

DU-35CLE

4-20mA Process Loop
with built-in loop excitation
3 1/2 Digit with 0.56" LEDs
in a 1/8 DIN Case



Easily user scaled, this meter has built-in 24V loop excitation, and is ideal for 4-20mA process measurement and loop indication in any engineering unit of measure.

General Features

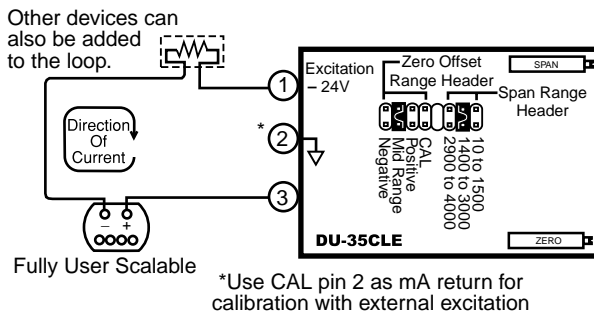
The DU-35CLE is an economical 4-20mA process loop measuring meter with a built-in 24V DC power supply to provide loop excitation. It is easily user adjustable to any reading between -1999 and +1999 without component changes. The 15 turn infinitely adjustable Span and Zero Pot facilitate easy scaling in engineering units.

An economical option is the dummy (non-functional) right-hand-side zero which allows the DU-35CLE to display of readings from -19990 to +19990 without going to the expense of a 4.5 digit meter. The apparent resolution with the dummy zero option would be 10 counts.

Typical Application Connections

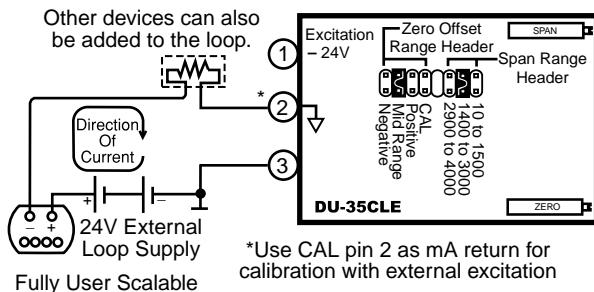
4 to 20mA Process Loop Measurement

Meter provides the loop excitation voltage.



4 to 20mA Process Loop Measurement

Where the DU-35CLE meter does not provide the loop excitation voltage.



Compatibility

The DU-Series have a matching DIN case style that is complementary to the Lynx, Leopard and Tiger family of meters. DU-Meters are the OEM's choice for economical switchboard and process indication. For economy, each model is dedicated to a specific application and designed for quick and easy installation.



Specifications

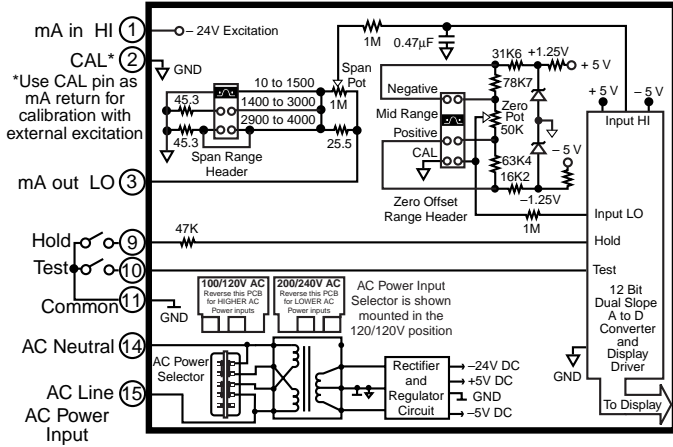
- Input Configuration:**Series connection to 4-20mA process loop. Provides 24V DC to excite the loop.
- Loop Excitation:**24V DC at 30mA. Provided by the meter.
- Full Scale Ranges:**User adjustable to any scaling between -1999 to +1999.
- Input Impedance:**70Ω. Maximum 1.4V drop
- A/D Converter:**12 Bit Dual Slope
- Accuracy:**± (0.05% of reading + 3 digits)
- Temperature Coefficient:** 100ppm/°C (Typical)
- Warm Up Time:**One minute to specified accuracy
- Conversion Rate:**3 readings per second
- Display:**0.56" hi efficiency Red or optional Green LEDs. Display Hold and Display Test are provided.
- Polarity:**Bipolar. Assumed positive displays negative.
- Decimal Selection:**Header under face plate, X•X•X•X•
- Over-range Indication:** ...Most significant "1" digit and polarity signal are displayed with all other digits blank.
- Power Supply (std):**120/240V AC, 50/60 Hz. approx 2.5W.
(Optn) VO-DC/ISOIsolated Switcher 9 to 36V DC/12 to 24V AC
(Optn) VO-24VIsolated Transformer 24V AC ±10%
(Optn) VO-5V DCNon-isolated 5V DC ±10%
- Operating Temperature:** ..-10 to 50 °C
- Storage Temperature:**-20 to 70 °C
- Relative Humidity:**95% (non-condensing)
- Case Dimensions:**1/8 DIN, Bezel: 96x48mm (3.78"x1.89")
Depth behind bezel 117 mm (4.61") plus 11.8mm (0.47") for Right-angled Connector or 20mm (0.79") for Straight-through Connectors.
- Weight:**11 oz., 14 oz when packed

