

# Selenio™ MCP3

3RU Media Convergence Platform



Today's customers recognize that IP infrastructure will eventually become the norm in the broadcast



facility as compression gets better, networks get larger and products get less expensive. While this shift will ultimately drive cost savings, the transition period will undoubtedly present challenges.

Selenio™ MCP3 is a next-generation, modular solution that presents an all-new approach to networking and signal processing in this converging baseband/broadband arena. The industry's first integrated media convergence platform, Selenio combines traditional baseband video and audio processing, compression and IP networking features — all in a single, space-saving 3RU frame. An intuitive, web-based GUI enables effortless configuration and effective troubleshooting for superior operational efficiency.

Now you can manage baseband and IP intelligently and efficiently. Reduce cabling and simplify your broadcast infrastructure. Deftly juggle multiple compression standards, video/audio signals, encoding formats. Get all the functionality you need to run your business today — and a clear, cost-effective growth path to whatever is on your horizon.

## Features

- Combined IP and baseband sub-networks in a single platform
- Video processing, advanced audio processing, compression and multiplexing in a single, flexible platform with intuitive graphical management tools
  - Dual-channel baseband modules provide 28 channels of high-density baseband video processing, including up-, down-, and cross-conversion and synchronization
  - Advanced audio processing capabilities, including integrated Dolby® E, Dolby® Digital, AAC, AAC-HE, MPEG audio and DTS Neural Surround™ UpMix, DownMix and DTS Neural Loudness Control
  - Audio and video multiplexing and demultiplexing for compressed streams
  - MPEG-2 and H.264 compression standards are supported from SD and HD to 3 Gb/s and mobile
- Support for up to 14 independent, single-slot modules with internal connectivity
  - 3 Gb/s baseband connections to/from each module
  - 1 Gb/s data connection to/from each module
  - Independent control network to/from each module
- Integrated, seamless signal redundancy with full redundant configurations across processing, compression and routing for critical broadcast paths
- Inputs/outputs include analog video/audio, SD-SDI, HD-SDI, AES audio (balanced, unbalanced), fiber optics, Ethernet for control and IP video, ASI and serial data
- Hot-swappable front and back modules, and controllers
- Standard support for thumbnails, customizable alarms and MPEG-4 streaming
- Two external reference genlock loops; high-performance passive loop-through inputs
- Support for two hot-swappable, redundant AC or DC power supplies — each independently able to handle the complete frame power load (650 W)

- Integral fan cooling with front-to-back primary airflow; designed to support full load at 40° C ambient with no thermal stacking limitations
- Direct Ethernet connectivity (1000Base-T for control/monitoring, 1000Base-T for data) to the frame with optional redundancy
- A variety of control methods to suit every operational environment: Magellan™ Control Panels, Magellan CCS™, local control panel, rich interface application (RIA) HTTP web browser or third-party control systems via published SNMP MIBs for application modules

## Details

Every shipment of the Selenio frame includes the following:

- A controller for interface to control networks (with an option for data networks)
- Two genlock reference looping inputs utilizing standard BNC connectors
- Built-in, browser-based management system (no software required) that incorporates support for rich interactive features through Microsoft® Silverlight®
- A General Purpose Interface (GPI) — Two GPI inputs and outputs are provided on a multi-pin type connector
- Power Supply — Each frame includes one energy-efficient, 80 Plus Gold-certified power supply that will power a fully loaded frame

Selenio options include a second power supply and a second controller for redundancy, as well as a local control panel.

### N+1 Redundancy

N+1 redundancy is supported in the Selenio frame. Redundancy is accomplished by using an external router or a crosspoint on the Selenio controller module.

Redundancy is implemented through software provisioning (controller module, application module and control system).

### Genlock Reference

There are three means of utilizing the external reference:

- Main and back-up color black (blackburst) or TLS (Tri-Level Sync) references
- Color black (blackburst) or TLS and DARS (Digital Audio Reference Signal) for AES-11 compliance configurations
- Two different reference signals – e.g., color black NTSC and (black burst) PAL – can be applied to the frame, and each module capable of locking to an external reference can be chosen to lock to either reference

Application modules with a frame synchronizer function have an analog reference connection to the two external reference inputs. Neither of these analog reference connections is broken if the controller module must be removed for servicing.

