Glyph Technologies GPM-216™ User Manual

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Chapter 1 Introduction

About the GPM-216™

Congratulations on your purchase of the GPM-216. When performing, the GPM-216 will improve the way you hear yourself and other musicians. Plug your instruments and microphones into the front-panel audio inputs, and the audio is digitized. It is distributed as audio data streams over a network using standard Ethernet cables. The unit has an easy to use interface to control your individual mix of local and networked audio sources using front panel controls and an LCD screen. It has front-panel output connectors for headphones or earbuds, and line outs on the back for powered wedges or other audio gear. Send/Return loops allow musicians to patch in external effects or EQ for their overall mix, or apply them to their own input channels.

The GPM-216 enables bands to have a private, peer-to-peer (or, more accurately, musician-to-musician) network, independent from the house sound system. Each musician creates their own individual monitor mix exactly the way they want it. The GPM-216 provides a way for musicians to mix and monitor network signals on a rack-mountable piece of hardware through earbuds, headphones or speakers.

Peer-to-Peer/Musician-to-Musician Monitoring Architecture

Using the Glyph Monitor system on stage is dramatically different than using a traditional monitoring setup because it does not require a dedicated monitor mixing board or engineer. Its design implements a peer-to-peer architecture, where all the units connect to one another, instead of connecting to a central mixer. Signals from performers are split at each performer's unit, sending to both the monitoring network and the front of house (FOH) mixing board. Each performer's unit contains the basic functions of a mixing board (mic pre, gain, volume, pan, mute, phase reverse).

Features

GPM-216 features

- Peer-to-peer, no board sends or monitor board required.
- Signals plug directly into the GPM-216, cable split sends signals back to mixer.
- Units connect with CAT5 Ethernet cable.
- Front-panel inputs, gain and three-color LED input meters.
- Each GPM-216 transmits 2 streams of audio and can mix up to 16 stereo or mono incoming streams.
- Large LCD screen and “soft labels” display the functions of controls on the front panel. The same knob, in different modes, is used to adjust various parameters.
- Save and recall monitor mix settings and get the same mix every show for quicker setup and more consistent sound.
- Multiple monitor “profiles” allow you to quickly change between pre-set settings
- Front and back panel outputs for use with headphones, earbuds and powered wedges.
- Setup mode allows programming the unit in advance of the performance.
- Enclosure can be tabletop or rack-mountable with optional rack ears.
- Uses standard network protocols for use with other computers.
- Graphical configuration via Java and web interface.
- Built-in reverb and instrument tuner

GPM-216 compared to other personal monitoring systems

Other personal monitoring systems, which use a transmitter/receiver architecture, require a mixing board because signals need to be centralized and distributed onto the network from one box, the transmitter. This works fine if the signals are already gathered in one place, but fails in situations where the central mixing board doesn't have the outputs needed to patch into the transmitter, or if the outputs are already being used for other things. This proves to be a problem for sound engineers to accommodate in many situations.

Since all of the units connect to each other without the use of any outputs from the main board, a band can use the GPM-216 system in venues where monitoring would be otherwise very difficult. Picture a venue where a band brings its own PA system, including a front of house mixing board, but does not want to bring a separate monitor mixing board or monitor engineer. By first connecting the instruments to each GPM-216 on stage, the engineer does not need to bother with monitors at all. The signal flow is truly from musician to musician.

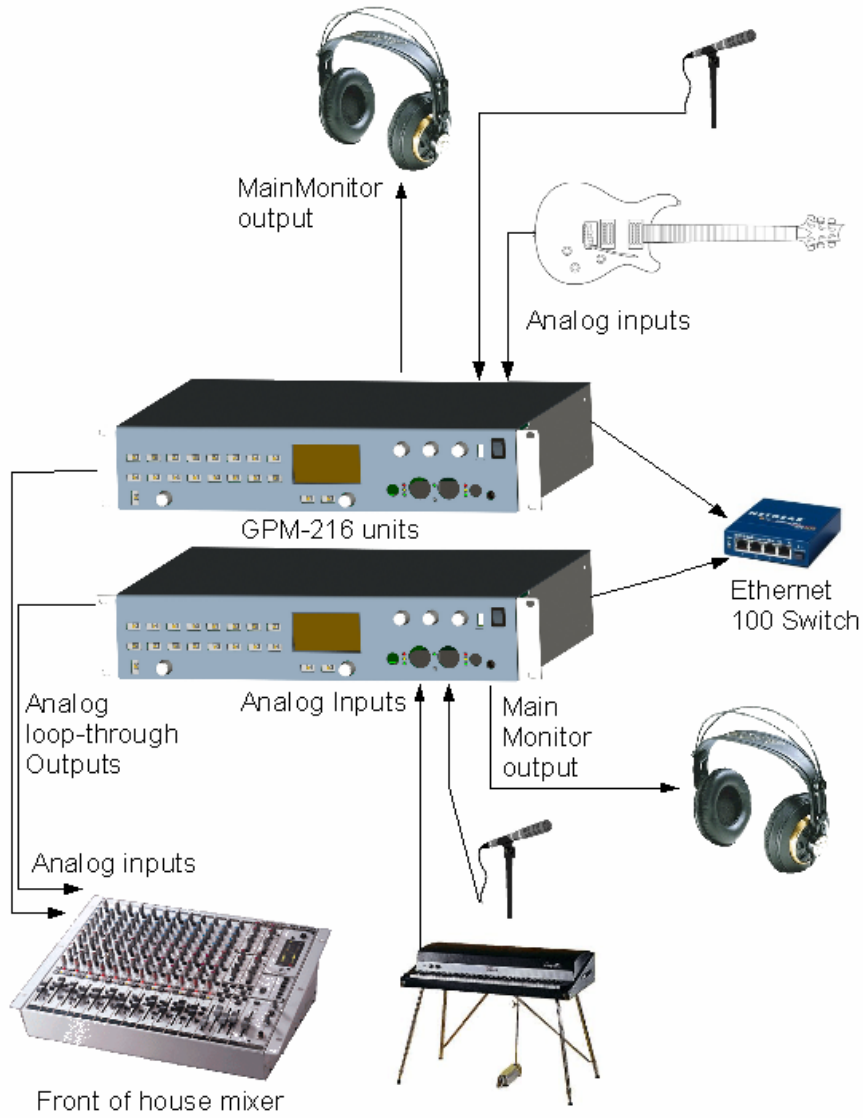
Advantages of personal networked monitoring

- Every Musician creates his own mix.
- No mixing board required.
- No volume wars on stage.
- Musician is allowed to have "more me".
- Band plays more quietly because they can hear what they want.
- Less stage volume = better mix, sound not coming from two places.
- Same mix every night with saved presets.
- Saves monitor setup and check time.
- Don't need a monitor board, depending on how it's configured.
- FOH engineer spends more time mixing the band, less time on monitors.
- GPM-216 is an upgradeable platform for future product enhancements and interfaces.

- Bands can use it for practice, recording, jamming and playing gigs.
- Less gear to haul to the gig.

How to Connect the GPM-216

Figure 1: Stage connection Diagram



Connecting the GPM-216 on stage

Each musician carries a GPM-216 with them to the gig, and sets it up with their gear on stage. The unit acts as a console for mixing each musician's monitor. Here's how it's connected:

- Musicians connect instruments to the analog inputs, which can accommodate sources such as vocal mics, instrument mics, direct guitar, keyboard or bass signals. It can also handle the output from a mixer, or output from guitar/bass amps.
- The "loop through" outputs on the back of the unit are connected to the FOH mixing board. This can be done through the existing stage snake head. The signals delivered to the FOH console are unaffected by the GPM-216. It is essentially a cable split.
- Musicians connect the main outputs of the GPM-216 to their monitor of choice, which could be headphones, earbuds, or amplifiers driving traditional wedges.
- GPM-216 units are connected together via standard CAT5 Ethernet cable through an Ethernet 100 switch.

Signals from everyone in the band are seen as "inputs" on every GPM-216. Musicians mix local and incoming sources, and broadcast their own sources onto the network for others to mix. Musicians select a source via a front panel selector button and can quickly change volume, pan, mute and solo for that source. It is designed for easy readout with an LCD screen for identifying names of sources, placement in the stereo spectrum and status of mute or solo. All of the controls and the screen are well lit for stage use.

About GPM-216 Modes - Setup and Performance

Setup Mode

The front panel has controls for mixing incoming sources to create a personal monitor mix. It also has controls for programming the unit in advance of the performance. This is called Setup Mode. Setup Mode allows a user to change parameters that will remain more or less the same during performance. During setup mode, the GPM-216 does not transmit local sources to the network. Examples of Setup Mode parameters would be:

- Unit name
- CPU usage
- Save diagnostics info
- Mixer software version
- Source name
- Stereo/mono source transmit
- Source channel number
- Phase reverse (polarity)
- Phantom power
- Network configuration

Performance Mode

Most of the time the GPM-216 will be used in Performance Mode. While in this mode, the user can make changes to each source while performing. Examples of Performance Mode parameters would be:

- Volume
- Mute
- Solo
- Pan
- Instrument Tuner

Details of the GPM-216 Front Panel

Here is a guide to the front panel controls.

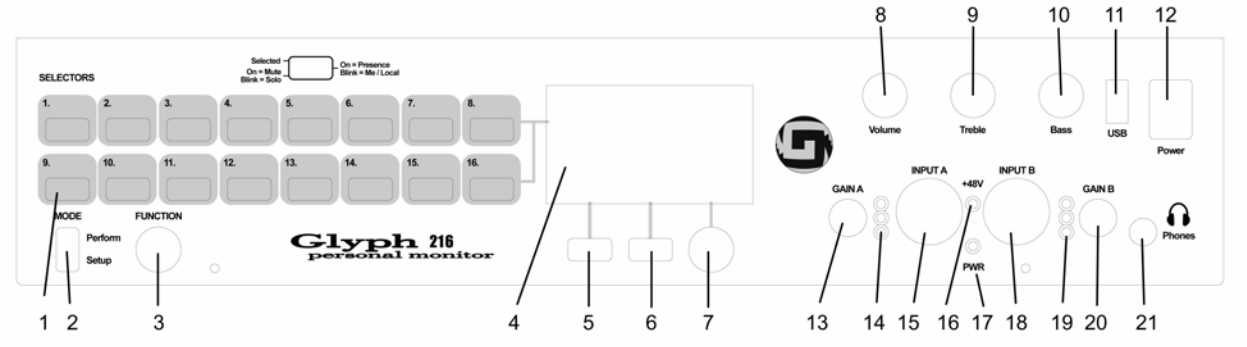
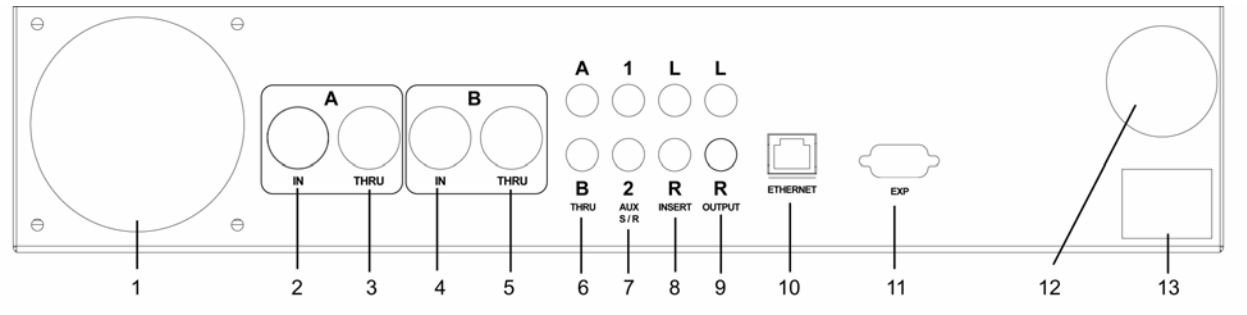


