

SIEMENS

ACP 1703 Ax 1703

CM-0823

Fieldbus Interface Ring (3x FO, 1x RS485)



Bus interface for an optical field bus or multi-point traffic as

- optical ring or
- optical star

Features:

- 3 optical transmitter and receiver for each channel (ST-connector)
 - optical fibre up to 1300m can be used
- 1 electrical interface RS-485 (terminals)
 - shielded cable up to 500m can be used
 - up to 5m if the slave's RS-485 interface is supplied
- Transmission rate max. 115.2 kbps
- Power supply
 - via PS-663x

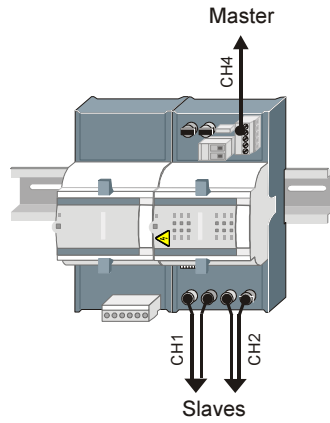
Application

CM-0823 is used for the construction of complex optical networks:

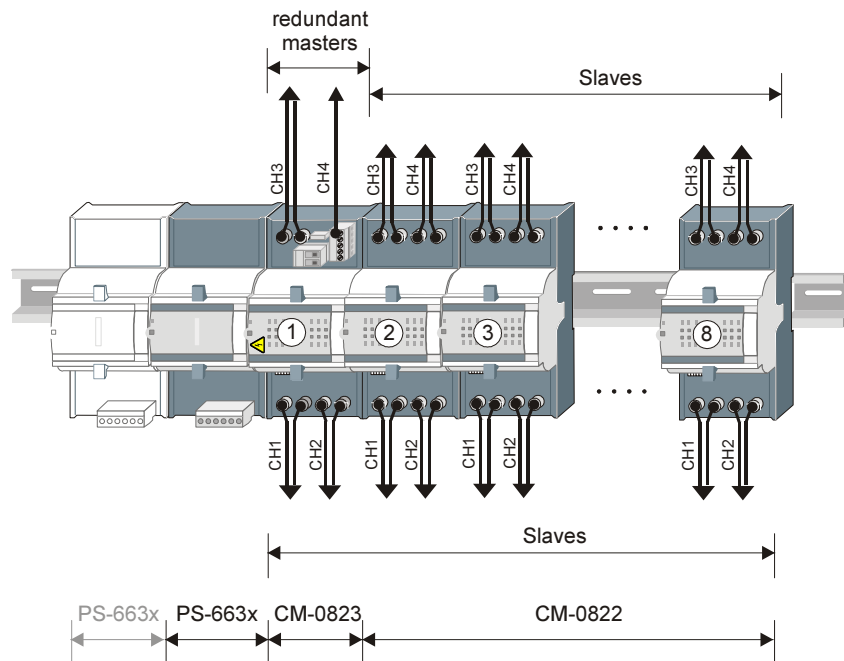
- Modes of operation
 - IEC 60870-5-101 unbalanced multi-point (multi-point traffic, halfduplex)
 - IEC 60870-5-103 unbalanced multi-point (multi-point traffic, halfduplex)
- Network structure
 - Ring
 - redundant master
 - (redundant) bi-directional communication in the ring
 - signaling of a ring interruption using a potential-free contact
 - Star, Tree
 - redundant master
- Up to 115.2 kbps transmission rate
- 3 optical transmit and receive channels
 - Receive channel stuck at zero monitoring
- 1 electrical interface RS-485
 - for connecting a slave
- Power supply
 - PS-6630 or PS-6632
 - redundant power supply is supported (but not to increase power)
- Is able to supply power to the slave's RS-485 interface, $I_{\max} = 50\text{mA}$

