



Broadcast Devices, Inc.

GPMRC Remote Control Panel

*For use with the GPM-300 General Purpose Matrix Audio
Switcher*

TECHNICAL REFERENCE MANUAL

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Table of Contents

I. Introduction

A. Unpacking and Inspection

B. General Description

II. Specifications

III. Installation

A. Initial Installation Consideration

B. GPMRC Operation and Configuration

IV. Diagrams

V. Warranty

I. Introduction

The GPMRC Remote Control Panel is designed to be used in conjunction with the Broadcast Devices, Inc. GPM-300 General Purpose Matrix Audio Switcher series. The GPMRC is single rack unit panel designed to be connected via RS-485 communications cable intra facility to the GPM-300 series switcher. Up to 8 – GPMRC panels can control a single GPM-300 switcher using RS-485 communications protocol.

A. Unpacking and Inspection

Carefully unpack the unit after receipt and inspect for damage that may have occurred during shipping. If damage is noted, contact the shipper immediately and file a damage claim. The contents of the package have been insured to cover total replacement cost.

B. General Description

The GPMRC has two sets of 8 buttons and 8 status indicators. On the left side of the panel 8 control inputs and on the right 8 select outputs. 8 audio presence status indicators are located in the center of the panel. The audio presence status LED indicators remain lit as long as audio on the designated channel is present and above threshold for a least 5 seconds. To the far right of the panel there is a protected “arming” button which when depressed allows the panel to send commands to the GPM-300.

II. Specifications

Number of Push Buttons:	2 Sets of 8
Input Connectors:	DB25 Female – RS485 I/O
Status:	LED for each button / 8 Audio Presence
Power Requirements:	5 VDC Power Pack supplied 100-240 VAC 50/60HZ

III. Installation

A. Initial Installation Consideration

Install up to eight GPMRC panels as desired. Connection from the GPM-300 switcher is via the RS-485 serial connector on the rear panel of the unit. See the schematic diagram for pin wiring information. Communication between the GPM-300 switcher and GPMRC panels is through a two wire connection and shield utilizing RS-485 serial data. Belden 8451 or suitable substitute wire is recommended for the connection between the GPM switcher and the GPMRC panels. RS-485 wiring dictates that a 2 wire shielded cable be run from the GPM switcher to the first GPMRC panel and then another 2 wire shielded cable be run to the next panel until the last panel is connected. Each panel has 2 - DB25 female D connectors for RS-485 I/O. Simply wire a connection to the first panel from the GPM-300 switcher and then use the second DB25 connector to connect to the next panel until all panels – up to a maximum of 8 panels have been interconnected. A 110 ohm termination should be placed on the last panel second DB-25 connector.

Some general dos and don'ts about RS-485 wiring.

Do:

- 1 – Always use shielded pairs
- 2 – Terminate the last connection with 110 Ohms – terminator supplied
- 3 – Keep cable runs between I/O ports as short as practical.

Don't!

- 1- Parallel wire runs. Always run a single pair from unit to unit until the last unit is reached.
- 2- Forget to terminate the last connection with the supplied terminator
- 3- Have two units on the same RS-485 address. This will cause conflicts and faulty operation

Troubleshooting tips

If once all of the GPMRC panels are connected there is a communications error signified by the Channel Audio status LED array blinking follow these steps to correct the problem.

1. Check wiring to make sure it conforms to the schematic diagram entitled “Typical RS-485 Pin Configuration – GPM-300 to GPMRC Remote Control Panels”
2. To determine a wiring issue between panels, remove all but the first connection to the first GPMRC panel and install the supplied termination

to the second DB-25 connector to see if the wiring between the GPM-300 audio switcher and the first panel is correct. If this is successful move connect the next panel and place the termination there and repeat this until the defective wiring is found.

B. GPMRC Operation and Configuration

The GPMRC Remote Panel allows operation of the GPM-300 as an 8x8 matrix switcher.

