FS1

Installation and Operation Guide

December 20, 2007
(Software Version 1.0.2.37)

AJA VIDEO SYSTEMS

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To contact AJA Video for sales or support, use any of the following methods:

443 Crown Point Circle, Grass Valley, CA. 95945 USA

Telephone: +1.800.251.4224 or +1.530.274.2048
Fax: +1.530.274.9442

Web: http://www.aja.com
Support Email: support@aja.com
Sales Email: sales@aja.com

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Warning: *This symbol, when used in the manual, indicates a serious risk or threat to personal safety.*

Caution: *This symbol, when used in the manual, indicates important safety and informational notices.*

Warning:

1. Read these instructions
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

(continued next page)

9. *Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.*
10. *Protect the power cords from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.*
11. *Only use attachments/accessories specified by the manufacturer.*
12. *Unplug this apparatus during lightning storms or when unused for long periods of time.*
13. *Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled, or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.*

Warning: *Do not open the chassis. There are no user-serviceable parts inside. Hazardous voltage is present inside the unit, presenting a risk of electric shock or serious personal injury. Opening the chassis will void the warranty unless performed by an AJA service center or licensed facility. Remove the two supplied AC line cords from mains power when moving the unit. Do not defeat the safety purpose of the grounding-type plug.*

Warning: *To meet safety regulations for leakage current, connect the FS1 dual power supplies to separate branch circuits.*

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Chapter 1: Introduction

Overview

Featuring a flexible "everything in, everything out" architecture, the FS1 Universal SD/HD Audio/Video Frame Synchronizer and Converter can simultaneously work with both HD and SD video—all in full 10-bit Broadcast quality video and 24-bit audio. The FS1 supports virtually any input or output, analog or digital, HD or SD. The FS-1 can up- or down-convert between SD and HD, and provide simultaneous HD and SD outputs. Cross-conversions between HD formats are also supported, with simultaneous output of both formats. For audio, the FS1 supports 8-channel AES, Balanced analog, or embedded audio with full flexibility. The FS-1 supports closed captioning and the conversion of closed captioning between SD and HD formats. The FS-1 is also network ready, supporting web-based remote control.

Features

The FS1 product offers a large number of unique features for connectivity, control, and ease of use in any environment:

- Universal HD/SD audio/video frame synchronizer and converter
- SD⇦⇨HD up/down conversion
- SD⇦⇨SD aspect ratio conversion
- HD⇦⇨HD cross conversion (720p/1080i)
- Up/down/cross converting with both the input and converted formats on SD/HD SDI outputs (both synchronized)
- HD cross converting with simultaneous downconverted SDI output
- Dual HD/SD SDI inputs and outputs
- Component analog HD/SD input and output
- Composite/S video input and output with TBC

- 8 Channel AES and balanced analog audio inputs and outputs
- 8 Channel embedded audio I/O
- Fully redundant power supplies standard
- 10/100 LAN with SNMP, and embedded web server for remote control
- Video Proc Amp
- Closed caption support – including SD to HD upconversion
- Chassis styling optimized for use in a wide variety machine rooms, with simple panel and remote web browser user interfaces
- Front panel alphanumeric and graphical display shows input and output settings, and is also used for parameter viewing/editing
- LED status indicators for at-a-glance system monitoring
- Two GPI inputs and outputs, TTL, isolated
- 5-year international warranty, with unlimited technical support

FS1 Front Panel Control

FS1 operation can be monitored and changed in a number of ways:

- Front panel control
- Remote web browser via Ethernet
- SNMP—Simple Network Management Protocol

Feature sets in each of the control methods vary, although the Front Panel and Web Browser interfaces offer much of the same features.

The front panel offers the most direct control of the device, ideally for use in machine rooms or where quick and fast changes and status checks must sometimes be made. *Chapter 2, Controls and Indicators* discusses the front and rear panel features of the panel in great detail.

Remote Web Browser Control of FS1 via Ethernet

The FS1 internally contains an optimized web server that allows remote monitoring and parameter setting via a network-attached computer running a web-browser. From a network-connected computer you can communicate with one or more FS1 devices, even getting them to identify themselves via LEDs on the front and rear panel (front: “Identify”, rear: “ID”). Networks can be closed local area networks or even a straight computer-to-FS1 cable, or the greatest flexibility, exposed through a firewall to a broadband WAN. The LAN connection on the FS1 uses a standard RJ45 connector, but internally is intelligent and communicates via standard “straight-through” CAT 5 ethernet cables or null-modem (cross-over) cables without any configuration or strapping required.

Note: Firefox/Mozilla and Internet Explorer 7 are supported as web browsers for FS1 control. Other browser software may work, but AJA cannot guarantee operation.

The browser GUI operation and features are discussed in Chapter 5.

SNMP Interface

SNMP offers a command line interface for manual or scripted control of certain aspects of the FS1 such as system monitoring, alarm conditions and other system and network management tasks. SNMP support is described in Chapter 6.

Note: SNMP is not yet supported in the current software version.

Block Diagram

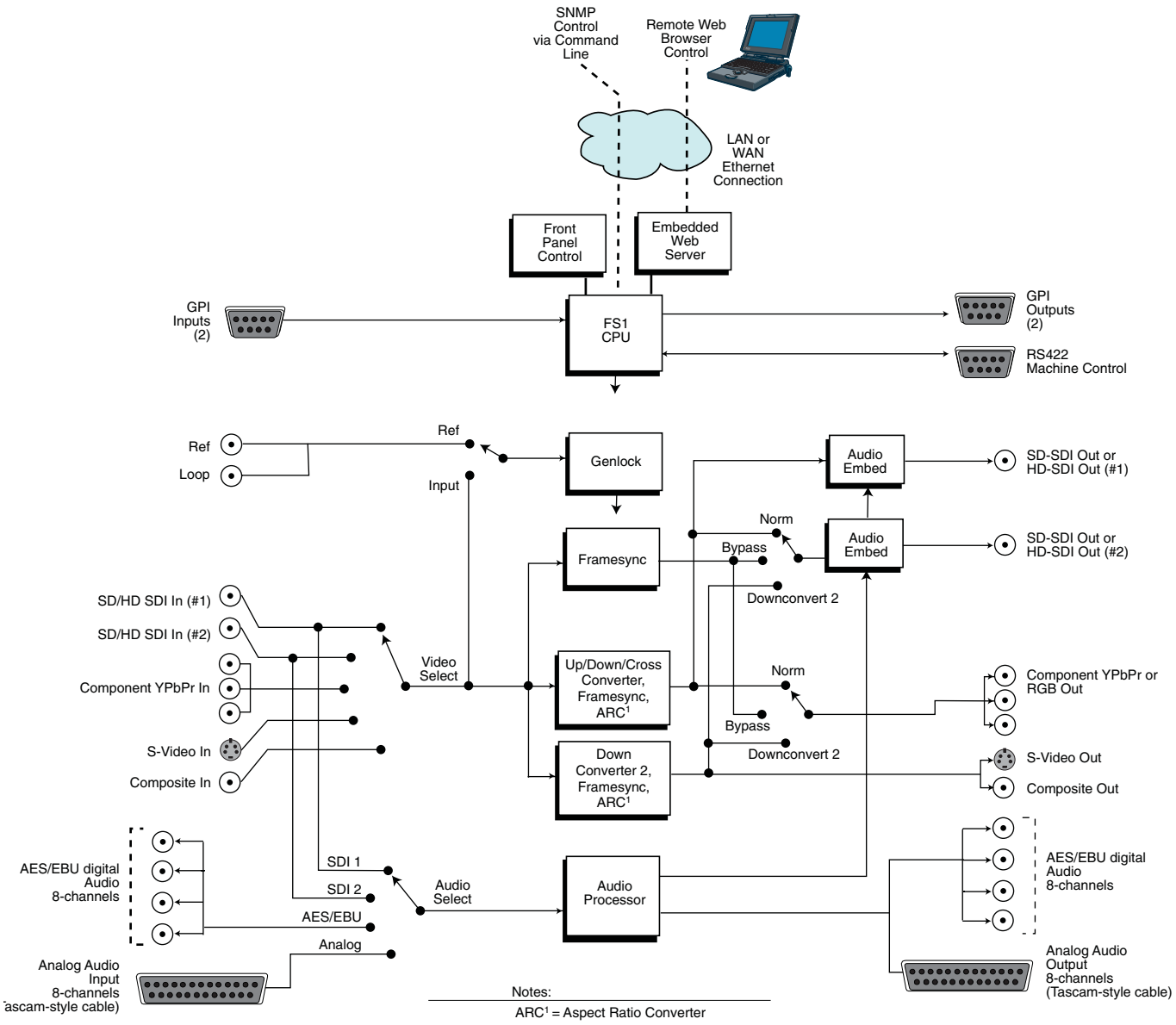
Block Diagram Description

The FS1 features a very flexible architecture that allows simultaneous HD/SD operation. There are actually three separate frame synchronizers in the FS1: a full up/down/cross converting synchronizer, a downconverting synchronizer, and a standard HD/SD non-converting synchronizer. This architecture allows the following functions:

- HD cross converting with simultaneous downconverted SDI output
- Up/down/cross converting with both the input and converted formats on SD/HD SDI outputs (both synchronized)
- Up/down/cross converting with dual SD/HD-SDI outputs
- Composite and S Video outputs are always active (dedicated down-converter for HD inputs)

For example, the FS1 can input 720p, and output both cross-converted 1080i HD-SDI and down-converted 525i SDI (or the same with 1080i in and 720p out).

The FS1 also allows the user to set the output format, and the conversion will be automatic depending on what the input is. The FS1's output format can also be controlled by using the reference input (follows the reference input format).



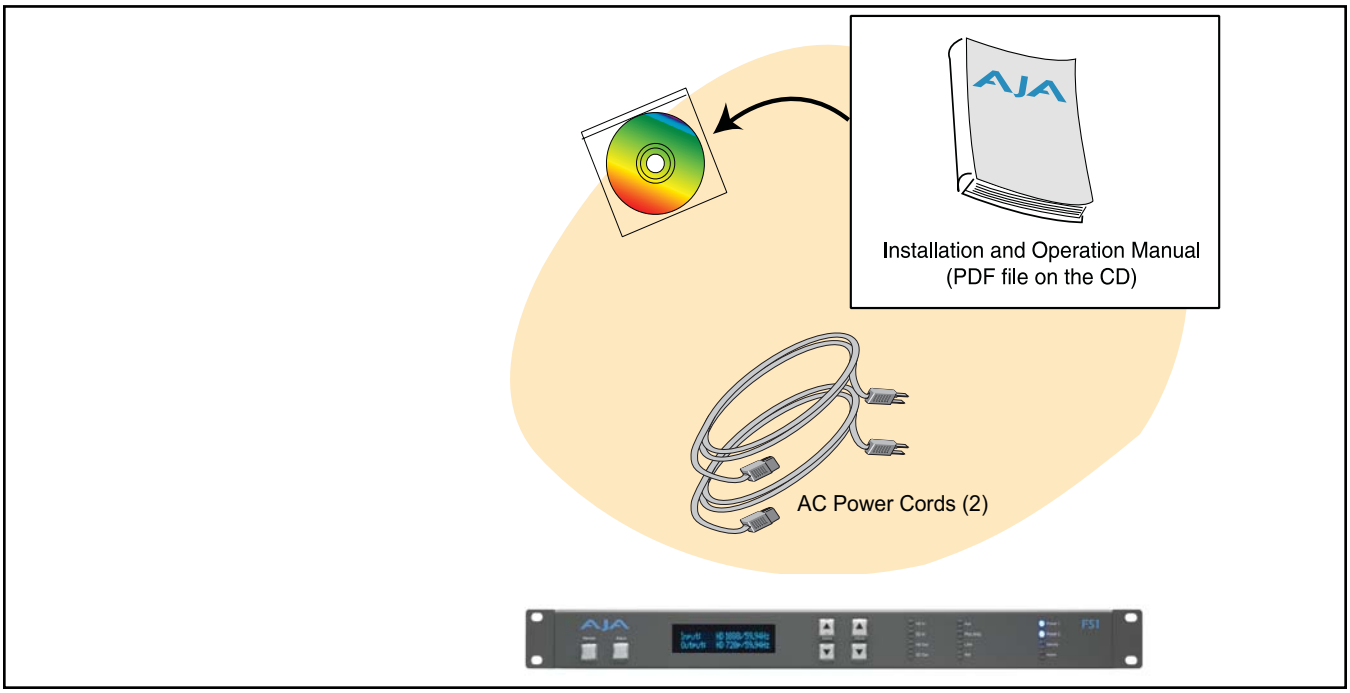
FS1 Simplified Block Diagram

What's In The Box?

When you unpack your AJA FS1 chassis, you'll find the following components:

- AJA FS1 Chassis
- AC Power cords (2).
- The manual you're reading (on CD).
- Optional: Late-breaking News or Read-Me-First notices (where applicable, AJA may include additional bulletins related to your product and software).

Please save all packaging for shipping the FS1 should you wish to do so when moving or sending it in for service.



FS1 Shipping Box Contents

In This Manual

Chapter 1 is the introduction you're reading, listing features, box contents, and requirements.

Chapter 2 discusses the FS1 front and rear panel connections and indicators. Illustrations point out the various connectors and indicators with text discussions of each.

Chapter 3 provides complete instructions for installing and configuring the FS1 panel, from unpacking, cabling the system and then getting it up and running.

Chapter 4 gets you started with setting up and using the FS1 via its front panel controls. Discussed are the Parameter Menu and Select/Adjust buttons used to view and edit settings.

Chapter 5 discusses controlling the FS1 remotely via a network-attached computer with a web browser.

Appendix A presents a list of technical specifications for the product.

The remainder of the manual consists of an index section to help you rapidly find topics in the manual.

FS1
Chapter 2: Controls and Indicators

Controls and Indicators

When installing the AJA FS1 chassis, you'll make media cable connections to a variety of equipment. After installation, the front panel indicators will be useful in monitoring what is happening on the system as well as troubleshooting problems that can occur. Becoming familiar with the FS1 front and rear panels will simplify installation, setup, and operation of the system. Use of the Web browser user interface is described in a later chapter.

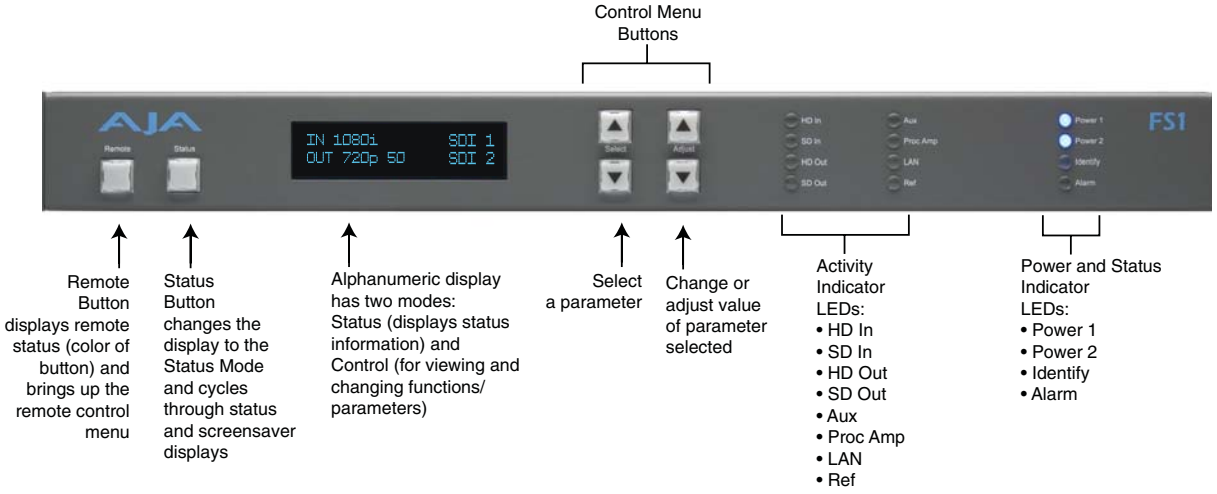
On the following pages are front and rear panel illustrations with notations that summarize all of the connectors and indicators. Detailed descriptions of each of the connectors and indicators follow afterward.

