m701 Audio Recording Interface

Owner's Manual – Revision E / 05/21/2026

Firmware version: 1.2.1

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1 Welcome

Thanks for purchasing the m701 Audio Interface. It has been painstakingly designed and built to provide you with a beautiful sounding, configurable and reliable recording system. While the m701 is designed to be easy and intuitive to use please familiarize yourself with the setup and operational details contained in this manual. And as always with this or any other Grace Design products, please don't hesitate to reach out if you have any questions. We are available by telephone Monday – Friday, 9AM to 5PM MST, or by email at service@gracedesign.com. Also, other information including technical documents and firmware can always be found on our website – www.gracedesign.com. Thanks for reading and enjoy your m701!

2 Important Safety Information

2.1 General

- Indoor use only
- Ordinary Protection: This equipment should not be exposed to dripping or splashing.
- Avoid placing objects filled with liquids, such as vases or glasses, on this equipment.
- Class I Equipment (grounded type)
- Electrical rating: 90-240V~ 50-60Hz 75W
- Pollution Degree 2
- Installation (Over voltage) Category II for transient over voltages.
- Maximum Relative Humidity: <80%
- Operation temperature range: 10 °C to 40 °C
- Storage and transportation temperature range –40 °C to 70 °C
- Maximum altitude: 3000m (9843 ft)
- Equipment suitable for continuous operation

2.2 Safety Marking Symbols

This symbol, located on the equipment and in this manual, refers to important instructions. Read this manual thoroughly before operating this equipment.

This symbol, located on the equipment and in this manual, indicates the potential for electrical shock hazard.

2.3 Service Information

The Grace Design m701 contains no user serviceable components. Contact Grace Design for repair and upgrade information. In the event that your Grace Design m701 needs to be returned to the factory, contact us for a return authorization number.

2.4 California Proposition 65 Warning

This product may contain metallic nickel, a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

3 Overview And Features

3.1 Features

- Up to 64 channels of AD/DA IO
- Up to 340 channels of digital IO
- AES3 8 channel IO included
- ADAT 8 channel IO included (SMUX modes available)
- SPDIF 2 channel IO included
- Word clock IN and OUT with 75Ω termination control
- Ethernet port for GraceNet web user interface
- USB Host connector for firmware upgrades or Wi-Fi access point adapter
- Digilink IO Option 32 x 32 channels
- Dante IO Option 64 x 64 channels
- Ravenna IO Option 64 x 64 channels
- USB IO Option 32 x 32 channels
- AES3 Option 24 x 24 channels
- ADC Option 8 channels
- DAC Option 8 channels
- Mic preamp option 4 channels
- 32 x 8 low latency monitor mixer
- Full featured front panel user interface with WVGA display.
- Universal input AC power with redundant power supplies for high reliability

3.2 Description

The m701 is a modular system allowing for many combinations of analog and digital IO. There are eight 8

channel converter slots, two 64 x 64 channel digital interface slots and an additional option slot. At the time of this writing the option slot accepts the 24 channel AES3 option module.

Converter cards include 8 channel ADC, DAC, and a 4 channel microphone preamplifier. The converter cards can be installed in any configuration of inputs and outputs.

Computer interface options currently include Dante, Ravenna (AES67 ST2112), and Digilink HDX.

The front panel user interface is fully functional and allows access to all of the m701 settings.

The GraceNet web UI allows complete control and configuration of the m701 from any web browser on desktop or mobile operating systems.

As a bonus, the m701 can fully control the Grace Design m108 microphone preamplifier from within the GraceNet UI. This allows for saving and recalling settings across a distributed system.

All of the settings in the m701 are saved in a workflow file. Workflow files can be copied, exported, and imported. An entire studio setup can be recalled in seconds.

The m701 features dual AC-DC converters in its power supply that provides high reliability and long life.

3.3 m701 Front Panel Controls

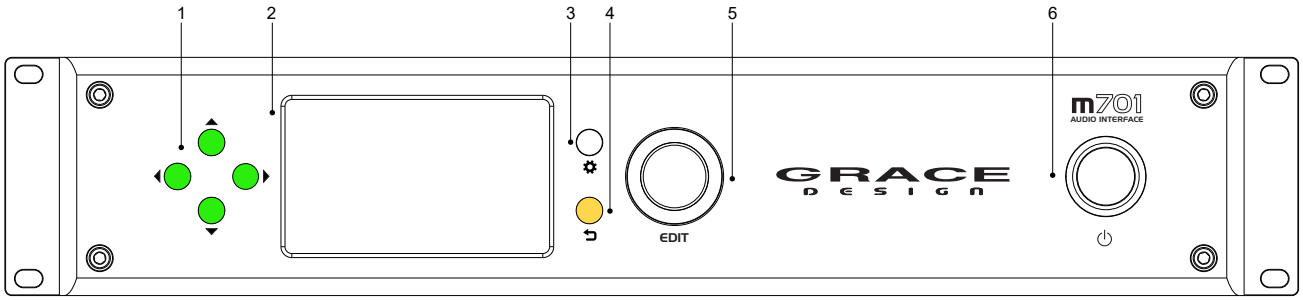


Illustration 1: Front Panel Controls

1. Navigation push-button
2. WVGA Color LDC Display
3. Setup push-button
4. Back (peak clear) push-button
5. Data Edit knob with push switch

6. Power/Standby push-button.

3.4 m701 Rear Panel Connections

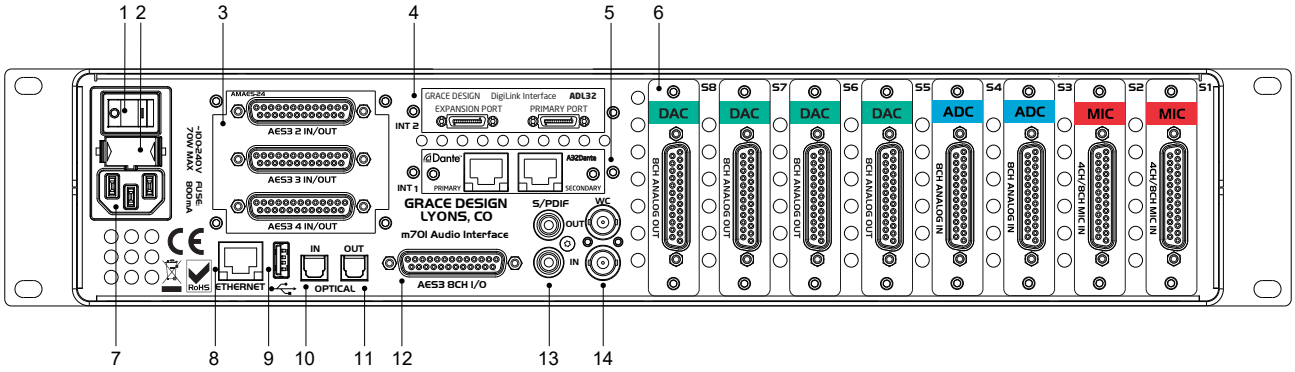


Illustration 2: Rear Panel Connections

1. AC Mains switch
2. AC Fuse Holder
3. Option Module
4. Digital Interface Slot 2
5. Digital Interface Slot 1
6. Analog IO Slots 1-8
7. AC Line Input IEC 320-C14
8. Ethernet RJ45 Control Port
9. USB A Host
10. Optical Digital Input
11. Optical Digital Output
12. AES3 DB25 8 channel IO AES59 (Tascam) pinout
13. SPDIF Coaxial IN and OUT
14. Word Clock/Loop Sync BNC IN and OUT

4 Installation

4.1 Unboxing your m701

4.1.1 Open and inspect your box

Please take care when removing the m701 from its OEM packaging. Our packaging is designed with

Korrvu© suspension inserts, which provide the best protection from the dubious underworld of freight handling – so save your packaging material. Inner boxes will contain all the items listed below. If you think you are missing anything, give your dealer or us a call and we'll get you taken care of right away.

Box contents:

- m701
- AC power cord
- 4pc 10-32 rack mount screws with nylon shoulder washers
- 4pc adhesive backed rubber feet

4.2 Connecting your m701

4.2.1 Base Unit Back panel connections

- Connect any clock or digital audio connections as required.
- Connect an Ethernet cable to the Ethernet control port. The network interface on the m701 comes preset from the factory for dhcp operation. For other network address modes see Network Setup.
- Verify that the AC mains switch is in the OFF position and connect the AC power cable.

4.2.2 Option Module connections

- Connect ADC and DAC modules with DB25 cables. The pinouts are all to the AES59 (Tascam) standard for 8 channel analog.
- Connect Mic Pre modules with DB25 cables. Note that the Mic Pre modules are 4 channels instead of 8. If only one Mic Pre module is installed then only the first 4 channels of the DB25 connector are used. If two Mic Pre modules are installed then the modules will be linked together so that all 8 channels appear on the lower Slot number card. The higher Slot numbered card will have a dust cap over its DB25 connector.
- Digilink: The Digilink interface option has two connectors on it. Only the Primary connector is used. The m701 emulates 2 Avid HDIO interfaces for a total of 32 x 32 channels of IO.
- Dante/Ravenna: These Ethernet based interfaces each have two 1000T Ethernet connectors. Connect according to your Dante/Ravenna network configuration needs.

5 Operation

5.1 Getting Started

After making the audio, control, and power connections, the m701 can be put in to standby mode by turning on the AC Mains power switch on the rear panel. In standby mode the front panel power switch

will illuminate yellow. Pressing the front panel power switch will activate the boot sequence and the switch will illuminate green. When the m701 has booted and is operational, the switch will illuminate white.

Once the m701 is powered up for the first time, the following configuration settings will need to be made:

- Set the system clock source
- Change any routing to suit your studio application
- Create Cue mixers if necessary.

These settings can be made from the front panel interface or via the GraceNet web based interface.

If the m701 is connected to a computer LAN with dhcp, the GraceNet user interface can be viewed on any computer browser. The URL to the m701 will be shown on the lower right corner of the front panel LCD screen. In the absence of a dhcp server, the m701 can be set to a static IP address or used in link-local mode.

5.2 Front Panel Interface

5.2.1 Home Screen

The m701 front panel interface allows for simple control and configuration of all system settings.

When the m701 powers on it shows the "home" screen. The home screen displays level meters for Input, Output, and Mixer IO channels. Analog IO meters will be on the top row while digital interface meters will be on lower rows.

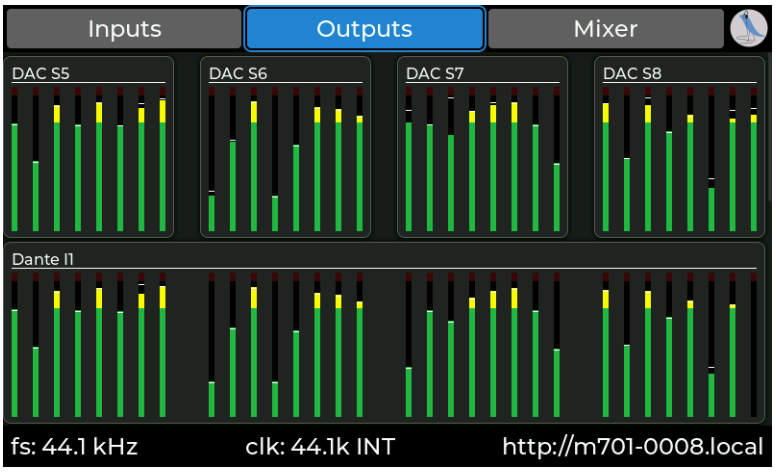


Illustration 3: Home Screen showing output meters

To navigate the meter views use the ◀ ▶ navigation buttons or turn the EDIT knob to select the tabs at the top of the screen. Push the EDIT knob to select a tab to view it's meters. Each row of meters shows 32 channels so a total of 64 channels can be viewed at one time. If there are more than 64 channels in your m701 system use the ▲ ▼ navigation buttons to scroll up and down.

The bottom band of the Home screen displays the current system sample rate, the clock source and status, and the URL for finding the m701 on a web browser.

While on the home screen pushing the back button will reset meter peak overs.

5.2.2 Setup Screen

To access the setup screen press the setup button. The setup button will flash on and off and the main Setup menu will be displayed.

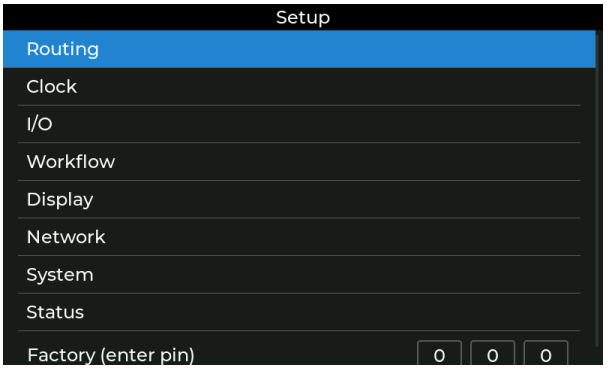


Illustration 4: Main Setup Screen

To navigate the setup menu screen use the ▲ and ▼ navigation keys or turn the EDIT knob to select menu items from this list. Pres the EDIT knob to select a menu item.

Once in a setup screen, the back < in the upper left corner will be selected with a blue outline. Pushing the EDIT knob when this is selected will return to the Setup Menu. Pushing the back button will also return to the Setup Menu. Rotating the EDIT knob or using the navigation buttons will move the selection to other setup elements.

Pressing the setup button will exit the Setup Menu. If any setting have been changed while in Setup mode a dialog box will appear asking if you want to:

- Save and Exit
- Cancel Exit (and return to Setup)
- Revert and Exit (don't save changes)

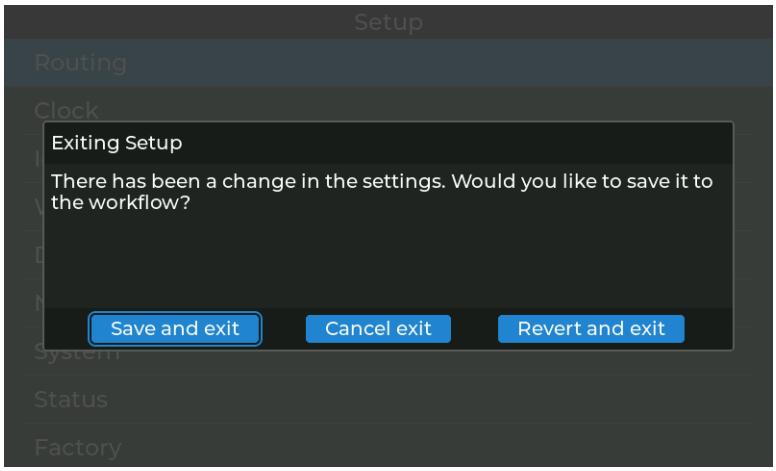


Illustration 5: Exit Setup Confirmation Dialog

Each setup menu is explained in the Front Panel Setup section of this manual.

5.3 Network Connections

The m701 comes with an Ethernet control connection as a standard feature. However, the USB host connector can be used to add a secondary network connection: wired Ethernet, Wi-Fi Hot Spot, or Wi-Fi client. In this manual we will refer to the Ethernet control port as the Primary network interface and any USB network adapter as the Secondary network interface. The secondary network interface can be used for supplying studio clients with a dedicated network for accessing the m701 Cue Mixer pages.

See the GraceNet web UI Network setup or the Front Panel Network setup for details.

There are 6 typical network configurations for the m701 although other configurations are possible.

1. **Ethernet only**. The m701 primary interface is connected to a network via the RJ45 Ethernet jack. If the network contains a DHCP server then the m701 can be configured to get an IP address automatically. Otherwise the IP address can be set to Static and configured manually.

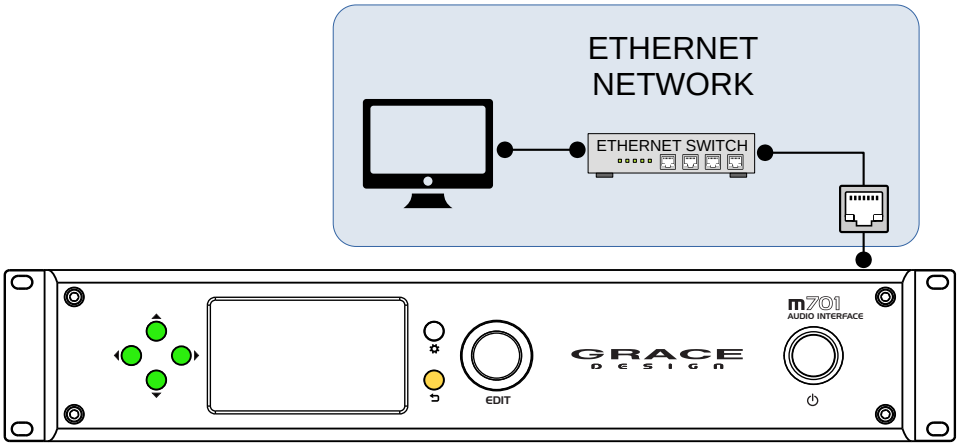


Illustration 6: Network Configuration 1

2. **Ethernet and USB Wi-Fi hot spot.** The m701 is connected to an Ethernet network and is acting as a Wi-Fi hot spot. In this configuration the studio manager can control and configure the m701 and clients can connect to the m701 via the hot spot.

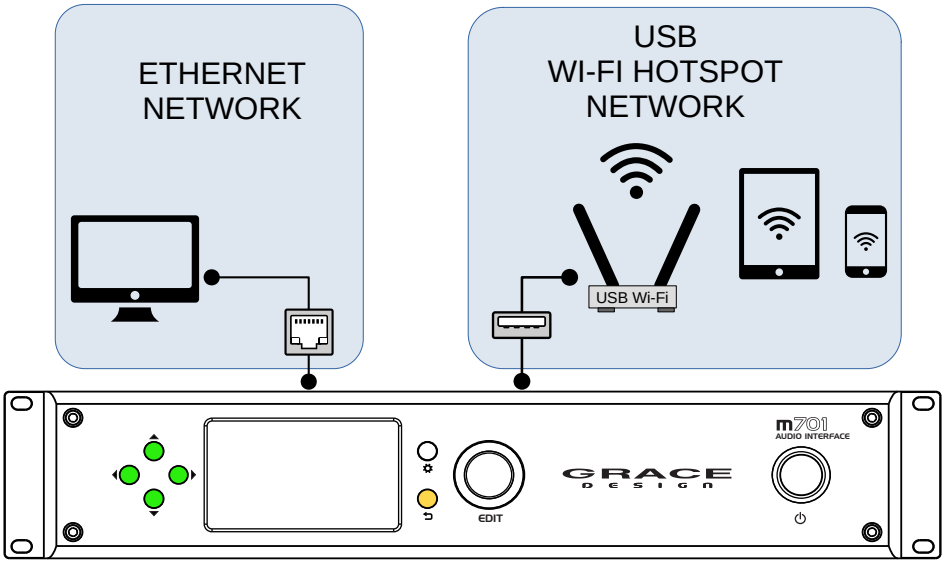


Illustration 7: Network Configuration 2

3. **Ethernet and USB Wi-Fi client.** The m701 is connected to an Ethernet network and an existing Wi-Fi network. In this configuration the studio manager can control and configure the m701 through the main GraceNet web UI while clients can use Wi-Fi connected devices to access the Client Cue Mix pages.

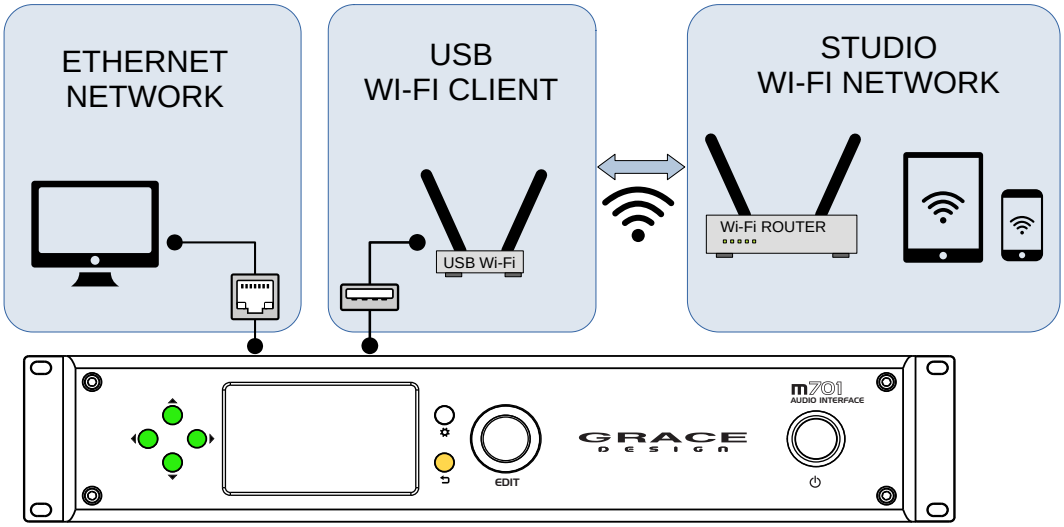


Illustration 8: Network Configuration 3

4. **Ethernet and USB-Ethernet**. The m701 is connected to an Ethernet network and an existing separate network. The USB-Ethernet connection can be to an existing Wi-Fi router.

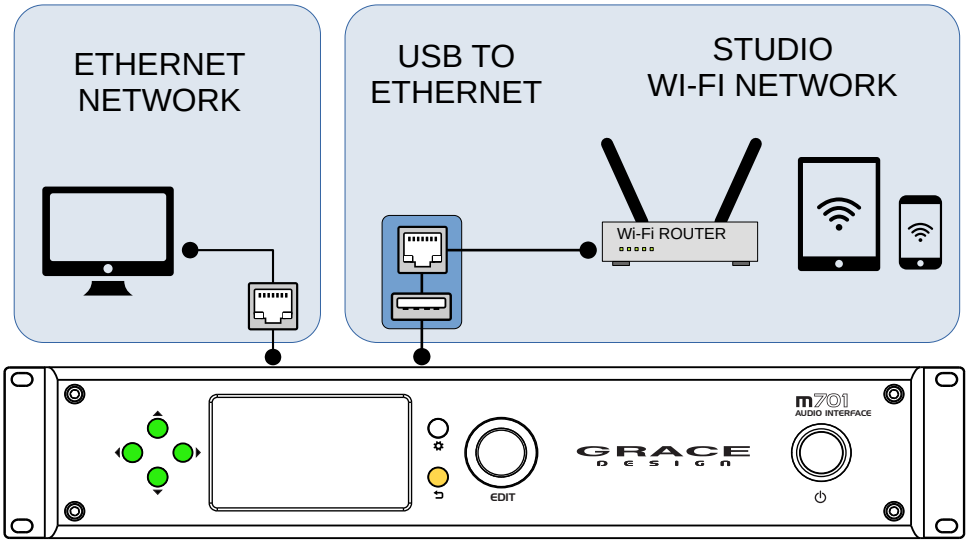


Illustration 9: Network Configuration 4

5. **Ethernet in Link-Local mode.** The simplest connection to the m701 can be made by connecting the Ethernet port directly to the Ethernet port on a computer. In this configuration the m701 auto-configures it's IP address so that it can communicate with the computer in the absence of a DHCP server and without the complication of setting up a static IP address on both devices.

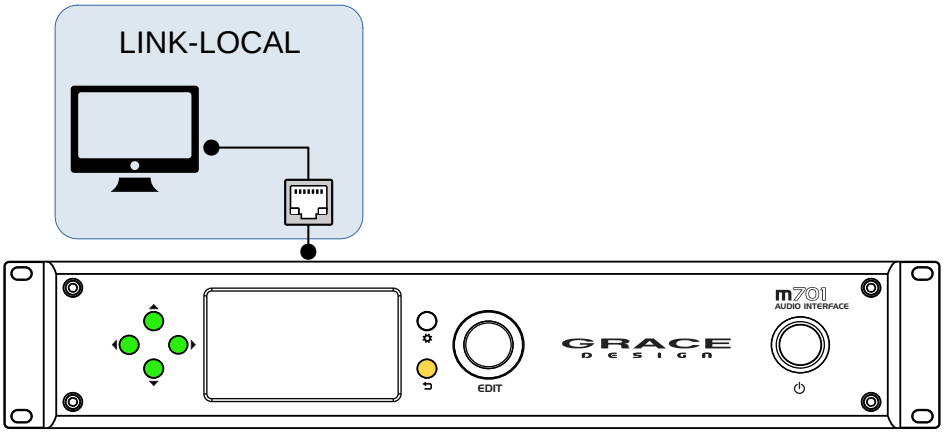


Illustration 10: Network Configuration 5

6. Wi-Fi only mode. If there is no access to a wired Ethernet connection the m701 can be connected to an existing Wi-Fi network or it can become a Wi-Fi hotspot. Note that this configuration requires that the network settings be made from the front panel interface.

NOTE: when more than one network interface is being used at the same time on the m701 it is important to make sure that the attached networks are separate from each other with no overlap in IP addresses. The m701 runs on a Linux operating system so any Wi-Fi or Ethernet adapter has to have supported drivers in the Linux kernel. While others might work we recommend using on of the adapters we have tested and are known to work well.

Most of the USB to Wi-Fi adapters listed have removable antennas which allow for placing them for better signal coverage if the m701 is located in an equipment rack using an SMA coaxial extension cable. Any of them can be extended with a USB extension cable.

The models we have tested are listed below:

USB to Wi-Fi Adapters				
Make	**Model**	**Chipset**	**Antenna Style**	**Wi-Fi Standard**
Netgear	A8000	MT7921AUN	Single integrated with remote dock.	Wi-Fi 6E
EDUP	AX3000M	MT7921AU	Dual removable	Wi-Fi 6E
ALFA Network	AWUS036AXML	MT7921AUN	Dual removable	Wi-Fi 6E
ALFA Network	AWUS036ACHM	MT7621U	Single removable	Wi-Fi 5
ALFA Network	AWUS036ACM	MT7610U	Dual removable with extension cable.	Wi-Fi 5
Panda Wireless	PAU0B	MT7610U	Single removable	Wi-Fi 5

Most USB to Ethernet adapters are USB class compliant and should work with the m701. Below are some devices that we have tested:

USB to Ethernet Adapters	
Make	**Model**
TP-Link	UE306
Ugreen	CR111
Ugreen	CM209

5.4 GraceNet web UI

GraceNet™ is a web based user interface for controlling the m701 and other Grace Design products like the m908. It uses an internal web server so that the m701 can be controlled by any device with a web browser (desktop, tablet, smartphone). To use GraceNet, the m701 must be connected to a network via the rear panel Ethernet connector or with a USB Wi-Fi adapter. The network configuration page in the setup menus allows for three different connection modes:

- dhcp
- static
- link-local

The m701 ships from the factory in *dhcp* mode for easy automatic configuration on a typical network with a dhcp server. For custom network configurations where the m701 IP address should not change then *static* mode can be selected.

For easy connection directly to a computer without a network *link-local* mode can be used.

In each mode the GraceNet web UI can be accessed by entering the following in to the URL line of a browser: **http://m701-xxxx.local** where xxxx is the last four digits of the m701 serial number. The ".local" tells the browser that this is a host on the local network not an internet destination.

Note: Most browsers will accept just the host name without the "http://" prefix. For example, simply type "m701-xxxx.local" in to the browser URL.

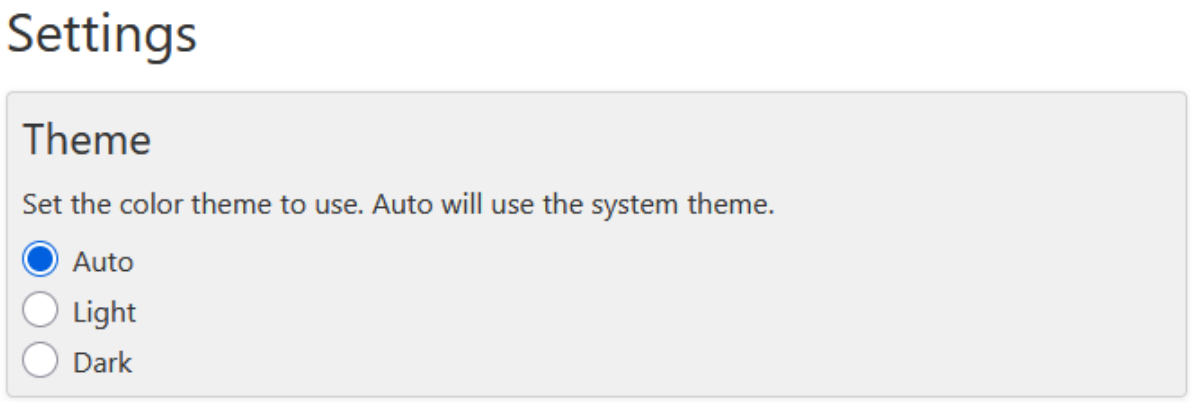
Alternatively, the IP address can be entered directly. The IP address is visible on the front panel Setup/Network menu.

Once connected to a network and the GraceNet address entered in to the URL, the m701 Home page will appear.

The GraceNet web UI is divided in to three primary sections which are accessible from the top menu bar.

5.4.1 Settings Page

The settings page allows the user to set the GraceNet web UI color mode. Options are Light, Dark, or Auto.



5.4.2 Home Page

The Home Page displays level meters for all of the m701 inputs and outputs.