Application modules that require a digital reference — such as the encoder, decoder or multiplexer/demultiplexer — have a digital reference connection to each of the two controller modules.

### Intuitive Web-based GUI

Featuring a built-in, browser-based management system (no software required) that incorporates support for rich interactive features through Microsoft® Silverlight®, Selenio provides a graphically rich interface that enables operators to get the most functionality from the new platform — without being buried under an avalanche of manuals and bespoke commands.

Operators can access the platform from their web browser and, using graphical block diagrams for each particular module, can easily step through the configuration process — significantly reducing the chance of error.

### HD-BNC Connectors

Selenio application modules utilize high-density HD-BNC connectors for video and audio connectivity. The HD-BNC offers the same strength and is the same bayonet-locking connector as standard BNC connectors.

HD-BNC connectors meet all SMPTE 292M and SMPTE 424M return loss specifications — and exceeds them at 3 Gb/s. For high-density applications, a cable insertion/extraction tool is available, which is as simple to use as the standard BNC tool.

### **Back Module Installation**

Back modules are easily connected to the frame utilizing alignment pins and captive machine screws.

### **Controller Modules**

The Selenio system redundant controller module provides control and management for the entire system. Functions include provisioning, status, fault management and supervisory control. Integral SDI/ASI and Ethernet switching with external routing provides N+1 redundancy.

Each controller includes two 1000Base-T Ethernet interfaces. One interface provides an IP connection for system control and firmware upgrades, as well as for monitoring purposes. The second 1000Base-T Ethernet interface is enabled for video and audio data applications with an optional plug-in sub-module, and may be provided with an RJ-45 or optional SFP fiber transceiver.

One controller is included with every frame and features two RJ-45 connections: one for control and one for video networking applications (utilizing the optional video IP sub module). For optical connectivity in video networking applications, an SFP transceiver option is available for the controller module. A secondary controller can be provided with the appropriate connectivity at the time of order or easily added in the field.

### **Expansion Modules**

Inputs, outputs and functionality can be easily increased in Selenio application modules by simply adding video and audio expansion modules.

Video and audio signals are connected internally over bidirectional high-speed busses — eliminating external cabling. When an expansion module is installed beside an application module, an automatic connection takes place. The corresponding block diagram in the graphical user interface is updated, giving the user setup, control and monitoring functions.

One video expansion module can be placed beside a frame sync or video conversion application module. Five back-module options provide interfaces for electrical and optical inputs and outputs and relay bypass for critical signals upon power loss.

For audio expansion, up to two analog audio expansion modules and/or digital audio expansion modules can be placed beside a frame sync or video conversion application module. Audio expansion modules can enable additional audio processing such as Dolby® codecs and DTS Neural Loudness Control.

When viewing the front of the frame, video expansion modules are added to the left of the application module (lower slot numbers). Audio expansion modules are added to the right of the application module (higher slot numbers).

# Specifications

Specifications and designs are subject to change without notice

## SELENIO MCP3 FRAME

### Environment

Selenio MCP3 Frame requires an ambient temperature of between 32° to 104° F (0° and 40°C), with a relative humidity of 10 to 90% (non-condensing). The frame can only maintain proper operating temperatures when the front panel is closed.

## PHYSICAL CHARACTERISTICS

Form Factor	3RU
Dimensions (H x W x D)	5.25 x 19 x 20.8 in. (13.3 x 48.3 x 52.8 cm) (Depth includes 0.7 in (1.8 cm) of optional SFP module and transceiver)
Power Consumption	No modules installed 90 W maximum 14 modules installed 650 W maximum

## ETHERNET

Connector	RJ-45
Standard	10/100/1000Base-T (10/100Base-T on front Ethernet port)
Differential Output Voltage	0.75 V ±0.83 dB
High Frequency Jitter	0.3 ns
CMRR	1V RMS 1 to 250 MHz
Clock Frequency	125 MHz ±0.01%

