

OXMOOR®

C O R P O R A T I O N

A Limited Liability Company

PIR-88M™ INFRARED MODULATOR MATRIX



Installation
&
Operation
Manual

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PIR-88M INTRODUCTION

- Eight audio inputs
- Eight internal RF modulators
- Switchable between 95 kHz and 250 kHz
- Front Panel LED Frequency indicators
- Eight RF outputs through BNC jacks
- PA-422 serial control capability
- Removable terminal blocks for easy wiring

Oxmoor Corporation, LLC's eight-channel Infrared Matrix system simplify the integration of infrared assistive listening and room combining systems. By routing appropriate IR modulators and emitter panels to coincide with room combining changes, eliminate intermodulation interference without the need for complicated physical patching.

The PIR-88M Infrared Modulator Matrix™ packs eight electronically balanced audio inputs and eight RF modulators into the same, compact 1U chassis. Each of the PIR-88M's modulators is limiter protected and may be switched to 95 kHz or 250 kHz with front-panel LED display of the selected frequency.

The system easily interfaces with Oxmoor's MCS™ Room Combining System through PA-422 ports. Connected to the MCS-Mainframe, the PIR-88M configures IR assistive listening systems, automatically tracking room combining changes selected at the MCS master controller. IM interference between emitter panels is prevented by allowing only one modulator to drive the selected group of emitter panels.

Integrating the Oxmoor Infrared Matrix Systems into other combining systems is also simple. Control can come from either external "preset" switches or a PA-422 controller. Up to eleven presets can be user programmed, each providing a different patching assignment between the eight output connections.

A 37-pin, standard D-sub connector provides the connections for external preset switches. This Control Port facilitates an external switch for programming the presets and

"tally" indicator activation (open-collector closures to common) for routing and program switches. DC power is also present at the Control Port for tally LEDs.

The PIR-88M accepts eight balanced or unbalanced audio inputs. The eight modulated outputs are through BNC jacks that present the signal to be delivered to each emitter panel.

Other rear panel connectors include 9-pin, D-sub PA-422 input and output ports, used to receive PA-422 data and pass it along to the next PA-422 device, and cage clamp terminal block connections for the external ± 15 VDC powering module.

The logo for Oxmoor Corporation, featuring the word "OXMOOR" in a stylized, bold, serif font. The letters are closely spaced, and the "O" and "M" are particularly prominent.

