



HPX-1600 USER GUIDE

**Chapter 2-16:
HPX-IM-1632
ET3M (M13) Multiplexer IM**

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1. GENERAL CHARACTERISTICS

The ET3M Multiplexer Interface Module (IM) is an E1-E3 or T1-T3 PDH multiplexer contained in an interface module.

The IM allows for E1 or T1 tributaries to be connected between SDH and SONET networks. It also has the capability to multiplex E1 or T1 circuits from East and West in a single spur trunk.

The ET3M Mux IM is shown Figure 1.



Figure 1: ET3M Mux IM

This interface module can be installed in the HPX-1600-SS platform, slots 1 through to 14. See Chapter 3-8 for cross connection and application notes.

2. IM CONFIGURATION

The IM configuration dialog has configuration tabs as discussed below.

2.1. INTERFACE PARAMETERS

Commonly referred to as an “M13” interface module, the M13 can be soft configured to one of four multiplexer standards.

- M13: 28x T1(1.5Mbps) multiplexed into a DS3 (45Mbps)
- T3 (C bit parity): 28x T1(1.5Mbps) multiplexed into a DS3 (45Mbps)
- E13: 16x E1(2Mbps) multiplexed into a E3 (34Mbps)
- G.747: 21x E1(2Mbps) multiplexed into a DS3 (45Mbps)

A remote management HDLC channel is supported in only these operational modes;

- T3
- E13

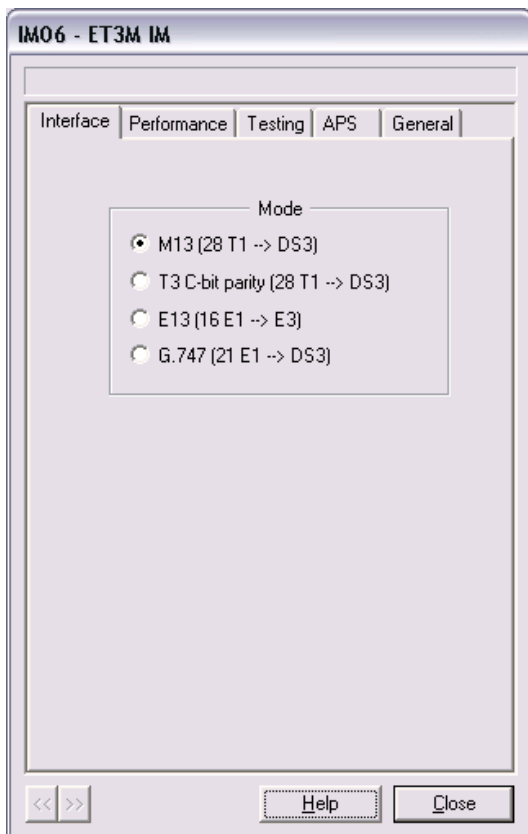


Figure 2: ET3M Mux IM Configuration Dialog Interface Tab

2.2. PERFORMANCE PARAMETERS

There are no configurable parameters.

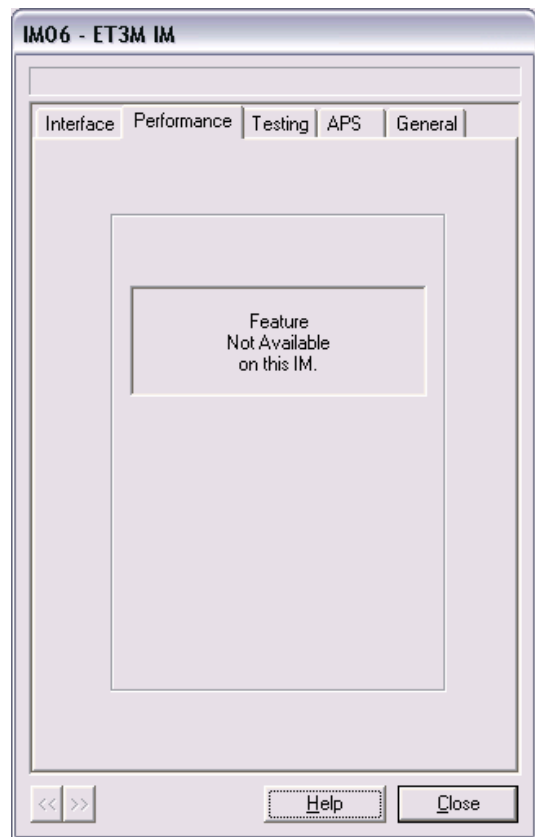


Figure 3: ET3M MUX IM Configuration Dialog Performance

2.3. TESTING PARAMETERS

The testing tab allows the user to select a loopback mode for testing.

