MTL7700 Series
DIN-rail mounting safety barriers

- Removable terminals
- Bussed power feed to other modules
- Relay and solid state switch modules
- Dual channel variants – 6.3mm per channel
- Proximity detector inputs
- Electronic fusing
- Direct replacement for MTL700 Series barriers
- Compatible terminal numbering and safety descriptions

Since its introduction in 1984 the MTL700 Series barrier has established itself as the worldwide standard for safety barriers. Known for its quality and reliability, the MTL700 Series is widely used in applications all over the world.

The MTL7700 Series follows closely in the footsteps of the MTL700, but as a DIN rail mounting barrier, providing quick and easy installation without the need for special hardware.

Removable terminals are used for ease of installation, maintenance and for providing a loop disconnect by simply unplugging the terminals from the side of the module. Wire entry is also angled to assist wiring within limited space enclosures.

MTL7700 barriers clamp simply and securely onto standard T-section DIN rail, simultaneously making a reliable IS earth connection.

For applications where field power is required for switch inputs or 2-wire transmitters, the MTL7700 Series provides a bussed power feed facility. When used in conjunction with the MTL7798 power feed module the user has a fully protected, electronically fused supply to many barriers with no additional wiring required.

MTL7700 active modules are protected with an electronic fuse for the majority of applications. The MTL7798 active fused, power feed module can protect up to 40 other modules using the bussed power facility and provides a clear indication of a trip condition via a red LED.

The MTL774X range of barriers offer a NAMUR compatible input and a choice of relay or solid state output. The solid state outputs are floating so switching to ground or from a power rail into an input is also possible. The solid state interface also provides a high frequency transfer for use in flow or rotation applications.

Dual channel relay or solid state modules offer the highest packing density with only 6.3mm per channel and when used in conjunction with the power bus, offer users the minimum of wiring with the maximum packing density and the lowest cost per channel.

MTL7700 Series
DIN-rail mounting safety barriers
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<tr>
<th>Model No.</th>
<th>MTL</th>
<th>V</th>
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**Key** barriers shown in blue

For notes 1 to 7 see ‘Terminology’ (later in this section)

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**Crouse-Hinds**

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HOW THEY WORK

All MTL7700 Series barriers are based on the same simple principle. Each channel contains two stages of pulse-tested Zener or forward-connected diodes and an ‘infallible’ terminating resistor. In the event of an electrical fault in the safe area, the diodes limit the voltage that can reach the hazardous area and the resistor limits the current. A fuse protects the diodes, and the two stages of voltage limitation ensure continued safety if either stage should fail. No active output-current limiting circuits are employed. All models are certified ‘ia’ for all zones and ‘IIIC’ for all explosive atmospheres (except MTL7707P+ and MTL7729P+, ‘ia’ ‘IIB’).

TERMINOLOGY

1. Safety description
The safety description of a barrier, eg ‘10V 50Ω 200mA’, refers to the maximum voltage of the terminating Zener or forward diode while the fuse is blowing, the minimum value of the terminating resistor, and the corresponding maximum short-circuit current. It is an indication of the fault energy that can be developed in the hazardous area, and not of the working voltage or end-to-end resistance.

2. Polarity
Barriers may be polarised + or –, or non-polarised (‘ac’). Polarised barriers accept and/or deliver safe-area voltages of the specified polarity only. Non-polarised barriers support voltages of either polarity applied at either end.

3. End-to-end resistance
The resistance between the two ends of a barrier channel at 20°C, i.e. of the resistors and the fuse. If diodes or transistors are present, their voltage drop (transistors ON) is quoted in addition.

4. Working voltage (Vwkg)
The greatest steady voltage, of appropriate polarity, that can be applied between the safe-area terminal of any barrier channel and earth at 20°C for the specified leakage current, with the hazardous-area terminal open circuit.

5. Maximum voltage (Vmax)
The greatest steady voltage, of appropriate polarity, that can be applied continuously between the safe-area terminal of a ‘basic’ barrier channel and earth at 20°C without blowing the fuse. For ‘basic’ barriers, it is specified with the hazardous-area terminal open circuit; if current is drawn in the hazardous area, the maximum voltage for these barriers is reduced. The ‘ac’ channels of ‘basic’ barriers and most channels of overvolt-protected barriers withstand voltages of the opposite polarity also – see circuit diagrams.

