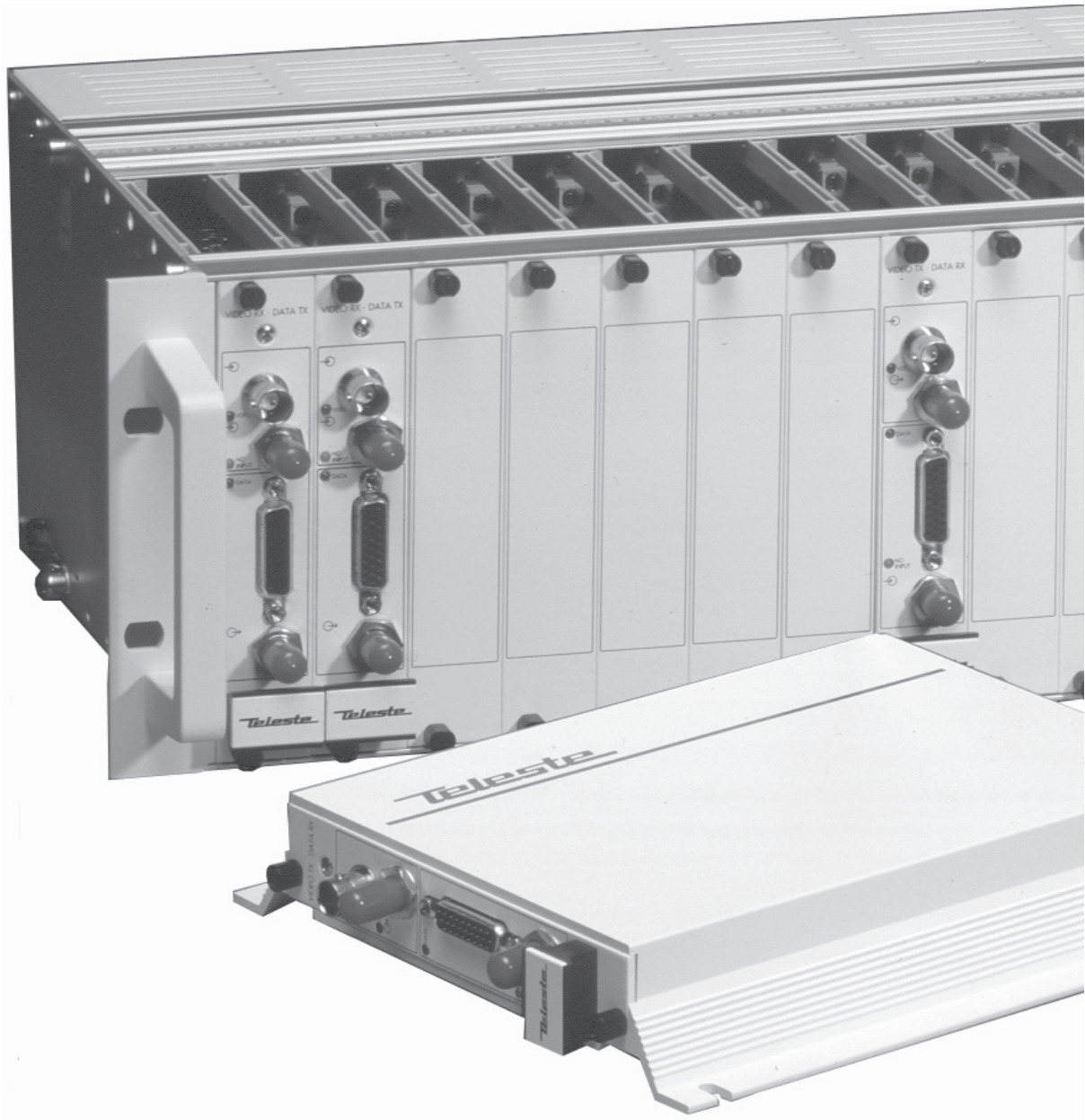


# User Manual



## CRT212 & CRR212

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# CFO200 Multimode Single Channel Units with Return Data

## Introduction

**CFO200** fibre optic video transmission system provides a transmission of video signal and return data on two multimode fibres. The operating wavelength is 860 nm.

