



Haliplex
Communication Systems

HPX-1600 USER GUIDE

**Chapter 2-10:
HPX-IM-1630
E3/DS3 IM**

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1. GENERAL CHARACTERISTICS

The E3/DS3 IM is a single port IM that can operate as either an E3 or a DS3 IM. The E3 IM operates at 34Mbps and the DS3 IM operates at 45Mbps. It is a single port IM that allows connection via 1.6/5.6 female connectors to equipment that supports E3/DS3. The E3/DS3 IM can be used as a tributary circuit in the HPX-1600-SS chassis in IM slots 3, 4, 5, 6, 7 or 8.

The HPXView graphic of the E3/DS3 IM is shown Figure 1.



Note: Adapter cables from 1.6/5.6 to BNC connectors are available.



Figure 1 – E3/DS3 IM

2. IM CONFIGURATION

The IM configuration dialog has configuration tabs as discussed below.

2.1. INTERFACE PARAMETERS

The interface module can be configured for E3 (34Mbps) or DS3 (45Mbps) operation before cross connection. After a SD/SONET connection of this tributary interface has been made and installed, these mode options are “greyed” out and not available until the SDH/SONET connection has been deleted and the configuration change installed.

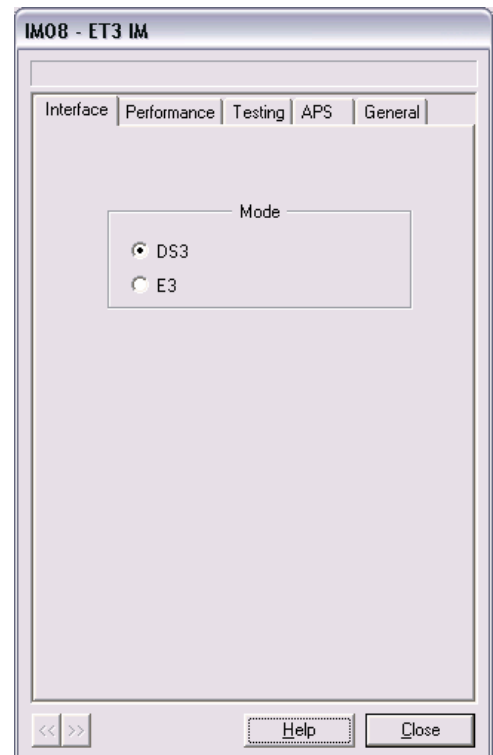


Figure 2 – E3/DS3 IM configuration dialog interface tab

2.2. PERFORMANCE PARAMETERS

There are currently no configurable performance parameters.

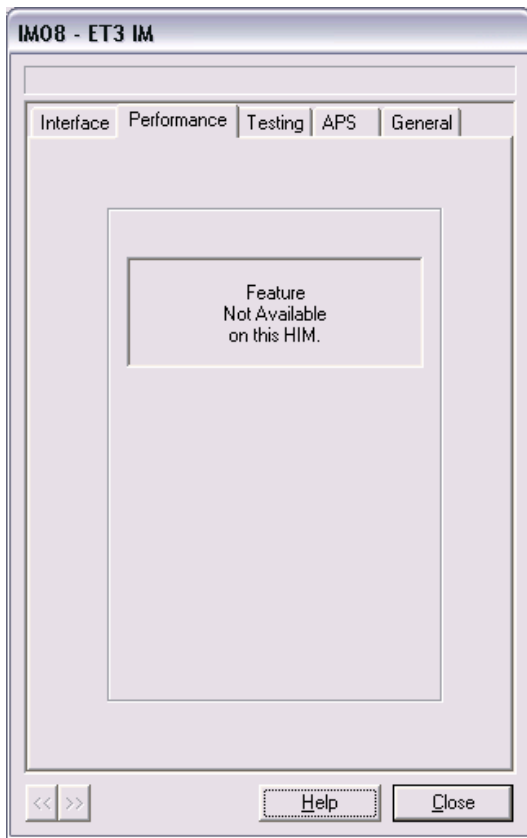


Figure 3 – E3/DS3 IM configuration dialog performance tab

2.3. TESTING PARAMETERS

The testing tab of the E3/DS3 IM configuration dialog allows the user to select a loopback option for testing purposes. There are currently 4 loopback options;

- No loopback (default)
- LIU Line loopback
- LIU Equipment loopback
- IM Connector loopback

