

SFS6803+D

# 3G/HD/SD-Capable A/V Frame Synchronizer

The SFS6803+ 3G/HD/SD video frame synchronizer is an auto-timing serial digital frame synchronizer and audio synchronizer processing module for the 6800+™ frame.

The module provides video frame synchronization and delay for 3G/HD/SD signals and can be used in any broadcast, post-production, cable or mobile facility where processing and synchronization of HD or SD video and audio (embedded and/or discrete) signals are required. The SFS6803+ has the capability to re-time an I/O signal to a local station clock for the clean processing of all synchronized signals.

The base model SFS6803+D supports SD-SDI with embedded audio. HD-SDI and 3G-SDI capability can be added with the optional software licenses, SFS68OPT-HD and SFS68OPT-3G. Unbalanced AES audio can be added with the optional software licenses, SFS68OPT-AES4 and SFS68OPT-AES8. A breakout cable for unbalanced AES is included.

Also available is the base model SFS6803+BD, supporting HD-SDI and SD-SDI with embedded audio. 3G-SDI capability can be added with the optional software license, SFS68OPT-3G. Balanced AES audio can be added with the optional software licenses, SFS68OPT-AES4 and SFS68OPT-AES8. The breakout cable for balanced AES is not included.

## Features

- Video frame and audio sync with genlock support
- Full 3 Gb/s support
- Audio embedder and de-embedder
- Seamless sound functionality: audio embedding on loss of video
- Fast Switch feature allows for clean/quiet output on hot switch at the input with no output frame freeze
- Dolby® header adjustment
- Fiber TX or RX
- Eight AES inputs and outputs. Two models available, one with balanced and the other with unbalanced I/O
- 10-bit video processing
- Passes all HANC samples
- Passes VANC with user-selectable option for VBI/ANC line-by-line video deleting
- Up to eight frames of HD and 50 frames of SD video delay
- Ability to embed AES on output (fiber or SDI) without video source or genlock
- Ability to de-embed metadata and embed external metadata
  
- Operates video standards:
  - 525 and 625 (SMPTE 259M)
  - 1080i/p
  - 720p (SMPTE 274M/296M)
  - 3 Gb/s (SMPTE 424M) upgradeable
- Loss of video modes:
  - Pass
  - Black
  - Freeze

- Video processing amplifier with controls for:
  - Luminance gain
  - Luminance offset
  - Chrominance gain
  - Chrominance offset
  - White clip
  - Black clip
  - Hue adjustment
- Audio processing amplifier for de-embedded and external audio channels:
  - Gain
  - Swap
  - Invert
  - Delay
  - Mix (sum)
- Video and audio test generator
- 16, 20- or 24-bit audio processing
- DATA I/O signal provides audio tracking and hot-switching information to other modules
- C, U and V bit transparency
- VBI line-by-line deleting
- Auto-detect or user-forced input video standard
- Inputs:
  - One video serial digital input
  - Genlock input (composite or tri-level sync) frame or card user selectable
  - Eight AES inputs (unbalanced, balanced compatible with external baluns)
  - Eight Analog audio inputs
  - DARS input (unbalanced, balanced compatible with external baluns)
  - RS-232/422 serial port for external metadata source
  - Optional fiber receiver (OP+SFS+R+D)
- Outputs:
  - Four synchronized serial video digital outputs
  - One DATA I/O signal for tracking audio processing
  - Eight AES outputs (unbalanced, balanced compatible with external baluns)
  - Eight Analog audio outputs
  - RS-232/422 serial port metadata output
  - Optional fiber transmitter (OP+SFS+D)
- Shadowed/restored parameter settings when switching video standards
- Card-edge control
- Ethernet remote control and monitoring
- Q-SEE™ thumbnail support

#### Features Supported

- Video frame and audio sync with genlock support
- Full 3 Gb/s support
- Audio embedder and de-embedder
- Audio metadata embedder and de-embedder
- Audio embedding on loss of video
- Data embedder and de-embedder
- Dolby® header adjustment
- Fiber TX and/or RX
- Advanced audio procamp with audio routing
- Audio limiter
- VBI line-by-line deleting
- Video procamp
- Eight AES in/out support
- AFD metadata handling

