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Thank you for choosing EMM Labs...

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Warranty

EMM Labs warrants the PRE2 product against defects in material and workmanship under normal use and service for a period of time specified by the product's serial number from the date of first delivery to the owner. The warranty time period is 5 years. Warranty is limited to the original owner and is non-transferable.

EMM Labs will pay for return shipping charges back to the owner when the product is sent to EMM Labs within the first 90 days after purchase (US and Canada end-users only). Otherwise, owner will be responsible for all shipping charges to and from EMM Labs.

For all warranty claims, a copy of the original invoice must accompany the product.

Opening the product or modifying it in any way by the owner, including but not limited to cryogenic treatment, will void any warranty.

Please contact EMM Labs *(support@emmlabs.com)* for RMA number and shipping instructions before shipping any product to EMM Labs.

EMM Labs products are sold worldwide through authorized dealers with restricted territories. EMM Labs product purchased from non-authorized dealers or from a dealer selling outside his / her authorized territory will automatically void product warranty.

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PRE2 STEREO PREAMPLIFIER

Built on the heritage of the famous PA6i, the PRE2 preamplifier incorporates Ed's latest preamplification designs coupled with ground breaking technology.

The PRE2 STEREO PREAMPLIFIER features:

- 6 sets of stereo analog inputs and 1 stereo recording loop.
- 100% contactless dual-balanced discrete audio paths.
- Proprietary software-based analog volume control.
- Exclusive aerospace-grade composite laminate circuit boards.
- Newly designed intuitive control system featuring programmable input naming, settings recall and many additional features.
- Proprietary High-isolation resonant mode power supply for silent, green operation.

The PRE2 is the culmination of years of research and development resulting in EMM Labs most sophisticated and transparent preamplifier to date.

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Features & Specifications

S/N ratio: 110dB (A-weighted)
THD: 1kHz <0.01%; 20kHz <0.01%
Frequency range: 0Hz-100kHz
Gain control range: Better than 62dB
Maximum output level: 21.9Vpp or 7.75Vrms(20 dBu)
Maximum input level: 5.6Vpp or 2Vrms (8.2dBu)
System Gain: +12dB

Analog Inputs:

- 2 Stereo sets of Balanced (XLR) - Input Impedance: 20kΩ
- 4 Stereo sets of Un-Balanced (RCA) - Input Impedance: 10kΩ
- 1 Stereo Loop Input Un-Balanced (RCA) - Input Impedance: 50kΩ

Analog Outputs:

- 1 Stereo set of Balanced (XLR) - Output Impedance: 150Ω
- 1 Stereo set of Un-Balanced (RCA) - Output Impedance: 75Ω
- 1 Stereo Loop Output Un-Balanced (RCA) - Output Impedance: 300Ω

System:

- System control via serial RS-232
- Software upgradeable

Power Consumption Max: 40W

Dimensions W x D x H: 435 x 400 x 92mm, Weight: 12kg

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Front Panel & Functions

1. *Standby/Power-Save button:*
   Toggles the operation between on and power-save mode. In power save mode the remote control and all front panel functions become inactive.
2. *Program and Function buttons:*
   Front panel buttons used to access functions and program the PRE2.
3. *PRE2 Display:*
   Display can be dimmed or turned off using the the remote DIM button.
4. *Input Selection buttons.*
5. *PRE2 Volume Knob.*

