

ProStream[®]

1000

Stream Processing Platform

RELEASE 7.5

Installation Guide



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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.



IMPORTANT: The Important symbol calls your attention to information that should stand out when you are reading product details and procedural information.



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.

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Convention	Explanation
Typed Command	Indicates the text that you type in at the keyboard prompt.
<Ctrl>, <Ctrl>+<Shift>	A key or key sequence to press.
<i>Links</i>	The <i>italics in blue</i> text to indicate Cross-references, and hyperlinked cross-references in online documents.
Bold	Indicates a button to click, or a menu item to select.
ScreenOutput	The text that is displayed on a computer screen.
<i>Emphasis</i>	The <i>italics</i> text used for emphasis and document references.



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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 needs.

Control Modes

ProStream 1000 supports 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 on-board 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.

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	<ul style="list-style-type: none">■ Pentium 3.x or higher■ Windows 2000, XP■ Internet Explorer 5.0 - 6.0

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 can 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 the user's needs. The ASI-RMX card supports a maximum bitrate 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 a maximum bitrate of 140 Mbps.



NOTE: For further details, see [DVB-ASI IOM Card](#).

- 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 can be routed from any input port to any output port.
- Advanced scrambling - 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.

ProStream 1000 Device Types

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

- With a removable front panel
- With a fixed front panel

ProStream 1000 Front Panel

The front panel of ProStream 1000 contains the following:

- Front bezel
- Control panel
- LEDs



Figure 1–1: ProStream 1000 Front Panel

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 [Air Filters](#) for information about cleaning the air filters.

Control Panel

The control panel consists of an LCD display and a keypad. The control panel enables preliminary configuration and basic monitoring of the ProStream 1000. It is usually used for standalone devices. For more information, see [Initial Device Configuration](#).

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	Device is on and boot up process is complete.
	Orange	Device is on and boot up process is taking place.
Fault	Red	An alarm has been activated in the device. See Troubleshooting for more details.
Local	Orange	Identifies the device.
Activity		Currently not applicable

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 varies according to the needs of the user.

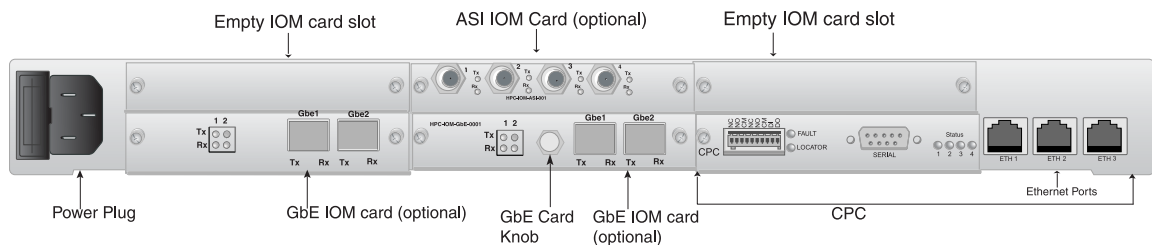


Figure 1–2: ProStream 1000 Back Panel

Power Supply

ProStream 1000 supports both VAC and VDC, according to requirements. A fuse is located inside the power socket. For information about replacing the fuse, see [Fuse Replacement](#). The compartment next to the power cable holds a spare fuse.

VAC Power Supply

The power supply supports a 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

-48 VDC Power Supply

The -48 VDC power supply unit is supplied with the required 3-pin male connector. See [Appendix E, Wiring the -48VDC Power Supply](#) for instructions to connect the power supply.

The following table lists the ProStream 1000's electrical rating for the -48VDC version.

Table 1–4: -48VDC Power Supply

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

Each power supply unit features two LEDs. For a detailed description, see [VAC Power Supply](#).



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.

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, as follows:

- Three Ethernet ports - Ethernet ports allow connection to separate networks. The Ethernet ports are labeled ETH1, ETH2 and ETH3. The ETH3 port is used to connect the device to the management network. The ETH2 port is used to connect the device to the CAS network when required. ETH1 is optional for future use.

ETH1 is 10/100 Base-T port and ETH 2 and ETH3 are 10/100/1000 Base-T ports. For cabling instructions, see [Installing the ProStream 1000 Unit](#).

- EIA-RS-232 Serial Communication Port - Used by 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 describes their functionality. The LEDs function in a similar way whether ProStream 1000 operates in standalone or NMX control mode.

Table 1–5: CPC LEDs

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

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:

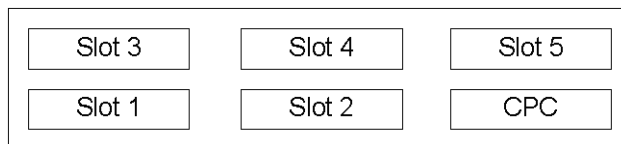


Figure 1–3: ProStream 1000 Slot Arrangement

ProStream 1000 version 5 and up supports two types of the DVB-ASI card and the GbE IOM card.

- DVB-ASI RMX-IOM card
- DVB-ASI SCR-IOM card
- GbE IOM card
- 8VSB Modulation card

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- ASI 4. Each port can 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	ASI ports x 4. Each port can be configured as an input or output port. In the DVB-ASI-SCR card, port 2 can be configured to receive the GPS frequency.
Connector	Female BNC connector.

Table 1–6: ASI Card Specifications

Feature	Description
Max. input bitrate	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 can be routed to multiple output ports simultaneously.

ASI Port LEDs

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

Table 1–7: Status of ASI Port Rx LEDs

Color	Description
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

Table 1–8: Status of ASI Port Tx LEDs

Color	Description
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

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 and GbE 2. Both ports are active and work as two independent ports. Each port is bi-directional and can 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 1–9: 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 bitrate	Up to 400 Mbps per card.
Number of input sockets	Up to 128 sockets SPTS or MPTS for both ports.
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 ports.
Input Dejittering capability	Up to 50msec point-to-point.
Multicast content	Content elements may be simultaneously routed to multiple output ports.
Null Packet Insertion	Constant bitrate 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: <ul style="list-style-type: none"> ■ 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.

GbE Port LEDs

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

Table 1–10: 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 - Real traffic flows through the link.
Alarm	Red	On - Indicates an error in the GbE port.

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

Table 1–11: SFP Types

Fiber/Cable Type	Connector Type	Wave Length	Qualified SFP Make/Model
Multimode fiber	2 x LC	850 nm	Finisar FTRJ-8519-7D

Table 1–11: SFP Types

Fiber/Cable Type	Connector Type	Wave Length	Qualified SFP Make/Model
Singlemode fiber	2 x LC	<ul style="list-style-type: none"> ■ 1310 nm ■ 1550 nm 	Finisar FTRJ-1310-3 Finisar FTRJ-1550-7D
Shielded and grounded CAT-6 or CAT-7	1 x RJ-45	N/A	Finisar FCMJ-8521-3(HR)

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 1–12: Fiber and Required SFP

Fiber	SFP
Multimode	850 nm SFP
Singlemode	<ul style="list-style-type: none"> ■ 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).

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 sends to the outputs four MPEG-2 Transport Streams.



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

8VSB Modulation Card Specifications

[Table 1–13](#) provides the specifications for the RF module.

Table 1–13: 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 decision to release channels 60 to 69 for public safety use.
Sensitivity	-83dBm/6 MHz.
Dynamic Range	> 80dB.

Table 1–13: RF Module Specifications

Feature	Support
MPEG Format	188 Bytes per TS packet.
MPEG-2 TS	MPTS and SPTS.

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

RF Module LED Lights

Table 1–14: LED Status Lights

LED	Color	Description
RF inputs 1 to 4	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 connect the cables.

Preparation

For installation and cabling, you need the following:

- Phillips screwdriver
- Rack-mount screws

Unpacking

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

It contains the following items:

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



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

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.

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.

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.

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.

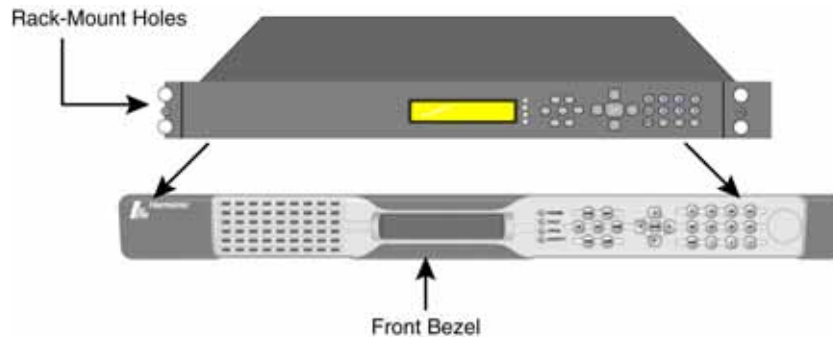


Figure 2–1: Mounting ProStream 1000

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.

