Mentor XL
Master Reference Generator &
MasterMind Auto Changeover
The ultimate SPG/TSG solution

LEADER

T rilogy has a successful 20 year track record of delivering advanced, reliable Sync and Test generators to major broadcast, post and cable/satellite users in over 70 countries. Designed to satisfy the demands generated by mixed analogue, SD and HD/3G installations, Mentor XL is the most sophisticated and reliable Master Reference Generator available.

Mentor XL's innovative architecture avoids the need for numerous option boards or factory upgrades by allowing most optional features to be activated in software via an IP connection. This ensures that units may be easily upgraded in the field whilst also further enhancing the unit's reliability.

Analogue, SD and HD references and test signals are generated simultaneously for both 525 and 625 standards with independent timing control for all outputs to simplify system integration. Special attention has been paid to the audio section with multiple audio generators assignable for AES, embedded SD/HD, wordclock and stereo audio.

All HD and Tri-level sync formats are accommodated either within the base unit or by fitting the appropriate option board. HD test patterns are available in all of the recognised 1.485 Gb/s standards or, with the optional 3G output board, in any of the extended 2.970 Gb/s formats.

The optional GPS receiver provides an extremely stable and robust method for accurately locking multiple SPGs and also for governing the unit's LTC, VITC and NTP outputs, whilst the SNMP agent permits remote status monitoring of critical functions.

The browsable Vector application allows remote configuration and monitoring of all system parameters, in addition to managing software and feature upgrades.

For enhanced security, redundant Mentor XLs may be deployed together with the compatible MasterMind unit. This failsafe, modular changeover monitors the integrity of both main and reserve reference signals to effect an automatic switch to the reserve unit. Optional boards for detection of Tri-level sync, LTC, AES and SDI may also be fitted.

Key Features

- 525/625/SD/HD/3G simultaneous operation
- Operation as master generator or locked to GPS, NTP, 10 MHz or video black/burst
- Extensive test signal library including full field test
- GPS receiver for ultimate timing accuracy
- Multiple independent audio generators for AES, embedded SD/HD and analogue
- Independent Tri-level sync outputs for all 720 and 1080 standards
- 3G-SDI option for 1080/60p, 1080/59.94p, and 1080/50p formats
- Dual LTC outputs plus VITC/DVITC
- Vector editor browser
- NTP server and client support
- Redundant main and reserve operation in combination with MasterMind changeover
- SNMP support

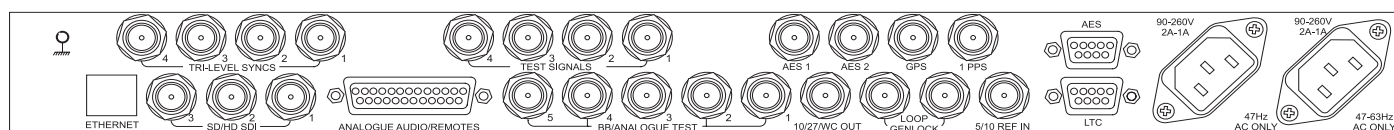## Mentor XL Options

Hardware Options

In addition to the standard features found in the base unit, Mentor XL has positions for 3 option boards, nominally assigned as:

- Tri-level sync board, with 4 independently timed outputs selectable to any HD video format
- SD/HD or HD/3G test signal board, each with 4 independently timed outputs and selectable frame format
- GPS Receiver with 1pps output + 2 unbalanced AES

If no GPS board is fitted, up to 3 TLS or SD/HD boards may be configured in any combination.

Software Options

Audio test – Adds independent audio tone generators for analogue, AES and embedded SDI outputs. Sample rate, amplitude and audio frequency are all selectable, with the option of interrupted tone for channel identification.

Video test – Allows any of the 5 analogue and 3 SDI outputs to be individually configured from a comprehensive range of test signals, with horizontal or vertical 4 line scrolling text ident, and moving markers to indicate 'live' video. In addition to the conventional signals such as colour bars and pathological test, Mentor XL provides a Lip Sync signal to expose video or audio delays within a signal path, and a Clean Aperture signal to ensure that out of picture artifacts are not displayed.