PIR-88M CALLOUTS

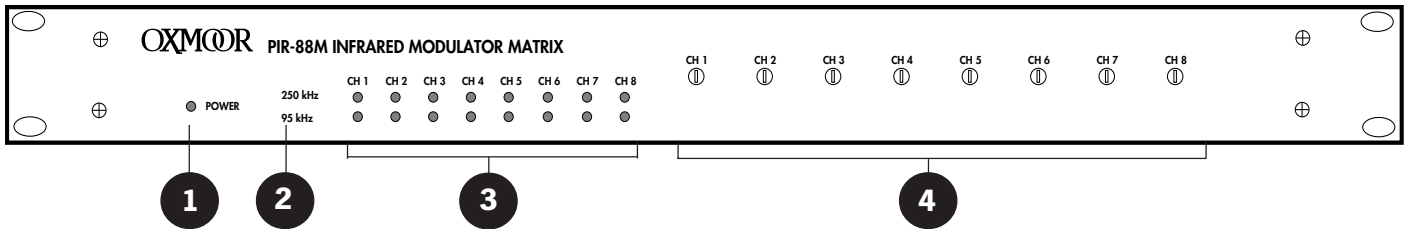


Figure 1.0: Front Panel View

1. **POWER STATUS LED** - Indicator for AC Power On.
2. **CARRIER FREQUENCY OPTIONS** - Internal jumpers provide a means to switch each modulator between two frequency-modulated subcarriers. Each modulator can be set to either 95 kHz or 250 kHz.
3. **CARRIER FREQUENCY INDICATOR**- The illuminated LED indicates the selected carrier frequency.
4. **INPUT GAIN TRIM POTS** - Accessed through the front panel with a small flat-blade screwdriver, these trim pots adjust the input gain +/- 15 dB, to compensate for varying input signal levels.
5. **PROGRAM INPUTS** - Audio inputs, terminal block connections with mating connector, electronically balanced, accept balanced or unbalanced signals from line-level devices. Normal input level is +4 dBu with a maximum input level of +24 dBu.
6. **PROGRAM OUTPUTS** - Audio outputs, terminal block connections with mating connector. Outputs are loop through from the inputs.
7. **RF OUTPUTS** - Chassis mounted RF BNC jacks, (3.5 mm). The RF jacks provide the frequency modulated audio subcarrier signal which the emitter panel(s) will convert into infrared light. Modulated audio bandwidth is 30 Hz - 20 kHz.
8. **CONTROL PORT** - Female, 37-pin, standard D-sub connector. Provides connections for external control of Presets selection and preset programming. Also provides tally connections for all control functions.
9. **PA-422 IN** - Male, 9-pin D-sub connector. This port connects to the PA-422 OUT of the MCS-MCP Master Control Panel, an MCS-IB Interface Box or other PA-422 control devices.
10. **PA-422 OUT** - Female, 9-pin D-sub connector. It is used to carry the PA-422 data to the next PA-422 device.
11. **POWER CONNECTOR** - Six-pin wago connector. Requires +15 VDC and -15 VDC external supply.
12. **CHASSIS GROUND POST** - A screw with a star washer enables the installer to secure a ground wire to the chassis.

