INSTALLATION INSTRUCTIONS

MicroComm DXI

IOC-110 I/O Card Cage

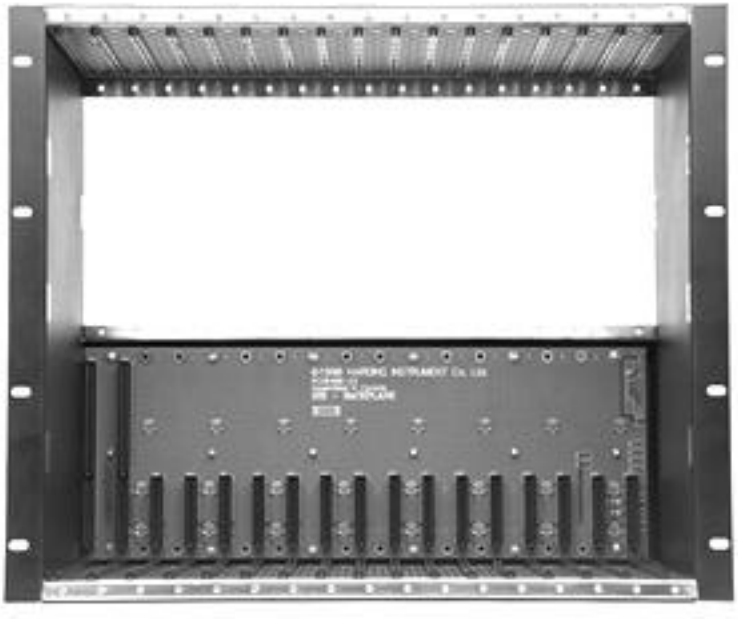
1. Intent & Scope

This document describes the installation procedure for the IOC-110 I/O Card Cage.

2. Description

The IOC-110 card cage holds the audio control, audio interface and discrete input and output cards of the DXI intercom system. It provides power, network, and digital audio bus connections for these boards. Up to 17 boards may be installed in each card cage, at least one of which must be an audio control board.

The card cage is designed for mounting in an EIA standard 19" equipment rack and occupies 9 U (15.75") of vertical rack space. Its maximum depth is 12", excluding clearance for field interface wiring cables.



IOC-110 Card Cage

An Audio Control Card (ACB-100 or ACB-101) must be installed in slot 1 of each card cage. In a system configured with redundant control, an audio control board would also be installed in slot 2. In a non-redundant configuration, slot 2 may be used for any other type of board.

Station Audio Boards (SAB-400's), Audio Input Boards (AIO-400's), Audio Input/Output Boards (AIO-400's), Audio Output Boards (AOB-400's), Telephone Set Boards (TSB-400's), Telephone Line Boards (TLB-400's), Discrete I/O Boards (DIO-100's), and Remote Driver Boards (RDB-100's) can be installed in any other available slot.

It is recommended that Paging Amplifier Boards (PAB-400's) be installed in the last slots of the card cage. This makes it easier to insert and remove their lower profile connectors. Due to their high current draw, it is important to

check the total current requirements of all boards installed in the card cage to ensure that the paging amplifier boards do not overload the power supply. Normally, only two or three paging amplifier boards should be installed in each card cage.

3. Card Configuration

The following table shows the card slot assignment for the IOC-110.

Card Slot	Card Type
1	Audio Control Board (ACB-100 or ACB-101)
2	Audio Control Board (Redundant) Any Board (Non-Redundant)
3	Any Board
4	Any Board
5	Any Board
6	Any Board
7	Any Board
8	Any Board
9	Any Board
10	Any Board
11	Any Board
12	Any Board
13	Any Board
14	Any Board
15	Any Board
16	Any Board
17	Any Board

4. Exchanges

A MicroComm DXI exchange consists of one or more card cages connected to a Service, Administration and Control (SAC) Computer. Up to three card cages located in the same equipment rack may be linked together to form an exchange. More than three card cages in different locations may be linked together to form an exchange, if they do not contain more cards than can be installed in three fully populated card cages.

When card cages are linked together to form larger exchanges, they require two types of interconnection - a LonWorks data network connection for I/O control and a CEPT audio trunking interconnection.

Card cages that are located together in the same equipment rack, and use ACB-100's, are linked using a CBL-220 (2 card cage) link cable or a CBL-230 (3 card cage) link cable for CEPT audio trunking. Card cages that are located together in the same equipment rack, and use ACB-101's, are linked using a CBL-221 (2 card cage) link cable or two CBL-221 (3 card cage) link cables for CEPT audio trunking. Card cages in different locations are linked through optional CEPT ports installed on the audio control boards. Both of these link connections are made through the audio control boards. Refer to the installation bulletins IM-ACB-100-2.4 or IM-ACB-101-1 for detailed information on linking card cages.