## Specifications

Specifications and designs are subject to change without notice

SERIAL VIDEO INPUT	
Number	1

SERIAL VIDEO INPUT		
Standards	1080p (SMPTE 424M): 3 Gb/s HD 1080i/p (SMPTE 274M); 720p (SMPTE 296M): HD-SDI SMPTE 259M-C, 270 Mb/s, 525/625 component: SD-SDI	
Connector	BNC per IEC 169-8	
Impedance	75 ohms	
Frame Rate	1080i/p: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60 Hz (3 Gb/s rates are future software upgradeable) 720p: 50, 59.94, 60 Hz	
Return Loss	>15 dB from 5 to 1485 MHz; >12 dB from 1485 to 2970 MHz	
Equalization	SD = 984 ft (>300 m), typical HD = 984 ft (>300 m), typical 3G = 459 ft (>140 m), typical	
SERIAL VIDEO OUTPUT		
Number	4 synchronized	
Standards	0p (SMPTE 424M): 3 Gb/s HD 1080i/p (SMPTE 274M); 720p (SMPTE 296M): HD-SDI SMPTE 259M-C, 270 Mb/s, 525/625 component: SD-SDI	
Frame Rate	1080i: 25, 29.97, 30 Hz 1080p: 23.98 (p/psf), 24 (p/psf), 25, 29.97, 30, 50, 59.94, 60 Hz (3 Gb/s rates are software upgradeable) 720p: 50, 59.94, 60 Hz 525, 625	
Connector	BNC per IEC 169-8	
Impedance	75 ohms	
Return Loss	>15 dB from 5 to 1485 MHz; >12 dB from 1485 to 2970 MHz	
D.C. Offset	0 V $\pm$ 0.5 V	
Signal Level	800 mV $\pm$ 10%	
Rise and Fall Time	<135 ps: 3G <270 ps: HD-SDI 0.4 to 1.5 ns: SD-SDI	
Overshoot/Undershoot	<10%	
Jitter	3 Gb/s: <2 UI pk-pk of timing jitter (>10 Hz); <0.3 UI pk-pk of alignment jitter (>100 kHz) HD: <1 UI pk-pk of timing jitter (>10 Hz); <0.2 UI pk-pk of alignment jitter for (>100 kHz) SD: <0.2 UI pk-pk (>10 Hz)	
Delay	Up to 8 frames less 2 lines for 3G/HD; 50 frames for SD	
Frame Synchronizer Lock Range	At least $\pm$ 45 ppm	
REFERENCE VIDEO		
Level	1 V pk-pk +6 dB/-3.5 dB	
Signal Type	Analog composite 525/625 or tri-level sync (1080i/p/720p)	
Connector	BNC per IEC 169-8	
Impedance	75 ohms	
Return Loss	>40 dB to 10 MHz, typical	
AES/DARS INPUT	BALANCED/DARS (WITH SFS6803+BD OR EXTERNAL BALUN)	UNBALANCED/DARS
Standard	AES 3	AES 3, SMPTE 276M

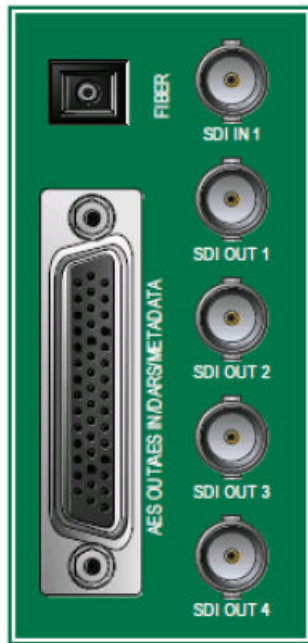
AES/DARS INPUT	BALANCED/DARS (WITH SFS6803+BD OR EXTERNAL BALUN)	UNBALANCED/DARS
Connector	44-pin connector; or	BNC (IEC 169-8)
Sensitivity	<200 mV	<100 mV
Impedance	110 ohms $\pm$ 20%	75 ohms
Return Loss	N/A	>25 dB, 0.1 to 6 MHz
Common Mode	0 to 7 V (0 to 20 kHz)	N/A
Input Audio Rate	32 to 108 kHz	32 to 108 kHz
Maximum Input	10 V pk-pk	N/A
Bits	16, 20, or 24	16, 20, or 24
Channel Status	Maintained, but professional mode	48 kHz
AES/AUDIO OUTPUTS	BALANCED	UNBALANCED
Standard	AES 3	AES 3, SMPTE 276M
Type	Balanced, transformer	Unbalanced, AC
Connector	44-pin connector; or	BNC (IEC 169-8)
Impedance	110 ohms $\pm$ 20%	75 ohms
Return Loss	N/A	>25 dB, 0.1 to 6 MHz
Signal Amplitude	2 to 7 V pk-pk into 110	N/A
Audio Rate	48 kHz	48 kHz
Jitter	$\pm$ 20 ns	$\pm$ 20 ns
Rise/Fall Time	5 to 30 ns (10% to 90%)	30 to 44 ns (10%)
Bits	24, 20, or 16	24, 20, or 16
Channel Status	Maintained, but professional mode	48 kHz
DATA I/O OUTPUT		
Number of Outputs	1	
Connector	BNC (IEC 169-8)	
Impedance	75 ohms	
Return Loss (up to 6 MHz)	>20 dB	
FIBER OPTIC OUTPUT (TRANSMITTER)		
Number of Outputs	1	
Wavelengths (nm)	1310 FP 1270, 1290, 1310, 1330, 1350, 1370, 1430, 1450, 1470, 1490, 1520, 1530, 1550, 1570, 1590, 1610 CWDM	
Connector	SC/PC per IEC 61754-4-1 ST/PC (optional) FC/PC (optional)	
Output Power	-7 dBm $\pm$ 1 dBm FP 0 dBm $\pm$ 2 dBm CWDM	
Extinction Ratio	8 dB, typical	
FIBER OPTIC INPUT (RECEIVER)		
Number of Inputs	1	
Wavelength	1260 to 1620 nm	