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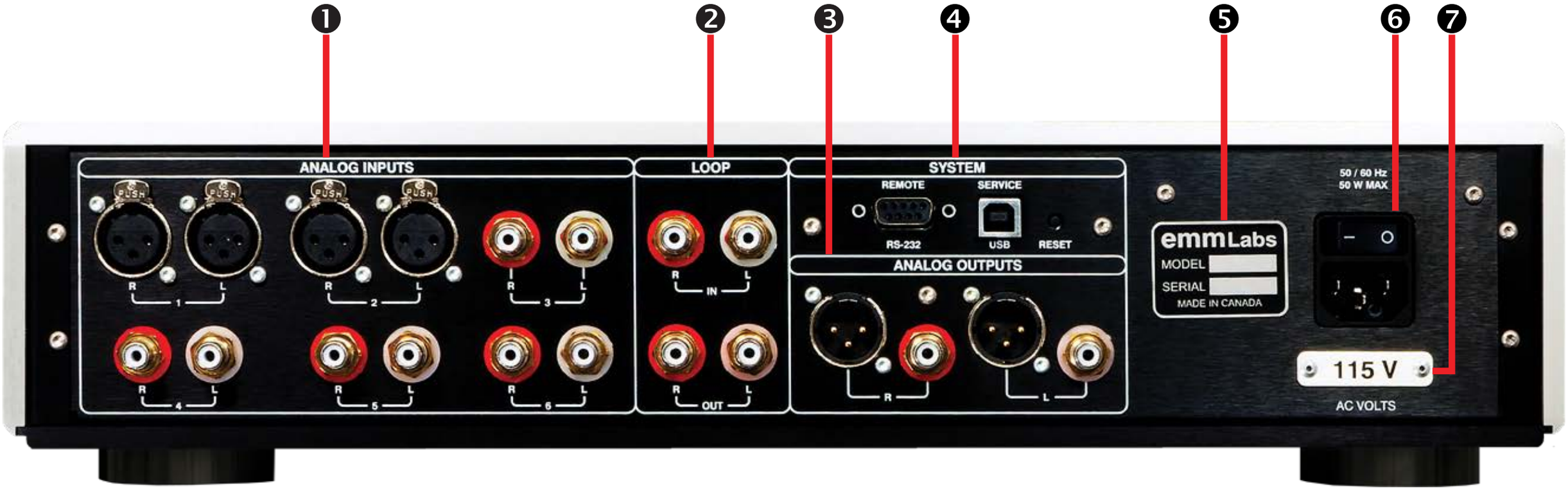
Back Panel & Functions



1. *Analog Inputs:*
    - Inputs 1 and 2 are balanced XLR inputs
    - Inputs 3, 4, 5 and 6 are un-balanced RCA inputs
2. *Loop Input and Output (un-balanced)*
3. *Analog Outputs:*
    - Left and Right Balanced (XLR) Connectors
    - Left and Right Un-Balanced (RCA) Connectors
4. *System:*
    - Remote RS232: RS232 control port
    - USB: software update port

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Back Panel & Functions

4. *System (Cont'd):*
    - RESET: Used to access the backup BIOS.
5. *Product model and serial number indicator:*
   Warranty void if model/serial number indicator is not attached to unit, missing or damaged whereby serial number cannot be seen.
6. *Main Power connector and Power Switch*
7. *Product VOLTAGE indicator:*
   Indicates working voltage of the PRE2. Only use with indicated line voltage.

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Main Screen

1. Mute Button

   Pressing the mute button initiates a 2-stage, sequential Mute function. Soft Mute (-20dB from the current level), Full Mute, and finally Mute Off. Mute is Off/disabled as soon as the Volume knob is rotated or the Volume buttons are depressed on the remote. Once Mute is off the PRE2 will return the signal path to its current volume setting. A short fade-in is performed to avoid audible transient artifacts.

2. Loop Button

   The Loop function allows for the insertion of an external device (e.g. signal processor) into the main signal path. There is no gain applied to loop return signal. The state of Loop path is input-dependent. Each preamp input can engage the Loop as required.

3. PGM Button

   The PGM (program) opens a pop-up menu with 4 main programming or configuration selections. New navigation buttons will appear: Up, Down, Enter, and Exit. See "Programming Menu" section.

4. SAVE Button

   The SAVE function immediately saves the state of the system in non-volatile memory. The following parameters are saved:

   - Volume Step Number and Loop state - as set for each input
   - Volume Display Units (steps or decibels)
   - Volume Font: 7-Segment or a 'Designer' font
   - LCD display Contrast and Brightness settings
   - The default input to be selected upon power-up.