6. Fuse rating
The greatest current that can be passed continuously (for 1000 hours at 35°C) through the fuse.

7. Star connection
In star-connected barriers, the two channels are interlocked such that the voltage between them cannot exceed the working voltage, Vwkg: this allows for higher cable capacitance or inductance.

8. Maximum safe-area voltage (Uₘₐₓ)
The maximum permissible safe-area voltage (Uₘₐₓ) for MTL7700 Series barriers is 250V ac/dc.

GENERAL SPECIFICATION

Ambient temperature and humidity limits
~20 to +60°C continuous working
~40 to +80°C storage
5–95% RH

Leakage current
For ‘basic’ barriers with a working voltage of 5V or more, the leakage current decreases by at least one decade per volt reduction in applied voltage below the working voltage, over two decades. For the MTL7755ac/7756ac it decreases by at least one decade for a 0.4V reduction in applied voltage.

Terminiations
Removable terminals accommodate conductors up to 2.5mm² (13AWG). Hazardous-area terminals are identified by blue labels. Removal force >15N

Colour coding of barrier label
Grey: non-polarised
Red: positive polarity (MTL7706 negative to transmitter)
Black: negative polarity
White: dummy barrier, MTL7799

Weight
140g approx

Mounting and earthing
By 35mm Top Hat DIN rail

DIMENSIONS (mm)

MTL7700 SERIES KEY BARRIERS SUMMARISED

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<tr>
<th>TYPE</th>
<th>APPLICATION</th>
<th>KEY BARRIER</th>
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<td>Thermocouples, ac sensors</td>
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<tr>
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<td>Controller outputs, one line</td>
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</tr>
<tr>
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</tr>
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</table>

Crouse-Hinds by Eaton
**ACTIVE / ELECTRONICALLY PROTECTED BARRIERS**

**MTL7706+ for ‘smart’ 2-wire 4/20mA transmitters**

The MTL7706+ is a 1-channel shunt-diode safety barrier, with built-in electronic overvolt protection, for energising a 2-wire, 4/20mA transmitter in a hazardous area. It is powered from a positive supply of 20–35V dc and delivers a 4/20mA signal into an earthed load in the safe area. It is proof against short circuits in the field and in the safe area. It is powerfully protected against reverse voltages: the return channel is unaffected by voltages up to +35V.

Since the MTL7706+ has no return channel for energising the load, the entire output of the single ‘28V’ channel is available to power the transmitter, providing high output capability. This channel is negatively polarised, and the safe-area signal is in fact the very current that returns through it from the hazardous area, the novel circuit being energised by a built-in floating dc supply derived from the external dc source of power.

To prevent any leakage through the zener diodes and maximise the output voltage available at 20mA, the floating supply is given a rising voltage/current characteristic. A separate circuit limits the current to protect the fuse in the event of a short circuit in the hazardous area.

With a 20V supply, the barrier will deliver 16.2V minimum at 20mA for the transmitter and lines and consumes typically 45mA at 24V operation.

**BASIC CIRCUIT**

**ADDITIONAL SPECIFICATION**

**Safety description**

- 28V 300Ω 93mA, terminals 1 to 3
- 28V Diode, terminals 2 to 4

**Supply voltage**

- 10 to 35V dc with respect to earth

**Output current**

- Up to 35mA available

**Maximum voltage drop**

- (at 20°C, current not limited)
  - Iout x 345Ω + 0.3V, terminals 1 to 3
  - Iout x 25Ω + 0.9V, terminals 4 to 2

**Supply current**

- Iout + 1.6mA, supply <26V
- Limited to 50mA, supply >28V or low load resistance

**MTL7707P+ for switch inputs and switched outputs, 2W Transmitters (IIB gases)**

The MTL7707P+ is a two-channel shunt-diode safety barrier similar to the MTL7787P+, but is designed for use with group IIB gases and features built-in electronic overvolt protection allowing use with unregulated power supplies up to 35V dc. It is intended primarily as a low cost solution for driving IIB certified 2-wire 4/20mA transmitters, but can also be used with controller outputs with current monitoring, solenoid valves and switches. To protect the fuse and enable the loop to continue working, the supply current is limited automatically at 50mA should the output be short-circuited or excess voltage applied.
**MTL7741 proximity sensor or switch input and relay output**