Configurations

Star, singular Master, max. 2 Slaves

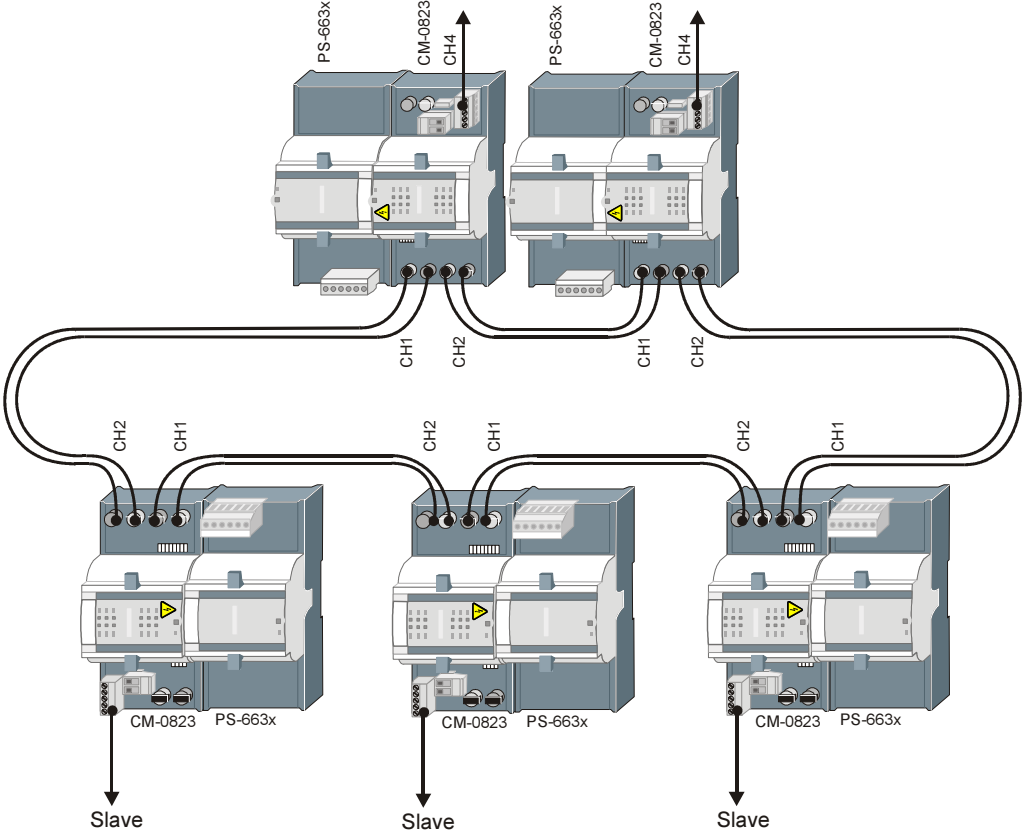


Star, redundant Master, > 2 Slaves



Configuration

Ring, redundant Masters



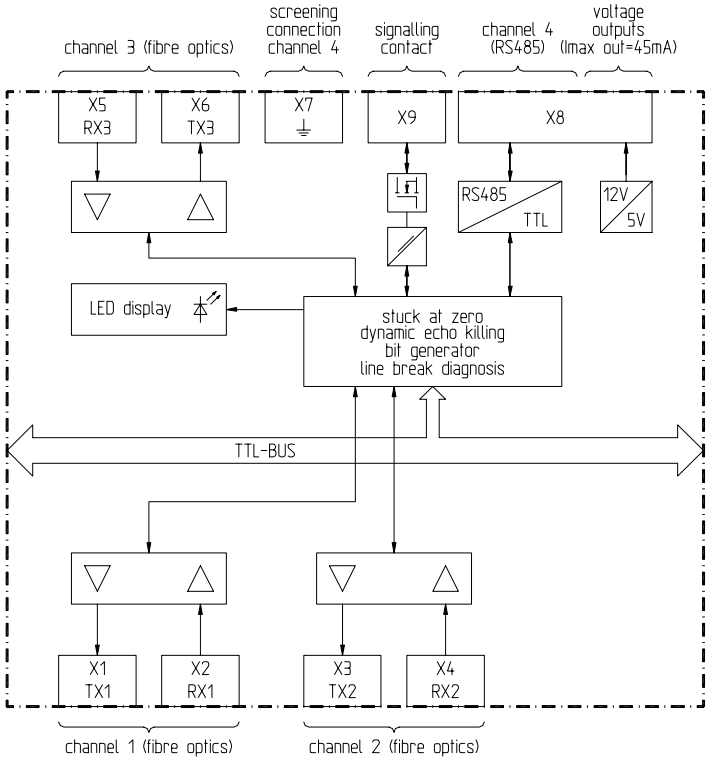
Features Ring

- 1 CM-0823 per branch
- Supports redundant masters (2 branches)
- Channels 3 (CH3, optical) and 4 (CH4, electrical) together can be set for a connection in direction to a master or in direction to the slaves
- Channel 3 (CH3, optical)
 - transmission rate for stuck at zero monitoring can be set using DIP switch
 - line-idle state can be set using DIP switch
- Using channels 1 (CH1) and 2 (CH2), the ring is made respectively the connection to the slaves

Features Star / Tree

- 1 CM-0823 and up to 7 CM-0822 can be attached side by side
- Supports redundant masters (optically and electrically connected)
- Channels 3 (CH3, optical) and 4 (CH4, electrical) together are set for a connection in direction to a master
- Channels 1 (CH1) and 2 (CH2) connect to one slave each
- Optical channels
 - transmission rate for stuck at zero monitoring can be set using DIP switch
 - line-idle state can be set for each interface using DIP switch

