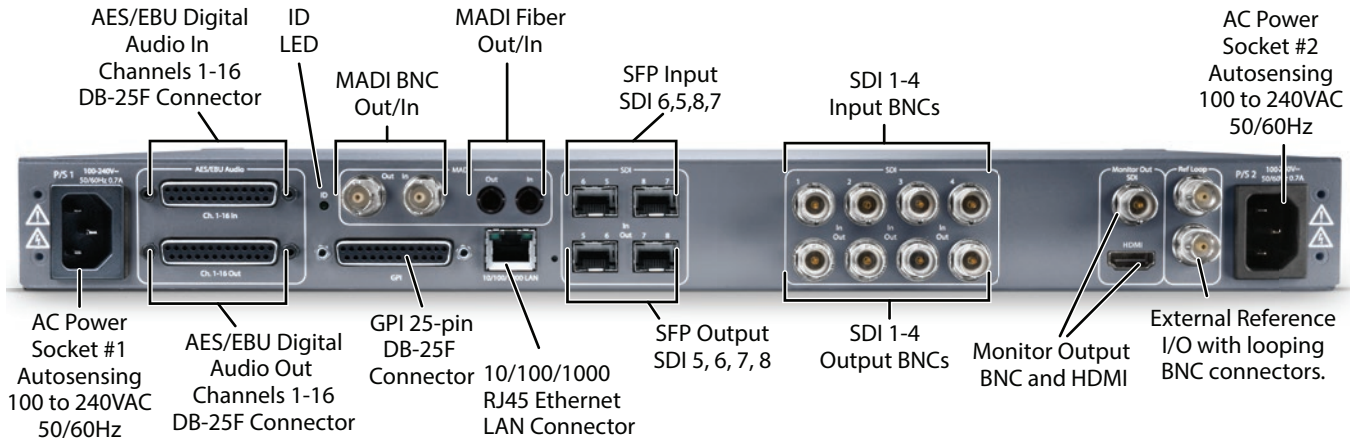




Figure 1. FS4 Rear Panel



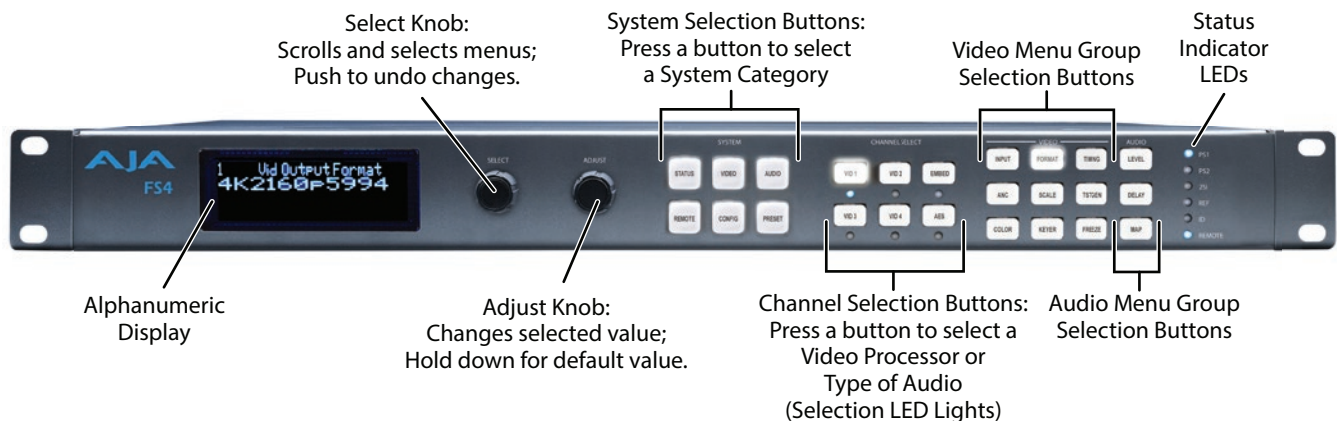
5. Connect one or two power cords to the FS4 and mains AC (100-240 VAC, 50/60 Hz, 55 Watts). For redundancy, use both cords and connect them to separate branch circuits. The FS4 power supply is autosensing and adjusts to the available power.
6. Connect your computer to the FS4 using a CAT5 Ethernet cable to the FS4 RJ45 10/100/1000 Ethernet LAN connector. You can connect directly or via a network device such as a switch, hub, bridge, etc. The FS4 automatically senses and adjusts to either a straight-through or crossover cable.

