

# CCM 1010

## Unidirectional optical and digital contact closure multiplexer system

### USER MANUAL

### 1. General description

The CCM 1010 contact closure multiplexer system can transmit eight independent contact closure signals unidirectionally over either one optical fiber or a serial data link (RS-232). A CCM 1010 TX/RX combination uses an optical wavelength of 850 nm over multimode fiber.

Front panel LEDs indicate DC power good, correct transmission framing and correct receiver synchronisation.

CCM 1010 equipment comes in the form of rack-mountable 7TE modules to be slotted into a TKH Security MC 11 or similar power supply cabinet, or as stand-alone units (option /SA) needing separate power supplies PSA 12 DC.

### 2. Indications and connectors

The CCM's front panel indications and connectors are listed in table 1 below.

| CCM TX         |   |
|----------------|---|
|                | (optical connector) optical out         |
|                | 8xCC (37-pin conn.) CC inputs, data out |
| Indicator LEDs |   |
| *DC            | DC power good                           |
| *FR            | signal framing OK                       |
| CCM RX         |   |
|                | (optical connector) optical in          |
|                | 8xCC (37-pin conn.) CC outputs, data in |
| Indicator LEDs |   |
| *DC            | DC power good                           |
| *SYNC          | input signal sync OK                    |

Table 1. CCM front panel features

### 3. Installation instructions

#### 3.1 General

- Insert the units into an appropriate MC 11 or similar power supply cabinet (and/or connect stand-alone units to their power supplies) and connect appropriate cabling. Pin assignments are listed in section 5.

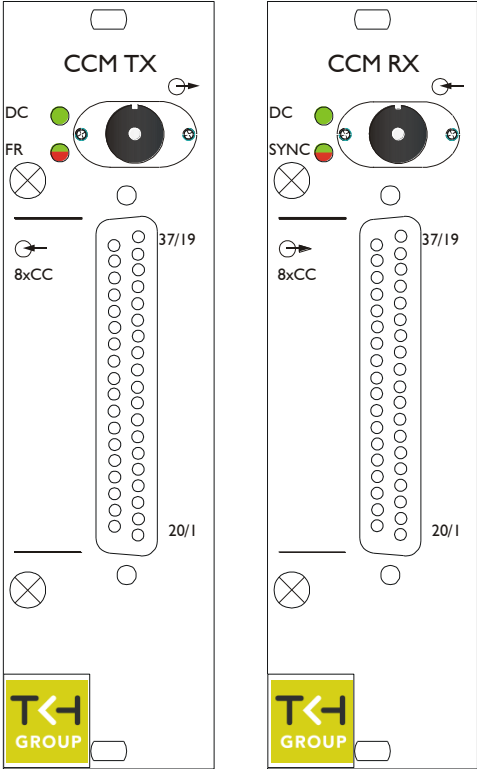


Figure 1. Front panel features of the CCM 1010 TX (left) and RX

- After switching on the system, check whether all LEDs glow green. If the FR LED on the CCM TX is red, that unit is faulty. If the SYNC LED on the RX lights red while the FR LED glows green, check the optical link first.

#### 3.2 Link type

The unit tries to establish and use a link type based on link input measurements (default autodetect mode; it holds on to an interface as long as signal is present). To permanently select either the optical or the RS-232 link, internal dip switches can be set. To access these switches, take out the front panel Phillips head screws indicated in figure 1 and slide out the front panel/circuit board assembly. Dip switches S1/S2 select between autodetect, the serial link and the optical link (see figure 2 and table 2).

| S2  | S1  | function             |
|-----|-----|----------------------|
| OFF | OFF | autodetect (default) |
| OFF | ON  | optical              |
| ON  | OFF | RS-232               |
| ON  | ON  | optical              |

Table 2. Dip switch settings for link type selection

### 3.3 RS-232 data framing

Set the serial data framing of serial digital transmission equipment connected to the CCM RS-232 ports to the correct values:

- 1 start bit
- 8 data bytes
- 1 stop bit
- no parity
- speed 2k4 bit/s.

