MTL4851 and MTL4852

HART® connection systems

- **Designed to mount directly to a range of general purpose HART® connection units and IS backplanes**
- **Provides a simple interface to smart devices in the field**
- **Connect up to 7936 HART® devices on a single RS485 network**
- **LED indication for fault diagnosis**
- **Auto baud rate detection**
- **Connectivity to HART® configuration and Instrument Management software (IMS)**

The MTL4851 and MTL4852 HART connection system provides a simple interface between smart devices in the field, control systems and HART instrument management software run on a pc.

The system is based on 16-channel modularity to provide a compact, easily configurable and expandable system. Using a standard RS485 serial link up to 7936 HART devices can be connected on a single network.

For the optimum solution, choose from a range of general purpose and IS termination boards. For maximum flexibility the HMM64 HART backplane locates an MTL4851 master communications module and up to three MTL4852 secondary interface modules, with each module connecting to 16 field devices. General purpose HART connection units and IS backplanes are available fitted with an cable interface connection to the HMM64. This system can be extended with further HMS64 HART backplanes linked to the master, each carrying up to four MTL4852 secondary interface modules.

The MTL4851 and MTL4852 modules can also be located on HTP-SC16x termination boards for general purpose applications. HART loops are simply wired through these HART Termination Panels and may be grounded or floating circuits. The HTP boards offer a compact and cost-effective solution for general applications. CPH-SC16x backplanes are ideal for signal loops requiring intrinsic safety (IS) protection, combining multiplexer and IS isolator mounting. This offers considerable simplification in wiring when compared to DIN-rail based solutions.

The HCU16 HART units connect to 16 general purpose field instruments while maintaining channel to channel isolation. Resistor conditioning options are compatible with all types of I/O cards. It allows pass-through connections for transmitter power supply, input signal and common.

The HCU16AO unit includes HART filters for use with I/O cards that are incompatible with HART communication signals.

Customised backplanes and connection units are available to provide direct connection from DCS I/O cables, replacing the standard termination boards.

See also the MTL4850 datasheet for alternative HART solutions using a 32 channel multiplexer module ideally suited for use in conjunction with emergency shutdown and safety systems.

Connectivity to HART Configuration and Instrument Management Software :

The online access to the information contained within HART devices allows users to diagnose field device troubles before they lead to costly problems. Software can capture and use diagnostic data from HART field instruments via the MTL HART connection hardware. This allows users to realise the full potential of their field devices to optimise plant assets, which results in significant operations improvement and direct maintenance savings.

IMS products provide essential configuration, calibration, monitoring and maintenance history functions for conventional analogue (4-20 mA) and HART protocol compatible smart process instruments and field devices. They deliver powerful tools to meet the need for standardised instrument maintenance procedures and record keeping mandated by some quality standards and regulatory bodies.

The benefits of utilising these powerful software packages online include:

- Reduced commissioning time and costs
- Reduced maintenance costs
- Reduced documentation
- Reduced process downtime

The MTL485x offers connectivity to a comprehensive range of FDT based software packages via the comms Device Type Manager (DTM). The DTM can be downloaded from www.mtl-inst.com. Other software packages, such as AMS from Emerson, work with the MTL485x through custom software drivers or by the inclusion of the device description (DD) file for the MTL multiplexers.

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MTL4851 and MTL4852 HART® Connection Systems

