iVAM1-1

1RU Multi-Channel Audio Video Monitor

User Guide

Part Number 821829, Revision A

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Last Update

August 26, 2020

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CHAPTER 1: Installation

Introduction

Overview

The iVAM1-1 is a 1RU multichannel multi-source audio/video monitor with basic 3G-SDI and analog inputs. It may also be purchased with a large variety of other inputs or these may be added later at the need arises. Refer to the Specifications section of this manual or contact Wohler Sales for more information.

The iVAM1-1 is compact and simple to operate, with straightforward controls. It has a touch screen LCD display providing either video or high resolution level meters, and in addition has an HDMI output. Any channels (or channel pairs) from any audio/video source stream may be monitored. Either 8 or 16 channel meters can be displayed.

The iVAM1-1 includes two 3G SDI inputs and it can monitor both video and audio from them. Optional modules will allow decoding of an additional SDI input, MADI, AES3, SMPTE 2110, SMPTE 2022-6, and AES streams. It contains APIs for remote management.

Setups are created and configured using local menus and a web browser over a network connection to the integral web server of the iVAM1-1. The web server will also allow you to view the audio meters remotely.

Safety

Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.

2. Do not use this equipment near water.

3. Use only a dry cloth to clean the equipment.

4. Do not block any ventilation openings.

5. Do not install near any heat source such as a radiator, heat register, amplifier, or stove.

6. Do not attempt to plug the unit into a two-blade outlet (with only two prongs of equal width).

Important: By design, the supplied AC mains power cord will only plug into a three-prong grounded outlet for your safety. If the plug does not fit into the outlet, contact an electrician to replace the obsolete outlet.

7. Protect the power cord from being walked on or pinched, particularly at plug connection on the equipment and at the socket.

8. Use only the attachments/accessories specified by the manufacturer.

9. Unplug the equipment during lightning storms or when unused for long periods

of time.

10. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:

    a. The equipment has been damaged in any way, such as when the power-supply cord or plug is damaged.

    b. Liquid had been spilled or objects have fallen onto the equipment.

    c. The equipment has been exposed to rain or moisture.

    d. The equipment does not operate normally.

    e. The equipment has been dropped.

Safety Symbols
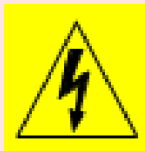
WARNING: The symbol to the left warns of electric shock hazard inside the unit. Disconnect the power cord before removing access panels when installing upgrades. Only qualified service personnel are to operate the equipment with covers removed, and are to exercise caution to avoid personal injury.

Mounting

The unit is designed for a standard 19" rack. Install it at ear/eye level for best high frequency response and visual observation of the display screens. Please adhere to the following clearances:

Table 1-1: Clearance Recommendations

Clearance	Surface
24"	Front
3"	Rear
2"	Sides
1.75"	Top and Bottom (if either radiates heat)
0"	Top and Bottom (if no heat)

Heat Dissipation

The ambient temperature inside the mounting enclosure should not exceed 40° Celsius (104° Fahrenheit). Adjacent devices can be rack mounted (or stacked) in proximity to the unit if this temperature is not exceeded. Otherwise, allow a 1RU (1.75"/44.45mm) space above and below the unit for air circulation.

Important

Heat generated by the class D power amplifiers, power supplies, and other components is vented by slots in the sides and back of the unit. Therefore, as a safety precaution, you must allow proper ventilation on these surfaces.

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Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.) in the rack may be serious enough to interfere with the unit's sound quality. If you experience sympathetic vibrations, use thin card stock, felt, foam, or weather-stripping between the vibrating surfaces. Tie loose cables securely with cable ties.

Mechanical Bracing

The 1RU chassis is securely attached to the front panel. In addition, the chassis has mounting tabs through which you attach it to the rack rail. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

Electrical Interference

Be careful to avoid mismatched cable types and other similar causes of undesired reflections in digital signal systems. If severe enough, such reflections can result in corruption of the digital data stream. As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry ground is connected to the chassis.

Power

The unit connects to an AC mains power source (100 to 240 VAC, 65W, 50/60Hz) using an IEC power cord.

When the mains plug or appliance coupler is used as the disconnect device, the disconnect device should remain operable.

Compliance

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

ICES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CHAPTER 2: Local Operation

Operation

The iVAM1-1 can be operated easily and simply from controls on its front panel, as described in this chapter. It may be accessed remotely in two ways, via the Wohler Web GUI for administrative purposes or by third party equipment via Application Programming Interface (API) commands. The Wohler Web GUI is described in Chapter 4 of this manual. The API commands are described in Appendix B of this manual.

Startup

The iVAM1-1 will begin its startup process when it is connected to power. There is no power switch. It is normal for the product to require about 45 seconds to start up and be ready to use.

When the iVAM1-1 completes its startup, the **Status** indicator will turn green. Depending upon optional settings, all channel pairs will either be in the muted condition or set in a predetermined way. You may then use the **Source** and **Channel** controls to enable only the program channels you want to hear.

Front Panel

The front panel is shown in Figure 2-1.

Figure 2–1: iVAM1-1 Front Panel
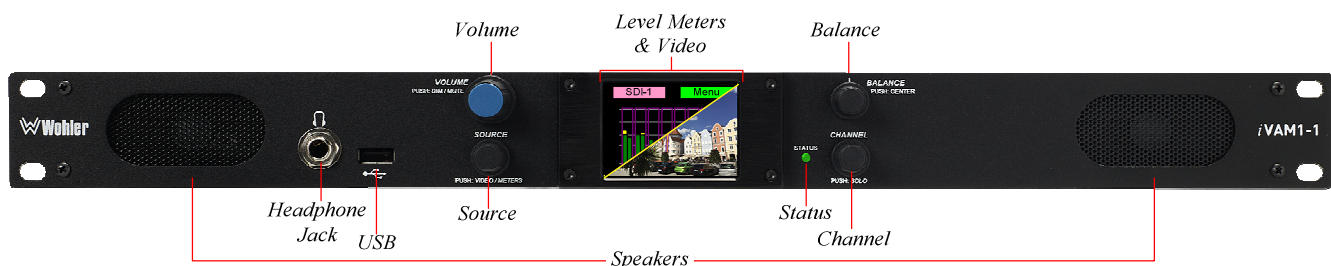
1. **Level Meters & Video**: A 2.4" LCD screen allows monitoring of either video or high resolution bar graph meters of up to 16 channels. Press the **Source** control to switch between them.

2. **Speakers**: Local near field audio monitoring is achieved through the use of class D amplifiers. There are two (left/right) speakers. The speaker response may be adjusted with tone controls in the **Speaker Options** menu. Refer to the **Menu / Option Touchscreen** section of Chapter 2.

3. **Headphone Jack**: A 1/4" jack for an optional headphone is provided on the front panel. Speaker audio can be optioned to either mute or not mute when

headphones are plugged in. This is set in the **Speaker Options** menu. If the speaker audio is set to mute with headphone insertion, and a headphone is plugged into the Headphone Jack, the following icon will appear at the center top of the display:

4. **Volume**: This controls the speakers, the headphone, the analog outputs, and the HDMI audio output. As the **Volume** control is turned, a graphic appears on the upper left of the screen in place of the Source display, as follows: 35

Pressing the **Volume** control mutes the audio and a speaker muted icon appears at the center top the display: ◀× This icon also displays whenever the **Volume** control is turned all the way counterclockwise.

5. **Balance**: This controls the relative left/right levels for the monitored stereo mix. Pressing the knob will bring the balance back to center. It controls the speakers, the headphone, the analog outputs, and the HDMI audio output. As the **Balance** control is turned, a graphic appears in place of the Source display as follows:

6. **Source**: Turning this control right or left selects between the available licensed input sources. In 8 Channel Mode, the **Source** control also selects between the lower or upper 8 channels for 16-channel sources. Note that for 8-channel sources, the 8 channels are always displayed with 8 larger meters. The selected Source input is displayed in the upper left of the meter screen as follows: SDI-1

Pressing the **Source** control selects between displaying the video from the selected SDI source or displaying audio meters from the selected source. The high resolution bar graph meters appear here showing the levels of up to 16 channels. Holding the **Source** control pressed for two seconds proceeds to the **Main Menu**.

7. **Channel**: Turning this control moves a white selection box from channel to channel on the metering screen. Press the control to solo the highlighted channel. The box will turn blue and any other boxes will disappear. To remove the solo and return to the previous monitoring configuration, press the **Channel** control once again.

8. **USB**: This USB 2.0 Type A connector allows you to use a flash drive (not supplied) to perform software updates and copy system configurations to another iVAM1-1 or to a PC. Refer to Appendix A of this manual to learn about performing a software update.

9. **Status**: This indicator lights green when the system is powered and ready for use. A solid or blinking yellow color indicates that the product is starting up. A red color indicates that a system update is taking place. Refer to Appendix A.

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Rear Panel

The rear panel is shown in Figure 2-2.
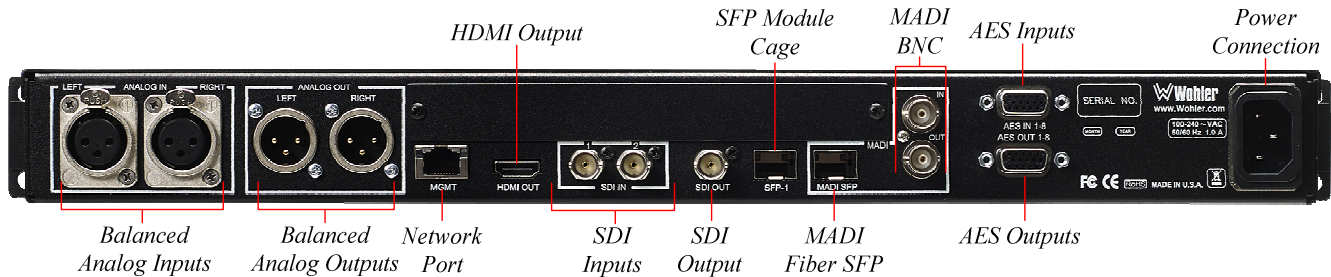
Power Connection: The iVAM1-1 receives power from an AC inlet, which is a standard IEC receptacle for 100 to 240 VAC ±10%, 50/60 Hz power connection. Four regional AC power cords, supplied according to shipping region, are available.

> **Important:**
> By design, the supplied AC mains power cord will only plug into a three-prong grounded outlet for your safety. If the plug does not fit into the outlet, contact an electrician to replace the obsolete outlet.

1. **SDI Inputs**: These two BNC connectors accept the two 3G/HD/SD-SDI input signals containing audio and video to be monitored. This is a standard feature.

2. **SDI Output**: This BNC connector outputs the selected 3G/HD/SD-SDI or SFP module input signal.

3. **HDMI Output**: An HDMI output of the monitored 3G/HD/SD-SDI or SFP module video source is available from this connection.

4. **Network Port**: This Ethernet port can connect to either a LAN or to a PC to let you perform administrative tasks remotely. The Wohler Web GUI is described in Chapter 4 of this manual. Third party equipment, connecting to the iVAM1-1 via a LAN plugged into this port and using an API commands, can view and change product options, as well. This API is described in Appendix B of this manual.

5. **MADI BNC**: (optional) The COAX input accepts an AES10 64-channel signal at 48 kHz sample rate. An optional license key must be purchased to enable this function. The COAX output is reclocked from the MADI source. When power to the iVAM1-1 is not present, the COAX input and output are automatically connected together to allow the MADI signal to pass through. A software license must be installed for this input to function. Refer to the **System Setup** section in Chapter 4 and to Figure 4-7 to install software licenses.

6. **MADI Fiber SFP**: (optional) This input module accepts an optical AES10 64-channel MADI input signal at 48 kHz sample rate. An optional license

key must be purchased to enable this function. A software license must be installed for SFP ports to function. Refer to the **System Setup** section in Chapter 4 and to Figure 4-7 to install software licenses.

7. **AES Inputs**: (optional) This HD-15F connector accepts 4 AES3id digital audio pairs (8 channels) at a 48 kHz sample rate. Refer to Figure 2-3 for the pinout of this connector. The easiest way to interface with this connector is to use an HD-15 to VGA adaptor cable. Channels are selected as AES 1-8. A software license must be installed for these inputs to function. Refer to the **System Setup** section in Chapter 4 and to Figure 4-7 to install software licenses.

