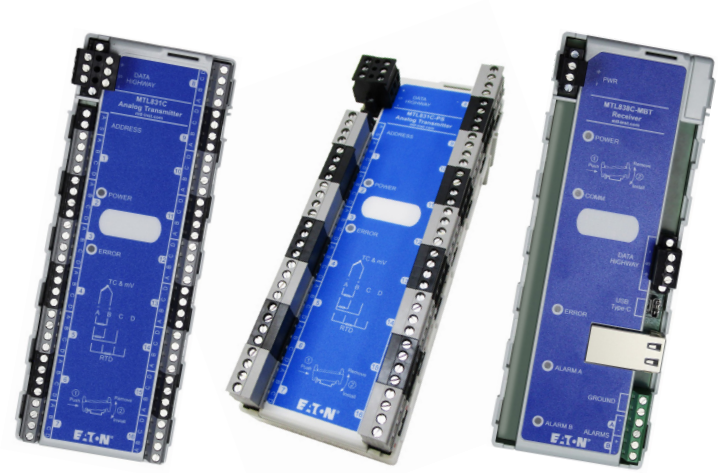
MTL830C-MBT

Temperature Multiplexer system for Zone 0 hazardous area applications

- **Reduce the cost of installing hazardous-area cabling**
- **Save installation time, space and weight**
- **Highlight problems quickly with status reporting systems**
- **Protect the process with sensor failure detection and safety drives**
- **Connect directly to host systems with Modbus TCP over Ethernet**
- **Analog inputs to controllers with Modbus TCP® communications**



MTL831C
Analog Transmitter with Fixed Terminals

MTL831C-PS
Analog Transmitter with Pluggable Terminals

MTL838C-MBT
Receiver

MTL830C-MBT analog multiplexer system with Modbus TCP® output provides a cost-effective alternative to single-loop isolation. The cost of installed wiring is reduced by up to 50% by communicating the input of multiple hazardous-area sensors over a single twisted pair data highway. Further savings are achieved by reducing the number of inputs to the host, cabinet space and weight.

An analog transmitter, mounted in the hazardous area, supports thermocouple, RTD, potentiometer and mV analog inputs. A compatible safe-area receiver provides a Modbus TCP® output for feeding to host PLC, PC or DCS controllers. The transmitter comes in two different flavours, MTL831C with fixed screw terminals and MTL831C-PS with pluggable screw terminals (recommended for applications requiring periodic maintenance).

The data highway cable, a simple twisted pair or a pair of wires within a core cable, connects the transmitter and receiver for carrying both power and data over distances up to 2km. If the analog transmitter is located in the hazardous area, the data highway must be protected by an MTL5553 digital isolator.

Multiplexer systems can communicate the status of up to 32 inputs, reducing the number of hazardous area wiring pairs from 32 to one.

Reduce costs by eliminating long runs of expensive thermocouple compensation cable from the hazardous to the safe area. Also, if 3- or 4-wire RTDs are used, costs are reduced by terminating each RTD at the transmitter or its enclosure.

Accessories include stainless-steel enclosures, a USB cable, and a PC-based configuration software package.

Powering Business Worldwide

Eaton Electric Limited,
Great Marlings, Butterfield, Luton
Beds, LU2 8DL, UK.
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: mtlenquiry@eaton.com
www.mtl-inst.com

Publication No. EPS MTL830C-MBT Rev 4 180424
April 2024

MTL831C ANALOG TRANSMITTER

MTL831C analog transmitters are normally sited in the hazardous area. They are connected to sensors in the field and communicate these inputs to the safe area via single-pair data highway. The data highway supports communication between the safe and hazardous areas, and also provides power to the transmitters – no additional field power is required.

The MTL831C would typically be mounted close to the field instruments in an enclosure.

MTL831C ANALOG TRANSMITTER

Monitors inputs from up to 16 THC or millivolt sources (max ±100mV) or up to 16 2-, 3- or 4-wire RTDs or 16 potentiometers within a hazardous area.

- Intrinsically safe; Zone 0 location
- Communication and power pass over a single data highway
- Any combination of thermocouples, RTDs, millivolt sources, and potentiometers may be mixed on each transmitter

MULTI-DROPPING TWO MTL831C UNITS

Two MTL831C multiplexer transmitters can share the same single-pair highway to a single safe-area isolator/receiver combination, providing up to 32 multiplexed inputs.

DATA HIGHWAY CABLING

Twisted shielded pair cabling with low capacitance and resistance is recommended to achieve greater distances between transmitters and receivers. See cable parameters in 'Basic Specifications' for specific requirements, and contact Eaton's MTL product line support for latest cable recommendations.

ENCLOSURES

A range of stainless steel enclosures are available for mounting MTL831C units in the field providing protection for a single MTL831C. The enclosures are dust-tight and waterproof to IP66. Please see ordering information (on the last page) for further detail.

