ProStream 1000

Transcoder

VERSION 5.0 & UP

HW and Installation User Guide

Rev B

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the Federal Communications Commission (FCC) rules.

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?品中的有毒有害物?或元素的名?及含量表

Names and Contents of the Toxic and Hazardous Substances or Elements in the Products if the Part is Present

?表?示哈雷公司?品中可能含有的有毒有害物?元配件的信息，除了?源于元配件供?商的物料成分?料，亦?自其它相?的机构与?料。哈雷?品不一定使用?些元配件。

This table shows those components where hazardous substances may be found in Harmonic products based on, among other things, material content information provided by third party suppliers. These components may or may not be part of the product.

除非特殊注明，哈雷公司?品的?保使用期限 均? 20 年。??保使用期限的有效条件?：必?遵循??品使用手?的?定，???品?行使用或存?。

The Environmental Protective Use Period for Harmonic products is 20 years unless displayed otherwise on the product. The EPUP period is valid only when the products are operated or stored as per the conditions specified in the product manual.

部件名? **(Part name)**	有毒有害物?或元素 **(Hazardous Substance)**					
	? (PB)	汞 (Hg)	? (Cd)	六价? (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷?路板 (Printed Circuit Assemblies)	X	O	O	O	O	O
机械?件 (Mechanical Subassemblies)	X	O	O	O	O	O
光学?件 (Optical Subassemblies)	X	O	O	O	O	O
电源 (Power Supplies)	X	O	O	O	O	O
缆? / ?束 (Cables, harnesses)	X	O	O	O	O	O
屏幕 / ?示器 (Screens, Monitors)	X	O	O	O	O	O
金属零件 (Metal Parts)	O	O	O	O	O	O
塑料 / 发泡材料 (Plastics, foams)	O	O	O	O	O	O
电池 (Batteries)	O	O	O	O	O	O

O: 表示在?部件的所有均?材料中，此类有毒有害物?的含量均小于 SJ/T11363-2006 ?准所?定的限量。

O: Indicates the content of the toxic and hazardous substances at the homogeneous material level of the parts is below the limit defined in SJ/T11363 2006 standard.

X: 表示至少在?部件的某一均?材料中，此类有毒有害物?的含量超出 SJ/T11363-2006 ?准?定的限量。

X: Indicates that the content of the toxic and hazardous substances in at least one of the homogeneous materials of the parts is above the limit defined in SJ/T11363 2006 standard.

Standards and Agency Approval

The following tables list regulatory standards and agency approvals:

North America

Standards	Agency Approval
EMI: FCC Part 15, Subpart B, ICES-003, Issue 2, Class A	FCC
Safety: UL 60950, CSA 60950	cTUV-us Mark

Europe

Standards	Agency Approval
EMI/EMC: EN55022, Class A, EN55024	CE
Safety: EN 60950	TUV-GS-Mark, CE

Japan

Standards	Agency Approval
EMI: VCCI V-3 / 2000.04	VCCI

Australia and New Zealand

Standards	Agency Approval
EMI: AS/NZS-3548: 1995 +A1: 1997 +A2: 1997	N/A

Documentation Conventions

This manual uses some special symbols and fonts to call your attention to important information. The following symbols appear throughout this manual:

DANGER: The Danger symbol calls your attention to information that, if ignored, can cause physical harm to you.

CAUTION: The Caution symbol calls your attention to information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.

LASER DANGER: The Laser symbol and the Danger alert call your attention to information about the lasers in this product that, if ignored, can cause physical harm to you.

NOTE: The Note symbol calls your attention to additional information that you will benefit from heeding. It may be used to call attention to an especially important piece of information you need, or it may provide additional information that applies in only some carefully delineated circumstances.

TIP: The Tip symbol calls your attention to parenthetical information that is not necessary for performing a given procedure, but which, if followed, might make the procedure or its subsequent steps easier, smoother, or more efficient.

In addition to these symbols, this manual uses the following text conventions:

- `Data Entry`: indicates text you enter at the keyboard.
- User Interface: indicates a button to click, a menu item to select, or a key or key sequence to press.
- Screen Output: shows console output or other text that is displayed to you on a computer screen.
- **Bold**: indicates the definition of a new term.
- *Italics*: **used for emphasis, cross-references, and hyperlinked cross-references in online documents.**

Table of Contents

Chapter 1
ProStream 1000 Overview

ProStream 1000 is a digital video multiplexer/scrambler that suits the dynamic requirements of various market segments such as Telco, Cable, DBS and Broadcast. ProStream 1000 receives MPEG streams over Gigabit Ethernet (GbE) and/or DVB-ASI inputs. It multiplexes, scrambles and outputs the content over GbE and/or DVB-ASI ports. The number of input and output ports changes according to device configuration to fully meet customer's needs.

1.1 Control Modes

ProStream 1000supports the following control mode options:

- NMX - Harmonic's NMX Digital Service Manager offers comprehensive management of networks including automatic device redundancy, source switching and automation. ProStream 1000 is managed as an integral part of a broadcasting system.

NOTE: The current ProStream 1000 version is NMX controlled only.

- Standalone - the device is managed as a standalone device independent of the broadcasting system. It is controlled by a Web client which is an onboard interface accessible through Microsoft Internet Explorer with comprehensive management capabilities.

NOTE: Some features, like scrambling and device redundancy are supported in NMX control mode only.

1.1.1 System Requirements of Managing PC

System requirements of the managing computer vary according to the control mode as the following table lists:

Table 1-1: Control Mode Requirements

Control Mode	Requirements
NMX	NMX runs on an NMX computer which is a Harmonic approved Dell™ Computer.
Standalone	■ Pentuim 3.x or higher ■ Windows 2000, XP ■ Internet Explorer 5.0 - 6.0

1.2 ProStream 1000 Device Features

The main features and capabilities of the device are as follows:

- Modular platform - provides a density of up to 5 IOM (Input Output Module) cards in a single one-rack-unit (1-RU) chassis. The modular design allows a flexible and easy field replacement of cards as well as field upgrades of SW and HW features.
- IP IOM card - when mounted in the device, ProStream 1000 receives and transmits data via a GbE port. Each IP IOM card has two active GbE ports.
- DVB-ASI IOM card - when mounted in the device, ProStream 1000 receives and transmits data via four DVB-ASI ports. Each port may be configured as an input or output port. The following two types of DVB-ASI cards are available:
  - ASI-RMX – allows the ProStream 1000 to receive and transmit data and streams and to re-multiplex them according to user's needs. The ASI-RMX card supports maximum bit rate of 140 Mbps.
  - ASI-SCR – in addition to the ASI-RMX capabilities, this card type also supports DVB-CSA (Common Scrambling Algorithm). The ASI-SCR card supports maximum bit rate of 140 Mbps.

NOTE: For further details, see *1.4.3.1 DVB-ASI IOM Card* on page 13.

- Input Extraction capability - the device extracts incoming feeds and displays their structure and elements on the control interface in a user friendly view.
- Full multiplexing capability — content may be routed from any input port to any output port.
- Advanced scrambling - the ProStream 1000 scrambles the input content in compliance with the DVB-CSA standard. This feature is available for both GbE and DVB-ASI output ports, in NMX control mode.

1.2.1 ProStream 1000 Device Types

Harmonic ProStream 1000 device is available with two types of chassis:

- A chassis with a removable front panel - Chassis part number PRM-1K-CHS-AC-L
- A chassis with a fixed front panel - Chassis part number PRM-1K-CHS-AC-B-L

1.3 ProStream 1000 Front Panel

The front panel of ProStream 1000 contains the following:

- Front bezel
- Control Panel
- LEDs

The following figure illustrates the front panel of ProStream 1000:

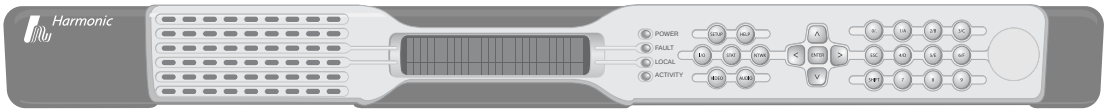


Figure 1-1: ProStream 1000 Front Panel

1.3.1 Front Bezel

ProStream 1000 has a detachable front bezel that snaps on top of the control panel. The air inlets located on the left side of the bezel provide access to the reusable air filters. See *6.1 Air Filters* on page 56 for information about cleaning the air filters.

1.3.2 Control Panel

The control panel consists of an LCD display and a keypad. The control panel enables preliminary configuration and basic monitoring of ProStream 1000. It is usually used for standalone devices. For further information, see *Initial Device Configuration* on page 27.

1.3.3 Front Panel LEDs

The four LEDs on the front panel indicate the operational status. The LEDs function the same whether ProStream 1000 is operating in standalone or NMX control mode.The following table describes the front panel LEDs, from top to bottom.

Table 1-2: Front Panel LEDs

LED	Color	Description
Power	Green Orange	Device is on and boot up process is complete. Device is on and boot up process is taking place.
Fault	Red	An alarm has been activated in the device. Refer to *Troubleshooting* on page 30 for further details.
Local	Orange	Identify the device, indicates the device when it needs service.
Activity		Currently not applicable

1.4 ProStream 1000 Back Panel

The back panel of ProStream 1000 contains the following:

- Power Plug
- Central Processing Card (CPC)
- Input/Output Module (IOM) card Slots

The following figure illustrates the back panel of the ProStream 1000 device with an optional configuration of the IOM cards. The number and type of mounted IOM cards may vary according to the needs of the user:

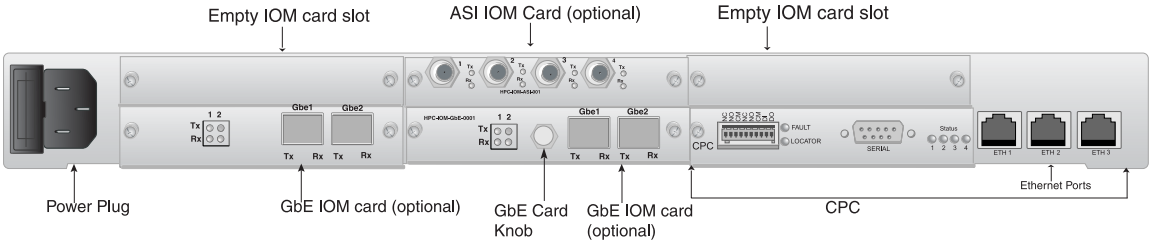


Figure 1-2: ProStream 1000 Back Panel

1.4.1 Power Supply

ProStream 1000 supports both VAC and VDC according to your requirements. A fuse is located inside the power socket. For information about replacing the fuse, see *6.3 Fuse Replacement* on page 59. The compartment next to the power cable holds a spare fuse.

1.4.1.1 VAC Power Supply

The power supply supports 85-264 VAC range. The required voltage is automatically selected according to the wall outlet.

The following table lists the power supply specifications.

Table 1-3: VAC Power Supply Specifications

Parameter	Specification
Input voltage	85 - 264 VAC (autoselected)
Line frequency	47 - 63 Hz
Typical power consumption	125 W

1.4.1.2 -48 VDC Power Supply

The -48 VDC power supply unit is supplied with the required 3-pin male connector. See *Wiring the –48 VDC Power Supply* on page 63 for instructions to connect the power supply.

The ProStream 1000's electrical rating for the -48VDC type is as follows:

Table 1-4: -48VDC Power Supply

Parameter	Specification
Voltage	36 - 72VDC
Maximum Operating Current	4A

Each power supply unit features two LEDs. For detailed description, see *1.4.1.1 VAC Power Supply* on page 11.

NOTE: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

1.4.2 Central Processing Card (CPC)

The Central Processing Card (CPC) is the main card of the ProStream 1000 platform. It includes the communication interfaces of the device and additional components all of which are described henceforth:

- Three Ethernet ports - the Ethernet ports allow connection to separate networks. The Ethernet ports are labeled ETH1-3. ETH3 port is used to connect the device to the management network and ETH2 port for CAS network when required. ETH1 is optional for future use.
  ETH1 is 10/100 Base-T port and ETH 2 and 3 are 10/100/1000 Base-T ports. For cabling instructions, see *Installing the ProStream 1000 Unit* on page 19.
- EIA-RS-232 Serial Communication Port - the EIA-RS-232 serial port is used for technical support only.
- Status LEDs - currently not in use.
- Fault Relay Port - currently not in use.
- CPC LEDs - the following table lists the CPC LEDs from top to bottom and explains their functionality. The LEDs function similar whether ProStream 1000 operates in standalone or NMX control mode:

Table 1-5: CPC LEDs

LED	Color	Explanation
Fault	Red	Same as front panel. An alarm has been issued. For further details, refer to *Troubleshooting* on page 30.
Locator	Blue	Identify unit, indicates the device when it needs service.