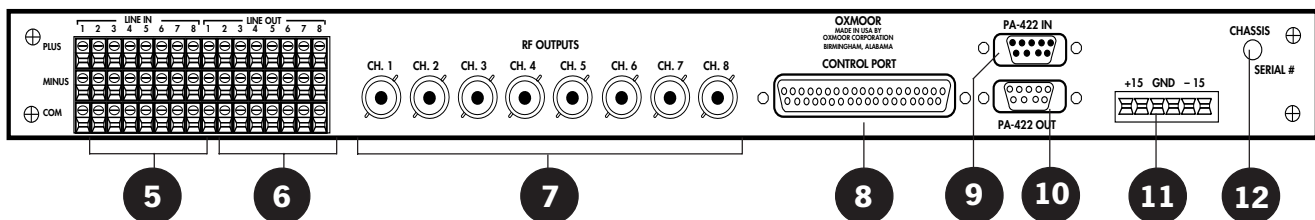


Figure 1.1: Rear Panel View

PIR-88M BLOCK DIAGRAM

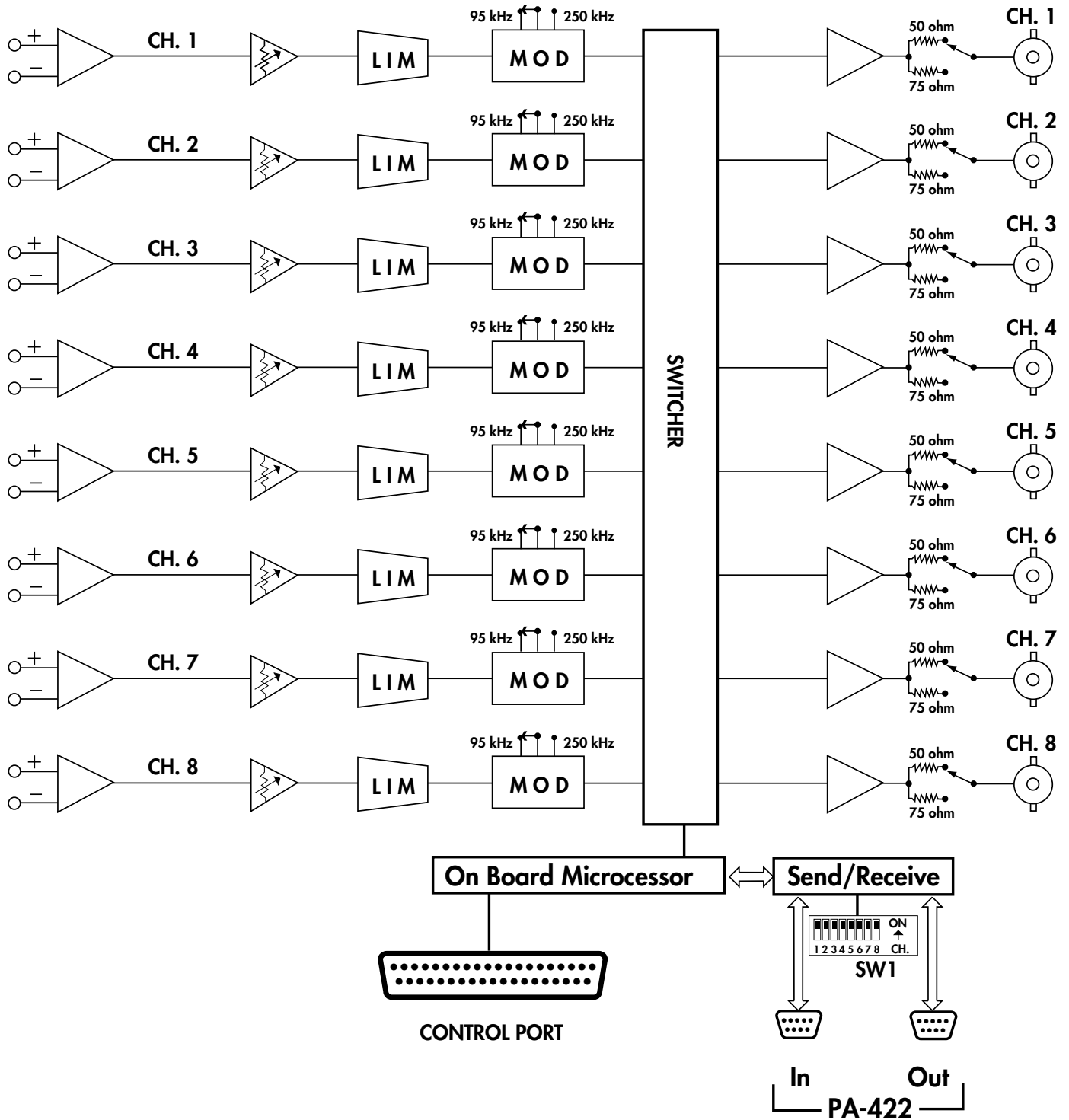


Figure 1.2: Block Diagram

PIR-88M SET-UP

PIR-88M SET-UP OVERVIEW

The PIR-88M has three sets of internal jumpers and one dip switch. The internal jumpers are used to configure carrier frequency, output impedance and output drive levels. The dip switch is used to set the PA-422 address.

The factory settings are:

Carrier frequency = 95 kHz
Output Impedance = 50 ohm
Output Drive Level = 750 V rms
PA-422 address = 3

If it is necessary to make changes to the factory settings, please follow the directions below:

CAUTION!

Hazardous voltages are present inside the chassis. Before opening the case to gain access to the printed circuit board, always remove the AC power from the unit by disconnecting the external AC power adaptor.

ACCESS TO INTERNAL JUMPERS:

1. Disconnect the external AC power adaptor.
2. Remove the top cover screws and set the cover aside.

PIR-88M CARRIER FREQUENCY SELECTION:

(Refer to Figure 2.0)

The carrier frequency jumpers are located right behind the front panel carrier frequency LED indicators. The set of pins closest to the front panel are the 95 kHz setting.

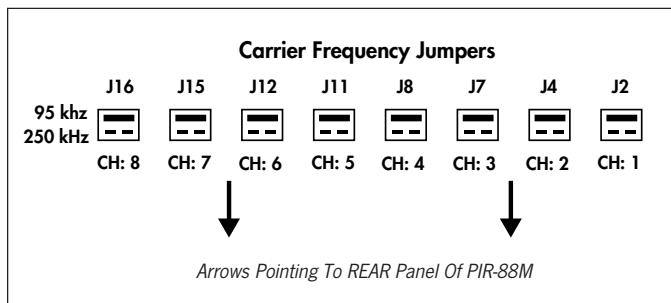


Figure 2.0: Factory Set-Up for 95 kHz

PIR-88M RF OUTPUT IMPEDANCE SELECTION:

(Refer to Figure 2.1)

The output impedance jumpers are located behind the rear panel BNC RF jacks. The set of pins closest to the rear panel is the 50 ohm settings.

