pêma

ASHLY

Protea™ Equipped Media Amplifier

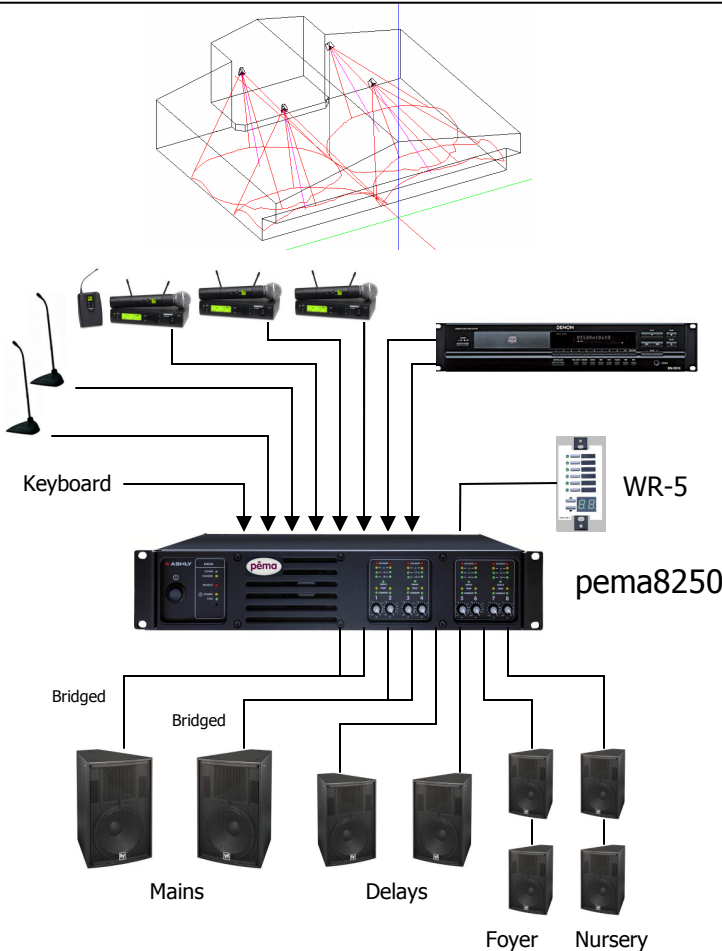Church in a Box

simplifyintegration

January 2011

Ashly's PEMA™ has the features that let Systems Integrators replace a rack of amplifiers and signal processing equipment with a single two-rack unit. The combination of a 4 or 8-channel amplifier, 8-in x 8-out sophisticated matrix mixing, and DSP signal processing brings a new level of technology and innovation to Restaurants, Retail Stores, liturgical Churches, School Gymnasiums/Cafetoriums and Courtrooms. Systems designers can select either 125W or 250W output units that are a perfect fit for your project based on ceiling height, loudspeaker sensitivity and ceiling speaker density.

Keyboard

WR-5

pema8250

Bridged

Bridged

Mains   Delays

Foyer   Nursery

Church in a Box

- Eight Mic/Line Inputs
  EQ / Compressor

- Input Mix Matrix
  Gain-Sharing Automatic Mixing
  Automatic Feedback Suppression
  Stereo summed to mono

- Eight Channel Power Amplifier
  Crossover / EQ / Delay / Limiter
  150W into 8 ohms (Delays)
  250W into 4 ohms (Foyer & Nursery)
  500W bridged into 8 ohms (Mains)

- Ethernet control is standard

- Extensive protection circuitry

- WR-5 Remote Control
  Select input(s)
  Adjust input levels

- Remote Power On/Off

Creating and controlling a church sound system has now been simplified with Ashly's PEMA™ Series multi-channel power amplifier. This application uses the **pêma8250**, an 8 channel power amplifier with an 8 x 8 mic/line matrix mixer and DSP on all inputs and outputs. Processing blocks include Gain-Sharing Automatic Mixing, Automatic Feedback Suppression, Stereo-Summed-to-Mono, Ambient Noise Control, Equalization, High-, Low- and All-Pass Filters (HPF/LPF/APF), Delay, Compressor/Limiter, Gate, Ducking, Gain and Signal Generators (sinewave, white and pink noise). The full Matrix Mixer with assignable routing allows any input to drive any or all amplifier outputs. Presets can be used to store and retrieve system configurations.

