



**Haliplex**  
Communication Systems

# **HPX-1600 USER GUIDE**

**Chapter 2-5:  
HPX-IM-1621  
Dual FXS IM**

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# 1. GENERAL CHARACTERISTICS

The dual FXS Interface Module (IM) operates at 64kB/s and allows connection via an RJ-45. This IM supports dual FXS ports. The dual FXS or Station Loop Start operation provides connection to a standard single-line, 2-wire telephone instrument, the line circuit of a Key Telephone System or a loop start trunk circuit of a Private Branch Exchange (PBX) that normally connects to incoming Central Office (CO) circuits. This interface type provides power and ringing signals to its interfacing equipment.

The Dual FXS IM is shown below in Figure 1.



Figure 1: Dual FXS IM

# 2. IM CONFIGURATION

The IM configuration dialog has configuration tabs as discussed below.

## 2.1. INTERFACE PARAMETERS

The interface parameters managed are;

- Companding type ( $\mu$ -law, A-law)
- Signalling type (CAS, R2, PLAR)
- Ringing Setting
  - Repeated ring
    - Applies the received “abcd” bits to generate the ring cadence
  - Interrupted ring
    - Generates an independent cadence
- Line set up
  - Transmit gain in dB; (-30 to +6, nominally 0)
  - Receive gain in dB; (-30 to +6, nominally 0)

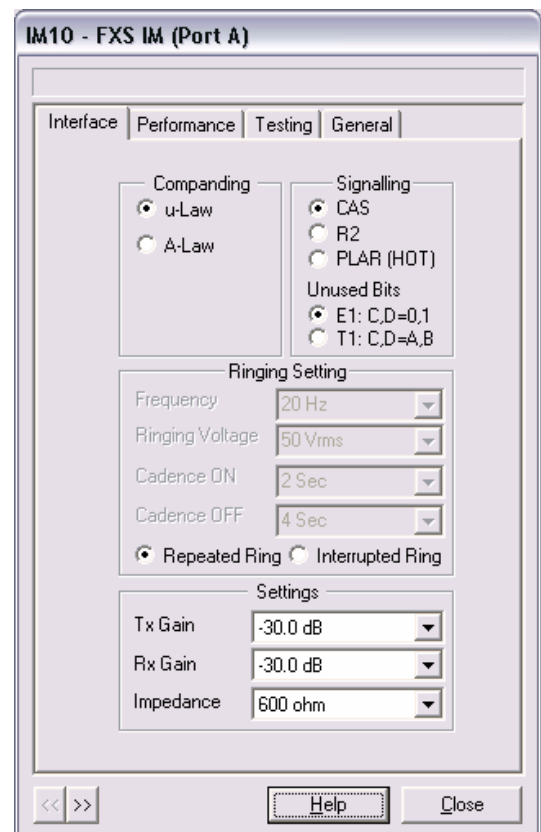


Figure 2: Dual FXS IM Configuration Dialog Interface Tab

## 2.2. PERFORMANCE PARAMETERS

This feature is not available at present time.