## 4. Care and maintenance

For reliable operation of the system, observe the following precautions:

- prevent dust from collecting on the equipment
- protect the equipment against moisture
- maintain sufficient free space around the equipment for cooling.

General safety and EMC information is found in the final section of this document.

## 5. Pin assignments of the 37-pin connector

CCM 1010 D-37 connector pin assignments are listed in table 3 below, combined for TX and RX units; they are rendered graphically in figure 3.

| Pin no. | Assignment          | Pin no. | Assignment         |
|---------|---------------------|---------|--------------------|
| 1       | CC1 in              | 20      | GND                |
| 2       | CC2 in              | 21      | GND                |
| 3       | CC3 in              | 22      | GND                |
| 4       | CC4 in              | 23      | GND                |
| 5       | CC5 in              | 24      | GND                |
| 6       | CC6 in              | 25      | GND                |
| 7       | CC7 in              | 26      | GND                |
| 8       | CC8 in              | 27      | GND                |
| 9       | RS-232 out (CCM TX) | 28      | RS-232 in (CCM RX) |
| 10      | GND                 | 29      | GND                |
| 11      | CC8 out A           | 30      | CC8 out B          |
| 12      | CC7 out A           | 31      | CC7 out B          |
| 13      | CC6 out A           | 32      | CC6 out B          |
| 14      | CC5 out A           | 33      | CC5 out B          |
| 15      | CC4 out A           | 34      | CC4 out B          |
| 16      | CC3 out A           | 35      | CC3 out B          |
| 17      | CC2 out A           | 36      | CC2 out B          |
| 18      | CC1 out A           | 37      | CC1 out B          |
| 19      | not used            |         |                    |

Table 3. D37 pin assignments of CCM 1010 TX (pins 1-9) and RX (pins 11-37). GND pins are the same for both.

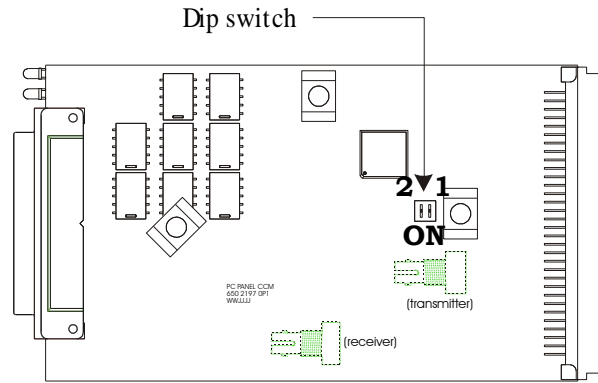


Figure 2. CCM TX/RX circuit board with dip switch for link type selection (see text).