## Stand Alone Tests

The stand alone tests can be performed without a computer, using the FS4 front panel controls and rear connections. The following procedures assume the FS4 is at factory defaults (taken from a newly opened box). If not set to defaults, the FS4 may behave differently.

*NOTE: FS4 units are configured at the factory to operate in Four Channel Mode.*

Figure 2. FS4 Front Panel



## First Power Up

The following workflow powers up a default FS4 and demonstrates some example alarms.

## Setup

- Ensure the FS4 is completely disconnected (all video, audio, network, and power connector ports are empty).

## Procedure

1. Connect both FS4 power cords to mains AC and allow time for the unit to boot up. Observe the front panel LEDs.
  - The REF LED will light red, indicating an alarm condition. By default the FS4 is configured to operate genlocked to an external reference signal.
2. Press the front panel *STATUS* button, then turn the *SELECT* knob to view various Status menus.
  - The Status menu for Video Processor 1 will report No Input for IN1, the port is disconnected), and the *GEN* (Genlock) parameter will report *Ref* (configured for external reference) but will also report *No Input*.

Video Format Status screen			Video Format Alarm Status screen		
IN1	SDI 1	No Input	IN1	SDI 1	OK
BKGD	Black	1080i59	BKGD	Black	OK
GEN	Ref	No Input	GEN	Ref	No Ref
OUT1		1080i59	Rate		59/29/23

3. Connect a 1080i59.94 HD tri-level sync reference signal to one of the FS4 Ref Loop BNCs, and connect a 75 ohm terminator to the other Ref BNC.
  - The REF LED will light blue, indicating the FS4 is genlocked to an external reference signal.
  - The Status menu *GEN* parameters will report *Ref* and indicate the format of the incoming reference signal or *OK*.
  - However, because the FS4 is still not receiving a compatible video input, No Input, will be reported for IN1.

Video Format Status screen			Video Format Alarm Status screen		
IN1	SDI 1	No Input	IN1	SDI 1	OK
BKGD	Black	1080i59	BKGD	Black	OK
GEN	Ref	1080i59	GEN	Ref	OK
OUT1		1080i59	Rate		59/29/23

4. Connect a 1080i59.94 SDI video source to the SDI 1 input BNC.
  - The front panel will report 1080i59 and an OK status for SDI 1. This indicates no alarm condition exists.

Video Format Status screen			Video Format Alarm Status screen		
IN1	SDI 1	1080i59	IN1	SDI 1	OK
BKGD	Black	1080i59	BKGD	Black	OK
GEN	Ref	1080i59	GEN	Ref	OK
OUT1		1080i59	OUT1		1080i59

5. Disconnect one of the power cords, leaving the other attached.
  - The front panel PWR LED will light red for the power supply with the removed cord.
  - The PS status will report PS1 (or 2) OFF
6. Reconnect the power cable. The PWR LED for that power supply will light blue and the power supply status will report OK.

This workflow confirms the FS4 powers up successfully and reports reference and power supply alarms.

*NOTE: FS4 Reference, Power Supply, and Video Format alarms can be disabled, if desired. This will prevent the LEDs from going red, but will not affect front panel status displays.*

## Internal Test Signals

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This workflow generates bars and tone and routes them to an FS4 video and audio output. This example uses the SDI 1 and AES output connectors, an SDI video monitor, and an AES audio monitor.