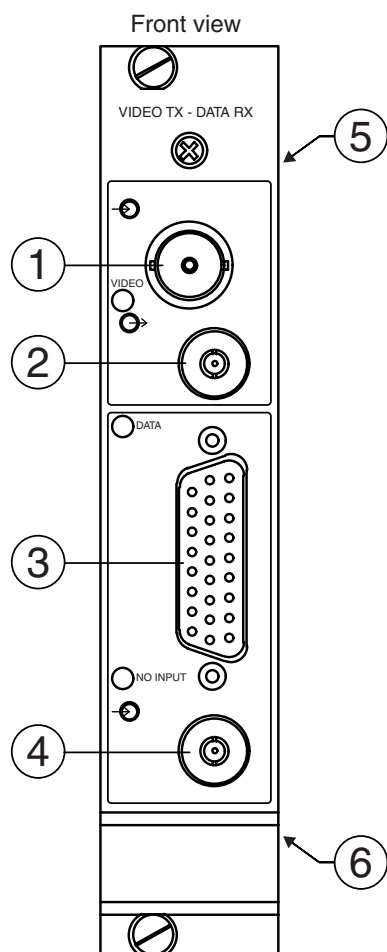
**CFO200** system is ideal in systems where e.g. PTZ controlled surveillance cameras are utilised or other remote controlled device is operated from the control centre. The data format used in the separate return path can be internally selected and supports the following formats: simplex **RS232**, **RS422**, **RS485**, **TTL** and **FSK**. Current loop or contact closure operation can also be selected.

Optical transmission is based on the intensity modulation of a laser diode by the incoming video signal.

**All CFO200 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 CRT212

**CAUTION:**  
THIS OPTICAL UNIT USES CLASS 3A LASER LED,  
MAXIMUM OUTPUT 1mW AT WAVELENGTH 860 nm.  
DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH  
OPTICAL INSTRUMENTS. APPLICABLE STANDARD  
IEC825-1: 1993



**Picture 1.**

**CRT212** Video Transmitter.

- 1) Baseband video input (BNC female) and VIDEO indicator light.
- 2) Optical output (ST).
- 3) Data connector (HD-26 female) and DATA indicator light.
- 4) Optical input (ST) and NO INPUT indicator light.
- 5) DIP switches for VIDEO input settings.
- 6) DIP switches for DATA settings.

### GENERAL

The **CRT212** is a one channel optical transmitter for uni-directional video transmission with bi-directional data in a multimode fibre. The current consumption is 250 mA (+12V DC).

### SWITCH SETTINGS

The video-input impedance, video filter and subcarrier operation, as well as data format selection and contact closure operation, are set by 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 **CRT212** 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.

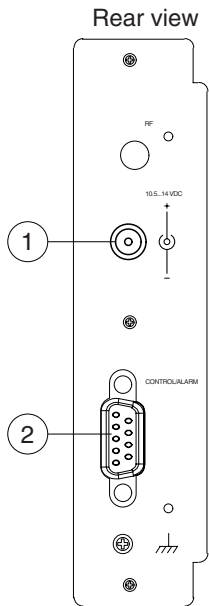
If audio or data sub-carriers are added to the video channel, a **CSM111** dual sub-carrier modulator unit should be installed next to, and on the left-hand side of the **CRT212** unit (in order to enable subcarrier transmission via the backplane).

### 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 250 mA. 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**.



**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.

If **CMA011** adapters are used, they are connected together for subcarrier operation by means of **CMC030** data cable (see table 1 and picture 5).

### 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 signal level is too low, the VIDEO led is not lit.

### DATA CONNECTION AND INDICATOR LED

The desired data mode for DATA channel can be selected by using DIP switches (see table 2 for more details). DATA input is equipped with the green DATA led on the front panel. In case a DATA signal is present and in nominal level, the DATA led is lit. If there is no DATA signal, or the DATA signal level is too low, the DATA led is not lit. During correct DATA transmission the DATA led is also operating synchronously with the data stream.