Figure 2: GPM-216 Front Panel

1. 16 Selector buttons - in Performance Mode, buttons select sources while the LCD screen displays current information about those sources, such as the status of solo and mute. In Setup Mode, buttons are used for data entry
2. Mode Select button - switches between Performance and Setup Mode
3. Function Select knob - selects functions under each Mode, such as Volume and Pan under Performance Mode; and Diagnostics, Polarity and Phantom Power under Setup Mode
4. LCD screen - 160 x 80 pixels (2.8" x 1.5") with a blue background and white lettering. Displays current selections and control labels
5. P1 button - a Soft Key that changes binary parameters, like mute and solo, on and off
6. P2 button - a Soft Key that changes binary parameters, like mute and solo, on and off
7. Data knob - changes continuous parameters, like source volume level and source pan position
8. Volume knob - controls audio level sent to headphone jack and rear line outputs for personal mix
9. Treble knob - controls treble sent to headphone jack and rear line outputs for personal mix
10. Bass knob - controls bass sent to headphone jack and rear line outputs for personal mix
11. USB Port - provided for future expansion
12. Power switch
13. Input A gain control knob - controls input A level at front combo input jack and rear XLR input jack
14. Input A three-color LED meters - displays signal level of analog A input
15. Input A - combo XLR and balanced TRS ¼" mic/instrument input
16. +48V Phantom power LED indicator
17. Input power LED indicator - displays that there is power to input section
18. Input B - combo XLR and balanced TRS ¼" mic/instrument input
19. Input **B** three-color LED meters - displays signal level of analog B input
20. Input B gain control knob - controls input B level at front combo input jack and rear XLR input jack
21. Stereo headphone jack - provides monitoring connection from front panel

Details of the GPM-216 Back Panel



1. 80mm Fan for exhausting heat from the unit
2. Input A - Female XLR mic/instrument input (can also be used as output)
3. Thru A - Male XLR mic/instrument output (can also be used as input)
4. Input B - Female XLR mic/instrument input (can also be used as output)
5. Thru B - Male XLR mic/instrument output (can also be used as input)
6. Thru A and B - Balanced TRS 1/4" loop-through outputs
7. Aux Send/Return 1 and 2 - TRS per input channel, returns to the main mix
8. Left and Right Main Insert - TRS send/return inserts for main mix
9. Left and Right Main Output - Balanced TRS 1/4" main outputs to monitors
10. CAT5 Ethernet Connector
11. I/O Expansion Port for future functionality
12. Power supply cooling fan
13. Power connector

Chapter 2 Installation

Unpacking Your GPM-216

Your GPM-216 and accessories are packaged in a sturdy shipping container. Please inspect the container for evidence of shipping damage and mishandling.

Caution:

If the container is damaged, file a report with the carrier or dealer immediately. Do not attempt to unpack and operate your GPM-216 until the carrier or dealer confirms the damage.

If the container is in good condition, proceed with unpacking. Verify that all of the items described in the next section are present and in good condition.

Inspecting Your GPM-216

Caution:

If any of the items you expect to find in your container is missing or damaged, contact the dealer before proceeding any further.

You should keep the shipping container and all packing materials in a safe place, in case you should have to use them at a later date.

GPM-216 Package

Below is a list of the GPM-216 component parts.

- GPM-216 unit
- Ethernet cable
- Power cable
- 4 rubber feat
- Rack ears and ear-mounting screws
- Four rack-mounting screws

- This manual
- Documentation CD with drivers, software, warranty registration, spec sheets and manuals

Requirements

Macintosh Computer (for graphical configuration)

- Mac OS X

Windows Computer (for graphical configuration)

- Computer with Ethernet port or Ethernet host bus adapter
- Windows 2000 or XP

CAT5 Cable

- Length can be up to 328 feet (100 meters)

Ethernet Switch

- 100Base T
- 10Base T IS NOT SUPPORTED
- Glyph has tested and recommends the NetGear 8-port (model FS608) and the NetGear 5-port (model FS605) switches

Monitoring Device of Your Choice

- Headphones using 1/4” stereo front panel connector
- Earbuds adapting to a 1/4” stereo front panel connector
- Powered wedges using L/R back panel connectors
- Power amp and wedges using L/R back panel connectors

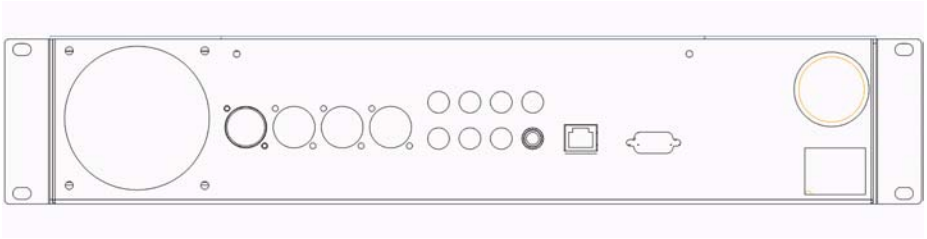
Connecting and Checking the Hardware

The GPM-216 can be rack-mounted or used on a tabletop.

Position and Connect the GPM-216

1. Decide if the unit will be used in a rack or on a tabletop.
2. If rack mounted, attach rack ears to the unit using supplied rack ear mounting screws. Mount the unit into the rack using the four supplied rack-mounting screws.
3. If used on a tabletop, position the unit on a flat, level surface. Attach the four supplied rubber feat to the bottom of the unit.
4. Insert the power cable to the power connector on the GPM-216 while the wall power is off.

Figure 1: GPM-216 rear view



5. Connect one end of the CAT5 cable to the GPM-216 and the other end to the Ethernet switch.
6. Connect your instruments or microphones to the analog inputs, either on the front or the back of the GPM-216.

Note: The front of the GPM-216 has two Neutrik “universal” inputs. These inputs can accommodate XLR or ¼” TRS cables. The XLR pins of the input are wired directly to the XLR pins of the male and female XLR jacks on the back of the unit. This essentially makes a cable split, so you can connect your XLR input cables to the front or back of the unit, and use either of the two remaining XLR jacks as loop outputs.

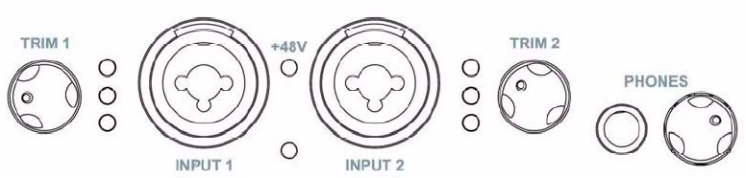
Note: The TRS pins of the input are wired directly to the TRS jacks on the back of the unit. When a ¼” cable is inserted into the front panel universal input, it flips a switch that selects the output of the line level preamp to go to the A/D converter, and therefore sent to the monitoring network. When there is no ¼” cable in the TRS input, the output of the mic level preamp is sent to the A/D converter. The front panel gain controls change the gain of both preamp outputs sent to the A/D converter.

7. Connect the “loop-through” outputs to the mixing console or other downstream gear.

Note: If using XLR inputs on the front or back of the unit, the remaining XLR jacks can be used as loop-through outputs. If using TRS inputs on the front of the unit, the TRS Thru connectors on the back of the unit become the loop-through outputs. This allows the GPM-216 to pick off the signals and send them to the monitoring network before they are sent to the mixing console.

8. Connect a monitoring device of your choice, either headphones, earbuds or powered wedges.
9. Power on the GPM-216. The power switch is a momentary switch like a computer power switch. Flip the switch up and allow it to return to its original spot. The LEDs on the unit will flash as the unit boots up.

Test Drive the GPM-216: Inputs and Gain



The universal input connections can accept balanced or unbalanced signals via ¼" or XLR connectors. Since the GPM-216 has built-in preamps, you can just plug your microphone or guitar cable right into the universal input. No external preamp, direct box, or mixer is needed.

To use a microphone, plug the microphone's XLR cable into one of the universal inputs. Whenever an XLR cable is connected to a universal input, the microphone preamp is enabled and the gain range of the trim knob is set to range from +10 to +58dB. The input impedance of each microphone preamp is 1.5Kohms. Full-scale input is 9dBu with the trim set to minimum gain.

The GPM-216 can provide 48 volts of phantom power for microphones that require it. Phantom power can be enabled by going into Setup Mode, or via the Configurator remote software, and the LED on the faceplate marked +48v will light up. Phantom power will be provided to both microphone inputs.

Phantom power will not be applied to any line level equipment or guitars plugged in using cables with ¼" connectors.

To use a guitar or line level signal, just plug a cable with a ¼" connector into one of the universal inputs. Whenever a ¼" cable is connected to a universal input, the guitar/line preamp is enabled and the gain range of the trim knob is set to range from 0 to +45dB. The guitar/line preamp can support both guitar & line level signals. The input impedance of each guitar/line preamp is 102Kohms. Full-scale input is 18dBu with the trim set to minimum gain.

If you want to adjust the input level of a universal input, just turn the trim knob and watch the corresponding level meter. The red light at the top will light anytime the input signal is greater than −6.5dBFS (or within 6.5dB of clipping). The yellow light represents a signal greater than −12.5dBFS and the green light represents a signal greater than −24.5dBFS.

For optimal audio quality, you should adjust the input trim knob so that your loudest input signal lights up the yellow light, but not the red. When the red meter light shines extra bright, the signal has been clipped. If the signal level ever exceeds 0dBFS the signal will be "clipped" and you will hear a "pop" or "tick" in the sound. This is a very bad thing, and clipping should be avoided at all costs! There is enough headroom so that you can be conservative in this area, and there is no need to push the input levels right up to the edge of clipping.

Back Panel Details

About Cable Splits, Phantom Power, Mic Preamps

In a typical stage use, microphone signals would connect first to the GPM-216, and would loop out to the FOH console. This is considered a cable split with the signal being sent to the mic preamp in the GPM-216 and the mic preamp at the FOH console simultaneously. Cable splits are already very common in venues where the stage mics are sent to the FOH console and the monitor console at the same time.

Many mics need phantom power applied. Phantom power can be applied from two places at the same time, and everything should still work smoothly. The preamp with the higher phantom power output will end up powering the mic, while the other will not add any more voltage to the wire.

A similar situation holds true when two microphone preamps are pre-amplifying a microphone signal. The microphone signal is not ganged and there will be no audio degradation in the signal.

About Direct Outputs (D.I.) and Direct Boxes

It is important to point out that the GPM-216 does not have direct outputs included, and it will often be necessary to use a direct box after the GPM-216.

