

OWNERS MANUAL

**MODEL 801R
REMOTE CONTROL
MICROPHONE PREAMPLIFIER**



GRACE

d e s i g n

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Grace Design 801R Remote Control Preampifier

Preliminary user information

Overview

The 801R system consists of an 8 channel preamplifier chassis, a power supply chassis and an optional RCU . The preamplifier chassis contains 8 audio amplifier PCBs, a micro controller PCB and a front panel LCD display. The preamplifier chassis is equipped with two Phillips I²C Bus connectors (D-sub 9 pin) and MIDI IN and OUT connectors. The RCU contains identical micro controller and display PCBs and has a single Phillips I²C Bus connector.

The preamplifier can be controlled by the RCU, via MIDI, or directly from its front panel. The RCU connects to the preamplifier via I²C which provides a bi-directional data link. **Please Note: The 9pin I²C is a proprietary interface. It is not compatible with RS-232, RS-422, or any other 9 pin based serial protocol found in the recording studio environment. Do not connect your Grace Design 801R or remote unit to any other equipment!**

The RCU can control more than one preamplifier. By connecting the remote unit to one preamplifier and then connecting the remaining preamplifier units together with I²C cables in a daisy chain fashion up to 8 preamplifiers can be connected together in a system.

Operation

Front Panel Controls

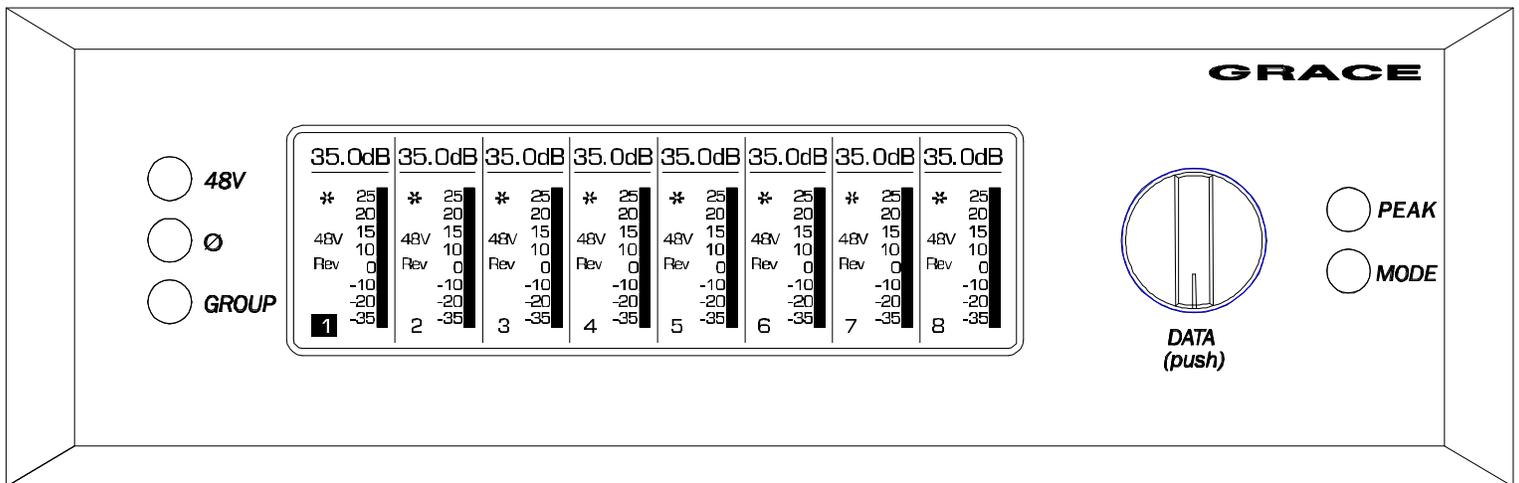


Figure 1. RCU front panel

The front panels of the RCU and the 801R preamplifier are identical and consist of the following controls and indicators:

- +48 Volt phantom power push-button
- PHASE reverse push-button
- GROUP push-button
- PEAK Indicator Reset push-button
- DATA Variable function rotary encoder with push-button
- MODE select push-button
- LCD display 64x240 pixels

Preamplifier Modes

Channel mode: This is the default power on mode. In Channel mode the rotary encoder is used to select one of the eight visible channels for adjustment. When selected, the settings for a channel can be adjusted with the +48, PHASE, or DATA controls. Pushing the +48V or PHASE button toggles that function on or off on that channel. Pushing the DATA control enters the Gain Adjust mode. While in Gain Adjust Mode the Gain numeric display characters are highlighted and the rotary encoder adjusts the gain up or down. Pushing the DATA control again exits the Gain Adjust mode and returns to the Channel select mode. The bar graph meter at the right edge of each channel section is a 15 segment peak meter that indicates preamplifier output levels from -35dBu to $+25\text{dBu}$. Unlike the typical log scale level meter in a tape recorder, the 801R meter represents level in a mostly linear dB scale. This allows for a meter range of 60dB and useful peak output level information up to 4dB of the output clip point.

Note: You will notice that the meter ballistics will at first seem sluggish but this setup actually provides more useful information about your peak levels and headroom status.

