TEXMATE

Large display option 0.8” red or green LED


LEOPARD FAMILY

c UL us
LISTED
E469078

DL-40

Leopard Panel Meter
4 Digit 0.56” or 0.8” LEDs
in a 1/8 DIN CASE

An economically smart programmable meter relay with isolated 4 to 20 mA retransmission or control loop output capability for measurement and control applications in a 96x48mm case.

General Features

- External transmitters or signal conditioners can be eliminated by direct connection of the sensor output to more than 38 Plug-in Input Signal Conditioners that include:

– AC/DC Current	– Pressure	– Resistance
– AC/DC Voltage	– Process	– *Temperature
– Load Cell	– Prototype	– 4 to 20 mA

  *See models DL-40H for higher accuracy digitally linearized thermocouple and RTD
- Optional isolated 16 bit analog output. User or factory scalable to 4 to 20 mA, 0 to 20 mA or 0 to 10 V across any desired digital span from ± one count to the full scale range of – 1999 to 9999 (12000 counts).
- Auto-sensing AC/DC power supply. For voltages between **85-265 VAC / 95-300 VDC (PS1)** or 15-48 V AC / 10-72 V DC (PS2).
- 24 V DC excitation is available to power external transmitters and 5 or 10 V DC excitation is available for resistance bridge type sensors such as Load Cells and Pressure Transducers.
- Standard red or optional green or super bright red 4-digit LED with display range –1999 to 9999 (12000 counts).
- Red or green 0.8” LED large display option
- Four annunciator LEDs provide front panel alarm status indication for up to four setpoints.
- Two 9 Amp Form C and two 4 Amp Form A relays, or optionally four 4 Amp Form A relays are available.
- Automatic intelligent averaging smooths noisy signals, while providing a fast display response to real level changes.
- UL Listed

Software Features

- Three-button programming from the front panel (UP, DOWN and PROGRAM buttons).
- Three front panel selectable ranges.
- Front panel selectable four-level brightness control of digital display, and setpoint LEDs.
- Four programmable setpoints.
- Relay activation can be selected to occur above (HI) or below (LO) each setpoint.
- Hysteresis setting for all four setpoints. Delay on make and delay on break for SP1 and SP2.
- Peak and Valley. View and Reset.

Input Module Compatibility

☑ **LEOPARD FAMILY**: More than 38 different Plug-in **I-Series** Input Signal Conditioners are approved for Texmate’s Leopard Family of meters.

See www.texmate.com for an up to date listing.


LEOPARD

Specifications

Input Specs:	Depends on Input signal conditioner
A/D Converter:	14 bit single slope
Accuracy:	±(0.05% of reading + 2 counts)
Temp. Coeff.:	100 ppm/°C (Typical)
Warm up time:	2 minutes
Conversion Rate:	5 conversions per second (Typical)
Display:	**4 digit 0.56" Red LED display (std)**, 0.56” or 0.8" Red, Green or Super Bright Red (optn) Range –1999 to 9999 counts.
Polarity:	Assumed positive. Displays – negative
Decimal Selection:	Front panel button selectable, X•X•X•X•
Positive Overrange:	Top segments of digital display flash
Negative Overrange:	Bottom segments of digital display flash
Relay Output:	Two 4 Amp Form A relays and two 9 Amp Form C, or 4 Amp form A relays.
Analog Output:	Isolated 16 bit user scalable mA or V
AIC (mA out)	4-20 mA @ 0 to 500Ω max loop resistance
AIV (volts out)	0-10 V DC @ 500 Ω or higher resistance
Power Supply:	AC/DC Auto sensing wide range supply
PS1 (std)	**85-265 VAC 50-400Hz / 95-300 VDC @ 3W**
PS2	15-48 VAC 50-400HZ / 10-72 VDC @ 2.5W
Operating Temp.:	0 to 50 °C
Storage Temp:	–20 °C to 70 °C.
Relative Humidity:	95% (non condensing)
Case Dimensions:	1/8 DIN, Bezel: 96x48 mm (3.78”x1.89”) Depth behind bezel: 117 mm (4.61”) Plus 11.8 mm (0.47”) for Right-angled connectors, or plus 20 mm (0.79”) for Straight-thru connector.
Weight:	6.5 oz., 8.5 oz when packed

