Crystal Vision

SYN103

SD video synchroniser

SYN103 is a cost-effective and fully-featured video frame synchroniser for Standard Definition sources. Designed principally for applications without embedded audio and ideal for synchronising in the studio or before the vision mixer, it can correct any timing problems – whether you need to synchronise sources timed to a different reference or correct system processing delays. The useful features include delay compensation, video proc-amp and integrated fibre input/output connectivity, while you can save yourself the expense of a distribution amplifier by using the four video outputs to easily send the synchronised signal to multiple places.

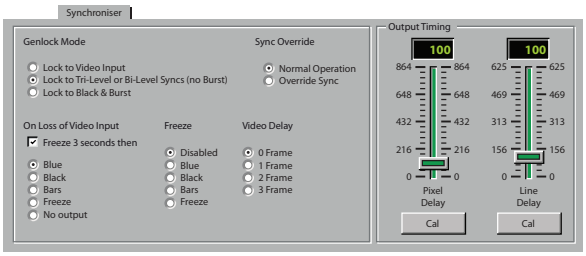
- The most cost-effective Crystal Vision synchroniser for Standard Definition-only sources
- Correct any timing problems: either synchronise incoming video signals or compensate for timing delays within video system
- Use any available timing signals: reference your source to HD tri-level syncs or SD Black and Burst
- Easy to time all your signals: with full vertical and horizontal timing adjustments, plus up to three frames of additional user video delay
- Use the video proc-amp to optimise the video: with adjustment of the video gain, black level and independent RGB and YUV gains
- Optional integrated fibre input/output connectivity means you won't be limited by cable lengths
- Save yourself a distribution amplifier: send the synchronised signal to multiple places, with four video outputs
- Saves rack space: 100mm x 266mm module allows 12 SYN103 in 2U (24 in 4U, six in 1U and two in desk top box)
- Flexible control: select from board edge, front and remote panels, GPIs, SNMP and PC software

SYNCHRONISE THE VIDEO

SYN103 can both synchronise incoming video signals which are not locked to the local reference and compensate for timing delays within the video system. It has two operational modes: synchroniser and delay line.

Synchroniser mode is ideal for external sources that are not timed to station references such as satellite or remote contribution feeds. In synchroniser mode SYN103 takes its timing from the external analogue reference and will automatically synchronise sources between 0 and 1 frame, fixing any incorrect frame rates plus any delays. The ability to cross-lock allows it to conveniently use any existing timing signals, either HD tri-level syncs or SD Black and Burst.

Delay mode takes its timing from the video input and is ideal for when the frame rate is correct but the source has been passed through other equipment and therefore been delayed for a few lines. The delay is adjustable in samples, lines and whole frame steps. Should the reference be removed or the board powered without a connected reference, SYN103 will revert to delay mode.



Set up your synchronising options

You can easily compensate for mistimed sources elsewhere in your system by adjusting the output timing relative to the reference through an entire frame using horizontal and vertical settings. Further fixed delays can then be added, with up to three frames of video delay – adjustable in one frame steps – allowing you to match any big video delays in the system.

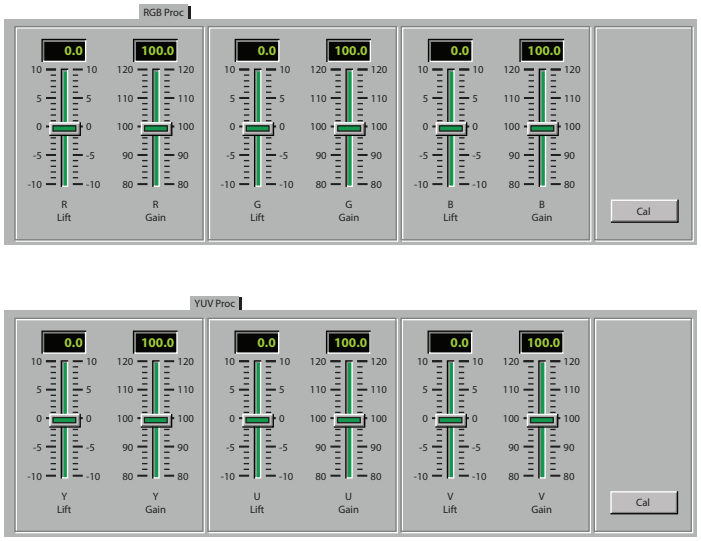
SYN103 is principally designed for use with video-only sources, but can pass through embedded audio transparently if the input and output frame rates are locked together.

FREEZE FUNCTIONS

Both automatic and manual freeze are available. You can choose to show the last good field or alternatively a black or blue screen or 100% colour bars, with an optional initial delay of three seconds. Manual freeze allows SYN103 to be used as a simple still store.

