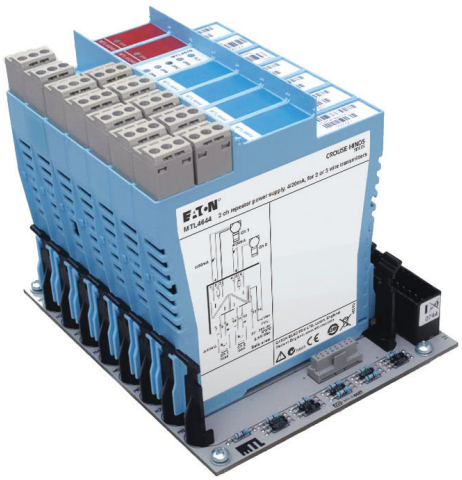
MTL4600 range

Isolating interfaces

- **3-port isolation as standard**
- **Highest module/channel packing densities**
- **Low power dissipation**
- **Quick install and release mechanism**
- **Multi-channel I/O modules**
- **Broken line and earth-fault protection**



Isolation—protecting your system Designing your plant with good clean earth systems is not always possible. Poor ground conductivity, large process areas and heavy electrical machinery, all contribute to increased noise. This noise is induced or conducted into adjacent wiring, which in turn degrades the quality of the signals passing through the cables. Without isolation this noise is superimposed on the process signal causing a loss of accuracy, poor control and possibly failures or false trips.

Many control systems, PLCs and safety systems do not have full isolation between channels. In compact well defined plant layouts this is acceptable, but these are not always guaranteed. To avoid interference between channels, isolation is the solution.

The MTL4600 range of isolators offer reduced risk and greater protection to the system, with all the advantages of a common design approach for both IS and non-IS signals.

System Solutions

Building on the base of the MTL4500 range of solutions, the MTL4600 offers a high level of signal isolation for installations where multiple loops on a common connection are not desirable.

Signal isolation provides excellent protection against surges, common faults and noisy environments. It also eliminates the risk of earth loops between different areas of the plant, which, if not isolated, can cause significant errors or failures under fault conditions.

MTL4600 isolators are fully compatible with all existing backplanes used with MTL4500 range and many control systems. The form factor and signal types offer the user a common approach for both IS and non-IS signals.

The backplane mounting MTL4600 range is designed with system vendors in mind for "project-focussed" applications such as Distributed Control System (DCS), Emergency Shutdown Systems (ESD) and Fire and Gas monitoring (F&G).

The reduced power consumption and high efficiency enable high signal density to be achieved together with improved freedom in cabinet layout and design. Easy integration with the input/output assemblies of control or safety instrumentation systems not only simplifies project engineering but also reduces installation and maintenance costs.

A multiway connector to the backplane provides safe-area and power supply connections, while hazardous-area connections plug into the front of the module, simplifing installation and maintenance and reducing time, cost, and the risk of errors.

Line fault detection (LFD) facilities are provided across the range of I/O functions; on the switch/proximity detectors, the MTL4623 solenoid/alarm drivers and the isolating drivers. Analogue input units such as the MTL4641 provide line fault detection by repeating o/c or s/c currents to the control system.

Status LEDs, configuration switches and ports are located on the top or side of individual modules, as appropriate, for easy access.

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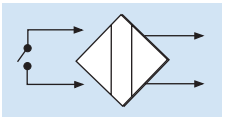
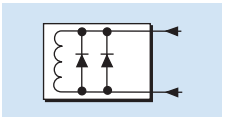
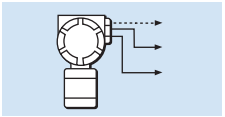
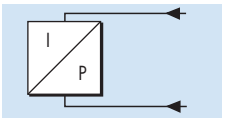
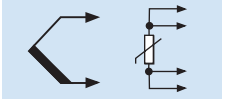
ISOLATOR FUNCTION SELECTOR

		Channels	*Function*
Digital Input			
MTL4604		1	switch/prox input, phase reversal + LFD
MTL4610		4	switch/prox input, solid-state output
MTL4611		1	switch/prox input, c/o relay output
MTL4613		2	switch/prox input, solid-state output
MTL4614		1	switch/prox input, relay + LFD alarm
MTL4614D		1	switch/prox input, dual output relay
MTL4616		2	switch/prox input, relay
MTL4617		2	switch/prox input, relay + LFD alarm
MTL4619L		1	24V/48V digital input
MTL4619H		1	110Vac/125Vdc digital input
Digital Output			
MTL4621		1	loop powered solenoid driver
MTL4623		1	solenoid driver with LFD alarm
MTL4623L		1	loop powered solenoid driver with LFD alarm
MTL4623R		1	solenoid driver with reverse LFD alarm
MTL4624		1	switch operated solenoid driver
MTL4624S		1	switch operated solenoid driver, 24V override
MTL4626		2	switch operated relay
MTL4627		1	24V 250mA digital output
MTL4628		1	Relay output
Pulse Output			
MTL4632		1	pulse isolator, digital or analogue output
Analogue Input			
MTL4641		1	2/3 wire transmitter repeater
MTL4641A		1	transmitter repeater, passive input
MTL4641AS		1	transmitter repeater, passive input, current sink
MTL4641S		1	2/3 wire transmitter repeater, current sink
MTL4644		2	2/3 wire transmitter repeater
MTL4644A		2	transmitter repeater, passive input
MTL4644AS		2	transmitter repeater, passive input, current sink
MTL4644S		2	2/3 wire transmitter repeater, current sink
MTL4644D		1	2/3 wire transmitter repeater, dual output
Analogue Output			
MTL4646		1	4-20mA smart isolating driver + LFD
MTL4646Y		1	4-20mA smart isolating driver + oc LFD
MTL4649		2	4-20mA smart isolating driver + LFD
MTL4649Y		2	4-20mA smart isolating driver + oc LFD
Temperature Input			
MTL4675		1	temperature converter, THC or RTD
MTL4676-RTD		2	temperature converter, RTD
MTL4676-THC		2	temperature converter, THC

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MTL4604
SWITCH/ PROXIMITY DETECTOR INTERFACE
1-channel with LFD and phase reversal

The MTL4604 enables a load to be controlled, through a relay, by a proximity detector or switch. Line faults are signalled through a separate relay and indicated on the top of the module. MTBF information for the LFD relay is available from Eaton to allow the failure rate for the LFD relay to be calculated when used in the critical path with the output relay for safety critical applications. Switches are provided to select phase reversal and to enable the line fault detection.

SPECIFICATION

See also common specification

Number of channels
One

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

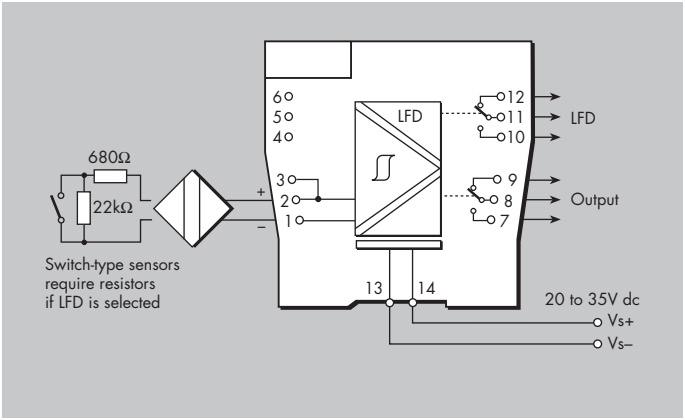
Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User-selectable via switches on the side of the unit. Line faults are indicated by an LED. Line fault relay is de-energised and channel output relay de-energised if input line-fault detected
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Output
Channel: Single pole relay with changeover contacts
LFD: Single pole relay with changeover contacts
Note: reactive loads must be adequately suppressed

Relay characteristics
Response time: 10ms maximum
Contact rating: 10W, 0.5A, 35V dc

MTL4604



LED indicators
Green: power indication
Yellow: channel status, on when output energised
Red: LFD indication, on when line fault detected

Maximum current consumption
25mA at 24V dc

Power dissipation within unit
0.6W at 24V

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MTL4610
SWITCH/ PROXIMITY DETECTOR INTERFACE
4-channel, digital input

The MTL4610 enables four solid-state outputs to be controlled by up to four switches or proximity detectors. Each pair of output transistors shares a common terminal and can switch +ve or –ve polarity signals. A range of module configurations is available (see Table 1) through the use of selector switches. When proximity detector modes are selected, LFD is enabled and the output switches to OFF if a line fault is detected.

SPECIFICATION

See also common specification

Number of channels
4, configured by switches

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User-selectable via switches on the side of the unit.
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Outputs
Floating solid-state outputs compatible with logic circuits

Operating frequency:	dc to 500Hz
Max. off-state voltage:	± 35V
Max. off-state leakage current:	± 50µA
Max. on-state resistance:	25Ω
Max. on-state current:	± 50mA

LED indicators
Green: power indication
Yellow: four: on when output active
Red: LFD indication + faulty channel's yellow LED flashes

Maximum current consumption
40mA at 24V (with all output channels energised)

Power dissipation within unit
0.96W at 24V, with 10mA loads

MTL4610

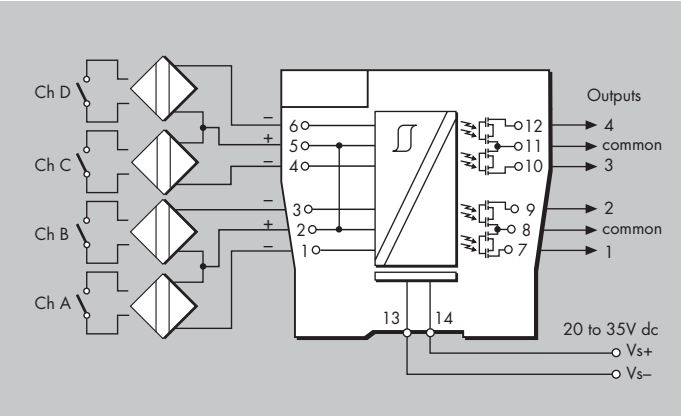

Table 1 - Mode options

MODE	o/p 1	o/p 2	o/p 3	o/p 4	i/p type
0	chA	chB	chC	chD	switch
1	chA rev.	chB	chC	chD	
2	chA	chB rev.	chC	chD	
3	chA	chB	chC rev.	chD	
4	chA	chB	chC	chD rev.	
5	chA rev.	chB	chC rev.	chD	
6	chA	chB rev.	chC	chD rev.	
7	chA rev.	chB rev.	chC rev.	chD rev.	
8	chA	chB	chC	chD	prox. detector + LFD
9	chA rev.	chB	chC	chD	
10	chA	chB rev.	chC	chD	
11	chA	chB	chC rev.	chD	
12	chA	chB	chC	chD rev.	
13	chA rev.	chB	chC rev.	chD	
14	chA	chB rev.	chC	chD rev.	
15	chA rev.	chB rev.	chC rev.	chD rev.	

See Instruction Manual INM4500 for further mode information.

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MTL4611
SWITCH/ PROXIMITY DETECTOR INTERFACE
1-channel, with line fault detection

The MTL4611 enables a load to be controlled by a switch or proximity detector. When selected, open or short circuit conditions in the field wiring are detected by the line-fault-detect (LFD) facility and also indicated on the top of the module. Phase reversal for the channel is selected by a switch on the side of the module and output is provided by changeover relay contacts.