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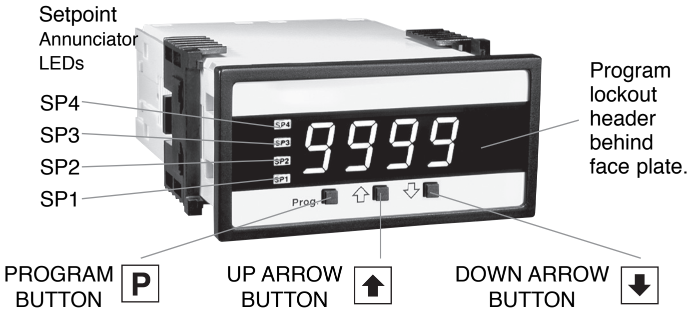
Controls and Indicators



Front Panel Buttons

Program Button

The P button is used to move from one program step to the next. When pressed at the same time as the ↑ button, it initiates the **calibration mode**. When pressed at the same time as the ↓ button, it initiates the **setpoint setting mode**.

Up Button

When in the operational display, pressing the ↑ button alone, allows you to view and reset the Peak and Valley (Highest and Lowest Readings.)

When in the **calibration mode** or the **setpoint setting mode** the ↑ button is used to increase the value of the displayed parameter.

Down Button

When in the operational display, pressing the ↓ button alone, allows you to view, but not change, the setting of setpoint 1,2,3 & 4.

When in the **calibration mode** or the **setpoint setting mode** the ↓ button is used to decrease the value of the displayed parameter.

Glossary of Programming Symbols

To explain software programming procedures, logic diagrams are used to visually assist in following the programming steps. The fol-lowing symbols are used to represent various functions and associated display elements of the meter:

Symbol **Explanation**

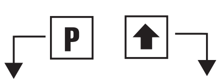
This symbol represents the OPERATIONAL DISPLAY.

P

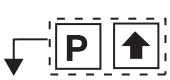
This is the PROGRAM button.

This is the UP button.

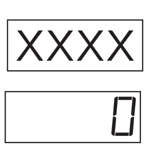
This is the DOWN button.



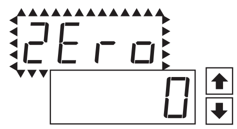
When a button is shown, press and release it to go onto the next step in the direction indicated by the arrow. When two or more buttons are shown, each with an arrow, this indicates that there is a number of programming choices.



When two buttons are shown side by side and enclosed by a dotted line, they must be pressed at the same time then released to go onto the next programming step.



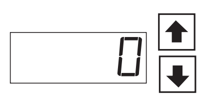
If the display is shown with XXXX it means the value displayed will be the previously set value. When a number is shown it indicates the initial factory default setting or a specific “example number”.



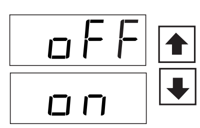
When two displays are shown together with bursts, this indicates that the display is toggling (flashing) between the name of the function and the value.

[Span]
[10000]

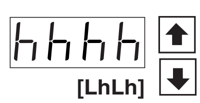
Text or numbers shown between square brackets in a procedure indicate the programming code name of the function or the value displayed on the meter display.



When the ↑ and ↓ buttons are shown together, the display value can be increased by pressing and releasing the ↑ button or decreased by pressing and releasing the ↓ button.

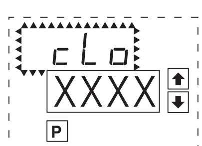


When the ↑ and ↓ buttons are shown with two displays, either display can be selected by pressing and releasing the ↑ or ↓ buttons.



[LhLh]
[hLhh]
[LLLh]

