

# How to install, configure, and troubleshoot the FXS Coin Card in the IMACS

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## Scope

This document pertains to the following products: IMACS 600, 800, and 900.

## Introduction

This document is a guide on how to install, configure, and provide basic troubleshooting steps for the FXS Coin Card.

## Requirements

### Hardware:

- FXS Coin Card

### Software:

- In order for the FXS Coin Card to operate, system requires software release 4.x.x or higher.

## Configuration Steps

### 1. Installing the FXS Coin Card

- 1a. Install the FXS Coin Card in any user slot. These slots are U1 to U8 on the two-sided chassis and front-loading chassis with power supplies on top, or P1 to P4 and W1 to W4 on the front-loading chassis with power supplies on the side.

### 2. Configure FXS Coin Card settings

- 2a. Once FXS Coin Card is installed go to the FXS Coin Card Main Screen to configure. The following table illustrates a typical Main Screen:

|        |       |               |       |       |              |       |              |       |
|--------|-------|---------------|-------|-------|--------------|-------|--------------|-------|
| NODE 1 | U2    | FXS 6-<br>600 | REV   | D1-0  | SER<br>00061 |       | 07-<br>05-00 | 11:00 |
|        | 1     | 2             | 3     | 4     | 5            | 6     | 7            | 8     |
| STATE  | STDBY | STDBY         | STDBY | STDBY | STDBY        | STDBY | STDBY        | STDBY |
| WAN    | W1-1  | W1-1          | W1-1  | W1-1  | W1-1         | W1-1  | W1-1         | W1-1  |

|             |             |                |             |             |             |       |       |       |
|-------------|-------------|----------------|-------------|-------------|-------------|-------|-------|-------|
| TS          | 01          | 01             | 01          | 01          | 01          | 01    | 01    | 01    |
| MODE        | FXSC        | FXSC           | FXSC        | FXSC        | FXSC        | FXSC  | FXSC  | FXSC  |
| TYPE        | HF-A1       | HF-A1          | HF-A1       | HF-A1       | HF-A1       | HF-A1 | HF-A1 | HF-A1 |
| Rx TLP      | 0.0         | 0.0            | 0.0         | 0.0         | 0.0         | 0.0   | 0.0   | 0.0   |
| Tx TLP      | 0.0         | 0.0            | 0.0         | 0.0         | 0.0         | 0.0   | 0.0   | 0.0   |
| CODING      | U-LAQ       | U-LAW          | U-LAW       | U-LAW       | U-LAW       | U-LAW | U-LAW | U-LAW |
| TC CGA      | IDLE        | IDLE           | IDLE        | IDLE        | IDLE        | IDLE  | IDLE  | IDLE  |
| LB          | OFF         | OFF            | OFF         | OFF         | OFF         | OFF   | OFF   | OFF   |
| PATTRN      | NONE        | NONE           | NONE        | NONE        | NONE        | NONE  | NONE  | NONE  |
| HYBRID      | SET1        | SET1           | SET1        | SET1        | SET1        | SET1  | SET1  | SET1  |
| RINGBK      | OFF         | OFF            | OFF         | OFF         | OFF         | OFF   | OFF   | OFF   |
| SIG CONV    | OFF         | OFF            | OFF         | OFF         | OFF         | OFF   | OFF   | OFF   |
| RATE        | 64K         | 64K            | 64K         | 64K         | 64K         | 64K   | 64K   | 64K   |
| ADPCM       | N/A         | N/A            | N/A         | N/A         | N/A         | N/A   | N/A   | N/A   |
|             |             |                |             |             |             |       |       |       |
| <b>SAVE</b> | <b>UNDO</b> | <b>REFRESH</b> | <b>COPY</b> | <b>TEST</b> | <b>MAIN</b> |       |       |       |

The bottom-highlighted line of screen shows various commands that can be performed. The following table defines the commands:

| Command | Function  |
|---------|---|
| Save    | Saves changes to settings   |
| Undo    | Returns all settings to the last saved state                                |
| Refresh | Updates certain time-related info fields that are not automatically updated |
| Copy    | Copies the contents of the current column to the next column                |
| Test    | Initiates and monitors testing of all FXS Coin Card Ports                   |
| Main    | Returns to the System Main Screen   |

