15.2 DCOM-232/485

15.2.1 RS232/485 communication FTA

The communication FTA DCOM-232/485 is the combined RS232/485 communication interface of Safety Manager. It is used to provide Safety Manager with a RS485/422 or a RS232 connection.

The communication FTA may be driven by one (or a pair of redundant) Control Processor(s). The communication FTA does not require separate supply wiring. It is supplied by the connected Control Processor(s). The communication FTA must be connected with earth (use the supplied terminal). This will connect the shield of the internal cable(s) and the housing of the field connector(s) with (cabinet-) earth. For information on required communication cables, see section Communication cables.

The module has a universal snap-in provision for standard DIN EN rails.

Usage of DCOM-232/485

- It can be used for RS-232 and RS-485 communication with SM-SM SafeNet and 3rd party equipment.
- It cannot be used for RS-485 FSC-SM SafeNet communication for 1M or 2M baudrate.
- It is a preferred FTA for RS-232 communication.

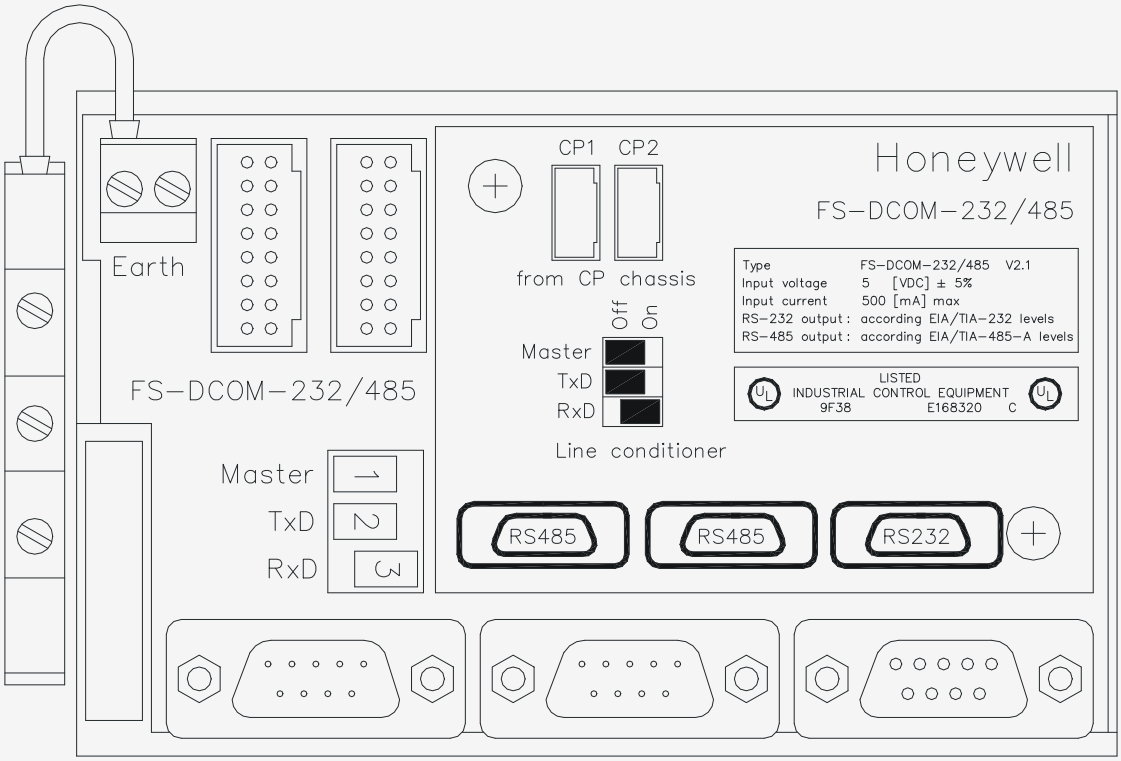

Figure 15-1: Top view of the DCOM-232/485 communication FTA

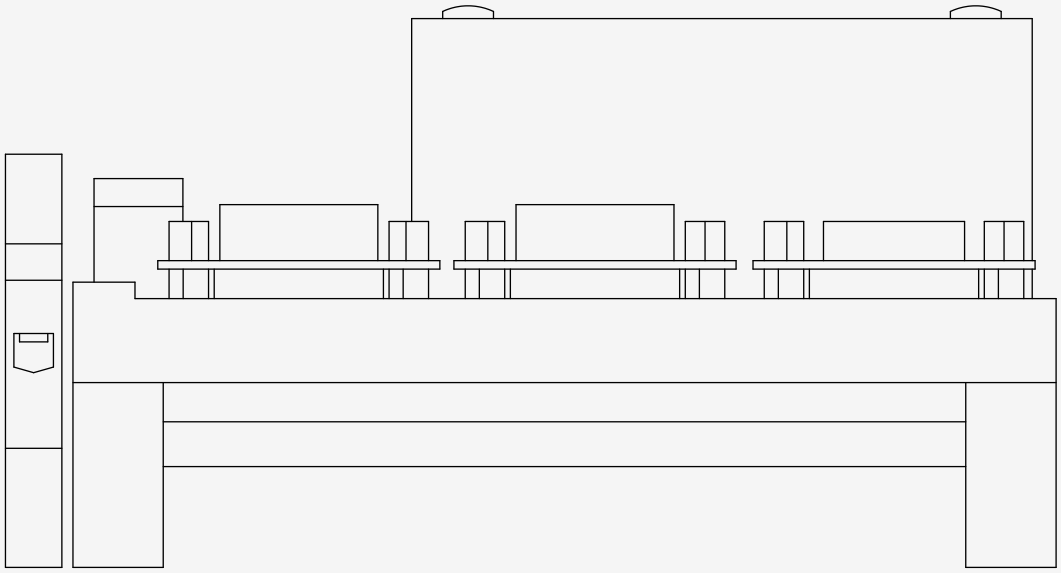

Figure 15-2: Front view of the DCOM-232/485 communication FTA

15.2.2 Connectors

The below table describes the connectors present on the DCOM-232/485.

Table 1. Connections for the DCOM-232/485

Connector	Quantity	Description	Use with cable
2-pin earth connector	1	FTA connection to cabinet earth (see Figure 1).	-