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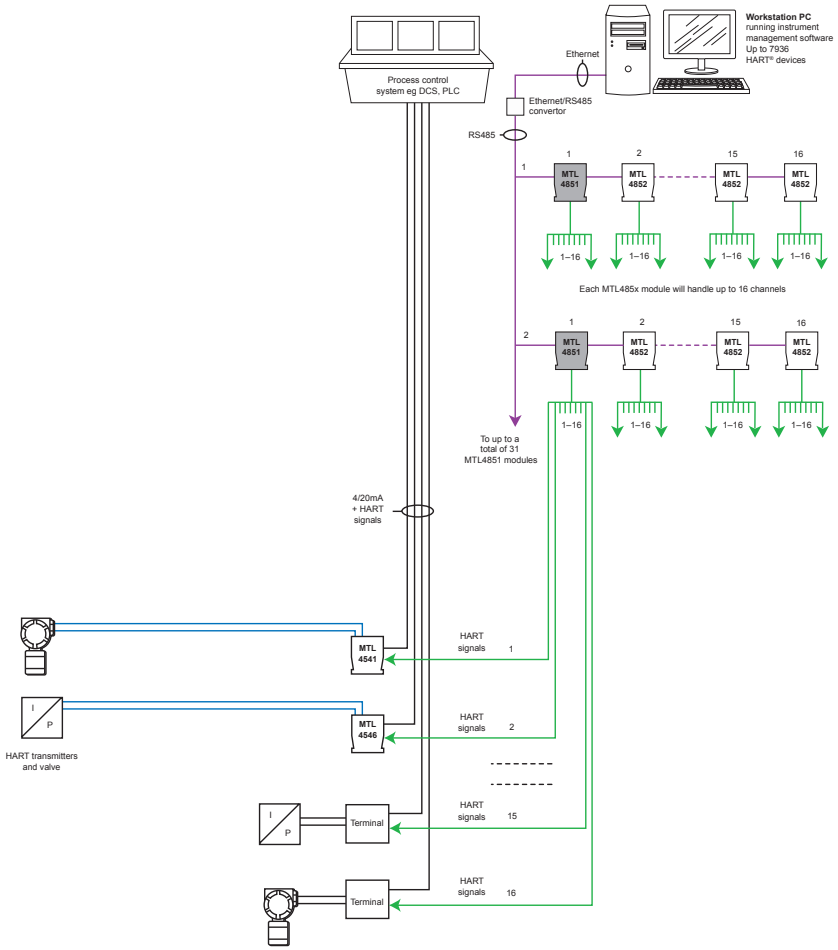
SYSTEM OVERVIEW (TYPICAL INSTALLATION)



LED INDICATORS - MTL4851 module

LED	Colour	State	Description
PWR	green	Off	Multiplexer is not receiving power
		On	Multiplexer is receiving power
FAULT	red	Off	Multiplexer is in the running state
		Pulsing	Multiplexer build/rebuild is in progress
		Blinking	No HART loops found
		On (steady)	A fault was detected and multiplexer operation has halted
HOST	yellow	Off	No communication on the RS485 channel
		Short flash (0.25 sec)	Correctly framed message received by the multiplexer
		Long flash (1 sec)	Response transmitted—this is re-triggerable so repeated transmissions will leave the indicator permanently on
HART	yellow	Off	No communication on the channel
		Short flash (0.25 sec)	Message transmitted
		Long flash (1 sec)	Response received- this is re-triggerable so repeated transmissions will leave the indicator permanently on

LED INDICATORS - MTL4852 module

LED	Colour	State	Description
PWR	green	Off	Unit is not receiving power
		On	Unit is receiving power
HART	yellow	Pulsing	Indicating a channel is selected
		On	Channel continuously selected

The given data is only intended as a product description and should not be regarded as a legal warranty of properties or guarantee. In the interest of further technical developments, we reserve the right to make design changes.

SPECIFICATION

MTL4851 Master Communications Module

Number of HART channels
16 (ch1 to ch16)

Channel device type
HART rev 5-7

Channel interface
2 connections to each channel

Host system interface
RS485 2-wire multidrop
(up to 31 MTL4851 modules can be connected to one host)

RS485 baud rate
38400, 19200, 9600, 1200 baud- auto detected

Address selection
up to 31 addresses, set on backplane

Alarm output
Open-collector transistor, referenced to 0V
V_{max} = 35V, I_{max} = 5mA, P_{max} = 100mW

MTL4852 Secondary Interface Module

Number of HART channels
16 (ch17 to ch256 in 16 channel groups)

Channel device type
HART rev 5-7

Channel interface
2 connections to each channel

MTL systems interface
Up to 15 off MTL4852 modules per MTL4851
Total length of interface bus, 4m max.