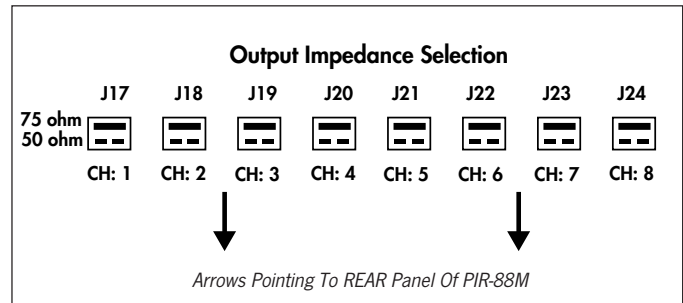


Figure 2.1: Factory Set-Up for 50 ohm output

OUTPUT LEVEL SET-UP PROCEDURE

(Refer to Figure 2.2)

JP1 through JP8 determines the drive level of each terminated output.

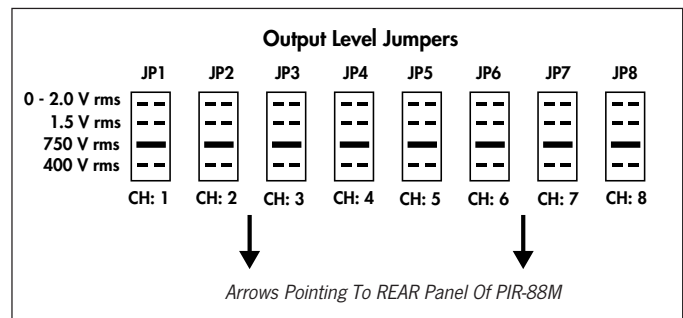


Figure 2.2: Factory Set-Up for 750 V rms terminated output

SW1 PA-422 SET-UP PROCEDURE

(Refer to Figure 2.3)

Switch SW1 determines the PA-422 address. Note: unit must be reset after PA-422 address change.

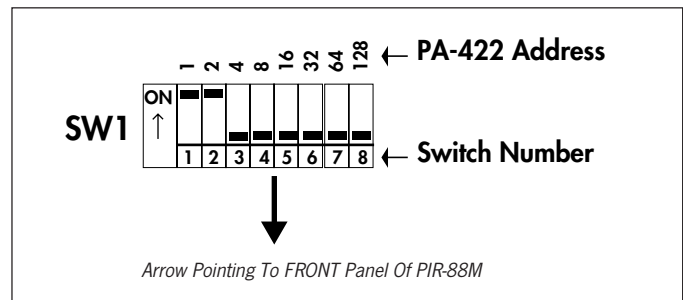


Figure 2.3: Factory Set-Up for PA-422 Address 3

PIR-88M CONNECTIONS

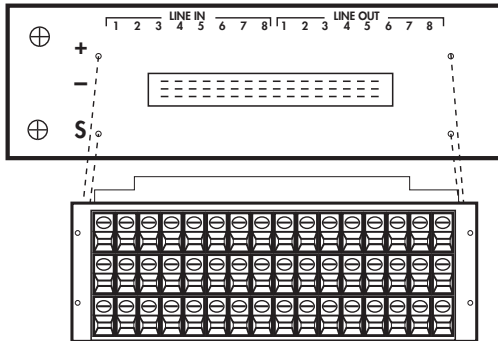


Figure 3.0: Program Inputs and Outputs View

PROGRAM INPUT AND OUTPUT CONNECTIONS

(Refer to Figure 3.0)

The PIR-88M Infrared Modulator Matrix provides connections for eight program channels.

The Program Input and Output connections are made through a 48-pin screw terminal block mating connector.

PROGRAM INPUTS: (S) = Shield, (+) = High, (-) = Low, electronically balanced input, accepts balanced or unbalanced signals from line-level devices. Nominal input level is +4 dBu with maximum input level of + 24 dBu.

PROGRAM OUTPUTS: (S) = Shield, (+) = High, (-) = Low. The outputs are loop through from the inputs. Output impedance and level is determined by the source device feeding the PIR-88M.