Connected directly to the **pêma8250** inputs are two wired podium microphones, three handheld wireless microphones, a keyboard, and a rack-mounted CD player. Input eq and compressors are set specifically for the individual inputs. Microphones have the bass rolled off and music has the bass "pumped up". The internal matrix sums all inputs and routes them to the correct outputs. Stereo main and delay outputs and mono outputs have dedicated eq and limiter protection applied. Bridged outputs (500W into 8 ohms) drive the mains loudspeakers and 150W will be available on each delay loudspeaker. 125W will be available for each foyer and nursery loudspeaker. The WR-5 wall remote provides user adjustments for microphone and music playback levels.

Visit www.ashly.com to download Protea software and data sheets

Setting up a DSP processor will be unique to your application.
Here are a few things to consider when setting up your Church-In-A Box system:
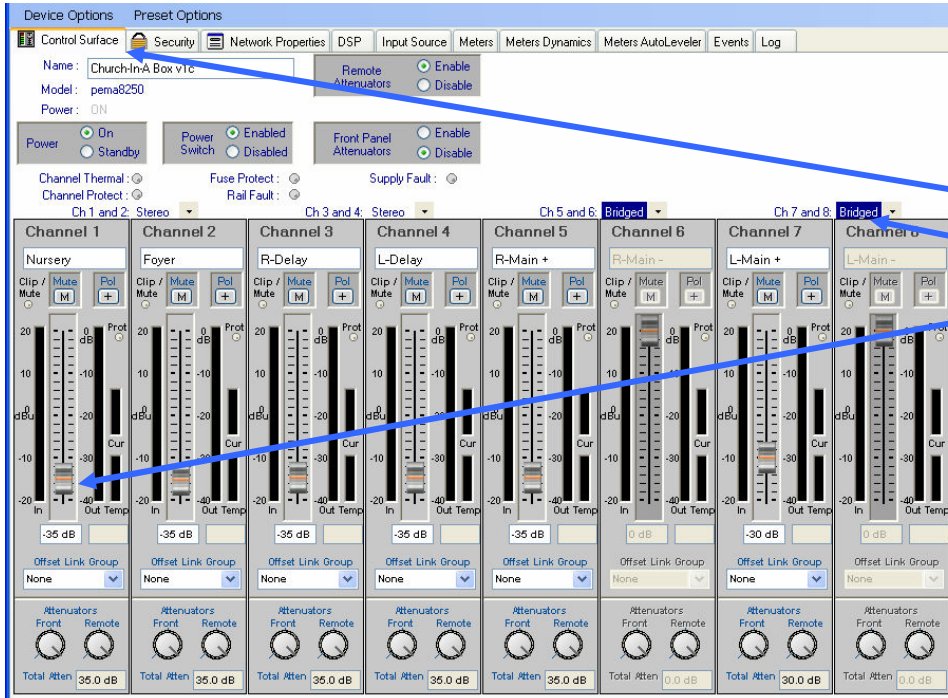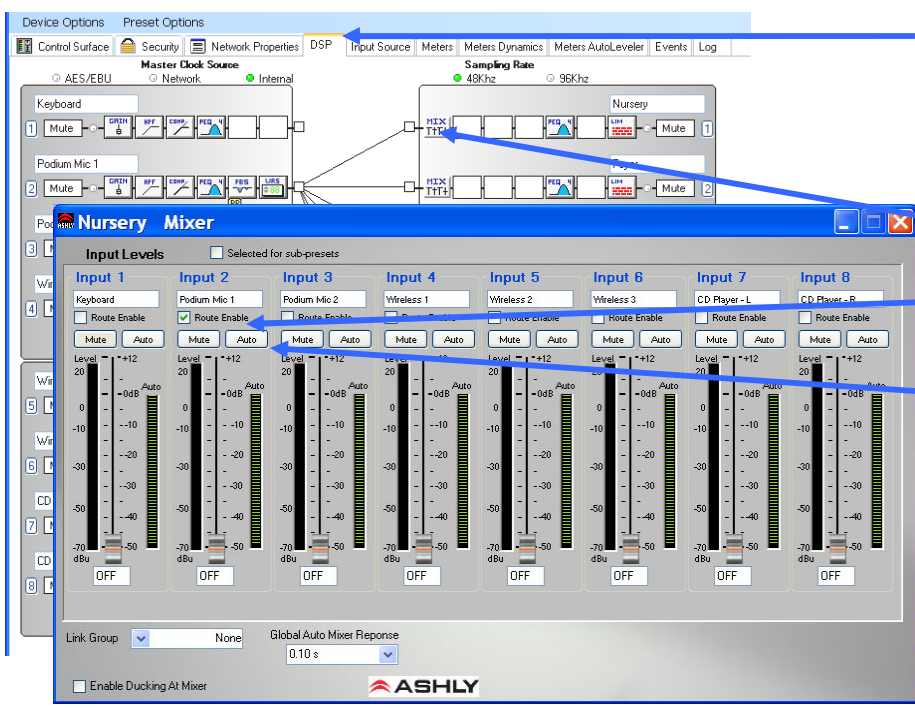