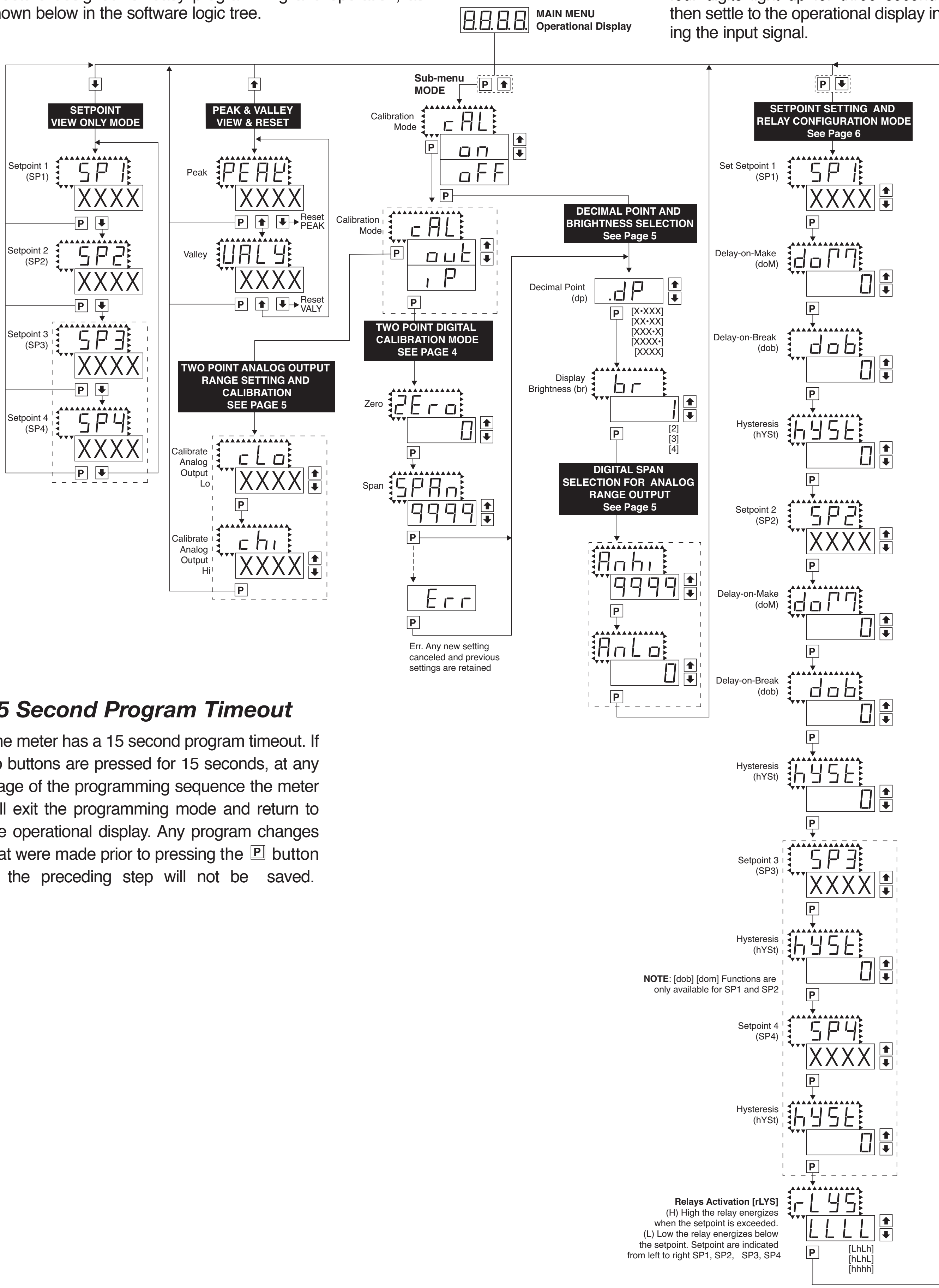
When there are more than two display selections they are shown in brackets below the first display and are also selectable by pressing and releasing the ↑ or ↓ buttons.



A dotted box indicates these functions are omitted or bypassed when the related hardware is not present

The DL-40 is an intelligent meter with a hierarchical software structure designed for easy programming and operation, as shown below in the software logic tree.

After the meter has been powered up, the four digits light up for three seconds and then settle to the operational display indicating the input signal.



15 Second Program Timeout

The meter has a 15 second program timeout. If no buttons are pressed for 15 seconds, at any stage of the programming sequence the meter will exit the programming mode and return to the operational display. Any program changes that were made prior to pressing the P button in the preceding step will not be saved.

Digital Calibration Mode

This mode enables the meter to be calibrated with an automatic scale factor calculation, by applying a high input signal, entering the desired reading for that signal, then applying a zero or low input signal, and then entering the desired 0 or low reading. The meter then automatically calculates and programs in the requisite scale factor, within the following parameters.

1. Positive and negative signals may be applied, but the difference between the high and the low signal inputs must be at least 1000 counts or Err will be indicated.
2. Positive and Negative values for the desired reading can be entered, but the scale factor created can not exceed the Digital Display Span capability of the meter which is 12,000 counts between –1999 to 9999.
3. The internal Signal Span is limited to 3 V DC between – 1 V DC to + 2 V DC. Any outputs from an Input Signal Conditioning module that exceed these limits will cause the meter to indicate overrange regardless of the Digital Display Span scaled.

Note: Most input signal conditioners have provisions for analog calibration and scaling. If the meter's digital scale factor is set to read zero with a zero input (shorted input), and to read 1000 with a 1.000 V input, any pre-calibrated signal conditioner with an output that does not exceed – 1 V to + 2 V, will read correctly in the meter without any further calibration.