SPECIFICATION

See also common specification

Number of channels
One

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

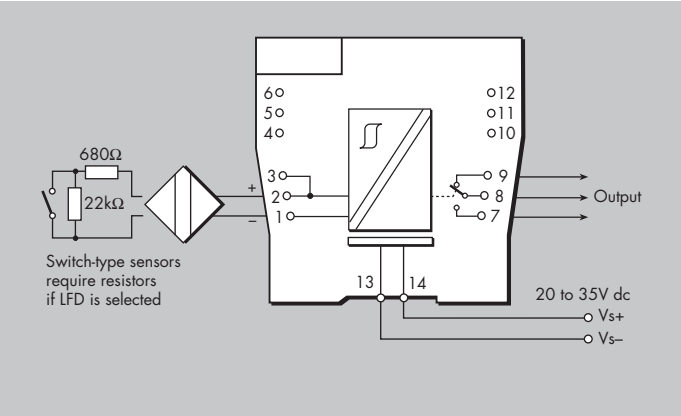
Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User-selectable via switches on the side of the unit. A line fault is indicated by an LED. The channel output relay is de-energised if an input line fault is detected.
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Output
Single pole relay with changeover contacts
Note: reactive loads must be adequately suppressed

Relay characteristics
Response time: 10ms maximum
Contact rating: 10W, 0.5A, 35V dc

MTL4611



LED indicators
Green: power indication
Yellow: channel status, on when output energised
Red: LFD indication, on when line fault detected

Maximum current consumption
25mA at 24V

Power dissipation within unit
0.6W at 24V

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MTL4614
SWITCH/ PROXIMITY DETECTOR INTERFACE

1-channel, line fault detection, phase reversal

The MTL4614 enables a load to be controlled, through a relay, by a proximity detector or switch. Line faults are signalled through a separate relay and indicated on the top of the module. Switches are provided to select phase reversal and to enable the line fault detection.

SPECIFICATION

See also common specification

Number of channels
One

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

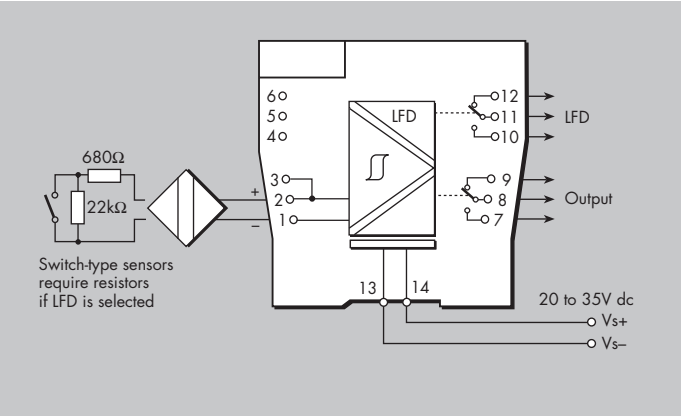
Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User-selectable via switches on the side of the unit. Line faults are indicated by an LED. Line fault relay is energised and channel output relay de-energised if input line-fault detected
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Output
Channel: Single pole relay with changeover contacts
LFD: Single pole relay with changeover contacts
Note: reactive loads must be adequately suppressed

Relay characteristics
Response time: 10ms maximum
Contact rating: 10W, 0.5A, 35V dc

MTL4614



LED indicators
Green: power indication
Yellow: channel status, on when output energised
Red: LFD indication, on when line fault detected

Maximum current consumption
25mA at 24V dc

Power dissipation within unit
0.6W at 24V

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MTL4614D
SWITCH/ PROXIMITY DETECTOR INTERFACE
1-channel, dual output, LFD, phase reversal

The MTL4614D enables two safe–area loads to be controlled, through relays, by a proximity detector or switch. When selected, open or short circuit conditions in the field wiring are detected by the line fault detect (LFD) facility and indicated on the top of the module. Switches are provided to select phase reversal and to enable the line fault detection.

SPECIFICATION

See also common specification

Number of channels
One

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User-selectable via switches on the side of the unit. Line faults are indicated by an LED. The channel output relays are de-energised if an input line-fault is detected
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Output
Two, single pole relays with normally-open contacts
Note: reactive loads must be adequately suppressed

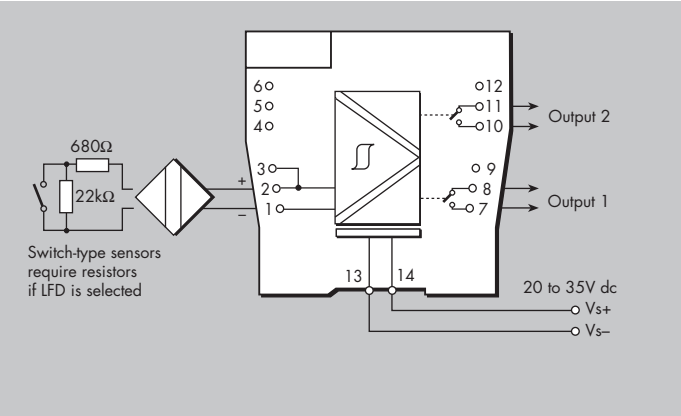
Relay characteristics
Contact rating: 10W, 0.5A, 35V dc

LED indicators
Green: power indication
Yellow: channel status, on when output energised
Red: LFD indication, on when line fault detected

Maximum current consumption
29mA at 24V dc

Power dissipation within unit
0.7W at 24V

MTL4614D



* Signal plug SAF1-3 is required for access to this function

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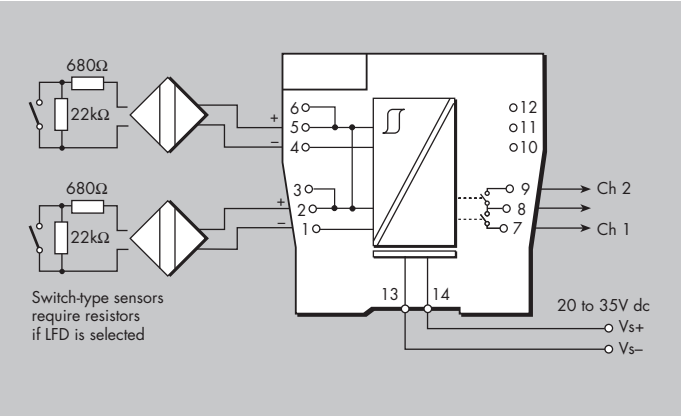
MTL4616
SWITCH/ PROXIMITY DETECTOR INTERFACE
2-channel, with line fault detection

The MTL4616 enable two loads to be controlled by a switch or proximity detector. When selected, open or short circuit conditions in the field wiring are detected by the line-fault-detect (LFD) facility and also indicated on the top of the module. Phase reversal for each channel is selected by a switch on the side of the module and output is provided by changeover relay contacts.

MTL4616



SPECIFICATION

See also common specification

Number of channels
Two

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User-selectable via switches on the side of the unit. Line faults are indicated by an LED for each channel. The channel output relay is de-energised if an input line fault is detected.
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Output
Two single-pole relays with changeover contacts
Note: reactive loads must be adequately suppressed

Relay characteristics
Response time: 10ms maximum
Contact rating: 10W, 0.5A, 35V dc

LED indicators
Green: power indication
Yellow: two: channel status, on when output energised
Red: two: LFD indication, on when line fault detected

Maximum current consumption
35mA at 24V

Power dissipation within unit
0.84W at 24V

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MTL4617
SWITCH/ PROXIMITY DETECTOR INTERFACE

2-channel, line fault detection, phase reversal

The MTL4617 enables two loads to be controlled, through a relay, by proximity detectors or switches. Line faults are signalled through a separate relay and indicated on the top of the module. Switches are provided to select phase reversal and to enable the line fault detection.

SPECIFICATION

See also common specification

Number of channels
Two

Inputs
Inputs conforming to BS EN60947–5–6:2001 standards for proximity detectors (NAMUR)

Voltage applied to sensor
7 to 9V dc from 1kΩ ±10%

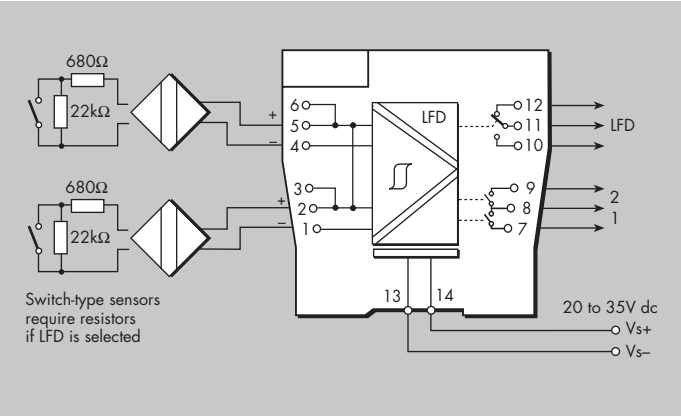
Input/output characteristics
Normal phase
Outputs closed if input > 2.1mA (< 2kΩ in input circuit)
Outputs open if input < 1.2mA (> 10kΩ in input circuit)
Hysteresis: 200µA (650Ω) nominal

Line fault detection (LFD) (when selected)
User selectable by switches on the side of the module.
Line faults are indicated by the LED for each channel.
Line fault relay is energised and channel output relay de-energised if input line-fault detected
Open-circuit alarm on if I_{in} < 50µA
Open-circuit alarm off if I_{in} > 250µA
Short-circuit alarm on if R_{in} < 100Ω
Short-circuit alarm off if R_{in} > 360Ω
Note: Resistors must be fitted when using the LFD facility with a contact input
500Ω to 1kΩ in series with switch
20kΩ to 25kΩ in parallel with switch

Output
Channel: Two single-pole relays with normally open contacts
LFD: Single pole relay with changeover contacts
Note: reactive loads must be adequately suppressed

Relay characteristics
Response time: 10ms maximum
Contact rating: 10W, 0.5A, 35V dc

MTL4617



LED indicators
Green: power indication
Yellow: two: channel status, on when output energised
Red: two: LFD indication, on when line fault detected

Maximum current consumption
35mA at 24V

Power dissipation within unit
0.84W at 24V

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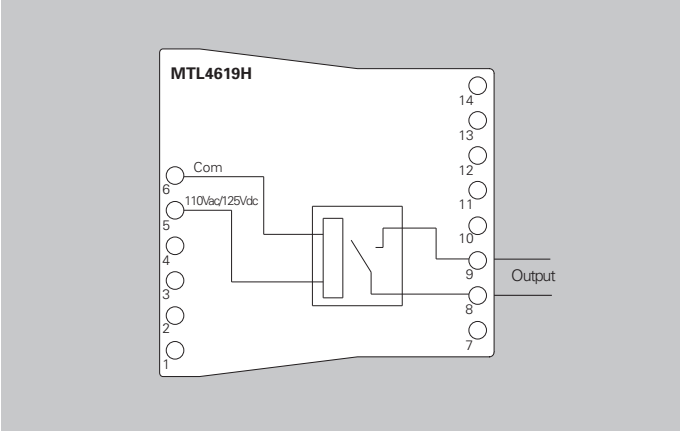
MTL4619H
DIGITAL INPUT INTERFACE
1 channel for 110Vac /125Vdc digital signals

The MTL4619H is a single channel, high voltage, digital input module with a relay interface to the system. The relay is powered by the field signal.