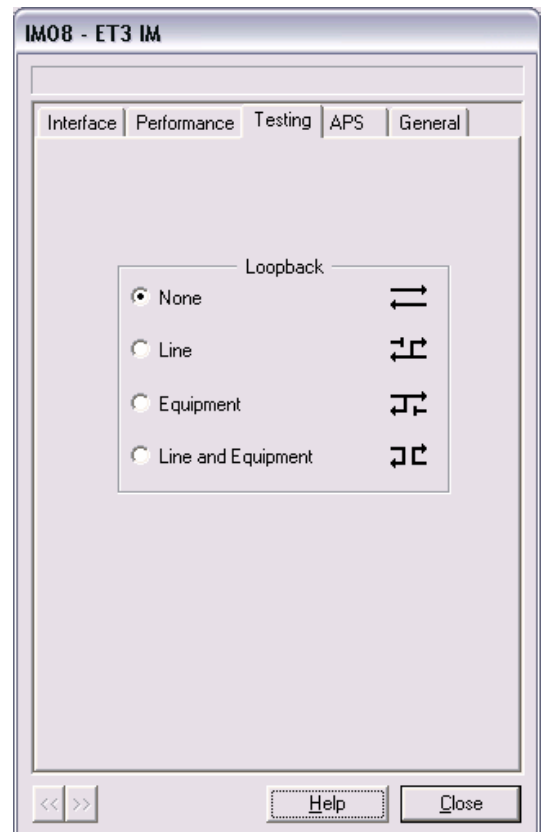


Figure 4 – E3/DS3 IM configuration dialog testing tab

2.4. AUTOMATIC PROTECTION SWITCHING (APS)

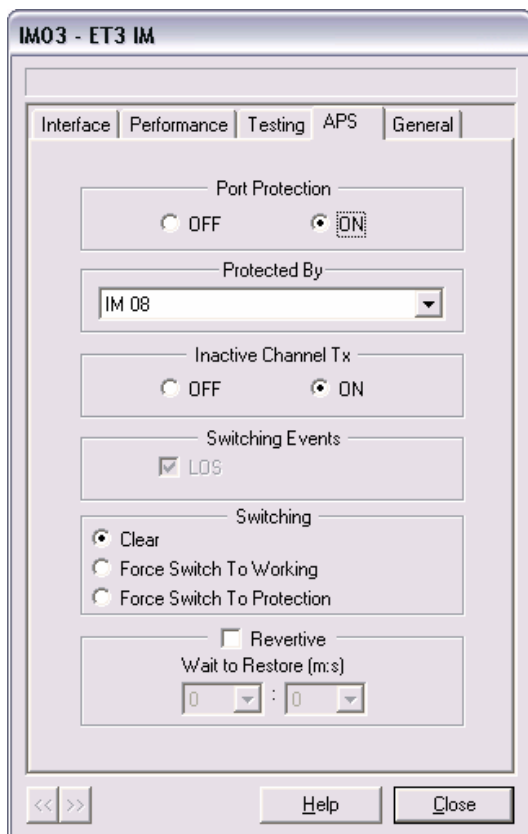
The E3/DS3 IM requires another E3/DS3 IM to be configured for APS to be available. The APS Tab allows the user to set up APS on that IM. To enable APS for the E3/DS3 IM, select ON from Port Protection. To disable APS switch the Port Protection OFF. The configuration of the protected and protection IM's can not be changed once APS is ON. IM's that already have an Async connection in the SDH/SONET cross connect window cannot be used as protection IM's. The protection IM cannot have an Async connection in the SDH/SONET cross connect window.

2.4.1. PROTECTED BY

APS for the E3/DS3 requires another E3/DS3 IM to be configured and only works in pairs. The IM's configured are then accessible as protected IM's and can be selected from the drop down list. The E3/DS3 IM can only have one protected IM.

2.4.2. SWITCHING EVENTS

Switching Events is the selection of events (alarms) that determines when the path of transmission is to switch from working path to protected path. Explanations on the listed events can be read about in Section 4 IM Alarms. The E3/DS3 only has a LOS alarm and is therefore the default for the switching events, this cannot be changed.



2.4.3. SWITCHING

The switching section has a default setting to 'Clear' this allows the switching to occur based on the events selected in the 'Switching Events' section.

The user can opt to Force Switch to Working, or Protection. The force switch uses the new path as the path of transmission and is not selected by any of the above conditions. When a force is selected the switch will apply regardless of whether there are any errors on the path.

2.4.4. REVERTIVE

Enable for APS to revert. If a switch has occurred, it attempts to restore itself after the specified time period, selected from the drop down list. As default, 5 seconds minimum is required. Revertive is only available when the Inactive Channel Transmitter is ON.