Inserting the IOM Cards and RF Input Card

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

ESD Guidelines

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



CAUTION: Electrostatic Discharge (ESD) can 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, 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 an ESD workstation and use an 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.

Required Hardware to insert an IOM/RF card

Before you insert an IOM card, have the following at hand:

- Phillips screwdriver to remove the fillers and to fasten the card to its place.
- ESD-preventive wrist band and a rubber mat.

To insert an IOM/RF card:

1. Unplug the device to power off.
2. Mount the device into the rack (optional).
3. Remove the filler panel that covers the required IOM slot.
4. Follow the ESD guidelines (see [ESD Guidelines](#)) and unpack the IOM card.
5. Hold the card by its edges and 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 now.
9. Start cabling the device. See [Cabling the ProStream 1000](#).

Cabling the ProStream 1000

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 [ProStream 1000 Back Panel](#). 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

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 ETH2 and ETH3 ports on the ProStream 1000 device to your network hub or switch.

Connecting the ASI Input/Output Ports

The ASI ports require a 75-Ohm cable with a 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.

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 [SFP Module](#).

To connect fiber optic/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 optic cable only - If you are using a bi-directional network configuration, use another fiber to connect the Tx port of the SFP to the Rx port of the switch.

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

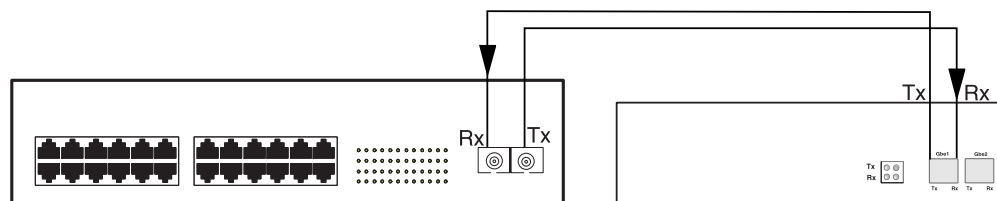


Figure 2–2: Connections with fiber optic cables

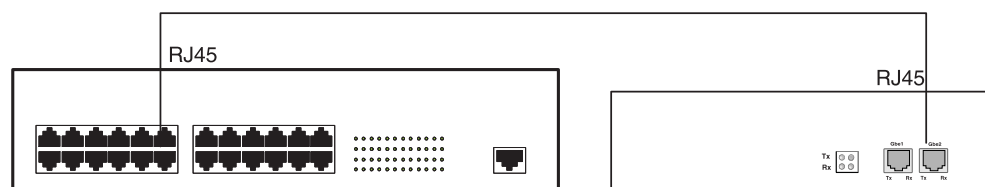


Figure 2–3: Connection with copper cable

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.

Connecting Power

The encoder is customized with either an AC or DC power supply. Instructions for both are included in this section.

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

The unit does not have a power switch. The unit powers on automatically when you plug it in.

Before you power-up the device, make sure that you have performed all of the cabling required for each of the optional modules that are installed.

Connecting the AC Power Supply

Power cord rating

Harmonic ships the AC power supply of ProStream 1000 with a power cord of the required rating. Customers who choose to use a different cord due to their specific considerations or constraints should use an AC cord that complies with national electrical code and meets the following rating:

- Current rating - 16 Amps or higher
- Wire gauge - 18 AWG or thicker



CAUTION: Use the recommended 16A/18AWG cord to ensure your own personal safety and to help protect the device and working environment from potential damage.

- Electro-Static 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, remember the following:

- 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 an 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 the board only by its edges.

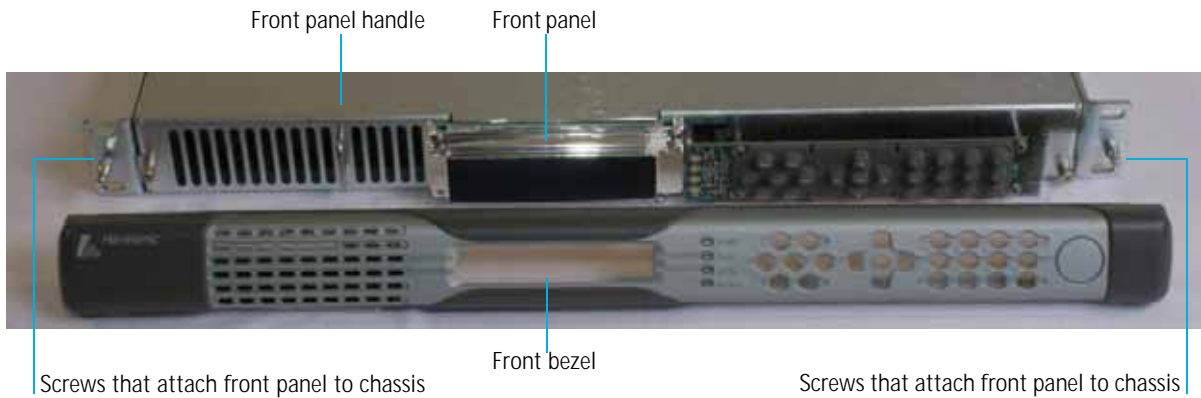
Hardware needed to insert an IPC

Before you insert an IPC, have the following on hand:

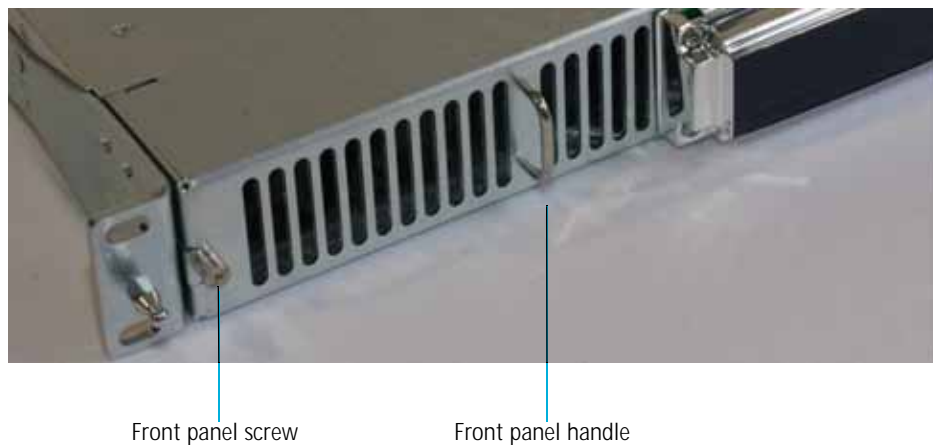
- Phillips screwdriver to remove the fillers and to fasten the card in place.
- ESD-preventing wrist band and a rubber mat.

To insert an IPC:

1. Unplug the device to power 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. Follow the ESD guidelines and unpack the card.
10. Hold the card by its edges and 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 5-3](#).
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 in the previous procedure (To insert an IPC).
2. Locate the card to be replaced.
3. Follow the ESD guidelines and, holding the card by its handle, pull to disconnect it from its mate-connector and then pull it out.



4. Follow the ESD guidelines and pack the card away.
5. Follow the ESD guidelines and unpack the card.
6. Hold the card by its edges and 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 5-3](#).
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.

Initial Configuration in NMX control mode

The ProStream 1000 unit ships with the BOOT program preconfigured as follows for operation under NMX:

- BOOTP enable - Enables the 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.

To configure a ProStream 1000 device in an NMX managed network:

1. Launch NMX.
2. Activate a map.
3. Add a ProStream 1000 unit to the map.
4. Enter the name and hardware model in the *Configure ProStream 1000* window.
5. 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*.
- Use the control panel to view the MAC Address as explained in [Viewing MAC Address](#).

6. Enter the Network Address.

The network address is the Ethernet 3 IP address to which you want the NMX to assign the ProStream 1000 unit.

7. Enter the default gateway.
8. Enter the subnet mask.
9. Select the desired firmware version.
10. Click **OK**.
11. 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.



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

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 a BOOTP response from NMX after the first attempt, it sends additional requests, up to 5 BOOTP requests. The following table lists faults that might 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 a 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](#).