Figure 2-3: AES HD-15F Connector Pinout
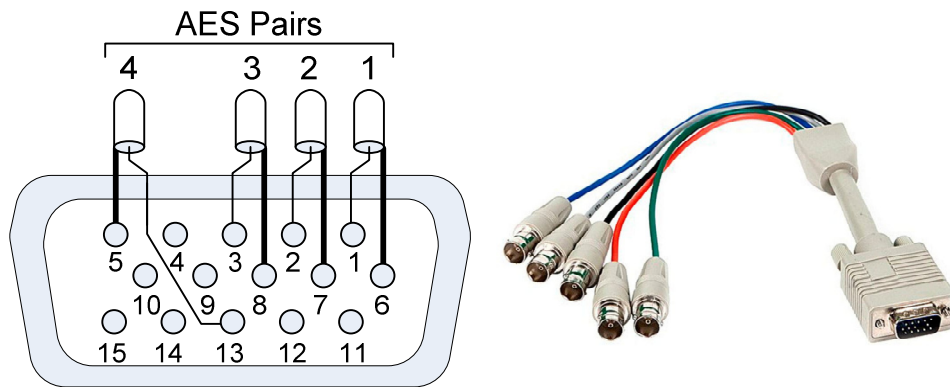
8. **AES Outputs**: This HD-15F connector provides 4 AES3id digital audio pairs (8 channels) at a 48 kHz sample rate from selected monitored sources. Refer to Figure 2-3 for the pinout of this connector. The easiest way to interface with this connector is to use an HD-15 to VGA adaptor cable. These outputs are <u>not</u> controlled by the **Volume** and **Balance** controls. Monitored channels 1 and 2 are sent from AES-1, channels 3 and 4 are sent from AES-2, channels 5 and 6 are sent from AES-3, and channels 7 and 8 are sent from AES-4.

9. **SFP Module Cage**: An SFP cage is provided to accept one optional SFP module compatible with SDI coaxial or optical signals. The SFP modules are hot swappable for convenience. An optional license key must be purchased to enable each module. A software license must be installed for the SFP port to function. Refer to the **System Setup** section in Chapter 4 and to Figure 4-7 to install software licenses. The following SFP modules are offered:

    a. **3G/HD/SD-SDI Single Video Receiver with Active Loopback**: This uses HD-BNC connectors.

    b. **3G/HD/SD-SDI Video SFP with Optical Input**: This uses LC fiber connectors. It is a Single-Mode Receiver, Medium Haul, Non-MSA, and no output.

    c. **SMTPE 2022-6 Receiver**: This uses Multi-Mode 850 NM, LC fiber connectors. It allows the iVAM1-1 to monitor SDI audio transmitted in real time over Ethernet. You must use the emSET

configuration software to set up this option. It is available from Wohler Technologies Technical Service.

d. **SMTPE 2110 Receiver**: This uses Multi-Mode 850 NM, LC fiber connectors. It allows the iVAM1-1 to monitor SDI audio transmitted in real time over Ethernet. You must use the emSET configuration software to set up this option. It is available from Wohler Technologies Technical Service.

e. **SMTPE 2110 or 2022-6 Receiver**: This uses Multi-Mode 850 NM, LC fiber connectors. It allows the iVAM1-1 to monitor SDI audio transmitted in real time over Ethernet. You must use the emSET configuration software to set up this option. It is available from Wohler Technologies Technical Service.

10. **Analog Inputs**: These female XLR connectors provide two balanced analog inputs: Left and Right. The **Analog Inputs** are standard on the iVAM1-1. Refer to Figure 2-4 for the pinout of this connector.

Figure 2-4: Analog XLR-F Output Connections
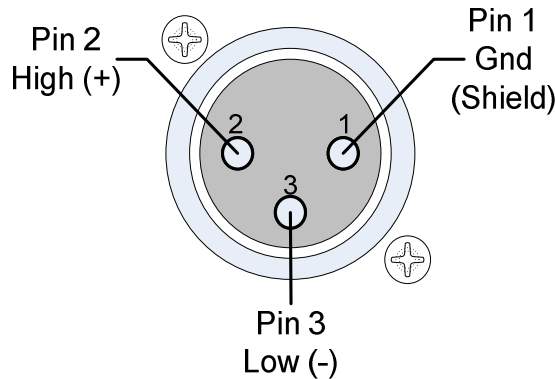
11. **Analog Outputs:** These male XLR connectors provide two balanced analog outputs: Left and Right. The source of these signals is the mix of audio as monitored by the internal speakers and is adjusted by the **Volume** and **Balance** controls. The **Analog Outputs** are standard on the iVAM1-1. Refer to Figure 2-5 for the pinout of this connector.

Figure 2-5: Analog XLR-M Output Connections
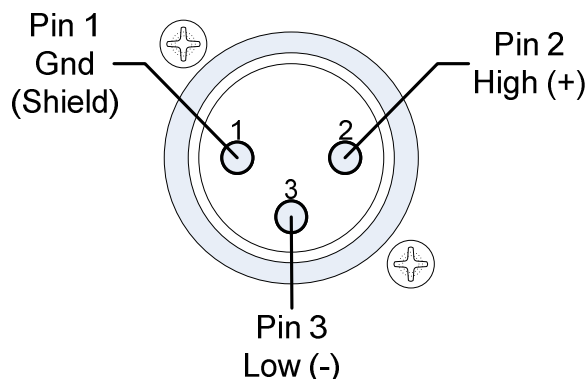
SFP-2022-6 / SFP-2110 Address Setup

While the optional SFP-2022-6 and SFP-2110 modules monitor program audio created from distinctly different technologies, both are connected to the network in the same way and have the same requirements for addressing. Figure 2-6 illustrates the network connections they need.

Figure 2-6: SFP-2022-6 and SFP2110 Network Diagram
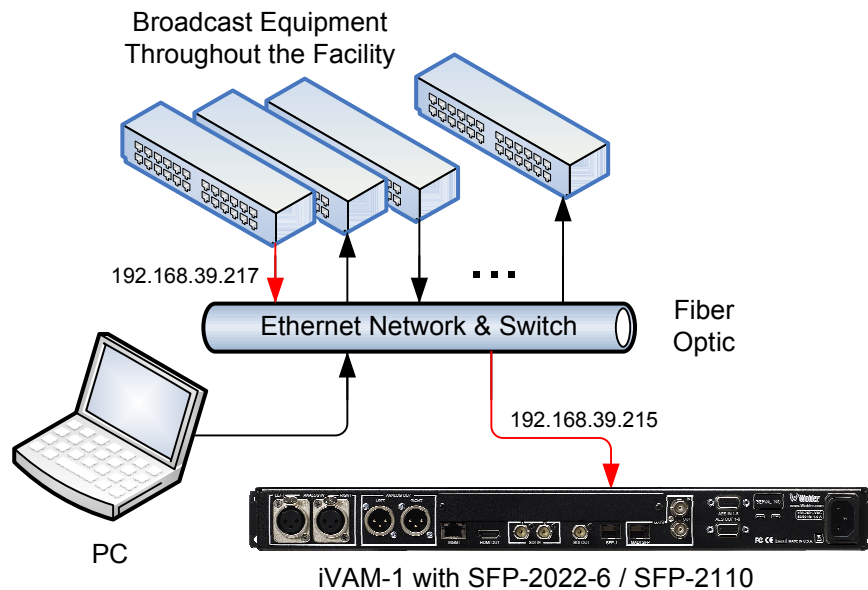
The optional SFP-2022-6 or SFP-2110 module furnished by Wohler Technologies is manufactured by Embrionix and comes from the factory with a default IP address. To integrate it into your digital network, you need to set its address to the source to be monitored. You must use the emSET configuration software to set up this option. It is available from Wohler Technologies Technical Service. The procedure to accomplish this is described in the **SFP-2022-6 / SFP-2110 Setup Guide** (part number 821822), which is available at https://www.wohler.com/wp-content/uploads/2016/09/SFP-2022-6-SFP-2110-Setup-Guide-821822A.pdf

Channel Meters and Touch Operations

The audio mixer terminology of "solo" is used in this manual when referring to muting all but a specific audio channel or pair.

Audio meters are displayed on touchscreen LCD display(s) in up to 8 channel pairs, as shown in Figure 2-7. Alternatively, 8-Channel Mode can be turned on to display only 4 channel pairs, as shown in Figure 2-8.

Figure 2-7: Audio Level Meter Screen

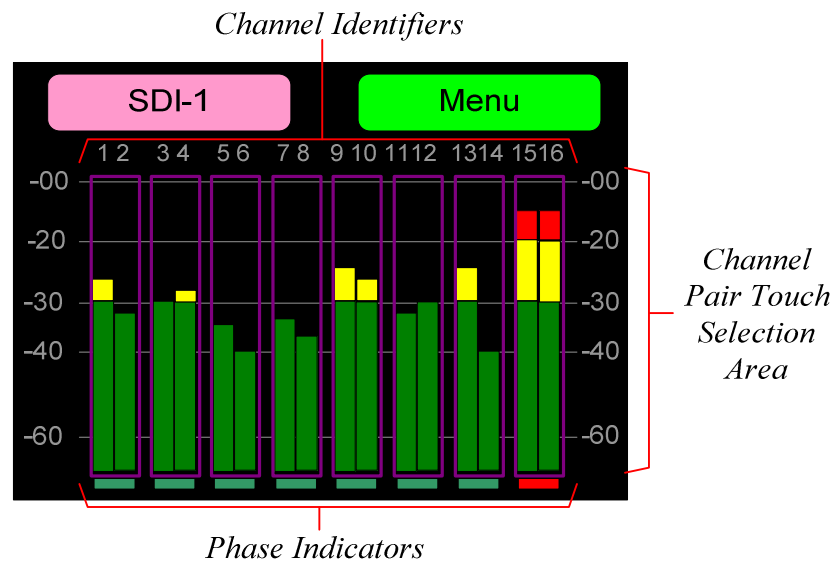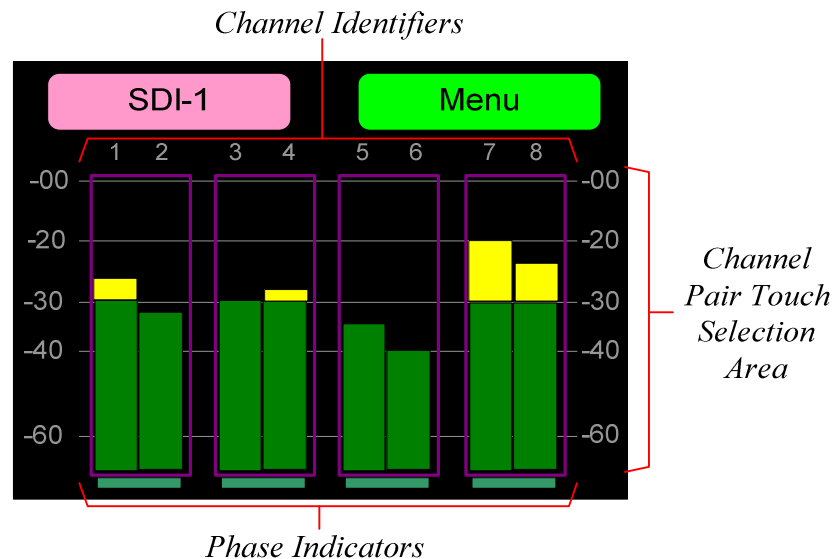Figure 2-8: Audio Level Meter Screen, 8-Channel Mode On

1. **Channel Identifiers**: Above the level meters are the Channel Identifiers. They indicate the consecutive channel numbers in the selected source.

2. **Channel Pair Touch Selection Area**: Touching the meters of any channel pair will let you mute, un-mute, or solo the associated channel(s). Colored boxes surrounding the channel pair or channel

indicate what operation is being performed. Note that if it is not necessary to view all 16 channels at the same time, 8-Channel Mode can be turned on, resulting in 8 larger, easier-to-touch meters being displayed. The 8-Channel Mode setting is in the **Unit Config Menu**. The following describes each function:

    a. **Mute / Un-Mute Selection**: A violet box surrounds any channel pair that is muted. Typically, when the iVAM1-1 is first powered, all of the channel pairs are muted. Touching a muted channel pair un-mutes it and removes the violet box. Muting and un-muting by touching is an alternate action function.

    b. **Solo Selector**: Touch for two seconds any channel pair you would like to solo. A blue box will then surround the pair and that will be the only pair you hear. Any violet boxes will disappear. Touching another channel pair will then move the blue box to it, and it will be soloed. Touch again to return the combination of monitored channel pairs to the way they were before you soloed the pair.

    c. **Channel Solo**: Rotating the **Channel** control will move a white selection box from channel to channel. Press the **Channel** control to solo the selected channel. That channel alone will then be surrounded by a blue box and it will the only channel being monitored. Press the **Channel** control again or touch anywhere on the meters to undo the solo and return the combination of monitored channel pairs to as it was before you soloed the channel.