A direct box is an electronic device utilizing a transformer or amplifier to change the electrical output of an electric instrument (for example, an electric guitar) to the impedance and level usually obtained from a microphone. The function of a direct box can also be built into another piece of gear and is sometimes called a direct out.

If you plan on plugging an instrument (for example, an electric guitar) into one of the front panel universal inputs, you would still need to patch a ¼" cable from the rear panel TRS Thru connector to a direct box. The direct box would change the impedance from instrument to microphone level, which would allow you to connect to the stage snake. You could not use the rear panel XLR Thru connector as a direct output.

Auxiliary Send/Return 1 and 2

The auxiliary send/return jacks are two ¼" TRS jacks on the back panel of the GPM-216. The tip is send, the ring is return, and the sleeve is ground. The aux jacks act as per channel inserts for the two local A and B inputs. The purpose is to provide an insert point for local processing units such as reverb, EQ and dynamics into the musician's signal flow. These jacks are directly wired to the inputs on the GPM-216 so that the musician can affect his own input signal in his monitor only. The affected signal is not broadcast to other GPM-216s on the network, it can only be heard on that musician's unit. You can use the input gain control on the external processing unit to adjust the input level if the output from the GPM is too high or too low. The return signal level will be determined by the output level control on the external processing unit.

NOTE: The GPM-216 has built-in reverb for the local inputs. If the GPM's internal reverb is applied to local signals, they will be broadcast to the network with reverb.

Left and Right Main Insert

Similar to the aux jacks, the GPM-216 has Main Inserts that appear on the back panel. The Main Inserts are used for adding local processing such as reverb, EQ and dynamics to the entire mix prior to being sent to the Left and Right Main Outputs. Again, the effects are only heard on that musician's unit and are not broadcast to other units over the network. You can use the input gain control on the external processing unit to adjust the input level if the output from the GPM is too high or too low. The return signal level will be determined by the output level control on the external processing unit.

USB Port

The USB port is supplied for future functionality.

Chapter 3

User Interface

Front Panel User Interface

You can think of the GPM-216 as a basic rack-mounted mixer. Like a mixer channel, it has inputs, gain (trim), pan, mute, solo, faders, aux buses and inserts. But unlike a traditional mixer, you have to mix 16 channels with only one set of fader, mute and solo controls. These controls are shared between each channel using *soft labels* on the LCD screen. When you press one of the selector buttons to select a source, the LCD will display information about that source, and you use the Mute, Solo and Volume controls under the LCD to mix that source with the others.

As an example, say you have four audio sources to mix: sax, bass, drums and keyboards. Each source is mapped to a channel. You have chosen to place sax on channel 1, bass on channel 2, keyboards on channel 3 and drums on channel 4. If this were a traditional mixer, you would have done this by physically patching the inputs into the unit. With the GPM, however, you have "patched" them in advance by creating a *profile*. (More about profiles later). If you want to change the volume of the bass in your mix, you will press *Selector* button 2 to select the bass channel. You then turn the *Data* knob to change the volume of the bass. If you then want to change the volume of the sax, press *Selector* button 1. Turning the *Data* knob will then change the volume of the sax in the mix.

The LCD provides information to help you when using the GPM. It will display labels for the *Selector* buttons, the *P1* and *P2* buttons and the *Data* knob. It will also display information about the selected audio source, such as its name ("sax") and its current volume, mute and solo settings.

LCD Screen

The LCD screen is 160 x 80 pixels (2.8" x 1.5") with a blue background and white lettering. It can display 7 rows of text with 26 characters per line. It is used to display current selections and control labels from the front panel. Information is displayed using light letters on a dark background. Control labels are displayed using dark letters on a light background.

P1, P2 and Data Knob

Underneath the screen there are two buttons, P1 and P2, and the Data Knob. The bottom line of the LCD screen is used to display the "soft labels" of these buttons and knob. For example, in the Mix: Volume function, the P1 button mutes the selected source, the P2 button solos the selected source, and the data knob controls the volume of that source.

Selector Buttons

There are 16 Selector buttons on the front of the GPM-216. Each button has three LEDs behind it that deliver different information to the user. In Perform Mode, the buttons are used to select the incoming signal and display information about that signal using a green LED, red LED and amber LED. The red and green LED's are located to the left of the button and the amber LED is located to the right of the button.

Green LED

When the green LED is lit solid it means that this button is selected. The green LED does not have a blinking state.

Red LED

The red LED shows a special circumstance about that source or menu choice. For instance, in Perform Mode, if the red LED is on solid the source is muted. If the red LED is blinking, the source is soloed. If the red LED is on solid, the source is muted.

Amber LED

The amber LED shows that there is a choice available for that button. In Perform mode, if the amber LED is on solid or blinking, there is an audio source available for that button. On solid means that the audio source is from another GPM, blinking means that the audio source is from a local input on that GPM unit. When performing, you only need to remember blinking means me.

Profiles

Profiles are a snapshot of the settings on your unit. Once you have configured the unit you store the settings. Every time the unit is restarted it will restore your settings. If you wish, you can create more than one profile. If you play in more than one band, or want a different mix for different locations, you can save the changed settings in a new profile. You can then select the stored profile that contains the pre-set settings appropriate for your performance.

About Function and Mode

A function is a program that can be run on your GPM unit. For example, to change the volume of a source in your mix, you will use the Mix: Volume function and to change the pan position of a source you use the Mix: Pan function. You can choose the current function by turning the Function knob. When you change functions, you will see the name of the current function on the top left of the LCD. The LCD will also

display labels for the Selector buttons, the P1 and P2 buttons and the Data knob. In some functions, the use of these controls will change. Checking the labels can guide you to the use of the controls when you change functions.

Perform Mode

In order to simplify the use of the GPM while performing, the GPM runs in two modes: Setup and Perform. In Perform mode the Function knob selects between the Mixer: Volume, Mixer: Pan and the TUNER functions. Typically when performing you will only need two functions: Mixer: Volume and Mixer: Pan. When configuring or troubleshooting the unit, there are other functions to assist you. Different functions are available in each mode.

In Perform Mode, when you push a Selector button, various information will be shown on the LCD screen. The top line of the screen will indicate which function of perform mode is selected (Mix: Volume, Mix: Pan or Tuner). The 2nd from the top line of the LCD screen will show what the selector buttons do, while the 3rd line down identifies the source itself. The identification appears as two names separated by a colon, the first name is the name of the unit where the source originates and the second name is the name given to the source. Before the GPM-216 unit has been configured with a profile, the default name for each GPM-216 will be GPMxxx (where the "xxx" is a random number) and the source will be identified as InputA or InputB. Once configured with a profile a source will be identified with the names given to the unit and the inputs.

The mode button's LED's will tell you if you are in Setup or Perform mode. When in Perform mode the green LED will be on solidly.

Tuner Function

The TUNER function is a utility to allow an instrument connected to either of the GPM-216's inputs to be tuned. The buttons beneath the LCD screen select which input signal passes into the tuner and the screen displays which input has been selected for tuning. When a note is played, the tuner will display the note closest to the one being played, the frequency of that note and the indication FLAT, TUNED or SHARP. If the note is FLAT or SHARP, a number of characters will be displayed in the lower left hand portion of the screen indicating the degree away from tuned the note being played is. The more characters that are displayed (F if Flat, S if Sharp) indicate the further away from being in tune.

The TUNER utility is directly associated with the GPM-216 inputs meaning that instruments can be tuned regardless of how the unit's input configuration is set. This means, for example, that if the unit is configured for one mono input (which would be Input A), it is still possible to tune an instrument connected to Input B.

Setup Mode

To enter Setup mode, press the Mode button twice in quick succession (just like you would double click with a mouse). To return to Perform mode, press the Mode button once.

The mode button's LED's will tell you if you are in Setup or Perform mode. When in Setup mode the blinking red LED will be on.

In Setup mode the Function knob selects between many functions that enable you to configure the GPM, save settings permanently, select between stored profiles, troubleshoot the system and more.

Setup Mode consists of two sections of informational displays as well as several operational utility functions.

The two informational displays can be reached by entering Setup Mode and rotating the Function knob until the screen displays the headings of MIX: Info or SYSTEM:Info

MIX: Info:

The informational displays in this section are switched between by pressing the lighted selector buttons as follows:

1. Unit Name (the current name of the GPM unit)
2. Current profile name
3. Current Input designation (two mono inputs, one mono, stereo, etc.)
4. Software Build number

SYSTEM: Info:

The informational displays in this section are also switched between by using the lighted selector buttons as follows:

1. IP address (the network address of the unit)
2. Current CPU usage
3. Max CPU usage
4. Jack Xrun Total (a troubleshooting diagnostic statistic)
5. CPU Temperature (a troubleshooting diagnostic)
6. Operating System Build number
7. Hardware Build number
8. Save Diag (pressing the button labeled Save generates a diagnostic log file for troubleshooting purposes – should only be used at the direction of Glyph technical support)

Setup Mode Functions:

Rotating the Function knob while in Setup Mode will make available the following options and utilities:

Save Settings:

Pressing the Save button will save the current Volume and Pan settings to the Current Profile.

Remote Config:

This function is required to use the GPM Configurator utility. Press the button labeled "ON" and verify that the screen now confirms this. In order to use any of the utilities that require this state, the GPM unit must remain with this notation on the screen.

Phase Setting:

This function allows for the phase of local audio input channel(s) to be changed. The options are Normal, Reverse (Input) A and Reverse (Input) B. The change of phase occurs immediately upon turning the knob labeled Set.

Note: As Phase can only be changed on a local input source; it is necessary to have a local source selected before entering Setup Mode.

Phantom Power:

This utility both displays the current state of the GPM unit's Phantom Power setting and allows for this setting to be changed. The change takes effect immediately upon pressing either the On or Off button.

Note: Phantom Power is a requirement of some types of microphones and its use should follow the specifications and requirements of the microphone's manufacturer.

Select Profile:

When this function is selected, selector buttons will light indicating the presence of profiles existing on the GPM unit. Pressing the lighted buttons will display the name of each profile. When the desired profile name is displayed, pressing the button labeled Select will make this profile the current one. The profile will be active as soon as the select button is pressed.

Change Local Input:

This function allows for changing the type of Local Input. Rotating the Options knob will provide the selections of Two Mono, One Mono, Stereo, None (no local input) and Collapse. The Collapse designation will take an existing setting of Two Mono or Stereo and "collapse" it to a single mono input. The change in local input type will take effect as soon as the select button is pressed.

Network: Configure:

This function allows the GPM unit to obtain its necessary IP address in three different ways: "Fast Auto", "Safe Auto" and "Use DHCP". The two "Auto" options are similar with the "Safe" option performing some extra collision detecting routines to verify a unique IP address. Using this setting will cause the GPM unit to take a few seconds longer to initialize when powered up. This option should only be needed if the default setting of "Fast Auto" fails to provide a unique IP address for the GPM unit. The "Use DHCP" option can only be used on a network containing a DHCP server. The "Fast Auto" option is the preferred setting and is suitable for most network environments that consist of only GPM units and one or two computers.

TUNER: Setup

This option allows the frequency scale of the Tuner to be adjusted. In default configuration, the frequency of the note "A" is 440 cycles per second. Rotating the knob labeled "freq" will adjust what the Tuner utility identifies as a "TUNED" A. All other notes will be adjusted accordingly.

