

LST6100  
LogoSat

User Manual  
LST6100 Broadcast Satellite Modem

R1.1  
V1.0

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## Table of Contents

<b>1 Copyright .....</b>	<b>1</b>
<b>2 EU Compliancy Statements .....</b>	<b>2</b>
2.1 Radio and Telecommunications Terminal Equipment (R&TTE) 5 Directive 1995/5/EC.....	2
2.2 EMC Information.....	3
2.3 Restriction of Hazardous Substances Directive (RoHS) (Directive 2011/65/EU).....	4
2.4 Registration, Evaluation and Authorization of Chemicals (REACH).....	5
2.5 WEEE – Waste Electrical and Electronic Equipment Directive.....	6
<b>3 Safety Regulations .....</b>	<b>7</b>
3.1 Environmental.....	8
<b>4 Feedback .....</b>	<b>9</b>
<b>5 About this Manual .....</b>	<b>10</b>
5.1 Cautions and Symbols.....	10
5.2 Version History and Applicability.....	11
5.3 Related Documentation.....	12
<b>6 Introduction .....</b>	<b>13</b>
6.1 Short Description.....	13
<b>7 Physical Description .....</b>	<b>15</b>
7.1 Front Panel Description.....	15
7.1.1 Display.....	15
7.1.2 Soft Buttons and Navigation Buttons.....	16
7.1.3 Front Panel Management Interface.....	16
7.1.4 USB Interface.....	16
7.1.5 LED Status Indicators.....	16
7.2 Back Panel Description.....	17
7.2.1 Power Connector.....	18
7.2.2 Earth Ground.....	19
7.2.3 Craft Interface.....	19
7.2.4 Alarm Interface.....	20

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# 1 Copyright

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## 2 EU Compliancy Statements



To Whom it May Concern.

### 2.1 Radio and Telecommunications Terminal Equipment (R&TTE) 5 Directive 1995/5/EC

We,

Declare that the following product:

- Product number: LST6100
- Type identifier: NTC/2353

to which this declaration relates is in conformity with the essential requirements of European Union Directive 1995/5/EC Radio and Telecommunication Terminal Equipment Directive Essential Requirement 3.1(a), 3.1 (b), 3.2.

Done at St-Kristoff, on March 11, 2016



Serge Van Herck,

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## 2.2 EMC Information

Relevant EMC information (to FCC rules)

This equipment has been tested and was found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications.

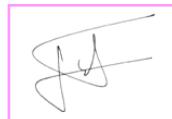
Do not operate this equipment in a residential area, as it is likely to cause harmful interference. When this is the case, you will be required to correct the interference at your own expense.

## 2.3 Restriction of Hazardous Substances Directive (Ro-HS) (Directive 2011/65/EU)

The undersigned hereby confirms the following statement:

We hereby declare that this equipment is compliant to the RoHS Directive 2011/65/EU.

Done at St-Kristoff, on March 11, 2016



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## 2.4 Registration, Evaluation and Authorization of Chemicals (REACH)

European Regulation N°1907/2006 "REACH" (Registration, Evaluation, and Authorization of Chemicals), came into force on June 1st, 2007. It aims at regulating the use of the chemical substances within the European Union.

We are committed to meeting our legal obligations under REACH, as a manufacturer of articles and as a downstream user of chemicals products.

In order to comply with the REACH regulation, LogoSat Cy N.V. has put into place processes and procedures to ensure implementation and compliance with the regulation, especially the assessment of the presence of Substances of Very High Concern (SVHC's) and communication along the supply chain to both suppliers and customers.

All products manufactured by LogoSat Cy N.V. fall under the category of Articles within the REACH Regulation and none of them present the notion of intentional release of SVHC's, therefore no obligation of registration applies.

Done at St-Kristoff, on March 11, 2016



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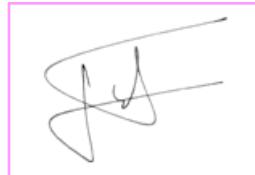
Fax: +32 (0)3 999 65 49

## 2.5 WEEE – Waste Electrical and Electronic Equipment Directive

The undersigned hereby confirms the following statement:

We hereby declare that this equipment is compliant to the WEEE Directive 2012/19/EU.