Meter Mode: In Meter mode the LCD displays bargraph level meters for up to 24 channels at a time. The DATA control is used to highlight an individual channel. If there are more than 24 channels present in the system then the display “scroll” as the DATA control is rotated. Pushing the DATA control when a given channel is highlighted “zooms” to the Channel mode for channel parameter adjustment. Note: Meter Mode is available on the RCU only and can only be accessed if more than one preamplifier are connected to the system.

Setup Mode: The Setup mode displays a series of menus for various user setup options. Step through the various setup screens by pushing the MODE pushbutton.

The Preamplifier ID: This field allows one to select a unique identification for each preamplifier in a system. The ID number also assigns channel numbers to the preamplifier. For instance, ID 1 includes channels 1-8, ID 2 includes channels 9-16 and so on to ID 8 which includes channels 57-64. Pushing the DATA knob once allows the ID number field to be changed by rotating the DATA knob. Pushing the DATA

knob again saves the setting. It is very important that all preamplifiers in a multiple preamplifier system have unique ID numbers.

Peak Threshold: Each preamplifier maintains a history of peak events. A peak event is defined as a moment where the audio level on a preamplifier channel exceeds a user adjustable reference level. If a channel has experienced a peak above reference level then the “Peak” character appears next to the appropriate channel in the Display. Pushing the PEAK button resets all Peak History values on the *channels being displayed*. The Peak Threshold can be adjusted by pushing the DATA knob once and then turning the DATA knob until the desired level is visible. Pushing the DATA knob again saves the setting.

Peak Hold: Various decay times can be chosen for the peak indicator. These include 1, 3, 10 second and infinite hold times.

Presets: The settings for each channel in a preamplifier can be manually stored for later recall in one of 10 user pre-set registers. Registers 1 through 10 are available for user storage.

Display contrast: The display contrast can be adjusted to optimize the display for various viewing angles.

Back light control: The LCD display back light illumination can be turned off if desired.

GROUP MODE: The group mode allows two to eight adjacent channels to be grouped together for gain change operations. This can be very convenient when using stereo pairs or groups of microphones on one instrument. To enter group mode push the GROUP pushbutton. The words “Group Mode Active” will appear just below the gain status characters. To define a group, place the cursor on the left most channel of the channels to be grouped and turn the DATA knob clockwise while pressing the GROUP pushbutton. You will notice that the vertical dividing lines between channels disappear as channels are added to a group. Once in Group mode, gain changes are made in the same manner as in normal Channel select mode. To remove a group place the cursor on the right most channel of the channels in the group and turn the DATA knob counter clockwise while holding the GROUP pushbutton. You will notice that the vertical dividing lines between channels reappear as channels are removed from a group.

INSTALLATION

PREAMPLIFIER POWER CONNECTIONS

An 8' (2.8m) DC power cord is supplied to connect the power supply unit to the preamplifier unit. This cord can be identified by the 9 pin circular connectors at each end.

Please note that the DC power cord should be connected before the AC power is turned on. This prevents incorrect power sequencing which can cause damage to the audio circuits.

To avoid any interference with the low level audio circuitry, the power supply should be located at least 3' (1m) from the preamplifier unit.

A standard AC power cable is included. For safety, it is recommended that the cord be connected to a grounded outlet. In the event of noise from a ground loop, the audio ground can be isolated from the chassis ground by removing jumper J9 in the power supply. (See paragraph 6)

AC input voltage settings can be adjusted for 100V, 120V, 220V and 240V operation at 50-60Hz. From the rear of the power supply unit, open the trap door next to the IEC power inlet with a small screwdriver. Carefully pull the voltage select cam straight out and then insert with the desired voltage showing. Do not try to rotate the cam while it is in the power input module. Replace the fuses with the proper value selected from the table below. Be sure to use a GMC type time delay or fuse with a 250V rating.

Voltage	100V	120V	220V	240V
Fuse rating	0.75A	0.75A	0.5A	0.5A

Figure 4. Fuse value table

Grounding options

In certain installations, it may be desirable to separate the preamplifier signal ground from the power supply chassis and earth grounds. Noise inducing ground loops can be broken while retaining the safety feature of the grounded AC power cord. The 801R should not be operated with a ground lift or "cheater" plug on the AC power cord. Simply set the AUDIO GND toggle switch on the rear panel of the power supply unit to the desired setting (ISO or EARTH).

REMOTE UNIT POWER CONNECTION

The RCU is powered with the supplied AC wall adapter. It is recommended that the I²C data connections be made before applying power to the RCU. Simply plugging the 2.1mm barrel connector into the DC power jack turns the power on. The AC wall adapter is rated for 7.5V / 1A DC. (+) is in the center and (-) is on the outside sleeve.

AUDIO CONNECTIONS

Input connections are made via female XLR connectors with pin 2 positive, pin 3 negative and pin 1 ground. 48V phantom power is supplied on pins 2 and 3.

Output connections are made via male XLR connectors with pin 2 positive, pin 3 negative and pin 1 ground. An additional set of parallel outputs is provided with a 25 pin D-sub connector. Both sets of output connectors can be used simultaneously.

