Crystal Vision

FTX-L 3G and FRX 3G

3G/HD/SD fibre optic transmitter and receiver

The FTX-L 3G fibre optic transmitter and FRX 3G fibre optic receiver have been designed to transmit and receive 3Gb/s, HD or SD signals over long distances in a robust, reliable and space-saving way.

Perfect for moving signals around in big installations, the FTX-L 3G and FRX 3G are trusted by broadcasters who have bought hundreds at a time. They will save you money and rack space by being dual channel products (with 24 channels fitting in 2U) and can easily be used in conjunction with our other products. They are designed for SMPTE 297-2006 short-haul applications, with the FTX-L 3G using a Class I laser and with CWDM lasers available as an option for those who wish to transmit multiple signals through one fibre.

With the FTX-L 3G and FRX 3G you can easily meet the challenges created by the limited range of coaxial cable with HD and 3Gb/s video – without an increase in the cost or complexity of your system.

- Dual channel fibre optic transmitter (FTX-L 3G) and dual channel fibre optic receiver (FRX 3G)
- Send 3Gb/s, HD or SD signals over long distances – ideal for use within a large building or for passing signals between OB vehicles
- Use them with single-mode and multi-mode fibre: meet the SMPTE 297-2006 short-haul specification
- Reduce the need for additional distribution amplifiers: with two input loop-throughs on FTX-L 3G and two outputs per channel on FRX 3G
- Troubleshoot your system: use the two input loop-throughs on FTX-L 3G for system checking
- Stay safe: FTX -L 3G includes laser safety features
- Transmit multiple signals down one fibre: FTX-L 3G can be provided with CWDM lasers, with ten different wavelength pairs available
- Effortless integration: fitting in the Indigo frames makes it easy to use them with Crystal Vision's interface and keying modules
- Fit up to 24 channels in 2U: space-saving 100mm x 266mm modules allow 12 FTX-L 3G or FRX 3G in 2U (six in 1U and two in desk top box)
- Flexible monitoring, including web browser and SNMP

TRANSPORT YOUR SIGNALS RELIABLY

The FTX-L 3G and FRX 3G are ideal for use together, but can be used with alternative transmitters and receivers.

The FTX-L 3G has two independent 3Gb/s, HD or SD inputs, each with one optical output. It can transmit a serial digital signal down a fibre optic cable to the FRX 3G receiver, which offers two optical inputs and two reclocked 3Gb/s, HD or SD outputs per channel – meaning it doubles as a DA and reduces the need, rack space and cost of having distribution amplifiers after the receiver. The FRX 3G recognises whether the standard is 3G/HD or SD and switches the slew rate automatically.

Specially modified laser modules allow the FTX-L 3G to cope successfully with pathological signals – with this challenging test pattern useful for testing your serial link. All outputs on the FRX 3G are DVB-ASI compatible, with one non-inverted output and one inverted output per channel.

USE THEM WITH SINGLE-MODE AND MULTI-MODE FIBRE

Both boards meet the SMPTE 297-2006 short-haul specification, allowing operation with the more popular single-mode fibre, as well as multi-mode fibre. This makes them suitable for a wide range of applications – from moving signals around in large installations to passing signals between Outside Broadcast vehicles.

PASS LIGHT MORE EFFECTIVELY

The FRX 3G includes a number of useful features.

Sometimes factors such as dirty connectors or damaged fibre cables can cause light to be passed less effectively. You can therefore monitor the received power in both microwatts and dBm, allowing you to judge the amount of headroom you have and guarantee that your signal will be transmitted successfully.

STAYING SAFE

The FTX-L 3G comes with all the safety features you would expect.

These include a Class I laser that will automatically switch off if there is no video input or if any of the laser's critical parameters are exceeded. The laser can also be shut down manually. A warning is given when the laser is approaching the end of its expected lifetime, with this warning triggered after approximately 85% of the expected lifetime has expired.

DISTRIBUTE YOUR INPUT VIDEO – OR CHECK YOUR SYSTEM

The FTX-L 3G includes two input loop-throughs. These can be assigned as one loop-through per channel or both loop-throughs can be assigned to Input 1.

These loop-throughs can be used to distribute the input video to equipment such as a picture monitor, or alternatively for system checking: if a signal path has a good input and a faulty output, you can use the spare output to check each stage of the system without breaking any of the connections, and so work out which equipment or cable is broken.