DU-Series, the OEMs choice for switchboard and process indication

DU-35AC11/5AC amps, Scaled RMS. (1 or 5 Amp Internal shunt), 3.5 digit
DU-35ACIRMS1/5 ..AC amps, True RMS. (1 or 5 Amp Internal shunt), 3.5 digit
DU-40AC11-5AC amps, Scaled RMS. (1 or 5 Amp Internal shunt), 4 digit
DU-35ACAC volts, Scaled RMS. 199.9/700V AC Header Selectable Ranges, 3.5 digit
DU-35ACRMSAC volts, True RMS 199.9/700V AC Header Selectable Ranges, 3.5 digit
DU-40ACAC volts, Scaled RMS. 700.0V AC full scale, 4 digit
DU-35HZ15.0Hz to 199.9Hz or 15/500Hz. Up to 700V AC input, 3.5 digit
DU-35DC volts ±2V/±20V/±200V Header Selectable Ranges, 3.5 digit
DU-35MVDC mV ±50mV, ±100mV, ±200mV Header Selectable Ranges, 3.5 digit

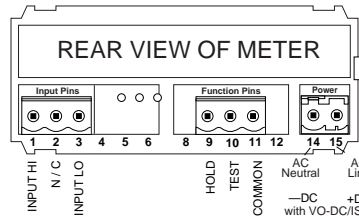
DU-45DC volts ±2V/±20V/±200V Header Selectable Ranges, 4.5 digit
DU-45MVDC mV ±50mV/±100mV/±200mV Header Selectable Ranges, 4.5 digit
DU-35CLProcess 4 to 20mA (100.0), easily user scalable, 3.5 digit
DU-35CLEProcess 4 to 20mA (100.0) with 24V DC excitation, scalable, 3.5 digit
DU-45CLProcess 4 to 20mA (100.00), easily user scalable, 4.5 digit
DU-35PPressure, strain gage and load cell, 4 and 6 wire, 5V DC excitation, Header Selectable Sensitivity 2mV/V, 5mV/V, 10mV/V, 20mV/V, 3.5 digit
DU-35J/KOrder J or K Thermocouple and °C or °F, 3.5 digit
DU-35RTD100Ω platinum RTD, 3 or 4 wire, order °C or °F and 0.1° or 1°, 3.5 digit

Functional Diagram



Connector Pinouts

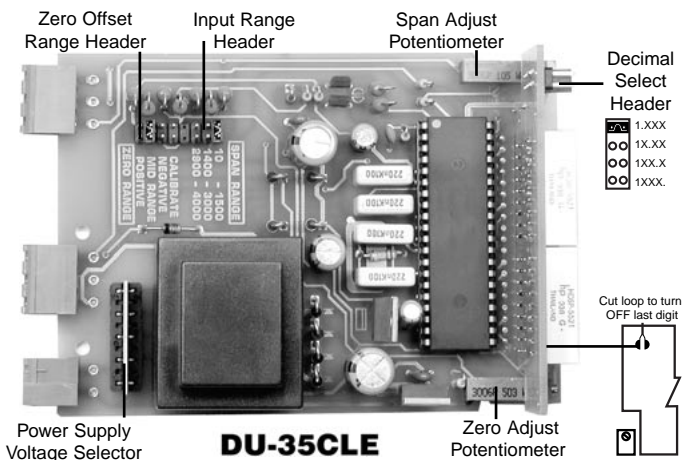
This meter is supplied with plug-in type screw terminal connectors. The power supply pins (14 & 15) have a unique plug and socket outline to prevent cross connection. (see DU Connectors)