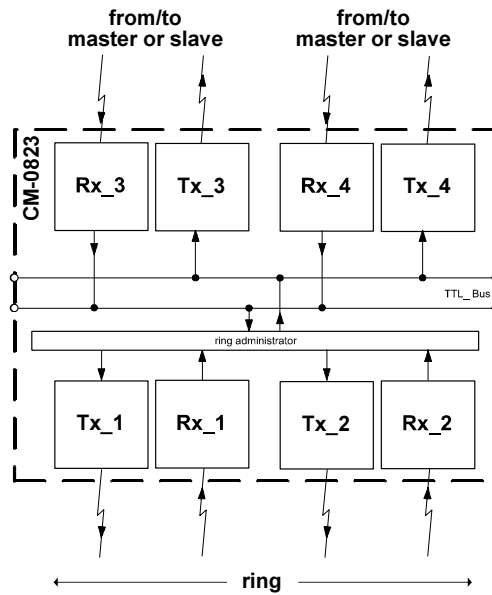
Block Diagram (Module)



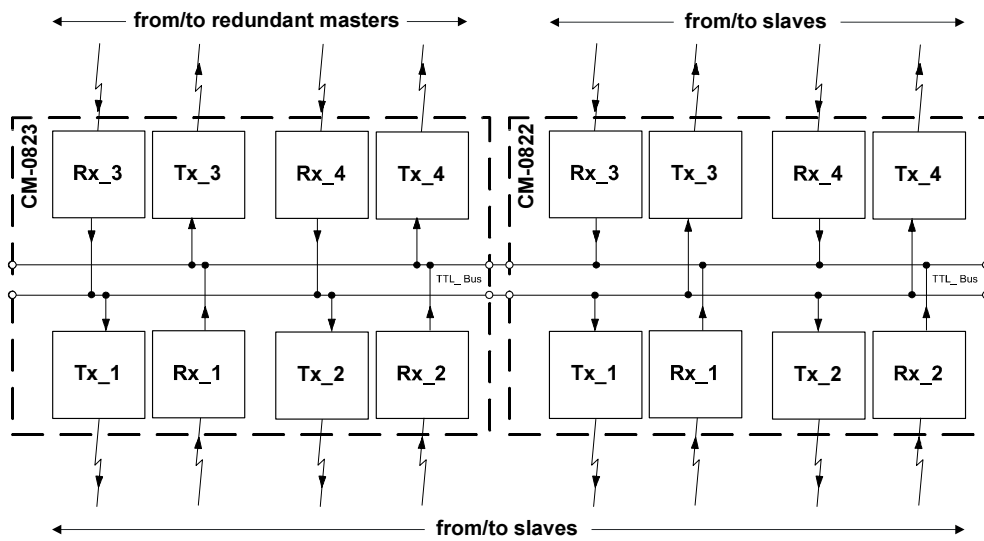
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Block Diagram Data Flow

Ring



Star/Tree



Signal propagation delays ring

in the ring
(CH1 ⇔ CH2)
add to ring
(CH3/CH4 ⇔ CH1/CH2)
drop from ring
(CH3/CH4 ⇔ CH1/CH2)
in the optical fibre

- $T_{CH1 \leftrightarrow CH2} [\mu s] = 8,65 + (6,25 \cdot 10^5) / R_D [bps]$
- $T_{CH3/CH4 \leftrightarrow CH1/CH2} [\mu s] = 4,78 + (5 \cdot 10^5) / R_D [bps]$
- $T_{CH1/CH2 \leftrightarrow CH3/CH4} [\mu s] = 11,5 + (6,25 \cdot 10^5) / R_D [bps]$
- approx. 5ns/m (approximate value)

The signal propagation delays do not depend on direction.

Note:

In order to obtain the total signal propagation delay from one master to one specific slave, the above mentioned signal propagation delays and the signal propagation delay of all fibre optics sections have to be taken into consideration (see an example in [ACP 1703 Platforms Configuration Automation Units and Automation Networks](#)).