Data network linking is through LonWorks network connections on the rear of the card cages. LonWorks networks are described in detail in the SAC computer and FTR-120 installation bulletins.

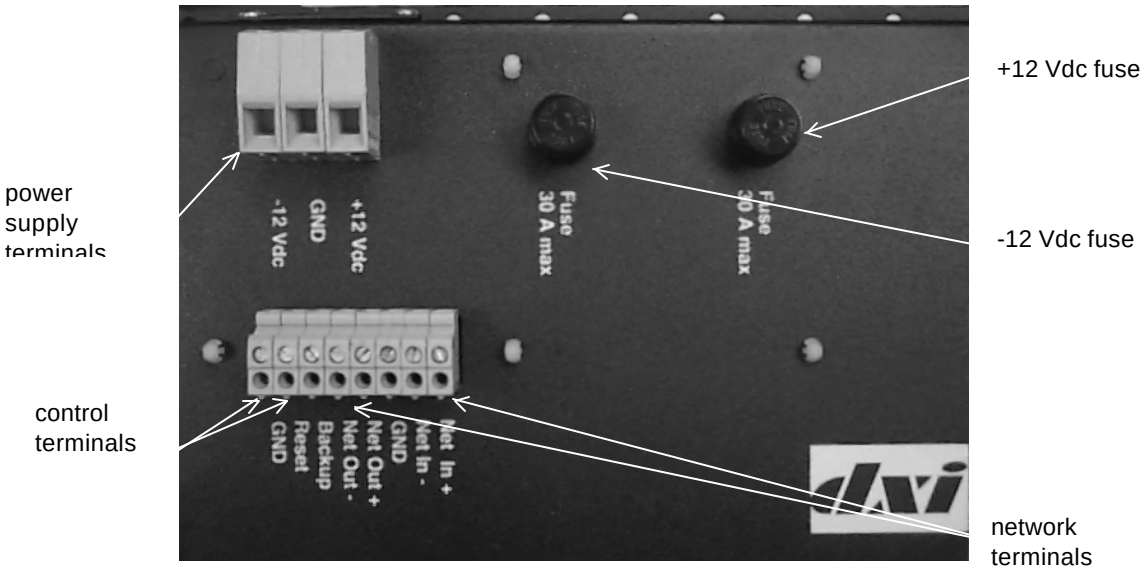
5. Power Supply

IOC card cages are powered from MicroComm DXI power supplies. These are available in 10 amp and 30 amp outputs, each of which may have optional battery back up support.

The card cage power input terminals should be connected to the power supply output terminals using 10 Ga. wires to minimize the voltage drop in the power wires.

Card cages connected to 30 A supplies should have 30 A slow blow fuses installed. Card cages connected to 10 A supplies should have 10 A slow blow fuses installed.

> Caution: When connecting the power supply to the card cage make sure the power supply wires are securely connected at both the power supply and the card cage. A three wire connection is required +12 Vdc, GND and –12 Vdc. If one of the power supply wires is unconnected or loose, and power is on, the cards in the card cage can be damaged



Card Cage - Partial Rear Panel

6. Network Connections

The MicroComm DXI system uses Echelon LonWorks networks to transfer control and status information between its various components. The LonWorks free topology network is used to connect I/O card cages to the SAC computer. It is also used to connect Master Stations and remote I/O modules to the SAC computer.

When the distances to be covered are to great for a single network segment (a segment is a portion of a network connected by one or more cables, which are electrically connected), a free topology repeater is used to extend the network wiring to the required length.

6.1 Free Topology Network

The free topology network is a long distance (1640 feet of total cable with up to 1300 feet between nodes) network which allows the SAC computer to communicate with remote card cages, Master Stations and other remote I/O devices.

The free topology network connections should be made with a level 4 or level 5 22 Ga. unshielded twisted pair. As an alternative Belden 85102 or 8471 16 Ga. cables can be used. Please consult the factory before using any other type of cable.

The pin out of a free topology port on a SAC computer is given in the following table.