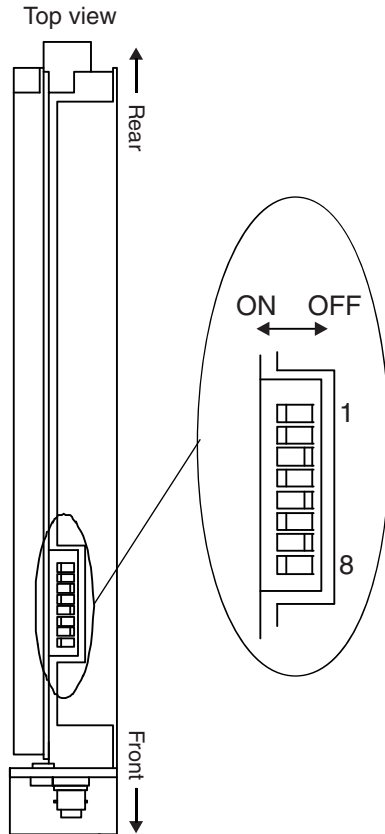
### FIBRE CONNECTIONS AND INDICATOR LEDS

The optical connectors are of the type **ST**. The optical output level depends on the modulating video signal and has no adjustment. The nominal optical output level is -10 dBm (62.5 / 125  $\mu$ m fibre) or -14 dBm (50 / 125  $\mu$ m fibre) at a high white picture content (minimum optical input level at the data receiver is -40 dBm). The optical input is equipped with the dual color NO INPUT led on the front panel. If the optical signal is present and otherwise correct, the NO INPUT led is green. If the optical input signal is missing or the data carrier is lost, the NO INPUT led is yellow.

When installing fibre optic cables, do not exceed the minimum bending radius when connecting the cables 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 female **ST** optical connectors on the equipment should always be protected with dustcaps when there is no fibre inserted.*

## SETTING AND CONNECTION INFORMATION



**Picture 3.**

Location of the video DIP switches. Data DIP switches are located at bottom side of the unit (see picture 1).

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	-	-	-	-	-	-	-
<u>Video alarm enable</u>	-	-	-	off	-	-	-	-
Video alarm disable	-	-	-	on	-	-	-	-

DATA: Function / DIP switch	1	2	3	4	5	6	7	8
<u>RS232</u>	-	-	on	-	-	on	off	off
RS422 / TTL	-	on	on	-	-	off	on	off
RS485	-	off	on	-	-	off	on	off
Active C/L	on	-	on	-	-	on	on	off
Passive C/L	off	-	on	-	-	on	on	off
FSK	-	-	on	-	-	off	off	on
Contact closure	-	-	off	-	-	on	off	on