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Main Screen

4. Notes:
    - The Mute is a transient feature and its state is not saved. PRE2 product powers up with Mute Off.
    - Input names are saved from a dedicated, on-screen name editor; see the 'Programming Menu'

The Volume Knob and Signal Gain

The Volume knob adjusts the signal gain from full attenuation (step 0) to maximum gain at step 100. The maximum gain measured from any input to RCA output is +6dB. Maximum gain measured from any input to XLR output is +12dB. From the top of the control range (Step 100) down to Step 10, a single step lowers the gain by 0.5dB. Below Step 10, the changes are progressively coarser. Step 1 is at -64dB. Volume indicator shows either the Volume Step or Signal Gain in decibels (Set using 'Programming Menu'). **The gain displayed references the signal level at the RCA outputs. Actual gain at XLR outputs is 6dB higher. Unity gain setting for RCA output is volume step 88. Unity gain setting for XLR output is volume step 76.**

Input Selectors (1 to 6)

Input selection buttons connect one of six front-end input stages to main signal path. The system performs short fadeout/fade-in operation on signals being switched. Please Note: The Mute is applied in the main (common) signal path; input selection does not affect the state of Mute.

Product Power-up

Upon Power-Up Reset, the system controller restores the input and display settings as listed in section 1.1.4. In addition, all input names (kept in separate files in non-volatile memory) are restored. File data integrity is checked. Should data corruption occur, the system reformats affected set-up files and restores default configuration.

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Product Power-up *(cont'd)*

In a newly built product or when PRE2 is reset, default settings are as follows:

- Selected input : Input 1 (XLR)
- Volume : Step 0 (all inputs)
- Volume Units : Steps
- Loop : Off (all inputs)
- Mute : Off
- LCD Contrast/Brightness : Mid-point
- Input Names: : Blank, no characters (all inputs)
- Volume Font : '7-segment' font

Programming Menu

In this release, the programming menu has 4 items, shown in a pop-up box on the LCD screen.

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Programming Menu *(cont'd)*

Display Contrast and Brightness

Input Naming Menu

1. Display Contrast and Brightness

   Contrast and Brightness both have a 9-step adjustment range, visualized on screen by horizontal indicator bar. The left and right arrow soft buttons operate the adjustment. Contrast and Brightness adjustments have separate screens, and the soft button 'NEXT' allows you to access both screens. Both settings are saved in non-volatile memory from the main screen.

2. Input Naming Menu

   Input names are edited using the Volume knob and the line editor with 3 soft buttons: Cursor Left, Cursor Right, and Backspace Erase. Rotating the Volume knob changes the character at the cursor position. The character set is as follows:

   - capital letters A-Z
   - SPACE character

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Programming Menu

2. Input Naming Menu *(cont'd)*
    - DASH, PERIOD, and SLASH characters
    - digits 0-9.

    Rotating the Volume knob scrolls through the characters. Pressing one of Input Selector buttons shows the current name of the input, and allows the name to be edited. The name being edited is stored only by pressing the 'SAVE' button on this screen. Pressing another input button or selecting a different/same input discards the changes. Pressing the 'Quit' button returns you to the 'Programming Menu' page, discarding any changes made.

3. Volume Display Units

The screen shows a sample value of the Volume display. The 'Change Units' soft button toggles the Volume display units to the following two options:

- Volume Step
- Gain in [dB]

The Volume knob is active and you can change the sample value. The actual Volume (signal gain) is not affected. The Volume display unit selected is stored only by pressing the 'SAVE' button. Upon 'EXIT' after 'SAVE' the main screen will display the selected Volume display unit. Pressing 'EXIT' without pressing 'SAVE' discards any changes.

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Programming Menu

4. System Maintenance

System Maintenance

Volume Font Selection

The System Maintenance screen shows the current firmware version and a list of maintenance tasks. The tasks are selected by using the numbered input select buttons. In this release, there are 3 maintenance tasks:

- Set Volume Font (2 options):
    a. 7-segment font
    b. EMM font

  In future updates EMM may update the Volume Font selection with many other fonts.