Full Installation instructions are provided in Chapter 3 later in this manual.

Note: The AJA FS1 should be plugged into 3-prong AC power before you make connections to other equipment. The AC cords provide a path to ground for accidental static discharge and protect system equipment. The FS1 has two fully independent and redundant power supplies; it will operate with one or both AC power cords plugged into the unit, although fault-tolerance will only exist if both are connected.

Warning: *To meet safety regulations for leakage current, connect the FS1 dual power supplies to separate branch circuits.*

Front Panel

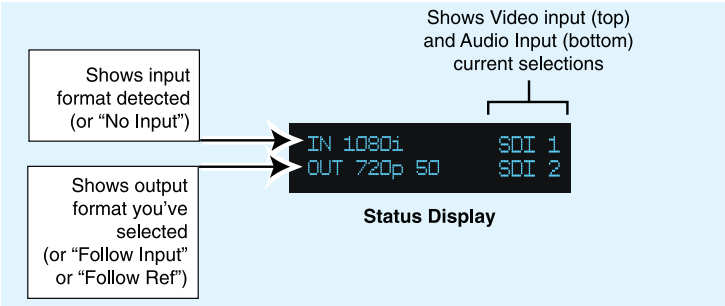


AJA FS1 Front Panel Indicators

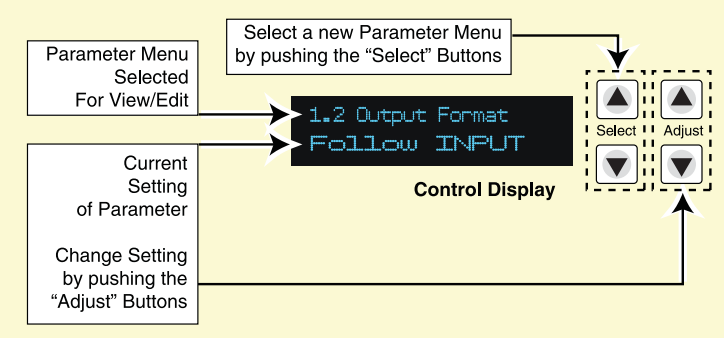
Alphanumeric Display

The Alphanumeric display has two modes:

Status: Displays current machine status and/or error conditions. The Status display is enabled by pushing the Status button.



Control: The control mode displays the menu structure for selecting and changing/adjusting machine functions and parameters. The display is changed from Status to Control mode by pushing a Select or Adjust button (the up/down arrow buttons).



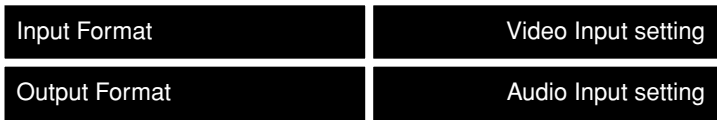
When the FS1 is powered up, the display will show a scrolling AJA screensaver and then the Status Display.

Status Display

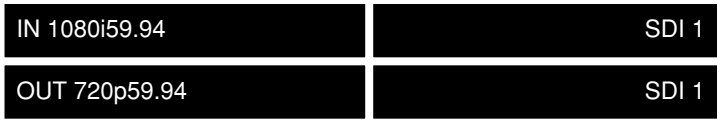
There are several different status displays you may see (the main status display was shown in the previous illustration). The other status displays are Network Status and Error Status (describes any error conditions, for example over temperature, power supply failure, etc.) If there are multiple status displays, you can page through them by repeatedly pressing the “Status” button under the AJA logo on the front panel.

Normally, you'll be viewing the main Status shown earlier. Information contained in the Status Display shows the current primary settings for the FS1:

- Input Format (upper left)
- Output Format (lower left)
- Selected Video Input setting (upper right)
- Selected Audio Input setting (lower right)



For example, if set up to do a cross-convert from 1080i59.94 to 720p59.94 using embedded audio in and out, the display would look as follows:



If the selected input has no valid signal present, the FS1 displays “IN No Input”. If the input is corrupted, the FS1 displays “IN Error”.

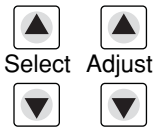
Note: If the input is incompatible with the chosen output format, the default status screen will display the actual format, such as “IN 525i 59.94". The status alarm screen, however, would be the 'default' status screen at that point (since the Alarm LED would be on), and it would display “IN Incompat”.

When no button activity has been detected for 60 minutes, the FS1 enters a screen-saver mode where a scrolling “AJA” will be seen. Pressing the Status button will bring up to the Status display.

If the input is corrupted or incompatible with the chosen output format, the FS1 displays “IN Error”.

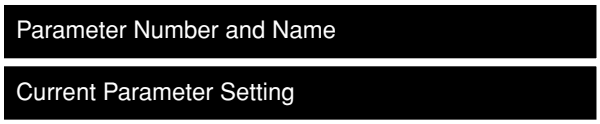
Controlling the FS1 Using the Select and Adjust Buttons

The FS1's Control system is designed to be easy to operate and remember. All functions in the menu system are numbered for easy reference. There are two sets of up/down buttons, *Select* and *Adjust:*



To operate the FS1, one merely selects a function/parameter with the Select buttons, and then adjusts the selected function/parameter with the Adjust buttons.

The Control Display has two lines:



The top line contains a numbered and named FS1 parameter and or function. The lower line contains the current setting.

The parameter Select buttons select a parameter to view or modify. Pressing one of the parameter Adjust buttons changes the current parameter's value to a new one from the FS1's list of choices—repeating the list if you continue to press Adjust-or adjusting a numerical value up or down. The exact choices displayed will vary depending on the Parameter. Adjustment choices made with the Adjust buttons take effect immediately (except 1.1 Output Format which has a 1/2 second delay). Any changed parameter will be subsequently stored into the FS1s non-volatile memory if it remains unchanged for 3 seconds.

If a Select or Adjust button is held down continuously, the changes will begin to happen automatically - with acceleration if applicable.

Pressing either a Select or Adjust button-while on the Status or Screen Saver displays-changes the display to the last remembered Control menu.

Holding down both the Adjust (up) and Adjust (down) buttons—*at the same time* —will set that parameter back to its factory default value.

Note: Parameter displays and adjustment choices and values are described in detail in Chapter 4.

Remote Control

Pressing the *Remote* button once results in a display showing how the FS1 is being controlled. Pressing the button again cycles the display through all the control options possible:

LOCAL+REMOTE: control is from the panel buttons and/or a web browser. The *Remote* button will glow white.

REMOTE ONLY: control of the FS1 is from a web browser on a network attached computer (except for the remote control function). The *Remote* button will glow red.

LOCAL ONLY: FS1 control is only allowed from the front panel buttons (except for the remote control function). The Remote button will glow green.

Indicator Descriptions

Indicators on the front panel are multi-state LEDs that illuminate when a condition is present. The following indicators are conveniently arranged in groups to show specific subjects:

- Activity LEDs
- Power and Status LEDs

Each group of indicators are discussed on the following pages.

Activity Indicators

HD In—shows that an active HD signal is detected at the previously selected input.

SD In—shows that an active SD signal is detected at the previously selected input.

HD Out—shows that an HD signal is being output.

SD Out—shows that an SD signal is being output.

Aux—this LED will flash once whenever the FS1 is being controlled by a web browser input. If a GPI input is being detected, the LED will be steady ON.

Proc Amp—shows that the ProcAmp values are different from the factory nominal values. If lit, the video passing through the FS1 is being altered according to changes in ProcAmp parameter settings (it's no longer at unity).

LAN—shows that the FS1 Ethernet connector is detecting an active *LAN* connection.

Ref—shows that the FS1 has an external reference video source applied to the *Ref* connector.

Power and Status Indicators

Power 1—shows that the FS1 #1 power supply is connected to AC mains power via its power cord and is operational. Both the *Power 1* and *Power 2* LEDs must be lit to ensure redundant power is available.

Power 2—shows that the FS1 #2 power supply is connected to AC mains power via its power cord and is operational.

Identify and *ID*—these two LEDs (one on the front panel and one on the rear) will be lit when directed to do so via the FS1's Web browser interface "Identify" button. This action is useful for identifying which FS1 you're controlling when there are multiple FS1 units in a machine room being controlled by a laptop or computer. To do so via the browser, simply click "Identify" and then watch for one of the FS1s "Identify" LEDs to light up. The "Identify" LED on the front panel and "ID" LED on the rear panel perform the exact same function—no matter which side of a rack you're facing, you'll be able to see one of the LEDs.

Alarm—if this LED is illuminated, press the Status button to see a description of the alarm event detected.

The Alarm LED may be lit because of a hardware failure, or because of video incompatibilities.

Video incompatibilities may be deduced from the “Alarm Status” screen. When the Alarm LED is lit, press the front panel *Status* button to go directly to the “Alarm Status” screen.

Video incompatibilities that the FS1 may detect include:

Video Incompatibility Detected	Alarm Status screen will show
6.1 Genlock Source is set to “Reference”, but no Reference signal is detected.	Alarm Status screen shows: “IN..... GEN Ref” “OUT.... REF No Ref”
6.1 Genlock Source is set to “Reference”, but Reference signal format is not compatible with selected Output Format.	Alarm Status screen shows: “IN..... GEN Ref “ “OUT.... REF Incompat”
6.1 Genlock Source is set to “Reference”, and selected Output Format is compatible with detected Reference format, but Input signal format is not compatible with detected Reference format.	Example: if Reference and Output formats are 525, but Input is 625, Alarm Status screen shows: “IN Incompat GEN Ref “ “OUT 525i 59 REF 525i 59 “
Input signal is not compatible with selected Output Format.	Alarm Status screen shows: “IN Incompat “ “OUT 525i 59

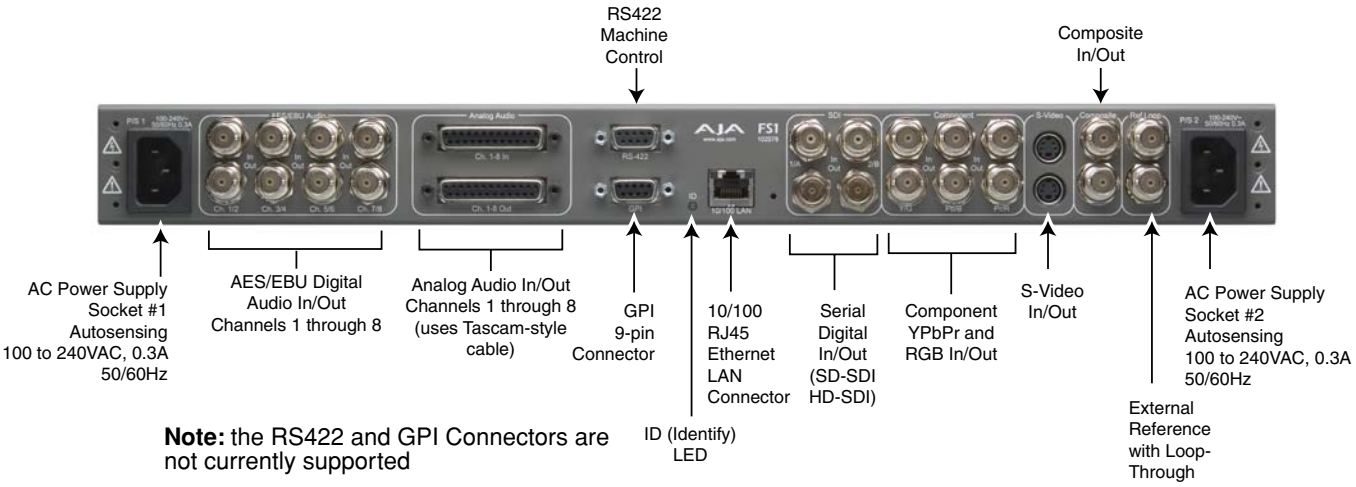
About video and format compatibility

The table below shows at a glance all the conversions (and straight-through modes) possible for given input formats. In the case of interlace formats the table lists the field rate; for progressive formats the table lists the frame rate.

Input	Possible Output Formats
525i59.94	525i59.94 720p59.94 1080i59.94
720p59.94	525i59.94 720p59.94 1080i59.94
1080i59.94	525i59.94 720p59.94 1080i59.94
1080pSF23.98	1080pSF23.98 1080i59.94 525i59.94
625i50	625i50 1080i50 720p50
720p50	625i50 1080i50 720p50
1080i50	625i50 1080i50 720p50
1080pSF24	1080pSF24 1080i60
1080i60	1080i60 720p60
720p60	720p60 1080i60

Note: In the case of 1080pSF/23.98 input, FS1 automatically does 3:2 pulldown to get the correct frame rate. Similarly, in the case of 1080pSF/24 input, FS1 automatically does 3:2 pulldown to get the correct frame rate.

Rear Panel



AJA FS1 Rear Panel Connectors

About Inputs and Outputs

The function of the FS1 Inputs and Outputs depend on the operational mode. Operation is simple in steps: first select an output format, and then select the desired input. All outputs are active all the time. By selecting an output format first and then the input source, the FS1 can automatically put in place any conversion required (up/down/cross). Audio embedding/disembedding is also automatic, following any parameter settings you've selected for your application. For example, even though the input selected might be HD-SDI with embedded audio, the analog audio output connectors will output proper analog audio that has been disembedded from the serial digital stream (unless you've chosen to mute it via a parameter selection).

Please study Chapter 4 Parameter Menus, for a full understanding of all the FS1 settings possible.

Connectors

Connectors on the rear panel are arranged in groups for easy installation and maintenance. Connectors provided are:

- 2 AC power connectors, each 3 pin (with Ground), one for each independent power supply. Each power supply is autosensing from 100 to 240VAC at 50/60Hz. Only one has to be connected for FS1 operation, but redundant operation can only be ensured if both connectors are plugged into mains power.
- 8 channels AES/EBU digital audio in and out, two pairs per BNC.
- 8 channels of analog audio in and out via a DB25 Tascam-style cable (not supplied).
- RS-422: Machine control interface, supporting Master or Slave (selectable in software).
- GPI connector: Dual isolated TTL compatible inputs and outputs. Functions of each are selectable in software.

- 10/100 LAN RJ45 connector.
- SDI video with embedded audio In/Out. There are two input and two output BNC connectors. The outputs are active all the time, although you must specify the output format (and thus whether any conversion takes place).
- Component YPbPr/RGB Video, 3 BNCs for input, and 3 BNCs for output.
- S-Video In/Out (Y/C), one 4-pin mini-DIN for input, and one 4-pin mini-DIN for output.
- Composite NTSC/PAL Video In/Out, 1 BNC for input, and 1 BNC for output.
- Reference Video (looping), 2 BNCs

Each of these groups of connectors are discussed on the following pages.

Connector Descriptions

8 Channel AES/EBU Audio Inputs And Outputs

One BNC is provided for each of four groups of two channels, both on the input and output: 1/2, 3/4, 5/6, and 7/8.

AES/EBU signals are handled by the FS1 internally as 24-bit digital.

Analog 8 Channel Audio

The two DB25 connectors, one for input and one for output, support a Tascam-style cable snake for balanced 8-channel audio. Analog audio signals are converted internally to 24-bit digital Audio Inputs And Outputs

RS422 Machine Control

A female DB9 connector provides connection and control for VTRs and other devices using RS422 SMPTE (Sony) protocol. The Master/Slave configuration is selectable in software.