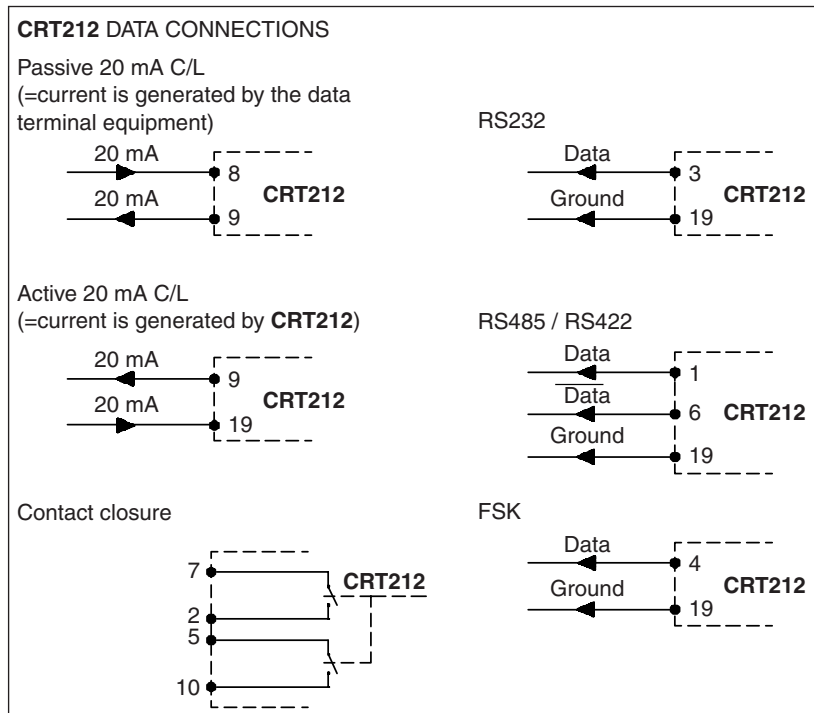
**Table 2.**

The DIP switch settings of CRT212. The underlined functions are default factory settings (“-” = setting irrelevant). See pictures 1 and 3 for location of DIP switches.

Pin	Signal
1	RS485 (A) / RS422 non inverting (+)
2	Relay contact 1 (N.O.)(max. 24 VDC / 1A)
3	RS232
4	FSK
5	Relay contact 2 (com)(max. 24 VDC / 1A)
6	RS485 (B) / RS422 inverting (-)
7	Relay contact 1 (com)(max. 24 VDC / 1A)
8	20 mA C/L input (passive mode only)
9	20 mA C/L output
10	Relay contact 2 (N.O.)(max. 24 VDC / 1A)
11-18	NC
19	Ground
20-26	NC

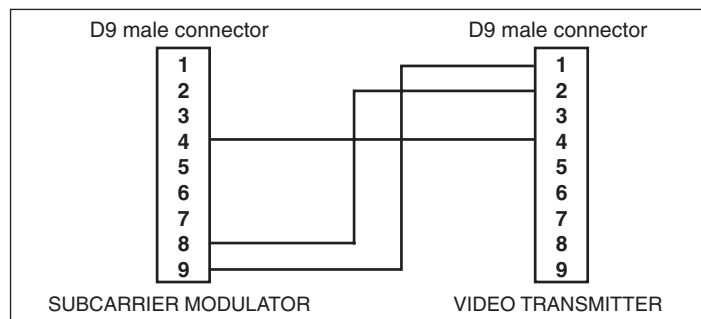
**Table 3.**

Pin information for the HD26 female connector (Relay contacts; N.O.= normally open, com = common).



**Picture 4.**

Wiring information for C/L, contact closure and data operation.

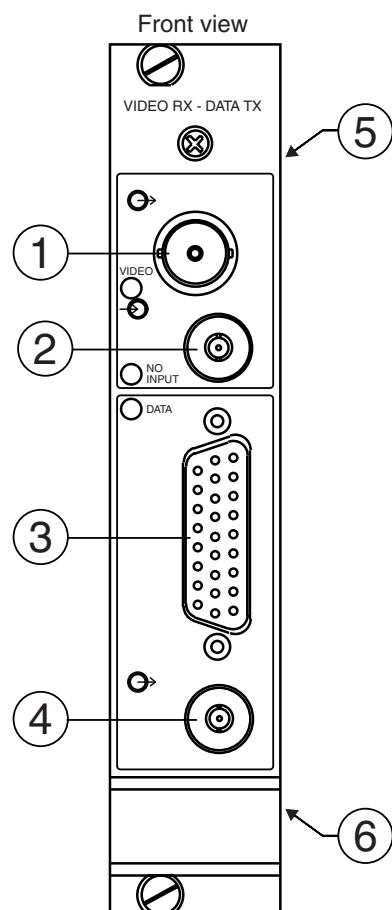


**Picture 5.**

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.

