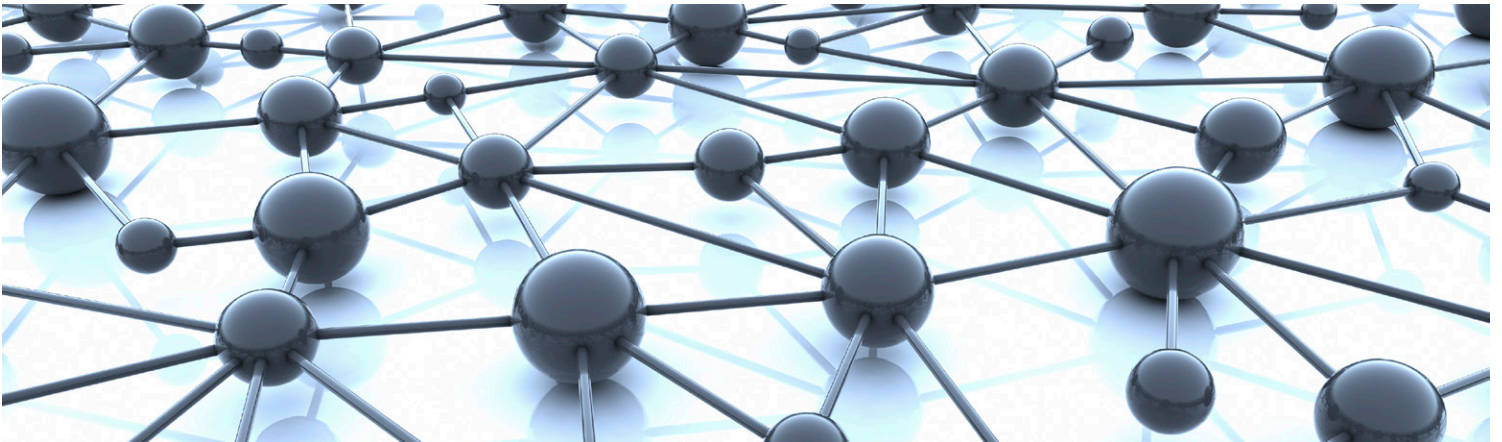


# IQHCO51

## 3G/HD/SD-SDI Synchronized Signal Protection Module



Automatic 3G/HD/SD-SDI signal protection with clean switching and powerful rules engine.

The IQHCO51 from Grass Valley, a Belden Brand, provides backup protection for SDI signal paths with a clean switching feature. IQHCO51 uses video and audio input error monitoring to drive an automatic change-over to a backup feed on error state detection. A powerful rules engine is available to provide logical conditions for auto-switching, whilst GPI inputs and card edge control can force the unit to switch independent of signal state. Features include three selectable inputs and a dedicated TPG input, along with monitoring of the unselected inputs for video and audio signal confidence.

### Why should you choose this module?

- Ideal for multiformat workflows where signal redundancy is an essential requirement
- Flexible control interfacing including fully automatic, RollCall, card edge and GPI operation
- RollCall integration ensures real-time alarm reporting of potential failure conditions and SNMP compatibility allows easy integration with Grass Valley, or third-party, network management systems providing an all inclusive monitoring and control solution

### KEY FEATURES

- 3 Gb/s SDI, HD-SDI and DVB-ASI operation with a synchronizer per input and RGB legalization
- Auto change-over from either input on pre-defined error conditions
- User-definable change-over delay
- Connectivity: 3 SDI inputs, analog reference input, up to 4 SDI outputs (2 main and 2 monitoring) and up to 8x GPI/O
- Flexible routing with 4x1, 4x2, 3x1, 3x2, 2x1 and 2x2 configurations available
- Input signal monitoring including SDI lock, EDH/ CRC error, Freeze detection, Black detection, embedded audio loss and standard mismatch
- Agile, router switching tolerant synchronizer operation with genlock adjustment allowing you to time any SDI signal to pixel accuracy with greater tolerance to mis-timed upstream SDI switching (up to  $\pm 10$  lines), ensuring disturbance free picture output
- Video controls including video gain, offset and hue, audio proc. amp features including channel level (sub-frame) routing, independent gain, invert and mute control with audio V-fade on input loss
- Up to 32 channel embedded audio support and Dolby E compatibility
- Input loss detection — default output of black/pattern and tone mute
- Independent HANC and VANC blanking control per input
- Card edge control for input switch and LED status indicators
- Selectable SDI monitoring outputs enable either input to be monitored independent of the main signal selection
- Built-in test pattern generator and audio tone generator assignable per input for testing purposes and provision for a dedicated routable TPG fourth input
- 16x user memories, save/recall/rename
- Input signal relay bypass versions available (options for either basic input 1 to output 1, or follow input select bypass)
- RollCall monitoring allows all signal paths to be managed, and Media Biometrics Signature generation on program output provides full integration with Sigma media assurance systems