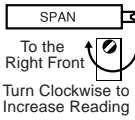
WARNING: AC and DC input signals and power supply voltages can be hazardous. Do Not connect live wires to screw terminal plugs, and do not insert, remove or handle screw terminal plugs or internal jumper clips with live wires connected to the meter.

- Pin 1 - Signal Input High:** Signal high input for the meter when the built-in 24V excitation is used.
- Pin 2 - Signal Input High:** Signal high input for calibration and scaling when the built-in 24V excitation is not used.
- Pin 3 - Signal Input Low:** Signal low input for the meter.
- Pin 9 - Hold Reading:** If this Pin is left unconnected, the meter will operate in a free-running mode. When this pin is connected to the Hold/Test Common Pin 11, the meter will latch up. A/D conversions will continue, but the display will not be updated until Pin 9 is disconnected from the Hold/Test Common pin 11.
- Pin 10 - Display Test:** All numeric display segments will light up when this pin is connected to the Hold/Test Common Pin 11.
- Pin 11 - Hold/Test Common:** The Hold and Display Test Pins have to be connected to this pin to activate their respective functions.
- Pins 14 & 15 - AC Power Input:** These pins are the Power Input pins for the meter. All DU-Series meters sold in North America are pre-configured at the factory for 100/120VAC operation. To re-configure for 200/240VAC operation, simply pull out the AC Power Voltage Selector located directly behind the transformer, turn it around and re-insert it into the socket so that "200/240V AC" is visible. Various other AC/DC power options are available. See Ordering Information for details.

Component Layout



Signal Conditioning Components

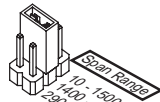


SPAN Potentiometer (Pot)

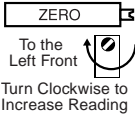
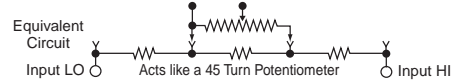
The 15 turn SPAN Pot is always on the right side (as viewed from the front of the meter). Typical adjustment is 37% of the input signal range.

SPAN ADJUST Header

This three position header enables the SPAN Pot, in three equal overlapping 37% steps, to precisely scale down the input Signal Span, to provide any required Digital Display Span. Without any scaling or offset, a 4mA to 20mA input would produce a digital output of 1000 to 5000, which is a Digital Display Span of 4000 counts.



SPAN Adjust Header position	10 to 1500	1400 to 3000	2900 to 4000
SPAN Pot %	37%	37%	37%
Signal Span %	37%	75%	100%

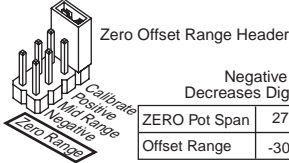


ZERO Potentiometer (Pot)

The ZERO Pot is to the left of the SPAN Pot. It enables the Digital Display Span to be offset 2000 to 2700 counts, depending on the Zero Offset Range Header position selected.

ZERO OFFSET RANGE Header

This four position header enables the ZERO Pot to offset the Digital Display Span -3000 to +2000 counts with a user selectable Negative offset, Mid-range (- & + offset), Positive offset, and a Calibrate position (ZERO Pot disengaged). The Calibrate position facilitates a simple two step calibration with no interaction between Span and Offset.



Zero Offset Range Header	Calibrate position, Zero Pot Disengaged	Positive Offset	Mid Range	Negative Offset
ZERO Pot Span	2700 Counts	2300 Counts	2000 Counts	Decreases Digital Reading
Offset Range	-300 to +2000	-300 to +2000	-1000 to +1000	-3000 to -300

Calibration Procedure (use pins CAL & Input LO)

For calibration use pins CAL & Input LO to bypass the 24V excitation.

The first step is to disengage the ZERO Pot and scale down the Signal Span input to produce the desired Digital Display Span output.