Signalling Contact - Signalling a Ring Interruption

Signalling contact (X9)

- Semiconductor relay in MOSFET technology, optically separated
- Potential-free contact
- Not short-circuit proof
- Ring interruption monitoring
 - error-free operation contact closed
 - ring interruption contact open

Maximum output current

- 120 mA

Maximum short-time current (10ms)

- 350 mA

Maximum switching voltage

- 350 V AC or DC

Resistance when ON

- 35 Ω ±20% (@ 120 mA)

Current when OFF

- 1 µA

Make time T_{ON}

- 3 ms

Break-time T_{Off}

- 3 ms

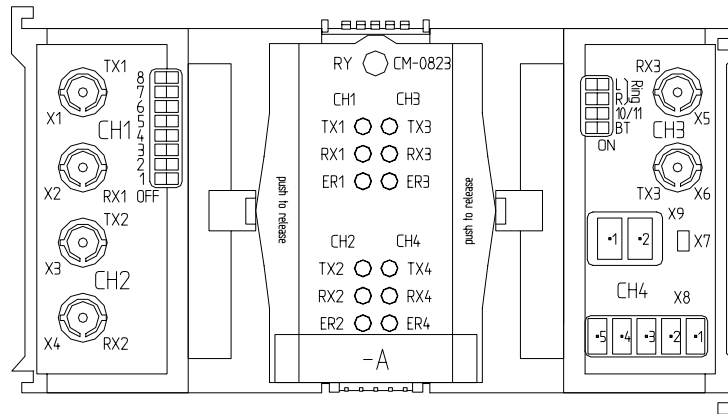
Power supply

Operating voltage

5 VDC, typ. 0.5W .. 1W (depending on the set line-idle state)
Power to be supplied by PS-663x

Engineering

Front View and Connectors



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channel 1:

X1: ST connector

pin	signal
1	Tx

X2: ST connector

pin	signal
1	Rx

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channel 2:

X3: ST connector

pin	signal
1	Tx

X4: ST connector

pin	signal
1	Rx

channel 3:

X5: ST connector

pin	signal
1	Rx

X6: ST connector

pin	signal
1	Tx

channel 4:

X8: 5 pol. socket

pin	signal
1	TXD+/RXD+
2	TXD-/RXD-
3	GND
4	GND
5	Uout+

X7: 1 pol. flat connector for flat pin bushing (e.g.: Klauke 820/1 or 830/1)

X9: 2 pol. socket

pin	signal
1	OUT N/O
2	OUT COM

GND supply voltage 0VDC
 TXD+/RXD+ serial interface transmit/receive data +
 TXD-/RXD- serial interface transmit/receive data -
 Uout+ output voltage +12VDC/50mA

Tx serial interface (transmit data)
 Rx serial interface (receive data)

OUT N/O monitoring normally open contact
 OUT COM monitoring common contact

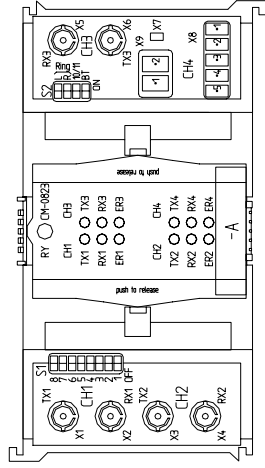
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RY board ready to operate (ready)
 TX1 ... 4 ... Data are sent, channel 1..4
 RX1 ... 4 ... Data are received, channel 1..4
 ER1 ... 4 ... error, channel 1 ... 4

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Settings

front view:



configuration switch S2

configuration switch S2

- master/slave/redundancy mode (star and ring)
 - single-master operation in the ring or star mode (module is master)
 - single-slave operation in the ring or star mode (module is slave)
 - master/redundancy operation in the ring mode (module is topological placed on the left side (active master))
 - master/redundancy operation in the ring mode (module is topological placed on the right side (passive master))
- Word length of the asynchronous serial transmission
- 10 Bit word length
 - 11 Bit word length (IEC 60870-5-101/103)
- RS485 bus termination
- RS485 bus with terminating resistor 100R
 - RS485 bus without terminating resistor 100R

* connection for master resp. slave

configuration switch S1

- stuck at zero data rate (bit/s)
- 50
 - 100
 - 150
 - 200
 - 300
 - 600
 - 1K2
 - 2K4
 - 4K8
 - 9K6
 - 19K2
 - 38K4
 -
 -
 - 15K2
 - stuck at zero switched off (eg. minute pulse)

operating mode (star or ring)

- star
 - ring
- line-idle state
- channel 1 (CH1) ring coupling
 - channel 2 (CH2) ring coupling
 - channel 3 (CH3)* (ON = light on)
 - channel 3 (CH3)* (OFF = light off)
 - channel 4 (CH4)*
- line-idle state is standard V28
- with setting ring is line-idle state "light on" parameterized

3K08V50MG

Literature

ACP 1703 Platforms Configuration Automation Units and Automation Networks	DC0-020-2
Data Sheet SM-x551/PROTOCOL	MC0-003-2
Data Sheet CM-0821	MC0-031-2
Data Sheet PS-663x	MC6-027-2