Set Reverb:

Reverb can be added to the local inputs. The local input signal, with reverb, will be broadcast to the network for the other GPM units to hear. When this option is selected, the Selector lights will blink in accordance with how the local inputs are configured on the unit. Each input can be assigned either the same or a different reverb type. The choices are:

No Reverb
Vocal Plate
Small Room
Small Plate
Small Hall
Slap Chamber
Medium Room
Medium Plate
Medium Hall
Large Room
Large Plate
Large Hall

Configuration

Graphical Configuration Software

The Graphical Configuration software allows you to setup and configure the GPM-216 units from a computer on the same local network as the GPM-216 units. The configuration software (Setup.exe) must be installed on a computer running the Windows 2000, XP or Macintosh OS X operating system. You will need Java software installed on your machine. The GPM Configurator install will also install Java. If you already have Java installed, uncheck the checkbox specifying Java on the appropriate dialog box during installation of the GPM Configurator software.

Once the GPM Configurator software is installed, this computer should be connected to the same network switch as the GPM units and then restarted. It is also necessary to be certain that the computer being used is set to "Receive an IP address automatically" to ensure proper connectivity to the GPM units.

Configurator Main Page

There are two ways to configure the GPM-216 units within the Configurator Software. Configure Single Unit allows you to make detailed changes to a single GPM unit, while Configure All Units allows you to make general changes to many units at the same time. We will go through the steps of configuring several units at once, and then configuring the units further by themselves.

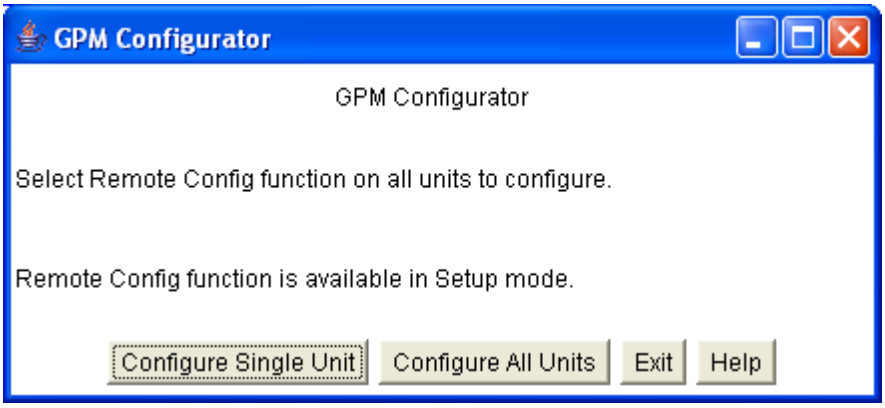


Figure 1: Configurator Main Page

Configure All Units

When you click Configure All Units, it informs you to place all the units in remote configuration mode. You will need to do this to see them remotely. Press "continue" after all units are in remote configuration mode.

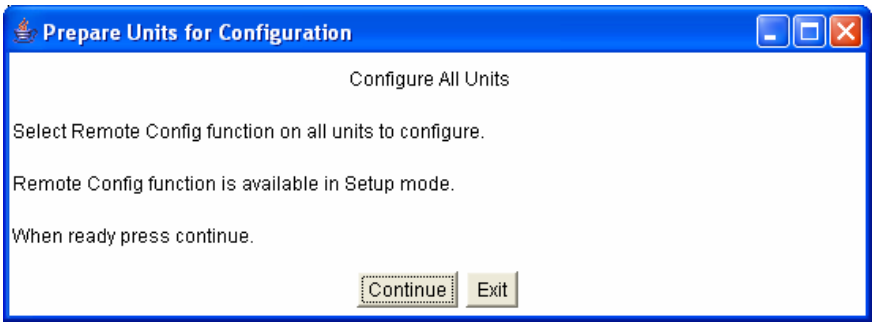


Figure 2: Prepare Units for Configuration

After it scans the network for available units, you will see the Configure All Units page. Here you will see a list of the GPM-216 units available on the network, and you can change various aspects of them. The changes you make will be stored as a Profile in the memory of each GPM-216 unit. You first must name this Profile something so that it makes sense with the setup you are doing. If you are setting the units up for

practice, you might want to name the profile “Practice”. If you are setting up for a recording session, you might want to name the profile “Recording”. In our example we’ll name it “Test”.

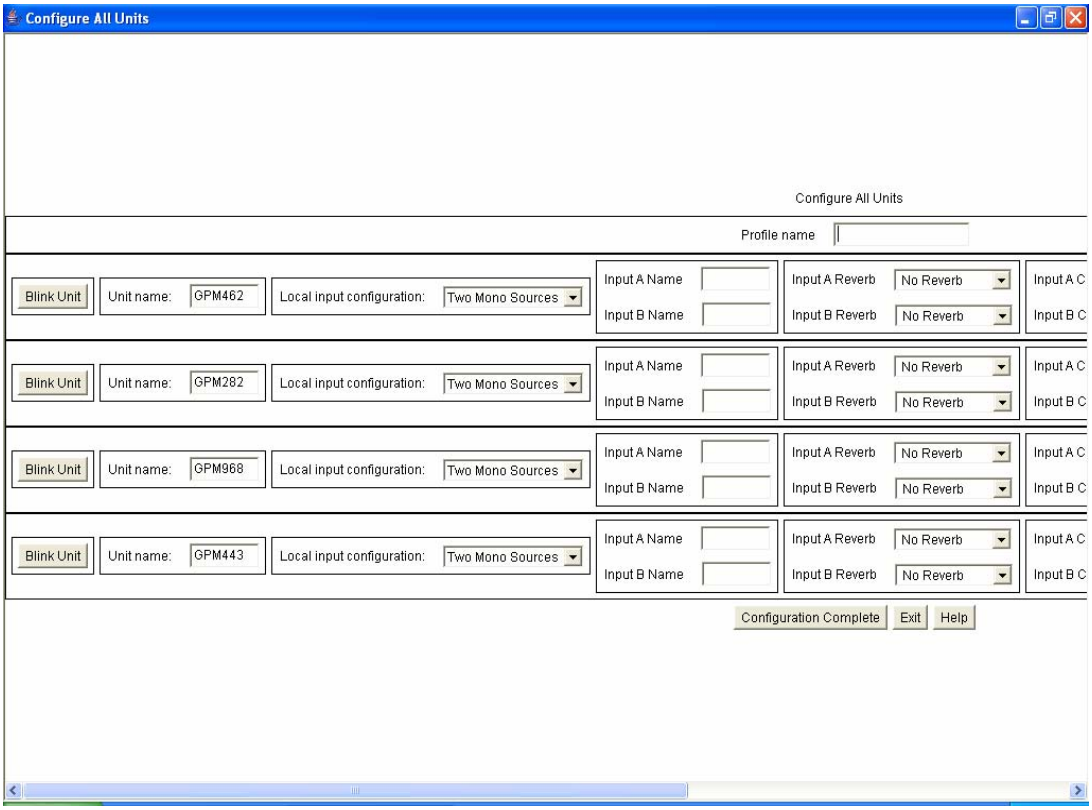


Figure 3: Configure All Units

Blink Unit

On the far left side of the Configure All Units page, you’ll see the Blink Unit button. When you click this button, the corresponding unit will blink the LEDs on the selector buttons.

System name

When several units are booted up for the first time, they are given a default name so you can determine which is which. The naming convention is “GPMXXX” where “XXX” is a random number. In our example, the units are named GPM462 GPM282, GPM968 and GPM443. Use the Blink Unit button to determine which unit is which, and name them something that makes sense as to which instrument or person will be using the unit. In our example they will be named John, Paul, George and Stan.

Local input

The GPM-216 has two local inputs on the front of the unit. From the perspective of the network, these inputs can be configured as one stereo source, one mono source, two mono sources, or no local sources. In our example all units will have two mono inputs.

1. John sings and plays guitar so we will set his local input to Two Mono Sources
2. Paul sings and plays bass so he will have Two Mono Sources
3. George sings and plays guitar so he will have Two Mono Sources
4. Stan uses two microphones on his drums so he will also have Two Mono Sources

Naming Sources

The names that you give to the sources will be the names that everybody sees on their individual GPM-216 units.

Note: The selector buttons on the GPM-216 can access mono or stereo sources. If you choose to use mono sources, each source will be accessed on the front panel with a separate selector button. If you use stereo sources, you can access both signals of the stereo source with one selector button.

The GPM-216 will display the Unit name first, then the input name. For John's guitar, it will display like this:

Input: 1:John:guitar

In our example, the Configurator screen would look like this:

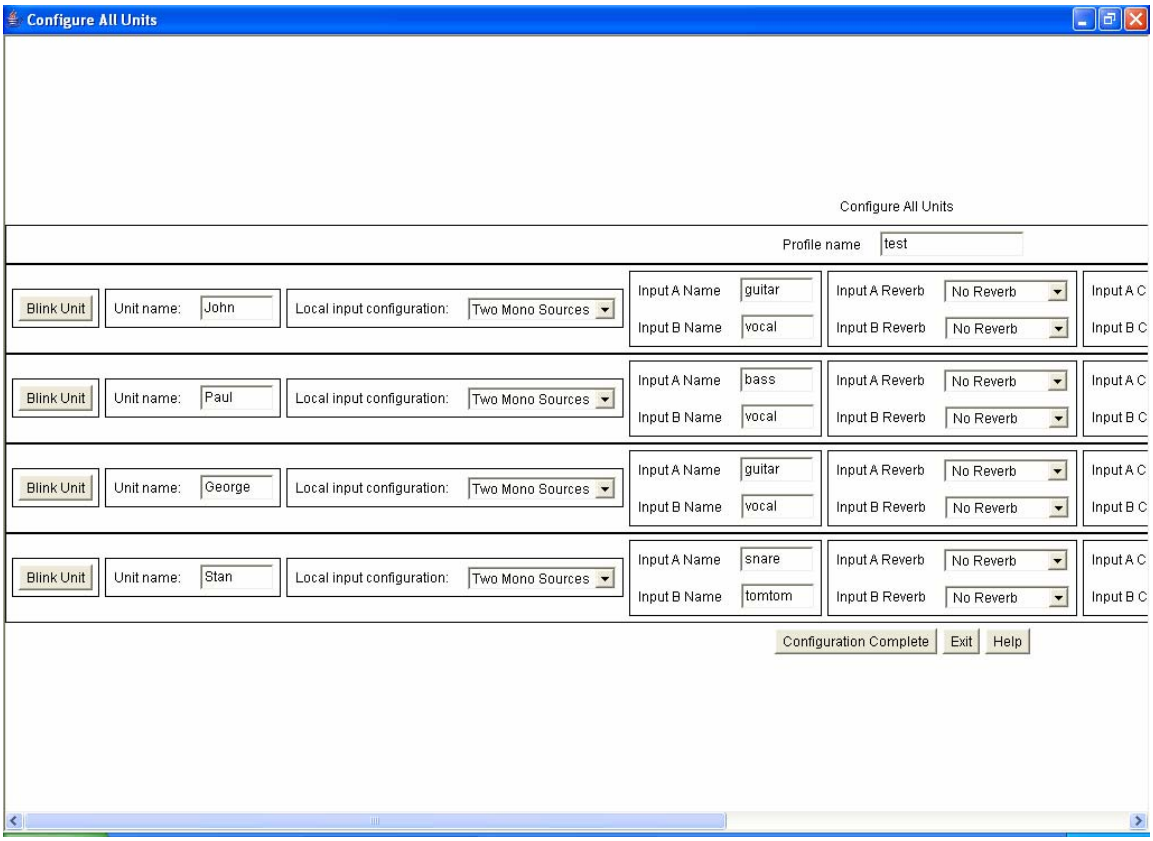


Figure 4: Naming sources

Reverb Select

Each input on each GPM-216 can have one of the included reverb settings assigned.