While working in NMX control mode, use the control panel for viewing purposes only. Any attempt to set device properties using the control panel can adversely affect the ProStream 1000 operation.

Start Using the Device – NMX Control Mode

Once ProStream 1000 boots up successfully, you can use NMX to further configure the device and provision stream through it. For further instructions, refer to [NMX Online Help](#).

Initial Configuration in Standalone Control Mode

While working in the standalone control mode, you may set the 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.

Control Panel Overview

The front panel includes a control panel comprised of a Liquid Crystal Display (LCD) and a keypad as described in [ProStream 1000 Front Panel](#).

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)

Control Panel Display

The 2-line, 20-character local control panel display shows the menus and their parameters. The control panel display comprises 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 are modified in Edit mode

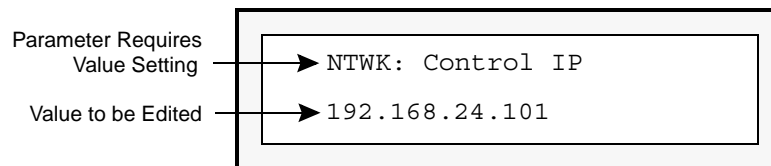


Figure 3–1: Control Panel Display

The Control panel display has two modes:

- Navigation - Enables you to browse through menus and sub-menus.
- Edit - Enables you to change the parameter value. A blinking cursor shows the character to be edited.

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:

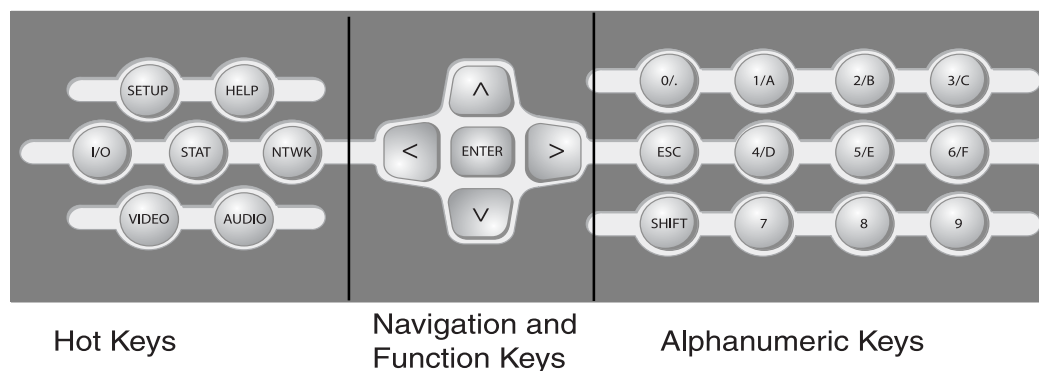





Figure 3–2: Control Panel Key Pad

Hot Keys - Includes six keys for accessing various menus. Currently only the NTKW 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	<ul style="list-style-type: none"> ■ Navigates through the menus
	Left and Right arrows	<ul style="list-style-type: none"> ■ Navigates through the menu parameters ■ In Editing mode, move the cursor along the line
	Enter button	<ul style="list-style-type: none"> ■ Executes the selection of a menu ■ Quits an editing session and applies changes ■ Shifts to Editing mode

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

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

Setting Network Properties

Before you start working with the device, set the device IP address, subnet mask, and default gateway. To define network settings, use the control panel.



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



TIP: To erase an existing parameter value, press **Enter** and then press the right arrow to bring you to the right of the value you want to erase. Press **Shift**, then press the left arrow, character by character until the value is erased.



TIP: To enter a space at the insertion point, press **Shift** and then press the left arrow.

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]

Setting the IP Address of Management Port

To set the management port IP address:

1. Press the NTKW hot key.

The display shows
NTWK: Configuration.

2. Press the **▲** or the **▼** 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 **Shift** then press the **O/.** key.

5. To apply changes and to shift to Navigation mode, press **Enter**.
Do not exit the Network menu because you can set other properties from there.

Setting the Subnet Mask

To set the subnet mask:

1. Press the **▲** or the **▼** 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 **Shift** then press the **O/.** key.

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

Setting the Default Gateway Address

To set the gateway address:

1. Press **▲** or **▼** 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 **Shift** then press the **O/.** key.

4. To apply and to shift to Navigation mode, press **Enter**.
5. Press **Esc** to exit the **Network** menu.

Viewing MAC Address

To view the MAC address:

1. Press the **NTWK** hot key.
2. Press **▲** or **▼** to navigate to *NTWK: Control MAC*.
The MAC address displays beneath the parameter name.
3. Press **Esc** to exit the parameter.

Starting to Use the Device - Standalone Control Mode

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

Table 3–4: Standalone Access Level

Access Level	Authorized Operation
Monitor	Allows only the monitoring of the operation of the device.
Configure	Allows configuring the device only via a web client and defining 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.

Logging into the Device

To log into the device:

1. Start Microsoft Internet Explorer (IE) on a PC that meets the system requirements as listed in [System Requirements of Managing PC](#).
2. In the address bar of 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 following default passwords.

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. Selecting the **Save this password in your password list** check box and click **OK**.

It is recommended to not use this option when accessing the Web client as **Configure** and when working from a computer that many users can access.

The Web client opens and you can 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 forget your password/username, you need to 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 updated as new features are introduced.

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 *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.

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.

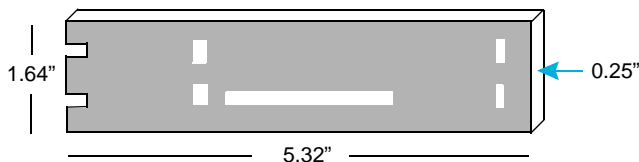


Figure 5–1: Bezel Filter Dimensions

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.

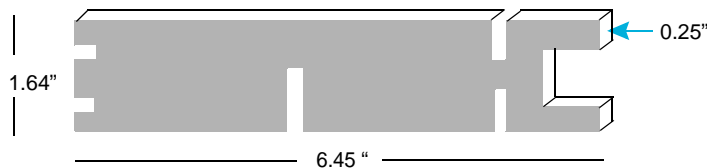


Figure 5–2: Keypad Filter Dimensions

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.

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.

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.

Fan Replacement



NOTE: This section applies to ProStream 1000 with a removable front panel. For details see, [ProStream 1000 Device Types](#).

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.

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.

Preparation

To remove and replace the fans, you need the following:

- Phillips screwdriver.
- A new front panel.

To remove and replace a fan:

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 5–3: 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.

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 5-4: ProStream 1000 Fuse

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.
6. Plug in the power cord.

Appendix A

Contacting the Technical Assistance Center

Harmonic Global Service and Support has many Technical Assistance Centers (TAC) located globally, but virtually co-located where our customers can obtain technical assistance or request on-site visits from the Regional Field Service Management team. The TAC operates a Follow-The-Sun support model to provide Global Technical Support anytime, anywhere, through a single case management and virtual telephone system. Depending on time of day, anywhere in the world, we will receive and address your calls or emails in one of our global support centers. The Follow-the-Sun model greatly benefits our customers by providing continuous problem resolution and escalation of issues around the clock.

Report an issue online at:

<http://harmonicinc.com/webform/report-issue-online>

Table A–1: Technical Support Phone Numbers and Email Addresses

Region	Telephone Technical Support	Email
Americas	888.673.4896 (888.MPEG.TWO) or +1.408.490.6477	support@harmonicinc.com
Europe, Middle East, and Africa (EMEA)	+44.1252.555.450	emeasupport@harmonicinc.com
India	+91.120.498.3199	apacsupport@harmonicinc.com
Russia	+7.495.926.4608	rusupport@harmonicinc.com
Mainland China	+86.10.6569.5580	chinasupport@harmonicinc.com
Japan	+81.3.5565.6737	japansupport@harmonicinc.com
Asia Pacific – Other Territories	+852.3184.0045 or 65.6542.0050	apacsupport@harmonicinc.com

The Harmonic Inc. support website is:

<http://www.harmonicinc.com/content/technical-support>

The Harmonic Inc. software downloads sites are:

Distribution and Delivery Software	ftp://ftp.harmonicinc.com
Production and Payout Software	ftp://ftp.Omneon.com//Updates/Omneon/Current/
Software for Select Electra Encoders	https://harmonic.force.com/SWAccess/SWDownloadLogin

The Harmonic Inc. corporate address is:

Harmonic Inc.
4300 North First St.
San Jose, CA 95134, U.S.A.
Attn: Customer Support

The corporate telephone numbers for Harmonic Inc. are:

Tel. 1.800.788.1330 (inside the U.S.)
Tel. +1.408.542.2500 (outside the U.S.)
Fax.+1.408.542.2511

Appendix B

Safety and Regulatory Compliance Information

Legal Disclaimer: Information in this document is provided in connection with Harmonic products. Unless otherwise agreed in writing Harmonic products are not designed nor intended for any application in which the failure of the product could cause personal injury or death.