1.4.3 IOM Slots and Cards

The ProStream 1000 device back panel has five Input Output Module (IOM) slots labeled one to five. Each one of the slots accommodates a single IOM card. The following figure illustrates the arrangement of the slots at the back panel:

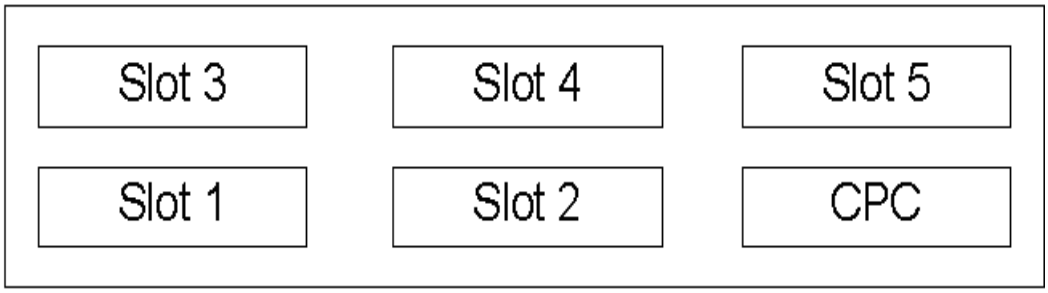


Figure 1-3: ProStream 1000 Slot Arrangement

ProStream 1000 Version 5.0 & Up supports two types of DVB-ASI card and GbE IOM card. The part numbers of the IOM cards as follows:

DVB-ASI RMX-IOM card - PRM-1K-ASI-RMX-0001-L

DVB-ASI SCR-IOM card - PRM-1K-ASI-SCR-0001-L

GbE IOM card - PRM-1K-IOM-GBE-0002-L

8VSB Modulation card -

1.4.3.1 DVB-ASI IOM Card

NOTE: The following information applies to both types of the DVB-ASI card.

Each DVB-ASI IOM card has four independent ports labeled ASI 1- 4. Each port may be configured as an input or output port. The following table lists the ASI card specifications:

Table 1-6: ASI Card Specifications

Feature	Description
Number of Ports	4 x ASI ports. Each port may be configured as an input or output port. In DVB-ASI-SCR card, port two may be configured to receive the GPS frequency.
Connector	Female BNC connector
Max. input bit rate	Up to 156 Mbps per port
Input extraction	Extraction of incoming streams is displayed on the management interface.
Max. output bit rate	Up to 140 Mbps per port
Multicast content	Content elements may be simultaneously routed to multiple output ports.

1.4.3.2 ASI Port LEDs

Each ASI port features two LEDs: Tx and Rx. The following table describes the available status of each LED:

Table 1-7: Status of ASI Port LEDs

LED	Color	Description
Rx	Off	Port is disabled
	Red	Port is enabled and there is no ASI input flow
	Amber	Port is enabled and invalid MPEG data is detected
	Green	Port is enabled and nulls only are detected in the flow
	Blinking green	Port is enabled and traffic is flowing
Tx	Off	Port is disabled
	Red	Port is enabled and overflow is detected in output port
	Green	Port is enabled and nulls only are detected in the flow
	Blinking green	Port is enables and traffic is flowing

1.4.3.3 GbE IOM Card

GbE cards should be mounted in slots 1 and 2 only. Each GbE IOM card has two independent ports labeled GbE 1-2. Both ports are active and work as two independent ports. Each port is bi-directional and may receive and transmit streams simultaneously. Each GbE port includes an SFP module receptacle. The following table lists the GbE card specifications of both cards:

Table 1-8: GbE Card Specifications

Feature	Description
Number of Ports	Two independent GbE ports per IOM card. Each port serves simultaneously as an input and output port.
Connector	Two receptacles for SFP module
Max. input bit rate	Up to 400 Mbps per card
Number of input sockets	Up to 128 sockets SPTS or MPTS for both cards
Input extraction	Extraction of incoming streams is displayed on the management interface.
Max. output bit rate	Up to 400 Mbps per card
Number of output sockets	Up to 128 sockets SPTS or MPTS for both cards
Input Dejitering capability	Up to 50msc point-to-point
Multicast content	Content elements may be simultaneously routed to multiple output ports.

Table 1-8: GbE Card Specifications *continued*

Feature	Description
Null Packet Insertion	Constant Bit rate output stream with null packet insertion and PCR correction.
IP UDP modes	The following IP UDP modes are supported in both input and output streams: ■ IP UDP unicast ■ IP UDP multicast (IGMP Ver. 2)
Max. number of input services	512 per device
Max. number of output services	512 per device

1.4.3.4 GbE Port LEDs

Each GbE port features two LEDs: Tx and Rx. The following table describes the available status of each LED:

Table 1-9: Status of GbE Port LEDs

LED Status	Color	Description
Activity	Green	On - A live fiber is connected to the port and a network link is detected. Blinking - A real traffic flows through the link.
Alarm	Red	On - Indicates an error in the GbE port.

1.4.3.5 SFP Module

The SFP (Small Form Pluggable) module converts incoming data to match the GbE card interface. There are two types of SFP modules:

- Fiber optic SFP
- Copper SFP

The following figure illustrates both types of the SFP module)

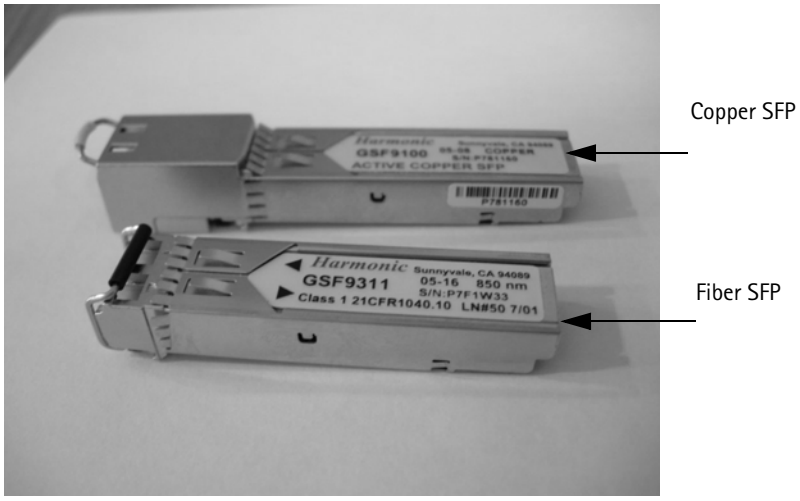


Figure 1-4: SFP Types

LASER DANGER: Class I laser product.

You can use either of the types of SFP depending on the cable/fiber type you are using. You can purchase SFPs from Harmonic or other sources. In this case, it is strongly recommended to purchase SFP models qualified by Harmonic:

Table 1-10: SFP Types

Fiber/Cable Type	Connector Type	Wave Length	Qualified SFP Make/ Model	Harmonic Part Num.
Multimode fiber	2 x LC	850 nm	Finisar FTRJ-8519-7D	SFP-850
Singlemode fiber	2 x LC	■ 1310 nm ■ 1550 nm	Finisar FTRJ-1310-3 Finisar FTRJ-1550-7D	SFP-1310 SFP-1550
Shielded and grounded CAT-6 or CAT-7	1 x RJ-45	N/A	Finisar FCMJ-8521-3(HR)	GSF9100-02-1

An optical SFP has two LC sockets, Receive (Rx) and Transmit (Tx). Use Multimode or Singlemode fiber optics to connect your Gigabit Ethernet switch to the Rx socket. If bi-directional topology is used, connect the Tx socket back to the switch. The following table lists the fibers and SFPs required accordingly:

Table 1-11: Fiber and Required SFP

Fiber	SFP
Multimode	850 nm SFP
Singlemode	■ 1310 nm SFP for transferring signals to a distance of up to 1 km. ■ 1550 nm SFP for transferring signals to a distance of up to 100 km (depending on other network parameters).

1.4.4 8VSB Modulation Card

The 8VSB modulation card is an RF input module that enables the reception of ATSC terrestrial TV. It receives four independent ATSC 8VSB signals on the inputs and outputs four MPEG-2 Transport Streams.

NOTE: The four inputs are enabled by optional firmware licenses.

1.4.4.1 8VSB Modulation Card Specifications

Table 1-12 provides the specifications for the RF module.

Table 1-12: RF Module Specifications

Feature	Support
Connectors	4x Type F, 75 Ω per IEC 60169-24
Modulation	8–VSB (ATSC compliant)
Tuning Range	VHF/UHF (Channels 2–59) Note: The tuning range is limited to Channels 2 to 59 by software (and SCTE 02-2006), per the FCC/Industry Canada decisions to release channels 60 to 69 for public safety use.
Sensitivity	–83dBm/6 MHz
Dynamic Range	> 80dB
MPEG Format	188 Bytes per TS packet
MPEG-2 TS	MPTS and SPTS

1.4.4.2 Environmental and Physical

Compliant with ROHS Directive 2002/95/EC. Refer to the encoder environmental specifications for additional information.

Figure 1-5 displays the module (rear panel).

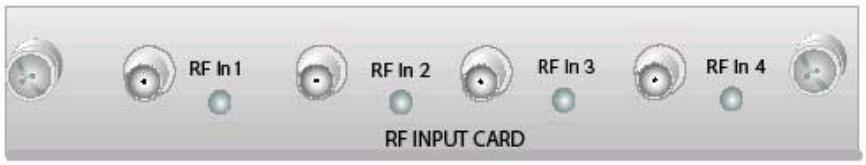


Figure 1-5: RF Input Module

1.4.4.3 RF Module LED Lights

The LED lights show status, as shown in *Table 1-13*.

Table 1-13: LED Status Lights

	Display	Status
	Off	Port disabled
	Blinking Yellow	Loss of sync
	Red	Packet error rate (PER) threshold exceeded
	Steady yellow	SNR below threshold
	Green	Port Enabled, no alarms

Chapter 2
Installing the ProStream 1000 Unit

This chapter describes how to install the device into a standard EIA 19-inch computer rack and to cable it.

2.1 Preparation

For installation and cabling, you need the following

- Phillips screwdriver - to mount the ProStream 1000 device in a standard 19-inch computer rack.
- Rack-mount screws

2.2 Unpacking

The ProStream 1000 device comes in a specially designed shipping container that ensures the integrity of the unit.

When you unpack the ProStream 1000 device, you should find the following items:

- Device
- Standard IEC power cord.
- Spare air filters
- Installation manual

NOTE: The AC power input cable shall comply with national electrical code and 18 AWG minimum.

2.3 Installing the device in a Rack

This section describes how to mount the device in a standard 19-inch rack. A 30 inch deep rack with a spacer or chimney between racks with multiple devices is the recommended rack setup.

2.3.1 Chassis Warnings for Rack Mounting and Servicing

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to assure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

2.3.1.1 Airflow

The airflow through the device is critical for maintaining the proper temperature range. Fans in the chassis draw air in through the front bezel and through the device. The airflow ventilates out from the right side (front view).

CAUTION: Do not obstruct the airflow of the device. Severe equipment damage can result when the device cannot properly exhaust the airflow.

2.3.1.2 Mounting the device

⇨ To mount the device in a rack:

1. Using both hands, grasp the outside corners of the plastic front bezel and slowly pull to detach it from the device and expose the mounting holes.