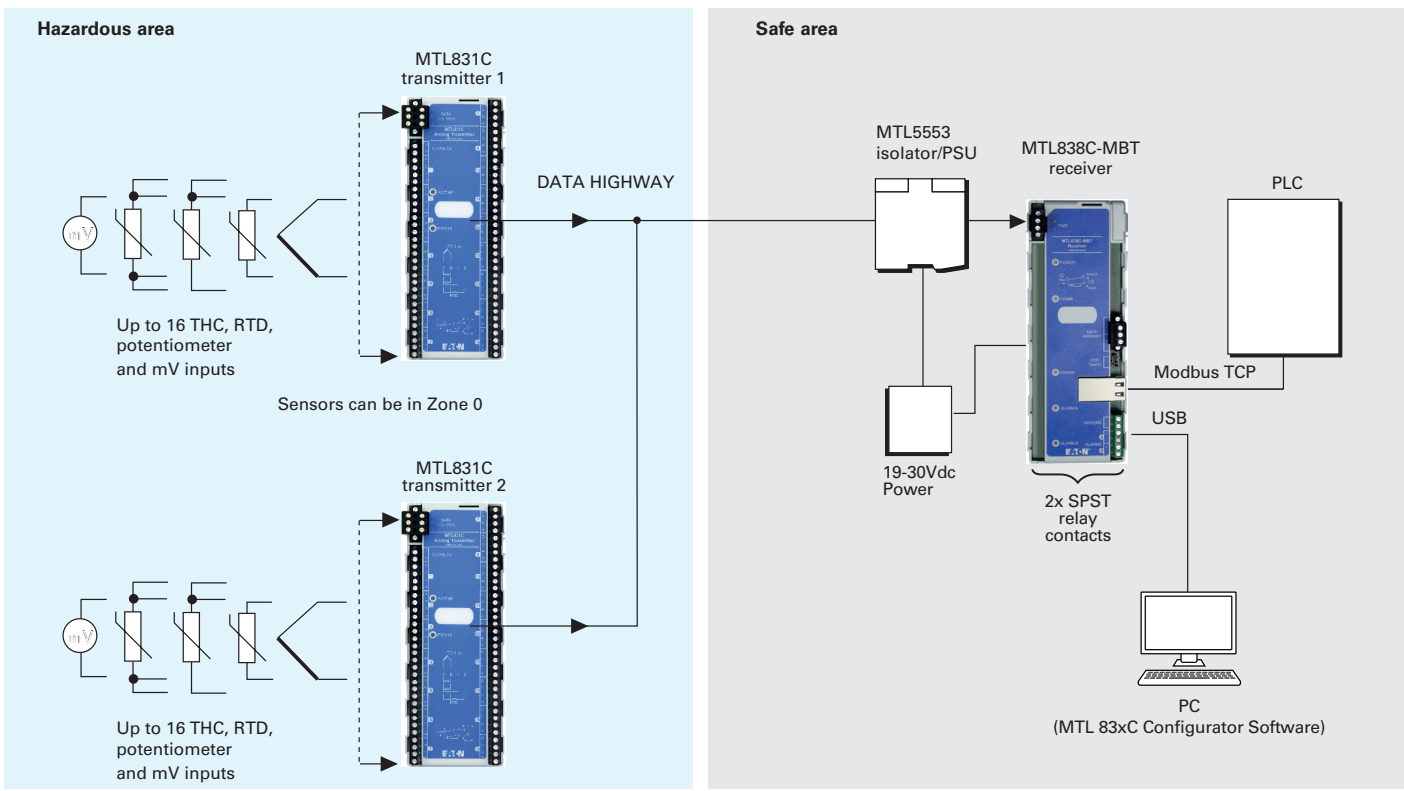
MTL838C-MBT RECEIVER

MTL838C-MBT receivers translate the information transmitted from the MTL831C via the data highway. The MTL838C-MBT provides a Modbus TCP® output representation of the inputs together with status information.

MTL5553 DATA HIGHWAY ISOLATOR

An MTL5553 isolator is required for the data highway, when the transmitter is located in a hazardous area. It is not required for safe-area applications.

MTL830C-MBT MULTIPLEXER SYSTEM DIAGRAM



MTL831C ANALOG TRANSMITTER

BASIC SPECIFICATIONS

(see also 'Common specification')

Number of input channels	16 – any combination of TC, mV, RTD, and potentiometer (up to 550Ω) sources

(IS segregated and fully floating when used with MTL5553)

Location of input sources	Zone 0, Ex ia IIC T4 Ga
Location of unit	Zone 0, Ex ia IIC T4 Ga
Power requirement	Loop-powered through data highway from receiver. No hazardous-area power supply required
Multi-transmitter facility	1 or 2
Ambient temperature limits	–40 to +70°C working –40 to +85°C storage
Weight	0.26kg
Typical response time (input to Modbus register)	500ms
Entity input parameters (Data Highway)	Ui = 24V Ii = 250mA Pi = 1.2W Ci = 0, Li = 0
Entity output parameters (each sensor input)	Uo = 5.88V Io = 48.1mA Po = 71mW

Sensor input cable parameters (based on Simple Apparatus or Other (not simple) Apparatus attached as a sensor)

		Simple Apparatus		Other	
Gas Group		C_o (µF)	L_o (mH)	C_o (µF)	L_o (mH)
D	**IIA**	987	122.8	487	61.47
C, D	**IIB**	987	61.47	487	30.73
A, B, C, D	**IIC**	30	15.36	9.4	7.68

ADDITIONAL SPECIFICATIONS

MTL831C
Each input terminal block is user-selectable by software for mixed mV, TC, potentiometer, 2-, 3-, or 4-wire RTD input.

mV measuring range
±100mV

mV signals
Accuracy at 21°C (including non-linearity and hysteresis)
Greater of +/- 0.045% of input or +/- 20uV
Temperature effects on accuracy
+/- 0.0008% of input / °C

Thermocouple signals
Accuracy at 21°C (including non-linearity and hysteresis)
Greater of +/- 0.04% of input or +/- 18uV
Temperature effects on accuracy
+/- 0.0008% of input / °C
Cold Junction Compensation influence
Less than 1°C (Minimum 30 min. warm-up required. Must be installed on a vertical plane on vertical or horizontal DIN rail. Heat sources causing a temperature gradient in the unit will introduce measurement error.)

Thermocouple range supported
Types B, C, E, J, K, N, R, S, T, and Russian XK THCs to BS EN 60584-1:1996.
Other options are available. Please contact Eaton's MTL product line for details.

Common mode Voltage
Maximum 0.5V common mode between input channels of one transmitter

RTD signals
RTD range
-200 to +850°C (Pt100 type, BS EN 60751:2008)
-200 to +200C (Cu50)
-50 to +200C (Cu53)
-60 to +250C (Ni100)

RTD excitation current
200µA
RTD Accuracy
+/- 135 milliohm
Accuracy at 21°C (including non-linearity and hysteresis)
<0.1% of measuring range
Temperature effects on accuracy
4 Wire +/- (0.001% of input) / °C
3 Wire +/- (0.001% of input + 2mΩ) / °C
2 Wire +/- (0.001% of input + 11mΩ) / °C

Isolation
500V withstand isolation from the Data Highway port to the sensor input ports.