The MTL7741 is a single channel switch/prox input barrier with changeover relay contacts acting as the safe area interface. Relay contacts provide a universal interface capable of switching a wide range of signals including ac, low level and high level voltages. Reverse phase is achieved by connecting the normally open or normally closed contacts as required. The power bus terminal may be used to connect the module to a power source.

**ADDITIONAL SPECIFICATION**

**Safety description**
- 28V 164Ω 171mA, terminals 1 to 3
- 28V Diode, terminals 4 to 2

**Supply voltage**
- 10 to 35V dc with respect to earth

**Output current**
- Up to 35mA available

**Maximum voltage drop**
- (at 20ºC, current not limited)
  - 0.3V, terminals 1 to 3
  - 0.9V, terminals 4 to 2

**Supply current**
- 1.6mA, supply <26V
- Limited to 50mA, supply >28V or low load resistance

---

**MTL7742 proximity sensor or switch input with solid state output**

The MTL7742 is a single channel switch/prox input barrier with an open collector solid state interface to the safe area equipment. The solid state switch is especially useful for high frequency switching apparatus including pulse and rotational sensors. The power bus terminal can be used to connect power to the module and the input power supply range makes the module suitable for use with unregulated supplies.

**ADDITIONAL SPECIFICATION**

**Safety description**
- 10V 19mA

**Supply voltage**
- 20 to 35V dc with respect to earth

**Input characteristics**
- Relay energised if input >2.1mA (<2kΩ)
- Relay de-energised if input <1.2mA (>10kΩ)

**Output characteristics**
- Operating frequency: dc to 2.5kHz
- Max off-state voltage: 35V
- Max off-state leakage: 10µA
- Max on-state voltage drop: <1.41V @ 50mA, <1.22V @ 2mA, typically <1V
- Max on-state current: 50mA

**Supply current**
- 20mA maximum @ 24V

---

**MTL7743 2 channel proximity sensor or switch input and relay outputs**

The MTL7743 is a dual channel switch/prox sensor input barrier with a relay interface. This module is ideal for applications where high channel packing densities are required for digital inputs. Power is connected using the power bus terminal.

**ADDITIONAL SPECIFICATION**

**Safety description**
- 10V 19mA

**Supply voltage**
- 22.9 to 30V dc with respect to earth

**Input characteristics**
- Relay energised if input >2.1mA (<2kΩ)
- Relay de-energised if input <1.2mA (>10kΩ)

**Relay Contacts**
- AC 50V, 0.5A. Resistive
- DC 30V, 1A. Resistive

**Supply current**
- 45mA maximum @ 24V

**Response time**
- <10ms
**MTL7744 2 channel proximity sensor or switch inputs with solid state outputs**

A dual channel version of the MTL7742. This module provides two solid state interfaces for prox-switch inputs. Power is connected via the power bus.

**BASIC CIRCUIT**

**Hazardous Area**

**Safe Area**

---

**ADDITIONAL SPECIFICATION**

Safety description
- 10V 19mA
- 10V 19mA

Supply voltage
- 20 to 35V dc with respect to earth

Input characteristics
- Output energised if input \( > 2.1 \text{mA} \)\(< 2k\Omega \)
- Output de-energised if input \( < 1.2 \text{mA} \)\( > 10k\Omega \)

Output characteristics
- Operating frequency dc to 2.5kHz
- Max off-state voltage 35V
- Max off-state leakage 10µA
- Max on-state voltage drop 1.41V @ 50mA, 1.22V @ 2mA typically <1V
- Max on-state current 50mA

Supply current
- 29mA maximum @ 24V

---

**MTL7745 proximity sensor or switch input with relay output and line fault detect**

The MTL7745 is a single channel switch/prox input barrier providing line fault detection. Proximity detectors or switches fitted with end-of-line resistors may be connected. Short circuit or open circuit conditions in the field wiring will generate an alarm condition. The LFD relay contacts close when a fault is detected allowing the contacts to be connected in parallel to provide a common alarm. The power bus terminal can be used to connect power to this module.