Up to 8 GPMRC Remote Panels may be connected to each GPM-300 simultaneously for operation from multiple locations. The currently selected source for each output channel and the audio presence status of each input are indicated on the panel. Sources may be selected for each output. The panel may be programmed to allow or disallow any source for each output.

Normal Operation

To activate the GPMRC panel for operation the protected green arming button to the extreme right of the panel must be pushed and the button will illuminate signifying that the panel is active and will accept commands. This button can be labeled with a transparency by removing the button and placing a clear transparency with a naming convention of choice. In normal operation pushing one of the output select buttons will cause the input select button for the currently selected source to illuminate. The input status LED's will illuminate when audio is present on the corresponding GPM-300 input channel.

Pushing an input select button will route the corresponding source to the currently selected output. The button will then illuminate to indicate that the selected source is now routed to the output.

Panel Enable

To enable remote operation from the GPMRC either Dip Switch 1-1 must be ON or the optional ENABLE switch must be ON. These switches are connected in parallel so closing either switch will prevent the other from disabling operation of the panel. Note that the when the panel is disabled it will still display Audio Status and the currently selected source for each output channel.

RS-485 Configuration

The RS-485 address of the GPMRC must be set using DIP switches 1-2 through 1-4.

The factory default address is 1.

Address	DIP SW 1-2	DIP SW 1-3	DIP SW 1-4
1	ON	ON	ON
2	OFF	ON	ON
3	ON	OFF	ON
4	OFF	OFF	ON
5	ON	ON	OFF
6	OFF	ON	OFF
7	ON	OFF	OFF
8	OFF	OFF	OFF

The RS-485 address switches must be configured BEFORE power is applied to the panel. If the address is changed the panel must be power cycled to accept the new address.

Warning: Duplicate addresses on the same RS-485 bus will cause erratic operation.

If communications is lost with the GPM-300 all Audio Status LED's will blink simultaneously.

When the programming DIP switch (SW2-1) is in then normal operation position.

Programming Source Selection Permissions

Each source selection may be allowed or disallowed on a per output basis. The factory default programming will allow any source (input) to be selected for all outputs. To change this, enter the programming mode by turning OFF DIP Switch 2-1.

In programming mode the currently selected output button will flash to indicate programming mode. In addition the RS-485 address will be displayed by the Audio Status LED's. The input selection buttons will display the "allow" or "disallow" status of each source for the selected output. A source select button which is illuminated is allowed for the selected output. Pushing a source select button will toggle the allow/disallow status of the corresponding source ONLY for the currently selected output.

Once the "allow" / "disallow" permissions for each output channel have been selected, move DIP Switch 1-1 to the ON position to exit the programming mode.

RS-232 Output

The GPMRC has an additional RS232 port labeled on the PC board. Use the supplied DB9 to IDC interface cable to connect the panel to a 9 pin RS232 connection to a laptop computer.