SPECIFICATION

See also common specification

Number of channels
One, with fully floating output
Location of sensor
Safe area
Input Voltage
80Vac/125Vac /115dc to 135Vdc input
Input Current
9mA RMS @110Vac / 3.5mA @ 125Vdc
Output
Relay, dry contact 10W, 0.5A, 35V dc
Response time
8mS typical, 15mS maximum on / 0.5s off
Power dissipation
0.7w/0.7w @ 125Vdc / 110Vac
Isolation
250V RMS between any input and output

Terminals	Function
5	110 /125V ac/dc input
6	Common
8	Relay contact output
9	Relay contact output

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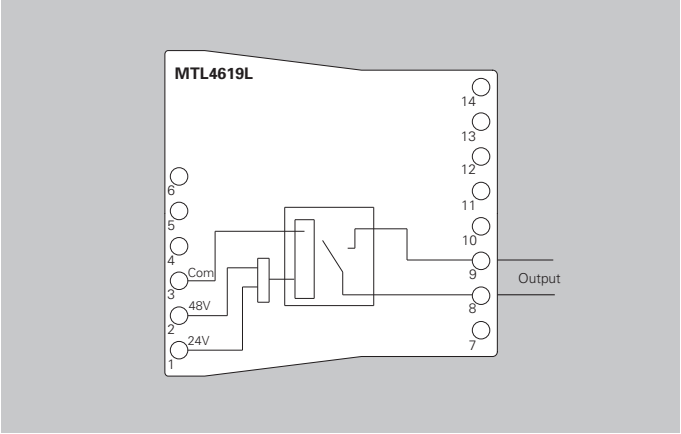
MTL4619L
DIGITAL INPUT INTERFACE
1 channel for 24V-48V digital input signals

The MTL4619L is a single channel digital input module with a relay interface to the system. The relay is powered by the field signal.

SPECIFICATION

See also common specification

Number of channels
One, with fully floating output
Location of sensor
Safe area
Input
24V dc (22-32V)
48V dc (42-60V)
Output
Relay, dry contact 10W, 0.5A, 35V dc
Response time
8mS typical, 15mS maximum
Current consumption
14mA @ 24V
Power dissipation
0.4W @24V, 0.7W @ 48V
Isolation
250V RMS between any input and output



Terminals	Function
1	24V dc input
2	48V dc input
3	Common
8	Relay contact output
9	Relay contact output

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MTL4621
SOLENOID/ALARM DRIVER
loop-powered

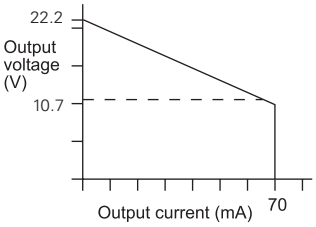
The MTL4621 is a loop-powered module that can drive a low-power load as well as apparatus such as an LED. The unit's input/output isolation allows the control switch to be connected into either side of the 24V dc supply circuit.

SPECIFICATION

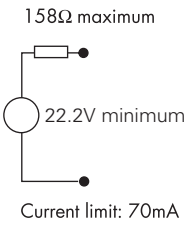
See also common specification

Number of channels
One

Minimum output voltage



Equivalent output circuit



Input voltage
20 to 35V dc

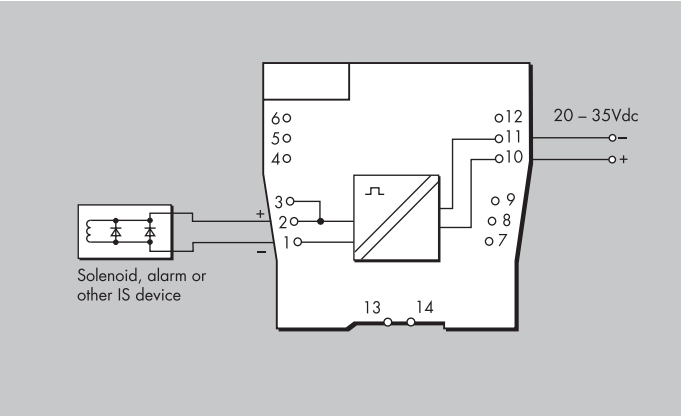
Output

Minimum output voltage:	10.7V at 70mA
Maximum output voltage:	24V from 158Ω
Current limit:	70mA

Output ripple
< 0.5% of maximum output, peak to peak

Response time
Output within 10% of final value within 100ms

MTL4621



LED indicator
Yellow: output status, on when output active

Maximum current consumption
125mA (typ.) at 24V

Power dissipation within unit
1.4W at 24V

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MTL4623L
SOLENOID/ ALARM DRIVER
loop-powered with line fault detection

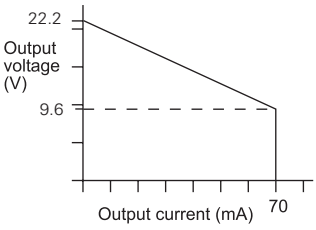
With the MTL4623L interface, an on/off device can be controlled by a voltage signal. It is suitable for driving loads such as solenoids. Line fault detection (LFD), which operates when the output is energised, is signalled by a solid-state switch which energises if a field line is open or short-circuited. Earth fault detection can be provided by connecting an MTL4220 earth leakage detector to terminal 3.

SPECIFICATION

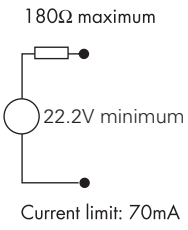
See also common specification

Number of channels
One

Minimum output voltage



Equivalent output circuit



Input voltage
20 to 35V dc

Output

Minimum output voltage:	9.6V at 70mA
Maximum output voltage:	24V from 180Ω
Current limit:	70mA

Output ripple
< 0.5% of maximum output, peak to peak

Response time
Output within 10% of final value within 100ms

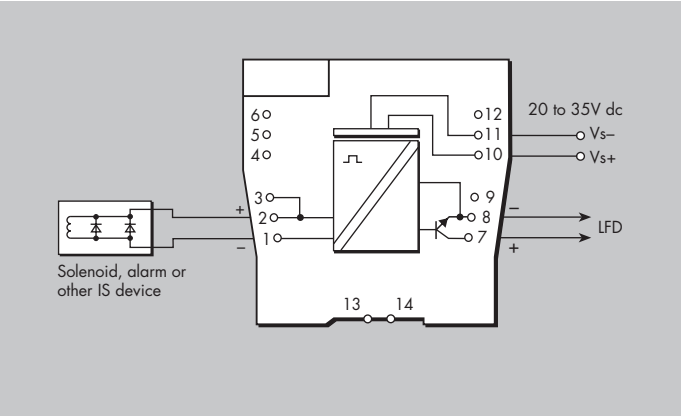
Line fault detection (LFD)
Open or short circuit in field cabling energises solid state line fault signal
LFD transistor is switched on, provided that the field circuit impedance is > 55Ω and < 4kΩ.

Line fault signal characteristics

Maximum off-state voltage:	35V
Maximum off-state leakage current:	10µA
Maximum on-state voltage drop:	2V
Maximum on-state current:	50mA

Note: LFD signal is Zener-diode protected against inductive loads

MTL4623L



LED indicators
Yellow: output status, on when output active
Red: LFD indication, on when line fault detected

Maximum current consumption
125mA at 24V dc

Power dissipation within unit
1.4W with typical solenoid valve, output on

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MTL4623/R
SOLENOID/ALARM DRIVER
with line fault detection, IIC

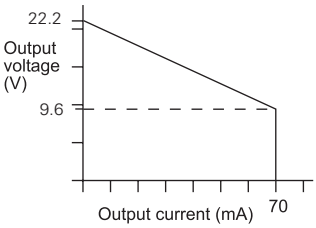
With the MTL4623 interface, an on/off device can be controlled by a volt-free contact or logic signal. It is suitable for driving loads such as solenoids. Line fault detection (LFD), which operates irrespective of the output state, is signalled by a solid-state switch which de-energises MTL4623, or energises MTL4623R, if a field line is open or short–circuited. Earth fault detection can be provided by connecting an MTL4220 earth leakage detector to terminal 3.

SPECIFICATION

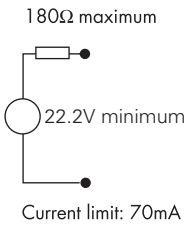
See also common specification

Number of channels
One

Minimum output voltage



Equivalent output circuit



Output

Minimum output voltage:	9.6V at 70mA
Maximum output voltage:	24V from 180Ω
Current limit:	70mA

Output ripple
< 0.5% of maximum output, peak to peak

Control input
Suitable for switch contacts, an open collector transistor or logic drive.
(Internal contact wetting voltage 12V @ 0.2mA contact closed.
Not suitable for voltage control via series diode.)
Output turns on if input switch closed, transistor on or
< 1.4V applied across control input
Output turns off if input switch open, transistor off or
> 4.5V applied across control input

Response time
Output within 10% of final value within 100ms

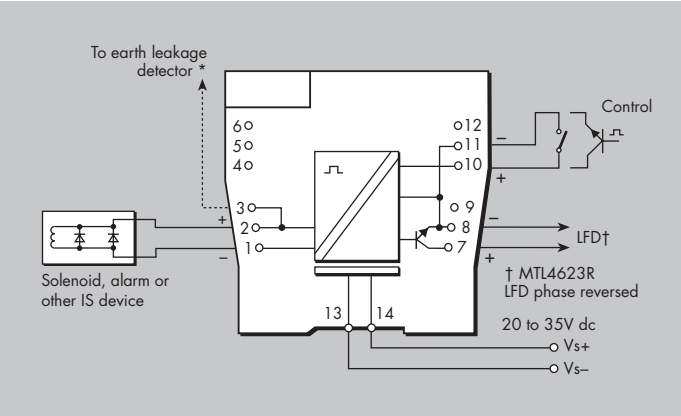
Line fault detection (LFD)
Open or short circuit in field cabling de-energises* solid state line-fault signal.
LFD transistor is switched on*, provided that the field circuit impedance is > 55Ω and < 4kΩ.

* These conditions are reversed for the MTL4623R. This is to permit parallel connection of alarms between modules to provide a group alarm output.

Line fault signal characteristics

Maximum off-state voltage:	35V
Maximum off-state leakage current:	10µA
Maximum on-state voltage drop:	2V
Maximum on-state current:	50mA

MTL4623 / MTL4623R



LED indicators
Green: power indication
Yellow: output status, on when output active
Red: LFD indication, on when line fault detected

Maximum current consumption
125mA at 24V dc

Power dissipation within unit
1.4W with typical solenoid valve, output on
2.0W worst case

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MTL4624
SOLENOID/ALARM DRIVER
switch operated with override

The MTL4624 enables an on/off device to be controlled by a volt-free contact or logic signal. It can drive loads such as solenoids, alarms, LEDs and other low power devices.

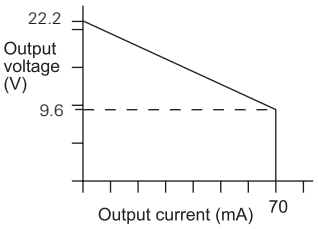
The MTL4624 allows a second switch or logic signal to be connected enabling the output to be disabled to permit, for example, a safety system to override a control signal.

