

The 5700MSC–IP is an IP Network Grand Master Clock and a Video Master Sync Generator both referenced to GPS and/or GLONASS. The system features 2x GbE, 2x10GbE ports, 6x fully timeable sync outputs, 4x SDI outputs and a loop thru reference input. For those hyrbrid plants where LTC outputs and AES/analog audio test sets are required, an optional (+AUX) expansion module is available.

This combo IP Network Grand Master Clock and Master Sync Generator is ideal for timing today's 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 any baseband SDI/Analog systems.

The test generator option(s) provide several test sets which are available on the 4x SDI (SD/HD/3Gbps) outputs as well as over the 10GbE IP outputs (10GbE SFP's are optional). There are 10x independent test signal generators when a test generator option is ordered, any can be routed to the 10GbE outputs, or the SDI outputs (4 generators may be combined to form a 4K signal generator).

As for IP timing formats, the 5700MSC–IP has been designed to be enterprise class, handling all current IP timing needs with the horsepower to address the future. It supports NTP, PTP–IEEE1588, MASTER PCR, AVB–IEEE802.1AS, AES67 profile, and SMPTE 2059–2. IP networking for live production and broadcast environments have very specific needs and requirements that typically involve deterministic flows, high bandwidth, and an SDN–based network design. The 5700MSC–IP can be used to design a robust, safe and

deterministic timing system for any IP Network or Hybrid IP/Baseband Video system. The product has been designed to handle timing requirements of several thousands of PTP clients. The 5700MSC–IP has 2x 10 GbE ports as well as two GbE ports that can be configured to provide and distribute any of the timing protocols described above.

This 5700MSC–IP is delivered with a GNSS head (GPS and GLONASS capable) complete with a 50ft cable for remote mounting (100ft, 400ft and fiber optic extension options are available for longer cable lengths).

A high stability, temperature–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 then 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. Note that the provided GNSS antenna is required for PTP, AVB PCR, or 2059–2 timing protocols to be hosted by the system.

The SPG section of the 5700MSC–IP provides six 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 various available pulses.

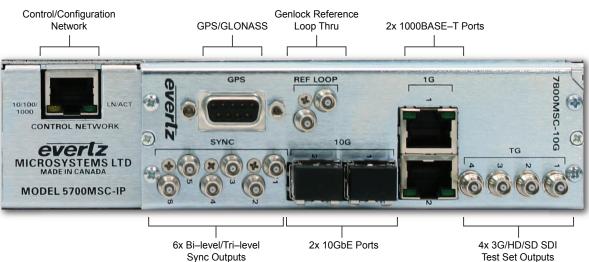
It is available with a main processing board and optional redundant power supply.

# Features & Benefits

- Modular 1RU design
- IP Network Grand Master Clock for NTP, PTP–IEEE1588, MASTER PCR, AVB–IEEE802.1AS, and SMPTE 2059–2
- 2x 1000BaseT RJ-45 ports
- 2x 10GbE ports (SFP's are not provided and are optional)
- 6x independently timeable sync outputs
- 4x optional SDI test generator outputs with the +SDI–TG option (supports SD/HD/3Gbs SDI)
- Optional 10GbE video test generator support with the
- +10G–TG option (SFP's are not included)
- Configurable to run in Boundary Clock mode for larger enterprise scale network designs (with an upstream 5700MSC–IP Grand Master Clock)
- GNSS (GPS and/or GLONASS) referenced system outdoor antenna and 50ft cable provided
- · Optional 100ft, 400ft and fiber optic extenders available for GNSS antenna
- All active components are front panel extractable & serviceable
- Optional dual power supply for redundancy (+2PS option)
- Full featured front panel control interface
- · Contact closure output for critical warning
- VistaLINK<sup>®</sup> control for device configuration and status monitoring
- Multi System GPS referenced designs will be in sync and timed
- An optional expansion module (+AUX option) provides AES and analog audio test generator, LTC, DARS and GPIO functionality