Signal Span is defined as the total change of signal input that would be required for a specific change of the Digital Display. The largest Signal Span that can be specified with a 4 to 20mA input is 16mA. A 4mA Signal Span proportionately scaled can meet full scale display accuracy.

Digital Display Span is defined as the exact total in counts, that the display would change within a specific Signal Span. The largest Digital Display Span that can be displayed is -1999 to +1999 (4000 counts). 16mA can not display +4000, so instead 4mA can be scaled to +1000.

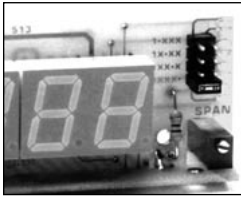
The second step is to select a Zero Offset Range and offset the Digital Display Span with the ZERO Pot, until the desired reading is displayed.

Maximum offset is -3000 to +2000 counts. A Digital Display Span of 4000 counts requires an offset of -3000 to display -1999 to +1999.

For example: A 4 to 20mA input to read -40.0°C to +199.9°C
Signal Span = 16mA, Digital Display Span = 2400 counts.

- Remove the meter from its case and set the Zero Offset Range Header to the Calibrate position. Select the 1400 - 3000 position on the Span Adjust Header and slide the meter back into the case.
- Connect power to the meter and apply 4mA (25% of 16mA). Adjust the SPAN Pot until the display reads +600 (25% of 2400). The meter is now scaled for a Signal Span of 16mA and a Digital Display Span of 2400 counts. In the example 4mA should read -400 and 20mA read 1999, therefore the Digital Display Span should be offset by -1000.
- Disconnect power and remove the meter from the case, select the Negative offset position on the ZERO OFFSET RANGE Header, and slide the meter back into the case.
- Connect power to the meter, apply 4mA and adjust the ZERO Pot until the display reads -400. With the Digital Display Span now offset by -1000 counts, the meter will read -400 for a 4mA input, and read +1999 for a 20mA input. Select decimal point 1XX.X to display -40.0 to +199.9. Then apply the self adhesive °C symbol (from the Face Plate Descriptor sheet provided) to complete the calibration.

Decimal Point Selection



Decimal selection is made on the front of the display board by moving the jumper to the indicated position on the header for the decimal required.

Rear Selection of Decimal Points

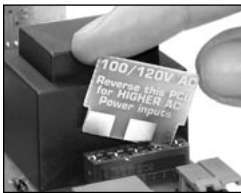
An optional output board is available that provides access to all decimal points via a rear PCB edge connector.

Opening Back Panel



To open back panel, insert a flat screwdriver or similar instrument in both slots on the top of the case and pry open. The DU-Series meters slide out from the rear of the case as a complete assembly.

Selecting Power Supply Voltage

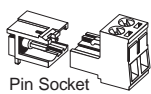


This unique voltage selector PCB displays the operating voltage selected. To change the voltage, disconnect power to the meter. Remove the selector, reverse the selector and fully re-insert it in the socket. This selector is not required for optional power supplies.

DU-Series Connector Options

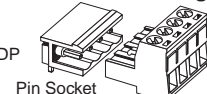
Plug-in Screw Terminal Connectors are Provided

Input Power Screw Terminal Plug



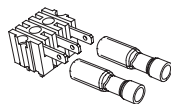
Part Number:
93-PLUG2P-DP

Right-angled Screw Terminal Plug



Part Numbers:
93-PLUG2P-DR.....2 pins
93-PLUG3P-DR.....3 pins
93-PLUG4P-DR.....4 pins
93-PLUG5P-DR.....5 pins
93-PLUG6P-DR.....6 pins

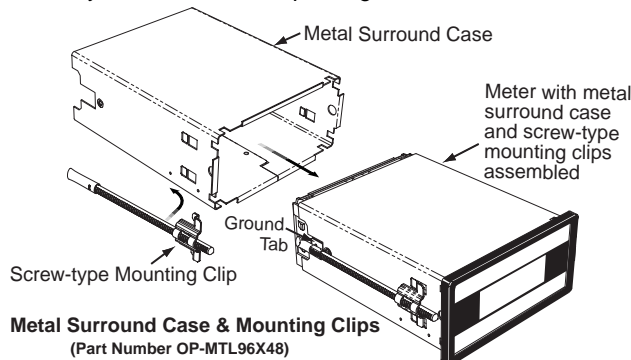
Spade Lug pinouts and insulated quick disconnects may still be ordered as an option. P/N.:CN-SPADE.