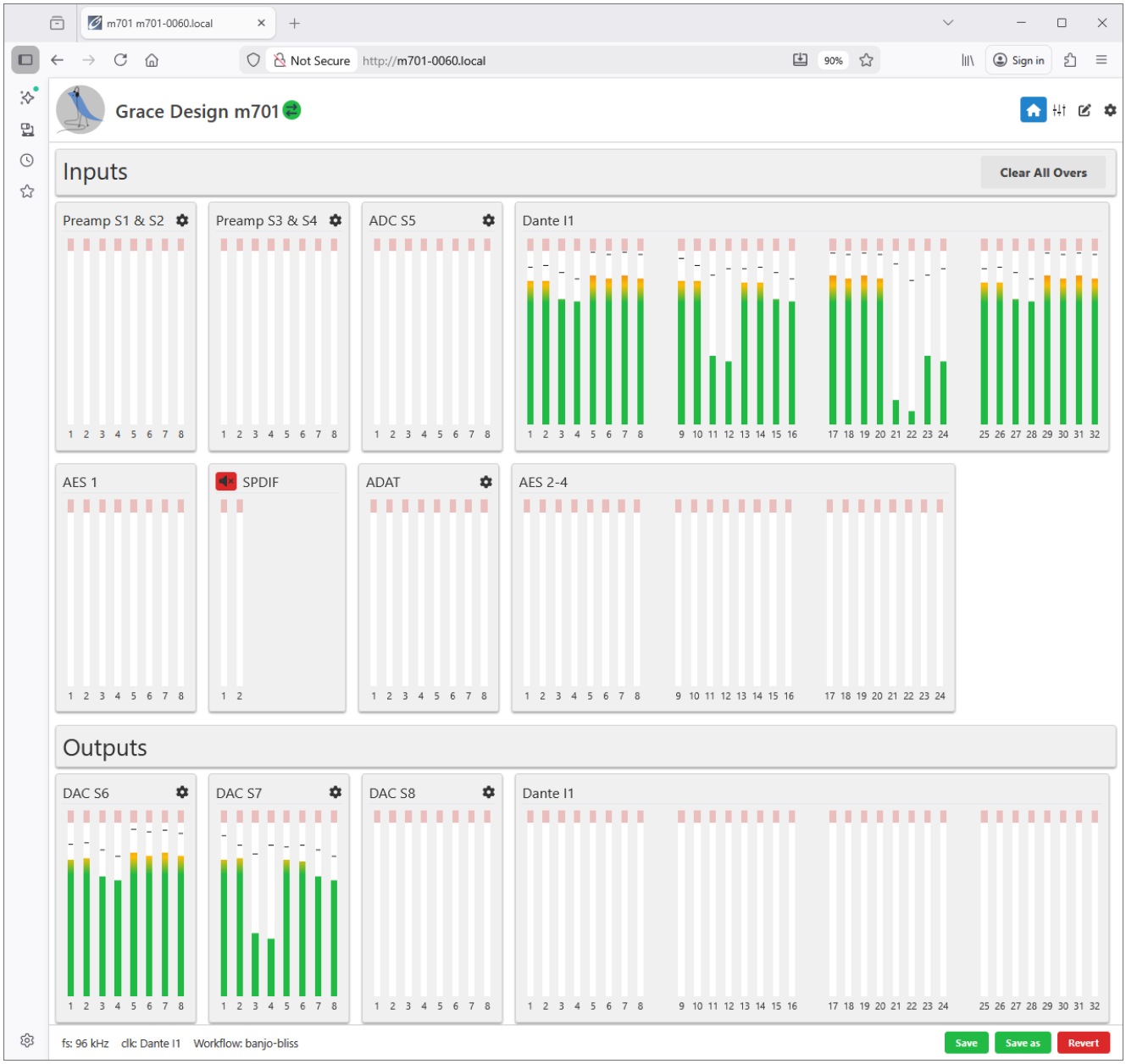


Illustration 11: Web UI Home Page

To see detailed level information click in the meter area of a group of meters and a pop-up window will appear with the meter level detail.

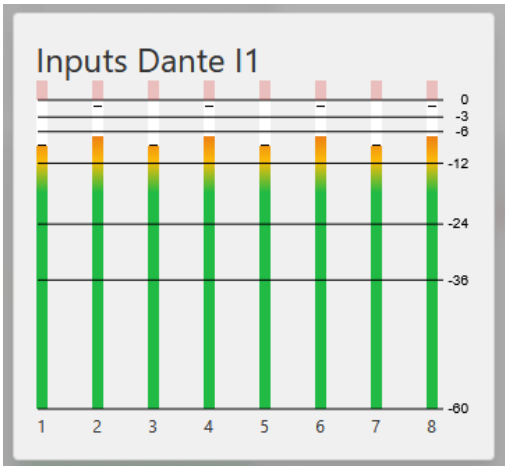


Illustration 12: Meter Detail Pop-Up

Wherever a setup icon is seen on the home page direct access to the setup panel is available.

The Mute Indicator will be visible on a digital input whose sample rate does not match the current system sample rate.

5.4.3 Mixer Page

The Mixer page displays the Cue Mixer console for the low latency internal mixer. If there are no mixers defined the page will be blank with a "Manage Cues" button that will take you to the Setup Cue Mixers page. Once one or more mixers have been created the Mixer Page will display them.

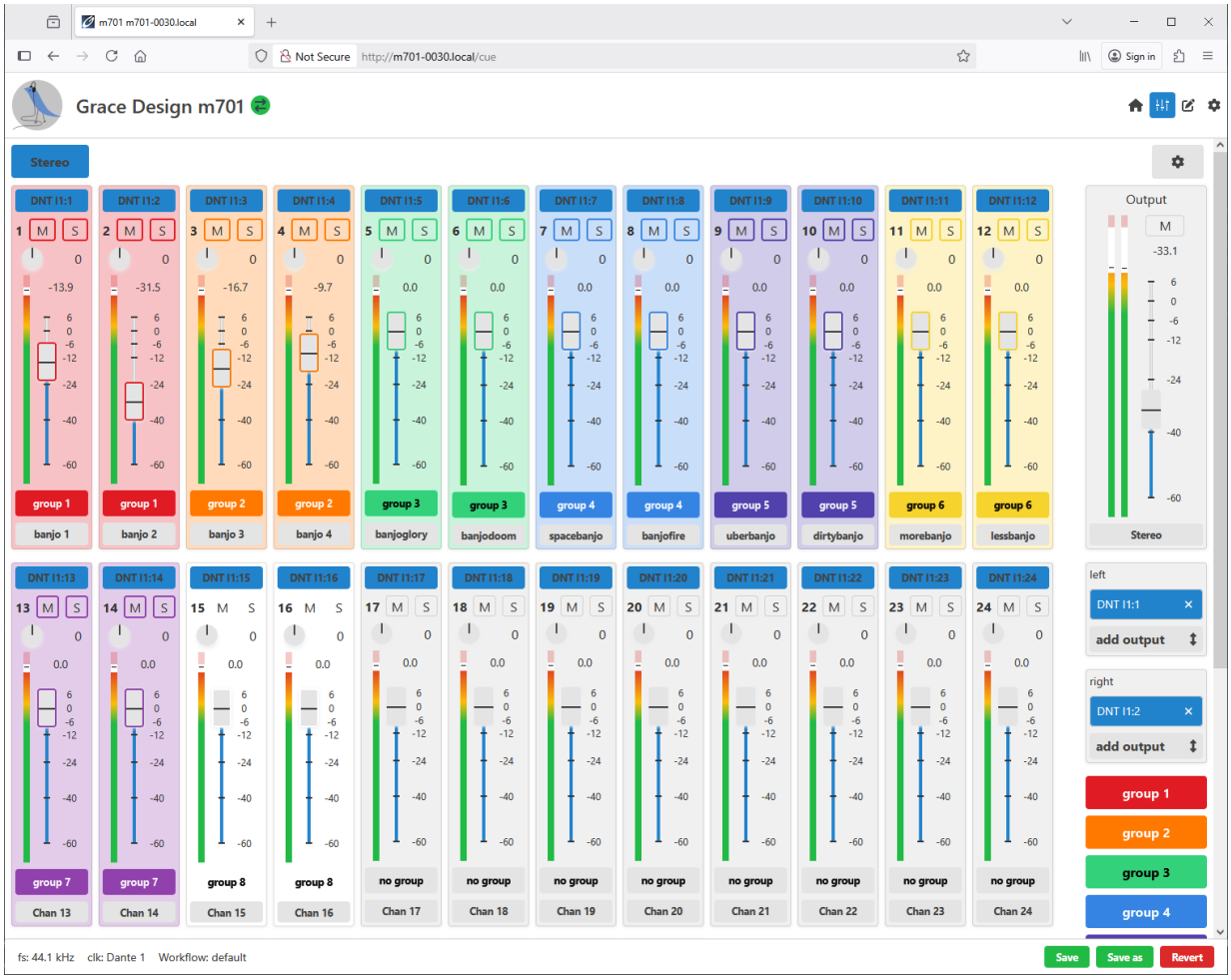


Illustration 13: Web UI Cue Mixer

Mixer input channels are on the left side of the screen and the Output fader is on the right side of the screen. Below the Output fader are the Group Enable buttons.

Each input channel contains the following elements:

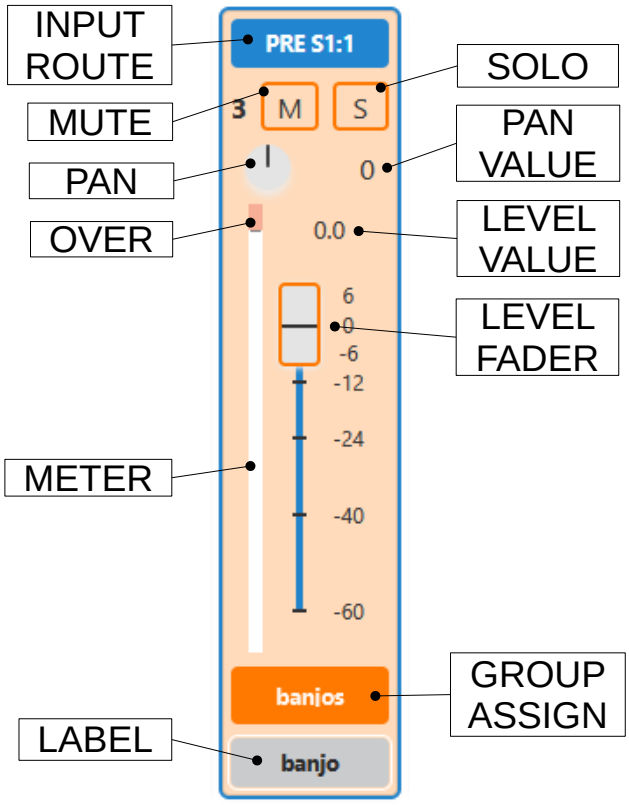


Illustration 14: Mixer Input Fader

- **Input Route** This drop down list routes any input channel in the m701 to the mixer input channel. Note that the input route will be identical for the same channel number of any of the cue mixers. Mixer input channel routing can also be done in the main Setup > Routing page.
- **Mute** The Mute button will mute the audio. If the mixer channel is the member of a group with Mute enabled as a group function any other channels in the group are muted also.
- **Solo** Clicking the Solo button will cause all of the other channels in the mixer to mute. If the mixer channel is the member of a group with Solo enabled as a group function any other channels in the group are soloed also.
- **Pan** The pan knob pans the input signal between the left and right output buss. To change the pan setting click-drag the knob in the up and down directions with a mouse. You can also click the Pan knob to select it and use the left/right arrow keys on a keyboard. As well you can click in the Pan Value field and directly enter a pan value from -100 (left) to 100 (right).
- **Level Fader** The fader allows for a volume range of +6dB to 60dB. Click and drag with a mouse or click-select and adjust with the keyboard arrow keys. As well, you can click in the Level Value field and directly enter a level value between 6 and -60. Double click the fader knob to set the fader to 0dB, Alt + Click will set the fader to -60dB.
- **Meter** The level meter indicates the level of the input signal pre fader.

- **Group assign** If groups have been created in Cue Mixer setup then they will be available in the group assign drop down menu.
- **Label** The label field is an editable text field to name the input.

The Output Fader panel contains the following elements:

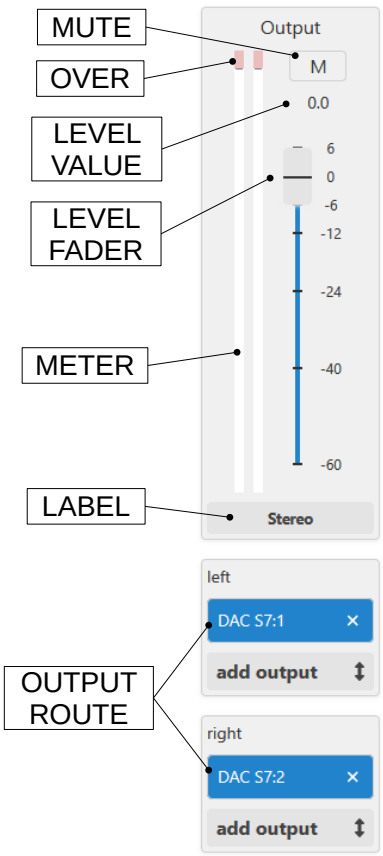


Illustration 15: Mixer Output Fader

- **Mute** Click the Mute button to mute the audio output from the mixer.
- **Over** The over indicator lights up when the level of the summed output signal reaches 0dBFS. Click the Over indicator to reset it.
- **Level Fader** The fader allows for a volume range of +6dB to 60dB. Click and drag with a mouse or click-select and adjust with the keyboard arrow keys. As well, you can click in the Level Value field and directly enter a level value between 6 and -60. Double click the fader knob to set the fader to 0dB, Alt + Click will set the fader to -60dB.
- **Meter** The level meter (two meters for stereo) indicates the level of the summed signal post fader.
- **Label** The output fader label will have the same name as the mixer as created in the Cue Mixer setup. Changed the name on this label will also change the name of the mixer.
- **Output Route** The blue output route boxes show the current output destination for the mixer. There can be more than one output route.
- **add output** This drop down menu selects the mixer output routes.

5.4.4 Client Mixer Page

The m701 Cue Mixer has an additional control interface that is simplified compared to the mixer described above. This "client" mixer is simplified for use by studio musicians who want to be able to

control the mix they hear in their headphones. It is also optimized for display on tablets or phones. As well there are no navigation links on the client mixer page so the user can not accidentally navigate away from the mixer to other configuration pages of the GraceNet UI.

To access the client mixers simply point a phone or tablet's camera at the QR code on the mixer setup page. The URL for the client mixers is http://m701-xxxx/user/1 where "xxxx" is the last four digits of the m701 serial number. The "1" indicates which mixer is being viewed. There are up to 8 possible Cue Mixers so this digit could be 1 through 8 depending on how many mixers have be created.

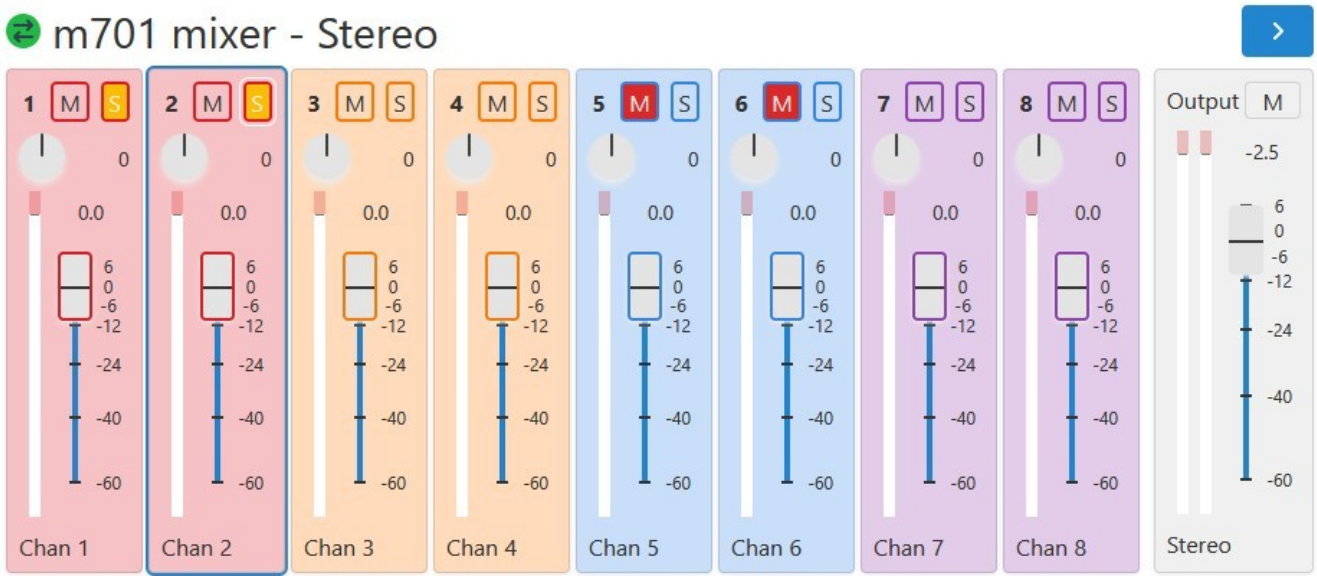


Illustration 16: Client Mixer

Note that the Client mixer does not have input routing or group assign buttons. In the upper right corner of the screen the ">" button will show and hide the master fader. If groups are defined for the mixer, scrolling down will reveal the group enable/disable buttons.

5.4.5 Setup Page

The Setup Page allows access to all of the m701 system settings. The Setup Page defaults to showing the system signal routing page. Available Setup pages are:

- Routing
- Clock
- I/O
- Cue Mixers
- m108
- Workflow

- Display
- Network
- System
- Status

The status bar at the bottom of the page contains some basic system status including current sample rate, clock source, and current workflow. As well there are Save, Save as, and Revert buttons.

The *Save* and *Revert* buttons will have faded color if the current workflow has no unsaved changes. If the workflow does have changes that are unsaved then the Save and Revert will be in full color. Clicking Save will save the workflow while clicking Revert will undo any changes since the last time the workflow was saved.

The *Save As* Workflow allows saving the currently loaded workflow to a new name. From the factory the m701 contains one workflow named "default". You can select Save As Workflow from the menu to save a copy of "default" to a name of your choosing.

See the GraceNet web UI Setup section of this manual for details on each setup page.

5.5 Channel Grouping

Cue Mixer channels and Microphone preamp channels can be grouped together so that multiple channels can be controlled simultaneously.

Note: Grouping is only available on the GraceNet web UI.

On a Cue Mixer, channels can be grouped so that fader level, mute, and solo functions can be controlled together. Up to 8 groups can be created for each Cue Mixer.

On the Microphone preamplifiers, if installed, the gain levels can be grouped together. Up to 8 groups can be created.

5.5.1 Cue Mix Grouping.

From the Setup > Cue Mixers page add a mixer group to the currently selected mixer. Enable the check boxes for the functions that you want to have grouped together. The options are fader, mute, and solo.

On the mixer page, each input channel can be assigned to group by clicking the group assign drop down.

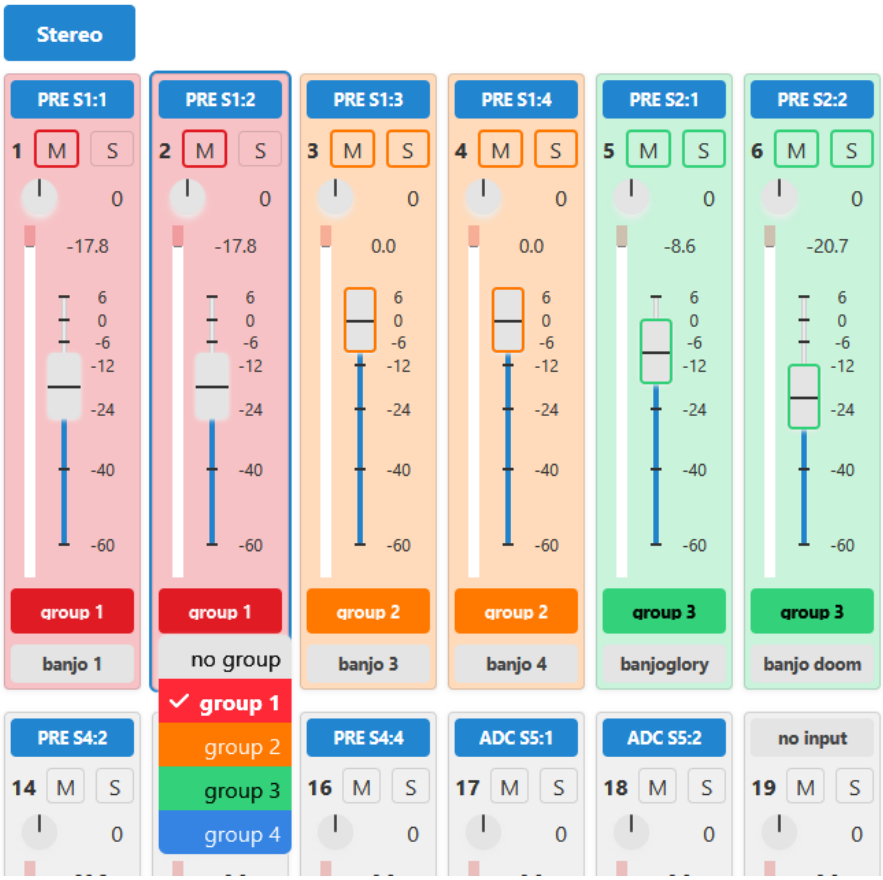


Illustration 17: Mixer Input Group Assign

When assigned to a group an input channel fader panel will change color to match the group color.

With two or more channels assigned to the same group the fader levels, mutes, and solos can be controlled together.

To make a change to an individual channel in a group hold the *Shift* key on your keyboard while dragging the fader or clicking on Mute or Solo. Alternatively, the group can be deactivated by clicking on the group enable buttons on the lower right side of the screen (under the Output fader and routing section).

5.5.2 Mic Preamp Grouping

If installed, the Mic Preamp card channel gains can be grouped using up to 8 groups.

From the Setup > I/O page add Preamp groups by clicking the "+" button.

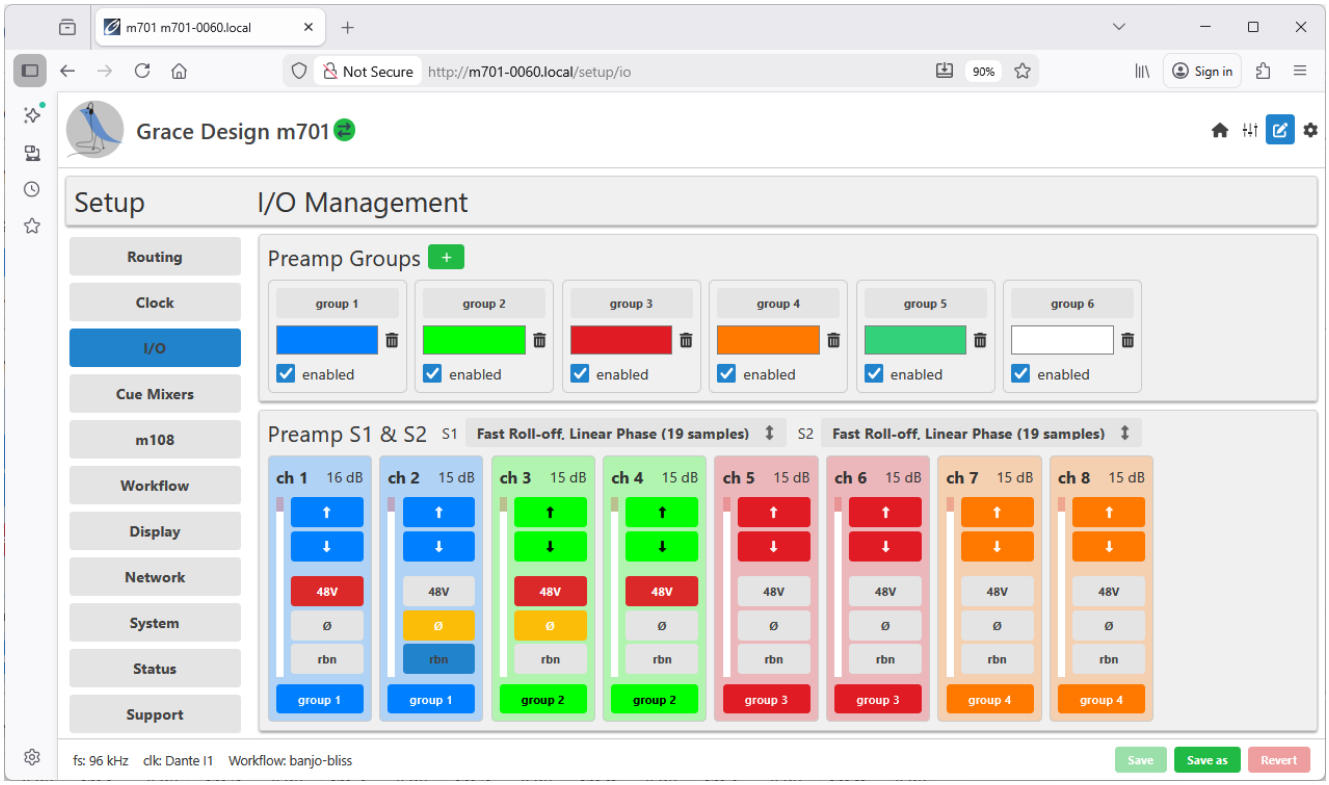


Illustration 18: Preamp Groups

Each Group has the following settings.

- **Group name**. The default name can be edited by clicking in the group name field.
- **Group color** The group color can be customized by clicking in the color rectangle.
- **Group enable** Click the check box to disable/enable the group.
- **Delete group** Click the trash can icon to delete the group.

Clicking the gain Up or Down button on a channel in a group will cause all other channels in the same group to increase or decrease by the same amount. To change the gain of a grouped channel individually hold the *Shift* key while clicking the gain adjust buttons or temporarily disable the group by clicking the "enabled" checkbox.

5.6 Clocking

The m701 System Clock can run from an internal crystal reference, external Word Clock, or digital audio input. See Clock Source Setup for configuration details.

For external clock sources, the m701 will attempt to lock to the System clock source selected in System setup. If the selected clock is at a valid sample rate (see Electrical Specifications for frequency ranges), the m701 will lock and the Clock Display on the front panel and GraceNet web UI will indicate the lock

status.

If the Selected Clock is present but not at a valid sample rate, the m701 will mute audio and indicate an unlocked clock condition.

The m701 has one clock domain. This means that all digital input and output signals need to be at the same sample rate. If the System Clock is at a different sample rate from any digital input connected to the m701, those signals will be muted.

If sound can not be heard on a digital signal input check that it is running at the same sample rate and is synchronous to the m701 system clock.

AES3 Clocking: When the clock source is one of the 8 Channel AES3 inputs, the m701 will lock to the lowest channel number with a valid signal. All signals are assumed to be at the same sample rate and synchronous to each other. If there are mismatched sample rates among the input signals for the input source, then audio will be muted and the system clock status will flash red.

If the clock source is set to a connector that is not at the same sample rate as any digital audio data source, then the audio data will be muted.

If the m701 system clock source is set to one of the Internal sample rates, then the m701 is the clock master. Any digital audio source connected to the m701 will need to be synchronized to the m701 word clock output or one of the AES, SPDIF, or Optical output connectors.

If there is a digital input source that can not be synchronized to an external clock (CD player for instance), then the workflow should only contain routing to and from digital IO that can synchronize to the m701.

Below are two tables that summarize the various clock and sample rate states that are indicated by the clk: display on the m701.

Clock Status			
Clock Status Display	System Clock Status	Audio Source Condition	User Action Required
White	Locked to indicated System Clock source	m701 will play audio using indicated clock.	None
Flashing-Red/White	Indicated clock source is invalid. The clock signal is missing or the frequency is out of the PLL lock range.	The m701 will mute all audio.	Check the input signal connection. Reconfigure clock source for a sample rate in the valid lock range

5.7 Word Clock In and Out

The m701 can accept a standard 5V/75Ω word clock signal from an external clock generating unit. This

might be a stand-alone master clock source or the word clock output from some other source. The m701 locks to the incoming word clock with our ultra low jitter s-Lock™ PLL. The PLL has a fast lock mode which rapidly acquires lock and then switches to a high jitter rejection mode with a loop bandwidth of 0.5Hz. This provides exceptional jitter rejection for the ADC and DAC sample clocks. In the event of a dropout or loss of incoming word clock signal, the intelligent PLL will remain at the last known valid frequency. When the signal is restored the PLL will smoothly re-acquire lock.

The word clock output allows the user to synchronize other digital audio equipment to the m701. When the menu setting **clock output** is set to <clock in> this connector output is a copy of the signal on the Word Clock IN jack. This mode is useful for "daisy chaining" multiple devices together in a system. When **clock output** is set to <system clock> this connector outputs a copy of the m701 system word clock. The Word Clock output jack is buffered and is designed to drive a 75Ω line at 5V.

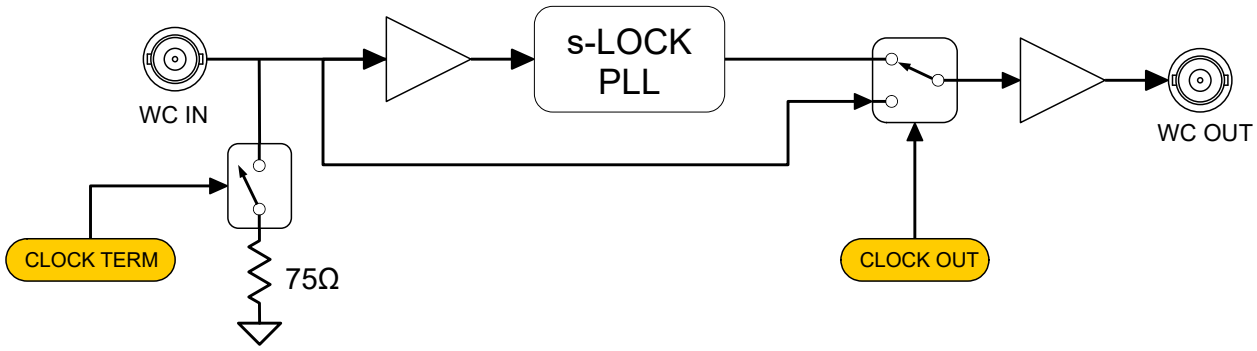


Illustration 19: Word Clock Flow Diagram

If the **clock output** parameter is set for <system clock> and the m701 is being synchronized to an external word clock, the Word Clock output will be a re-clocked low jitter version of the incoming clock. If the incoming clock is interrupted the m701 will continue to transmit on the Word Clock output at the last frequency that the system was locked to. When the input clock is restored the m701 will re-lock smoothly unless then new incoming sample rate has changed.

For use with Avid Pro Tools HDX systems the m701 Word Clock In and Out connectors can be configured for Loop Sync operation. See the DigiLink option section of this manual for details.

See Clock Setup for details.

The word clock polarity is high for left channel data and low for right channel data.

5.8 m108 Integration

The m701 can control up to 12 Grace Design m108 microphone preamplifiers from its Grace Net Web UI.

All of the m108 mic preamp, ADC, and built in digital mixer settings can be controlled. All of the m108 setting are saved in the m701 workflow.

To setup control of a m108 preamplifier:

- Open the GraceNet web UI and navigate to the setup page by clicking the icon in the upper right corner of the GraceNet page.
- Click on the m108 button on the left side of the page.
- Enter the IP address of the m108 in the address field and then click the Add m108 button.

- For settings details see the m108 Setup section of this manual.

6 System Setup

6.1 GraceNet web UI Setup Menus

To access the GraceNet web UI setup menus click on the setup icon:

The following setup buttons are on the left side of the screen.

- Routing
- Clock
- I/O
- Cue Mixers
- m108
- Workflow
- Display
- Network
- System
- Status

6.1.1 Routing

Click on the Routing button to show the m701 full routing matrix. This page shows all of the signal *sources* on the left side of the matrix and all of the signal *destinations* on the top of the matrix. The routing

matrix is made up of "blocks" for each hardware IO module. All of the existing routes will be displayed as green boxes.

The module names indicate the type of module and where it is installed in the m701.

For instance, ADC S5 is an 8 channel ADC located in Slot 5. DNT I1 is a Dante interface card installed in Interface slot 1.

