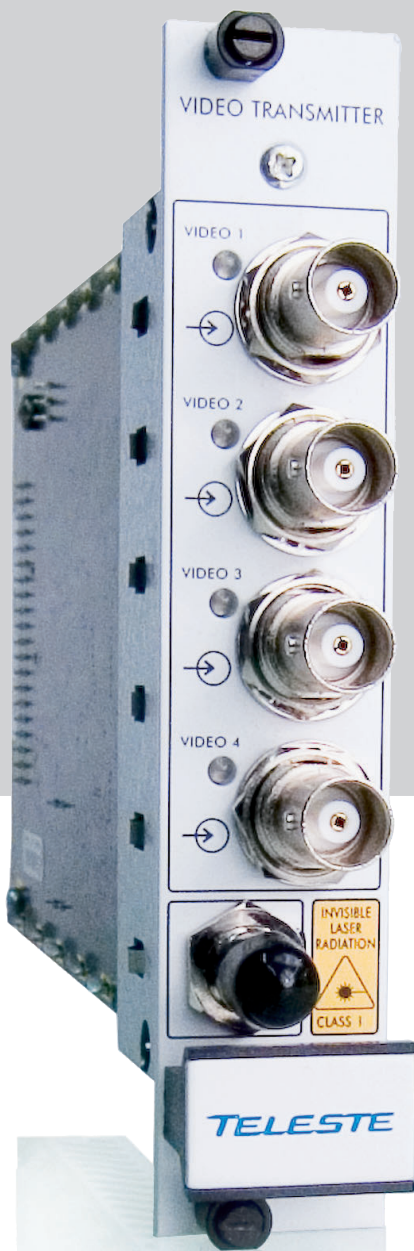


# Four channel video link

For low cost video transmission

CFO First Mile series consist of fibre optic modems which provide a high quality and losless video transmission for variety of CCTV applications over multimode fibre



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# CFO411 - 4 channel video link only

## CFO411 multimode 4 channel video link for uni-directional video transmission for fixed camera applications



Welcome, and thank you for purchasing Teleste's CFO Products.

### General

The **CFO411** is a four channel uni-directional video link. **PAL** and **NTSC** video formats are supported to provide a transparent video transmission. Optical transmission is based on **class 1M laser** operation. The multiplexed data stream of 540 Mb/s enables a full quality and a real-time video transmission in one multimode fiber up to 1 km typical transmission distance.

The primary application is a point-to-point transmission from camera to monitoring centre. In advanced video network systems the CFO411 offers a flexible way for first mile transfer to the nearest collection point of a larger scale network.

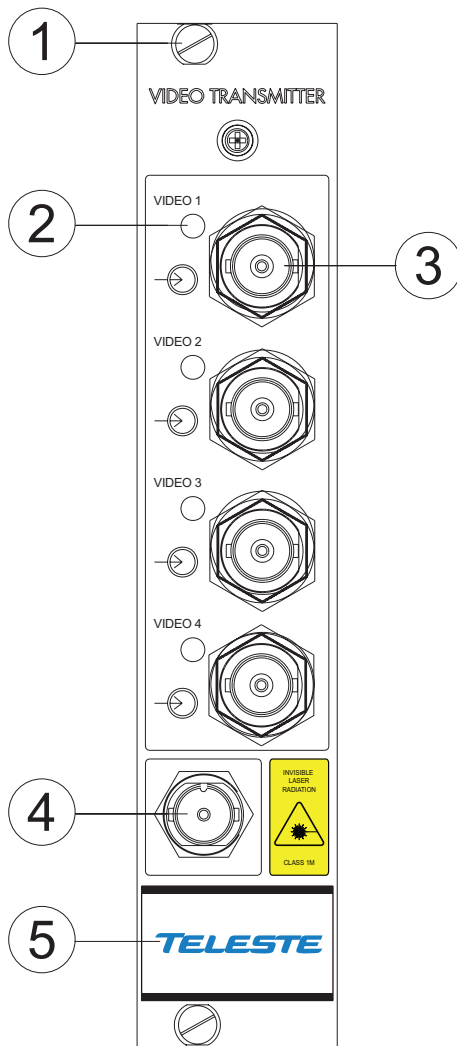
**All CFO411 units are compatible with all CFO rack systems. Stand-alone options are available with the CMA011 module adapter and separated CPS series mains adapter.**

As with all CFO platform products these specific models do meet all typical EMC as well as other environmental and manufacturing related requirements.