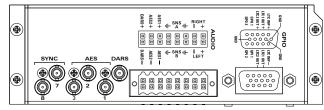


### Rear Panel View



# 5700MSC-IP IP Network Grand Master Clock & Video Master Clock System

Analog Sync Output	s:	Timing:	NTP, PCR		SMPTE ST 372 dual link,
Output Standards:			AVB (IEEE802.1AS)		and SMPTE ST 424
Black Burst:	SMPTE ST 170 (NTSC–M), ITU–R BT.1700–1 (PAL–B)		IEEE1588 (annex J) SMPTE 2059–2		SMPTE ST 259–C (270Mb/s), SMPTE ST 292–1 4:2:2,
Bi–Level:	Slo–Pal 625i/48, 625i/47.95, 480p/59.94		AES67		SMPTE ST 372 dual link, and SMPTE ST 424
HD Tri–Level:	SMPTE ST 274 (1080p/23.98,	10GbE Timing Netw	ork:		Quad link SMPTE ST 292-1 4:2:2
	1080p/24, 1080i/50, 1080i/59.94, Quantity: 2				Quad link SMPTE ST 424 4:2:2
	1080i/60, 1080p/23.98sF,	Network Type:	IEEE 802.3ae (10GbE)		SMPTE ST 425-3 Dual link 3Gb/s
	1080p/24sF, 1080p/25,	Connector:	SFP (SFP not included), LC/UPC		SMPTE ST 425–5 Quad link 3Gb/
	1080p/29.97, 1080p/30, 1080p/50,	Timing:	NTP, PCR	Number of Outputs:	4
	1080p/59.94, 1080p/60),		AVB (IEEE802.1AS)	Embedded Audio:	Up to 4x audio groups as specified
	SMPTE ST 296 (720p/59.94,		IEEE1588 (annex J)		SMPTE ST 299–1 or
B / 0' /	720p/60, 720p/50, 720p/30, 720p/24)		SMPTE 2059–2		SMPTE ST 272
Pulse Signals:	PAL color frame, 1Hz pulse,		AES67		Selectable tone
	IRIG DATUM 1/1.001Hz pulse,	Combook Innut ()/ide			frequencies (from 20Hz
CW Signals:	6/1.001Hz pulse 5MHz, 10MHz, NTSC–M	Type:	o/10MHz selectable): Autodetects standard	Connector:	to 12kHz) and audio group 75Ω HD–BNC
GW Signais.	Subcarrier, PAL–B Subcarrier	Type.	SMPTE ST 170 (NTSC–M),	Signal Level:	800mV nominal drive
Wordclock:	48KHz Wordclock		ITU-R BT.1700–1 (PAL–B),	DC Offset:	0V ±0.5V
	Level 5V CMOS (1k $\Omega$ ) or ±1V (75 $\Omega$ )		Color Black 1V p-p with optional	Rise and Fall Time:	100ps HD/3G, 600ps SD
10MHz Output:	$1.0V p-p, 2.0V p-p, in 75\Omega,$		VITC and 10-field pulse	Overshoot:	< 10% of amplitude
	SNR > 70dB rms		HD Tri–level Sync (same	Jitter:	< 0.2 UI
	SFDR > 50dBc		HD standards as sync outputs)	Return Loss:	> 15dB to 1.5GHz
Connector:	75Ω HD–BNC	Number of Inputs:	2 Loop-thru		> 10dB to 3GHz
Number of Outputs:	6		High impedance, isolated,		
DC Offset:	0V ±0.05V		differential external	Electrical:	
Return Loss:	> 40dB up to 10MHz		termination required	Voltage:	Auto-ranging 100 to 240V AC,
SNR:	> 75dB rms	Connector:	75Ω HD-BNC	Orafianation	50/60Hz
Output Levels:	1.0V p-p, 2.0V p-p,	Return Loss:	>40dB to 10MHz (with	Configuration:	Optional redundant
	in 75Ω, selectable	Input Level Range:	external 75Ω termination)	Power:	supply available 125W (all options installed)
GPS/GLONASS Rec	eiver:	Video:	-3.5dB (double-terminated) to	Safety:	TüV Listed
Temperature:	-40°C to +70°C	video.	+6dB (un-terminated)	Galety.	Complies with EU safety directives
Humidity:	95% R.H. Condensing at 60°C	10MHz:	0.3V p-p to 4.0V	EMI/RFI:	Complies with FCC Part 15 Class
		Frequency Lock Rang			Complies with EU EMC Directive
1000BASE-T Timing	Network:	Wide mode:	±15ppm min		
Quantity:	2	Narrow mode:	±0.1ppm min	Physical:	
Network Type:	IEEE 802.3 (10BASE-T)			Dimensions:	19" W x 1.75" H x 11.5" D
	IEEE 802.3u (100BASE-TX)	SDI Test Generators			(483mm W x 45mm H x 292mm D)
- ·	IEEE 802.3ab (1000BASE-T)	(with +SDI-TG, or +		Weight:	8lbs (3.5kg)
Connector:	RJ-45	Standards:	SMPTE ST 259-C (270Mb/s),		
			SMPTE ST 292–1 4:2:2,		
	on Module Option (AES & A	nalog Audio Test Balanced:			66Ω
TC Outputer		Dalaliceu.	AES3 (24-bit)	Output Impedance: Signal Level:	–30 to +10dBu into 10kΩ load
	SMPTE ST 12_2 or IPIC B		$(4)/n_n 1100$ terminated)		
Standard:	SMPTE ST 12–2 or IRIG–B 24, 25, 30 and 29,97	Number of Outpute:	(4V p-p 110Ω terminated)		< 10mV
Standard:	24, 25, 30 and 29.97	Number of Outputs: DARS:		DC Offset:	< 10mV < –90dBu, unweighted
Standard: Frame Rate:		DARS:	1 unbalanced, 1 balanced		< -90dBu, unweighted
Standard: Frame Rate: Number of outputs:	24, 25, 30 and 29.97 (drop frame and non-drop frame)			DC Offset: Noise floor:	
Standard: Frame Rate: Number of outputs: Connectors:	24, 25, 30 and 29.97 (drop frame and non–drop frame) 2x balanced	DARS: AES Test Gen:	1 unbalanced, 1 balanced	DC Offset: Noise floor:	< –90dBu, unweighted < –100dB with 1kHz @ +10dBu
Standard: Frame Rate: Number of outputs: Connectors: Level: Un–powered:	24, 25, 30 and 29.97 (drop frame and non–drop frame) 2x balanced Female high density DB–15 Adjustable, 1.0–8.0V p–p, balanced	DARS: AES Test Gen: Connector: Unbalanced: Balanced:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip	DČ Offset: Noise floor: THD+N: General Purpose In	< -90dBu, unweighted < -100dB with 1kHz @ +10dBu into 10kΩ load
Standard: Frame Rate: Number of outputs: Connectors: Level:	24, 25, 30 and 29.97 (drop frame and non–drop frame) 2x balanced Female high density DB–15 Adjustable, 1.0–8.0V p–p, balanced 2V p–p with 11V DC offset to drive	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC	DČ Offset: Noise floor: THD+N: General Purpose In Number of Inputs:	< -90dBu, unweighted < -100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2
Standard: Frame Rate: Number of outputs: Connectors: Level: Un-powered:	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz	DČ Offset: Noise floor: THD+N: General Purpose In Number of Inputs: Number of Outputs:	<-90dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 2 (function menu selectable)
Standard: Frame Rate: Number of outputs: Connectors: Level: <i>Un-powered:</i> <i>Powered</i> :	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave clocks on LTC1 only	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz 75Ω unbalanced	DČ Offset: Noise floor: THD+N: General Purpose In Number of Inputs:	<-00dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 2 (function menu selectable) Opto-isolated, active closure
Standard: Frame Rate: Number of outputs: Connectors: Level: <i>Un-powered:</i> <i>Powered:</i> Output Impedance:	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave clocks on LTC1 only 44 $\Omega$ balanced (un-powered)	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced	DC Offset: Noise floor: THD+N: General Purpose In Number of Inputs: Number of Outputs: Output Type:	<-90dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V
Standard: Frame Rate: Number of outputs: Connectors: Level: <i>Un-powered:</i> <i>Powered:</i> Output Impedance: Rise Time:	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave clocks on LTC1 only 44 $\Omega$ balanced (un-powered) 40 ±10 µs	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz 75Ω unbalanced	DČ Offset: Noise floor: THD+N: General Purpose In Number of Inputs: Number of Outputs:	<-00dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure
Standard: Frame Rate: Number of outputs: Connectors: Level: <i>Un-powered:</i> <i>Powered:</i> Output Impedance: Rise Time:	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave clocks on LTC1 only 44 $\Omega$ balanced (un-powered)	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: AES Tones:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable	DČ Offset: Noise floor: THD+N: General Purpose In Number of Inputs: Number of Outputs: Output Type: Input Type:	<-00dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V
Standard: Frame Rate: Number of outputs: Connectors: Level: <i>Un-powered:</i> <i>Powered:</i> Output Impedance: Rise Time: Jitter:	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave clocks on LTC1 only 4 $\Omega$ balanced (un-powered) 40 ±10µs < 2µs	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedanced: Unbalanced: Balanced: AES Tones: Analog Audio Tone	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable Generator:	DC Offset: Noise floor: THD+N: General Purpose In Number of Inputs: Number of Outputs: Output Type:	<-90dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V 4 pins plus 2 ground pins
Standard: Frame Rate: Number of outputs: Connectors: Level: <i>Un-powered:</i> <i>Powered:</i> Output Impedance: Rise Time: Jitter: DARS & AES Test G	24, 25, 30 and 29.97 (drop frame and non-drop frame) 2x balanced Female high density DB-15 Adjustable, 1.0-8.0V p-p, balanced 2V p-p with 11V DC offset to drive downstream 1200 series slave clocks on LTC1 only 4 $\Omega$ balanced (un-powered) 40 ±10µs < 2µs	DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedanced: Unbalanced: Balanced: AES Tones: Analog Audio Tone Number of Outputs:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced 75Ω HD–BNC Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable Generator: 2	DČ Offset: Noise floor: THD+N: General Purpose In Number of Inputs: Number of Outputs: Output Type: Input Type:	<-00dBu, unweighted <-100dB with 1kHz @ +10dBu into 10kΩ load puts and Output: 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V
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Pordering Information				
5700MSC-IP	IP Network Grand Master Clock & Video Master Clock System (includes GPS/GLONASS receiver antenna & 50ft cable, loop thru genlock, IEEE 1588, 2x 1000GbE ports, 6x sync outputs, 2x10GbE ports (10GbE SFP's not included) and 1x power supply)	Ordering Options: +2PS +SDI-TG +10G-TG	Redundant Power Supply 4x outputs, configurable SD/HD/3G SDI Test/black generators Test Generater outputs over 10GbE Ports and 4x SDI outputs,	
SFP Options: +SFP10G-TR13-A	1310nm laser, standard sensitivity 1310nm optical transceiver, 10km, single mode	+AUX	configurable SD/HD/3G SDI Test/black generators (* includes +SDI–TG option) Includes expansion test module which provides AES and Analog audio test generator, DARS, GPIO, and LTC outputs	