2-pin earth terminal		1 FTA connection to cabinet earth	Supplied
9pole sub-D male	2	Used for RS422 or RS485 communication. The two connectors are identical: if only one is used, then the other needs an end of line terminator.	CCE-485-01/Lx CCE-485-02/Lx EOL-485-01
9pole sub-D female	1	Used for RS232 communication.	CCE-232-01/Lx CCE-232-02/Lx
16-pins male	2	Communication and supply connection to the Control Processor (s).	CCI-UNI-02 CCI-UNI-04

15.2.3 Pin allocation

The below figure shows the pin allocation of the RS232 and RS485 connectors on the DCOM-232/485 communication FTA.

- The RS485/422 connectors are male type connectors.
- The RS232 connector is a female type connector.
- The pin assignment for the RS485/422 connectors depends on the position of the “Master” switch (dip switch 1).

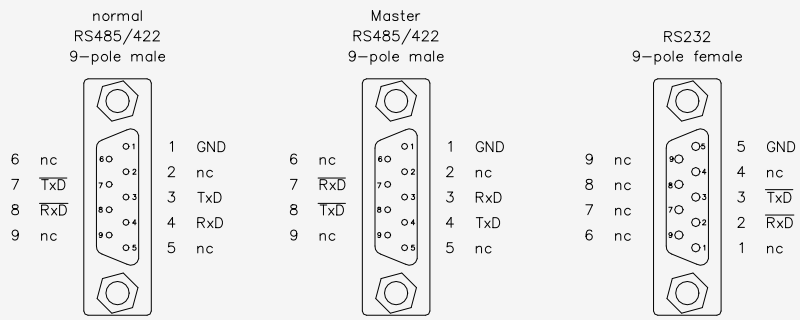

Figure 15-3: Pin allocation of the connectors on the DCOM-232/485[1]

Note:

1. Figure 1 shows the physical location of these connectors.

15.2.4 Dip switches

The DCOM-232/485 contains three color-coded dip switches for configuration of the external RS485/422 communication lines.

15.2.4.1 Line conditioner

A line conditioner consists of a pull-up and a pull-down resistor of 680 Ω each.

Line conditioners are connected to the RxD lines if switch 2 and/or 3 are ON. With these resistors connected, the receivers will get less noise during the periods in which no transmitter is active on the line.

15.2.5 DIP switch settings

The below figure and table show the possible settings when configuring the DCOM-232/485.