### Features

- >> High performance uncompressed zero delay digital video transmission, SNR 60 dB typical, 8 bit video sampling
- >> Four CVBS (PAL/NTSC) video channel
- >> Uni-directional video transmission on one multimode fibre up to 1 km
- >> Same units for rack mount or stand-alone installations
- >> Mechanically compact and ruggedised
- >> International EMC and environmental conformance

# CRT411 - Four channel optical transmitter



## CRR411 Optical transmitter

- 1) Locking screw (2 pcs)
- 2) Video input indicator led
- 3) Video input connector (BNC female)
- 4) Optical output (ST)
- 5) Handle

Pin	Signal
1	N/A
2	Ground
3	A - alarm
4	+12 V DC in/out
5	B - alarm
6	N/A
7	N/A
8	Ground
9	N/A

Pin information for the D9 connector of the CMA011 module adapter (with CRT411 installed).

**CAUTION:**  
**THESE OPTICAL UNITS USES CLASS 1M LASER DIODE.**  
**DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS. APPLICABLE STANDARD IEC60825-2: 2004**

## General

The **CRT411** is a four channel optical transmitter for uni-directional video transmission in a multimode fibre. The current consumption is max. 450 mA (+12V DC).

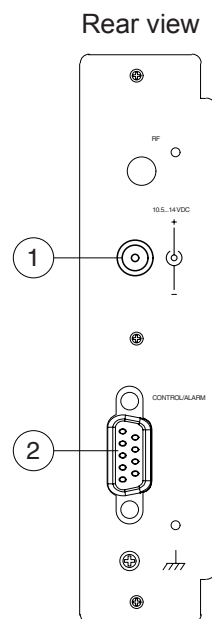
## Frame installation

The **CRR411** module is to be pushed along the guide rails into the installation frame (e.g. **CSR216** or **316** series) and secured with the two locking screws. The unit can be freely positioned in any slot in the frame. The empty positions in the frame should be blanked off with cover plates. The supply voltage is to be provided by a **CPS384** or **CPS390** power supply unit which are installed back of frame.

## Stand-alone installation

The unit can be installed for stand-alone use by using a **CMA011** module adapter. The module should be mounted to a vertical surface. The +12 VDC supply voltage is supplied by the means of a separate mains adapter with a regulated output, (e.g. **CPS221**).

The permitted supply voltage range is 10.5...14 VDC. The current consumption is 450 mA. The permitted operational temperature range is from -10 to +55 °C.



## CMA011 Module Adapter

- 1) Supply voltage connector, 2) Control / alarm interface connector (D9).

## Video connection and indicator led

The impedance of the video connection (BNC female) is 75  $\Omega$ . The nominal input level is 1 Vpp. Each video connection is equipped with the dual colour VIDEO led on the front panel. See table below for explanation of VIDEO indicator led's lights.

Colour	Status
Green	Video signal is present, in nominal level, and the unit detects video synchronization pulses
Yellow	No video signal, or the video level is too low

VIDEO indicator operation.

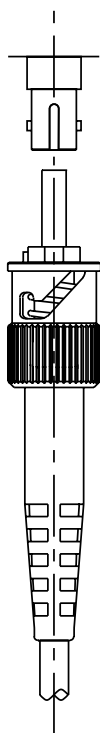
## Fibre connection

The optical connector is of the type **ST**. The optical output level is constant and cannot be adjusted. The nominal optical output level is around -4 dBm. The operating wavelengths is 850 nm. When installing the fibre optic cable, do not exceed the minimum bending radius when connecting cable to the system.

**Note!** For correct optical operation ensure that all optical connectors are cleaned immediately before mating. Connectors should always be cleaned using high purity alcohol (e.g. methyl or isopropyl alcohol). Dry the surfaces using clean compressed air or other equivalent pressurised gas. The optical connectors on the equipment should always be protected with dustcaps when there is no fibre inserted.

Optical connection meets class 1M laser safety requirements of IEC 60825-2: 2004 and US department of health services 21 CFR 1040.10 and 1040.11 (1990) when operated within the specified temperature, power supply and duty cycle ranges.