*NOTE: In the following procedures, where the terms select and adjust are used, turn the front panel SELECT and ADJUST knobs.*

### Setup

---

- Connect the FS4 SDI 1 output BNC connector to an SDI video display with a BNC cable.
- Connect the FS4 AES/EBU output DB25 connector to an AES audio monitor using a standard TASCAM pinout cable (customer supplied). Separate DB25 connectors carry all 8 AES digital audio pairs (16 audio signals), one connector for input and one for output. Turn the output gain of the audio monitor to a low level.

### Procedure

---

1. Press the VID1 Channel Select button.
2. Press the *FORMAT* Video button
  - Select 1 Output Format and adjust to a signal compatible with your SDI monitor (for example, 1080i59.95).
3. Press the *TSTGEN* Video button.
  - Select 1 Test Pattern Gen and adjust to On.
  - Select 2 Test Pattern and adjust to 75% Bars.
4. Press the AES Channel Select button.
5. Press the *MAP* Audio button.
  - Select 1.0 AES Out and adjust to Sig Gen 400KHz.

You should now be able to see the test signal on the SDI Monitor display, and hear the audio on the AES monitor.

This workflow confirms the FS4 generates and outputs video and audio.

## FS4 Network Setup

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The following instructions summarize ways to configure the FS4 to communicate with a computer directly or over a network.

### FS4 Default Network Settings

---

The FS4 ships from the factory set for DHCP networking, and can be manually reset to the following default network settings:

IP Address	192.168.0.2
Subnet Mask	255.255.255.0
Gateway	192.168.0.1

## Networking Using DHCP or Default Static IP

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The FS4 factory default configuration automatically looks for a DHCP server to issue an IP address. If your network includes a DHCP server, plug the FS4 into the network and connect with the unit as follows:

1. Press the CONFIG button.
2. Turn the SELECT knob to navigate to the Status menu that has the name of the FS4 at the top (default is "aja-fs4"). Note the DHCP-supplied IP address shown.
3. With your laptop or desktop computer connected to the same LAN as the FS4 and DHCP enabled, type the IP address you noted on the FS4's display into the browser address field and press Enter. You should now see the FS4's browser Status screen.

If the FS4 cannot get an address from the network DHCP server, the FS4 will automatically use a preset factory static IP address of 192.168.0.2. You can access the FS4 using the default static address as follows:

1. Set your computer's IP address to whatever address you prefer in the 192.168.0 (class C) network.
2. Set the computer's Subnet mask to 255.255.255.0 (most PCs default to the proper netmask when the address is set).
3. Set the gateway address, if used, to match the FS4 default: 192.168.0.1. Alternatively, change the FS4 gateway address to match your gateway:
  - A. Press CONFIG, turn SELECT to 3.4 Default Gateway, push and then turn ADJUST to change the first group of digits.
  - B. Turn SELECT to advance to the next set of numbers, and turn ADJUST to set these numbers.
  - C. Continue using SELECT and ADJUST to set the full address.
  - D. When finished, push ADJUST momentarily to save the address.
5. Run a browser on the computer and type "192.168.0.2" (the factory static IP address). You should now see the FS4's browser status screen.

## Networking the FS4 Using Your Own Static IP

---

If you don't want to use DHCP or the default static IP address, you can set your own static IP address:

1. Select the CONFIG button and use the SELECT knob to navigate to parameter 3.1 IP CONFIG. Use the ADJUST knob to select Static.
2. Turn SELECT to navigate to parameter 3.2 IP ADDRESS. The display shows the default static IP address: 192.168.0.2.
3. Change the IP address as follows.
  - A. Push the ADJUST knob momentarily so that the first octet (set of numbers) blinks, and then turn ADJUST to change the numbers.
  - B. Turn SELECT to advance to the next set of numbers, and turn ADJUST to set these numbers.
  - C. Continue using SELECT and ADJUST to set the full address.
  - D. When finished, push ADJUST momentarily to save the address.
5. Turn SELECT to advance to 3.3 Subnet Mask. Use the SELECT and ADJUST knobs as in the previous step to set the desired subnet mask.
6. Turn SELECT to advance to 3.4 Default Gateway. Use the SELECT and ADJUST knobs as in the previous step to set the desired gateway address.