Done at St-Kristoff, on March 11, 2016



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## 3 Safety Regulations

Please read this chapter before you install and use this equipment.

To ensure your safety, the equipment has been designed to comply with the following safety standards:

Safety of Information Technology Equipment.



- IEC 60950-1:2006/A11:2009/A1:2010/A12:2011
- EN 60950-1:2006/A11:2009/A1:2010/A12:2011
- UL60950-1, Second Edition
- CSA C22.2 N°. 60950-1-07.Second Edition

Before you start to install and operate the device, please make sure you observe the following points:

- The equipment described in this manual is designed to be used by properly trained personnel only. Only qualified personnel who are aware of hazards involved may adjust, maintain and repair the exposed equipment.



No operator serviceable parts inside. Refer servicing to qualified personnel.  
To prevent electrical shock, do not remove covers.

- To use the equipment correctly and safely, it is essential that both operating and servicing personnel follow generally accepted safety procedures in addition to the safety precautions specified in this manual. Warning and caution statements and/or symbols are marked on the equipment when necessary. Whenever it is likely that safety protection is impaired, immediately switch off the equipment and secure it against unintended operation. Inform the appropriate servicing authority about the problem. For example, safety is likely to be impaired if the equipment fails to perform the intended measurements or shows visible damage.
- The only way to shut down the device is to disconnect the power cable from the power connector. Therefore make sure that the power cable is accessible and not obstructed when the device is operational. For more information please refer to section: [Power Connector. on page 18](#)



### **Additional safety requirements for Finland, Norway and Sweden**

Telecommunication connections and cable distribution system.

Special conditions apply to the use of this equipment in Finland, Sweden and Norway due to different earthing arrangements in these countries. Therefore it is essential that the installation is done by authorized personnel and according to the national requirements only.

This equipment is specified for use in a restricted access location only, where equipotential bonding has been applied and which has provision for a permanently connected protective earthing conductor.

A protective earthing conductor must be installed by a Service Person.

**Additional safety requirements for Norway and Sweden**

Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing - and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)." NOTE: In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.



Translation to Norwegian:

Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr - og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel-TV nettet.

Translation to Swedish:

"Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet."

### 3.1 Environmental

Operating the equipment in an environment other than that stated in the specifications also invalidates the safety compliance.

Do not use the equipment in an environment in which the unit is exposed to:

- Unpressurized altitudes higher than 2000 meters;
- Extreme temperatures outside the stated operating range operating temperature range 0 to + 50°C;
- Excessive dust;
- Moist or humid atmosphere above 85% RH;
- Excessive vibration;
- Flammable gases;
- Corrosive or explosive atmospheres;
- Direct sunlight.



Use a slightly damp cloth to clean the casing of the equipment. Do not use any cleaning liquids containing alcohol, methylated spirit or ammonia etc.

## 4 Feedback

LogoSat encourages your comments concerning this document. We are committed to providing documentation that meets your needs .

Please send any comments by contacting us at .

Please include document and any comment, error found or suggestion for improvement you have regarding this document.

## 5 About this Manual

This document is intended to help you to

- Understand the different possibilities of the LST6100 Broadcast Satellite Modem;
- Understand the basic features of the LST6100 Broadcast Satellite Modem;
- Find your way connecting and configuring the LST6100 Broadcast Satellite Modem.

### 5.1 Cautions and Symbols

The following symbols appear in this manual:



A caution message indicates a hazardous situation that, if not avoided, may result in minor or moderate injury. It may also refer to a procedure or practice that, if not correctly followed, could result in equipment damage or destruction.



A hint message indicates information for the proper operation of your equipment, including helpful hints, shortcuts or important reminders.



A reference message is used to direct to a location in a document with related document or a web-link.

## 5.2 Version History and Applicability

Document Version	Date	Subject	Comment
1.0	March 2016	LST6100 Broadcast Satellite Modem	Initial version.

## 5.3 Related Documentation

- The LST6100 Broadcast Satellite Modem Reference Manual describes the parameters available in the device;
- Device leaflet containing the specifications (We refer to <http://www.LogoSat.eu> );
- The System Integration Guide for LST6100 describes how to integrate the device into a network management environment;



The related documentation can be found on the CD-ROM that is delivered together with the device.