  Font selection is saved only when you press the 'SAVE' button. Pressing 'EXIT' without pressing 'SAVE' discards any changes.

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Programming Menu

4. System Maintenance (*cont'd*)

- Input Preselect
  The power-on input can be changed by the user using the 'Input Preselect' feature. The current power-on input is shown on-screen. At this point, any Input can be chosen either by pressing the associated numbered input button or by using the 'NEXT' soft button. Pressing the 'SELECT' soft button saves the new setting.

Input Preselect

Clear Settings

- Clear Settings
  All user settings will be reset to run the factory default programming. An alert box 'Proceed?' is shown first allowing the user to cancel the operation.

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Infrared Remote Control

VOL UNITS : This button toggles volume display units between steps and dB

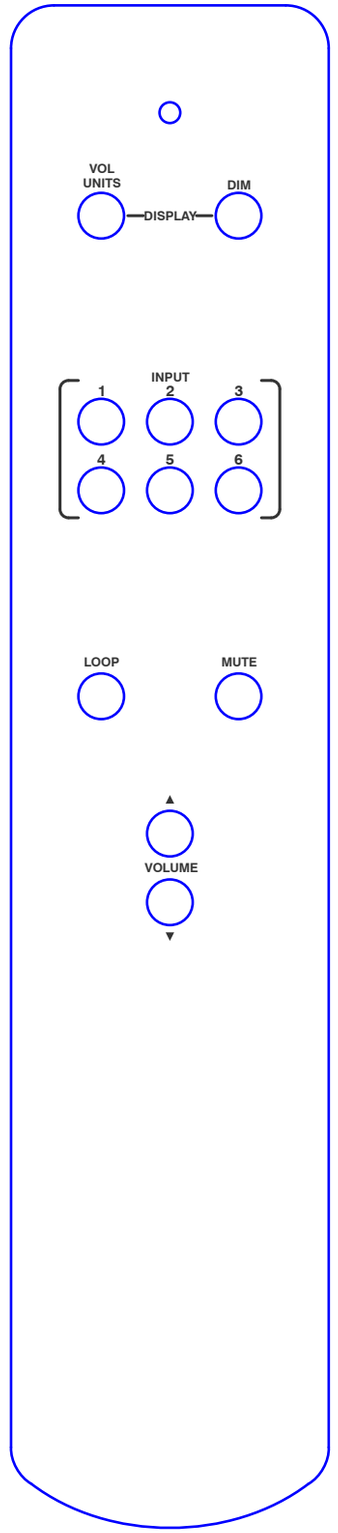
DIM : This butons toggles through the 3 display states:
- DIM (dim the display)
- OFF (display off)
- FULL (back to the current default setting)

INPUT (1 to 6) : These buttons can be used to directly access any INPUT.

LOOP : Turns LOOP funtion on/off for the selected INPUT

MUTE : This buttons toggles through 3 MUTE states:
- SOFT MUTE
- MUTE
- MUTE OFF

VOLUME : Controls the volume/signal gain. Press the up arrow button to increase volume/gain. Press the down arrow button to decrease volume/gain



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PRE2 Serial Remote Control (RS232)

Introduction

The PRE2 can be remotely controlled in one of the two (mutually exclusive) modes:

- Standard mode
- Slave Preamp mode.

In Standard mode the product receives and acts upon the RC-6 Infra Red Remote commands. Recognized IR codes are translated into EMM Labs' ASCII-based control commands that are sent out on the RS232 port. The Command Protocol is defined in Section 2. The PRE2 also receives the control commands from RS232 port. Recognized commands are acted upon, and, in addition, echoed (sent out) in the transmit path on the RS232 port.

All outgoing RS232 commands are destined for slave PRE2s, which are meant to act in sync with main unit. In Slave Preamp mode, the IR Remote receiver is disabled, but the product still receives commands at its RS232 port. As before, the decoded and recognized commands are echoed in the transmit path of the RS232. This will facilitate product daisy-chaining, where multiple slave preamps can act in sync with the main (Standard) unit.