Use recognizable names (labels) on the input and output sections, it could be years before you see them again.

Click on "Control Surface" tab and configure **Ch 5/6** and **Ch 7/8** for "bridged".

Start with the output levels at -15dB (-35dB absolute).

Return to this tab and adjust for the desired output levels when the system is fully configured.

Click on the "DSP" tab and assign (route) inputs to outputs. Simply click on the end of the input section and drag to the beginning of an output section.

Click the "Mix" block:

"Route Enable" is also used to connect inputs to outputs.

"Auto" selects automatic mixing for all microphone inputs.

The "Mix" block sets different input levels for each output section.

Example: There can be less CD playing in the Nursery.

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Click on the "DSP" tab to add functions to each input or output section.

An equalizer of choice is inserted (PEQ / GRAPHIC 31) in the output section. This example uses a 4 Band Parametric EQ (PEQ 4). An equalizer here is mostly used to smooth the frequency response of a specific loudspeaker or loudspeaker type.

Placing a limiter (LIM) in the last block of the output section will prevent accidental clipping of the power amplifier. The limiter threshold should be set no higher than the input sensitivity of the power amplifier section; The pêma sensitivity ratings are; 125W @ 3.2dBu, 250W @ 6.2dBu, 70/100V @ 7.2dBu

A "Delay" block is used on the fill-speakers for this application. When fill-speakers are physically located more than 25 feet from the mains speakers, the human ear detects the fill-speaker as a second source or echo. Properly setting the fill-speakers delay and level will help reduce echo and fool the listener into thinking they are listening to the mains speakers. The delay is set to the distance between the mains and the fills. In this example the distance is 37.5 feet.