Figure 5 – E3/DS3 IM Configuration Dialog APS Tab

3. IM TESTING

The following tests are currently available;

- No loopback (default)
- LIU Line loopback (1)
 - Data is sent through the IM connectors to the backplane and loops back to the IM connector, whilst the data sent from the backplane through the IM is dropped.
- LIU Equipment loopback (2)
 - Data is sent through the backplane to the IM connector and loops back to the backplane, whilst the data sent from the IM connector is dropped.
- IM Connector loopback (3)
 - Data that is sent through the IM connector loops back out to the IM connector. Data that is sent from the backplane through the IM is looped back out to the backplane.

The location of each of these loopbacks is shown below.

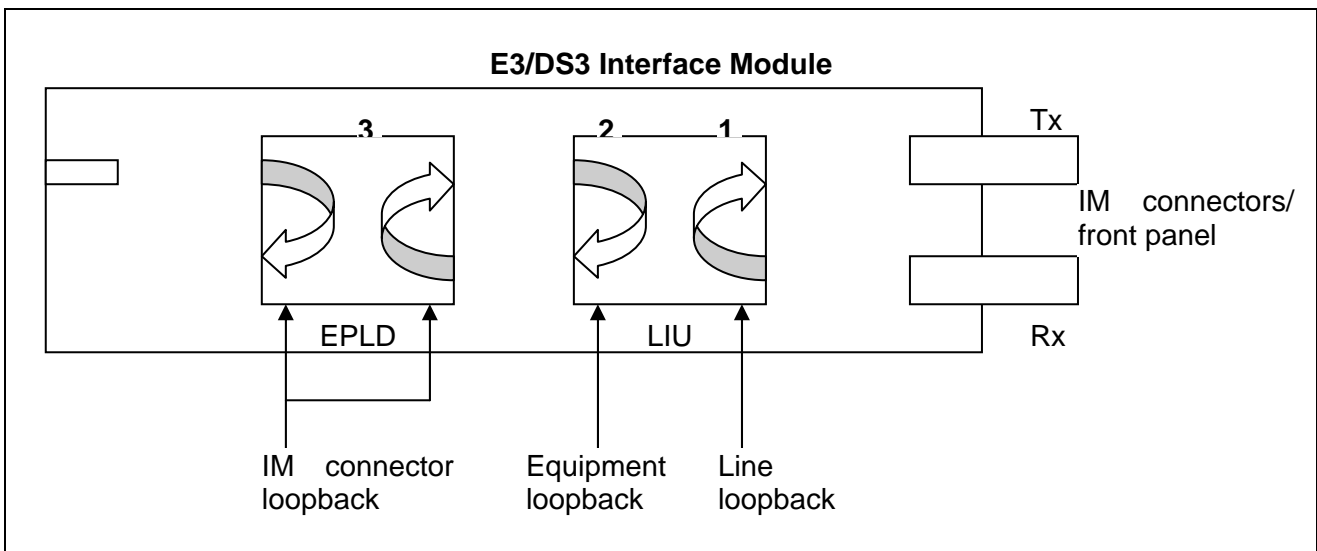


Figure 6 – E3/DS3 IM loopback options

4. IM ALARMS

The E3/DS3 IM has a Loss of Sync alarm that can be configured and monitored via the IM alarm monitor setup window.

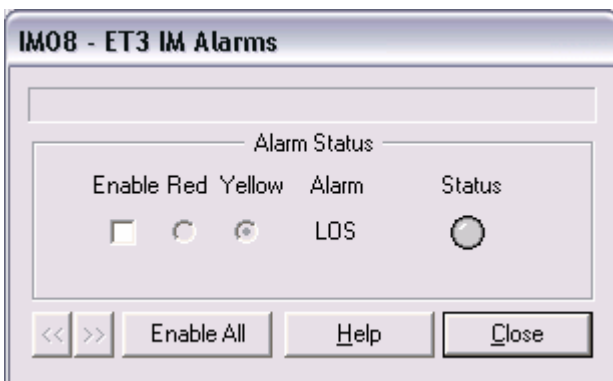


Figure 7 – E3/DS3 IM alarm monitor setup window

5. RECIEVER GROUNDING

The isolated receiver on the E3/DS3 IM can be connected to ground using jumpers. The jumper settings are shown below in Figure 8.