Digital Calibration Procedure

STEP A Enter the Calibration Mode

1) Press the P and ↑ buttons at the same time.
   Display toggles between [cAL] and [oFF].
2) Press the ↑ or ↓ button.
   Display changes from [oFF] to [on].
3) Press the P button. Display toggles between [ZEro] and the previous zero setting.

STEP B Select Between Two Point Digital Calibration of Input Signal and Two Point Analog Output

Note: If the analog output option is not present, Step B is skipped and the program goes directly from Step A to Step C.

1) Press the ↑ or ↓ button to select the display toggling from [cAL] to [iP] input calibration.
2) Press the P button. Display toggles between [ZEro] and the previous zero setting.

STEP C Set the Meter's Low Input Signal Reading on the Digital Display

1) Apply a zero or low signal to the meter.
   (Positive or negative values are allowed)
2) Using the ↑ and ↓ buttons, adjust the meter display to the desired reading for the applied low input signal.
3) Press the P button. Display toggles between [SPAn] and the previous span setting.

STEP D Set the Meter's High Input Signal Reading on the Digital Display

1) Apply a high input signal to the meter.
2) Using the ↑ and ↓ buttons, adjust the digital display to the desired reading for the applied high input signal.
3) Press the P button.

The Digital Calibration Procedure Mode is Now Complete.

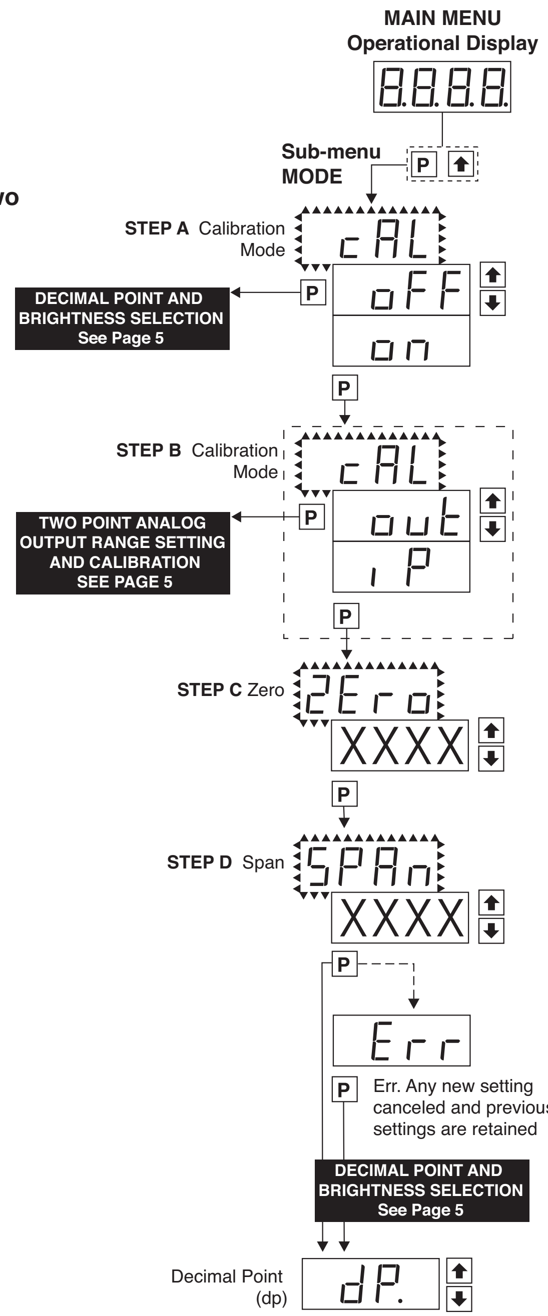
If the digital calibration was successfully completed, the menu branches to the DISPLAY FUNCTION CONFIGURATION MODE, (see page 7) and the display flashes [dP] and the previous setting.

ERROR Indicates Unsuccessful Calibration

If the calibration was unsuccessful, the display indicates [Err], the new calibration settings just entered will not take effect and the previously stored setting will remain.

The three most likely causes of an error during calibration are:

1) The full scale and zero signals were too similar. The full scale signal must be at least 1000 counts greater than the zero or low input signal (positive and negative values are allowed).
2) The scaling requirement exceeded the capability of the meter (–1999 to 9999).
3) No input signal present, or incorrect connections.