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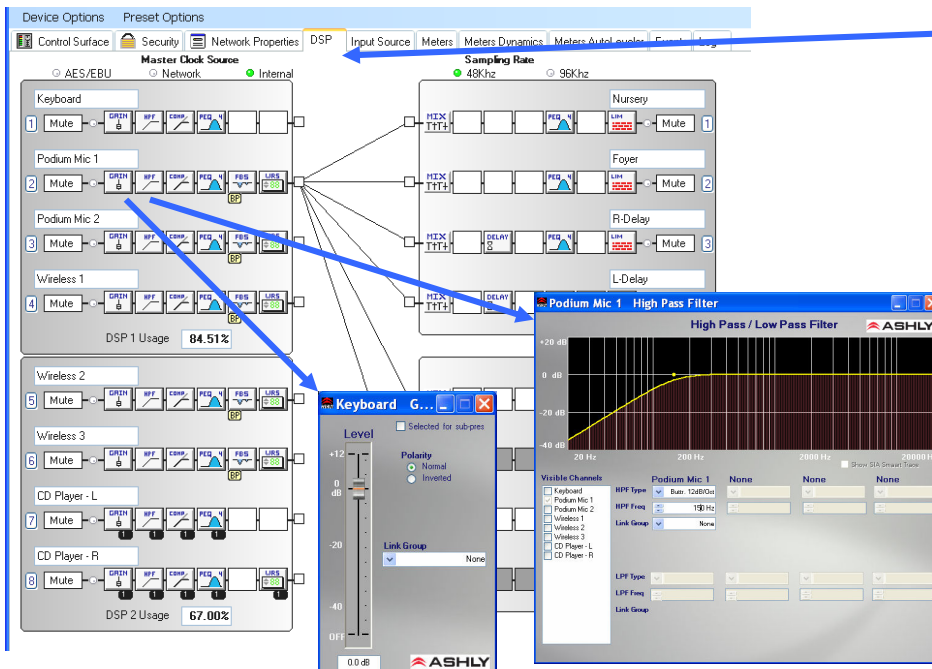simplifyintegration

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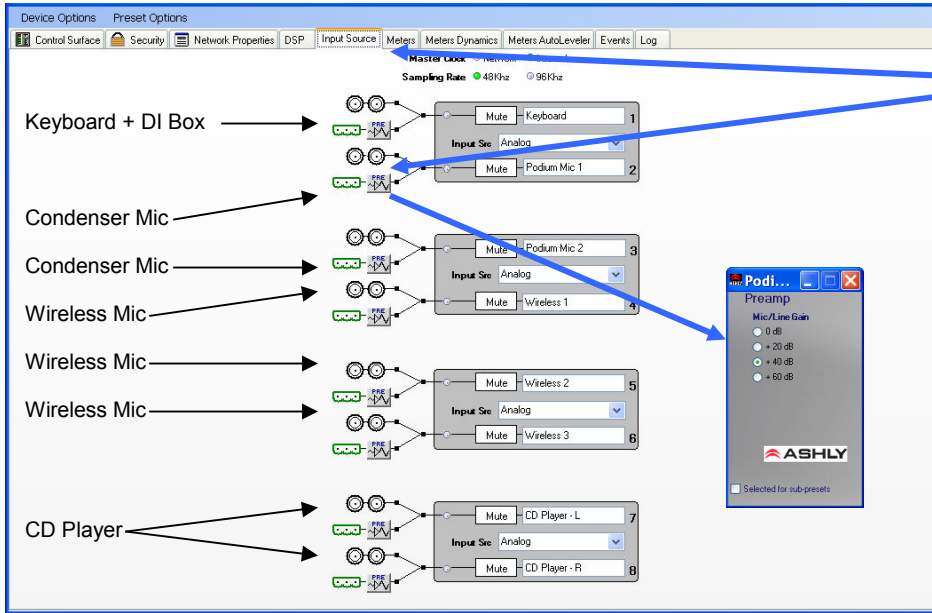
Click on the "Input Source" tab to set the balanced inputs for the correct microphone gain.

A condenser podium mic will require Phantom Power. A switch on the back of pêma puts Phantom Power on all balanced inputs (+15Vdc).

With Phantom Power engaged;
● Connect or disconnect microphones when pêma is off
● Connect Keyboard and other line level devices through a DI Box to the balanced inputs.
● Connect a wireless mic unbalanced out to an unbalance RCA connector on pêma.

Click on the "DSP" tab to add functions to each input or output section.

The first block should be "Gain" for incremental changes needed to get a good mix.

A high-pass filter (HPF) is used to minimize damaging low frequencies.

Start with a 40Hz HPF on the Keyboard and CD Player.

A HPF set for 150Hz is good for most microphones.

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Here are a few things to consider when setting up your Church-In-A Box system:

Click on the "DSP" tab to add functions to each input or output section.