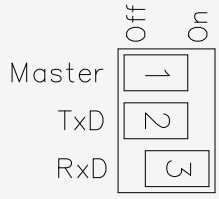

Figure 15-4: Detail of the DCOM-232/485 dip switches

- Dip switch 1 (Master) selects the RS485/422 pin configuration.
  - The *Off* position is “normal”.
  - The *On* position changes the pin allocation of the RS485/422 connectors from “normal” to “master”.

This switch makes it possible to use one-on-one cables only (see e.g. CCE-485-01/Lx). In case of a communication-master re configuration, no new cabling is required (provided only one-on-one cables are used).

- Dip switch 2 (TxD) is the line conditioner for the transmitter lines (on pins 3 and 7).
- Dip switch 3 (RxD) is the line conditioner for the receiver lines (on pins 4 and 8).

Usage of DCOM 232/485

- It can be used for RS-232 and RS-485 communication with SM-SM SafeNet and 3rd party equipment.
- It cannot be used for RS-485 FSC-SM SafeNet communication for 1M or 2M baudrate.
- It is a preferred FTA for RS-232 communication.

Table 1. dip switch settings for the DCOM-232/485[1]

DCOM-232/485 Configuration	Dip switch 1	Dip switch 2	Dip switch 3
RS422 Point-to-point	On/Off[2]	On	On
RS485 Slave	Off	Off	Off
RS485 Master	On	On	On
RS485 Master half duplex	On	On	Off
RS232 Point-to-point	Off	Off	On

1. *On* and *Off* positions are marked on the actual module (see Figure 1).
2. When using standard one-on-one cables (e.g. cable CCE-485-01/Lx), dip switch 1 of the DCOM-232/485 on one side must be On and dip switch 1 of the other DCOM-232/485 must be *Off*.

   When using a cross-cable, dip switch 1 of both DCOM-232/485s must be *Off*.

Note:
For proper RS232 operation, it is important that dip switch 3 is *On*!

15.2.6 Cable lengths

The maximum (total) cable length for RS232, RS422 and RS485 communication depends on the baud rate and the communication method (full-duplex or half-duplex).

The below table gives the maximum cable length provided a proper cable type is used.

Table 1. Maximum cable length versus baud rate

communication method	baud rate	maximum cable length
RS232 full-duplex	≤ 100 kBd	10 m
RS422 full-duplex RS485 full-duplex	≤ 100 kBd	1.2 km
	≤ 125 kBd	1 km
	≤ 1 MBd	120 m
	≤ 2 MBd	60 m
RS485 half-duplex	≤ 100 kBd	600 m
	≤ 125 kBd	500 m
	≤ 1 MBd	60 m
	≤ 2 MBd	30 m

15.2.7 Fan in/fan out

- RS232 connections are point to point only
- RS422 connections are point to point only
- RS485 full duplex connections allow maximum 32 connected devices
- RS485 half duplex connections allow maximum 16 connected devices

15.2.8 Technical data

General	Type numbers:	FS-DCOM-232/485
		FC-DCOM-232/485
	Approvals:	CE, TUV, UL, FM
Physical	Module dimensions:	110 × 70 × 61 mm (L × W × H) 4.33 × 2.76 × 2.40 in (L × W × H)
	Terminal dimensions:	6 × 57 × 47 mm (L × W × H) 0.24 × 2.24 × 1.85 in (L × W × H)
	DIN EN rails:	TS32 / TS35 × 7.5
	Used rail length:	117 mm (4.6 in)
Power	Input voltage:	5 V DC ±5%
	Input current:	Max 500 mA, supplied by the Control Processor(s)
Output	RS232 output:	According EIA/TIA-232 levels
	RS232 baudrate:	0-250 kBaud
	RS485/422 output:	According EIA/TIA-485-A levels
	RS485/422 baudrate:	0-2 MBaud (transparent, FM0, FM1 or Manchester coded)

15.3 DCOM-485

15.3.1 RS422/485 communication FTA

The communication FTA DCOM-485 is the RS422/485 communication interface of Safety Manager. It is used to provide Safety Manager with a RS422/485 connection facilities including Manchester, FM0 or FM1 modulation/demodulation at 1Mb and 2Mb.

The communication FTA may be driven by one (or a pair of redundant) Universal Communication Units (USI) in a Safety Manager Controller processor cabinet. The communication FTA does not require separate