LEDs
POWER LED, green
ON when power is supplied to the tranmitter. Blinking when receiving transmissions.
FAULT LED, red
ON when a Comm error is detected.

MTL838C-MBT RECEIVER

BASIC SPECIFICATIONS

(see also 'Common specification')

Location of unit	Safe area
Type of Outputs	Ethernet Modbus TCP® protocol , USB, 2 alarm relay contact pairs
Output Protocol	Modbus TCP
Power requirement	19-30Vdc 300mA max.
Ambient temperature limits	–40 to +70°C working –40 to +85°C storage
Weight	0.19kg
Typical response time (input to Modbus register)	500ms

ADDITIONAL SPECIFICATIONS

MTL838C-MBT

System configuration
Serial communications parameters and system parameters are entered via the USB port using the MTL83xC Configurator Software. Configuration parameters are saved in onboard memory to retain the configuration even during loss of power.

Linearisation
Calculation by microprocessor (output is linearised and cold junction compensated)

Broken TC indication
Serial output drives upscale or downscale

Alarm facilities
High and low alarms are indicated in the serial data and can be set for each input

Alarm relays
Two programmable alarm relays are available for wiring into plant alarm circuitry. The alarm conditions that trigger the relays are programmable via the MTL83xC Configurator Software. The alarm relay contacts open when an alarm condition occurs.

Isolation
Input power, the ethernet port, the Data Highway port, and the USB port are all isolated from each other at a 500V withstand rating. The alarm relays have 250V withstand isolation to each other and the Data Highway port, 500V withstand isolation to the power, ethernet, and USB ports. Isolation from power for safety purposes must be provided by using an input power supply compliant with local electrical codes (i.e. an SELV rated 24V supply).

LEDs

PWR LED, green
ON when adequate power is supplied to the receiver

COMM LED, green
Blinking when communication is established with at least one transmitter

ERROR LED, red
Blinking when a communication problem is detected by the receiver

ALARM 1 and 2 LEDs, red
ON when the associated alarm relay is in the alarm condition (contacts open).

MTL83xC Configurator Software

Function: Software configuration of multiplexer system
Format: Downloadable
Requires: PC with Windows 7, 8, or 10 and a USB port. USB Type A male to USB Type C male cable.

MTL830C-MBT COMMON SPECIFICATION

COMMON SPECIFICATION

Humidity
5–95% RH (without condensation)

EMC compliance
IEC 61326-1, Electrical equipment for measurement, control and laboratory use – EMC requirements.
NE21: 2012

Terminals

Pluggable terminals	5.08mm pitch, 2.5mm^2
Fixed Screw Terminals	5.08mm pitch, 1.5mm^2

Casings
Moulded polycarbonate

Transmission distance (transmitter to receiver)
1km typically (IS applications)
2km typically (non-IS applications)

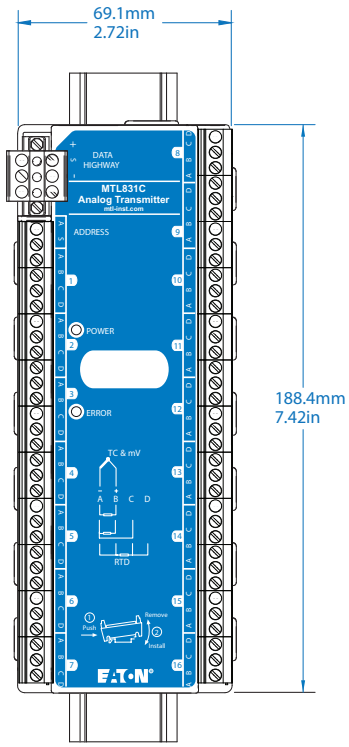
Intrinsically safe interface (IS applications)
1 MTL5553 isolating interface unit for the data highway

CONDITIONS FOR SAFE USE

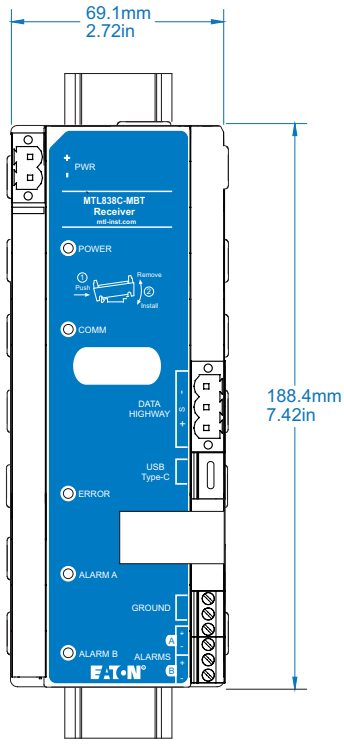
The conditions governing the use of MTL800 range of multiplexers are given in the relevant certificates and schedules, copies of which are available from Eaton's MTL product line.

DIMENSIONS*

MTL831C



MTL838C-MBT



MTL831C APPROVALS

COUNTRY	INTERNATIONAL	EUROPE	US	Canada
Authority	**FM (IECEx)**	**FM (ATEX)**	**FM**	**FM**
Standard	IEC 60079-0, IEC 60079-11	EN 60079-0, EN 60079-11	FM 3600, FM 3610, FM 3810 ANSI/UL 60079-0, ANSI/UL 60079-11, ANSI/UL 61010-1	CAN/CSA-C22.2 No. 60079-0, CAN/CSA-C22.2 No. 60079-11, CAN/CSA-C22.2 No. 61010-1
Approved for	Ex ia IIC T4 Ga	II 1 G Ex ia IIC T4 Ga	IS CL I DIV 1 GP ABCD T4 CL I Zone 0 AEx ia IIC T4 Ga	IS CL I DIV 1 GP ABCD T4 Ex ia IIC T4 Ga
Certificate/ File No.	IECEx FMG 20.0038X	FM20ATEX0048X	FM20US0142X	FM20CA0071X