GPI

A female DB9 connector provides connection to external equipment or circuits via an isolated TTL-compatible interface. Appendix B contains a pinout and specifications for the GPI connector.

LAN

An RJ45 connector provides a 10/100 Ethernet port for connection directly to a computer or Ethernet hub or switch for connecting to a LAN. The FS1 is compatible with both straight-through CAT-5 and cross-over (null-modem) Ethernet cables, automatically detecting which is used.

SDI Input and Outputs

BNC connectors are provided for two SDI inputs and two SDI outputs. SDI video connections include embedded audio In/Out (depending on your parameter settings). The outputs are active all the time, although you must specify the output format (and thus whether any conversion takes place). For example, with an SD-SDI input selected, you could set the SDI 1 output to HD 720p for an upconvert, and then set the SDI 2 output to "Follow Input" to output the SD-SDI at the same format/framerate as the input.

Use SDI wherever possible for the best quality 10-bit video input and output. If peripheral equipment has a variety of inputs/outputs, look to see if it has SDI I/O, and use it where possible.

Component (YPbPr/RGB)

Connect SD or HD component YPbPr or RGB video cables from a VTR, camera, or other source to the three input BNCs. Then connect the YPbPr or RGB output BNCs to your destination component device. Component video signals are A/D (input) and D/A (output) converted (10-bit).

S-Video (Y/C)

S-Video input and output female 4-pin mini-DINs provide for connection of desktop video/pro-sumer level equipment, including camcorders, VCRs/VTRs, and monitors—to name a few. Use high quality shielded S-Video cables when making connections. S-video signals are converted internally to 10-bit digital.

Composite NTSC/PAL

BNC connectors support composite NTSC or PAL standard definition input and output. Connect an NTSC or PAL composite video cable from a VTR, Camera, or other source to the Composite In BNC. Then connect the Composite Out BNC to a destination composite video device. Composite video signals are A/D (input) and D/A (output) converted (10-bit).

Reference Video (looping)

These two BNC connectors allow you to synchronize FS1 outputs to your house reference video signal. If you have a sync generator or central piece of video equipment to use for synchronizing other video equipment in your studio, then connect its composite output here. When FS1 outputs video it uses this reference signal to lock to.

FS1

Chapter 3: Installation & Configuration

Installation Overview

The installation and set up of an FS1 is very simple. Plug both AC supply cords into AC mains power, connect the LAN connector to a LAN, WAN or local computer with a web-browser, and then connect source and destination video and audio equipment.

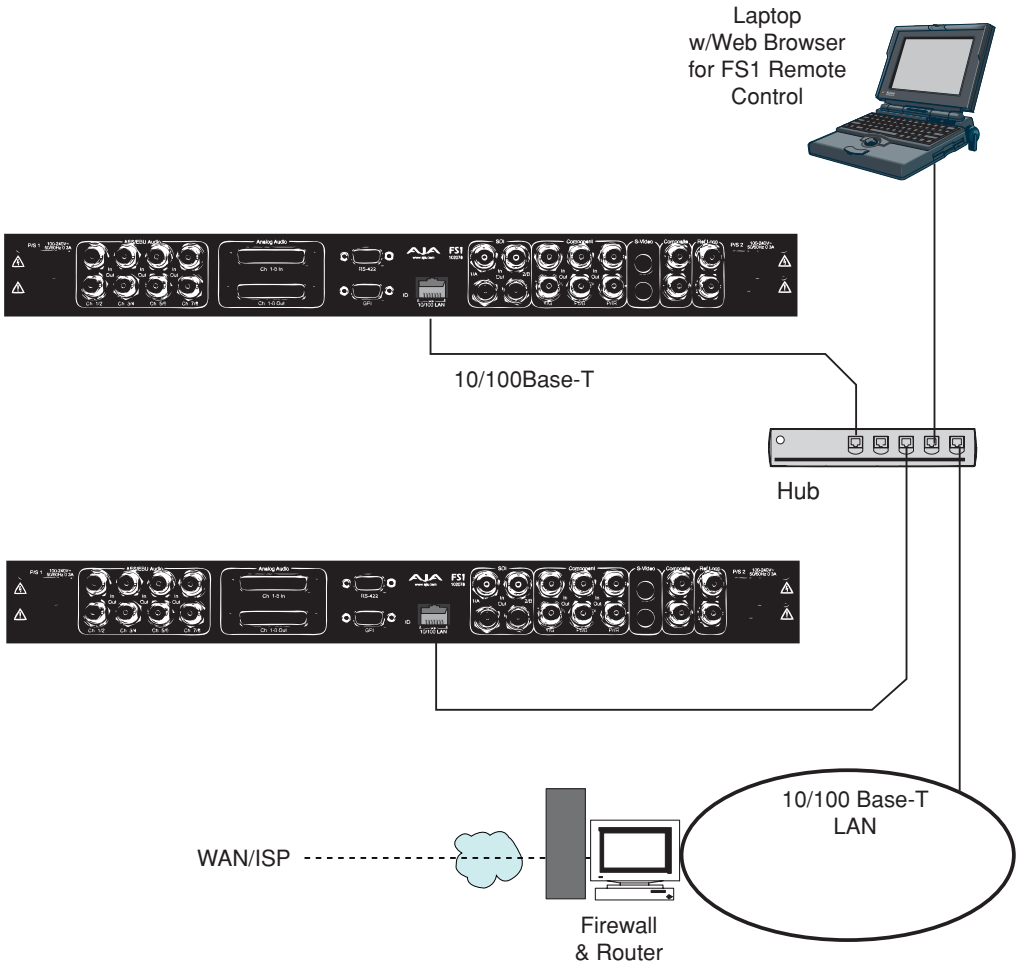
Warning: *Do not open the chassis. There are no user-serviceable parts inside. Hazardous voltage is present inside the unit, presenting a risk of electric shock or serious personal injury. Opening the chassis will void the warranty unless performed by an AJA service center or licensed facility. Remove the two supplied AC line cords from mains power when moving the unit. Do not defeat the safety purpose of the grounding-type plug.*

Warning: *To meet safety regulations for leakage current, connect the FS1 dual power supplies to separate branch circuits.*

All of the steps of Installation and Configuration are documented in this chapter, summarized as follows:

1. Unpack the shipping box, removing the FS1 and two power cords.
2. Connect the FS1 to power, connecting the two power cords to mains AC.

3. If remote control of the FS1 is desired, ensure you have an Ethernet cable routed to where the FS1 will be placed. It can be connected over a LAN, or attached directly to a locally attached computer. Ensure that the computer (whether communicating over a LAN or directly to the FS1 Ethernet port) has a web browser on it (FireFox or IE 7 recommended). If the FS1 will be attached to a LAN, talk to your IT administrator and obtain the details on how he/she wishes you to configure the FS1 (DHCP or static IP, explained in this chapter).
4. If connecting to a network, configure the FS1 IP CONFIG, IP ADDR, IP MASK, and IP GATEWAY parameters according to the information obtained from your IT administrator in the last step. Connect it to the LAN. From a network attached computer or one directly connected to the FS1, "ping" the FS1 (explained later in this chapter).
5. Mount the physical chassis as desired: front rack, rear rack, or deskmount. If you are mounting multiple FS1 units, try to place them visually in the same area so if you communicate with them via a network attached computer, you can use the FS1's "Identify" feature to turn ON the corresponding LED of the FS1 you're communicating with.
6. Cable the system audio and video sources, VTR(s), monitors, and audio equipment.

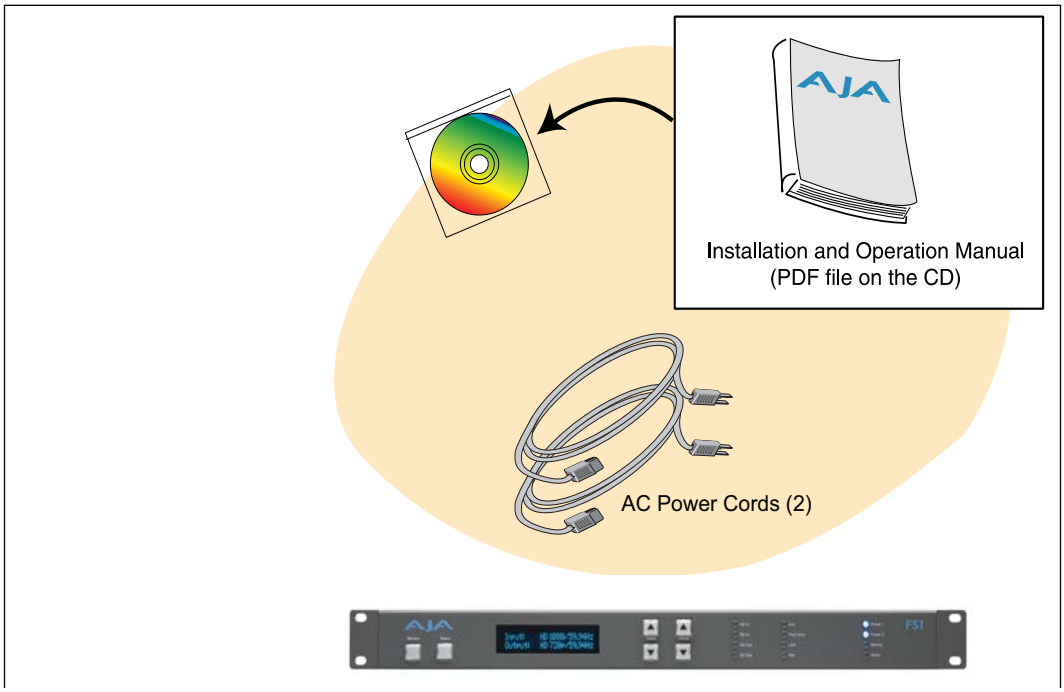


FS1 Network Example, Two FS1s on a LAN, with Laptop for Remote Control

Unpacking

Shipping Box Contents

An FS1 chassis is shipped with two AC power cords, a user manual CD, and any late-breaking news bulletins (if applicable). Chassis rackmount brackets are provided as part of the chassis with screws.



Box Contents

As you unpack the shipping box, carefully examine the contents. Ensure you received everything and that nothing was damaged during shipment. If you find any damage, immediately notify the shipping service and supply them with a complete description of the damage. AJA will repair or replace damaged items.

If you find shipping damage, contact your AJA dealer or distributor for details on how to have your FS1 repaired or replaced.

Note: Save packing materials and the shipping box. If you ever require service or move your system—use the packaging materials and box for safe shipment.

The FS1 Chassis Rackmount or Place on a Desk

Physical Requirements

You can locate your chassis in two ways:

- Rackmounting—attach the FS1 (rear or front mounted) to a standard 19" equipment rack. The FS1 chassis takes up only one rack unit vertically.
- Desktop—lay it on a horizontal flat surface.

When planning equipment locations and mounting methods, take into account the size of the chassis:

- Chassis Dimensions:
  Height—1 rack units, 1.75” (4.445 cm)
  Depth—12” (30.48 cm)
  Width—17.25” (43.8 cm)

Network Connection

The FS1 can be networked directly to a laptop or other desktop computer using a single Ethernet cable (straight or cross-over)—or it can be connected to a local area network (LAN). In either case, the FS1 connects via its 10/100Base-TX Ethernet connector. A LAN is a shared network that includes other Ethernet devices all attached via a hub or digital switch. LANs may be divided into zones separated by software or hardware routers. Routers may also be used to connect the LAN to an outside wide area network (WAN) such as the internet. Devices on a LAN have IP addresses which may be fixed and permanent, or dynamically assigned by the network (DHCP). When attaching the FS1 to a LAN, you should first talk to your network administrator and find out how they want it connected (static IP or DHCP). Your IT department will be able to supply the information you need to install the FS1 on a LAN.

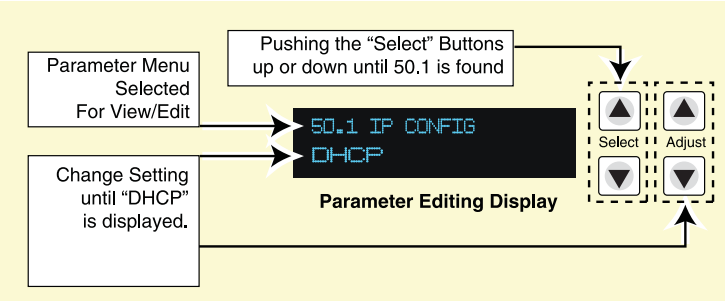
TCP/IP Information You’ll Need

If your LAN has a DHCP server that assigns IP addresses dynamically, then configure the FS1 to use it (it’s easier). If for some reason your IT administrator prefers an assigned IP address that is fixed (called a “static IP), then get the IP address—you’ll be entering it in the “IP CONFIG parameter” of the FS1. If your LAN requires static IP addresses, then also ask your IT administrator for the *Subnet Mask* (usually 255.255.255.0) and *default gateway* IP address (your LAN’s internet router). The following two topics discuss two different ways to set up the FS1: via DHCP or via a static IP address.

Note: At the time of publishing, DHCP is not implemented in the FS1 software.

Networking the FS1 via DHCP

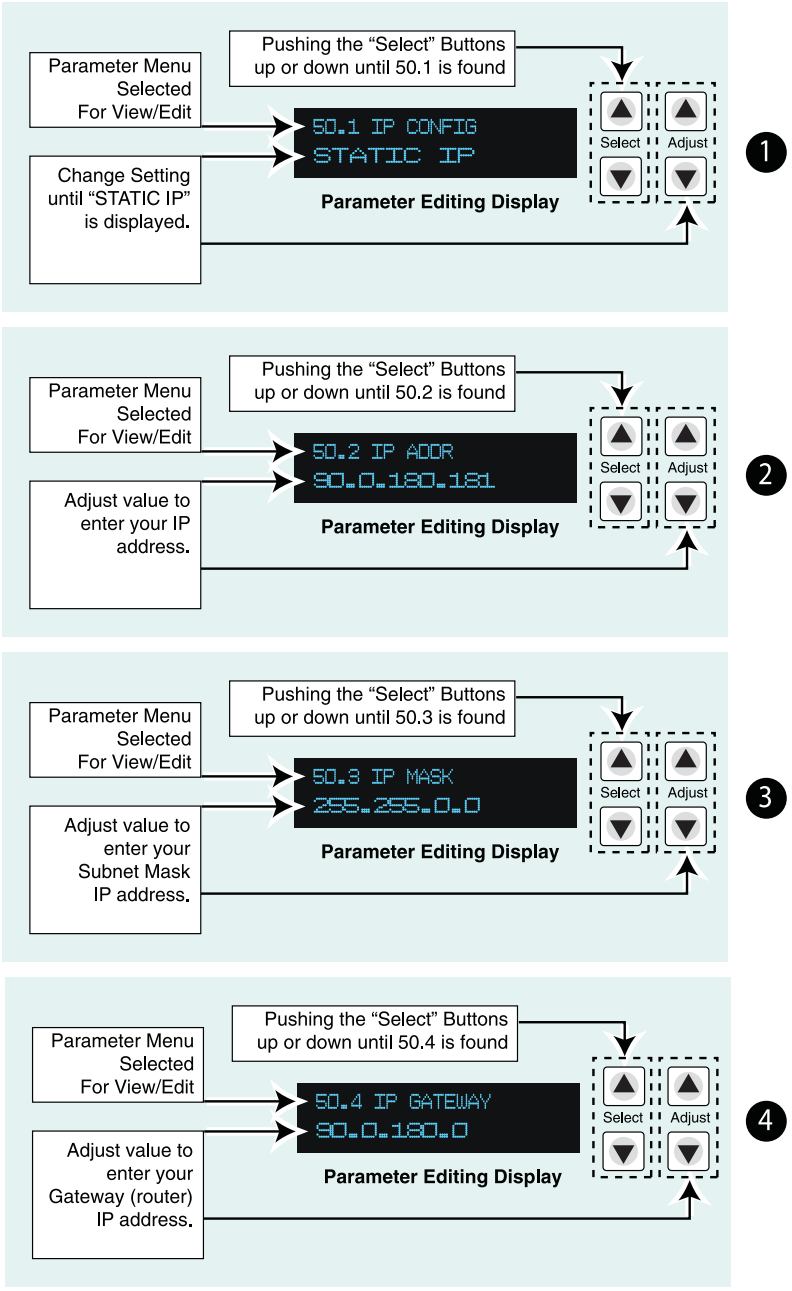
The FS1 configuration for using a DHCP server to automatically issue an IP address is simple. Using the Select buttons, just navigate to the parameter “50.1 IP CONFIG”, and then use the Adjust buttons to select “DHCP”. That’s it!