Power requirements
Powered from MTL4851 module

ISOLATION

Channel-to-channel isolation
50V dc

Field loop isolation
50V dc
Module is coupled to loops via capacitor in each connection leg (i.e. 2 capacitors per channel)

RS485 interface isolation (Between module and interface)
50V dc

Alarm output isolation (Between module and output)
50V dc

PSU isolation (Between module and PSU input)
50V dc

POWER SUPPLY, MTL4851 (from backplane)

Supply voltage
19V to 35V dc

Current consumption
42mA at 24V ±10% for MTL4851, plus
2mA for each MTL4852

Power dissipation (MTL4851 + 15 MTL4852)
<1.6W at 24V ±10%

PSU protection
Reversed polarity protected

ENVIRONMENTAL

Temperature range
Operating: –40°C to +60°C
Non-operating: –40°C to +85°C

Relative humidity
5% to 95% - non-condensing

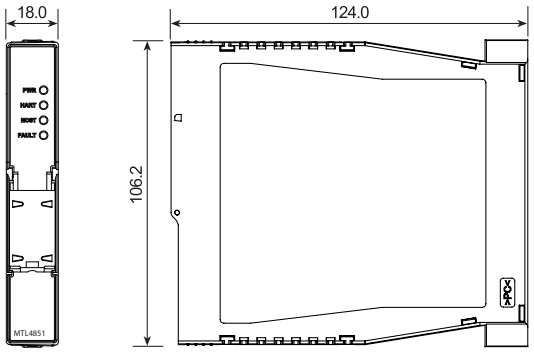
MECHANICAL

Dimensions
See drawing

Weight
MTL4851 95gm
MTL4852 75gm

Approvals
Zone 2 mounting ATEX & IECEx
Div 2 mounting FM & FMc pending

DIMENSIONS (mm)