For more information on the loopback options available, refer to section 3.

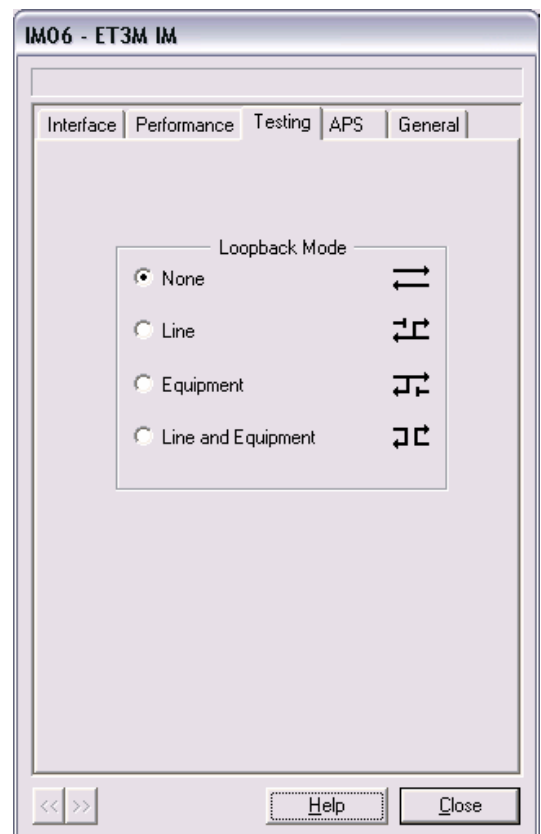


Figure 4: ET3M MUX IM Configuration Dialog Testing Tab

2.4. AUTOMATIC PROTECTION SWITCHING (APS)

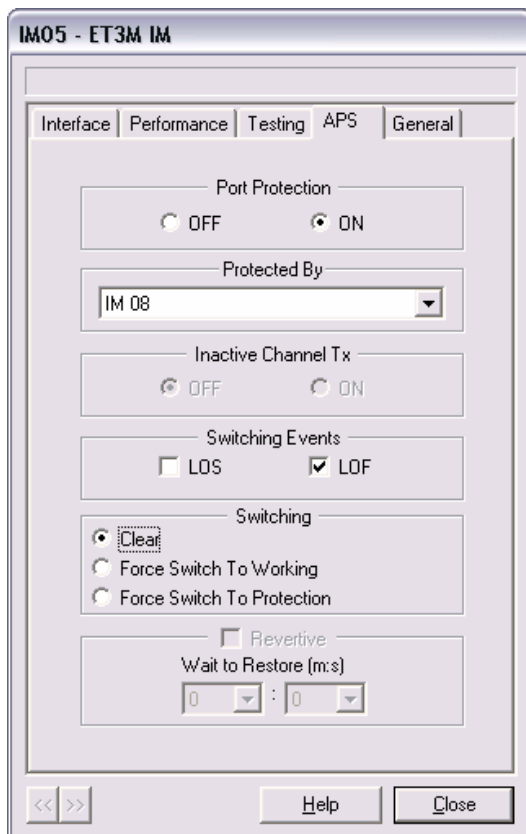
The E3/DS3 IM requires another E3/DS3 IM to be configured for APS to be available. The APS Tab allows the user to set up APS on that IM. To enable APS for the E3/DS3 IM, select ON from Port Protection. To disable APS switch the Port Protection OFF. The configuration of the protected and protection IM's 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 ET3M Mux requires another ET3M Mux 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 ET3M Mux 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.



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: ET3M MUX IM Configuration Dialog APS Tab

3. IM TESTING

The ET3M Mux IM has no loopback selected as the default setting for normal IM operation. However, for testing purposes, one of three loopback options can be set. The three available loopback options are illustrated below in Figure 6.

- Line loopback
 - 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.
- Equipment loopback
 - 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.
- Line and Equipment loopback
 - 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.