## EXTERNAL REFERENCE - GENLOCK

Connector	BNC (IEC169-8)
Impedance	75 ohms
Return Loss	>40 dB 25 Hz to 10 MHz (SMPTE 318M-1999)
Common Mode Range	5.5 V pk-pk
CMRR	60 dB @ 60 Hz, 5 V pk-pk
Input Level	NTSC/PAL-B: 1 V pk-pk, -6.0 dB to +6.0 dB Tri-level sync: ±300 mV, -6.0 dB to +6.0 dB DARS: 1 V pk-pk
Controller Module Reference Standards	525i/59.94, 625i/50, 720p/25, 720p/29.97, 720p/30, 720p/50, 720p/59.94, 720p/60, 1080i/50, 1080i/59.94, 1080i/60, 1080sF/23.98, 1080sF/24, 1080sF/25, 1080sF/29.97, 1080sF/30, 1080p/23.98, 1080p/24, 1080p/25, 1080p/29.97, 1080p/30
Standard	SMPTE 170M (NTSC), ITU-R BT.470-6 (PAL-B), SMPTE 274M (1080i, 1080p), SMPTE 296M (720p), AES3 SMPTE 276M

## GPI IN/OUT

Connector	2 x 3 position screw terminal (Keystone 8739)
Input Signal Level	+5 V
Output Signal Level	±75 V with reference to GPI out common

## POWER SUPPLY

### AC Power Supply

Input Voltage Rated	100 to 240 VAC
Operating	90 to 250 VAC
Frequency Rated	50 to 60 Hz
Operating	47 to 63 Hz
Input Current Rated	9A RMS maximum
Operating	8A RMS maximum at 90 VAC with 650 W output 3A RMS maximum at 250 VAC with 650 W output
Inrush Current	40A peak maximum @ high line, hot or cold start, duration not to exceed 10 ms
Efficiency	The PSU will deliver an efficiency of no less than 86% at any net power level greater than 25% of rated output
Power Factor	>0.95 at output power >50% load @ 250 VAC input >0.95 at output power >30% load @ 90 VAC input >0.97 at 90 to 135 VAC and >0.95 at 180 to 250 VAC, typical
Harmonic Distortion	Complies with the requirements of EN61000-3-2

## DC POWER SUPPLY

Input voltage	Rated: 48 VDC Operating: 36 to 75 VDC
Output Voltages	Nominal: 12 VDC Set tolerance at 1/2 load: 11.98 to 12.02 VDC Output Programming: 10.8 to 13.2 VDC
Output Power	25 A
Transient Response	±0.60 V
Maximum Inrush	40 A cold start @ 75 VDC
Fuse Rating	40 A at 60 VDC
Hold-Up Time	1.5 ms at 48 VDC
Thermal Shutdown Protection	55° C (ambient), with auto restart

## SFPs for Selenio MCP3 Frames

**GIGABIT OPTICAL SINGLE-MODE (OP+SFP+SEL) LASER**

Type	LC
Average Output Power (minimum)	-9 dBm
Average Output Power (maximum)	-3 dBm
Mean Optical Wavelength	1270 to 1355 nm; 10 km range
Input Power (minimum)	-20 dBm
Input Power (maximum)	-3 dBm
Laser Mode	Single-mode, 1310 nm FP laser
Supply voltage	3.135 to 3.465 V
Ejector	Bail actuator operating case
Temperature	-40° to 185° F (-40° to 85° C)

**GIGABIT OPTICAL MULTI-MODE (OP+SFP1+TRM) LASER**

Output Power (minimum)	-9.5 dBm
Output Power (maximum)	-2 dBm
Output Center Wavelength	830 to 860 nm; 850 nm (typical)
Input Power (minimum)	-17 dBm
Input Power (maximum)	0 dBm
Optical Input Wavelength	770 to 860 nm
Line Rate	1.25/1.0625 Gbaud
Laser Mode	Multi-mode, 850 nm VCSEL
Voltage	3.3 V
Ejector	Bail actuator operating case
Operating Case Temperature	23° to 176° F (-5° to 80°C)
Applicable Standards	IEEE 802.3z 1000 Base SX specification for optical links