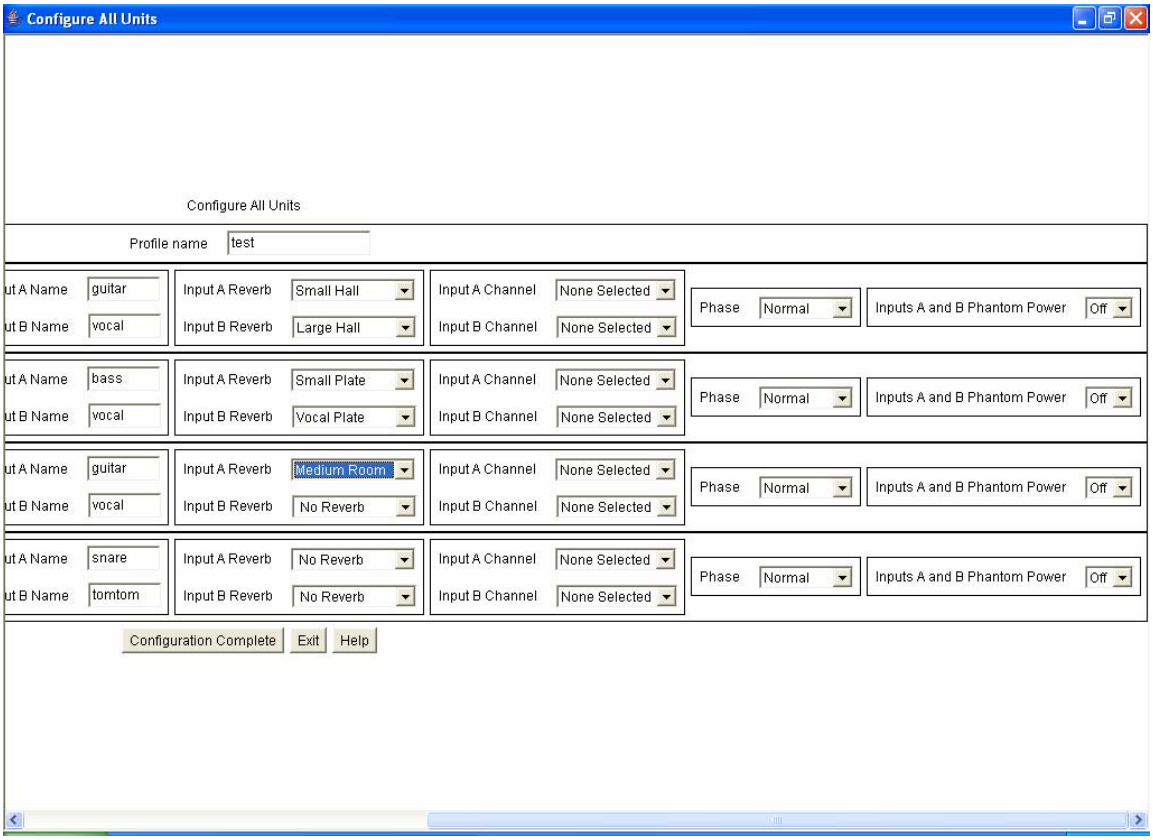


Figure 5: Reverb Select

Source Channel Select

The next part of the Configurator determines the Input source that will be mapped to each channel of the GPM-216 units. If you select a source to be mapped to a channel, then that source will show up on that channel of every GPM-216 unit. Once you map a source to a channel, that channel will not be available in the pick lists for any other sources. Just to make it simple, in our example we'll map the sources sequentially on the screen.

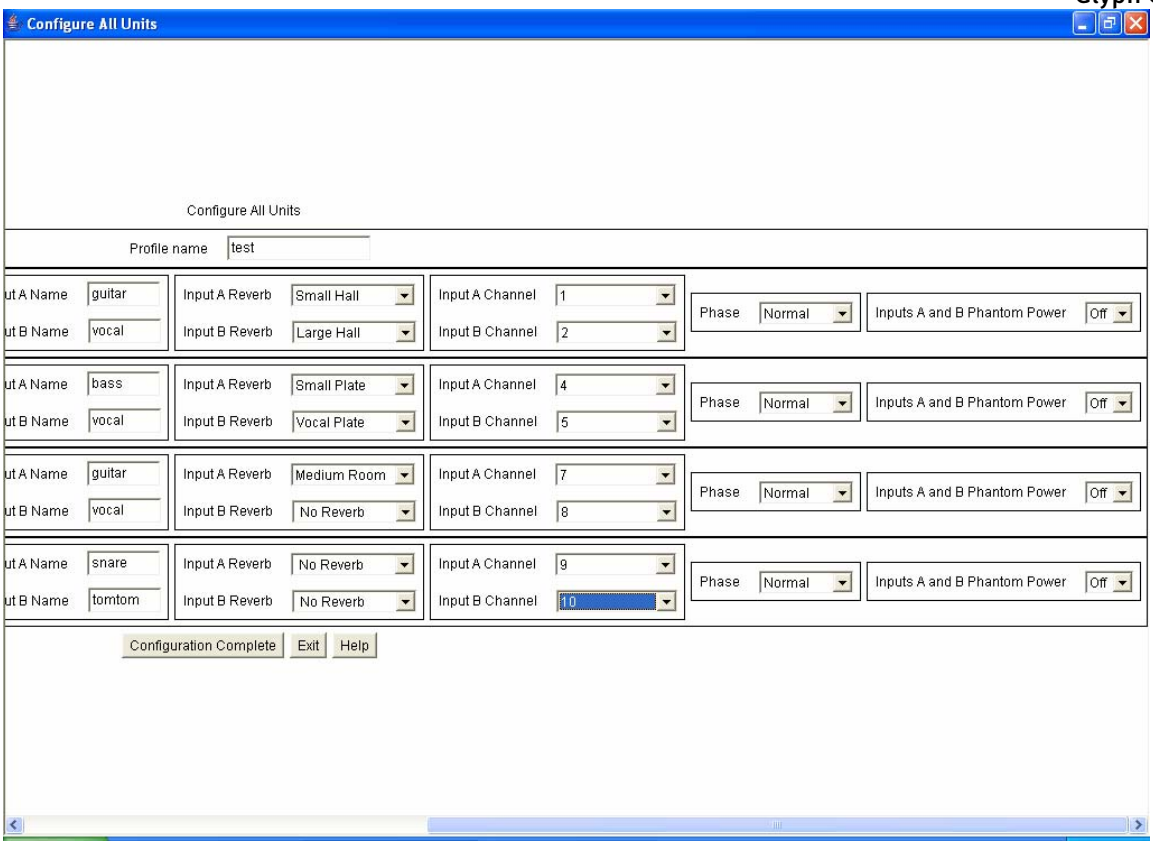


Figure 6: Mapping sources to channels

Polarity

The polarity drop down menu allows you to set the phase reverse of the two local signals. Your choices are:

1. Normal (both channels are unchanged)
2. Invert1 (Input A phase reverse enabled)
3. Invert2 (Input B phase reverse enabled)

Phantom Power

The GPM-216 can apply phantom power to microphones that need it. To turn on phantom power in the Configure All Units page, just select "ON" from the Phantom Power drop down box for the GPM-216 units that are using phantom powered microphones. You can also turn on phantom power using the front panel of the GPM-216.

Configuration Complete

Once you have finished creating the Profile with Configure All Units, you need to upload the Profile to all of the GPM-216 units. Click the Configuration Complete button and the Configurator will check for errors in your Profile. By "errors", what is meant is entry fields accidentally left blank or giving two units the same name. If there are errors, the error message box will identify the specifics of the errors.

Figure 7: Configuration Error Report

The next screen verifies that you want to update the units. When you click "Yes" you will copy the profile containing these settings to the units.

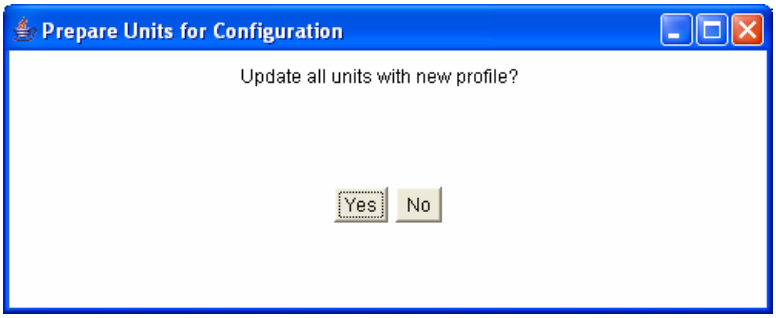


Figure 8: Update Units with Profile

The next screen will allow you to make this profile the current profile on all the units at the same time. Clicking "Yes" will immediately make this profile active on all units.

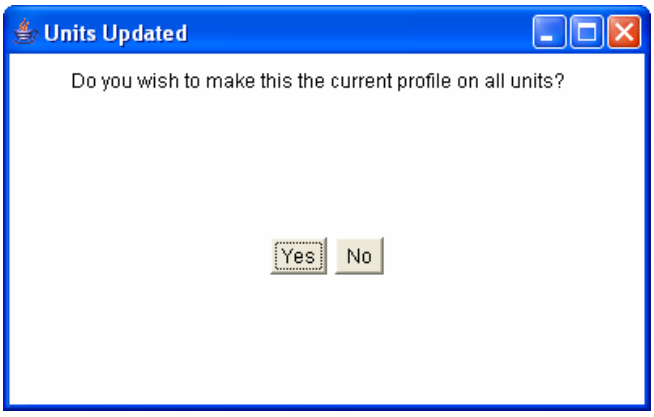


Figure 9: Make Profile Current

You have successfully updated the Profile and you are brought back to the Configurator Main Page.

Configure Single Unit

In order to use the Configure Single Unit utility, it is necessary to set the unit(s) desired to be configured into Remote Config ON mode and leave that indication visible on the GPM LCD screen.

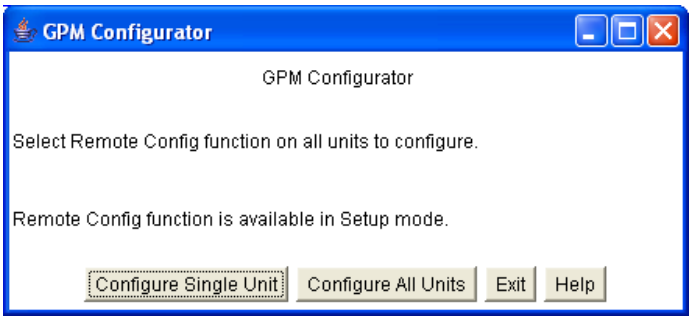


Figure 10: Configurator Main Page

Configure Single Unit allows you to have more detailed control over each GPM-216 unit individually. When you press the Configure Single Unit button, the network is scanned and you will see a drop down menu of the available units that are in Remote Config Mode on the network. If there are GPM units powered up on the network that are not in Remote Config mode, a dialog box will appear specifying what those units are.

