



HPX-1600 USER GUIDE

Chapter 1-3: HPX-1600-IA Product Specifics

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RECORD OF CHANGES

4.06	Amended	Section 1	Paragraph 2: “The HPX-1600-IA...E1/T1 circuits.”
4.06	Removed	Section 6.1.1.1	“The cable specification may be found in”
4.06	Amended	Section 6.1.1.1	Table 1: For pin #3 “Rx” changed to “Tx”
4.06	Addition	Section 6.1.1.6	“6.1.1.6 Rack Mount Preparation...making the connection.”
4.06	Addition	Section 6.1.1.7	“Note: This product contains ...the equipment.”

1. INTRODUCTION

The HPX-1600-IA integrates voice and data services from an optical or copper trunk service. The HPX-1600-IA may also be connected to a central HPX-1600-SS using a compatible Haliplex fibre or E1/T1 Interface Module. This would allow voice subscribers or data circuits located in a high-rise or campus environment to integrate into an SDH/SONET network.

The HPX-1600-IA allows users to connect traditional E&M, FXS, FXO, serial data (V.35/V.24/X.21), n x 64Kbps E1, teleprotection, codirectional and Ethernet with multiple E1/T1 circuits. Ethernet support includes dynamic concatenated bandwidth in multiples of n x DS0 (64Kbps).

The inbuilt cross connect functionality in the HPX-1600-IA allowing users to build new DDN infrastructure or integrate it with existing ones. The standard DACS is a 1024x1024 DS0 type.

The modular approach to the HPX-1600-IA allows network providers to mix and match multiple services using a wide variety of Interface Modules (IMs).

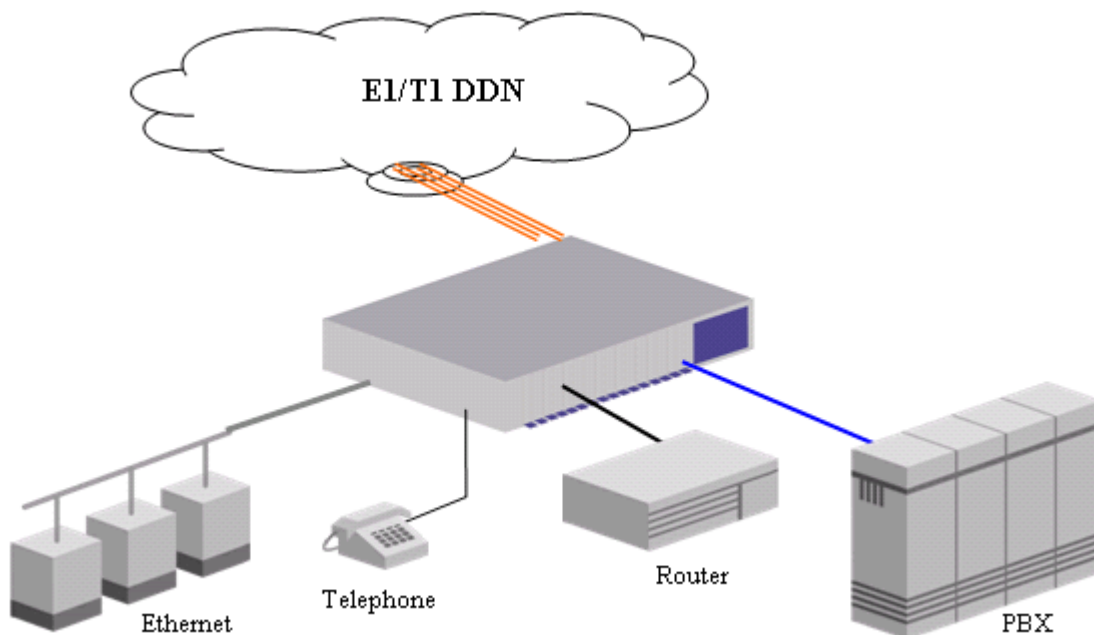


Figure 1 - Application of HPX-1600-IA in DDN Networks

2. IMPLEMENTATION

The HPX-1600-IA can be configured with E1, T1 or the Haliplex Low Speed Fibre (LSF) optic trunk IMs for trunk connectivity and can accept a range of IMs for tributary interfaces. The HPXView management system allows the user to manage the node.