Two Point Analog Output Range Setting and Calibration

STEP A Enter the Calibration Mode

1) Press the P and ↑ buttons at the same time.
   Display toggles between [cAL] and [oFF].
2) Press the ↑ or ↓ button. Display changes from [oFF] to [on].
3) Press the P button. Display toggles between [cAL] and [out] input calibration.

Note: If at this point the display skips directly to toggle between [SPAn] and the previous [SPAn], the software is detecting that the optional analog output hardware is NOT installed.

STEP B Enter the Analog [oUT] Output Mode

1) Press the P button. Display toggles between [cLo] and an internal scale factor.

STEP C Set or Calibrate the [cLo] Low Analog Output Range

1) Select the voltage or current loop output header position on the output module. (See Component Layout on page 9).
2) Connect a multimeter to pins 16 and 17 on the output module. (See Rear Panel Pinouts on page 8). Using the ↑ and ↓ buttons, adjust the analog output to the desired low value as shown on the multimeter display.
   cLo may be adjusted to any value from –0.3 mA to 17 mA (mA output selected) or from –0.6 V to 8 V (volt output selected)
3) Press the P button. Display toggles between [chi] and an internal scale factor.

STEP D Set or Calibrate the [chi] High Analog Output Range

1) Using the ↑ and ↓ buttons, adjust the analog output to the desired high value as shown on the multimeter display. chi may be adjusted to any value from 17 mA to 21 mA (mA output selected) or from 8 V to 10.3 V (volt output selected)
2) Press the P button. The display exits the calibration mode and returns to the operational display.

Note: Having established the Low and High range of the analog output, the digital span can now be selected which will set the two digital points between which the analog output will occur. (See Digital Span Selection below).

Decimal Point and Brightness Selection

Enter the Decimal Point and Brightness Mode Through the Sub Menu [CAL] [oFF]

1) Press the P and ↑ buttons at the same time.
   Display toggles between [cAL] and [oFF].
2) Press the P button. Display shows previous [dp] selection.

STEP E Set the Decimal Point

1) Using the ↑ and ↓, adjust the display to the desired decimal point setting.
2) Press the P button. Display toggles between [Br] and the previous [Br] setting.

STEP F Set the Display Brightness

1) Using the ↑ and ↓ buttons, adjust the display to the desired brightness setting (4 is the brightest setting).
2) Press the P button. Display brightness changes to new setting and display toggles between [Anhi] and the previous [Anhi] setting.

Digital Span Selection for Analog Range Output

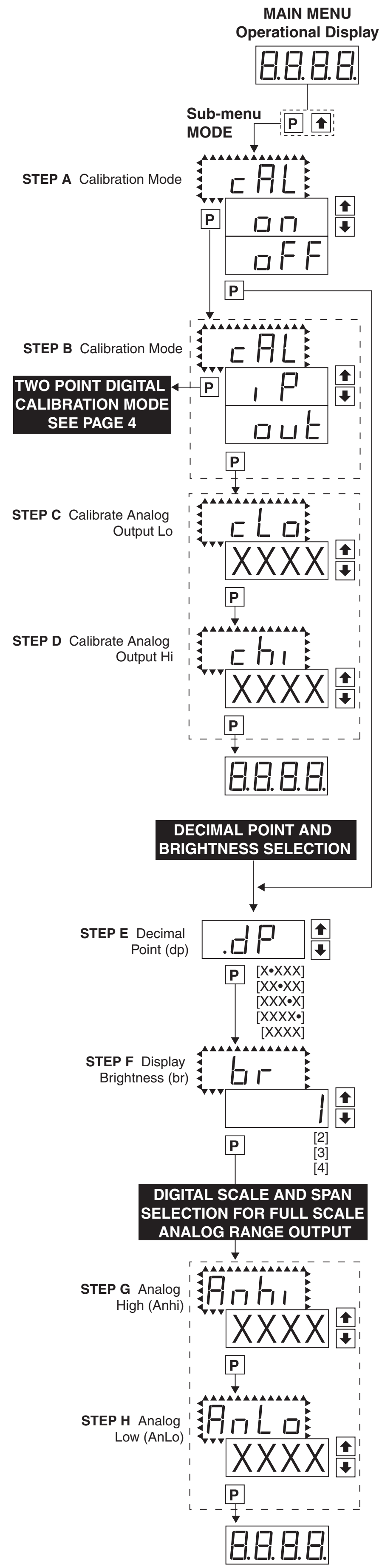
STEP G Setting the Digital Span Point for Analog High Output

1) Using the ↑ and ↓ buttons, adjust the display to the desired digital value which sets the point at which the selected analog high output range will occur.
2) Press the P button. Display toggles between [AnLo] and previous [AnLo] setting.