There is a column of signal present indicators to the right of each Source Module block. When a signal is present the signal indicator will show as a green circle.

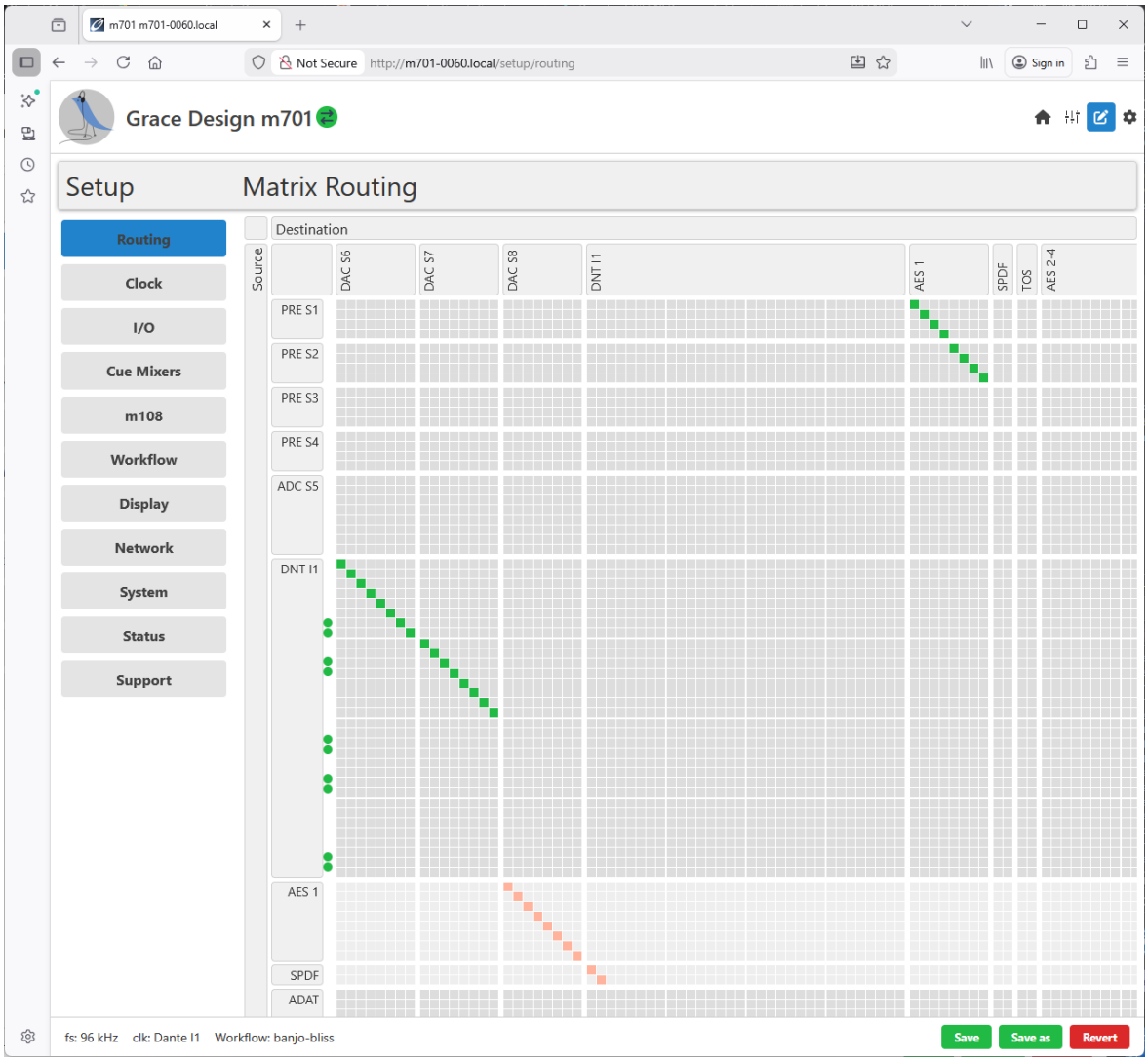


Illustration 20: Web UI Main Routing Page

Digital input sources that are muted due to sample rate mismatch are grayed out and routes are shown in

orange.

Clicking on a routing "block" in the routing matrix will show the actual routing pop-up where individual routes can be added or removed.

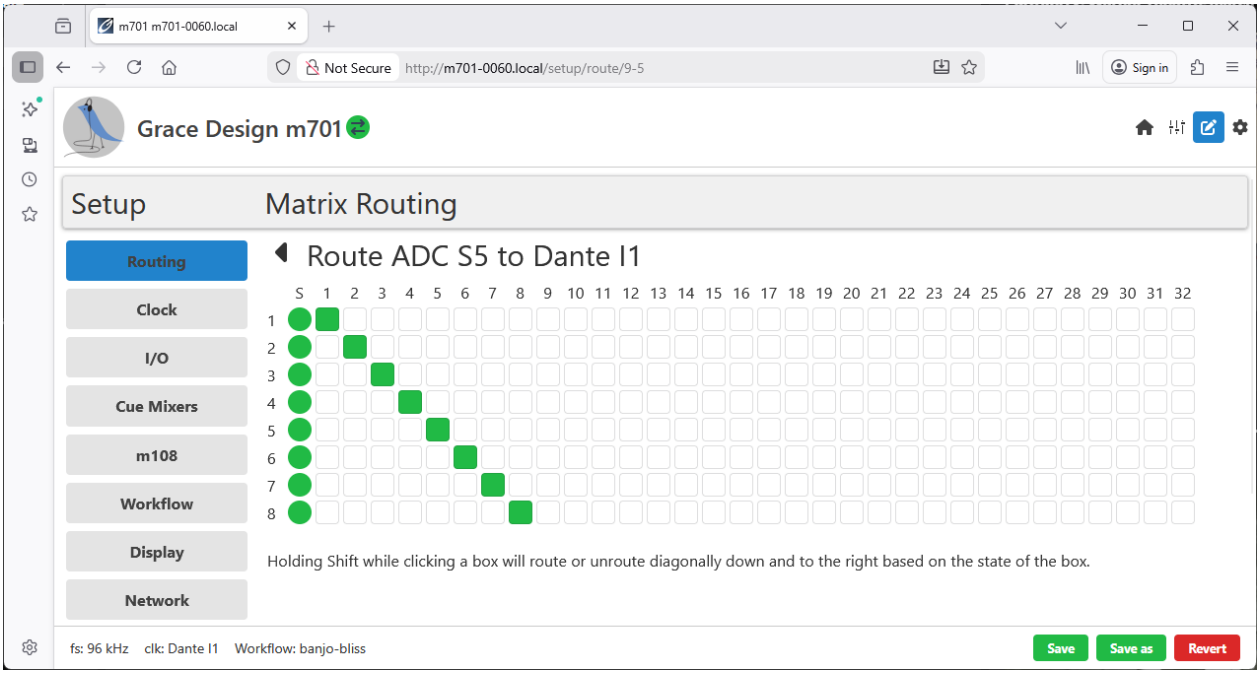


Illustration 21: Web UI Routing Block

From this screen you can click to route and un-route inputs to outputs. Holding the *Shift* key while clicking on an un-routed routing box will route all if the channels on the diagonal of increasing channel numbers. Holding the *Shift* key while clicking a routed box will un-route it and all of the channels on the diagonal of increasing channel numbers. A routed connection will show as a green square.

If a signal is present the signal present indicators will show as green circles next to the Source channel numbers.

If the routing source selected is muted due to a sample rate mismatch the Mute icon will appear next to the warning message. Routed connections will be indicated as orange squares.

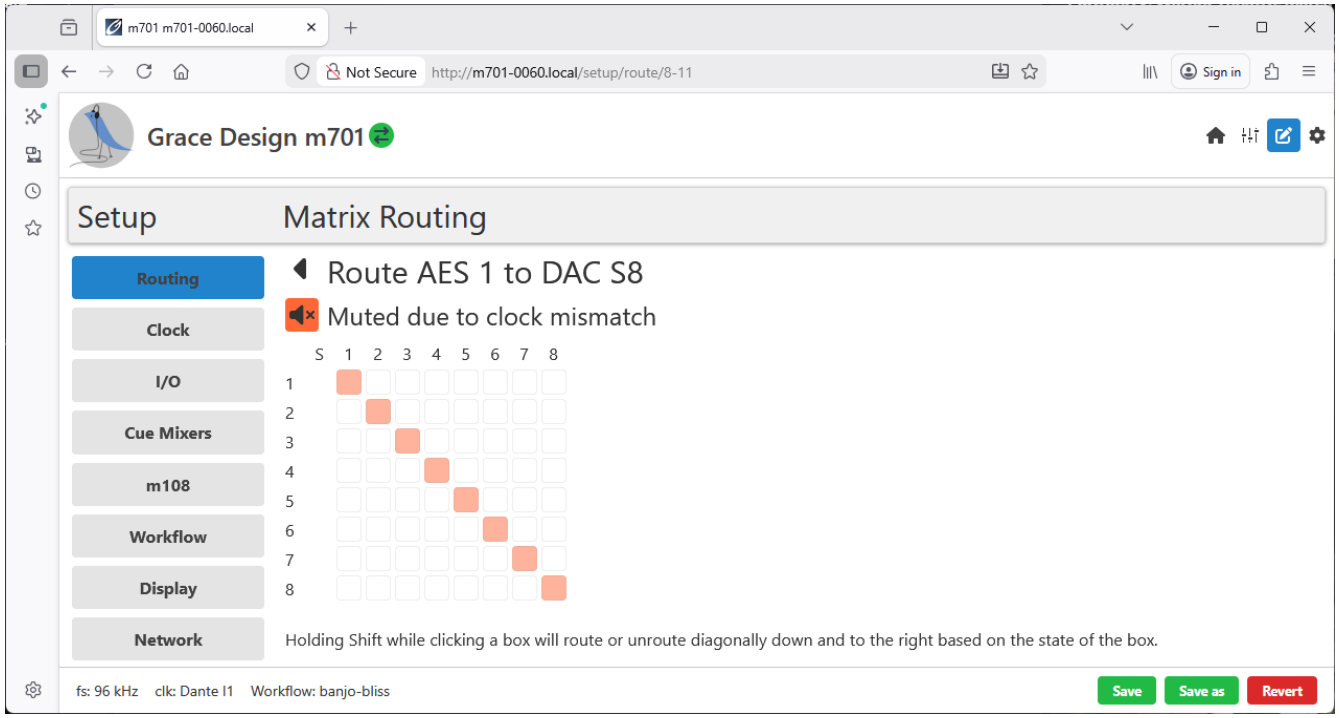


Illustration 22: Web UI Routing Block, Muted

Clicking the back arrow will navigate back to the main routing page.

NOTE: An input can be routed to multiple outputs but each output can only have one input.

6.1.2 Clocking

The Clock setup screen allows setting the system clock source as well as sample rate if using the internal clock as a source. It also provides controls for the word clock input termination and word clock output signal source.

Below the settings section of the screen all of the possible clock sources in the m701 are listed with the current sample rate and source state.

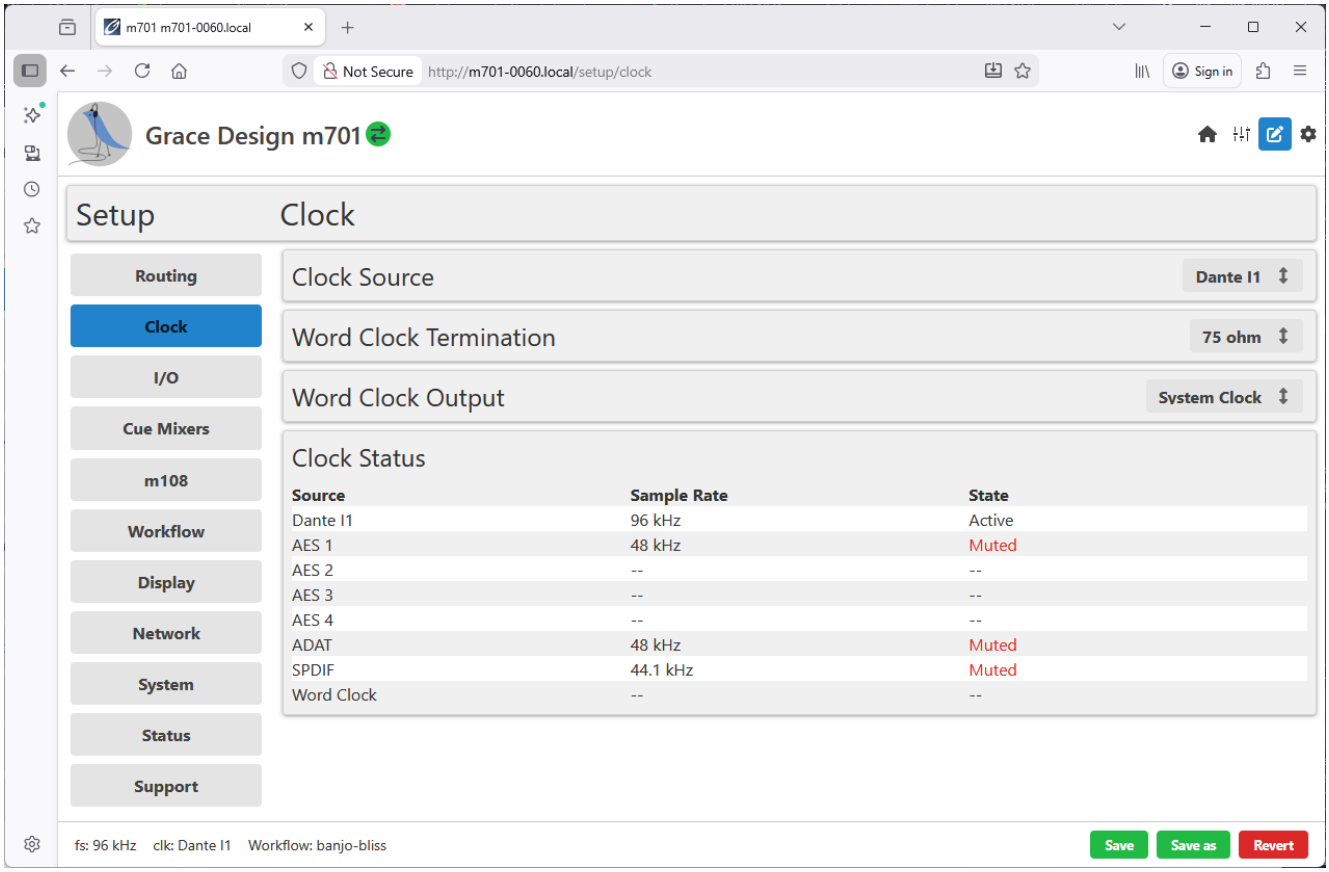


Illustration 23: Web UI Clock Setup Page

The following settings and status are available on this page:

- **Source** Selects the system clock source. Available clock sources depends on options installed. <44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz internal, *Interface* 1, *Interface* 2, AES 1, AES 2, AES 3, AES 4, Optical, SPDIF, Word Clock> Note: If a Dante option is installed in Interface Option slot 1 then the Clock Source list will indicate "Dante 1". The same goes for Digilink, Ravenna, and USB interface options. AES1 is the base 8 channel AES3 connector. AES 2-4 are visible if the AES 24 Channel Option Module is installed.
- **Termination** Sets the BNC clock input connector termination. Options are <75 Ohm, 1M Ohm>
- **Output** Sets the signal source for the BNC clock output connector. Options are <Clock in, System Clock>
- **State** Shows all of the available clock sources that are installed in the m701 and indicates the current sample rate of each as well as if the audio is active or muted. Clock sources that are not at the current system sample rate will have their audio automatically muted.

6.1.3 I/O

The IO setup page contains the control panels for the ADC, DAC, Mic Preamp, Option Module, Interface Module, and Baseboard IO connectors.

6.1.4 I/O Microphone Preamplifier Groups:

If one or more Mic Preamp cards are installed then the Preamp Groups panel will be visible. This panel allows the creation of up to 8 preamp gain control groups. Each group can be custom named and assigned a custom color.

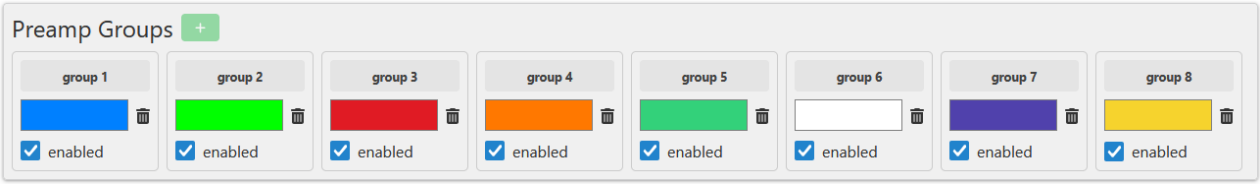


Illustration 24: Web UI Mic Preamp Group Controls

The controls for each group are:

- **name** The group name field can be edited with a custom name up to 8 characters long.
- **color** Click in the color box to pick a custom color for the group.
- **delete** Click the trash can icon to delete the group.
- **enabled** Click the enabled checkbox to enable and disable the group.

6.1.5 I/O Microphone Preamplifier:

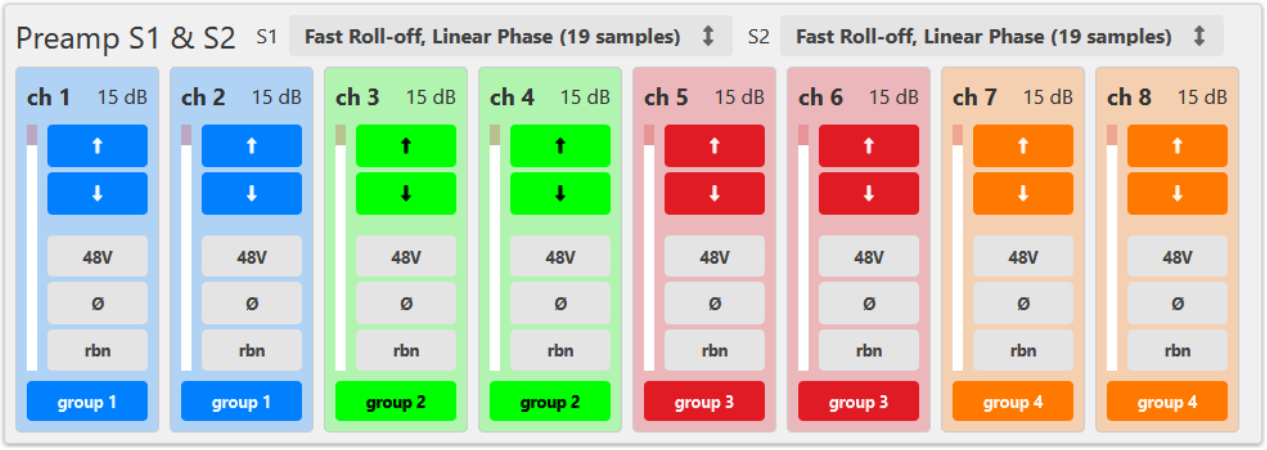


Illustration 25: Web UI Mic Preamp Controls

There is a control panel for each microphone preamplifier installed in the m701. Gain, +48V, phase reverse, and ribbon mode can be set for each channel. As well the signal level can be monitored on the level meter on each channel.

The Mic Pre option cards are 4 channels each. Two Mic Pre cards can be installed in adjacent slots and connected internally so that the lower slot number card will have all 8 inputs on the same DB25 connector.

If two Mic Pre modules are installed in adjacent slots then the UI will show them as an 8 channel preamp.

The controls for each channel are as follows:

- **Gain** Clicking on the ↑ and ↓ buttons will adjust the gain. As well you can click in the gain value field and enter the gain directly. The gain range is -6dB, and 2dB – 69dB in 1dB steps. The gain control uses zero crossing detection to minimize clicks and pops while changing the gain.
- **48V** The 48V button will toggle +48V on and off. The +48V supply uses a soft turn on and turn off to minimize transients. If the rbn button is on then the 48v will not engage.
- **rbn** The rbn button toggles Ribbon Mode. Ribbon mode provides two functions: Disables +48V so that mic power can not be accidentally applied to the microphone. Raises the input impedance from 8kΩ to 20kΩ which significantly improves low frequency flatness on most ribbon microphones.
- **group** The group assign is at the bottom of each channel. Click on this to select a group assignment.

- **Over Clear** Click on the over indicator at the top of the level meter to clear the over indication.
- **ADC Filter Type** Selects from a list of 4 digital oversampling filter responses. The options are:
  - Fast Roll-off, Linear Phase (19 samples)
  - Fast Roll-off, Minimum Phase (5 samples)
  - Slow Roll-off, Linear Phase (7 samples)
  - Slow Roll-off, Minimum Phase (5 samples)

  See Converter oversampling filter characteristics for a details on each filter type.

Note that if a Digilink Interface card is installed and it is set to enable Pro Tools Delay Compensation Compatibility then the filter settings will be grayed out and can not be changed.

6.1.6 I/O ADC

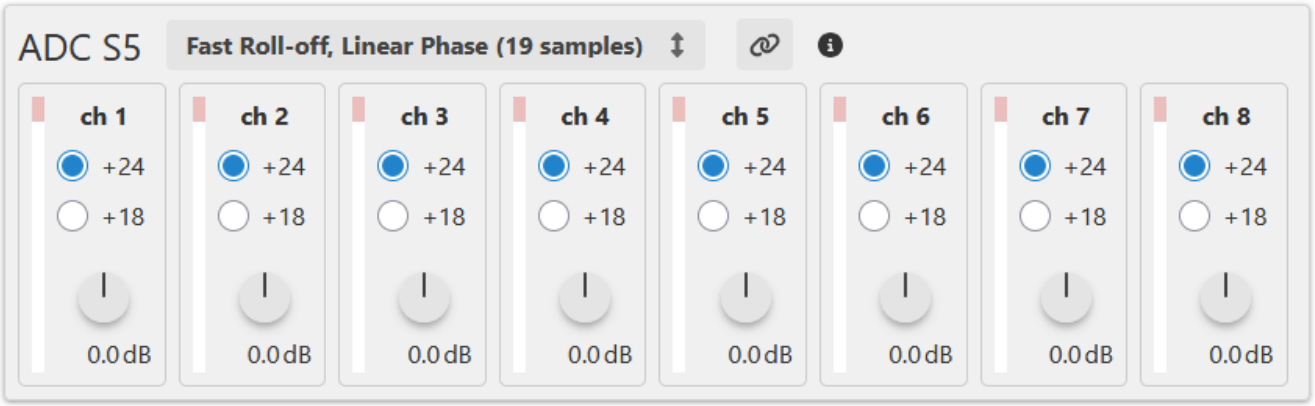


Illustration 26: Web UI ADC Controls

This is the control panel for each ADC in the m701. There is a hardware input reference level, digital trim for each channel and an ADC converter oversampling filter type selection.

- **Sensitivity** The sensitivity radio buttons will toggle the hardware input reference level <+18dBu or +24dBu = 0dBFS>.
- **Digital trim** Click and drag the trim knob to adjust the digital trim level. As well the trim level can be directly entered in the trim field. The range is -20dB to +20dB in 0.1dB steps.
- **Over Clear** Click on the over indicator at the top of the level meter to clear the over indication.
- **Link** Clicking the Link button allows all of the settings on the ADC module to be linked together. This allows all of the settings to be quickly set to the same value.

- **ADC Filter Type** Selects from a list of 4 digital oversampling filter responses. The options are:
  - Fast Roll-off, Linear Phase (19 samples)
  - Fast Roll-off, Minimum Phase (5 samples)
  - Slow Roll-off, Linear Phase (7 samples)
  - Slow Roll-off, Minimum Phase (5 samples)

  See Converter oversampling filter characteristics for a details on each filter type.

Note that if a Digilink Interface card is installed and it is set to enable Pro Tools Delay Compensation Compatibility then the filter settings will be grayed out and can not be changed.

6.1.7 I/O DAC

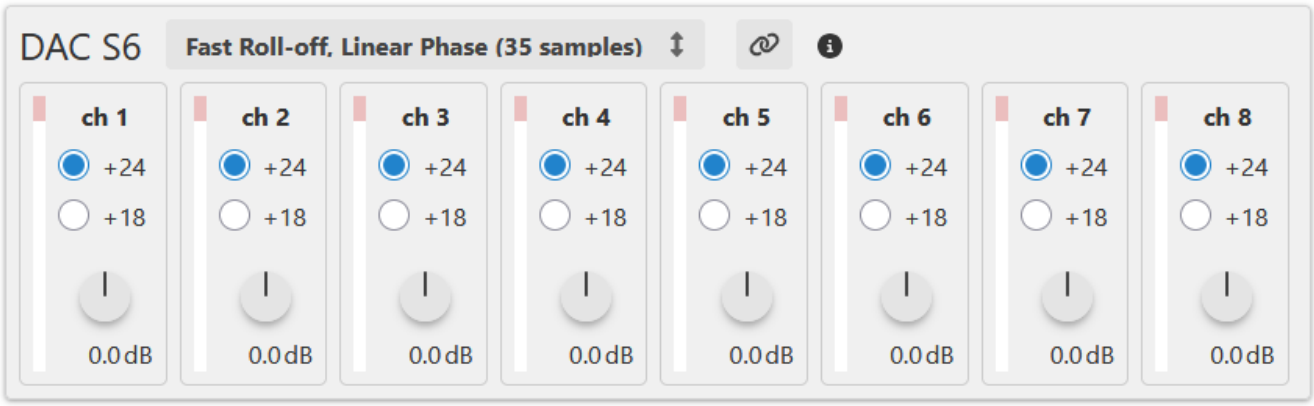


Illustration 27: Web UI DAC Controls

This is the control panel for each DAC in the m701. There is a hardware output reference level as well as digital trim for each channel.

- **Sensitivity** The sensitivity radio buttons will toggle the hardware output reference level <+18dBu or +24dBu = 0dBFS>.
- **Digital trim** Click and drag the trim knob to adjust the digital trim level. As well the trim level can be directly entered in the trim field. The range is -20dB to +20dB in 0.1dB steps.
- **Over Clear** Click on the over indicator at the top of the level meter to clear the over indication.
- **Link** Clicking the Link button allows all of the settings on the DAC module to be linked together. This allows all of the settings to be quickly set to the same value.
- **DAC Filter Type** Selects from a list of 4 digital oversampling filter responses. The options are:
  - Fast Roll-off, Linear Phase (35 samples)
  - Fast Roll-off, Minimum Phase (5.4 samples)

- Slow Roll-off, Linear Phase (8.75samples)
- Slow Roll-off, Minimum Phase (3.5 samples)
- Apodizing Linear Phase (35 samples)
- Hybrid Minimum Phase (18.5 samples)

See Converter oversampling filter characteristics for a details on each filter type.

Note that if a Digilink Interface card is installed and it is set to enable Pro Tools Delay Compensation Compatibility then the filter settings will be grayed out and can not be changed.

6.1.8 I/O Digilink

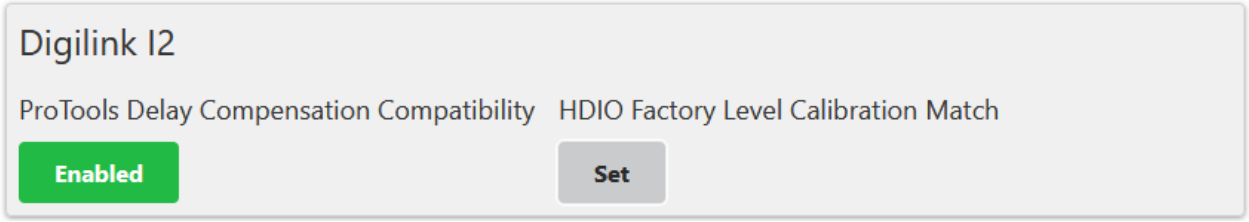


Illustration 28: Web UI Digilink Settings Panel

If a Digilink Interface module is installed in either interface slot there will a be Digilink control panel.

- **Pro Tools Delay Compensation Compatibility** Enabling this control will automatically set the ADC and DAC modules to match the latency and phase response of an Avid HDIO interface. This allows the Pro Tools Automatic Delay Compensation values to work with the m701.
- **HDIO Factory Level Calibration Match** Clicking this button will set all ADC and DAC operating levels to match the factory settings on an Avid HDIO. This is +22dBu for 0dBFS. The m701 will produce a confirmation dialog box before applying these settings.

6.1.9 I/O Base IO

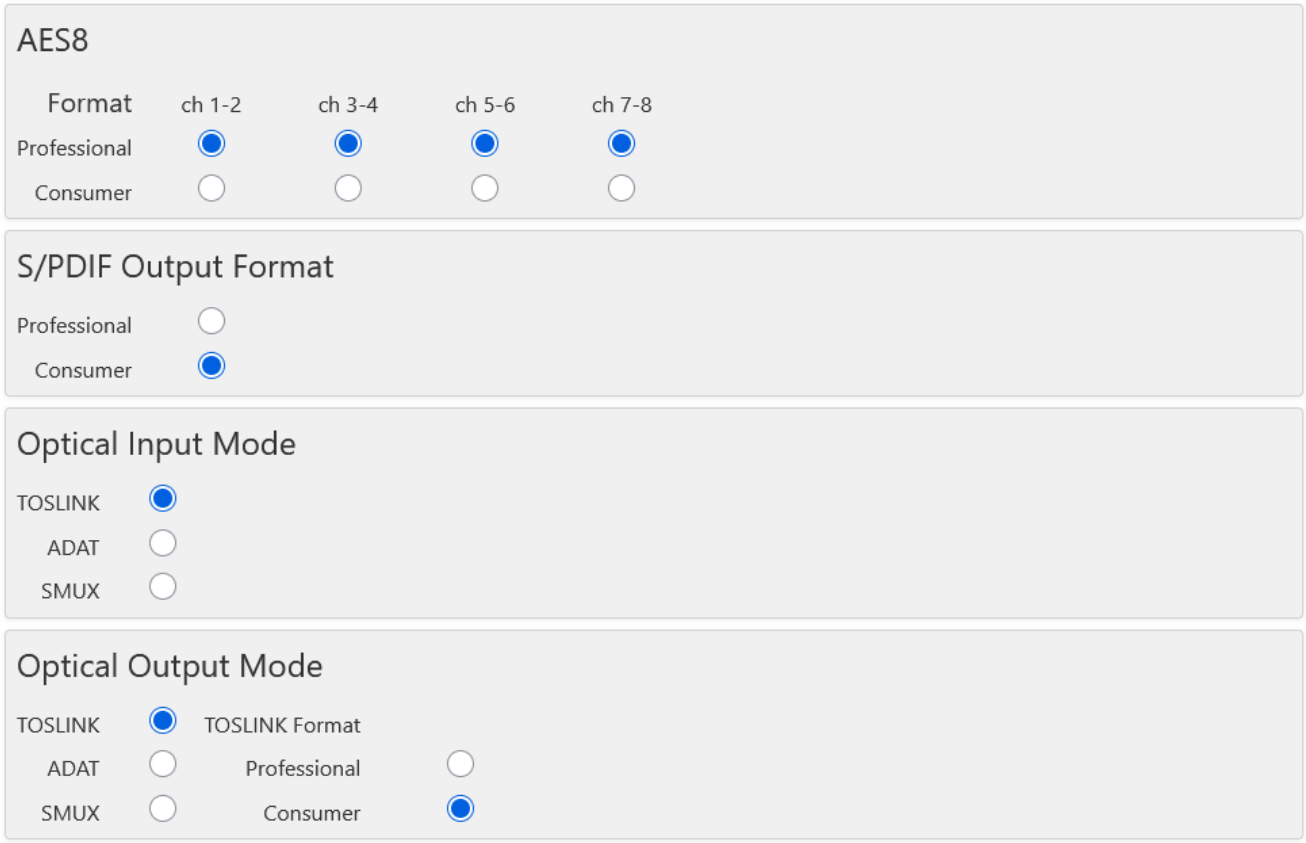


Illustration 29: Web UI Base IO Controls

This group of panels contain format options for the digital inputs and outputs on the base chassis of the m701. This is primarily Professional/Consumer bit control on AES3, SPDIF, and TOSLINK. There are also settings for the Optical input and output connector ADAT, SMUX, or TOSLINK modes.