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The test generator option(s) provide several test sets which are available on the 4x SDI (SD/HD/3Gbps) outputs as well as over the 10GbE IP outputs (10GbE SFP's are optional). There are 10x independent test signal generators when a test generator option is ordered, any can be routed to the 10GbE outputs, or the SDI outputs (4 generators may be combined to form a 4K signal generator).

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deterministic timing system for any IP Network or Hybrid IP/Baseband Video system. The product has been designed to handle timing requirements of several thousands of PTP clients. The 5700MSC–IP has 2x 10 GbE ports as well as two GbE ports that can be configured to provide and distribute any of the timing protocols described above.

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The SPG section of the 5700MSC–IP provides six 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 various available pulses.

It is available with a main processing board and optional redundant power supply.

# Features & Benefits

- Modular 1RU design
- IP Network Grand Master Clock for NTP, PTP–IEEE1588, MASTER PCR, AVB–IEEE802.1AS, and SMPTE 2059–2
- 2x 1000BaseT RJ-45 ports

10/100

- 2x 10GbE ports (SFP's are not provided and are optional)
- 6x independently timeable sync outputs
- 4x optional SDI test generator outputs with the +SDI–TG option (supports SD/HD/3Gbs SDI)
- Optional 10GbE video test generator support with the

Control/Configuration

Network

CONTROL NETWORK

everlz

MICROSYSTEMS LTD MADE IN CANADA MODEL 5700MSC-IP

- +10G–TG option (SFP's are not included)
- Configurable to run in Boundary Clock mode for larger enterprise scale network designs (with an upstream 5700MSC–IP Grand Master Clock)
- GNSS (GPS and/or GLONASS) referenced system outdoor antenna and 50ft cable provided
- · Optional 100ft, 400ft and fiber optic extenders available for GNSS antenna
- All active components are front panel extractable & serviceable
- Optional dual power supply for redundancy (+2PS option)
- Full featured front panel control interface
- Contact closure output for critical warning
- · VistaLINK<sup>®</sup> control for device configuration and status monitoring
- Multi System GPS referenced designs will be in sync and timed
- An optional expansion module (+AUX option) provides AES and analog audio test generator, LTC, DARS and GPIO functionality