**BASIC CIRCUIT**

**Hazardous Area**

**Safe Area**

---

**ADDITIONAL SPECIFICATION**

Safety description
- 10V 19mA

Supply voltage
- 22.9 to 30V dc with respect to earth

Input characteristics
- Output energised if input \( > 2.1 \text{mA} \)\(< 2k\Omega \)
- Output de-energised if input \( < 1.2 \text{mA} \)\( > 10k\Omega \)

LFD relay + Red LED
- Energised if input \( < 50\mu \text{A} \) or \( < 100 \Omega \)

---

**MTL7798 Power feed and protection module**

The MTL7798 power feed module incorporates both voltage and current sense mechanisms to protect barrier circuits by activating a solid state trip mechanism when fault or overload conditions occur in the power source circuit. Resetting the module after tripping is achieved by interrupting the supply to the unit. A red LED indicates a circuit trip condition and a green LED the availability of power at the outputs. Bussed power for other modules is sourced from the top of the unit using the Bus Power Link BPL7700 or via terminals 1 and 2.

**BASIC CIRCUIT**

**Hazardous Area**

**Safe Area**

---

**ADDITIONAL SPECIFICATION**

Input voltage range (terminals 5&6)
- 20 to 26.8V

Maximum input voltage capability
- 45V

Power source requirements
- \( > 1.8A \)

Trip mechanism
- Minimum trip 26.8V @ 20°C (+18mV/°C)

Output current range
- 0 to 800mA

Maximum voltage drop
- 20mV @ 0mA, 1.0V @ 800mA load
MTL7700 SERIES BARRIER APPLICATIONS

ANALOGUE INPUTS (HIGH LEVEL)

2-wire transmitters, 4/20mA, conventional and smart
The recommended barrier for use with ‘conventional’ and ‘smart’ 4/20mA transmitters (fed by a 26V regulated supply) is the MTL7787+. This provides up to 12.9V (14.6V for MTL7787P+) at Vwkg and 20mA for a transmitter and its lines as well as 5V for the typical 250Ω load. This application and this barrier is suitable for use with the optional power bus facility.

The MTL7706+ is recommended for applications where an unregulated supply of up to 35V is used. It provides 16.0V for conventional and Smart transmitters at 20mA, as well as 5V for a typical 250Ω load. With the MTL7706+ terminal 3 is negative with respect to earth, so the connections to terminals 3 and 4 should be reversed.

Vibration probes
The 3-wire transmitters used with vibration monitoring equipment are invariably supplied by a –24V dc power supply – hence the recommended barrier choice is the negatively-polarised MTL7796–.

ANALOGUE INPUTS (LOW-LEVEL)

Thermocouples and mV sources
The recommended barrier for thermocouples and mV sources is the MTL7760ac. This 2-channel non-polarised barrier retains the ‘earth-free’ nature of the signal and, providing the receiver’s input ‘floats’, rejects common-mode ac and dc interference up to at least 7V and is unaffected by earth faults on the primary element.

AC sensors, photocells, microphones and turbine flowmeters
The MTL7760ac is the recommended choice for these devices. While many of these are designated ‘simple apparatus’ and thus do not need certification, note that some ac sensors may be subject to a significant level of inductance and will therefore need to be designed and certified for hazardous-area locations.

Slidewire displacement transducers
The simplest choice is the MTL7760ac. This barrier supplies power and brings back a unipolar signal.
RTDs
For 3-wire RTDs, a single MTL7755ac barrier is the most economical choice. This is suitable for use with a floating bridge – the two leads from the bridge arms are protected by the barrier with the third (supply) lead being earthed through the barrier. The barrier has a low end-to-end resistance of only 19Ω/channel to minimise span changes and its channels track within 0.15Ω (between –20°C and +60°C) to minimise zero shift with temperature.

If the bridge circuit is already earthed, the third barrier channel provided by an MTL7756ac is needed. For extreme accuracy, 3 channels and an earth-free bridge can be used, a configuration that cancels out the small errors due to barrier leakage.