AES 8CH I/O Output Format These set the channel status to Professional or Consumer for each pair of channels on the DB25 AES 8CH I/O connector outputs.

S/PDIF Output Format This sets the channel status to Professional or Consumer for the coaxial S/PDIF output connector.

Optical Input Mode This control sets the optical input mode. Options are: <Toslink, ADAT, SMUX>

In Toslink mode the m701 will receive stereo signals at 44.1-48kHz and 88.-96kHz.

In ADAT mode the m701 will receive 8 channels at 44.1-48kHz.

In SMUX mode the m701 will receive 4 channels at 88.2-96kHz.

6.1.10 I/O AES 24

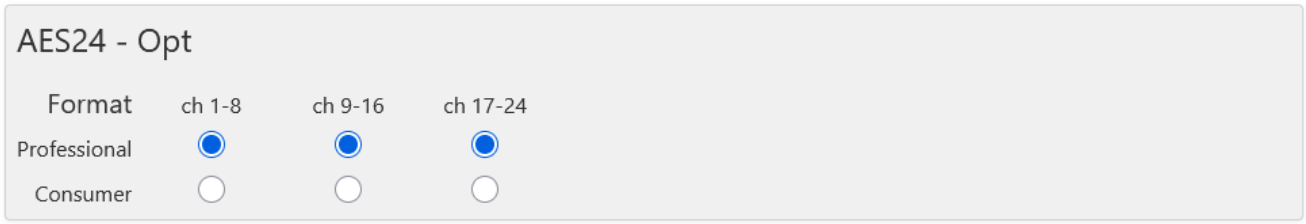


Illustration 30: Web UI AES 24ch Controls

If the AES 24 channel option module is installed this panel will be visible. The AES 24 panel contains Professional/Consumer settings for each 8 channel connector.

6.1.11 Cue Mixers

The m701 contains a low latency 32 x 8 channel mixer for creating monitor cue mixes. The 8 output busses can be used as mono or stereo busses by creating Stereo or Mono mixers. The m701 supports up to 4 stereo mixers or up to 8 mono mixers and any combination of the two.

If there are no mixers defined then the Cue Mixer page will be blank except for the "add stereo" and "add mono" buttons. Clicking one of these buttons will create a new blank mixer configuration. In this mixer configuration page you can change the visibility of individual channels as well as add fader/mute/solo groups.

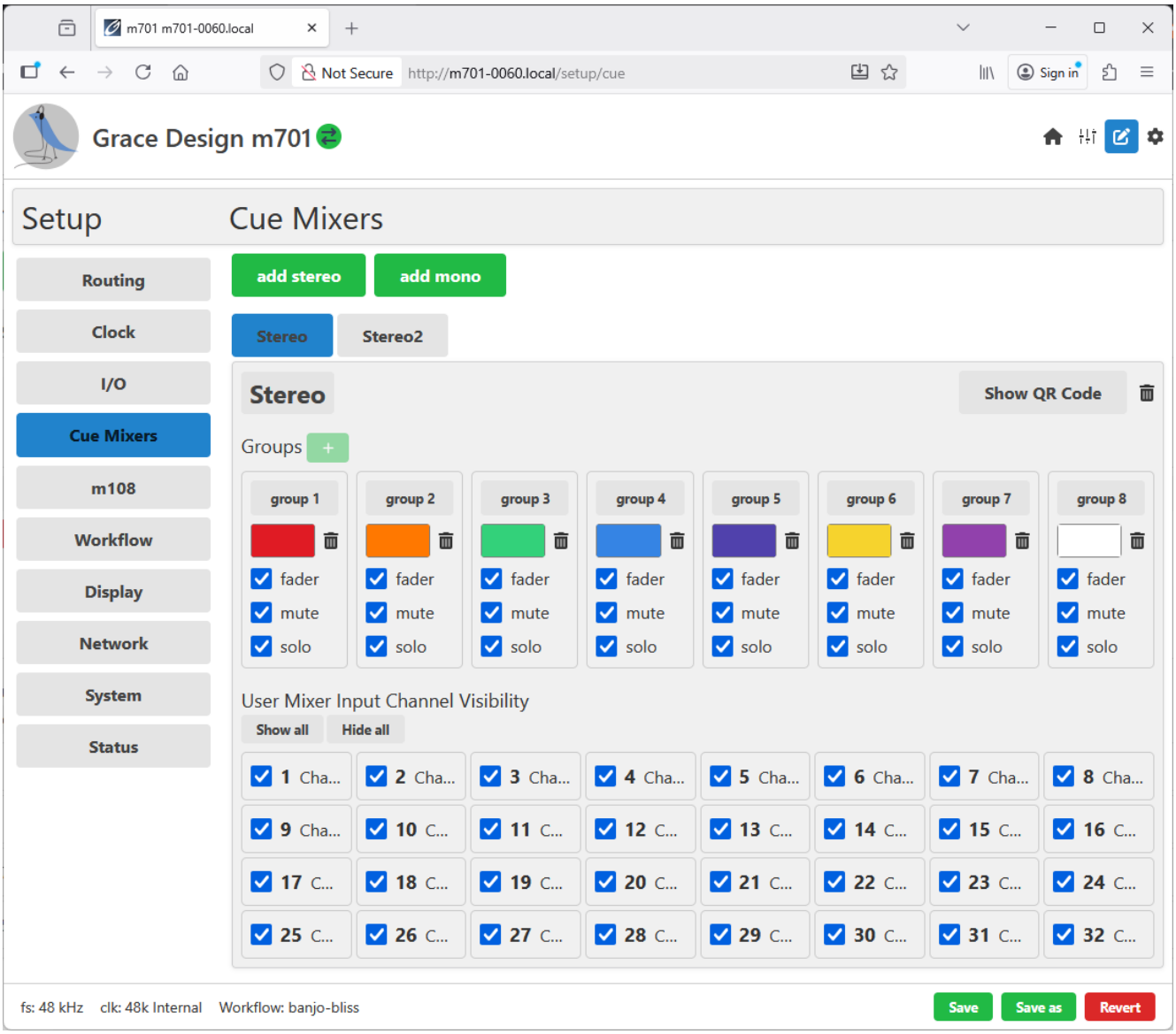


Illustration 31: Setup Cue Mixers

Mixer Name The default mixer name is "Stereo" or "Mono". Clicking on the name will allow you to edit it.

Mixer Groups Clicking the Groups "+" button will add a group to the mixer. The newly created group panel has the following settings:

- Group Name (click to edit)
- Group Color (click to pick custom colors)

- Fader, Mute, and Solo check boxes.
- Delete group trash can icon.

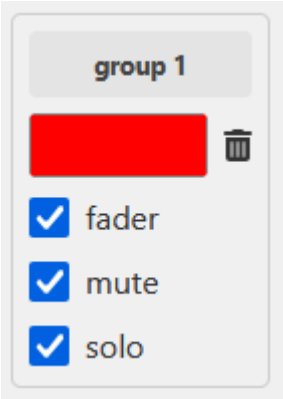


Illustration 32:
Mixer Group Panel

Up to 8 mixer groups can be created for each mixer.

Channel Visibility If not all 32 inputs are needed for a cue mixer the unused channels can be hidden by clicking in the visibility check boxes. The "Show all" and "Hide all" buttons will show and hide all channels at once.

Show QR Code Clicking on this text opens a QR code containing a link to the selected mixer. This makes it simple to navigate to a Cue Mixer on a mobile device.

Illustration 33: Mixer QR Code

Once a new mixer has been created it can be viewed on the Mixer page by clicking the Mixer button in the upper right corner of the page:

See Mixer Page for details on Mixer operation.

6.1.12 m108

With the GraceNet web UI in the m701, control of the m108 Microphone Preamplifier is built in.

To connect the m701 to a m108 preamplifier simply type the IP address of the m108 in to the "net address" field at the top of the m108 setup page and then click the "Add m108" button. The m701 should load a control panel for the m108 as shown below.

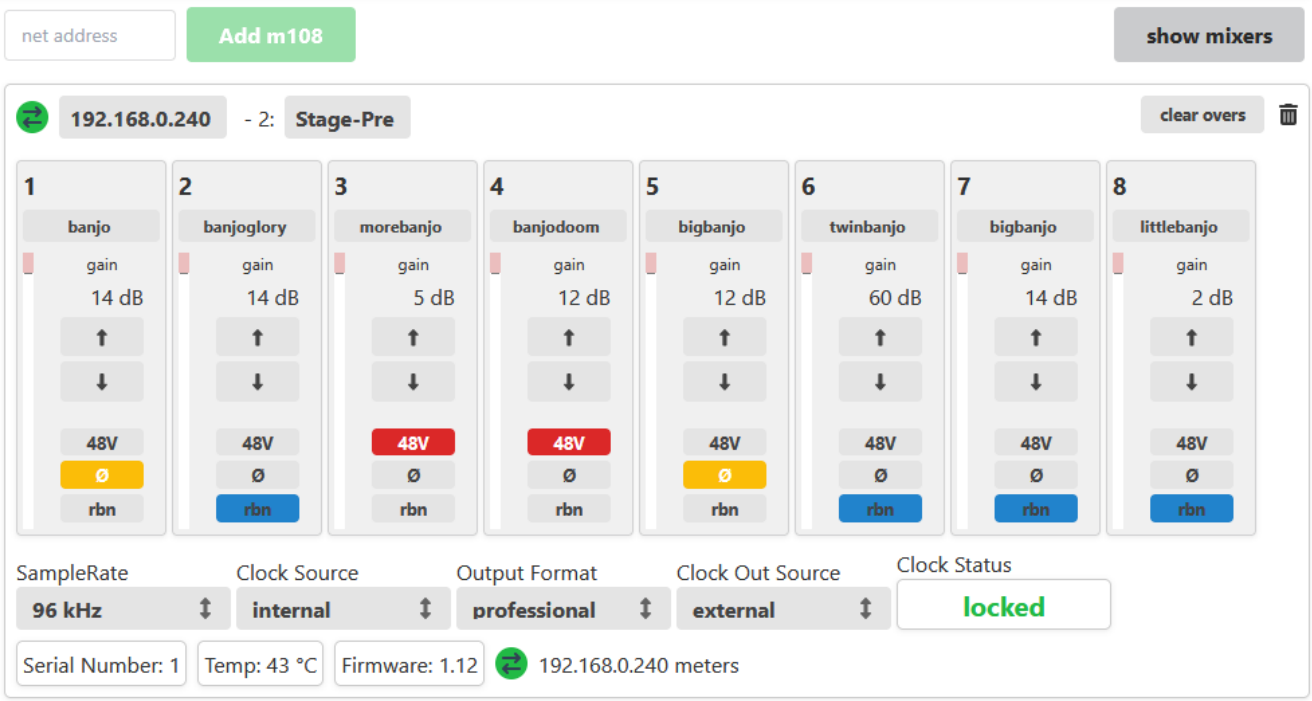


Illustration 34: m108 Control Panel

From this control panel the m108 preamplifier controls can be adjusted and the settings saved when the workflow is saved.

To access the m108 on board digital mixer click the "show mixers" button in the upper right hand corner of the screen.

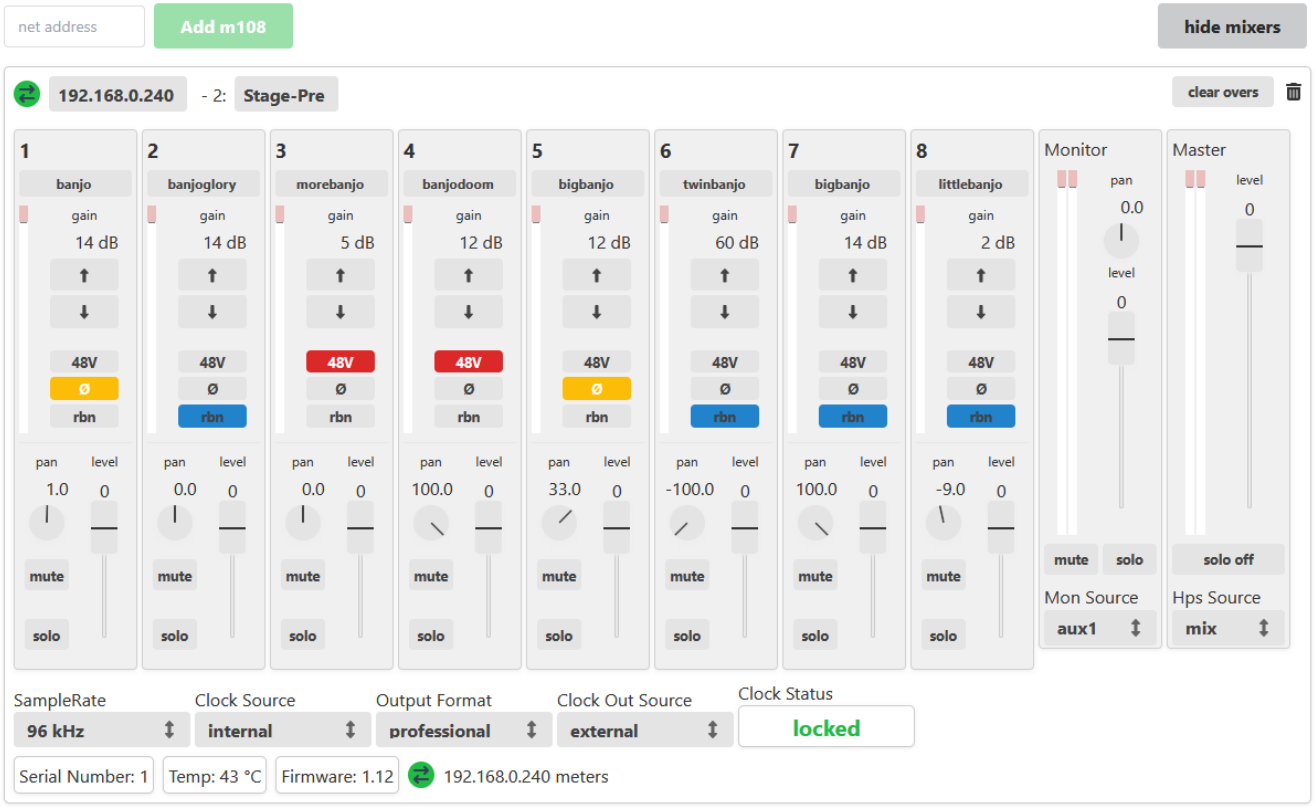


Illustration 35: m108 Control Panel with Mixer

With the mixer control is it easy to use the m108 with it's DAC and headphone amplifier for remote cue monitoring in Dante or Ravenna networked systems.

Note: It is recommend to set the ethernet control port of the m108 to a static IP address. This will simplify reconnecting from the m701.

If the IP address changes on the m108 or its power has been turned off, the m701 will report that the m108 is offline or not found at the original IP address. Turn on the m108 and click the "reconnect" button. Or, if the IP address changed, click on the IP address button to enter a new address and then click the "reconnect" button.

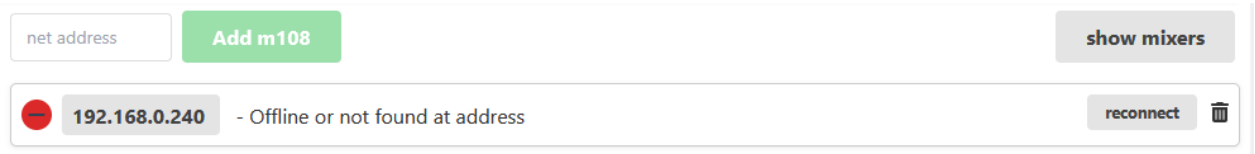


Illustration 36: m108 Offline Notification

If the m108 settings on the preamp change while not connected to the m701 when it re-connects, the m701 will report that the settings in the m701 workflow are out of sync with the settings on the m108. The m108 controls will be greyed out and there will be a list of differences between the two units with options to synchronize the settings.

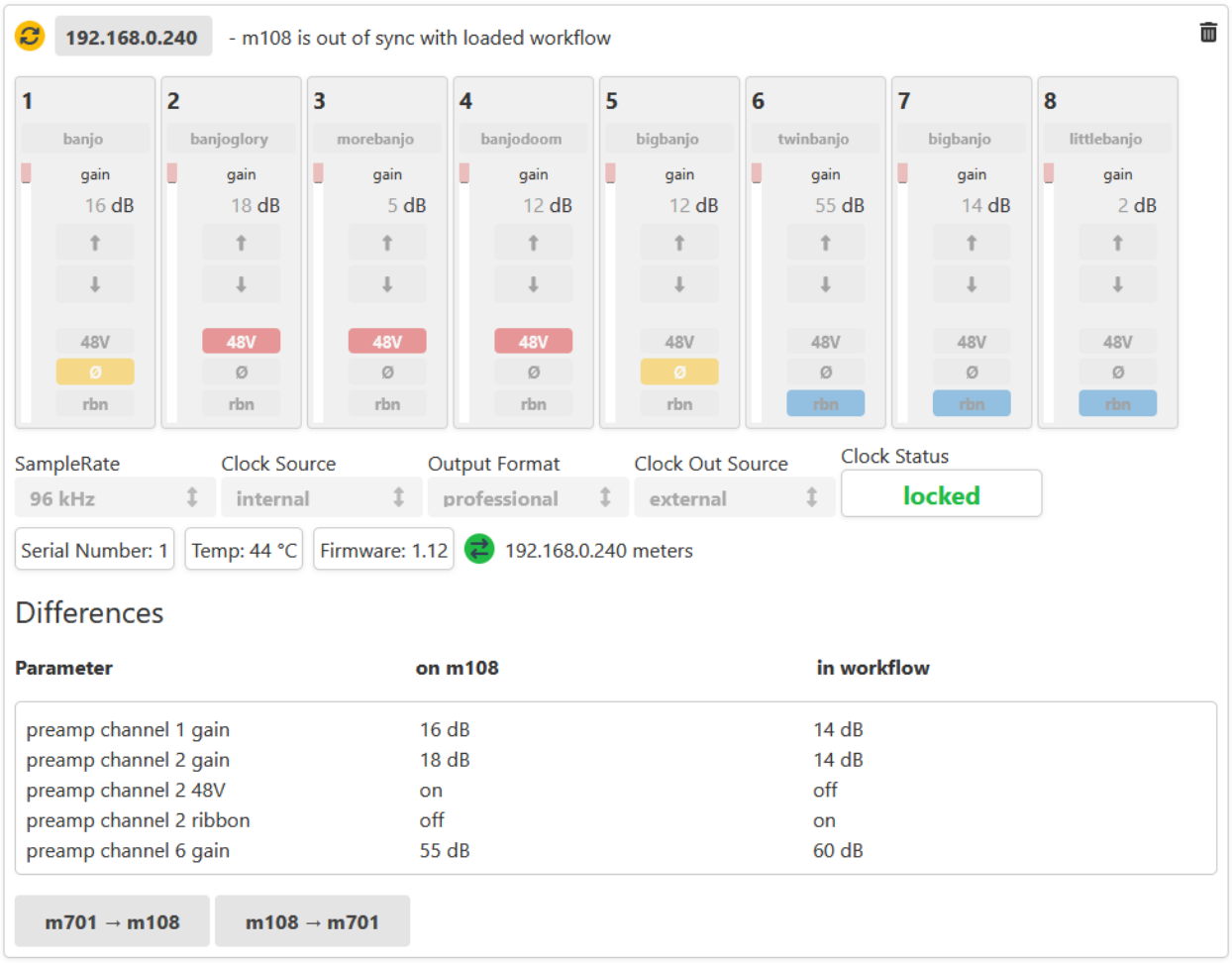


Illustration 37: m108 Synchronization

The Differences section of the page lists the settings for the m108 and the m701. Below the list of differences are the two synchronization buttons. The settings in the m701 workflow can be pushed to the m108 with the m701→m108 button. The settings in the m108 can be pulled to the m701 with the m108→m701 button.

6.1.13 Workflow

Workflows are the files which contain all of the settings in the m701 with the following exceptions:

- Network settings.
- Display settings.

The controls at the top of the Workflow setup page allow the user to load, copy, make new, rename, delete, import, and export m701 workflows. The controls in the status bar at the bottom of the GraceNet web UI window allow the user to save, save as, and revert the currently loaded workflow. These controls are always visible.

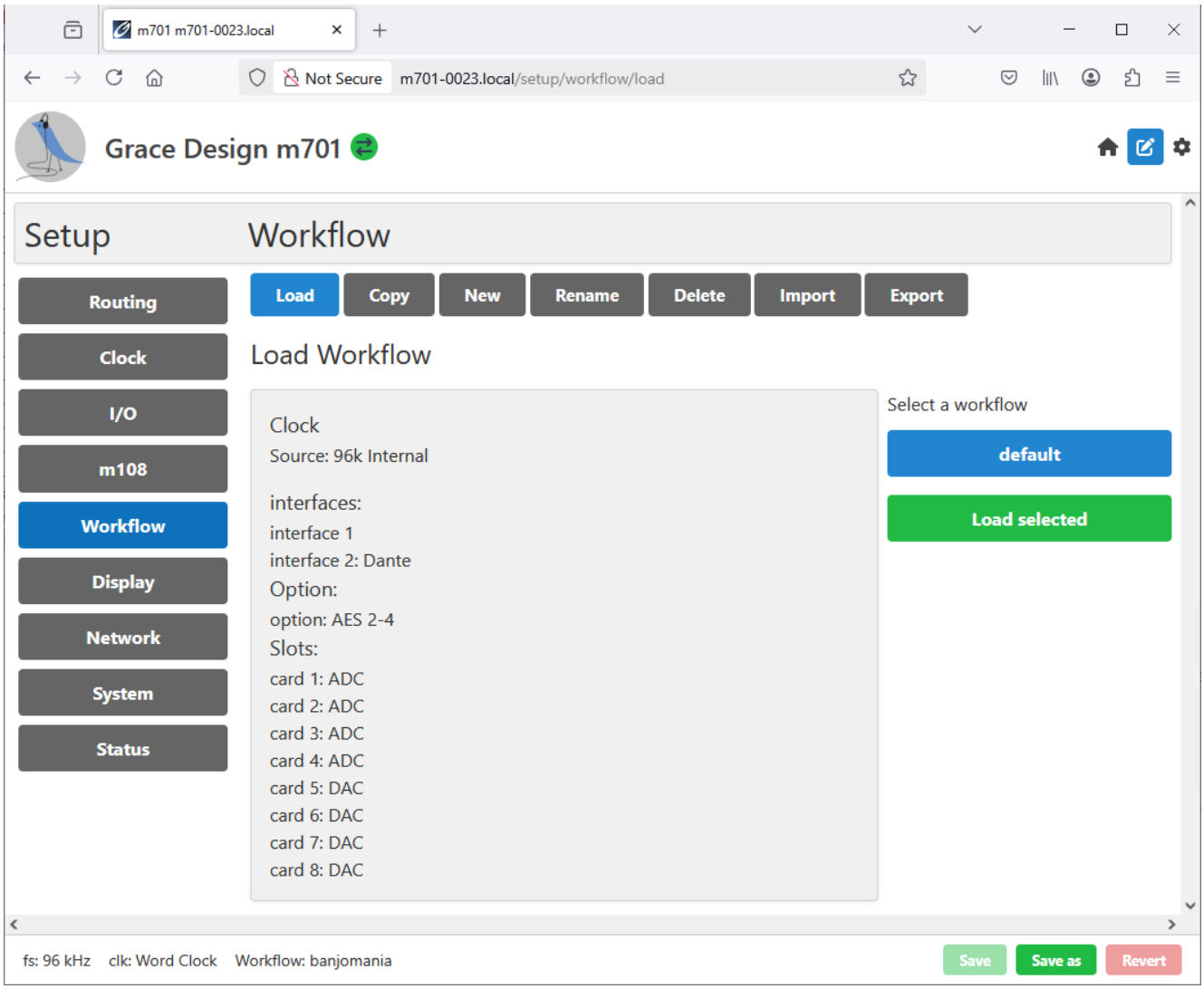
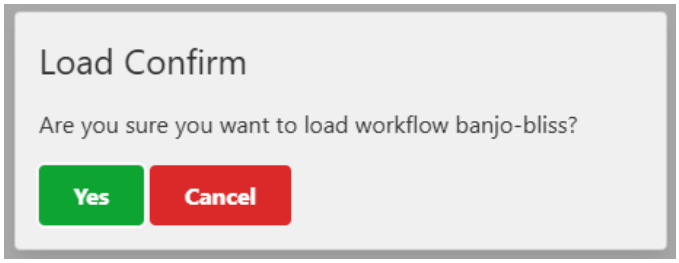


Illustration 38: Web UI Workflow Setup

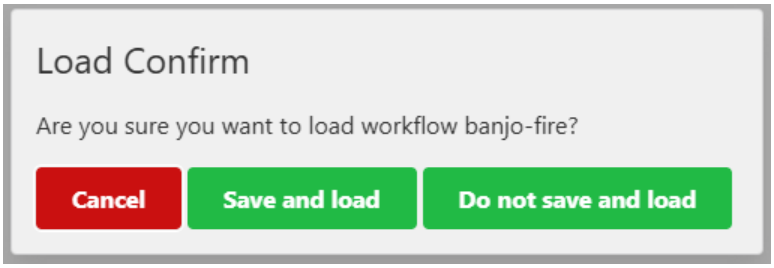
Load Clicking the Load button lists all of of the workflows on the m701 as buttons on the right side of the page. Clicking on one of the available workflow buttons will select it and display the workflow hardware configuration in the Workflow Preview area in the middle of the page. This is the hardware configuration that was used when the workflow was saved. Clicking the green *Load Selected* button will

open a confirmation dialog box.



Click *yes* to load the workflow in to the m701 or click cancel.

If the current workflow loaded on the system has unsaved changes then the dialog will give you the choice of canceling, loading the new workflow without saving the current workflow or saving the current workflow and then loading the new workflow.



Copy Clicking the *Copy* button lists the available workflows to copy on the right side of the page. Select the workflow to be copied and then type the desired name for the new workflow in the "New Name" text field. The workflow name is limited to 16 characters and can include numbers, upper case letters, lower case letters, and the characters - _ . ( ) [ ]. With a valid name entered click the green *Copy selected* button.

New Clicking the *New* button will create a new workflow. The dialog box will ask for a workflow name.

Rename Clicking the *Rename* button will rename the selected workflow. Enter the name in the New Name field and click the *Rename Selected* button.

Delete Clicking the *Delete* button will bring up a list of workflows. Select the workflow to be deleted and click the *Delete Selected* button. Note that the currently loaded workflow can not be deleted and will not be in the list.

Import Clicking the *Import* button will show the file Drag and Drop/Open panel. Clicking the panel will open a file selection dialog box. Dragging on to the panel will also select the file for importing. Multiple files can be imported at the same time.

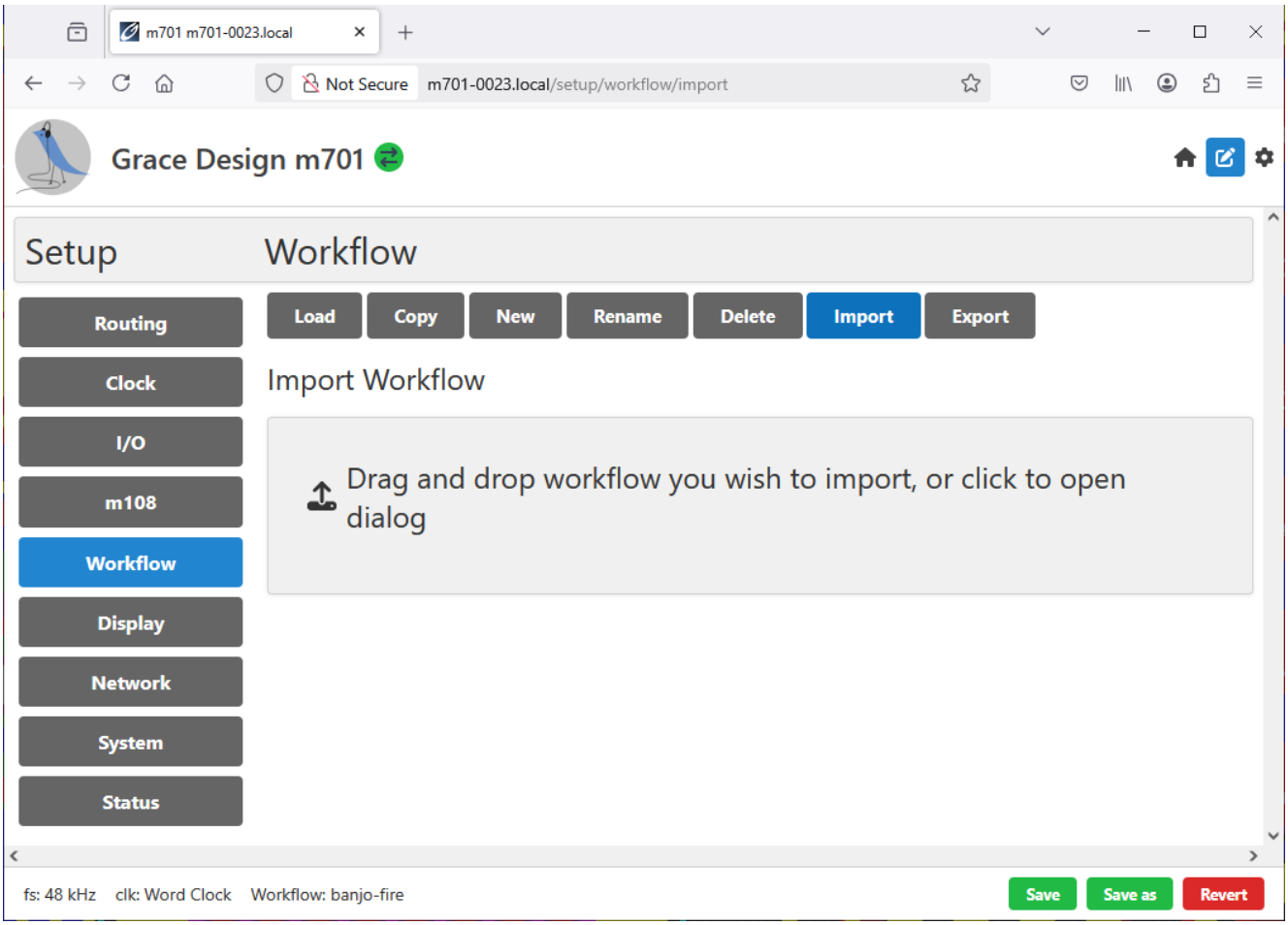
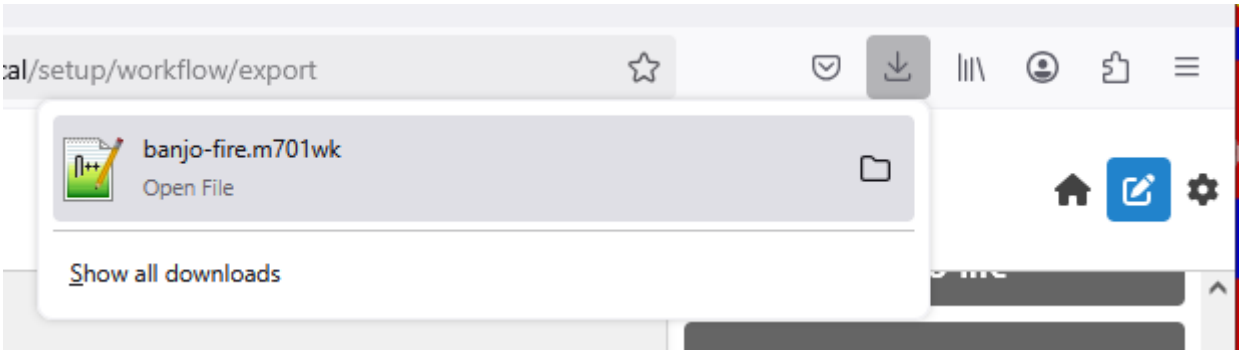


Illustration 39: Workflow Import Page

Export Click the *Export* button to view the list of workflows to export. Select the workflow to export and click the *Export Selected* button. The browser will download the workflow file to your computer's download location.