SPECIFICATION

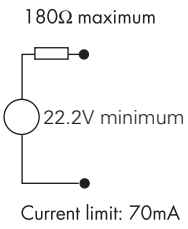
See also common specification

Number of channels
One

Minimum output voltage



Equivalent output circuit



Output
Minimum output voltage: 9.6V at 70mA
Maximum output voltage: 24V from 180Ω
Current limit: 70mA

Output ripple
< 0.5% of maximum output, peak-to-peak

Control input
Suitable for switch contacts, an open collector transistor or logic drive
0 = input switch closed, transistor on or <1.4V applied
1 = input switch open, transistor off or >4.5V applied

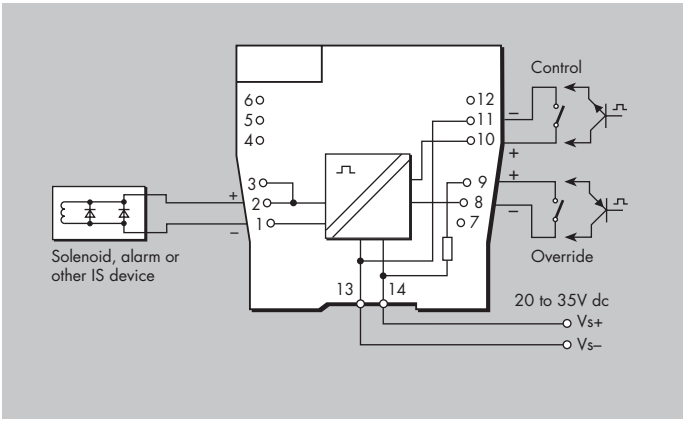
Override input
An open collector transistor or a switch connected across the terminals can be used to turn the output off whatever the state of the control input
0 = transistor on or switch closed
1 = transistor off or switch open

Control and override inputs

Control input	Override input	Output state
0	0	off
0	1	on
1	0	off
1	1	off

Response time
Output within 10% of final value within 100ms

MTL4624



LED indicators
Green: power indication
Yellow: output status, on when output active

Maximum current consumption
125mA at 24V dc

Power dissipation within unit
1.4W with typical solenoid valve, output on
1.9W worst case

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MTL4624S
SOLENOID/ALARM DRIVER
switch operated with 24V override

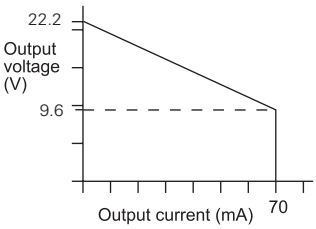
The MTL4624S enables an on/off device to be controlled by a volt-free contact or a floating logic signal. It can drive loads such as solenoids, alarms, LEDs and other low power devices. By connecting a second voltage, the output can be disabled to permit, for example, a safety system to override a control signal.

SPECIFICATION

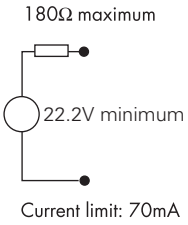
See also common specification

Number of channels
One

Minimum output voltage



Equivalent output circuit



Output
Minimum output voltage: 9.6V at 70mA
Maximum output voltage: 24V from 180Ω
Current limit: 70mA

Output ripple
< 0.5% of maximum output, peak-to-peak

Control input (must be fully-floating)
Suitable for switch contacts or an opto-isolator
0 = input switch closed, transistor on or < 1.4V applied
1 = input switch open, transistor off or > 4.5V applied

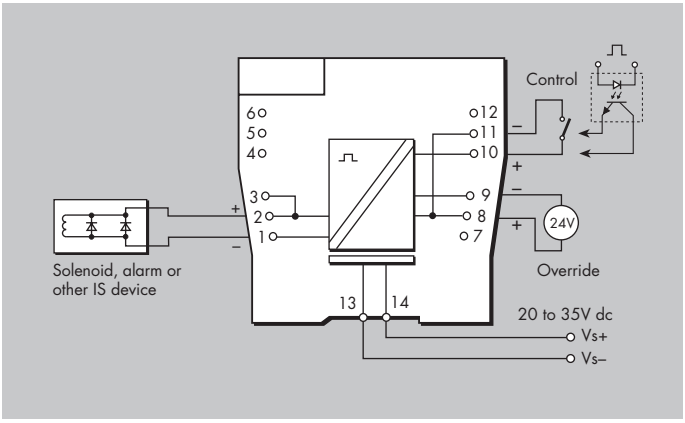
Override input
A 24V logic signal applied across the terminals allows the solenoid/alarm to be operated by the control input. If it is disconnected, the solenoid/alarm is off.
0 = < 2.0V applied across terminals 8 & 9
1 = > 9.0V applied across terminals 8 & 9
(nominal switching point 4.5V)

Control and override inputs

Control input	Override input	Output state
0	0	off
0	1	on
1	0	off
1	1	off

Response time
Output within 10% of final value within 100ms

MTL4624S



LED indicators
Green: power indication
Yellow: output status, on when output active

Maximum current consumption
125mA at 24V dc

Power dissipation within unit
1.4W with typical solenoid valve, output on
1.9W worst case

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MTL4626
SWITCH-OPERATED RELAY
2–channel switched output

The MTL4626 enables two separate circuits to be contact controlled by one or two, on/off, control inputs. Applications include the calibration of strain–gauge bridges; changing the polarity (and thereby the tone) of a sounder; the testing of fire alarms; and the transfer of signals into an annunciator with input terminals not segregated from each other.

SPECIFICATION

See also common specification

Number of channels
Two, fully floating

Input/output characteristics
Contact/Logic mode
(Inputs suitable for switch contacts, an open–collector transistor or logic drive)

Relay energised if	< 450Ω or < 1V applied
Relay de–energised if	> 5kΩ or > 2V applied (35V max.)

Loop powered mode

Relay energised if	>20V
Relay de-energised if	<17V

Power supply failure protection
Relays de–energised if supply fails

Response time
25ms nominal

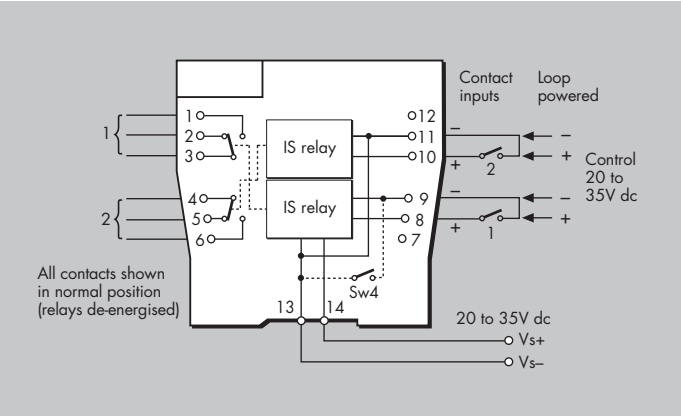
Contacts
1–pole changeover per channel

Contact rating
250V dc, 2A
(reactive loads must be suppressed)

Contact life expectancy
10 x 10^6 operations at maximum load

Relay drive (see switch setting table)
Choice of "loop-powered" or "contact/logic" control, for both channels, by switch selection. A further switch option ("1in2out") enables either input, in contact/logic mode, to activate both outputs.

MTL4626



LED indicators
Green: power indication
Yellow: two: output status, on when relay energised

Power requirement, Vs
41mA at 20V dc
44mA at 24V dc
60mA at 35V dc

Power dissipation within unit
1.1W maximum at 24V

User switch settings for operating mode

Mode	Function	SW1	SW2	SW3	SW4
Contact/Logic Input	2 ch	Off	On	On	On
	1in2out	On	On	On	On
Loop Powered	2 ch	Off	Off	Off	Off

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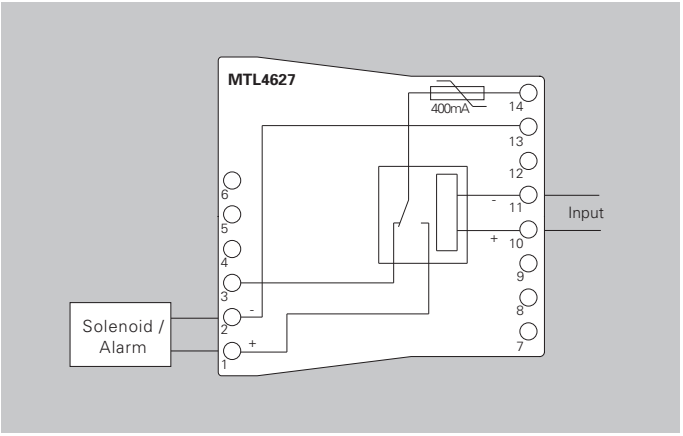
MTL4627
24V DIGITAL OUTPUT INTERFACE
1 channel for 24Vdc digital signals

The MTL4627 is a single channel module with a relay controlled by the system to switch power to 24V devices such as solenoids and alarms. A self-resetting fuse provides protection for the power feed.

NOTE: These modules must only be used on suitable rated backplanes.



SPECIFICATION

See also common specification

Number of channels
One, 24V from main supply
Location of field device
Safe area
Output ranges
20-32V dc, 250mA maximum
Output
24V dc, internally protected by 400mA resettable fuse
Current consumption
15mA @ 24V plus external load, max 250mA
Power dissipation
0.4W @ 24V
Isolation
None

Terminals	Function
1	24V output, normally off
2	24V Common
3	24V output, normally on
10	Control input +ve
11	Control input –ve
13	Power supply –ve
14	Power supply +ve

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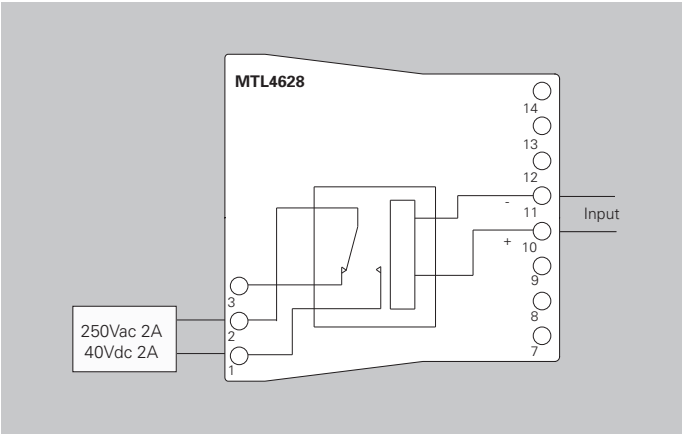
MTL4628
RELAY INTERFACE
1 channel changeover contacts

The MTL4628 is a single channel module with a relay controlled by the system to switch signals. Power for the field signals is connected externally.

SPECIFICATION

See also common specification

Number of channels
One with normally open and closed contacts
Location of field device
Safe area
Contact ranges
250Vac 2A, 40V dc 2A
Current consumption
10mA @ 24V
Power dissipation
0.25W @24V
Isolation
250V RMS



Terminals	Function
1	Relay contact normally open
2	Relay common
3	Relay contact normally closed
10	Relay Control +ve
11	Relay Control –ve

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MTL4632
PULSE ISOLATOR
pulse & 4/20mA current outputs

The MTL4632 isolates pulses from a switch, proximity detector, current pulse transmitter or voltage pulse transmitter. It is ideal for applications involving high pulse rates and fast response times, by repeating the pulses into an isolated circuit. An analogue output proportional to frequency is also provided, together with a relay output, which may be configured to act as an alarm. Configuration is carried out with a personal computer.