2.1. TRIBUTARIES AND TRUNKS

The HPX-1600-IA accepts a wide range of interface modules. All interface modules are cross connected by the DACS. The DACS can support a maximum of 32 x E1 digital data streams, all cross connected at a DS0 (64Kbps) granularity. The HPX-1600-IA has no reserved slots and E1 and T1 interface modules can be used equally as trunks or tributaries

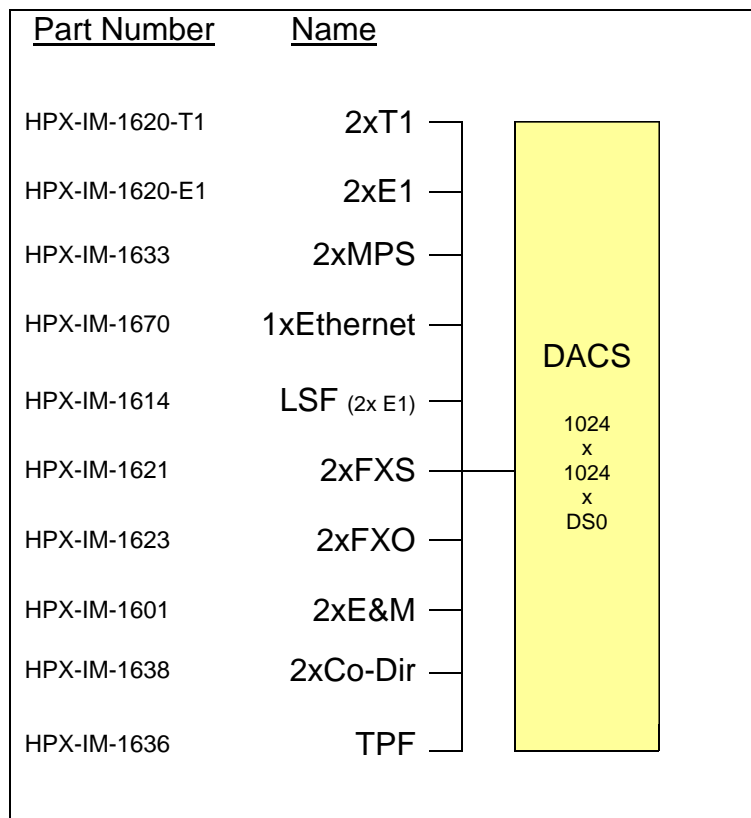


Figure 2 : Tributary to trunk data path

Interface modules that carry digitised voice have channel associated digital signalling, that is also transported by the DACS.

3. NETWORK TOPOLOGY

The HPX-1600-IA can exist as a free-standing networked DACS or can be connected in any combination of linear Point-to-Point network or Star topology. In linear or terminal mode the HPX-1600-IA can interface to a central HPX-1600-SS or as a terminal extension of SDH/SONET network.