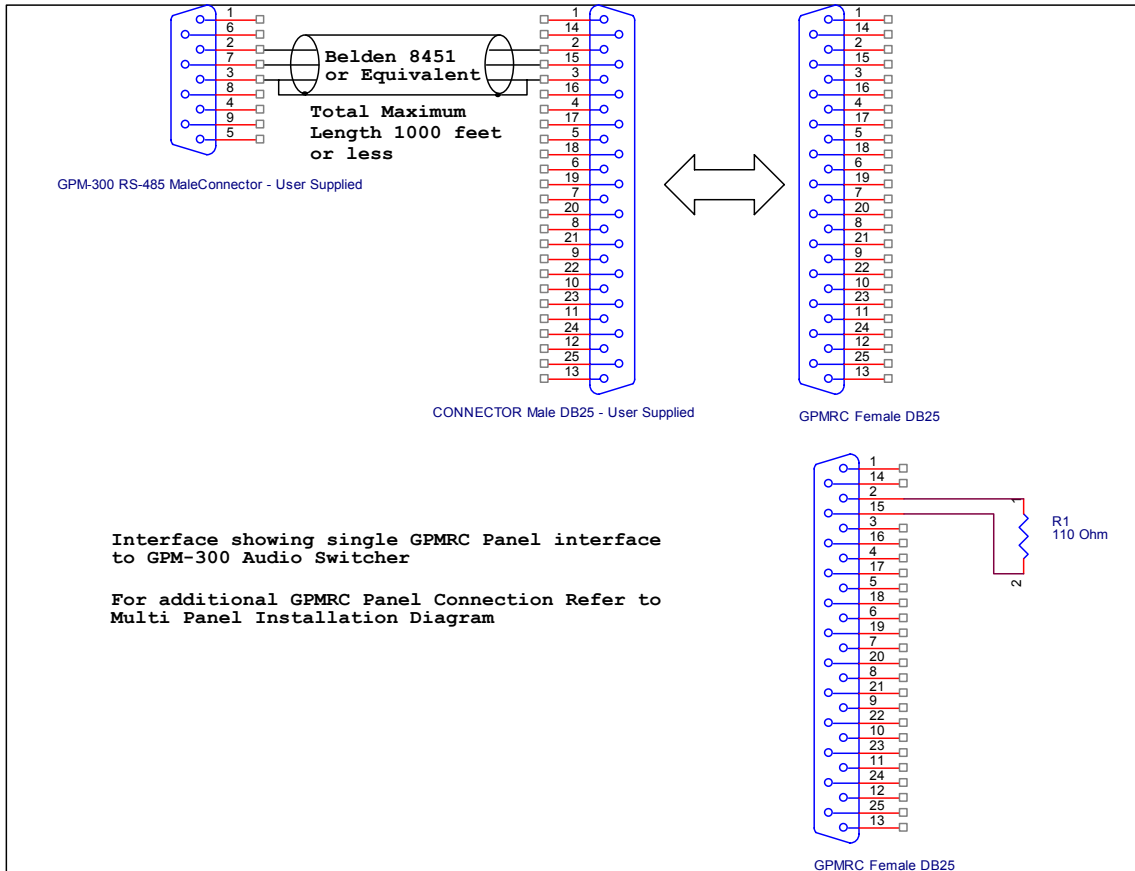
The RS-232 output provides self-test information as well as the status of the GPMRC remote control panel. Serial data is at 38.4K baud, 8 bits, no parity with 1 stop bit.

On power-up the GPMRC self test results will be sent to the RS-232 port. A successful self test will result in the following display:

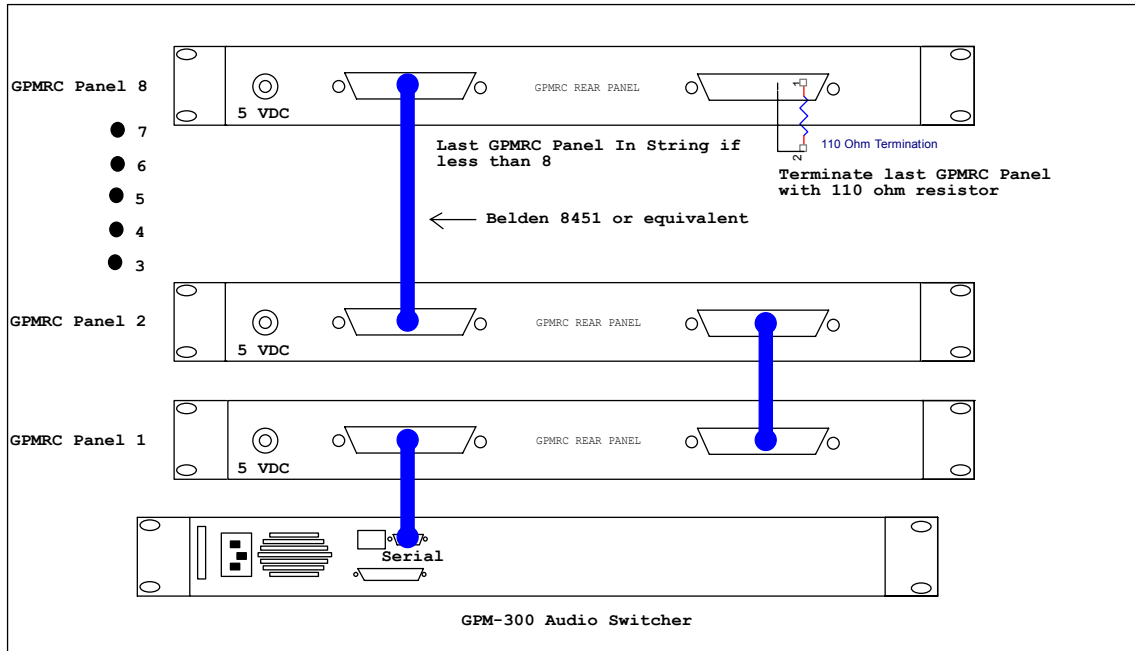
```
GPMRC V1.0.3  
FRONT PANEL PASS 0  
FRONT PANEL PASS 1
```