MTL838C APPROVALS

COUNTRY	INTERNATIONAL	EUROPE	US	Canada
Authority	**FM (IECEx)**	**Relcom (ATEX)**	**FM**	**FM**
Standard	IEC 60079-0, IEC 60079-7	EN 60079-0, EN 60079-7	FM 3600, FM 3611, FM 3810 ANSI/UL 60079-0, ANSI/UL 60079-7, ANSI/UL 61010-1 ANSI/UL 121201	CAN/CSA C22.2 No. 213 CAN/CSA-C22.2 No. 60079-0, CAN/CSA-C22.2 No. 60079-7, CAN/CSA-C22.2 No. 61010-1
Approved for	Ex ec IIC T4 Gc	II 3 G Ex ec IIC T4 Gc	CL I DIV 2 GP ABCD T4 CL I Zone 2 IIC T4 CL I Zone 2 AEx ec IIC T4 Gc	CL I DIV 2 GP ABCD T4 CL I Zone 2 IIC T4 CL I Zone 2 Ex ec IIC T4 Gc
Certificate/ File No.	IECEx FMG 20.0040X	RELC21ATEX1011X	FM20US0158X	FM20CA0081X

TO ORDER, SPECIFY:

Transmitters

MTL831C Analog transmitter with fixed screw terminal inputs

MTL831C-PS Analog transmitter with pluggable screw terminal inputs

Receivers

MTL838C-MBT Receiver, RS485 outputs for Modbus®

Isolating interface units

MTL5553 Isolator/Power Supply

Enclosures

FCS-9616	16 sensor outlets + data highway (for 1 x MTL831C)
FCS-9632	32 sensor outlets + data highway (for 2 x MTL831C)

Further details (datasheet and drawing) can be found in the 'MTL Process Junction Boxes' page (under MTL Fieldbus section) on the MTL website.

Literature

INM MTL838C-MBT - MTL838C-MBT Receiver manual

INM MTL831C - MTL831C Analog Transmitter manual

AN9003 Application Note: A Users Guide to Intrinsic Safety

Powering Business Worldwide

Eaton Electric Limited,
Great Marlings, Butterfield, Luton
Beds, LU2 8DL, UK.
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: mtlenquiry@eaton.com
www.eaton.com

Publication No. EPS MTL830C-MBT Rev 4 190424
April 2024

EUROPE (EMEA):
+44 (0)1582 723633
mtlenquiry@eaton.com

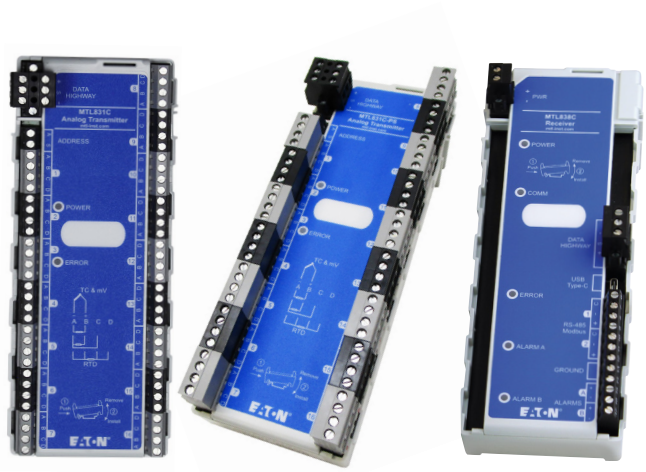
THE AMERICAS:
+1 800 835 7075
mtl-us-info@eaton.com

ASIA-PACIFIC:
+65 6 645 9888
sales.mtlsing@eaton.com

MTL830C

Temperature Multiplexer system for Zone 0 hazardous area applications

- **Reduce the cost of installing hazardous-area cabling**
- **Save installation time, space and weight**
- **Highlight problems quickly with status reporting systems**
- **Protect the process with sensor failure detection and safety drives**
- **Connect directly to host systems through serial-data outputs**
- **Analog inputs to controllers with Modbus® communications**



MTL831C
Analog Transmitter with Fixed Terminals

MTL831-PS
Analog Transmitter with Pluggable Terminals

MTL838C
Receiver

MTL830C analog multiplexer system with Modbus® outputs provide a cost-effective alternative to single-loop isolation. The cost of installed wiring is reduced by up to 50% by communicating the input of multiple hazardous-area sensors over a single twisted pair data highway. Further savings are achieved by reducing the number of inputs to the host, cabinet space and weight.

An analog transmitter, mounted in the hazardous area, supports thermocouple, RTD, potentiometer and mV analog inputs. A compatible safe-area receiver provides serial Modbus® outputs for feeding to host PLC, PC or DCS controllers. The transmitter comes in two different flavours, MTL831C with fixed screw terminals and MTL831C-PS with pluggable screw terminals (recommended for applications requiring periodic maintenance).

The data highway cable, a simple twisted pair or a pair of wires within a core cable, connects the transmitter and receiver for carrying both power and data over distances up to 2km. If the analog transmitter is located in the hazardous area, the data highway must be protected by an MTL5553 digital isolator.

Multiplexer systems can communicate the status of up to 32 inputs, reducing the number of hazardous area wiring pairs from 32 to one.

Reduce costs by eliminating long runs of expensive thermocouple compensation cable from the hazardous to the safe area. Also, if 3- or 4-wire RTDs are used, costs are reduced by terminating each RTD at the transmitter or its enclosure.

Accessories include stainless-steel enclosures, a USB cable, and a PC-based configuration software package.

Powering Business Worldwide

Eaton Electric Limited,
Great Marlings, Butterfield, Luton
Beds, LU2 8DL, UK.
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: mtlenquiry@eaton.com
www.mtl-inst.com

Publication No. EPS MTL830C Rev 6 250324
March 2024

MTL831C/MTL831C-PS ANALOG TRANSMITTER

MTL831C/MTL831C-PS analog transmitters are normally sited in the hazardous area. They are connected to sensors in the field and communicate these inputs to the safe area via single-pair data highway. The data highway supports communication between the safe and hazardous areas, and also provides power to the transmitters – no additional field power is required.

