MASTER SPG / CLOCK SYSTEM

evertz

Combo Master Sync. Pulse Generator/Master Clock

Master Sync and Time Reference Generator

The 5600MSC is a Master SPG, Master Clock and Master Time Code Generator all in one box. It provides analog black and HDTV tri-level sync signals and solves the problem of locking the in-house master clock system to the master video sync pulse generator. The separate 5600ACO automatic changeover unit completes the package.

Master SPG functions

- 6 timeable black burst outputs
- PAL and NTSC blacks (simultaneously if required)
- HDTV Tri-level sync (simultaneously with blacks if required)
- All HDTV standards
- 10MHz input and output
- Optional NTSC/PAL, SDI and HDTV test generators
- DARS reference (optional with +STG test generator)
- Analog and AES audio tones (optional with +STG test generator)
- Subcarrier stability of better than 0.1Hz per month
- Optional GPS receiver with ATR video phasing

Slave SPG functions

- Gen-lock mode for locking to other external black burst source

Test Generator options

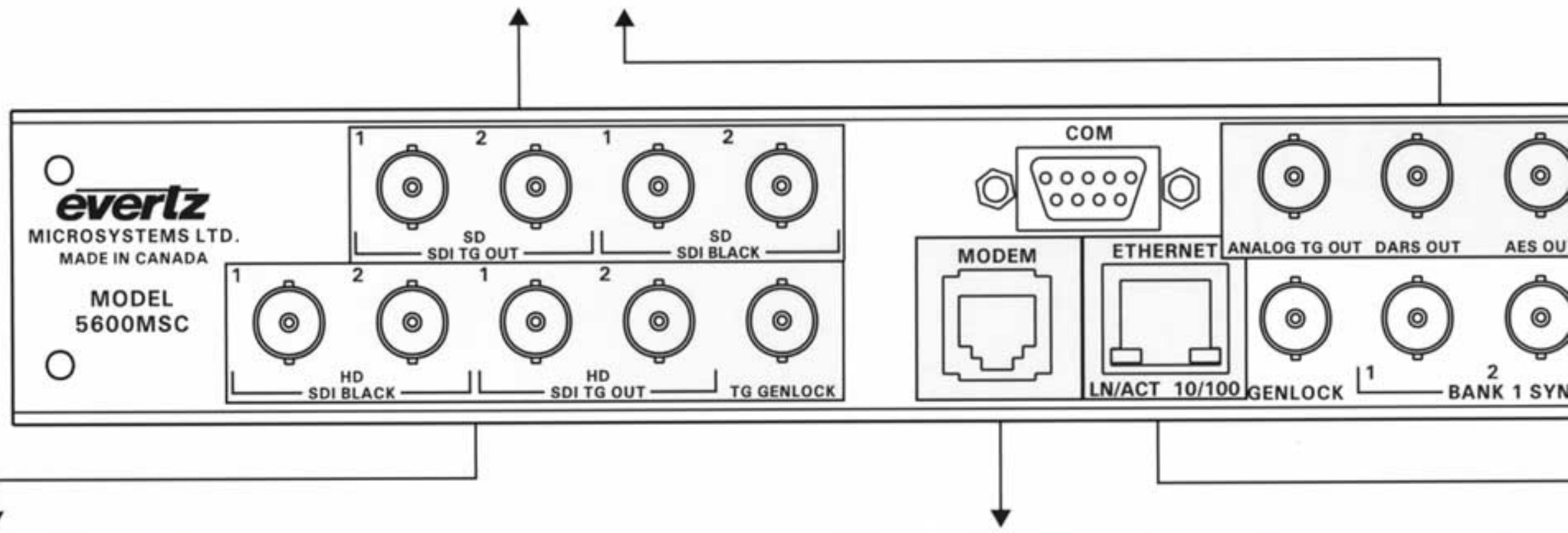
- PAL/NTSC/SDI Test Generator with Source Ident and Audio Tones
- HDSDI Test Generator with Source Ident and Audio Tones (embedded)
- Multiple test signals; 28 SDI/PAL, 33 SDI/NTSC over 30 HDTV
- Programmable Audio Tones (continuous or interrupted)

Master Clock Time Code Generator functions

- Two Master LTC Time Code Generators - may be different frame rates and different times
- 23.98, 24, 25, 29.97 (drop frame and non-drop frame) and 30Fps Time Code
- Date in the user bits (all standards supported)
- Daylight Saving Time compensation
- 6 VITC automatic timecode outputs (in video blacks). Can support 6 additional time zones
- Optional GPS receiver for time of day reference
- Optional Modem for time of day reference
- Optional Network Time Protocol

Standard Definition Test Generator (option +STG)

- 2 SDI test signal outputs for 625 or 525 line video, with 4 embedded audio tones; 2 digital blacks
- 1 analog test signal output for 625 line (PAL) or 525 line (NTSC)
- Balanced and unbalanced DARS and AES/EBU audio tones
- Audio tones pre-programmable as events (continuous or interrupted as required)