Customer defined logos may be imported and positioned in any test signal.

HD Test – This enables any of the base units 3 SDI or Black outputs to be independently configured for HD test signals.

Full Field Test – As standard, this feature provides the FUBK pattern in all video formats. Other test patterns may be imported and stored in bitmap format.

Timecode – Dual LTC outputs together with VITC / DVITC may be locked to the optional GPS receiver or to NTP. In picture timecode may also be optionally displayed in any test signal.

NTP – The NTP Server option allows the Mentor XL to act as a highly accurate and stable source of time for other broadcast equipment, whilst the client option may be used to lock a 'Slave' SPG to a 'Master'.

SNMP – This provides remote monitoring of power supplies, lock status and presence of external reference inputs.

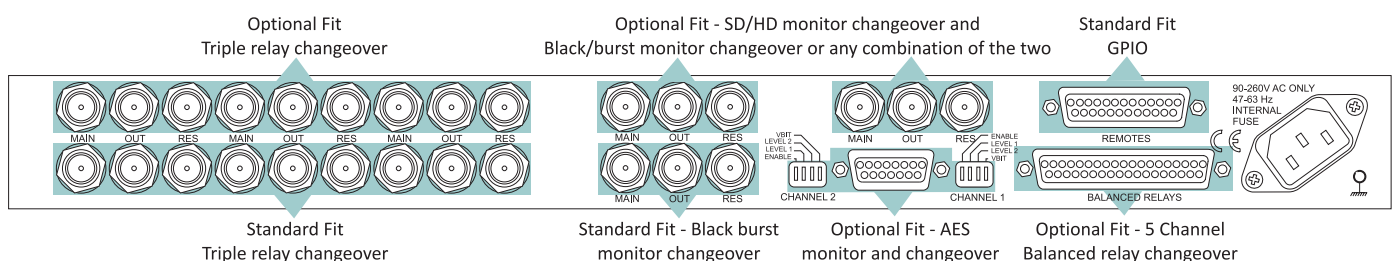|		
Base System	Genlock loop through	1
	Black/burst	5, independently timed
	SD-SDI Black	3, independently timed
	5/10 MHz clock input	1, selectable
	Wordclock/10/27 MHz	1, selectable
	Misc	2 x 2 GPI, 4 x Memory preset
	PSU & fan fail alarms	NC relay output
Software	Video Test	Composite: 5, SD and HD: 3 All 720, 1080 (1.485 and 2.970 Gb/s) standards
	Full field test pattern	FuBK pattern for composite & SD-SDI outputs (Other patterns are available)
	Audio test	Independent generators for AES 1 & 2, analogue (2ch) & embedded (16) Sample rate selectable: 32/44.1/48/96 kHz
	Timecode	2 independent LTC outputs + VITC/DVITC
	Network Time Protocol	NTP client or server support
	SNMP	SNMP agent
	Vector Editor	Remote configuration & status reporting
Boards	Tri-Level sync	4 per module. All 720p, 1080i and 1080p standards
	GPS receiver	GPS time reference
	GPS antenna	5 volt high gain antenna with mount
	3G output board	Provides 4, 3G outputs (2.970 Gb/s)
	HD/SD output board	Adds 4, each assignable as HD or SD
	Redundant PSU	Redundant load sharing power supply

MasterMind Changeover Unit

For added security, main and reserve Mentor XL units may be deployed with the MasterMind auto changeover to create a highly resilient master generator solution.

MasterMind's modular design allows it to be scaled to suit specific requirements. Inputs may be analogue, digital or a mix with the changeover effected manually or by auto detection. An internal buzzer may be activated to indicate changeover action, or alternatively, alarm status may be activated remotely via the GPI interface.

The base system, in standard configuration, accommodates one pair of main and reserve black/burst inputs with relay changeover for three pairs of auxiliary unbalanced signals. A further five option boards may be fitted to service additional SD/HD, TLS, AES, LTC and audio signals as required.