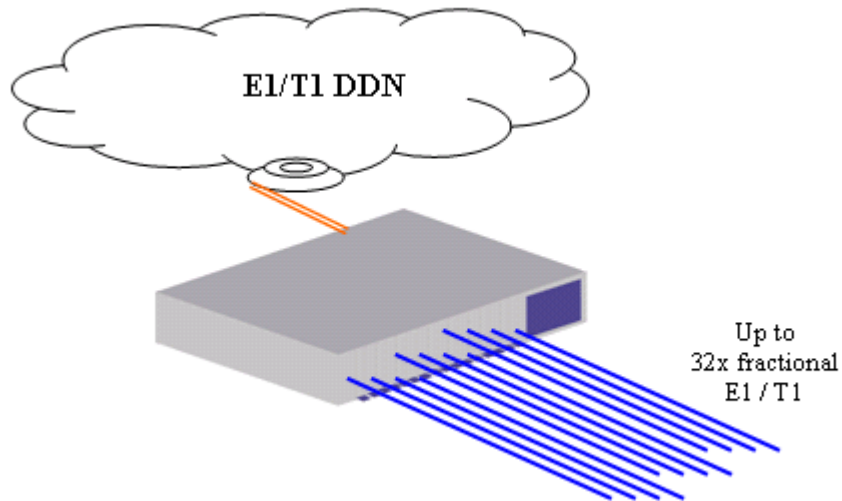


Figure 3 : Grooming fractional E1/T1

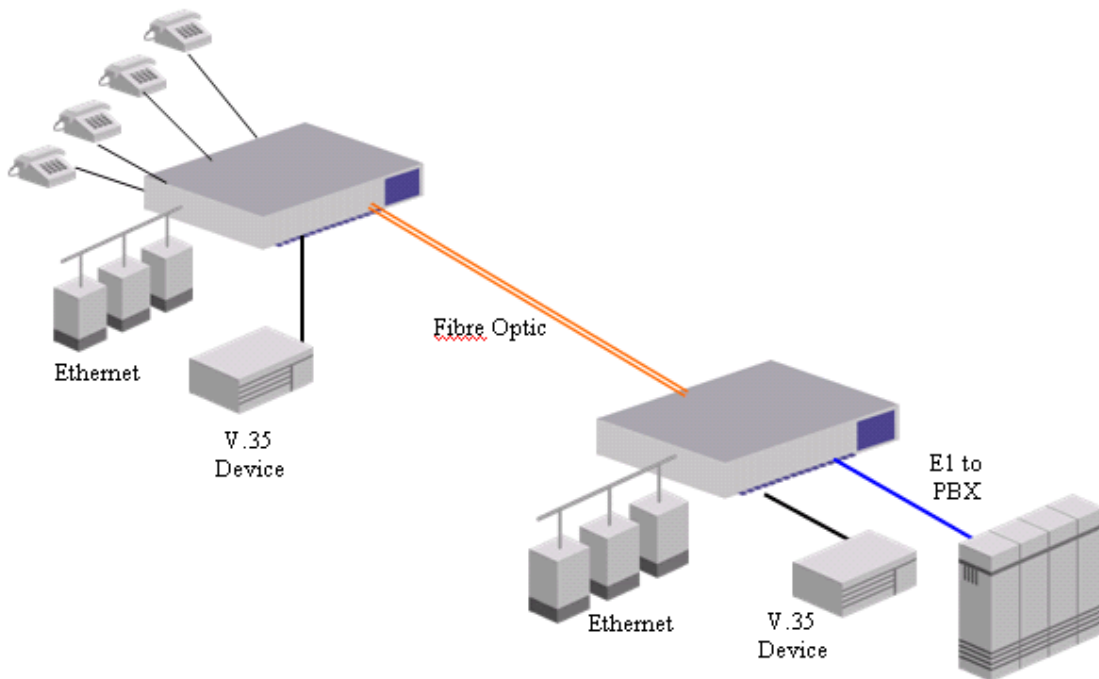


Figure 4 : Point-to-Point multi-service network

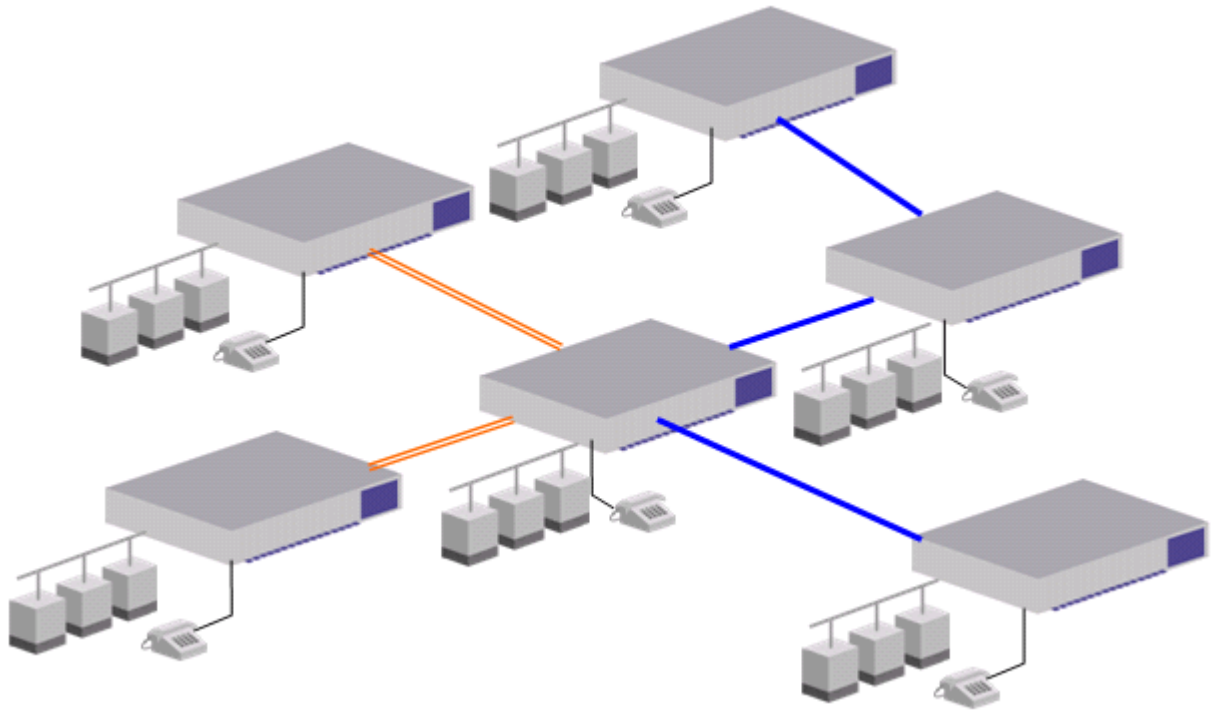


Figure 5 : Complex network, Linear, Star, Spur

4. NODE CONFIGURATION AND MANAGEMENT

4.1. HPXVIEW CONFIGURATION

When a computer running HPXView is connected to an HPX-1600-IA node, the configuration dialog (Refer to Figure 6) is located in the main HPXView screen.