PROGRAM INPUT AND OUTPUT WIRING SCHEMES

(Refer to Figures 3.1 and 3.2)

The diagrams below illustrate the correct wiring of balanced and unbalanced program inputs and outputs.

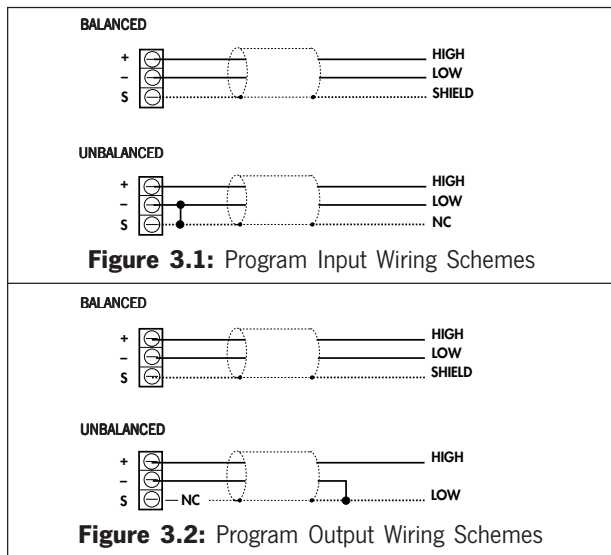


Figure 3.1: Program Input Wiring Schemes

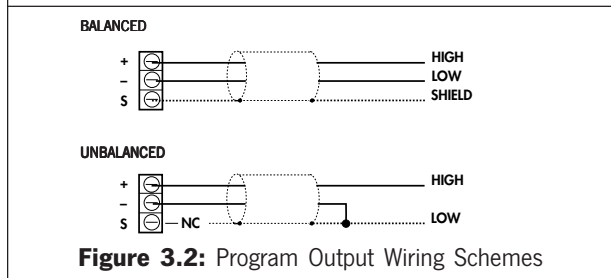


Figure 3.2: Program Output Wiring Schemes

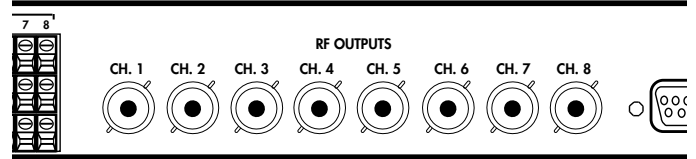


Figure 3.3: BNC RF Outputs

BNC RF OUTPUTS

(Refer to Figure 3.3)

The PIR-88M Infrared Modulator Matrix provides connections for eight infrared emitter panels. Channel one output corresponds to channel 1 audio input. Depending on the programming set-up - when a Preset is selected - the BNC jacks will be routed to the appropriate RF modulator.

PIR-88M CONNECTIONS (CONTINUED)

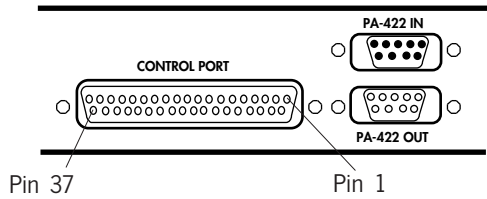


Figure 3.4: Control Port View

CONTROL PORT CONNECTIONS

(Refer to Figures 3.4, 3.5 and 3.6)

The PIR-88M Infrared Modulator Matrix Control Port provides connections for external programming and selections of eleven presets. Also provides tally connections for all control functions.

All control functions are operated by simple momentary contact closures.

Pin	Function	Pin	Function
1	Channel 1/Preset 1	20	Channel 1/Preset 1 Tally
2	Channel 2/Preset 2	21	Channel 2/Preset 2 Tally
3	Channel 3/Preset 3	22	Channel 3/Preset 3 Tally
4	Channel 4/Preset 4	23	Channel 4/Preset 4 Tally
5	Channel 5/Preset 5	24	Channel 5/Preset 5 Tally
6	Channel 6/Preset 6	25	Channel 6/Preset 6 Tally
7	Channel 7/Preset 7	26	Channel 7/Preset 7 Tally
8	Channel 8/Preset 8	27	Channel 8/Preset 8 Tally
9	Preset 9	28	Preset 9 Tally
10	Preset 10	29	Preset 10 Tally
11	Preset 11	30	Preset 11 Tally
12	Not Used	31	Program Tally
13	Program Enable	32	Not Used
14	Not Used	33	Not Used
15	Not Used	34	+15 VDC
16	+15 VDC	35	Bias for back-EMF
17	Bias for Back-EMF	36	Common
18	Common	37	Common
19	Common		