OPTIMISE THE VIDEO

SYN103 includes a video proc-amp for picture optimisation and to help maintain colour fidelity. The video gain, black level and independent RGB and YUV gains can all be adjusted.



Optimise the picture with the video proc-amp

FIBRE CONNECTIVITY – ON THE BOARD

SYN103 allows you to have fibre input or output straight into the board – ideal when you need to send and receive signals beyond the local equipment bay. Just order either the FIP fibre input option or FOP fibre output option.

Designed for SMPTE 297-2006 short-haul applications, the FIP is used to receive an optical input and the FOP to transmit an optical output using a Class I laser. With a FIP fitted you can select your video input source to be taken either from the input BNC or the optical input. Having the fibre integral to the board reduces the need to use up additional rack space for separate fibre optic transmitters and receivers – as well as saving you money.

SYN103 can also support CWDM lasers if required.

SAVE RACK SPACE – AND GET MULTIPLE OUTPUTS

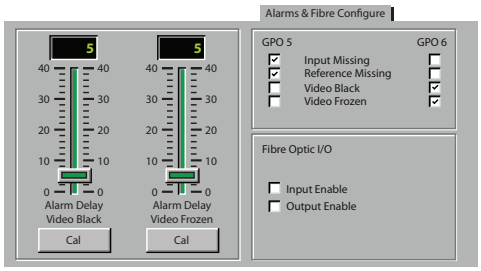
SYN103 is a space-saving 100mm x 266mm module which is housed in the standard frames, available in 4U, 2U, 1U and desk top sizes and with up to 12 boards fitting in 2U. It can be used with two different frame rear modules – either the default RM41 or the RM57 for fibre applications.

The four video outputs will save you the expense of a distribution amplifier on the output if you need to send the synchronised signal to multiple places.

FLEXIBLE CONTROL

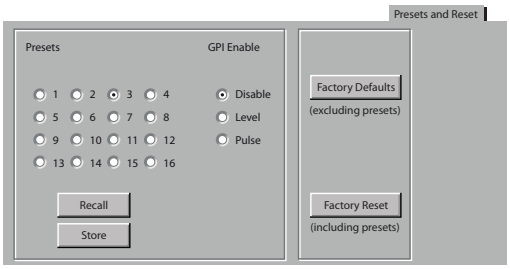
SYN103 is very easy to control, with options including board edge switches, an active front panel on the frame, a remote control panel, GPIs, SNMP and the Statesman PC software.

Signal monitoring is provided by the two GPI outputs reserved for alarm indication, which may be assigned any number of four video alarms: video missing, reference missing, video black and video frozen. The video black and video frozen alarms can be delayed by up to 40 seconds before an alarm is asserted.



Get signal monitoring with four alarms

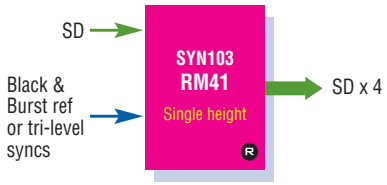
Up to 16 user-defined presets, containing the board setup data, may also be stored and recalled.

