5700MSC–IP

IP Network Grand Master Clock and Video Master Clock System

The 5700MSC–IP is an IP network grandmaster clock and video master sync generator capable of being referenced to GPS and GLONASS global navigation satellite constellations with the included smart antenna, and additionally Galileo and Beidou in L1 and L5 bands with the optional MSC-RF-ADAPT-720 GNSS receiver and MSC-RF-HEAD-720 Dual Band multi-GNSS RF antenna. The system features 2x 1GbE, 2x10GbE ports, 6x independently configurable and fully timeable Sync outputs, 4x SDI video test generator outputs*1 and a loop-through input. For hybrid plants where LTC outputs, DARS and AES/analog audio test generator signals are required, an optional (+AUX) expansion module is available. This combo IP network grandmaster clock and master sync generator is ideal for timing today's SMPTE 2110 IP–based video broadcast, production and distribution facilities. It provides all the future timing needs of an IP–based plant while providing precision reference to baseband SDI/Analog facilities.

The +SDI-TG test generator option provides several test signals available on the 4x independently configurable SDI (SD/HD/3Gbps) outputs that may be combined to form a 4K UHD test signal generator capable with 2SI or Square Division format.

The +10G-TG test generator*2 option includes the above SDI test generator feature and adds 6x independently configurable SMPTE 2110 IP outputs in HD and 3G format with SMPTE 2022-7 capability delivering 3 sets of test signals. The +10G-TG option*2 also supports 4K UHD in 2SI or Square Division by combining four outputs.

As for IP timing formats, the 5700MSC–IP has been designed to be enterprise class, with 4x independently configurable IP timing interfaces (2x 10GbE*2 and 2x1GbE) for unmatched flexibility and robustness. The architect may now design fault-tolerant meshed timing systems capable of recovering from single points of network failure without resorting to failing over to a degraded grandmaster. PTP profiles include SMPTE 2059-2, AES67 and IEEE1588 Annex J. NTP is supported on all four IP timing interfaces as well as the dedicated control network interface. PCR is supported on 4x IP timing interfaces for workflows where required.

*1 +SDITG SDI video test signal generator option required.
*2 Optional single-mode and multi-mode 10GbE SFPs not included.

Features & Benefits

- Oven Controlled Crystal Oscillator (OCXO) with 0.01ppm free run stability for ultra-stable timing accuracy and reference signal generation
- IP network grandmaster clock for NTP, PTP (SMPTE 2059-2, AES67 and IEEE1588 Annex J), PCR
- 6x independently timeable sync outputs and 4x optional SDI test generator outputs (+SDI–TG), supports SD/HD/3G SDI
- Optional 10GbE video test generator support (+10G–TG), (SFPs not included)
- Configurable to run in Boundary Clock Mode for larger enterprise scale network designs (with an upstream PTP Grandmaster)
- GNSS (GPS, GLONASS) referenced system — outdoor antenna and 50ft cable provided, more options available
- Optional Dual Band (L1 and L5) GNSS receiver supporting GPS, GLONASS, Galileo and Beidou satellite constellations
- Contact closure output for critical warning
- Optional AES and analogue audio test generator, LTC, DARS and GPIO functionality (+AUX)

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Specifications

Analog Sync Outputs:

Standards:	
Black Burst:	SMPTE ST170 (NTSC–M), ITU–R BT.1700–1 (PAL–B)
Bi–Level:	Slo–Pal 625i/48, 625i/47.95, 480p/59.94
HD Tri–Level:	SMPTE ST274 (1080p/23.98, 1080p/24, 1080i/50, 1080i/59.94, 1080i/60, 1080p/23.98sF, 1080p/24sF, 1080p/25, 1080p/29.97, 1080p/30, 1080p/50, 1080p/59.94, 1080p/60); SMPTE ST296 (720p/59.94, 720p/60, 720p/50, 720p/30, 720p/24)
Pulse Signals:	PAL color frame, 1Hz pulse, IRIG DATUM 1/1.001Hz pulse, 6/1.001Hz pulse
CW Signals:	5MHz, 10MHz, NTSC–M subcarrier, PAL–B subcarrier
Wordclock:	48kHz wordclock level 5V CMOS (1kΩ) or ± 1V (75Ω)
10MHz Output:	1.0V p–p, 2.0V p–p, in 75Ω, SNR > 70dB rms SFDR > 50dBc
Connector:	75Ω HD–BNC
No. of Outputs:	6
DC Offset:	0V ± 0.05V
Return Loss:	> 40dB up to 10MHz
SNR:	> 75dB rms
Output Levels:	1.0V p–p, 2.0V p–p, in 75Ω, selectable