Optional Fit
Triple relay changeover

Optional Fit - SD/HD monitor changeover and
Black/burst monitor changeover or any combination of the two

Standard Fit
GPIO

Standard Fit
Triple relay changeover

Standard Fit - Black burst
monitor changeover

Optional Fit - AES
monitor and changeover

Optional Fit - 5 Channel
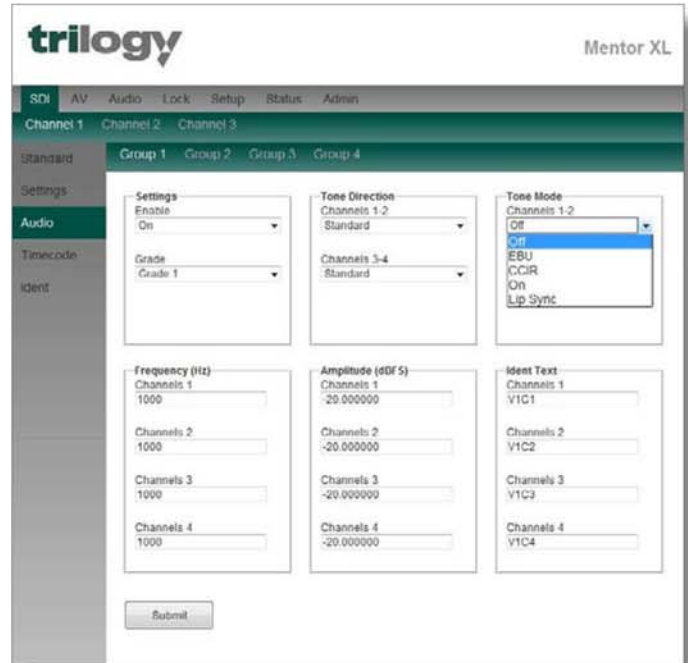Balanced relay changeover

Vector Editor

Vector is a powerful browser based utility designed to facilitate remote configuration and status monitoring of single or multiple Mentor XLs within a broadcast facility across a standard Ethernet network.

Virtually all of Mentor XL's parameters, including output formats, test patterns and timings can be modified with immediate effect. The browser is password protected to prevent unauthorised access.

The current configuration can be instantly verified and amended: alternatively, preset configurations can be downloaded to any Vector enabled Mentor XL. Vector also provides a convenient means of copying a configuration from one Mentor XL to another, simplifing both initial installation and unit upgrades.

The browser allows the operator to change multiple settings, enable features, upgrade the unit, import new logos and proprietary patterns and delete unwanted pattern files. Information on version numbers and enabled features can also be accessed using the browser.

Vector also indicates the unit's status, allowing visual confirmation of Genlock, GPS operation and power supply integrity. Remote access through the browser enables Trilogy to provide full diagnostics support via a direct connection to a customers unit.

Key Features

- Remotely configure any IP enabled Mentor XL
- Indicates current status of all parameters
- Displays event log file with time stamp
- Simple cloning of Mentor XL configuration
- Convenient entry of test signal ident text
- Remote firmware upgrade

Mentor XL Bundles		The following bundles may be supplemented with any of the options shown below
Leader part#		Descriptions
MXL-PKG-01	PAL/NTSC SD-SDI & HD - SDI	Mentor XL Master/Slave Sync Pulse Generator Includes Vector Remote Configuration Browser Base unit supplied with single power supply. Facilities : Genlock loop thru 10/5MHz ref input 5 x black/burst 3 x SD-SDI black 27/10MHz/word clock output 2 in/2 out GPI Ethernet port All SDI and analogue outputs individually timeable Simultaneous 525/60 and 625/50 operation Package Includes : - Mentor XL Main Frame (inc. Vector) - Video Test Patterns with SD and HD - SDI - Audio Test Tones (Balanced AES and Stereo Analogue)
MXL-PKG-02	PAL/NTSC SD-SDI & HD - SDI TRI-LEVEL SYNC	Package Includes : - MXL PKG-01 - XL-OP07 Tri-Level Sync option card
MXL-PKG-03	PAL/NTSC SD-SDI & HD - SDI TRI-LEVEL SYNC HD/3G-SDI	Package Includes : - MXL PKG-01 - XL-OP07 Tri-Level Sync option card - XL-OP11 HD/3G-SDI output option card