Note: DHCP is not supported by the FS1 at the time this manual is being published.

Networking the FS1 using a Static IP Address

To set a static IP address for the FS1's IP address, you'll also make some simple Parameter menu selections. The illustration below shows the four menu selections you need to make, while entering the information provided to you by your IT administrator (as discussed earlier).



Configuring the FS1 with a Static IP Address

Note: for parameters 50.2, 50.3, and 50.4, you will be setting IP addresses that consist of "octets" separated by a period (i.e., 90.0.180.0).

For these parameters, the *Select* button selects the octet and then the *Adjust* buttons select the desired number. Pressing Select again advances to the next octet. At the final octet, the address will flash—pressing Select at that point confirms the setting.

Test the FS1 Network Connection with "Ping"

After setting the IP address and other TCP/IP settings and connecting the FS1's Ethernet connection to a LAN or directly to a computer, ensure that you have a valid connection by "Pinging" the FS1. Pinging ensures that other devices on the network, or a computer directly attached to it, can see it. Simply run the Ping utility from a computer on the same LAN as the FS1, or one attached directly to the FS1. Here's how to Ping an FS1 from a Mac OSX computer or Windows PC:

Mac Ping Procedure

1. Find the Applications Folder, and then find the Utilities Folder inside of the Applications Folder.
2. Locate the "Terminal" utility application and double-click it.
3. At the Terminal prompt, enter: ping 10.65.74.65
(if you've changed the FS1 IP address from the default factory IP, substitute your new IP here).
4. If successful, the ping utility will respond that packets were sent, received and how long it took. For example:
64 bytes from 10.65.74.65: icmp_seq=0 ttl=64 time=0.590 ms
5. If unsuccessful, check the FS1 network settings and resolve the problem with your IT administrator.

Windows PC Ping Procedure

1. From the Start button, find and locate and select the All Programs menu.
2. From the All Programs list, select Accessories, and then from that list, select Command Prompt.
3. From the *Command Prompt* utility's prompt, enter: ping 10.65.74.65
(if you've changed the FS1 IP address from the default factory IP, substitute your new IP here).
4. If successful, the ping utility will respond that packets were sent, received and how long it took. For example:
64 bytes from 10.65.74.65: icmp_seq=0 ttl=64 time=0.590 ms
5. If unsuccessful, check the FS1 network settings and resolve the problem with your IT administrator.

Controlling the FS1 from a web-browser

To control the FS1 from a web-browser on a network attached computer, you must enter the FS1 IP address as a URL in the browser. For example, if the FS1 IP address were "90.0.6.31", you would then type into the web browser: http://90.0.6.31

This topic is explained in greater detail in *Chapter 5: Browser Remote Control.*

Note: FS1 software versions 1.0.2.21 and earlier required the port number ":8080" at the end of the IP address, for example http://90.0.6.31:8080. If you are running this early software on the FS1 (not recommended), you'll need to enter the IP in this manner to communicate with the FS1. For later software versions do not add the port number—enter only the IP address (i.e., http://90.0.6.31).

Installing The Latest Software

Although the FS1 comes from the factory pre-installed with software, it may not be as up-to-date as software posted on our AJA website. This topic describes the steps required to upgrade the software in your AJA FS1.

Download the Latest FS1 Software

Current and past releases of FS1 software are available on the World Wide Web from AJA's website. To get the software, point your browser to:
http://www.aja.com/html/FS1_update_page.html

Once there, FS1 software files can be selected to download for upgrading your local FS1 machine.

Unpack the Software

FS1 software update files are "ZIP" files, which you can open with a number of standard and third party uncompressor applications. The software image that you'll install on the FS1 is a file with a name like *fs1_ver_1.0.2.37.bin* or similar.

Note: Depending on your PC or Mac operating system settings, the ".bin" extension may not be visible to you in a file directory.

Uploading and Installing the Software to the FS1

Uploading and installing the software update only requires a PC or Mac that can "see" the FS1 via its ethernet connection. Follow this procedure to install the software:

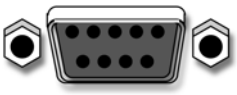
1. Point your browser at the FS1's upgrade page by clicking on the "Update Firmware" link at the bottom of the navigation box on the left-hand side of any FS1 web page. The FS1 web pages are discussed in Chapter 5.

2. Click the "Browse..." button to select the file you previously downloaded. For example: fs1_ver_1.0.2.37.bin contained in the zipfile downloaded from AJA.
3. When you have selected a valid FS1 image file, click the "Upload" button in the web browser. The file you select will upload to the FS1 and be tested for validity. Incomplete, corrupted, or non-FS1 software files are rejected.
4. Wait for the procedure to complete—it will take only a few minutes. When done, the FS1 will prompt you to restart your FS1. After restart, the FS1 will be running the new software—and if necessary, will perform a second and final upgrade phase, updating four items inside the FS1. Progress is shown on the front panel of the FS1 only. This second upgrade phase is performed only once per software update and may take up to 8 minutes.

5. Once these steps are complete, the FS1 will be running the software you just uploaded until the next time you upgrade it. The configuration of the FS1 prior to the upgrade will be preserved. Ensure the new software is running by bringing up the FS1 web page again; the software version is displayed at the top of all FS1 web screens. If for some rare reason it didn't update, you can then run through the update steps again.

Note: If there is a power outage or glitch during the software download, the FS1 will boot the older software version and the upgrade process can then be re-started by the user. This happens because the FS1 has been designed with a safety feature where an internal "safe" copy of the previous software is retained in the event the updating process fails.

GPI Connections



Pin	Function	Pin	Function
1	GPI Input 1	6	I/O Ground 1
2	GPI Input 2	7	I/O Ground 2
3	GPI Output 1	8	I/O Ground 1
4	GPI Output 2	9	I/O Ground 2
5	Chassis Ground		

GPI Connector Pinout

The GPI inputs and outputs are electrically isolated from the power and ground on the FS1 frame. There are two inputs and two outputs. Electrical isolation is provided for up to two pieces of external equipment. The following guidelines apply to the two GPI inputs and outputs:

- Input 1 and Output 1 share a common isolated ground on pins 6 & 8 (I/O Ground 1),
- Input 2 and Output 2 share a common isolated ground on pins 7 & 9 (I/O Ground 2).
- Pin 5, local chassis ground, may only be used as a reference when isolation is not required.
- Both GPI inputs are internally pulled high through a 10K ohm resistor to an isolated 5V supply, so that a relay contact closure or any device sinking at least 0.4 mA to ground will register a logic low.
- Both GPI outputs are 5V TTL compatible, sourcing up to 6mA and sinking up to 4mA each.

Cabling the System

Where to Place FS1

- Plan adequate space for cable routing from the back of the chassis. Ensure that cable connectors are not stressed and that cables are not bent or crimped.
- When rackmounting or stacking multiple FS1 chassis, ensure there is adequate airspace for cooling around the FS1 units. Note the location of cooling vents on all equipment next to the FS1 and ensure none are obstructed.

Note: FS1 units earlier than serial number 2F0482 should not be stacked more than two together; later units can be stacked vertically without limit as long as there is adequate cool air supply around the FS1 vents.

Power Requirements

- Input Voltage—Chassis: autosensing 100VAC to 240VAC, 50/60Hz, fully redundant with both power supplies diode isolated
- Power Consumption—25 Watts

Warning: *Do not open the chassis. There are no user-serviceable parts inside. Hazardous voltage is present inside the unit, presenting a risk of electric shock or serious personal injury. Opening the chassis will void the warranty unless performed by an AJA service center or licensed facility. Remove the two supplied AC line cords from mains power when moving the unit. Do not defeat the safety purpose of the grounding-type plug.*

System Video/ Audio Cable Connections

When installing your system, you'll make video and audio input/output connections. These connectors are explained individually in chapter 2.

FS1 Audio Level Choices Pro or Consumer

Since the FS1 handles both digital and analog audio and can convert between the two, it provides settings via the parameter menus and the remote web browser, that allow you to control the relationship between audio level in analog versus the same audio level in the digital domain. The FS1 offers four settings to accommodate these different audio relationships in both professional and consumer audio applications.

The analog audio levels listed on the next page are defined in reference to 0 dBFS (where FS = full scale), which is the maximum level that can be represented digitally. **Note:** test criteria mentioned here involves a 1kHz sine wave.

FS1 Professional Audio Level Settings

FS1 Audio Setting	Meaning
+24 dBu analog = 0 dBFS SMPTE standard	With digital audio at maximum possible level (before clipping), the analog audio level will be +24 dBu.
+18 dBu analog = 0 dBFS EBU standard	With digital audio at maximum possible level (before clipping), the analog audio level will be +18 dBu.
+15 dBu analog = 0 dBFS	With digital audio at maximum possible level (before clipping), the analog audio level will be +15 dBu.

FS1 Consumer Audio Level Setting

FS1 Audio Setting	Meaning
+12 dBu analog = 0 dBFS.	With digital audio at maximum level (before clipping), the analog audio level will be +12 dBu. These levels are provided for consumer equipment that outputs audio at levels lower than the professional levels. Note: In the consumer audio world, units are often given in terms of dBV, so +12.2dBu is equivalent to +10dBV. The standard operating level then corresponds to -10dBV (-7.8dBu). The "+12dBu" FS1 setting provides consumer audio levels with headroom.

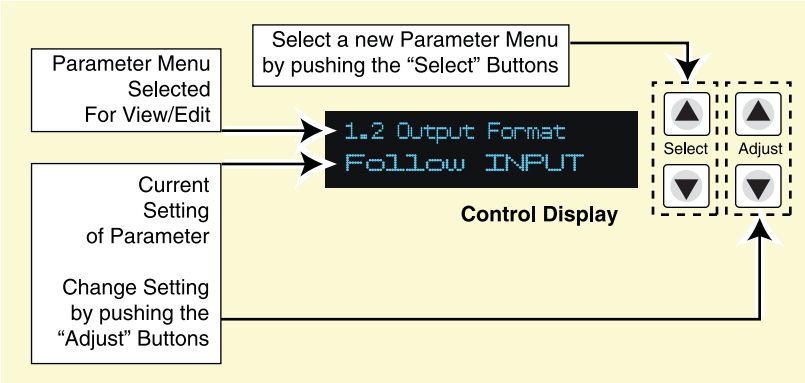
How Do Audio Levels Settings Relate to Nominal Levels ?

Most users refer to audio levels at the *Standard Operating Level* for the U.S. and *Alignment Level* for the EU—a level not at maximum level, but rather at some lower point to allow “headroom” for audio to become louder without clipping.

In the U.S. most users use +4 dBu as their Standard Operating Level. This corresponds to -20dBFS in the digital domain (20 dB of headroom, per SMPTE RP-155), so the +24 dBu setting on the FS1 provides proper headroom levels for digital and analog audio.

Most users in the EU use 0dBu as their Alignment Level. This corresponds to -18dBFS in the digital domain (18 dB of headroom per EBU R68). Correspondingly, the +18dBu setting on the FS1 provides for this relationship. Alternatively, the FS1 +15 dBu setting provides safe headroom levels corresponding to some German professional audio equipment.

FS1
Chapter 4: Parameter Menus



Controlling the FS1 via Its Front Panel Parameter Menus

There are two ways to control the FS1: remotely from a web browser and using front panel Select/Adjust buttons and Parameter Menus. This chapter deals with the latter—the most direct and all inclusive way to configure an FS1.

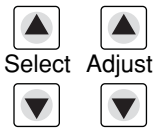
In Chapter two we discussed the panel controls overall, so ensure you've read and understand that material first. Here in this Chapter we discuss each of the parameter menus and their usage.

In each parameter screen we discuss the Parameter Number and Name on the top line of the display and the Parameter Setting(s) possible as shown on the bottom line of the display; remember, the current setting is what is shown.

As mentioned in Chapter 2, the Parameter Menu is entered whenever any of the Select or Adjust buttons are pressed. Here is the general Parameter Menu display:

```
Parameter Number and Name
Current Parameter Setting
```

Pressing either a parameter *Select* or parameter *Adjust* button—while on the Status or Screen Saver displays—changes the display to the last remembered Parameter Adjust menu. If you're already viewing a Parameter Menu, pressing a Select or Adjust button causes a change to the next item.



The parameter *Select* buttons to the right of the display select a parameter to view or modify.

Pressing one of the parameter *Adjust* buttons changes the current parameter's value to a new one from the FS1's list of choices—repeating the list if you continue to press *Adjust*—or adjusting a numerical value up or down. The exact choices displayed will vary depending on the parameter. Adjustment choices made with the Adjust buttons take effect immediately and will be subsequently stored into the FS1s non-volatile memory if they remain unchanged for 3 seconds.

If a Select or Adjust button is held down continuously, the changes will begin to happen automatically - with acceleration if applicable.

Pressing either a Select or Adjust button-while on the Status or Screen Saver displays-changes the display to the last remembered Control menu.

Holding down both the Adjust (up) and Adjust (down) buttons—*at the same time*—will set that parameter back to its factory default value.

The remaining topical headings in this chapter list all of the Parameter Menus by number and name. The number shows the order in the menu navigation system: pressing the up or down *Select* button shifts you numerically up or down in the order of their assigned parameter numbers. The name is what you'll see in the Parameter Menu display (for example, the first heading listed here is "1.1 Output Format" which is exactly what you'll see in the top line of the display when viewing this parameter).

1.1 Output Format

This parameter defines the output format.

Note: Available rates that are listed here are dependent on what has been chosen in the 3.3 Frame Rates parameter setting.

1.1 Output Format	**Description of Choices**
Parameter Adjustments:	
Follow Input *(Default)*	Follow the format of the selected input
Follow Ref	Follow the format of the reference video input (Ref)
SD <sd_rate>	Select standard definition (available SD rates are listed choices)
HD 720p <hd_rate1>	Select HD 720p (available rates are listed choices)
HD 1080i <hd_rate1>	Select HD 1080i (available rates are listed choices)
HD 1080psf <hd_rate2>	Select HD 1080psf (available rates are listed choices)

1.2 SDI 2 Out Format

This parameter defines the output format as seen on the SDI 2 BNC connector.

Note: the output from downconverter 2 (see block diagram in Chapter 1) is always standard definition.

1.2 SDI 2 Output Format	**Description of Choices**
Parameter Adjustments:	
Normal *(Default)*	SDI 2 output follows the 1.1 Output Format parameter selection (both SDI outputs are the same format).
Bypass (Follow Input)	SDI 2 output follows the format of the selected input.
Standard Def	The output from downconverter 2 (see block diagram in Chapter 1) is always standard definition.

1.3 Component Out

This parameter defines the output format of the Component Video Output BNC connectors.