3. **Phase Indicators**: At the bottom of each channel pair is a Phase Indicator. The indicators light a dull green if the channels in the pair are in phase or bright red if they are out of phase. You may set which Phase Indicators appear using the **Phase Config Menu** or with the **System Preferences: Phase Indicator Configuration** tab in the Wohler Web GUI.

Video Screen

Pressing the **Source** knob alternates between the Video Screen and the Meter Screen on an SDI source. Information about the signal can be superimposed over the upper part of the video image. The **Video Info** selection in the **Unit Config Menu** determines whether this information is always displayed, never displayed, or is only displayed for the first 5 or 10 seconds after switching to the video screen. Figure 2-9 shows the Video Screen.

Figure 2-9: Video Screen
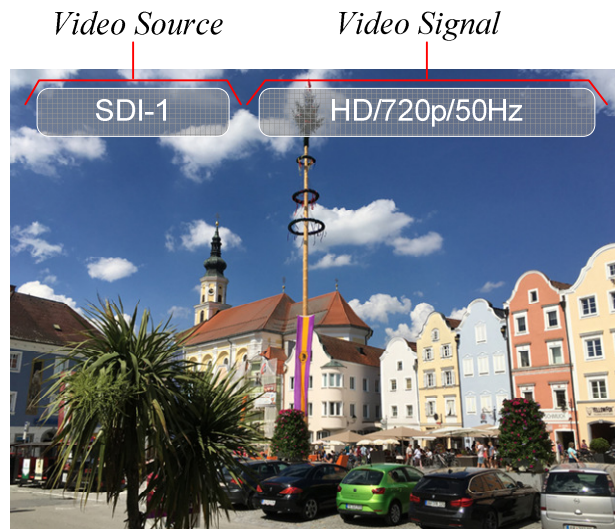
1. **Video Source**: This translucent box displays the input source of the video signal.

2. **Video Signal**: This translucent box displays the resolution and frame rate of the video signal.
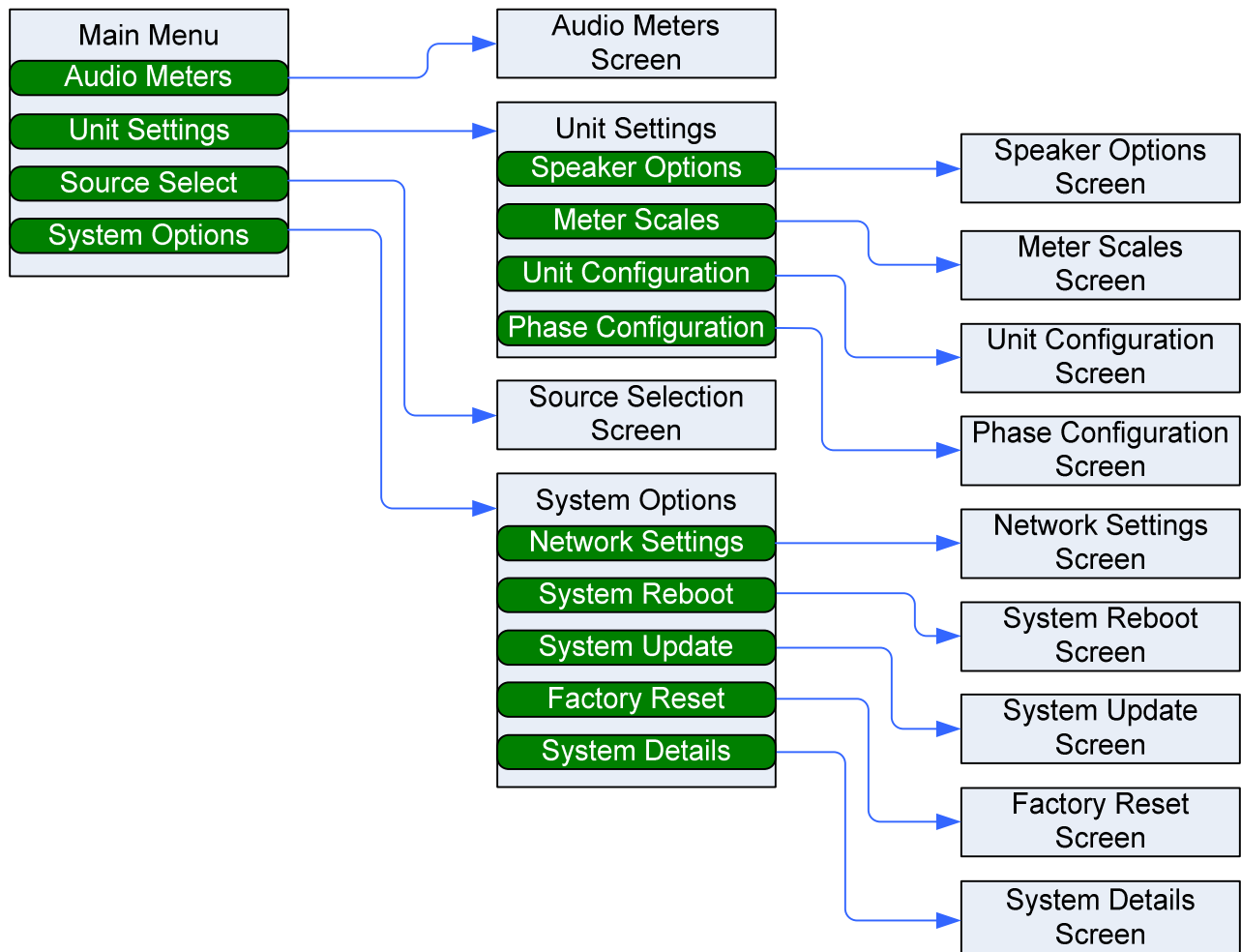
Note: If the **Video Source** and **Video Signal** displays have been optioned to disappear after 5 or 10 seconds and you wish them to reappear, simply touch the video screen.

Menu / Option Touchscreen

You may set most options or view a variety of system information using the self-contained menus. To access this, touch the **Menu** button which appears on the right of the level meter screen. Figure 2-10 is a diagram of the menu arrangement, a tree showing how to reach any menu from the **Main Menu**. Figure 2-11 shows the **Main Menu**.

Figure 2-10: Menu Tree

Main Menu
Audio Meters
Unit Settings
Source Select
System Options

Audio Meters Screen

Unit Settings
Speaker Options
Meter Scales
Unit Configuration
Phase Configuration

Speaker Options Screen

Meter Scales Screen

Unit Configuration Screen

Phase Configuration Screen

Source Selection Screen

System Options
Network Settings
System Reboot
System Update
Factory Reset
System Details

Network Settings Screen

System Reboot Screen

System Update Screen

Factory Reset Screen

System Details Screen

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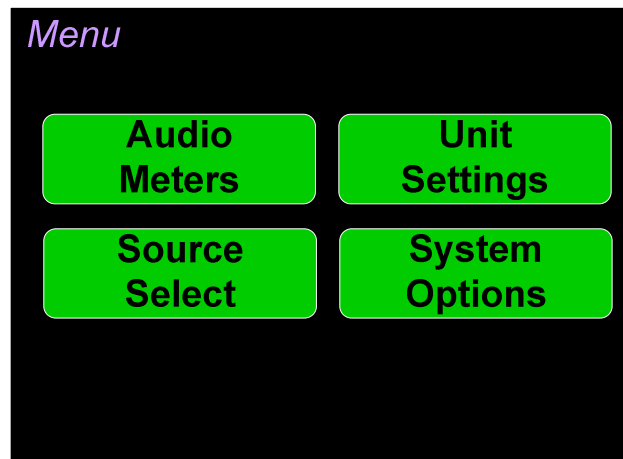
Main Menu

Touching the **Menu** button on the **Audio Meters** screen accesses the **Main Menu**. Alternatively, especially when monitoring the video program, you may access the **Main Menu** by holding the **Source** knob pressed for two seconds. The **Main Menu** is shown in Figure 2-11.

Figure 2-11: Main Menu

```
Menu

   ┌─────────────┐   ┌─────────────┐
   │   Audio     │   │    Unit     │
   │   Meters    │   │  Settings   │
   └─────────────┘   └─────────────┘
   ┌─────────────┐   ┌─────────────┐
   │   Source    │   │   System    │
   │   Select    │   │  Options    │
   └─────────────┘   └─────────────┘
```
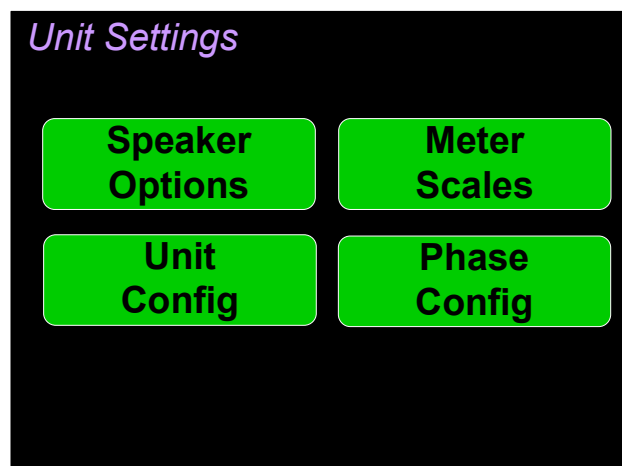
Audio Meters

Touching the **Audio Meters** selection on the **Main Menu** screen simply returns you to the Audio Level Meters screen.

Unit Settings

Touching the **Unit Settings** selection on the **Main Menu** screen proceeds to the **Unit Settings Menu**, which contains additional menu selections. The **Unit Settings Menu** is shown in Figure 2-12. This is an intermediary menu which leads to other menus and screens.

Figure 2-12: Unit Settings Menu

```
Unit Settings

   ┌─────────────┐   ┌─────────────┐
   │  Speaker    │   │   Meter     │
   │  Options    │   │   Scales    │
   └─────────────┘   └─────────────┘
   ┌─────────────┐   ┌─────────────┐
   │    Unit     │   │   Phase     │
   │   Config    │   │   Config    │
   └─────────────┘   └─────────────┘
```
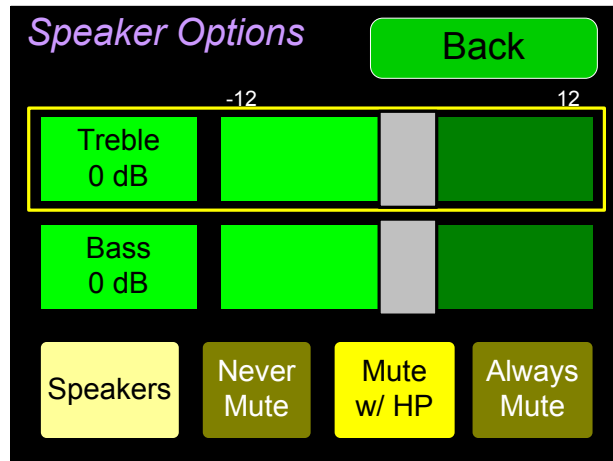
Speaker Options

Touching the **Speaker Options** selection on the **Unit Settings** Menu screen proceeds to the **Speaker Options** screen. The controls on this screen affect various characteristics of the monitored audio as heard on the iVAM1-1. This screen is shown in Figure 2-13.

Figure 2-13: Speaker Options Screen
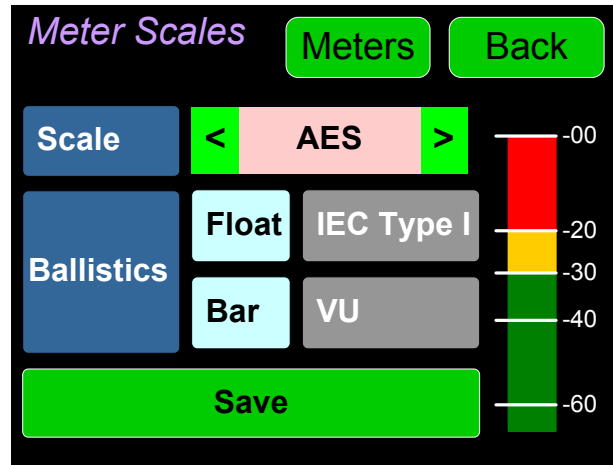

The controls function as follows:

1. **Treble**: This tone control adjusts the high frequency speaker audio response from -12 dB to +12 dB. Lowering **Treble** compensates for high frequency pre-emphasis or removes sibilance effects. Increasing **Treble** will add "sizzle" to the sound and bring high-pitched sounds out of the mix. The control can be touched and moved left or right to adjust in 2 dB increments. After touching the **Treble** control, the **Channel** knob can also be turned to make the adjustment.

2. **Bass**: This tone control adjusts the low frequency speaker audio response from -12 dB to +12 dB. Lowering **Bass** will unmask midrange band sounds, while increasing **Bass** will make the sound "fatter". The control can be touched and moved left or right to adjust in 2 dB increments. After touching the **Bass** control, the **Channel** knob can also be turned to make the adjustment.