Figure 3.5: Control Port Pin-Out

Function	Description
Channel X Preset X	Used to program/select Presets
Program Enable	Toggles between: A. Preset Mode B. Channel Select Mode C. Preset Assign Mode D. Review Mode
Channel X Tally	Provides open-collector closure to common when control function is active
Preset X Tally	Provides open-collector closure to common when control function is active
Program Enable Tally	Provides open-collector closure to common when control function is active
Common	Logic Common
Bias for Back-EMF	Used with external power supply to protect the open-collector outputs from the back EMF of the relay coil.
+15 VDC	DC voltage to power Tally LEDs

Figure 3.6: Control Port Functions and Descriptions

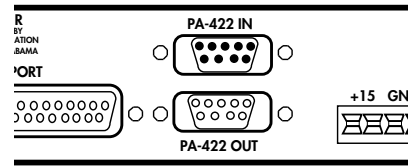


Figure 3.7: PA-422 Serial Control Port View

PA-422 SERIAL CONTROL PORT CONNECTIONS

(Refer to Figures 3.7, 3.8 and 3.9)

All PRM-8 functions can be controlled through the PA-422 serial control port. See Wiring detail below.

Use Belden #9681 or equivalent.

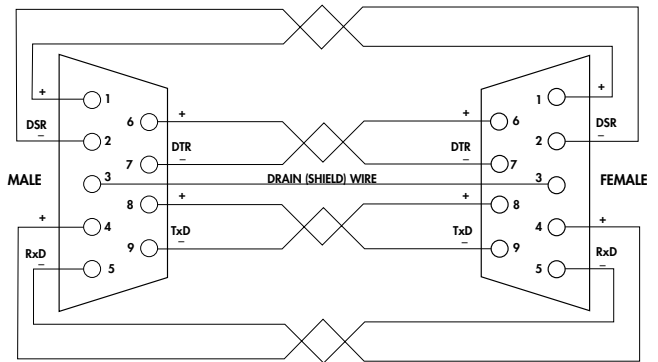


Figure 3.8: PA-422 Serial Control Port Wiring

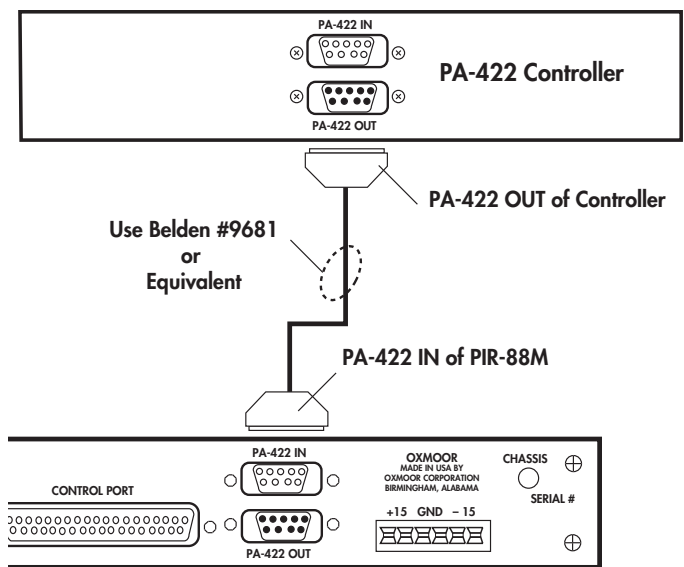


Figure 3.9: PA-422 Typical Connection Scheme

PIR-88M PRESET PROGRAMMING

PIR-88M PRESET PROGRAMMING OVERVIEW

The PIR-88M Infrared Modulator Matrix **Control Port** provides connections for external programming and selection of eleven Presets. All control functions are operated by momentary contact closures.