1.3 Component Output	**Description of Choices**
Parameter Adjustments:	
Normal *(Default)*	Component output follows the 1.1 Output Format parameter selection
Bypass (Follow Input)	Component output follows the format of the selected input Note: the signal type of the component output (RGB versus YPbPr) is defined in another parameter (3.2 Component OUT Format)
Standard Def	The output from downconverter 2 (see block diagram in Chapter 1) is always standard definition.

2.1 Video Input

This parameter performs input video source selection for the FS1. Multiple input sources may be present at all the connectors on the FS1 rear panel, but the active input source routed through the FS1 will be the one selected here.

2.1 Video Input	**Description of Choices**
Parameter Adjustments:	
SDI 1 *(Default)*	Select SDI 1 connector as the input source
SDI 2	Select SDI 2 connector as the input source
Composite	Select the Composite connector as the input source
S-Video	Select the S-Video connector as the input source
Component	Select the Component connector as the input source

2.2 Audio Input

This parameter performs input audio source selection for the FS1. Multiple input sources may be present at all the connectors on the FS1 rear panel, but the active input source routed through the FS1 will be the one selected here.

2.2 Audio Input	**Description of Choices**
Parameter Adjustments:	
Embed Auto (Follows Video Input select)	Use the embedded audio from the currently selected Video Input (SDI 1 or 2) as the input source (defaults to SDI 1 if 2.1 is not set to SDI)
Embed SDI 1	Use the embedded audio from the SDI 1 connector as the input source
Embed SDI 2	Use the embedded audio from the SDI 2 connector as the input source
AES unbal *(Default)*	Select the AES/EBU digital audio connectors (8-ch) as the audio input source
Analog	Select the Analog audio connector (DB25, 8-ch) as the audio input source

3.1 Component In

This parameter configures the format of the *Component* video input.

3.1 Component In	**Description of Choices**
Parameter Adjustments:	
Beta YPbPr	Configure the Component video input source as Beta YPbPr (Standard Definition) (If the selected Component video source is HD, this will default to SMPTE YPbPr)
SMPTE YPbPr *(Default)*	Configure the Component video input source as SMPTE YPbPr

3.2 Component Out

This parameter configures the format of the *Component* video output.

3.2 Component Out	**Description of Choices**
Parameter Adjustments:	
Beta YPbPr	Configure the Component video output as Beta YPbPr (Standard Definition) (If the Component video is HD, this will default to SMPTE YPbPr)
SMPTE YPbPr *(Default)*	Configure the Component video output as SMPTE YPbPr
RGB	Configure the Component video output as RGB

3.3 Frame Rate

This parameter selects the HD video frame rate associated with the video standard.

3.3 Frame Rate	**Description of Choices**
Parameter Adjustments:	
59.94/23.98 *(Default)*	Select the “59.94/23.98” item if your desired rate is either 59.94 *or* 23.98
60/24	Select the “60/24” item if your desired rate is either 60 or 24
50/25	Select the “50/25” item if your desired rate is either 50 or 25 (PAL)

3.4 NTSC Standard

This parameter selects the NTSC video standard.

3.4 NTSC Standard	**Description of Choices**
Parameter Adjustments:	
NTSC *(Default)*	Select NTSC for US NTSC standard.
NTSC Japan	Select NTSC Japan for Japan’s NTSC standard.

4.1 Analog Audio Level

This parameter sets the analog audio level of the FS1 with reference to full scale digital, from consumer levels (+12 dBu) all the way to professional (+24 dBu).

4.1 Analog Audio Level	**Description of Choices**
Parameter Adjustments:	
+24 dBu *(Default)*	Select +24 dBu as the analog audio level
+18 dBu	Select +18 dBu as the analog audio level
+15 dBu	Select +15 dBu as the analog audio level
+12 dBu	Select +12 dBu as the analog audio level
	Maximum amplitude (0 dBFS)

4.2 Audio Delay (mS)

This parameter allows you to adjust the delay to compensate for video timing issues (delay/latency). Pressing the Adjust buttons changes the delay from -16 to 256 ms (the default is zero delay).

4.2 Audio Delay (mS)	**Description of Choices**
Parameter Adjustments:	
Variable	Adjustment range increments from -16 to 256ms
	Default: 0 (synchronized to Video Out)

4.3 Embedded Audio Out

This parameter allows you to pass SDI embedded audio to the output (ON), or mute the audio so it isn't present at the output (MUTE).

4.3 Embed Audio Out	**Description of Choices**
Parameter Adjustments:	
ON *(Default)*	Select to pass SDI embedded audio to the output
OFF	Do not pass SDI embedded audio packets to the output
MUTE	FS1 outputs embedded audio packets with silence in them

4.4 Sample Rate Convert

This parameter controls audio sample rate conversion on input audio. ON is the default (audio is rate converted and synced with video) and OFF is a setting for use when Dolby 5.1 and similar schemes need to be preserved and the audio data passed unaltered. This setting should be left ON unless both of the following are true:

1. You want to pass digital encoded audio from either embedded or AES into embedded and/or AES out.
2. You have the embedded or AES input genlocked to the FS1 output. In other words, the encoded audio will not survive the frame-sync function (dropping or repeating frames) so it needs to be set to lock to the input. You can lock to a reference only if that reference is driving both the FS1 and the upstream source of the embedded or AES input to the FS1.

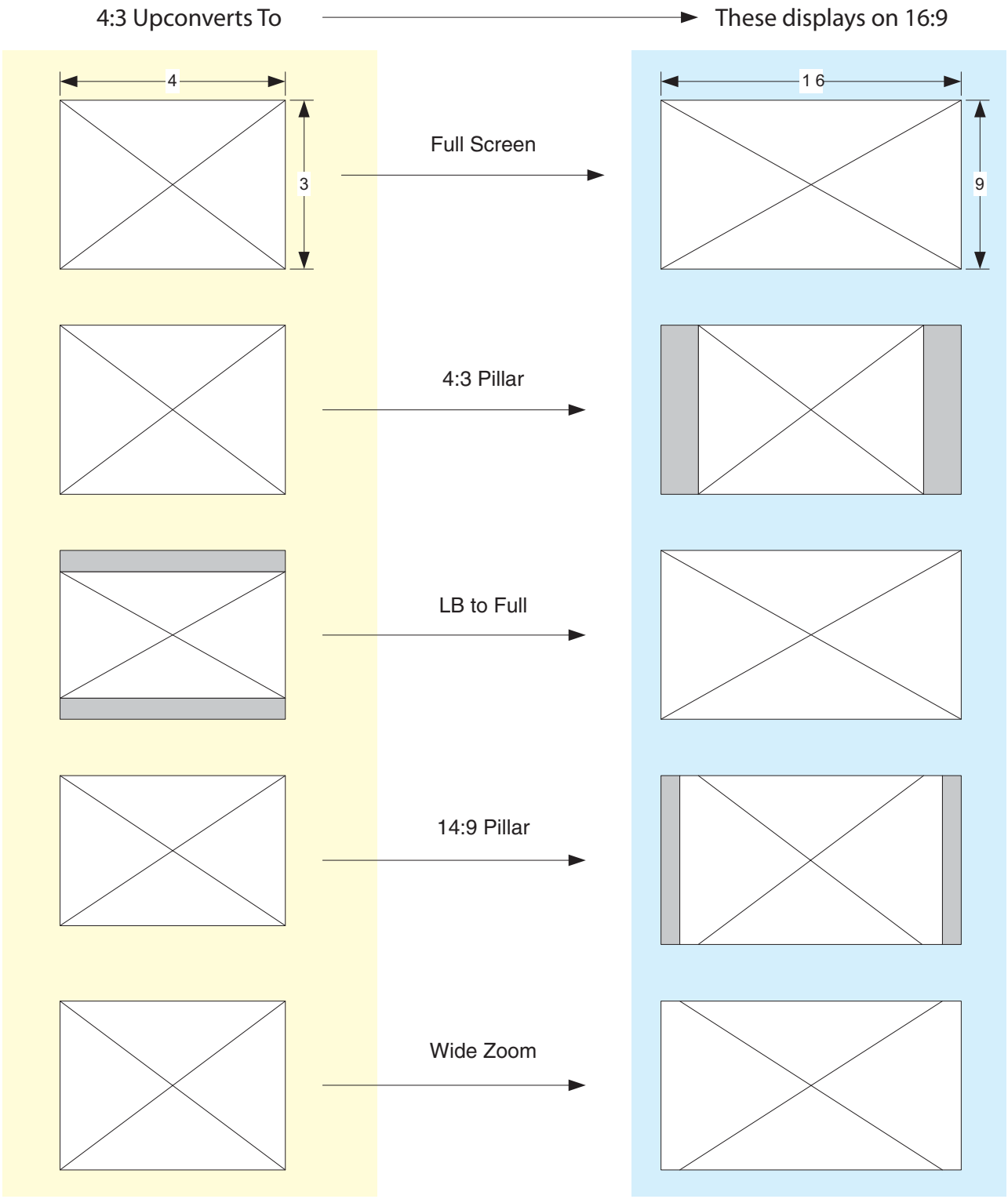
4.4 Sample Rate Conversion	**Description of Choices**
Parameter Adjustments:	
ON *(Default)*	Normal operation. The FS1 performs audio sample rate conversion and keeps the video and audio synchronized.
OFF	The FS1 does not sample rate convert the audio, leaving embedded audio as-is, useful for Dolby 5.1 embedded audio and other applications.

5.1 Upconvert Mode

This parameter selects the type of upconversion performed on the incoming selected SD source input.

5.1 Upconvert Mode	**Description of Choices**
Parameter Adjustments:	
4x3 Pillar	Results in 4x3 image in center of screen, with black sidebars
14x9 Pillar *(Default)*	Results in 14x9 image, zoomed slightly to fill a 14x9 image with black sidebars
Full Screen	Anamorphic full screen display
LB to Full	Image is zoomed to fit the full screen (letterbox)
Wide Zoom	Using a combination of zoom and stretch, the image is sized to fit a 16x9 screen (this can introduce a small aspect ratio change)

Upconvert Illustrations—FS1

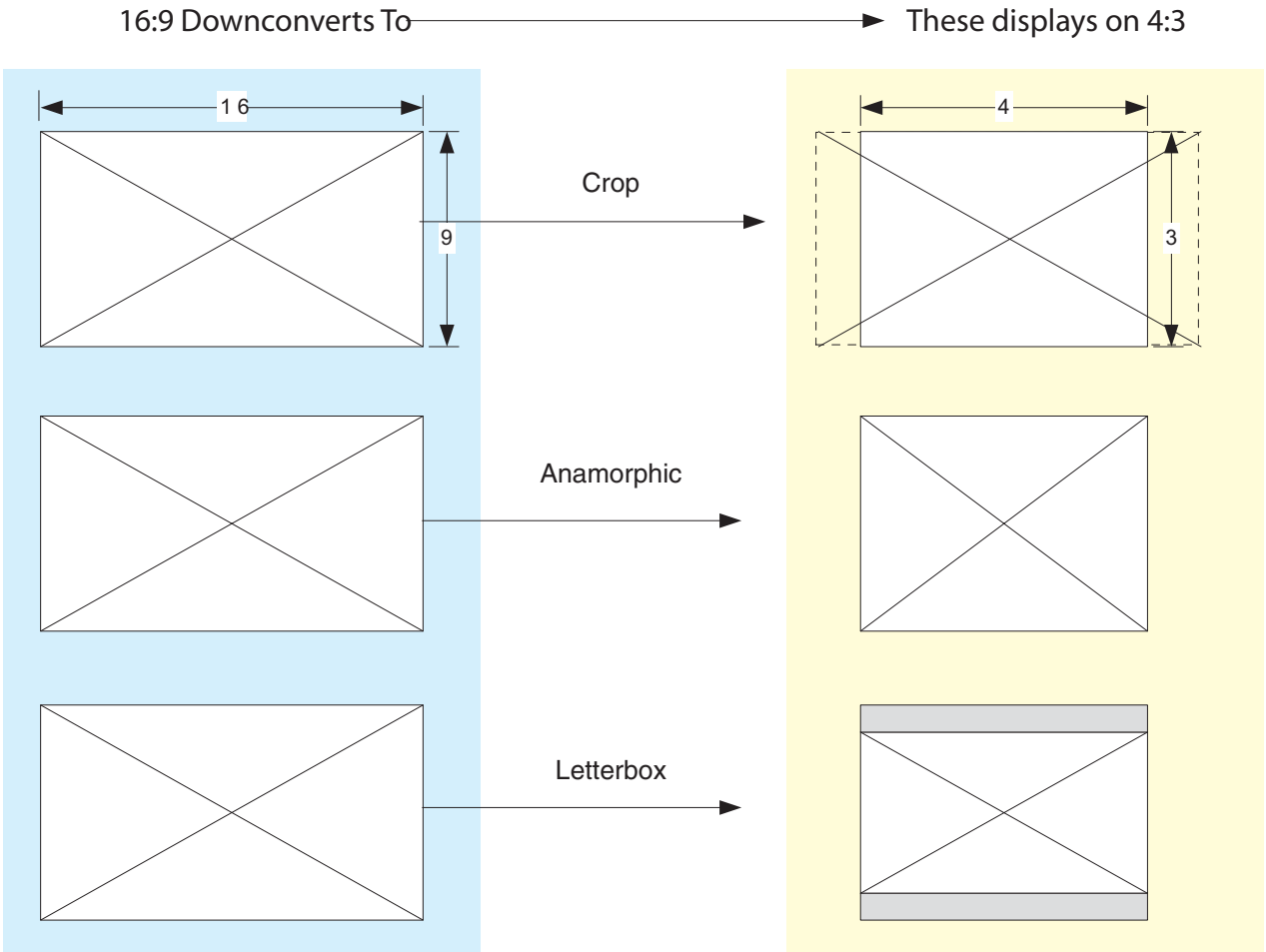


5.2 Downconvert Mode

This parameter selects the type of downconversion performed on the incoming selected HD source input.

5.2 Downconvert Mode	**Description of Choices**
Parameter Adjustments:	
Crop	Image is cropped to fit new screen size
Anamorphic	HD image is converted to full-screen SD with a 16x9 aspect ratio (anamorphic)
Letterbox *(Default)*	Image is reduced with black top and bottom added to image area, with the aspect ratio preserved

Downconvert Illustrations—FS1



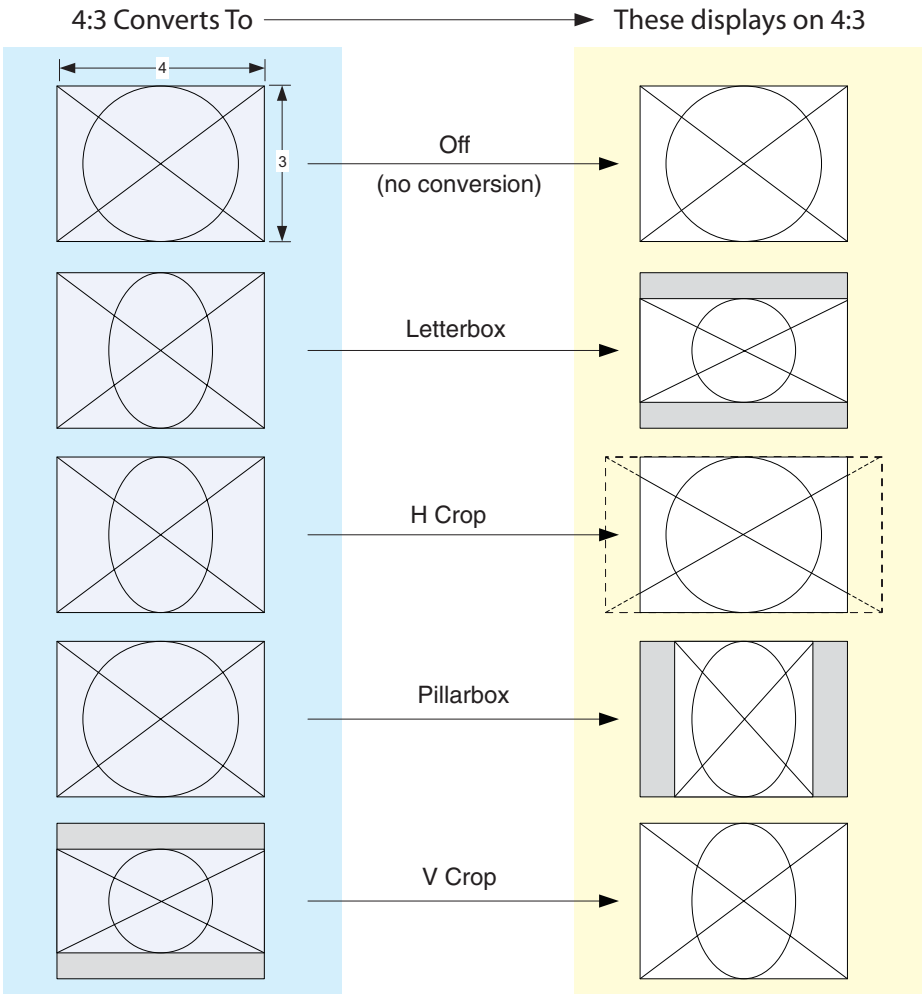
5.3 SD Aspect Ratio Convert

This parameter selects an SD to SD Aspect Conversion mode for converting between normal 4:3 SD video and either 16:9 Anamorphic SD video or Letterbox SD video.

