MicroComm DXI

System Planning Guide

Full System Version

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Introduction

MicroComm DXI General Description

A MicroComm DXI intercom system is configured using a variety of modular components to meet a facility's needs. It can be configured to provide a wide range of operating features, from a very basic system to an extremely flexible multi-operator system.

The DXI system employs digital signal processing, digital switching, and the benefits of:

- master stations with menu driven call response and placement
- touch screen control master stations
- telephone type administrative stations and sub-masters
- selective and parallel master station operation
- programmable call routing for any station to any master station(s)
- user defined station and point labels
- intercom station group call and paging
- call forwarding, conference calling and call transfer
- background music distribution to cell stations and paging zones
- zoned public address announcements
- two-way radio and telephone system interface
- external audio inputs and outputs
- software adjustable volume controls for each master and station
- audio level alarm monitoring
- reduced system wiring
- extended wiring distances
- system supervision and diagnostics
- basic alarm handling and event response
- data communication interface to external control systems
- data communication interface to CCTV systems
- basic system diagnostic and maintenance functions
- call and event activity logs
- on line factory support

Planning a MicroComm DXI system begins by determining what types of devices will be used, their distribution throughout the facility, and the locations for the centralized equipment that those devices are connected to.

Then, the various hardware components are selected and assembled to form the intercom system. That system is then configured to define the hardware components included and how they will interact to form a complete operational package.

Hardware Configuration

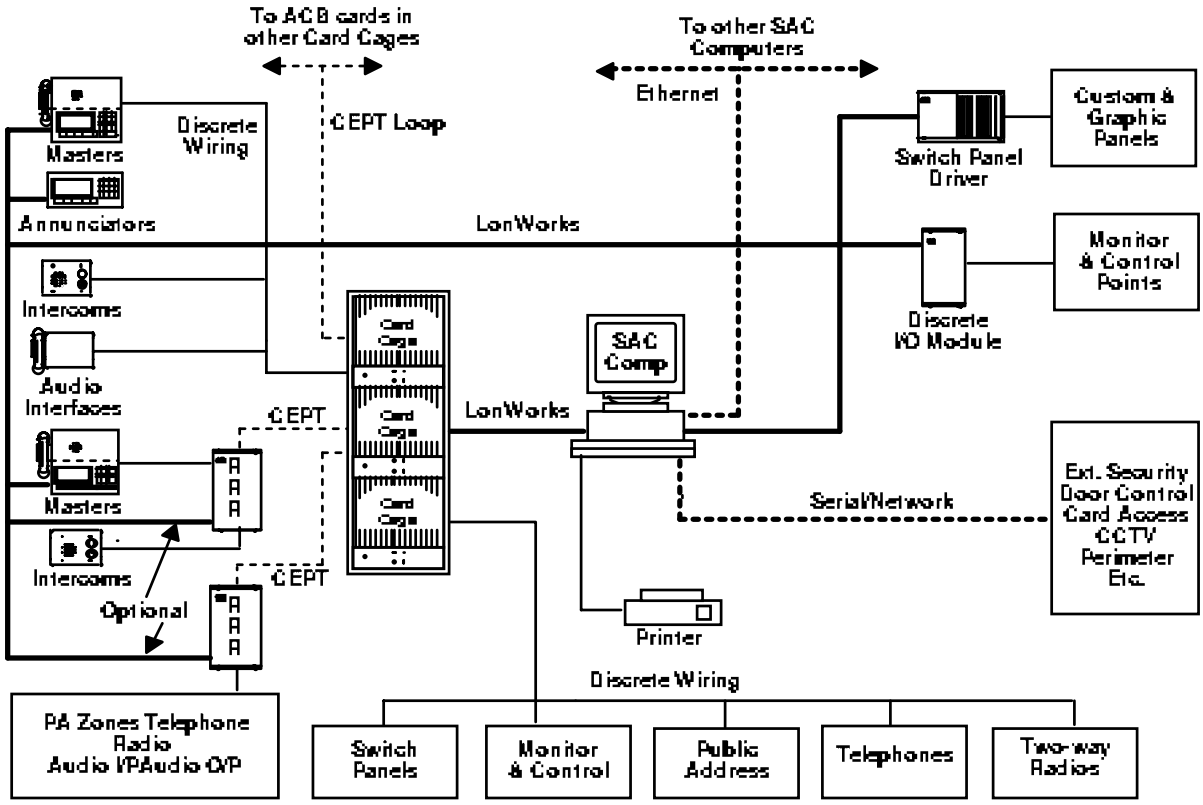
The basic hardware building blocks of a MicroComm DXI intercom system include:

- Service, Administration, and Control computers
- input/output (I/O) module card cages
- power supplies
- audio control boards
- station audio boards
- telephone set boards
- audio input/output boards
- paging amplifier and talkback amplifier boards
- discrete input/output boards
- intercom master stations
- intercom stations
- call operating devices

Every MicroComm DXI system requires at least one Service, Administration, and Control (SAC) computer to function. This computer controls the operation of the system and is used for system programming and maintenance. Each SAC computer is supplied with the DXI system operating software and requires an associated keyboard and monitor. SAC computers must also include the correct set of communications cards for interface to other system components and integration of related systems.