2x 1000BASE-T Ports

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800MSC-10G

TG

4x 3G/HD/SD SDI

Test Set Outputs



Sync Outputs

Ve

Rear Panel View

**GPS/GLONASS** 

GPS

SYNC

6x Bi-level/Tri-level

Genlock Reference

Loop Thru

REF LOOP

10G

2x 10GbE Ports

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Analog Sync Outpu	ts:	Timing:	NTP, PCR		SMPTE ST 372 dual link,
Output Standards:			AVB (IEEE802.1AS)		and SMPTE ST 424
Black Burst:	SMPTE ST 170 (NTSC-M),		IEEE1588 (annex J)		SMPTE ST 259-C (270Mb/s),
Bi–Level:	ITU–R BT.1700–1 (PAL–B) Slo–Pal 625i/48, 625i/47.95, 480p/59.94		SMPTE 2059–2 AES67		SMPTE ST 292–1 4:2:2, SMPTE ST 372 dual link, and SMDTE ST 424
HD Tri–Level:	480p/59.94 SMPTE ST 274 (1080p/23.98,	10GbE Timing Netw	lork:		and SMPTE ST 424 Quad link SMPTE ST 292–1 4:2:2
	1080p/24, 1080i/50, 1080i/59.94,	Quantity:	2		Quad link SMPTE ST 424 4:2:2
	1080i/60, 1080p/23.98sF,	Network Type:			SMPTE ST 425–3 Dual link 3Gb/s
	1080p/24sF, 1080p/25,	Connector:	SFP (SFP not included), LC/UPC		SMPTE ST 425-5 Quad link 3Gb
	1080p/29.97, 1080p/30, 1080p/50,	Timing:	NTP, PCR	Number of Outputs:	4
	1080p/59.94, 1080p/60),		AVB (IEEE802.1AS)	Embedded Audio:	Up to 4x audio groups as specified
	SMPTE ST 296 (720p/59.94,		IEEE1588 (annex J)		SMPTE ST 299–1 or
Dulas Siznalai	720p/60, 720p/50, 720p/30, 720p/24)		SMPTE 2059–2		SMPTE ST 272 Selectable tone
Pulse Signals:	PAL color frame, 1Hz pulse, IRIG DATUM 1/1.001Hz pulse,		AES67		frequencies (from 20Hz
	6/1.001Hz pulse	Genlock Input (Vide	eo/10MHz selectable):		to 12kHz) and audio group
CW Signals:	5MHz, 10MHz, NTSC–M	Туре:	Autodetects standard	Connector:	75Ω HDBNC
	Subcarrier, PAL-B Subcarrier	<b>J</b> 1 <sup>-2</sup>	SMPTE ST 170 (NTSC-M),	Signal Level:	800mV nominal drive
Wordclock:	48KHz Wordclock		ITU-R BT.1700-1 (PAL-B),	DC Offset:	0V ±0.5V
	Level 5V CMOS (1k $\Omega$ ) or ±1V (75 $\Omega$ )		Color Black 1V p-p with optional	Rise and Fall Time:	100ps HD/3G, 600ps SD
10MHz Output:	1.0V p–p, 2.0V p–p, in 75Ω,		VITC and 10-field pulse	Overshoot:	< 10% of amplitude
	SNR > 70dB rms		HD Tri-level Sync (same	Jitter:	< 0.2 UI
oppostor:	SFDR > 50dBc	Number of Innuts	HD standards as sync outputs)	Return Loss:	> 15dB to 1.5GHz
connector:	75Ω Mini BNC, bayonet positive locking (Amphenol)	Number of Inputs:	2 Loop–thru High impedance, isolated,		> 10dB to 3GHz
lumber of Outputs:	6		differential external	Electrical:	
C Offset:	0V ±0.05V		termination required	Voltage:	Auto-ranging 100 to 240V AC,
Return Loss:	> 40dB up to 10MHz	Connector:	75Ω Mini BNC, bayonet positive		50/60Hz
NR:	> 75dB rms		locking (Amphenol)	Configuration:	Optional redundant
Output Levels:	1.0V p-p, 2.0V p-p,	Return Loss:	>40dB to 10MHz (with		supply available
	in 75Ω, selectable	=	external 75Ω termination)	Power:	125W (all options installed)
	alvan	Input Level Range:	2 EdD (double to main to d) t	Safety:	TüV Listed
PS/GLONASS Rec		Video:	-3.5dB (double-terminated) to		Complies with EU safety directive Complies with FCC Part 15 Class
emperature: lumidity:	-40°C to +70°C 95% R.H. Condensing at 60°C	10MHz:	+6dB (un–terminated) 0.3V p–p to 4.0V	EMI/RFI:	Complies with EU EMC Directive
.a.many.	seventin contending at 00 C	Frequency Lock Ran			Complete with LO LINE Directive
000BASE-T Timing	Network:	Wide mode:	±15ppm min	Physical:	
Quantity:	2	Narrow mode:	±0.1ppm min	Dimensions:	19" W x 1.75" H x 11.5" D
Network Type:	IEEE 802.3 (10BASE-T)				(483mm W x 45mm H x 292mm D
	IEEE 802.3u (100BASE-TX)	SDI Test Generators		Weight:	8lbs (3.5kg)
Connoctor	IEEE 802.3ab (1000BASE–T)	(with +SDI-TG, or +			
Connector:	RJ-45	Standards:	SMPTE ST 259–C (270Mb/s), SMPTE ST 292–1 4:2:2,		
	ion Module Option (AES & A				
TC Outputs:		Balanced:	AES3 (24-bit)	Output Impedance:	66Ω
standard:	SMPTE ST 12–2 or IRIG–B	Number (C. )	(4V p–p 110Ω terminated)	Signal Level:	-30 to +10dBu into 10kΩ load
rame Rate:	24, 25, 30 and 29.97	Number of Outputs:	1 unholonood 1 holonood	DC Offset:	< 10mV
lumber of outputs:	(drop frame and non–drop frame) 2x balanced	DARS: AES Test Gen:	1 unbalanced, 1 balanced 2 unbalanced, 2 balanced	Noise floor: THD+N:	< –90dBu, unweighted < –100dB with 1kHz @ +10dBu
Connectors:	2x balanced 3–pin male XLR type, Female DB–15	Connector:			< =100dB with 1kHz @ +10dBu into 10kΩ load
evel:		Unbalanced:	BNC per IEC 61169–8 Annex A		
Un–powered:	Adjustable, 1.0-8.0V p-p, balanced	Balanced:	Removable Terminal Strip	General Purpose In	puts and Output:
Powered:	2V p-p with 11V DC offset to drive	Sampling Rate:	48kHz	Number of Inputs:	2
	downstream 1200 series slave	Impedance:		Number of Outputs:	2 (function menu selectable)
	clocks on LTC1 only	Unbalanced:	75Ω unbalanced	Output Type:	Opto-isolated, active closure
output Impedance:	44Ω balanced (un–powered)	Balanced:	110Ω balanced	la sut Tax	to GND, $20k\Omega$ pull–ups to +5V
Rise Time:	40 ±10µs	AES Tones:	Menu selectable	Input Type:	Opto-isolated, senses closure
itter:	< 2µs	Analog Audio Tone	Generator:	Connector	to GND, pull–ups to +5V 4 pins plus 2 ground pins
	enerator Outputs:	Number of Outputs:	2	Connector:	on DB–15 female
ARS & AFS Test G	enerator outputo.	Type:	Z Balanced analog audio		
		Connector:	6 pins on 16–pin removable		
	SMPTE ST 276–1 single–ended		terminal strips		
tandard:	SMPTE ST 276–1 single–ended AES (24–bit) (1V p–p into $75\Omega$ )				
Standard:					
DARS & AES Test G Standard: Unbalanced:					
Standard:	AES (24-bit) (1V p-p into 75Ω)		10:00 10 10:00 10		
Standard:				_/ I( <b>a</b> -)	
Standard:	AES (24-bit) (1V p-p into 75Ω)				
tandard:	AES (24-bit) (1V p-p into 75Ω)			_/ I( <b>a</b> -)	
tandard:	AES (24-bit) (1V p-p into 75Ω)			GPIO	
tandard:	AES (24-bit) (1V p-p into 75Ω)	<b>@ @ @ @ @ !</b>		GPIO	
andard:	AES (24-bit) (1V p-p into 75Ω)	<b>@ @ @ @ @ !</b>		GPIO	
tandard:	AES (24-bit) (1V p-p into 75Ω)	<b>@ @ @ @ @ !</b>		GPIO	