HDTV Test Generator (option +HTG)

- 2 HDSDI test generator outputs and 2 HDSDI blacks
- 480p/59.94, 720p/59.94, 1080p/23.98sF, 1080i/59.94, 1080i/50 and 1080p/25sF
- 4 embedded audio tones and on-screen SID

Internal Modem (option +M)

- Modem for time accessed by dialing a remote device at preprogrammed times

The Standard 5600MSC

The standard 5600MSC offers 6 NTSC/PAL black burst and/or HDTV tri-level syncs, plus the Master Clock timecode functions, as well as a high stability 10MHz output and input. The 5600MSC has both a high stability master oscillator for Master SPG operation as well as a gen-lockable oscillator for Slave SPG work. Even when operating without an external frequency reference, the timecode output of the 5600MSC can be relied upon to remain well within one second per year.

The sync outputs are derived from 3 oscillators, providing references for NTSC/PAL, HDTV rates and HDTV rates/1.001 respectively. The 6 outputs are grouped into 2 Banks of 3, with each bank being assigned one type of oscillator. For example outputs 1 – 3 (Bank 1) might output PAL and/or NTSC, while outputs 4 – 6 (Bank 2) provides 1080p/23.98, 1080i/59.94, and 720p/59.94. Alternatively Bank 2 might provide two outputs of 1080i/50 and one of 1080i/60. Here are some examples of possible permutations:

BANK 1			BANK 2		
1	2	3	4	5	6
NTSC	NTSC	NTSC	NTSC	NTSC	PAL
NTSC	NTSC	NTSC	1080i/59.94	1080i/59.94	720p/59.94
NTSC	NTSC	PAL	1080i/23.98	1080i/59.94	720p/59.94
PAL	PAL	PAL	1080i/50	1080i/50	1080p/24
1080i/23.98	1080i/59.94	720p/59.94	1080i/50	1080i/50	1080p/24

LTC (timecode) is available on two different outputs and VITC can be enabled on any black burst output. All time code outputs are referenced to the master system time, but may be offset to any desired time. For example the two LTC outputs could be set for UTC and local time, drop frame and non drop frame, or 23.98 and 29.97Fps. If required, the VITC times could represent 6 different time zones. VITC may be enabled on any desired line.

Because NTSC has 59.94 fields per second instead of 60 and because the earth does not rotate in precisely 60 x 60 x 24 seconds, the 5600MSC is provided with a *jam sync* function to realign the time with the video. (The timecode is realigned as closely as possible with the correct time of day without disturbing the video). For example, in the NTSC world, where the time drift is around 75ms per day, a daily jam sync ritual is recommended. In the PAL world, insertion of a leap second creates a 40ms offset. The jam sync function may be used to correct this error if desired.

The status of the 5600MSC's vital statistics, is provided by selecting the status screens on the front panel of the unit. Failure alarms are available on GPOs. GPIs provide the ability to control certain functions.

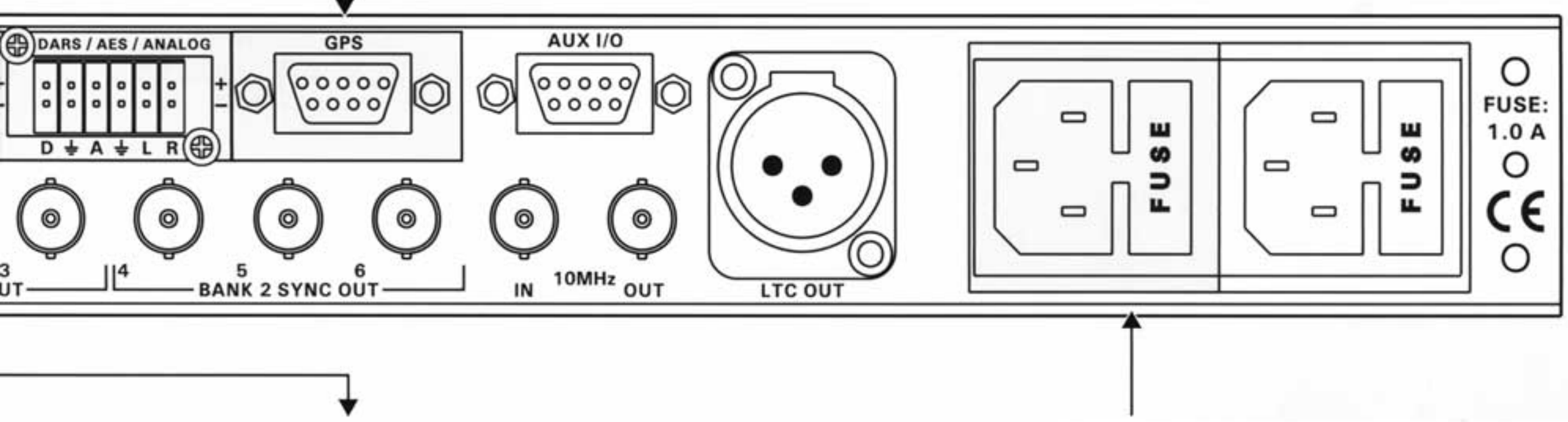
A com port is provided to facilitate firmware upgrades.