Note: In Europe 16:9 Anamorphic video is also known as "Widescreen" video.

5.3 SD Aspect Ratio Convert	**Description of Choices**
Parameter Adjustments:	
Off *(Default)*	Turns aspect ratio conversion OFF
Letterbox	Converts 16:9 Anamorphic video to Letterbox video
H Crop	Converts 16:9 Anamorphic video to 4:3 Standard video (crops left and right edges of video)
Pillarbox	Converts 4:3 Standard video to 16:9 Anamorphic video
V Crop	Converts Letterbox video to 16:9 Anamorphic video

SD Aspect Ratio Conversion Illustrations—FS1



6.1 Genlock Source

This parameter selects the source of reference video used to genlock to, either automatically or explicitly.

6.1 Genlock Source	Description of Choices
Parameter Adjustments:	
Reference *(Default)*	Use the *Ref* connector as the Genlock source
Input	Use the currently selected input as the Genlock source
Free run	Free run mode (FS1 syncs to its own timebase, not locked to an external source)

6.2 Output Timing H

This parameter adjusts horizontal output timing with reference to the Ref video already selected. When adjusting the horizontal timing (H), this parameter specifies a number of pixels to offset, from zero to full line width.

6.2 Output Timing H	Description of Choices
Parameter Adjustments:	
Variable	Adjustment range increments from 0 to the width of the line in pixels. This could be 720, 1280, or 1920, depending on the format already chosen *Default: 0*

Note: Independent horizontal and vertical timing values are kept for all available output formats.

6.3 Output Timing V

This parameter adjusts vertical output timing with reference to the Ref video already selected. When adjusting the vertical timing (V), this parameter specifies a number of lines to offset, moving the screen up to a half a frame up or down.

6.3 Output Timing V	Description of Choices
Parameter Adjustments:	
Variable	Adjustment range increments from half a frame up to a half a frame down in single line increments (where the frame size could be 525, 625, 750, or 1125—depending on the format already chosen). *Default: 0*

10.1 Proc Amp Gain

This parameter adjusts the video gain from black to 1.5 times luma in steps of .05, each time an Adjust button is pressed.

Note: Proc Amp controls are not supported in the current software at the time this manual was published (Parameters 10.1, 10.2, 10.3, and 10.4).

10.1 Proc Amp Gain	**Description of Choices**
Parameter Adjustments: Variable	Adjustment range increments from zero to 1.5 in .05 steps. *Default (unity):* 1.0

10.2 Proc Amp Black

This parameter adjusts the video black level from -20 IRE to +20 IRE in .5 steps, each time an Adjust button is pressed.

10.2 Proc Amp Black	**Description of Choices**
Parameter Adjustments: Variable	Adjustment range increments from -20 IRE to +20 IRE in .5 steps. *Default:* 0

10.3 Proc Amp Hue

This parameter adjusts the video color hue through 360 degrees (color wheel). Steps increment/decrement 1 degree each time an Adjust button is pressed.

10.3 Proc Amp Hue	**Description of Choices**
Parameter Adjustments: Variable	Adjustment range increments from -180 to +180 in steps of 1. *Default:* 1.0

10.4 Proc Amp SAT

This parameter adjusts the video color saturation from black & white to 1.5 times chroma in steps of .05, each time an Adjust button is pressed

10.4 Proc Amp SAT	**Description of Choices**
Parameter Adjustments: Variable	Adjustment range increments from 0 (black and white) to 1.5 (Chroma) in steps of .05. *Default:* 1.0

30.1 Closed Captioning Translator

30.1 Caption Xlator	**Description of Choices**
Parameter Adjustments: On	When set to ON and using the UpConverter, the FS1 will automatically translate incoming line 21 captions to CEA-708 format and insert the VANC packets into the converted HD video stream. This is a complete translation from CEA-608 format to CEA-708 format (including the embedded SD captions). When set to ON and using the Downconverters, the FS1 will automatically intercept and reformat the SD caption data in the incoming CEA-708 VANC packets, and output it on line 21 of the standard definition outputs.
Off *(Default)*	When OFF, translation is not performed.

In Standard Definition (525i59.94) video, closed captioning data is encoded and sent on line 21 of both fields, using a format defined by the Consumer Electronics Association standard, CEA-608. This is traditionally called “line 21", “SD”, or “608” captioning, and is used for analog composite, analog component, and serial digital (SDI) video.

In High Definition video, closed captioning is encoded and sent as Vertical Ancillary (VANC) packets in SDI video, using a format defined by the Consumer Electronics Association standard CEA-708 (there is no equivalent for analog HD video). This is traditionally called “HD”, “DTV”, or “708” captions. The data formatting and encoding for 708 captions is very different from the data contained in 608 (SD) captions, reflecting the added features and capabilities available with CEA-708 standard.

The FS1 UpConverter automatically translates incoming line 21 captions to CEA-708 format and inserts the VANC packets into the converted HD video stream. This is a complete translation from CEA-608 format to CEA-708 format (including the embedded SD captions).

The FS1 DownConverters automatically intercept and reformat the SD caption data in the incoming CEA-708 VANC packets, and outputs it on line 21 of the standard definition outputs.

To pass closed captioning data to the outputs, parameter 31.1 must also be set to "Pass."

31.1 Upconvert Line 21

31.1 Upconvert Line 21	**Description of Choices**
Parameter Adjustments:	
Blank *(Default)*	Blank the Closed Captioning ancillary data so it is not passed to the outputs.
Pass	Pass Closed Captioning data (including CC translation as defined in 30.1) to the outputs.

35.1 Remote Control

This parameter determines how the FS1 panel responds to controls locally from the front panel and from a network attached computer and web browser (or both). The selected mode is clearly indicated by the color of the *Remote* button. (Note: the *Remote* button and other front panel buttons and indicators are described in Chapter2.)

35.1 Remote Control	**Description of Choices**
Parameter Adjustments:	
LOCAL + REMOTE *(Default)*	Allow FS1 control from both the front panel and a network-attached browser Selection lights the Remote button white.
REMOTE ONLY	Allow FS1 control only from a network attached browser Selection lights the Remote button red.
LOCAL ONLY	Allow FS1 control only from the front panel (browsers cannot change parameters) Selection lights the Remote button green.

36.1 GPI IN 1 Response

Setting of this parameter determines what happens when a GPI trigger is received at the FS1s first GPI input (pin #1 on DB9).

36.1 GPI IN 1 Response	**Description of Choices**
Parameter Adjustments:	
No Action *(Default)*	FS1 performs no action if a GPI trigger is received at pin#1
Freeze	FS1 freezes the current video frame at its outputs if a GPI trigger is received at pin#1

Note: A GPI Trigger is defined as a TTL low voltage level (0 to 0.8V with respect to its isolated ground pin). GPI interface pinout and specifications are discussed in Appendix B at the back of this manual.

36.2 GPI IN 2 Response

Setting of this parameter determines what happens when a GPI trigger is received at the FS1s second GPI input (pin #2 on DB9).

36.2 GPI IN 2 Response	**Description of Choices**
Parameter Adjustments:	
No Action *(Default)*	FS1 performs no action if a GPI trigger is received at pin#2
Freeze	FS1 freezes the current video frame at its outputs if a GPI trigger is received at pin#2

37.1 GPI 1 OUT

Setting of this parameter determines what (if any) FS1 event will generate a GPI trigger output at GPI 1, pin #3 on DB9.

37.1 GPI 1 OUT	**Description of Choices**
Parameter Adjustments:	
No Action *(Default)*	FS1 will not trigger a GPI 1 output trigger regardless of event
Alarm	FS1 will generate a GPI 1 output trigger on pin#3 if an internal alarm condition occurs
No Video	FS1 will generate a GPI 1 output trigger on pin#3 if no video is detected at its selected input
No Ref	FS1 will generate a GPI 1 output trigger on pin#3 if no video is detected at its *Ref* video input

37.2 GPI 2 OUT

Setting of this parameter determines what (if any) FS1 event will generate a GPI trigger output at GPI 2, pin #4 on DB9.

39.1 GPI 2 OUT	Description of Choices
Parameter Adjustments:	
No Action *(Default)*	FS1 will not trigger a GPI 2 output trigger regardless of event
Alarm	FS1 will generate a GPI 2 output trigger on pin#4 if an internal alarm condition occurs
No Video	FS1 will generate a GPI 2 output trigger on pin#4 if no video is detected at its selected input
No Ref	FS1 will generate a GPI 2 output trigger on pin#4 if no video is detected at its *Ref* video input

40.1 Freeze

This parameter tells the FS1 to freeze the current video frame on all outputs. This may be useful for either testing or in case of loss of the input source.

40.1 Freeze	Description of Choices
Parameter Adjustments:	
OFF *(Default)*	Normal operation. The FS1 outputs video from the input.
ON	The FS1 captures and freezes the most current video frame and displays it on the outputs as long as this parameter is set to ON.

41.1 Test Signals

This parameter selects the test pattern for immediate output, or selects normal operation (test pattern OFF).

Note: Test signals and Test pattern controls are not supported in the current software at the time this manual was published (Parameters 41.1 through 41.3).

41.1 Test Signals	Description of Choices
Parameter Adjustments:	
OFF *(Default)*	Normal operation. No video test signal or tones are output.
Test Pattern	FS1 generates test signals on all outputs. The test signal output is determined by parameter 41.2
Patt & Tone	FS1 generates a tone on all audio outputs and a video test pattern on all video outputs. The test signal output is determined by parameter 41.2 and the tone by parameter 41.3.
Tone Only	FS1 generates a tone on all audio outputs (no video test pattern is output). The tone frequency is determined by parameter 41.3

41.2 Test Pattern

This parameter selects the type of video test pattern output when test patterns are enabled in parameter 41.1. Default = 100% bars.

41.3 Audio Tone

This parameter selects the type of tone output when test patterns are enabled in parameter 41.1.

41.3 Audio Tone	**Description of Choices**
Parameter Adjustments:	
400 Hz *(Default)*	Output 400 Hz tone.
1 kHz	Output 1 kHz tone

50.1 IP Config

This parameter determines the type of TCP/IP network configuration used by the FS1. (Networking is discussed in *Chapter 3, Installation, topic "Network Connection."*

50.1 IP Config	**Description of Choices**
Parameter Adjustments:	
Default Addr *(Default)*	Use the factory default static IP address: 10.65.74.65
DHCP	Select automatic IP address assignment from DHCP server on LAN.
Static Addr	Assign a static IP address manually (parameters 50.2, 50.3, and 50.4 will have to be entered to accomplish this).

50.2 IP Address

This parameter determines the static IP address used by the FS1 for TCP/IP networking. (Networking is discussed in *Chapter 3, "Network Connection."*

50.2 IP Address	**Description of Choices**
Parameter Adjustments:	
variable	Using the adjust buttons, enter an IP address compatible with your LAN (if you have one). If direct connecting to a computer, enter a legal IP address that you'll also enter in the computer's web browser. This is only needed for Static IP configurations. *Default static IP address:*10.65.74.65

For parameters 50.2, 50.3, and 50.4, you will be setting IP addresses that consist of "octets" separated by a period (i.e., 90.0.181.0). When editing these, the *Select* button selects the octet and then the *Adjust* buttons select the desired number. Pressing Select Up again advances to the next octet. At the final octet, the address will flash—pressing Select Up at that point confirms the setting.

50.3 Subnet Mask

This parameter determines the subnet mask used by the FS1 for TCP/IP networking. (Networking is discussed in *Chapter 3, "Network Connection."*

50.3 Subnet Mask	**Description of Choices**
Parameter Adjustments: variable	Using the adjust buttons, enter a subnet mask compatible with your LAN (if you have one). This is only needed for Static IP configurations. *Default:* 255.255.0.0

50.4 Default Gateway

This parameter determines the gateway or router used on your LAN for TCP/IP networking. (Networking is discussed in *Chapter 3, "Network Connection."*

50.4 Default Gateway	**Description of Choices**
Parameter Adjustments: variable	Using the adjust buttons, enter the IP address for your LAN's gateway/router (if you have one). *Default:* 192.0.1.0

70.1 Screen Saver

When set to "AJA Logo", a rolling AJA logo screen saver will appear on the alphanumeric display after 60 minutes of inactivity—defined as no button presses on the front panel. If disabled, then the display just becomes dim. When the Screen saver is on, the *STATUS* button will return the display to the last Status display, or any Select or Adjust button will return the display to the last Parameter menu.

70.1 Screen Saver	**Description of Choices**
Parameter Adjustments:	
AJA Logo *(Default)*	Display horizontally rolling AJA logo after 60 minutes of button inactivity
Disabled	Dim display after 60 minutes of button inactivity

70.2 Display Intensity

This parameter determines the brightness of the alphanumeric display.

70.2 Display Intensity	**Description of Choices**
Parameter Adjustments: variable	Using the adjust buttons, you can dim or brighten the alphanumeric display in steps from 1 (dim) to 8 (brightest) *Default: 6*

80.1 Serial Number

This parameter displays the FS1's unique serial number.

80.2 Software Version

This parameter displays the FS1's software version level.

99.1 Factory Settings

Selecting this parameter and then pressing the Adjust (up) button recalls the FS1's factory default settings.

Caution: *Selecting this parameter and recalling factory defaults will overwrite the current settings (with the exception of network settings, which are retained).*

Recalling factory defaults does not affect these network settings: IP Config, IP Address, Subnet Mask, or Default Gateway. To clear network settings and recall factory defaults, hold down both the Adjust (up) and Adjust (down) buttons at the same time.

Note: To set a single parameter to its factory default value, go to that Parameter's "Adjust" menu, and hold down both the Adjust (up) and Adjust (down) buttons at the same time.