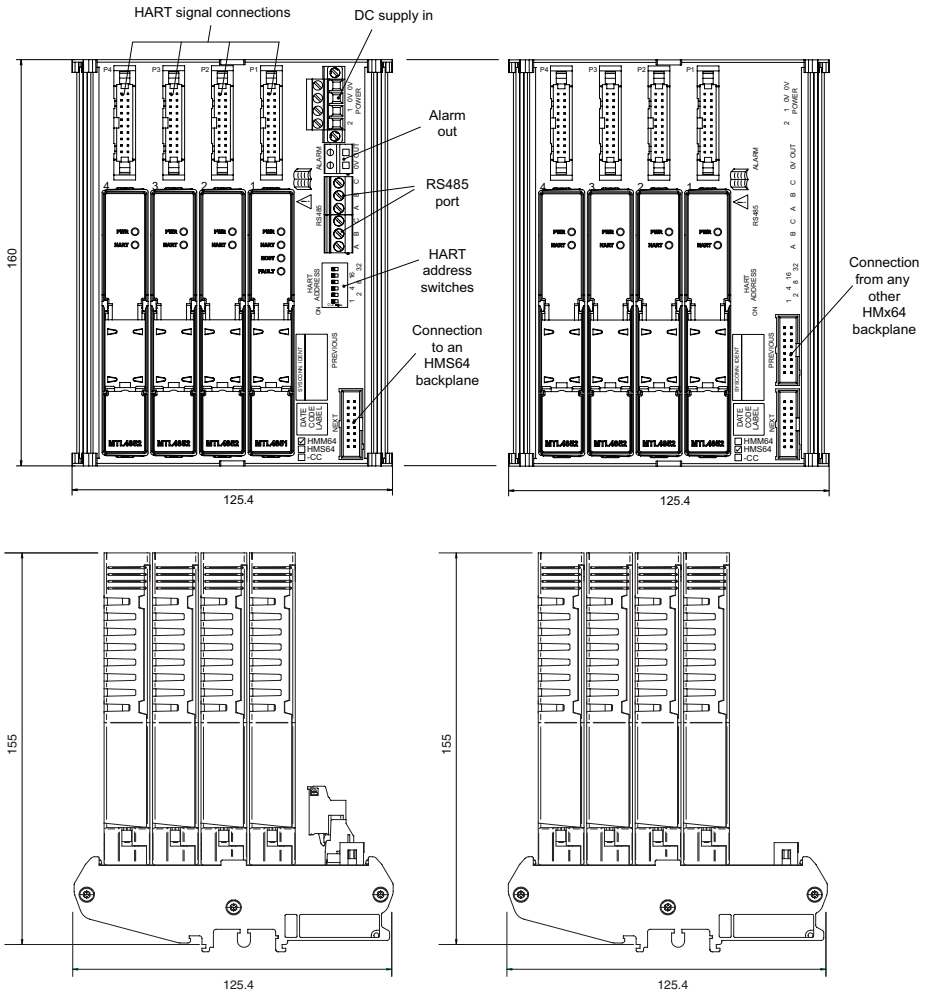
INSTRUMENT MANAGEMENT SOFTWARE

The MTL HART Connection System offers connectivity to a comprehensive range of both general instrument management software packages and dedicated software packages for optimising Valve positioner performance and maintenance including-

AMS Device Manager	Emerson Process Management
Cornerstone	ASTEC
DAT200 Asset Vision Basic	ABB
FDM	Honeywell
FDT Container	M&M Software
FieldCare	Endress & Hauser/Metso Automation
Fieldmate	Yokogawa
HART OPC Server	HART Communication Foundation
PACTware	PACTware Consortium
PDM	Siemens
SoftTools	Flowserve
ValveLink	Emerson Process Management
Valvue	Masoneilan

For software packages that are based on a FDT frame i.e FieldCare, PACTware etc communication with the MTL HART multiplexer system requires the MTL Generic Communications DTM. This can be downloaded Free of Charge from the MTL website.

BACKPLANES FOR MTL4851/MTL4852 GENERAL PURPOSE VERSIONS



HMM64 **HMS64**

HMM64/HMS64 BACKPLANE

Capacity

HMM64 1xMTL4851, 3xMTL4852
HMS64 4xMTL4852
Max. 3xHMS64 connected to 1xHMM64

Maximum power requirements

1.9W for fully equipped HMM64, plus
3 HMS64 backplanes.

HART interface connectors

4xDIN41651 20-way HART signal cables
(16 HART signal connections + 4 common returns)
For use with HM64RIB20 cables

Backplane inter-connect

HMM64 1x DIN41651 16-way socket
HMS64 2x DIN41651 16-way socket
For use with HMRIB16 cables

Weight (excl. modules)

215g approx.

Power requirements, Vs

21 to 35V dc through plug-in connectors, screw-secured
4 terminals for dual power supplies

RS485 port

2 terminals for bus, plus screen terminal
6 terminals in total to enable chained bus connection.
HART address switch, five poles active in six position switch

