

# User Manual



## CRT531, CRT541 & CRR531

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# Contents

Introduction .....	1
Video Transmitter CRT531 / 541 .....	2
Video Receiver CRR531 .....	5

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# CFO500 Single Mode Single Channel Units

## Introduction

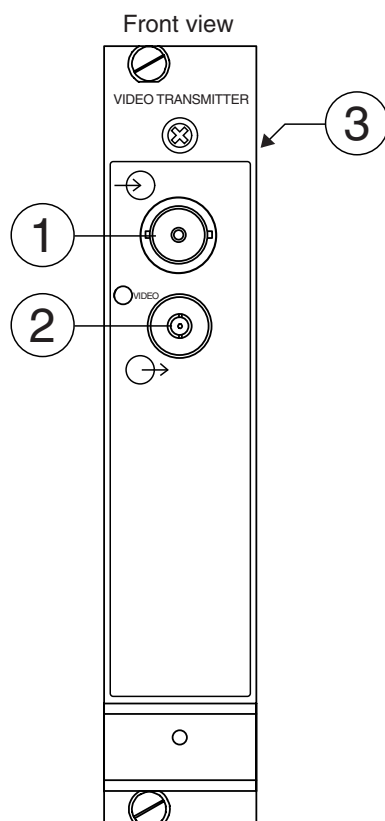
**CFO500** is a reliable fibre optic video transmission system for distances of tens of kilometres on single mode optical fibre. The operating wavelength is 1310 nm. In addition the video transmission also an audio / data transmission is available by means of subcarrier modulation. **CFO500** is upgradeable to **CFO700** series multichannel link.

Optical transmission is based on the intensity modulation of a FP LASER by the incoming video signal.

**All CFO500 units are compatible with all CFO rack systems. Stand-alone options are available with the CMA011 module adapter and a separate mains adapter.**

## VIDEO TRANSMITTER CRT531 / 541

**CAUTION:**  
THIS OPTICAL UNIT USES CLASS 1 LASER DIODE.  
DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH  
OPTICAL INSTRUMENTS. APPLICABLE STANDARDS  
IEC825-1: 1993 AND IEC825-2: 1993



**Picture 1.**

### **CRT 531/541\***

- 1) Baseband video input (BNC female).
- 2) Optical output (FC/PC).
- 3) DIP switches for video input settings.

*\*Note! The only operational difference between models **CRT531** and **CRT541** is the optical output levels of these units.*

### **GENERAL**

The **CRT531/541** is a one channel optical transmitter for uni-directional video transmission in a singlemode fibre. The current consumption is 150 mA (**CRT531**) / 120 mA (**CRT541**).

### **SWITCH SETTINGS**

The video input impedance, video filter, subcarrier operation and subcarrier input impedance are set by the means of the unit's internal **DIP** switches (see table 2 for more details).

### **FRAME INSTALLATION**

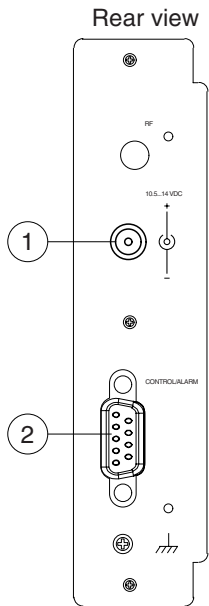
The module is to be pushed along the guide rails into the installation frame (e.g. **CSR014** or **CSR216**) and secured with the two locking screws. The unit can be freely positioned in any slot in the frame. The empty positions in the frame should be blanked off with cover plates. If only **CRT531/541** units are used in the system, there is no need to use a wideband combiner at the back of the frame. The supply voltage is provided by a **CPS3\*\*** PSU which is installed either right-hand end of frame or back of frame.

If audio or data sub-carriers are added to the video channel, a **CSM111** dual sub-carrier modulator unit should be installed next to, and on the left-hand side of the **CRT531/541** unit (in order to enable subcarrier transmission via the backplane).

### **VIDEO CONNECTION AND INDICATOR LED**

The impedance of the video input (BNC female) can be set to 75  $\Omega$  or high impedance by the means of the **DIP** switches (see table 2 for more details). The nominal input level is 1 Vpp.