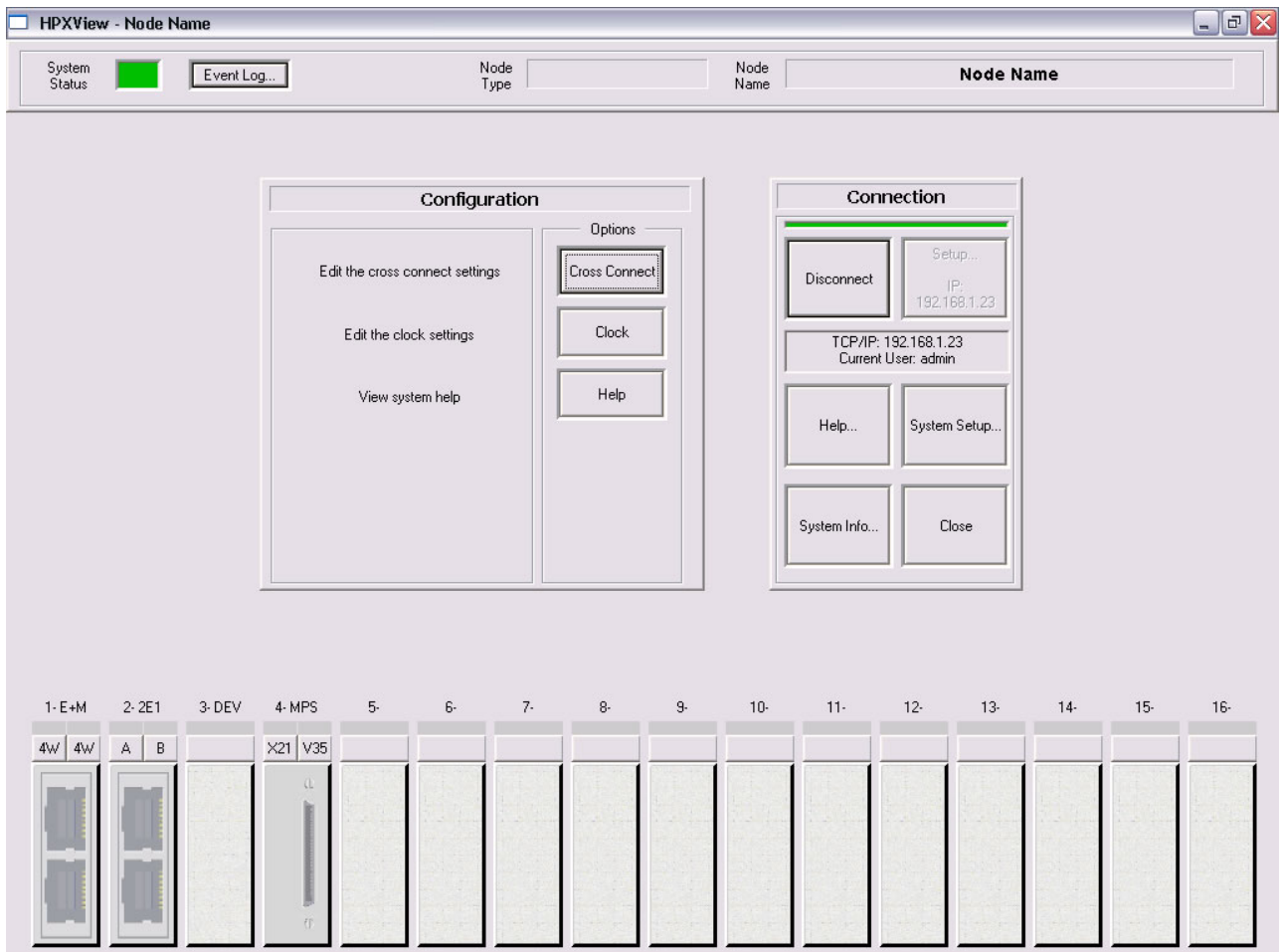


Figure 6 : HPXView

Refer to Chapter 3 for details of connecting and configuring the HPX-1600-IA with HPXView.

5. INSTALLATION - REQUIRED INFORMATION

After you install the chassis, your system administrator must configure the individual and system interfaces before you connect your system to external networks. Refer to Chapter 3-1 – HPXView Setup and Configuration for more detailed information.

Before you commence configuration, you will need information about the network. Following is some of the information you might need, depending on the services you plan to offer:

- ❑ Node name and IP address for the HPX-1600-IA.
- ❑ Passwords to prevent unauthorized privileged-level access to the configuration.
- ❑ Optical interface standards.
- ❑ Operating speeds and required electrical standards for electrical interfaces-For example, serial interfaces operate at speeds of up to 2 Mbps. The speed of an interface will depend on the speed of the remote device to which it is attached. Interfaces may conform to V.24, V.35 or X.21 standards.