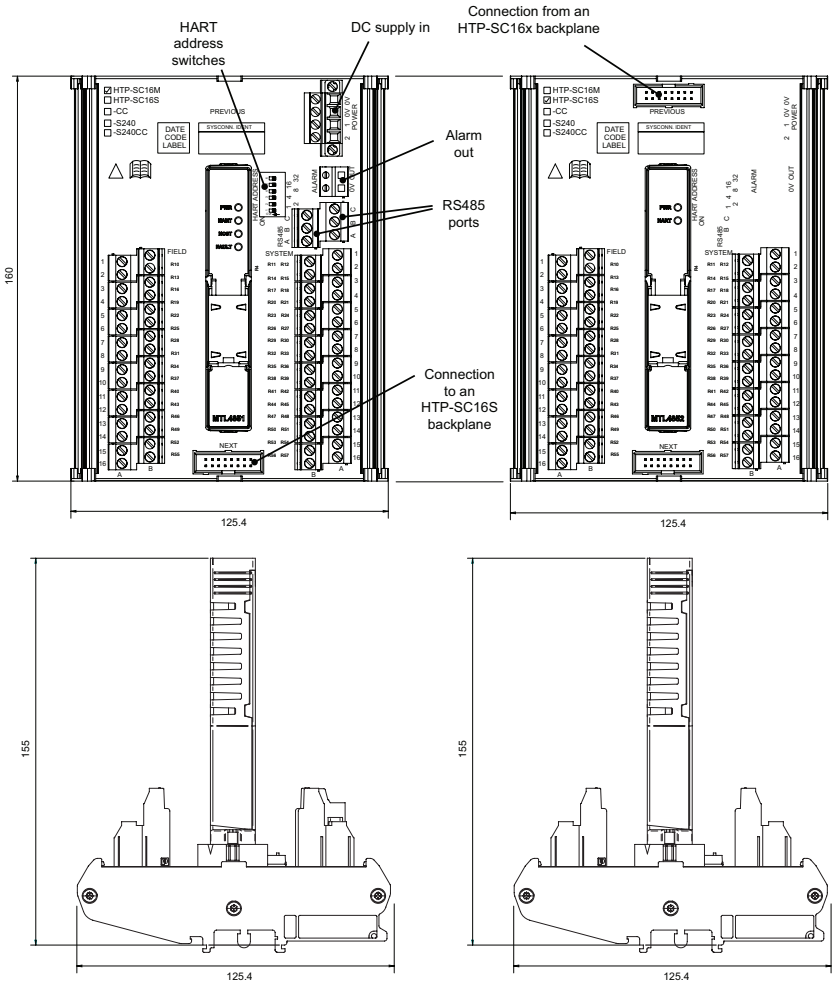
Alarm connectors

2 terminals for alarm output and alarm clear

Conductor terminals

Accept conductors of up to 2.5mm^2 stranded or single-core

BACKPLANES FOR MTL4851/MTL4852 GENERAL PURPOSE VERSIONS



HTP-SC16M **HTP-SC16S**

HTP-SC16M/HTP-SC16S BACKPLANE *

Capacity

HTP-SC16M 1xMTL4851
HTP-SC16S 1xMTL4852
Max. 4xHTP-SC16S connected to 1xHTP-SC16M

Maximum power requirements

1.3W for HTP-SC16M, plus
4 HTP-SC16S backplanes.

Signal connectors

2.5mm² screw-clamp terminals
2 terminals per channel for field and system

Backplane inter-connect

HTP-SC16M 1x DIN41651 16-way socket
HTP-SC16S 2x DIN41651 16-way socket
For use with HMRIB16 cables

Weight (excl. modules)

300g approx.

Power requirements, Vs

21 to 35V dc through plug-in connectors, screw-secured
4 terminals for dual power supplies

RS485 port

2 terminals for bus, plus screen terminal
6 terminals in total to enable chained bus connection.
HART address switch, five poles active in six position switch

Alarm connectors

2 terminals for alarm output and alarm clear

Conductor terminals

Accept conductors of up to 2.5mm² stranded or single-core

** for further details of the model options refer to the Instruction Manual INM4851 - available from the MTL website.*

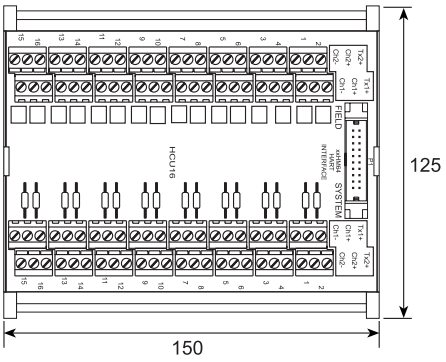
BACKPLANES FOR MTL4851/MTL4852 GENERAL PURPOSE VERSIONS

HCU16 HART CONNECTION UNIT*

Accuracy (HCU16-P250 only)
250Ω ±0.05%

Connectors
2.5mm² screw-clamp terminals
3 terminals per channel
20-way HART signal cable (to HMM64/HMS64)

Weight
383g approx.