STEP H Setting the Digital Span Point for Analog Low Output

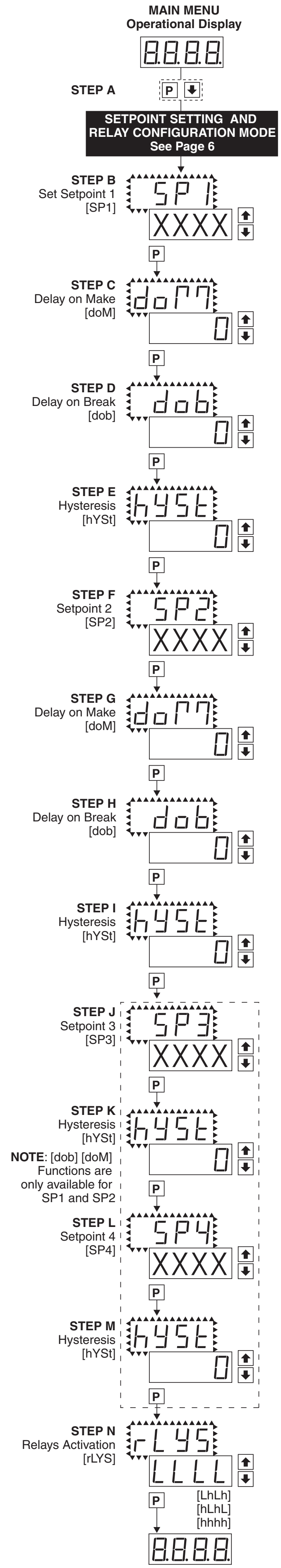
1) Using the ↑ and ↓ buttons, adjust the display to the desired digital value which sets the point at which the selected analog low output range will occur.
2) Press the P button. The display exits the calibration mode and returns to the operational display.

Note: Any two digital scale points from –1999 to 9999 can be selected. The digital scale points for analog high and analog low can be reversed for reversed 20-4 mA output. The span of the digital scale can be as small as two counts however small spans cause the 16 bit D to A to increment in stair case steps.



Setpoint Setting and Relay Configuration Mode

The following programming steps are required to enter the setpoint values and configure the relay functions in a meter with four relays using four setpoints. Generally if less than four relays are installed the software auto detects missing relays and deletes reference to them from the menu. In some cases setpoints without relays are operational for display only purposes.



STEP A Enter the Setpoint Mode

1) Press the P and ↓ buttons at the same time.
   Display toggles between [SP1] and the previous [SP1] setting.

STEP B Set Setpoint 1 (SP1)

1) Using the ↑ and ↓ buttons, adjust the display to the desired SP1 value.
2) Press the P button. Display toggles between [doM] and the previous [doM] setting.

STEP C Set the SP1 Delay-on-Make (doM) Delay Time Setting

1) Using the ↑ and ↓ buttons, adjust the display to the desired [doM] value (0 to 9999 seconds). The reading must continuously remain in an alarm condition until this delay time has elapsed before the relay will make contact (energize).
2) Press the P button. Display toggles between [dob] and the previous [dob] setting.

STEP D Set the SP1 Delay-on-Break (dob) Delay Time Setting

1) Using the ↑ and ↓ buttons, adjust the display to the desired [dob] value (0 to 9999 seconds). The reading must continuously remain in an non-alarm condition until this delay time has elapsed before the relay will break contact (de-energize).
2) Press the P button. Display toggles between [hYSt] and the previous [hYSt] setting.

STEP E Set the Hysteresis Setting for Setpoint 1

1) Using the ↑ and ↓ buttons, adjust the display to the desired hysteresis [hYSt] value.
2) Press the P button. Display toggles between [SP2] and the previous [SP2] setting.
   NOTE: Half of the Hysteresis value selected is applied above and below the setpoint.

NOTE: Steps F, G, H and J have functionally the same procedure as steps B, C, D, and E shown above.

STEP F Set Setpoint 2 (SP2)
STEP G Set the SP2 Delay-on-Make (doM) Delay Time Setting
STEP H Set the SP2 Delay-on-Break (dob) Delay Time Setting
STEP I Set the Hysteresis Setting for Setpoint 2

1) Using the ↑ and ↓ buttons, adjust the display to the desired hysteresis [hYSt] value.
2) Press the P button. Display toggles between [SP3] and the previous [SP4] setting.