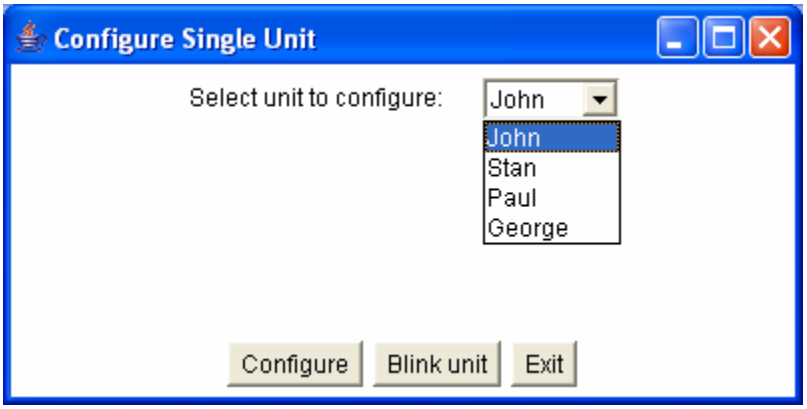


Figure 11: Configure Single Unit

Select a unit from the list and click the “Configure” button. This opens your default browser and you will be viewing the GPM Monitor Configuration Wizard web page.

Figure 12 GPM Configurator Opening page.

There are several menu options available at this point:

1. New Profile
2. Edit Profile
3. Download Profile
4. Backup Profile
5. Set Current Profile
6. Delete Profile
7. Copy Diagnostic Logs to your Computer
8. Download Software
9. Restore Factory Software
10. About Configuration Wizard

The GPM unit keeps its configuration in configuration profiles that are stored on the GPM unit. Each configuration profile that you create (New Profile) has a name. It includes the GPM unit name, information regarding the local audio inputs, and mapping information for external channels. You can have more than one profile stored on a GPM unit. This allows you to completely reconfigure the GPM unit by selecting a different current profile (Set Current Profile).

You can backup a GPM profile from the GPM unit to your computer (Backup Profile). You can download a backed up profile from your computer to the same GPM unit or to a different GPM system (Download Profile). You can also edit or delete profiles stored on the GPM unit (Delete Profile).
In addition to profile management, the configuration wizard can be used to upload diagnostic logs under the direction of Glyph technical support and to download software updates to the GPM unit.

New Profile

New Profile is used to create a GPM unit configuration profile. The profile is stored on the GPM unit. You can create more than one GPM profile and switch between them by using Set Current Profile.
Each profile stored on a GPM unit must have a unique name.

The profile contains a GPM unit name. Each GPM unit on a GPM network must have a unique name. If there are other configured GPM units on the network, configuration wizard will check to be sure that there are no other units with the name you enter. This name will be used to identify your local audio inputs on your GPM unit as well as on other GPM units connected to the network.

In addition, you must select the number and type of local audio inputs that will be included in the audio mix for this GPM unit and other GPM units on the network.

Finally, you can set the state of phantom power on the GPM unit. Phantom power can be used to provide power to microphones connected to the GPM unit. Phantom power setting affects both inputs on the GPM unit. You cannot set phantom power on just one input.

Figure 13: New Profile.

After creating a profile, it can be changed later by using Edit Profile.

You can also alter a profile using the GPM unit interface to change channel volume and pan settings. These can then be saved using a menu option on the GPM unit in Setup mode.

Input Names

Each input included in the GPM mix is identified by a name. This name is used on the GPM unit you are configuring. It is also used to identify this input on other GPM units connected to the network. The GPM unit will display the input name in the format "unit name":"input name". In addition, you must select the channel used for the input in the audio mix.

Input refers to the physical audio input attached to connectors A and B on the front or rear of the GPM unit. Each input on the GPM unit is mapped to a mixer channel. Each input on other GPM units on the network is also mapped to a mixer channel. A channel can be selected by one of the 16 buttons on the front of the GPM unit in order to change volume, pan position, mute and solo.

You must also decide about whether or not one of the included reverb types is to be assigned to each of the inputs. The drop down menu will display the lost of reverb options.

The input phase drop down menu(s) allow you to set the phase reverse of the two local signals. Your choices are:

1. Normal (both channels are unchanged)
2. Reverse A (Input A phase reverse enabled)
3. Reverse B (Input B phase reverse enabled)

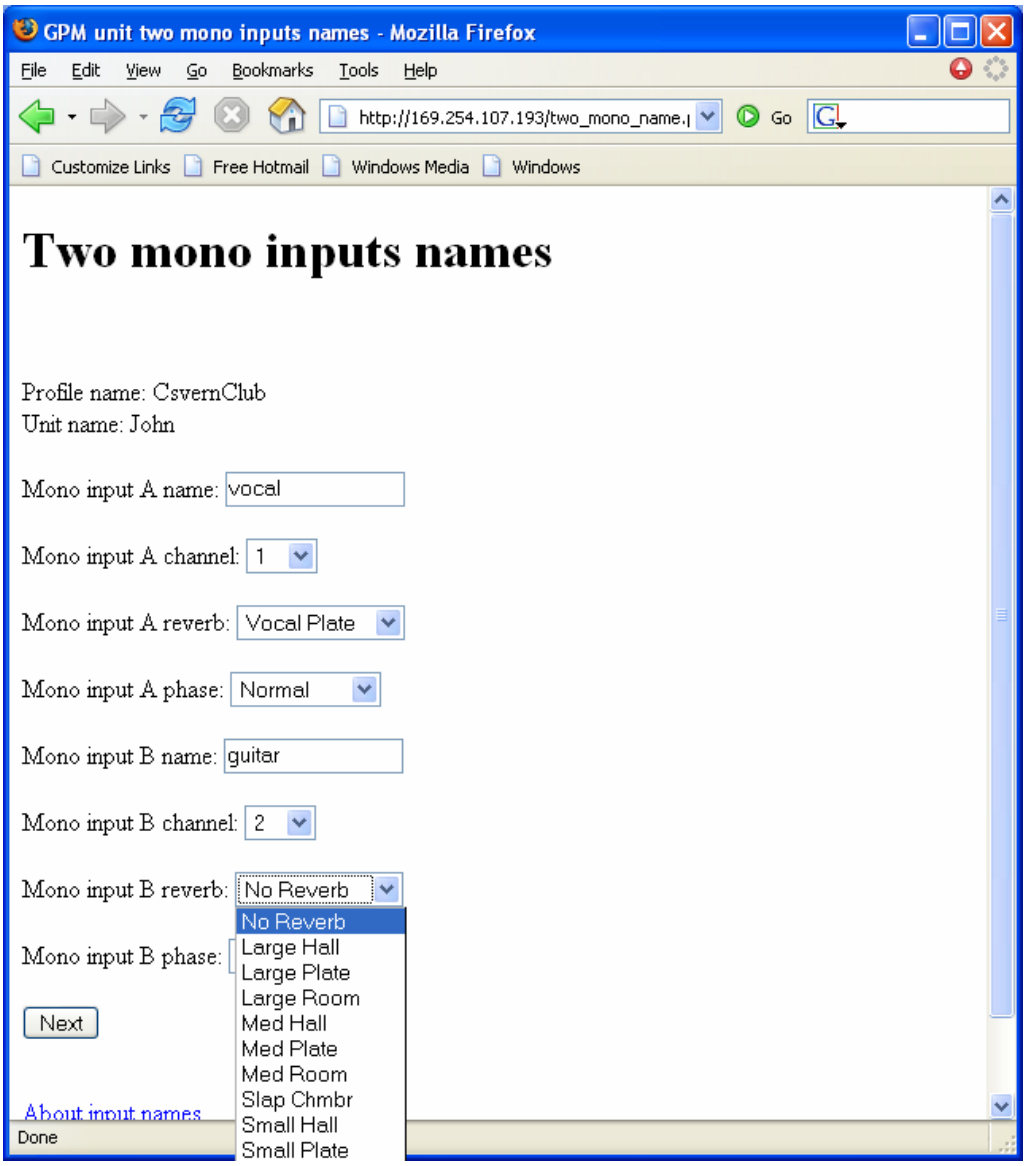


Figure 14: Local Input Names.

Once the local inputs have been given names and assigned to channels, you can save the profile. If you wish to additionally configure the external sources from other GPM-216 units on the network, use the Advanced Configuration Options utility.

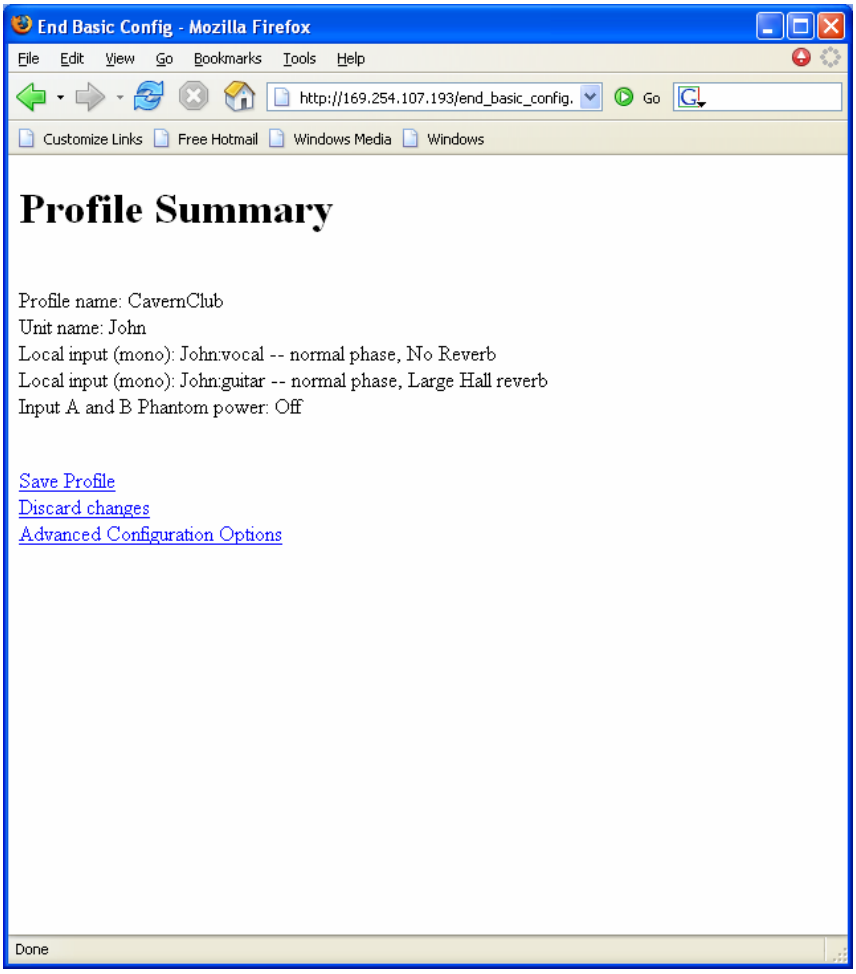


Figure 15: End Basic Configuration

Map External Inputs

This step allows you to assign audio inputs from other GPM units to channels in your audio mix. Each input included in the GPM mix is identified by a name. This name is used when assigning the source to a channel. The format of this name is "unit name":"input name". For example, if the GPM unit was named "john" and the input was named "guitar", you will identify the input as "john:guitar".