Channels 1 and 2 (those between terminals 1 & 2 and 3 & 4 respectively) track to within 0.15Ω (between –20°C and 60°C).

4-wire constant-current circuits do not need matched barrier resistances and can be protected by two MTL7761ac barriers. If the increase in loop resistance is too great, use two MTL7755ac barriers instead.

**STRAIN-GAUGE BRIDGES**

**Single strain-gauge bridges**
This shows an arrangement using two or three barriers, which is safe in IIC gases.

With the MTL7761ac, the circuit is powered from a 12V (±6V), 214Ω (107Ω + 107Ω) source. If the resistive bridge elements are 230Ω, then the voltage applied to the bridge will be 6.2V, and if the bridge resistances are 350Ω, then the bridge’s applied voltage will be 7.4V.

An MTL7764ac can be used to sense the bridge supply voltage. An MTL7761ac is used here for the mV output.
STRAIN-GAUGE BRIDGES (cont)

Double strain-gauge bridges
Quite frequently there is a demand to monitor two load cells, and a possible circuit, safe in IIC, is shown.

Here, the lower voltage drop of the MTL7766Pac is an advantage.

The MTL7766Pac supplies power to the bridge(s) while two MTL7761Pac barriers interface with the sense and pick-off circuits.

Using 350Ω bridge systems, the following voltages are available from an MTL7766Pac with a ±10V supply:

1 bridge: 13.11V
2 bridges: 9.75V

ANALOGUE OUTPUTS

Controller outputs (I/P converters)
The single-channel MTL7728+ with a voltage drop of 6.66V at 20mA is the recommended choice for most controller outputs. Higher-power versions are available: the MTL7728P+ (5.1V drop) is suitable for IIC applications; the MTL7729P+ (3.68V drop) for IIB applications.

For controllers with an output circuit separated from the 0V rail by the control transistor, the 2-channel MTL7787+ is the preferred choice as the return channel can handle up to 26.6V allowing the control signal to be turned off completely. The voltage drop is 8.1V at 20mA. A higher-power version of the latter, the MTL7787P+, is also available. The return channel of these barriers handle up to 26.4V and the maximum voltage drop is only 6.38V.

The MTL7787+ and MTL7787P+ are also suitable for controllers containing a resistor which enables the return current to be monitored for high-integrity operation.
DIGITAL (ON/OFF) INPUTS

Switches
The normal choice is the MTL7787+/7787P+ with a regulated supply. The MTL774X modules are recommended for applications where an unregulated supply of up to 30V for relay output modules, or 35V for solid state output modules, is used.

The MTL7789+ offers a dual channel passive barrier for switch inputs where the input current for each channel is <10mA.

Switches / Proximity detectors
MTLs range of new switch/prox input barriers provide the user with a choice of relay and solid state outputs in single and dual channel versions.

The MTL7741 is single channel with a changeover relay output.

The MTL7742 has a single channel solid state switch that can be configured to switch from a power rail or down to ground. This is also ideal for high switching frequency applications.

The MTL7743 and MTL7744 are dual channel versions affording very high packing densities. Power must be provided to these modules using the power bus facility.

The MTL7745 is a single channel proximity input (or switch input if 'end of lines' resistors are fitted) with relay contacts providing switch and line fault status. The LFD relay contacts close when a fault is detected.
**DIGITAL (ON/OFF) OUTPUTS**

**Alarms, LEDs, solenoids valves, etc**

For these applications, the MTL7728+ is recommended. Higher-powered versions are available: the MTL7728P+ is suitable for IIC applications; the MTL7728P+ for IIIB applications.

If the control switch is to earth, then the 2-channel MTL7787+ barrier should be used, or, alternatively, the MTL7787P+ higher-power version. If the supply is poorly regulated use the MTL7707+.

The MTL7707+ is recommended for applications where an unregulated supply of up to 35V is used.

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<tr>
<th>Hazardous Area</th>
<th>Safe Area</th>
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<td><img src="safe_area.png" alt="Diagram" /></td>
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**POSITIVE DC SYSTEMS**

**Low-level to 12V dc systems**

The two channels of the MTL7764+ and MTL7767+ can be combined safely in IIC.