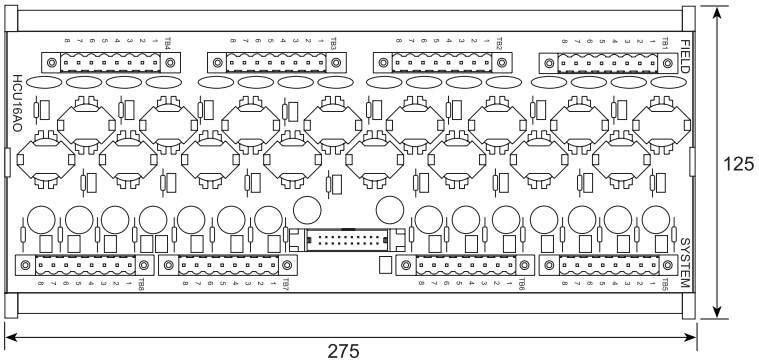
HCU16

HCU16AO CONNECTION UNIT WITH FILTERS

Series impedance
dc < 2Ω
HART signal > 240Ω

Connectors
2.5mm² removable, screw-clamp terminals
2 terminals per channel in groups of 4 channels
20-way HART signal cable (to HMM64/HMS64)

Weight
768g approx.



HCU16AO

COMMON SPECIFICATION HCU16 & HCU16AO

Capacity
16 channels

Isolation
Channel-to-channel 50V dc

Mounting
Supplied fitted in DIN-rail (T- or G- section) carrier

** for further details of the model options refer to the Instruction Manual INM4851 - available from the MTL website.*

CUSTOMISED CONNECTION UNITS

Eaton offers a range of general purpose and IS interfaces providing direct connection with control system I/O cables as well as HART® connectivity. For general purpose signals, a number of custom HART® interface termination units are available for most DCS and PLC I/O cards. These replace the existing DCS termination units, saving space and allowing easy upgrading.

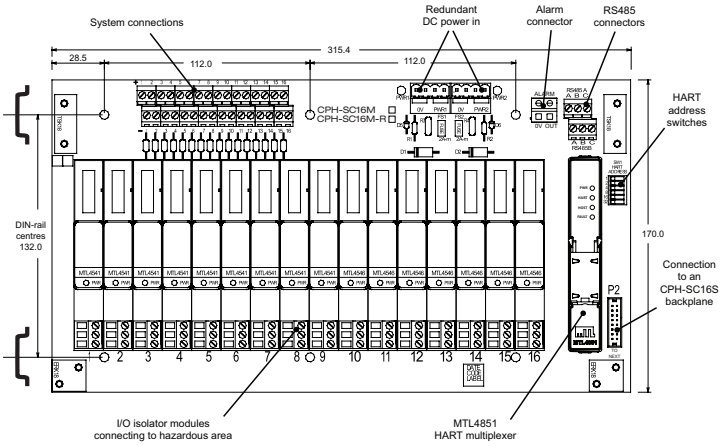
Typical system examples are:

Emerson	DeltaV and DeltaV SIS systems
HIMA	HiMax
Honeywell	Experion C300, Safety Manager, Process Manager I/O systems
Invensys	Foxboro FBM systems, Triconex Tricon & Trident systems
Siemens	ET200M
Yokogawa	Centum R3, Prosafe RS systems

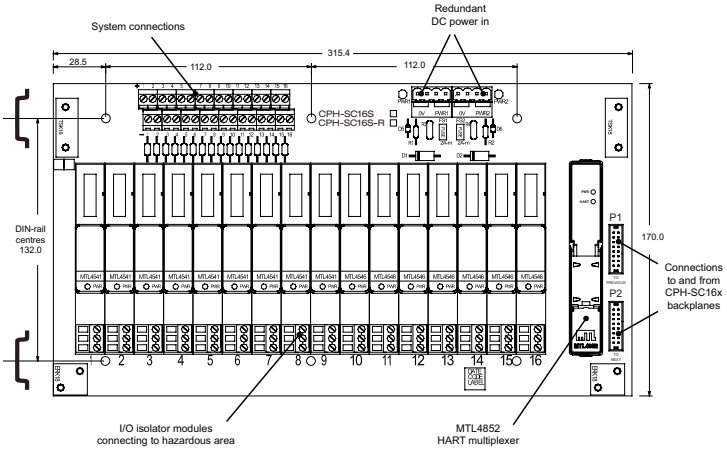
Contact Eaton's MTL product line with details of your specific requirements.