STEP J Set Setpoint 3 (SP3) (No [doM] or [dob])

1) Using the ↑ and ↓ buttons, adjust the display to the desired SP3 value.
2) Press the P button. Display toggles between [hYSt] and the previous [hYSt] setting.

STEP K Set the Hysteresis Setting for Setpoint 3

1) Using the ↑ and ↓ buttons, adjust the display to the desired hysteresis [hYSt] value.
2) Press the P button. Display toggles between [SP4] and the previous [SP4] setting.

STEP L Set Setpoint 4 (SP4) (No [doM] or [dob])

1) Using the ↑ and ↓ buttons, adjust the display to the desired SP4 value.
2) Press the P button. Display toggles between [hYSt] and 0.

STEP M Set the Hysteresis Setting for Setpoint 4

1) Using the ↑ and ↓ buttons, adjust the display to the desired hysteresis [hYSt] value.
2) Press the P button. Display toggles between [rLYS] and the previous relay setting.

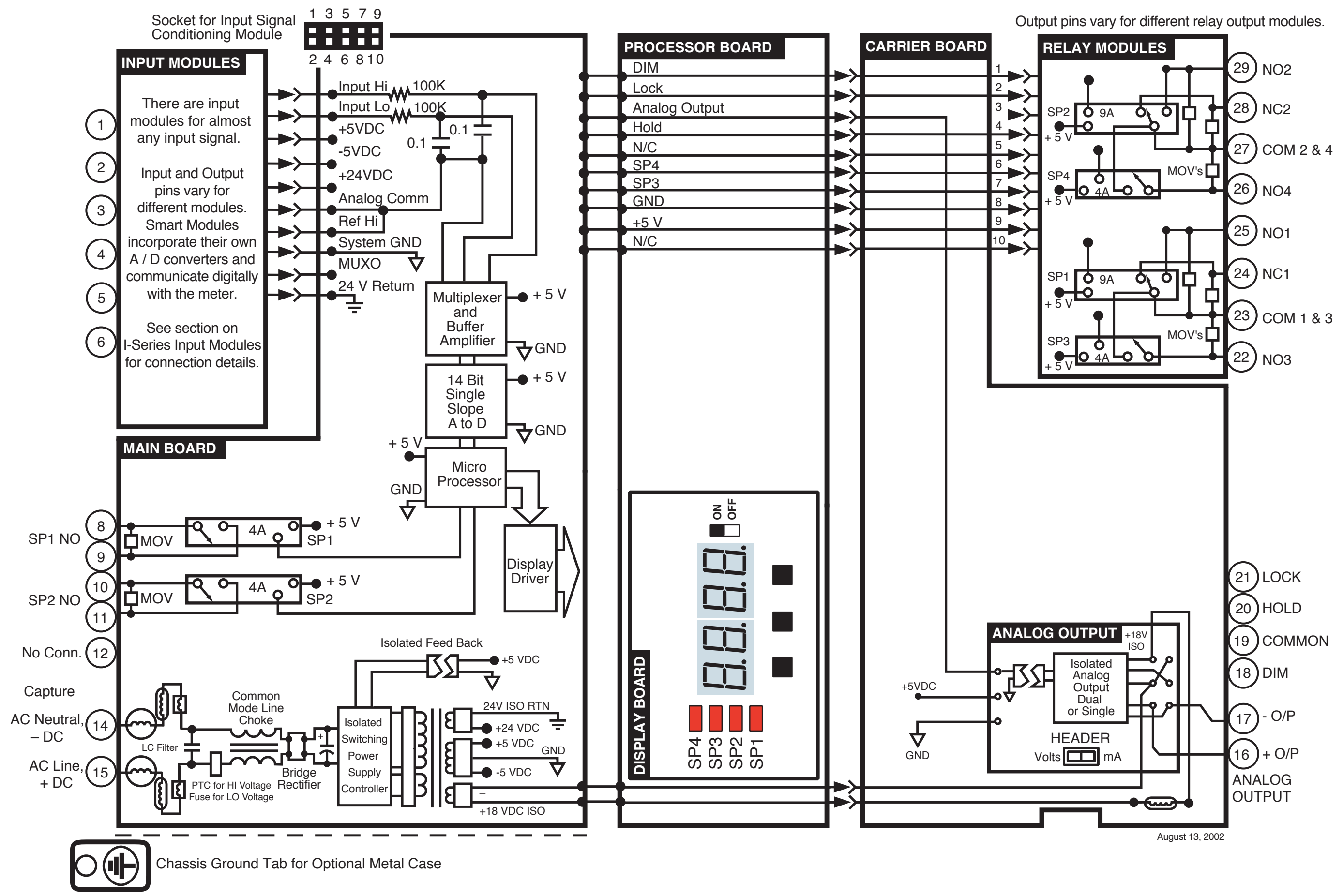
STEP N Set Relay Activation mode [rLYS]

(h) High the relay energizes when the setpoint is exceeded. (L) Low the relay energizes below the setpoint. The setpoint is indicated from left to right SP1, SP2, SP3, SP4.