Unless the system is only controlling remote digital inputs and outputs, it must also include at least one I/O card cage and associated power supply. The card cage holds the boards that connect to the intercom and master stations, telephone sets, paging loudspeakers, auxiliary audio devices, and digital I/O points. It can also include driver cards that allow any audio board to be located in a remote receiver rack. Every card cage with audio cards must include an audio control board for signal processing and switching.

The following block diagram illustrates the typical configuration and functions of a system exchange. Multiple exchanges can be networked together to form a system capable of meeting the needs of any size facility.



Exchange Block Diagram

SAC Computers

As discussed previously, a Service, Administration and Control computer is required for each:

- exchange of a MicroComm DXI intercom system.

A MicroComm DXI exchange is defined as one or more card cages, together with remote I/O and audio modules, connected to a controlling SAC computer. Typically, an exchange should not exceed ten card cages. Those card cages may be physically located within one equipment rack, or distributed around a facility. For example, an exchange could be configured with three central card cages and seven distributed card cages.

A SAC computer consists of a Central Processing Unit (CPU), video monitor, keyboard, data network module(s), and integration interface modules. The interface modules are selected to provide the appropriate connections to other integrated systems and other SAC computers. Large systems with multiple exchanges and SAC computers are interconnected with data networks and audio trunks to provide transparent operations throughout the system. Transparent operations refers to the fact that a device connected to one exchange, and configured to communicate with a device connected to another exchange, will perform as if there were only one exchange and SAC computer in the system.

Central Processing Units (CPU's)

Central Processing Units are available in rack mount, desk top and mini tower packages that are chosen to meet the customer's space requirements or preferences. Rack mount units are more ruggedly constructed and are, therefore, more costly.

Each CPU will require QNX operating system software, MicroComm DXI system software, a video card, a keyboard port, at least one parallel printer port, and at least one serial port. Also required are one or two LonWorks network cards for communicating with the card cages and intelligent remote devices such as master stations, a modem for on-line factory support, and Ethernet or similar network cards to interface multiple SAC computers and other integrated systems.

QNX is a multi-tasking, priority driven, fast switching computer operating system that is ideally suited for processing the DXI's many activities in real time. A real time operating system quickly switches tasks while giving time critical tasks the highest priority. The DXI system software is developed and licensed by Harding Instruments. It is the application software that is used to configure, run, and diagnose the intercom system.

LonWorks is a leading open networked control system that is used by thousands of application developers and millions of installed devices worldwide. In a LonWorks network, intelligent control devices, called nodes, communicate with each other using a common protocol. In a MicroComm DXI system, the intelligent control devices include the audio control boards, master stations, telephone set boards discrete I/O modules, and remote receivers and driver sets.

Multiple SAC computers in a system exchange information through an Ethernet network. Any other networking cards are selected as required to interface to other integrated systems such as door control, closed circuit television, etc. Card selection for those systems is usually determined by the requirements of the other system.

Monitors

SAC computer monitors are color SVGA type computer monitors. They are available in rack mount and desktop styles, each with a range of screen sizes.

Keyboards

SAC computer keyboards are available in desktop, rack mount, and flush panel mount styles. They are all 101 key PC type keyboards.

Desktop SAC computer keyboards are available in a standard 101 key format or a narrow 101 key format. The narrow format keyboard has the numeric and function keys rearranged so the keyboard can fit in a 19" equipment rack shelf or drawer. A ruggedized version of the standard keyboard includes heavier duty contacts and splashguard protection.

The rack mount keyboards come with a slide out drawer with pull handle. They are also available in a NEMA rated rugged version.

Panel mount keyboards are only available in a NEMA4X rated configuration for rugged environments.

LonWorks Network Interface

Usually a SAC computer will have one LonWorks network card with two ports – one port to communicate to the card cages and a second port to communicate to the intelligent remote devices. A second LonWorks card may be installed if a redundant data network is required.

Two types of LonWorks network interface options are available to connect the card cages to the SAC computers - direct connect or free topology. Only the free topology interface is recommended because of its reliability, flexibility, and extended distance capabilities.

Data communication between SAC computers and intercom master stations, remote input/output modules, and remote receiver modules is always via a free topology network and separate from the one used for the card cages.

The free topology network can extend up to 1300 feet in length. Network repeaters can extend that limit where required.

Modems

In order to provide on-line system support from the factory, a data modem is required for the SAC computer. The modem may be either an internal type mounted in a SAC computer card slot, or an external type connected through a serial port.

If there is an available card slot in the SAC computer, the internal modem offers a less costly solution. In the case when all the SAC computer card slots are filled with system integration, system networking, or special application modules, an external modem must be used.

Regardless of which type of modem is provided with a SAC computer, it will require a modem compatible telephone line connection.

Ethernet Cards

An Ethernet network is used for communication between SAC computers or for communication to other integrated systems. A variety of standard types of Ethernet cards are listed as SAC computer options. When integrating to another system, choose the type specified by the system integrator. Ethernet cards other than those listed are also available upon request.