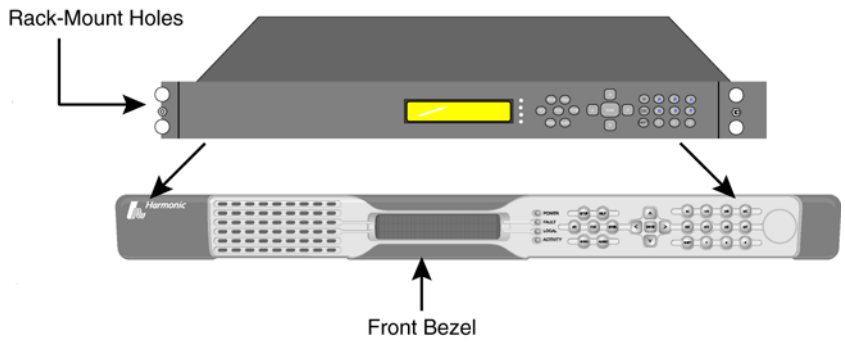


Figure 2-1: Mounting ProStream 1000

2. Gently slide the device to rest in its place on the rack.
3. Push the device back until the rack-mount holes in the front of the device line up with the rack posts.
4. Insert four screws through the mount holes in the front of the device to go through the corresponding holes on the rack posts.
5. Tighten the screws with a screwdriver.
6. Carefully replace the front bezel of the device, making sure you do not damage the air filters.

2.4 Inserting the IOM Cards and RF Input Card

Usually, ProStream 1000 devices are shipped with the IOM cards installed according to the hardware configuration required by the customer.

2.4.1 ESD Guidelines

In case you need to install or replace an IOM card, handle it according to the following instructions to avoid any damage.

CAUTION: Electrostatic Discharge (ESD) may damage the device components. Take precautions to eliminate ESD from your body and clothes before handling the device or card by using a wrist band and a rubber mat and read the following section.

To prevent damage caused by ESD, it is recommended to follow these instructions:

- When unpacking an IOM card, keep the card in the anti-static wrapping until you are ready to install it in the device. Unwrap the card only at an ESD workstation or when grounded.
- If for any reason you cannot insert the card, lay it in an anti-static container or packaging.

- Handle the card only at ESD workstation and use anti-static rubber mat and wrist bands.
- Handle the IOM card with care. Do not touch components and contacts on the board and hold board by its edges.

⇨ To insert an IOM/RF card:

To insert an IOM card, you need the following:

- Phillips screwdriver to remove the fillers and to fasten the card to its place.
- ESD-preventing wrist band and a rubber mat
- Powered off device.

1. Verify that the device is powered off.
2. Mount the device into the rack (optional)
3. Remove the filler panel that covers the required IOM slot.
4. While following the ESD guidelines mentioned above, unpack the IOM card.
5. While holding the card by its edges, insert it into the slot. Make sure that the sides of the card slide into the guides of the IOM slot.
6. Push the card until its edge-connector mates securely with the connector in the slot.
7. Fasten the screws of the card to secure the IOM card to the chassis.
8. If you did not mount the device into the rack, mount it into the rack.
9. Start cabling the device as instructed in the following section.

2.5 Cabling the ProStream 1000 Device

Cabling the ProStream 1000 device is very straight forward. All input and output ports as well as Ethernet ports are clearly marked. For further information, refer to *1.4 ProStream 1000 Back Panel* on page 11. The following table lists the ports, cables/fibers and the required connectors:

Table 2-1: Cabling ProStream 1000

Port	Description	Connector
ASI	75 Ohm coax cables	Standard BNC
GbE	Multimode or singlemode optic fiber or Shielded and grounded CAT-6 or CAT-7	LC RJ-45
Ethernet	Shielded and grounded CAT-5E	RJ-45

2.5.1 Connecting the Ethernet Cables

The Ethernet ports, labeled ETH2 and ETH3 provide access to two independent networks. All ProStream 1000 devices use the ETH3 port to connect to a management network. The ETH2 port is used to connect the ProStream 1000 to a CAS (Conditional Access) network. ETH1 is currently not in use.

To connect the Ethernet ports:

- Connect a shielded and grounded CAT-5E cable from the ETH1/ETH2 port on the ProStream 1000 device to your network hub or switch.

2.5.2 Connecting the ASI Input/Output Ports

The ASI ports require a 75 Ohm cable with standard BNC connector.

⇨ To connect the ASI ports

1. Connect the BNC male connector to the BNC female connector of the required ASI port located on the ProStream 1000 back panel.
2. Connect the connector on the other side of the cable to your ASI source/destination.

2.5.3 Connecting the GbE Input/Output Ports

The GbE connection requires SFP modules and either of the following:

- Optic fiber with standard LC connectors
- Shielded and grounded CAT-6 or CAT-7 cable (copper cable) with RJ-45 connector

The SFP modules should be purchased separately. For further information about SFP modules see *1.4.3.5 SFP Module* on page 15.

⇨ To connect the optic fiber/copper cables to the ProStream 1000:

1. Insert the SFP module into the SFP receptacle of the required GbE port at the back of the ProStream 1000.
2. Do either of the following:
   Fiber cable — insert the LC connector into the Rx port of the SFP.
   Shielded and grounded CAT 6 or 7 (copper cable) — Insert the RJ-45 connector into the SFP.
3. Connect the connector on the other side of the fiber to your GbE source/destination (typically a GbE switch).
4. Fiber cable only — If using bi-directional network configuration, use another fiber to connect the Tx port of the SFP to the Rx port of the switch.

   The diagrams below illustrate a typical case for the ProStream 1000 device connected with a fiber cable or with a copper cable:

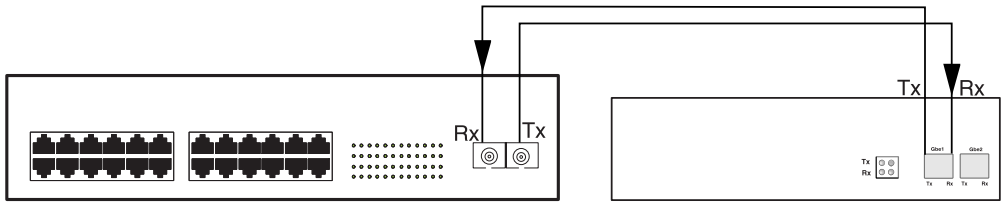


Figure 2-2: Connection with optic fiber

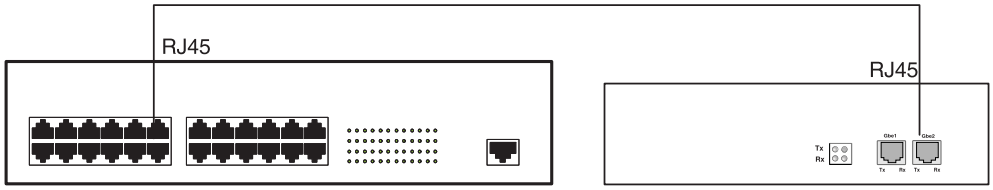


Figure 2-3: Connection with copper cable

2.5.4 Connecting the Input 8VSB Modulation Card

The RF ports require a 75 Ohm cable with standard BNC connector.

⇨ To connect the 8VSB ports (RF ports)

1. Connect the BNC male connector to the BNC female connector of the required RF port located on the ProStream 1000 back panel.
2. Connect the connector on the other side of the cable to your ATSC 8VSB source/ destination.

2.5.5 Connecting Power

The ProStream 1000 unit comes with either an AC power supply or a -48VDC power supply. Follow the instruction appropriate to your power supply.

2.5.5.1 Connecting the AC Power Supply

When connecting the ProStream 1000 to the power outlet, use the provided cord or an AC power input cable that complies with national electrical code and 18 AWG minimum.

To connect the unit to the power outlet:

- Connect the power cord to the power plug on the ProStream 1000 back panel and to the power outlet.

  The power supply automatically senses the input voltage.

2.5.5.2 Connection the -48VDC Power Supply

For instructions, see *Wiring the –48 VDC Power Supply* on page 63.

2.6 Inserting/Replacing IPC Cards

Usually, ProStream 1000 with ACE™ (Agile Compression Engine) devices are shipped with Transcoding modules installed according to the hardware configuration required by the customer. Transcoding specifications per ProStream 1000 with ACE are as follows:.

Table 2-2:

Item	Specification
Transcoding module	Up to four
Transcoding chips	Five per Transcoding module

Table 2-2:

Item	Specification
Services (channels)	5 HD services per card Up to 20 services per box

In case you need to install or replace a Transcoding module, or other IPC, handle it according to the following instructions to avoid any damage.

CAUTION: Electrostatic Discharge (ESD) may damage the device components. Take precautions to eliminate ESD from your body and clothes before handling the device or card by using a wrist band and a rubber mat and read the following section.

To prevent damage caused by ESD, it is recommended to follow these instructions:

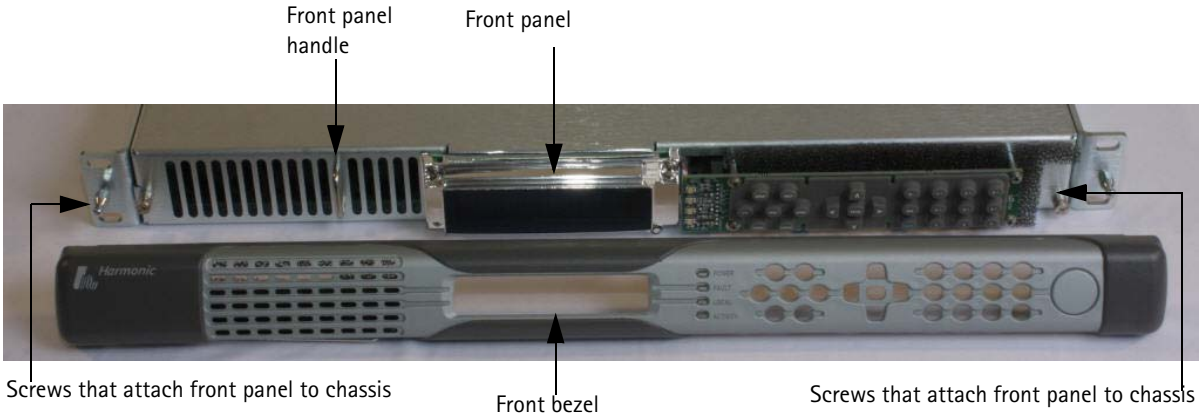
- When unpacking an IPC , keep the module in the anti-static wrapping until you are ready to install it in the device. Unwrap the module only at an ESD workstation or when grounded.
- If for any reason you cannot insert the card, lay it in an anti-static container or packaging.
- Handle the card only at ESD workstation and use anti-static rubber mat and wrist bands.
- Handle the card with care. Do not touch components and contacts on the board and hold board by its edges.

⇨ To insert an IPC:

Required equipment:

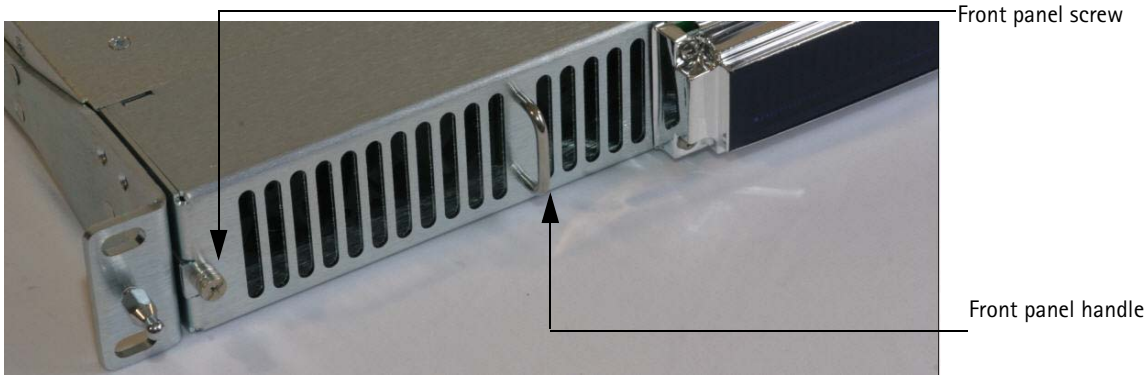
- Phillips screwdriver to remove the fillers and to fasten the card to its place.
- ESD-preventing wrist band and a rubber mat
- Powered off device.

1. Verify that the device is powered off.
2. Dis-Mount the device of the rack (optional)
3. Grasp with your hands each side of the device front bezel.
4. Carefully remove the front bezel by pulling it away from the device.