If the output is to be used unbalanced, pin 1 should be connected to signal ground and pin 2 to signal hot. Due to the nature of the balanced output stage, pin 3 should be left open for unbalanced operation. See figure below. Note: This will provide a signal of positive absolute polarity when the preamplifier is being used with a microphone which produces a positive voltage on pin 2 with positive air pressure on the front of the diaphragm. While a vast majority of microphones conform to this standard a few do not. Use the phase reverse switch to compensate if necessary.

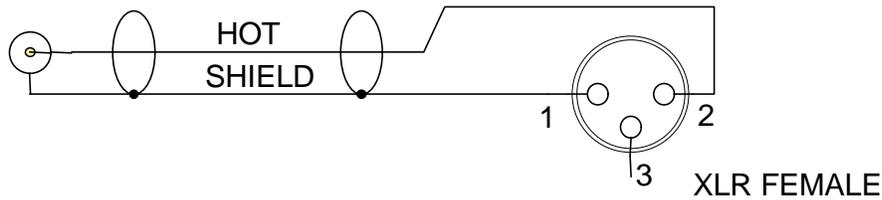


Figure 2. Unbalanced output cable termination

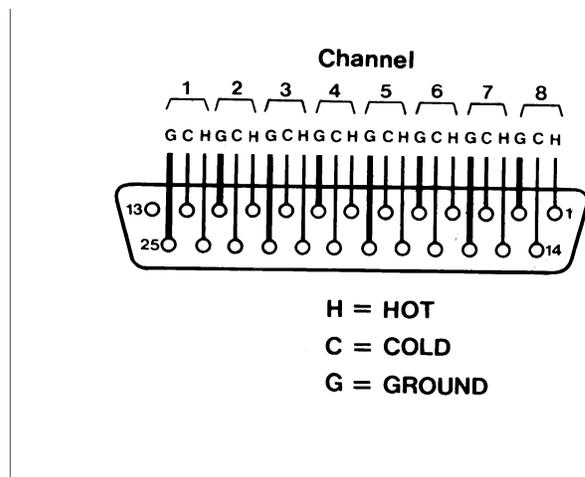


Figure 3. 25 pin D-sub output connector

DATA CONNECTIONS

RCU to Preampifier data connections are made with an I²C serial cable. This cable has a male 9 pin D-sub connector at each end. The data cable can be supplied by the factory in any length up to 1000'. The I²C cable should be connected to the 9 pin D-sub connector on the remote unit and to the I²C IN 9 pin D-sub connector on the preampifier. As well, the RCU is supplied with a set of adapters that allow one to use a standard microphone cable for the serial data link. The microphone cable can be up to 1000' long. It is not recommended to use a microphone line in a multi-channel snake for this application because the serial data activity can induce noise into adjacent audio signal lines.

Preampifier to Preampifier connections are made by connecting a 9 pin I²C cable from the I²C OUT connector on one preampifier to the I²C IN connector on another preampifier.

SPECIFICATIONS

PREAMPLIFIER SPECIFICATIONS

FREQUENCY RESPONSE

@ 40.5dB gain \pm 0.2dB 50 Ω source	15Hz-300KHz
@ 40.5dB gain \pm 3dB 50 Ω source	4.5Hz-1.0MHz

THD+N

@ 20dB gain +20dBu out	<.0010%
@ 40.5dB gain +20dBu out	<.0010%
@ 60.0dB gain +20dBu out	<.0050%

INTERMODULATION DISTORTION

@40dB gain +25dBu out	
SMPTE/DIN 1:1 (50Hz, 7kHz)	<.0020%
SMPTE/DIN 4:1 (50Hz, 7kHz)	<.0040%

NOISE - REFERRED TO INPUT

@60dB gain 50 Ω source	-130dB
@60dB gain 150 Ω source	-128dB
@60dB gain 600 Ω source	-124dB

PHASE DEVIATION

50-20KHz	<4°
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CROSSTALK

Any Channel @40.5dB gain 1kHz	-100dB
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CMRR

@60dB gain, 3.5Vcm, 1KHz	>70dB
@60dB gain, 3.5Vcm, 10KHz	>70dB
Output CMRR	>60dB

PHANTOM POWER

Voltage	+48V +0.9/ -0.0
6.8k Ω resistor match tolerance	+/- 0.01%

MAXIMUM OUTPUT LEVEL

Balanced	+28dBu
Unbalanced	+22dBu

IMPEDANCE

Input	1600 Ω
Output	50 Ω
Minimum Load Impedance	50 Ω

WEIGHT

12lbs

DIMENSIONS

2U rack mount x 10" deep

POWER SUPPLY SPECIFICATIONS

POWER CONSUMPTION

100-240VAC 50/60Hz

63 Watts max

WEIGHT

4lbs

DIMENSIONS

H1.7" x W8.5" x D8.5"

REMOTE CONTROL UNIT SPECIFICATIONS

POWER CONSUMPTION

7.5VDC

.55A

WEIGHT

3.3lbs

DIMENSIONS

H2.5" x W11.0" x D3.5"