6.1.14 Display

The display settings page contains controls for the m701 front panel LCD display. Settings include backlight brightness, dim level, dim timer, and meter peak hold time. Note that the settings made on this screen are not saved in the workflow file.

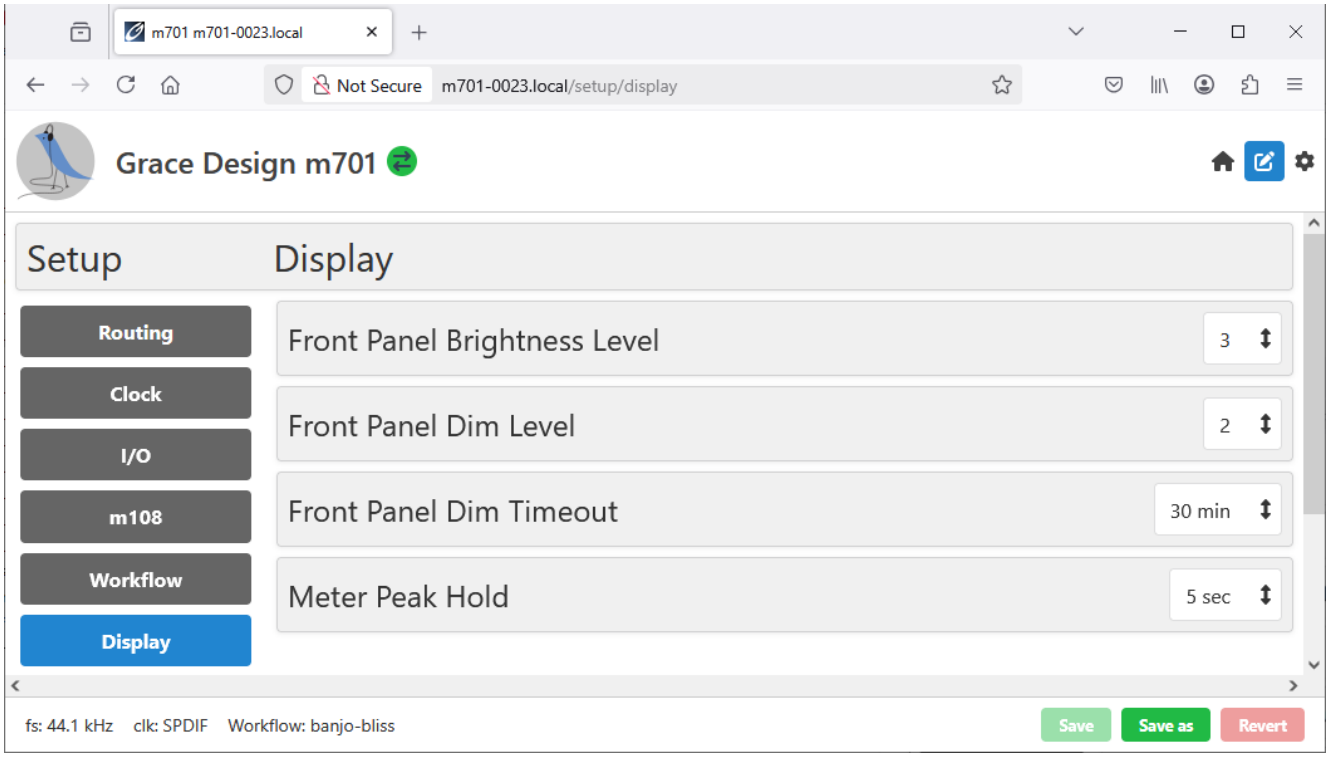


Illustration 40: Web UI Display Setup

The Display page options are:

- **Front Panel Brightness Level** Backlight brightness values are 1-5 with 5 being the brightest.
- **Front Panel Dim Level** The dim level values are 1-3.
- **Front Panel Dim Timeout** The timeout setting determines how many minutes after any front panel controls have been used before the dim will be activated. Values are <off, 10 min, 15 min, 20 min, 25 min, 30 min, 45 min, 60 min>
- **Meter Peak Hold** Sets the time that peak levels indicators are held on signal meters throughout the m701. Values are <off, 1 sec, 5 sec, infinite> This setting affects the peak hold time on the front panel LDC display as well as the meters on the Web UI home page.

If the m701 is to be left on 24-7 we recommend that the display be set to go to dim after some time. This

will extend the life of the back-light LEDs.

6.1.15 Network - Primary

The network setup page contains controls and status for the m701 network interfaces. To be able to access the GraceNet web UI on the m701 the unit must be connected to your computer network.

The m701 primary network interface uses the rear panel RJ45 Ethernet control port. A secondary network interface can be added by connecting a USB to Ethernet or USB Wi-Fi adapter. See the next section for Secondary interface setup information.

The m701 Primary Network interface supports three network connection modes: DHCP, Static, and Link local. The m701 factory default setting is DHCP for automatic ip addressing.

If the m701 is connected to a network the url for accessing the GraceNet web UI will be on the front panel LCD display in the lower right corner.

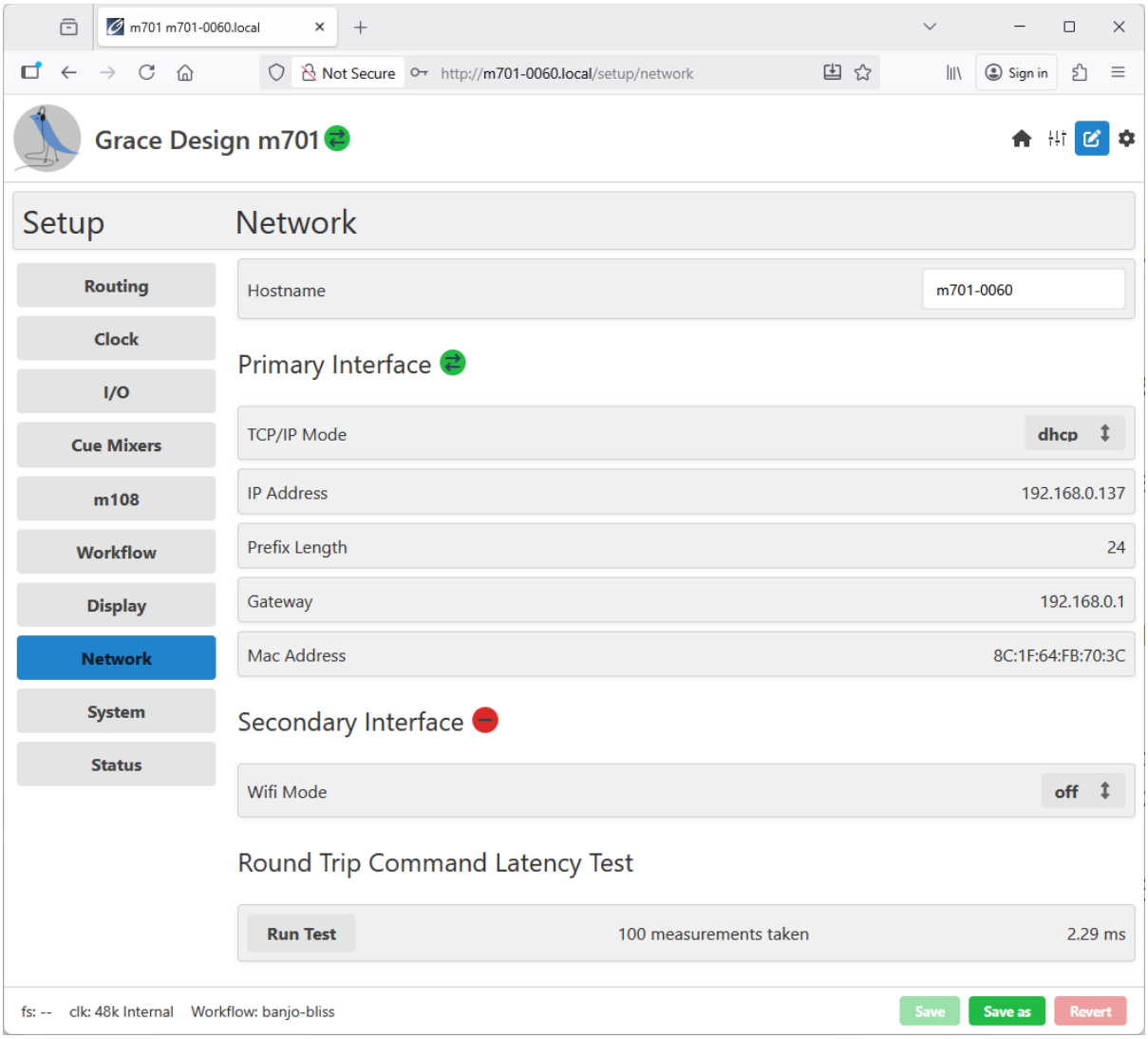


Illustration 41: Network Primary connection setup

The Network setup page options are:

- **Hostname** The hostname comes from the factory set to "m701-xxxx" where the xxxx represents the last four digits of the m701 serial number. To access the GraceNet web UI on the m701 simply enter the URL: http://m701-xxxx.local in to a web browser that is on the same network. The ".local" tells the browser that this is a host on the local network not an internet destination. The hostname can be edited to a custom name if desired.
- **Network Mode** Options are <dhcp, static, and link-local>. DHCP (Dynamic Host Configuration Protocol) is the default setting. Out of the box the m701 will request an IP address from a DHCP server and configure it's network interface automatically. If no DHCP server is found the m701 will time out and fall back to link-local mode. In static mode the m701 IP address, gateway, and

prefix length (net mask) can be manually entered. In link-local mode the m701 can be connected directly to another computer. The m701 will set its own IP address to 169.254.xxx.xxx with a prefix length of 16.

- **Round Trip Command Latency Test** This is a diagnostic tool that verifies that there are no significant problems with the network connection between the browser and the m701 server. Latency measurements above 10ms for wired Ethernet or 20ms for Wi-Fi connections may indicate inefficiency in the network path.

6.1.16 Network - Secondary

If the m701 has a USB to Ethernet or Wi-Fi adapter connected then there will be a second set of options and status fields listed for the Secondary Interface connection. For each type of connection there will be different settings.

Wi-Fi client mode:

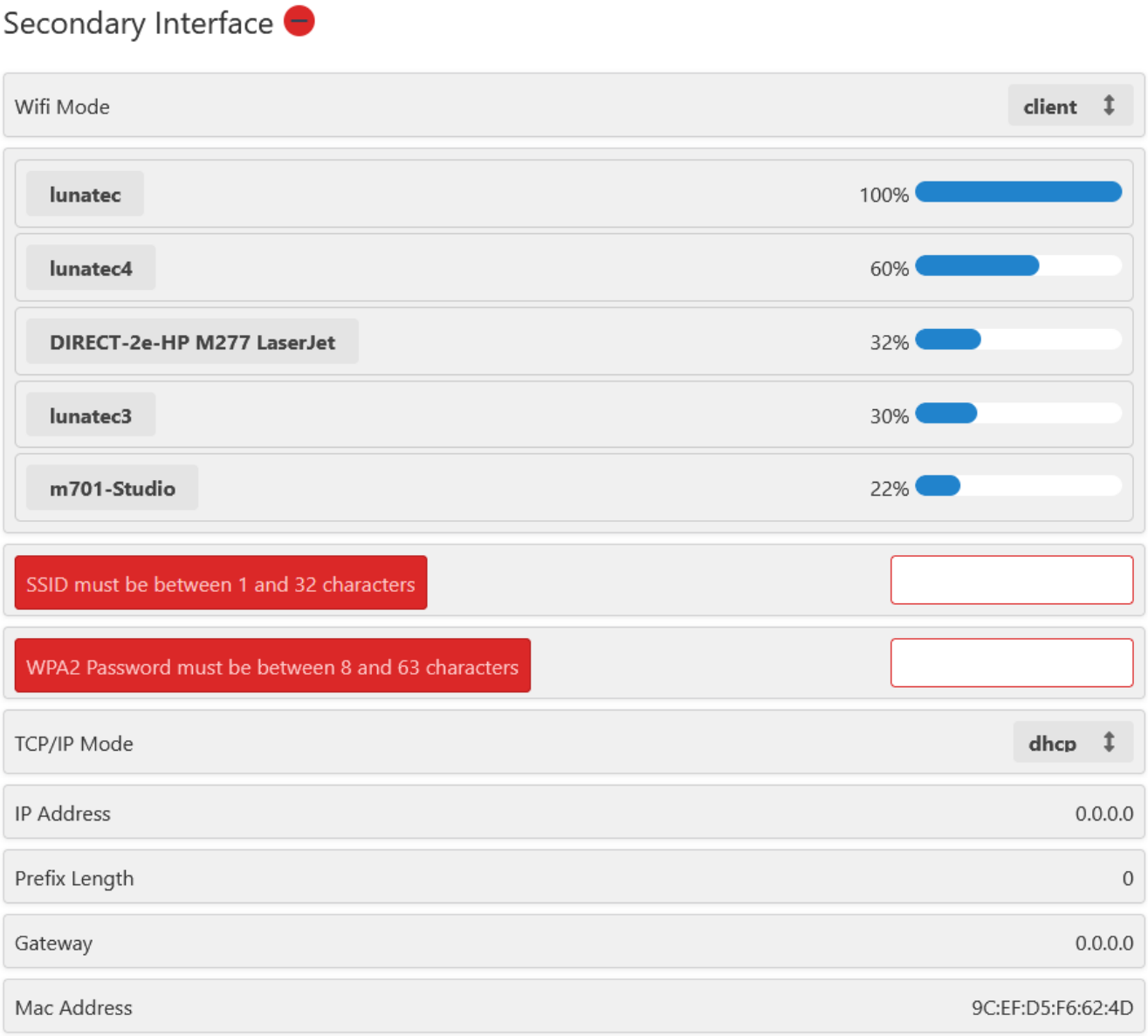


Illustration 42: Secondary Interface Wi-Fi Client Mode

The Wi-Fi Client network setup menu options are:

- **Wireless Mode** Sets the Wi-Fi radio mode. Options are <Client, Hotspot>
- **Network Select** Lists the Wi-Fi networks that are available to connect to. Also shows the signal strength of each available network.
- **TCP/IP Mode** Sets addressing mode. Options are <dhcp, static>
- **IP Address** In DHCP mode displays the currently assigned IP address. In static mode allows the user to enter an IP address manually.

- **Prefix Length** In DHCP mode displays the assigned prefix length. In static mode allows the user to enter the prefix length.
- **Gateway** In DHCP mode displays the gateway device IP address.. In static mode allows the user to enter the gateway device address manually..

The Wi-Fi network setup information includes:

- **SSID** Shows the SSID (name) of the currently selected Wi-Fi network. With no network selected the SSID field can be used to enter the SSID of a network manually.
- **WPA2 Password** Field for entering the Wi-Fi password. The m701 supports WPA2/3 Passwords. Passwords must be at least 8 characters in length.

Wi-Fi Hotspot mode

Illustration 43: Secondary Interface Wi-Fi Hotspot

The Wi-Fi Hotspot network setup menu options are:

- **Wireless Mode** Sets the Wi-Fi radio mode. Options are <Client, Hotspot>
- **SSID** Sets the SSID (name) of the m701 Wi-Fi Hotspot network. Currently WPA2 is the only available security mode.
- **Password** Sets and Displays the Wi-Fi Hotspot password. Passwords must be more than 8 character in length.

The Wi-Fi network setup information includes:

- **IP Address** The gateway IP address of the hotspot.
- **MAC Address** Current MAC address for the wireless interface..

Ethernet mode

Illustration 44: Secondary Interface Ethernet mode

If the USB port is connected to an Ethernet adapter the secondary network interface settings will look identical to the built in Primary Interface Ethernet settings.

6.1.17 System

The System setup page displays basic system information and contains the system update and diagnostic debug log generation controls.

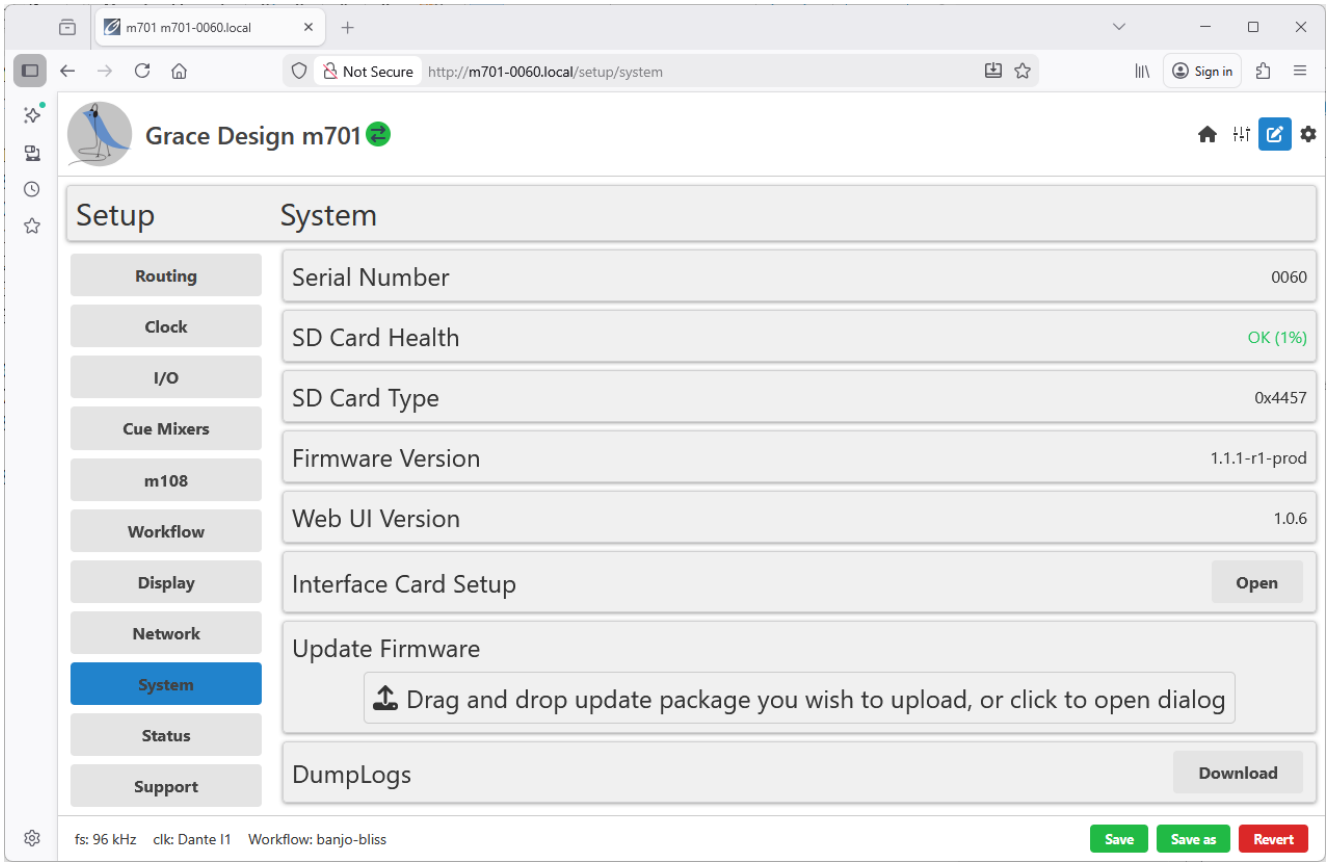


Illustration 45: WEB UI System Setup

- **Serial Number** This is the last 4 digits on the m701 main chassis serial number. The full serial number is printed on the right side of the chassis.
- **Firmware Version** This is the current system firmware version.
- **Web UI Version** This is the current GraceNet web UI firmware version
- **System Update** System firmware updates are initiated by uploading a firmware upgrade package here. See the Firmware Update Procedure section of this manual for details.
- **Debug Logs** Clicking this button will download a .m701log file package to your computer. This may be requested by our Customer Service if you are experiencing problems or bugs in the m701.
- **Interface Card Setup** Clicking this button will load the Interface Card Setup page which allows configuring the interface card types. This is only accessed after an interface card has been added, removed, or changed in the m701 chassis. See the Hardware Configuration section of this manual for details.

6.1.18 Status

The Status page displays the voltages and status of the internal power supplies. It also displays the

temperature on the main pcb and the current rpm of the cooling fan.

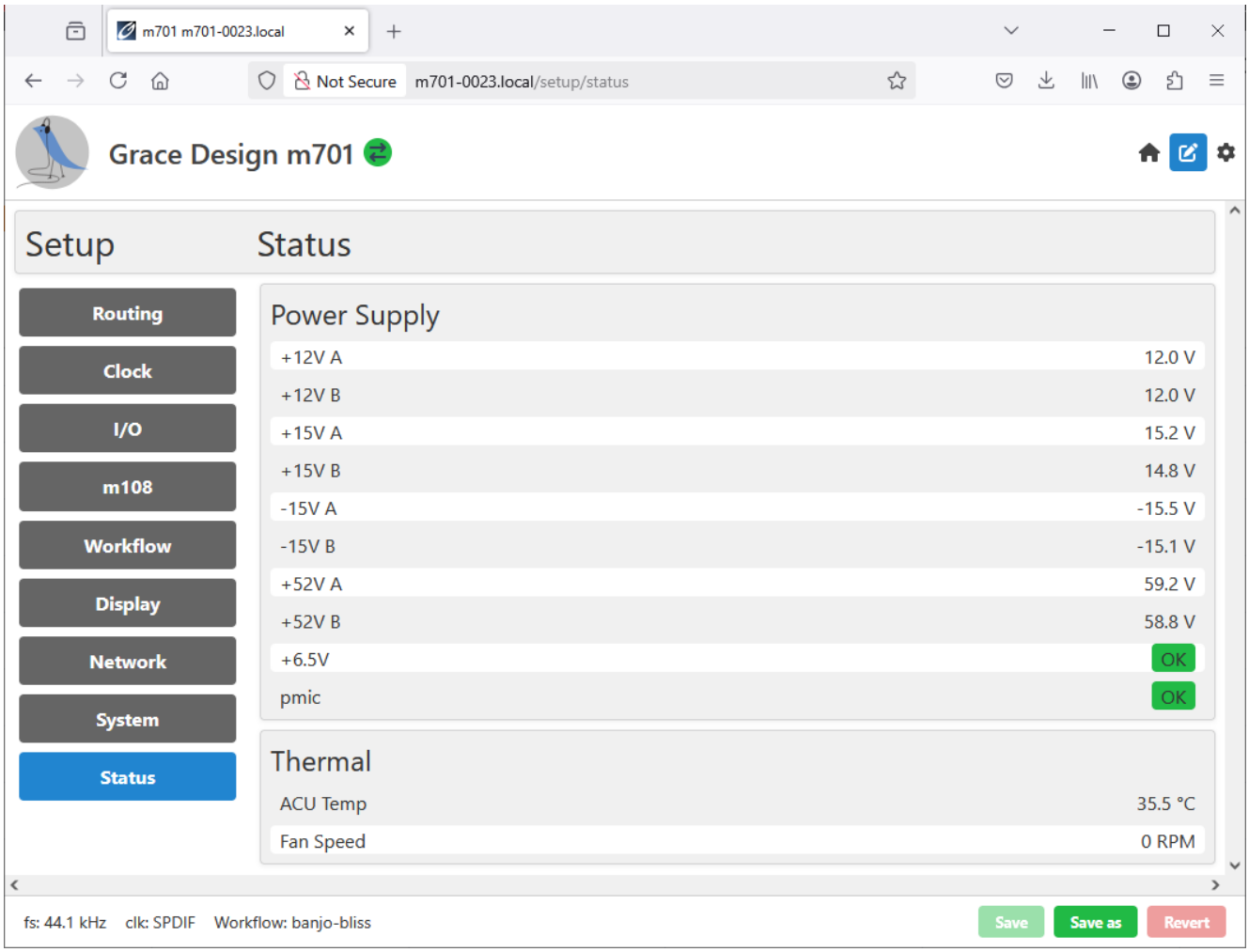


Illustration 46: Web UI System Status

6.2 Front Panel Setup Menus

To access the setup screen press the setup button. The setup button will flash on and off and the main Setup menu will be displayed.

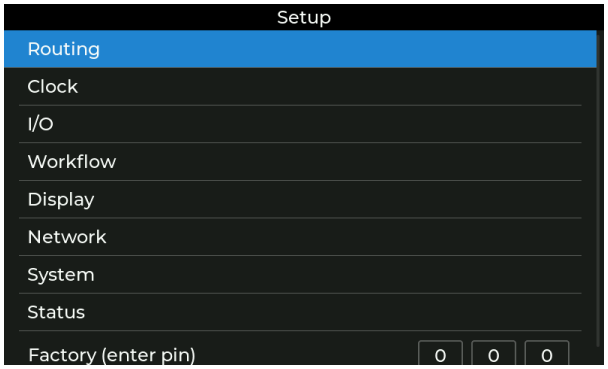


Illustration 47: Main Setup Screen

6.2.1 Routing

The routing screen allows any input to be routed to any output. One input can be routed to multiple outputs but an output can only have one input routed to it.

Selecting the Routing screen from the main setup menu puts the m701 in routing mode.

To return to the Setup Menu press the EDIT knob to select the back < in the upper left corner. Or press the back button.

Using the navigation buttons or the EDIT knob move the highlight to a routing block. The grid lines will highlight in blue and text at the top of the screen will indicate what inputs and outputs are selected. ADC, DAC, and PRE modules are shown with their Slot Number. i.e. ADC S2 is the 8 Channel ADC mounted in Slot 2.

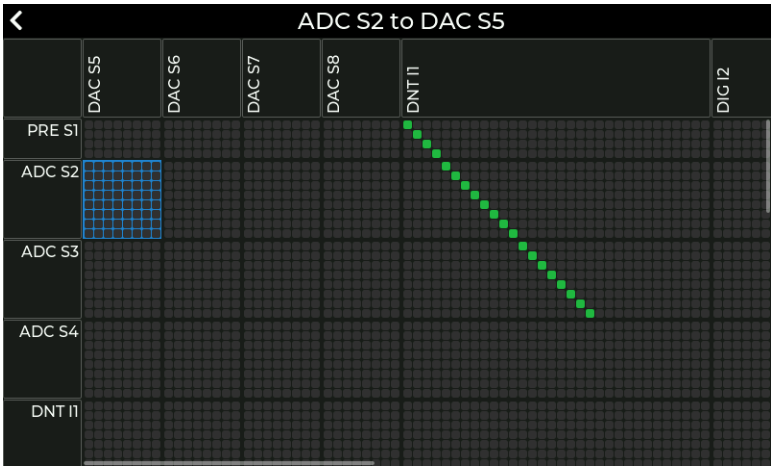


Illustration 48: Routing Matrix Selection

In the picture above the ADC in Slot 2 and DAC in Slot 5 are selected for routing. Pressing the EDIT knob will open the actual routing pop-up screen for the selected block.

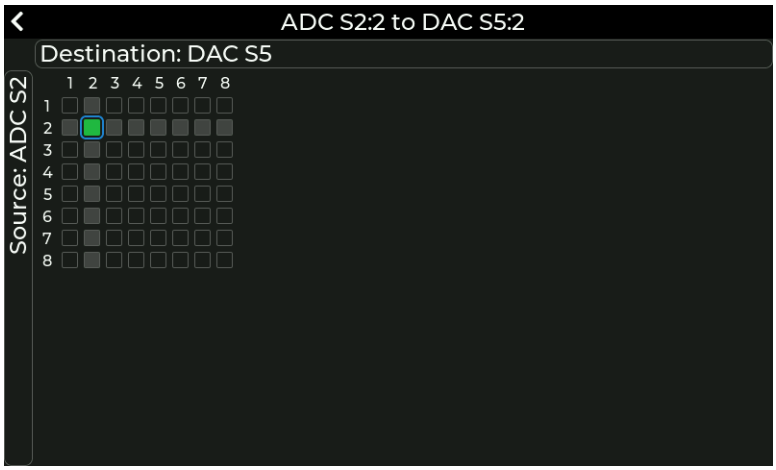


Illustration 49: Routing Matrix Pop Up Screen

Using the navigation buttons or the EDIT knob move the highlight to a row and column intersection that you want to route and press the EDIT knob to set or clear the route. When the route is set the square will be green.