Metal Surround Case Option

The meter's plastic case is made from fire retardant polycarbonate. A metal surround case can be ordered to enhance the meter's fire retardant capabilities and also provide shielding against electromagnetic interference (EMI). The metal case slides over the polycarbonate case and is held firmly in place by spring-type non-return clips. The Metal Surround Case must be factory installed on the polycarbonate case and once installed, it cannot be removed in the field.

With the metal case in place, the meter's standard ratchet-type mounting clips can not be used. Instead a pair of screw-type DIN standard mounting clips are provided, which clip into holes on the side of the metal case and tighten against the rear of the panel. A ground tab on the metal case enables the metal case to be easily connected to the panel ground.



Face Plate Descriptors

AC	Ω	kV	kVAR	m ³ /hr	Hz	RPM
V	mV	min	PF	°F	°C	Cosθ
DC	x10kN	μA	PSIG	mS	kg/cm ²	psi
KW	W	KWH	pH	%	K	kPa
A	mbar	mA	MW	kA	RPS	MWH
mWs	μm	kW/s	l	l/sec	ml	cm
ORP	mm/s	1/min	mm	kg/sec	lbs	kg/hr
FT	bars	min ⁻¹	m/min	Mvars	μV	dB

To customize the face plate, each DU-meter is supplied with a white printed clear adhesive label containing various popular descriptors. Choose the descriptor desired, peel off the adhesive backing and align the descriptor in the center right of the faceplate.

Custom Face Plates



Texmate Produces Thousands of Custom OEM Face Plates

Have Texmate Design and Build a Custom Face Plate to Suit your Next project!

- Custom face plates have a non-recurring artwork charge. A serial number is then assigned to each artwork, to facilitate re-ordering.

- Small Run or One-Off custom face plates incur an installation charge, and are generally printed on a special plastic film, which is then laminated to custom faceplate blanks as required.
- Large Run (250 pieces min): custom face plates are production silk screened, issued a part number, and held in stock for free installation as required by customer orders.
- OEMs may also order Custom Meter Labels, Box Labels Custom Data Sheets and Instruction Manuals.

Optional Display Styles



DU Series Above-Center Display Option



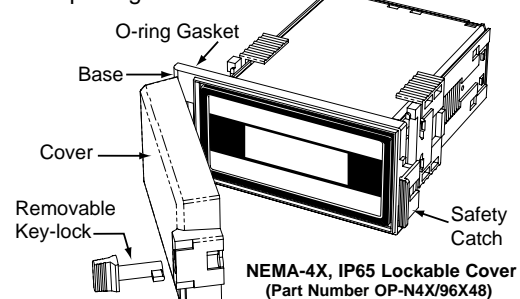
0.8" LED Options available in Lynx Family

To match all display styles, DU-Meters have an optional display and faceplate with the digits positioned above center. (see Display Options)