Ordering Information	mation		
5700MSC-IP	IP Network Grand Master Clock & Video Master Clock System (includes GPS/GLONASS receiver antenna & 50ft cable, loop thru genlock, IEEE 1588, 2x 1000GbE ports, 6x sync outputs, 2x10GbE ports (10GbE SFP's not included) and 1x power supply)	Ordering Options +2PS +SDI-TG +10G-TG	Redundant Power Supply 4x outputs, configurable SD/HD/3G SDI Test/black generators Test Generater outputs over 10GbE Ports and 4x SDI outputs, configurable SDI U/C2 SDI Test/black generators
SFP Options: +SFP10G-TR13-A	1310nm laser, standard sensitivity 1310nm optical transceiver, 10km, single mode	+AUX	configurable SD/HD/3G SDI Test/black generators (* includes +SDI–TG option) Includes expansion test module which provides AES and Analog audio test generator, DARS, GPIO, and LTC outputs



The 5700MSC-IP is an IP Network Grand Master Clock and a Video Master Sync Generator both referenced to GPS (or GNSS). The system features 2 x GbE, 2 x 10GbE ports, 6 fully timeable sync outputs, 4 SDI outputs, and a loop thru reference input. For those hybrid plants where LTC outputs and AES/ analog audio test sets are required, an optional (+AUX) expansion module is available.

This combo IP Network Grand Master Clock and Master Sync Generator is ideal for timing today's 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 any baseband SDI/Analog systems.

The test generator option(s) provide several test sets which are available on the 4 SDI (SD/HD/3Gbps) outputs as well as over the 10GbE IP outputs (10GbE SFP's are optional). There are 10 independent test signal generators when a test generator option is ordered, any can be routed to the 10GbE outputs, or the SDI outputs (4 generators may be combined to form a 4K signal generator).

As for IP timing formats, the 5700MSC-IP has been designed to be enterprise class, handling all current IP timing needs with the horsepower to address the future. It supports NTP, PTP- IEEE1588, MASTER PCR, AVB-IEEE802.1AS, AES67 profile, and SMPTE 2059-2. IP networking for live production and broadcast environments have very specific needs and requirements that typically involve deterministic flows, high bandwidth, and an SDN based network design. The 5700MSC-IP can be used to design a robust, safe, and deterministic timing system for any IP Network or Hybrid IP/Baseband Video

# Features & Benefits

- · Modular 1RU design
- IP Network Grand Master Clock for NTP, PTP- IEEE1588, MASTER PCR, AVB-IEEE802.1AS, and SMPTE 2059-2
- 2 x 1000BASE-T RJ45 ports
- · 2 x 10 GbE ports (SFP's are not provided and are optional)
- · 6 independently timeable sync outputs
- 4 optional SDI test generator outputs with the +SDI-TG option (supports SD/ HD/3Gbs SDI)
- Optional 10GbE video test generator support with the +10G-TG option (SFP's are not included)
- Configurable to run in Boundary Clock mode for larger enterprise scale network designs (with an upstream 5700MSC-IP Grand Master Clock)

system. The product has been designed to handle timing requirements of several thousands of PTP clients. The 5700MSC-IP has two 10 GbE ports as well as two GbE ports that can be configured to provide and distribute any of the timing protocols described above.