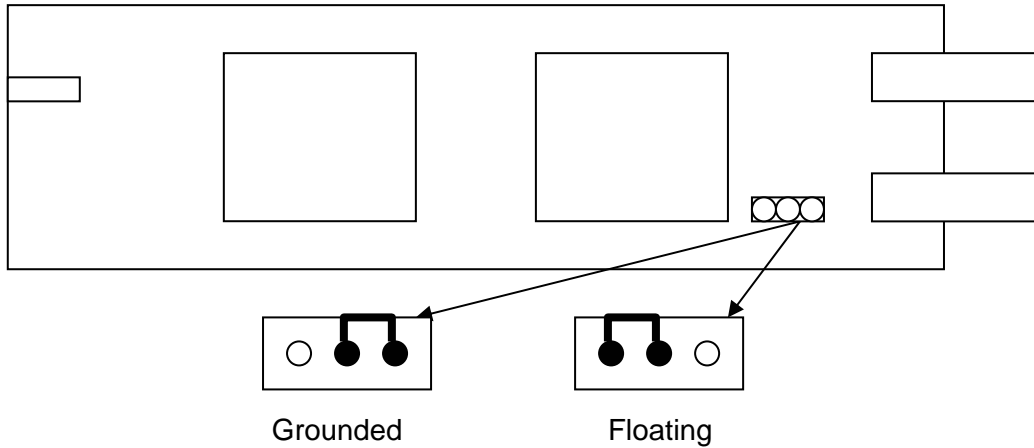


Figure 8 – Jumper settings for receiver grounding

6. IM INDICATORS

The E3/DS3 IM front panel contains a LED. The LED displays the status of the electrical trunk. When the IM is synchronised over an electrical trunk with a peer E3/DS3 IM the LED is illuminated Green. Failure of synchronisation or Loss of Signal will cause the LED to show Red.

**Any alarm condition is latched and displayed for 15 seconds.
Therefore the electrical may be up and operational but still displaying a flashing alarm.**

Table 1 below shows the E3/DS3 indicator interpretations.

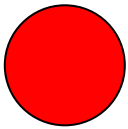
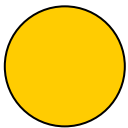
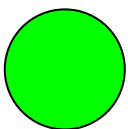
	Red LED: Loss of signal
	Orange LED one flash: Indicates IM booted
	Green LED: Signal is present

Table 1 – E3/DS3 IM LED interpretations

7. INTERFACE SPECIFICATION

Bit Rate	E3 – 34.368Mbit/s, DS3 – 44.736Mbit/s
Bit rate tolerance	+/- 20ppm
Line coding	E3-HDB3, DS3-B3ZS
Electrical connector	1.6/5.6 75 Ohms connector
Transmission Medium	Coax Cable (RG179 or equivalent)
Alarm monitoring per channel	Loss of Signal, TX drive monitor, Line Code Violation
Indicator LED's	Red: Alarm, Green: Ok, Flashing Green: Timing off that IM
Pulse mask	G.703/ANSI T1.107
Transmit Jitter	<0.04 Unit Intervals peak to peak
Jitter tolerance	G.823
Jitter Attenuation	G.735
Transmit Return Loss	Greater than or equal to 20dB @ $F_b/2$ (F_b =Tx bit rate)
Receive Return Loss	Greater than or equal to 20dB @ $F_b/2$ (F_b =Tx bit rate)
Maximum cable attenuation	15dB
Power consumption	Max 3 Watts
Standards	ITU: G.703, G.775, G.823, I.431, ETS 00 166 ANSI T1.107
Interface protection	ITU: K.41

Table 2 – Interface Specifications

8. INTERNATIONAL COMPLIANCES

All HPX-1600 products have achieved the following international compliances;

- CE
- A Tick
- C Tick
- FCC part 15 class B
- UL



FCC COMPLIANCE STATEMENT

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.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures

- *Reorient or relocate the receiving antenna*
- *Increase the separation between the equipment and the receiver*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected*
- *Consult the dealer or an experienced radio/TV technician for help*

Warning: *Any changes or modifications not expressly approved by Haliplex Pty Ltd could void the user's authority to operate this equipment.*

8.1. ELECTROMAGNETIC COMPATIBILITY (EMC)

- CISPR 22 class B
- EN55022
- FCC part 15 class B
- AS/NZS3548
- EN300386-1

8.2. SAFETY

- IEC60950, UL60950, and AS-NZ60950:2000 for General safety

8.3. IMMUNITY

- EN61000-4-2
- EN61000-4-3
- EN61000-4-4
- EN61000-4-5
- EN61000-4-11

8.4. PERFORMANCE

- TS 016, G-703 TBR12, TBR13