The MTL831C/MTL831C-PS would typically be mounted close to the field instruments in an enclosure.

MTL831C/MTL831C-PS ANALOG TRANSMITTER

Monitors inputs from up to 16 THC or millivolt sources (max ±100mV) or up to 16 2-, 3- or 4-wire RTDs or 16 potentiometers within a hazardous area.

- Intrinsically safe; Zone 0 location
- Communication and power pass over a single data highway
- Any combination of thermocouples, RTDs, millivolt sources, and potentiometers may be mixed on each transmitter

MULTI-DROPPING TWO MTL831C/MTL831C-PS UNITS

Two MTL831C/MTL831C-PS multiplexer transmitters can share the same single-pair highway to a single safe-area isolator/ receiver combination, providing up to 32 multiplexed inputs.

DATA HIGHWAY CABLING

Twisted shielded pair cabling with low capacitance and resistance is recommended to achieve greater distances between transmitters and receivers. See cable parameters in 'Basic Specifications' for specific requirements, and contact Eaton's MTL product line support for latest cable recommendations.

ENCLOSURES

A range of stainless steel enclosures are available for mounting MTL831C/MTL831C-PS units in the field providing protection for a single MTL831C/MTL831C-PS. The enclosures are dust-tight and waterproof to IP66. Please see ordering information (on the last page) for further detail.

MTL838C RECEIVER

MTL838C receivers translate the information transmitted from the MTL831C/MTL831-PS via the data highway. The MTL838C provides a Modbus® or Honeywell LLMUX serial-data output representation of the inputs together with status information.

By default the MTL838C RS-485 ports are configured to communicate using the Modbus protocol. The MTL83xC Configurator Software is required to configure it to communicate with the Honeywell LLMUX.

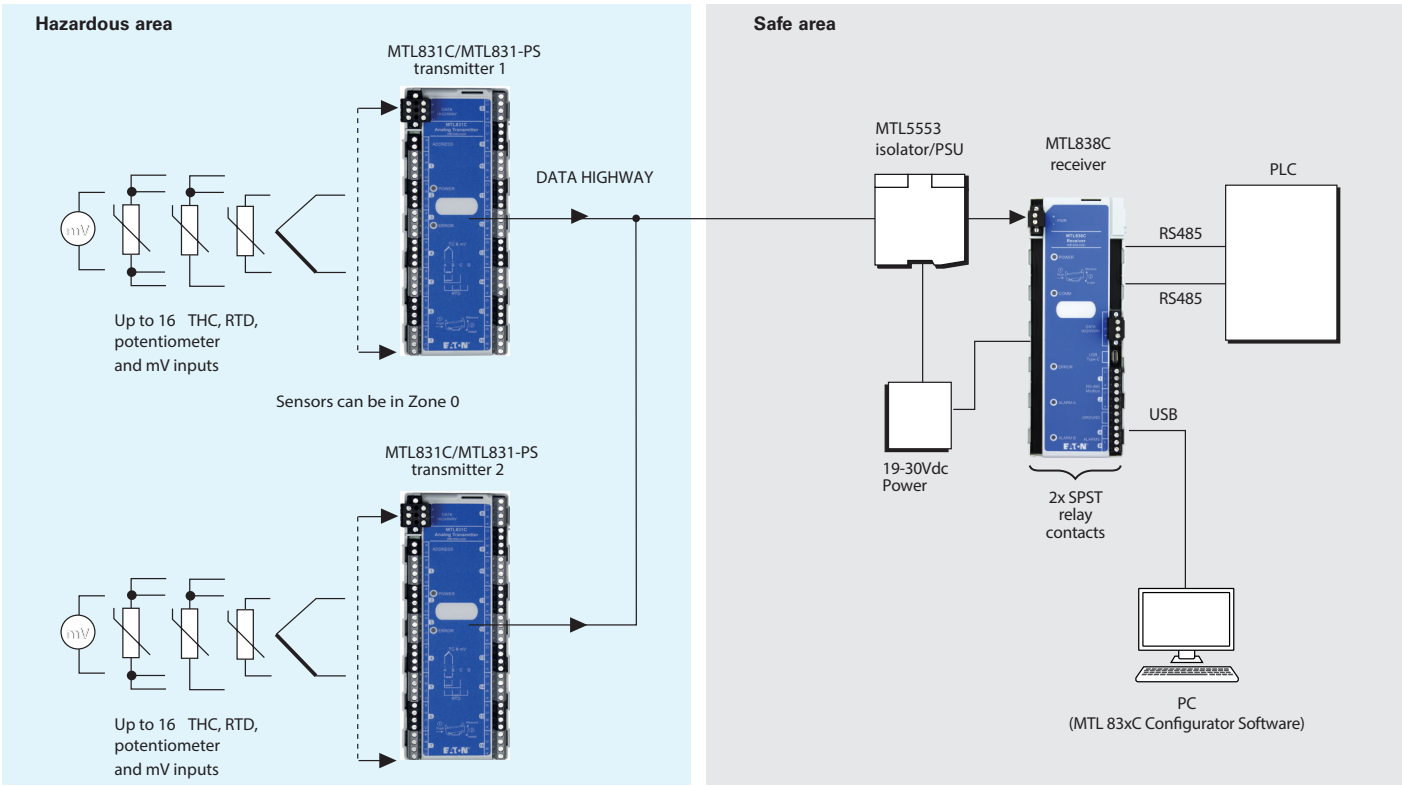
MULTI-DROPPING MTL838C RECEIVERS

Up to 31 MTL838C receivers can be multi-dropped on a single RS-485 link to the host system. MTL838C receivers can be controlled by any suitable Modbus® master. The receivers may be used with other Modbus® slaves on the same RS-485 link.