Video input is equipped with the green VIDEO led on the front panel. In case a video signal is present and in nominal level (and the unit detects video synchronization pulses), the VIDEO led is lit. If there is no video signal, or the video level is too low, the VIDEO led is not lit.



**Picture 2.**

**CMA011 Module Adapter**

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

PIN	SIGNAL
1	BB input
2	Ground
3	A - alarm
4	+12 V DC in / out
5	B1 - alarm
6	B2 - alarm / Control 2
7	B3 - alarm / Control 1
8	Ground
9	BB output

**Table 1.**

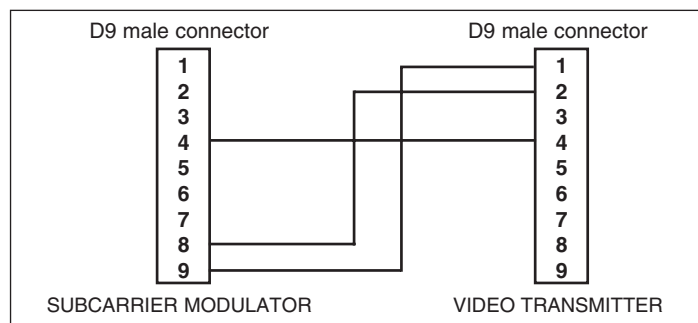
Pin information for the D9 male connector of the CMA011 module adapter.

**STAND-ALONE INSTALLATION**

The unit can be installed for stand-alone use by using a **CMA011** module adapter (see picture 2). The module should be mounted to a vertical surface. The 12V DC supply voltage is supplied by the means of a separate mains adapter with a regulated output, (e.g. **CPS221**).

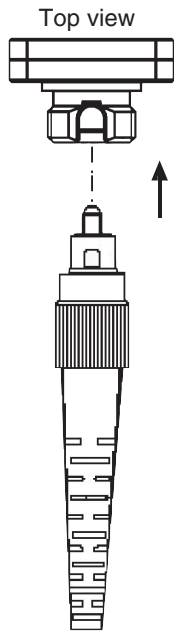
The permitted supply voltage range is 10.5...14V DC. The current consumption is 150 mA (**CRT531**) or 120 mA (**CRT541**). The permitted operational temperature range is from -10...+55 °C.

If subcarriers are used in the stand-alone system, it is recommended to use 2-slot module adapter **CMA021**. If **CMA011** adapters are used, they are connected together for subcarrier operation by means of **CMC030** data cable (see table 1 and picture 3).



**Picture 3.**

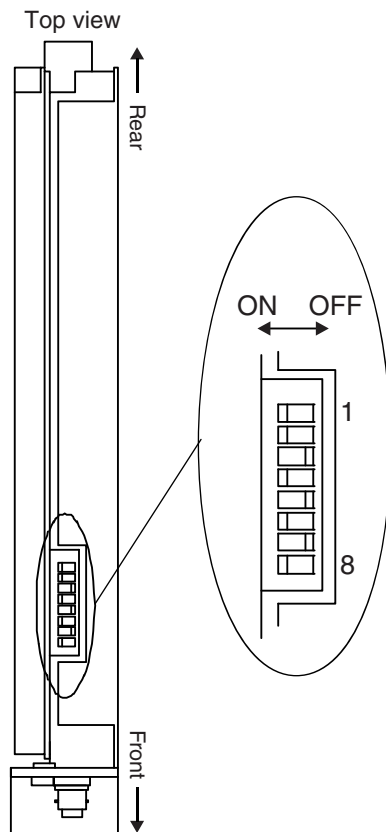
The wiring between module adapters when audio / data subcarriers are added to a video channel and when units are installed in separate CMA011 module adapter.



**Picture 4.**

**FC/PC Connectors**

Make sure the key is aligned in the slot properly before tightening!



**Picture 5.**

Location of the video DIP switches.