## 6 Introduction

### 6.1 Short Description

The LogoSat LST6100 Broadcast Satellite Modem is the next generation DVB-S2 and DVB-S modem specifically designed for broadcast applications. The modem supports the S2 Extensions to achieve barrier-breaking efficiency. This release R2.0 supports multistream demodulation. From release R2.1 onwards, the unit can act as a modulator, demodulator or modem. As a modulator, it is the best fit for broadcast direct-to-home, primary distribution to head-ends and contribution of television and radio content. As a modem or demodulator, it is typically installed in head-ends or at both sides of a contribution link. The LST6100 can be used in conjunction with set-top boxes, professional IRD's or professional satellite demodulators such as the LogoSat AZ910.

#### **Delivering the Highest Uptime for Vital Links**

Uptime and reliability are essential in the design of the modem, taking a vital role in the satellite network. Input source redundancy and the shortest redundancy switch-over times of modems, operating both in 1+1 and N+1 topologies, are setting the standard in our industry. Advanced capabilities are built in such as a built-in MPEG Transport Stream analyser, support of SMPTE 2022 FEC at the GbE inputs (for distributed IP headends), and native support of Carrier ID according to the new DVB standard as well as in the transport stream NIT Table. Special care was taken to cope with jittery transport stream over IP inputs. The 6 ASI ports are programmable as inputs or outputs allowing for monitoring as well as operational ASI ports.

#### **Get the Best Performance and Lower your Costs**

The Broadcast Satellite Modem performs among the best, offering unmatched bandwidth efficiency optimization options, thereby lowering overall Total Cost of Ownership. The fully automated operation of LogoSat's field-proven Equalink® pre-distortion technology, providing up to 10% bandwidth gains, is now available for any satellite transmission application. Clean Channel Technology™, in combination with S2 Extensions, improve satellite efficiency by up to 15%, thereby enabling much smaller carrier spacing. Maximum symbol rates up to 72 Mbaud and modulations up to 64APSK (S2 extensions) combined with VCM (Variable Coding and Modulation) allow for maximum throughput in large contribution links. The unit allows transmitting and receiving simultaneously up to four transport stream(s) in full compliance with the DVB standards. At the output of the Broadcast Satellite Modem, the signal is available in IF or extended L-band (950 MHz-2150 MHz), providing a compact and cost effective solution. A switchable 10 MHz reference signal and optional 24V or 48V DC for an outdoor BUC is multiplexed on the L-band interface. The input is dual L-band or as an option 70/140MHz and single L-band.

The Broadcast Satellite Modem can be easily monitored and controlled via a comprehensive front panel menu, advanced web GUI as well as via SNMP protocol. This enables easy integration into any industry-standard EMS/NMS system.

#### **Evolve Towards Tomorrow's Technology**

Built upon flexible and latest generation programmable technology, the LST6100 Broadcast Satellite Modem is a future-proof building block that lets any satellite network evolve to the next level of capabilities. A scalable, pay-as-you-grow, licensing and software upgrade mech-

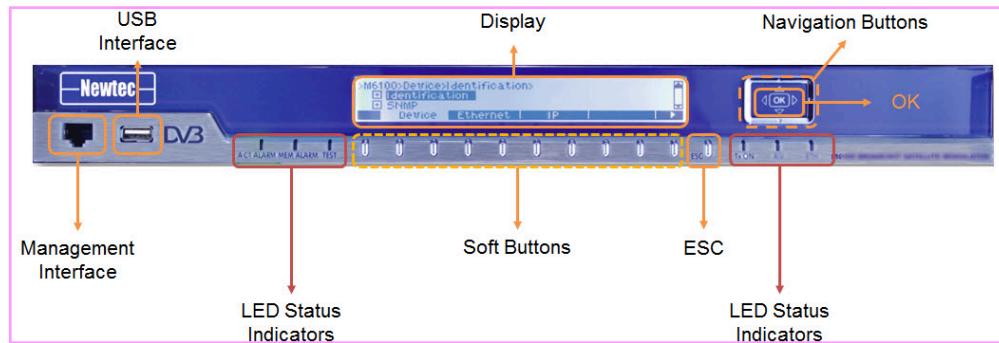
anism facilitates the launch of new services, or last minute network design changes, without rebuilding the entire network infrastructure. Migration from ASI to GbE and IF to L-band is facilitated by simple in-field installation of license keys. Migration of standard distribution links towards S2 Extensions can be as simple as inserting a LST6100 modem in the head-ends while keeping the installed base of IRDs.