NOTE: The information in this appendix may apply to purchased products only.

Important Safety Instructions




This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electric shock or injury to persons. You must adhere to the guidelines in this document to ensure and maintain compliance with existing product certifications and approvals. In this document, we use “product,” “equipment,” and “unit” interchangeably.



This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if it is not installed and used in accordance with the instructions in this manual. Operation of this equipment in a residential area is likely to cause harmful interference. If this occurs, the user will be required to correct the interference at his or her own expense.




In event of conflict between the information in this document and information provided with the product or on our website for a particular product, this product documentation takes precedence.

Safety Symbols & Translated Safety, Warning & Caution Instructions (English)

To avoid personal injury or property damage, before you begin installing or replacing the product, read, observe, and adhere to all the following safety instructions and information. Harmonic products and/or product packaging may be marked with the safety symbols used throughout this document, when it is necessary to alert operators, users, and service providers to pertinent safety instructions in the manuals.




Mark	Notes
 <p>Warning</p>	<p>Installing or Replacing the Product Unit Warning</p> <ul style="list-style-type: none"> ■ Only trained and qualified service personnel should be allowed to install, replace, or service this unit (refer AS/NZS 3260 Clause 1.2.14.3 Service Personnel). ■ Read the installation instructions before connecting the system to the power source. ■ When installing or replacing the unit, always make the ground connection first and disconnect it last. ■ Installation of the unit must comply with local and national electrical codes. ■ This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of special tool, lock and key or other means of security. ■ Use only specified replacement parts. ■ Do not use this unit in or near water. Disconnect all AC power before installing any options or servicing the unit unless instructed to do so by this manual.
 <p>Warning</p>	<p>Rack Mount Warning</p> <ul style="list-style-type: none"> ■ To prevent bodily injury when mounting or servicing this unit in a rack, special precautions must be taken to ensure your safety and stability of system: ■ Conform to local occupational health and safety requirements when moving and lifting the equipment. ■ Ensure that mounting of the unit by mechanical loading tools should not induce hazardous conditions. ■ To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed on it.
 <p>Warning</p>	<p>Chassis Warning</p> <ul style="list-style-type: none"> ■ Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. ■ To prevent personal injury or damage to the chassis, lift the unit only by using handles that are an integral part of the chassis, or by holding the chassis underneath its lower edge. ■ Any instructions in this guide that require opening the chassis or removing a board should be performed by qualified service personnel only. ■ Slots and openings in the chassis are provided for ventilation. Do not block them. Leave the back of the frame clear for air exhaust cooling and to allow room for cabling - a minimum of 6 inches (15.24 cm) of clearance is recommended.


Mark	Notes
 <p data-bbox="347 489 448 520">Warning</p>	<p data-bbox="529 285 816 317">Electric Shock Warning</p> <ul style="list-style-type: none"> <li data-bbox="529 317 1414 411">■ This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit. <li data-bbox="529 411 1425 474">■ Before working on a chassis or working near power supplies, unplug the power cord on AC units. <li data-bbox="529 474 1365 537">■ Do not work on the system or connect or disconnect cables during periods of lightning activity. <li data-bbox="529 537 1438 632">■ This unit is grounded through the power cord grounding conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product input or outputs. <li data-bbox="529 632 1398 726">■ Route power cords and other cables so that they are not likely to be damaged. Disconnect power input to unit before cleaning. Do not use liquid or aerosol cleaners; use only a damp cloth to clean chassis. <li data-bbox="529 726 1438 852">■ Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Do not insert anything into either of the system's two power supply cavities with power connected <li data-bbox="529 852 1422 915">■ Never install an AC power module and a DC power module in the same chassis. <li data-bbox="529 915 1406 978">■ Do not wear hand jewelry or watch when troubleshooting high current circuits, such as the power supplies. <li data-bbox="529 978 1382 1073">■ To avoid fire hazard, use only the specified correct type voltage and current ratings as referenced in the appropriate parts list for this unit. Always refer fuse replacement to qualified service personnel. <li data-bbox="529 1073 1422 1199">■ This unit relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors). <li data-bbox="529 1199 1422 1293">■ To avoid electrocution ensure that the rack has been correctly grounded before switching on the unit. When removing the unit remove the grounding connection only after the unit is switched off and unplugged.
 <p data-bbox="347 1518 448 1549">Caution</p>	<p data-bbox="529 1323 995 1354">Electrostatic Discharge (ESD) Caution</p> <ul style="list-style-type: none"> <li data-bbox="529 1354 1268 1386">■ Follow static precaution at all times when handling this unit. <li data-bbox="529 1386 1422 1480">■ Always wear an ESD-preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system <li data-bbox="529 1480 1357 1543">■ Handle cards by the faceplates and edges only; avoid touching the printed circuit board and connector pins. <li data-bbox="529 1543 1373 1606">■ Place any removed component on an antistatic surface or in a static shielding bag. <li data-bbox="529 1606 1114 1638">■ Avoid contact between the cards and clothing. <li data-bbox="529 1638 1341 1701">■ Periodically check the resistance value of the antistatic strap. Recommended value is between 1 and 10 mega-ohms (Mohms).





Mark	Notes
 Warning	<p>Laser Radiation Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Never operate a unit with a broken fibre or with a separated fiber connector.</p>
 Warning	<p>Lithium Battery Handling Safety Instructions</p> <ul style="list-style-type: none"> ■ CALIFORNIA PERCHLORATE ADVISORY: Some lithium batteries may contain perchlorate material. The following advisory is provided: "Perchlorate Material - special handling may apply, see: www.dtsc.ca.gov/hazardous_waste/perchlorate/for_information".
 Caution	<ul style="list-style-type: none"> ■ Risk of explosion if battery is replaced incorrectly or with an incorrect type ■ Dispose of used batteries according to the manufacturer's instructions ■ There are no user-serviceable batteries inside Harmonic products. Refer to Harmonic qualified personnel only to service the replaceable batteries

Symboles de sécurité et traduits de sécurité, d'avertissement et Attention Instructions (français)

Pour éviter des blessures ou des dommages matériels, avant de commencer l'installation ou le remplacement du produit, lire, observer, et de respecter toutes les instructions et informations de sécurité suivantes. Produits harmoniques et / ou l'emballage du produit peuvent être marqués avec les symboles de sécurité utilisés dans le présent document, lorsque cela est nécessaire pour alerter les opérateurs, les utilisateurs et les fournisseurs de services de consignes de sécurité pertinentes dans les manuels.




Mark	Notes
 Avertissement	<p>Installation ou remplacement de l'unité de produit Avertissement</p> <ul style="list-style-type: none"> ■ Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés. (voir AS / NZS 3260 article 1.2.14.3 du personnel de service). ■ Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation. ■ Lors de l'installation ou le remplacement de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier. ■ L'équipement doit être installé conformément aux normes électriques nationales et locales. ■ Cet appareil est à installer dans des zones d'accès réservé. Ces dernières sont des zones auxquelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité. ■ Utilisez uniquement des pièces de rechange spécifiées. ■ Ne pas utiliser ce produit dans l'eau ni à proximité de l'eau. Débrancher toutes les prises d'alimentation secteur avant d'installer des options ou d'effectuer l'entretien de l'unité, à moins d'instructions contraires dans le présent manuel.
 Avertissement	<p>Rack Monture Avertissement</p> <p>Pour éviter les blessures corporelles lors du montage ou l'entretien de cet appareil dans un rack, des précautions particulières doivent être prises pour assurer votre sécurité et la stabilité du système:</p> <ul style="list-style-type: none"> ■ Conformez-vous aux exigences de médecine du travail et de sécurité lorsque vous déplacez et soulevez le matériel. ■ Assurez-vous que le montage de l'appareil par des outils de chargement mécaniques ne doit pas induire des conditions dangereuses. ■ Pour éviter tout risque d'électrocution, le rack et chaque élément de l'équipement installé dans le rack doivent être correctement reliés à la terre.
 Avertissement	<p>Châssis Avertissement</p> <ul style="list-style-type: none"> ■ Avant de connecter ou de déconnecter les câbles d'alimentation (pôles et terre) du châssis, vérifiez que le circuit de courant continu est hors tension. ■ Pour éviter toute blessure ou des dommages au châssis, soulevez l'unité uniquement par les poignées du châssis lui-même ou en portant celui-ci par le bord inférieur. ■ Toutes les opérations du présent guide nécessitant l'ouverture du châssis ou le retrait d'une carte doivent être uniquement effectuées par du personnel d'entretien qualifié. ■ Le châssis est muni de fentes et d'ouvertures d'aération. Ne pas les bloquer. Dégager l'arrière du cadre pour permettre le refroidissement de l'évacuation d'air et laisser de la place au câblage; un dégagement d'au moins 15.24 cm (6 po) est recommandé.