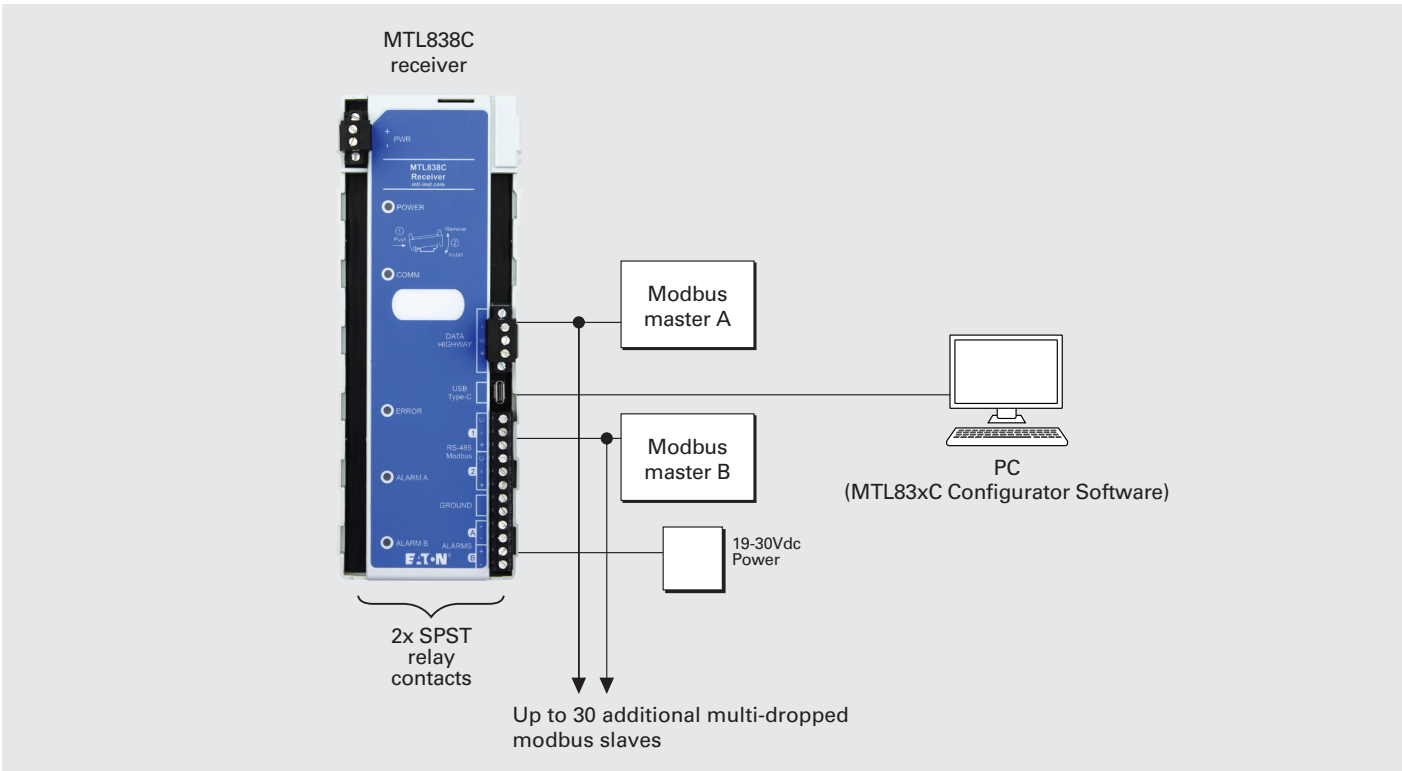
MTL5553 DATA HIGHWAY ISOLATOR

An MTL5553 isolator is required for the data highway, when the transmitter is located in a hazardous area. It is not required for safe-area applications.

MTL830C MULTIPLEXER SYSTEM DIAGRAM



MTL838C MODBUS SYSTEM DIAGRAM



MTL831C/MTL831C-PS ANALOG TRANSMITTER

BASIC SPECIFICATIONS

(see also 'Common specification')

Number of input channels	16 – any combination of TC, mV, RTD, and potentiometer (up to 550Ω) sources

(IS segregated and fully floating when used with MTL5553)

Location of input sources	Zone 0, Ex ia IIC T4 Ga
Location of unit	Zone 0, Ex ia IIC T4 Ga
Power requirement	Loop-powered through data highway from receiver. No hazardous-area power supply required
Multi-transmitter facility	1 or 2
Ambient temperature limits	–40 to +70°C working –40 to +85°C storage
Weight	0.26kg
Typical response time (input to Modbus register)	500ms
Entity input parameters (Data Highway)	Ui = 24V Ii = 250mA Pi = 1.2W Ci = 0, Li = 0
Entity output parameters (each sensor input)	Uo = 5.88V Io = 48.1mA Po = 71mW

Sensor input cable parameters (based on Simple Apparatus or Other (not simple) Apparatus attached as a sensor)

		Simple Apparatus		Other	
Gas Group		C_o (µF)	L_o (mH)	C_o (µF)	L_o (mH)
D	**IIA**	987	122.8	487	61.47
C	**IIB**	987	61.47	487	30.73
A, B	**IIC**	30	15.36	9.4	7.68

ADDITIONAL SPECIFICATIONS

Common mode voltage
Maximum 0.5V common mode between input channels of the transmitter.

MTL831C/MTL831C-PS
Each input terminal block is user-selectable by software for mixed mV, TC, potentiometer, 2-, 3-, or 4-wire RTD input.

mv measuring range
±100mV

mV signals
Accuracy at 21°C (including non-linearity and hysteresis)
Greater of +/- 0.045% of input or +/- 20uV
Temperature effects on accuracy
+/- 0.0008% of input / °C

Thermocouple signals
Accuracy at 21°C (including non-linearity and hysteresis)
Greater of +/- 0.04% of input or +/- 18uV
Temperature effects on accuracy
+/- 0.0008% of input / °C
Cold Junction Compensation influence
Less than 1°C (Minimum 30 min. warm-up required. Must be installed on a vertical plane on vertical or horizontal DIN rail. Heat sources causing a temperature gradient in the unit will introduce measurement error.)