**Selenio Frame /Controller selection table:**

SELENIO FRAME PIN	AC PSU	DC PSU	EXT. REF.	CONTROLLER MODULE					LCP
				NO. OF UNITS	CONTROL (RJ-45)	VIDEO IP SM	DATA (RJ-45)	DATA (OPTICAL)	
SEL-FR3-AC-RR	1		2	1	1	No			
SEL-FR3-AC-RR-R	2		2	2	1	No			
FR3-AC-RR-IP	1		2	1	1	Yes	1		1
SEL-FR3-AC-RR-IP-R	2		2	2	1	Yes	1		1
SEL-FR3-AC-RO-IP	1		2	1	1	Yes		1	1
SEL-FR3-AC-RO-IP-R	2		2	2	1	Yes		1	1
SEL-FR3-DC-RR-IP		1	2	1	1	Yes	1		1



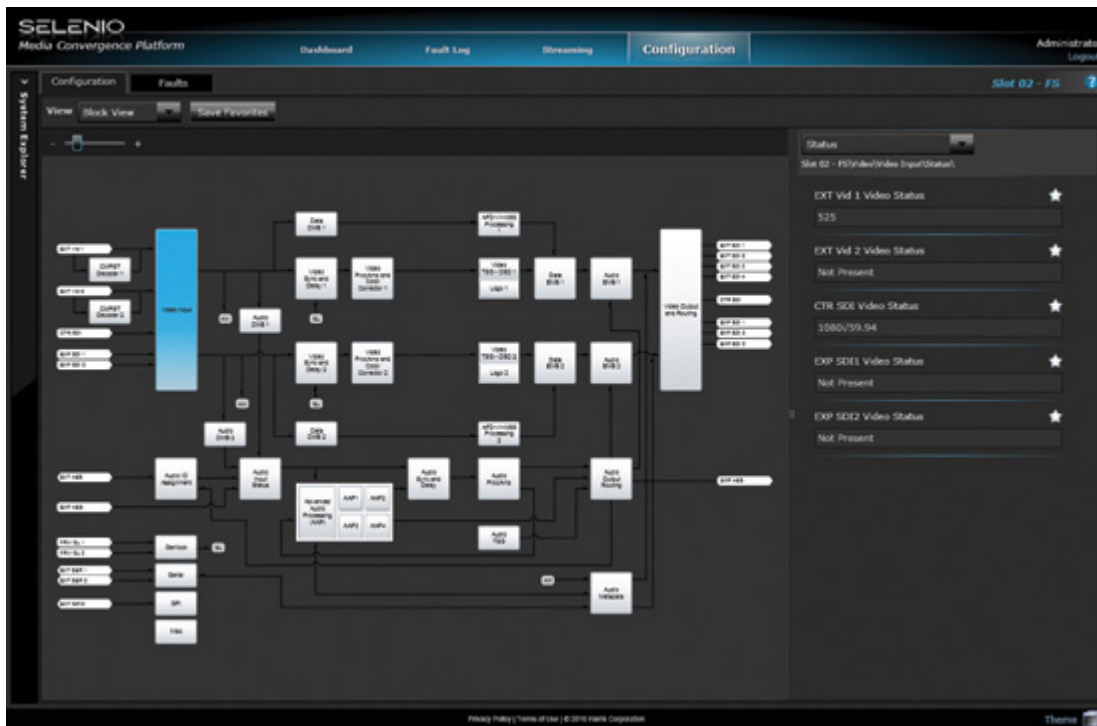
## Ordering Information

MOUNTING FRAME	
SEL-FR3-AC-RR	Selenio 3RU Frame: 1 AC PSU, 2 external reference looping BNC inputs, 1 controller (1 RJ-45 for control/monitoring, 1 RJ-45 for data (video IP sub module required)), no control panel
SEL-FR3-AC-RR-R	Selenio 3RU Frame: 2 AC PSU, 2 external reference looping BNC inputs, 2 controllers (1 RJ-45 for control/monitoring, 1 RJ-45 for data (video IP sub module required)), no control panel
SEL-FR3-AC-RR-IP	Selenio 3RU Frame: 1 AC PSU, 2 external reference looping BNC inputs, 1 controller (1 RJ-45 for control/monitoring, 1 RJ-45 for data (video IP sub module included)), includes control panel
SEL-FR3-AC-RR-IP-R	Selenio 3RU Frame: 2 AC PSU, 2 external reference looping BNC inputs, 2 controllers (1 RJ-45 for control/monitoring, 1 RJ-45 for data (video IP sub module included)), includes control panel
SEL-FR3-AC-RO-IP-R	Selenio 3RU Frame: 2 AC PSU, 2 external reference looping BNC inputs, 2 controllers (1 RJ-45 for control/monitoring, 1 optical transceiver for data (video IP sub module included)), SFP transceiver ordered separately, includes control panel
SEL-FR3-DC-RR-IP	Selenio 3RU Frame: 1 DC PSU, 2 external reference looping BNC inputs, 1 controller (1 RJ-45 for control / monitoring, 1 RJ-45 for data (video IP sub module included)), includes control panel
MOUNTING FRAME OPTIONS	
SELOPT-LCP	Optional local control panel
SELOPT-PSU-AC	Optional AC power supply module
SELOPT-PSU-DC	Optional DC power supply module
SELOPT-CTR-RR	Optional controller module with 1 RJ-45 for control and monitoring and 1 RJ-45 for data (video IP submodule required)
SELOPT-CTR-RR-IP	Optional controller module with 1 RJ-45 for control and monitoring and 1 RJ-45 for data (video IP), video IP submodule included