Other Interface Cards

Other interface cards can be installed in a SAC computer when required to provide a specialty interface to a specific manufacturer's equipment. This is typical when connecting to a PLC door control or touch screen control system. The PLC or touch screen manufacturer may produce a custom interface module that simplifies communications between the two systems.

I/O Card Cages

MicroComm DXI I/O card cages house the system's audio control boards, audio interface boards, discrete I/O boards, and remote driver boards. Audio boards connect speech, music, and similar communication devices to the system while discrete I/O boards monitor switch points and control switched devices. I/O card cages include a backplane that is used for data flow and signal distribution between the boards. The backplane also distributes power from the rear power supply connection to each board. A separate power supply is required for each I/O card cage.

Each card cage board slides in on upper and lower card rails and is secured with locking screws on both the front and rear. The rear plate locking screws also help to relieve stress on the connectors from the field interface cables. Unused card slots are covered with blank plate assemblies to totally enclose the card cage.

Configuration and Capacities

A MicroComm DXI I/O card cage has 17 card slots. The first and second slots are designed to accept audio control boards. The second slot may also be assigned to any other card. Any other card slot will accept any other MicroComm DXI card cage board.

There is no other functional restriction on what type and how many MicroComm DXI card cage boards can be installed in each card cage. For example, a card cage may be completely equipped with station audio boards, discrete I/O boards, or any combination of the two. A restriction does exist, however, with respect to power supply loading. Paging Amplifier Boards (PAB's) and Talkback Amplifier Boards (TAB's) are high power units that may cause the power supply's current capacity to be exceeded.

The following guideline gives the maximum current draw for each type of card cage board:

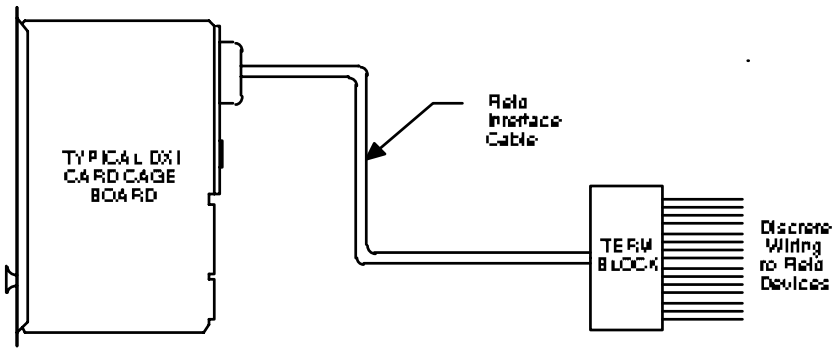
Audio Control Board (ACB)	0.7 A
Station Audio Board (SAB)	2.5 A
Paging & Talkback Amplifiers (PAB & TAB)	4.7 A
Audio Input/Output Boards (AIO)	0.3 A
Telephone Boards (TSB & TLB)	1.0 A
Discrete Input/Output Boards (DIO)	2.0 A

Field Interface Wiring

Field interface wiring refers to the connection of intercom stations, loudspeakers, switches and other similar devices located throughout a facility to the exchange equipment. All field interface connections to card cage mounted boards are made through connectors on the rear of each card. Factory manufactured field interface cables must be ordered for each type of card. In some cases, more than one cable may be required, such as for a discrete I/O module with 48 inputs and 48 solid state outputs. That case will require two 50 conductor cables interfaced through two DB-50 connectors.

Each cable can be ordered in a variety of standard lengths with custom lengths available upon request. One end of the cable is fitted with a factory-installed connector, or connectors, and the other end is left non-terminated. The end of the cable without the connector is to be terminated on a field wiring interface block provided by the system installer.

Field interface cable connectors all have a locking mechanism, such as a quick release latch lock or screw lock, to prevent accidental disconnection of the cable.



Typical Card Cage Field Interface Wiring

Card Cage Linking

Many I/O card cages can be linked together to form an exchange that allows calls to be routed between their associated field devices. Those card cages may be either located in the same equipment rack, or located at different points in the facility to reduce wiring costs.

When card cages are located together, card cage linking may be accomplished through the link connector on each card cage's audio control board. Card cage link cables are available for that purpose.

Any card cages, located at physically remote locations from each other or in the same equipment rack, may be linked using CEPT trunk interfaces on the audio control boards. These are available in copper cable and fiber optic formats, the choice of which depends on the physical separation of the card cages. Refer to the Audio Control Board section dealing with CEPT interfaces for further details.

Multiple exchanges can interconnect to form very large systems. In that case, all card cages in the system would be linked together so that calls can be routed without restriction.

Power Supplies

A MicroComm DXI power supply must be provided for each card cage. Power supplies are also required for some remote devices such as intercom master stations, annunciation control panels, discrete I/O modules and remote receiver modules. All MicroComm power supplies include +12 volt DC and -12 volt DC outputs that can be used to power 24-volt DC devices.