SPECIFICATION

See also common specification

Number of channels
One, fully floating

Sensor type
Switch or proximity detector (NAMUR/BS EN 60947–5–6:2001)
2– or 3–wire voltage or pulse transmitter

Input

Switch input:
Output ON if switch is closed
Proximity detector input:
Excitation: 7.0 to 9.0V dc from 1kΩ nominal
Output ON if input > 2.1mA* (< 2kΩ)
Output OFF if input < 1.2mA* (> 10kΩ)
Switching hysteresis: 0.2mA (650Ω) nominal
*NAMUR and BS EN 60947–5–6:2001 standards

Current pulse input:
Transmitter supply: 16.5V dc at 20mA
Short circuit current: 24mA
Output: I_{in} > 9.0mA = ON, I_{in} < 7.0mA = OFF
Switching hysteresis: 0.5mA

Voltage pulse input
Input impedance: > 10kΩ
Switching point voltage (V_{sp}): 3, 6, or 12V nominal
(User selectable by switches on the side of the module)
Output: V_{in} > V_{sp} = ON, V_{in} < V_{sp} = OFF
Switching hysteresis: 100mV + (0.1 x V_{sp}) typical

Pulse output
Maximum off–state voltage: 35V
Maximum off–state leakage current: 10µA
Maximum on–state resistance: 25Ω
Maximum on–state current: 50mA
Output OFF if supply fails
Note: LFD signal is Zener-diode protected against inductive loads

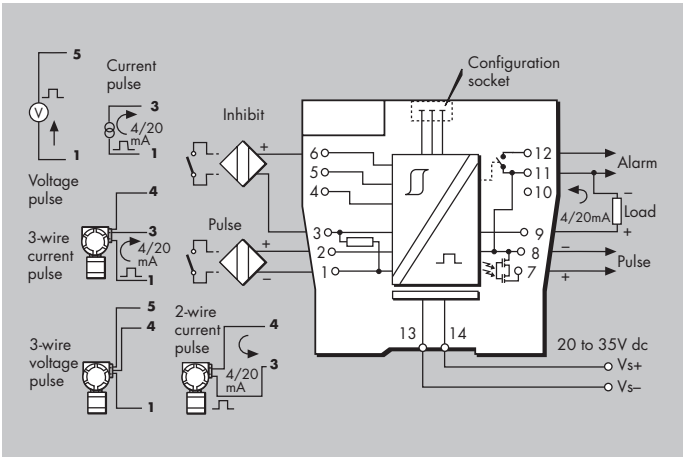
Current output
Signal range: 4 to 20mA
Under/over range: 0 to 22mA
Load resistance: 0 to 450Ω @20mA
Output resistance: >1MΩ
Ripple: < 50µA peak-to-peak
Accuracy: better than 20µA at 20°C
Temperature drift: < 1µA/°C
Response delay: TBA ms

Alarm output
Relay ON in alarm, 0.5A @ 35Vdc max.

Pulse width
High: 10µs min
Low: 10µs min

Frequency range
0 – 50kHz - pulse output mode
0 – 10KHz - for analogue output

MTL4632



LED indicators
Green: power indication
Yellow: on when output circuit is on
Red: flashing when line fault or error

Power requirement
65mA at 24V dc
70mA at 20V dc
55mA at 35V dc

Power dissipation within unit
1.35W maximum at 24V
1.75W maximum at 35V

Configurator
A personal computer running MTL PCS45 software with a PCL45USB serial interface.

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MTL4641A/AS
CURRENT REPEATER
4/20mA passive i/p for HART® transmitters

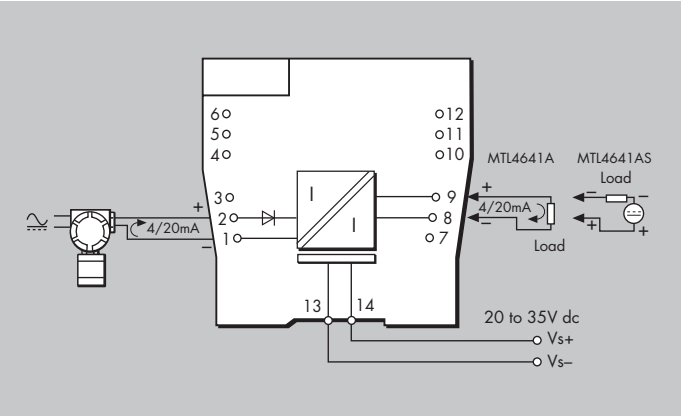
The MTL4641A provides an input for separately powered 4/20mA transmitters and also allows bi–directional transmission of HART communication signals superimposed on the 4/20mA loop current. Alternatively, the MTL4641AS acts as a current sink rather than driving a current into the load.

SPECIFICATION

See also common specification

Number of channels
One
Input
Signal range: 4 to 20mA
Under/over-range: 1.0 to 21.5mA
Input impedance for HART signals
at terminals 1, 2: > 230Ω
Maximum input volt drop
at terminals 1, 2: < 6.6V
i.e. a transmitter load of 330Ω at 20mA
Output
Signal range: 4 to 20mA
Under/over-range: 1.0 to 21.5mA
Load resistance (MTL4641A)
Conventional transmitters: 0 to 360Ω
Smart transmitters: 250Ω ±10%
Load (MTL4641AS)
Current sink: 600Ω max.
Maximum voltage source: 24V DC
Circuit output resistance: > 1MΩ
Circuit ripple
< 50µA peak-to-peak up to 80kHz
Transfer accuracy at 20°C
Better than 20µA
Temperature drift
< 1µA/°C
Response time
Settles within 200µA of final value after 20ms
Communications supported
HART

MTL4641A / MTL4641AS



LED indicator
Green: power indication
Power requirement (with 20mA signal)
50mA at 20V
45mA at 24V
35mA at 35V
Power dissipation within unit (with 20mA signals)
MTL4641A 0.8W @ 24V dc
MTL4641AS 1.1W @ 24V dc

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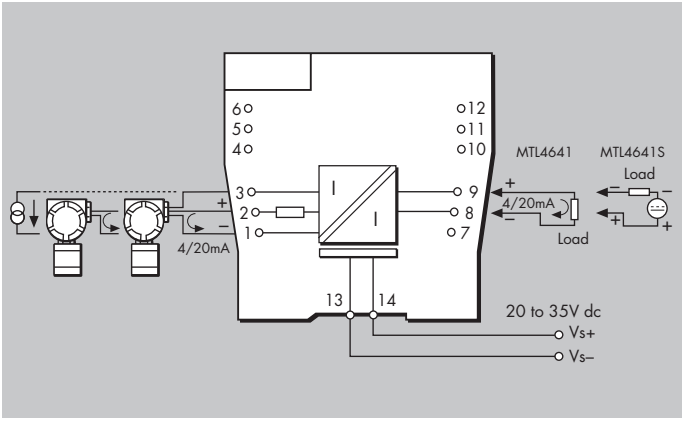
MTL4641/S
REPEATER POWER SUPPLY
4/20mA, HART®, 2- or 3-wire transmitters

The MTL4641 provides a fully-floating dc supply for energising a conventional 2- or 3-wire 4/20mA transmitter and repeating the current in another floating circuit to drive a load. For HART 2-wire transmitters, the unit allows bi-directional communications signals superimposed on the 4/20mA loop current. Alternatively, the MTL4641S acts as a current sink rather than driving a current into the load.

MTL4641 / MTL4641S



SPECIFICATION

See also common specification

Number of channels
One

Output

Signal range:	4 to 20mA
Under/over-range:	0 to 24mA
Load resistance (MTL4641)	
@ 24mA:	0 to 375Ω
@ 20mA:	0 to 465Ω
Load (MTL4641S)	
Current sink:	600Ω max.
Maximum voltage source:	24V dc
Circuit output resistance:	> 1MΩ

Circuit ripple
< 50µA peak-to-peak

Input

Signal range:	0 to 24mA (including over-range)
Transmitter voltage:	20V at 20mA (MTL4641)
	16.5V at 20mA (MTL4641S)

Transfer accuracy at 20°C
Better than 20µA 4-20mA (Terminals 1 & 2)
Better than 30µA 4-20mA (Terminals 1 & 3)

Temperature drift
< 0.8µA/°C

Response time
Settles to within 10% of final value within 50µs

Communications supported
HART (terminals 1 & 2 only)

LED indicator
Green: power indication

Maximum current consumption (with 20mA signal)
53mA at 24V

Power dissipation within unit (with 20mA signal)

MTL4641	0.8W @ 24V dc
MTL4641S	1.0W @ 24V dc

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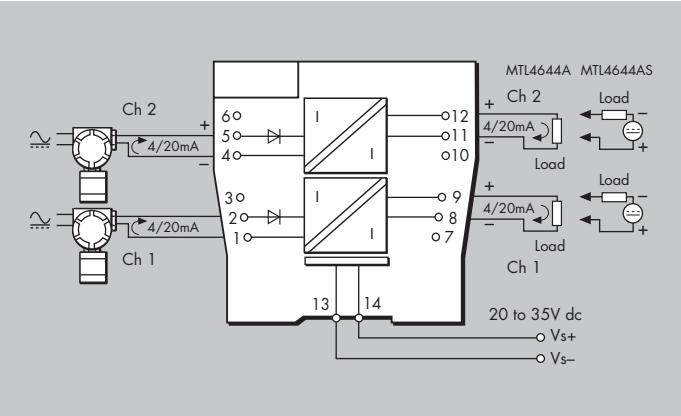
MTL4644A/AS
CURRENT REPEATER
4/20mA passive i/p for HART® transmitters

The MTL4644A provides an input for separately powered 4/20mA transmitters and also allows bi–directional transmission of HART communication signals superimposed on the 4/20mA loop current, so that the transmitter can be interrogated either from the operator station or by a hand-held communicator (HHC). Alternatively, the MTL4644AS acts as a current sink rather than driving a current into the load.

MTL4644A / MTL4644AS



SPECIFICATION

See also common specification

Number of channels
Two

Input
Signal range: 4 to 20mA
Under/over-range: 1.0 to 21.5mA

Input impedance for HART signals
at terminals 1, 2 and 4, 5: > 230Ω

Maximum input volt drop
at terminals 1, 2 and 4, 5: < 6.6V
i.e. a transmitter load of 330Ω at 20mA

Output
Signal range: 4 to 20mA
Under/over-range: 1.0 to 21.5mA
Load resistance (MTL4644A)
Conventional transmitters: 0 to 360Ω
Smart transmitters: 250Ω ±10%
Load (MTL4644AS)
Current sink: 600Ω max.
Maximum voltage source: 24V DC
Circuit output resistance: > 1MΩ

Circuit ripple
< 50µA peak-to-peak up to 80kHz

Transfer accuracy at 20°C
Better than 20µA

Temperature drift
< 1µA/°C

Response time
Settles within 200µA of final value after 20ms

Communications supported
HART

LED indicator
Green: power indication

Power requirement (with 20mA signal)
70mA at 24V
85mA at 20V
50mA at 35V

Power dissipation within unit (with 20mA signals)
MTL4644A 1.5W @ 24V dc
MTL4644AS 2.0W @ 24V dc

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MTL4644D
REPEATER POWER SUPPLY

single channel, 4/20mA, HART®
for 2- or 3-wire transmitters, two outputs

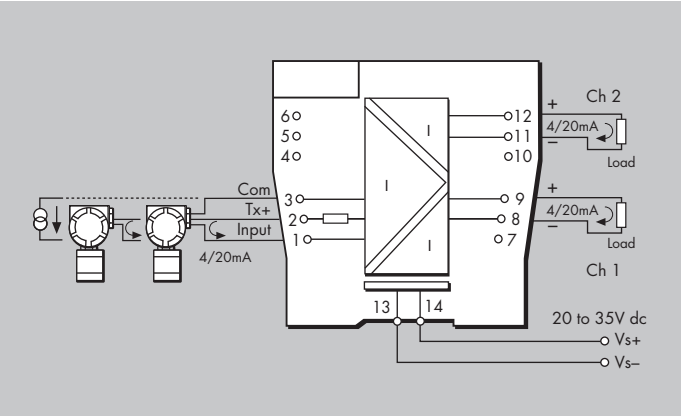
The MTL4644D provides a fully-floating dc supply for energising a conventional 2- or 3-wire 4/20mA transmitter and repeating the current in other circuits to drive two loads. For HART 2-wire transmitters, the unit allows bi-directional transmission of digital communication signals superimposed on the 4/20mA loop current.