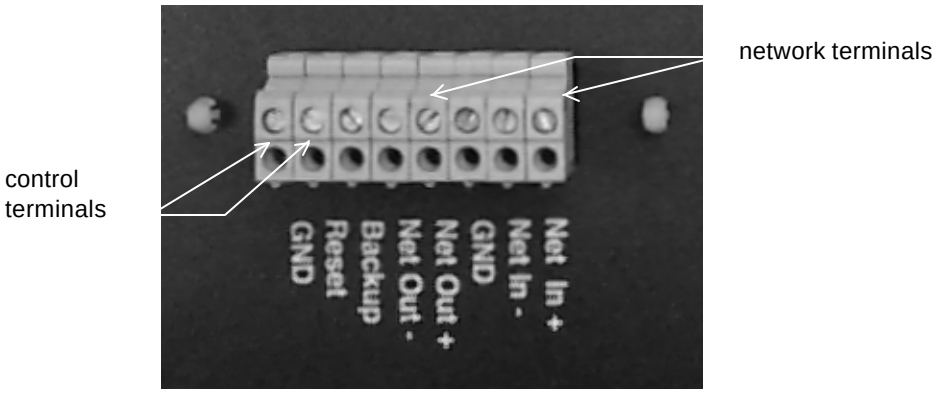
Pin Number	Signal
1	network data +
2	network data -

Pin 1 of each connector is the pin nearest the LED indicator associated with each port.

Note: The free topology network requires a 51 termination resistor somewhere along each segment. This may be located between the LonWorkrs terminals at the SAC computer port. If the network segment is connected to a free topology repeater, it contains an internal terminating resistor and the additional resistor is not required.

6.2 Network Connections

The following illustration shows the network connection terminal block on the rear of the card cage.



Card Cage - Network Terminals

Input connections are made on the 'Net In' terminals. Ensure that the polarity of the network cable is correct. The 'Net Out' terminals are used to extend the network to the next card cage, or the may be used to install a terminating resistor.

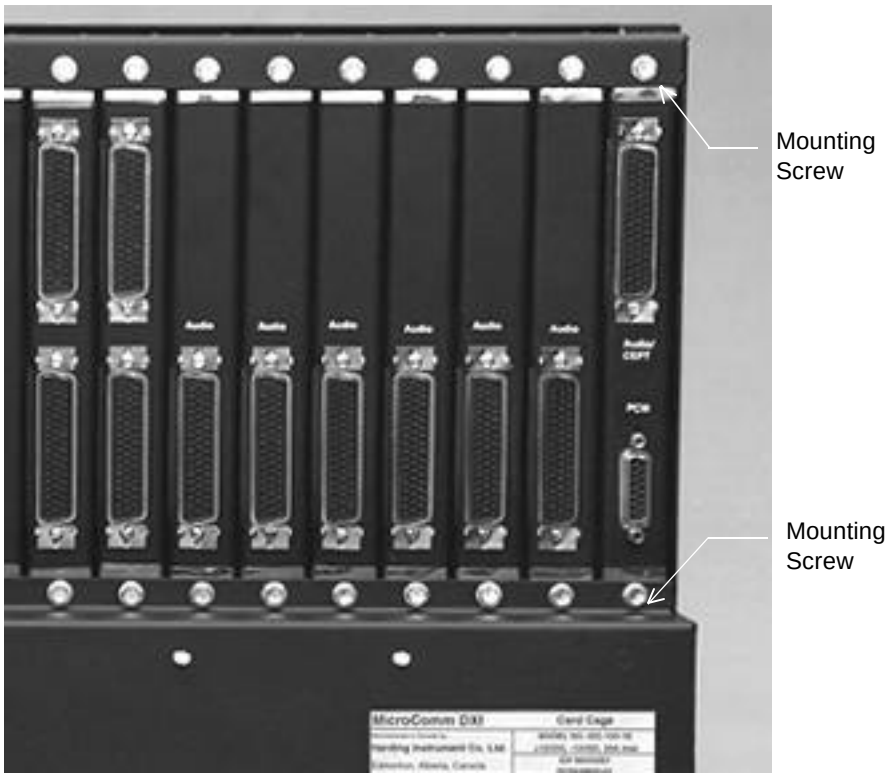
7. Reset Connections

There are reset control terminals on the same block as the network connections. These are used only if a remote card cage reset switch is used, and would be wired to a set of normally open contacts.

8. Board Installation

DXI card cage boards are mounted from the front of the card cage. When inserting the I/O boards, ensure that the top and bottom of the boards are seated in the guide channels and gently but firmly push the board straight back until the rear connectors are fully seated. Next secure the card with the two front plate and two rear plate mounting screws.

> Caution: Ensure that the card is fully seated before inserting and tightening the mounting screws. If the front plate mounting screws are tightened before the card is fully inserted, the backplane connector on the board can be damaged from the uneven tension on the board.