## VIDEO RECEIVER CRR212

**CAUTION:**  
THIS OPTICAL UNIT USES CLASS 3A LASER LED,  
MAXIMUM OUTPUT 1mW AT WAVELENGTH 860 nm.  
DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH  
OPTICAL INSTRUMENTS. APPLICABLE STANDARD  
IEC825-1: 1993



**Picture 1.**

**CRR212** Video Receiver.

- 1) Baseband video output (BNC female) and VIDEO indicator light.
- 2) Optical input (ST) and NO INPUT indicator light.
- 3) Data connector (HD-26 female) and DATA indicator light.
- 4) Optical output (ST).
- 5) DIP switches for VIDEO input settings.
- 6) DIP switches for DATA settings.

### GENERAL

The **CRR212** is a one channel optical receiver for uni-directional video transmission with bi-directional data in a multimode fibre. The current consumption is 300 mA (+12V DC).

### SWITCH SETTINGS

The video filter, AGC operation, data format selection and contact closure operation are set by 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 **CRR212** 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.

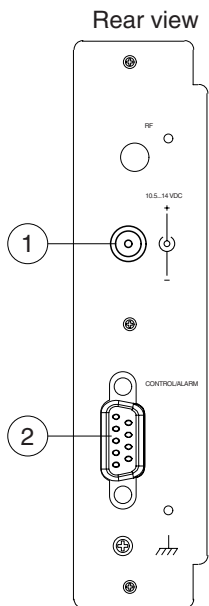
If audio and / or data sub-carriers will be received from the video channel, install a **CSD111** dual sub-carrier demodulator unit next to, and on the right hand side of the **CRR212** unit (in order to enable subcarrier transmission via the backplane).

### VIDEO CONNECTION AND INDICATOR LED

The impedance of the video outputs (BNC female) is 75  $\Omega$ . The nominal output level is 1 Vpp.

Each 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 signal 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.

## DATA CONNECTION AND INDICATOR LED

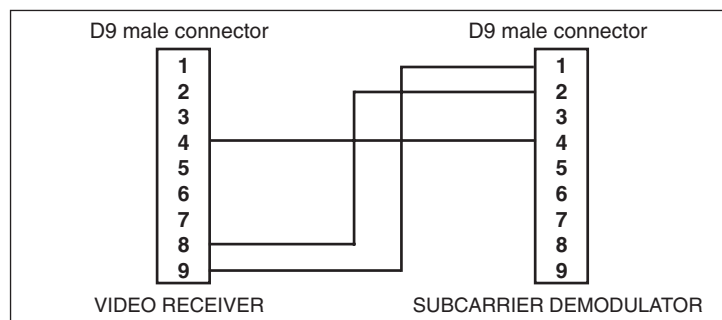
The desired data mode for DATA channel can be selected by using **DIP** switches (see table 2 for more details). DATA output is equipped with the green DATA led on the front panel. In case a DATA signal is present and in nominal level, the DATA led is lit. If there is no DATA signal, or the DATA signal level is too low, the DATA led is not lit. During correct DATA transmission the DATA led is also operating synchronously with the data stream.

## 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**).

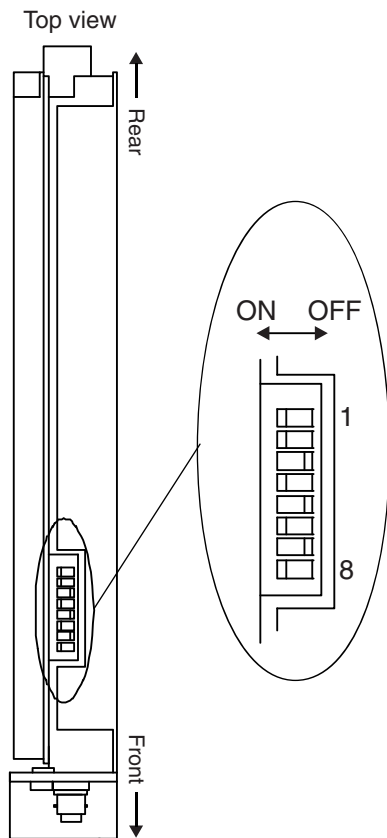
The permitted supply voltage range is 10.5...14V DC. The current consumption is 250 mA. The permitted operational temperature range is from -10...+55 °C.