GPS/GLONASS Receiver:

Temperature:	-40 to 70°C
Humidity:	95% relative humidity, condensing at 60°C

1000BASE–T Timing Network:

Quantity:	2
Network Type:	IEEE 802.3 (10BASE–T), IEEE 802.3u (100BASE–TX), IEEE 802.3ab (1000BASE–T)
Connector:	RJ–45
Timing:	NTP, PTP (SMPTE 2059-2, AES67 and IEEE1588 Annex J), PCR

10GbE Timing Network:

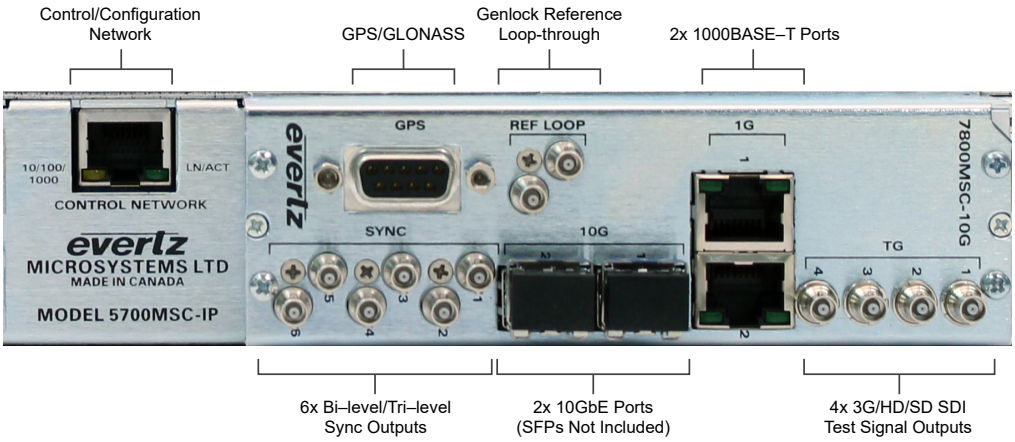
Quantity:	2
Network Type:	IEEE 802.3ae (10GbE)
Connector:	SFP (not included), LC/UPC
Timing:	NTP, PTP (SMPTE 2059-2, AES67 and IEEE1588 Annex J), PCR

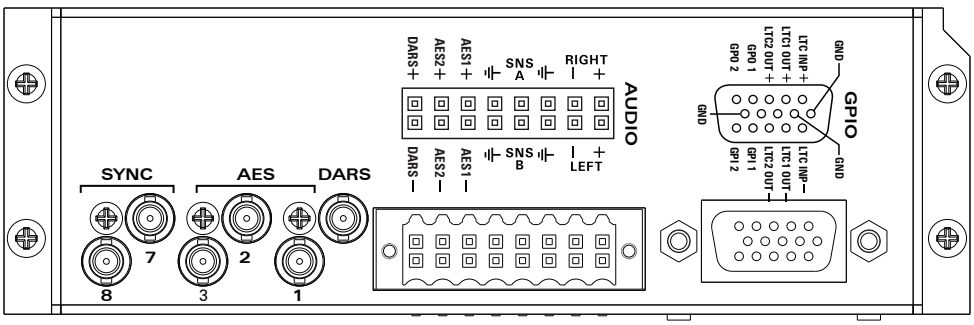
The 5700MSC–IP is delivered with a GNSS smart antenna/receiver (GPS and GLONASS capable) complete with a 50ft cable for remote mounting (100ft, 200ft, 400ft, 800ft, 1200ft and fiber optic extension options are available for longer cable lengths).