3. **Speakers**: This setting controls whether the monitor speakers are never muted, muted while a headphone plug is inserted into the headphone jack on the front panel, or always muted.

Touch **Back** to exit this screen.

Meter Scales

Touching the **Meter Scales** button on the **Unit Settings** Menu displays the **Meter Scales** screen as shown in Figure 2-14. The controls on this screen select the scale standards as well as the ballistics that will be applied to the audio meters.

Figure 2-14: Meter Scales Screen

The controls function as follows:

1. **Scale**: This meter scales standard to be used when displaying audio levels. A choice of seven scales is available. Touch the left or right arrows to select the scale. A representation of the chosen scale will be shown at the right. The possible scales that can be selected are shown in Figure 2-15.
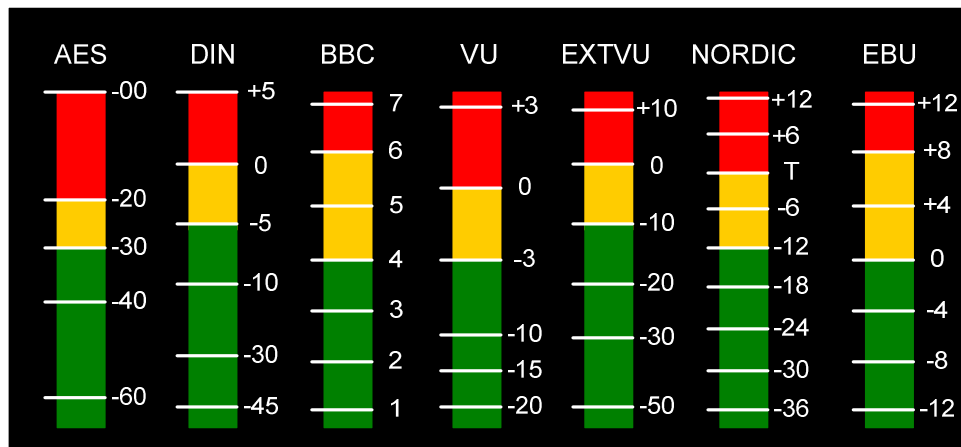
Figure 2-15: Meter Scale Selection

Table 2–4: Meter Limits and References

Scale	Bottom Limit	Top Limit	Default Reference	Default Color Bounds		Default Ballistics	
				Lower	Upper	Float	Bar
AES	-72 dBFS	0.0 dBFS	0 dBFS = 0 dBFS	-30 dBFS	-20 dBFS	IEC Type I	VU
DIN	-53 dBr	+5.5 dBr	-15 dBFS = 0 dBr	-5 dBr	0 dBr	—	IEC Type I
BBC	-13.25 dBr	+13.0 dBr	-18 dBFS = 0 dBr	0 dBr	8 dBr	—	IEC Type I
VU	-45 dBr	+3.5 dBr	-20 dBFS = 0 dBr	-3 dBr	0 dBr	—	VU
EXTVU	-56 dBr	+16.0 dBr	-20 dBFS = 0 dBr	-10 dBr	0 dBr	—	VU
NORDIC	-44 dBr	+12.5 dBr	-18 dBFS = 0 dBr	-10 dBr	0 dBr	—	IEC Type I
EBU	-13.25 dBr	+13.0 dBr	-18 dBFS = 0 dBr	0 dBr	8 dBr	—	IEC Type I

2. **Ballistics**: The Bar and Float ballistics associated with the selected meter scale are displayed. Refer to Table 2-5. Ballistic timings are valid only at 48 kHz.

Table 2–5: Meter Timings

Ballistics	Rise	Fall	
		Level Change	Time
VU	Not Specified		
IEC Type I	5 ms to reach -2 dB of settled reading	-20 dB	1.7 sec.
IEC Type II	10 ms to reach -2 dB of settled reading	-24 dB	2.8 sec.
None	Bar or Floating Segment Not Displayed		

When you have made your choices, touch **Save** to retain them. Touch **Back** or **Meters** to exit this screen.

Unit Configuration

Touching the **Unit Config** selection on the **Unit Settings** Menu proceeds to the **Unit Config Menu**. This menu is shown in Figure 2-16.

Figure 2-16: Unit Configuration Menu
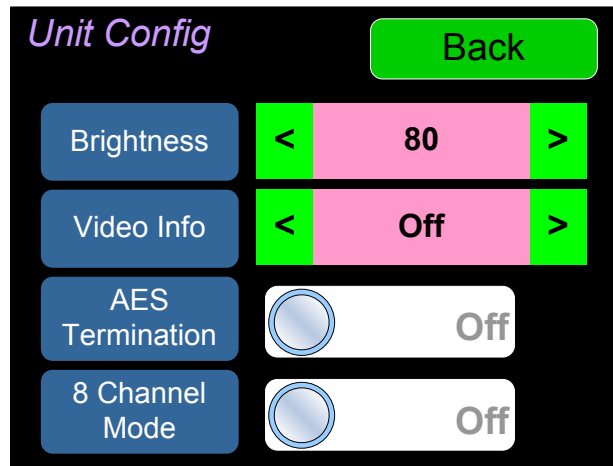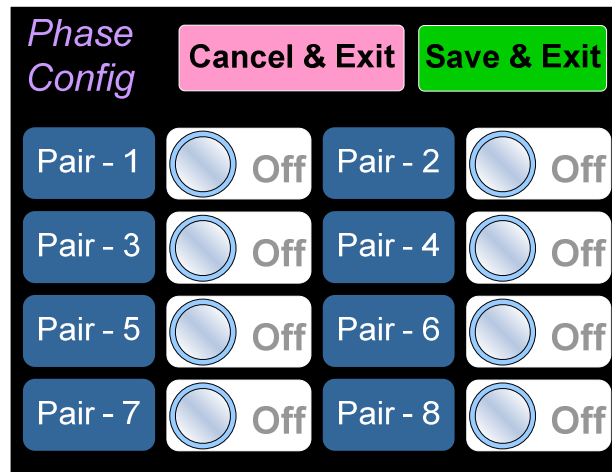

The controls function as follows:

1. **Brightness**: This setting adjusts the brightness of the display screen. Touch the left pointing arrow to dim the brightness or touch the right pointing arrow to increase the brightness.

2. **Video Info**: This setting determines if or how video information is displayed when the video screen is selected by pressing the **Source** knob. The possible selections are as follows:

   a. **Always On**: The video information is always displayed.

   b. **Off**: The video information is never displayed.

   c. **5 Secs**: The video information is displayed for 5 seconds after the video screen is selected and then it disappears.

   d. **10 Secs**: The video information is displayed for 10 seconds after the video screen is selected and then it disappears.

3. **AES termination**: AES signals should have one and only one termination. This termination should physically be at the last destination of an AES coax cable. If the iVAM1-1 is the last connection in a series of AES connections, then its terminations should be turned on. A symptom of too many terminations (or no termination) is that no signal appears to be present on the AES input. Touch the On - Off switch to change the termination setting.

4. **8 Channel Mode**: This setting selects whether 16 meters are shown on the Metering Screen or whether 8 larger meters are displayed instead. If it is not necessary to view 16 meters at a time, 8 larger, easier-to-touch meters can be a better choice. Touch the On - Off switch to change the 8 Channel Mode setting.

Touch **Back** to exit this menu.

Phase Configuration

Touching the **Phase Config** selection on the **Unit Settings** Menu proceeds to the **Phase Config Menu**. This menu is shown in Figure 2-17.

Figure 2-17: Phase Configuration Menu

The controls function as follows:

1. **Pair 1 – 8**: These switches allow you to select which channel pairs will receive a phase meter on the **Metering Screen**. Generally, it is useful to monitor the relative phase of stereo pairs. However, sometimes each channel of a pair is unrelated to each other. This can be because the channels are used to convey two independent monophonic signals or that one channel may be a Center channel and the other may be a Low Frequency Effects channel. In these instances, the Phase Indicator would almost always indicate an out of phase condition. Because this would be a needless distraction to the operator, switches are provided on this screen to individually turn phase monitoring for each channel pair on or off.

2. **Cancel & Exit**: If you decide that you do not want to keep the settings you have made on this screen, touch the **Cancel & Exit** button to discard the changes and return to the **Unit Settings** menu.

3. **Save & Exit**: When you have finished making the changes you want on this screen, touch the **Save & Exit** button to save the changes and return to the **Unit Settings** menu.

Source Select

Touching the **Source Select** selection on the **Main Menu** proceeds to the **Source Select** menu. While the monitored source can simply be selected by rotating the **Source** knob on the front panel, this menu is provided to show all of the possible sources. The selected source is shown in a light color. You may simply touch another source in this menu to switch to it. This screen also shows sources which are unlicensed and therefore nonfunctional. These sources are shown in a gray color. To license these sources so that they may be used, contact Wohler Technologies. Figure 2-18 shows the Source Select Menu.

Figure 2-18: Source Select Menu
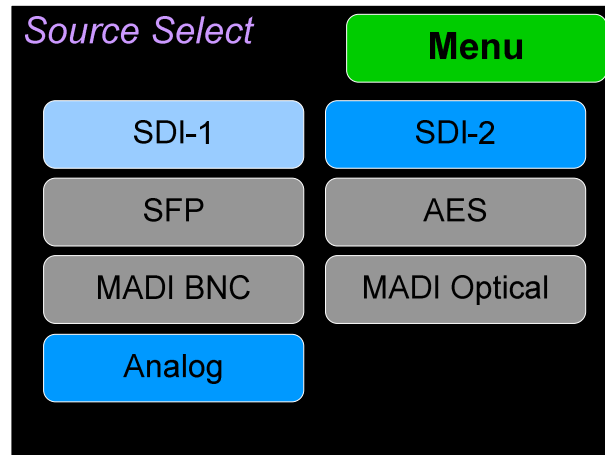
Touch **Menu** to exit this menu.

If you touch MADI BNC, MADI Optical, or SFP, an additional selection screen will be shown, asking you select which 16 MADI channels to monitor or which SFP functionality to monitor. These screens are shown in Figure 2-19.

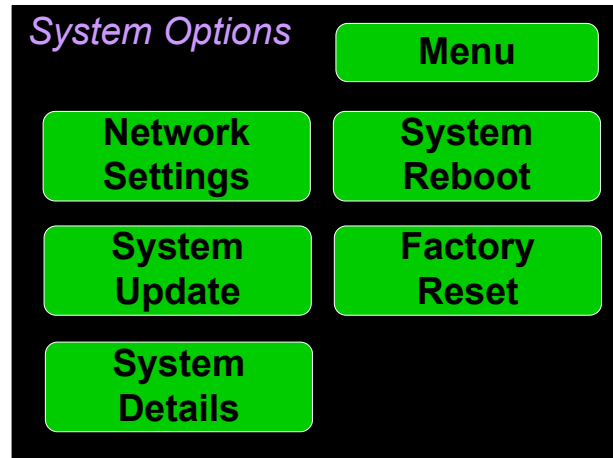Figure 2-19: MADI or SFP Selection Screens:

Touch **Back** to return to the **Source Select** menu or touch **Menu** to return to the **Main Menu**.

System Options Menu

Touching System Options in the **Main Menu** proceeds to the **System Options** menu, which is an intermediate menu leading to other screens. This menu is shown in Figure 2-20.
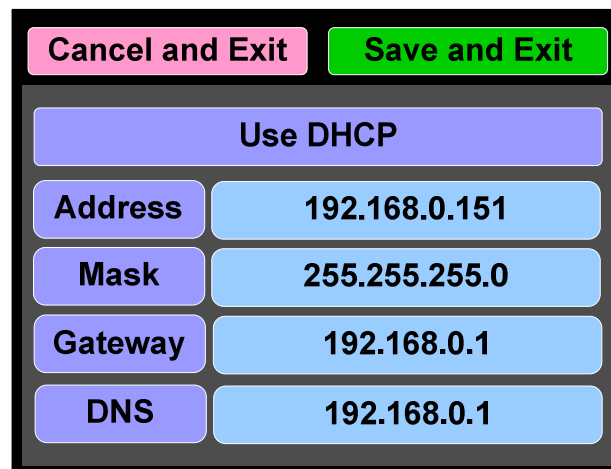
Touch **Menu** to exit this menu.

Network Settings

Touch the **Network Settings** selection on the **System Options** Menu displays the **Network Settings** menu as shown in Figure 2-21. This screen lets you view or change the product IP, the Net Mask, Gateway and DNS. It also lets you switch between a static (fixed) or a dynamic (DHCP) network address.