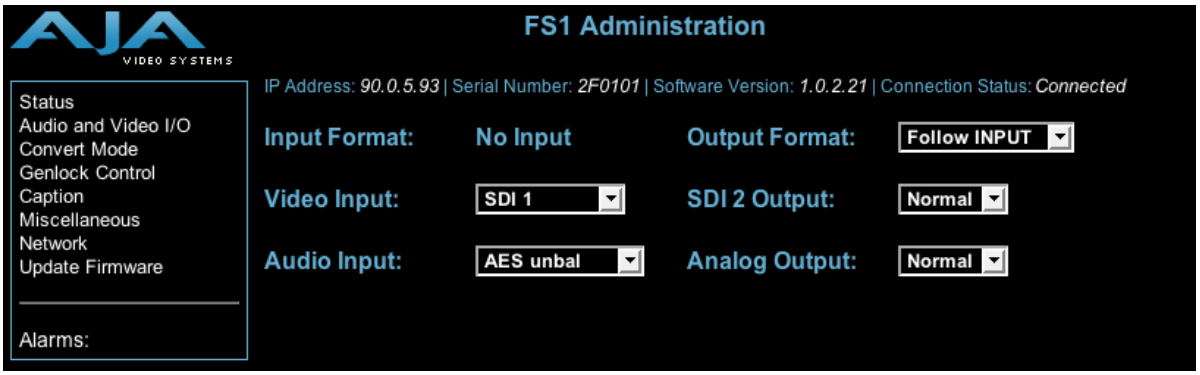
Chapter 5: Browser Remote Control

Remote FS1 Control Via a Web Browser

An optimized web server inside the FS1 allows you to remotely monitor and adjust parameter settings via a network-attached computer running a web-browser. The network can be a closed local area network, a straight computer-to-FS1 cable, or for the greatest flexibility—exposed through a firewall to a broadband WAN. The LAN connection on the FS1 uses a standard RJ45 connector, but internally it's intelligent and communicates via standard "straight-through" CAT 5 ethernet cables or null-modem (cross-over) cables without any configuration or strapping required.

Note: Firefox/Mozilla and Internet Explorer 7 are supported as web browsers for FS1 control. Other browser software may work, but AJA cannot guarantee operation.

To access the FS1, simply enter its URL in the web browser. The URL will be the fixed IP defined in the FS1's Network parameter menus (50.2—please note also that 50.1 through 50.4 must all be configured correctly to access the FS1 on your network)—if the FS1 is using DHCP, the IP address can be found by pressing the Status button on the FS1 front panel repeatedly until the Network Status display is shown. When the FS1 is shipped from the AJA factory, the static IP is preset to "10.65.74.65"; so for example, if left to the factory default, you would type the following in the web browser: http://10.65.74.65



FS1 Web Interface, Main Status Screen

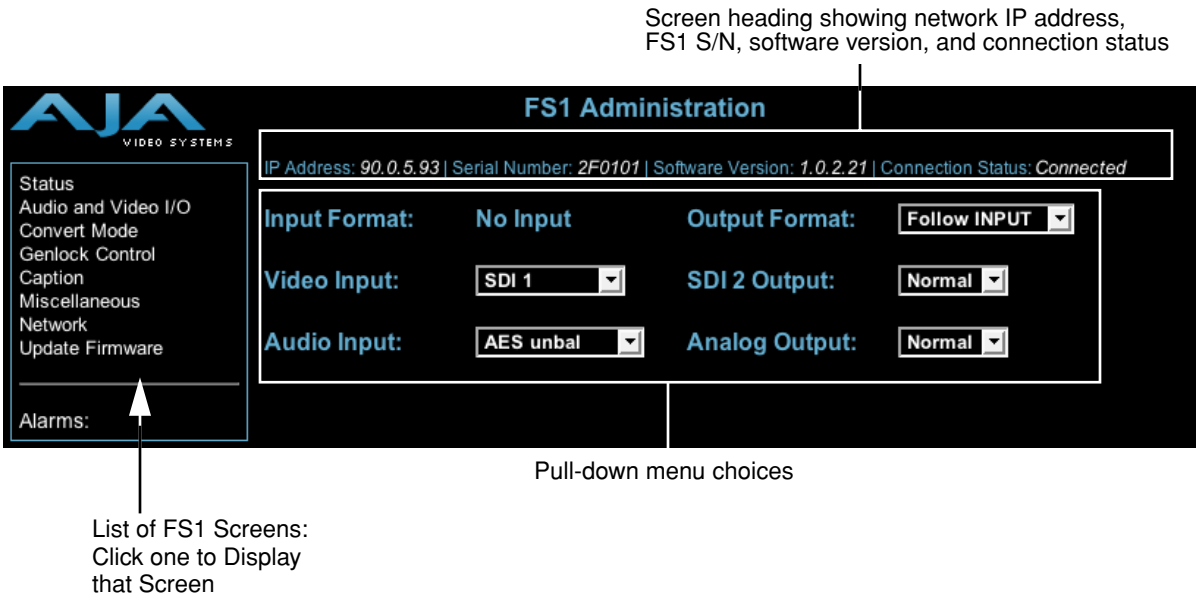
When the URL is entered in the browser and a connection is made the main *Status* screen will be displayed.

General Screen Information

All FS1 web screens have certain areas in common. On the left of each screen is a navigational list of the available FS1 screens. Click any of these items to jump to that screen. At the top of each screen you'll also find a heading showing the connection status and IP address in addition the FS1's serial number and software version. This latter information is useful if you ever have to call AJA Technical Support to discuss a problem or get help.

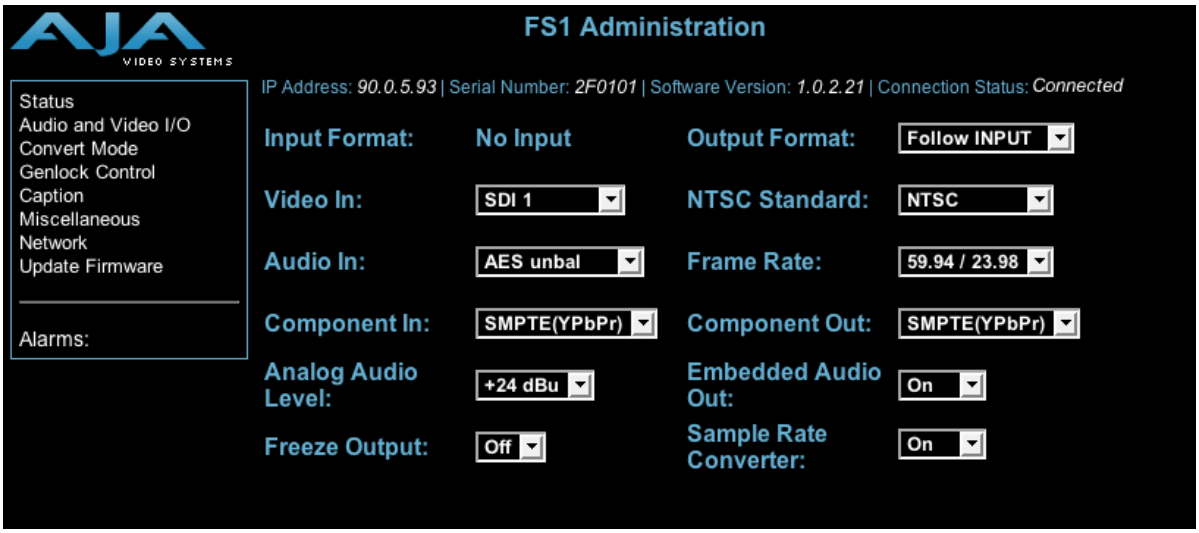
In the middle of each screen there menu choices and information pertaining to the subject matter of that screen (i.e., the "Audio and Video I/O" screen has choices about audio and video).

FS1 web screens closely mirror the parameter menus displayed on its front panel. In each of the screens presented on the following pages, we'll list the parameter menu numbers that are related. However, to make things easier for you to reference, we'll list the definitions redundantly here so you don't have to flip back and forth between chapters.



FS1 Web Interface, Main Status Screen

Audio and Video I/O Screen



FS1 Web Interface, Audio and Video I/O Screen

Input Format—information only field that displays what the FS1 has detected at the selected input.

Output Format (1.1)

Follow Input (default)	Output follows the format of the selected input
Follow Ref	Output follows the format of the reference video input (Ref)
SD <sd_rate>	Output is standard definition (available SD rates are listed choices)
HD 720p <hd_rate1>	Output is HD 720p (available rates are listed choices)
HD 1080i <hd_rate1>	Output is HD 1080i (available rates are listed choices)
HD 1080psf <hd_rate2>	Output is HD 1080psf (available rates are listed choices)

Video In (2.1)

SDI 1 (default)	Select SDI 1 connector as the input source
SDI 2	Select SDI 2 connector as the input source
Composite	Select the Composite connector as the input source
S-Video	Select the S-Video connector as the input source
Component	Select the Component connector as the input source

Audio In (2.2)

Embed Auto (Follows Video Input select)	Use the embedded audio from the currently selected Video Input (SDI 1 or 2) as the input source. (This defaults to SDI 1 if Video In is not SDI.)
Embed SDI 1	Use the embedded audio from the SDI 1 connector as the input source
Embed SDI 2	Use the embedded audio from the SDI 2 connector as the input source
AES unbal (default)	Select the AES/EBU digital audio connectors (8-ch) as the audio input source
Analog	Select the Analog audio connector (DB25, 8-ch) as the audio input source

Frame Rate (3.3)

59.94/23.98 (default)	Select the “59.94/23.98” item if your desired rate is either 59.94 *or* 23.98
60/24	Select the “60/24” item if your desired rate is either 60 or 24
50/25	Select the “50/25” item if your desired rate is either 50 or 25 (PAL)

Component In (3.1)

Beta YPbPr	Configure the Component video input source as Beta YPbPr (Standard Definition)
	(If the selected Component video source is HD, this will default to SMPTE YPbPr)
SMPTE YPbPr (default)	Configure the Component video input source as SMPTE YPbPr

Component Out (3.2)

Beta YPbPr	Configure the Component video output as Beta YPbPr (Standard Definition)
	(If the Component video is HD, this will default to SMPTE YPbPr)
SMPTE YPbPr (default)	Configure the Component video output as SMPTE YPbPr
RGB	Configure the Component video output as RGB

Analog Audio Level (4.1)

+24 dBu (default)	Select +24 dBu as the analog audio level
+18 dBu	Select +18 dBu as the analog audio level
+15 dBu	Select +15 dBu as the analog audio level
+12 dBu	Select +12 dBu as the analog audio level
	Maximum amplitude (0 dBFS)

Embedded Audio Out (4.3)

ON (default)	Select to pass SDI embedded audio to the output
OFF	Do not pass SDI embedded audio packets to the output
MUTE	FS1 outputs embedded audio packets with silence in them

Freeze Output (40.1)

OFF (default)	Normal operation. The FS1 outputs video from the input.
ON	The FS1 captures and freezes the most current video frame and displays it on the outputs as long as this parameter is set to ON.

Sample Rate Convert (4.4)

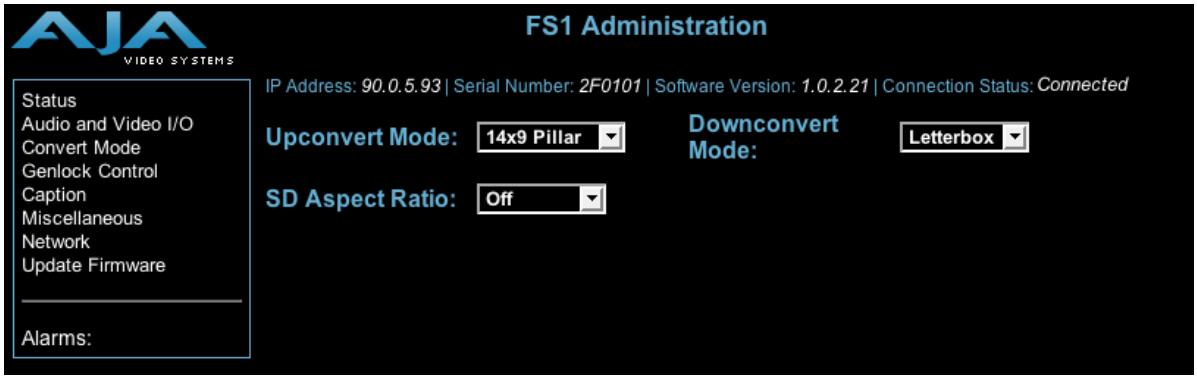
ON (default)	Normal operation. The FS1 performs audio sample rate conversion and keeps the video and audio synchronized.
OFF	The FS1 does not sample rate convert the audio, leaving embedded audio as-is, useful for Dolby 5.1 embedded audio and other applications.

This setting should be left ON unless both of the following are true:

1. You want to pass digital encoded audio from either embedded or AES into embedded and/or AES out.
2. You have the embedded or AES input genlocked to the FS1 output. In other words, the encoded audio will not survive the frame-sync function (dropping or repeating frames) so it needs to be set to lock to the input. You can lock to a reference only if that reference is driving both the FS1 and the upstream source of the embedded or AES input to the FS1.

Convert Mode Screen

This screen offers settings for the FS1 upconverter, downconverter, and SD Aspect Ratio converters.



FS1 Web Interface, Convert Mode Screen

Upconvert Mode (5.1)

4x3 Pillar	Results in 4x3 image in center of screen, with black sidebars
14x9 Pillar (default)	Results in 14x9 image, zoomed slightly to fill a 14x9 image with black sidebars
Full Screen	Anamorphic full screen display
LB to Full	Image is zoomed to fit the full screen (letterbox)
Wide Zoom	Using a combination of zoom and stretch, the image is sized to fit a 16x9 screen (this can introduce a small aspect ratio change)

Downconvert Mode (5.2)

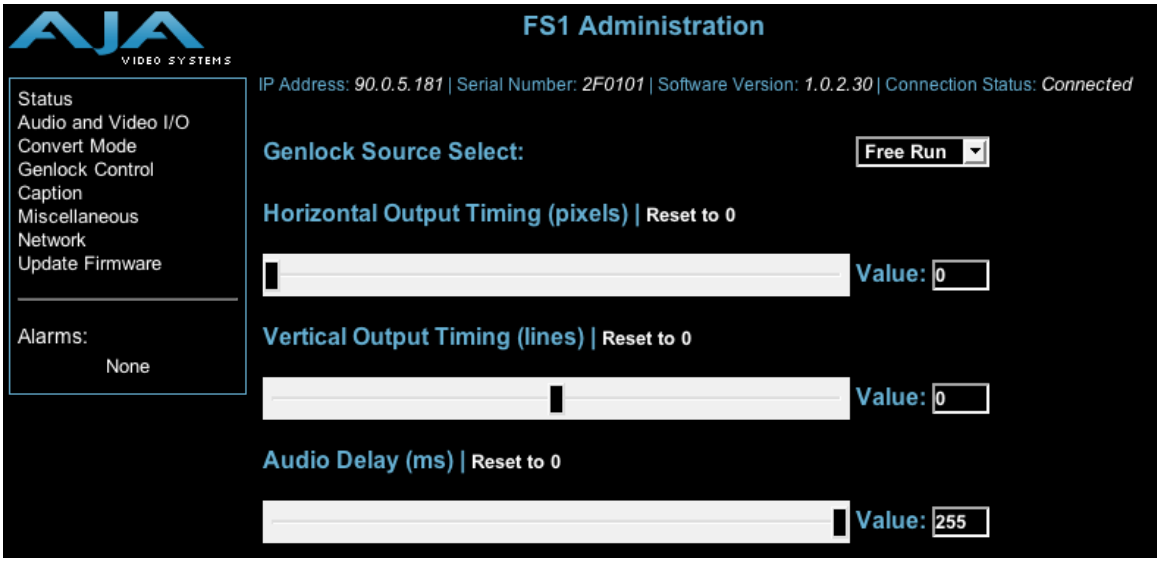
Crop	Image is cropped to fit new screen size
Letterbox (default)	Image is reduced with black top and bottom added to image area, with the aspect ratio preserved
Anamorphic	HD image is converted to full-screen SD with a 16x9 aspect ratio (anamorphic)

SD Aspect Ratio (5.3)

Off (default)	Turns aspect ratio conversion OFF
Letterbox	Anamorphic converted to Letterbox 16:9 to 4:3
H Crop	Anamorphic 16:9 screen cropped to 4:3 screen
Pillarbox	Converts standard 4:3 screen to Pillarbox (black sidebars) as an anamorphic screen
V Crop	Transforms an SD Letterbox image to an anamorphic image

Genlock Control Screen

This screen selects the type of Genlock source and then allows fine adjustment of the horizontal and vertical timing, and audio delay—relative to the source selected.