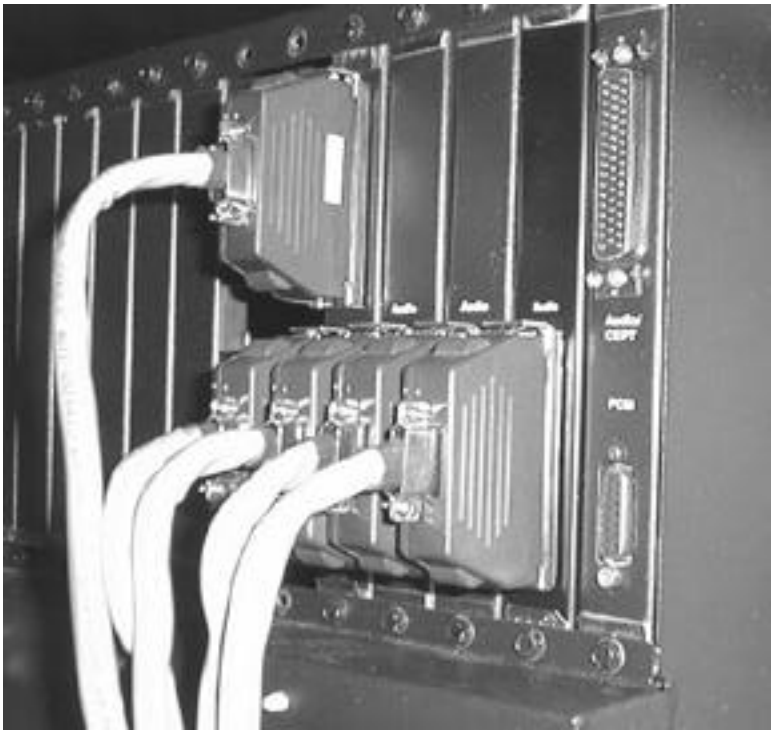


I/O Board Mounting Screws

Installation of the rear plate mounting screws is important to ensure that the I/O board field cables are disconnected prior to removing the board from the card cage.

9. Board Wiring

All field interface connections to boards mounted in the card cages are made through factory manufactured cables. There are specific cables with the appropriate conductors and connectors for each type of board.



Card Cage - Field Interface Cables

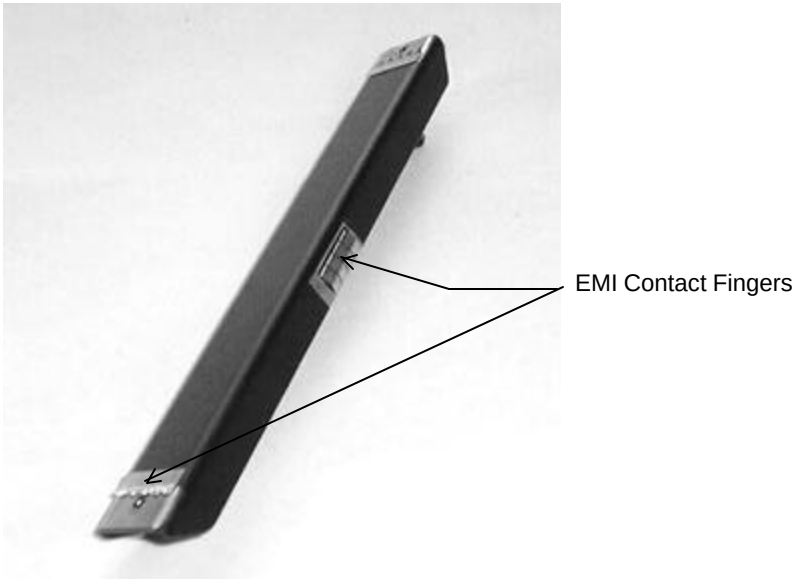
10. Blank Slot Covers

Unused slots in each card cage should be fitted with blank slot covers. These are provided in pairs for the front and rear card cage openings. The front cover extends the full height of the card cage, while the rear cover is shorter to fit the connector assembly opening.

Card Cage with Cards and Blank Slot Covers

Each side of the blank slot covers is different, and the covers must be oriented properly when being installed. The left side of each cover has rectangular portions of the paint masked off. On the right side of each cover, the masked portion is slotted and EMI (Electro-Magnetic Interference) contact fingers are installed. Rear panel covers also have EMI contact fingers on the top and bottom of the outward facing side.

Blank slot covers must be installed with the EMI contact fingers facing toward card slot 1 so that they align and contact properly with adjoining cards and/or other blank slot covers. The cover plates are secured with the same mounting screws as those used for the I/O card plates.



Blank Slot Cover - EMI Contact Fingers

Figure 1