This 5700MSC-IP is delivered with a GPS(GNSS) head complete with a 50ft cable for remote mounting. (100ft, 400ft and fiber optic extension options are available for longer cable lengths).

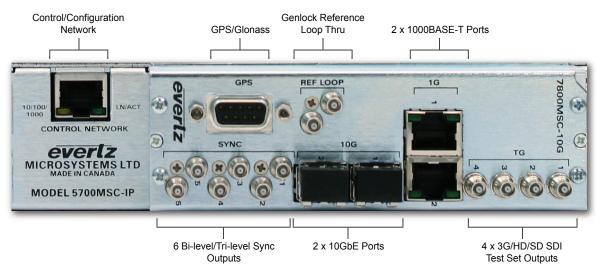
A high stability, temperature controlled oscillator provides the 5700MSC-IP with better than 1.0x10-8 (or 0.01ppm) frequency reference. The free running drift of this 10MHz reference will be less then 0.1Hz (which amounts to less than one millisecond time drift per day). This guarantees that any frequency drift, with time and temperature, will be within the tolerances expected from the best SPGs or master clocks available in the industry. Note that the provided GPS/ GNSS antenna is required for PTP, AVB PCR, or 2059-2 timing protocols to be hosted by the system.

The SPG section of the 5700MSC-IP provides six 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 various available pulses.

It is available with a main processing board and optional redundant power supply.

- Can drive and interoperate with the sister product, the modular 570GMP-10G devices which act as Boundary Clocks for larger enterprise scale designs.
- GPS/GNSS(Glonass) referenced system outdoor antenna and 50ft cable provided.
- · Optional 100ft, 400ft and fiber optic extenders available for GPS antenna
- · All active components are front panel extractable & serviceable
- Optional dual power supply for redundancy (+2PS option)
- Full featured front panel control interface
- Contact closure output for critical warning
- VistaLINK<sup>®</sup> control for device configuration and status monitoring
- Multi System GPS referenced designs will be in sync and timed
- An optional expansion module (+AUX option) provides AES & analog audio test generator, LTC, DARS, and GPIO functionality