**FIBRE CONNECTION**

The optical connector is of type **FC/PC** (see picture 4). The optical output level depends on the modulating video signal, and has no adjustment. The nominal optical output level is in **CRT531** -7 dBm and in **CRT541** +2 dBm. The operating wavelength is 1310 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.*

**SETTING AND CONNECTION INFORMATION**

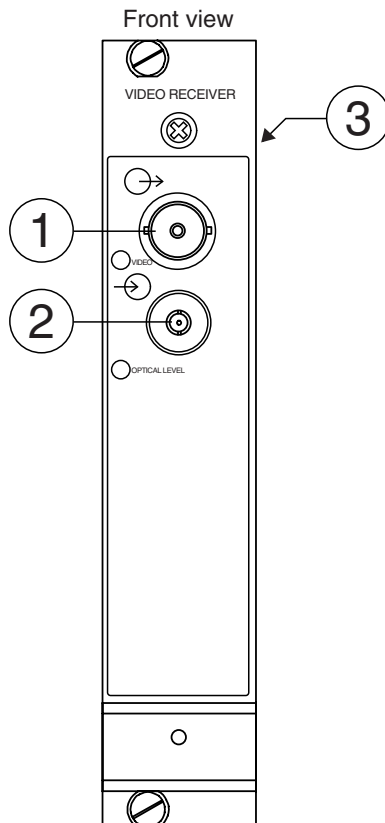
VIDEO: Function / DIP switch	1	2	3	4	5	6	7	8
<u>Input impedance 75 Ω</u>	-	-	-	-	-	-	-	on
Input impedance high	-	-	-	-	-	-	-	off
Video filter enable	-	-	-	-	on	off	on	-
<u>Video filter disable</u>	-	-	-	-	off	on	off	-
Subcarrier enable	on	-	-	-	-	-	-	-
<u>Subcarrier disable</u>	off	-	-	-	-	-	-	-
Subcarrier impedance 75 Ω	-	on	-	-	-	-	-	-
<u>Subcarrier impedance high</u>	-	off	-	-	-	-	-	-

**Table 2.**

The **DIP** switch settings of **CRT531 / 541**. The underlined functions are default factory settings ("-" = setting irrelevant). See pictures 1 and 5 for location of **DIP** switches.

## VIDEO RECEIVER CRR531

**CAUTION:**  
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IEC825-1: 1993 AND IEC825-2: 1993



**Picture 1.**

**CRR531** Video Receiver

- 1) Baseband video output (BNC female).
- 2) Optical input (straight FC/PC).
- 3) DIP switches for video input settings.

### GENERAL

The **CRR531** is a one channel optical receiver for uni-directional video transmission in a singlemode fibre. The current consumption is 260 mA.

### SWITCH SETTINGS

The video filter and AGC operations in this unit are set by the means of internal **DIP** switches (see table 2 for more details).

### FRAME INSTALLATION

The module is to be pushed along the guide rails into the installation frame (e.g. **CSR014** or **CSR216**) 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.

If only **CRR531** units are used in the system, there is no need to use a wideband combiner at the back of the frame.

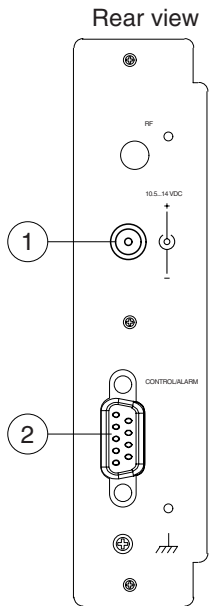
The supply voltage is provided by a **CPS3\*\*** PSU which is installed either right-hand end of frame or back of frame.

If audio and / or data sub-carriers will be received from the video channel, install a **CSD111** dual sub-carrier demodulator unit next to, and on the right hand side of the **CRR531** unit (in order to enable subcarrier transmission via the backplane).

### VIDEO CONNECTION AND INDICATOR LED

The video output connector (BNC female) can be set to filtered video or baseband video mode by the means of the **DIP** switches (see table 2 for more details). The nominal output level is 1 Vpp.

Video output is equipped with the green VIDEO led on the front panel. In case a video signal is present, the VIDEO led is lit. If there is no video signal, or the video level is too low, the VIDEO led is not lit.