1. To change the IP Address, Net Mask, Gateway, or DNS, tap the item you would like to change. A keypad will appear, as shown in Figure 2-22.

Figure 2-22: Network Configuration: Setting Change

DNS	192.168.0.151		
1	2	3	Backspace
4	5	6	Clear
7	8	9	Cancel
255	0	.	Enter

2. Touch the digits to be entered and then touch the **Enter** button. The **Clear** button may be touched to erase any mistyped digits.

3. Now repeat steps 1 and 2 until you have replaced all of the necessary digits.

4. To save the newly entered address, touch the **Enter** button. Touch the **Cancel** button to return to the previous screen without saving any changes.

Important:

There is no confirmation for **Save**, so make sure you want to perform this action before taking it. The system does not need to reboot before it is once again ready for operation.

To change from a static (fixed) to a dynamic (DHCP) network address, touch the **DHCP** button. The screen will change, as shown in Figure 2-23. To change back to a static (fixed) network address, touch the **DHCP** button again. The colors of the buttons will return to the ones depicted in Figure 2-21.

Figure 2-23: Network Settings: DHCP

Cancel and Exit	Save and Exit
Use DHCP	
Address	192.168.0.151
Mask	255.255.255.0
Gateway	192.168.0.1
DNS	192.168.0.1

1. To complete the network addressing scheme change, touch the **Save** button. This will save the changes you selected.

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2. Touch the **Cancel** button to return to the previous screen without saving any changes.

Important:

There is no confirmation for **Save and Exit**, so make sure you want to perform this action before taking it. The system will not need to reboot before it is once again ready for operation.

System Reboot

Touching the **System Reboot** selection on the **System Options** Menu displays the **System Reboot** screen as shown in Figure 2-24. This function is normally only used upon request from Wohler Technical Service to troubleshoot or correct an issue.

The **System Reboot** function should be used with a bit of forethought. It puts the system out of service for several minutes while it is rebooting.

Figure 2-24: System Reboot
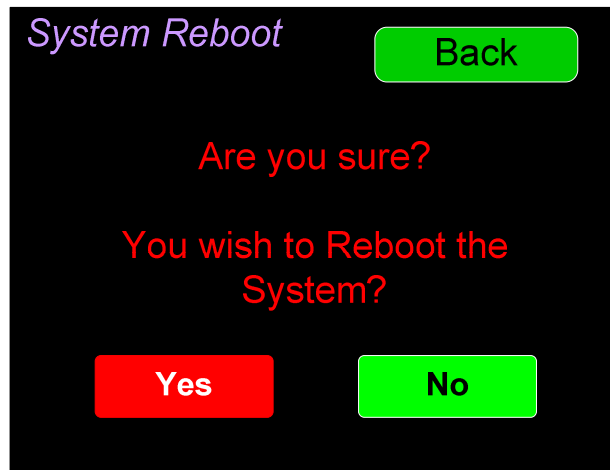
If you have any doubt as to whether you should press **Yes**, press **Back** or **No** instead, and contact Wohler Technical Service for advice. Pressing **Back** or **No** will return you to the **System Options** menu.

System Update

Touching the **System Update** selection in the **System Options** Menu displays **System Update** screen as shown in Figure 2-25, showing the current software version of the product. To update the system software locally from the iVAM1-1 front panel, follow the procedure in the **Local Update from the Front Panel** section of Appendix A.

Figure 2-25: System Update Screen
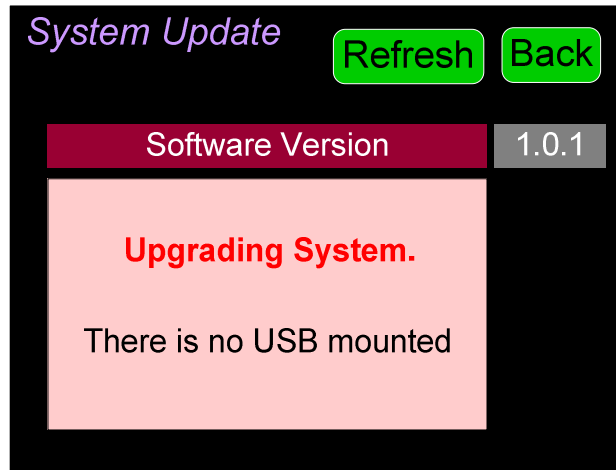
If you have just inserted a flash drive with a valid software upgrade package, press **Refresh** to see that package.

Touch the **Back** button return to the **System Options Menu**.

Factory Reset

Touching the **Factory Reset** selection in the **System Options** menu displays the **Factory Reset** screen as shown in Figure 2-26. Because of the large change this function is about to make to the product, it asks for you for verification that you really want to proceed.

The **Factory Reset** function should be used with caution. It deletes all of the settings you have programmed into the system. It returns the system to the way it was when received new from the factory. After using this function, you will need to use the Wohler Web GUI to reprogram everything from the start.
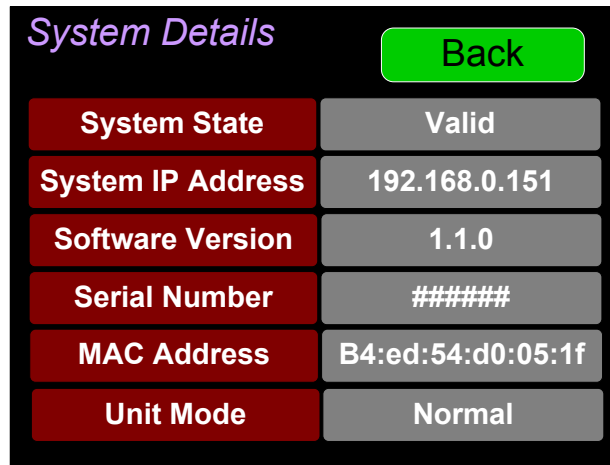
Figure 2-26: Factory Reset
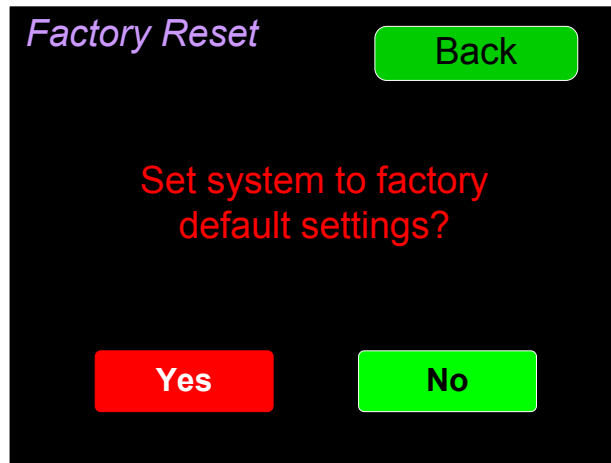
Note: Factory Reset will also reset your IP address to the default one. After a Factory Reset, the IP Settings will need to be updated. The default IP address for the unit is determined based upon the Mac address. It is 169.254.1.xx where xx is the last octet of the management Mac address. For example, if the Mac address is b4:ed:54:d0:04:28 then the IP address would be 169.254.1.40 (40 is the decimal equivalent for the last octet of Mac address 28.)

If you have any doubt as to whether you should press **Yes**, press **Back** or **No** instead, and contact Wohler Technical Service for advice. Pressing **Back** or **No** will return you to the **System Options** menu.

System Information

Touching the **System Details** selection in the **System Options** menu displays the **System Details** screen as shown in Figure 2-27. This screen lets you view the product Serial Number, Software Version, and various other information.

Figure 2-27: System Details Screen

System Details	Back
System State	Valid
System IP Address	192.168.0.151
Software Version	1.1.0
Serial Number	######
MAC Address	B4:ed:54:d0:05:1f
Unit Mode	Normal

The information shown on this screen is read only and cannot be changed.

Touch **Back** to return to the **System Options** Menu.

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CHAPTER 3: Technical Info

Table 3–1: iVAM1-1 Specifications

Specification	Values/Domains
Power Requirements	100 VAC to 240 VAC ± 10%, 50/60Hz
Power Consumption	65 Watts
Dimensions (H x W x D)	1.75" x 19" x 5.5" (44mm x 483mm x 140mm), standard 19" rack mounting
Shipping/Net Weight	8 lbs. (3.6 kg) / 5.5 lbs. (2.5kg)
Supplied Accessories	AC Power Cord
Display Type	2.4" Capacitive Touchscreen LCD
Screen Resolution	320H x 240V
Viewing Angle	160 (H) x 160 (V)
Audio Channels	16 Max
Level Meters	Simultaneous Average & PPM
Level Meter Scale	Choice of AES, BBC, DIN, EBU, EXTVU, NORDIC, or VU
Sample Rate	48kHz
De-Multiplexing	16 channels from: • 16-channel SD/HD/3G-SDI • 64-channel AES10 MADI
SDI Inputs / Outputs	• 1 or 2 SDI Inputs or Outputs Optional – Single SFP Transceiver: • HD-BNC Coax 3G/HD/SD-SDI • Multi-Mode Fiber: 1 SI Optical SC-Connector, 1300nm • Single-Mode Fiber: 1 SI Optical SC Connector, 1310nm
MADI Inputs / Outputs	• 1 MADI BNC, Standard Coax I/O Optional – SFP Transceiver: • Multi-Mode Fiber: 1 MADI Optical SC-Connector, 1300nm • Single-Mode Fiber: 1 MADI Optical SC Connector, 1310nm
SMPTE 2022-6 Receiver	Optional - SFP Receiver: • Multi-Mode Fiber: LC Connectors, 850nm
SMPTE 2110 Receiver	Optional - SFP Receiver: • Multi-Mode Fiber: LC Connectors, 850nm

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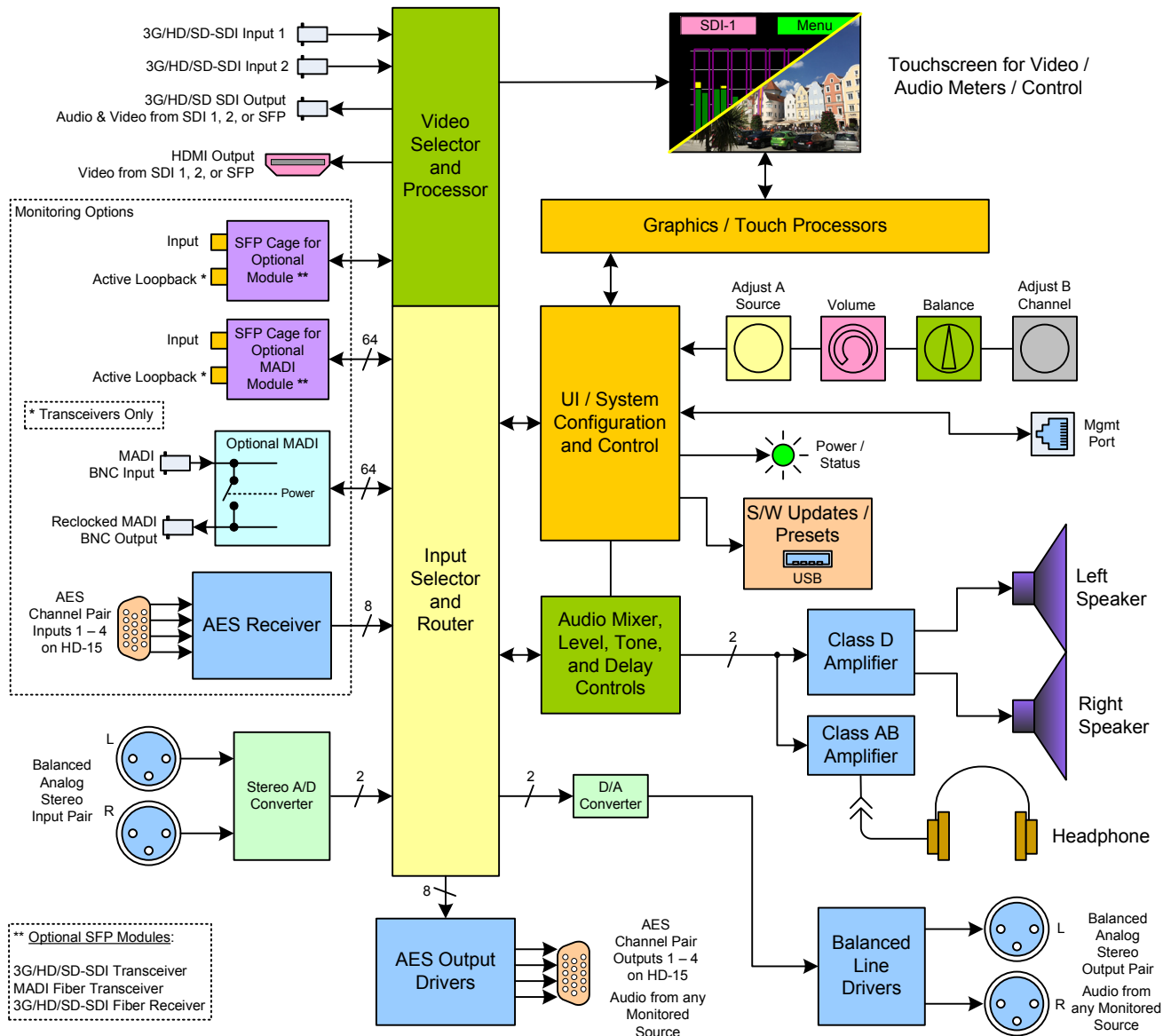| Specification	Values/Domains
Cable/Fiber Length (max)	COAX (such as Belden 1694A): > 150 m
	Single-mode fiber: 10 km
AES Inputs	8 AES channels on 2 x HD-15 are optional
Upgrades	Via USB interface
SDI Input Termination	75Ω unbalanced
AES/EBU Input Termination	75Ω unbalanced
AES/EBU/MADI Sampling Rate	48 kHz
Analog Inputs - Stereo	XLR-3 Female, balanced
Analog Input Impedance	40kΩ balanced
Analog Outputs - Stereo	XLR-3 Male, balanced +28 dBU max
Analog Output Frequency Response	40 Hz to 20 kHz (± 1dB)
Analog Output Distortion	<0.02% THD+N
Analog Output Dynamic Range	> 100 dB
Analog Output Reference Level	-20 dBFS = +4 ± 1.0 dBU
Internal Speakers - Stereo	70mm Full Range
Peak Acoustic Output	90 dB SPL (@ 2 feet)
Hum and Noise	Better than -68 dB below full output
Power Output	5 Watts RMS, 12 Watts peak (each side)
Acoustic Frequency Response	150 Hz to 16 kHz (± 5 dB)
Headphone Out - Stereo	40 Hz to 20 kHz (± 1 dB)
Headphone Load	8Ω to 150Ω