GET MULTIPLE SIGNALS THROUGH ONE FIBRE – WITH CWDM

The FTX-L 3G uses a standard 1310nm laser, but Crystal Vision can alternatively provide precise CWDM lasers on request.

CWDM (coarse wavelength division multiplexing) allows many signals to be transmitted down a single fibre link by using a different wavelength of light for each signal – saving you money and rack space.

By fitting the appropriate CWDM laser and using an external combiner, you can take the output signal from the FTX-L 3G and combine it with signals from other sources down one fibre. The output wavelengths are defined by the ITU and are available in the following ten combinations: 1271nm and 1291nm, 1311nm and 1331nm, 1351nm and 1371nm, 1391nm and 1411nm, 1431nm and 1451nm, 1471nm and 1491nm, 1511nm and 1531nm, 1551nm and 1571nm, 1591nm and 1611nm or 1310nm and 1550nm.

For CWDM, please order the FTX-L-CWDM 3G version and specify the laser wavelength pair required.

SAVE RACK SPACE

The FTX-L 3G and FRX 3G will make the most of your rack space.

Both are 100mm x 266mm dual channel modules, which brings financial and rack space savings with up to 24 channels possible in a 2U frame.

As part of the normal Crystal Vision range, the boards are housed in the Indigo frames in a choice of three sizes: 2U, 1U and desk top box. This makes it remarkably easy to transport or receive the signals from the company's interface or keying modules.

On both products the inputs and outputs are accessed by using the RM55 frame rear module.

MONITOR YOUR SIGNALS

Status monitoring and basic control can be performed by using either board edge switches, an integrated control panel on the AE frame, the VisionPanel remote control panel, SNMP, our ASCII and JSON protocols, the Statesman Lite PC Control System or the VisionWeb web browser control.

Board edge LEDs provide status reporting and can provide visual assistance when fault finding.

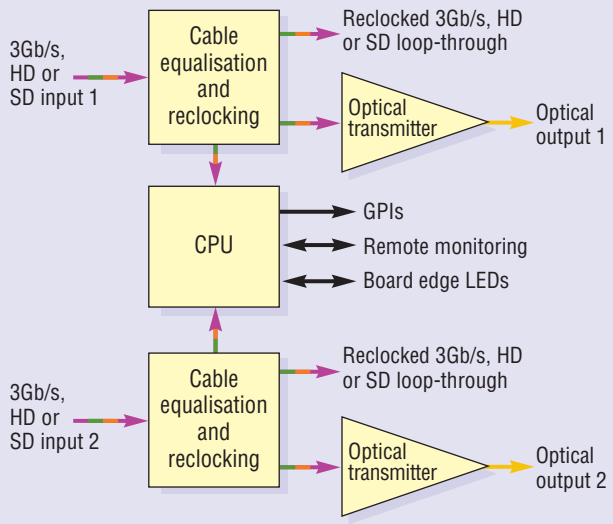
OTHER FIBRE OPTIONS

As an alternative to the FTX-L 3G and FRX 3G, some Crystal Vision boards feature the option of integrated fibre connectivity in a single slot by fitting either the FIP fibre input option, FOP fibre output option or FIO fibre input and output option directly to the motherboard.

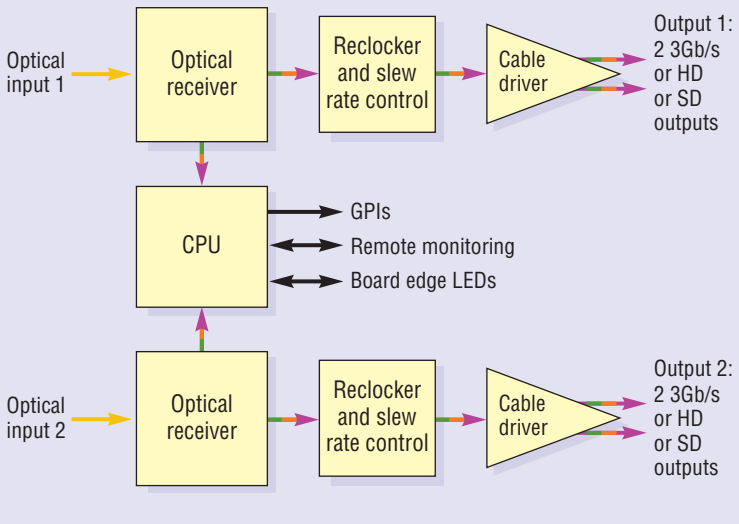
This integrated fibre option is available on some of the up and down converters, synchronisers, routing switches, colour correctors, video delays and audio embedders/de-embedders.