Options Ordering Information

The required options are ordered as in the following example: 5600MSC+2PS+G+STG (see below)

GPS reference (option +G)

The GPS option includes an antenna and receiver in a weather proof housing, together with a 50ft cable (100ft - order option WA-T76; 400ft - order WA-T11). The GPS receiver provides a reference for frequency, time and video, based on absolute time reference. Remote SPGs also locked to GPS reference, may be used to time remote sources and, as both SPGs are locked to GPS, no frames will be dropped or repeated. When two SPGs are employed with an auto-changeover, it is recommended that each SPG has it's own GPS receiver to ensure complete redundancy.



Network Time Protocol (option +T)

- RJ45 connector for Network Time Protocol option - precise time to computers

Redundant Power Supply (option +2PS)

- Second redundant power supply and separate power cord

5600ACO Automatic Changeover

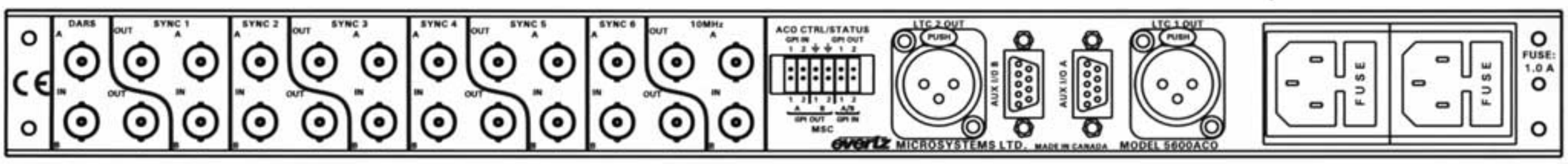
5600ACO Automatic Changeover

The 5600ACO Automatic Changeover is intended for use with two 5600MSC Master Clock / Sync Generators. The complete system provides the highest level of security for television station video and time synchronization systems. Two power supplies are included as standard.

The front panel has three switches, recessed into the panel for added security. There is an AUTO / MANUAL switch, a GPI / FRONT PANEL switch and an A / B select switch for manual changeover. In automatic mode, all signals from both 5600MSCs are monitored to detect any abnormal signals. If an error is detected in any signal, the entire bank of signals will be switched to the backup 5600MSC. In manual mode the changeover can be operated from a GPI or from the front panel switch. Twenty-four LEDs provide status information as to the health of the two 5600MSCs, together with indication as to which one is active. In addition two GPO outputs indicate which master is active and when the inputs from both masters are not the same.

The 5600ACO offers connections for 6 color black, (or tri-level sync signals), 10MHz and DARS. Each 5600MSC Master offers two LTC outputs that may be used for different timecodes. All four LTCs are fed to the 5600ACO on two 'D' connectors, one for each Master. The LTC outputs from the selected master are available on two XLR connectors on the 5600ACO.

Identical timing for both 5600MSCs is assured by locking both to the same frequency and phase source (e.g. GPS). Identical phasing of the independent black outputs is assured by implementing the "Syncro" mode in the 5600MSCs. To use this mode, both 5600MSC communication ports are connected together using the link cable supplied with the 5600ACO. With both 5600MSCs operating in Syncro mode, timing adjustments made to one 5600MSC will be automatically applied to both. The link cable is connected permanently, so that any system re-timing will be applied to both 5600MSC units.



Features:

- Latching relays for all the system critical outputs from two 5600MSC units
- 6 black burst or tri-level sync outputs
- 10MHz frequency reference output
- DARS output
- 2 Time Code outputs
- 3 recessed front panel switches select automatic, front panel or GPI activation of changeover
- 20 Front panel status LEDs show the health of each of the inputs
- 10 Front panel status LEDs show the operational modes of the changeover
- GPI inputs and outputs

Ordering Information:

5600MSC	Master SPG / Master Clock System
5600ACO	Automatic Changeover System

Ordering Options and Accessories:

+2PS	Redundant power supply
+M	Modem Option
+G	GPS Option (includes GPS receiver and 50' weatherproof cable)
+T	Network Time Protocol (Call factory for availability)
+STG	NTSC/PAL test signal generator Audio tone generator (analog) DARS generator (balanced & unbalanced) AES generator (balanced & unbalanced) PLUS an SDI Test Generator with 2 SDI test signals and 2 SDI black
+HTG	HD SDI Test Generator with 2 HD SDI test signals & 2 HDSDI black
WA-T76	100' weatherproof cable for GPS receiver
WA-T11	400' weatherproof cable for GPS receiver

Phone: +1-905-335-3700 Fax: +1-905-335-3573 www.evertz.com