Presets can be programmed to route any combination of RF output jacks to a given modulator. The PIR is factory set with each output programmed to receive its respective input. Channel 1 output is programmed to receive channel 1 input, channel 2 output is programmed to receive channel 2 input, etc.

In programming the Presets, the Program Enable switch provides a means to switch between:

Preset Mode:

Standard operating mode.

Channel Select Mode:

To select channel combinations for a given Preset.

Preset Assign Mode:

To assign the channel combinations to a given Preset.

Review Mode:

Review channel combinations for a given Preset.

PRESET PROGRAMMING:

Connect a momentary contact closure/push button switch between each of the eleven preset pins (pins 1–11 on the control port) and common. Connect a momentary contact closure/push button switch between the Program Enable pin (pin 13 on the control port) and common.

It is essential that each switch has a tally indicator for a visual indication of its on/off status. Each tally indicator should be connected between the +15 VDC (pin 16 or 34 on the control port) and its respective button tally (pins 20–30 on the control port).

Assuming that the above wiring is complete, program the Presets as follows:

Step 1: Power-up the PRM-88M.

Step 2: Toggle the Program Enable switch to enter into the Program Mode. Its tally should now be illuminated.

Step 3: Select all channels that are to be included in this Preset, using the preset switches 1–8. Each

selected preset's tally indicator should be illuminated. Remember, while in the Program Mode, preset switches 1–8 represent modulator channels 1–8.

Step 4: Toggle the Program Enable switch to enter into the Preset Assign Mode. The Program Enable tally should now be blinking.

Step 5: Assign a Preset by selecting a preset switch, 1–11, for this combined set-up. When a Preset is selected, the PIR will return you to the Preset Mode.

Step 6: Return to Step 1 to program additional Presets.

PRESET REVIEW:

Step 1: Push and hold the Program Enable button until its tally indicator illuminates, now release the Program Enable switch. All of the Preset tally indicators should now be blinking, indicating that the Preset Review Mode is active.

Step 2: Select any one of the eleven Presets to review by pushing the appropriate preset button. When a Preset is selected, all channels assigned to the selected Preset will turn on their tally indicator.

Remember the Preset you selected, its tally will not be illuminated unless the channel it represents is one of the channels in the combined group.

Step 3: After reviewing the Presets, return to the Preset Select Mode by toggling the Program Enable button once. The Program Enable tally indicator should turn off.

REMOVE CHANNELS FOR A PRESET:

The only way to remove a channel from a Preset is to re-program the Preset. Follow steps 1 through 5 in "PRESET PROGRAMMING."

PIR-88M PA-422 PROGRAMMING

PIR-88M COMMUNICATION PORT OVERVIEW:

This document is a PA-422 communications reference for those interested in designing their own custom software to control the Oxmoor PIR-88M[®] system. Intended as a supplement to the PA-422 standard documentation (which describes in detail the operation of PA-422), this text describes those commands which are used with the PIR-88M. These commands are described in a manner consistent with the PA-422 standards draft: each command is introduced and its exact usage given in a procedural, step-by-step fashion. Also included are the data formats associated with each command.

DEVICE CONTROL LANGUAGE STRUCTURES:

Transmit All Data - 81 hex

This command sends the data necessary to specify the input to output channel configurations of the PIR-88M. The data transmitted are the status of link switches when connected to an Oxmoor MCS[®] System. To send this command the controller must:

1. Transmit the address of the desired device.
2. Wait until DSR is set or 250 msec time-out period has elapsed.
3. Set DTR.
4. Get DT (device-type code; 32 hex).
5. Get ID (manufacturer's identification code; 29 hex).
6. Transmit 81 hex (command code).
7. Transmit the data as shown in the data structure description (see section 3).
8. Get COMSTAT (should be 00 hex if successfully executed).
9. Verify DSR is reset by addressed device.
10. Reset DTR

DEVICE CONTROL LANGUAGE (DCL)

DATA STRUCTURES:

This section details the exact data streams that should be sent with each PA-422 command to correctly communicate with the desired device. Each data structure is presented in the following format:

Data Transmitted:

(the data that should be sent with the command)

Byte# =	Data stream position
Valid Data Range =	Valid values for byte
Description =	Information byte contains

Data Received:

(the data returned from the desired device).