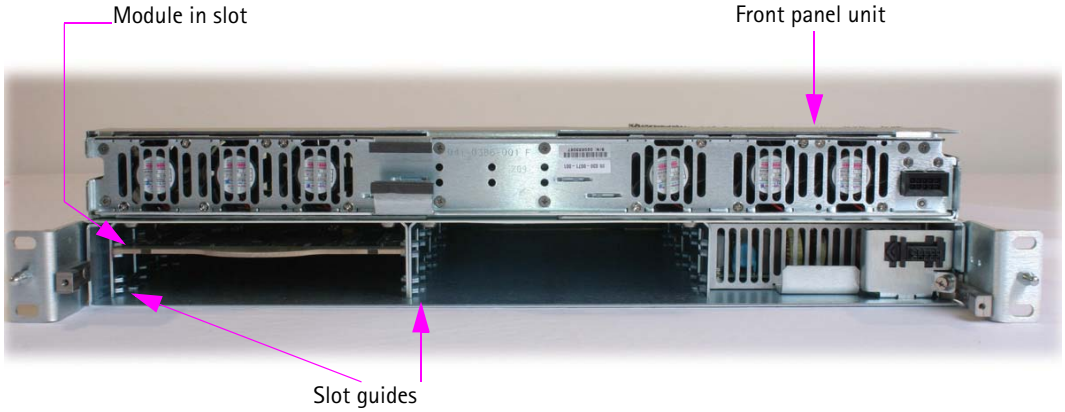


5. Place the front bezel in a safe and easy to access location.
6. Unscrew the screws that attach the front panel to the chassis in a synchronized manner.

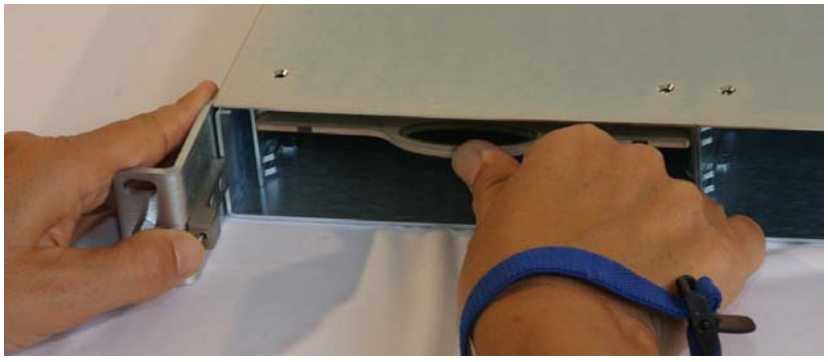
7. Hold the front panel handle and pull the panel away from the device to disconnect the front panel connector.



8. Place the front panel in a safe and easy to access location.



9. While following the ESD guidelines mentioned above, unpack the card.
10. While holding the card by its edges, insert it into the slot. Make sure that the sides of the card slide into the guides of the IPC slot.
11. Push the card until its edge-connector mates securely with the connector in the slot.



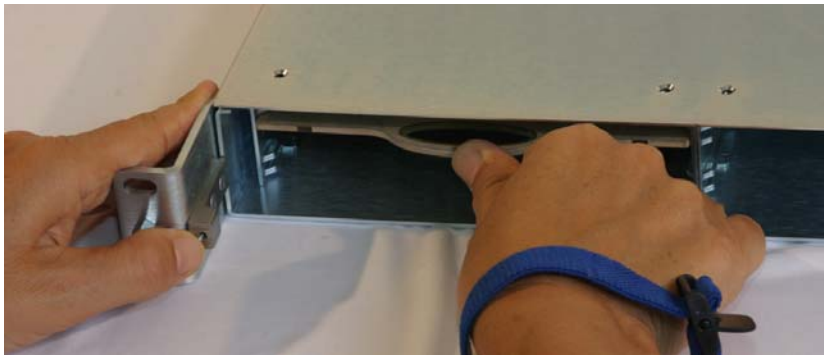
12. Place the front panel in its place on the chassis.
13. Verify that the notches located on both sides of the front panel slide on the brackets jutting from both sides of the chassis. See *Figure 6-3* on page 58.
14. Push the front panel to allow the mating connector to mate securely with the connector on the chassis.
15. Screw the front panel screws.
16. Push the bezel to snap on the chassis.

17. Power up the device.

⇨To replace an IPC

1. Follow steps 1-8
2. Locate the card to be replaced.
3. While following the ESD guidelines mentioned above, hold the card by its handle and pull to disconnect it from its mate-connector and then pull it out.

4. While following the ESD guidelines, pack away the card.
5. While following the ESD guidelines mentioned above, unpack the card.
6. While holding the card by its edges, insert it into the slot. Make sure that the sides of the card slide into the guides of the card slot.
7. Push the card until its edge-connector mates securely with the connector in the slot.



8. Place the front panel in its place on the chassis.
9. Verify that the notches located on both sides of the front panel slide on the brackets jutting from both sides of the chassis. See *Figure 6-3* on page 58.
10. Push the front panel to allow the mating connector to mate securely with the connector on the chassis.
11. Screw the front panel screws.
12. Push the bezel to snap on the chassis.
13. Power up the device.

Chapter 3
Initial Device Configuration

This chapter describes how to set initial configuration parameters to the ProStream 1000 device depending on the control mode of the device.

3.1 Initial Configuration in NMX control mode

The ProStream 1000 unit ships with BOOT program pre-configured as follows for operation under NMX:

- BOOTP enable — allows an automatic assignment of a valid IP address by NMX.
- BOOTP time out — (5 seconds) defines the period of time during which the device sends BOOTP requests.

In order to configure a ProStream 1000 device in an NMX managed network, perform the following:

- Launch NMX
- Activate a map
- Add a ProStream 1000 unit to the map and define its IP settings as instructed in the following steps:

NOTE: For more details about NMX, refer to the *NMX Installation and Startup Guide* or the *NMX Online help*.

1. Enter the name and hardware model in the **Configure** ProStream 1000 window.
2. Enter the physical address.

   The physical address is otherwise known as the MAC address. To obtain the MAC address, do either of the following:

   - Look for a sticker on the back panel under the label *MAC Address for Ethernet port 3*.

   Or

   - Use the control panel to view the MAC Address as instructed in *3.2.2.5 Viewing MAC Address* on page 32.
3. Enter the Network Address.

   The network address is the Ethernet 3 IP address that you would like the NMX to assign the ProStream 1000 unit.
4. Enter the default gateway.
5. Enter the subnet mask.
6. Select the desired firmware version.
7. Click **Ok**.
8. Reboot the ProStream 1000 unit manually by disconnecting and re-connecting its power inlet.

   ProStream 1000 broadcasts a BOOTP request. NMX recognizes the ProStream 1000 device according to its physical address and assigns it the following:

   - IP properties as configured.
   - Firmware file path

If the required firmware version matches the version that is currently stored on the hard disc of the device, the device uses the locally stored version to complete the boot process.

If the required firmware version does not match the version that is currently stored on the hard disk of the device, the device downloads the updated version and completes the boot process.

If ProStream 1000 does not receive BOOTP response from NMX, after the first attempt, it will send additional requests, up to 5 BOOTP requests. The following table lists faults that may occur during initial configuration and the ensuing consequences:

Table 3-1: Possible Faults during Initial Configuration

Fault	Consequence
No BOOTP response	ProStream 1000 reboots with its previous IP settings and firmware version. In case of a new device, it boots up with the factory settings.
BOOTP response received, firmware file not found, or no FTP response	ProStream 1000 continues sending BOOTP requests.
BOOTP response received, TFTP download starts but failed to complete successfully.	ProStream 1000 boots up with the version residing on its hard disk. In case of firmware mismatch, an alarm is issued.

NOTE: During boot up process various messages appear on the control panel. To view these messages, refer to *Control Panel Messages* on page 61.
While working in NMX control mode, use the control panel for viewing purposes only. Any attempt to set device properties using the control panel, may adversely affect the ProStream 1000 operation.

3.1.1 Start Using the Device — NMX Control Mode

Once ProStream 1000 boots up successfully, you may use NMX to further configure the device and provision stream through it. For further instructions, refer to *NMX Online Help*.

3.2 Initial Configuration in Standalone Control Mode

While working in the standalone control mode, you may set preliminary configuration and control the ProStream 1000 unit via its front panel. This section provides a general review of the control panel and instructs you on how to set network properties via the control panel.

3.2.1 Control Panel Overview

The front panel includes a control panel comprised of a Liquid Crystal Display (LCD) and a keypad as described in *1.3 ProStream 1000 Front Panel* on page 10.

You can set and view the following network properties using the Control panel of the device:

- IP address
- Mask address
- Default Gateway
- MAC address (view only)

3.2.1.1 Control Panel Display

The 2-line 20-character local control panel display shows the menus and their parameters. The control panel display is comprised of two lines:

Line 1 — shows the menu path for the currently selected option as follows: *menu*: *parameter name*.

Line 2 — shows a parameter value. The parameters you can change, can be modified in Edit mode only.

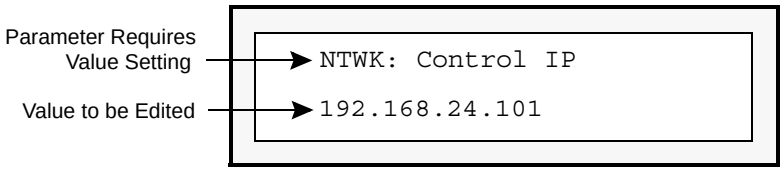


Figure 3-1: Control Panel Display

The Control panel display has two modes:

Navigation — allows you to browse through menus and sub-menus.

Edit — allows you to change the parameter value and a blinking cursor shows the character to be edited.

3.2.1.2 Keypad

The keypad on the local control panel provides several functions. The following table lists the function and the Control panel section that provides the function:

Table 3-2: Control Panel Functionality

Function	Control Panel
Access to the menus	Hot Keys
Navigation through the menu hierarchies	Navigation and Function keys
Editing capabilities	Alphanumeric keys

The following figure shows the keypad and its sections:

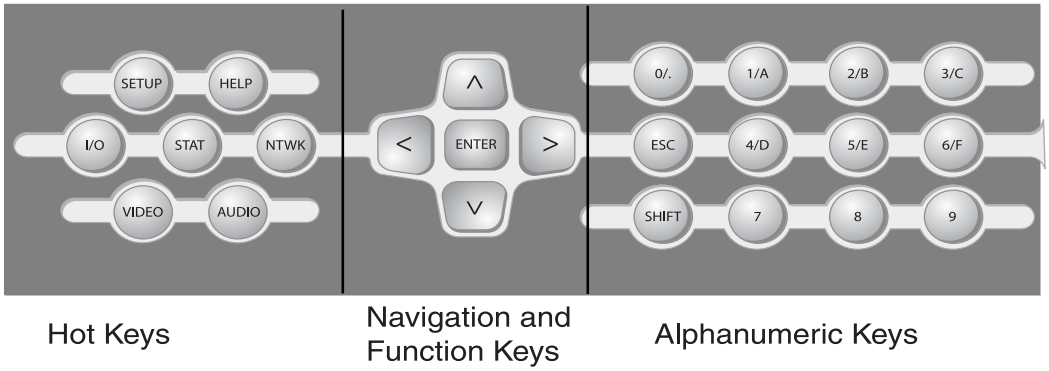


Figure 3-2: Control Panel Key Pad

Hot Keys — include six keys for accessing various menus. Currently only the NTWK key pad is active. It allows you to set network parameters.

Navigation Keys — the following table lists the Navigation keys and explains their functionality:

Table 3-3: Navigation Keys Functionality

Button		Explanation
	Up and Down arrows	■ Navigate through the menus
	Left and Right arrows	■ Navigate through the menu parameters ■ In Editing mode - move the cursor along the line
	Enter button	■ executes the selection of a menu ■ quits an editing session and applies changes ■ shifts to Editing mode

Alphanumeric Keys — allows you to change the values of the parameters. In addition to the alphanumeric keys, the keypad includes the following keys:

- ESC — allows you to shift from Editing mode to Navigation without applying the changes.
- SHIFT — allows you to shift to alphabetical and other symbols by pressing Shift and then the required key. (press the keys consecutively)

3.2.2 Setting Network Properties

Before you start working with the device, you should set the device IP address, subnet mask, and default gateway. To define network settings, you may use the Control panel as instructed below:

TIP: To exit the Edit mode without applying changes, press Esc, or any Hot key.