SPECIFICATION

See also common specification

Number of channels
One
Output
Signal range: 4 to 20mA
Under/over-range: 0 to 24mA
Load resistance
@ 24mA: 0 to 360Ω
@ 20mA: 0 to 450Ω
Circuit output resistance: > 1MΩ
Circuit ripple
< 50µA peak-to-peak
Input
Signal range: 0 to 24mA (including over-range)
Transmitter voltage: 16.5V at 20mA
Transfer accuracy at 20°C
Better than 15µA
Temperature drift
< 0.8µA/°C
Response time
Settles to within 10% of final value within 50µs
Communications supported
HART (terminals 1 & 2, output Ch 1 only)

MTL4644D



LED indicator
Green: power indication
Maximum current consumption (with 20mA signals)
96mA at 24V dc
Power dissipation within unit (with 20mA signals)
1.4W @ 24V dc

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MTL4644/S
REPEATER POWER SUPPLY
2-channel, 4/20mA, HART®, 2- or 3- wire transmitters

The MTL4644 provides fully-floating dc supplies for energising two conventional 2-wire or 3-wire 4/20mA or HART transmitters, and repeats the current in other circuits to drive two loads. For smart transmitters, the unit allows bi-directional transmission of digital communication signals superimposed on the 4/20mA loop current. Alternatively, the MTL4644S acts as a current sink rather than driving a current into the load.

SPECIFICATION

See also common specification

Number of channels
Two

Output

Signal range:	4 to 20mA
Under/over-range:	0 to 24mA
Load resistance (MTL4644)	
@ 24mA:	0 to 375Ω
@ 20mA:	0 to 465Ω
Load (MTL4644S)	
Current sink:	600Ω max.
Maximum voltage source:	24V dc
Circuit output resistance:	> 1MΩ

Circuit ripple
< 50µA peak-to-peak

Input

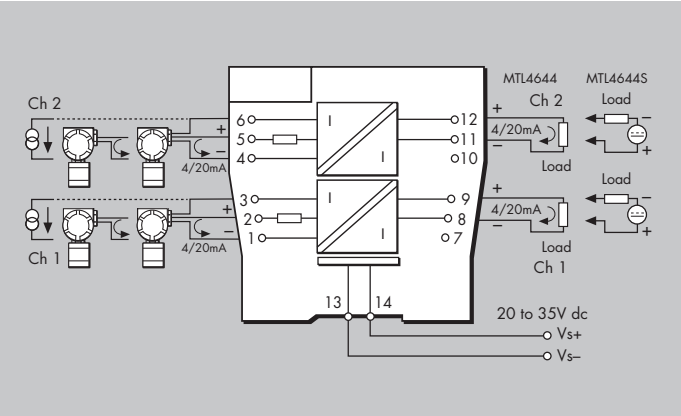
Signal range:	0 to 24mA (including over-range)
Transmitter voltage:	20V at 20mA

Transfer accuracy at 20°C
Better than 20µA 4-20mA (Terminals 1 & 2 / 4 & 5)
Better than 30µA 4-20mA (Terminals 1 & 3 / 4 & 6)

Temperature drift
< 0.8µA/°C

Response time
Settles to within 10% of final value within 50µs

MTL4644 / MTL4644S



Communications supported
HART (terminals 1 & 2 and 4 & 5 only)

LED indicator
Green: power indication

Maximum current consumption (with 20mA signals)
100mA at 24V dc

Power dissipation within unit (with 20mA signals)

MTL4644	1.5W @ 24V dc
MTL4644S	2.0W @ 24V dc

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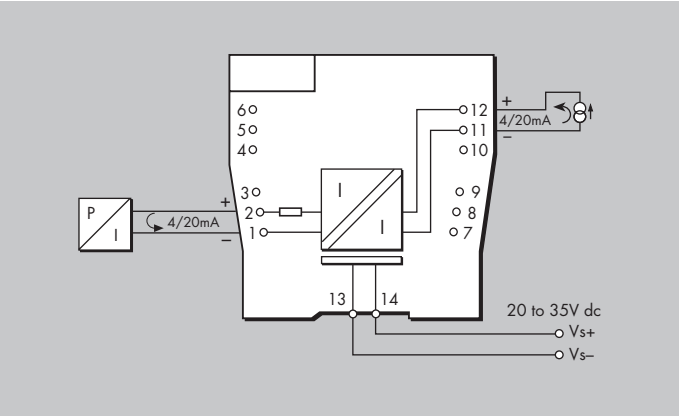
MTL4646/Y
ISOLATING DRIVER
for 4–20mA HART® valve positioners with line fault detection

The MTL4646 accepts a 4/20mA floating signal from a safe-area controller to drive a current/pressure converter (or any other load up to 800Ω). For HART valve positioners, the module also permits bi-directional transmission of digital communication signals. Process controllers with a readback facility can detect open or short circuits in the field wiring: if these occur, the current taken into the terminals drops to a preset level. The MTL4646Y is very similar except that it provides open circuit detection only (i.e. no short-circuit detection).

MTL4646 / MTL4646Y



SPECIFICATION

See also common specification

Number of channels
One
Working range
4 to 20mA
Digital signal bandwidth
500Hz to 10kHz
Maximum load resistance
800Ω (16V at 20mA)
Minimum load resistance
90Ω (short-circuit detection at < 50Ω)
Output resistance
> 1MΩ
Under/over range capability
Under range = 1mA
Over range = 24mA (load ≤ 520Ω)
Input and output circuit ripple
< 40µA peak-to-peak
Transfer accuracy at 20°C
Better than 20µA
Temperature drift
< 1.0µA/°C
Input characteristics

Field wiring state	MTL4646	MTL4646Y
Normal	< 6.0V	< 6.0V
Open-circuit	< 0.9mA	< 0.5mA
Short-circuit	< 0.9mA	N.A.

Response time
Settles within 200µA of final value within 100ms
Communications supported
HART
LED indicator
Green: power indication
Maximum current consumption (with 20mA signals into 250Ω load)
35mA at 24V dc
Power dissipation within unit (with 20mA signals into 250Ω load)
0.8W at 24V

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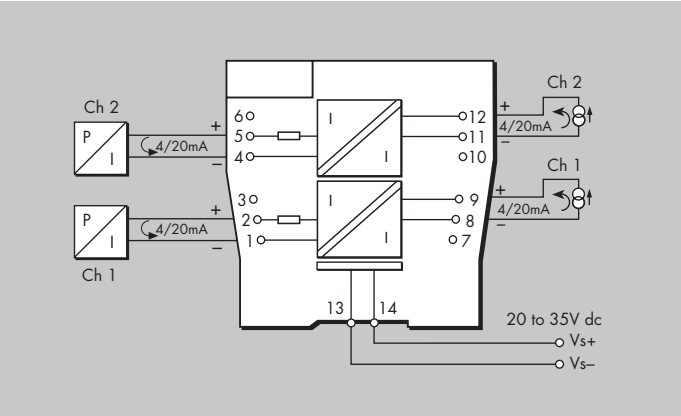
MTL4649/Y
ISOLATING DRIVER

two-channel, for 4–20mA, HART®
valve positioners with line fault detection

The MTL4649 accepts 4/20mA floating signals from a controller to drive 2 current/pressure converters (or any other load up to 800Ω). For HART valve positioners, the module also permits bi-directional transmission of digital communication signals. Process controllers with a readback facility can detect open or short circuits in the field wiring: if these occur, the current taken into the terminals drops to a preset level. The MTL4649Y is very similar except that it provides open circuit detection only (i.e. no short-circuit detection).

MTL4649 / MTL4649Y



SPECIFICATION

See also common specification

Number of channels
Two
Working range
4 to 20mA
Digital signal bandwidth
500Hz to 10kHz
Maximum load resistance
800Ω (16V at 20mA)
Minimum load resistance
90Ω (short-circuit detection at < 50Ω)
Output resistance
> 1MΩ
Under/over range capability
Under range = 1mA
Over range = 24mA (load ≤ 520Ω)
Input and output circuit ripple
<40µA peak-to-peak
Communications supported
HART
Transfer accuracy at 20°C
Better than 20µA
Temperature drift
< 1.0µA/°C
Input characteristics

Field wiring state	MTL4649	MTL4649Y
Normal	< 6.0V	< 6.0V
Open-circuit	< 0.9mA	< 0.5mA
Short-circuit	< 0.9mA	N.A.

Response time
Settles within 200µA of final value within 100ms
LED indicator
Green: power indication
Maximum current consumption (with 20mA signals into 250Ω load)
70mA at 24V dc
Power dissipation within unit (with 20mA signals into 250Ω load)
1.6W at 24V

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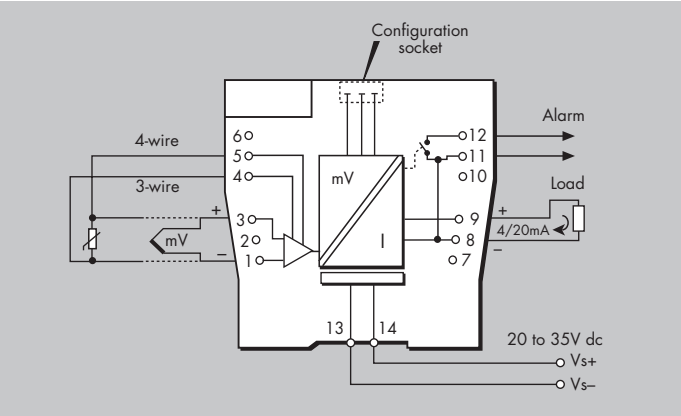
MTL4675
TEMPERATURE CONVERTER
THC or RTD input + Alarm

The MTL4675 converts a low-level dc signal from a temperature sensor mounted into a 4/20mA current for driving a load. Software selectable features include linearisation, ranging, monitoring, testing and tagging for all thermocouple types and 2-, 3- or 4-wire RTDs. (For thermocouple applications the SAF-CJC plug on terminals 1–3 includes an integral CJC sensor). Configuration is carried out using a personal computer. A single alarm output is provided and may be configured for high or low process alarm or to provide notice of early thermocouple failure.

