MTL646/647 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.

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
$Ui = 28Vdc, Ii = 200mA, Pi = 0.85W$

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°C to +60°C (certified for use at –40°C)
Humidity
To 95% @ 40°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:
www.mtl-inst.com/certs_1.nsf

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	3026711	Class I, Div 1, Grps A-D Class 1, Zone 0 Group IIC
	3611 non-incendive		Class I, Div 2, Grps A-D Class 1, Zone 2 Group IIC

MTL647

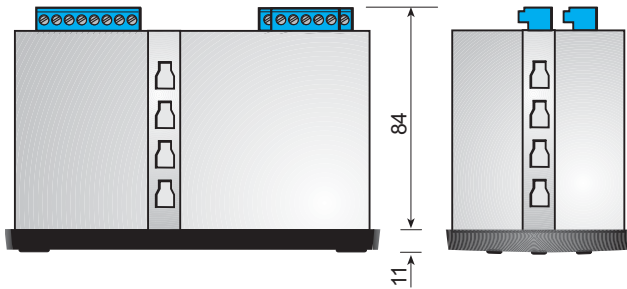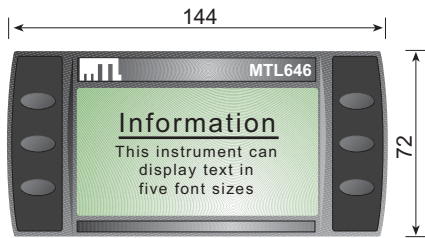| Country (Authority)	Standard	Certificate/ file no.	Approved for
UK (ITS to CENELEC standards & ATEX Directive)	EN 50020: 2002 EN 50014: 1997 EN 50284: 1999	ITS03ATEX21173	Group II Category 1G EEx ia IIC T5
UK (ITS to CENELEC standard)	EN 50039: 1980	Ex 03E21194 2-wire system Ex 03E21195 3-wire system Ex 03E21196 4-wire system	EEx ia IIC T5
USA (FM)	3610 entity	3026711	Class I,II,III, Div 1, Grps A-G Class 1, Zone 0 Group IIC
	3611 non-incendive		Class I, Div 2, Grps A-D Class 1, Zone 2 Group IIC Class II, Div 2, Grps E-G Class III, Div 2

MTL646

DIMENSIONS
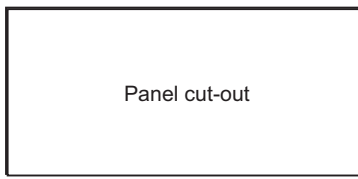
Panel cut-out

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
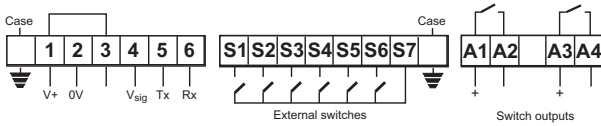Four panel mounting clips must
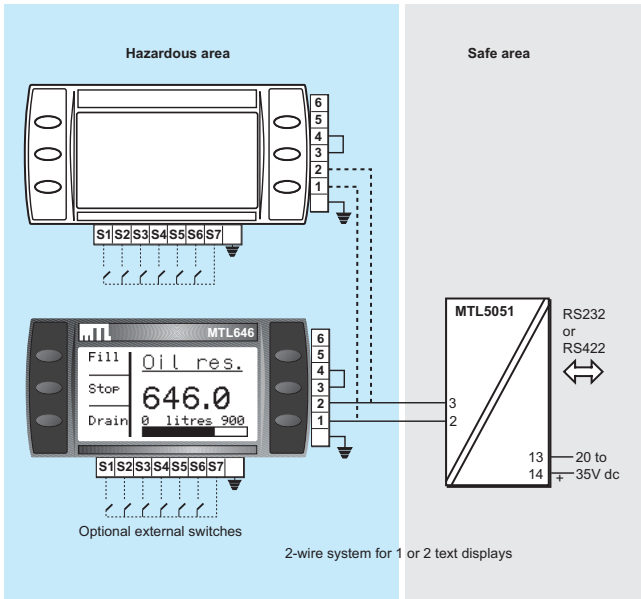be used

84

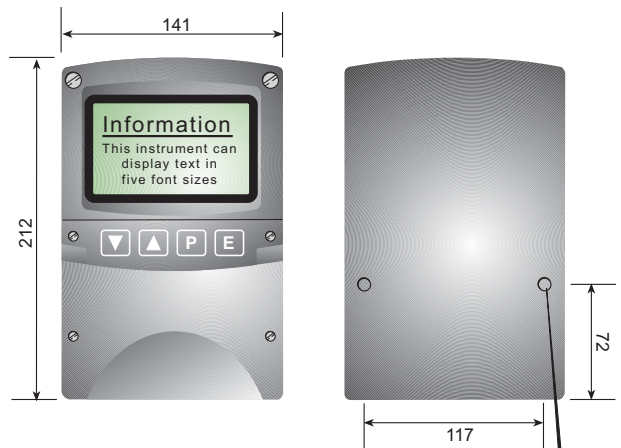11

144

72

TERMINAL CONNECTIONS

Case

1	2	3	4	5	6
V+	0V		V$_{sig}$	Tx	Rx

| S1 | S2 | S3 | S4 | S5 | S6 | S7 |

Case

External switches

A1 A2   A3 A4
+   +

Switch outputs

CONNECTIONS

Hazardous area

Safe area

Optional external switches

2-wire system for 1 or 2 text displays

MTL647

DIMENSIONS

141

212

72

117

Two M6 clearance
holes for surface
mounting

91

Three 22.25 ⌀ holes
for cable entries

TERMINAL CONNECTIONS

Case

6	5	4	3	2	1
Rx	Tx	V$_{sig}$		0V	V+

| S7 | S6 | S5 | S4 | S3 | S2 | S1 |

External switches

A3 A4   A1 A2
+   +

Switch outputs

CONNECTIONS

Hazardous area

Safe area

Optional external switches

2-wire system for 1 or 2 text displays