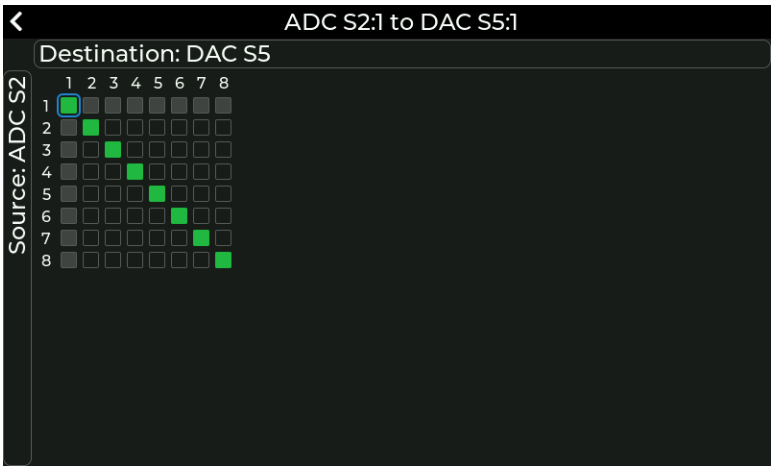


Illustration 50: Routing Matrix Pop Up Multi Route

To automatically route all connections in a diagonal line set the highlighted connections to the upper left of the desired diagonal line and *double click* the EDIT knob. Double clicking again will automatically un-route on a diagonal line.

6.2.2 Clock

The Clock setup screen allows setting the system clock source as well as sample rate if using the internal clock as a source. It also provides controls for the word clock input termination and word clock output signal source.

Below the settings section of the screen all of the possible clock sources in the m701 are listed with the current sample rate and clock source status.

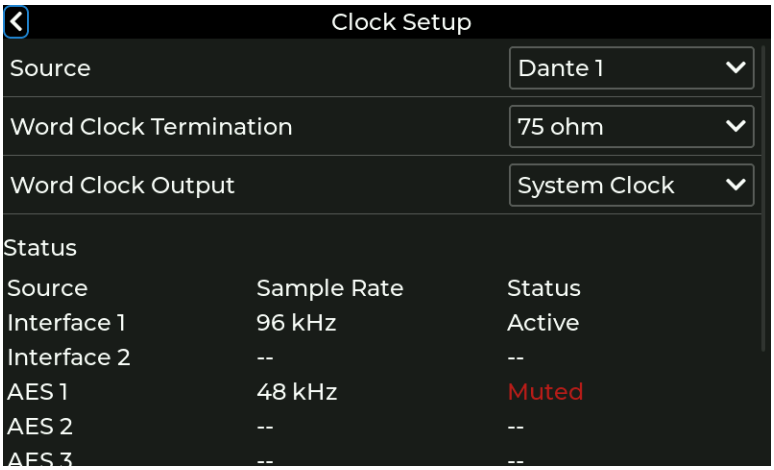


Illustration 51: Clock Setup Panel

To navigate the clock setup screen use the ▲ and ▼ navigation keys or turn the EDIT knob to select menu items from this list. Pushing the EDIT knob selects a menu for editing values. Pushing the EDIT knob again enters the value.

- **Source** Selects the system clock source. Available clock sources depends on options installed. <44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz internal, *Interface* 1, *Interface* 2, AES 1, AES 2, AES 3, AES 4, Optical, SPDIF, Word Clock, Loop Sync> Note: If a Dante option is installed in Interface Option slot 1 then the clock list will indicate "Dante 1". The same goes for Digilink, Ravenna, and USB interface options. AES1 is the base 8 channel AES3 connector. AES 2-4 are visible if the AES 24 Channel Option Module is installed.
- **Termination** Sets the BNC clock input connector termination. Options are <75 Ohm, 1M Ohm>
- **Output** Sets the signal source for the BNC clock output connector. Options are <Clock in, System Clock, Loop Sync>
- **Status** Shows all of the available clock sources that are installed in the m701 and indicates the current sample rate of each as well as if the source is Active or Muted.

6.2.3 I/O Setup Menu

The I/O setup screen contains the control panels for the ADC, DAC, Mic Preamp, Digilink, Option Module, and Baseboard IO connectors.

Illustration 52: I/O Setup Menu

To navigate the I/O setup screen use the ▲ and ▼ navigation keys or turn the EDIT knob to select menu items from this list.

6.2.4 I/O Base IO

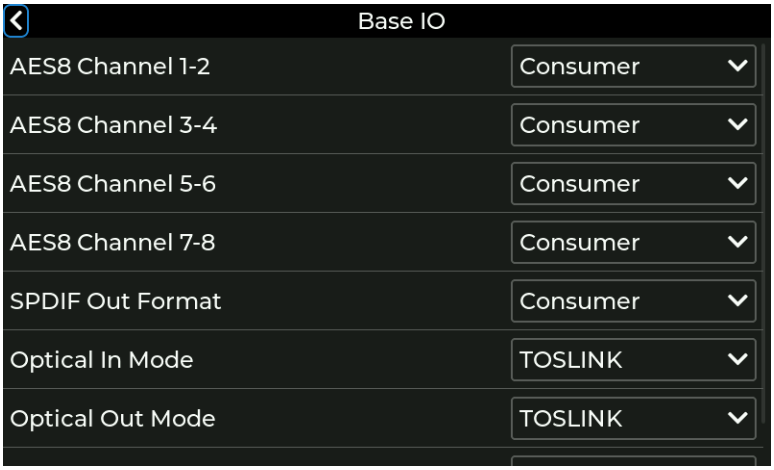


Illustration 53: Base IO Setup Panel

This screen contains format options for the digital inputs and outputs on the base chassis of the m701. This is primarily Professional/Consumer bit control on AES3, SPDIF, and TOSLINK. There are also settings for the Optical connector ADAT, SMUX, or TOSLINK modes.

6.2.5 I/O Mic Preamp.

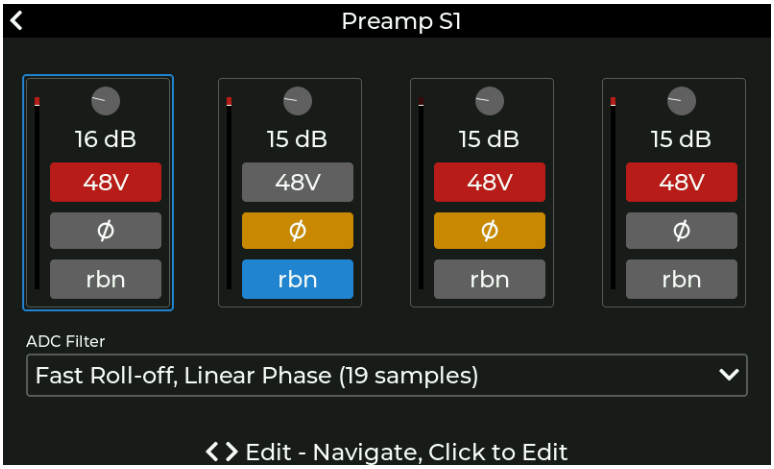


Illustration 54: Microphone Preamp Control Panel

There is a control panel for each microphone preamplifier installed in the m701. Gain, +48V, phase reverse, and ribbon mode can be set for each channel. As well the signal level can be monitored on the level meter on each channel and the ADC oversampling filter type can be selected from a drop-down menu.

To set the ADC oversampling filter type turn the EDIT knob until the ADC Filter drop down list is highlighted then push the knob to select the desired filter. See the Converter oversampling filter characteristics.

Note that if a Digilink Interface card is installed and it is set to enable Pro Tools Delay Compensation Compatibility then the filter settings will be grayed out and can not be changed.

To select a mic preamp channel for editing, use the ▲ and ▼ navigation keys or turn the EDIT knob to select a channel. Press the EDIT knob to enter the channel in edit mode. The selected channel will be outlined in white.

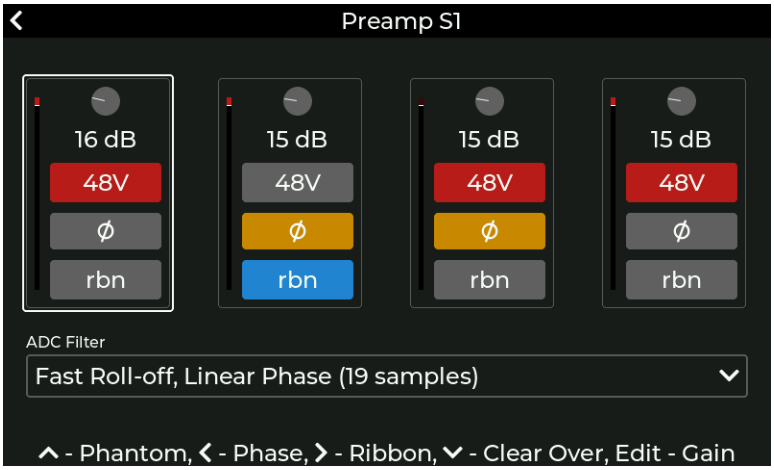


Illustration 55: Microphone Preamp Edit Mode

Once a channel is in edit mode the following changes can be made.

- **Gain** The EDIT knob will adjust the gain. The gain range is -6dB, and 2dB – 69dB in 1dB steps. The gain control uses zero crossing detection to minimize clicks and pops while changing the gain.
- **+48V** The ▲ button will toggle +48V on and off. The +48V supply uses a soft turn on and turn off to minimize transients.
- **Rbn** The ▶ button toggles Ribbon Mode. Ribbon mode provides two functions: Disables +48V so that mic power can not be accidentally applied to the microphone. Raises the input impedance from 8kΩ to 20kΩ which significantly improves low frequency flatness on most ribbon microphones.
- **Over Clear** The ▼ button clears level meter over indicators.

6.2.6 I/O ADC

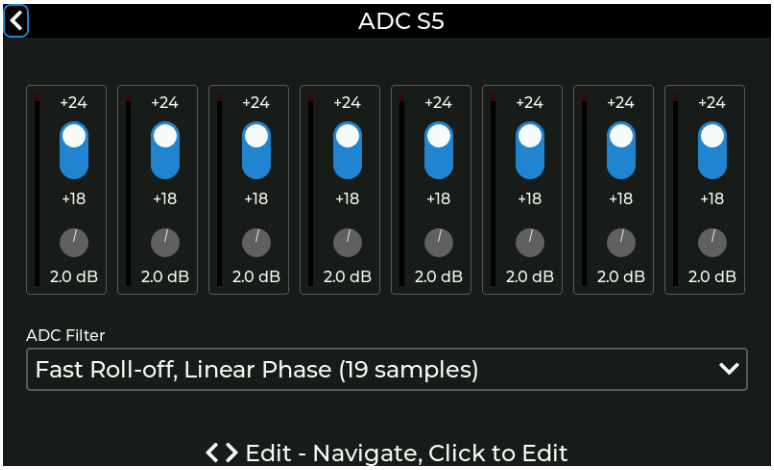


Illustration 56: ADC Control Panel

This is the control panel for each ADC in the m701. Hardware input reference level can be selected as well as +/-20dB digital trim for each channel. As well the ADC oversampling filter type can be selected.

To set the ADC oversampling filter type turn the EDIT knob until the ADC Filter drop down list is highlighted then push the knob to select the desired filter. See the Converter oversampling filter characteristics.

Note that if a Digilink Interface card is installed and it is set to enable Pro Tools Delay Compensation Compatibility then the filter settings will be grayed out and can not be changed.

To select an ADC channel for editing use the ▲ and ▼ navigation keys or turn the EDIT knob to select a channel. Press the EDIT knob to enter the channel in edit mode.

Once a channel is in edit mode the following changes can be made.

- **Sensitivity** The ▲ button will toggle the hardware input reference level <+18dBu or +24dBu = 0dBFS.
- **Digital trim** The pressing the ◀ ▶ buttons or turning the EDIT knob will adjust the digital trim level. The range is -20dB to +20dB in 0.1dB steps.
- **Over Clear** The ▼ button clears level meter over indicators.

6.2.7 I/O DAC

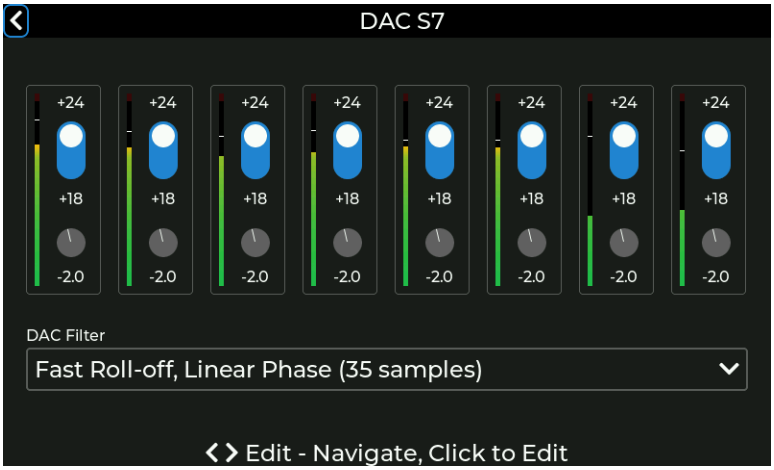


Illustration 57: DAC Control Panel

This is a control panel for each DAC in the m701. Hardware output reference level can be selected as well as +/-20dB digital trim for each channel. As well the DAC oversampling filter type can be selected.

To set the DAC oversampling filter type turn the EDIT knob until the DAC Filter drop down list is highlighted then push the knob to select the desired filter. See the Converter oversampling filter characteristics.

Note that if a Digilink Interface card is installed and it is set to enable Pro Tools Delay Compensation Compatibility then the filter settings will be grayed out and can not be changed.

To select a DAC channel for editing use the ▲ and ▼ navigation keys or turn the EDIT knob to select a channel. Press the EDIT knob to enter the channel in edit mode.

Once a channel is in edit mode the following changes can be made.

- **Reference Level** The ▲ button will toggle the hardware output reference level <+18dBu or +24dBu = 0dBFS>.
- **Digital trim** The pressing the ◀ ▶ buttons or turning the EDIT knob will adjust the digital trim level. The range is -20dB to +20dB in 0.1dB steps.

6.2.8 I/O AES 24

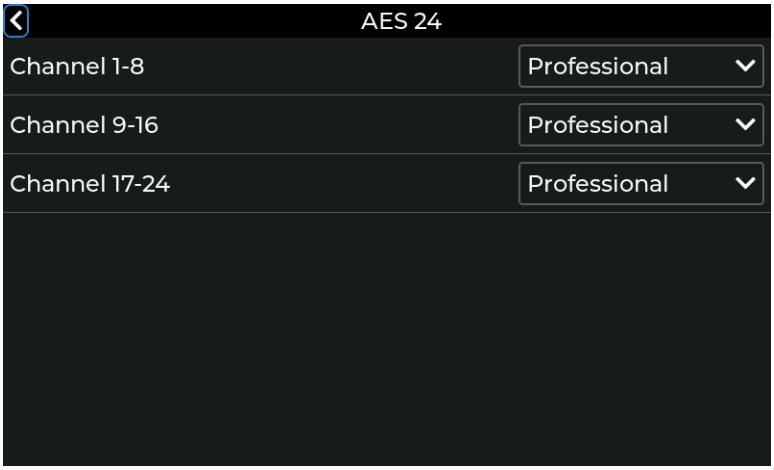


Illustration 58: AES 2-4 Control Panel

The AES 24 Setup control panel allows the Consumer/Professional bit to be set for the AES2 (Channel 1-8), AES3 (Channel 9-16), and AES4 (Channel 17-24) connectors on the 24 Ch AES Option Module if present.

- **Channel x-x** Channel status bit <Consumer, Professional>

6.2.9 I/O Digilink

Illustration 59: Digilink Control Panel

If a Digilink option is installed in the m701 there will be an IO setup panel visible in the list. Selecting the Digilink setup panel will show the following controls:

- **Pro Tools Delay Compensation Compatibility** Enabling this control will automatically set the ADC and DAC modules to match the latency and phase response of an Avid HDIO interface. This

allows the Pro Tools Automatic Delay Compensation values to work with the m701.

- **HDIO Factory Level Calibration Match** Clicking this button will set all ADC and DAC operating levels to match the factory settings on an Avid HDIO. This is +22dBu for 0dBFS. The m701 will produce a confirmation dialog box before applying these settings.

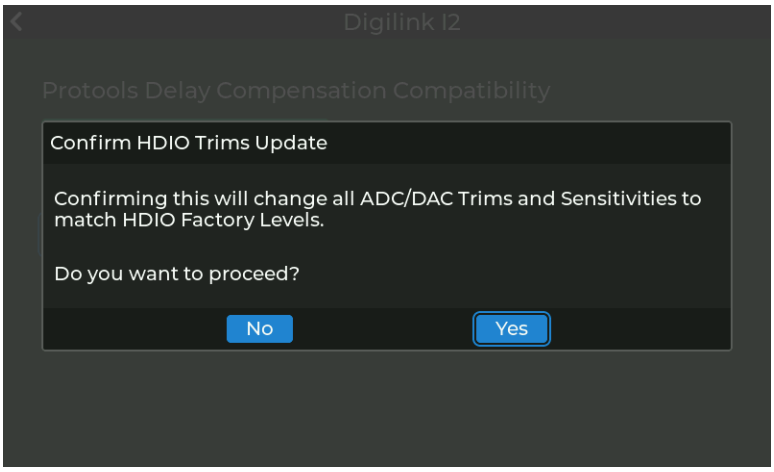


Illustration 60: Digilink Level Cal Confirmation

6.2.10 Workflow

The Workflow setup screen allow the user to save, save as, make new, copy, rename, delete, import, and export m701 workflows. Workflows are the files which contain all of the settings in the m701 with the following exceptions:

- Network settings.
- Display settings.

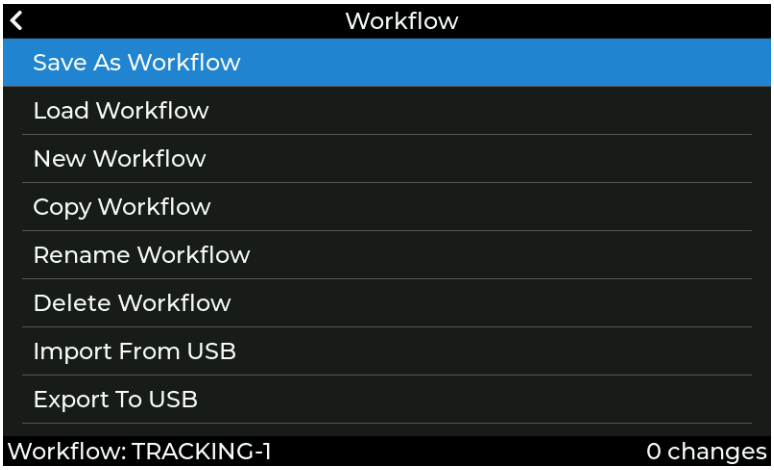


Illustration 61: Workflow Management Menu

Save As Workflow From the factory the m701 contains one workflow named "default". You can select Save As Workflow from the menu to save a copy of "default" to a name of your choosing.

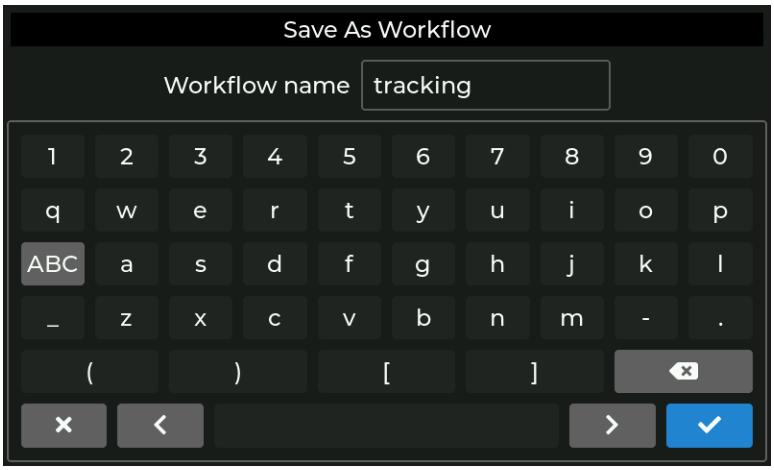


Illustration 62: Workflow Save As

The Save As Workflow allows saving to a custom name. There is a keyboard interface which allows for a wide array of letters and characters. Use the ▲ ▼ ◀ ▶ buttons and the EDIT knob to navigate to the desired character. Press the EDIT knob to enter a character in the Workflow name field. When finished navigate to the "check" key in the lower right and push the EDIT knob.

Load Workflow The Load Workflow page displays a list of available workflows on the m701.

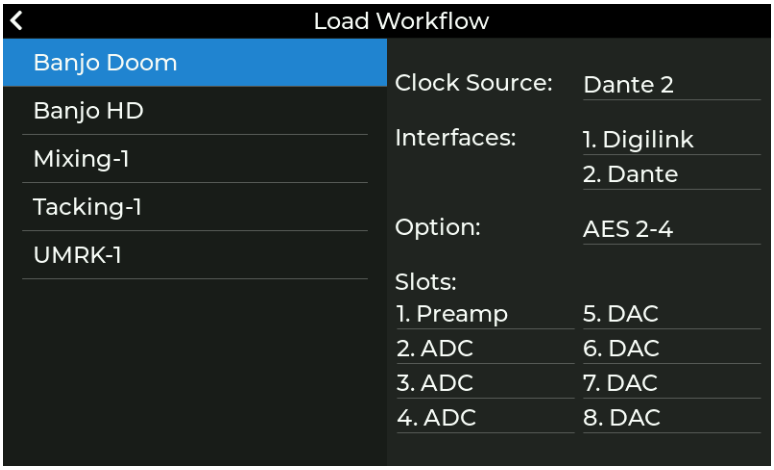


Illustration 63: Workflow Load

When a workflow is selected from the list the right side of the screen will display the hardware configuration that was used when the workflow was saved. This allows you to see if a workflow was made on a different m701 with different options before attempting to load it. Navigate to the desired workflow and press the EDIT knob to load it in to the m701. A confirmation dialog box will appear.

New Workflow Create a new workflow from this screen.

Illustration 64: New Workflow

If a workflow with the same name exists on the m701 an error message will appear. Change the name to a unique name. Workflow names are limited to 30 characters.

Copy Workflow To make a copy of an existing workflow select this option.

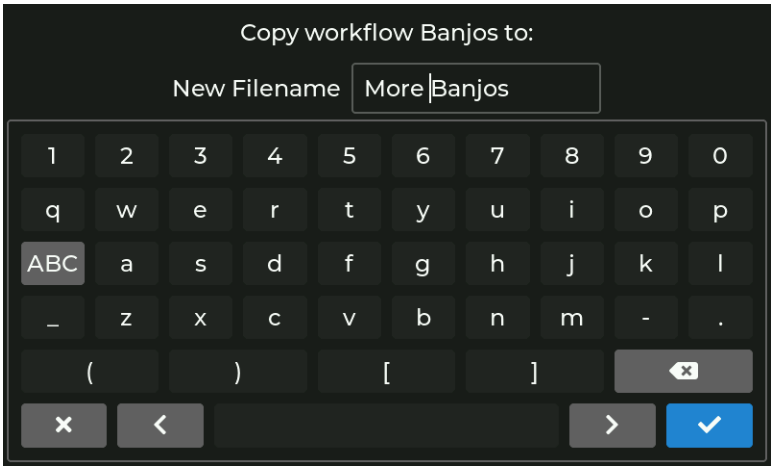


Illustration 65: Copy Workflow

If a workflow with the same name exists on the m701 an error message will appear. Change the name to a unique name. Workflow names are limited to 30 characters.

Delete Workflow Select this option to remove a workflow from the m701. Note that you can not delete the currently loaded workflow.

6.2.11 Display

Display settings include LCD backlight brightness, dim level, dim timer, and meter peak hold time. Note that the settings made on this screen are not saved in the workflow file.

Illustration 66: Setup Display Menu

The Display menu options are:

- **Brightness Level** Backlight brightness values are 1-5 with 5 being the brightest.
- **Dim Level** The dim level values are 1-3.
- **Dim Timeout** The timeout setting determines how many minutes after any front panel controls have been used before the dim will be activated. Values are <off, 10 min, 15 min, 20 min, 25 min, 30 min, 45 min, 60 min>
- **Peak Hold** Sets the time that peak levels indicators are held on signal meters throughout the m701. Values are <off, 1 sec, 5 sec, infinite>

If the m701 is to be left on 24-7 we recommend that the display be set to go to dim after some time. This will extend the life of the back-light LEDs.

6.2.12 Network - Primary

The network setup panel contains controls and status for the m701 network interfaces. To be able to access the GraceNet web UI on the m701 the unit must be connected to your computer network.

The m701 primary network interface uses the rear panel RJ45 Ethernet control port. A secondary network interface can be added by connecting a USB to Ethernet or USB Wi-Fi adapter. See the next section for Secondary interface setup information.

The m701 primary network interface supports three network connection modes: DHCP, Static, and Link local. The m701 factory default setting is DHCP for automatic ip addressing.

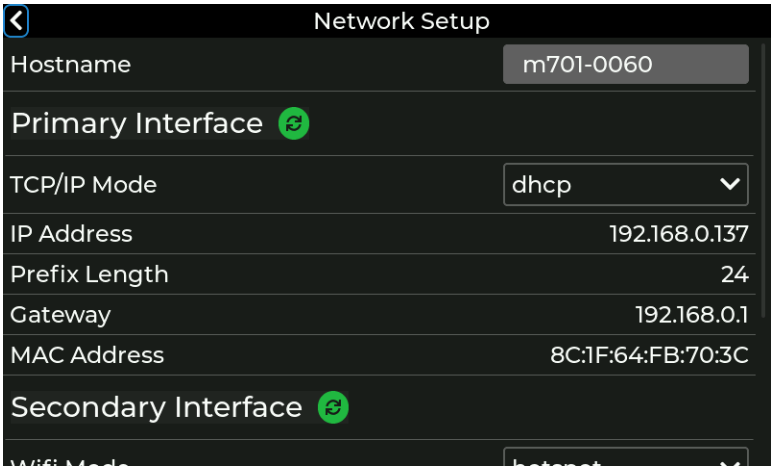


Illustration 67: Primary Interface Ethernet Setup

The Network setup menu options are:

- **Hostname** The hostname comes from the factory set to "m701-xxxx" where the xxxx represents the last four digits of the m701 serial number. To access the GraceNet web UI on the m701 simply enter the URL: http://m701-xxxx.local in to a web browser that is on the same network. The ".local" tells the browser that this is a host on the local network not an internet destination. The hostname can be edited to a custom name if desired.

- **Network Mode** Options are <dhcp, static, and link-local>. DHCP (Dynamic Host Configuration Protocol) is the default setting. Out of the box the m701 will request an IP address from a dhcp server and configure it's network interface automatically. If no dhcp server is found the m701 will time out and fall back to link-local mode. In static mode the m701 IP address, gateway, and prefix length (net mask) can be manually entered. In link-local mode the m701 can be connected directly to another computer. The m701 will set its own IP address to 169.254.xxx.xxx with a prefix length of 16.

The Network setup information includes:

- **IP Address** The currently assigned IP address
- **Prefix Length** Current prefix length indicated in number of bits.
- **Gateway** The current gateway address
- **MAC Address** Network interface Media Access Control (MAC) address. This is the unique network address of the m701

6.2.13 Network - Secondary

If the m701 has a USB to Ethernet or Wi-Fi adapter connected then there will be a second set of options and status fields listed. For each type of connection there will be different settings.

Wi-Fi client mode:

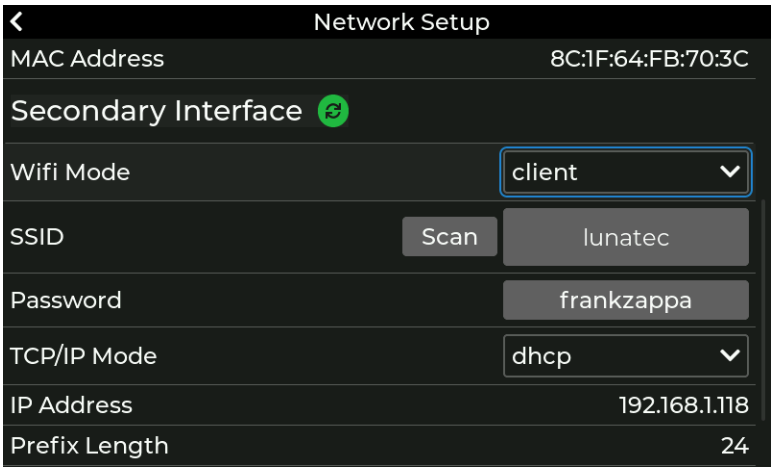


Illustration 68: Secondary Interface Wi-Fi Client Mode

The Wi-Fi Client network setup menu options are:

- **Wifi Mode** Sets the Wi-Fi radio mode. Options are <Client, Hotspot>
- **SSID** Selects the Wi-Fi network to connect to from a list of available networks. The SSID can be entered in to the SSID field manually if the network is not visible in the list.
- **Password** Password entry field. The m701 supports WPA2 password security. Passwords must be 8 or more characters in length.
- **TCP/IP Mode** Sets addressing mode. Options are <dhcp, static>

The Wi-Fi Client network setup information includes:

- **IP Address** In DHCP mode displays the currently assigned IP address. In static mode allows the user to enter an IP address manually.
- **Prefix Length** In DHCP mode displays the assigned prefix length. In static mode allows the user to enter the prefix length.
- **Gateway** In DHCP mode displays the gateway device IP address.. In static mode allows the user to enter the gateway device address manually.

Wi-Fi Hotspot mode

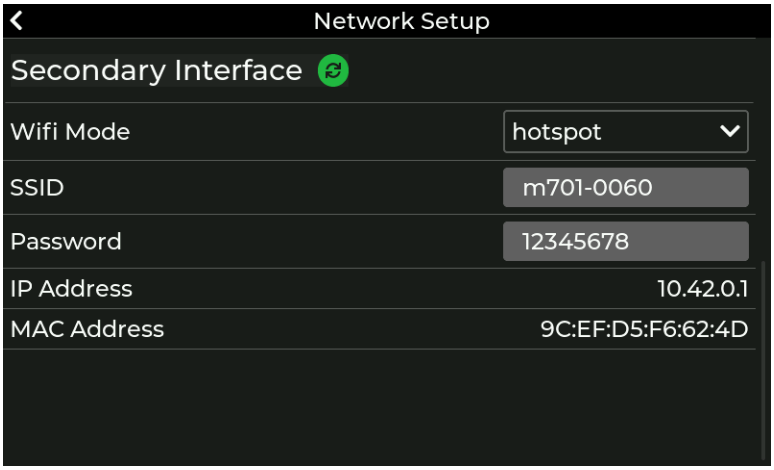


Illustration 69: Secondary Interface Wi-Fi Hotspot

The Wi-Fi Hotspot network setup menu options are:

- **Wireless Mode** Sets the Wi-Fi radio mode. Options are <Client, Hotspot>
- **SSID** Sets the SSID (name) of the m701 Wi-Fi Hotspot network. Currently WPA2 is the only available security mode.
- **Password** Sets and Displays the Wi-Fi Hotspot password.