MTL4675



SPECIFICATION

See also common specification

Number of channels
One
Signal source
THC types J, K, T, E, R, S, B or N to BS 60584 and XK
mV input
RTDs 2/3/4-wire platinum to BS 60751
Pt 100, Pt 500, Pt 1000
Cu-50 & Cu-53
Ni 100/500/1000 DIN 43760
Input signal range
–75 to +75mV, or 0 to 400Ω (0 to 1000Ω Pt & Ni sensors)
Input signal span
3 to 150mV, or 10 to 400Ω (10 to 1000Ω Pt & Ni sensors)
RTD excitation current
200µA nominal
Cold junction compensation
Automatic or selectable
Cold junction compensation error
≤ 1.0°C
Common mode rejection
120dB for 240V at 50Hz or 60Hz (500ms response)
Series mode rejection
40dB for 50Hz or 60Hz
Calibration accuracy (at 20°C)
(includes hysteresis, non-linearity and repeatability)
Inputs: (500ms response)

mV/THC:	± 15µV or ± 0.05% of input value (whichever is greater)
RTD:	± 80mΩ
Output:	± 11µA

Temperature drift (typical)
Inputs:

mV/THC:	± 0.003% of input value/°C
RTD:	± 7mΩ/°C
Output:	± 0.6µA/°C

Example of calibration accuracy and temperature drift (RTD input - 500ms response)

Span:	250Ω
Accuracy:	± (0.08/250 + 11/16000) x 100% = 0.1% of span
Temperature drift:	± (0.007/250 x 16000 + 0.6) µA/°C = ±1.0µA/°C

Safety drive on sensor failure
Upscale, downscale, or off
Early burnout
Early burnout detection for thermocouples (when selected)
Alarm trips when loop resistance increase is > 50Ω

Output range
4 to 20mA nominal into 600Ω max. (direct or reverse)
Alarm output (configurable)
Relay ON in alarm, 250mA @ 35V max
Maximum lead resistance (THC)
600Ω
Response time
Configurable - 500 ms default
(Accuracy at 100/200ms - contact MTL)
LED indicator
Green: power and status indication
Yellow: alarm indication, on when contacts are closed
Maximum current consumption (with 20mA signal)
50mA at 24V
Power dissipation within unit (with 20mA signal)
1.2W at 24V
Configurator
A personal computer running MTL PCS45 software with a PCL45USB serial interface.

Powering Business Worldwide

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MTL4676-RTD
TEMPERATURE CONVERTER
RTD/potentiometer input, 2-channel

The MTL4676–RTD converts signals from resistance temperature detectors (RTDs) into 4/20mA currents. Software selectable features include input type and characterisation, ranging, monitoring, testing and tagging. Configuration is carried out using a personal computer. The MTL4676–RTD is compatible with 2– and 3–wire RTD inputs.

SPECIFICATION

See also common specification

Number of channels
Two

Signal source
2-/3-wire RTDs to BS 60751
Pt 100, Pt 500, Pt 1000
Cu-50 & Cu-53
Ni 100/500/1000 DIN 43760

Input signal range
0 to 400Ω (0 to 4000Ω Pt & Ni sensors)

Input signal span
10 to 400Ω (10 to 1000Ω Pt & Ni sensors)

RTD excitation current
200µA nominal

Common mode rejection
120dB for 240V at 50Hz or 60Hz

Series mode rejection
40dB for 50Hz or 60Hz

Calibration accuracy (at 20°C)
(includes hysteresis, non-linearity and repeatability)

Input:	± 80mΩ
Output:	± 16µA

Temperature drift (typical)

Input:	± 7mΩ/°C
Output:	± 0.6µA/°C

Example of calibration accuracy and temperature drift (RTD input)

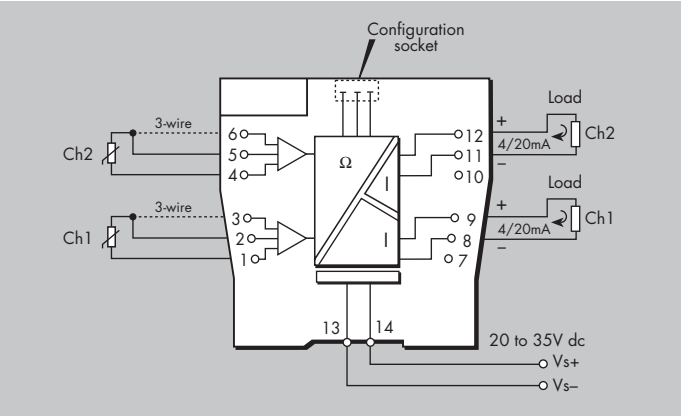
Span:	250Ω
Accuracy:	± (0.08/250 + 16/16000) x 100% = 0.13% of span
Temperature drift:	± (0.007/250 x 16000 + 0.6) µA/°C = ±1.0µA/°C

Safety drive on sensor failure
Upscale, downscale, or off

Output range
4 to 20mA nominal into 300Ω max. (direct or reverse)

Response time
Configurable - 500 ms default
(Accuracy at 100/200ms - contact MTL)

MTL4676-RTD



LED indicator
Green: power and status indication
Yellow: one provided for channel status
Red: alarm indication

Power requirement, Vs with 20mA signal
60mA at 24V

Power dissipation within unit with 20mA signal
1.4W at 24V

Isolation
Functional channel–channel isolation for safe and hazardous–area circuits

Configurator
A personal computer running MTL PCS45 software with a PCL45USB serial interface.

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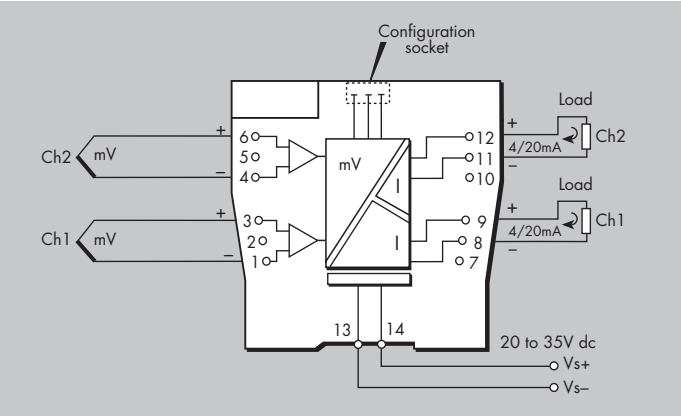
MTL4676-THC
TEMPERATURE CONVERTER
mV/THC input, 2-channel

The MTL4676–THC converts low–level dc signals from temperature sensors mounted in a hazardous–area into 4/20mA currents. Software selectable features include linearisation for standard thermocouple types, ranging, monitoring, testing and tagging. Configuration is carried out using a personal computer. The field connections include cold–junction compensation and do not need to be ordered separately.

MTL4676-THC



SPECIFICATION

See also common specification

Number of channels
Two

Signal source
THC types J, K, T, E, R, S, B or N to BS 60584 and XK
mV input

Input signal range
–75 to +75mV

Input signal span
3 to 150mV

Cold junction compensation
Automatic or selectable

Cold junction compensation error
≤ 1.0°C

Common mode rejection
120dB for 240V at 50Hz or 60Hz

Series mode rejection
40dB for 50Hz or 60Hz

Calibration accuracy (at 20°C)
(includes hysteresis, non-linearity and repeatability)

Input:	±15µV or ±0.05% of input value (whichever is greater)
Output:	±16µA

Temperature drift (typical)

Input:	±0.003% of input value/°C
Output:	±0.6µA/°C

Safety drive on sensor burnout
Upscale, downscale, or off

Output range
4 to 20mA nominal into 300Ω max. (direct or reverse)

Maximum lead resistance
300Ω

Response time
Configurable - 500 ms default
(Accuracy at 100/200ms - contact MTL)

LED indicator
Green: power and status indication
Yellow: one provided for channel status
Red: alarm indication

Power requirement, Vs with 20mA signal
60mA at 24V

Power dissipation within unit with 20mA signal
1.4W at 24V

Isolation
Functional isolation channel–channel for input and output circuits.

Configurator
A personal computer running MTL PCS45 software with a PCL45USB serial interface.

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MTL4600 RANGE COMMON SPECIFICATIONS

Please go to our website at www.mtl-inst.com for the latest information regarding safety approvals, certificates and entity parameters.

Connectors
Each unit is supplied with signal connectors, as applicable. When using crimp ferrules for the signal connectors the metal tube length should be 12mm and the wire trim length 14mm.

Isolation
1500V rms minimum, between system and field terminals.
50V between system circuits and power supply

Supply voltage
20 – 35V dc

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

Mounting
MTL4500/4600 series backplanes

Ambient temperature limits
–20 to +60°C (–6 to +140°F) operating
–40 to +80°C (–40 to +176°F) storage

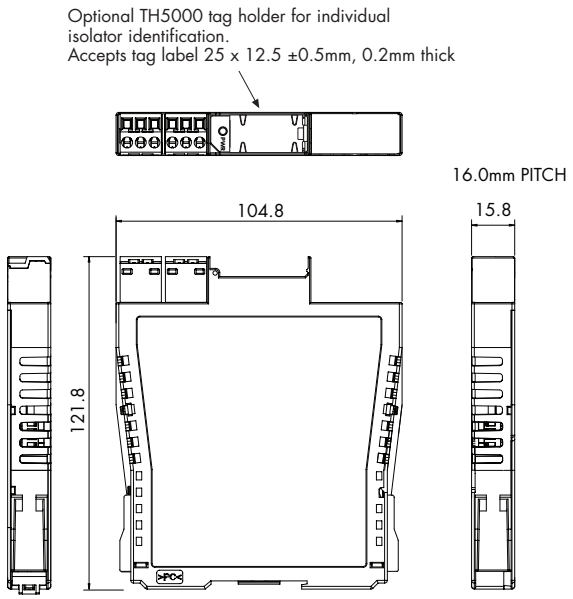
Humidity
5 to 95% relative humidity

Weight
140g
Approximate (except where indicated)

HART® is a registered trademark of HART Communication Foundation

DIMENSIONS (MM)

MTL4600



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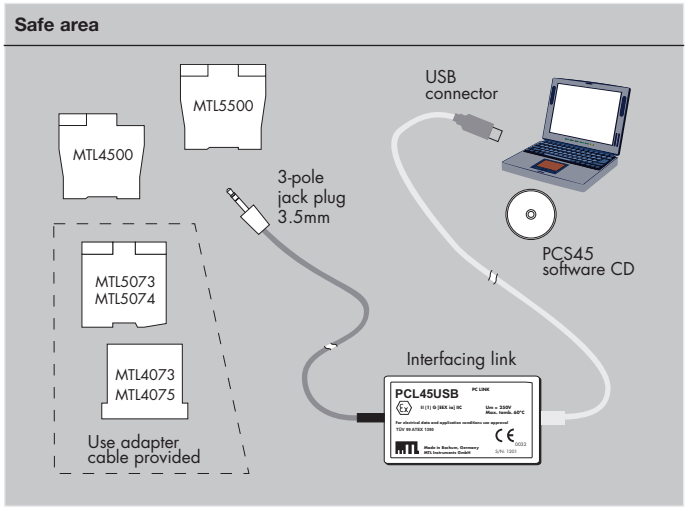
PCS45/PCL45USB CONFIGURATOR FOR MTL CONVERTERS

The PCS45/PCL45USB configurator allows MTL converters to be configured from a standard PC running a Microsoft® Windows® operating system. It comprises PC software, provided on a CD (PCS45), and an ATEX certified interfacing link (PCL45USB). Converters can be configured from the safe area, while on-line, and configurations can be saved to disk and printed out when required. It is suitable for use with MTL4000, MTL4500, MTL4600, MTL5000 and MTL5500 range of products.



SPECIFICATION

PCL45USB hardware

Location
Safe area

Connections
PC side: USB B(F) socket
Converter side: cable with 3.5mm jackplug, 3-pole for MTL4500, MTL4600 and MTL5500 range of converters. An adapter cable is provided for other earlier MTL converters.