# Rear Panel View



Rev. 17–2

## ▶ 5700MSC-IP Specifications

	S:	1000BASE-T Timing			(with +SDI-TG, or +10G-TG Option
Dutput Standards:	CMDTE OT 170 (NITOC M)	Quantity:	2 IEEE 802.3 (10BASE-T)	Standards:	SMPTE ST 259-C (270Mb/s),
Black Burst:	SMPTE ST 170 (NTSC-M), ITU-R BT.1700-1 (PAL-B)	Network Type:	IEEE 802.3 (10BASE-1) IEEE 802.3u (100BASE-TX)		SMPTE ST 292-1 4:2:2, SMPTE ST 372 dual link, and
Bi-Level:	Slo-Pal 625i/48, 625i/47.95,		IEEE 802.3ab (1000BASE-TX)		SMPTE ST 424
Di Lovoi.	480p/59.94	Connector:	RJ-45		SMPTE ST 259-C (270Mb/s),
HD Tri-Level:	SMPTE ST 274 (1080p/23.98,	Timing:	NTP, PCR		SMPTE ST 292-1 4:2:2,
	1080p/24, 1080i/50, 1080i/59.94,	5	AVB (IEEE802.1AS)		SMPTE ST 372 dual link, and
	1080i/60, 1080p/23.98sF,		IEEE1588 (annex J)		SMPTE ST 424
	1080p/24sF, 1080p/25, 1080p/29.97,		SMPTE 2059-2		Quad link SMPTE ST 292-1 4:2:2
	1080p/30, 1080p/50, 1080p/59.94,		AES67		Quad link SMPTE ST 424 4:2:2
	1080p/60)				SMPTE ST 425-3 Dual link 3Gb/s
	SMPTE ST 296 (720p/59.94,	10GbE Timing Netwo		Number of Outputs	SMPTE ST 425-5 Quad link 3Gb/s
	720p/60, 720p/50, 720p/30, 720p/24)	Quantity:	2 IEEE 802.3ae (10GbE)	Number of Outputs: Embedded Audio:	4
Pulse Signals:	PAL color frame, 1Hz pulse,	Network Type: Connector:	SFP (SFP not included), LC/UPC	Linbeaded Addio.	Up to 4 audio groups as specified SMPTE ST 299-1 or
i disc olgitals.	IRIG DATUM 1/1.001Hz pulse,	Timing:	NTP, PCR		SMPTE ST 272 Selectable tone
	6/1.001Hz pulse		AVB (IEEE802.1AS)		frequencies (from 20Hz to 12kHz)
CW Signals:	5MHz, 10MHz, NTSC-M Subcarrier,		IEEE1588 (annex J)		and audio group
-	PAL-B Subcarrier		SMPTE 2059-2	Connector:	75Ω Mini BNC, bayonet positive
Wordclock:	48kHz Wordclock		AES67		locking (Amphenol)
	Level 5V CMOS (1k $\Omega$ ) or ±1V (75 $\Omega$ )			Signal Level:	800mV nominal drive
10MHz Output:	1.0V p-p, 2.0V p-p, in 75Ω,		o/10MHz selectable):	DC Offset:	0V ±0.5V
	SNR > 70dB rms	Туре:	Autodetects standard SMPTE ST	Rise and Fall Time:	100ps HD/3G, 600ps SD
onnector:	SFDR > 50dBc		170 (NTSC-M), ITU-R BT.1700-1 (PAL R), Color Black 1V p. p. with	Overshoot: Jitter:	< 10% of amplitude < 0.2 UI
UTITIECIUI.	75Ω Mini BNC, bayonet positive locking (Amphenol)		(PAL-B), Color Black 1V p-p with optional VITC and 10- field pulse	Return Loss:	< 0.2 01 > 15dB to 1.5GHz
umber of Outputs:	6		HD Tri-level Sync (same HD	Noturn 2088.	> 10dB to 3GHz
C Offset:	0V ±0.05V		standards as sync outputs)		
teturn Loss:	> 40dB up to 10MHz	Number of Inputs:	2 Loop thru	Electrical:	
NR:	> 75dB rms		High impedance, isolated,	Voltage:	Auto ranging 100 to 240V AC,
utput Levels:	1.0V p-p, 2.0V p-p, in 75Ω,		differential external termination		50/60Hz
	selectable		required	Configuration:	Optional redundant supply availab
		Connector:	75Ω Mini BNC, bayonet positive	Power:	125W (all options installed)
PS/GLONASS Rece		B	locking (Amphenol)	Safety:	TüV Listed
emperature:	-40°C to +70°C	Return Loss:	>40dB to 10MHz (with external 75Ω	EMI/RFI:	Complies with EU safety directives
lumidity:	95% R.H. Condensing at 60°C	Input Level Range:	termination)		Complies with FCC Part 15 Class Complies with EU EMC Directive
		Video:	-3.5dB (double-terminated) to +6dB		Complies with EO EWIC Directive
		1400.	(un-terminated)	Physical:	
		10MHz:	0.3V p-p to 4.0V	Dimensions:	19" W x 1.75" H x 11.5" D
		Frequency Lock Rang			(483mm W x 45mm H x 292mm D
		Wide mode:	±15ppm min	Weight:	8lbs (3.5kg)
		Narrow mode:	±0.1ppm min		
		nalog Audio Tes	t Set, DARS, GPIO, and LTC)		
	on Module Option (AES & A				
TC Outputs:		Balanced:	AES3 (24-bits)	Connector:	
TC Outputs: tandard:	SMPTE ST 12-2 or IRIG-B	Balanced:	AES3 (24-bits) (4Vp-p 110Ω terminated)		strips
TC Outputs: tandard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame	Balanced: Number of Outputs:	(4Vp-p 110Ω terminated)	Output Impedance:	strips 66Ω
TC Outputs: tandard: rame Rate:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame)	Balanced: Number of Outputs: DARS:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced	Output Impedance: Signal Level:	strips 66Ω -30 to +10dBu into 10kΩ load
TC Outputs: tandard: rame Rate: umber of outputs:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced	Balanced: Number of Outputs: DARS: AES Test Gen:	(4Vp-p 110Ω terminated)	Output Impedance: Signal Level: DC Offset:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV
TC Outputs: tandard: rame Rate: lumber of outputs: connectors:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame)	Balanced: Number of Outputs: DARS: AES Test Gen: Connector:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced	Output Impedance: Signal Level: DC Offset: Noise floor:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A	Output Impedance: Signal Level: DC Offset:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip	Output Impedance: Signal Level: DC Offset: Noise floor:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel: Jn-powered:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A	Output Impedance: Signal Level: DC Offset: Noise floor:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel: Jn-powered: Dutput Impedance:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p,	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel: Jn-powered: Dutput Impedance: ise Time:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered)	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load
TC Outputs: itandard: rame Rate: lumber of outputs: connectors: evel: Jn-powered: Dutput Impedance: itse Time: itter:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced:	<ul> <li>(4Vp-p 110Ω terminated)</li> <li>1 unbalanced, 1 balanced</li> <li>2 unbalanced, 2 balanced</li> <li>BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz</li> <li>75Ω unbalanced</li> </ul>	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel: Jn-powered: Dutput Impedance: ise Time: tter: ARS & AES Test Ge	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: AES Tones:	<ul> <li>(4Vp-p 110Ω terminated)</li> <li>1 unbalanced, 1 balanced</li> <li>2 unbalanced, 2 balanced</li> <li>BNC per IEC 61169-8 Annex A Removable Terminal Strip</li> <li>48kHz</li> <li>75Ω unbalanced</li> <li>110Ω balanced</li> <li>Menu selectable</li> </ul>	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load <b>buts and Output:</b> 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V
TC Outputs: tandard: rame Rate: umber of outputs: onnectors: evel: Jn-powered: Dutput Impedance: ise Time: tter: ARS & AES Test Ge tandard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 440 balanced (un-powered) 40 ±10µs < 2µs	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: Balanced: Balanced: AES Tones: Analog Audio Tone	<ul> <li>(4Vp-p 110Ω terminated)</li> <li>1 unbalanced, 1 balanced</li> <li>2 unbalanced, 2 balanced</li> <li>BNC per IEC 61169-8 Annex A Removable Terminal Strip</li> <li>48kHz</li> <li>75Ω unbalanced</li> <li>110Ω balanced</li> <li>Menu selectable</li> </ul> Generator:	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load huts and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to