Thermocouple range supported
Types B, C, E, J, K, N, R, S, T, and Russian XK THCs to BS EN 60584-1:1996.
Other options are available. Please contact Eaton's MTL product line for details.

RTD signals
RTD range
-200 to +850°C (Pt100 type, BS EN 60751:2008)
-200 to +200C (Cu50)
-50 to +200C (Cu53)
-60 to +250C (Ni100)

RTD excitation current
200µA
RTD Accuracy
+/- 135 milliohm
Accuracy at 21°C (including non-linearity and hysteresis)
<0.1% of measuring range
Temperature effects on accuracy
4 Wire +/- (0.001% of input) / °C
3 Wire +/- (0.001% of input + 2mΩ) / °C
2 Wire +/- (0.001% of input + 11mΩ) / °C

Isolation
500V withstand isolation from the Data Highway port to the sensor input ports.

LEDs
POWER LED, green
ON when power is supplied to the tranmitter. Blinking when receiving transmissions.
FAULT LED, red
ON when a Comm error is detected.

MTL838C RECEIVER

BASIC SPECIFICATIONS

(see also 'Common specification')

Location of unit	Safe area
Type of Outputs	Dual RS-485 Modbus® protocol , USB, 2 alarm relay contact pairs
Output Protocol	Modbus RTU
Serial communication Parameters	Baud rate: 300 to 19200 Stop bits: 1 Data bit: 8 Parity bits: odd, even or none
Multi-receiver facility	Up to 31 MTL838C units can be connected to communicate with one Modbus® master controller
Power requirement	19-30Vdc 300mA max.
Ambient temperature limits	–40 to +70°C working –40 to +85°C storage
Weight	0.19kg
Typical response time (input to Modbus register)	500ms

ADDITIONAL SPECIFICATIONS

MTL838C

System configuration
Serial communications parameters and system parameters are entered via the USB port using the MTL83xC Configurator Software. Configuration parameters are saved in onboard memory to retain the configuration even during loss of power.

Linearisation
Calculation by microprocessor (output is linearised and cold junction compensated)

Broken TC indication
Serial output drives upscale or downscale

Alarm facilities
High and low alarms are indicated in the serial data and can be set for each input

Alarm relays
Two programmable alarm relays are available for wiring into plant alarm circuitry. The alarm conditions that trigger the relays are programmable via the MTL83xC Configurator Software. The alarm relay contacts open when an alarm condition occurs.

Isolation
Input power, the RS485 ports, the Data Highway port, and the USB port are all isolated from each other at a 500V withstand rating. The alarm relays have 250V withstand isolation to each other and the Data Highway port, 500V withstand isolation to the power, RS485, and USB ports. Isolation from power for safety purposes must be provided by using an input power supply compliant with local electrical codes (i.e. an SELV rated 24V supply).

LEDs
PWR LED, green
ON when adequate power is supplied to the receiver
COMM LED, green
Blinking when communication is established with at least one transmitter
ERROR LED, red
Blinking when a communication problem is detected by the receiver
ALARM 1 and 2 LEDs, red
ON when the associated alarm relay is in the alarm condition (contacts open).

MTL83xC Configurator Software
Function: Software configuration of multiplexer system
Format: Downloadable
Requires: PC with Windows 7, 8, or 10 and a USB port. USB Type A male to USB Type C male cable.

MTL830C
COMMON SPECIFICATION

COMMON SPECIFICATION

Humidity
5–95% RH (without condensation)

EMC compliance
IEC 61326-1, Electrical equipment for measurement, control and laboratory use – EMC requirements.
NE21: 2012

Terminals

Pluggable terminals	5.08mm pitch, 2.5mm^2
Fixed Screw Terminals	5.08mm pitch, 1.5mm^2

Casings
Moulded polycarbonate

Transmission distance (transmitter to receiver)
1km typically (IS applications)
2km typically (non-IS applications)

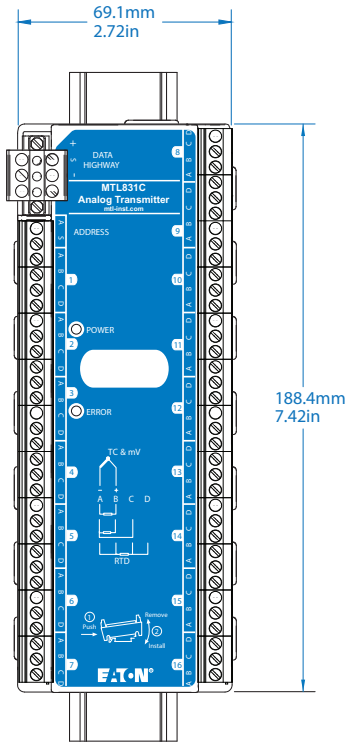
Intrinsically safe interface (IS applications)
1 MTL5553 isolating interface unit for the data highway

CONDITIONS FOR SAFE USE

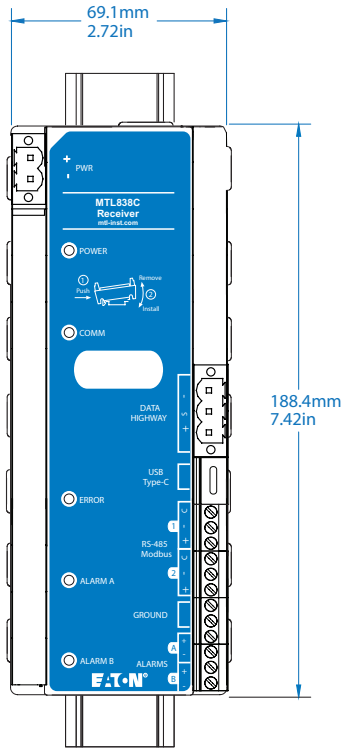
The conditions governing the use of MTL800 range of multiplexers are given in the relevant certificates and schedules, copies of which are available from Eaton's MTL product line.