Power Supply Options

Power supplies for remote devices are available with 3.4 ampere and 5 ampere capacities. They are designed to be mounted within a console or on an equipment room wall.

Audio Control Boards

Each I/O card cage requires an Audio Control Board (ACB) to be installed in the first card cage slot. The ACB includes the system's digital signal processing and digital switching for audio routing.

The ACB-101 Audio Control Board supports redundant ACB operation. In that configuration, a second ACB is installed in slot two of each card cage and the CEPT network is duplicated.

DSP Modules

Each ACB has a Digital Signal Processing (DSP) module installed on it. Two additional daughter boards, each with two DSP modules, can be added for additional processing power.

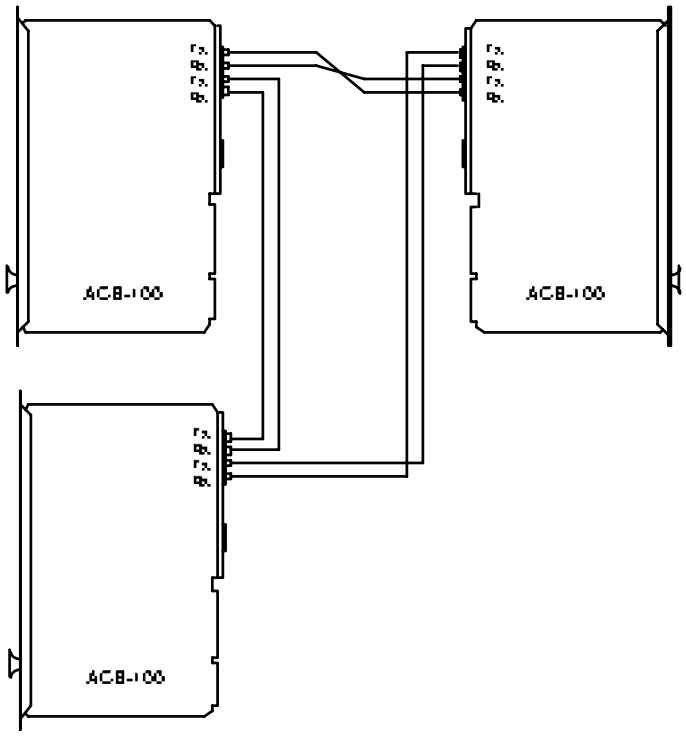
There are many interrelated factors that determine how many SP modules are required for each ACB. They include the number of intercom master stations, use of conference calling or voice activated switching, etc. As a general guideline for the ACB-100, a DSP daughter card should be ordered if there are more than 6 intercom master stations connected to the card cage or if conference calling is employed. Both DSP daughter cards should be ordered if both expansion criteria are met.

For the ACB-101, a DSP daughter card is required of the Audio Level Alarm (ALA) function is to be provided on its card cage. A second DSP daughter card is required if the are more than 128 stations that require ALA.

CEPT Interface

The CEPT interface is a multi-channel high speed digital audio link system for interconnecting multiple card cages to form larger distributed exchanges, and to link exchange audio trunks to remote audio boards. It is available in a copper conductor or fiber optic cable interface. For electrical isolation and lightning protection, the fiber optic interface should be used.

CEPT communication networks are bi-directional and may be between two points, or looped around multiple points. When planning CEPT communication networks, ensure that the modules at each end of the link are ordered with the same format (copper or fiber optic) interface.



Typical Card Cage CEPT Link

Audio Boards

Audio boards are those used to interface intercom and master stations, telephones, loudspeakers, program sources, recording devices, radios and other audio signal devices to the MicroComm DXI system. Since they can be used in remote receiver racks for placing at remote locations they are manufactured only in the card cage board configuration.

Audio boards are available in 100, 300, and 400 series. A 100 series system must contain all 100 series audio boards and devices. The 300 and 400 series audio boards can be mixed together in a system and use 400 series devices.

Station Audio Boards

Station Audio Boards (SAB's) interface all intercom stations and master stations to the system. Each board has 16 audio channels, each with its own device amplifier.

Each intercom station and intercom master station must be connected to its own SAB port(s). Any attempt to parallel stations will upset the supervisory and audio networks.

Each SAB includes 15 half-duplex intercom ports and one full duplex intercom port. Intercom stations are normally connected to the half duplex ports and intercom master stations are connected to the full duplex ports. Intercom master stations may also be connected to adjacent pairs of half duplex ports. One intercom station may also be connected to each unused full duplex port. On the SAB-300, master stations can only be connected to the full duplex port.

Station Audio Boards include all the circuitry to interface the intercom station switch contacts.

Intercom master station audio signals are connected to the SAB's with two shielded twisted pair cables. Master station power supply and data communication signals are connected separately as described under the Intercom Master Station heading.

SAB-400 and SAB-401

400 series SAB's are available in two models. The SAB-400 is used to connect 400 series intercom stations without LED indicators. SAB-401's are used with 401 series intercom stations with LED indicators and/or 400 series intercom stations.