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Table 3–2: iVAM1-1 I/O Options

Option	Part #	Description
SFP-Madi-MM-Fiber	829081	MADI optical fiber transceiver. Multi-Mode, LC (fiber) connectors. SFP module with software activation key.
SFP-Madi-SM-Fiber	829082	MADI optical fiber transceiver. Single-Mode, LC (fiber) connectors. SFP module with software activation key.
SFP-SDI	829089	3G/HD/SD-SDI single video receiver with active loopback, HD-BNC connectors. SFP module with software activation key.
SFP-SDI-Fiber	829084	3G/HD/SD-SDI video SFP optical input; LC (fiber) connectors; Single-Mode Receiver, Medium Haul, Non-MSA, no output.
SFP-2022-6	829088	SMTPE 2022-6 receiver; Multi-Mode 850 NM, LC (fiber) connectors. SFP module with software activation key. Use emSET** to configure SFP.
SFP-2110	829086	SMTPE 2110 receiver; Multi-Mode 850 NM, LC (fiber) connectors. SFP module with software activation key. Use emSET** to configure SFP.
SFP-2110+2022-6	829087	SMTPE 2110 or 2022-6 receiver; Multi-Mode 850 NM, LC (fiber) connectors. SFP module with software activation key. Use emSET** to configure SFP.
OPT-AES	829080	Enables decoding and monitoring of 4 x AES inputs on an HD-15 connector and 1 AES output on BNC connector. Requires a software activation key.
OPT-MADI	829092	Enables decoding and monitoring of 1 x MADI64 input. BNC connectors. Requires a software activation key.

**emSET is configuration software that is necessary so that you can set up this module. It is available at no cost either from its manufacturer, Embrionix, or by contacting Wohler Technologies Technical Service.

Figure 3−1: iVAM1-1 Block Diagram

3G/HD/SD-SDI Input 1

3G/HD/SD-SDI Input 2

3G/HD/SD SDI Output
Audio & Video from SDI 1, 2, or SFP

HDMI Output
Video from SDI 1, 2, or SFP

Video Selector and Processor

Touchscreen for Video / Audio Meters / Control

SDI-1   Menu

Graphics / Touch Processors

Monitoring Options

Input
Active Loopback *

SFP Cage for Optional Module **

Input
Active Loopback *

SFP Cage for Optional MADI Module **

64

* Transceivers Only

MADI BNC Input

Reclocked MADI BNC Output

Optional MADI

Power

64

AES Channel Pair Inputs 1 – 4 on HD-15

AES Receiver

8

Input Selector and Router

UI / System Configuration and Control

Adjust A Source   Volume   Balance   Adjust B Channel

Power / Status

Mgmt Port

S/W Updates / Presets

USB

Audio Mixer, Level, Tone, and Delay Controls

2

Class D Amplifier

Left Speaker

Class AB Amplifier

Right Speaker

** Optional SFP Modules:

3G/HD/SD-SDI Transceiver
MADI Fiber Transceiver
3G/HD/SD-SDI Fiber Receiver

Balanced Analog Stereo Input Pair

L

R

Stereo A/D Converter

2

2

D/A Converter

Headphone

8

AES Output Drivers

AES Channel Pair Outputs 1 – 4 on HD-15

Audio from any Monitored Source

Balanced Line Drivers

L

R

Balanced Analog Stereo Output Pair

Audio from any Monitored Source

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CHAPTER 4: The iVAM1-1 Web GUI

The self-contained iVAM1-1 Web GUI allows you to customize the configuration of the iVAM1-1 to suit your needs. If the default configuration of the iVAM1-1 suits your needs and you prefer to use it that way, then you do not need to use the iVAM1-1 Web GUI.

The iVAM1-1 Web GUI also allows you to have a remote view of the Meter Screen. Refer to the Audio Meters section in this chapter.

Web Browser / Control Device

Any web browser application running on any networked device such as desktop or laptop computer, tablet or smart phone can be used with the iVAM1-1 Web GUI.

Tablets with no network connector need to be linked to a copper LAN through a Wi-Fi adapter.

Although they can be used, smart phones are not recommended because their smaller screen size would require more scrolling, making operation challenging.

The Chrome® web browser is recommended for speed and compatibility.

First Time IP Assignments

The iVAM1-1 can operate with a static (fixed) or dynamic (DHCP) IPv4 address. The default address will be **169.254.1.x** where x depends upon the MAC address of the unit, when received from the factory or when switched from DHCP to static addressing mode. There two basic types of connections that may be used to connect the iVAM1-1 to a web browser, a **Peer-to-Peer Connection** or a **Network Connection**.

Peer-to-Peer Connection

The most straightforward way to connect the iVAM1-1 to a web browser, free of possible network conflicts, is to establish a static peer-to-peer connection between the setup computer and the iVAM1-1. A 10/100/1000 MHz Ethernet switch may be used in between, but is not required.

Figure 4-1 shows an example of suitable address settings for the host computer in a Windows control panel. For Peer-to-Peer the ip address of windows should be in 169.254.1.x domain.

Figure 4–1: Host IP Settings
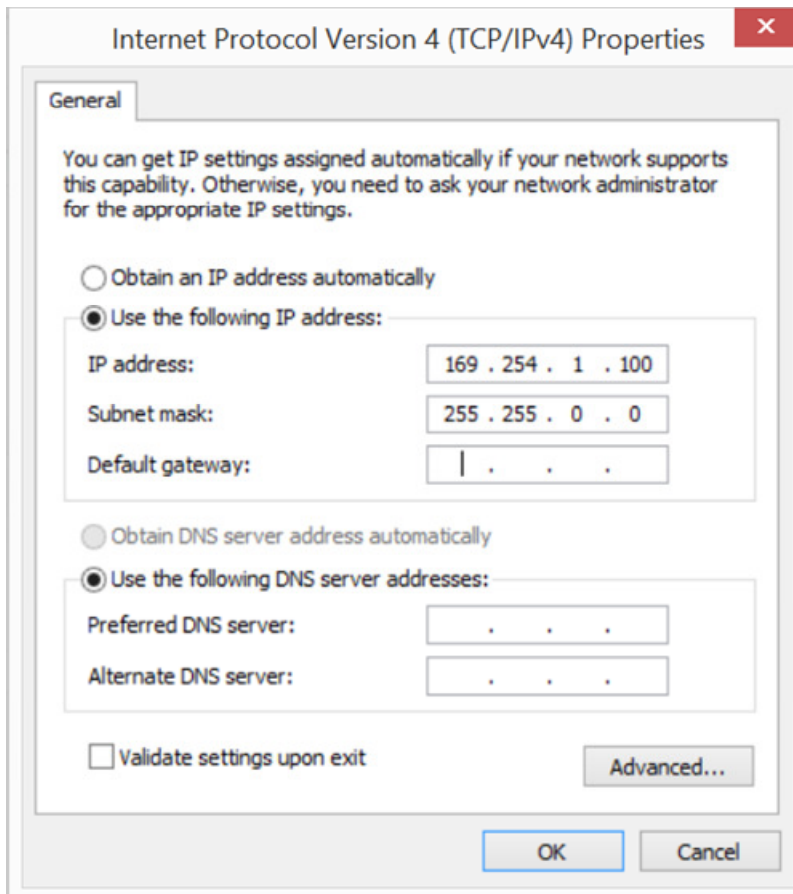
Close the control panel and reboot the host computer after making an IP address change to be sure the change takes effect. Either reconnect to the installed network or continue with this direct connection to access the iVAM1-1 Web GUI.

Network Connection

When connected to a network, the iVAM1-1 address will need to be changed to another address in order to be compatible with the address assignments for that particular network. Immediately after the host setup is complete, change the iVAM1-1's address. Make the corresponding address, mask and gateway changes in the iVAM1-1 **Network Setup** page. Refer to the **Network Setup** section which follows.

Otherwise set the iVAM1-1 to DHCP address mode by checking the box for 'Use DHCP?' in Network Setup and have your IT administrator assign rights and settings for operation on the network. Allow enough time for your network's DHCP server to recognize a new network device and assign an address after booting.

The iVAM1-1 uses link local addressing for its internal network, so no accommodation for this need be made in the network.

Network Setup

Make network **IP Address** changes for the local iVAM1-1 **Management (MGMT) Port** here.

Figure 4–2: Set IP Addresses

The procedure for changing the IP Address information is as follows:

1. **Use DHCP?** Check this box if your network has a DHCP server and you want to use dynamic addressing. Otherwise, you must enter static IP address entries in the four fields which follow.

2. **IP Address**: Enter the network address. Leading zeroes are not required.

3. **IP Mask**: This should usually be 255.255.255.0 unless your network can work across multiple subnets.

4. **Gateway Address**: This should usually be the same domain and subnet address numbers as the IP Address, but with the last octet being .1.

5. **DNS-nameserver**: A default value is shown for reference only. DNS is not normally required for basic static IP network configurations to work. Your IT administrator will specify a value to work with mixed static/dynamic network setups.

6. **Apply**: When you have made all of the necessary entries, press **Apply** to apply the changes.

7. **Reset**: If you should start to make changes and then change your mind about making them, press **Reset** to return the settings back to where they were.

Audio Meters

Click on **Audio Meters** to remotely display the audio meters of the iVAM1-1. This display is shown in Figure 4-3. Also displayed is the name of the source that the meters are displaying. In Figure 4-3, this is SDI-1.