Leader part#	Descriptions	
MXL-PKG-04	PAL/NTSC SD-SDI & HD - SDI TRI-LEVEL SYNC GPS & Timecode	Package Includes : - MXL PKG-01 - XL-OP07 Tri-Level Sync option card - XL-OP04 GPS Receiver - XL-OP06 GPS Antenna and mount - XL-OP03 Timecode Generator option - XL-OP09 NTP Server

Leader part#	Descriptions
XL-OP01	Redundant Power Supply Module
XL-OP02	Full field test pattern Software option to generate FUBK test pattern, selectable 4:3 & 16:9
XL-OP03	LTC Timecode Software option to provide two LTC outputs with VITC
XL-OP04	GPS Time Reference Includes receiver module & software upgrade. Requires 50W 5v antenna. Suitable types available from Trimble <www.trimble.com> Also activates the 2 x AES unbalanced outputs.
XL-OP05	Unbalanced AES Output Card Activates the 2 x AES unbalanced outputs Not required if XL-OP04 fitted
XL-OP06	GPS Antenna & Universal Mount Bullet III Dome 5 V antenna. Supplied with F - type female connector Dims : 66.2 (h) x 77.5(dia) mm Complete with screw in, reinforced nylon mount (height 100mm) Suitable cable types for up to 100m : LMR400 (Times Microwave), BPE400 (Semflex) or equivalent 50W types. Downgraded cable types may be used for applications involving shorter cable runs providing the total loss at 2GHz does not exceed 20dB.
XL-OP07	Tri level Sync Module Provides 4 x individually configurable tri level sync outputs
XL-OP08	SD/HD Output Expansion Module Provides 4 additional SD-SDI or HD-SDI outputs in any combination
XL-OP09	NTP Server Support
XL-OP10	SNMP Support
XL-OP11	HD 3G Output Card

Leader part#	Descriptions	
MasterMind	Main Frame	MasterMind Changeover Unit Automatic changeover between two SPGs Includes : 1 x MM-OP06 Black & Burst Detector/Changeover 1 x MM-OP01 Triple Relay Board Auto / Manual operation Manual override control Switching of up to three analogue/digital/HD video sources Local / Remote operation

Important Note.
The following options are only compatible with
the MasterMind base unit. Consult the factory for options for earlier MasterMind versions

Leader part#	Descriptions
MM-OP01	Triple Switching Board Switching of up to 3 analogue Video or SD-SDI or SD-HDI sources One option card included in Main Frame. Max one additional board per main frame.
MM-OP02	Balanced Relay Changeover Board Provides 5 channels of balanced relay changeover for LTC, Audio, & AES. Max one MM-OP02 board per main frame
MM-OP03	AES Audio Monitor & Changeover Board Monitors and switches a pair of AES inputs. One board max per Mastermind
MM-OP04	Timecode Monitor & Changeover Board Monitors and switches a pair of LTC inputs
MM-OP05	SD-SDI & HD-SDI Monitor & Changeover Board Monitors and swiitches a pair of SD/HD inputs.
MM-OP06	Black/Burst Monitor & Changeover Board Monitors and switches an additional pair of black burst inputs.
MM-OP07	Tri Level Sync Monitor & Changeover Board Monitors and swiitches a pair of Tri Level Sync inputs.

LEADER
Technology Innovator

Leader Instruments Corporation
6484 Commerce Drive Cypress , CA 90630
1 (714) 527-9300
E-mail : Sales@LeaderAmerica.com
www.LeaderAmerica.com