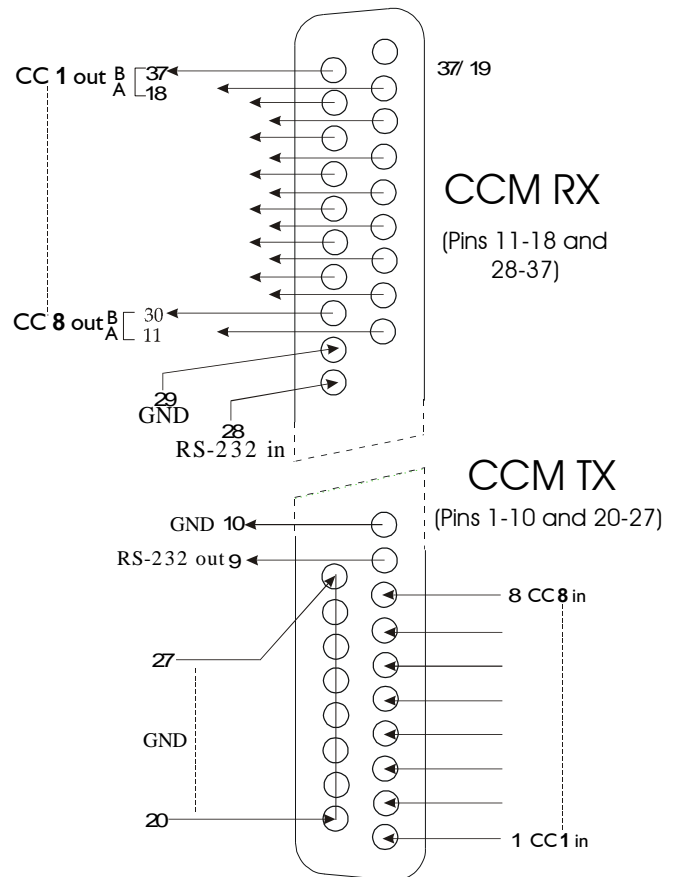


Figure 3. CCM 1010 RX (top) and TX (bottom) pin assignments. GND pins indicated are on both units.

## 6. Technical specifications

The technical specifications of the CCM 1010 system are listed in table 4 below.

| Feature                         | Value  | Unit  |
|---------------------------------|--|-------|
| <b>System I/O</b>               |  |       |
| Contact closure I/O             |  |       |
| Number of channels              | 8  |       |
| Input                           | +5 V pull-up, 10 kΩ                              |       |
| Input sink (max)                | 2.5  | mA    |
| Activation threshold            | 0.75 (<1.5 kΩ)                                   | V     |
| Output (potent.-free)           | normally open, fail-safe                         |       |
| Output switch rating            | 2 A @ 30 Vdc (per switch)                        |       |
| System response time            | <2   | ms    |
| Interface detect poll           | 400  | ms    |
| <b>Optical</b>                  |  |       |
| Wavelength                      | 850  | nm    |
| Fiber type                      | multimode (50/62.5)                              |       |
| TX output power                 | -21  | dBm   |
| RX min. input power             | -45  | dBm   |
| System budget                   | ≥ 28 (23) <sup>1)</sup>                          |       |
| <b>Electrical</b>               |  |       |
| Data link interface             | RS-232   |       |
| Data framing                    | 1 start bit, 1 stop bit, no parity               |       |
| Data rate                       | 2k4  | bit/s |
| <b>Management</b>               |  |       |
| LED status indicators           |  |       |
| *DC                             | power-on indication (green)                      |       |
| (TX) *FR                        | framing okay                                     |       |
| (RX) *SYNC                      | input synchronised                               |       |
| <b>Environmental and Safety</b> |  |       |
| Operating temp. range           | -40 to +74                                       | °C    |
| Relative humidity               | <95 (no condensation)                            | %     |
| MTBF                            | >100,000   | h     |
| Sinusoidal vibration            | IEC69-2-6, Test Fc: 10-100Hz@9.8m/s <sup>2</sup> |       |
| Drop and topple                 | IEC68-2-31, Test Ec                              |       |
| Electrical safety               | AL / IEC / EN 60950-1                            |       |
| UL recognition file             | E242498  |       |
| Laser safety                    | IEC 60825-1, IEC 60825-2                         |       |
| EMC immunity                    | EN 55024, EN 50130-4, EN 61000-6-2               |       |
| EMC emission                    | EN 55022 (Class B)<br>FCC 47 CFR 15 (Class B)    |       |
| <b>Electrical</b>               |  |       |
| Supply voltages                 | 12 (/SA)   | Vdc   |
| Power consumption               | 1.2  | W     |
| <b>Mechanical</b>               |  |       |
| Optical connector               | ST   FC (others on request)                      |       |
| I/O connector                   | D37, female                                      |       |
| Serial connector                | 2 (TX), 2 (RX) pins on D37                       |       |
| Housing                         | Eurocassette or SA                               |       |

Table 4. CCM 1010 technical specifications

<sup>1)</sup> Into 50/125µ fibre

## 7. Safety, EMC, ESD

### General

The safety information contained in this section, and on other pages of this manual, must be observed whenever this unit is operated, serviced, or repaired. Failure to comply with any precaution, warning, or instruction noted in the manual is in violation of the standards of design, manufacture, and intended use of the unit.