This series of SAB's includes additional digital signal processing modules on the boards themselves and features the least amount of crosstalk between channels. The crosstalk reduction is achieved through increased channel separation on the boards and greater amplification of the microphone signal at the station to offset crosstalk induced through the wiring.

A single twisted shielded pair cable is required to connect each 400 or 401 series DXI intercom station to an SAB. All power, loudspeaker, switch, indicator, and supervisory signals are integrated onto that single cable.

SAB-300

SAB-300's are used to connect other manufacturers' generic intercom stations that are comprised of a loudspeaker/transformer and a separate call switch. The loudspeaker transformer must be rated at 25 volts and tapped to draw a maximum of 1 watt.

Two field interface connectors are provided on each SAB-300, one for the audio channels and one for the switch connections. Separate field interface cables for each function are also required. A twisted shielded pair cable is

required to connect each station's loudspeaker. A separate unshielded twisted pair cable is also required to connect each call switch. The SAB-300 also supports two switches per input with termination resistors.

SAB-100

100 series Station Audio Boards connect all 100 series intercom and intercom master stations to the MicroComm DXI system. They have been superseded by the 400 series, but are available to expand and maintain existing 100 series systems.

A single twisted shielded pair cable is required to connect each 100 Series DXI intercom station to an SAB. All power, loudspeaker, microphone, switch, and supervisory signals are integrated onto that single cable.

Audio Input and Output Boards

Audio input and output boards are used to accept microphone level or line level input signals to the DXI system, and to transmit output signals in the same level range to external devices.

Typical audio input signals could be used for:

- background music sources
- stand alone paging microphones
- inputs from two-way radio systems

Typical audio output signals may be used for:

- outputs to two-way radio systems
- outputs to monitoring or recording equipment
- paging signals to external amplifiers

Audio input and output boards are available in three configurations:

- eight (8) audio inputs
- eight (8) audio outputs
- eight (8) audio inputs and eight (8) audio outputs

Which boards, or combinations of boards, that are the most cost effective for each application is determined by the number and interface locations of the inputs and outputs. Microphone level and line level signals can be mixed on the same board.

Each input and output is software configurable to interface to signals in either the microphone level or line level range. Independent software adjusted volume level controls are also provided for each channel.

Contact closure control inputs are provided for each audio input and output to permit disabling of the signals by external equipment for press-to-talk functions. Status signal outputs are also provided for each channel for external signaling.

Paging Amplifier Boards

Paging Amplifier Boards (PAB's) are used to drive constant voltage type external paging loudspeakers. Constant voltage loudspeaker circuits include a matching transformer on each loudspeaker that is used to set the amount of power that loudspeaker will draw from the circuit. This will determine that loudspeaker's relative loudness.

Each PAB provides eight (8) power amplifier channels, rated at 5 watts RMS per channel. PAB's may be ordered with either 25 volt or 70 volt outputs. Adjacent output channels on the PAB-401 can be bridged in any combination to drive loads up to 40 watts.

Talkback Amplifier Boards

Talkback Amplifier Boards (TAB's) are similar to paging boards with the added feature of permitting two way communications through the loudspeaker.

Telephone Set Boards

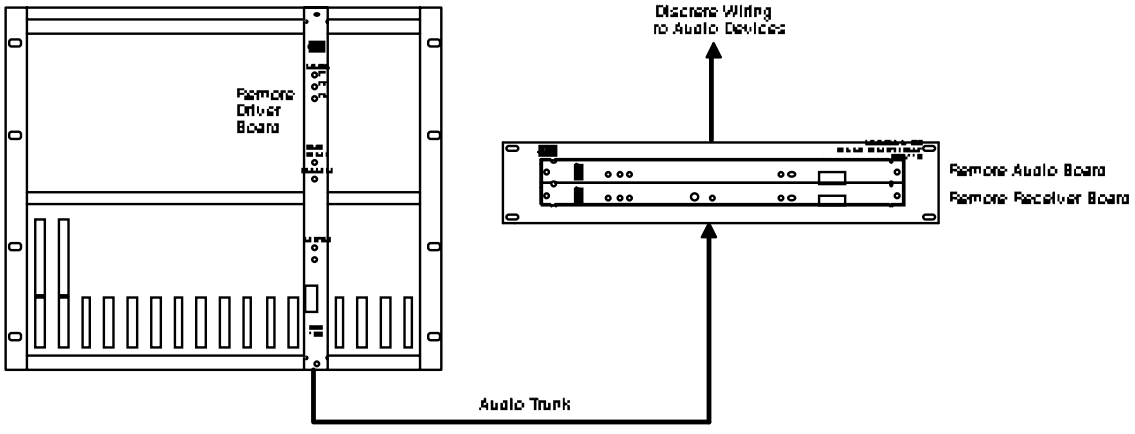
MicroComm DXI Telephone Set Boards (TSB's) are used to connect industry standard 2500 type telephones to the system. These telephones may be used as sub-master intercom stations and administrative intercoms.

Each TSB can have eight telephone sets connected. The sets may be basic units, or include loudspeaking and LCD display options. The LCD display may be programmed to indicate caller identification and dialing information.