Cable lengths
Converter side (fitted): 1.5m
USB cable A(M) to B(M) (supplied): 2m

Ambient temperature limits
–10°C to +60°C operating
–20°C to +70°C storage

Humidity
5 to 95% relative humidity (non-condensing)

Weight
200g

PCS45 Configuration software
Compatible with Windows 2000 or Windows XP.
Consult MTL for operation with any other operating system, e.g. Windows Vista™.

Software medium
PCS45 supplied on CD
Updates are available at www.mtl-inst.com

Recommended minimum PC configuration
Microsoft Windows 2000 or Windows XP
20MB of available hard disc space
CD ROM drive
Available USB port
Printer (local or network)

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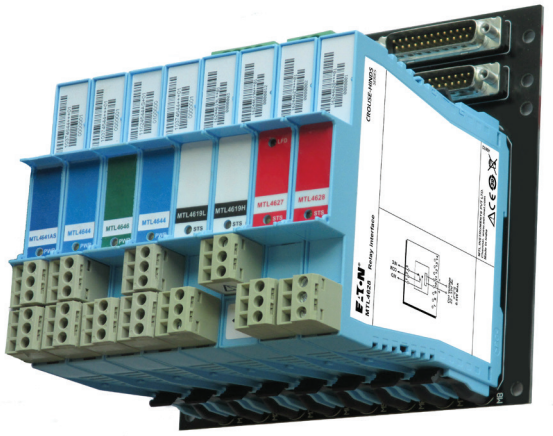
CUSTOM, STANDARD AND UNIVERSAL BACKPLANES FOR EASY DCS INTEGRATION

- **Total flexibility**
- **Reduce wiring**
- **Simplify installation**
- **Special functions**
- **Signal conditioning**
- **HART® integration**



The MTL4500/MTL4600 range of backplanes, enclosures and other accessories provide comprehensive, flexible and remarkably compact mounting facilities for system vendors, original equipment manufacturers and end users alike.

CUSTOMISED BACKPLANES

Eaton provides a complete design and manufacturing service for MTL customised backplanes. Customised backplanes give the vendors and users of process control and safety systems the opportunity to integrate MTL4500/MTL4600/HART® modules directly into their system architecture. As there are no hazardous-area circuits on the backplanes, customised versions can be produced without the need for IS certification, so simplifying design and lowering costs.

UNIVERSAL CUSTOM BACKPLANES

The 'universal' backplane allows a fast and economic approach to providing a custom interface. Where tight time schedules exist, the backplane can be installed to allow the panel building and wiring to be completed. The customised adapter card can then be plugged in at any time up to integrated test.

ADAPTER CARDS

Adapter cards already exist for many of the DCS companies. In addition there is a range of general purpose cards that offer reduced wiring for use with specific MTL modules. These are also available in left- and right-hand versions to ease panel wiring.

STANDARD MTL BACKPLANES

Standard MTL backplanes are available to accommodate 4, 8, 16, or 24 modules using screw-clamp connectors for the safe-area circuits. On an individual backplane, any module can be plugged into any position and module types can be mixed. For 8-, 16- and 24-way backplanes, screw-clamp connectors which plug into the backplanes provide primary and secondary 24V dc power supplies. Power to several 8- or 16-way backplanes can be interconnected to reduce and simplify wiring – see instruction manual INM4500/INM4600 for details.

OPTIONAL ACCESSORIES

Optional accessories include colour coded tagging strip kits for all three sizes of backplane and earth rail kits for 8 and 16-way versions. Mounting accessories are available for surface (all backplanes), T-section and G-section DIN-rail (8- and 16-way versions), and a horizontal plate for mounting 24-way backplanes in 19-inch racks.

WEATHERPROOF ENCLOSURES

Weatherproof enclosures are available for applications where separate safe–area enclosures are required for backplanes with modules. Available to accommodate one 4-way or one 8-way backplane, they are manufactured from GRP giving protection against dust and water to IEC529:IP65. The lids are made from transparent high-strength polycarbonate so that LEDs, switches, etc, on the tops of the modules are easy to see.

DCS VENDORS/SYSTEMS SUPPORTED:

ABB Automation
S100, INFI90, S800

Emerson
Delta V, M Series, S Series

GE Bently-Nevada

HIMA
HIMax

Honeywell
PMIO, C200, C300, UPIO, Safety Manager, USIO

Rockwell Automation
ICS Triplex, Plantguard

Schneider Electric
Foxboro I/A, Triconex Trident/Tricon, Modicon

Siemens
ET200, S7

Yokogawa
Centum R3, VP, Prosafe RS, CS3000

MTL CPS STANDARD BACKPLANES

Backplane model no.	Number of modules	Safe-area connections	MOUNTING KITS			ACCESSORIES		
			Surface	DIN–rail (T or G)	19–inch rack	Earth–rail kit	Tagging strip kit	Spare fuse pack
CPS04	4	Screw–clamp	SMS01	DMK01	–	–		FUS1.0ATE5
CPS08	8	Screw–clamp	SMS01	DMK01	–	ERK08	TSK08	FUS1.0ATE5
CPS16	16	Screw–clamp	SMS01	DMK01	–	ERK16	TSK16	FUS2.0ATE5 or FUS2.5ATE5
CPS24	24	Screw–clamp	SMS01	DMK01	HMP24	–	TSK24	FUS4.0ATE5

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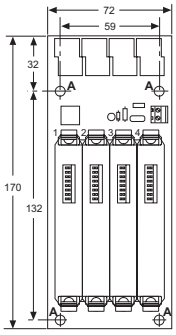
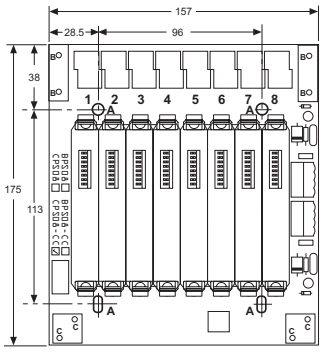
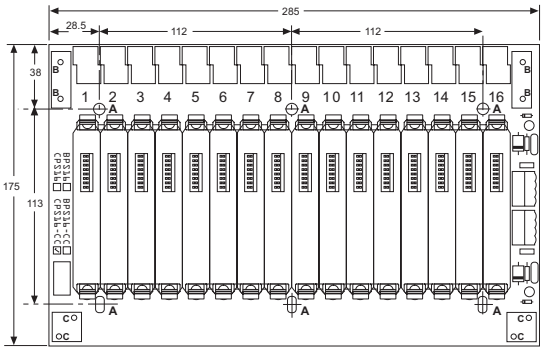
CPS BACKPLANE DIMENSIONS (mm)



CPS04
CPS04-CC

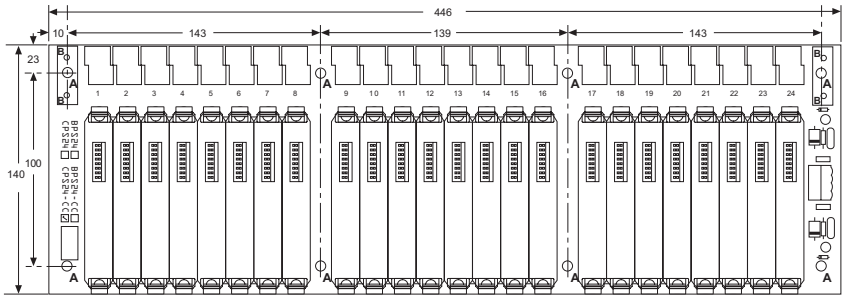


CPS08
CPS08-CC



CPS16
CPS16-CC

-CC - Conformal Coating

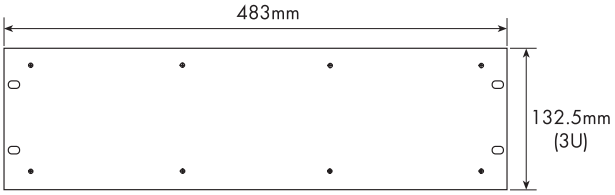


CPS24

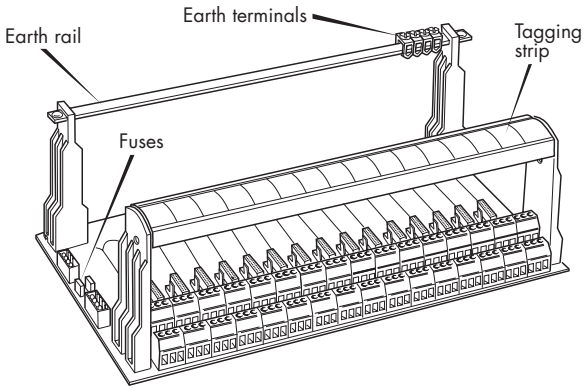
Power requirements, Vs
21V dc to 35V dc through plug-in connectors
Safe–area connections
CPS: 2.5mm^2 screw-clamp terminals – 6 positions per module
Weight (without modules or accessories)

CPS04:	96g
CPS08:	225g
CPS16:	419g
CPS24:	592g

HMP24 - 19" RACK MOUNTING PLATE FOR CPS24



BACKPLANE ACCESSORIES



SCK45 - backplane clips

10 x strip of four

MCK45 - backplane clips

16 x strip of two

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ORDERING INFORMATION

MTL4600 range of isolators
Specify part number: eg, **MTL4611**

Individual isolator identification

TH5000	Tag holder (Pack of 20)

Connectors - MTL4600

SAF-CJC	Field plug, terminals 1 and 3 with cold-junction sensor
SAF-CJC2	Field plug, terminals 4 and 6 with cold-junction sensor
SAF1-3	System plug, terminals 1, 2 and 3
SAF4-6	System plug, terminals 4, 5 and 6

MTL4500/4600 Standard Backplanes

CPS04	4-way backplane screw-clamp connector
CPS08	8-way backplane screw-clamp connector
CPS16	16-way backplane screw-clamp connector
CPS24	24-way backplane screw-clamp connector

MTL4500/4600 Custom Backplanes
Contact MTL for options and advice

MTL4500/4600 Backplane mounting accessories

DMK01	DIN-rail mounting kit, T- or G-section (pack of 40) 8-way backplanes require 4, 16-way backplanes require 6
SMS01	Surface mounting kit (pack of 40) 4- and 8-way backplanes require 4, 16-way backplanes require 6, 24-way backplanes require 8
HMP24	Horizontal mounting plate and screws for 19-inch rack mounting 24-way backplanes only
BMK08	Mounting kit for one 4- or 8-way backplane
BMK16	Mounting kit for one 16-way backplane

MTL4600 Backplane accessories

ERK08	Earth rail kit for CPS08 backplane
ERK16	Earth rail kit for CPS16 backplane
TSK08	Tagging strip kit for CPS08 backplane
TSK16	Tagging strip kit for CPS16 backplane
TSK24	Tagging strip kit for CPS24 backplane
FUS1.0ATE5	Fuse kit for 4- and 8-way backplanes, (10 per pack)
FUS2.0ATE5	Fuse kit for 16-way backplane, (10 per pack)
FUS4.0ATE5	Fuse kit for 24-way backplanes, (10 per pack)
MCK45	MTL4000 backplane conversion kit (16 clip pairs per pack)
SCK45	Module 4-clip strips (10 strips + 40 rivets per pack)
MPL01	Module position label (blank) (50 per pack)

Literature

INM4500	MTL4600 range instruction manual

Configurator and software

PCL45USB	Configurator, PC interface and software
PCS45	PC software

Please go to our website at www.mtl-inst.com for the latest information.

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