During operation the state of the panel is displayed in a table which provides the firmware revision, RS-485 address, state of the enable/disable switch, programming of the individual source routing allow/disallow programming and the currently selected source for each output.

IV. Diagrams



Typical RS-485 Pin Configuration – GPM-300 to GPMRC Remote Control Panels



Typical GPMRC Interconnect Diagram

1. Connect from the GPM-300 DB9 Serial connector to the first panel and then to the next panel and so on.
2. Only connect a single pair between each unit. **DO NOT PARALELL RS-485 COMMUNICATIONS CABLE FROM A SINGLE POINT AS THIS WILL CAUSE ERONEOUS OPERATION!**
3. Terminate the last panel with the supplied 110 ohm termination plug.
4. Make sure that each GPMRC Panel is on its own RS-485 address. Refer to page 6 RS-485 configuration for instructions to change RS-485 addresses.

V. Warranty

Broadcast Devices, Inc. products are warranted against failure due to faulty materials or workmanship for a period of one year from the date of shipment to the ultimate user. The warranty covers repair or replacement of defective parts at the factory, provided the unit has been returned prepaid by the user. All shipments to the factory shall have affixed to the outside of the container an R. A. number obtained from the factory. The above warranty is void if the unit has been modified by the user outside of any recommendations from the factory or if the unit has been abused or operated outside of its electrical or environmental specifications. If customer conducted field tests suggest that the unit may be faulty, whether or not the unit is in warranty, a full report of the difficulty should be sent to Broadcast Devices, Inc. factory at Cortlandt Manor, New York. The office may suggest further tests or authorize return for factory evaluation.

Units sent to the factory should be well packed and shipped to Broadcast Devices, Inc. Check our web site: www.broadcast-devices.com for current shipping address or call the factory. Remember to affix the R.A. number to the outside of the carton. Any packages received without such R.A. number will be refused. Note: freight collect shipments will also be refused. When the unit has been received, inspected and tested, the customer will receive a report of the findings along with a quotation for recommended repairs, which are found falling outside of the standard warranty. Units returned for in-warranty repairs which are found not to be defective will be subject to an evaluation and handling charge. In-warranty units will be repaired at no charge and returned via prepaid freight.

Out-of-warranty units needing repair require a purchase order and will be invoiced for parts, labor, and shipping charges.

When ordering replacement part, always specify A) Part number or Description, and Quantity; B) Date of Purchase, Where Purchased; C) Any Special Shipping Instructions. Always specify a street address, as shipping companies cannot deliver to a postal box.

Broadcast Devices, Inc. is not responsible for any other manufacturer's warranty on original equipment. Nor are we responsible for any failure, damage, or loss of property that may occur due to the installation or operation of our equipment outside of recommended specifications.