Remote Audio Boards

Any MicroComm DXI audio interface board can be individually mounted remotely from a card cage. This permits reduction of long multiple cable runs when a limited number of interfaces are required at a distant location. Connection from the card cage to the remote location is made using either a fiber optic or copper CEPT digital audio trunk. CEPT connections for remote audio boards are made directly between the driver board and do not loop to other units as card cage CEPT links may.

The interface board is mounted in a remote receiver rack together with a remote receiver board that communicates with the card cage. For each remote receiver, an associated remote driver board is situated in the card cage. The remote audio board functions as if it were mounted in the same card cage slot as the remote driver board.



Typical Remote Audio Board

Remote Driver and Receiver Boards

Remote Driver Boards (RDB's) are mounted in any card cage slot suitable for mounting an audio interface board. An associated Remote Receiver Board (RRB) is paired with an audio interface board in a remote receiver rack. The RDB and RRB provide the interface between the remote audio board and the card cage.

RDB's and RRB's have the option of communicating using either a copper or fiber optic CEPT digital audio trunk. Each pair of boards must be ordered with the same communication option format.

Remote Receiver Racks

Remote Receiver Racks (RRR's) are available in two mounting options - rack mount or surface wall mount.

RRR's include the mounting hardware and the backplane interface for the remote receiver board and audio interface card.

An appropriate DC power supply must be provided for the remote receiver card and associated audio interface card at their mounting location.

Discrete I/O Modules

Discrete Input/Output (DIO) modules are used to monitor switch and contact closures and control auxiliary outputs.

Inputs can be used for functions such as door position monitoring, panic alarms, building alarms, tone signal initiation, etc. They may also be used as a contact interface to an external control system to initiate externally controllable DXI functions.

Outputs are used to control external devices in response to input point activity or manual and automatic system commands. Typical control functions could include release of door locks solenoids, sounding of signaling devices, illuminating external indicating devices, etc.

MicroComm DIO modules are offered in two model series, each with different mounting options.

100 Series DIO

The 100 Series of DIO modules is available in a card cage board, rack mount, or wall mount package. The rack mount and wall mount units communicate with the MicroComm system on the free topology network and require an external supply of DC power.

The 100 Series can be ordered to monitor 48 supervised or non-supervised contact closure inputs. Installing a terminating resister network that enables detection of two separate contact closures per input can double the quantity of supervised input monitor points.

Either 48 solid state output drivers or 16 relay outputs are available on each 100 Series DIO module. When ordering a solid state output, the options include the choice of voltage source, current sinking, or LED drivers. Relay outputs are form C (single pole double throw) contacts. All output drivers on each DIO board must be of the same type.

One field interface cable is required to connect the DIO inputs and one field interface cable is required for output connections.

300 Series DIO

300 Series DIO modules are only available in rack mount and wall mount packages. They also communicate with the MicroComm system on the free topology network and require an external supply of DC power.

Each 300 Series module can be ordered to monitor 48 supervised or non-supervised contact closure inputs. Installing a terminating resister network that enables detection of two separate contact closures per input can double the quantity of supervised input monitor points.

300 Series DIO modules always include 48 relay outputs on each unit. Relay outputs are form C (single pole double throw) contacts. All output drivers on each DIO board must be of the same type.

Four field interface cables are required to connect all 300 Series DIO module inputs and outputs. One cable is required for the inputs, and one cable is required to connect each group of 16 relay outputs.

Annunciation Control Panels

Annunciation Control Panels (ACP's) have an appearance similar to intercom master stations but they do incorporate any audio communication functions. They are used only to monitor input points and alarms, and to control output points.

ACP's are available in rack mount, flush panel mount, and desktop packages. Each, in turn may be available with a standard size or large size LCD display. The standard size display has characters that are 0.19" high. Characters on the large size display are 0.39" high and are easier to read at a distance. Regardless of which size is chosen, the text information will be the same. Large size display annunciation control panels are also slightly larger in size than standard size display annunciation control panels.

Intercom Master Stations

Intercom master stations connect to the DXI system through station audio boards and communicate with intercom stations, other master stations, paging zones, interfaced telephone sets, etc. They also include all the functions of the annunciation control panels.

100 series intercom master stations are used only with 100 series station audio boards. 400 series intercom master stations are used with both the 300 series and the 400 series of station audio boards. Since there are no audio functions on the panel mount keypad/display module, the 100 series is used with both the 100 and 400 series master audio interface modules for panel mount master station configurations.

Packaging Options

Intercom master stations are available in flush panel mount and desktop packages. The standard size display has characters that are 0.19" high.

The flush panel mount intercom master station actually consists of two units. One unit is identified as a flush mount intercom master station (IMS-130) and is the display and keyboard component that is flush mounted in a panel or millwork cut out. The other unit is the Master Audio Interface (MAI-120 or MAI-420) module. The MAI includes all the audio and communication electronics and interfaces. It is a wall-mounted unit that is located behind the panel of the keyboard/display module and connects panel mounted loudspeaker, microphone, press-to-talk switch, etc. and the IMS-130 to form a complete master station.