The Wi-Fi network setup information includes:

- **IP Address** The gateway IP address of the Hotspot.
- **MAC Address** Current MAC address for the wireless interface.

USB-Ethernet mode

If the USB port is connected to an Ethernet adapter the secondary network interface settings will look identical to the built in Primary Interface Ethernet settings.

6.2.14 System

The System menu screen shows basic system information and options.

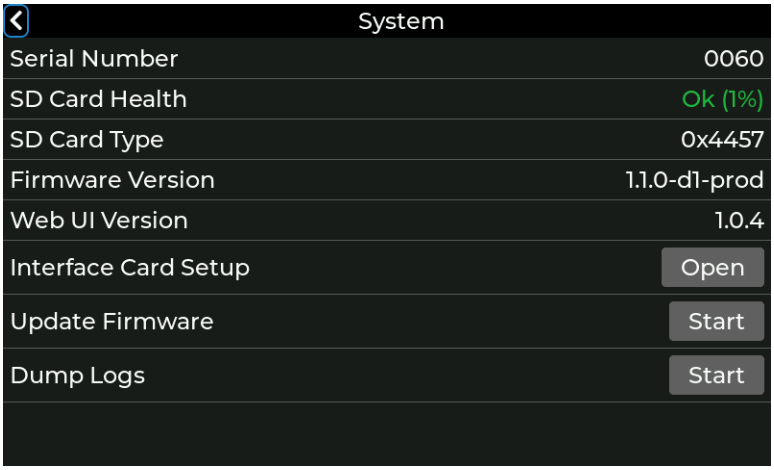


Illustration 70: System Menu

The system information displayed includes:

- **Serial Number** This is the last 4 digits of the unit serial number.
- **SD Card Health** This number indicates the health of the internal SD card. 1-100% is acceptable.
- **Firmware Version** The main m701 firmware version
- **Web UI Version** The installed version of the GraceNet web user interface.

The System options include:

- **Interface Card Setup** The m701 does not auto-detect the Interface cards. After changing the interface card hardware use this menu to tell the m701 what interface cards are installed. Note that changing interface cards can remove settings from your workflow. See the Hardware Configuration section of this manual for details.
- **Update Firmware** Starts the firmware update process from a USB flash drive. Visible if a USB flash drive is inserted that contains a valid .m701frm update file.
- **Dump Logs** Starts the diagnostic log file dump to a USB flash drive. Visible if a USB flash drive is inserted.

6.2.15 Status

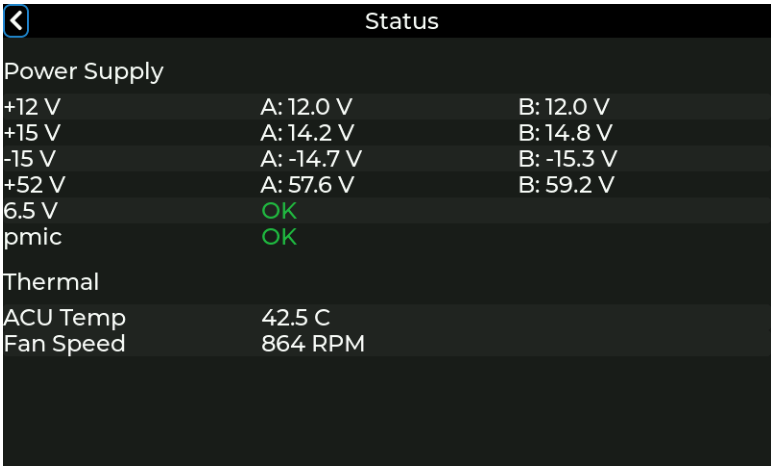


Illustration 71: System Status Page

The Status screen displays the voltages and status of the internal power supplies. It also displays the temperature on the main pcb and the current rpm of the cooling fan.

6.2.16 Factory

The Factory setup screen requires a passcode to view. It allows for changing the unit serial number and forcing a software reprogramming of the FPGA. Grace Design Technical Support will tell you how to access this menu if it becomes necessary.

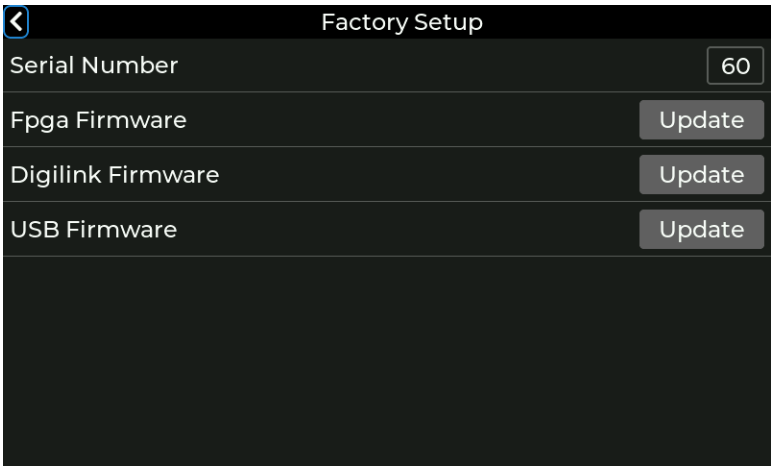


Illustration 72: Factory Setup Menu

7 Option Modules

7.1 ADC Option Module

The ADC option module provides 8 channels of high fidelity analog to digital conversion. The ADC module fits in one of the 8 Analog IO slots on the m701. Input connections are made via the DB25 connector which is wired to the AES59 (Tascam) standard.

Up to 8 ADC Modules can be installed in the m701.

7.2 DAC Option Module

The DAC option module provides 8 channels of high fidelity digital to analog conversion. The DAC module fits in one of the 8 Analog IO slots on the m701. Input connections are made via the DB25 connector which is wired to the AES59 (Tascam) standard.

Up to 8 DAC Modules can be installed in the m701.

7.3 Microphone Amplifier Option Module

The Microphone Preamplifier Option Module provides 4 channels of ultra high performance Grace Design mic preamps. These are uncompromised versions of our circuits found in the m108 and m801mk2 preamplifiers. Each preamplifier module has a DB25 input connector with channels 1-4 wired to the mic pre circuits. Channels 5-8 are connected to an internal pin header that can be connected to another mic preamp card so that 8 channels of input can be available on one DB25 connector. The DB25 connector is wired to the AES59 (Tascam) standard.

7.4 Dante Option Module

The Dante option provides the m701 with two gigabit Ethernet ports for streaming up to 64 channels of audio from and to other Dante enabled devices. This option is available on new and existing units. Please contact your Grace Design dealer or distributor for details. The heart of the Dante interface is the Brooklyn 3 module. This is where the digital audio data is sent to and received from the Dante network "flows".

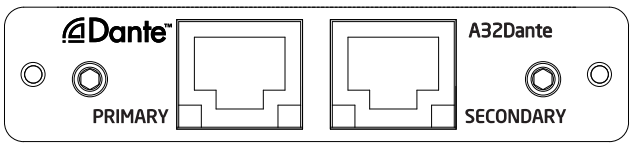


Illustration 73: Dante Option Module

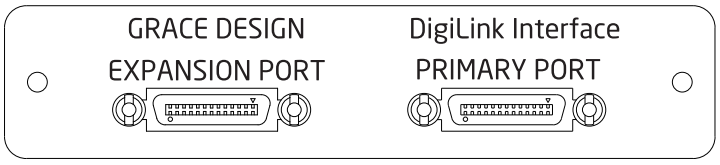
Dante Channel Count		
Sample Rate	Input Channels	Output Channels
44.1-48kHz	64	64
88.2-96kHz	32	32
176.4-192kHz	16	16

We strongly recommend reading through the Dante Controller software user guide and other Dante guides to become familiar with Dante networking basics.
These documents can be downloaded at https://www.getdante.com/resources/catalog/

7.5 DigiLink Option Module

The m701 Digilink option module provides 32 channels of I/O from a Pro Tools HDX/HD or Pro Tools HD Native system. The m701 will emulate two Avid HD I/O interfaces. This option is available on new and existing units. Please contact your Grace Design dealer or distributor for details.

I



llustration 74: Digilink Option Module

The m701 emulates *two* HD I/O interfaces with a total of 32 channels of I/O. The EXPANSION port is currently not active.

In Pro Tools Hardware Setup the only control that is active for the emulated HD I/Os is the Clock Source selection. Valid options are Internal and Word Clock. If choosing Word Clock select the option that is at the session sample rate.

If the m701 is the only device connected to the HDX port then the Clock Source selection is only valid for the HD I/O #1. HD I/O #2 is internally synchronized inside the m701 Digilink card.

When using the m701 Digilink interface, System Clock source should be set to "Digilink". When Word Clock is the selected clock source in Pro Tools Hardware Setup the m701 clock source must be set to any clock source *other than* Digilink. See table below.

There are two ways to connect the m701 to the HDX card or HD Native interface. See the illustrations below.

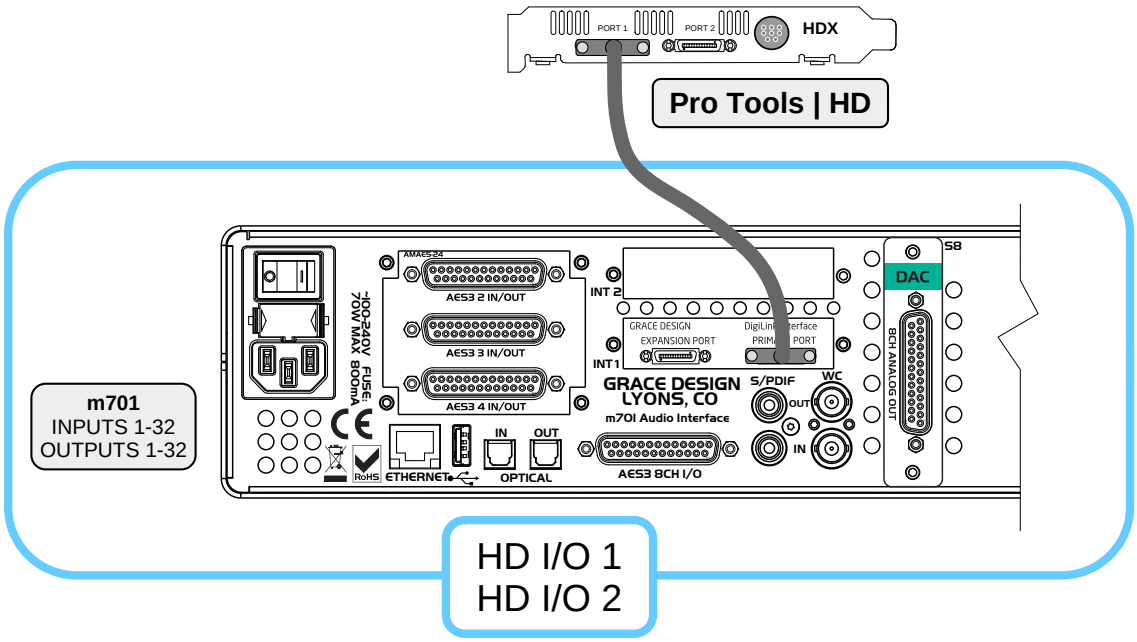


Illustration 75: 32 Channel Digilink Connection

When connected directly to an HDX or Native port the m701 will appear as two HD I/O interfaces and will allow 32 channels of IO.

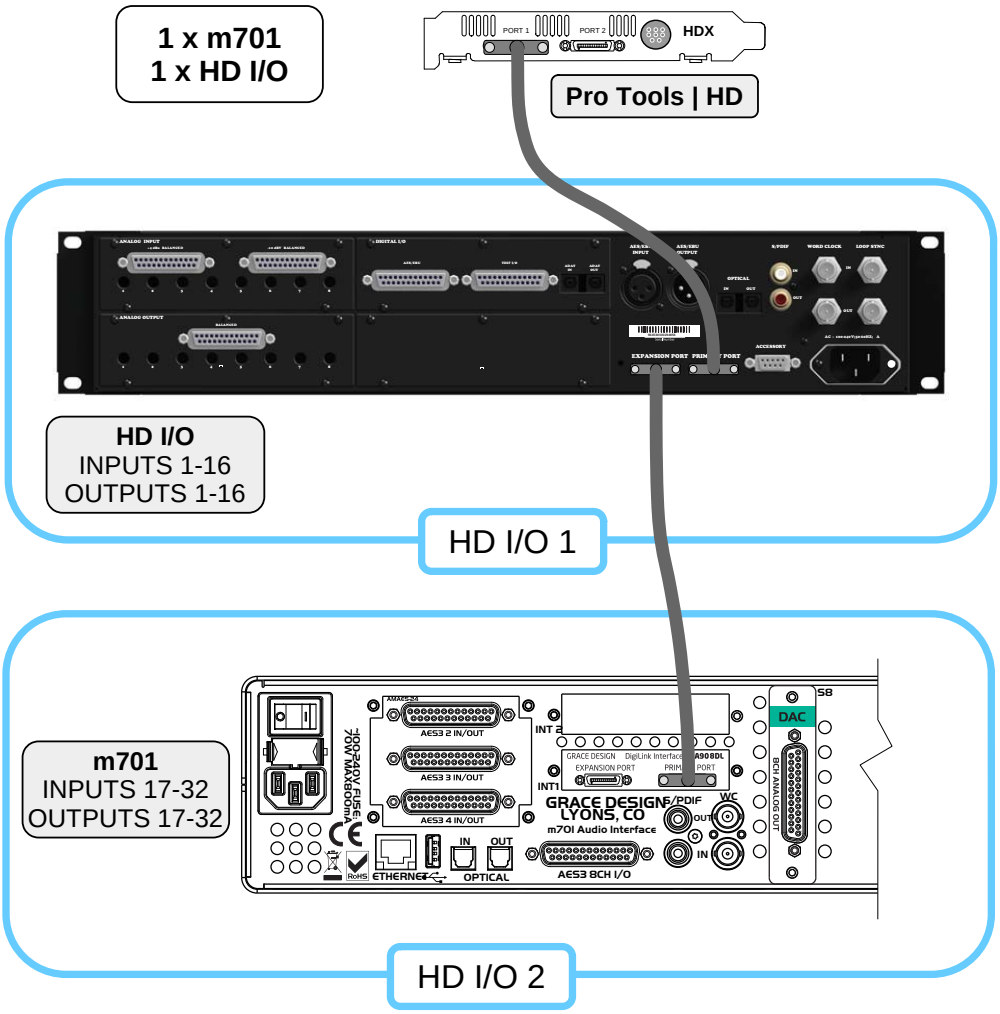


Illustration 76: 16 Channel Digilink Connections

When the m701 is connected to an HDX or Native port along with another interface the m701 must be second in the chain. This is because the m701 emulates two HD I/O devices and the EXPANSION port is not active.

When the m701 is connected in the second position it will show up in Pro|Tools Hardware Setup as HD I/O #2 and receive audio from Pro|Tools on the first 16 channels of the m701 Digilink interface.

To configure the m701 for use with Avid HDX follow the procedure below:

m701 is Loop Master and there is no external clock source.

1. In Pro Tools Hardware Setup Clock Master drop down list select: Internal

2. On the m701 select the Clock Source: Diglilink

m701 is Loop Master and there is an external clock source

- In Pro Tools Hardware Setup Clock Master drop down list select: Word Clock (session sample rate).
- On the m701 select the Clock Source: Word Clock (or any other clock source that is at the Pro Tools session sample rate)

m701 is not Loop Master

- In ProTools Hardware Setup, select the appropriate loop master device as the Clock Master.
- On the m701, select Loop Sync I1 or (Loop Sync I2) as the clock source.
- Set Word Clock Output mode to Loop Sync.

Digilink Clock Settings				
Configuration	m701 Clock Source	m701 Word Clock Output	Pro Tools HDIO Clock source	Notes:
m701 is Loop Master No external clock	Digilink	Loop Sync	Internal	This is for m701 stand alone operation with HDX. No other interfaces in system.
m701 is Loop Master With external clock	Word Clock, AES, SPDIF, ADAT, Internal, Dante, Ravenna	Loop Sync	Word Clock	This syncs the Digilink interface to whatever clock source the m701 is using. Sample rate must match Pro Tools
m701 is NOT Loop Master	Loop Sync I1 or I2	Loop Sync	Other Avid Hardware device	When other Avid hardware is the loop master.

Digilink Channel Count		
Sample Rate	Input Channels	Ouptut Channels
44.1-48kHz	32	32
88.2-96kHz	32	32
176.4-192kHz	32	32

7.6 Ravenna/AES-67/ST2110 Option Module

The Ravenna/AES67 option provides the m701 with two gigabit Ethernet ports for streaming up to 64 channels of audio from and to other Ravenna or AES67 enabled devices. This option is available on new and existing units. Please contact your Grace Design dealer or distributor for details. The Ravenna interface contains the Merging Audio ZMAN module. This allows the m701 to integrate seamlessly in to existing Merging Ravenna systems. Also, being AES67/SMPTE ST2110 compliant, this option will allow for connections to other Ethernet audio interfaces such as DANTE in AES67 mode.

The Ravenna/AES67 Option Module can stream up to 64 channels in and out.

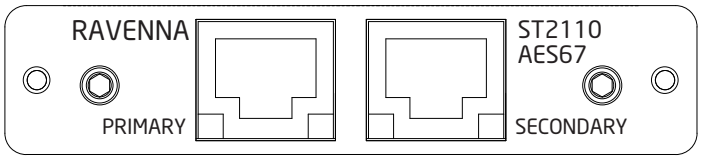


Illustration 77: Ravenna/AES67/ST2110 Option Module

Ravenna Channel Count		
Sample Rate	Input Channels	Ouptut Channels
44.1-48kHz	64	64
88.2-96kHz	64	64
176.4-192kHz	32	32

7.7 USB Option Module

The USB option module is a USB Audio Class 2 compliant interface providing up to 32 x 32 channels of IO. This option is available on new and existing units. The USB connection is via a USB C type connector running at USB 2.0 High-Speed.

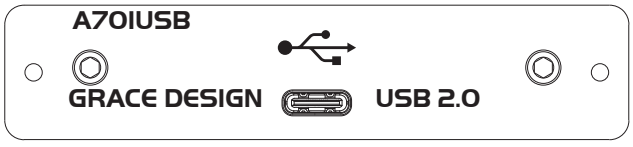


Illustration 78: USB Option Module

USB Channel Count		
Sample Rate	Input Channels	Ouptut Channels
44.1-48kHz	32	32
88.2-96kHz	32	32
176.4-192kHz	16	16

The m701 USB Option module is plug-and-play on MacOS. No driver is required. For ASIO operation under Windows operating systems a driver is required. It can be downloaded from the Grace Design website: https://gracedesign.com/support-documents

Typical USB latency times are listed in the table below. These are approximate as different operating systems and computer hardware performance will affect the latency. The below measurements were taken on a 2023 Mac Mini, Apple M2 Pro, Tahoe 26.3.1 and Oblique Audio RTL Utility

USB Typical Round Trip Latency			
Sample Rate	Configuration	Samples	Latency
48kHz	Digital Loop-back	166	3.45ms
48kHz	AD/DA Slow roll-off, minimum phase	181	3.77ms
48kHz	AD/DA Fast roll-off, linear phase	226	4.70ms
96kHz	Digital Loop-back	309	3.22ms
96kHz	AD/DA Slow roll-off, minimum phase	313	3.26ms
96kHz	AD/DA Fast roll-off, linear phase	359	3.70ms
192kHz	Digital Loop-back	589	3.07ms
192kHz	AD/DA Slow roll-off, minimum phase	640	3.12ms
192kHz	AD/DA Fast roll-off, linear phase	600	3.33ms

8 Hardware Configuration

The m701 is a modular system with a wide array of possible card configurations. This section describes how the m701 is configured for various combinations of converter cards and interface cards.

At boot the m701 will automatically detect what converter cards are installed in slots S1 through S8. It will also automatically detect what is installed in the options slot. i.e AES 24 channel IO option.

There are 4 hardware configuration states that are possible when the m701 powers on:

1. **No change** The system boots and loads the last used workflow.

2. **New hardware** The system detects that an option card has been added where there was an empty slot before. The m701 will boot, load the last used workflow, and add the new option card to the list of installed options.
3. **Removed Hardware** The system detects that a card has been removed from a slot. The m701 will boot, detect that a card is missing, then save a copy of the last used workflow. It will then remove any routes and settings for the missing card and inform the user that the hardware has changed.
4. **Changed hardware** The system detects that a card has been removed from a slot and replaced with a different kind of card. The m701 will boot, detect that a card is missing, then save a copy of the last used workflow. It will then remove any routes and settings for the missing card and add the new card to the list of installed cards. The m701 will inform the user that the hardware has changed.

The hardware change notification happens on the GraceNet web UI as well as the front panel display.

Illustration 79: Front Panel Hardware Change Notification

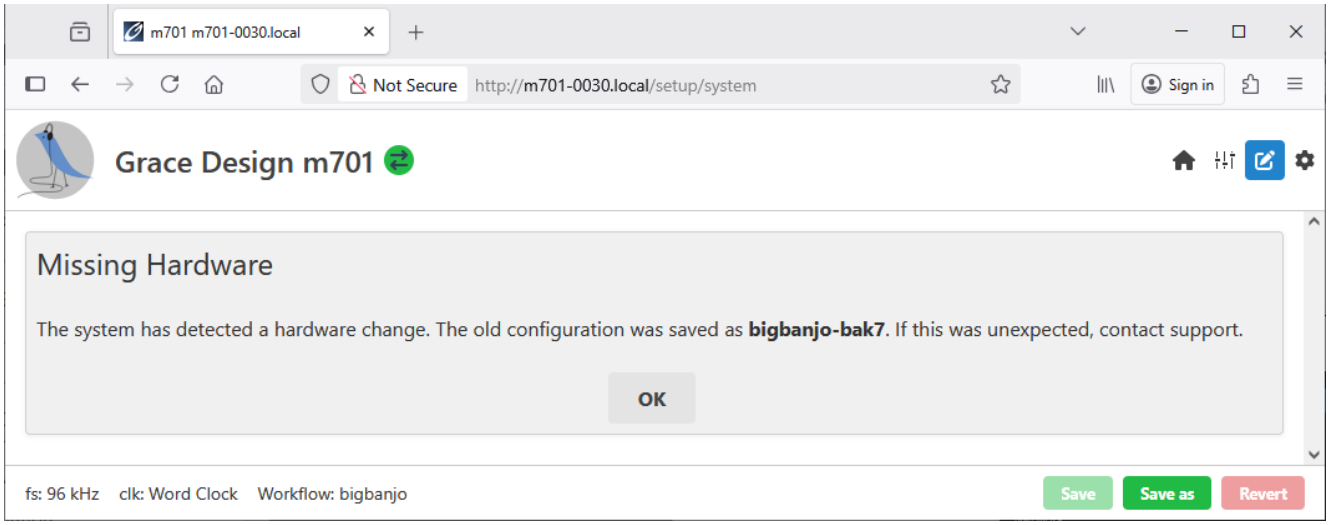


Illustration 80: Web UI Hardware Change Notification

If an Interface card is added, removed, or changed to a different type the m701 will need to be manually configured. This can be done from the front panel interface or from the web UI.

8.1 Front Panel Interface Card Setup

To configure the Interface hardware configuration after a hardware change on the front panel press the Setup button to enter the setup menu and then select "System". Select Interface Card Setup and pres the EDIT knob.

Illustration 81: Front Panel Interface Card Setup

Select the interface card to be changed and select the new interface card type from the drop down menu.

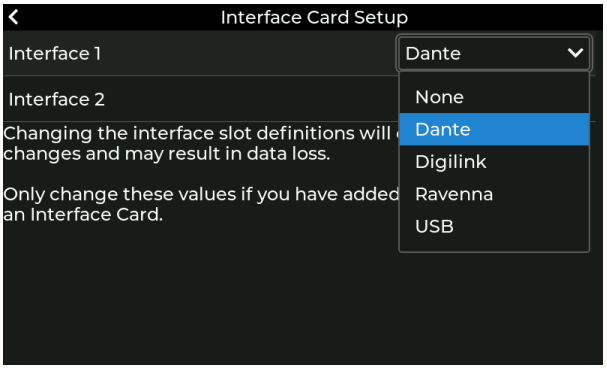


Illustration 82: Front Panel Interface Card Select drop-down

Changing either of the interface configurations will cause the m701 to save a backup of the current workflow and add (or remove) the interface card to the current workflow. The hardware change notification window will appear.

8.2 Web UI Interface Card Setup

To configure the Interface hardware configuration after a hardware change on the web UI navigate to the Setup > System page and click on the "Enter Setup" button in the Interface Card Setup section at the bottom of the page. This will open the Interfaces Setup page.

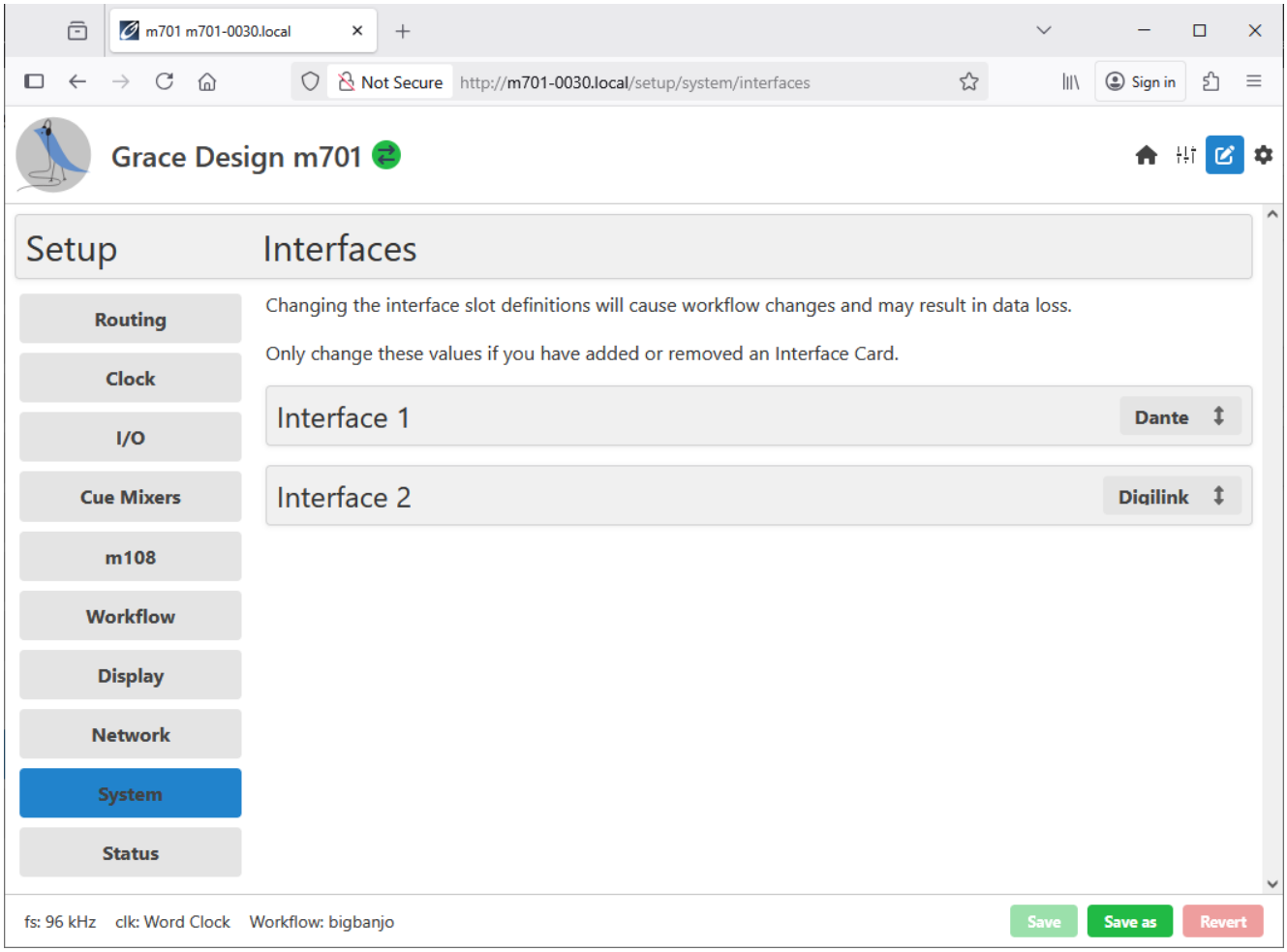


Illustration 83: web UI Interface Setup

Use the drop down menus on the right side of the page to set the m701 to match the Interface cards installed.

Changing either of the interface configurations will cause the m701 to save a backup of the current workflow and add (or remove) the interface card to the current workflow. The hardware change notification window will appear.

9 Firmware Upgrades

The m701 is designed so that system firmware upgrades are simple. The current m701 firmware is available on our website:

https://gracedesign.com/support-documents/

The firmware update process consists of three basic steps.

- Upload the firmware package file to the m701
- Install the new firmware files on the m701 file system update partition.
- Reboot the m701 to boot to the new firmware version.

The firmware can be updated from the front panel interface using a USB flash drive plugged directly in to the m701 or from the GraceNet web UI using an update file from your computer.

9.1.1 Firmware Update Procedure: USB Drive

1. Download the latest m701 firmware package from the link above.
2. Unzip the contents of the firmware package to a blank USB flash drive formatted for FAT16 or FAT32
3. Insert the USB flash drive into the USB host connector on the rear panel of the m701.
4. On the front panel of the m701 enter Setup mode by pressing the setup button.
5. Navigate to the System menu and press the EDIT knob.
6. Scroll down to the Update Firmware entry and press the EDIT knob to start the update process.
7. A dialog box will appear showing the available upgrade packages on the USB drive. Select the desired upgrade package and press the EDIT knob.

