer to GET_SIGNAL_LABEL
Answer ACK

Message 0x8B SET_SRC_LABEL5
Direction From KSC to UeZ and From UeZ to KSC
Coding 0x8B * QV-No * <Label1><Label2><Label3><Label4><Label5>
Description of Parameters
Qv-No Label1 Label2 Label3 Label4 Label5
0..9, Number of Crosslink, 4 Bytes Video-Label of Crosslink, 8 Bytes
Audio1-Label of Crosslink, 8 Bytes
Audio2-Label of Crosslink, 8 Bytes
Audio3-Label of Crosslink, 8 Bytes
Audio4-Label of Crosslink, 8 Bytes
Databytes 45
Notes Transmission of a Video-Sourcelabel and 4 Audio-SourceLabels
Answer ACK

Message 0x87 GET_SIGNAL_LABEL5
Direction From UeZ to KSC
Coding 0x87 * Mode * QV-No
Description of
Parameters
Mode
QV-No
0x00
0..9, Number of Crosslink, 4 Bytes
Databytes 6
Notes Question for the 5 Labels of Video and Audio
Answer ACK
SIGNAL_LABEL5

Message 0x88 SIGNAL_LABEL5
Direction From KSC to UeZ and From UeZ to KSC
Coding 0x88 * Mode * QV-No * <Label1><Label2><Label3><Label4><Label5>
Description of Parameters
Mode QV-No Label1 Label2 Label3
Label4 Label5
0x00 0..9, Number of Crosslink, 4 Bytes
Video-Label of Crosslink, 8 Bytes
Audio1-Label of Crosslink, 8 Bytes
Audio2-Label of Crosslink, 8 Bytes
Audio3-Label of Crosslink, 8 Bytes
Audio4-Label of Crosslink, 8 Bytes
Databytes 46
Notes Transmission of a Video-Sourcelabel and 4 Audio-SourceLabels with Mode-Byte
Answer ACK

Message 0x9B SET_SOURCE_LABEL16
Direction From KSC to UeZ and From UeZ to KSC
Coding 0x9B * QV-No * Label
Description of Parameters
QV-No Label
0..9, Number of Crosslink, 4 Bytes
Video-Label of Crosslink, 16 Bytes
Databytes 21
Notes Transmission of a Video-Sourcelabel with 16 characters
Answer ACK

Message 0x97 GET_SIGNAL_LABEL16
Direction From UeZ to KSC

Coding 0x97 * Mode * QV-No
Description of Parameters
Mode QV-No
0x0 0..9, Number of Crosslink, 4 Bytes
Databytes 6
Notes Question for a Video-Sourcelabel with 16 characters
Answer ACK

SET_SIGNAL_LABEL16
Message 0x98 SET_SIGNAL_LABEL16
Directon From UeZ to KSC
Coding 0x98 * Mode * QV-No * <Label>
Description of Parameters
Mode QV-No Label
0x00 0..9, Number of Crosslink, 4 Bytes
Video-Label of Crosslink, 16 Bytes
Databytes 22
Notes 1. As a spontaneous Message after Labelchange
2. As Answer to GET_SIGNAL_LABEL16
Answer ACK

4. Miscellaneous

The Idea of this Interfacing is to have some crosslinks from KSC to UeZ and some crosslinks from UeZ to KSC. The name UeZ comes from the german word „Uebertragungs-Zentrum“ which means a Central-Router-System. Between KSC and UEZ the KSC is Slave, UEZ is Master. As long as KSC-Interface doesn’t receive anything from UEZ, it doesn’t send anything on his part.
UeZ starts Communication with der Message MC_STARTED. Afterwards it asks for Crosslink-Labels from KSC to UeZ (if there are any) (GET_SIGNAL_LABEL5), and sends his Sourcelabels according to the crosslink from UeZ to KSC (SET_SIGNAL_LABEL5).
Afterwards all Changes in Labels are sent spontaneously from both sides.
UeZ has to send any message within all 20 seconds, otherwise KSC-Interface would recognize as TIMEOUT. For this purpose one can send DEVICE_STATUS all 10 Seconds DEVICE_STATUS, which will be answered with ACK by the KSC.
The KSC-Interface uses exclusivly command SET_SRC_LABEL5 (that is all 5 Labels, without Mode-Byte) to send Labels spontanesously.