The MTL7764+ can be used for low-level logic return signals whilst the MTL7767+ is used for 6V dc and 12V dc systems.

**18V dc systems**

The single-channel MTL7722+ is recommended for 18V dc systems.

**AC AND DC SYSTEMS**

**High-level ac and dc systems**

The versatile star-connected MTL7765ac and MTL7778ac allow Vwkg to be developed from each channel to ground but only allow Vwkg to be developed between channels. This provides some common-mode voltage capability and can allow higher cable parameters to be used.

**NEGATIVE AND FLOATING POWER SUPPLIES**

**Digital (on/off) outputs**

The MTL7728– is used with a negative power supply and positive earth. Typically used for digital inputs or outputs, as shown.

The MTL7728– can also be used with floating power supplies, for transmitters.

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<td><img src="floating_power_supplies.png" alt="Diagram" /></td>
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**SPARE CABLE CORES AND SCREENS**

The MTL7799 dummy barrier is used primarily for securing and earthing unused cables and screen connections. Hazardous area terminals 3 and 4 are internally connected to the DIN-rail mounting/earth connection. It also provides a power bus connection for direct connection of power for modules such as the MTL7743 and MTL7744 where no power supply screw terminal is provided.
POWER BUS APPLICATIONS

The PB7700 power bus is invaluable for saving installation time and wiring when connecting a 24V dc power source to a number of barriers.

Typical applications include hazardous-area switches, 4/20mA transmitters and proximity detectors. The diagram illustrates the configuration for 4 barriers but up to 40 barriers can be served by this method.

The MTL7798 power feed module would normally be used with standard barriers such as MTL7787+ and MTL7787P+ because the current/voltage trip protection mechanism of the MTL7798 protects the fuses in the barriers.

The MTL7799 dummy barrier can be used instead of the MTL7798 for direct ‘feed-through’ connection of a 24V dc supply onto the power bus. Looping the power feed to each end of the bussed power allows the removal of individual barriers without loss of power to others in the chain.

Other units that can use the power bus facility:

MTL7706
MTL7707+
MTL7707P+
MTL7741
MTL7742
MTL7743
MTL7744
MTL7745
MTL7787+
MTL7787P+
MTL7788+
MTL7788R+
MTL7789+
MTL7700 SERIES ACCESSORIES

MOUNTING/EARTHING ACCESSORIES

MTL7700 Series barriers mount easily and quickly onto standard DIN rail which also acts as the intrinsically safe earth.

THR2 standard DIN rail
THR7000 plated rail
Specially nickel-plated T-section (35mm x 7.5mm) DIN rail for use in potentially corrosive atmospheres. Supplied in 1 meter lengths.

ISP7000 insulating spacers
Attached to the base of a DIN rail at either end or at intervals (depending upon DIN rail length) to isolate the IS earth from a structural earth.

ERB57S Earth-rail bracket, straight
Nickel-plated; supplied with two push fasteners, one 14mm earth-rail clamp and one 10mm earth clamp for cables ≤16mm² (See ERB570).

ETM7 earth terminal
For terminating cable screens and 0V earth returns and securing spare cores to the earth rail. A maximum of two ETM7s per barrier can be accommodated.

IMB57 Insulating mounting block
One required at each end of a tagging strip/earth rail. Suitable for low-profile (7.5mm) and high-profile (15mm) symmetrical DIN rail.

ERB57O Earth-rail bracket, offset
Nickel-plated; supplied with two push fasteners, one 14mm earth-rail clamp and one 10mm earth clamp for cables ≤16mm².

ETL7000 earth terminal
Provides connection for routing the IS earth from the DIN rail to an appropriate plant earth. Maximum cable cross-section is 10mm². Two recommended per discrete length of DIN rail. See instruction manual INM7700 for more details.