TIP: To erase the existing parameter value, press Enter and then the or the button as soon as you shift to Edit mode.

TIP: To enter space at insertion point, press Shift and then the button. To backspace and delete the previous character, press Shift and then the button.

3.2.2.1 Validation of Parameter Value

When editing network settings, a validation mechanism, checks the structure and the entered parameters. If it detects an invalid structure or parameter, the following error message appears in the Control panel display:
Invalid [parameter name]

3.2.2.2 Setting the IP Address of Management Port

To set the management port IP address:

1. Press the **NTWK** hot key.

   The display shows
   `NTWK:Configuration`.

2. Press the **Λ** or the **V** button to navigate to `NTWK: Control IP`.
3. To shift to Edit mode, press **Enter**.
4. Enter the IP Address using the alphanumeric keys.

TIP: To enter a period, press the Shift button then press the **0/.** button.

5. To apply changes and to shift to Navigation mode, press **Enter**.

   Do not exit the Network menu because you can set the other properties from here.

3.2.2.3 Setting the Subnet Mask

To set the subnet mask:

1. Press the **Λ** or the **V** button to navigate to `NTWK:Control Subnet`.
2. To shift to Edit mode, press **Enter**.
3. Enter the subnet mask using the alphanumeric keys.

TIP: To enter a period, press the Shift button then press the 0/. button.

4. To apply and to shift to Navigation mode, press **Enter**.

3.2.2.4 Setting the Default Gateway Address

To set the gateway address:

1. Press the **Λ** or the **V** button to navigate to `NTWK:Gateway`.
2. To shift to Edit mode, press **Enter**.
3. Enter the default gateway using the alphanumeric keys.

TIP: To enter a period, press the Shift button then press the 0/. button.

4. To apply and to shift to Navigation mode, press **Enter.**

5. Press **Esc** to exit the Network menu.

3.2.2.5 Viewing MAC Address

To view the MAC address:

1. Press the **NTWK** hot key.
2. Press the **Λ** or the **Λ** button to navigate to NTWK: Control MAC.

   The MAC address displays beneath the parameter name.
3. Press **Esc** to exit the parameter.

3.2.3 Start Using the Device - Standalone Control Mode

Once you configured the ProStream 1000 IP address successfully, you may use the Web client to further configure the device and provision streams through it. Access to the Web client is restricted and requires to provide valid login information. Two optional access levels are available:

Table 3-4: Standalone Access Level

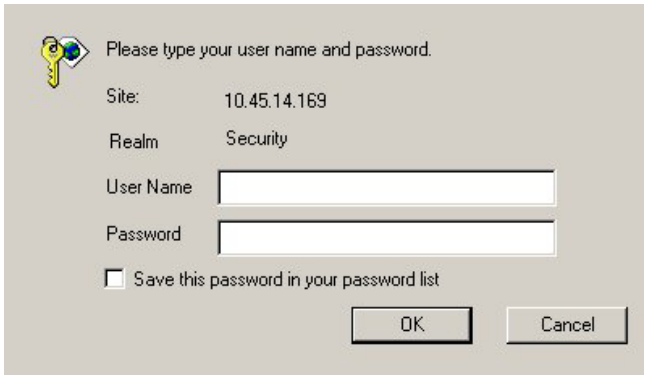
Access Level	Authorized Operation
Monitor	Allows only to monitor the operation of the device.
Configure	Allows to configure the device only via a web client and to define the monitor access level password.

Each access level requires a correct username and password combination. The current access level appears in the upper right corner of the web client page.

3.2.3.1 Logging into the Device

1. Start Microsoft Internet Explorer (IE) on a PC that meets the system requirements as listed in *1.1.1 System Requirements of Managing PC* on page 8.
2. In the address bar of the IE, type the address of the ProStream 1000.
3. Click the **Log In** link.

   The following window appears:



4. Type in the required user name and password. When logging in for the first time, use the default password indicated below:

Table 3-5: Standalone Default Password

User Name	Default Password
monitor	monitor
configure	configure

NOTE: To change a password, refer to the ProStream 1000 Online help.

5. You may save the password for future use by selecting the **Save this password in your password list** box and clicking **Ok.** However, it is recommended to avoid using this option when accessing the Web client as *Configure* and when working from a computer that many users may access.

   The Web client opens and you may complete the configuration, provision the device and monitor its operation. For information and explanations about the device configuration, provisioning and monitoring, refer to the **ProStream 1000** *Online Help*.

NOTE: After three unsuccessful login trials, or if you forgot your password/user name, reset your password. To reset the password, call Harmonic customer support.

Chapter 4
Upgrading Firmware

The device is shipped with valid firmware and web client installed. However, the firmware may need to be updates as new features are introduced.

4.1 Upgrading Firmware in NMX Control Mode

The firmware upgrade of ProStream 1000 units managed by NMX is done through the NMX Digital Service Manager. Refer to the *NMX Online Help* for further details. For standalone devices that are managed through the web client, refer to the following instructions, or to the *ProStream 1000 Online Help*.

NOTE: Upgrades from version 1.1.1 and up to version 2.0 and up should be done via NMX only. This applies also to devices that previously operated in a standalone mode.

Chapter 5
Troubleshooting

5.1 Troubleshooting

The table below lists the alarm messages and describes their probable cause and possible solutions. The alarms are arranged according to the various module and in alphabetical order:

.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Platform	CPC Card HW Failure	An essential component of the card is faulty.	Power-off the device and Call Customer Support
	CPC Card Temp. Sense Exceed Limits	The card is overheating.	■ Check for proper operation of the cooling fans. ■ Power-off the device. ■ Ensure that the air filters are clean. ■ If alarm persists, call Customer Support.
	CPC Card Voltage Error	Inappropriate power supply of CPC card.	Power-off the device and Call Customer Support.
	Got New Configuration	Indicative alarm that appears in History log only. Indicates a change in the configuration.	N/A
	NTP Connection Failure	Connection to NTP failed or lost	■ Check Ethernet link of Ethernet port 3. ■ Check NTP server definitions.
	Front Panel Not Present	Front panel malfunction	Call Customer Support
	Failure Generating CW	The CWS (Control Word Server) does not successfully generate CW.	Power down and power up the CWS
	More Than One NMX Connected to the Device	More than one NMX is controlling the device.	In the web client of the device, open the Support page, and click View Net Stat. Look for TCP connections port 80 (HTTP) and try to figure out via IPs which NMX is yours. If there is an unknown IP, ask your IT team about it.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Platforms	Platform Change to be Backup	Indicative alarm that the unit configuration has changed and currently it is configured as a backup device	N/A
	Platform Change to be Primary	Indicative alarm that the unit configuration has changed and currently it is configured as a primary device	N/A
	DT Mux Priority Changed	Indicative alarm remitted when a redundancy switch has taken place. Thus, the DT mux priority was changed.	N/A
	Platform Initializing	Indicative alarm that appears in History log only.	N/A
	Auto-Negotiation Failed: management network	The handshake protocol with the switch failed	Reconfigure the switch to use auto-negotiation settings.
	Auto-Negotiation Failed: CAS network	The handshake protocol with the switch failed	Reconfigure the switch to use auto-negotiation settings.
	Could not Reserve Max Splice Engines	The device could not reserve maximum splice engines to splice services.	Check how many spliceable services were configured and remove unnecessary services
	Reset Required after Successful DL	The required firmware is ready. Reset the device to bootup with the new firmware.	Reset the device.
	Background Download in Progress	Background download in progress	N/A
	Background Download in Progress - Retry	Indicative alarm. Background Download is in Progress.	N/A
	Background Download Failed - TFTP Error	Background download failed due to TFTP error.	Check that the TFTP server is up and running. Zap the device.
Platform	Background Download Failed - Disk Full	Background download failed because the disk is full.	Remove previous firmware files to free up space.
	Background Download Failed - Error	Background download failed.	Check that the TFTP server is up and running. Zap the device.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
	Background Download Cancelled	Background Download was cancelled	Reboot the device or retry to download firmware.
	Reserved BR in Safe Mode	At least one of the DiviTrack pools was configured to enable the reservation of pool bitrate. When this is true, the Multiplexer expects the reserved bitrate client to communicate with it at least once every 5 seconds. This term was not fulfilled, so the actual reserved bitrate for every DiviTrack pool will be the maximum configured bitrate.	Contact Harmonic Customer Support.
	License Grace Period Enabled	A licensed feature has been used without a license. You have a grace period of 45 days to use this feature and to purchase a license	Purchase the license for the feature
	License Expired	License has reached its expiration date.	Purchase the required license
	License General Failure	An internal licensing failure is detected	■ Restart the device ■ If problem persists, call Customer Support.
Slot	Card Mismatch	The detected card is not as configured	Verify that the appropriate card is mounted in the slot.
	Card Missing	The configured card is not detected in the slot.	■ Verify that the card is mounted in the slot ■ Verify that card is secured to the slot. ■ If problem persists, replace card.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
ASI Card	ASI Card Sensed Temp Exceeds Limits	The card is overheating.	■ Check for proper operation of the cooling fans. ■ Power-off the device. ■ Ensure that the air filters are clean. ■ If alarm persists, replace the IOM card.
	ASI Card HW Failure	An essential component of the card is faulty.	Replace card.
	ASI Card Initializing	An essential card error.	Replace card.
	ASI Card Voltage Error	Inappropriate power supply of GbE card.	Replace card. If more than one card issues the alarm, call Customer Support.
ASI Scr Card	ASI Sensed Temp Exceeds Limits	The card is overheating.	■ Check for proper operation of the cooling fans. ■ Power-off the device. ■ Ensure that the air filters are clean. ■ If alarm persists, replace the IOM card.
	ASI Card HW Failure	An essential component of the card is faulty.	Replace card.
	ASI Card Initializing	An essential card error.	Replace card.
	ASI Card Voltage Error	Inappropriate power supply of GbE card.	Replace card. If more than one card issues the alarm, call Customer Support.
8VSB Card	Meteor Card Initializing	An essential card error.	Replace card.
	Meteor Card HW Failure	An essential component of the card is faulty.	Replace card.
	Meteor Sensed Temp Exceeds Limits	The card is overheating.	■ Check for proper operation of the cooling fans. ■ Power-off the device. ■ Ensure that the air filters are clean. ■ If alarm persists, replace the card.
	Meteor Card Voltage Error	Inappropriate power supply of GbE card.	Replace card. If more than one card issues the alarm, call Customer Support.