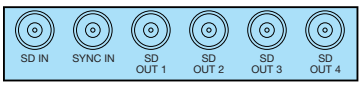


Store your frequently used settings in the 16 presets

REAR MODULE CONNECTIONS

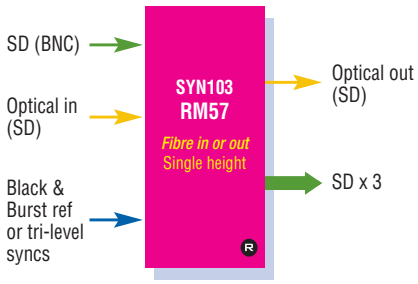
For standard applications



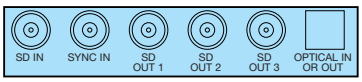


RM41

For fibre applications

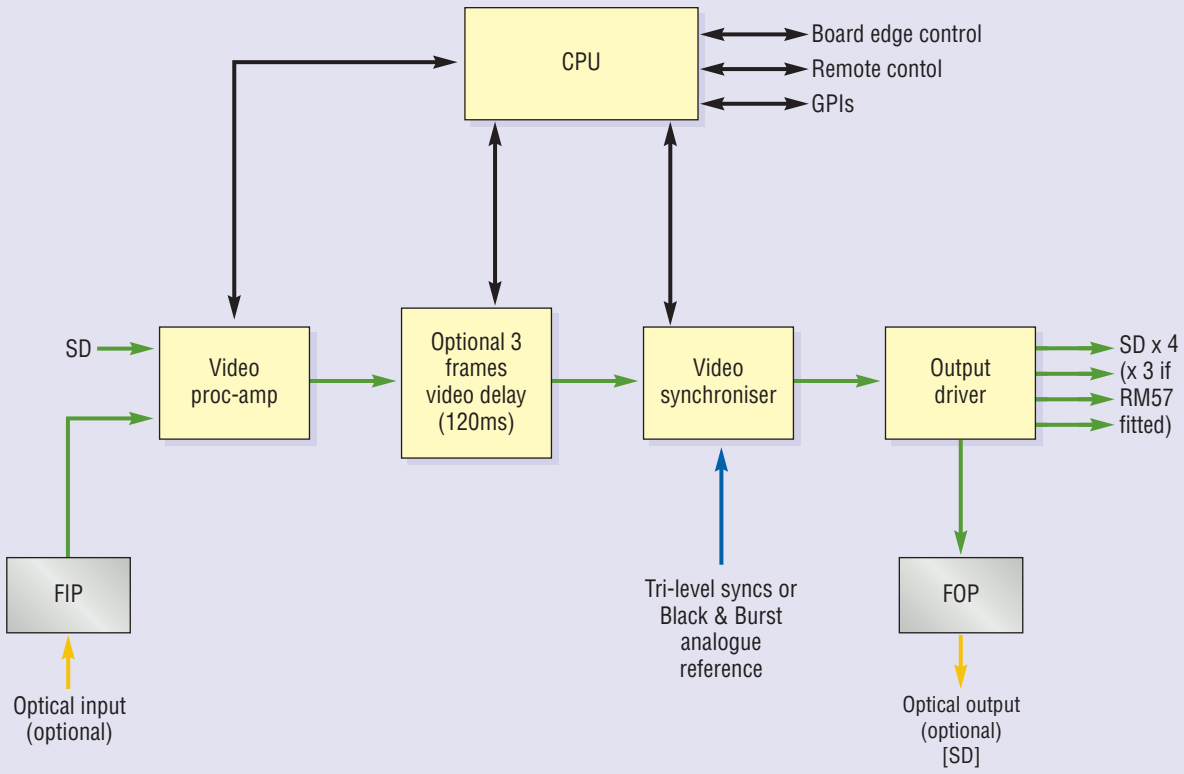


NB. Choose between fibre in or fibre out by selecting FIP or FOP fibre option



RM57

THE INPUTS AND OUTPUTS



SPECIFICATION

MECHANICAL

Standard Crystal Vision module 266mm x 100mm

Weight: 200g

Power consumption: 9 Watts; 0.6 Watts (FIP and FOP)

VIDEO INPUT

One SD input

When using FIP fibre input option allows selection between one optical and one BNC input

270Mb/s serial compliant to EBU 3267-E and SMPTE 259

The video formats supported are 625 and 525

SD cable equalisation >250m Belden 8281 or equivalent

Auto 625/525 line selection

May contain embedded audio when input and output frequencies are locked

VIDEO OUTPUTS

Using RM41 rear module: Four SD outputs

Using RM57 rear module with FIP fibre input option: Three SD outputs

Using RM57 rear module with FOP fibre output option: Four SD outputs (one on fibre and three on BNC)

Serial output: 270Mb/s serial compliant to EBU 3267-E and SMPTE 259

With or without an input present, the output format can be forced to give either a 100% colour bars, black or blue output

INTEGRATED FIBRE OPTIONS

SYN103 can be given integrated fibre connectivity by fitting the FIP fibre input option or FOP fibre output option

The chosen option should be fitted at the factory

To access the optical inputs or outputs an RM57 frame rear module must be used

When fitted with a FIP or FOP, SYN103 can be housed in any frame slot position but due to its extra height it is not possible to place most Standard Definition or audio boards directly above it when the SYN103 is in even numbered slot positions. 3Gb/s and HD boards do not share this restriction.

FIP and FOP meet the SMPTE 297-2006 short-haul specification, allowing operation with single-mode and multi-mode fibre

Connector type: SC/PC

FIP:

Optical wavelength: 1260-1620nm

Input level maximum: 0dBm

Input level minimum: Typical -20dBm (-18dBm 3Gb/s pathological)

FOP:

Optical power: Max 0dBm, min -5.0dBm (typical -2.0dBm or 630uW)

Fibre pigtail: Single-mode 8/125uM

Optical wavelength: 1290-1330nm (1310 typical)

Extinction ratio: 7.5dB

Laser safety classification: Class 1 (EN 60825), Class I (21CFR1040.10)