Two master audio interface modules, the MAI-125 and MAI-425, are intended for use when no keyboard or display functions are required at the master station. Each unit has provisions to connect a loudspeaker, microphone, telephone handset, telephone hook switch, press-to-talk swich, and volume control switches.

Accessory Options

There are a variety of accessory options available for use with intercom master stations, depending on how the operator wishes it to function. These include remote mounted loudspeakers and microphones to suit special architectural designs, remote mountable telephone handsets, wired headsets, wireless headsets, etc. Foot operated press-to-talk switches may be provided for operator convenience, and external buzzers for remote alert signaling.

Power Supply Requirements

Each intercom master station requires an external source of DC power to operate. They may be ordered for either 12-volt or 24-volt operation to suit the available power source.

Networking Requirements

An intercom master station's data communication with the MicroComm system is via the free topology network. Audio signal wiring is connected directly to the station audio boards.

Intercom Stations

MicroComm DXI Intercom (ICM) stations provide a voice communication link to a pre-configured intercom master station or stations. They are available in 100 Series and 400 Series models.

400 Series intercom stations connect to the DXI system through 400 Series station audio boards and communicate with 400 Series intercom master stations. 400 Series intercom stations are also capable of receiving numerous channels of background music at different levels. Using one of the station's switches to step through the selections performs music channel selection.

100 Series intercom stations connect to the DXI system through 100 Series station audio boards and communicate with 100 Series intercom master stations.

All MicroComm DXI intercom stations are available in weatherproof versions.

400 Series Intercom Stations

400 Series intercom stations interface to the MicroComm DXI system through SAB-400 station audio boards. Each station connects via a single shielded twisted pair cable that carries the audio and switch signals and the power for the station electronics. On the 401 models, that same cable also carries the LED indicator signals. Cable length for 400 Series intercom stations can extend to 2500 feet when using 22 gage conductors.

Loudspeakers are waterproof and protected from vandalism by an offset internal sub-plate. Microphones are not used in 400 series intercom stations. Additional DSP processing in the station audio boards is used instead to compensate for enclosure acoustics. The 400 series intercom stations internal amplifier boosts the microphone signal level close to that of the loudspeaker signal to reduce crosstalk between station wiring.

100 Series Intercom Stations

100 Series intercom stations interface to the MicroComm DXI system through SAB-100 station audio boards. Each station connects via a single shielded twisted pair cable that carries the audio and switch signals and the

power for the station electronics. Cable length for 100 Series intercom stations can extend to 2500 feet when using 22 gage conductors.

Loudspeakers are waterproof and protected from vandalism by an offset internal sub-plate. Microphones are also protected by an offset configuration. In the event of moisture sprayed directly at the station, the design provides for drainage. Intercom stations may be ordered without an internal loudspeaker if the loudspeaker needs to be mounted remotely from the microphone and call switch position.

Intercom Talkback Kits

Intercom talkback kits may be added to conventional loudspeakers and horn loudspeakers to interface them to station audio boards. This permits an intercom master station to conduct two-way audio communications through the loudspeaker. If a call-operating device is installed in conjunction with the talkback unit to place intercom call requests, the equipment combination can function as an intercom station.

Call Operating Devices

Call Operating Devices (COD's) are switch units, with optional LED indicators. They are used to place call requests, cancel calls, or initiate some other action such as opening a door or triggering an alarm. COD's are connected to the MicroComm DXI system through discrete I/O units. Switches are connected to an input point on a DIO and the LED indicators are connected to an LED driver output point.

Through The Wall COD

The COD-100 is a high security call-operating device that mounts in a hole drilled through the wall. A pushbutton actuator is connected through an aluminum cylinder to the switch and wiring on the opposite side of the wall. This configuration is virtually indestructible and tamperproof, limited only by the strength of the wall in which it is mounted.

Through the wall call operating devices are manufactured in various lengths to accommodate different ranges of wall thickness.

Pushbutton COD's

The COD-100 Series of call operating devices are pushbuttons mounted on single gang stainless steel plates. They are available with a standard pushbutton switch similar to those on the intercom stations, or with a very rugged solid metal piezo-electric switch that has no moving parts.

An LED indicator is optional with both switch types. The standard switch version LED is mounted above the switch, while the LED option on the piezo-electric unit is mounted right in the switch itself.

Standard switch plates are available in 16-gage stainless steel and 11 gage heavy-duty stainless steel versions. Both versions have a brushed finish. Custom switch plate sizes and thickness can also be provided.

Call Cord COD's

The COD-310 uses a plug in call cord with a pushbutton actuator at the end of the cord. Pushbutton and jack assemblies are 1/4" phono type. This unit is typically used in infirmary units with the call cord clipped to the pillow or sheet on a bed. The standard call cord length is 6 feet, with custom lengths available upon request. An optional LED indicator, mounted above the call cord jack, can also be ordered.

COD-310s are designed for mounting on a single gang masonry box. They are available with 16 gage or 11 gage brushed stainless steel faceplates, or in custom sizes and metal thickness if required.