- ❑ Voice interface requirements for specific interfaces.
- ❑ The source of the network clock reference.

6. OPERATION

6.1. HPX-1600-IA OPERATION

6.1.1. CONNECTIONS AND DISPLAY

The HPX-1600-IA front panel is located on the right side of the front of the unit. Overall HPX-1600-IA system status is reported to the front panel displays. The front panel also houses the connections for power, management workstation and alarm relays.

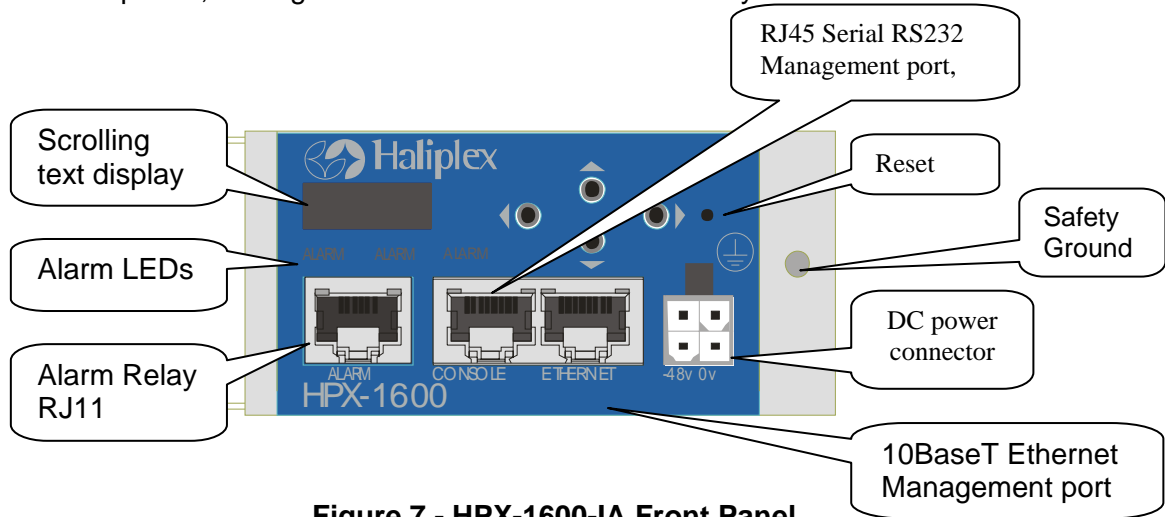
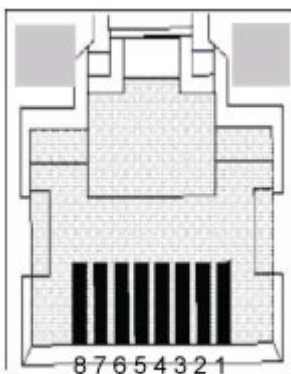


Figure 7 - HPX-1600-IA Front Panel

6.1.1.1. CONSOLE

The “Console” port is a RJ45 jack for connection to the HPXView management workstation. This method of connection uses a RS232 serial communications interface. Serial data console connection provides a management interface to the locally connected HPX-1600 only.