- Run a browser on the computer and type in the IP address you set for the FS4. You should now see the FS4's Status screen.

## Web Browser Menu Summary

Figure 3 on page 6 summarizes web browser menu operation. The settings generally correspond to the front panel display parameters, providing you two methods of controlling the FS4. To see the equivalent front panel display parameter number, hover the cursor over a setting.

Figure 3. FS4 Web Interface, Main Status Screen, Four Ch Mode

The screenshot shows the FS4 web interface in 'Video - HD/SD Mode'. The interface is annotated with red arrows and text labels:

- FS4 Status and Menu Display Area:** Points to the top header area containing the AJA logo and the title 'FS4'.
- AJA Systems on the Network:** Points to the 'Network' section on the right, showing 'aja-fs4' and 'Ki Pic Ultra Plus'.
- System Info:** Points to the 'Connection' section on the right, showing 'Serial Number ENG000016', 'Software Version 1.3.0.10', and 'Connection Status Connected'.
- Menu of FS4 System Screens:** Points to the 'System' menu on the left, listing options like Status, Config, Video, Audio, Presets, Remote, Network, and Firmware.
- Menu of FS4 Channel Screens:** Points to the 'Channels' menu on the left, listing options for Video 1, Video 2, Video 3, Video 4, EMBED, and AES.
- Collapse/Expand Button:** Points to the expand/collapse icon next to the 'Channels' menu.
- FS4 Alarms:** Points to the 'Alarms' menu on the left, which currently shows 'None'.

The main display area shows four video channels (Video 1-4) with parameters for Input, Output, Caption Translator, Proc Amp, Color Corrector, and UFC Custom. Below this are sections for Genlock and Monitor settings.

## FS4 Processing Examples

In the following procedures, your exact actions depend on which FS4 interface you are using. Where the terms *MENU NAME*, *select* and *adjust* are used:

- On the front panel interface, press the indicated Menu Group Selection button and then turn the *SELECT* and *ADJUST* knobs to choose the parameter and change the setting. The Front Panel menu numbers are included in the procedures.
- On the web browser interface, use your mouse to select the name of the Menu Screen and then choose the parameter and setting using the drop down list or slider. Menu numbers are not present on the FS4 web pages.