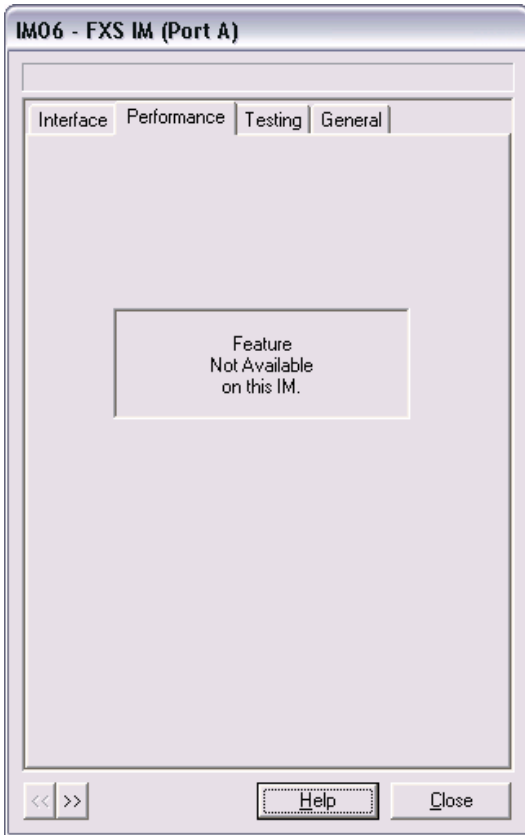


Figure 3: Dual FXS IM Configuration Dialog Performance Tab

## 2.3. TESTING PARAMETERS

There are two testing parameters available, Loopback and Launch Test.

### 2.3.1. LOOPBACK MODE

The user can select from Digital LIU loopback or IM loopback.

For more information on these tests, refer to section 3.

### 2.3.2. LAUNCH TEST

The user is able to launch a 1kHz tone at 0dBm into the transmit and receive paths of the circuit, channel and interface respectively.

This is done by an oscillator which is switched into the transmit and receive paths.

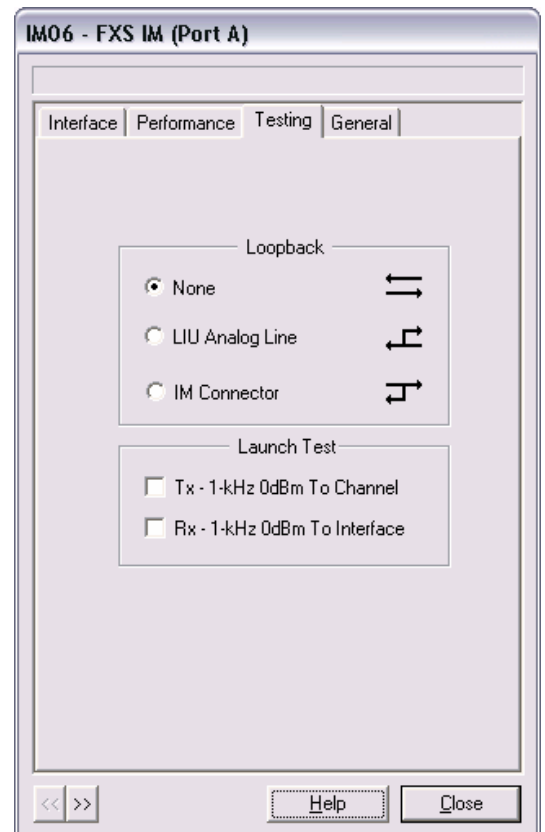


Figure 4: Dual FXS IM Configuration Dialog Testing Tab

### 3. IM TESTING

The following tests are available to the user via the testing tab of the IM Configuration Dialog;

- Digital LIU loopback; Digitally loops back an analog signal received after it has been converted to a digital stream. (1)
- IM loopback; Digitally loops back a signal received by the IM via its digital interface (from the ST-Bus). (2)

These loopbacks are illustrated below in Figure 5.