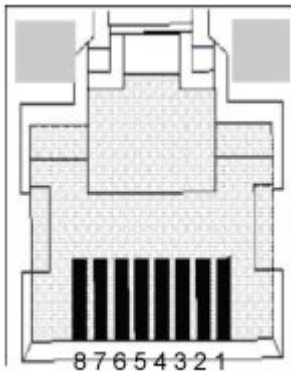
RJ45 pin #	Signal name	DB9 pin #
4	Gnd	5
6	Rx	3
3	Tx	2

Table 1 : Console Serial port pin out

Figure 8 : Console Serial pin out

6.1.1.2. ETHERNET

The RJ45 connector labelled "Ethernet" provides an IP management connection to the HPX-1600-IA. The Ethernet connector carries management information between a local management station, this HPX-1600-IA and other HPX-1600 family devices at the same location. The Ethernet uses HPXView and SNMP over the IP network protocol to connect the management workstation to the Haliplex nodes. Management access of remote nodes is only possible once the management IP addresses and routing have been configured and are operational.



RJ45 pin #	Signal name	Signal name	RJ45 pin #
1	Tx +	Rx +	3
2	Tx -	Rx -	6
3	Rx +	Tx +	1
6	Rx -	Tx -	2

Table 2 : Console Ethernet Cross Over Direct to HPXView PC

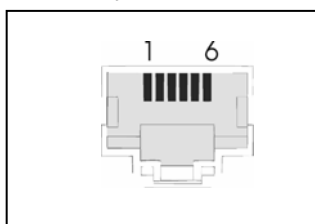
Figure 9 : Console Ethernet pin out

6.1.1.3. CONSOLE ALARMS

System alarms are defined with three levels of severity. Each level has an associated relay whose contacts are made available via the RJ11 jack. The contacts are normally open, but close when the alarm is active. The three LEDs indicate the alarm status and level of severity. The LEDs are coloured Green, Yellow and Red.

The pin assignments on the RJ11 socket and their associated alarm relay severity level are shown below in Figure 10 and Table 3.

The relay contacts are rated at :



- 0.3A @ 125VAC
- 0.5A @ 60VDC
- 1A @ 30VDC.

Figure 10 – RJ11 Socket (as viewed from the HPX-1600-IA Front Panel)

Alarm Relay Severity Level	RJ11 Pins (Relay Contacts)
Green	1 & 2
Yellow	3 & 4
Red	5 & 6

Table 3 – Alarm Relay Severity Levels

- The alarm relay contacts close when the alarm is active
- Under normal operation the Green relay contacts are closed
- If power is removed from the unit, all three of the alarm relays close contacts.

6.1.1.4. RESET

A concealed, momentary contact reset switch is located behind the front panel. Suggested access is with a paper clip or similar thin material through the small hole located in the "alarms" area of the front panel. Do not use a pencil or similar material that could leave conductive material inside the case, where it may cause damage. When pressed, the reset switch applies a reset to the HPX-1600-IA system processor. Do not operate this reset switch while the HPX-1600-IA is in operational use. All communications will be interrupted and data in transit lost. The reset switch is to be used to restart the system as if from a power up.

6.1.1.5. GROUND CONNECTOR

The Haliplex HPX-1600-IA series must be connected to an electrical ground using the ground screw connector on the face of the front panel. This is a safety feature. The equipment grounding should be in accordance with local and national electrical codes. Use a minimum of 16 AWG (1.25 mm²) wire for the ground connection.



All communications equipment should be connected to a common ground. This will result in improved data communications. Rack mounted systems may use the equipment rack as the ground path.