THE INPUTS AND OUTPUTS

FTX-L 3G

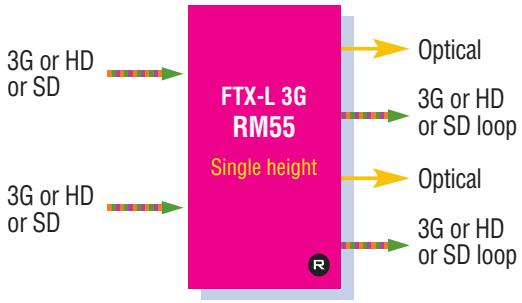


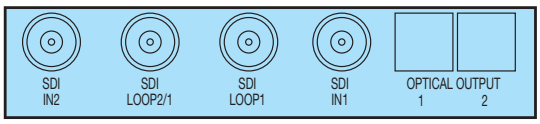
FRX 3G



REAR MODULE CONNECTIONS

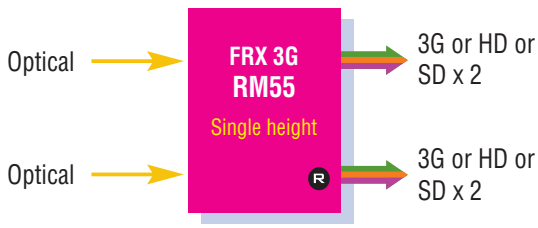
FTX-L 3G

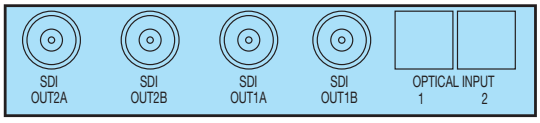




RM55 used with FTX-L 3G

FRX 3G





RM55 used with FRX 3G

SPECIFICATION

FTX-L 3G

MECHANICAL

Standard Crystal Vision module 266mm x 100mm

Weight: 200g

Power consumption: 3 Watts

VIDEO INPUT

Two 3Gb/s, HD or SD inputs

DVB-ASI compatible

270Mb/s or 1.5Gb/s or 3Gb/s serial compliant to SMPTE 259 or ASI data, SMPTE 292-1 and SMPTE 424/425-A

3Gb/s cable equalisation up to 80m using Belden 1694A. HD cable equalisation up to 140m with Belden 1694 or equivalent (approx. 100m with Belden 8281). SD cable equalisation >250m Belden 8281 or equivalent

Input return loss: -15dB for 50MHz to 1.5GHz

Auto 50/59.94/60Hz and video format selection

Passes all 3Gb/s, HD and SD signals transparently, including pathological signals

VIDEO OUTPUTS

One optical output per channel using RM55 frame rear module

Two reclocked 3Gb/s, HD or SD input loop-throughs. These can be assigned as one input loop-through per channel or both loop-throughs can be assigned to Input A

Meets the SMPTE 297-2006 short-haul specification. This allows operation with single-mode and multi-mode fibre

Laser safety classification: Class 1 FDA and IEC60825-1 Laser Safety compliant

Optical power: Max -0.0dBm, min -5.0dBm

Fibre pigtail: Single-mode 9/125uM

Optical wavelength: 1290-1330nm (1310 typical)

Extinction ratio: 7.5dB

Connector type: SC/PC

POSITION IN FRAME

The FTX-L 3G 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 cards directly above it when the FTX-L 3G is in even numbered slot positions. 3Gb/s and HD cards do not share this restriction

CWDM

The FTX-L 3G can be supplied with CWDM (coarse wavelength division multiplexing) lasers. The output wavelengths are defined by the ITU and are available in specific combinations

For CWDM, order the FTX-L-CWDM 3G and specify which of the following laser pairs you require:

- 1271nm and 1291nm
- 1311nm and 1331nm
- 1351nm and 1371nm
- 1391nm and 1411nm
- 1431nm and 1451nm
- 1471nm and 1491nm
- 1511nm and 1531nm
- 1551nm and 1571nm
- 1591nm and 1611nm
- 1310nm and 1550nm

DELAY THROUGH BOARD

Link delay less than 100ns

LED INDICATION OF:

Power supplies okay

HD or SD input present

Laser near end of life

Laser error/disabled

GPI OUTPUT LEVELS

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

GPI OUTPUTS

Six GPI outputs

Input present for each channel

Laser nearing end of life for each channel

Laser shutdown for each channel

LOCAL CONTROL

DIP switch enables/disables laser

REMOTE MONITORING

Software:

VisionWeb Control is available via the web server on the frame and allows monitoring using a standard web browser on a computer, tablet or phone

Statesman Lite allows monitoring from any PC on a network

SNMP monitoring available as a frame option

Monitor using ASCII and JSON protocols

Hardware:

Monitor from integrated control panel on Indigo 1AE-DP frame

Monitor from VisionPanel 3U remote panel

FRX 3G

MECHANICAL

Standard Crystal Vision module 266mm x 100mm

Weight: 200g

Power consumption: 3.5 Watts

VIDEO INPUT

Two optical inputs

Meets the SMPTE 297-2006 specification. This allows operation with single-mode and multi-mode fibre

Optical wavelength: 1260-1620nm

Input level maximum: -1dBm

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

Connector type: SC/PC

VIDEO OUTPUTS

Two reclocked 3Gb/s, HD or SD outputs per channel using RM55 frame rear module

Will drive 270Mb/s or 1.5Gb/s or 3Gb/s serial compliant to SMPTE 259 or ASI data, SMPTE 292-1 and SMPTE 424/425-A

Passes all 3Gb/s, HD and SD signals transparently, including pathological signals

All outputs are DVB-ASI compatible, with one non-inverted output and one inverted output per channel

Recognises whether the standard is 3G/HD or SD and switches the slew rate automatically

POSITION IN FRAME

The FRX 3G 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 cards directly above it when the FRX 3G is in even numbered slot positions. 3Gb/s and HD cards do not share this restriction

DELAY THROUGH BOARD

Link delay less than 100ns

LED INDICATION OF:

Power supplies okay

Optical input present

GPI OUTPUT LEVELS

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

GPI OUTPUTS

Two GPI outputs

Input present for each channel

LOCAL CONTROL

Selectable HD/SD slew rate

REMOTE MONITORING

Software:

VisionWeb Control is available via the web server on the frame and allows monitoring using a standard web browser on a computer, tablet or phone

Statesman Lite allows monitoring from any PC on a network

SNMP monitoring available as a frame option

Monitor using ASCII and JSON protocols

Hardware:

Monitor from integrated control panel on Indigo 1AE-DP frame

Monitor from VisionPanel 3U remote panel

ORDERING INFORMATION

FTX-L 3G	Dual channel 3Gb/s, HD or SD to fibre optic transmitter (For CWDM, order the FTX-L-CWDM 3G and inform Crystal Vision the laser wavelength pair you require)
FRX 3G	Dual channel fibre optic to 3Gb/s, HD or SD receiver
Indigo 2SE	2U frame with active front panel featuring smart CPU for up to 12 Crystal Vision modules
Indigo 1AE-DP	1U frame with active front panel featuring smart CPU and integrated control panel for up to six Crystal Vision modules, with included power supply redundancy
Indigo 1SE-DP	1U frame with active front panel featuring smart CPU for up to six Crystal Vision modules, with included power supply redundancy
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTSE	Desk top box with active front panel featuring smart CPU for up to two Crystal Vision modules
RM55	Single slot frame rear module for FTX-L 3G and FRX 3G. Allows maximum number of boards in frame (12 in 2U, six in 1U, two in desk top box). When used with FTX-L 3G, gives access to two 3Gb/s, HD or SD inputs, two input loop-throughs and one optical output per channel. When used with FRX 3G, gives access to two optical inputs and two 3Gb/s, HD or SD outputs per channel
VisionPanel	3U Ethernet remote control panel with touch screen
VisionWeb Control	VisionWeb web browser control included within frame software
SNMP	SNMP monitoring and control

Crystal Vision

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