# Four Channel Mode Conversion Example

Figure 4. Four Channel Mode Example, Two Conversions

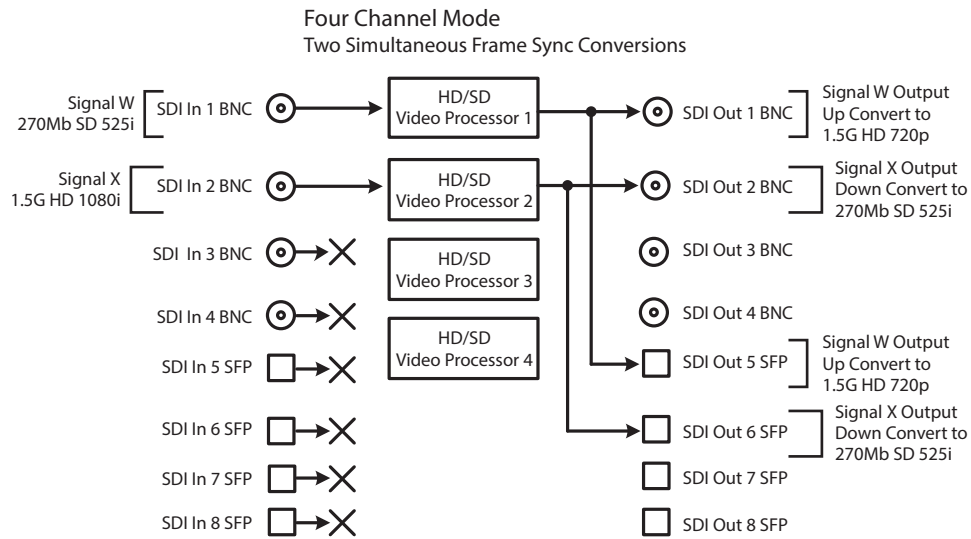


Table 1. FS4 Menu Settings for Four Channel Mode Example, Two Conversions

Channel Select Button	Video Button	Menu Name	Setting
VID1	INPUT	1 Input	SDI1
VID1	FORMAT	1 Output Format	720p 5994
VID1	FORMAT	2.0 Link Cfg SDI1	Sngl Link LvIA
VID2	INPUT	1 Input	SDI2
VID2	FORMAT	1 Output Format	525i 5994
VID2	FORMAT	2.0 Link Cfg SDI1	Sngl Link LvIA

The following workflow demonstrates simultaneously up-converting an SD 525i SDI input to an HD 720p SDI output, and also down-converting an HD 1080i SDI input to an SD 525i SDI output. Two copies of each output signal are available, one on a BNC connector and the other on an SFP connector. (Two additional conversions can be performed using the other two Video Processors.) This example uses a 1080i 59.94 reference.

## Setup

- Ensure the FS4 is receiving a valid reference signal. Connect a 1080i59.95 HD tri-level sync signal to one of the Ref Loop BNC connectors, and terminate the other Ref Loop BNC connector.
- Connect a 525i 59.94 SDI signal to the SDI1 BNC input on the rear of the FS4. Once connected the LED below the VID1 button on the FS4 front panel will light.
- Connect a 1080i59.94 SDI signal to the SDI2 BNC input on the rear of the FS4. Once connected the LED below the VID2 button will light.
- Connect the SDI1 BNC output connector to a compatible video monitor.
- Connect the SDI2 BNC output connector to a compatible video monitor.

## Procedure

If the FS4 has factory default settings, converted HD and SD signals should be present on both monitors. If not, check the following:

## System Configuration

1. Press the CONFIG System button:
  - Select 2 FS4 Mode, \ adjust to HD/SD, and press the ADJUST knob.
2. Press the VIDEO System button
  - Select 1 Output Frame Rate, and adjust to 59/29/23.
  - Select 2 Genlock Source, and adjust to Reference.

## Video Processor 1 Setup

3. Press the VID1 Channel Select button
4. Press the INPUT Video button
  - Select 1 Input, and adjust to SDI1.
5. Press the FORMAT Video button.
  - Select 1 Output Format, and adjust to 720p5994.
  - Select 2.0 Link Cfg SDI1 and adjust to Sngl Lnk Lv1A.
6. Press the TSTGEN Video button.
  - Select 1 Test Pattern Gen and adjust to Off.

## Video Processor 2 Setup

7. Press the VID2 Channel Select button
8. Press the INPUT Video button
  - Select 1 Input, and adjust to SDI2.
9. Press the FORMAT Video button.
  - Select 1 Output Format, and adjust to 1080i5994)
  - Select 2.0 Link Cfg SDI2 and adjust to Sngl Lnk Lv1A.
10. Press the TSTGEN Video button.
  - Select 1 Test Pattern Gen and adjust to Off.