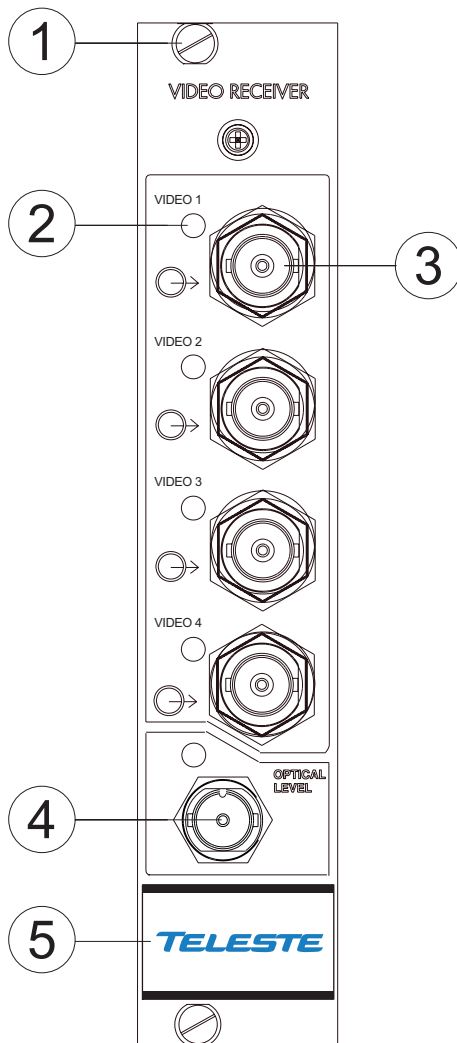
front view



The optical connector type is **ST**.



# CRR411 - Four channel optical receiver



## CRR411 Optical Receiver

- 1) Locking screw (2 pcs)
- 2) Video output indicator led
- 3) Video output connector (BNC female)
- 4) Optical input (ST) and optical input level indicator led
- 5) Handle

Pin	Signal
1	N/A
2	Ground
3	A - alarm
4	+12 V DC in/out
5	B - alarm
6	N/A
7	N/A
8	Ground
9	N/A

Pin information for the D9 connector of the CMA011 module adapter (with CRR411 installed).

## General

The **CRR411** is a four channel optical receiver for uni-directional video transmission in a multimode fibre. The current consumption is max. 550 mA (+12V DC).

## Frame installation

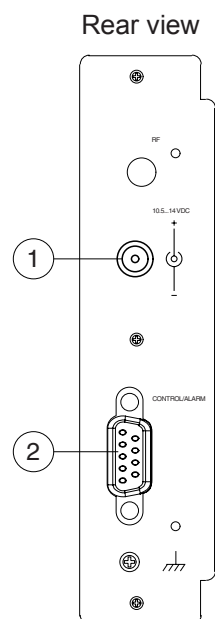
The **CRR411** module is to be pushed along the guide rails into the installation frame (e.g. **CSR216** or **316** series) and secured with the two locking screws. The unit can be freely positioned in any slot in the frame. The empty positions in the frame should be blanked off with cover plates. The supply voltage is to be provided by a **CPS384** or **CPS390** power supply unit which are installed back of frame.

**Note!** The maximum number of **CRR411** units in **CSR014 / 114** rack installations is **9 pcs** and it is recommended that doubled PSU is used in **CSR216 / 316** rack installations if number of **CRR411** units exceeds **15 pcs**.

## Stand-alone installation

The unit can be installed for stand-alone use by using a **CMA011** module adapter. The module should be mounted to a vertical surface. The +12 VDC supply voltage is supplied by the means of a separate mains adapter with a regulated output, (e.g. **CPS221**).

The permitted supply voltage range is 10.5...14 VDC. The current consumption is 550 mA. The permitted operational temperature range is from -10 to +55 °C.



## CMA011 Module Adapter

- 1) Supply voltage connector, 2) Control / alarm interface connector (D9).

## Video connection and indicator led

The impedance of the video connection (BNC female) is 75  $\Omega$ . The nominal output level is 1 Vpp. Each video connection is equipped with the dual colour VIDEO led on the front panel. See table below for explanation of VIDEO indicator led's lights.

Colour	Status
Green	Video signal is present, in nominal level, and the unit detects video synchronization pulses
Yellow	No video signal, or the video level is too low

VIDEO indicator operation.

## Fibre connection

The optical connector is of the type **ST**. The optical input is equipped with the dual color **optical level led** on the front panel. If the optical input signal is corrupted (e.g. if the fibre length is too long), too low (i.e. the input level is below -20 dBm), or missing, the **optical level led** is yellow. If the optical signal is present and otherwise correct, the **optical level led** is green. The operating wavelength is 850 nm.

When installing the fibre optic cable, do not exceed the minimum bending radius when connecting cable to the system.

**Note!** For correct optical operation ensure that all optical connectors are cleaned immediately before mating. Connectors should always be cleaned using high purity alcohol (e.g. methyl or isopropyl alcohol). Dry the surfaces using clean compressed air or other equivalent pressurised gas. The optical connectors on the equipment should always be protected with dustcaps when there is no fibre inserted.

Optical connection meets class 1M laser safety requirements of IEC 60825-2: 2004 and US department of health services 21 CFR 1040.10 and 1040.11 (1990) when operated within the specified temperature, power supply and duty cycle ranges.

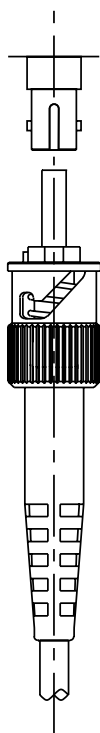
## Alarm connection

B alarm at the rear connector of the unit is type of low open collector output, with the capability of 30 V/10 mA switching.