Figure 4–3: Audio Meters Display
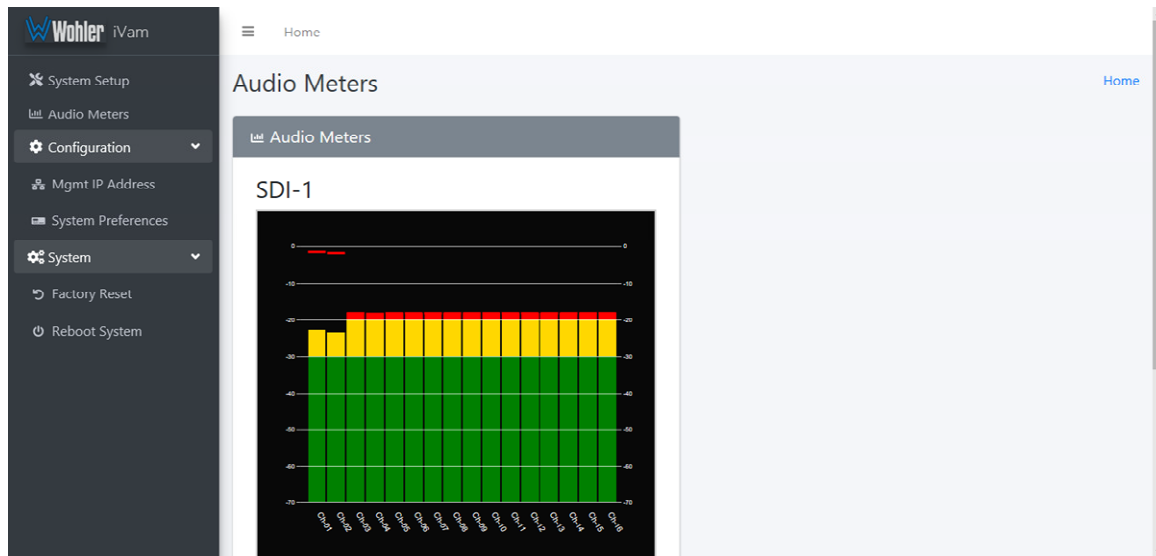
System Preferences

Click on **System Preferences** to find the Phase Indicator Configuration tab. This is as shown in Figure 4-4. It allows you to select which channel pairs will receive a phase meter on the **Metering Screen**. Generally, it is useful to monitor the relative phase of stereo pairs. However, sometimes each channel of a pair is unrelated to each other. This can be because the channels are used to convey two independent monophonic signals or that one channel may be a Center channel and the other may be a Low Frequency Effects channel. In these instances, the Phase Indicator would almost always indicate an out of phase condition. Because this would be a needless distraction to the operator, switches are provided on this tab to individually turn phase monitoring for each channel pair on or off. **Select All** and **Reset All** buttons are also provided.

Figure 4–4: Phase Indicator Configuration Tab
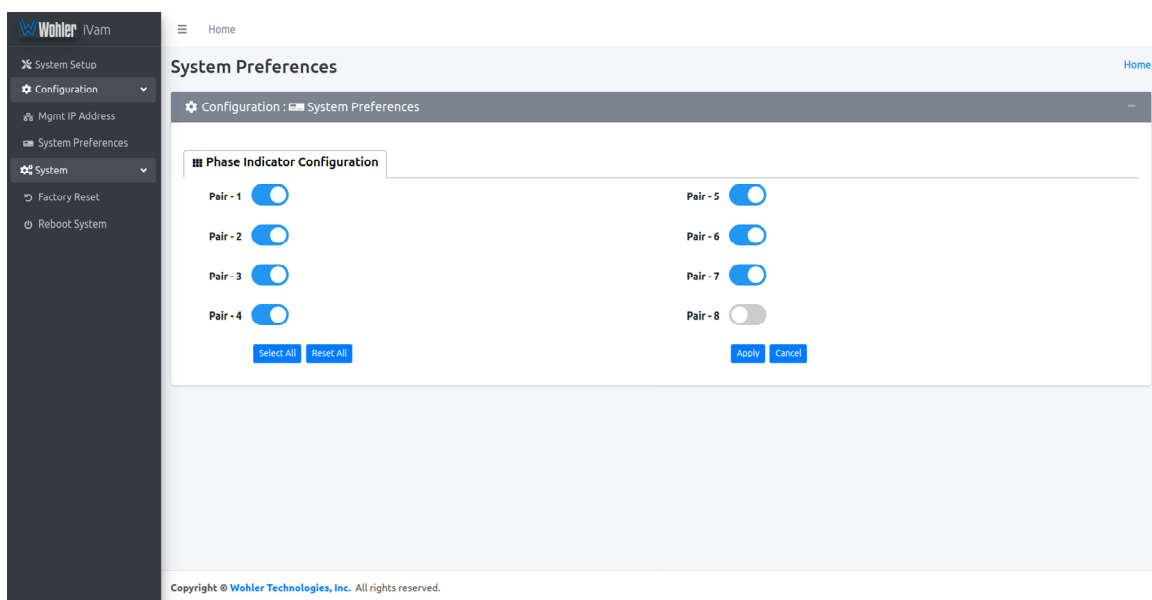
When you have finished making the settings click **Apply** to save them or click **Cancel** to discard them.

System

Click on **System** to find three tabs, each containing important information about the iVAM1-1. These tabs are explained in the following three sections.

System Information

This tab displays a variety of information about the iVAM1-1. It is shown in Figure 4-5. This information could be useful to view if you are contacting Wohler Technical Service.

<div align="center">

Figure 4–5: System Information Tab

</div>
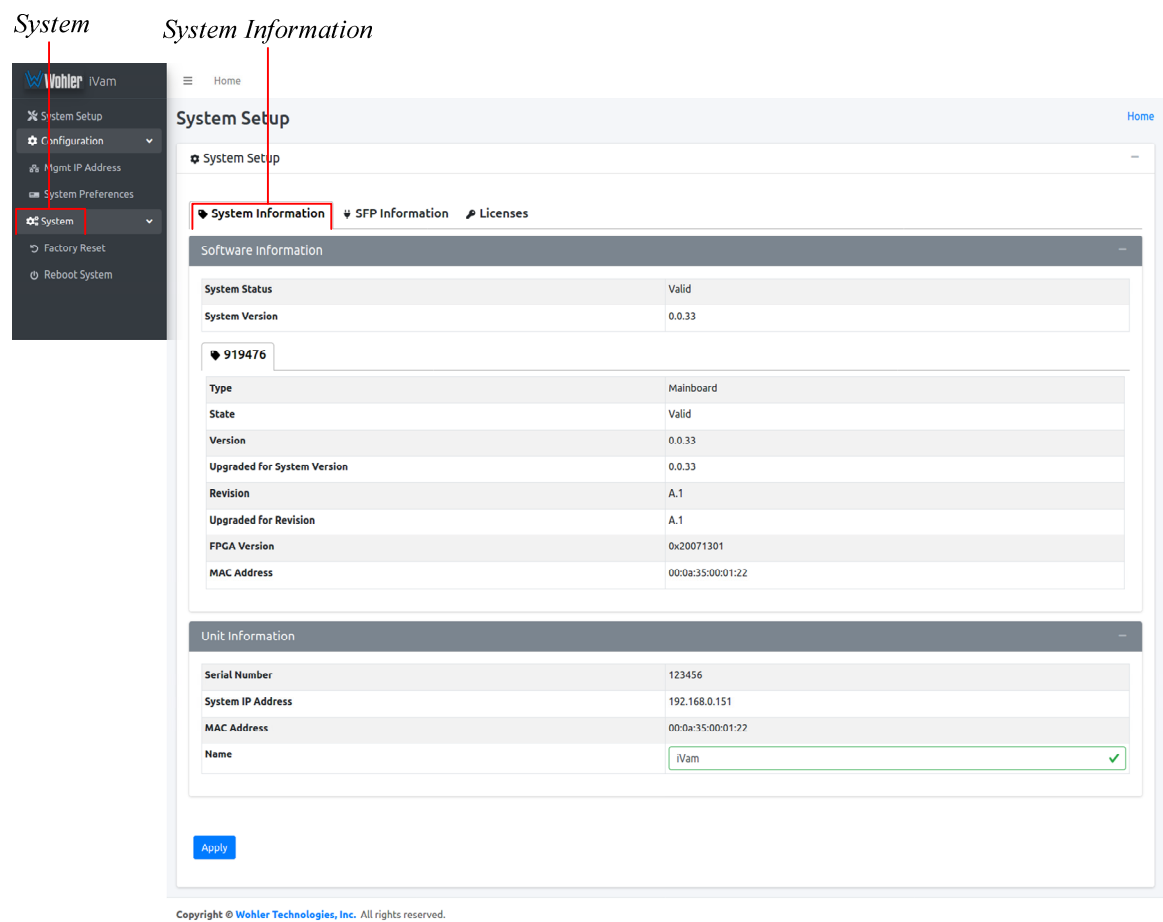
SFP Information

This tab displays a variety of information about the module inserted into the SFP slot on the rear panel of the iVAM1-1. It is shown in Figure 4-6. This information could be useful to view if you need to ascertain what module, if any, is installed, or if you are contacting Wohler Technical Service.

Figure 4-6: SFP Information Tab

Note: SFP Information, as shown in lower half of Figure 4-5, can be used to retrieve the 2110 or 2022 SFP Module network configurations. This is useful if the customer forgets the IP address assigned to these SFP modules.

Licenses

This tab displays the license number for each of the modules or features in the iVAM1-1. It is shown in Figure 4-7. You will use this tab to enter any new license numbers that you purchase. Contact Wohler Sales to obtain new license numbers. If you need help, Wohler Technical Service will be happy to assist you in installing these numbers.

Figure 4-7: Licenses Tab
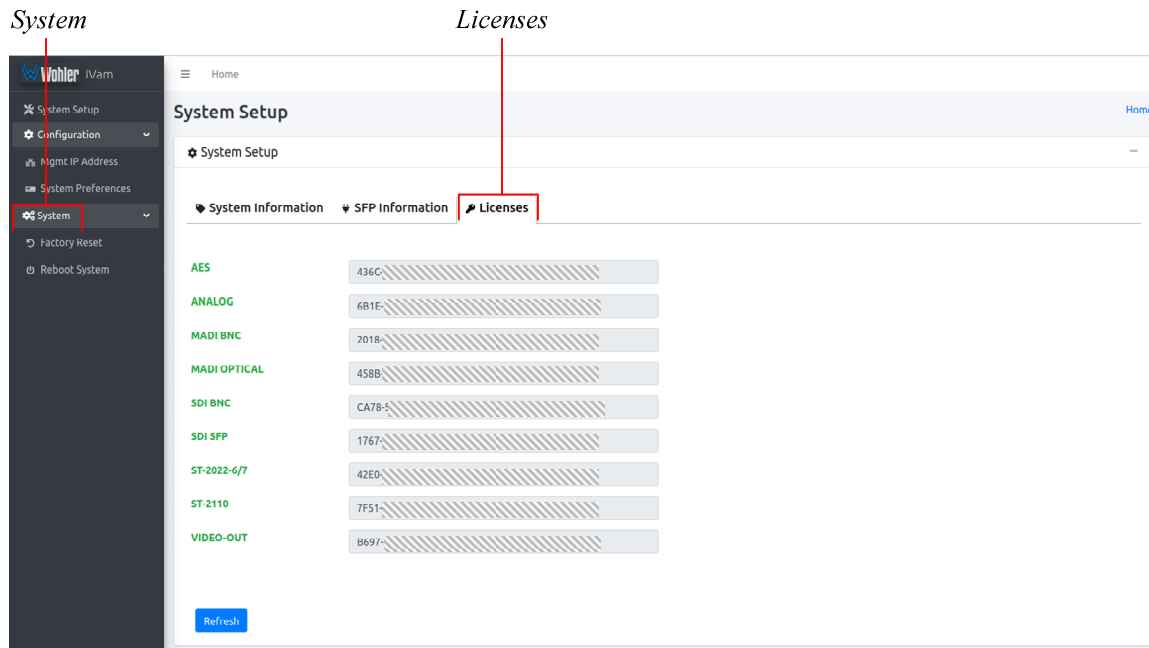
The example above shows an iVAM1-1 with license keys for inputs and license keys for SFP modules installed.

To enter a the license key provided to you by Wohler Customer Service, use the following steps:

1. Click the field to the right of the input or module desired.

2. Enter the license key in the box.

3. Repeat Steps 1 and 2 for any other license keys that you want to enter.

4. Click the **Refresh** button to save the information. Each new license will be immediately available for use.

Factory Reset

The **Factory Reset** function should be used with caution. It deletes all of the settings you have programmed into the system. It returns the system to the way it was when received new from the factory. After using this function, you will need to reprogram everything from the start.

Figure 4–8: Factory Reset
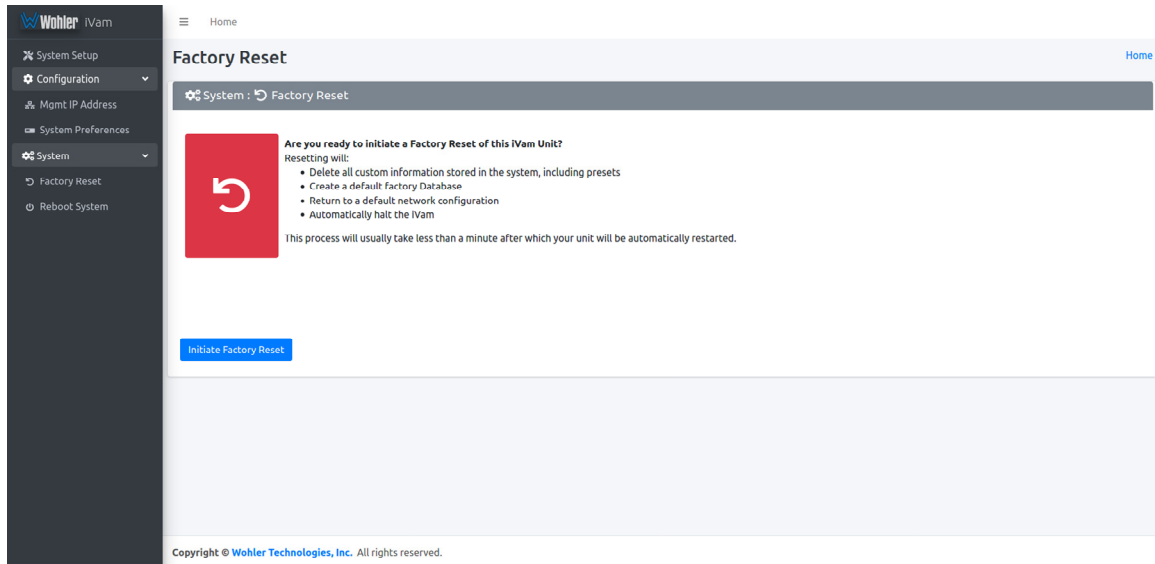
If you have any doubt as to whether you should perform a Factory Reset, do not click the **Initiate Factory Reset** button. Contact Wohler Technical Service for advice.