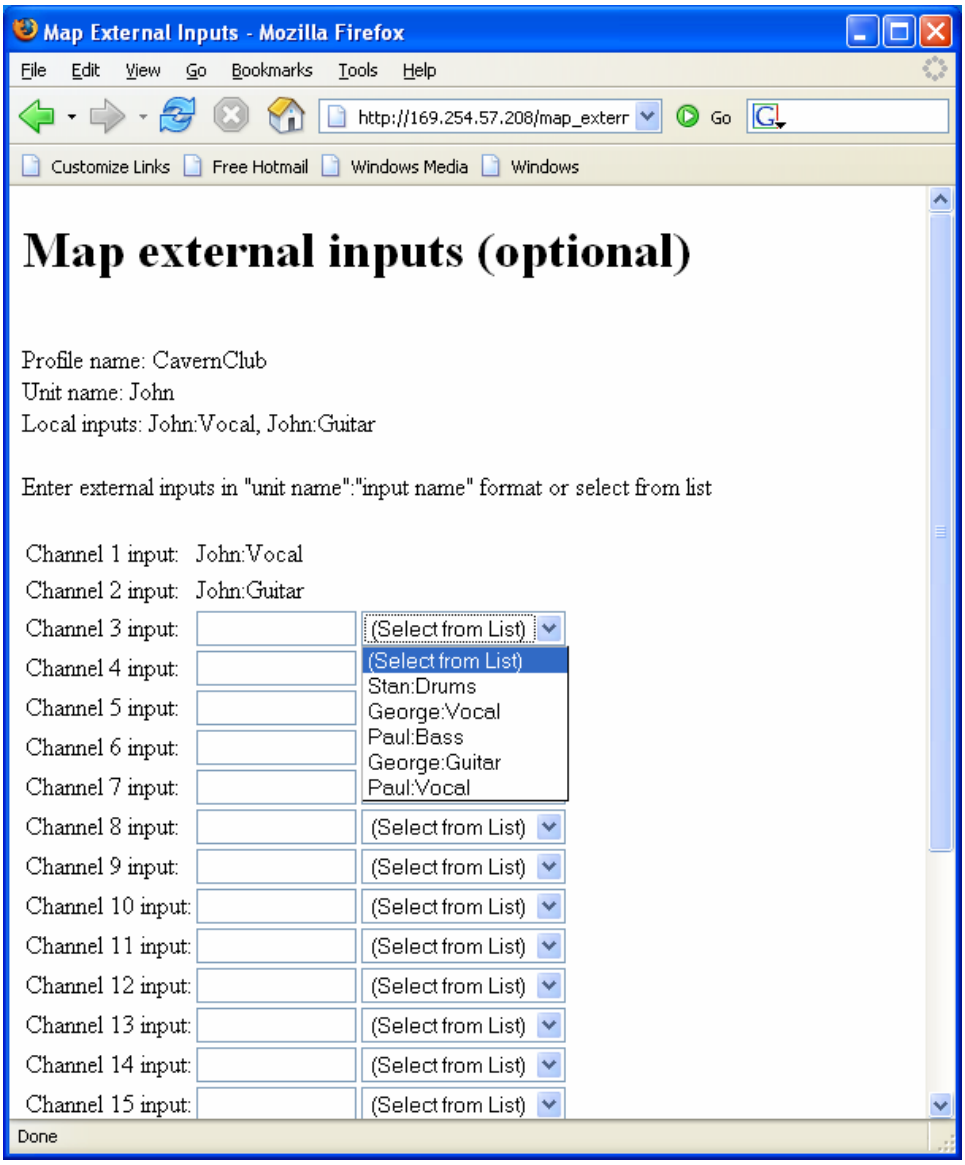


Figure 16: Map External Inputs.

If you do not map external inputs, the input will be assigned to a channel based on the channel selected when the other GPM unit was configured. In the case of collision, the input will be assigned to an available channel.

Note: An easy way to configure multiple GPM units is to connect them all to the network and choose unit and input names for all GPM units. Skip the Map External Inputs step and save the configuration. You can then edit each profile (Edit Profile). All external inputs will appear by name on the pick lists. If there are no external inputs on the pick lists, the GPM unit has detected no inputs available on the network.

Channel Volume and Pan Settings

You can set an initial volume and pan setting for each channel that is assigned to an input. Later, volume and pan settings can be changed using the GPM unit user interface. These can then be saved using a menu option on the GPM unit in Setup mode.

Volume is set on a scale of 0 to 100.

Pan sets the stereo position of the input. A percentage of the input is assigned to the left and right channels. The default is to set 50% to the left channel and 50% to the right channel ("50<>50"). This setting will place the input dead center in the mix. Setting the input 100% in the left channel and 0% in the right ("100<>0") will place the input full to the left. Setting the source 0% in the left channel and 100% in the right ("0<>100") will place the input full to the right. We will leave it to you to work out the effects of the other settings.

The format "50<>50" matches the way the pan setting is displayed on the GPM unit.

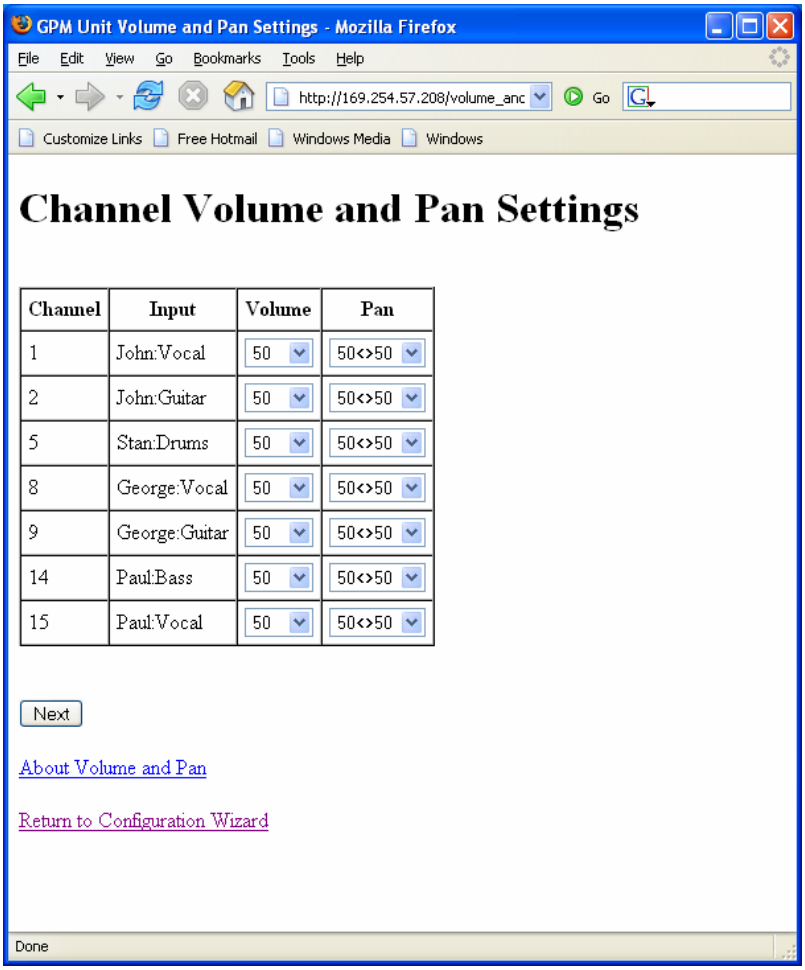


Figure 17: Channel Volume and Pan Settings.

Profile Summary

The Profile Summary is just what it sounds like. It lists the all the settings that were made up to that point on that GPM unit, and allows you to either save the profile or discard the changes

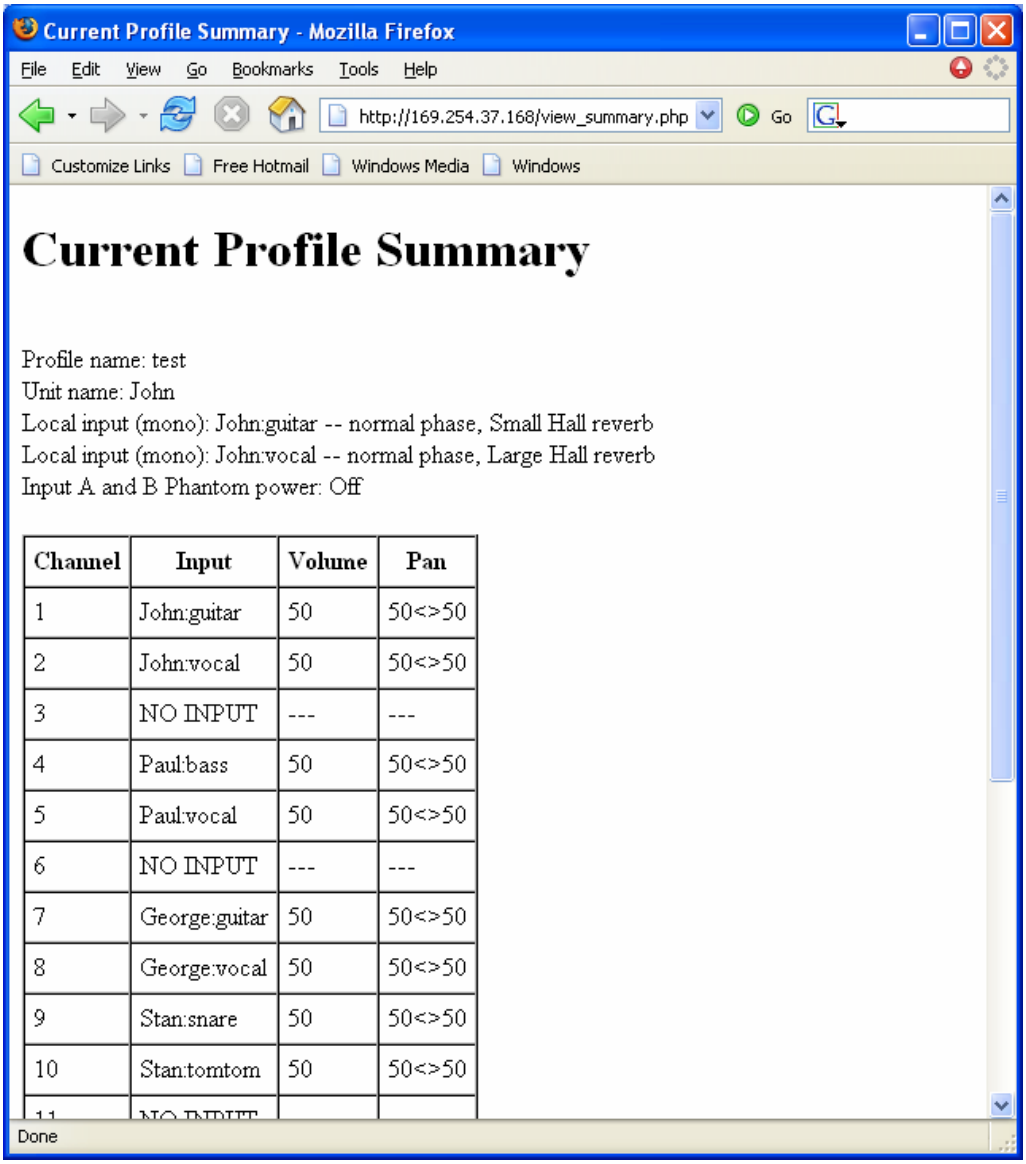


Figure 18: Profile Summary.