Byte# =	Data stream position
Valid Data Range =	Valid values for byte
Description =	Information byte contains

NOTE: All numbers in the data fields are decimal unless noted otherwise.

Transmit All Data (81 hex)

Data Transmitted:

Byte# =	1
Valid Data Range =	0
Description =	Dummy data which must be zero.

Byte# =	2-12
Valid Data Range =	0-FF hex
Description =	MCS Room Combining System Link switch settings. Room combinations for each of the 11 link switches. If a link switch is inactive the byte for that switch should be zero. Thus, if link switch one is active and it combines rooms 1 and 2 then byte 2 should be 00000011. Note that byte 2 corresponds to link switch 1 and byte 12 corresponds to link switch 11.

Data Received: none

PIR-88M SET-UP NOTES

PIR-88M SPECIFICATIONS

AUDIO INPUTS

Type Electronically Balanced (RF Suppressed)
Connectors Screw Terminal Blocks with Mating Connector
Input Impedance 80 K Ohms
Input Sensitivity Nominal +4 dBu, Maximum +24 dBu
Trim Pot Range ± 15 dB

MODULATOR

Input Limiter Protected
Frequency 95 kHz or 250 kHz Selectable
Preemphasis 50 μ sec.
Peak Deviation ± 50 kHz
Crosstalk Attenuation 50 dB @ 250 kHz

RF OUTPUTS

Connectors BNC
Selectable Output Levels 0 - 2.0 V rms (Terminated)
1.5 V rms (Terminated)
750 mV rms (Terminated)
400 mV rms (Terminated)

CONTROL PORT

Connector 37-pin D-sub, Female
Input Type Active Low, Internally Pulled Up
Logic Action Momentary to Common
Logic Levels Low < .8 Volts, High > 2.4 Volts
Maximum Sink Current 1 mA
Maximum Cable Length 600 m (2000 ft), #22 AWG
Switching Time 50 ms
Power Output +15 VDC \pm 0.5 V, 100 mA

COMMUNICATION

Protocol PA-422
Input Connector 9-pin D-sub, Male
Output Connector 9-pin D-sub, Female

POWER

Connector Cage Clamp Terminal Blocks
AC Adapter Provided Voltage ± 15 VDC, 24 watts maximum
Current 1 Amp Per Side DC current
Internal Thermal Fuses Poly Fuse, Resettable

MECHANICAL

Overall Dimensions 44 H x 482 W x 183 D mm
(1.72 H x 19 W x 10 D in)
Finish Textured Black Paint
Weight Shipping: 3.8 Kg (8.5 lb) Net: 3.1 Kg (6.9 lb)

Specifications subject to change without notice.

OXMOOR FACTORY SERVICE

For service information contact:

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Internet: www.oxmoor.com

Additional Installation & Operation Manuals are available from Oxmoor. Contact the Oxmoor Sales Department for pricing and other ordering information. Consult warranty statement for cautions concerning unauthorized service.

OXMOOR TWO YEAR LIMITED WARRANTY

Oxmoor warrants that each Oxmoor electronic product shall be free from defects in workmanship and materials and will, at its option, repair or replace any part of the product without charge provided the product is delivered to Oxmoor within two years of date of original purchase from or delivery by an authorized Oxmoor dealer. Excluded from this warranty are finish and appearance items and malfunction resulting from abuse, from use that is not in accordance with instructions, or operation under other than specified conditions. Also excluded are incidental or consequential damages except where precluded by applicable law. This warranty provides the customer with specific legal rights; there may also be other rights which vary from state to state.

Repair by other than Oxmoor Factory Service Department or its authorized service agency, unauthorized modification, or the removal or defacing of the serial number will void this warranty.

Products returned for factory warranty service must be prepaid and packaged in such a way as to insure safe transit and must be accompanied by a sales slip or other valid proof of purchase date.

PRIOR AUTHORIZATION FROM OXMOOR IS REQUIRED FOR RETURN. Contact Oxmoor for a Return Authorization (R.A.) Number and shipping information before returning product for service.



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For 24-hour access to product specs and information visit Oxmoor's complete product line on the internet at www.oxmoor.com.

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Specifications and design are subject to change without notice.