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.**

Location of the video DIP switches .  
Data DIP switches are located at  
bottom side of the unit  
(see picture 1).

## FIBRE CONNECTIONS AND INDICATOR LEDS

The optical connectors are of the type **ST**. The optical input level range is -27...-10 dBm with high white picture content. The nominal optical DATA output level is -10 dBm (62.5 / 125 µm fibre) or -15 dBm (50 / 125 µm fibre).

The optical input is equipped with the dual color NO INPUT led on the front panel. If the optical input is corrupted (e.g. if the fibre is too long), too low (i.e. the input level is below -37 dBm), or missing, the NO INPUT led is yellow. If the optical signal is present and otherwise correct, the NO INPUT led is green. The operating wavelength is 860 nm.

When installing the fibre optic cables do not exceed the minimum bending radius when connecting the cables 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 female **ST** 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
Video filter enable	-	-	-	-	-	on	off	on
Video filter disable	-	-	-	-	-	off	on	off
Peak AGC	-	-	-	off	on	-	-	-
Sync AGC	-	-	-	on	off	-	-	-

DATA: Function / DIP switch	1	2	3	4	5	6	7	8
<u>RS232</u>	off	off	-	-	-	on	off	off
<u>RS422 / RS485 / TTL</u>	off	off	-	-	-	off	on	off
<u>RS422 / RS485 terminated</u>	on	off	-	-	-	off	on	off
Active C/L	off	on	-	-	-	on	on	off
Passive C/L	off	off	-	-	-	on	on	off
FSK	off	off	-	-	-	off	off	on
Contact closure	off	on	-	-	-	on	on	off

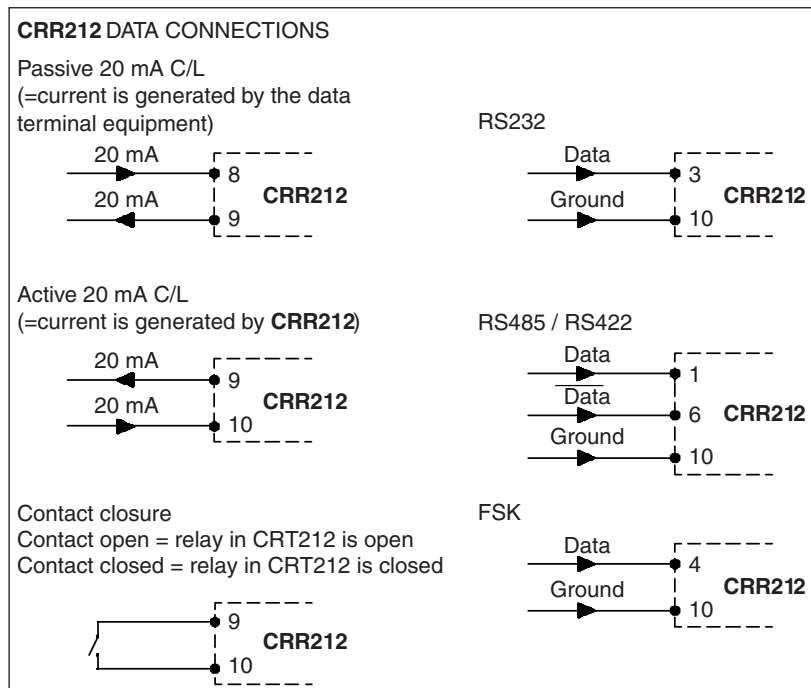
**Table 2.**

The DIP switch settings of CRT212. The underlined functions are default factory settings ("-" = setting irrelevant). See pictures 1 and 4 for location of DIP switches.

PIN	SIGNAL
1	RS485 (A) / RS422 non inverting (+)
2	NC
3	RS232
4	FSK
5	NC
6	RS485 (B) / RS422 inverting (-)
7	NC
8	20 mA C/L input (passive mode only)
9	20 mA C/L output
10	Ground
11-26	NC

**Table 3.**

Pin information for the HD26-female connector (data inputs).



**Picture 4.**

Wiring information for C / L, contact closure and data operation.