Alarm	Description	Reason
A	Not in use	
B	Link status alarm	No synchronisation achieved at optical input.

Open collector alarms.

front view

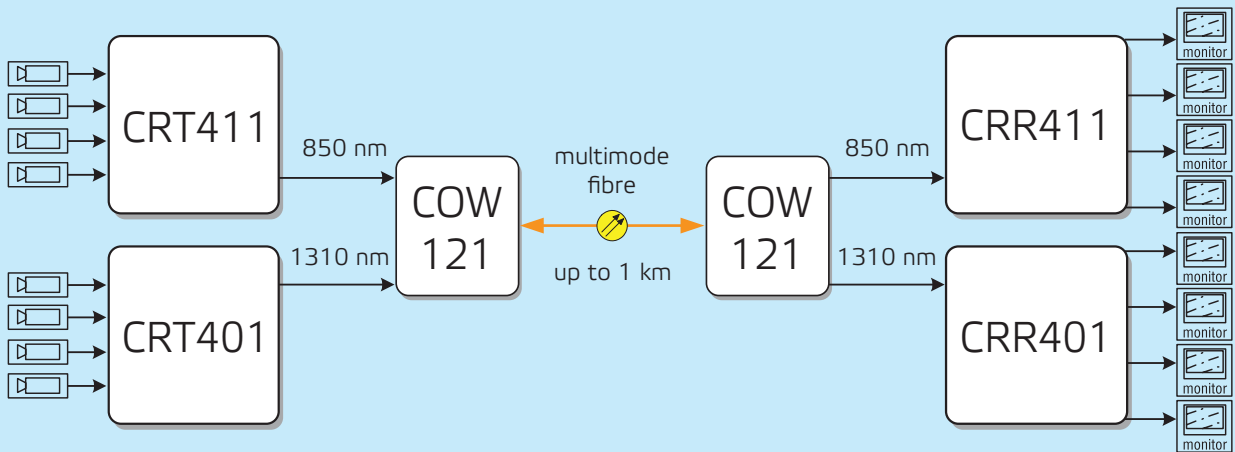
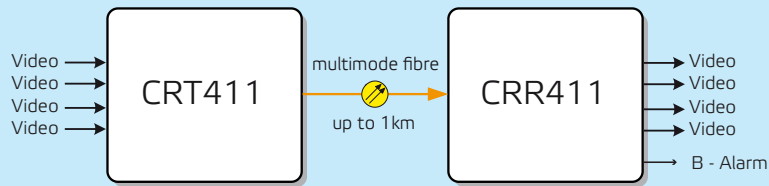


The optical connector type is **ST**.



# Technical Specifications

Optical			General		
Output/input wavelength	850 nm		Supply voltage	10.5...14 VDC	regulated
Spectral width	3 nm		Current consumption (max)	550 mA	CRT411
Link distance	1 km	62.5/125 $\mu$ m	Current consumption (max)	450 mA	CRR411
Bit Rate (forward)	540 Mbps	CRT to CRR	Dimensions (H x W x D)	3U • 5HP • 190 mm	
<b>Video</b>			Weight	0.7 kg	
Number of channels	4	composite	Connectors		
Sampling frequency	13.5 MHz		Video	BNC female	
Sampling resolution	8 bits		Optical	ST	
Source and load impedance	75 ohm		Operating temperature	-10...+55 °C	
Input and output signal levels	1 Vp-p		Storage temperature	-30...+70 °C	
Input overload level	1.5 Vp-p	DC component	Humidity	0...95 %	non condensing
Insertion gain	$\pm$ 10 %	1 V	Emissions	EN 50081-1	
Bandwidth	5.5 MHz		Susceptability	EN 50130-4	
C/L gain inequality	3 %		Other environmental	upon request	
C/L delay inequality	90 ns		<b>Notes</b>		
Differential gain	1 %		<b>Class 1M Laser Product</b>		
Differential phase	1 °		<i>Typical values unless otherwise stated</i>		
S/N ratio	60 dB	unified, weighted			





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## Copyright acknowledgements

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## WEEE directive

Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) obliges that producers appropriately mark electrical and electronic equipment with the symbol indicating separate collection. This obligation applies to the equipment put on the market in EU after 13 August 2005.

Teleste devices which belong to the scope of the directive have been marked with the separate collection symbol shown below. The marking is according to the standard EN 50419. The symbol indicates that the device has to be collected and treated separately from unsorted municipal waste.



User manual revision history note:  
The latest version is always available in pdf-format on our web site:  
**[www.teleste.com](http://www.teleste.com)**

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