In either mode, all front panel controls and menus are fully operational. Standard/Slave modality determines only the IR remote control capabilities of this product. The Standard controller mode is best used in the following scenarios:

- PRE2 is the only preamp in a system
- PRE2 is the main pre-amp in a multichannel set-up, typically running front-left and front-right channels; the main preamp is receiving IR remote commands, while other preamps are slaved to it.

The Slave mode should be used when the PRE2 is in the signal path of any additional channels in a multichannel set-up. The slave unit follows main preamp actions while the main unit receives IR Remote commands. Multiple slave preamps can be connected in a daisy-chain configuration.

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PRE2 Serial Remote Control (RS232)

Remote Control Protocol

The PRE2 Remote Control protocol is defined with the goal of structural simplicity and ease of implementation. Typical implementation requires only a standard, asynchronous UART/RS232 port. At the Data Link level the following assumptions are made:

- Short, fixed-length data frames
- Data encoding uses only ascii (printable) characters
- Data frame has a checksum field for error detection, but the checksum opt-out is possible at sender's request - in such a case, Sender's frame has a standard blank checksum, and the Receiver side does not check against it.

At the Application level (i.e. remote control of a product) the message processing will be stateless:

- Each message is handled independently
- Each command acted upon immediately.

Frame Structure

The PRE2 frame structure is shown in the following diagram:

Frame preamble	:	< * > Asterisk character.
Destination Product Class	:	P1, P0 two alphanumeric characters (a preamplifier product will be denoted as "PR").
Command Message	:	M3, M2, M1, M0 typically 4 characters long, but it is product-dependent.

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PRE2 Serial Remote Control (RS232)

Frame Structure (*cont'd*)

Checksum	:	C1, C0 one-byte checksum, its binary value represented by 2 hex characters, or, <N><A> the opt-out variant, where the checksum is substituted by "NA" token, as in 'Not-A-checksum' or 'Not Applicable'. The checksum is calculated as byte-wide exclusive OR from all preceding characters in the frame, excluding frame preamble (the asterisk). Checksum seed value is 0x00. Character ASCII codes are used in the calculation.

Command Message Structure

The Command Message for PRE2 is four character long (M3, M2, M1, and M0) and is composed of two parts:

Command Code	:	C1, C2 two alphanumeric characters and/or decimal digits (A-Z, a-z, 0-9)
Parameter Value	:	V1, V2 one-byte value represented by 2 hex digits (0-9, A-F).

Control Messages

Complete message frames are shown, and the blank checksum (the "NA") is used.

Volume (VL)	:	*PRVLxxNA where 'xx' is volume step number (0 to 100) formatted as 2 hexadecimal digits. Examples: step number 10 will be encoded as '0A' or step number 100 will be encoded as '64'.
Select Input (SI)	:	*PRSI0iNA where 'i' is the input number, encoded as a character '1' to '6'
Mute (MT)	:	*PRMT00NA mute OFF *PRMT01NA soft mute *PRMT02NA mute ON

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PRE2 Serial Remote Control (RS232)

Control Messages (*cont'd*)

Loop (LP)	:	*PRLP00NA loop OFF *PRLP01NA loop ON
Display Dim (DM)	:	*PRDM00NA no dimming, full brightness *PRDM01NA reduced brightness *PRDM02NA the backlight is turned off
Volume Display Units (VU)	:	*PRVU00NA reserved code *PRVU01NA the Volume is displayed in Steps (0 to 100) *PRDM02NA the gain of signal path is shown (in Decibels)
Save settings (SV)	:	*PRSV00NA product operational settings are saved in non-volatile memory
NULL Cmd. (NL)	:	*PRNLxxNA where 'xx' are any 2 alphanumeric characters; this message is used in system testing only.