FS1 Web Interface, Genlock Control Screen

Genlock Source Select (6.1)

Reference (default)	Use the *Ref* connector as the Genlock source
Input	Use the currently selected input as the Genlock source
Free run	Free run mode (FS1 syncs to its own timebase, not locked to an external source)

Horizontal Output Timing, pixels (6.2)—This slider adjusts horizontal output timing with reference to the Ref video already selected. When adjusting the horizontal timing (H), this value specifies a number of pixels to offset, from zero to full line width.

Vertical Output Timing, lines (6.3)—This slider adjusts vertical output timing with reference to the Ref video already selected. When adjusting the vertical timing (V), this value specifies a number of lines to offset, moving the screen up to a half a frame up or down.

Audio Delay, ms (4.2)—This slider allows you to adjust the delay to compensate for video timing issues (delay/latency). This slider changes the delay from -16 to 256 ms (the default is zero delay).

Caption Screen

This screen controls how the FS1 handles closed captioning ancillary data and whether it and VITC timecode are passed to the outputs or blanked.

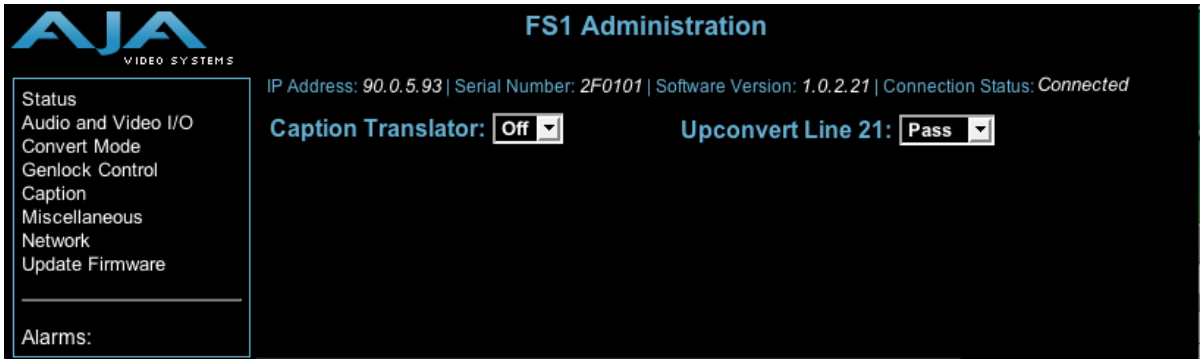
Caption Translator (30.1)—When set to ON and using the Upconverter, the FS1 will automatically translate incoming line 21 captions to CEA-708 format and insert the VANC packets into the converted HD video stream. This is a complete translation from CEA-608 format to CEA-708 format (including the embedded SD captions).

When set to ON and using the Downconverters, the FS1 will automatically intercept and reformat the SD caption data in the incoming CEA-708 VANC packets, and output it on line 21 of the standard definition outputs.

When OFF, translation is not performed.

Upconvert Line 21 (31.1)

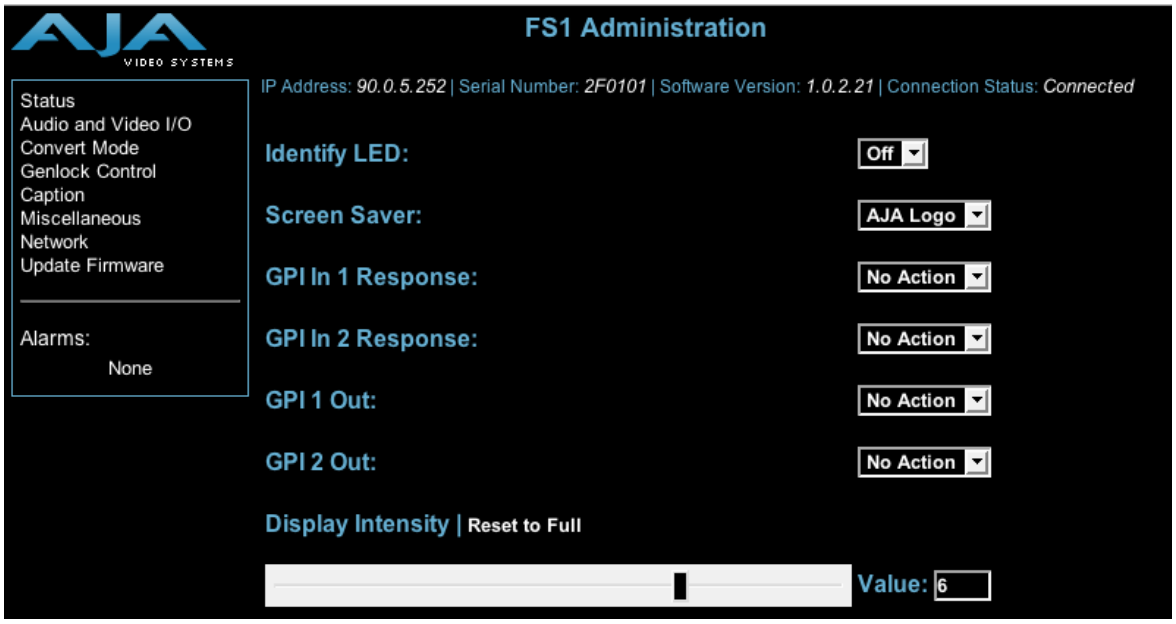
Blank (default)	Blank the VITC timecode and/or Closed Captioning ancillary data so it is not passed to the outputs.
Pass	Pass VITC and/or Closed Captioning data (including CC translation as defined in 30.1) to the outputs.



FS1 Web Interface, Caption Screen

Miscellaneous Screen

This screen allows you to adjust the brightness of alphanumeric display on the FS1 front panel and whether it reverts to an AJA screen saver after 60 minutes of activity.



FS1 Web Interface, Miscellaneous Screen

Identify LED

On	Turn the front and rear panel “ID” LED lights ON.
Off	Turn the front and rear panel “ID” LED lights OFF.

Screen Saver (70.1)

AJA Logo (default)	Display horizontally rolling AJA logo after 60 minutes of FS1 front panel button inactivity
Disabled	Dim display after 60 minutes of button inactivity

GPI In 1 Response (36.1)

No Action (default)	FS1 performs no action if a GPI trigger is received at pin#1 (GPI DB9 Connector)
Freeze	FS1 freezes the current video frame at its outputs if a GPI trigger is received at pin#1

GPI In 2 Response (36.2)

No Action (default)	FS1 performs no action if a GPI trigger is received at pin#2 (GPI DB9 Connector)
Freeze	FS1 freezes the current video frame at its outputs if a GPI trigger is received at pin#2

Note: For information on GPI connections, including pinout, refer to Appendix B.

CPI 1 Out (37.1)

No Action (default)	FS1 will not trigger a GPI 1 output trigger regardless of event
Alarm	FS1 will generate a GPI 1 output trigger on pin#3 if an internal alarm condition occurs (GPI DB9 Connector)
No Video	FS1 will generate a GPI 1 output trigger on pin#3 if no video is detected at its selected input
No Ref	FS1 will generate a GPI 1 output trigger on pin#3 if no video is detected at its Ref video input

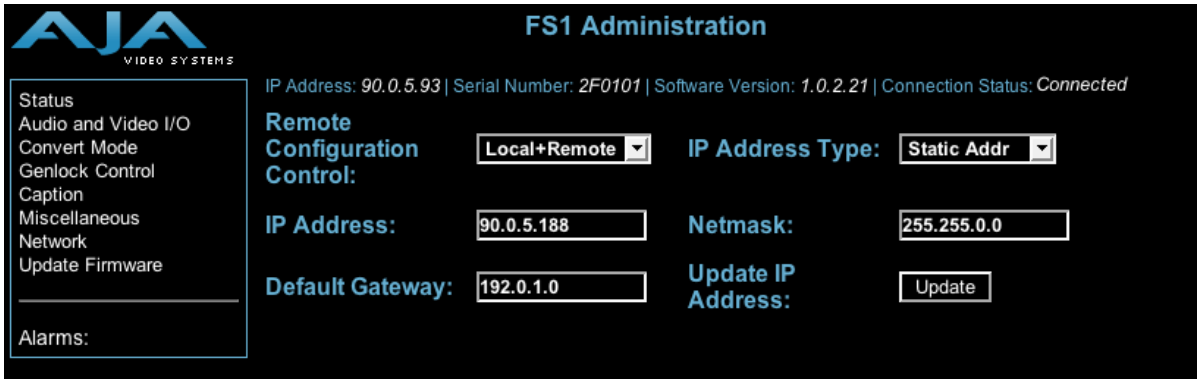
GPI 2 Out (37.2)

No Action (default)	FS1 will not trigger a GPI 2 output trigger regardless of event
Alarm	FS1 will generate a GPI 2 output trigger on pin#4 if an internal alarm condition occurs (GPI DB9 Connector)
No Video	FS1 will generate a GPI 2 output trigger on pin#4 if no video is detected at its selected input
No Ref	FS1 will generate a GPI 2 output trigger on pin#4 if no video is detected at its Ref video input

Display Intensity (70.2)—Either by using the slider or by entering a value, you can dim or brighten the alphanumeric display in steps from 1 (dim) to 8 (brightest).

Network Screen

This screen contains all of the information required to set up FS1 TCP/IP networking.



FS1 Web Interface, Network Screen

Remote Configuration Control (35.1)

Local + Remote (default)	Allow FS1 control from both the front panel and a network-attached browser Selection lights the FS1 front panel Remote button white.
Remote Only	Allow FS1 control only from a network attached browser Selection lights the FS1 front panel Remote button red.
Local Only	Allow FS1 control only from the front panel (browsers cannot change parameters) Selection lights the FS1 front panel Remote button green.

IP Address Type (50.1)

DHCP	Select automatic IP address assignment from DHCP server on LAN
Default Addr (default)	Use the factory default IP address: 10.65.74.65
Static Addr	Assign a static IP address manually (parameters 50.2, 50.3, and 50.4 will have to be entered to accomplish this).

IP Address (50.2)—Enter an IP address compatible with your LAN (if you have one). When networking the FS1 to a computer, this is the IP address that you'll enter in the computer's web browser to bring up the FS1's web interface from its embedded web server. You must also click the "*Update IP Address*" button to update the FS1 with the IP address entered here.

Netmask (50.3)—enter a subnet mask compatible with your LAN (if you have one). You must also click the "*Update IP Address*" button to update the FS1 with the changed information entered here.

Default Gateway (50.4)—enter the IP address for your LAN's gateway/router (if you have one). You must also click the "*Update IP Address*" button to update the FS1 with the changed information entered here.

Update IP Address—Pressing this button requests the FS1 to update its IP information with that entered on this screen.

FS1
Chapter 6: SNMP

FS1 Simple Network Management Protocol

SNMP is defined as a “simple network management protocol” and was defined as a component of the internet protocol suite specified by the Internet Engineering Task Force (IETF). Unfortunately, SNMP systems are often neither simple or standardized. For FS1 purposes, SNMP offers a command line interface for manual or scripted control of certain aspects of the FS1 such as system monitoring, alarm conditions and other system and network management tasks.

Note: although SNMP is not yet supported in the current software version, it will be in a future release.

Appendix A: Specifications

Formats

525i
625i
1080i 50/59.94/60 Hz
1080psf 23.98/24/25 Hz
720p 50/59.94/60 Hz

Video Inputs and Outputs

Dual SDI/HD-SDI, SMPTE 259/274/292/296
HD component YPbPr/RGB (RGB is output only), SMPTE-274
SD component/composite/YC (S Video)

Video A/D, D/A

12 bits
2x oversampled (HD)
4x oversampled (SD)

Audio Inputs and Outputs

8 Channel Balanced, 25 pin D (Tascam pinout)
8 Channel AES (BNC)
8 Channel SDI/HD-SDI Embedded

Audio levels

+12dBu, +15dBu, +18dBu, +24dBu, (Full Scale Digital)

LAN

10/100 automatic configuration
Automatic cable crossover (auto MDI-X)
Embedded web server HTTP v1.1

RS422

Machine Control

Physical

Width: 17.25"
Depth: 11.75"
Height: 1RU (1.75")
Weight: 6.5lbs
Convection cooled

Power

Voltage: 100-240 VAC
Power Consumption: 25W (30W maximum)
Two independent power supplies: fully redundant, diode isolated

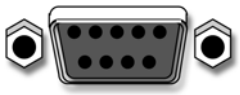
Regulatory

UL, FCC Class A, CE

FS1

Appendix B: GPI Connector Pinout

GPI Connections



Pin	Function	Pin	Function
1	GPI Input 1	6	I/O Ground 1
2	GPI Input 2	7	I/O Ground 2
3	GPI Output 1	8	I/O Ground 1
4	GPI Output 2	9	I/O Ground 2
5	Chassis Ground		

GPI Connector Pinout

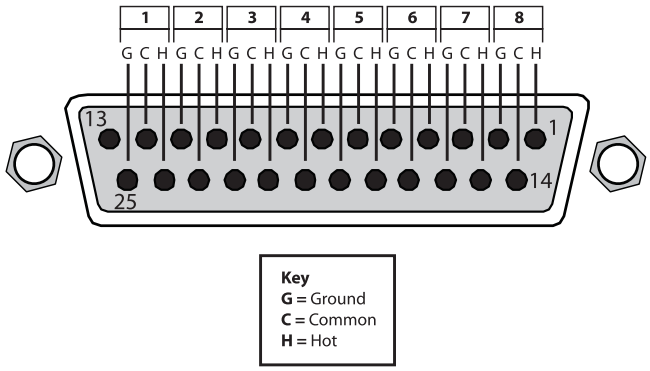
The GPI inputs and outputs are electrically isolated from the power and ground on the FS1 frame. There are two inputs and two outputs. Electrical isolation is provided for up to two pieces of external equipment. The following guidelines apply to the two GPI inputs and outputs:

- Input 1 and Output 1 share a common isolated ground on pins 6 & 8 (I/O Ground 1),
- Input 2 and Output 2 share a common isolated ground on pins 7 & 9 (I/O Ground 2).
- Pin 5, local chassis ground, may only be used as a reference when isolation is not required.
- Both GPI inputs are internally pulled high through a 10K ohm resistor to an isolated 5V supply, so that a relay contact closure or any device sinking at least 0.4 mA to ground will register a logic low.

Both GPI outputs are 5V TTL compatible, sourcing up to 6mA and sinking up to 4mA each.

Appendix C: Analog Audio Connector Pinout

Analog Audio Connections



Connector Pinout

The two DB25 connectors on the FS1 rear panel support a Tascam-style cable snake for balanced 8-channel analog audio. The pinout is the same for both input and output connectors, each following the Tascam DB-25 standard shown in the drawing above.

FS1

Appendix D: Addendum—Features/Status

In this Edition

At the time this manual was published, the following FS1 features as described in the manual are not implemented in Version 1.0.2.37 software:

- SNMP support
- RS422 machine control
- Proc Amp support
- Video Test Pattern Generator
- DHCP TCP/IP support (only static IP addresses can be used with this version)
- Saving/recalling user FS1 settings

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