Mark	Notes
 <p data-bbox="347 489 516 516">Avertissement</p>	<p data-bbox="558 283 943 310">Choc électrique Avertissement</p> <ul style="list-style-type: none"> <li data-bbox="558 317 1414 407">■ Il est possible que cette unité soit munie de plusieurs cordons d'alimentation. Pour éviter les risques d'électrocution, débrancher les deux cordons d'alimentation avant de réparer l'unité. <li data-bbox="558 413 1425 501">■ Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif. <li data-bbox="558 508 1419 569">■ Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage. <li data-bbox="558 575 1414 695">■ Ce unité est mis à la terre par le conducteur de protection intégré au cordon d'alimentation. Pour éviter les chocs électriques, brancher le cordon d'alimentation dans une prise correctement cable avant de raccorder les entrées ou sorties du unité. <li data-bbox="558 701 1455 821">■ Installer les cordons d'alimentation et autres cables de sorte qu'ils ne risquent pas d'être endommagés. Couper l'alimentation avant nettoyage. Ne pas utiliser de nettoyant liquide ou en aérosol; utiliser seulement un linge humide. <li data-bbox="558 827 1463 978">■ Des courants électriques dangereux circulent dans cet appareil. Afin d'éviter les lessures, ne pas toucher les connexions et composants exposés lorsque l'appareil est sous tension. Ne rien insérer dans l'une ou l'autre des cavités des prises de courant du système lorsque l'appareil est sous tension. <li data-bbox="558 984 1317 1045">■ N'installez jamais un module d'alimentation AC et un module d'alimentation DC dans le même châssis. <li data-bbox="558 1052 1463 1113">■ Ne pas porter de bijoux aux mains ni de montre durant le dépannage des circuits à haute tension, comme les transformateurs. <li data-bbox="558 1119 1463 1236">■ Pour prévenir les risques d'incendie, n'utiliser que le type, la tension et le courant nominal spécifiés dans la nomenclature des pièces de ce unité. Toujours confier le remplacement des fusibles à du personnel d'entretien qualifié. <li data-bbox="558 1243 1455 1394">■ Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge). <li data-bbox="558 1400 1463 1520">■ Pour éviter l'électrocution, assurez-vous que le rack a bien été mis à la terre avant de mettre l'unité en marche. Lors du retrait de l'unité, retirer le raccordement de terre seulement après avoir mis l'unité à l'arrêt et l'avoir débranchée.





Mark	Notes
 Attention	<p>Les décharges électrostatiques (ESD) Attention</p> <ul style="list-style-type: none"> ■ Respecter systématiquement les précautions relatives aux charges électrostatiques durant la manipulation de cet unité. ■ Portez toujours un poignet ou la cheville bracelet antistatique préventive lors de la manipulation des composants électroniques. Branchez une extrémité de la sangle à une prise ESD ou d'un composant métallique non peinte sur le système. ■ Manipulez les cartes en les faces avant et les bords seulement; éviter de toucher la carte de circuit imprimé et les broches du connecteur. ■ Placer un composant retiré sur une surface antistatique ou dans un sac de protection statique. ■ Éviter tout contact entre les cartes et les vêtements. ■ Vérifier périodiquement la valeur de résistance de la sangle antistatique. Valeur recommandée est comprise entre 1 et 10 méga-ohms (Mohms).
 Avertissement	<p>Rayonnement laser Attention</p> <ul style="list-style-type: none"> ■ Rayonnement laser invisible peut être émis à partir de fibres ou les connecteurs débranchés. Ne pas regarder en faisceaux ou regarder directement avec des instruments optiques. Ne jamais faire fonctionner une unité en cas de bris d'une fibre ou de séparation d'un connecteur de fibre.
 Avertissement	<p>Batterie au lithium Manipulation instructions de sécurité</p> <ul style="list-style-type: none"> ■ Perchlorate pour la Californie Consultatif: Certaines batteries au lithium, peuvent contenir du perchlorate. le texte qui suit consultatif est prévu: "Présence de perchlorate - une manipulation spéciale peut s'appliquer, voir: www.dtsc.ca.gov/hazardous_waste/perchlorate/for_information".
 Attention	<ul style="list-style-type: none"> ■ Il y a danger d'explosion si la batterie est remplacée de manière incorrecte ou par une batterie de type incorrect. ■ Mettre au rebut les batteries usagées conformément aux instructions du fabricant. ■ Les batteries des produits Harmonic ne peuvent pas être réparées ni entretenues par l'utilisateur. Ne confier l'entretien des batteries remplaçables qu'à du personnel compétent de Harmonic.

Sicherheit Symbole und übersetzt Sicherheit, Achtung & Vorsicht Anleitung (Deutsch)

Um Verletzungen oder Sachschäden zu vermeiden, bevor Sie mit der Installation oder Austausch des Produkts zu beginnen, zu lesen, zu beobachten, und sich an all den folgenden Sicherheitshinweise und Informationen. Harmonic Produkte und / oder Produktverpackungen können mit den Sicherheitssymbole in diesem Dokument verwendet werden, markiert, wenn es notwendig ist für die Betreiber, Anwender und Dienstleister, um relevante Sicherheitsanweisungen in den Handbüchern zu alarmieren.

Mark	Notes
 Warnung	<p>Installation oder den Austausch des Produkts Einheit Warnung</p> <ul style="list-style-type: none"> ■ Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden (siehe AS / NZS 3260 Clause 1.2.14.3 Servicepersonal) ■ Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen. ■ Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden. ■ Die Installation der Geräte muss den Sicherheitsstandards entsprechen. ■ Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Ein Bereich mit beschränktem Zutritt ist ein Bereich, zu dem nur Wartungspersonal mit einem Spezialwerkzeugs, Schloß und Schlüssel oder anderer Sicherheitsvorkehrungen Zugang. ■ Verwenden Sie nur die angegebenen Ersatzteile ■ Das Gerät in oder in der Nähe von Wasser verwenden. Trennen Sie vor der Installation von Optionen oder Wartung des Gerätes, es sei denn, dies wurde von diesem Handbuch alle Netz.
 Warnung	<p>Rack-Montage-Warnung</p> <p>Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt:</p> <ul style="list-style-type: none"> ■ Entsprechen den lokalen Arbeitsschutzanforderungen beim Bewegen und Heben der Ausrüstung. ■ Stellen Sie sicher, dass die Montage des Gerätes durch mechanische Belastung Werkzeuge sollten nicht gefährlichen Bedingungen zu induzieren. ■ Um das Risiko von möglichen elektrischen Schlag zu vermeiden, muss mit einer angemessenen Erdung für Rack und jedes Gerät installiert ist implementiert werden.
 Warnung	<p>Chassis Warnung</p> <ul style="list-style-type: none"> ■ Gleichstrom-Unterbrechung Bevor Sie Erdungs- oder Stromkabel an das Chassis anschließen oder von ihm abtrennen, ist sicherzustellen, daß der Gleichstrom-Stromkreis unterbrochen ist. ■ Um Verletzungen und Beschädigung des Chassis zu vermeiden, sollten Sie das Chassis nicht an den Henkeln auf den Elementen (wie z.B. Stromanschlüsse, Kühlungen oder Karten) heben oder kippen; oder indem Sie es unterhalb der Unterkante packen. ■ Alle Hinweise in diesem Handbuch, die das Öffnen benötigen Sie das Gehäuse oder das Entfernen eines Board sollte nur von qualifiziertem Fachpersonal durchgeführt werden. ■ Für Schlitze und Öffnungen im Chassis vorgesehen. Blockieren Sie sie nicht. Lassen Sie die Rückseite des Rahmens frei für Abluftkühlung und um Platz für die Verkabelung ermöglichen - ein Minimum von 6 Zoll (15,24 cm) Abstand wird empfohlen