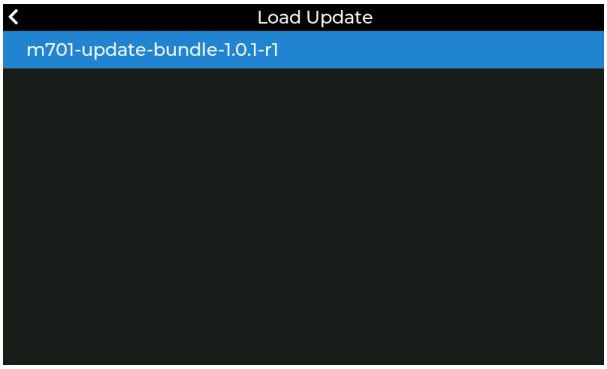


Illustration 84: Front Panel Update Package Select

8. After selecting an update bundle the m701 will as to confirm the update.

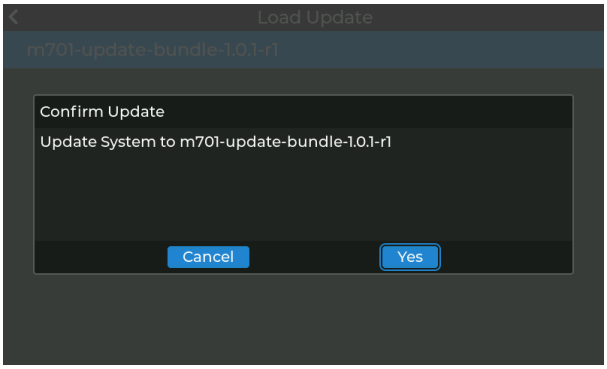


Illustration 85: Update Confirmation

9. Select Yes and push the EDIT knob to start the update process.

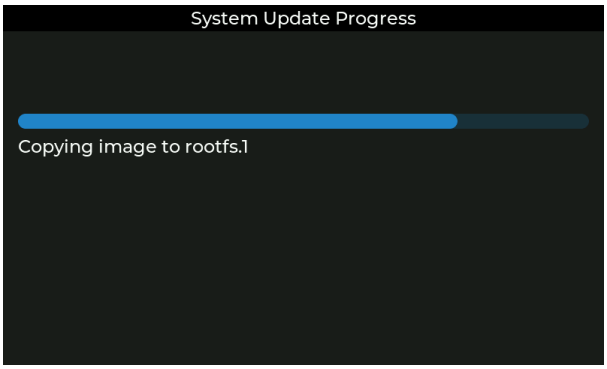


Illustration 86: System Update Progress

10. When the update files are done copying the system will need to be rebooted. Press the EDIT knob to reboot.

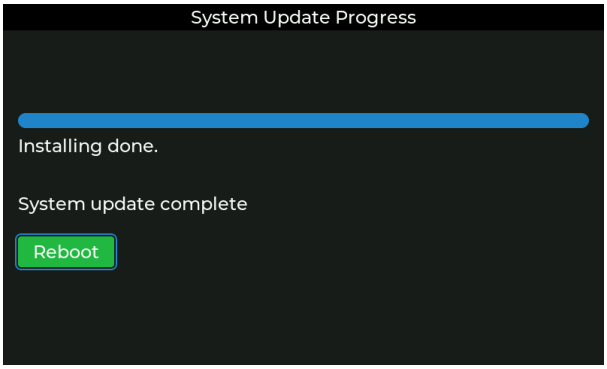


Illustration 87: Update Reboot

9.1.2 Firmware Update Procedure: web UI

1. Download the latest m701 firmware package from the link above. The m701 firmware upgrade file is named: m701-update-bundle-X.X.X.m701frm

2. Unzip the contents of the firmware package to a location on your local computer.
3. Open a browser and enter the URL of your m701 in to the address bar.
4. Navigate to the Setup menus and select System from the left side of the screen.

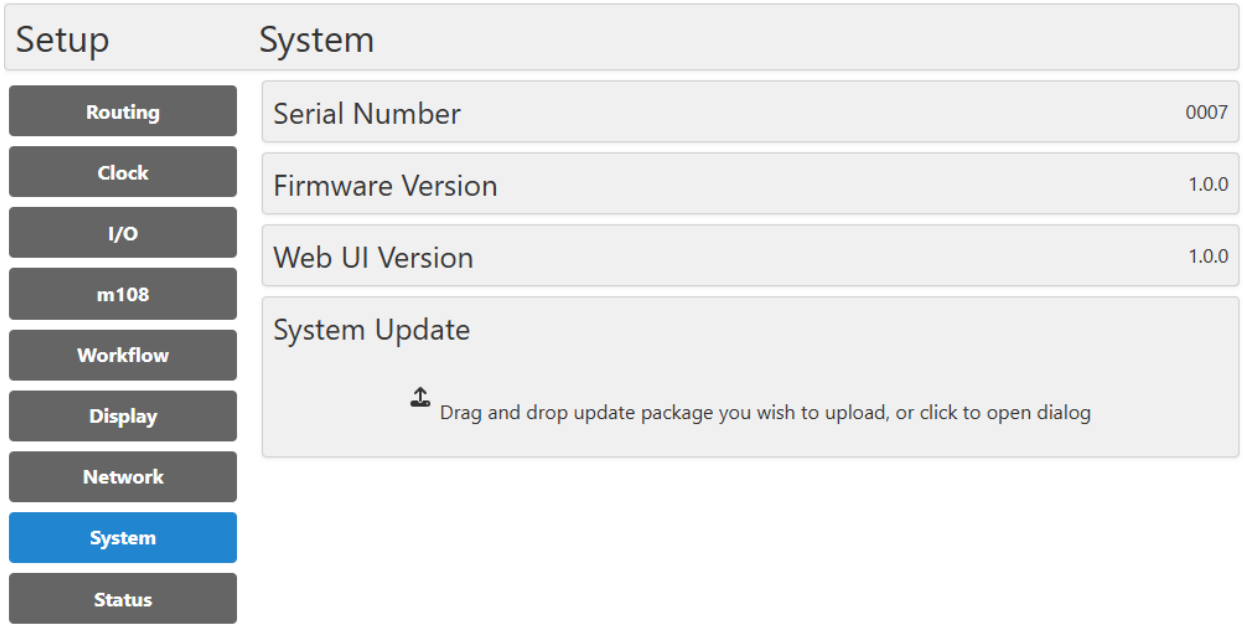


Illustration 88: Setup System Menu

5. Drag and drop the upgrade file or click to open the file open dialog.
6. Click the "Upload" button to upload the firmware package to the m701 or click "Cancel" to exit the upgrade process.

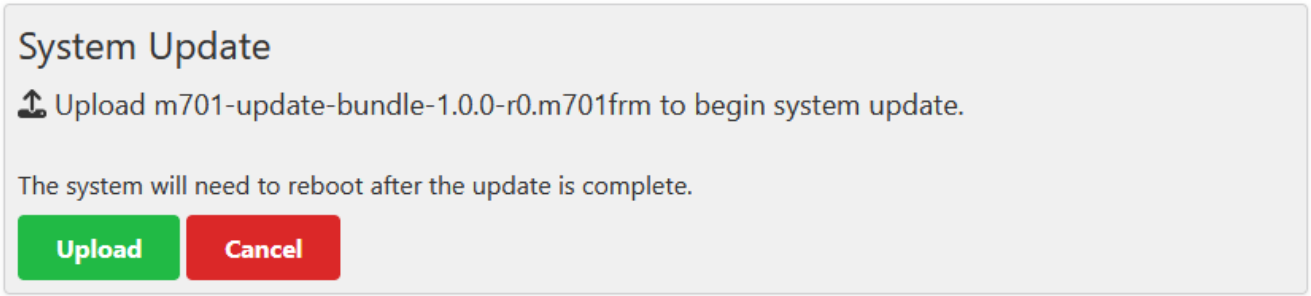


Illustration 89: Upload Update Bundle

7. After the upgrade file has been uploaded to the m701 you will be asked if you want to update the system. Click "Update" to install the upgrade. Click "Cancel" to abort the upgrade.

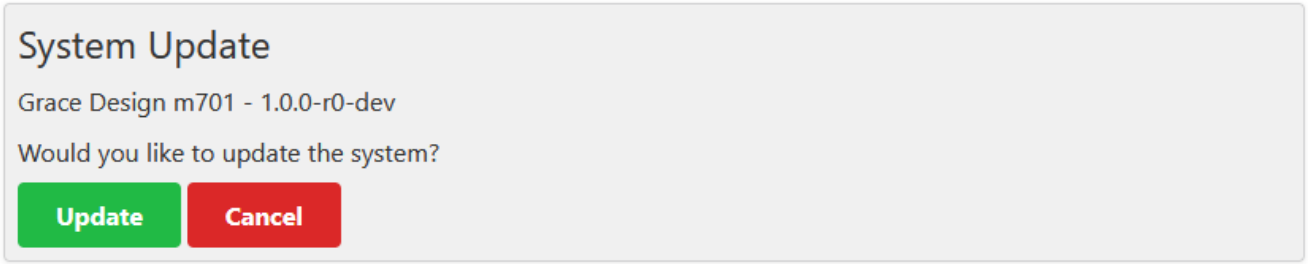


Illustration 90: Begin Update

8. Once the upgrade is finished the m701 will prompt you to reboot the system. Rebooting is required to run the new firmware. The unit can be re-booted from the web UI update page or the front panel of the m701.

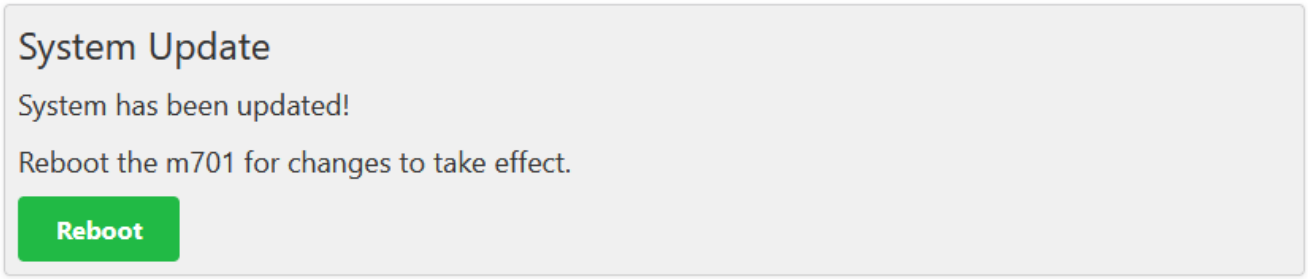


Illustration 91: Reboot System

9. The m701 will reboot and run the new firmware.
10. **NOTE**: If the update includes changes to the GraceNet web UI then the page should be reloaded while holding the *SHIFT* key on your keyboard. This clears the cached version of the web UI and loads the current version from the m701.
11. Once updated the Setup System page of the GraceNet UI will show the new version:

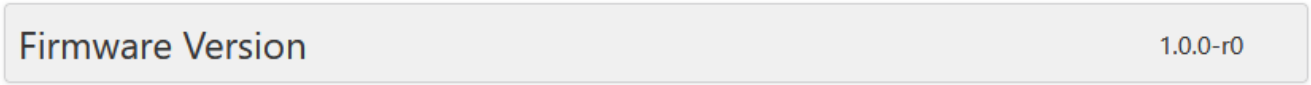
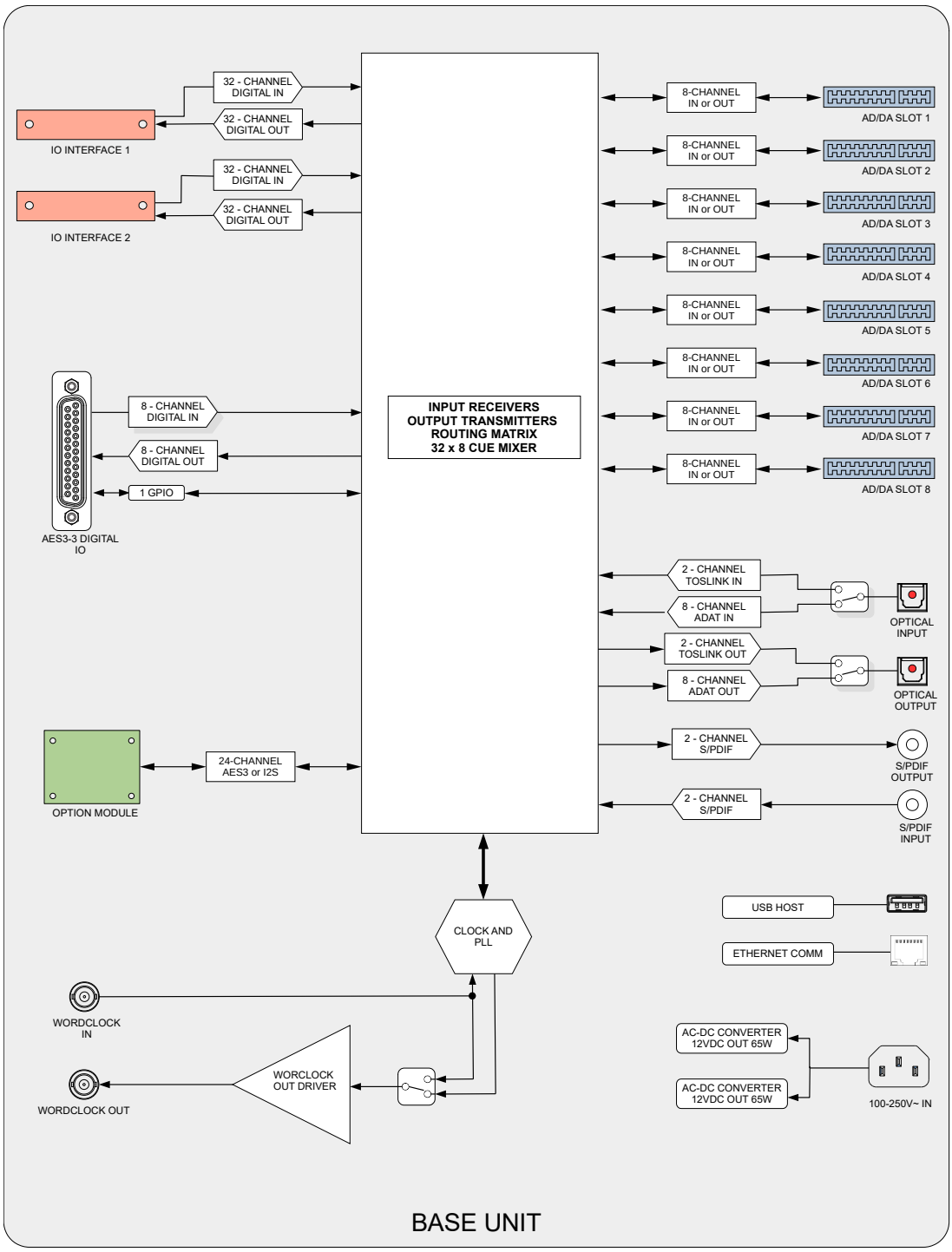


Illustration 92: Firmware Version

10 Block Diagram



11 Cable and Connector Diagrams

Table 3: DB25 AES3 (AES59 /Tascam Pinout)		
CH#	DB25 Pin#	AES3 1 IN/OUT
	13	GPIO 1
IN 1-2	25	GND
	24	Positive(+)
	12	Negative(-)
IN 3-4	11	GND
	10	Positive(+)
	23	Negative(-)
IN 5-6	22	GND
	21	Positive(+)
	9	Negative(-)
IN 7-8	8	GND
	7	Positive(+)
	20	Negative(-)
OUT 1-2	19	GND
	18	Positive(+)
	6	Negative(-)
OUT 3-4	5	GND
	4	Positive(+)
	17	Negative(-)
OUT 5-6	16	GND
	15	Positive(+)
	3	Negative(-)
OUT 7-8	2	GND
	1	ositive(+)
	14	Negative(-)

DB25 Analog (AES59 /Tascam Pinout)		
CH#	DB25 Pin#	Pin function
	13	Not Connected
1	5	GND
	24	Positive(+)
	12	Negative(-)
2	11	GND
	10	Positive(+)
	23	egative(-)
3	22	GND
	1	Positive(+)
	9	Negative(-)
4	8	GND
	7	Positive(+)
	20	Negative(-)
5	19	GND
	18	Positive(+)
	6	Negative(-)
6	5	GND
	4	Positive(+)
	17	Negative(-)
7	16	GND
	15	Positive(+)
	3	Negative(-)
8	2	GND
	1	Positive(+)
	14	Negative(-)
Note: For unbalanced output operation leave the Negative (-) pin open		

12 Converter oversampling filter characteristics

The AD and DA converter ICs used in the m701 allow for picking oversampling filter responses from a list of several different types. The basic characteristics of each type are described below.

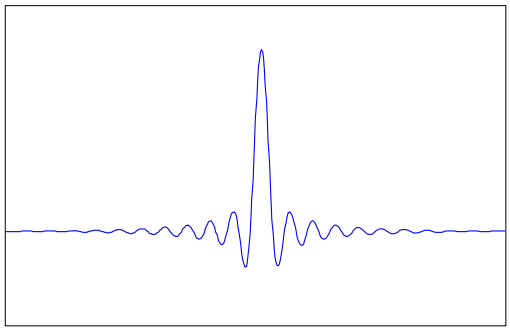


Illustration 93: Fast Roll-off, Linear Phase impulse response

Fast Roll-off, Linear Phase For linear phase response and time coherency. Fast roll off protects against aliasing distortion from high amplitude high frequency content. Best for recordings that are loud, compressed, and with lots of treble. Will contain substantial ringing before and after transients(pre-echo and post-echo). Note that the ringing occurs at the Nyquist frequency (½ of the sample rate), so it is not directly audible. However, it can cause intermodulation distortion in downstream components. Choose this filter if latency is not critical.

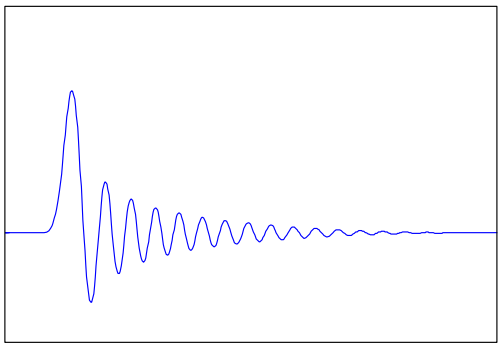


Illustration 94: Fast Roll-off, Minimum Phase impulse response

Fast Roll-off, Minimum Phase Not linear phase in the pass band. Fast roll off protects against aliasing distortion from high amplitude high frequency content. Best for recordings that are loud, compressed, and with lots of treble. Will contain substantial ringing caused by transients, but all of the ringing is shifted to after the transient. This can reduce the perceived effects off downstream intermodulation distortion due to the Hass Effect.

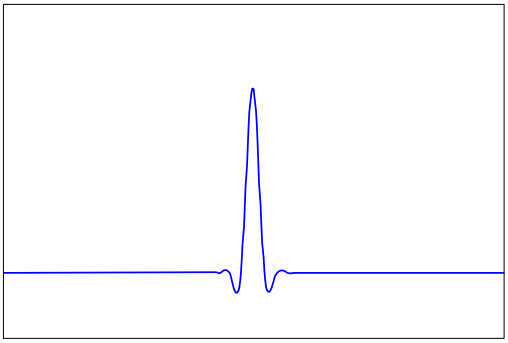


Illustration 95: Slow Roll-off, Linear Phase impulse response

Slow Roll-off, Linear Phase (7 samples) For linear phase response and time coherency. Best for acoustic music without compression and artificially high levels of treble. Will have very low levels of ringing before and after transients but is susceptible to distortion artifacts caused by high amplitude high frequency information in the program material.

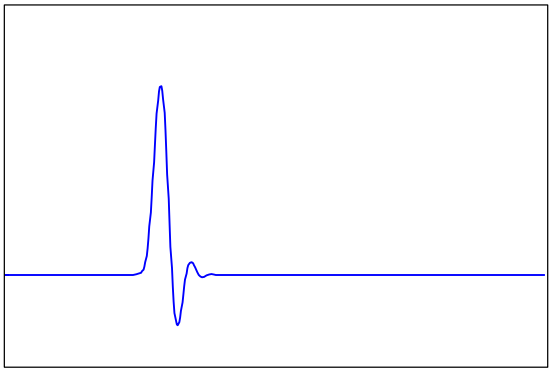


Illustration 96: Slow Roll-off, Minimum Phase impulse response

Slow Roll-off, Minimum Phase (5 samples) Not linear phase in the pass band. Best for acoustic music without compression and artificially high levels of treble. Will have very low level of ringing caused by transients and ringing will be shifted to after the transient.

The DACs have three additional filter types to choose from:

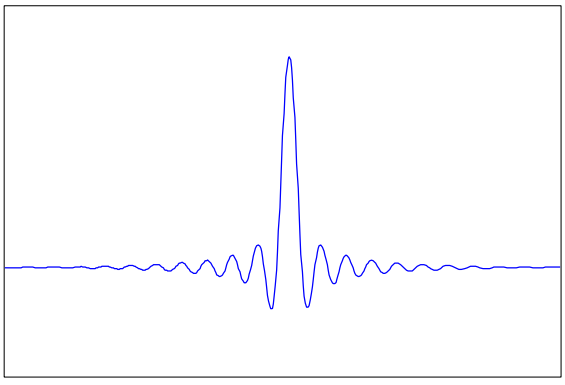


Illustration 97: Fast Roll-ff, Linear Phase impulse response

Apodizing Linear Phase Linear phase filter that is set to have a corner frequency slightly lower than the Nyquist frequency. In theory this will remove any ringing artifacts from upstream converters. The latency and impulse response are similar to the standard Fast Roll-off, Linear Phase filter.

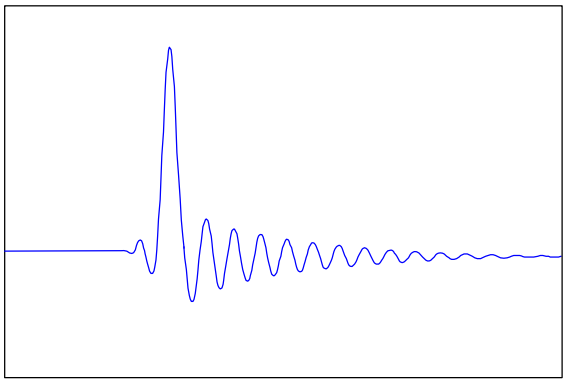


Illustration 98: Hybrid Minimum Phase impulse response

Hybrid Minimum Phase This filter is a compromise between the Fast roll-off Linear and Mimimum Phase filters. It has lower latency than the Linear Phase but mostly post ringing in its transient response.

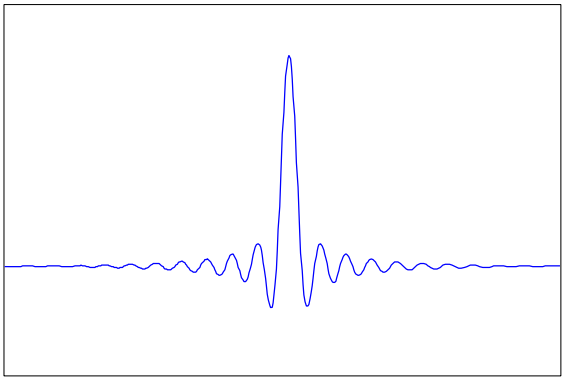


Illustration 99: Brickwall impulse response

Brickwall This filter is similar to the Fast roll-off Linear Phase filters except that it has a steeper slope. Use this filter to avoid aliasing distortion on program material that is highly compressed with lots of high frequency content.

13 System Specifications

DA CONVERTER Option Fs=48kHz unless otherwise noted.		
THD+N Ratio		
-3dBFS In, +15dBu Out, 22Hz-22kHz BW		<-115dB
-3dBFS In, +21dBu Out, 22Hz-22kHz BW		<-110dB
Dynamic Range		
20-22kHz bandwidth		123dB
20-22kHz bandwidth and A weighting filter		125dB
Intermodulation Distortion		
SMTPE/DIN 4:1 50Hz, 7kHz, 1.0V Out		<107dB
Frequency response	+/-0.2dB	-3dB
44.1kHz Fs	DC-20.5kHz	DC-20.6kHz
48kHz Fs	DC-22.2kHz	DC-23.5kHz
88.2kHz Fs	DC-27kHz	DC-43.2kHz
96kHz Fs	DC-27kHz	DC-47kHz
176.4kHz Fs	DC-27kHz	DC-85.5kHz
192kHz Fs	DC-27kHz	DC-92.7kHz
Full Scale Output Level (selectable)		
0dBFS		+24dBu or +18dBu
Output Noise (+18dBu=0dBFS)		
20-22kHz		-105dBu
20-22kHz, A weighting filter		-107dBu
Crosstalk		
Interchannel crosstalk, 1kHz		-123dB
Interchannel crosstalk, 10kHz		-103dB
Level and Impedance		
Digital Trim Range		-20 to +20dB, 0.1dB steps
Channel Tracking Accuracy		+/-0.05dB
Maximum Output Level		+18dBu or +24dBu
Output Impedance (balanced)		300Ω

A/D CONVERTER OPTION	**Fs=48kHz unless otherwise noted.**	
THD+N		
1kHz, -1dBFS, 20Hz-22kHz		< 0.0004% (-108dB)
Dynamic range		
22Hz-24kHz, 48kHz		>117dB
"A" weighted, 48kHz		>120dB
Intermodulation Distortion		
IMD SMPTE 4:1 60Hz, 7kHz, -3dBFS		<0.002%
Frequency response	+/-0.2dB	-3dB
44.1kHz Fs	14Hz-20.6kHz	4.5Hz-21.1kHz
48kHz Fs	15Hz-22.4kHz	4.5Hz-23.0kHz
88.2kHz Fs	14.9Hz-41.1kHz	4.5Hz-42.3kHz
96kHz Fs	15Hz-44.7kHz	4.5Hz-46.1kHz
176.4kHz Fs	15.5Hz-79.6kHz	4.5Hz-88.09kHz
192kHz Fs	15Hz-86.7kHz	4.5Hz-95.97kHz
Full scale input level 0dBFS		
Relay Selectable		+18dBu or +24dBu
Crosstalk		
Interchannel crosstalk, 1kHz		-140dB
Interchannel crosstalk, 10kHz		-127dB
Input Impedance		
Balanced Input (DB25 or XLR)		20k Ω

MICROPHONE PREAMPLIFIER OPTION MODULE	
Gain Range	-6, +2-69B in 1dB steps
Sensitivity @ -6dB Gain	+30dBu = 0dBFS
Sensitivity @ 69dB Gain	-45dBu = 0dBFS
Dynamic Range	
20-20kHz bandwidth, 14dB Gain	>119dB
20-20kHz bandwidth and A weighting filter, 14dB Gain	>122dB
Frequency Response	
@ 40dB gain ± 0.2dB (50Ω source)	15Hz-300kHz
@ 40dB gain ± 3dB (50Ω source)	4.5Hz-1.0MHz
THD+N ratio	
@ 20dB gain 0dBu in (-4dBFS), 1kHz	<-104dB
@ 40dB gain -20dBu in (-4dBFS), 1kHz	<-102dB
@ 60dB gain -40dBu in, (-4dBFS), 1kHz	<-87dB
Intermodulation Distortion	
@ 40dB gain +20dBu out	
SMPTE/DIN 1:1 (50Hz, 7kHz)	<.0010%
SMPTE/DIN 4:1 (50Hz, 7kHz)	<.0020%
Noise - Referred to Input	
@ 60dB gain, 50Ω source	-129dB
@ 60dB gain, 150Ω source	-127dB
@ 60dB gain, 600Ω source	-123dB
Crosstalk	
Any Channel @ 40dB gain 1kHz	-132dB
Any Channel @ 40dB gain 10kHz	-122dB
CMRR	
@ 60dB gain, +20dBu CM, 1kHz	>95dB
@ 60dB gain, +20dBu CM, 10kHz	>84dB
@ 60dB gain, +20dBu CM, 60Hz	>70dB
Maximum Input Level	
Balanced, 1kHz, -6dB Gain	+30dBu (24.5Vrms)
Balanced, 1kHz, 69dB Gain	-45dBu (4.3mVrms)
Impedance	
Input: +48V On	8kΩ
Input: +48V Off, Ribbon Mode	20kΩ
Dynamic Range	
20-20kHz bandwidth, 14dB Gain	>119dB
20-20kHz bandwidth and A weighting filter, 14dB Gain	>122dB
Channel Matching Accuracy	
	+/-0.05dB

CLOCKING	
Supported Sample Rates kHz	44.1, 48, 88.2, 96, 176.4, 192
External Clock	
Lock Range	FS +/- 1%
Word Clock Input Voltage (BNC)	200mV-5.0V peak to peak
Word Clock Output voltage	5V peak to peak
Word Clock Input Impedance	48kΩ or 75Ω
Word Clock polarity	Left data: High, Right data: Low
Intrinsic Jitter, 10Hz-20kHz BW	
Internal Clock	<40ps RMS
External Clock	<40ps RMS
Jitter Rejection Corner Frequency	0.5Hz

GENERAL			
System Latency, Linear Phase Filters	48kHz	96kHz	192kHz
ADC to Digital Output	0.5ms	0.25ms	0.12ms
Digital Input to DAC	0.8ms	0.4ms	0.2ms
System Latency, Minimum Phase Filters	48kHz	96kHz	192kHz
ADC to Digital Output	0.2ms	0.1ms	0.05ms
Digital Input to DAC	0.2ms	0.1ms	0.05ms
Cue Mixer Latency	0.02ms	0.01ms	0.005ms
Network connection modes: Primary Interface			
dhcp, static, link-local	100Mbps	RJ45	
Network connection modes: Secondary Interface			
dhcp, static, link-local		USB > Ehternet	
dhcp, static		USB > Wifi, Client mode	
-		USB > Wifi, Hotspot mode	
Mechanical	Weight	Dimensions	
Audio Control Unit	6.8lbs (3.2kg)	19"W x 3.5" H x 10.9" L	
Power Consumption			
90-250V~ 50-60Hz	75W Max		

14 Warranty Information

- Grace Design warrants this product to be free of defective parts and workmanship for a period of five years. This warranty period begins at the original date of purchase and is transferable to any person who may subsequently purchase the product during this time.
- This warranty excludes the following conditions: normal wear and tear, misuse, customer negligence, accidental damage, unauthorized repair or modification, cosmetic damage and damage incurred during shipment.
- During the time of this warranty, Grace Design will repair or replace, at its option, any defective parts or repair defective workmanship without charge, provided the customer has appropriate proof of purchase and that the product has its original factory serial number.
- In order for Grace Design to provide efficient and timely warranty service, it is important that you register the warranty online at www.gracedesign.com/support-documents/warranty within 10 days of the original date of purchase. You may also register your product directly with Grace Design by telephone (303-823-8100 Monday-Friday 9:00am to 5:00pm MST).
- This warranty is in lieu of all other warranties whether written, expressed, or implied, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
- In no event will Grace Design be liable for lost profits or any other incidental, consequential or Exemplary damages, even if Grace Design is aware of the possibility of such damages. In no event will Grace Design's liability exceed the purchase price of the product.
- This warranty gives the customer specific legal rights. The customer may also have other rights, which vary from state to state. Some states do not allow limitations on implied warranties or consequential damages, so some of the limitations of the above may not apply to a particular customer.

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16 Manual Revision History

Manual Revision History			
Rev.	**Description**	**Date**	**Initials**
A	Initial Production Release	7/15/2025	MBG
B	Add System Specifications, hardware configuration, QR code, block diagram	7/24/2025	MBG
C	Add secondary network and Wi-Fi modes	11/14/2025	MBG
D	GraceNet UI changes, Digilink Loopsync support, USB Support	2/20/2026	MBG
E	Dante/Ravenna 64 channel support, Mic Pre channel naming, system power specification changed.		