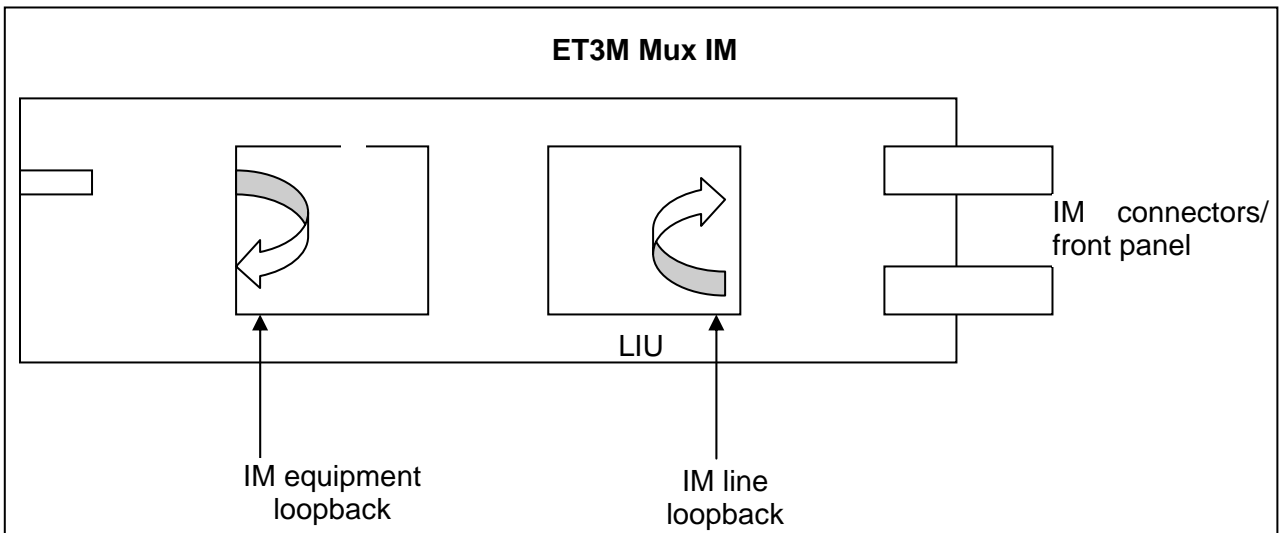


Figure 6: ET3M MUX IM loopback options

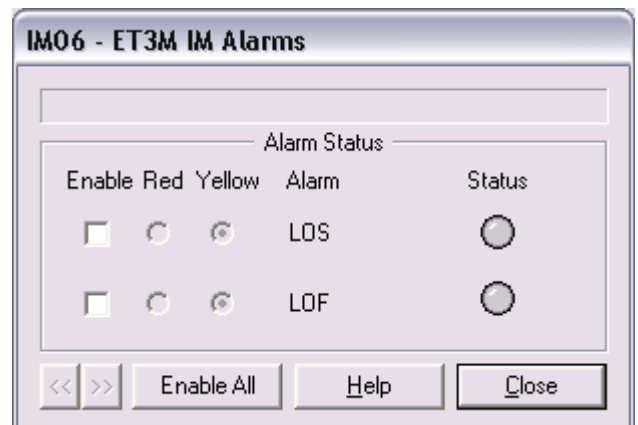
4. IM ALARMS

The ET3M MUX IM has alarms that can be configured and monitored via the IM alarm monitor setup window.

LOS: Loss of Signal, the electrical signal level has been lost.

LOF: Loss of Frame, the framing of the E1/T1 tributary circuits has been lost.

Figure 7: ET3M MUX IM Alarm Monitor Setup Window



5. IM INDICATORS

The ES-DS3 Mux module has a single LED indicator. The LED interpretations for the ET3M MUX IM are shown below in Table 1.

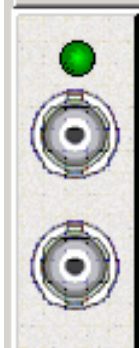
ET3M Mux module	Colour of LED	Interpretation
	Green	Signal detected
	Red	Loss of signal

Table 1: ET3M MUX IM LED Interpretations

6. INTERFACE SPECIFICATIONS

Bit Rate	E3: 34.368MBps, T3: 44.736MBps
Bit rate tolerance	+/- 20ppm
Line coding	E3-HDB3, T3-B3ZS
Electrical connector	BNC 75 Ohms connector
Management	HDLC, only in T3 C-bit parity and E13 mode
Framing	M13, T3 C-bit parity mode, E13, G.747 framing
Ds3/E3 alarms	LOS, LOF, AIS, RAI
Indicator LED's	Red: LOS, Green: No LOS
Pulse mask	G.703/ANSI T1.107
Jitter tolerance	G.823
Jitter Attenuation	G.735
Transmit Return Loss	G.703
Receive Return Loss	G.703
Maximum cable attenuation	24dB before LOS is declared
Power consumption	Max 3 Watts
Standards	ITU: G.703, G747,G735, G.775, G.823, ETS 300 166 ANSI T1.107

Table 2 : Interface Specifications