DIMENSIONS*

MTL831C/MTL831C-PS



MTL838C



MTL831C/MTL831C-PS APPROVALS

COUNTRY	INTERNATIONAL	EUROPE	US	Canada
Authority	**FM (IECEx)**	**FM (ATEX)**	**FM**	**FM**
Standard	IEC 60079-0, IEC 60079-11	EN 60079-0, EN 60079-11	FM 3600, FM 3610, FM 3810 ANSI/UL 60079-0, ANSI/UL 60079-11, ANSI/UL 61010-1	CAN/CSA-C22.2 No. 60079-0, CAN/CSA-C22.2 No. 60079-11, CAN/CSA-C22.2 No. 61010-1
Approved for	Ex ia IIC T4 Ga	II 1 G Ex ia IIC T4 Ga	IS CL I DIV 1 GP ABCD T4 CL I Zone 0 AEx ia IIC T4 Ga	IS CL I DIV 1 GP ABCD T4 Ex ia IIC T4 Ga
Certificate/ File No.	IECEx FMG 20.0038X	FM20ATEX0048X	FM20US0142X	FM20CA0071X

MTL838C APPROVALS

COUNTRY	INTERNATIONAL	EUROPE	US	Canada
Authority	**FM (IECEx)**	**Relcom (ATEX)**	**FM**	**FM**
Standard	IEC 60079-0, IEC 60079-7	EN 60079-0, EN 60079-7	FM 3600, FM 3611, FM 3810 ANSI/UL 60079-0, ANSI/UL 60079-7, ANSI/UL 61010-1 ANSI/UL 121201	CAN/CSA C22.2 No. 213 CAN/CSA-C22.2 No. 60079-0, CAN/CSA-C22.2 No. 60079-7, CAN/CSA-C22.2 No. 61010-1
Approved for	Ex ec IIC T4 Gc	II 3 G Ex ec IIC T4 Gc	CL I DIV 2 GP ABCD T4 CL I Zone 2 IIC T4 CL I Zone 2 AEx ec IIC T4 Gc	CL I DIV 2 GP ABCD T4 CL I Zone 2 IIC T4 CL I Zone 2 Ex ec IIC T4 Gc
Certificate/ File No.	IECEx FMG 20.0040X	RELC21ATEX1011X	FM20US0158X	FM20CA0081X

TO ORDER, SPECIFY:

Transmitters

MTL831C Analog transmitter with fixed screw terminal inputs

MTL831C-PS Analog transmitter with pluggable screw terminal inputs

Receivers

MTL838C Receiver, RS485 outputs for Modbus®

Isolating interface units

MTL5553 Isolator/Power Supply

Enclosures

FCS-9616	16 sensor outlets + data highway (for 1 x MTL831C/MTL831C-PS)
FCS-9632	32 sensor outlets + data highway (for 2 x MTL831C/MTL831C-PS)

Further details (datasheet and drawing) can be found in the 'MTL Process Junction Boxes' page (under MTL Fieldbus section) on the MTL website.

Literature

INM MTL838C - MTL838C Receiver manual

INM MTL831C - MTL831C Analog Transmitter manual

AN9003 Application Note: A Users Guide to Intrinsic Safety

Powering Business Worldwide

Eaton Electric Limited,
Great Marlings, Butterfield, Luton
Beds, LU2 8DL, UK.
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: mtlenquiry@eaton.com
www.mtl-inst.com

Publication No. EPS MTL830C Rev 6 250324
March 2024

EUROPE (EMEA):
+44 (0)1582 723633
mtlenquiry@eaton.com

THE AMERICAS:
+1 800 835 7075
mtl-us-info@eaton.com

ASIA-PACIFIC:
+65 6 645 9888
sales.mtlsing@eaton.com

Supporting the LLMUX with the MTL838C

Eaton has designed the MTL838C according to Honeywell LLMUX spec. To support Honeywell LLMUX with the existing installation, we propose the below workaround for easy configuration of the MTL838C.

1. The out-of-box default for the MTL838C will be Modbus mode. The following would need to be done for each MTL838C using the PC Software:

- **a.** The HW user will need to switch the MTL838C to LLMUX mode (a single dropdown box).
- **b.** They will then need to configure the number of 831Cs connected to the 838C. By default both are enabled.
- **c.** Finally select the input type for each MTL831 connected to the MTL838C. mV/THC is the default but RTD may be selected instead.

2. The MTL838C will interpret the Configuration codes from the HW system exactly as documented previously for the MTL838B – EXCEPT that all RTDs will be assumed to be 3-wire type.

3. If the HW user wants to use a 2-wire or 4-wire RTD, they will have to use the PC software to configure the channels. The PC Software is the only way to change the number of wires for RTD types. This is selectable on a channel by channel basis.

The PC configuration options will be:

Index	Description	HW Codes
0	Not Configured (default)	De-configure command
1	Voltage (mV)	0x0C, 0x7E, 0x7F
2	2W RTD Ω	0x08, 0x09, 0x0A, 0x0B
3	3W RTD Ω	0x08, 0x09, 0x0A, 0x0B
4	4W RTD Ω	0x08, 0x09, 0x0A, 0x0B
5	TC, B, mV, CJC	0x04
6	TC, E, mV, CJC	0x02
7	TC, J, mV, CJC	0x00
8	TC, K, mV, CJC	0x01
9	TC, R, mV, CJC	0x06
10	TC, S, mV, CJC	0x05
11	TC, T, mV, CJC	0x03

NOTES
1. The Not Configured mode would be implemented as mV in the 831s as they always have to be doing something.
2. The HW system does not ask the LLMUX to return the channel configuration code so multiple codes (that make the same measurement) can be represented by one input type.

Powering Business Worldwide

Eaton Electric Limited,
Great Marlings, Butterfield, Luton
Beds, LU2 8DL, UK.
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: mtlenquiry@eaton.com
www.mtl-inst.com

Publication No. TSN838C LLMUX Rev1 020718
July 2018