BPL7700 Power Bus link
When a number of barriers use a common power supply, the optional power link (BPL7700) can be used. Typical applications include hazardous area switches, solenoids and 4–20mA transmitters. The barriers it can be used with are the MTL7706, MTL7707+, MTL7787+, MTL7787P+, MTL7789P+ and MTL774X. See next page for further details.
TAGGING ACCESSORIES

Two methods of tagging are available which can be used separately or together:

1) Individual barrier identification
   TH7700 barrier identifiers
   TH7700 barrier identifiers are supplied clipped on to the tops of individual barriers to provide transparent holders for identification labels.

2) Tagging strip method
   TAG57 Tagging strip, 1m length
   Cut to size. Supplied with reversible tagging strip label suitable for either MTL5000 or MTL7000 Series module spacing.

TGL7700 Tagging strip labels, set of 10 x 0.5m
   For use with TAG57 tagging strip. Tags are reversible - one side for MTL7700, the other for MTL700.

HOW TO ORDER

MTL7700 barriers
   Select by barrier number and polarity, e.g. MTL7728+

Mounting accessories
   THR2       Standard DIN-rail, 35 x 7.5mm
   THR7000    T-section DIN-rail, specially-plated, 35 x 7.5mm, 1m length
   ISP7000    Insulating spacer

Standard earthing/earth-rail accessories
   ETL7000   Earth terminal, DIN-rail mounted
   IMB57    Insulating mounting block
   ERB57S   Earth-rail bracket, straight
   ERB57O   Earth-rail bracket, offset
   ERL7     Earth rail, 1m length
   ETM7     Earth terminal, pack of 50

Standard tagging accessories
   TAG57    Tagging strip, 1m length
   TGL7700  Tagging strip labels, set of 10 x 0.5m

Bussed power links
   BPL7700  Pack of 100

Enclosures
   DX070    Enclosure, for MTL7700 x 5
   DX170    Enclosure, for MTL7700 x 13
   DX430    Enclosure, for MTL7700 x 33

Spare (all in packs of 10)
   SAF7712  Safe-area terminals 1 & 2
   HAZ7734  Hazard area terminals 3 & 4
   SAF7756  Safe-area terminals 5 & 6
   HAZ7778  Hazard area terminals 7 & 8
   TH7700   Tag holder

INM7700  Instruction manual, MTL7700 Series
INA7700  ATEX information, MTL7700 Series
INM57ENC  Instruction manual, MTL5000/7000 Series Enclosures
CD7700...  Customer drawings
### APPROVALS
(for the latest certificate information see www.mtl-inst.com/support/certificates)

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<th>Region (Authority)</th>
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**Note:** For FM compliance, the MTL7700 Series barriers shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.

‡ Certified to CENELEC IIB/FM Grps C-G only.
† USA (FM) Ta = 65°C See "Approved for" above
### MAXIMUM CABLE PARAMETERS

(for the latest information see www.mti-inst.com/support/certificates)

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Notes:
1. \(\text{ac}\) indicates a non-polarised, star-connected barrier configuration.
2. When the external circuit contains no lumped inductance greater than 10µH, the cable inductance may be increased to the values within parentheses.
3. See next page.

For further barrier channel configuration data, please refer to the relevant certificate.
Note 3: The circuit configuration for the output parameters given in the table 'Maximum Cable Parameters' are as follows:-

- **Single channel barrier.**
- **First channel of a dual/triple channel barrier.**
- **Second channel of a dual/triple channel barrier.**
- **Third channel of a dual/triple channel barrier.**
- **Both channels of a dual channel barrier connected in parallel, with respect to earth.**
- **Two channels of a triple channel barrier connected in parallel, with respect to earth.**
- **Both channels of each switch input connected together**
- **Both channels of a dual channel barrier interconnected, with no earth return.**
- **Two channels of a triple channel barrier interconnected, with no earth return.**

The assumptions two of the channels are in parallel.

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### CORRELATION BETWEEN MTL7700 — MTL7000 — MTL700 BARRIERS (IIC)

<table>
<thead>
<tr>
<th>Module No.</th>
<th>Bussed Power</th>
<th>MTL7000 Equivalent</th>
<th>MTL7000 Original Certificate Number(s)</th>
<th>MTL7000 ATEX Certificate Number(s)</th>
<th>MTL700 Equivalent</th>
<th>MTL700 Original Certificate Number(s)</th>
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<th>Typical Application</th>
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