Mark	Notes
 <p data-bbox="347 489 456 520">Warnung</p>	<p data-bbox="521 285 818 317">Elektroschock-Warnung</p> <ul style="list-style-type: none"> <li data-bbox="521 317 1414 411">■ Diese Einheit hat möglicherweise mehr als ein Netzkabel. Zur Verringerung der Stromschlaggefahr trennen Sie beide Netzgerätekabel ab, bevor Sie die Einheit warten. <li data-bbox="521 411 1240 474">■ Vor der Arbeit an einem Chassis für Arbeiten in der Nähe Stromversorgung, ziehen Sie das Netzkabel mit Netzeinheiten. <li data-bbox="521 474 1370 537">■ Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert. <li data-bbox="521 537 1419 632">■ Dieses Gerät ist über das Netzkabel Erdungsleiter geerdet. Um einen Stromschlag zu vermeiden, stecken Sie das Netzkabel in eine Steckdose richtig verdrahtet, bevor Sie das Produkt Eingang oder Ausgänge. <li data-bbox="521 632 1386 758">■ Verlegen Sie Netzkabel und andere Kabel, so dass sie wahrscheinlich nicht beschädigt werden. Trennen Eingangsleistung Einheit vor der Reinigung. Verwenden Sie keine flüssigen oder Aerosolreiniger; nur mit einem feuchten Tuch zu reinigen Chassis. <li data-bbox="521 758 1430 915">■ Gefährliche Spannungen vorhanden sind an mehreren Stellen in diesem Produkt. Um Verletzungen zu vermeiden, berühren Sie nicht freiliegenden Anschlüsse und Komponenten während schaltet ist. Sie keine Gegenstände in einem der beiden Stromversorgungs Hohlräume des Systems mit Strom verbunden einführen. <li data-bbox="521 915 1382 978">■ Ein Wechselstrommodul und ein Gleichstrommodul dürfen niemals in demselben Chassis installiert werden. <li data-bbox="521 978 1403 1041">■ Tragen Sie keine Hand Schmuck oder schauen Sie bei der Fehlersuche hohen Stromkreise, wie beispielsweise die Stromversorgung. <li data-bbox="521 1041 1430 1167">■ Um die Brandgefahr zu vermeiden, verwenden Sie nur den genannten richtige Art von Spannung und Strom Ratings als in der entsprechenden Stückliste für diese Einheit verwiesen. Beziehen sich immer auf Austausch der Sicherung von qualifiziertem Fachpersonal. <li data-bbox="521 1167 1419 1325">■ Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird. <li data-bbox="521 1325 1370 1451">■ Um einen Stromschlag zu vermeiden, sicherzustellen, dass die Zahnstange wurde korrekt vor dem Einschalten des Gerätes geerdet. Beim Entfernen der Einheit entfernen Sie die Masseverbindung nur, nachdem das Gerät ausgeschaltet und der Netzstecker gezogen.

Mark	Notes
 Vorsich	<p>Elektrostatische Entladung (ESD) Vorsicht</p> <ul style="list-style-type: none"> ■ Folgen Sie statische vorsorglich zu jeder Zeit beim Umgang mit diesem Gerät. ■ Tragen Sie immer einen ESD-präventive Handgelenk oder Knöchel-Riemen beim Umgang mit elektronischen Komponenten. Schließen Sie ein Ende des Bandes an einem ESD-Buchse oder ein unlackiertes Metallteil auf dem System. ■ Hand Karten nur durch die Faceplates und Kanten; Berühren Sie die bedruckte Leiterplatte und Steckerstifte. ■ Legen Sie alle entfernten Komponenten auf eine antistatische Oberfläche oder in einem Statik-Beutel. ■ Kontakt zwischen den Karten und Kleidung vermeiden. ■ Den Widerstandswert der gegen statische Gurt in regelmäßigen Abständen überprüfen. Empfohlener Wert ist zwischen 1 und 10 Mega-Ohm (MOhm).
 Warnung	<p>Laserstrahlungen Warnung. Unsichtbare Laserstrahlung kann von getrennten Fasern oder Stecker emittiert werden. Nicht in die Strahlen blicken oder direkt mit optischen Instrumenten. Niemals ein Gerät mit einem gebrochenen Faser oder mit einem Glasfaseranschluss getrennt.</p>
 Warnung	<p>Lithium-Batterie Handhabung Sicherheitshinweise CALIFORNIA PERCHLORATE ADVISORY: Einige Lithium-Batterien kann Perchlorat enthalten. Die folgende Beratungs gesetz: "Perchlorat - Sonderbehandlung kann erforderlich sein, finden Sie unter: www.dtsc.ca.gov/hazardous_waste/perchlorate/ for information".</p>
 Vorsich	<ul style="list-style-type: none"> ■ Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr ■ Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers. ■ Es gibt keine zu wartenden Akkus im Harmonic Produkte. Siehe Harmonic qualifiziertes Personal, um die austauschbare Batterien Service

Site Preparation Instructions



NOTE: Only trained and qualified service personnel (as defined in IEC 60950 and AS/NZS 3260) should install, replace, or service the equipment. Install the system in accordance with the U.S. National Electric Code if you are in the United States.

To prepare the site for installation:

1. Preparing and Choosing a Site for Installation
 - To ensure normal system operation, plan your site configuration and prepare the site before installation.

- ❑ Install the unit in a restricted access area.
 - ❑ Choose a site with a dry, clean, well-ventilated and air-conditioned area.
 - ❑ Choose a site that maintains an ambient temperature of 32 to 104°F (0 to 40°C)
2. Creating a Safe Environment
- ❑ Connect AC-powered systems to grounded power outlets or as per local regulations.
 - ❑ Do not move or ship equipment unless it is correctly packed in its original wrapping and shipping containers.
 - ❑ Only allow Harmonic trained personnel to undertake equipment service and maintenance. Do not permit unqualified personnel to operate the unit.
 - ❑ Wear ear protection when working near an NSG Pro platform for a longer period of time.
3. Rack Mounting the Unit
- ❑ Install the system in an open rack whenever possible. If installation in an enclosed rack is unavoidable, ensure that the rack has adequate ventilation.
 - ❑ Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips). 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 the 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.
 - ❑ The rack must be anchored to an immovable support to prevent it from tipping when the unit is mounted on it. The rack must be installed according to the rack manufacturer's instructions.
 - ❑ Disconnect all power and external cables before lifting the unit. Depending on the weight of the unit, more than one person might be required to lift it.
4. Power Considerations
- a. AC Power
- ❑ Adding to the system a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulator) is highly recommended.
 - ❑ Installing the main power supply by a qualified electrician, according to power authority regulations. Make sure all powering are wired with an earth leakage, according to local regulations.
 - ❑ It is recommended to install the encoder within 1.5m (approximately 5 feet) from an easily accessible grounded AC outlet.
 - ❑ When the encoder is rack-mounted, ensure that the rack is correctly grounded.
- b. DC Power
- ❑ Ensure a suitable overcurrent device is in-line between the equipment and the power source.
 - ❑ Connect DC-input power supplies only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in the UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, AS/NZS 60950-1, EN/IEC 60825-1, 21 CFR 1040, EN 60950-1, and IEC 60950-1 standards.
 - ❑ Ensure that power is removed from the DC circuit before installing or removing power supplies
5. Handling Fiber Channel Cables
- ❑ Always read and comply with the handling instructions on the shipping container.

- ❑ Follow all ESD precautions and approved fiber cleaning procedures.
 - ❑ The fiber is made of a very pure, expensive glass and should be treated with great care. Handle fibers only in areas that are very clean and do not contain sharp objects.
 - ❑ Wear finger cots or gloves as dirt and oils can damage the fiber and contaminate connectors.
 - ❑ Do not allow kinks or knots to develop in the fiber. If tangles occur, carefully work out the tangles avoiding pulling or bending the fibre beyond its bend radius.
 - ❑ Always use the correct tools for stripping and cleaving the fiber. It will save time and reduce breakage caused by scratches.
 - ❑ If you must secure a bundle of fiber cables together, avoid plastic and metal tie wraps; secure with Velcro instead.
6. Disposing of the Unit
- ❑ Dispose of the unit and its components (including batteries) as specified by all national laws and regulations.

Product End-of-Life Disassembly Instructions

For disassembly instructions, please call the technical support in order to remove components requiring selective treatment, as defined by the EU WEEE Directive (2012/19/EU). See [Contacting the Technical Assistance Center](#).