6.1.1.6. RACK-MOUNT PREPARATION

For NEBS compliance, remove paint and any other non-conductive coatings on the surfaces between the mounting hardware and the rack framework. Clean all surfaces and apply anti-oxidant before joining. Coat all bare conductors with an appropriate anti-oxidant compound before crimp connections are made. Bring all connectors to a bright finish and coat with an anti-oxidant before making the connection.

6.1.1.7. DC POWER CONNECTOR

The DC power connector is a four pole jack through which -48VDC is provided to the HPX-1600-IA. The Haliplex HPX-1600-IA series ships with a 2-wire CABLE, which will fit into the HPX-1600-IA DC power inlet. The other end of the supplied cable should be connected to the customer supplied -48VDC supply. Use a minimum of 16 AWG (1.25 mm²) wire for the input to each DC-input power supply.

The four poles of the connector are wired in two parallel pairs. Only one pair of connectors needs to be wired. The second pair of connectors is available for optional connection to a redundant -48VDC power supply (not supplied). Diode isolation is provided internally between the primary and redundant -48VDC power supplies.

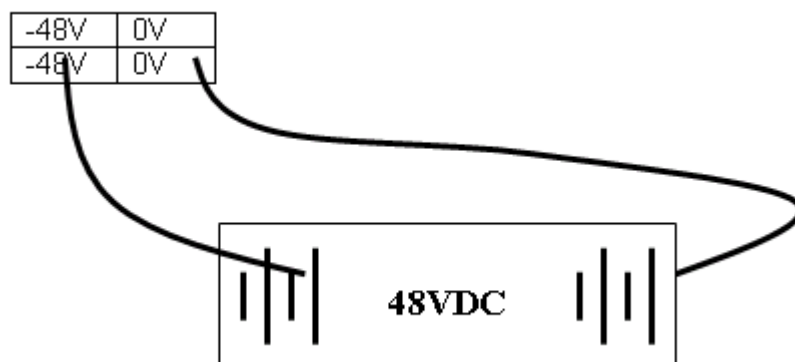


Figure 11 –48V Power Jack (viewed from front)



Note: This product contains an Isolated DC return configuration (DC-I), in which the DC return terminals are not connected to the equipment frame or the grounding means of the equipment.

6.1.1.8. STATUS DISPLAY AND SCROLL BUTTONS

The four character alpha-numeric display conveys system status and diagnostic information. A command menu can be navigated using the four scroll buttons for Up/Down, Left/Right selection. *These buttons will be enabled in a future software release.*

6.1.2. FUNCTIONS

The Front Panel displays a scrolling "HPX-1600-IA" message during normal operation. Pressing the "down" switch take the user into the first level of a menu tree. Use the "Left" and "Right" switches to move around the first level of the menu tree. Press the "Down" switch to select a branch. Pressing the "Up" switch returns to the previous level. *These buttons will be enabled in a future software release.*

6.1.3. POWER UP DISPLAY

At power up, the HPX-1600-IA system progresses through a staged sequence of initialisation. The status can be interpreted from the state of the front panel and IM display LEDs.

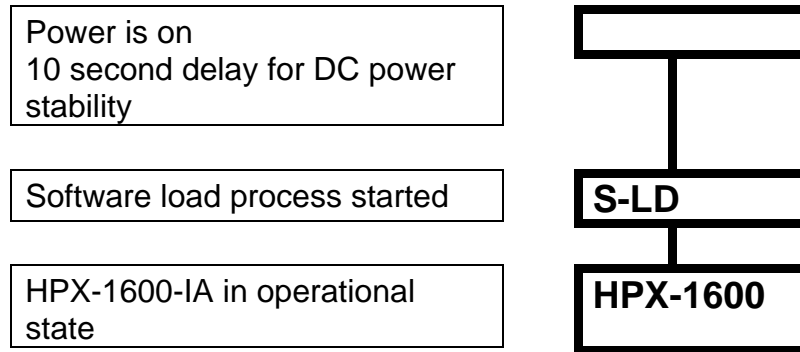


Figure 12 - Power up sequence display

The Interface Module LEDs display yellow after the software has been loaded and before the configuration files are enabled. Usually this sequence is too fast to see the “all Yellow” phase. If displayed it may indicate that there is a problem with the configuration file load process.

Initialisation Sequence	IM LED Display
Power On	All Off
IM Firmware Loaded	All Yellow
IM Configuration Files Loaded	Red or Green

Figure 13 – IM Initialisation LEDs