## Single Channel Mode Down Conversion Example

Figure 5. Single Channel Mode, Down Conversion

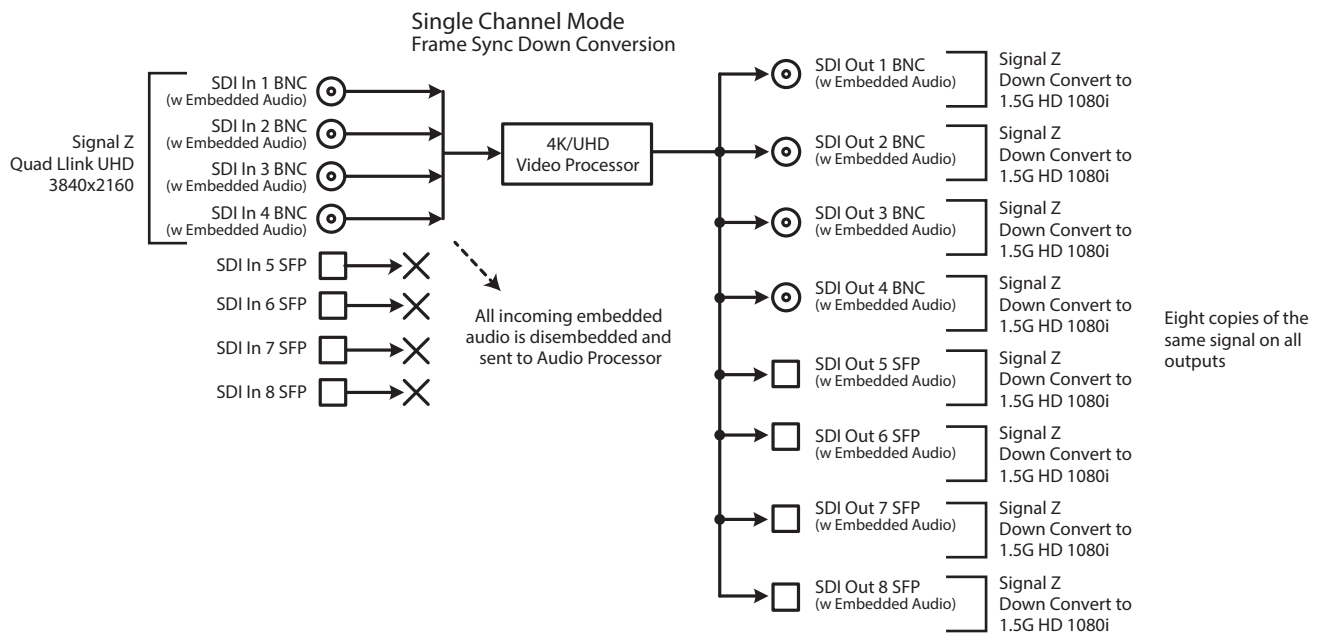




Table 2. FS4 Menu Settings for Single Channel Mode, Down Conversion

Channel Select Button	Video Button	Menu Name	Setting
VID1	INPUT	1 Input	1-4 QuadLink
VID1	FORMAT	1 Output Format	1080i5994
VID1	FORMAT	2.0 Link Cfg SDI1-4	Sngl Link LvlA

The following workflow demonstrates down -converting a Quad Link UltraHD input to an SD 525i SDI output.

## Setup

- Ensure the FS4 is receiving a valid reference signal. Connect a 1080i59.95 HD tri-level sync signal to one of the Ref Loop BNC connectors, and terminate the other Ref Loop BNC connector.
- Connect a Quad Link UltraHD 59.94 signal to the FS4 SDI 1, 2, 3, and 4 video input BNC connectors.
- Connect any one of the FS4 SDI BNC output connectors to a compatible video monitor.

## Procedure

### System Configuration

1. Press the CONFIG System button:
  - Select 2 FS4 Mode, select 4K/UltraHD and press the ADJUST knob. Wait for the FS4 to reboot (not longer than 90 seconds).
2. Press the VIDEO System button
  - Select 1 Output Frame Rate, and adjust to 59/29/23.
  - Select 2 Genlock Source, and adjust to Reference.

### Video Processor Setup

3. Press the VID1 Channel Select button
4. Press the INPUT Video button
  - Select 1 Input, and adjust to 1-4 QuadLink.
5. Press the FORMAT Video button.
  - Select 1 Output Format, and adjust to 1080i5994.
  - Select 2.0 Link Cfg SDI1-4 and adjust to Sngl Lnk LvlA.
6. Press the TSTGEN Video button.
  - Select 1 Test Pattern Gen and adjust to Off.

The down-converted SD signal should now be present on the connected video monitor.

