



## 5600ACO & 5600ACO2 Automatic Changeover

### 5600ACO Info



The 5600ACO/ACO2 Automatic Changeovers are intended for use with two 5600MSC Master Clock / Sync Generators. The 5600ACO/ACO2 system uses latching relays to ensure maximum reliability and minimal disruption in the event of any failure. The complete system provides the highest level of security for television station video and time synchronization systems. The 5600ACO is a 1RU device which is an ACO for a **subset** of the 5600MSC outputs. The 5600ACO2 is a 2RU ACO for **all outputs** of the 5600MSC. Two power supplies are included as a standard feature, to alleviate any single point of failure concerns.

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. For example if a level, pulse width, phase, time code error or other abnormality is detected, the 5600ACO2 circuitry will trigger and 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. 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.

Each 5600MSC is equipped with 2 GPI inputs and 2 GPO outputs. To facilitate installation, these connections are brought through to a 2x6 pin terminal block on the 5600ACO. The outputs from the 5600MSCs are passed straight through the 5600ACO's. The inputs to the 5600MSCs are internally split by a 'Y' connector, to ensure that both 5600MSCs receive the same GPI contact closures.

In the event of a changeover occurrence, it is necessary that all outputs on one 5600MSC have the same timing as those on the other. Identical timing for both 5600MSCs is assured by locking both to the same frequency and phase source (e.g. GPS or by genlocking one 5600MSC to the other). 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

- Three front panel switches select automatic, front panel or GPI activation of changeover
- Front panel switches are recessed to prevent accidental operation
- Front panel status LEDs show the health of each of the inputs
- Front panel status LEDs show the operational modes of the changeover
- Redundant power supply standard
- GPIO input/outputs
- Automatic changeover is a voting system based on which source has the most valid signals and that the good signals on the present master are also on the backup

### Protected Outputs

#### 5600ACO

- 6 video/sync or other coaxial signals
- 10MHz frequency reference output
- DARS output
- 2 Linear Time Code outputs

#### 5600ACO2

- 6 video/sync outputs
- 10MHz frequency reference output
- Balanced and unbalanced DARS and AES outputs
- 2 Linear Time Code outputs
- 4 HD-SDI test signal outputs
- 4 SDI test signal outputs
- 1 Analog video test signal output
- Balanced analog audio output

### Specifications

<b>LTC Inputs/Outputs</b>	
<b>Standard</b>	SMPTE 12M frame rate set by 5600MSC
<b>Number of Inputs</b>	2 per 5600MSC
<b>Number of Outputs</b>	2
<b>Connector</b>	
<b>Input</b>	Female DB9
<b>Output</b>	3 pin male XLR type
<b>Signal Level</b>	Set in 5600MSC

**Coaxial Inputs and Outputs**

<b>Type</b>	Depends on signal connected from 5600MSC DARS, bi-level or tri-level sync, colour black, 10MHz
<b>Number</b>	8 groups each consisting of two inputs and one output
<b>Connector</b>	BNC per IEC 60169-8 Amendment 2

**ACO General Purpose Inputs and Outputs**

<b>Inputs</b>	
<b>GPI1</b>	Master select in Manual GPI control mode <b>Low:</b> Selects Master A <b>High:</b> Selects Master B
<b>GPI2</b>	Future use
<b>Outputs</b>	
<b>GPO1</b>	<b>Low:</b> Master A is selected <b>High:</b> Master B is selected
<b>GPO2</b>	<b>Low:</b> Master A & Master B differ or PSU failure <b>High:</b> Master A & Master B have equivalent signals
<b>Type</b>	
<b>Inputs</b>	Opto-isolated input with internal pull-up to +5V
<b>Outputs</b>	Normally closed relay to ground. 10K internal pull-up to +5V when relay is in active position
<b>Connector</b>	4 pins plus 2 ground pins on 12 pin removable terminal block
<b>Signal Level</b>	+5V nominal

**MSC General Purpose Inputs and Outputs**

<b>Inputs</b>	2 GPI inputs connected to both Master A and Master B
<b>Outputs</b>	2 GPI outputs connected from Master A through AUXI/O A 2 GPI outputs connected from Master B through AUXI/O B
<b>Connector</b>	6 pins on 12 pin removable terminal block
<b>Signal Level</b>	As specified in 5600MSC manual

**Changeover conditions**

<b>Notes</b>	Changeover is a voting system based on which source has the most good signals and that the good signals on the current master are also present on the backup master. The input signals are considered good according to the following criteria
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<b>Video</b>	Level below 70 IRE
<b>Sync</b>	H timing detect
<b>10MHz</b>	3dB level below 0.3V p-p
<b>DARS</b>	Sync word error
<b>LTC</b>	Level below 0.3V p-p, Incorrect sync word

**Electrical**

<b>Power</b>	Autoranging 100-240V AC, 50/60Hz 30VA
<b>Configuration</b>	Dual redundant supplies
<b>Fuse Rating</b>	250V, 1A, time delay
<b>Safety</b>	ETL Listed, Complies with EU Safety Directive
<b>EMI/RFI</b>	Complies with FCC Part 15 Class A, EU EMC Directive

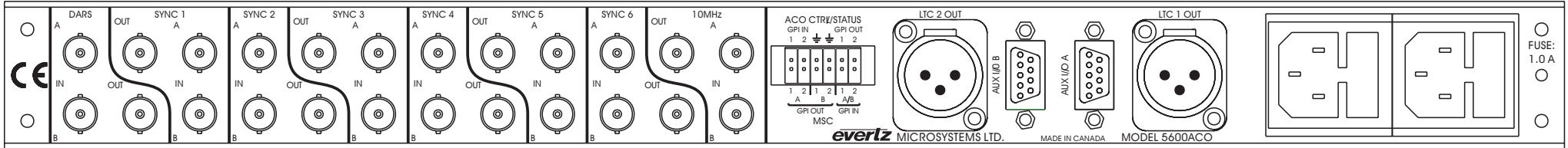
**Physical**

<b>Dimensions</b>	
<b>5600ACO</b>	19"W x 1.75"H x 18.75"D (483mm W x 45mm H x 477mm D)
<b>5600ACO2</b>	19"W x 3.5"H x 18.75"D (483mm W x 90mm H x 477mm D)
<b>Weight</b>	
<b>5600ACO</b>	8 lbs. (3.5Kg)
<b>5600ACO2</b>	16 lbs. (7.0Kg)

**Ordering Information**

<b>5600ACO</b>	1RU Automatic Changeover System complete with 2 power supplies, 2 power cords and 3 DB9 cables (BNC cables not included)
<b>5600ACO2</b>	2RU Automatic Changeover System complete with 2 power supplies, 2 power cords and 3 DB9 cables (BNC cables not included)

## 5600ACO Rear Panel



## 5600ACO2 Rear Panel

