

## MTL 646/647 Displays

- IS display certified to ATEX
- High contrast LCD with backlight
- Communication from a safe area via a galvanic isolator
- Operator push-buttons or external switch inputs
- Two switch outputs
- IP65 front panel



The **MTL646/647 Serial Text Displays** are intrinsically safe instruments that can display text and simple graphics in a hazardous area. Having a number of push-buttons and two solid-state switched outputs, they provide a low cost operator interface ideal for simple machine and process control applications. In addition to new installations, the legacy protocol enables existing MTL643/644 display systems to be easily upgraded.

**Data and power** are normally supplied by a 2-wire serial data link from an MTL5051 isolator in the safe area. This isolator, which can power and communicate with up to two MTL646/647 serial text displays, has a bi-directional RS232 or RS422 safe area port. Alternatively, a 3 wire system may be used to communicate with up to four MTL646/647 text displays. The high contrast LCD incorporates a green backlight that is powered by the serial data link. Brightness and contrast are adjustable enabling the display to be read in all lighting conditions from full sunlight to total darkness.

**Six push-buttons** on the front panel of the MTL646 (four on the MTL647) may be used for operator acknowledgments or controls. If larger industrial switches are required, these may be connected to the text display rear (MTL647–internal) terminals. When the remote switches are activated, the front panel push-buttons are disabled automatically.

**Two isolated switch outputs**, which can control certified hazardous area loads such as sounders, lamps and valves, are included.

The **MTL646/647 text displays** are normally controlled and interrogated by a safe area process computer or by a dedicated instrument such as a PLC or weighing system. The text displays may be used singly but up to four instruments can be multidropped on a hazardous area network. At a data rate of 9600 bps, the cable between the safe area galvanic isolator and the MTL646/647 text display may be up to 100m long. The protocol, which uses ASCII characters, enables text to be written anywhere on the screen in five different font sizes, together with lines, boxes and bargraphs. Simple bitmap graphics may be downloaded to the display and all characters can be reversed or flashed. Information can also be written to a hidden screen which may be displayed when required.

**Five different operational modes** are selectable, allowing the user to choose the appropriate level of communications security for each application. These range from immediate execution of a command with no message acknowledgement, to a 16 bit CRC. The communications speed, number of stop bits and polarity of the parity bit can also be defined.

The **legacy protocol** enables the MTL646 or MTL647 to replace an MTL643 or MTL644, in order to provide certification to ATEX and a display backlight. No software or galvanic isolator changes are required and the MTL646 will fit into the existing panel cut-out. If required, simple modifications to the driver software will allow the enhanced features of the MTL646/647 to be used.

# MTL 646/647 displays

September 2016

## SPECIFICATIONS

### Location

Zone 0, 1 or 2

### DISPLAY

#### Type

120 x 64 pixel liquid crystal.

#### Display Size

86.5mm x 45mm.

### Backlight

Powered from serial link.

### Characters

ASCII character set, 5 font sizes each with 4 computer definable soft characters.

### Hidden screen

May be written to at any time and displayed when required.

### Switch cable length

5m max.

### OUTPUTS

Two software controlled switch outputs.

### Contacts

Isolated single pole solid state switch (certified as simple apparatus).

$R_{on}$  less than  $5\Omega + 0.7V$

$R_{off}$  greater than  $1M\Omega$

### I.S. parameters

$U_i = 28Vdc$ ,  $I_i = 200mA$ ,  $P_i = 0.85W$

### DATA

#### Transmission Speed

0.3, 0.6, 1.2, 2.4, 4.8, 9.6 or 19.2k bps.\*

#### Cable length between isolator(s) & MTL646/647

100m max at Baud rate of 9.6k bps\*

\*Depends upon configuration & type of cable- see instruction manual.

### Format

1 or 2 stop bits; odd, even or no parity bit; 7 or 8 data bits.

### Protocol

MTL646/647 or MTL643/644.