Note: Factory Reset will also reset your IP address to the default one. After a Factory Reset, the IP Settings will need to be updated. The default IP address for the unit is determined based upon the Mac address. It is 169.254.1.xx where xx is the last octet of the management Mac address. For example, if the Mac address is b4:ed:54:d0:04:28 then the IP address would be 169.254.1.40 (40 is the decimal equivalent for the last octet of Mac address 28.)

Reboot System

The **Reboot System** page allows you to reboot an iVAM1-1 remotely. The **Reboot System** page is shown in Figure 4-9. This function is normally only used upon request from Wohler Technical Service to troubleshoot or correct an issue.

The **Reboot System** function should be used with a bit of caution. It puts the iVAM1-1 out of service for several minutes while it is rebooting, and this may unexpectedly interfere with the use of the product by the remote operator.

Figure 4–9: Reboot System
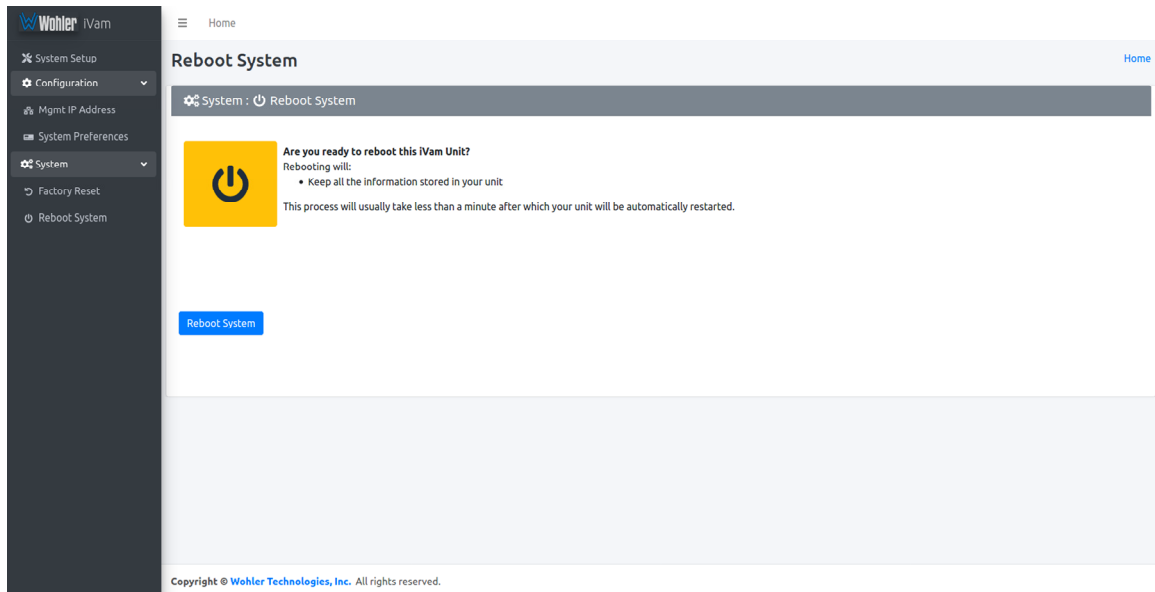
If you have any doubt as to whether you should reboot the remote iVAM1-1, do not click the **Reboot System** button. Contact Wohler Technical Service for advice.

APPENDIX A: Software Upgrades

Introduction

This chapter describes how to download a software update file to your computer, transfer it to a USB flash drive and install the updated software into an iVAM1-1.

Download the Software

The iVAM1-1 software update can be found at http://www.wohler.com, or contact Wohler Customer Support for more information.

You will need to copy the update file(s) to a USB flash drive. Unzip and copy the update file(s) from your computer to the root directory (not inside a folder) of a USB flash drive. It must be of the FAT32 file type, and does not need to be empty.

Local Update from the Front Panel

Use the following steps to update the software:

1. Insert the USB flash drive with iVAM1-1 update package(s) into the front panel USB jack. Refer to the Download the Software section of this chapter for the specifics of download and file transfer to the USB flash drive.

2. From the **Main Menu** screen, touch **System Options**. The screen shown in Figure A-1 will appear.

Figure A-1 - System Options Screen
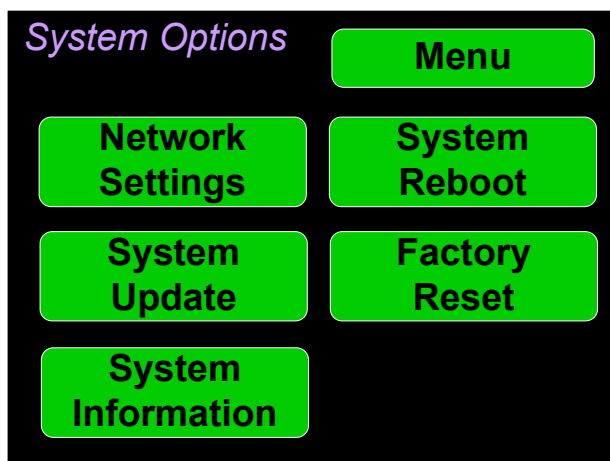
3. Insert the flash drive containing the system update into the USB socket on the front panel.

4. In the **System Options** menu, touch **System Update**. The **System Update** screen will appear, as shown in Figure A-2.

Figure A-2 - System Update Screen
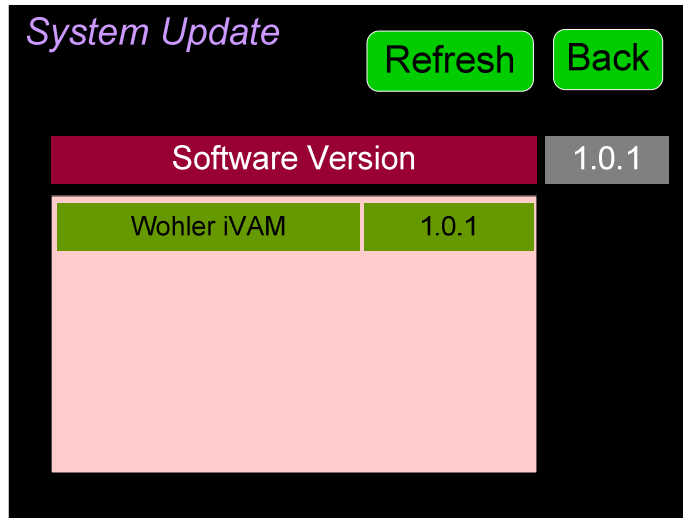
5. The new software version that is in the flash drive will be shown in the **Software Version** screen. To cancel the upgrade at this point for any reason, touch **Back**. To proceed, touch the software version entry in the **Software Version** screen. A screen will appear, as shown in Figure A-3.

Figure A-3 - Upgrade Verify
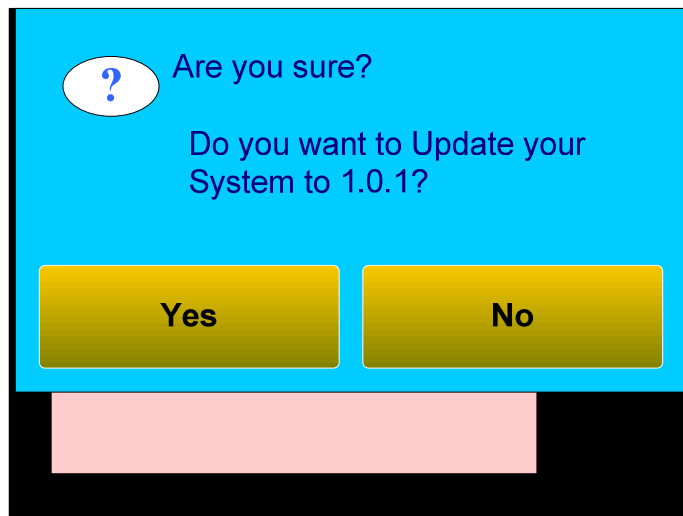
6. To proceed, touch **Yes**. To back out, touch **No**. After you touch **Yes**, the screens will change, as shown in Figure A-4. The **Status** indicator will turn red.
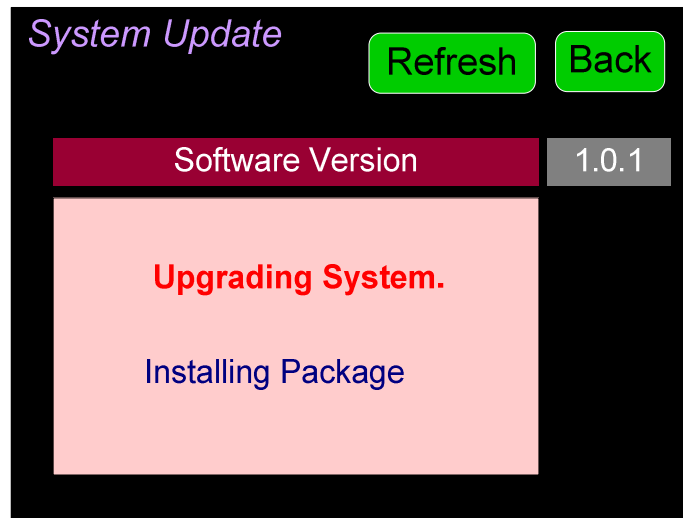
7. The text on the screen will change periodically to indicate the progression of the upgrade. The upgrade will take several minutes, after which the iVAM1-1 will restart. After the system has completed its restart cycle, the **Status** indicator will turn green and the iVAM1-1 will once again be operational. At this point, you may remove the flash drive.

Important:

Do not interrupt or remove power to the iVAM, or remove the USB drive during the installation process. Doing so could crash the iVAM software.

APPENDIX B: API Documentation

Introduction

This appendix discusses ways to use the Application Program Interface (API) to allow third party equipment to remotely access options and settings of the iVAM1-1. It includes specific code examples for commonly used requests. The API uses JavaScript Object Notation (JSON) as its communication language.

Follow the instructions in the **First Time IP Assignments** section of Chapter 4 to achieve the required network connection.

API

Method: POST
URL: /api/op/sourceselect

URL parameters:
data Data in JSON format.

Body Content for SDI/SMPTE-2022-6/ SMPTE-2110

```
{
"SourceType": <String: SDI Input Source>
}
```

Note: Allowed SDI input sources are:

1. "Sfp-1.Sdi"
2. "Sfp-1.Smpte2022"
3. "Sfp-1.Smpte2110"
4. "Bnc-1.Sdi"
5. "Bnc-2.Sdi"

Body Content for MADI

```
{
"SourceType": <String: MADI Input Source>,
"ChannelGroup": <Int: 1-4>
}
```

Note: Allowed MADI input sources are:

"Madi.Coax" and

"Madi.Optical"

ChannelGroup 1 => Channels 1-16 and
ChannelGroup 2 => Channels 17-32 and so on.

Body Content for Analog

```
{
"SourceType": "Analog"
}
```

Body Content for AES

```
{
"SourceType": "Aes"
}
```

Success Response:

```
{
    "unit_name": "iVam",
    "model": "iVam",
    "api_version": 1,
    "message": "Input Source Madi.Coax has been applied successfully",
    "serial_number": "123456",
    "status": 200
}
```

Failure Response:

```
{
    "action": "For more information about valid data, please see API document.",
    "status": 422,
    "message": {
        "SourceType": "Not a valid choice"
    }
}
```

Status Codes

- 200 OK
- 400 Bad Request Invalid URL
- 404 Method is not allow Invalid HTTP method request
- 422 Unprocessable Entity For missing or invalid parameters
- 500 Server Error Internal server error

Wohler