SONIFEX

AVN-GMCS

IEEE1588 PTP Grandmaster Clock with GPS Receiver

2015

Catalogue

AVN-GMCS IEEE1588 PTP Grandmaster Clock with GPS Receiver

Category: Audio Over IP Products.
Product Function: Provides a PTP time synchronised clock for use with AoIP audio networks.
Typical Applications: Synchronise a PTP AoIP network, provide a GPS referenced signal via AES-3id, provide a master wordclock studio output or distribute a PPS reference frequency to T&M equipment.

Features: -

- GPS enabled, with master and slave modes.
- 8ns PTPv2 time stamping resolution.
- Holdover drift <1ppm, with options for <0.01ppm & <0.0005ppm.
- AES-3id, wordclock & variable PPS outputs.
- Analogue master input.
- Dual power supply inputs.
- Front panel display.
- GPS sync and power supply present LED indicators.
- Ethernet webserver and front panel control & configuration.

RAVENNA

Sonifex joined the Ravenna group in 2012 and the AVN-GMCS is the result of our R&D in the area of audio over IP.

* This figure represents the holdover accuracy should the GPS signal be lost - this is an approximation based on 1st year stability figures.

The AVN-GMCS is a PTPv2 grandmaster clock for use with AoIP applications. IEEE1588-2008 PTPv2 (precision time protocol) is used to synchronise all the nodes within a network. To achieve this one of the nodes must become the master clock and distribute time packets to the others. The AVN-GMCS is designed to perform this role simply and accurately, enabling sub micro second synchronisation between all nodes.

RAVENNA (of which AES67 is a subset) allows for the distribution of audio across a network. For this to be possible, each of the nodes needs to be time synchronised with one another. Ravenna uses PTP time stamping to achieve this, which distributes the network time but also works out the latency involved in the delivery and adjusts the time at each node accordingly. Unit configuration is achieved easily either with the front panel controls or the webserver, including the setup of the PTP profile.

The AVN-GMCS supports the Default Profile and in normal operaton, the unit has PTPv2 time stamping resolution to 8nsec. The AVN-GMCS uses a combination of a GPS receiver, a PLL (phase lock loop) and a specialist on-board clock device to create the precise, low jitter clock signals required to drive the physical transceiver's time stamping circuitry, also providing holdover if the GPS signal is lost.

The specialist on board clock is available in three different types: TCXO, OXCO and CSAC (Chip Scale Atomic Clock, Caesium), which vary in both price and accuracy:

AVN-GMCS – TCXO Temperature Compensated Oscillator accurate to 1 part per million (worst case 1 sec gain/loss every 11.5 days). *

AVN-GMCOS – OCXO Oven Controlled Oscillator accurate to 0.01 parts per million (worst case 1 sec gain/loss every 3.1 years). *

AVN-GMCCS – SAC Quantum Atomic Clock accurate to 0.00050 parts per million (worst case 1 sec gain/loss every 63 years). *

A separate clock input can act as an alternative reference source to GPS. Clock outputs, driven from the physical transceiver, can be used to provide media clocks for external equipment local to the AVN-GMC when it is in both 'master' and 'slave' states. The clock outputs are available as a single AES-3id output and two outputs which can be selected as either word clock or variable PPS. The wordclock can operate at 32, 44.1, 48, 96, 176.4 and 192kHz. When set as a variable PPS output, the unit can act as a clock master to distribute a reference frequency to test and measurement equipment.

The unit shows UTC as standard, but can be set to show 'local time' on the front panel, by adding a time offset. Daylight saving time changes can be accommodated by entering Spring Forward and Fall Back dates.

The built-in webserver, or front panel OLED display, can be used to configure the unit. Front panel LEDs show the synchronisation status, GPS lock and the status of the AC and DC power supply inputs.

The brightness of the OLED display and LED indicators can be adjusted for low or high lighting conditions

4 general purpose outputs indicate critical states for the unit using a 9 way D-type connector mounted on the rear panel. Pull down when active pins are supplied for GPS lock status, external sync present, AC power present and DC power present.

The unit has a front panel power button and dual power connectors - an IEC mains input and a 12V DC input, which allows the AVN-GMCS to be used for both studio and mobile installations. Moreover this allows for a secondary power source to reduce the effect of power down events. In any case, the unit monitors the status of both power sources and displays this on the front panel.

The unit can be put into a low-power sleep mode when not in use, with an instant start when power is re-applied. In power off situations, a super capacitor is used to keep the GPS receiver powered in a low power mode for more than 20 hours, enabling the receiver to regain lock immediately rather than having to 'cold' start.

Specification For AVN-GMC

Timing Specification

Profile Support:	Default profile
Timing Protocol:	PTPv2, IEEE1588-2008
Timing Accuracy:	PTP time stamping resolution 8ns
Holdover Drift:	
TCXO:	<90ms
OCXO:	<900µs
CSAC:	<45µs
These figures are over 24 hours at constant temperature	
GPS Performance:	50 channel GPS receiver
GPS Frequency:	1575.42MHz, L1 band

Clock Specification

Word Clock Sync Impedance:	50Ω
Word Clock Output Input Impedance:	<50Ω
AES-3id Output Impedance:	<75Ω
Antenna Impedance:	50Ω

Connections

Clocking Input:	BNC female
Clocking Outputs:	3 x BNC female AES-3id @ 32, 44.1, 48, 96, 176.4 & 192kHz. 2 x Wordclock or Variable PPS (1, 10, 100, 1000) TTL
GPS Input:	SMA socket
GPIO:	D-type female 9 way
Ethernet Port:	RJ45 socket, 100BASE-T
Mains AC Input:	Universal filtered IEC socket, continuously rated 85-264 VAC @47-63Hz, max 10W
DC Input: Maximum Operating Range (DC):	1 x 12V, KPJX-45 socket, positive pins 1 and 3 10.3V to 13.2V DC

Equipment Type

AVN-GMCS:	Grandmaster clock for PTP systems, GPS, IP, TCXO, 1ppm, rackmount
AVN-GMCOS:	Grandmaster clock for PTP systems, GPS, IP, OCXO, 0.01ppm, rackmount
AVN-GMCCS:	Grandmaster clock for PTP systems, GPS, IP, CSAC, 0.0005ppm rackmount

Physical Specification

Dimensions: (Raw)	4.4cm (H) x 48.3cm (W) x 17.8cm (D) (1U) 1.8" (H) x 19" (W) x 7" (D) (1U)
Dimensions (Boxed):	6.8cm (H) x 58.8cm (W) x 27cm (D) 2.7" (H) x 23" (W) x 10.6" (D)
Weight:	Nett: 1.5kg Gross: 2.2kg Nett: 3.2lbs Gross: 4.8lbs

Accessories

AVN-DC150:	150W DC power supply with KPJX-45 plug

SONIFEX

www.sonifex.co.uk

UK Office:

Sonifex Ltd

61 Station Road, Irthlingborough,
Northants, NN9 5QE, UK
Tel: +44 (0) 1933 650700
Fax: +44 (0) 1933 650726
Email: sales@sonifex.co.uk

Australian Office:

Sonifex Pty Ltd

12/6 Leighton Place,
Hornsby NSW 2077, Australia
Tel: +61 (2) 9987 0499
Fax: +61 (2) 9476 4950
Email: sales@sonifex.com.au