### CONTROLS

#### Front panel

MTL646: 6 push-buttons which can be software interrogated.

MTL647: 4 push-buttons which can be software interrogated.

Each button function may be displayed on the screen. Buttons may be disabled.

#### External switches

Control may be transferred to six external switches; front panel buttons are inhibited.

### ENVIRONMENTAL

#### Operating temp

$-20^{\circ}C$  to  $+60^{\circ}C$  (certified for use at  $-40^{\circ}C$ )

#### Humidity

To 95% @  $40^{\circ}C$

#### Enclosure

Front IP65

Rear IP20

### MECHANICAL

#### Terminals

Removable with screw clamp for 0.5 to 1.5mm 2 cable.

#### Weight

MTL646 0.7kg

MTL647 1.6kg

### ACCESSORIES

#### Tag number

Thermally printed strip on rear of instrument.

#### Programming guide

May be downloaded from <http://www.mtl-inst.com>

## APPROVALS

For the latest certification information visit: <http://www.mtl-inst.com/certificates>

### MTL646

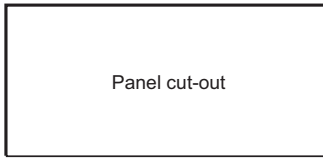
Country (Authority)	Standard	Certificate/ file no.	Approved for
UK (ITS to CENELEC standards & ATEX Directive)	EN 50020: 2002 EN 50014: 1997 EN 50284: 1999	ITS03ATEX21172	Group II Category 1G EEx ia IIC T5
UK (ITS to CENELEC standard)	EN 50039: 1980	Ex 03E21194 2-wire system Ex 03E21195 3-wire system Ex 03E21196 4-wire system	EEx ia IIC T5
USA (FM)	3610 entity  3611 non-incendive	3026711	Class I, Div 1, Grps A-D Class 1, Zone 0 Group IIC  Class I, Div 2, Grps A-D Class 1, Zone 2 Group IIC

### MTL647

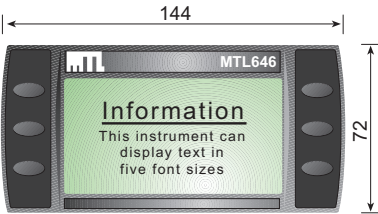
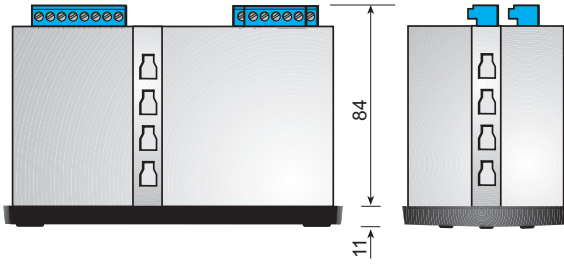
Country (Authority)	Standard	Certificate/ file no.	Approved for
UK (ITS to CENELEC standards & ATEX Directive)	EN 50020: 2002 EN 50014: 1997 EN 50284: 1999	ITS03ATEX21173	Group II Category 1G EEx ia IIC T5
UK (ITS to CENELEC standard)	EN 50039: 1980	Ex 03E21194 2-wire system Ex 03E21195 3-wire system Ex 03E21196 4-wire system	EEx ia IIC T5
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**MTL646**