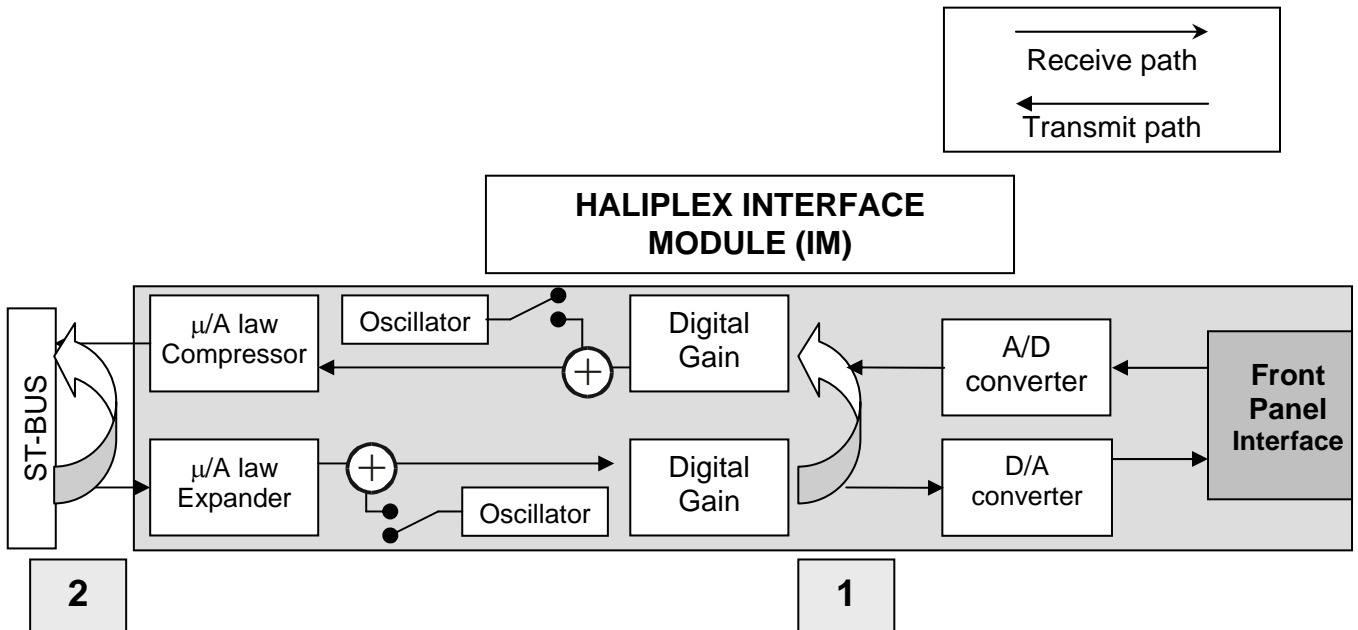
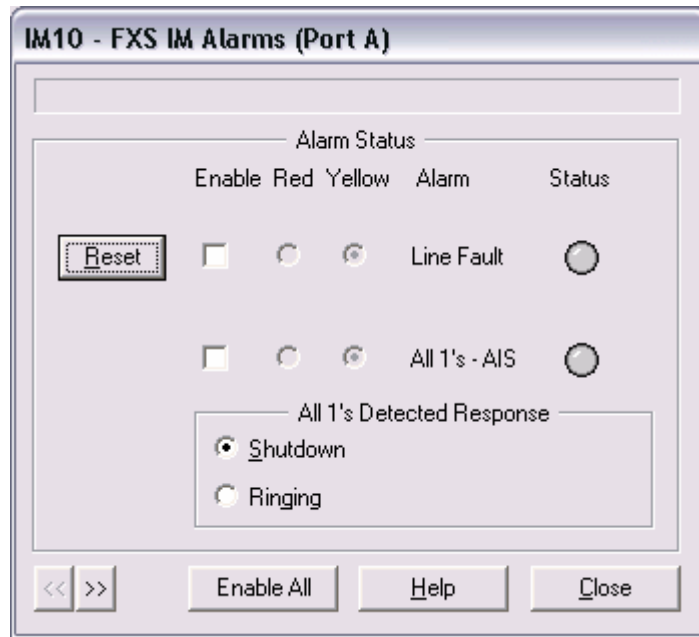


Figure 5: Dual FXS IM loopback options

## 4. IM ALARMS

The Dual FXS IM provides a facility to alarm when internal circuitry power thresholds are exceeded and deactivate the line feed. This can be caused by TIP and RING short, RING short to ground or internal circuitry damage. Once the alarm condition is removed, the Dual FXS IM has a reset button that will reactivate the line feed and remove the alarm.