Additional capabilities such as DVB-S2 extensions and others are anticipated to become available on the platform as the standardization efforts materialise in the near future. The brand new DVB-CID carrier identifier is already available as a software option on the LST6100.

# 7 Physical Description

## 7.1 Front Panel Description

The device can be configured, controlled and monitored using the front panel. The front panel consists out of the following parts.



For more information please refer to section: How to Use the Front Panel.

### 7.1.1 Display

The display consists of a 32 x 240 pixels LCD screen.

- The top rows indicates the tree menu pane;
- The bottom row indicates the root menu pane.



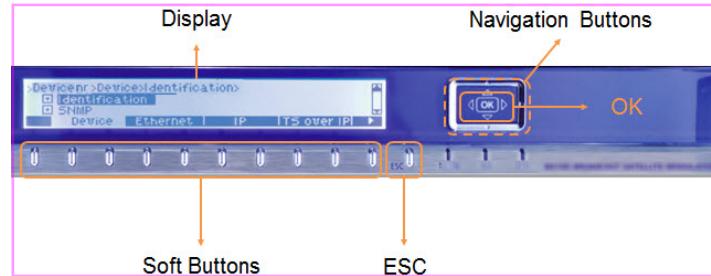
#### Menu Tree

The device management model is designed as a menu tree. The menu tree shows the organization of the parameters in the device. The tree is built up out of a root, branches, sub branches and leafs.

- Root: represents the complete device configuration;
- Branch/Sub branch: represents functional blocks that group leafs/parameters that are closely related to one another;
- Leaf: the leafs represent the parameters or commands that are used to perform a configuration.

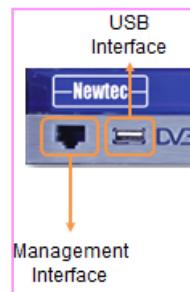
## 7.1.2 Soft Buttons and Navigation Buttons

Use the navigation button and soft buttons to navigate through the menu tree.



- The function of the soft buttons varies depending on the context. Their meaning is defined by the menu pane block setting atop of each button;
- Use the **navigation buttons** for navigating through the Tree menu pane;
- Use the **OK** button to confirm a selection;
- Use the **ESC** button to ignore a selection and to go up in the menu tree.

## 7.1.3 Front Panel Management Interface



The management interface allows the system administrators to manage the LST6100 Broadcast Satellite Modem and monitor its operation.



Note that this interface is disabled by default.

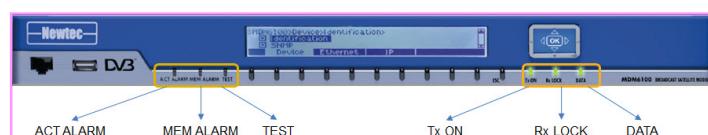
This connector has the same function as the management interface(s) on the back panel.

The management can also be done by using the GUI, CLI or SNMP.

## 7.1.4 USB Interface

The USB interface is a flash drive connector for future use.

## 7.1.5 LED Status Indicators



LED	LED Color	Description
ACT ALARM	Red	A general device or interface alarm is present on the device.
	Yellow	Alarms other than the general device alarm or interface alarm are present on the device.
	Green	There are no alarms present on the device.
MEM ALARM	Yellow	A memorized alarm is present on the device.
	Off	Indicates that all alarms are cleared, no memorized alarm is present on the device.
TEST	Off	Not used.
Tx ON	Green	The device is transmitting.
	Off	The transmission is disabled.
Rx Lock	Green	The demodulator is locked to the incoming RF Carrier.
	Red	Indicates an interface alarm.
	Off	The incoming signal is not valid.
DATA	Green	The input/output data signal is valid.
	Red	Indicates an Ethernet link failure on the MGMT and/or DATA interface(s).
	Off	No input/output interface is enabled.