### Options

- Single mode fiber optic transmitter and receiver support — rear panel option
- Advanced color corrector functionality that can be applied at each input — software license option

## SPECIFICATIONS

### Inputs and Outputs

#### Video Standards Supported

1125 (1080)/50p (A & B), 1125 (1080)/59p (A & B), 1125 (1080)/60p (A & B), 1125 (1080)/25p, 1125 (1080)/24p, 750 (720)/50p, 750 (720)/59p, 750 (720)/60p, 750 (720)/30p, 750 (720)/23p, 750 (720)/24p, 750 (720)/25p, 750 (720)/29p, (1035)/29i, (1035)/30i, 1125 (1080)/25i, 1125 (1080)/29i, 1125 (1080)/23p, 1125 (1080)/23sF, 1125 (1080)/24sF, 625 (576)/25i, 525 (480)/29i/DVB-ASI, EN50083-9

#### Signal Inputs

Primary switch: 3x SDI via BNC connectors

Input 1 cable length:

- Up to 70m Belden 1694A @ 3 Gb/s
- Up to 160m Belden 1694A @ 1.5 Gb/s
- >350m Belden 1694A @ 270 Mb/s

Input 2 cable length:

- Up to 60m Belden 1694A @ 3 Gb/s
- Up to 100m Belden 1694A @ 1.5 Gb/s
- Up to 100m Belden 1694A @ 270 Mb/s

Input 3 cable length:

- Up to 60m Belden 1694A @ 3 Gb/s
- Up to 100m Belden 1694A @ 1.5 Gb/s
- Up to 100m Belden 1694A @ 270 Mb/s

Analog reference:

1x analog reference with passive loop-through Black (HD tri-level and SD bi-level) and Black Burst (SD bi-level), SD bi-level – RS170A, HD tri-level – SMPTE ST 240, SMPTE ST 274 and SMPTE ST 296

#### Fiber Signal Input

Inputs: Up to 2

- Optical 3 Gb/s HD-SDI, 1.485 Gb/s HD-SDI or 270 Mb/s SD-SDI, ASI (270 Mb/s)

Connector/format: LC singlemode

Standard: SMPTE ST 297-2006

### Signal Outputs

Primary switch: 2x SDI via BNC connector

Monitoring switch: 2x SDI via BNC connector

#### Control Interface

GPI I/O: 8x closing contact via BNC

Card edge controls:

- External switch for manual and remote mode
- Input 1-3 manual override select push buttons

### Controls

#### Indicators

Power: OK (Green)  
 CPU: Running (Green flashing)  
 FPGA running: OK (Green flashing)  
 Status: OK (Green), Warning (Yellow), Error (Red)

Input 1: OK (Green), Fail (Red)

Input 2: OK (Green), Fail (Red)

Input 3: OK (Green), Fail (Red)

Rx 1: OK (Green), Fail (Red)

Rx 2: OK (Green), Fail (Red)

#### RollCall Controls

Default video output type: Input, Mute, TPG (Pattern, Captions, Tone), Black

Default video output standard: Last Known Good, 1125 (1080)/50P, 1125 (1080)/59P, 1125 (1080)/29i, 1125 (1080)/25i, 750 (720)/59P, 750 (720)/50P, 525 (480)/29i, 625 (576)/25i, Mute, Pattern

Main output switch: Rules selection, Primary, Secondary, FailSafe, Input 4 (Pattern, Caption, Tones)

Monitor output switch: Follow Main, Rules selection, Primary, Secondary, FailSafe, Input 4 (Pattern, Caption, Tones)

Switch rules: Logical combinations of warnings, GPI and RollTrack triggers

Change-over parameters: No SDI Lock, Standard mismatch, CRC (EDH) Error, Video freeze, Video black, Embedded audio loss, embedded audio quiet, audio overload, pair type detection (Dolby E, Data, PCM)

Switch delay:

Video 0s to 600s (Reversion) and 0fr to 16384fr (Trigger Condition)

Audio 0 to 16384 from Trigger Condition (fr)

Audio type 0 to 16384 from Trigger Condition (fr)

GPI/O program: TALLY any input state or warning or set as trigger

Pattern select: Color Bars, Black

Edit caption: 19 characters available, size and position adjustment

Reporting & logging: Input Loss; Input Line Standard; EDH error; Audio & data presence, change over status, main video output