A high stability, oven controlled oscillator provides the 5700MSC–IP with better than 1.0x10–8 (or 0.01ppm) frequency reference. The free running drift of this 10MHz reference will be less than 0.1Hz (which amounts to less than one millisecond time drift per day). This guarantees that any frequency drift, with time and temperature will be within the tolerances expected from the best SPGs or master clocks available in the industry.

The SPG section of the 5700MSC–IP provides 6x independent timeable reference outputs. These six sync outputs may be configured to provide independently timed color black (black burst) outputs, independently timed HDTV tri–level sync outputs, 10MHz outputs, word clock, and other bespoke continuous wave signals. Available with a main processing board and optional redundant power supply.

Rear Panel View





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Specifications (continued)

Genlock Input (Video/10MHz Selectable):

Type:	Auto–detects standard SMPTE ST170 (NTSC–M), ITU–R BT.1700–1(PAL–B), color black 1V p–p with optional VITC and 10–field pulse HD tri–level sync (same HD standards as sync outputs)
No. of Inputs:	2x loop–thru high impedance, isolated, differential external termination required
Connector:	75Ω HD–BNC
Return Loss:	> 40dB to 10MHz (with external 75Ω termination)
Input Level Range:	
Video:	-3.5dB (double terminated) to +6dB (un–terminated)
10MHz:	0.3V p–p to 4.0V
Frequency Lock Range:	
Wide Mode:	± 15ppm min.
Narrow Mode:	± 0.1ppm min.

SDI Test Generators (with +SDI–TG or +10G–TG option):

Standards:	SMPTE ST259–C (270Mbs), ST292–1 4:2:2, ST372 dual link, ST424; quad link ST292–1 4:2:2, quad link ST424 4:2:2; ST425–3 dual link 3Gb/s, ST425–5 quad link 3Gb/s
No. of Outputs:	4
Embedded Audio:	Up to 4x audio groups as specified in SMPTE ST 299–1 or SMPTE ST272; selectable tone frequencies (from 20Hz to 12kHz) and audio group
Connector:	75Ω HD–BNC
Signal Level:	800mV nominal drive
DC Offset:	0V ± 0.5V
Rise/Fall Time:	100ps HD/3G, 600ps SD
Overshoot:	< 10% of amplitude
Jitter:	< 0.2 UI
Return Loss:	> 15dB to 1.5GHz > 10dB to 3GHz

Electrical:

Voltage:	Auto–ranging 100–240V AC, 50/60Hz
Configuration:	Optional redundant supply available
Power:	125W (all options installed)
Safety:	CAN/CSA-C22.2 No. 62368-1:14 UL 62368-1 2nd Ed.
EMI/RFI:	Complies with FCC part 15, Class A; complies with EU EMC directives

Physical:

Dimensions:	19” W x 1.75” H x 11.5” D (483 x 45 x 292 mm) Weight: 8lbs (3.5kg)

Ordering Information

5700MSC–IP	Master Sync Generator for an IP or hybrid facility with GPS included. 6 syncs (NTSC, PAL, HD, subcarrier and Pulses). 4 SD/HD/3G TG outputs (requires +SDI-TG or +10GTG license). 2 10G Ethernets for NTP, PTP, PCR and test generator signals (test generator signals require +10GTG license). 2 1G Ethernets for NTP, PTP, PCR and Vistalink. 1 1G Ethernet for VistaLINK, NTP and syslog.

Ordering Options:

+2PS	Redundant Power Supply Option
+SDI–TG	4 outputs, configurable SD/HD/3G SDI Test/black generators
+10G–TG	Test Generator outputs over 10 GbE Ports, 4 outputs, configurable SD/HD/3G SDI Test/black generators
+AUX	Includes expansion test module which provides AES & Analog audio test generator, DARS, GPIO, and LTC outputs.

SFP Interface Options:

SFP10G–TR13–J SFP+	SFP+ Optical Transceiver, 10Gbps, 1310nm, SMF, 10km
SFP10G-TR85-J SFP+	SFP+ Optical Transceiver, 10Gbps, 850nm, MMF, 300m*

* On 2000MHz/km MMF, consult Evertz for max distance on other multimode fiber types