Table 5–1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
ASI Port	ASI Input Signal Loss	No ASI input flow	■ Check the ASI source ■ Check the ASI input cable and replace if defective.
	ASI Input Sync Loss	No valid MPEG data detected on the input ASI signal	Check the ASI source
	ASI Output Bitrate Unsynchronized	The physical ASI output transport rate is different from the transmitted data rate. Not all the devices in the SFN transport chain are locked to GPS clock. Verify that the GPS receivers on the central and peripheral headends are locked.	1. Verify that the SFN adapters on the central and peripheral he1adends are free of alarms. 2. Verify that the SFN parameters defined for the SFN adapter on the central headend are the same as the SFN parameters defined for the SFN output of the ProStream device of the peripheral headend. 3. Verify that the ProStream device of the peripheral headend has no other alarm and that there is no ASI Signal Loss alarm on the input of the external clock.
	DSR Inserted Bitrate Too High	The bit rate of the inserted regional content is higher than the bit-rate of the PIDs dropped from the national	■ Lower the bit-rate of the inserted regional content ■ Activate the Utilize Nulls Bitrate option
8VSB Port	Meteor Demodulator Reset	No RF input is detected	Check RF input
DSR	DSR National Sync Loss	National input TS sync loss	Check national source
	DSR National CC Errors	National input continuity counter errors	Check national source
	DSR Regional Sync Loss	Regional input TS sync loss	Check regional source
	DSR Regional CC Errors	Regional input TS continuity counter errors	Check regional source
	DSR MIP Missing	MIP PID is missing on input	Check national TS
	DSR Proview Off	DSR mode on the Proview is off	NA

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
ReEncoding Card	ReEnc Card Initializing	Indicative alarm that appears in History log only.	N/A
	ReEnc Card Failure	The recoding unit crashed resulting from an unknown error, or the input video stream is not MPEG compliant.	Check the input stream.
ReEncoding Card	ReEnc Card Temp. Sense Exceed Limits	The card is over heating	■ Check for proper operation of the cooling fans. ■ Power-off the device. ■ Ensure that the air filters are clean. ■ If alarm persists, call Customer Support.
	ReEnc Card Voltage Error	Inappropriate power supply of ReEncoding card.	■ Replace card. ■ If more than one card issues the alarm, call Customer Support.
ReEncoding Engine	MTS FPGA Signal Loss (from SBP)	ReEncoding engine internal error	Call Customer Support
	MTS FPGA Sync Loss (from SBP)	ReEncoding engine internal error	Call Customer Support
	MTS FPGA Output Overflow (to BIO)	ReEncoding engine internal error	Call Customer Support
Transcoding Card	Transcoding Card Initializing	Indicative alarm that appears in History log only.	N/A
	Transcoding Card Failure	The transcoding card crashed resulting from an unknown error.	Call Customer Support
	Transcoding Card is Not Supported by HW Model	The device RAM is less than 1G.	Call Customer Support
	Transcoding Card Temp. Sense Exceed Limits	The card is over heating	Call Customer Support
	Transcoding Card Voltage Error	Inappropriate power supply of transcoding card.	Call Customer Support

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Transcoding Engine	No Communication with TransEngine	The main processing unit cannot communicate with the transcoding engine	Verify that the Transocding card is securely fastened in its slot If persists, call customer support
	TransEngine FPGA Signal Loss	Transcoding engine internal fault	Call Customer Support
	TransEngine FPGA Sync Loss	Transcoding engine internal fault	Call Customer Support
Transcoding Engine	TransEngine FPGA Output Overflow	Transcoding engine internal fault	Call Customer Support
	Loss of Input TS (no nulls)	Transcoding engine internal fault	Call Customer Support
	TransEngine Application Error (no output)	Transcoding engine internal fault	Call Customer Support
	Host-TransEngine Sync Error (Time Change)	Transcoding engine internal fault	Call Customer Support
	TS RX Overflow Error	Transcoding engine internal fault	Call Customer Support
	TS TX Underflow Error	Transcoding engine internal fault	Call Customer Support
	Audio DSP - Communication Failure	Transcoding engine internal fault	Call Customer Support
	Audio DSP - Core Failure	Transcoding engine internal fault	Call Customer Support
	Audio DSP - System Failure	Transcoding engine internal fault	Internal problem. If problem persists, call Customer Support.
	Audio DSP - Not enough resources	Transcoding engine internal fault	Check that configuration meets spec.
	License Transcoding Missing	No license for transcoding and Grace period has expired.	Purchase the required license
	License PIP Missing	No license for PIP and Grace period has expired.	Purchase the required license
	License Audio Level Missing	No license for ALM and Grace period has expired.	Purchase the required license

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Pool	License Pool Missing	No license for pool and Grace period has expired	Purchase the required license
GbEPro Card	GbE Card Sensed Temp Exceeds Limits	The card is overheating.	■ Check for proper operation of the cooling fans. ■ Power-off the device. ■ Ensure that the air filters are clean. ■ If alarm persists, replace the IOM card.
	GbE Card HW Failure	An essential component of the card is faulty.	Replace card.
	GbE Card Initializing	An essential card error.	Replace card.
	GbE Card Sensed Temp. Exceeds Limit	The card is over heating	Replace card.
	GbE Card Voltage Error	Inappropriate power supply of GbE card.	Replace card. If more than one card issues the alarm, call Customer Support.
	GbE Output Multicast Buffer Overflow	Too many identical PIDs are output through the same IOM card.	Reduce the number of multicast PIDs.
	GbE Input Descrambling Bitrate Exceeded	The input traffic buffer overflowed.	Check the input bit rate.
GbEPro	GbE Card Input Data Loss	An internal data error in the GbE IOM card.	Reassign the GbE IOM.
	Pacer Clock Error	An internal error in the GbE IOM card.	Reassign the GbE IOM.
	GbE Flash Upgrade in Process	A notification message during the upgrade of the GbE IOM firmware.	N/A

Table 5–1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
GbE Port	GbE Auto-Negotiation Failed	The handshake protocol with the switch failed	Check switch.
	GbE Input Error	Input GBE port general failure.	1. Verify that an SFP is installed in the port. 2. Check the physical connection between the port and the switch. 3. Check the validity of the GbE port configuration and that it matches the network definitions.
	GbE Input IP Packet CRC Error	At least one IP packet has a CRC error	Check the switch, fiber, and SFP connections.
	GbE Input IP Packet Missing	At least one IP packet is missing	Check the switch, fiber, and SFP connections.
	GbE Input Non MPEG Buffer Overflow	Management traffic on the GbE network port exceeds the port's capacity.	Look for sources with excessive management traffic.
	GbE Input Inter Packet Gap Too Small	The Inter Packet Gap is below 12 ticks.	Check source.
	GbE Input Invalid IP/UDP Packet Length	The payload length of an input IP/UDP packet is not divisible by 188 bytes (standard length of an MPEG packet)	Check source.
	GbE Link Down - Cable Disconnect	The Gigabit Ethernet port is down.	Connect the cable.
	GbE Port Failed	The GbE port link is down.	Check the link for connectivity.
	GbE Output MPEG Buffer Overflow	FIFO overrun causes data to be dropped and might cause decoding problems.	Standalone - reset the module. If it does not remit the alarm, contact Harmonic Customer Support.
	GbE SFP Missing	The SFP connector is missing from the GbE port	Check that the SFP connector is fully inserted.
	GbE Slave Channel Activated	In port redundancy, the backup port is active	None

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
GbE In Access Point	GbE Input Backup Socket Not Active	No data is detected in the backup input socket	Verify the socket is correctly defined and is streamed to the device.
	GbE Input Primary Socket Not Active	No data is detected in the primary input socket	Verify the socket is correctly defined and is streamed to the device.
	GbE Input Socket Buffer Overflow	Input bit rate exceeds estimated bit rate	Check source
	Invalid Source Clock Frequency	Source clock frequency breaches the MPEG specifications	Check source
	GbE Input Socket Lost PCR	For more than 100ms, no PCR has been detected at input socket	Check source
	GbE Input Socket Erred PCR	PCR discontinuity with no Discontinuity indicator	Check source
	GbE Input Socket CBR Rate Changed	Detects a change in the bit rate of an MPTS. The MPTS must be a CBR stream.	Check source
	GbE Input Socket Max. Jitter Exceeded	An MPTS socket is not CBR	Check source
	GbE Input Socket Timestamp Error	The order of the transport stream packets inside the IP packet is wrong.	In most cases, this is a momentary alarm. If this alarm is not remitted, check the network.
	Failed to Receive CW for the Service	The descrambler does not successfully receive a CW response for the service from the CWS (Control Word Server).	Check that the CWS is alive and communication cables are connected.
	Invalid Response from CWS	There are problems in communication between the descrambler and CWS.	Check that the CWS is alive and communication cables are connected.
	Missing ECM	No ECM was extracted from PMT for the scrambled service.	The scrambler does not send ECM to the descrambler. Check scrambler configuration.
	Missing CA Information	There is no CA information for the descrambled service.	The CA descriptor is missing. Check the scrambler configuration.
	Undefined Scrambling Algorithm	There is no AES descriptor in the PMT.	The descrambler still will try to descramble the service. The scrambler should add a CAS Mode descriptor to the PMT.

Table 5–1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
GbE In Access Point	Unsupported Scrambling Algorithm	The scrambling descriptor is not AES-NSA.	In this case, the descrambler will still try to descramble the service. The scrambler should add a scrambling descriptor with an AES-NSA value to the PMT.
	Encoder's Clock Not Synced to Mux	The clock of the encoder is not synchronized with the clock of the multiplexer.	Check the schedule format against the specification.
	GbE Input Primary Socket-PAT Missing	PAT is missing in the primary socket for a longer period than the configured failover time	Check source
	GbE Input Backup Socket-PAT Missing	PAT is missing in the backup socket for a longer period than the configured failover time	Check source
	Missing PMT		
	Missing Backup PMT		
	GbE Backup Socket Activated	With access point/socket/service-level redundancy configured, the primary transport has failed, and the backup transport is active.	None
	Queue Depth Threshold Passed	The allocated buffer reaches the predefined fullness (50%)	Check bit rate configuration in the input data socket
	GbE Input Primary Socket - A/V Missing	With access point/socket/service-level redundancy configured, the primary transport failed.	1. Check the GbE input for link and activity. 2. Check that the IP and UDP are indeed flowing to the port. 3. Check that the IP and UDP do not create a conflict with other sockets (same 32 lower bits).
	GbE Input Backup Socket - A/V Missing	With access point/socket/service-level redundancy configured, the primary transport failed.	1. Check the GbE input for link and activity. 2. Check that the IP and UDP are indeed flowing to the port. 3. Check that the IP and UDP do not create a conflict with other sockets (same 32 lower bits).
	DiviTrack Upstream Problem	Connectivity problem between the DiviTrack controller and the encoder.	Check the connectivity between the device and the encoder.
	DiviTrack Downstream Problem	Connectivity problem between the encoder and the DiviTrack controller.	Check the connectivity between the device and the encoder.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
GbE In Access Point	PSIP Tables Missing	PSIP Master Guide Table (MGT) was lost.	Recheck the connection and extraction settings.
8VSB In Access Point	Meteor Weak Signal/Loss of Sync	No RF input is detected	Check RF input
	Meteor Packet Error Rate Threshold Exceeded	Problematic RF signal.	Check support Meteor page to get the actual instantaneous packet error rate value.
	Meteor Signal Quality (SNR) Below Threshold	Problematic RF signal.	Check support Meteor page to get the actual signal quality value.
GbE Out Access Point	GbE Output Socket Not Transmitted	Cannot get MAC address of the destination in unicast mode.	Check IP connectivity to destination.
	GbE Output Socket - Unreachable Destination	Cannot get an updated destination MAC address. Output is sent to the last known MAC address. (in unicast mode)	Check IP connectivity to destination.
	GbE Output Socket - Buffer Overflow Level = High	The actual bit rate of the GbE output socket exceeds the configured output bit rate	Delete services from the alarmed TS until the bit rate stabilizes and the alarm is remitted or redefine bit rate for this socket.
	GbE Output Socket - Buffer Overflow Level = Normal	Because of PID priority, some PIDs from Normal priority are dropped.	Informational only.
	GbE Output Socket - Buffer Overflow Level = Medium	Because of PID priority, some PIDs from Medium priority are dropped.	Informational only
	GbE Output Socket - Buffer Overflow Level = Low	Because of PID priority, some PIDs from Low priority are dropped.	Informational only.
	Invalid CAS Mode	An invalid CAS mode is detected	Set the correct CAS mode
	DVB Regen. Not Supported by this HW Model	DVB Regenerations Not Supported	This HW model does not support this feature.