#### PCM Tone Setup

Frequency L/R: 100 Hz to 10 kHz in 100 Hz steps

Channel Ident: On/Off

#### Audio Monitoring

Silence detect: 0 to -80 dB in steps of 1 dB

Signal overload detect: 0 to -80 dB in steps of 1 dB

#### Other Controls

User memories: 16x Save, Recall, Rename

Memory naming: User configurable naming of memories 1 – 16

Information window: Video Input Status, Audio Input Status, Rules status

RollTrack index: Up to 70 RollTrack destinations

RollTrack sources: Unused, Primary, Secondary, FailSafe, None output selection, Inputs Std, Inputs State, Caption/Pattern On/Off

Factory default: Resets all module settings to factory specified default values and clears memories

Default settings: Resets all module settings to factory specified defaults but does not clear memories

Restart: Software restart of the module

Module information: Reports following module information: Software version, Serial number, Build number, Firmware version, PCB version

### General Specifications

**Electrical:** 3 Gb/s SDI, SMPTE ST 424, 1.5 Gb/s HD-SDI, SMPTE ST 292, 270 Mb/s SDI, SMPTE ST 259-C/DVB-ASI

Connector/format: BNC/75Ω panel jack on standard IQ connector panel

Return loss:

>-15 dB (270 Mb/s, 1.5 Gb/s)

>-10 dB (3 Gb/s)

>-15 dB DVB-ASI, EN50083-9

Output jitter:

SD-SDI 0.2 UI (10 Hz)/0.2 UI (1 kHz)

3G/HD-SDI 1.0 UI (10 Hz)/0.2 UI (100 kHz)

DVB-ASI, EN50083-9

GPI I/O (x8) characteristics:

Closing contact type with internal source

Input threshold voltage: 1V typical

#### Module Power Consumption

IQHCO5100-1B3: 14.5 PR Max.

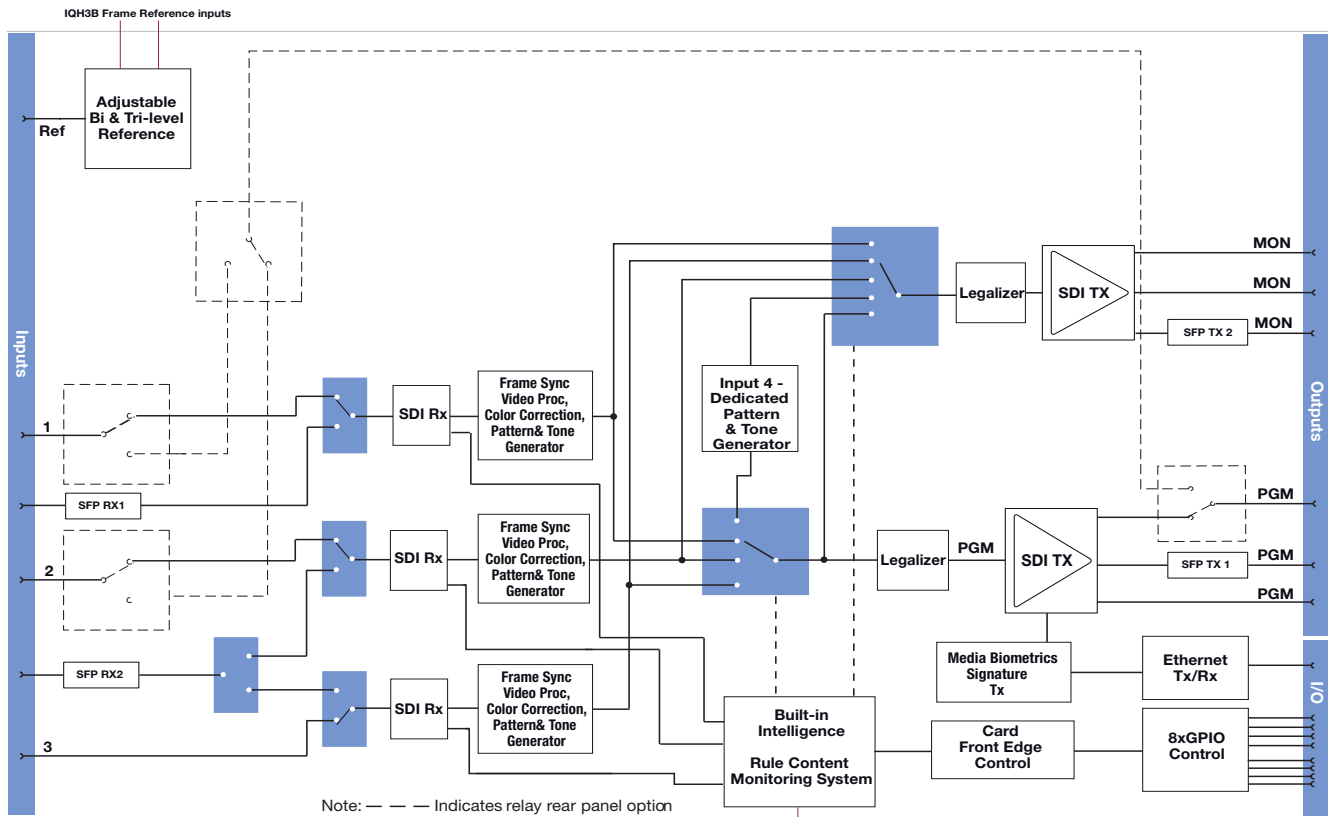
IQHCO5103-2B3: 16.5 PR Max.