Main Screen Option Settings and Defaults:

| Parameter | User options                                    | Notes | Default |
|-----------|---|-------|---------|
| STATE     | Stdby, Actv                                     |       | Stby    |
| WAN       | W1-1,W1-2,W2-1,<br>W2-2,W3-1,W3-3,<br>W4-1,W4-2 | 1     | W1-1    |
| TS        | 01-24, 01-31                                    | 2     | 01      |
| MODE      | Fxsc  |       | Fxsc    |
| TYPE      | Hf-a1,hf-a2,hf-cb,<br>Rb-a1,rb-a2,<br>rb-cb     |       | Hf-a1   |
| Rx TLP    | -10.0 dB to<br>+2.0 dB                          |       | 0.0     |
| Tx TLP    | -10.0dB to +5.0<br>dB                           |       | 0.0     |
| CODING    | u-law, a-law,a-<br>inv                          | 3     | u-law   |
| TC CGA    | Idle, busy                                      |       | Idle    |
| LB        | Off,dgtl,anlg                                   |       | Off     |

|        |   |   |      |
|--------|---|---|------|
| PATTRN | None, D-mW, quiet                           |   | None |
| HYBRID | Set1 to set8 user                           | 4 | Set1 |
| RINGBK | Off, on                                     |   | Off  |
| RATE   | 64k, 24k, 1 32k, 1 40k, 1 24k, 2 32k, 2 40k | 5 | 64k  |
| ADPCM  | N/a, p1, p2, p3                             |   | N/a  |
|        |   |   |      |

**Notes:**

- Choosing **wan** allows you to choose a WAN port (w1-1 through w4-2)
- Time slot 16 is not available if the port assigned to an E1 WAN link whose time slot is programmed for CAS or CCS.
- The default is **a-inv** for E1 and **u-law** for T1. These values will change depending upon the WAN link selected.
- The default (**set1**) is the only active option. It balances to the ideal termination of 600 ohms + 2.15uF.
- Choosing Rate other than 64k allows you to select an ADPCM.

**2b. Parameters**

- **State:**  
The State setting determines whether the port is active or inactive. An active port does not occupy a time slot on a WAN link. Set the State setting to **stdby** (standby) for ports that are not to be used or that have not yet been configured. Set it to **actv** (active) for ports that are ready for use.
- **WAN:**  
The WAN setting identifies the WAN link assigned to this port. If you choose **WAN**, you also must select the desired port (W1-1 through W4-2) of a WAN card for transmission over a T1 or E1 link. This can be an ATM or FRS card, which resides in chassis slot P1, P2, or P3. You must then choose a logical port on that card. The **user** option is not used.  
It is not necessary to assign all ports of the same FXS Coin Card to the same WAN link, or two contiguous time slots on a WAN link.
- **TS:**  
The TS setting identifies the time slot on the WAN link to which this port is assigned. Values range from 1 to 24 for T1 links and 1 to 31 for E1 links. Time slot 16 is not available on E1 links that are programmed for **cas** or **ccs** signaling.
- **Mode:**  
The Mode depends on the type of equipment connecting to the port. All options use two-wire balanced connections. The FXSC option allows users to connect the system to a two-way PBX trunk or a key system trunk.
- **Type:**  
The Type setting matches the signaling behavior of the FXSC equipment and the remote switch. The settings are **hf-a1** (high frequency-12kHz), **hf-a2** (high frequency-16 kHz), **hf-cb** (high frequency-clear back), **rb-a2** (reverse battery-answer 2), and **rb-cb** (reverse battery-clear back).
- **RX TLP:**

The Receive Transmission Level Point (TLP) setting controls the amount of gain or loss added to the incoming signal after it is decoded to analog. To increase the signal level, set the RX TLP setting to a positive value (i.e., the larger the number, the more gain is added). To decrease the signal level, set the RX TLP setting to a negative value (i.e., the more negative the number, the more the signal level is decreased).