ANALOGUE REFERENCE

Tri-level syncs or analogue Black and Burst or video

Reference must be same frame rate as video

Amplitude of syncs 150mV to 600mV

Link on PCB selects 75 ohm termination or high impedance

SYNCHRONISER TIMING ADJUSTMENTS

In synchroniser mode SYN103 takes its timing from the external analogue reference and will automatically synchronise sources between 0 and 1 frame. Further fixed delays can be added for matching purposes. Should the reference be removed, SYN103 will revert to delay mode

In delay mode timing is derived from the SD input, with the video delay adjusted in samples, lines and whole frame steps up to a maximum of four video frames

In both synchroniser and delay modes the timing can be fully adjusted using horizontal and vertical settings. Increasing the vertical setting will delay the output relative to the reference in increments of one line. Increasing the horizontal setting will increase this delay in increments of approx. 74ns. With maximum adjustment of vertical and horizontal timing, the delay can be set between 220us and four frames

DELAY THROUGH BOARD

220us minimum

VIDEO DELAYS

0 to 1 frame video synchroniser delay

Optional one frame (33.3ms or 40ms), two frames (66.7ms or 80ms) or three frames (100ms or 120ms) video delay can match any big video delays in the system

FREEZE FUNCTIONS

Manual freeze allows SYN103 to be used as a simple still store. Automatic freeze is available when input fails through loss of signal. The user can specify to show the last good field or alternatively a black or blue screen or 100% colour bars (with or without an initial delay of three seconds). A single field is output when frozen to protect against the jitter from a moving picture

VIDEO PROCESSING

Video proc-amp for picture optimisation and to help maintain colour fidelity, with adjustment for the video gain, black level and independent RGB and YUV gains of +/- 20%

ANCILLARY DATA

Ancillary data passed

LED INDICATION OF:

Power supplies okay

Video input

GPI output 5 active

GPI output 6 active

External reference connected

PRESETS

The current board settings can be saved in one of 16 locations to be recalled as required

GPI INPUT LEVELS

Active: pull to ground, pulled up to +5V through 10 kohm

GPI OUTPUT LEVELS

Electrically: Open collector transistors 30V, 270 ohm current limit resistors. Pulled up to +5V through 6800 ohm

GPI INPUTS

Four GPI inputs can be used to recall stored presets, either level or pulse triggered

GPI OUTPUTS

Two GPI outputs (GPI 5 and GPI 6) are reserved for alarm indication. They may be assigned any number of four video alarms:

Video missing

Reference missing

Video black

Video frozen

Video missing and reference missing will assert an alarm immediately. The video black and video frozen alarms can be delayed by up to 40 seconds before an alarm is asserted

LOCAL CONTROL

Intuitive board edge interface with two select buttons, shaft encoder and ten character alphanumeric display

REMOTE CONTROL

RS422/485

19200 baud, 8 bits, 1 stop no parity

Control from frame active front panel and remote panel

Statesman allows control from any PC on a network

SNMP monitoring and control available as a frame option

ORDERING INFORMATION

SYN103	SD video synchroniser
FIP	Fibre input option for SYN103 motherboard providing integrated fibre input connectivity
FOP	Fibre output option for SYN103 motherboard providing integrated fibre output connectivity. For CWDM laser options, contact Crystal Vision
Indigo 4	4U frame with passive front panel for up to 24 Crystal Vision modules
Indigo 4SE	4U frame with passive front panel fitted with Statesman CPU for up to 24 Crystal Vision modules
Indigo 2	2U frame with passive front panel for up to 12 Crystal Vision modules
Indigo 2AE	2U frame with active front panel for up to 12 Crystal Vision modules
Indigo 2SE	2U frame with passive front panel fitted with Statesman CPU for up to 12 Crystal Vision modules
Indigo 1	1U frame with passive front panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1-DP
Indigo 1AE	1U frame with active front panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1AE-DP
Indigo 1SE	1U frame with passive front panel fitted with Statesman CPU for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1SE-DP
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTSE	Desk top box with passive front panel fitted with Statesman CPU for up to two Crystal Vision modules
RM41	Single slot frame rear module. Allows maximum number of SYN103 in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box). Gives access to one SD input and four SD outputs
RM57	Single slot frame rear module. Allows maximum number of SYN103 in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box). Designed for applications using fibre inputs or outputs. **When using fibre input**, allows you to select between one fibre and one electrical SD input, and gives access to three SD outputs. **When using fibre output**, gives access to one SD input and three SD outputs, along with one copy of the output on fibre
REMIND	19" remote control panel
REMIND-E	19" Ethernet remote control panel
Statesman	PC Control System
SNMP	SNMP monitoring and control

Crystal Vision

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