Adding a compressor to each input provides peak protection and can help keep vocal mics at a more constant level. Start with a 3:1 ratio and the default attack and release settings. Threshold should be initially set slightly above normal input levels.

An equalizer helps to shape the input signal for maximum effect. This example has a small boost around 700Hz to add body, and a cut at 2.5kHz to reduce harshness.

Click on the "DSP" tab to add functions to each input or output section.

Damaging feedback can occur where a microphone is close to a loudspeaker and turned up. The cause is generally frequency peaks common to the microphone, speaker, and/or the room.

Narrow cuts in frequency response are not heard by the listeners and stabilize feedback.

Select "Set All Filters Floating" and force the input into feedback using the "Gain" block. The "Feedback Suppressor" will add a notch filter when feedback occurs. Repeat this process until 4 to 6 notches at different frequencies have been assigned.

"Lock" these filters and allow the other filters to float and activate when needed.

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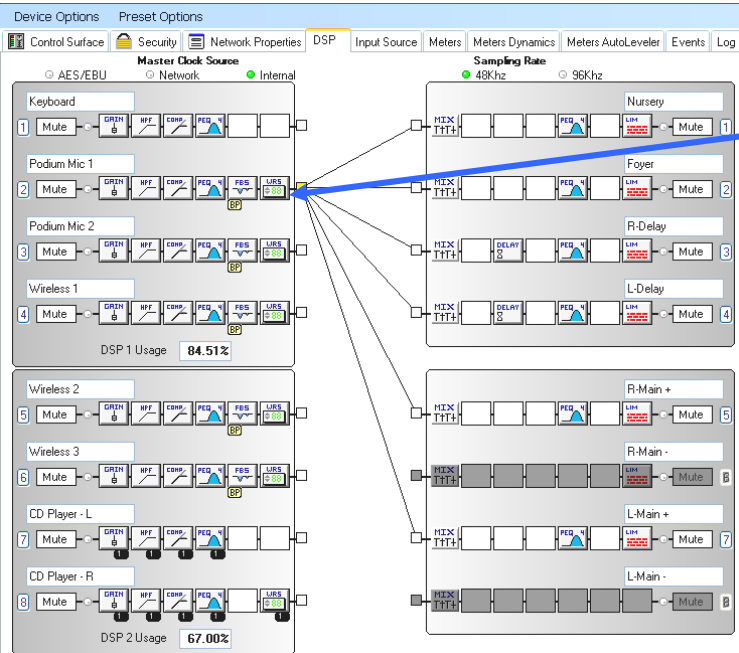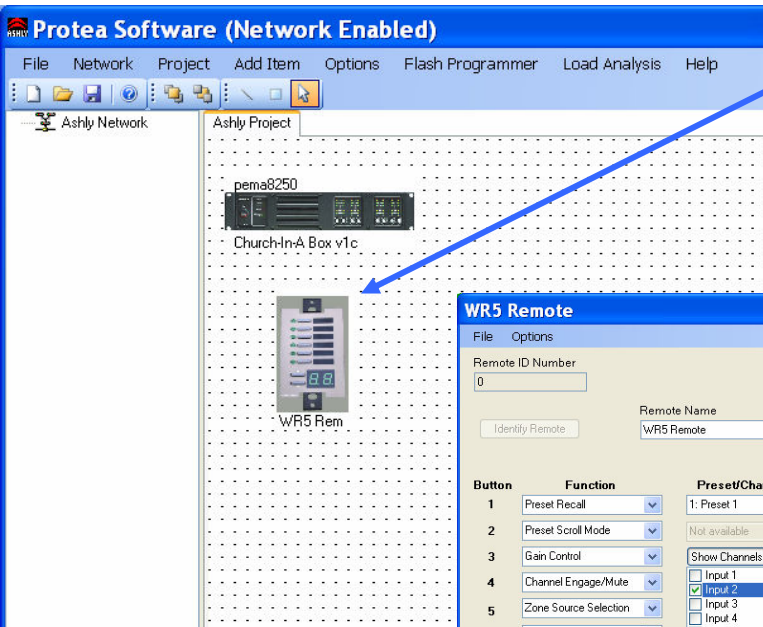

Click on the "DSP" tab to add functions to each input or output section.