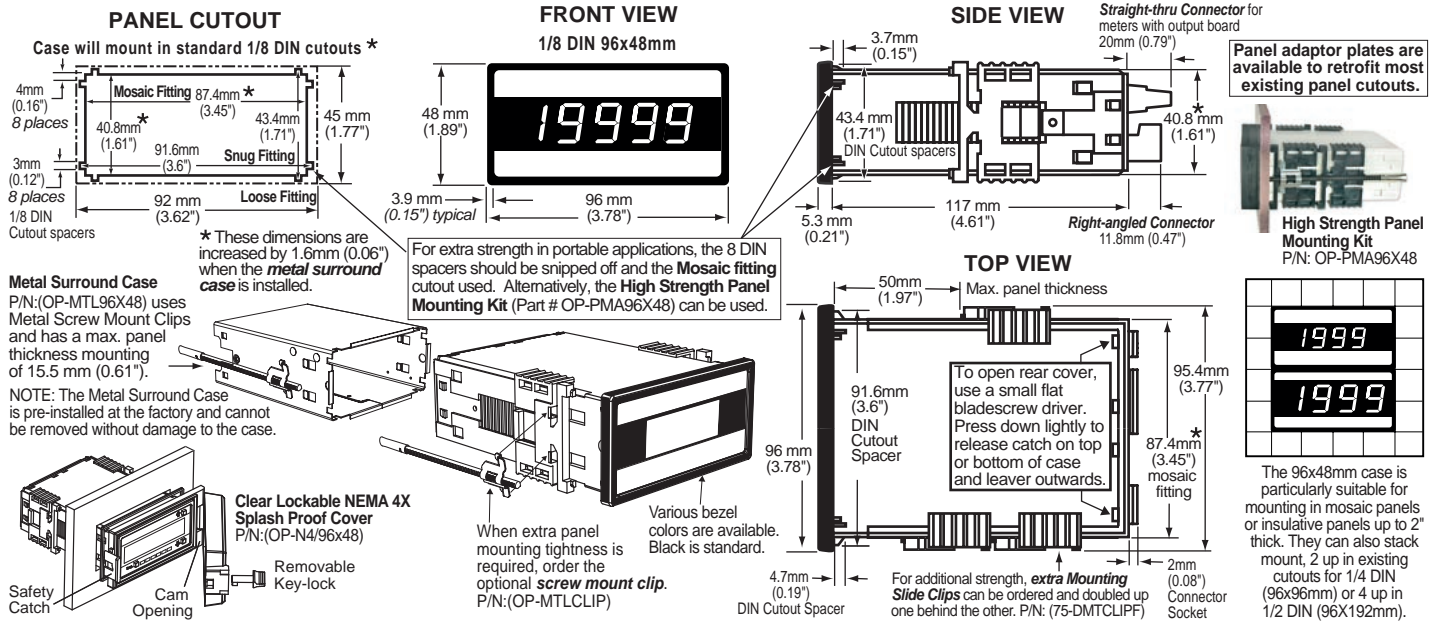
For 0.8" LEDs in 1/8 DIN cases order Lynx family DX-35 and DX-40 w/ LR or LG displays and input modules that match DU-Series inputs.

Clear Lockable Water-proof Cover

The clear lockable cover is designed to be dust and water proof to NEMA-4X, IP65 standards. The assembly consists of a base and cover with a cam hinge and key-lock fastening mechanism. An O-ring, or neoprene gasket forms a seal between the base and the panel. The cam hinge prevents the cover from closing when opened until pushed closed. The cover has a tapered recess that, when closed, forms a seal with a tapered spigot on the base. A key-lock employs a cam locking device to force the spigot into the recess, ensuring seal integrity. A safety catch keeps the cover closed even when the key is removed, and the keyhole can be used to attach a safety seal clip, preventing unauthorized opening.



DU Case Dimensions and Panel Cutouts



Ordering Information

Standard Options for this Model Number

Part Number	Description	List
► BASIC MODEL NUMBER Includes plug in type screw terminals, standard display and standard power supply unless optional versions are ordered.		
DU-35CLE	DPM, Process 4 to 20mA (100.0) with 24V DC excitation	\$.119
► DISPLAY		
STANDARD	Red LEDs, 0.56 inch high	.N/C
DU-BRIGHT	Super bright Red LEDs, 0.56 inch high	\$.20
DU-GREEN	Green LEDs, 0.56 inch high	\$.10
DU-GREEN 4.5D	Dummy Zero Display Option w/ Green LEDs	\$.25
DU-RED4.5D	Dummy Zero Display Option w/ Green LEDs	\$.25
DU-35HI/BRT	Above center position, .56 inch, Bright Red LED	\$.30
DU-35HI/GRN	Above center position, .56 inch, Green LED	\$.20
DU-35HI/RED	Above center position, .56 inch, Red LED	\$.10
► POWER SUPPLY		
STANDARD	100/120 or 200/240VAC User selectable	.N/C
V0-DC/ISO	Isolated auto-sensing AC/DC 9 to 36 VDC/12 to 24 VAC	\$.35
V0-24V	Isolated transformer 12 VAC or 24 VAC user selectable	\$.15
► SPECIAL OPTIONS (Specify Inputs or Outputs & Req. Reading)		
HD-CHANGE	Range change from the standard input as shown in BOLD type	\$.7
CB-FS35	Non-Std Range and Scale Changes for all DU-35 series	\$.10