SELOPT-VIDEO-IP	Optional video IP submodule for controller module
SELOPT-FAN	Spare fan
ACCESSORIES	
OP+SFP+TRMM+1G	1000BASE-SX fiber small form factor pluggable (SFP) transceiver. Up to 1.25 Gb/s bi-directional data links, up to 500m on 50/125 µm MMF, 220 m on 62.5/125 µm MMF
164-100113Q00	Spare blank back module
SELOPT-TOOL-CABLE	HD-BNC insertion/extraction tool
SELOPTCAB-HD-BNC-V	HD-BNC video adapter cable
SELOPTCAB-HD-BNC-A	HD-BNC audio adapter cable



SERVICEPAKS	
SEL-QS	1-day Quickstart Commissioning for Selenio to be performed by a Certified Selenio Technician (includes travel time, travel and expenses)
SEL-QS-NT	1-day QuickStart Commissioning for Selenio to be performed by a Certified Selenio Technician (excludes travel time, travel and expenses)
SEL-GL	1-day Go Live Support for Selenio to be performed by a Certified Selenio Technician (includes travel time, travel and expenses)
SEL-GL-NT	1-day Go Live Support for Selenio to be performed by a Certified Selenio Technician (excludes travel time, travel and expenses)
SEL-FR3-BASIC	1-year BASIC ServicePAK for Selenio SEL-FR3-AC-RR (frame, power supplies, controllers)
SEL-FR3-GOLD	1-year GOLD ServicePAK for Selenio SEL-FR3-AC-RR (frame, power supplies, controllers)
SEL-FR3-IP-BASIC	1-year BASIC ServicePAK for Selenio SEL-FR3-AC-RR-IP or SEL-FR3-AC-RO-IP (frame, power supplies, controllers, video IP submodules)
SEL-FR3-IP-GOLD	1-year GOLD ServicePAK for Selenio SEL-FR3-AC-RR-IP or SEL-FR3-AC-RO-IP
SEL-PSU-BASIC	1-year BASIC ServicePAK for Selenio power Supply
SEL-PSU-GOLD	1-year GOLD ServicePAK for Selenio power Supply
SEL-LCP-BASIC	1-year BASIC ServicePAK for Selenio local control panel
SEL-LCP-GOLD	1-year GOLD ServicePAK for Selenio local control panel
SEL-CTR-BASIC	1-year BASIC ServicePAK for Selenio SELOPT-CTR-RR controller
SEL-CTR-GOLD	1-year GOLD ServicePAK for Selenio SELOPT-CTR-RR controller
SEL-CTR-IP-BASIC	1-year BASIC ServicePAK for Selenio SELOPT-CTR-RR-IP and SELOPT-CTR-RO-IP controllers
SEL-CTR-IP-GOLD	1-year GOLD ServicePAK for Selenio SELOPT-CTR-RR-IP and SELOPT-CTR-RO-IP controllers

## Selenio™ MCP3 Web-based GUI



## Selenio™ MCP3 Rear View