Table 5–1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
TsIn	TsIn CC Error Detected	The splicer detected a continuity counter error on the transport stream input.	None
	TsIn MPEG Sync Loss	The port has lost sync with the incoming transport.	Check source
	Invalid CAS mode	The CAS mode for fixed key should be AES_CBC for both descrambler and scrambler	Change the CAS mode and reset the device

Table 5–1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
CAS	ECM Stream Error	This alarm is related to the ECMG machine. Cannot get ECM from ECMG.	1. Check ECMG logs. 2. Check AC. 3. Check the error number, reported from ECMG.
	ECM Spooling Error	There is a failure in ECM spooling.	The total number of spooled tables should not exceed 128 tables per transport stream.
	EMM PID Missing	The configured EMM is missing	■ Check EMM configuration ■ Check connectivity between device and EMMG.
	EMM Bitrate Exceeded	The bit-rate of the EMM is higher than the configured bit-rate	Check EMM configuration
	SCS ECMG Connection Error	The ECMG connection has been disconnected for 10 seconds. Services may not be encrypted properly.	Check the ECMG properties, the Ethernet network, and the ECMG.
	SCS EIS Not Connected	The TCP connection with the EIS client on port 11000 is not established.	Ensure the following: ■ The TCP link with EIS (ping) exists. ■ The EIS configuration is 11000.
	ECM is Missing in Configuration	One or more ECMs in one or more SCG messages are missing, or the device receives an SCG message with an unknown ECM ID.	Add an ECM and update as necessary to ensure that all ECMs in SCG messages are present in the ECM configuration.
	PID to Scramble is Missing in Config	One of the PIDs that suppose to be scrambled isn't configured in the output.	Verify output configuration and EIS SCG provisioning.
	SCS ECMG Communication Problem	The ECMG connection has been disconnected for 10 seconds. Services may not be encrypted properly.	Check the ECMG properties, the Ethernet network, and the ECMG.
	SCS CP Less than Delay Start	The Crypto Period is less than the delay start.	Adjust the Crypto Period or Delay Start property values so that the crypto period is greater than the delay start value.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Reference Service	Remap Range Overflow	The number of PIDs of the Reference Service exceeds the configured number	Increase the configured remap range.
	Input Service Missing	The PMT of the Reference Service is missing	Check source
	Input RSS PID Missing	At least one PID is missing in the Reference Service	Check source

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Output Stream	PID Missing	Provisioned PID is missing in the input	Check source.
	Unsupported Chroma Sampling Mode	The input video stream is not 4:2:0.	Do not attempt to re-encode video streams of chroma sampling mode other than 4:2:0.
	Low Delay Video Stream Detected	The input video stream is low-delay and cannot be re-encoded.	Do not attempt to re-encode low-delay content.
	HD Stream Detected	The video stream is HD and cannot be re-encoded.	Do not attempt to re-encode HD streams.
	Unsupported Frame Rate	The input video stream is not NTSC.	Do not attempt to re-encode non-NTSC video.
	Unsupported Resolution	The input video stream horizontal resolution is not supported.	Do not attempt to re-encode a video stream with a horizontal resolution that is not 480, 528, 544, 704, or 720.
	Encrypted PID	The input stream is encrypted and cannot be re-encoded.	Do not attempt to re-encode encrypted content.
	No DTS/PTS Detected at Input	No DTS/PTS was detected at input for 700 ms. The input video stream is not MPEG compliant.	Check the input stream.
	Invalid DTS at Input	The input video stream is not MPEG compliant.	Check the input stream.
	Sequence Header Error	The input video stream is not MPEG compliant.	Check the input stream
	Picture Header Error	The input video stream includes an invalid picture header or bad marker bits. The input video stream is not MPEG-compliant.	Check input stream.
	Video Macro Block Level Error	A problem was encountered in decoding the slice and macro blocks.	Check the source.
	MPEG1 Stream Detected	The video stream is MPEG1 and cannot be re-encoded.	Do not attempt to re-encode MPEG1 streams.
	Progressive Refresh Stream Detected	A progressive refresh video stream was detected in a re-encoded service. Re-encoded services do not support progressive refresh streams.	Remove the progressive refresh stream from the re-encoded service.

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Output Stream	Field Pictures Detected	Field pictures were detected. Field picture streams are not supported in re-encoded services.	Remove field picture stream from the re-encoded service.
	Unexpected Frame Rate (Video Standard)	The input video stream is not MPEG compliant.	Check the input stream
	Unable to Decode Input Stream	The device cannot decode the input stream.	Check the input stream.
	Corrupt Input TS	The input transport stream is corrupted.	Check the input stream.
	Processing Input PID Missing	Internal error in transcoding engine	Call customer support
	Wrong Video Standard (MPEG2/H264)	This input video format is not supported in this version.	Check input
	Input Vertical Resolution Mismatch	The configured VR does not match the actual VR	Check input
	Vertical Resolution Changed on Input	A notification because it is service affecting. While transcoding the input VR type changed.	Engine is resetting and transcodes with new resolution.
	Invalid Picture Type (not I, P or B)	Applies to input video format H264. It is a stream related failure while decoding the stream.	Check input
	Reference PCR PID Interval Error	Did not get reference PCR for > 500 ms. Either the PID does not contain PCR values or it is missing.	Check the source.
	PID Recoding Failure	Invalid content for reencoding.	Check source
	PID Xcoding Failure	Invalid content for transcoding	Check source
	Input Codec Not Supported	The input video type is different than 2, x80 and x1B.	Change the input type (should not require removal and re-creating the stream)
	Output Codec Not Supported	The output codec is not supported	Change the output
	SD Transcoding Not Supported	When trying to transcode a SD stream.	Check configuration

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Output Stream	Audio - Cannot decode - Corrupted input	Invalid content for decoding.	Check input source. If problem persists, call Customer Support.
	Audio - Decoder Failure	The device cannot decode the input stream due to either input source or stream configuration.	Check input source and stream configuration. If problem persists, call Customer Support.
	Audio - Encrypted PID detected	Cannot decode an encrypted PID.	Check input source.
	Audio - No input/ Unable to sync	No input stream is detected	Check input source.
	Audio - No PES detected	No audio frames are detected in the input stream.	Check input source.
	Audio - Input Audio Mode Higher than Config	Inconsistency between actual input audio mode and configured audio mode. For example, actual is MC and configured is ST.	Check Input Coding Mode configuration.
	Audio - Encoder Failure	Is this output stream????	Internal problem. If problem persists, call Customer Support.
	Audio - Unsupported Output Bitrate	The configured output bitrate is not supported for the configured coding mode.	Check that bitrate configuration is supported for configured Output Coding Mode. See Table 7-24 on page 123.
	Audio - Unsupported Output Coding Mode	The configured output coding mode is not supported.	Check configuration. Try changing *Follow* to another value.
	Audio - Unsupported Output Sample Rate	Output sample rate is always as in the input.	Check configureation
	Audio - Cannot Meet PCR Insertion Rate	The bitrate of the inserted PCR is too high.	Might be remitted by increasing stream configured bitrate
	Audio - Encoder detect PTS Gap	No PTS was detected at input for XXX ms. The input video stream is not MPEG compliant	Check input source

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Output Service	Backup Service 1 is Activated	Backup serivce1 is activated	Informational alarm only. Look for another alarm that triggered the backup service.
	Backup Service 2 is Activated	Backup service 2 is activated	Informational alarm only. Look for another alarm that triggered the backup service.
	Backup Service 3 is Activated	Backup service is 3 activated	Informational alarm only. Look for another alarm that triggered the backup service.
	Service Failure	Service is not streamed out	Check source
	Recoding Unit Failure	The recoding unit crashed resulting from an unknown error, or the input video stream is not MPEG compliant.	Check the input stream
	Input PCR Interval Error	Interval error > 100 ms.	Informational only.
	Corrupt Input PCR	The device detects more than one time base discontinuity within one second.	
	PCR on Unsupported Component	The input PCR is not carried on the video component.	Informational alarm.
	Too Many ES	The input service includes a number of non video elementary streams beyond the device's re-encoding capabilities. The maximum number of ES on the ProStream 1000 is 6.	Do not attempt to re-encode content with more than one video and five non video elementary streams.
	Could not Allocate Recoding Unit	The device could not allocate a re-encoder to re-encode this service. There were no free units to re-encode the program.	Check how many re-encoded services (VBR, Caped VBR, and DTMX pools) were configured and remove unnecessary services.

Table 5–1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Output Service	Excessive Non-Video Rate	The allocated video rate is less than 2 Mbps.	Monitor the service to check its behavior. If problem persists, call Customer Support.
	I-Frame Dropped	Due to errors in the input, the capped GOP structure was violated, and an I-frame was dropped.	Check the input stream.
	ReEncoded Service Required Video ES	There is no video ES for the re-encoded service.	Verify that a video PID is provisioned on the service.
	ReEncoded Service Rate Too Low	In DiviTrackMX, the rate is too low for encoding.	N/A
	EAS is Activated	EAS service is activated.	None
	EAS Input Service Missing	The associated EAS input service is missing.	Check the EAS input transport to ensure that the associated EAS input service exists.
	Pass-Through Service Exceeded Max Rate	Input bit rate of the Pass-Through Service is higher than Max Bit Rate. Service output will be muted.	Check input signal.
	Slate Service is Activated	Occurs when the Slate feature is activated.	None
Output Service	Slate Service Failure	Occurs on the service output when the Slate is missing from the service input (even when the Slate is not activated).	The stream cannot flow end-to-end. Check input stream.
	Primary Service Failure	The primary/backup source failed.	The stream cannot flow end-to-end. Check input stream.
	Backup Service 1 Failure	The stream cannot flow end-to-end.	Check input stream.
	Backup Service 2 Failure	The stream cannot flow end-to-end.	Check input stream.
	Backup Service 3 Failure	The stream cannot flow end-to-end.	Check input stream.
	Service Name SCTE30 Error	In splicing, another spliceable service with the same name is detected	Check configuration

Table 5-1: Alarm List Raised by Platform

Source Object	Alarm Message	Description	Solution
Output Service	Exceeded Spliceable ESs Capacity	In splicing, too many PIDs are associated with the service. The maximum PIDs are: Up to one video, up two audio, up to eight data PIDs	Check configuration to match spec
	No SCTE30 connection	In splicing, Ad-Server either did not send Init request or Init request is wrong.	Check Ad-Server configuration
	Insertion Channel is Missing	Insertion channel (ad) did not arrive on time.	Check Ad-Server streaming interface.
	Input PMT Missing	PMT entry required on the output was not received on the input.	Recheck the extraction settings on the service provided as the tables' input for the PSIP/DVB regeneration.
	Input VCT Missing	VCT entry required on the output was not received on the input.	Recheck the extraction settings on the service provided as the tables' input for the PSIP regeneration.
	ReEncoded Service Missed Rate	DiviTrackMX, internal fault	If alarm persists, call Customer Support
	Transcoding Unit Failure	The transcoding unit crashed resulting from an unknown error, or the input video stream is not MPEG compliant.	Check the input stream.
	Could not Allocate Transcoding Unit	Too many services to transcode. Cannot allocate trans engine	Check configuration
	Reenc and Trans are selected for the Service	Wrong configuration	Check configuration either to reencode or to trans

Chapter 6
Maintenance

6.1 Air Filters

ProStream 1000 uses two air filters to minimize dust and dirt in the circuitry and components in the chassis. These filters are made of flexible, compressed fiber spun from urethane foam. Installed in the front of the unit, the filters are fire retardant and conform to UL 900 Class II specifications.

The bezel filter (front view) fits on the left side, inside of the front bezel. The following figure shows the dimensions of the bezel filter.

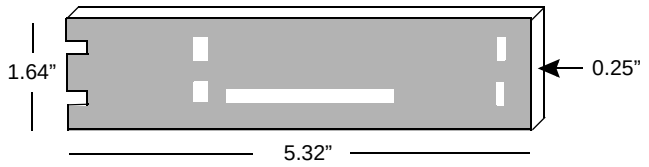


Figure 6-1: Bezel Filter Dimensions

The notches on the left side and the cutouts in the middle fit on either side of the front bezel mounting posts.

The keypad filter (front view) sits behind the keypad on the local control panel. The following figure shows the keypad filter.

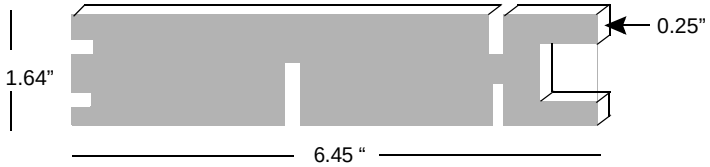


Figure 6-2: Keypad Filter Dimensions

6.1.1 Maintaining the Filters

The operating environment of the device plays a large factor in determining the life of the air filters. Devices that operate in dusty and dirty surroundings require more frequent inspections and filter cleaning than those operating in cleaner environments.

Inspect and clean the filters with a frequency that is appropriate to the environment in which the device operates. Harmonic recommends inspecting and cleaning the filters every six weeks to ensure proper airflow through the chassis.