BACKPLANES FOR MTL4851/MTL4852 INTRINSIC SAFETY VERSIONS

CPH-SC16M



CPH-SC16S



CPH-SC16M/CPH-SC16S BACKPLANES

Capacity

CPH-SC16M 1xMTL4851
CPH-SC16S 1xMTL4852
16 x MTL4541/A/S/AS, MTL4546/Y isolators
Max. 4xCPH-SC16S connected to 1xCPH-SC16M

Power requirements, Vs

21 to 35V dc through plug-in connectors,
2 x 4 terminals for dual power supplies and power chain
Dual 2.5A medium blow TE5 fuses

Maximum power requirements

CPH-SC16M 0.65A

CPH-SC16S 0.6A

Safe-area signal connectors

2.5mm^2 screw-clamp terminals
2 terminals per channel for system connections

Backplane inter-connect

CPH-SC16M 1x DIN41651 16-way socket
CPH-SC16S 2x DIN41651 16-way socket
For use with HMRIB16 cables

RS485 port

2 terminals for bus, plus screen terminal
6 terminals in total to enable chained bus connection.
HART address switch, five poles active in six position switch

Alarm connectors

2 terminals for alarm output and alarm clear

Accuracy

CPH-SC16xR: 250 Ω ±0.05% conditioning resistors
(note: MTL4541/41A only)

Weight (excl. modules and accessories)

410g approx.

** for further details of the model options refer to the Instruction Manual INM4851 - available from the MTL website.*

HART multiplexer

MTL4851	HART multiplexer primary module
MTL4852	HART multiplexer secondary module

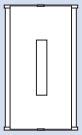
Multiplexer accessories

TH5000	Tag holder (Pack of 20)
ET-485	Serial RS485 to Ethernet converter

General purpose connection units

HMM64	64ch HART backplane for 1xMTL4851 & 3xMTL4852
HMS64	64ch HART backplane for 4xMTL4852
HCU16 †	HART connection unit, 16ch
HCU16-P250 †	HART connection unit, 16ch
HCU16-S150 †	HART connection unit, 16ch
HCU16-S200 †	HART connection unit, 16ch
HCU16AO	HART connection unit, 16ch o/p (With HART filters)

Integrated connection units



HTP-SC16M	Integrated HART connection unit, primary, 16ch
HTP-SC16M-S240	Integrated HART connection unit, 16ch, 240Ω series resistor
HTP-SC16S	Integrated HART connection unit, secondary, 16ch
HTP-SC16S-S240	Integrated HART connection unit, 16ch, 240Ω series resistor

HART Backplane accessories

RIB-CLIP16	Retaining clip for ribbon cable connector (pack of 10)
HM64RIB20-xx	20-way HART signal cable xx = 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, 4.5, 6.0 (metres)
HMRIB16-xx	16-way backplane linking cable xx = 0.5, 1.0, 2.0 (metres)

† See Notes

MTL4500 range of backplanes

CPH-SC16M	16ch backplane, primary
CPH-SC16M-R	16ch backplane, (250Ω conditioning resistor)
CPH-SC16S	16ch backplane, secondary
CPH-SC16S-R	16ch backplane, (250Ω conditioning resistor)

Backplane accessories for MTL4500 range

DMK01	DIN-rail mounting kit, T- or G-section (pack of 40)
SMS01	Surface mounting kit (pack of 40) 16-way backplanes require 6
ERK18	Earth rail kit
TSK18	Tagging strip kit
FUS2.5ATE5	Fuse kit, pack of 10, 2.5A

Literature

INM4851	MTL4851 Instruction manual
INA485x	ATEX safety instructions

Notes:

no suffix	No parallel resistor, 0Ω link in series - for use with current inputs with 250Ω input impedance or HART compatible outputs
-P250	250Ω parallel resistor, 0Ω link in series - for use with 1-5V system inputs
-S150	150Ω series link, no parallel resistor - for use with current inputs with 100Ω input conditioning
-S200	200Ω series link, no parallel resistor - for use with current inputs with 50Ω or 63.5Ω input conditioning
-S240	240Ω series link, no parallel resistor - for use with isolators connected to field terminals.

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