- **TX TLP:**  
The Transmit TLP setting controls the amount of gain or loss added to a voice signal from the CPE before it is encoded to digital PCM. To increase the signal level, set the TX TLP setting to a negative value. To decrease the signal level, set the TX TLP setting to a positive value.
- **Coding:**  
The Coding setting sets the PCM companding method used for a port. The T1 environment uses **m-law** coding and the E1 environment uses **a-law** or **a-inv** coding.
- **TC CGA:**  
The Trunk Conditioning during Carrier Group Alarm setting defines whether the FXS port should be forced **idle** or **busy** upon declaration of a Carrier Group Alarm (CGA) on the WAN link to which the port is assigned. In most cases, you should set this parameter to **busy**. If a call is in progress when the CGA alarm is received, the system will hold the call for two seconds, drop it, and then busy out the port to the attached PBX for the duration of the alarm. Once the alarm clears, the system will automatically place the port back in the idle mode, making it available to the PBX.
- **LB**  
The Loop back field lets you loop the port back toward the network and far end. The **dgt1** (digital) loop back sends the incoming digital DSO signal back to the far end without decoding it. The **anlg** (analog) loop back sends the decoded analog signal back to the far end after decoding and then re-encoding it.
- **Patrn:**  
The Pattern field selects an outgoing test pattern for the current port. The test pattern is generated by the system and sent to the selected port. You can select a different pattern for each port. The **none** option disables the test pattern. The **D-mW** (digital milliwatt) option sends a 1 kHz tone at 0.0 dBm. The setting of the RX TLP setting affects the D-mW signal level. The **quiet** option places a 600-ohm termination on the line so that no analog signal is sent (idle mode).
- **Hybrid:**  
The Hybrid option assigns a three- byte pattern to define the adjustment for return loss (similar to Build Out Capacitors). The default, **set 1**, balances the ideal termination of 600-ohms + 2.15 uF. The other settings are reserved for future use.
- **Ringbk:**  
The Ring back setting specifies whether a ring back tone is generated by the system and sent towards the network. Turn this option **off** when the network service does not provide an audible ringing tone to the calling party.
- **Rate:**  
The Rate parameter allows you to use the voice compression capabilities of an ADPCM card. If that card is not present in the system, the Rate stays at **64k** and cannot be changed. The **64k** option is the normal encoding/decoding rate for voice circuits.

ADPCM voice channels are assigned in pairs by designating two voice ports (E&M, FXO, or FXS) to the same WAN link and timeslot, and selecting rate settings for the pair that add up to 64kbps.

- **ADPCM:**  
The ADPCM parameter lets the user choose which ADPCM card to place this FXS port. The default setting is **n/a** and only changes when a Rate smaller than **64k** is selected. The user is then allowed to select which ADPCM card to use for the port. The options are slots **P1**, **P2**, and **P3**.

## Troubleshooting

The FXS Coin Card may be faulty if a voice signal is not received at one end of a circuit, or if the signaling is not detected. If this occurs, please check for the following possible causes:

### Problems:

- Faulty receiving CPE at the near end (where the problem was first noticed).
- Faulty transmitting CPE at the far (opposite) end.
- Faulty cabling between the CPE and FXS Coin Card at the far end.
- T1 or E1 network failure.
- Improper card configuration at either end (e.g., time slot and/or WAN port assignments)

### Steps:

- 3a. Verify that the T1 or E1 network has not failed.
- 3b. Check for CGA-Red alarm on the associated WAN port at the end where the incoming VF signal loss is first noticed. The CGA indicates that the incoming network signal was lost (or that the receiving WAN port is out of frame).
- 3c. During the CGA, all voice ports with time slots on that WAN port will also be disabled, and the associated far-end WAN port will be in CGA-Yellow alarm state. If the network is faulty, you must clear that trouble to restore your circuits. If the network is ok, verify that the proper WAN ports and time slots are assigned to the associated FXS and FXO voice ports at both ends. In a point-to-point network, the near-end and far-end FX card ports should both be assigned the same WAN port and time slot number. Also, make sure the other parameters (such as the transmit and receive TLP's) are set properly at both ends.

If the FXS card port parameters are correct at both ends, and if the network is okay, the trouble is isolated to the FXS card or the associated port. Proceed with next step.

- 3d. At the far end, activate an analog loop back on the FX card port.
- 3e. Send a 0 dBm (digital milliwatt) test signal toward the CPE at that end. That signal will be substituted for the normal signal coming from the far-end CPE; it will be sent back to the CPE at your end via loop back path.
- 3f. Check your CPE for this signal. If it is present, the far-end CPE or cabling to the far-end FX card is probably faulty. Disable the loop back and test signal there, and fix the problem. If you still don't receive a signal, go to step 2d.
- 3g. At your end, go to the FXS Card Main Screen and send a digital milliwatt test tone (0 dBm) toward the CPE, and check the CPE itself. If those items are okay, replace the FXS card at your end.

If the FXS Coin Card is determined to be faulty, replace it and return the faulty unit for repair to the location listed in your User Manual.