# Single Channel Mode Up Conversion Example

Figure 6. Single Channel Mode, Up Conversion

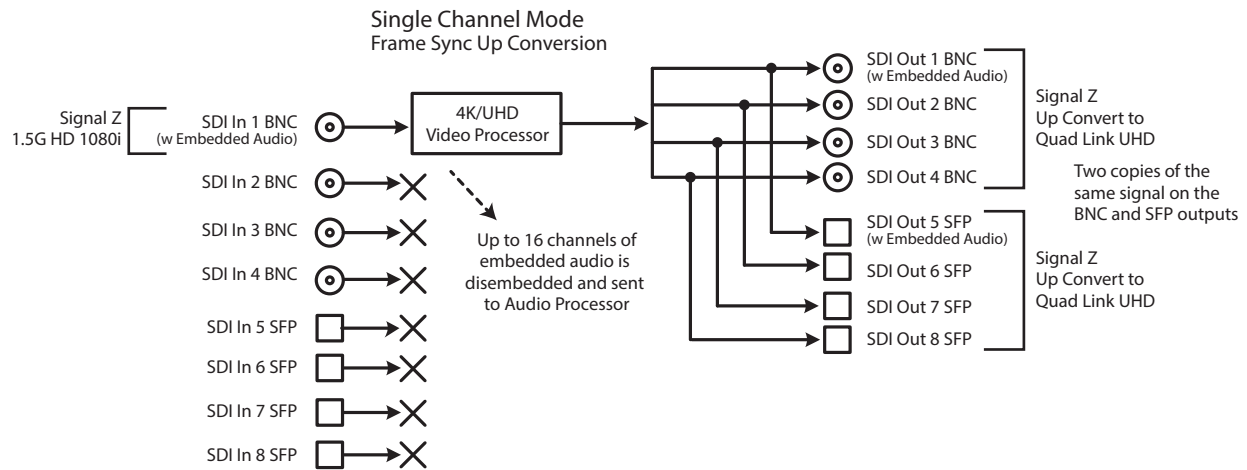


Table 3. FS4 Menu Settings for Single Channel Mode, Up Conversion

Channel Select Button	Video Button	Menu Name	Setting
VID1	INPUT	1 Input	SDI1
VID1	FORMAT	1 Output Format	UHD2160p5994
VID1	FORMAT	2.0 Link Cfg SDI1-4	QuadLink LvIA

The following workflow demonstrates up-converting an HD SDI input to a UltraHD SDI 4-Link Quadrant (Square Division) output. This example uses a 525i 59.94 input and generates a UltraHDp59.94 Two Sample Interleave output.

## Setup

- Ensure the FS4 is receiving a valid reference signal. Connect a 1080i59.95 HD tri-level sync signal to one of the Ref Loop BNC connectors, and terminate the other Ref Loop BNC connector.
- Connect a 1080i59.94 SDI signal to the SDI1 input on the rear of the FS4. Once connected the FS4 front panel VID IN LED will light.
- Connect the four FS4 SDI1-4 video output BNC connectors to a compatible UltraHD monitor.

*NOTE: Alternatively, you can monitor the entire raster of the 2SI signal at lower resolution on a standard SDI monitor by connecting just one of the four outputs.*

## Procedure

### System Configuration

1. If the FS4 is not already in Single Channel Mode, press the CONFIG System button:
  - Select 2 FS4 Mode, select 4K/UHD and press the ADJUST knob.
2. Press the VIDEO System button
  - Select 1 Output Frame Rate, and adjust to 59/29/23.
  - Select 2 Genlock Source, and adjust to Reference.

## Video Processor Setup

---

3. Press the *VID1* Channel Select button
4. Press the *INPUT* Video button
  - Select *1 Input*, and adjust to *SDI 1*.
5. Press the *FORMAT* Video button.
  - Select *1 Output Format*, and adjust to *UHD2160p5994*.
  - Select *2.0 Link Cfg SDI1-4* and adjust to *QuadLnk LvIA*.
  - Select *4 Link Output Image Mapping* and adjust to *2SI*.
6. Press the *TSTGEN* Video button.
  - Select *1 Test Pattern Gen* and adjust to *Off*.
7. The up-converted SD signal should now be present on the connected video monitor.