WARRANTY

Texmate warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment. Texmate's obligations under this warranty are limited to replacement or repair, at its option, at its factory, of any of the products which shall, within the applicable period after shipment, be returned to Texmate's facility, transportation charges pre-paid, and which are, after examination, disclosed to the satisfaction of Texmate to be thus defective. The warranty shall not apply to any equipment which shall have been repaired or altered, except by Texmate, or which shall have been subjected to misuse, negligence, or accident. In no case shall Texmate's liability exceed the original purchase price. The aforementioned provisions do not extend the original warranty period of any product which has been either repaired or replaced by Texmate.

Special Options and Accessories

Part Number	Description	List
► ACCESSORIES (Specify Serial # for Custom Artwork Installation)		
75-DBBZ9648F	Black Bezel for 96x48mm Case	\$.2
75-DMTCLIPF	Side Slide Brackets (2 pc) - extra set, extra strength	\$.2
76-DU35G	Replacement DU Series grey lens for Green LEDs	\$.3
76-DU35R	Replacement DU Series red lens for Red LEDs	\$.3
76-DUPP/N	Anti-glare protective front lens plate for DU Series	\$.3
93-PLUG2P-DP	Extra Screw Terminal Conn., 2 Pin Power Plug	\$.2
93-PLUG3P-DR	Extra Screw Terminal Conn., 3 Pin Plug	\$.3
CN-SPADE	Spade Lug pinouts and Insulated quick disconnects	\$.5
DN-CAS96X48A	Complete 96x48mm Case with bezel	\$.20
OP-DUEXTDP	Option for External Decimal Point	\$.20
OP-MCLP96X48	Screw Mounting Clips (2 pc) to screw tighten slide brackets	\$.6
OP-MTL96X48	Metal Surround Case includes metal mounting clips	\$.16
OP-N4X/96X48	Clear Lockable Water-proof cover, Nema 4X, IP65	\$.20
OD-KIT-1	Replacement Crimp-on Quick Disconnects (7 per Set)	\$.1
ART-FS-S/D	NRC for Artwork & set-up Custom Faceplate and/or Descriptor	\$.35
ART-FS-S/D/C	NRC for Artwork & set-up Custom Faceplate and Custom Logo	\$.75
ART-FS-001	Produce & Install Custom Faceplate per meter - 1 color no-min	\$.10
ART-FS-002	Produce & Install Custom Faceplate per meter - 2 color no-min	\$.20
ART-FS-003	Produce & Install Custom Faceplate per meter - 3 color no-min	\$.30
ART-FL-001	Custom Faceplate, 250 piece Min. (\$1.00 each) - 1 color	\$.250
ART-FL-002	Custom Faceplate, 250 piece Min. (\$1.40 each) - 2 color	\$.350
ART-FL-003	Custom Faceplate, 250 piece Min. (\$1.80 each) - 3 color	\$.450

Many other options and accessories are available. See full price list for more details.
Prices subject to change without notice.

USER'S RESPONSIBILITY

We are pleased to offer suggestions on the use of our various products either by way of printed matter or through direct contact with our sales/application engineering staff. However, since we have no control over the use of our products once they are shipped, NO WARRANTY WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE is made beyond the repair, replacement, or refund of purchase price at the sole discretion of Texmate. Users shall determine the suitability of the product for the intended application before using, and the users assume all risk and liability whatsoever in connection therewith, regardless of any of our suggestions or statements as to application or construction. In no event shall Texmate's liability, in law or otherwise, be in excess of the purchase price of the product.

Texmate cannot assume responsibility for any circuitry described. No circuit patent or software licenses are implied. Texmate reserves the right to change circuitry, operating software, specifications, and prices without notice at any time.



995 Park Center Drive • Vista, CA 92081-8397

Tel: 1-760-598-9899 • USA 1-800-839-6283 • That's 1-800-TEXMATE

Fax: 1-760-598-9828 • Email: sales@texmate.com • Web: www.texmate.com

Texmate has facilities in Japan, New Zealand, Taiwan, and Thailand. We also have authorized distributors throughout the USA and in 28 other countries.

For product details visit www.texmate.com

Local Distributor Address