TC Outputs: andard: ame Rate: umber of outputs: onnectors: evel: in-powered: butput Impedance: ise Time: tter: ARS & AES Test Ge andard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs enerator Outputs: SMPTE ST 276-1single ended AES	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: Balanced: AES Tones: Analog Audio Tone ( Number of Outputs:	<ul> <li>(4Vp-p 110Ω terminated)</li> <li>1 unbalanced, 1 balanced</li> <li>2 unbalanced, 2 balanced</li> <li>BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz</li> <li>75Ω unbalanced</li> <li>110Ω balanced</li> <li>Menu selectable</li> </ul>	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type: Input Type:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V
TC Outputs: tandard: 'ame Rate: umber of outputs: onnectors: evel: In-powered: Dutput Impedance: ise Time: tter: ARS & AES Test Ge tandard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 440 balanced (un-powered) 40 ±10µs < 2µs	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: Balanced: Balanced: AES Tones: Analog Audio Tone	<ul> <li>(4Vp-p 110Ω terminated)</li> <li>1 unbalanced, 1 balanced</li> <li>2 unbalanced, 2 balanced</li> <li>BNC per IEC 61169-8 Annex A Removable Terminal Strip</li> <li>48kHz</li> <li>75Ω unbalanced</li> <li>110Ω balanced</li> <li>Menu selectable</li> </ul> Generator:	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type:	66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu into 10kΩ load <b>buts and Output:</b> 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V 4 pins plus 2 ground pins on DB-19
TC Outputs: tandard: 'ame Rate: umber of outputs: onnectors: evel: In-powered: Dutput Impedance: ise Time: tter: ARS & AES Test Ge tandard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs enerator Outputs: SMPTE ST 276-1single ended AES	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: Balanced: AES Tones: Analog Audio Tone ( Number of Outputs:	<ul> <li>(4Vp-p 110Ω terminated)</li> <li>1 unbalanced, 1 balanced</li> <li>2 unbalanced, 2 balanced</li> <li>BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz</li> <li>75Ω unbalanced</li> <li>110Ω balanced</li> <li>Menu selectable</li> </ul>	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type: Input Type:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu inte 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V
TC Outputs: standard: rame Rate: Jumber of outputs: connectors: evel: Jn-powered: Output Impedance: Sites Time: itter: DARS & AES Test Ge Standard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs enerator Outputs: SMPTE ST 276-1single ended AES	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Balanced: Balanced: Balanced: Balanced: AES Tones: Analog Audio Tone ( Number of Outputs: Type:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable Generator: 2 Balanced analog audio AUDIO	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type: Input Type: Connector:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V 4 pins plus 2 ground pins on DB-1
HAUX Expansion     Transion     Transin     Transion     Transion     Transion     Transion     Transion	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs enerator Outputs: SMPTE ST 276-1single ended AES	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Balanced: Balanced: Balanced: Balanced: AES Tones: Analog Audio Tone ( Number of Outputs: Type:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable Generator: 2 Balanced analog audio AUDIO	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: <b>General Purpose Inp</b> Number of Inputs: Number of Outputs: Output Type: Input Type: Connector:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V 4 pins plus 2 ground pins on DB-1
TC Outputs: Standard: rrame Rate: Jumber of outputs: Connectors: .evel: Un-powered: Output Impedance: Rise Time: litter: DARS & AES Test Ge Standard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs senerator Outputs: SMPTE ST 276-1single ended AES (24-bits) (1V p-p into 75Ω)	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Balanced: Balanced: Balanced: Balanced: Balanced: Balanced: Balanced: Balanced: Balanced: Mumber of Outputs: Type: AES Test AES Tones: Analog Audio Tone ( Number of Outputs: Type:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable Generator: 2 Balanced analog audio AUDIO	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type: Input Type: Connector:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V 4 pins plus 2 ground pins on DB-1
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TC Outputs: tandard: rame Rate: lumber of outputs: connectors: evel: Jn-powered: Dutput Impedance: lise Time: itter: VARS & AES Test Ge tandard:	SMPTE ST 12-2 or IRIG-B 24, 25, 30 and 29.97 (drop frame and non-drop frame) 2 balanced Female DB-15 Adjustable, 1.0V to 8.0V p-p, balanced 44Ω balanced (un-powered) 40 ±10µs < 2µs SMPTE ST 276-1single ended AES (24-bits) (1V p-p into 75Ω)	Balanced: Number of Outputs: DARS: AES Test Gen: Connector: Unbalanced: Balanced: Sampling Rate: Impedance: Unbalanced: Balanced: AES Tones: Analog Audio Tone Number of Outputs: Type:	(4Vp-p 110Ω terminated) 1 unbalanced, 1 balanced 2 unbalanced, 2 balanced BNC per IEC 61169-8 Annex A Removable Terminal Strip 48kHz 75Ω unbalanced 110Ω balanced Menu selectable Generator: 2 Balanced analog audio AUDIO Comparison of the second seco	Output Impedance: Signal Level: DC Offset: Noise floor: THD+N: General Purpose Inp Number of Inputs: Number of Outputs: Output Type: Input Type: Connector:	strips 66Ω -30 to +10dBu into 10kΩ load < 10mV < -90dBu, unweighted < -100dB with 1kHz @ +10dBu int 10kΩ load wits and Output: 2 2 (function menu selectable) Opto-isolated, active closure to GND, 20kΩ pull-ups to +5V Opto-isolated, senses closure to GND, pull-ups to +5V 4 pins plus 2 ground pins on DB-1
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## Ordering Information

5700MSC-IP	IP Network Grand Master Clock & Video Master Clock System
	[includes GPS/Glonass receiver antenna & 50ft cable, loop thru
	genlock,IEEE 1588, 2 x 1GbE ports, 6 sync outputs, 2 x 10GbE
	ports (10GbE SPF's not included), and 1 power supply]

**Ordering Options** 

+AUX

+2PS +SDI-TG +10G-TG

Redundant Power Supply 4 outputs, configurable SD/HD/3G SDI Test/black generators Test Generater outputs over 10 GbE Ports, & 4 SDI outputs, configurable SD/HD/3G SDI Test/black generators (\*includes +SDI-TG option) Includes expansion test module which provides AES & Analog audio test generator, DARS, GPIO, and LTC outputs

SFP Options: +SFP10G-TR13-A

1310nm laser, standard sensitivity 1310nm optical transceiver, 10km, single mode