To clean dust and dirt from the filters, you can use a vacuum to remove the dirt or rinse them in water. You can also use soaps or mild detergents on the filters. If you rinse the filters in water, make sure that you squeeze the excess water from them before reinstalling them in the device. You might need to order replacement filters if the filters become too dirty over time.

NOTE: You do not need to turn off the device when removing and replacing the air filters.

6.1.1.1 Replacing the Bezel Filter

To remove the front left filter from behind the front bezel:

1. Grasp each side of the device's front bezel with your hands.
2. Carefully remove the front bezel by pulling it away from the device.
3. Remove the filter from inside the front bezel; inspect it for cleanliness.

NOTE: When new, the color of the filter is medium charcoal. As dust and dirt collect in the porous filter material, the filter's color gradually changes to brown, then an ash color.

4. Clean the filter if necessary.
5. Replace the filter inside the front bezel.

   Place the filter so that the long horizontal slot is at the bottom edge. Carefully place the cutouts in the filter around the bezel mounting posts.
6. Carefully replace the front bezel on the device making sure the filter does not fall out of the bezel.

6.1.1.2 Replacing the Keypad Filter

To remove the air filter behind the keypad:

1. Grasp each side of the device front bezel with your hands.
2. Carefully remove the front bezel by pulling it away from the device.

   Note the location of the filter. The keypad is screwed onto the front of the device through four mounting posts. Cutouts on the filter wrap around the four posts, and the right side of the filter extends past the keyboard.
3. Remove the filter by pulling the left side of the filter up and away from the keyboard mounting posts, then pulling up the right side.
4. Inspect the air filter for dirt and clean it if necessary.
5. Replace the air filter by inserting the right side of the filter behind the keypad, with the vertical slots around the mounting posts.
6. Insert the left side of the filter, placing the horizontal cutouts around the mounting posts.
7. Carefully replace the front bezel on the encoder making sure the filter does not fall out of the bezel.

6.2 Fan Replacement

NOTE: This section applies to ProStream 1000 with a removable front panel. For details see, *1.2.1 ProStream 1000 Device Types* on page 9.

The ProStream 1000 device uses six fans to control the temperature of the device during operation. The fans are mounted on the back of the front panel and are an integral part of the front panel. In case of a fan failure, hot swap the front panel as instructed below.

NOTE: A failure of a single fan, requires the replacement of the fan module.

6.2.0.1 Removing and Replacing the Fans

The design of the device allows a quick hot swap of the fans. Removing and replacing the fans does not affect the device operation and should last not more than two minutes. If it exceeds two minutes, the device may be damaged.

6.2.0.2 Preparation

For removing and replacing the fans, you need the following:

- Phillips screwdriver
- A new front panel

1. Grasp with your hands each side of the device front bezel.
2. Carefully remove the front bezel by pulling it away from the device.
3. Place the front bezel in a safe and easy to access location.
4. Unscrew the front panel screws.
5. Hold the front panel handle and pull the module away from the device to disconnect the front panel connector.
6. Place the new front panel in its place on the chassis.
7. Verify that the notches located on both sides of the front panel slide on the brackets jutting from both sides of the chassis.
8. Push the front panel to allow the mating connector to mate securely with the connector on the chassis.

Figure 6-3: ProStream 1000 Chassis with Notches and Front Panel Connector

9. Screw the front panel screws to the working device.
10. Push the bezel to snap on the chassis.
11. Verify that the alarm *Fan Failure* is remitted.

6.3 Fuse Replacement

The device uses a slow blow 3.15A, 250V fuse, 5 x 20mm. The fuse is located on the back panel beside the power input. A spare fuse is located in the fuse cover.

Figure 6-4: ProStream 1000 Fuse

6.3.0.1 Replacing the fuse

CAUTION: Always replace the fuse with a fuse of the same rating and type. Using a different fuse voids the Harmonic warranty and could result in fire or other electrical damage.

To replace the fuse:

CAUTION: You must disconnect the power cord before removing the fuse.

1. Unplug the power cord from the chassis.
2. Pull down the fuse cover on the back panel.
3. Remove the old fuse.
4. Install the new fuse.
5. Replace the fuse cover.

   Plug in the power cord.

Appendix A
Physical Specifications

This appendix contains a detailed list of the physical and environmental characteristics of the ProStream 1000 device.

A.1 ProStream 1000 Physical Specifications

Table A-1: ProStream 1000 Physical Specifications

Parameter	Specification
Chassis	1-RU, mounts in Electronic Industries Association (EIA) standard 19" rack.
Dimensions Height Width Depth Weight	 1.75" (4.45 cm) 19" (48.26 cm) 24" (61 cm) 33 lbs (15 kg)
Front Panel	24 button keypad 2 line, 20 character backlit LCD 4 LEDs (refer to *1.3.3 Front Panel LEDs* on page 10)
Communication ports	3 Ethernet ports Serial (EIA RS-232) port Fault Relay Port (currently not in use)

A.2 Environmental Specifications

Table A-2: ProStream 1000 Environmental Specifications

Parameter	Specifications
Operating temperature	32 to 122 °F (0 to 50 °C)
Storage temperature	-40 to 158 °F (-40 to 70 °C)
Relative humidity	Maximum 95% non-condensing

Appendix B
Control Panel Messages

B.1 Control Panel Messages

During boot up process, various messages appear on the control panel display. The messages indicate the progress of the boot up process. The following sections describe the messages that you can see during successful and unsuccessful boot attempts.

NOTE: During the boot sequence, do not press any key on the keypad.

B.1.1 Successful Boot

The following sequence describes the display on the LCD at startup during a successful boot:

B.1.1.1 NMX Control Mode

- Power on

  MAC Address
  System loading...
- Booting

  Boot from network
  Loading xx.xx.xx.xxx
- Finished

  HARMONIC ProStream 1000
  WWW.HARMONICINC.COM

Usually, the LCD display shows the device name and Harmonic's web site address as appears at the end of a successful boot process.

B.1.1.2 Standalone Control Mode

- Power on

  MAC Address
  System loading...
- Booting

  Boot from Hard Ware
  Boot Attempt 5

  MAC Address
  IP Address
- Finished

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B.1.1.3 Unsuccessful Boot

A failed network boot ends with the following message:

Error loading from net
Reset

At this point the device resets itself and starts the boot process again.

B.1.1.4 Additional Messages of the Control Panel

If you reset or zap the device, the local control panel displays messages for these actions:

Resetting ProStream 1000 - When you reset ProStream 1000 from the NMX, the following message appears on the LCD display:

Boot from HD
Loading xx.xx.xx.xxx

Zapping ProStream 1000 - When you zap ProStream 1000 from the NMX, the following message appears on the LCD display:

Boot from network
Loading xx.xx.xx.xxx

Appendix C
Wiring the –48 VDC Power Supply

If your ProStream 1000 uses the –48 VDC power supply, follow these steps to wire the power supply.

C.1 Getting Started

Before you begin wiring the –48 VDC power supply, make sure that you provide the necessary overcurrent protection, wires, and power connector.

C.1.1 Power Source Specifications

The DC power source feeding the ProStream 1000 device must meet the following requirements:

- Electrically isolated from any AC power source
- Positive ground. The Positive bus of the DC power source must be reliably connected to the Ground bus.

Each feed-pair must provide a continuous supply of power that meets the following specifications:

Table C-1: DC Power Source Specifications

Parameter	Specification
Voltage	36 to 75 VDC
Max. operating current	4 amps
Max. input surge current	35 amps

C.1.2 Overcurrent Protection

To provide overcurrent protection:

- Provide overcurrent protection devices as part of each rack housing ProStream 1000 devices.
- Locate readily accessible disconnect device between the DC power source and the ProStream 1000.
- Use a 10-amp double-pole fast trip, DC-rated disconnect device for each DC power connector.

NOTE: Overcurrent protection devices must meet applicable national and local electrical safety codes and be approved for the intended application.

C.2 Wiring Requirements

The ProStream 1000 is connected to the DC power source using three wires:

- –Vin
- GND

- +Vin

Although Harmonic provides the power input connector with the ProStream 1000 device, you must supply the wires.

The wires to be used must comply with the following specifications

Table C-2: Specifications of the DC Power Wires

Parameter	Specification
Suitable conductor material	Copper only
–Vin and +Vin wires	14 AWG rating
Ground cable	14 AWG rating
Cable insulation rating	Minimum 80 C, low smoke fume (LSF), flame retardant
Cable type	Must comply with at least one of the following standards: ■ UL 1581 (VW-1) - UL style 1028 or equivalent ■ EEE 383 ■ EEE 1202-1991
Branch circuit cable insulation color	Per applicable national electrical codes
Grounding cable insulation color	Green-yellow

C.2.1 Power Connector

The ProStream 1000 is supplied with a special DC power connector plug that matches the DC power socket on the power supply.

This connector is made by Wago, model number 231-103/037-000.

Use only the original connector for connecting the ProStream 1000 to the DC power source. Contact Harmonic Technical Support if you want to use any other type of connector.

C.3 Assembling the DC Input Power Cable

To assemble the DC input power cable:

1. Prepare the power wires as specified in *C.2 Wiring Requirements* on page 63.
2. Use the disconnect device to make sure that the power supply from the DC power source to the cables is switched off.

CAUTION: Turn off the power before proceeding with these instructions.

3. Unpack the power connector.
4. Identify the three wires coming from the DC power source that are used in the connection to the expansion unit:
   - ❑ –Vin
   - ❑ +Vin
   - ❑ GND

5. Strip up to 0.3 inches (8 mm) of insulation from each of the wires coming from the DC power source.

   Do not strip more than this length from each wire. Stripping more leaves uninsulated wire exposed outside the DC connector after the assembly is complete.

6. Feed the exposed section of the wires into the matching hole in the DC plug connector according to the following table to match wires with the required holes.

Table C-3: DC Plug Connector Pin Out

Pin	Signal Name
1	-VIN
2	+VIN
3	Chassis ground

C.4 Connecting the Power Cable to the ProStream 1000

For this procedure use a Protective Earthing Conductor listed as min. 14AWG, green/yellow insulation copper wire.

1. Ensure the ProStream 1000 is securely installed in a rack and in a Restricted Access Location only.
2. Connect the 14 AWG rating green-yellow grounding cable with cable terminals to the grounding screw on the ProStream 1000 back panel and to the ProStream 1000 rack as illustrated in the following figure. Make sure to connect to a reliably grounded 48VDC SELV source or a reliably grounded 60 VDC source.
3. Connect the DC input power cable to the DC connector on the power supply unit.
4. Connect the DC input power cable to the DC connector on the ProStream 1000 back panel, as illustrated in the following figure:.

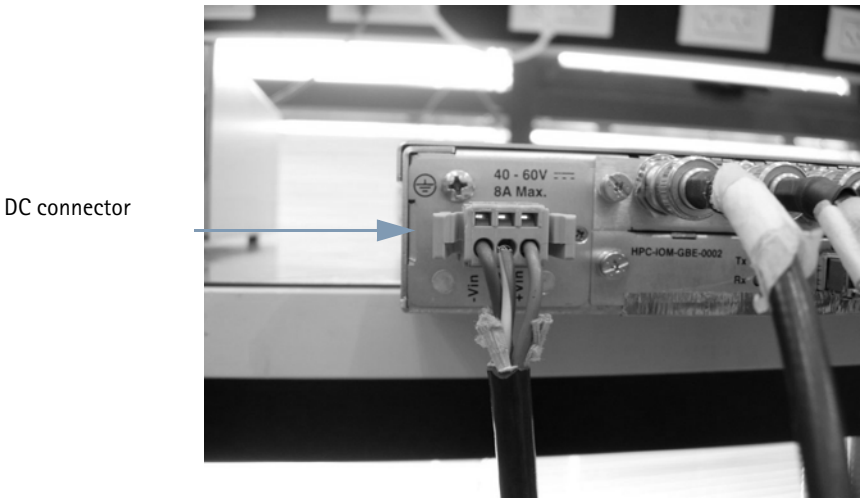

Figure C-1: Connection the DC Input Power

   Your ProStream 1000 is now connected to power.

5. Complete any other cabling that may still be needed, and engage the disconnect device to start using the device.

Harmonic Inc.
4300 North First Street
San Jose, CA 95134 U.S.A.
T +1 408 542 2500
F +1 408 542.2511

www.harmonicinc.com

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