Product Disassembly Process

To disassemble equipment:

1. Disassemble equipment at a dedicated area only, gather the needed tools for disassembly.
2. Remove covers, housing, etc.
3. Remove and separate sub-assemblies (i.e. cables, metals, displays, fans, etc.).
4. Separate hazardous materials from the remainder of the material.
 - a. Sort hazardous materials into their different types (i.e., batteries, hazardous liquids, hazardous solids, fiberglass, etc.).
 - b. Proceed with hazardous waste management processes only.
5. Identify re-usable materials/sub-assemblies and separate these from the rest of the material.
6. Identify and separate recyclable materials as per below examples:
 - a. Scrap material to be sent to smelter(s).
 - b. E-waste such as displays, CPU's, cables and wires, hard drives, keyboards, etc.
 - c. Metals such as steel, brass, and aluminum.
 - d. Plastics such as fan casings, housings, covers, etc.
 - e. Fiber optics and plastic tubing not containing electrical or data wiring.

Safety Rules (English)

Recycle personnel are to wear personal protective equipment including proper eye protection, proper hand protection, and proper breathing protection if needed.

Recycle personnel shall be experienced with using the proper tools required for disassembling equipment. Untrained personnel shall not disassemble Harmonic products. Unfamiliarity with tools can cause damage and injury.

Règles de sécurité (French)

Le personnel du recycleur doit porter de l'équipement de protection individuelle, y compris des lunettes, des gants et un masque de protection appropriés au besoin.

Le personnel du recycleur doit avoir de l'expérience des outils de démontage de l'appareil. Les produits Harmonic ne doivent pas être démontés par du personnel non qualifié. Une mauvaise connaissance des outils peut causer des dommages et des blessures.

EU Manufacturer's Declaration of Conformity

This equipment is in compliance with the essential requirements and other provisions of Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC.



NOTE: For specifics, about which standards have been applied, refer to the Declaration of Conformity of the product on Harmonic website at [Product Regulatory Compliance](#) or contact Harmonic Compliance Team at regulatory.compliance@harmonicinc.com

Electromagnetic Compatibility Notices – Class A

a. FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Connections between the Harmonic equipment and other equipment must be made in a manner that is consistent with maintaining compliance with FCC radio frequency emission limits. Modifications to this equipment not expressly approved by Harmonic may void the authority granted to the user by the FCC to operate this equipment and you may be required to correct any interference to radio or television communications at your own expense.

b. ICES–003 Statement (Canada)

English: This Class A digital apparatus complies with Canadian ICES-003.

French: Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

c. CE Declaration of Conformity (European Union)

This product has been tested in accordance too, and complies with the Low Voltage Directive (2014/30/EU) and EMC Directive (2014/35/EU). The product has been marked with the CE Mark to illustrate its compliance.

d. VCCI Class A Warning (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this equipment is used in a domestic environment, it may cause radio interference. When such trouble occurs, the user may be required to take corrective actions.

e. BSMI EMC Notice (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

English translation of the notice above:

This is a Class A Information Product, when used in residential environment, it may cause radio frequency interference, under such circumstances, the user may be requested to take appropriate counter measures.

f. Class A Warning (Korea)

주의 A급 기기 이 기기는 업무용으로 전자파 적합 등록을 한 기기이
오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약
잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

English translation of the notice above:

This is a Class A device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this was sold or purchased by mistake, it should be replaced with a residential-use type.

g. Class A Statement (China)

中华人民共和国“A类”警告声明

声明
此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

English translation of the notice above:

When labeled with the CCC marking, the product meets the applicable safety and EMC requirements for China. This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

h. Class A Warning – CISPR 22 (AS/NZS)

Warning (English)

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Attention (French)

Il s'agit d'un produit de classe A. Dans un environnement local, ce produit peut entraîner des perturbations radioélectriques, auquel cas l'utilisateur devra éventuellement prendre des mesures adéquates.

Product Regulatory Compliance

Harmonic products are typically tested to the latest safety and electromagnetic compatibility (EMC) specifications and test methods, and are marked with one or more of the following regulatory/certification markings. Some of the certification markings will vary depending on what certifier was used to obtain a certification.

Please visit Harmonic [Product Regulatory Compliance](#) page to view information on applied safety & EMC standards and regulatory marks on Harmonic products. You can also email us at regulatory.compliance@harmonicinc.com for assistance on regulatory compliance for Harmonic products.

Product Regulatory Compliance Markings

Table B–1:Regulatory Compliance Markings

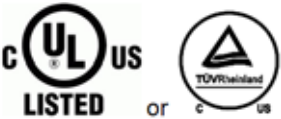
Country/Region	Testing Standard/Specification	Certification Type	Regulatory Mark Name	Product Marketing
USA/Canada	EN 60950-1:2006+A11:2009+A12:2011; CAN/CSA C22.2 No. 60950-1-07+A1:2011/UL 60950-1:2011	Safety	NRTL (National Recognized Test Laboratory)	
USA/Canada	FCC CFR 47 Part 15, Class A ICES-003: Issue 5, 2012; Class A	EMC	FCC Class A Statement	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p> </div>

Table B-1: Regulatory Compliance Markings







Country/Region	Testing Standard/Specification	Certification Type	Regulatory Mark Name	Product Marketing
European Union	RoHS: EN 50581:2012; EN55022:2010/ CISPR 22:2008; EN55024:2010/ CISPR 24:2010; EN61000-3-2:2006+A1:2009+A2:2009; EN61000-3-3:2008; Class A	Safety and EMC	CE / Low Voltage Directive	
Germany	EN 60950-1; EN60825-1 (for laser)	Safety	GS	
Mexico	NOM-019-SCFI-1998	Safety	NOM	
Taiwan	CNS 14336-1:2010 CNS 13438:2006; Class A	Safety and EMC	BSMI Certification (RPC) Number & Class A Warning	
Japan	VCCI V-3/2013.04; CISPR 22:2008, Class A	EMC	VCCI	
Australia and New Zealand	AS/NZS CISPR22:2009+A1:2010; Class A	Safety	C-Tick	
Korea	KN22 Class A and KN 24	EMC	KC	

Table B–1:Regulatory Compliance Markings

Country/Region	Testing Standard/Specification	Certification Type	Regulatory Mark Name	Product Marketing
China	GB4943.1-2011 GB9254-2008 GB17625.1-2012	Safety and EMC	CCC	
India	IS 13252 (Part 1): 2010	Safety	BIS Compulsory Registration	"Self Declaration - Conforming to IS 13252 (Part 1):2010, R-XXXXXXXX"

Product Environmental Compliance

Harmonic manufactures high quality and innovative IT and telecommunications equipment, video delivery infrastructure solutions and services for its customers worldwide. Harmonic is committed to providing our customers with safe and environmentally friendly products that are compliant with all relevant regulations, customer specifications, and environmental legislation, including the directives described below.

EU RoHS

In July 2006, the European Union’s (EU) Directive (2002/95/EC) on the Restriction of the use of certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE) went into effect, and in July, 2011, the European Union’s RoHS Recast Directive (2011/65/EU) also known as RoHS II entered into force.

Harmonic understands the environmental risks associated with the substances covered by the RoHS Directive and has committed to eliminating or reducing the use of these, as well as other environmentally sensitive substances in our products. Harmonic also continues to comply with the requirements under RoHS II.

For more information, please visit EU RoHS directive page at official EU website.

http://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm

Restricted Substance Statement

Harmonic products contain less than the permitted limits for the six restricted substances except where exemptions published in the RoHS2 Directive are applicable. This statement is based on vendor-supplied analysis or material certifications, and/or lab test results of the component raw materials used in the manufacture of Harmonic products.

Table B–2:Restricted Substances

Restricted Substance	Permitted Limit*
Cadmium (Cd)	≤_0.01%
Lead (Pb)	≤_0.1%
Chromium (VI) (Cr (VI))	≤_0.1%
Mercury (Hg)	≤_0.1%

Table B–2: Restricted Substances

Restricted Substance	Permitted Limit*
Polybrominated biphenyls (PBBs)	≤0.1%
Polybrominated diphenyl ether (PBDE)	≤0.1%
*Homogeneous material definition as per the EU Directive.	

EU REACH

REACH (Registration, Evaluation, Authorization and restriction of Chemicals) (EC 1907/2006) is a European Union's regulation on chemicals and their safe use which came into force in June, 2007.