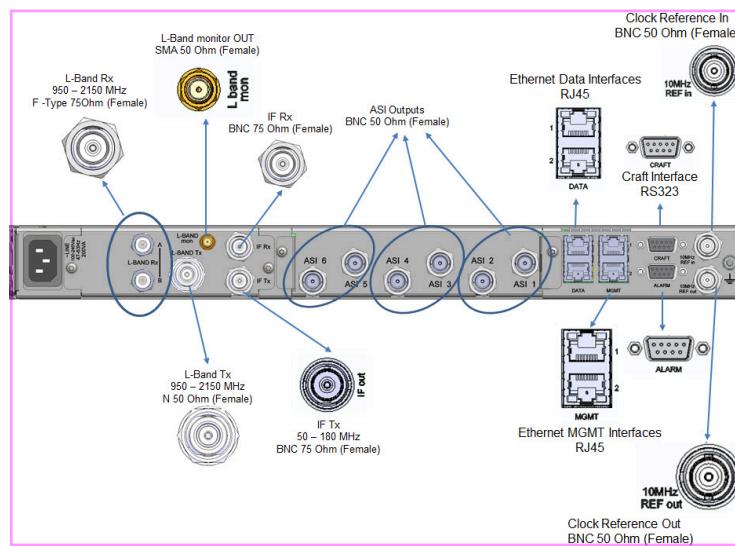
## 7.2 Back Panel Description

The following figure shows the possible connections on the LST6100. The back panel connections available depend on the specific hardware configuration of your device.

	<p>The maximum force that may be used to fix the SMA (L-Band monitor OUT) connector is restricted to 1.2Nm!</p> <p>The maximum force for the other connectors is restricted to 1Nm!</p> <p>When one of these limits is exceeded, the connectors can be damaged and the correct functioning of the connectors cannot be guaranteed.</p>
---	--

## Physical Description

## LST6100 Broadcast Satellite Modem



The 10MHz REF out is optional and is selected during ordering. (Ordering number is RO-01.)



IF Rx is optional and replaces the L-Band Rx B interface. (Ordering number is IU-01)

### 7.2.1 Power Connector

This connector has a protective earthing incorporated.

Insert the mains plug only in a socket that has a protective earth contact.



Any interruption of the protective conductor inside or outside the device causes hazards or electrical shocks.



The only way to shut down the device is to disconnect the power cable from the power connector. Therefore, make sure that the power cable is accessible and not obstructed when the device is operational.

The power supply has the following specifications: 90-130 & 180-260 Vac, 105 VA, 47-63 Hz.

To have power redundancy, a dual power supply can be ordered (ordering nr. PS-01).

- It is advisable to connect the two mains plugs to two different power circuits, so the device remains operational if one of these circuits fails (for example: fuse blown).



The equipment with redundant power supply has more than one power supply cord. **To reduce the risk of electric shock, disconnect two power supply cords before servicing.**