Relay rear versions:

IQHCO5101-1B3: 15.5 PR Max.

IQHCO5102-2B3: 16 PR Max.

# IQHC051 3G/HD/SD-SDI Synchronized Signal Protection Module



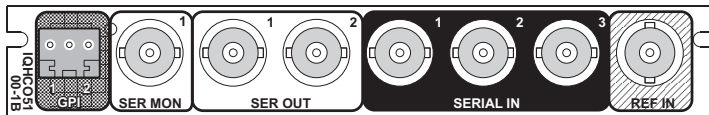
Note: - - - Indicates relay rear panel option

Block Diagram for IQHC051 range

## ORDERING

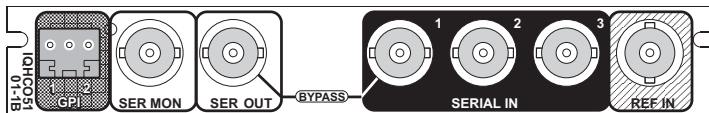
### IQHC051000-1B3

3G/HD/SD-SDI synchronized signal protection module. 3 inputs, external and internal frame reference selection, 2 main outputs, 2 monitoring outputs, 2 GPI/O



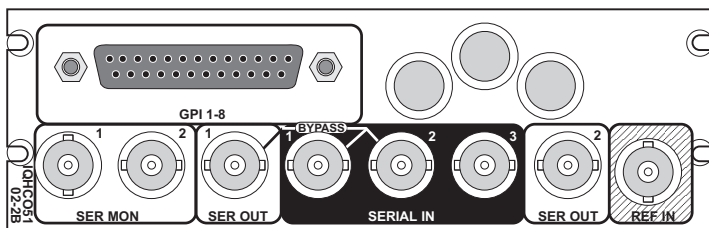
### IQHC05101-1B3

3G/HD/SD-SDI signal protection module with relay bypass. 3 inputs, external and internal frame reference selection, 1 main output, 2 monitoring outputs, 2 GPI/O



### IQHC05102-2B3

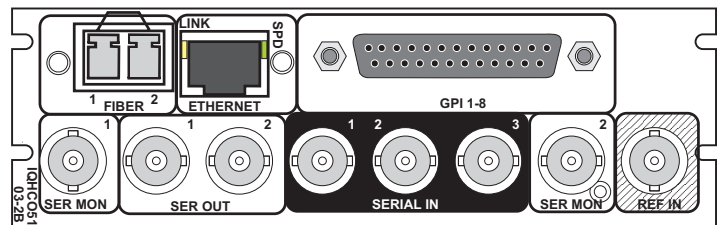
3G/HD/SD-SDI signal protection module with input follow relay bypass. 3 inputs, external and internal frame reference selection, 2 main outputs, 2 monitoring outputs, 8 GPI/O



### IQHC05103-2B3

3G/HD/SD-SDI signal protection module. 3 inputs, external and internal frame reference selection, 2 main outputs, 2 monitoring outputs, 8 GPI/O, Fiber SFP, Ethernet

For more details on enclosure types please refer to the IQ Modular Enclosures data sheet.



### SFP Options

- FC1-13T1** Single 1310 nm fiber Tx
- FC1-13T2** Dual 1310 nm fiber Tx
- FC1-R1** Single fiber Rx
- FC1-R2** Dual fiber Rx
- FC1-13TR** Fiber transceiver 1310 nm Tx/Rx

CWDM & high sensitivity options available on request

Note: SFP type must be ordered in addition to the module.



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