FIBER OPTIC INPUT (RECEIVER)	
Connector	SC/PC per IEC 61754-4-1
Overload Input Power	0 dBm PIN
Input Sensitivity	-20 dBm PIN
RS-232/RS-422 (METADATA I/O)	
Standard	Electrical specification EIA-232C
Connector	DB-9, RS-232/422 switchable
POWER AND TEMPERATURE	
Power Consumption	12 W maximum
Operating Temperature	41° to 113° F (5° to 45° C)

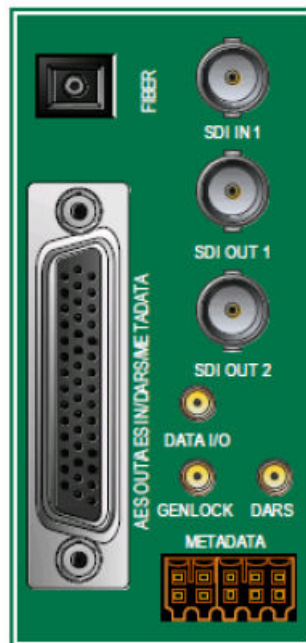
## Ordering Information

SFS6803+D	SD-SDI A/V frame synch and processing amplifier, HD & 3G ready (with appropriate software key), includes double-slot backmodule and breakout cable, QSEE-compliant
SFS6803+BD	HD-SDI A/V frame synch and processing amplifier, HD & 3G-capable (with appropriate software key), includes double-slot back module with balanced I/O, QSEE-compliant. No breakout cable provided by Imagine Communications
FIBER VERSIONS	
OP+SFS+13D	SFS6803+ with fiber output option (1310nm wavelength, SC connector)
OP+SFS+CxxD	SFS6803+ with fiber output option (1271nm-1611nm, CWDM wavelength, SC connector)
OP+SFS+R+D	SFS6803+ with fiber input option (PIN receiver, SC connector)
SOFTWARE LICENSE OPTIONS	
SFS68OPT-HD	Optional firmware upgrade for SFS6800+ and SFS6803+ to provide 1.5Gbps HD capability
SFS68OPT-HD-3G	Optional softkey for field upgrade of SFS6800+ and SFS6803+ from 1.5Gbps to 3Gbps capability
SFS68OPT-3G	Optional firmware upgrade for SFS6800+ and SFS6803+ to provide 3Gbps and 1.5Gbps HD capability
SFS68OPT-AES4	Optional software key upgrade for SFS6803+ to provide four discrete AES inputs and outputs
SFS68OPT-AES8	Optional software key upgrade for SFS6803+ to provide eight discrete AES inputs and outputs
FIBER OPTIONS	
OP+OPT+SC	OPTO+ SC standard default connector for OPTO+ fiber modules, no charge
OP+OPT+ST	OPTO+ ST connector option for OPTO+ fiber modules
BREAKOUT CABLE	
6800+OPT+16CAPM	Audio breakout cable for SFS/HMX/HDX6803+ and OP+SFS/HMX/HDX series modules

## Images/Diagrams



SFS6803+ and OP+SFS+



SFS6803+BD and OP+SFS+BD