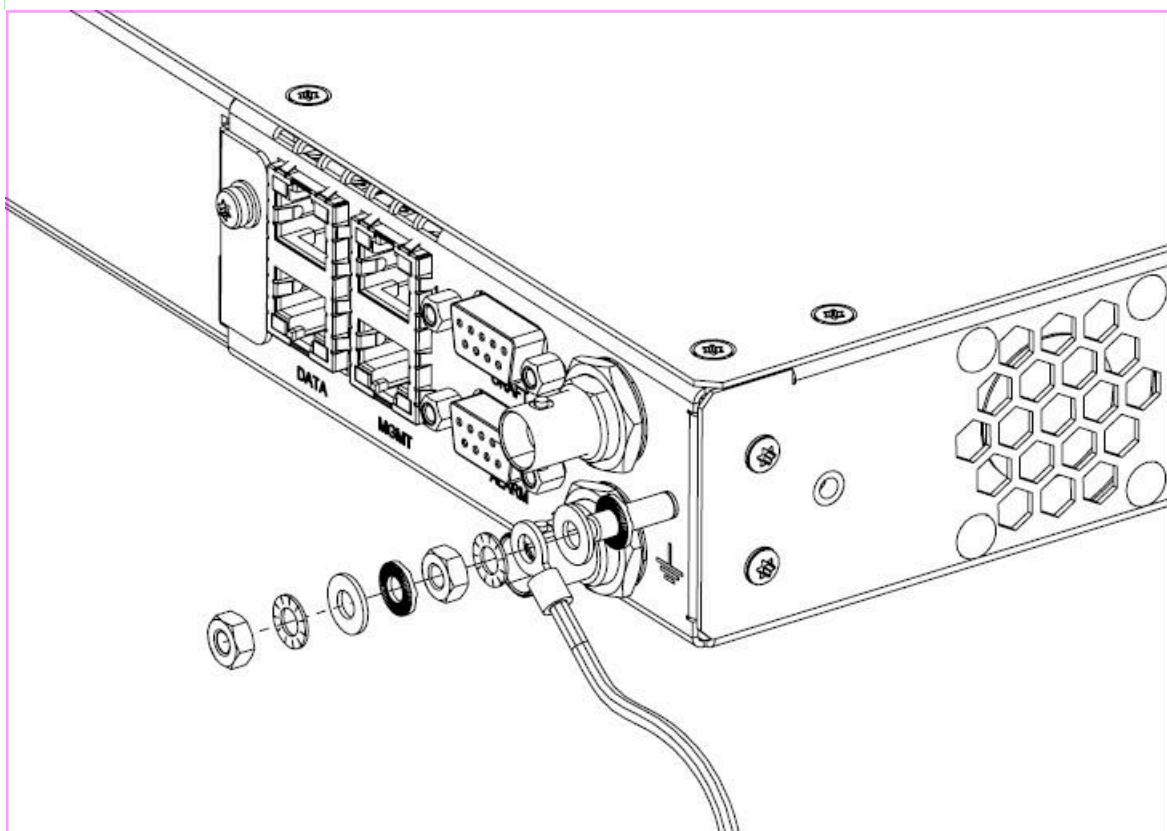
### 7.2.2 Earth Ground

On the rear panel of the equipment an earth ground is available.

It is provided to:

- Ensure that all equipment chassis fixed within a rack are at the same technical earth potential. This is done by connecting a wire between the technical earth terminal and a suitable point on the rack.
- Eliminate the migration of stray charges when connecting between equipment.

The following figure shows the position and how to connect the earth ground.



### 7.2.3 Craft Interface

The **craft** interface is a SUBD 9 pin connector interface that can be used to manage the device using the command line interface (CLI).

It is used to control the device over RS232.

## Physical Description

## LST6100 Broadcast Satellite Modem

The line settings for the craft interface are:

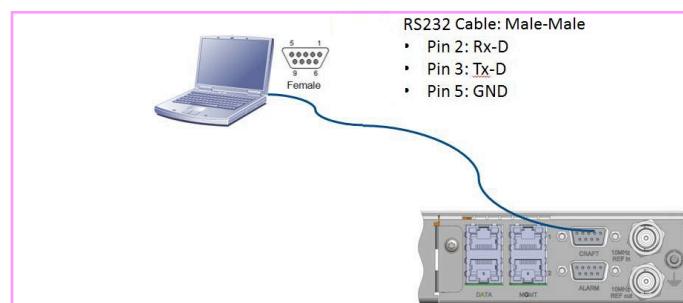
- Speed 115200 baud;
- Eight data bits;
- No parity bit;
- One stop bit.



Use the following pin connections to create a crossover cable between the LST6100 Broadcast Satellite Modem and the managing device.

Pin	Name	Function
1		Not connected
2	Rx-D	Receive Data
3	Tx-D	Transmit Data
4		Not connected
5	GND	Shield ground
6		Not connected
7		Not connected
8		Not connected
9		Not connected

The following figure shows the craft interface connection.



### 7.2.4 Alarm Interface

The alarm interface can be used to build up device redundancy switching systems.



When using the AZ202 Universal Redundancy Switch it is not mandatory to use alarm contacts. The Universal Redundancy Switch can also gather the alarm status from the different pieces of equipment in the setup over the management interface.

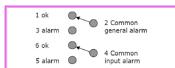
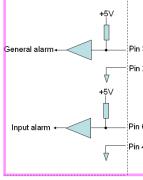
## Physical Description

## LST6100 Broadcast Satellite Modem

Connect the alarm interfaces.

The contacts are normally closed to insure that an alarm is generated when the alarm cables are removed.

Refer to the following figures for the pin layout:

Pin Layout	Technical Representation of the Pin Layout
	

The following figure shows how to connect the alarm cables in a 1+1 redundancy system.