**Picture 2.**

**CMA011 Module Adapter**  
 1) Supply voltage connector.  
 2) Control / alarm interface connector (D9 male).

PIN	SIGNAL
1	BB input
2	Ground
3	A - alarm
4	+12 V DC in / out
5	B1 - alarm
6	B2 - alarm / Control 2
7	B3 - alarm / Control 1
8	Ground
9	BB output

**Table 1.**

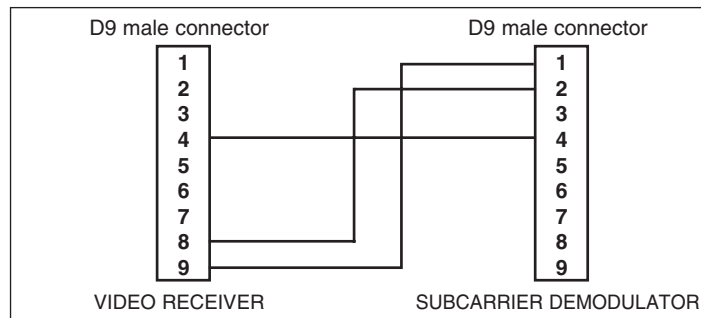
Pin information for the D9 male connector of the CMA011 module adapter.

## STAND-ALONE INSTALLATION

The unit can be installed for stand-alone use by using a **CMA011** module adapter (see picture 2). The module should be mounted to a vertical surface. The 12V DC supply voltage is supplied by the means of a separate mains adapter with a regulated output, (e.g. **CPS221**).

If subcarriers are used in the stand-alone system, it is recommended to use 2-slot module adapter **CMA021**. If **CMA011** adapters are used, they are connected together for subcarrier operation by means of **CMC030** data cable (see table 1 and picture 3).

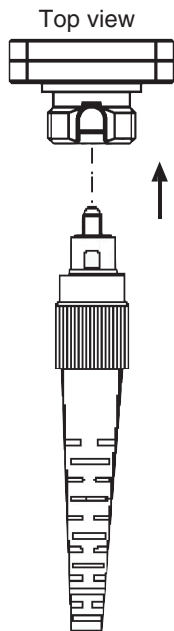
The permitted supply voltage range is 10.5...14V DC. The current consumption is 260 mA. The permitted operational temperature range is from -10...+55 °C.



**Picture 3.**

The wiring between module adapters when audio / data subcarriers are added to a video channel and when units are installed in separate CMA011 module adapter.





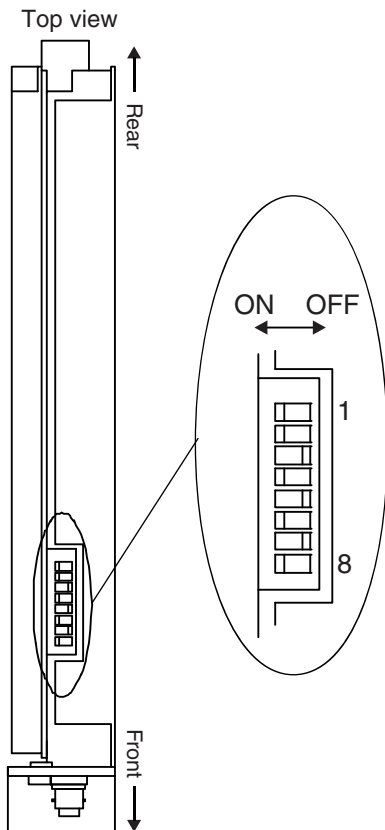
**Picture 4.**  
**FC/PC Connectors**  
 Make sure the key is aligned in the slot properly before tightening!

## FIBRE CONNECTION AND INDICATOR LED

The optical input connector is a of type **FC/PC** (see picture 4). The maximum optical input level is -27...-7 dBm. 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 is too long), too low (i.e. the input level is below -37 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 1310 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.*



**Picture 5.**  
 Location of the video DIP switches.

## SETTING AND CONNECTION INFORMATION

VIDEO: Function / DIP switch	1	2	3	4	5	6	7	8
Video filter enable	-	-	-	-	-	on	off	on
<u>Video filter disable</u>	-	-	-	-	-	off	on	off
Peak AGC	-	-	-	off	on	-	-	-
<u>Sync AGC</u>	-	-	-	on	off	-	-	-

**Table 2.**  
 The **DIP** switch settings of **CRR531**. The underlined functions are default factory settings ("- = setting irrelevant). See pictures 1 and 5 for location of **DIP** switches.