Edit Profile

The Edit Profile utility allows for changes to be made in any profile stored on a GPM unit. After selecting Edit Profile from the list on the opening page, use the drop down box to select the profile you wish to edit. If no profiles appear on the list, there are no stored profiles on the GPM unit.

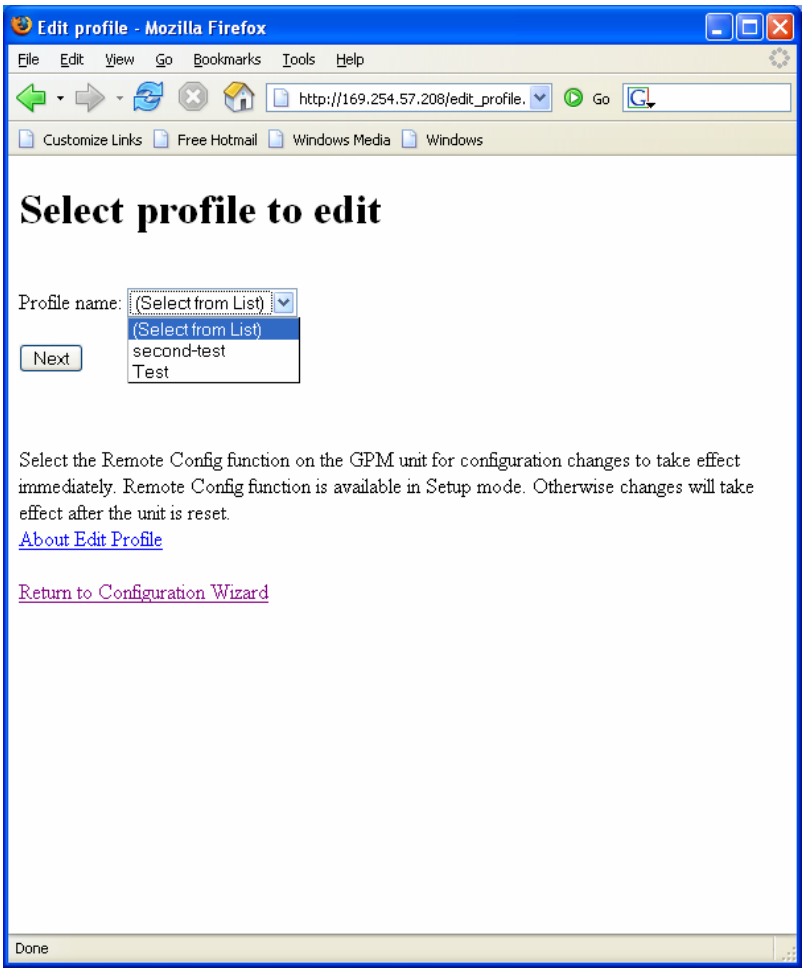


Figure 19: Select profile to edit.

Download and Backup Profile

Profiles stored on any GPM unit can be backed up (copied from the GPM unit to a computer running the GPM Configurator software). To Backup a profile using a Windows computer, right-click on the profile name and select “Save Target As” (or “Save Link As” depending on the default browser being used) and then choose a location on the computer to save the profile. Once a profile has been backed up, it can be downloaded to the same or another GPM unit. Once the Download Profile utility has been selected, use

the Browse button and locate the profile to be downloaded. Once the profile has been selected, use the Download Profile button to transfer the profile to the GPM unit. If the downloaded profile is the only profile on the GPM unit it will become active immediately. If there are other profiles already on the GPM unit, the Set Current Profile utility will need to be used to make this profile the active one.

Note: Each profile contains the unit name for the GPM unit it was created for. If a profile is backed up from one GPM unit and then downloaded onto another GPM unit, it is likely that the downloaded profile will need to be edited to provide a more appropriate unit name to avoid confusion.

Set Current Profile

When there is more than one profile stored on a GPM unit, the Set Current Profile utility is used to make whichever one is desired to be the active profile. Use the drop down box to choose the desired profile and click the Next button. The new profile will take effect immediately.

Delete Profile

A utility used to delete any profiles on the GPM unit no longer wanted.

Copy Diagnostic Logs to Your Computer

This utility provides a means for transferring troubleshooting diagnostic information from the GPM unit to a computer. This utility should only be used at the direction of Glyph Technical Support

Download Software

A utility to provide software updates to the GPM unit. This utility should only be used at the direction of Glyph Technical Support.

Restore Factory Software

This utility should only be used at the direction of Glyph Technical Support.

Mixer Status Snapshot

This option will display the current settings on the GPM-216 unit. In order to get the “snapshot”, the GPM-216 unit must be in Remote Config mode.

Appendix A - Getting Started

Out of the box

Remove your GPM units from the packing material.
Check for damage.

Plug in the GPM units.

1. Connect the power cord to the GPM units and plug it into your power strip. Connect an Ethernet cable to each GPM unit and connect it to your Ethernet switch (hub). Connect the power cord to your Ethernet switch and plug it into your power strip.

2. Connect your microphones and instruments to your GPM units using connectors Input A and Input B. By default, each unit is configured to have two mono input sources, but we will see how to change this later.

3. Connect your monitors, headphones or earbuds.

Turn on the GPM units

By default, the GPM unit will power up as soon as power is applied but, if the unit has been shut down, press the Power button on the far right side of the front of the unit.

- What if there is no display on the LCD and no lights go on?

⇒ Check the power.

Check your network connection

Look at the front of your GPM. Amber lights should be ON next to some of the buttons. These indicate that there are audio sources from other GPM units detected on the network. There should be blinking amber lights next to two of the Selector buttons. These are the Selector buttons for your audio sources. We will learn later how to assign sources to different channels.

- What if there is a blinking amber light, but no solid on amber lights? Then your GPM cannot see any other units.

⇒ Check that the other GPM units have been turned on.

⇒ Check that the Ethernet cable is securely connected to the GPM units and to the Ethernet switch (hub).

- What if there are some amber lights, but not one for every other GPM?

⇒ Then your network connection is OK, but there is something wrong with the network connection for one or more of the other machines. Check their Ethernet connections.

Listen to your instrument

Press the selector button next to the blinking amber light. Look at the screen. At the top it should say “Mix: volume”

- What if it says “Mix: Pan” or “Tuner”?

⇒ You have probably accidentally turned the Function knob. Turn it one or two clicks until you see "Mix:volume"

- What if it says something else?

⇒ You have probably accidentally pressed the Mode button and placed the GPM in Setup mode. Press the Mode button once. You should see a solid green LED next to the Mode button.

Turn the Data Knob under the screen clockwise. If you look at the screen, you can see that the control is labeled "Volume" as you turn the knob; you will see the volume on the screen increase from 0. Set it at 50 to start. You are changing the volume of your instrument in the mix.

Turn the volume knob to the right of the screen clockwise. This increases the volume of the mix in your monitor, headphones or earbuds.

Play your instrument or speak into your microphone. You should hear it in your monitor.

- What if there is no sound?

⇒ Check your instrument or microphone.
⇒ Check that your instrument or microphone is connected to Input A or Input B.
⇒ Check that there is LED activity next to the Gain A or Gain B (depending on which connector you have used for your instrument). If not, turn the appropriate gain knob clockwise while playing to increase the gain.
⇒ Make sure that you have selected the correct channel in the mix. The green light should be on next to the same Selector button as the blinking amber.
⇒ Check that the red LED next to your Selector button is not solid on. If it is, you have accidentally set this channel to Mute.
⇒ Try increasing the volume in the mix by turning the Volume knob under the screen.
⇒ Try increasing the monitor volume by turning the Volume knob the right of the screen to increase the monitor volume.

Listen to the other instruments

When all musicians can hear their own instrument it is time to listen to the others. Have one musician play. Press the selector button next to the first (non-blinking) amber light that is on. Turn the volume knob under the display to make the volume non-zero. If you hear no sound, go on to the next Selector with an amber light. Turn this volume knob. Continue until you can hear the instrument. When you do, you have found the channel for that instrument. Set the volume to suit your preference.

- What if none of the channels seem to work? Check the network connection of the GPM belonging to the musician you wish to hear. (See "Check your network connection" above.) Check that the other musician can hear the instrument locally. (See "Listen to your instrument" above.)

After you have set the desired mix volume for the first musician, do the same for all other instruments.

Make some music

Congratulations! You have checked out all of your GPM units - and you have created your first personal mix.

Creating a Profile

The power of the GPM will only be released when you learn to use profiles. A profile allows you to assign a meaningful name to each audio source, to assign it to a channel, and to store source volume and pan settings so you can get the same mix every time you turn on the GPM.

Plan ahead

There are many possible ways to configure your GPM units. We will discuss the simplest way here. As you gain experience, you can alter the profile that we create here, or create new ones.

The simplest approach is to configure all the GPM units used by your band so that the same source appears on the same channel on each GPM unit. Each musician will then set their own volume and pan settings for the source to create a personal mix.

1. Decide what type of sources each GPM unit will provide. A GPM unit can provide a single stereo source, a single mono source or two mono sources.
2. Choose a name for each GPM unit. A good choice would be the name of the musician who will be using the unit. Unit names are limited to 6 characters, and each unit name must be unique.
3. Choose a name for the input on each unit. If you have two mono sources you will need two names; if stereo or one mono you will need one name. A good choice is the name of the instrument.

⇒ The combination of unit name and input name will identify the source in the mix. If the unit name is “John” and the two mono inputs are “guitar” and “vocals” then the two source names in the mix will be “John:guitar” and “John:vocals”.

4. Decide which channel will be assigned to each source in the mix. This will determine which Selector button selects that source when you want to change its volume or pan position or to mute or solo it. You can cluster them together, using 1, 2, 3, 4, etc. or you can space them out on the display, using 1, 3, 5, 7, etc. In addition, you can group them as you like.

In this example we have seven sources named “John:guitar”, “John:vocals”, “Paul:bass”, “Paul:vocals”, “George:guitar” , “George:vocals” and “Stan:drums”. We have decided that we want all of the vocals grouped together on the top row of selectors and all of the instruments on the bottom row. So our channel assignments will be:
John:guitar - 9
John:vocals - 1
Paul:bass - 10
Paul:vocals - 2
George:guitar - 11
George:vocals - 3
Stan:drums - 12

Planning is complete. It is time to run the Configurator. Please refer to Chapter 3, page 18 of the GPM-216 Manual.

Appendix B

Beatnet Software

Behind the front panel of the GPM-216 there is a Linux computer running Glyph's Beatnet software. This is an embedded Linux OS that interfaces with the front panel and allows you to mix a personal monitor and program the GPM-216. It can be upgraded with new software for added features and can accommodate future expansion of the hardware also.

Appendix C

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Version 2, June 1991

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