Adding a WR-5 block to the Podium Microphone input will allow the church to make level changes, if needed, without reprogramming the system.
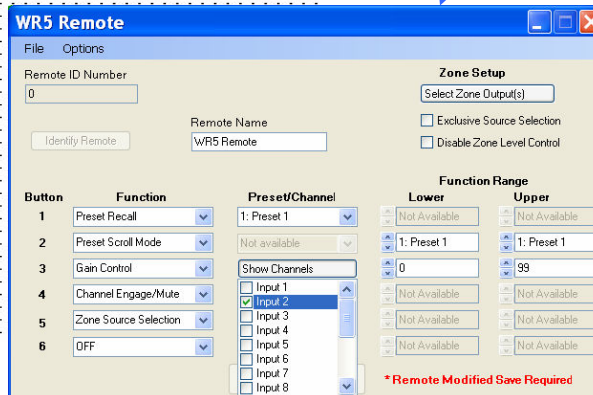
Changes are made by using the UP-Down buttons on the WR-5 after selecting one of the six main buttons.

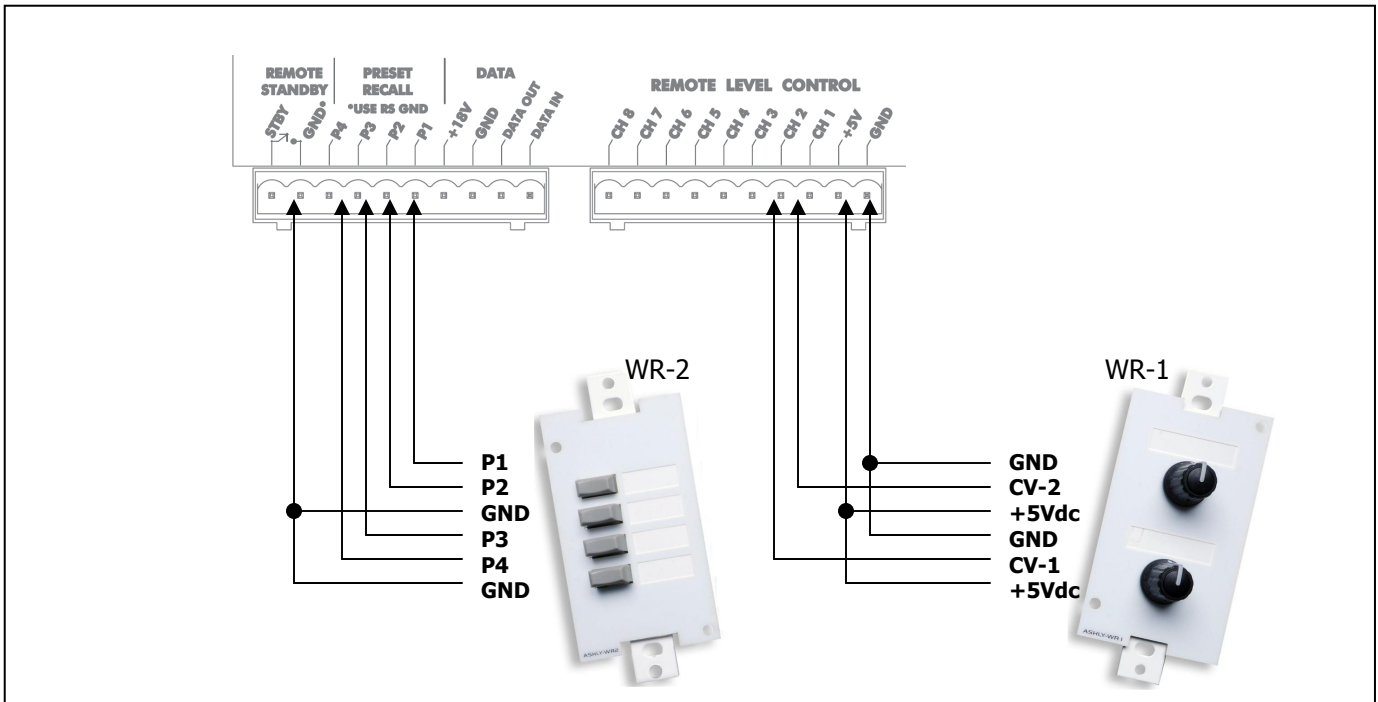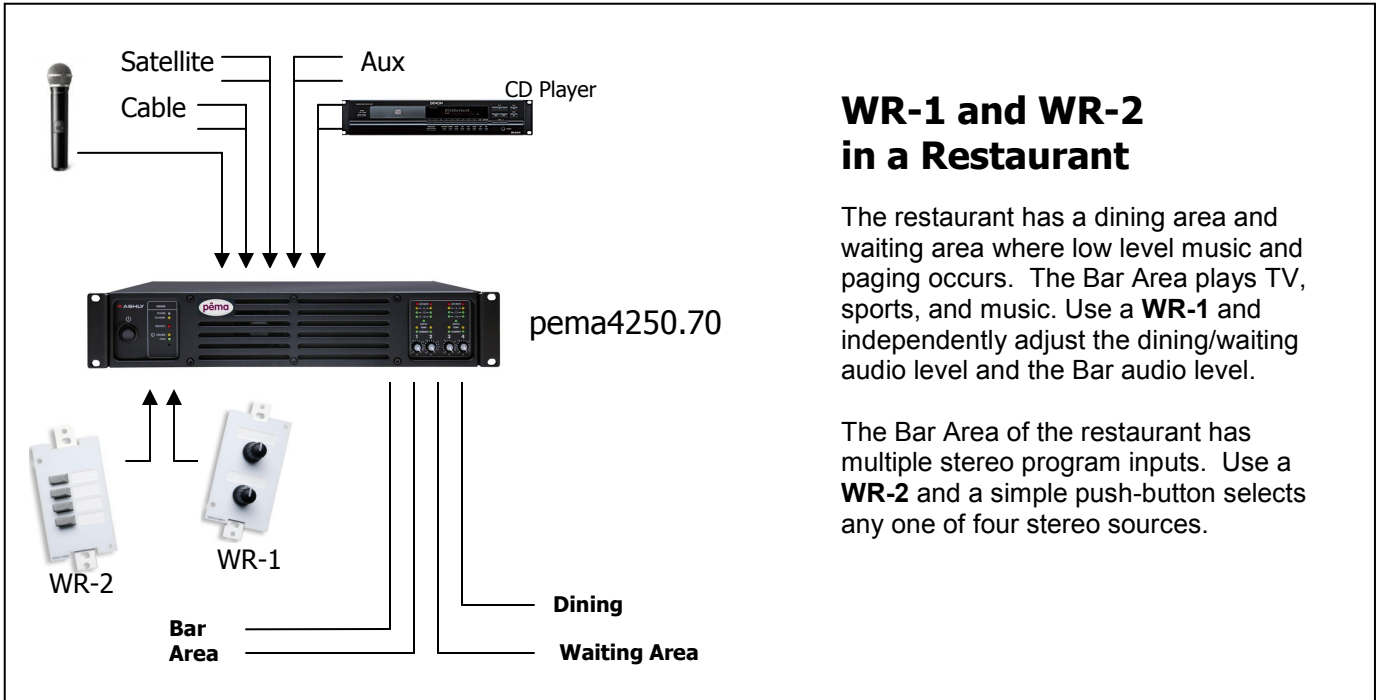Labels are used to identify the six main buttons on the WR-5.

Open the WR-5 Remote window to assign functions to the six main buttons.

The example has set Select Button 3 for "Gain Control" of Input 2.