Control Message Timing

Back-to-back command messages can be sent to PRE2 unit, however, no flow control mechanism is used. The longest recommended data burst is 10 messages. In such a case the burst should be followed by 100ms of idle time. In a real-life system, this constraint is of no consequence.

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PRE2 Serial Remote Control (RS232)

RS232 Port Set-up

The RS232 Control port in PRE2 is set up as follows:

- Baud rate 9600bps
- Character length 8 bits
- Stop Bits 1
- Parity none

Product Class Definitions

- Disc Transport : "CD"
- SACD Player : "SC"
- Blu-ray Player : "BD"
- Preamplifier : "PR"
- DAC : "DA"
- Media Player : - to be defined -
- Signal Processor : - to be defined -
- Power Amplifier : - to be defined -

Note: SACD or Blu-ray players can accept generic disc transport commands ("CD"), and, in addition, their product-specific commands. The command set for a SACD player, for example, should support the Program and Layer Selections.

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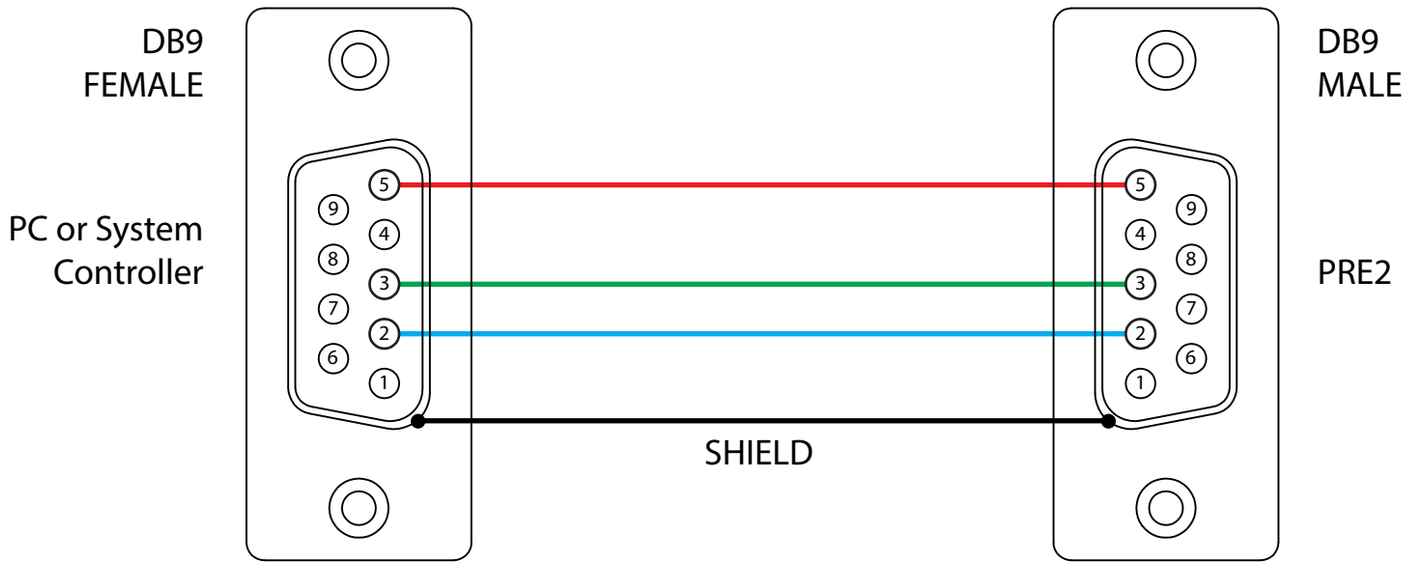
PRE2 Serial Remote Control (RS232)