The IM alarms to be configured as yellow or red alarms are shown below in Figure 7.



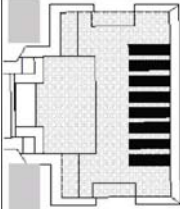
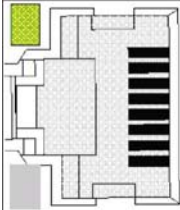
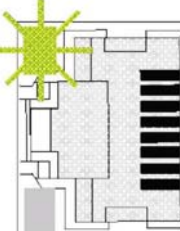
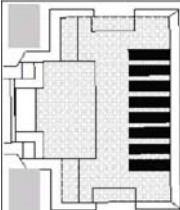
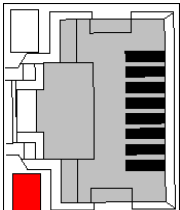
**Figure 6: Dual FXS IM Alarm Monitor Setup Window**

In the event of the connection to the remote end of the digital voice stream being disconnected or failing, the Dual FXS IM can detect all 1's. The user can select the alarm event and to either shut down the interface or generate a ring. The latter may be selected for monitoring critical services such as hotlines.

## 5. IM INDICATORS

Each Dual FXS IM has two alarm indications LEDs on the front panel.

The LED interpretations are summarised below in Table 1.

RJ45 LED Display		Interpretation
	Top LED off	<b>Phone on-hook</b>
	Top LED constantly on: green	<b>Phone off-hook</b>
	Top LED flashing: slow flash rate	<b>Phone ringing</b>
	Bottom LED off	<b>Line normal</b>
	Bottom LED constantly on - Red	<p><b>Line fault alarm condition occurring</b></p> <p>Alarm can be reset via the reset button on the IM alarm monitor setup window. The window is accessed by clicking on the coloured status bar above the IM graphic in HPXView. Note that the alarm can only be reset after the line fault has been rectified.</p>

**Table 1: Dual FXS IM LED Interpretations**

## 6. INTERFACE SPECIFICATIONS

IM Connector	Dual RJ-45 Connector
Interface	2 wire loopstart
Trunk Speed	64kbs
Power Consumptions	< 3W
Alarm Monitoring	AIS detection: Internal circuitry power thresholds are exceeded.  AIS detection response: Shutdown or Ring.
Indicator LED's	Show phone hook status, ringing and line fault alarms
Standards	ITU-T G.711, G.712, Q.421, AS-ACIF S003-2001
Ringing Frequency	20Hz
Maximum Ringer Load	1REN
Maximum DC Resistance	1200Ω
Maximum Wire Distance	2000ft
On Hook Battery Voltage	- 48V
Off Hook Line Current	20mA
ABCD Signalling	- PLAR (private line automatic ringdown) - CAS - R2 (Q.421)
Level Adjustment	-30dB to + 6dB (look at GUI to get range)
Maximum Level	
- Rx	+ 4dBm
- Tx	+ 4dBm
Impedence (AC resistance)	- 600Ω - 900Ω - 600Ω + 2.1μF - 900Ω + 2.1μF - 270Ω + 750Ω  150nF (TBR21) - 220Ω + 820Ω  120nF (Australia/New Zealand #1) - 220Ω + 820Ω  115nF (Slovenia/Slovakia/South Africa) - 370Ω + 620Ω  310nF (New Zealand #2)
Companding	μ-law, A-law G.711
Test Tones	1kHz, 0dBm Tx & Rx
Loopback	Bi-directional - Line & Equipment
Cadence	4 sec ON, and 4 sec OFF

**Table 2: Interface Specifications**

## 7. 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.*

## **7.1. ELECTROMAGNETIC COMPATIBILITY (EMC)**

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

## **7.2. SAFETY**

- IEC60950, UL60950, and AS/NZS60950:2000 for General safety

## **7.3. IMMUNITY**

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

## **7.4. PERFORMANCE**

- AC/ACIF S003:2001