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Satellite — Aux
Cable —
CD Player

pema4250.70

WR-2   WR-1

**Bar
Area**

Dining

Waiting Area

WR-1 and WR-2 in a Restaurant

The restaurant has a dining area and waiting area where low level music and paging occurs. The Bar Area plays TV, sports, and music. Use a **WR-1** and independently adjust the dining/waiting audio level and the Bar audio level.

The Bar Area of the restaurant has multiple stereo program inputs. Use a **WR-2** and a simple push-button selects any one of four stereo sources.

REMOTE STANDBY   PRESET RECALL   DATA   REMOTE LEVEL CONTROL

STBY GND P4 P3 P2 P1 *USE R5 GND +18V GND DATA OUT DATA IN   CH 8 CH 7 CH 6 CH 5 CH 4 CH 3 CH 2 CH 1 +5V GND

WR-2

P1
P2
GND
P3
P4
GND

WR-1

GND
CV-2
+5Vdc
GND
CV-1
+5Vdc

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WR-5 Remote Control Unit

Wall Remote Application

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Jan 2011

CD Player

WR-5

Main Area

Ambient Sensing

Cascade Seating

WR-5

Outside

Commons Area

The first **WR-5** has all six select push-buttons assigned to adjust input level (Gain) for the four microphones, CD Player and Aux inputs.

The second **WR-5** has the first button assigned as level control allowing the school to adjust all speakers at the same time. The second button mutes the speakers in Cascade A, the third button mutes Cascade B, and the fourth button mutes the outside speakers.

REMOTE STANDBY   PRESET RECALL *USE AS GND   DATA

+18V   GND   DATA OUT   DATA IN

J2 INPUT   4 3 2 1

J3 LINK   4 3 2 1

★ Jumper

+18
G
In
Out

+18
G
Out
In

To next WR-5
(An additional +18V power supply
is needed for more than four WR-5 remotes)

★ Install this jumper on last WR-5 in series, even if using only one WR-5

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WR-5 Remote Control Unit

Wall Remote Application
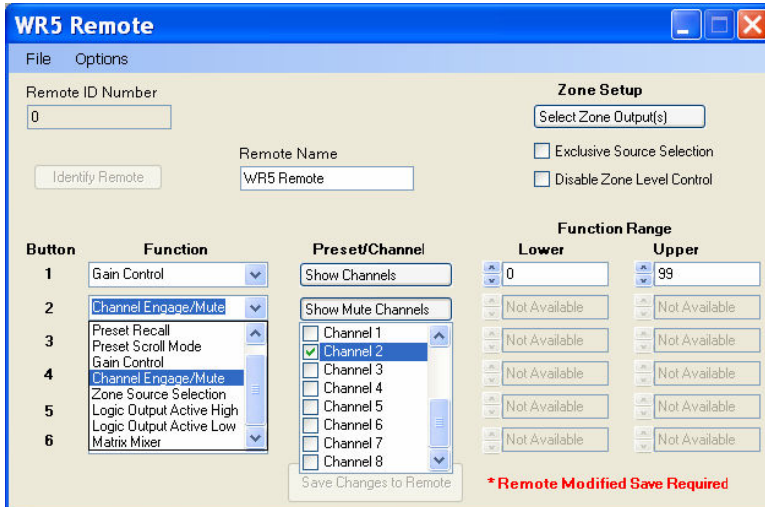
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Jan 2011

#1 WR-5

The **WR-5** is detected by the Protea Software, or a file can be created and loaded at a later date.

For this application the first **WR-5** has the six select buttons set for "Gain Control Function". "Preset/Channel" assigns the button to an input and "Function Range" limits the minimum or maximum level to the system.

All four microphone inputs are limited to 80% of max level.

#2 WR-5

The **WR-5** is detected by the Protea Software, or a file can be created and loaded at a later date.

For this application the second **WR-5** has the first select button set for "Gain Control Function". The next three buttons are assigned as "Channel Engage/Mute" and the target channel is checked.

Caution: Always verify changes are saved to the remote and to a disk.