Installation, adjustment, maintenance and repair of this equipment are to be performed by trained personnel aware of the hazards involved. For correct and safe use of the equipment and in order to keep the equipment in a safe condition, it is essential that both operating and servicing personnel follow standard safety procedures in addition to the safety precautions and warnings specified in this manual, and that this unit be installed in locations accessible to trained service personnel only.

Siquira assumes no liability for the customer's failure to comply with any of these safety requirements.

### UL/IEC/EN 60950-1: General safety requirements

**The equipment described in this manual has been designed and tested according to the UL/IEC/EN 60950-1 safety requirements.**

*If there is any doubt regarding the safety of the equipment, do not put it into operation.* This might be the case when the equipment shows physical damage or is stressed beyond tolerable limits (e.g. during storage and transportation).

*Before opening the equipment, disconnect it from all power sources.* The equipment must be powered by a SELV<sup>\*)</sup> power supply.

When this unit is operated in extremely elevated temperature conditions, it is possible for internal and external metal surfaces to become extremely hot.

### Optical safety

**This optical equipment contains Class 1M lasers or LEDs and has been designed and tested to meet IEC 60825-1:1993+A1+A2 and IEC 60825-2:2004 safety class 1M requirements.**

*Optical equipment presents potential hazards to testing and servicing personnel owing to high levels of optical radiation.* When using magnifying optical instruments, avoid looking directly into the output of an operating transmitter or into the end of a fibre connected to an operating transmitter, or there will be a risk of permanent eye damage. Precautions should be taken to prevent exposure to optical radiation when the unit is removed from its enclosure or when the fiber is disconnected from the unit. The optical radiation is invisible to the eye.

*Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.*

The installer is responsible for ensuring that the label depicted below (background: yellow; border and text: black) is present in the restricted locations where this equipment is installed.



The locations of all optical connections are listed in the Indications and Connectors section of this manual.

Optical outputs and wavelengths are listed in the Technical Specifications section of this manual.

## EMC

**Warning:** Operation of this equipment in a residential environment could cause radio interference.

**This device has been tested and found to meet the CE regulations relating to EMC and complies with the limits for a Class A device, pursuant to Part 15 of the FCC rules.**

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. These limits are designed to provide reasonable protection against interference to radio communications in any installation. The equipment generates, uses, and can radiate radio frequency energy; improper use or special circumstances may cause interference to other equipment or a performance decrease due to interference radiated by other equipment. In such cases, the user will have to take appropriate measures to reduce such interactions between this and other equipment.

Note that the warning above does not apply to TKH Security products which comply with the limits for a Class B device. For product-specific details, refer to the EU Declaration of Conformity.

*Any interruption of the shielding inside or outside the equipment could make the equipment more prone to fail EMC requirements.*

To ensure EMC compliance of the equipment, use shielded cables for all signal cables including Ethernet, such as CAT5E SF/UTP or better, as defined in ISO IEC 11801. For power cables, unshielded three wire cable (2p + PE) is acceptable. Ensure that *all* electrically connected components are carefully earthed and protected against surges (high voltage transients caused by switching or lightning).

## ESD

**Electrostatic discharge (ESD) can damage or destroy electronic components. Proper precautions should be taken against ESD when opening the equipment.**

<sup>\*)</sup> SELV: conforming to IEC 60950-1, < 60Vdc output, output voltage galvanically isolated from mains. All power supplies or power supply cabinets available from TKH Security comply with these SELV requirements.

## 8. Product disposal



### Recycling

The unit contains valuable materials which qualify for recycling. In the interest of protecting the natural environment, properly recycling the unit at the end of its service life is imperative.

## 9. EU Declaration of Conformity

The EU Declaration of Conformity for this product is available at <http://www.tkhsecurity.com/support-files>.