Harmonic supports the basic aim of REACH in improving the protection of human health and environment through the better and earlier identification of intrinsic properties of chemical substances. Harmonic products are considered "articles" under REACH; therefore, we are required to provide recipients of our products with information on Substance of Very High Concern (SVHC) present in concentration above 0.1% (w/w).

Substances in our products are not intended to be released under normal or reasonably foreseeable conditions of use; therefore, the registration requirement in REACH Article 7(1) does not apply to our products.

For more information, please visit REACH regulation page at official EU website.

http://ec.europa.eu/environment/chemicals/reach/reach_en.htm

China RoHS

China's regulation on restriction of the use of certain hazardous substances commonly (China RoHS), is applicable to all Electronic and Information Products (EIPs) and parts sold in China after March 01, 2007. China RoHS regulation restricts the use of the same six substances as the European Union's ROHS, but has requirements for product labeling and regulated substance information disclosure.

Harmonic complies with China RoHS Phase I for labeling and information disclosure requirements and continues to monitor new developments in China RoHS Phase II towards substance restriction and certification program.

For more information, please visit China RoHS regulation page at official US export website.

<http://www.export.gov/china/doingbizinchina/>

China RoHS Disclosure Report

Below table shows the presence of hazardous substances, or elements in Harmonic products, if the part is present.

该表显示哈雷公司产品中可能含有的有毒有害物质元配件的信息，除了来源于元配件供应商的物料成分资料，亦来自其它相关的机构与资料。哈雷产品不一定使用这些元配件。

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，哈雷公司产品的环保使用期限 均为 20 年。该环保使用期限的有效条件为：必须遵循

该产品使用手册的规定，对该产品进行使用或存储。

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.

部件名称 (Part name)	有毒有害物质或元素 (Hazardous Substance)					
	铅	汞 (Hg)	镉 (Cd)	六价铬 (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板 (Printed Circuit Assemblies)	X	O	O	O	O	O
机械组件 (Mechanical Subassemblies)	X	O	O	O	O	O
光学组件 (Optical Subassemblies)	X	O	O	O	O	O
电源 (Power Supplies)	X	O	O	O	O	O
缆线 / 线束 (Cables, harnesses)	X	O	O	O	O	O
屏幕 / 显示器 (Screens, Monitors)	X	O	O	O	O	O
金属零件 (Metal Parts)	X	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: 表示在该部件的所有均质材料中，此类有毒有害物质的含量均小于 SJ/T11363-2006 标准所规定的限量。

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: 表示至少在该部件的某一均质材料中，此类有毒有害物质的含量超出 SJ/T11363-2006 标准规定的限量。

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.

Other RoHS and REACH type Regulations

Harmonic will comply with RoHS and REACH type regulations evolving in other countries, if they become relevant to our products or in markets where we sell our products.

Waste Electrical and Electronic Equipment (WEEE)

European Parliament and the Council of the European Union's WEEE Directive (2002/96/EC) came into force on August, 2005 and, were more recently amended in July, 2012. This directive encourages the reuse, recycling, and recovery of WEEE and to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment, especially those dealing with WEEE. Harmonic ensures that all requirements for registration, reporting, design and data tracking are complied with to meet the objectives of the WEEE directive.

For more information, please visit WEEE directive page at official EU website.

http://ec.europa.eu/environment/waste/weee/legis_en.htm

Battery Directive

In September 2006, the European Union's Directive 2006/66/EC (Battery Directive) came into force with an aim to prohibit the sale of batteries and accumulators containing hazardous substances and to set rules and promote collection, treatment, recycling and disposal of waste batteries and accumulators. This directive applies to spent batteries collected together with WEEE and requires their removal and separate collection. Once removed from WEEE, spent batteries are governed by the Battery Directive. Harmonic uses lithium batteries in its products and our responsibility under the Battery Directive is taken care of under our WEEE Take-Back program.

For more information, please visit Batteries and Accumulators directive page at official EU website.

<http://ec.europa.eu/environment/waste/batteries/>

Harmonic is committed to manufacturing environmentally safe products for the community, and will make reasonable efforts and required adjustments to its practices, if necessary, to comply with various environmental directives and industry initiatives on the elimination of hazardous substances, labeling, marking, certification and registration as required in markets where we sell our products.

Download Harmonic's Environmental Compliance Statement at the following location:

<http://www.harmonicinc.com/sites/default/files/Environmental%20Compliance%20Statement.pdf>

WEEE Take-Back Request Program

In order to assist EU member states to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally, Harmonic strives to recycle in compliance with the WEEE Directive any of its products that cannot be re-used.

Harmonic's customers should:

- Not discard equipment in household or office garbage
- Arrange proper recycling of unneeded equipment. For the take-back of Harmonic equipment, customers must:
 - Collect the information required to complete Harmonic's WEEE Take-Back Request form
 - Complete and submit the online WEEE Take-Back Request form. Please note that forms must be fully completed in order to prevent process delays
 - Receive instant online confirmation indicating the reference number
 - Receive the End of Life (EOL) asset return authorization number and instruction for EOL asset return

- Not ship EOL product to Harmonic without a Harmonic-provided EOL asset return authorization number

The crossed-out wheeled bin symbol on a Harmonic-branded commercial product indicates that the product should not be disposed of along with municipal waste, but invites our customers to return the product to us under Harmonic's WEEE Take-Back program for product disposal.



Harmonic will pay for the cost of shipping and will provide a Certificate of Recycling or a Certificate of Destruction upon request. For more information on collection, reuse and recycling or to initiate the WEEE take-back process, please complete the form at <http://www.harmonicinc.com/webform/weee-takeback-request> or contact [Harmonic Technical Assistance Center \(TAC\)](#) or email RMA team at rma.emea@harmonicinc.com.

Compliance with additional country specific environmental, safety and EMC standards:

In addition to above listed standards and compliance regulations, Harmonic products may also be compliant with other country specific environmental, safety and EMC requirements. Please contact Harmonic Compliance Team at regulatory.compliance@harmonicinc.com or your local sales representative for more information about compliance with particular country or standard.

Appendix C

Physical Specifications

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

ProStream 1000 Physical Specifications

Table C–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 Front Panel LEDs)
Communication ports	3 Ethernet ports Serial (EIA RS-232) port Fault Relay Port (currently not in use)

Environmental Specifications

Table C–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

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.

Successful Boot

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

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.

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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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.

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 E

Wiring the -48VDC Power Supply

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

Getting Started

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

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 E-1: DC Power Source Specifications

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

Overcurrent Protection

To provide overcurrent protection:

1. Provide overcurrent protection devices for each rack housing ProStream 1000 devices.
2. Place a readily accessible disconnect device between the DC power source and the ProStream 1000.
3. 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.

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 E–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 style="list-style-type: none"> ■ 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

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.

Assembling the DC Input Power Cable

To assemble the DC input power cable:

1. Prepare the power wires as specified in [Wiring Requirements](#).
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 E–3: DC Plug Connector Pin Out

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

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.

To connect the power cable to the ProStream 1000:

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:.

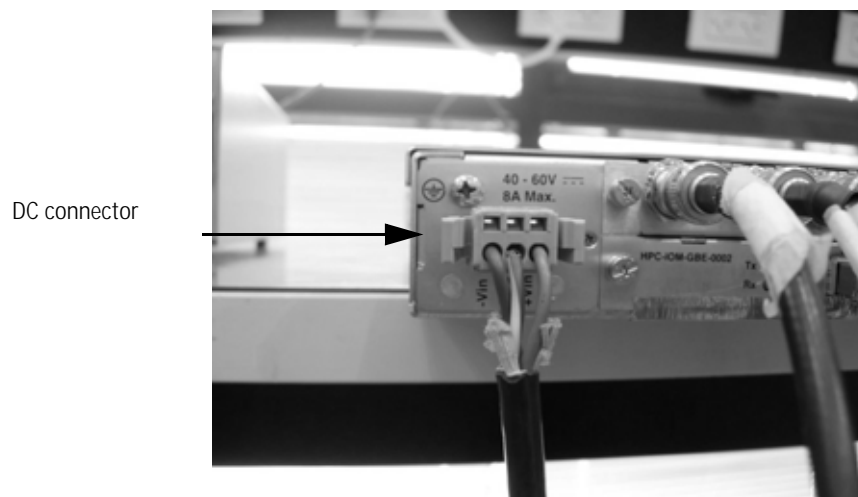


Figure E–4: Connection the DC Input Power

Your ProStream 1000 is now connected to power.

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