RS232 Cables for PRE2

Standard, direct RS232 cable from a PC (or dedicated System Controller) to PRE2



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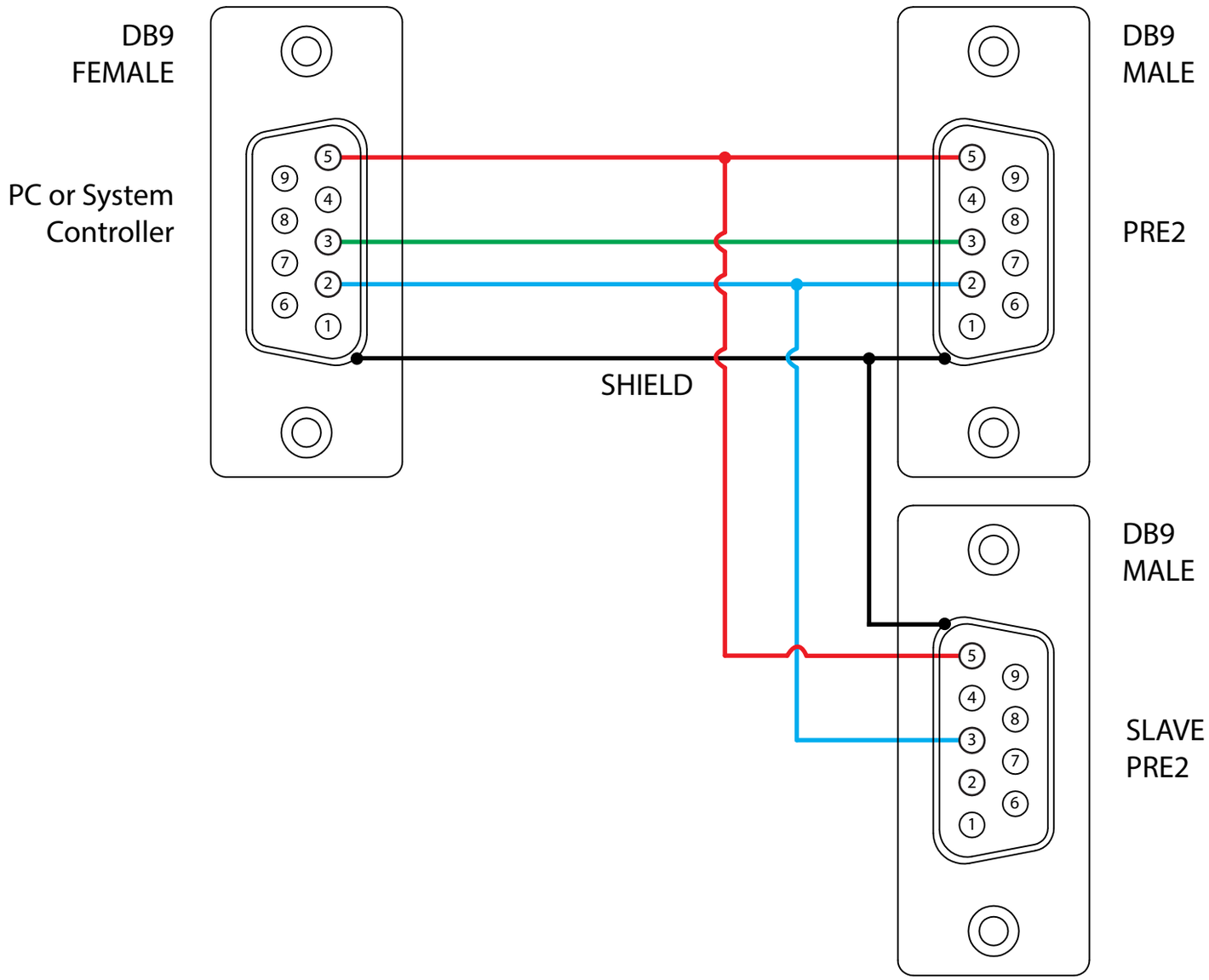
PRE2 Serial Remote Control (RS232)

RS232 Cables for PRE2 (*cont'd*)

Y-patchcord for PRE2 daisy chaining.
The patchcord has 2 'legs':

- from PRE2 (central) connector to the Input connector, and
- from PRE2 connector to slave Output connector.

Recommended length is 12 to 14 inches for each leg (approx. 30 to 35 cm).



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