Accessories and Ancillary Equipment

The MicroComm DXI specification manual data sheets describe and list a variety of accessory and ancillary equipment and devices that are used with the basic system equipment. These include microphones, headsets, loudspeakers, high power paging amplifiers, etc. The devices indicated are those most commonly used in DXI applications. If a specific make and model of accessory is required for a certain application, it can usually be ordered through the factory or supplied by the systems contractor.

Redundant Configurations

A MicroComm DXI intercom system may be configured with redundant SAC computers, power supplies, or the free topology network to reduce loss of operations from a key element failure

Redundant SAC Computers

A second SAC computer, connected to a primary SAC computer through an Ethernet network card, operates in a 'hot standby' mode. That means that system configuration, operating status, call queues, etc. are kept current on both machines. If one unit fails, that other unit will automatically take over the system operation with no interruption of service.

Through the use a keyboard/monitor switch, the primary redundant SAC computer can share a common video monitor and keyboard.

Redundant Power Supplies

Intercom master stations, free topology repeaters, remote discrete I/O modules, and remote audio modules are designed to be fed from two sources of power supply. This eliminates any loss of operation should one power supply, or the distribution wiring from that power supply fails.

Redundant Free Topology Network

I/O card cages, intercom master stations, remote discrete I/O modules and remote audio modules are also equipped with dual free topology network wiring connections. By configuring the system with two sets of free topology ports on the SAC computer and two sets of free topology repeaters, the system will continue to operate even if a port, repeater, or network-wiring element fails.

System Integration

The MicroComm DXI can interface to numerous other security control and security operation systems. This allows separate systems provided in a facility that perform separate, but related, functions to exchange information so that they work together to make it easier for the system operators to control.

PLC and Touch Screen Integration

PLC type door control computers and touchscreen control computers can be integrated with the MicroComm DXI system through a standard RS-232 serial port, a TCP/IP Ethernet link, or through a special interface designed for each specific control system.

The serial port RS-232 interface communicates with the control computer through the MicroComm DXI's host communication protocol. This protocol allows information and instruction to be easily exchanged between a SAC computer and external control computer through well defined, simple messages.

Special interface modules are intended to have external systems, such as the MicroComm DXI, communicate with a specific manufacturer's PLC or touchscreen control computer system in their standard format. These are usually different for each manufacturer, and each requires a unique DXI software interface.

Switch Panel Integration

Switch panels are used to provide single button control for a specific system function such as placing an intercom call to a certain intercom station or unlocking a certain door. They usually include an LED indicator to annunciate the status of that controlled operation. Switch panels may be built in a layout graphically representing the physical location of the controlled devices.

Integration of switch panels to a MicroComm DXI system is performed using discrete input/output modules or through a host port link from a PLC controlled switch panel.

CCTV System Integration

CCTV system integration to a MicroComm DXI system can be through a standard RS-232 serial port or through discrete contact closure monitor and control points.

Since each CCTV system manufacturer usually has a different command structure, the RS-232 interface requires a special DXI instruction set for each CCTV system. The discrete contact closure interface is made using discrete I/O modules that are programmed in the DXI system.

Telephone System Integration

The MicroComm DXI can communicate to an external, either PBX or telephone service provider's telephone system. This is performed through DXI telephone line and telephone set boards that receive and transmit the necessary control and audio signals.

Two-way Radio System Integration

MicroComm DXI intercom master stations can communicate to two-way radio system radios when the two systems are integrated. This system integration is achieved by sending and receiving audio signals through audio input and output modules, and connecting control signals through discrete I/O modules, or the control and status points on the audio I/O cards.

System Cabling

Field Interface Cables

Factory manufactured field interface cables are available for all MicroComm DXI audio interface modules and discrete input/output modules. These cables are provided with an equipment mating connector on one end and left unterminated on the other end. The unterminated end of the cable is to be dressed and connected to appropriate field wiring interface terminal blocks.

Field interface cables are manufactured in a variety of styles depending on the number of signal channels, type of signal, and mating connector that is required. Each cable can also be ordered in a variety of lengths to accommodate different cable plans between the actual equipment and the field interface point.

For each MicroComm DXI module, the appropriate field interface cable model numbers are indicated under the accessories heading. The DXI Cables data sheet should be consulted for detailed cable descriptions and ordering information.

Equipment Interface Cables

Equipment interface cables are available from the factory for linking card cages mounted in the same equipment rack. These are manufactured in two versions for linking either two or three card cages together. Refer to the DXI Cables data sheet for descriptive and ordering information.

Field Wiring

Field wiring information for each MicroComm DXI field device is listed on each data sheet. The information listed will give the connector type, the type of cable required, including the number of conductors and shielding requirements, and the allowable cable length for the recommended wire gage.

Terminal Blocks

MicroComm DXI field interface cables are designed to be terminated on multi-pin terminal blocks. These serve to provide a neat and manageable interface between the building's field wiring and the system equipment. This will simplify troubleshooting of field wiring and system additions and modifications.