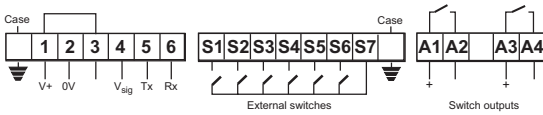
**DIMENSIONS**



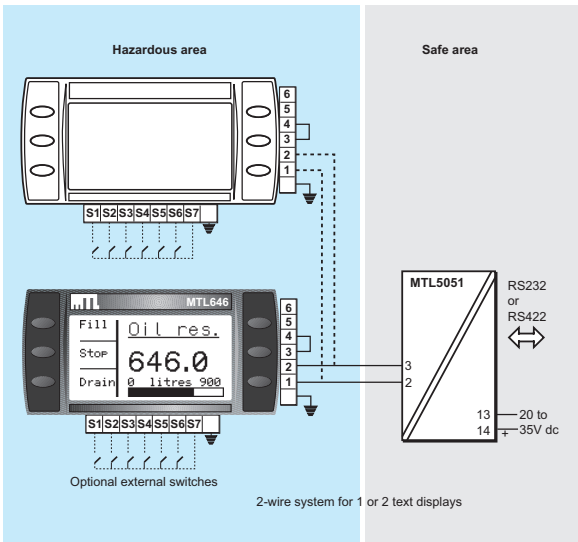
**Recommended panel cut-out**  
DIN 43 700  
138.0 +1.0/-0.0 x 68.0 +0.7/-0.0  
To achieve an IP65 seal between the instrument and the panel  
136.0 +0.5/-0.0 x 66.2 +0.5/-0.0  
Four panel mounting clips must be used



**TERMINAL CONNECTIONS**

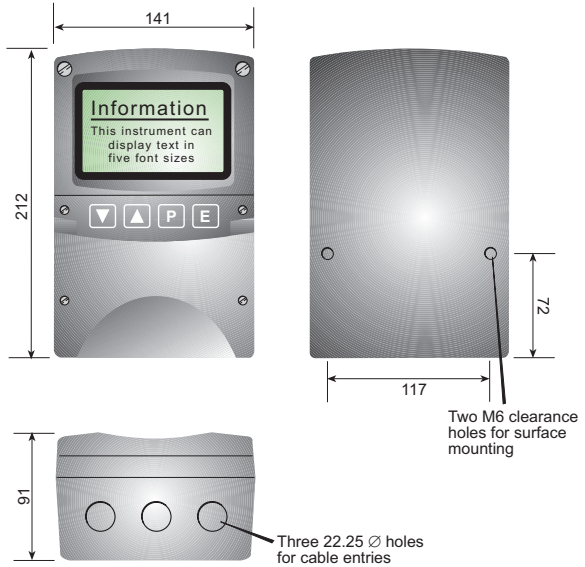


**CONNECTIONS**

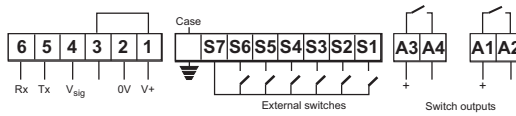


**MTL647**

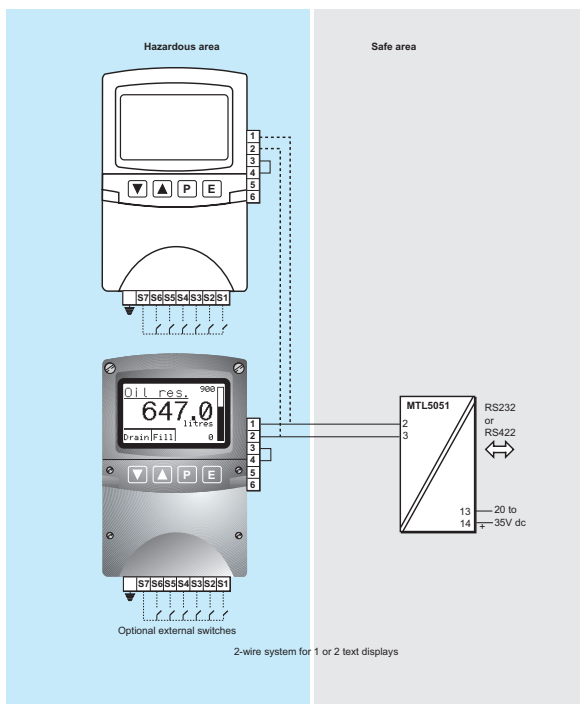
**DIMENSIONS**



**TERMINAL CONNECTIONS**



**CONNECTIONS**



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