1) Using the ↑ and ↓ buttons, adjust the reading on the display to the desired relay settings: [LLLL], [LhLh], [hLhL], [hhhh].
   If only 2 relays installed [Lh] [hL] [hh] [LL].
2) Press the P button.
   The meter exits the setpoint mode and returns to the operational display.

The Setpoint Relay programming mode is now complete.

Functional Diagram



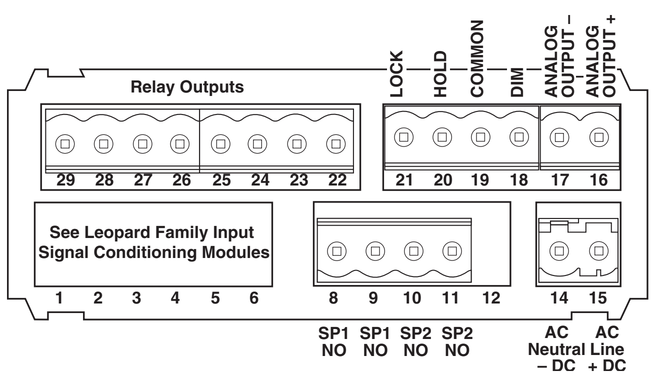
Connector Pinouts

Pinout Diagram

The Rear View of the Meter diagram shows the meter with the relay configuration: dual 9 Amp Form C and dual 4 Amp Form A relays. An analog output module is also shown as installed.

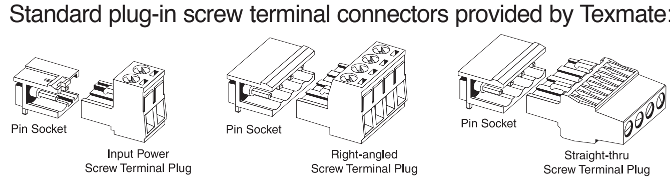
The DL-40 uses plug-in type screw terminal connectors for all input and output connections. The power supply connections (pins 14 and 15) have a unique plug and socket outline to prevent cross connection. The main board and input signal conditioner use right-angled connectors as standard. The output module uses straight-thru connectors as standard.

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 with live wires connected.



Auto-sensing AC/DC power supply. For voltages between 85-265 V AC / 95-300 V DC (PS1) or 18-48 V AC / 10-72 V DC (PS2).

Standard plug-in screw terminal connectors provided by Texmate:



Input Signal – Pins 1 to 6

Pins 1 to 6 are reserved for the input signal conditioner. See the data sheet for the selected input signal conditioner.

Relay Output Pins- Pins 8 to 12

Note: If relays for setpoints 1 & 2 are installed on the main board, a relay output module is not available (and viseversa).

Pin 8 **SP1 NO.**
Pin 9 **SP1 NO.** Normally Open 4 Amp Form A.
Pin 10 **SP2 NO.**
Pin 11 **SP2 NO.** Normally Open 4 Amp Form A.
Pin 12 **NO CONNECTION.**

AC/DC Power Input- Pins 14 and 15

Auto-sensing AC/DC power supply. For voltages between 85-265 V AC/95-300 V DC (PS1) or 18-48 V AC/10-72 V DC (PS2).
Pin 14 **AC/DC Neutral.** Neutral power supply line.
Pin 15 **AC/DC line.** Live power supply line.

Optional Carrier Board Output Pins

Analog Output- Pins 16 and 17

Pins 16 and 17 are the analog output pins on the optional output module. Their pin definitions are:
Pin 16 Positive (+) analog output.
Pin 17 Negative (–) analog output.

Connector Pinouts continued

Pins 18 to 21 – Rear Panel Function Pins

Pins 18 to 21 provide functions that can be implemented with an external switch. Their pin definitions are:

Pin 18 DIM. By connecting the display dim (DIM) pin to the COMMON pin, the display brightness setting is halved.

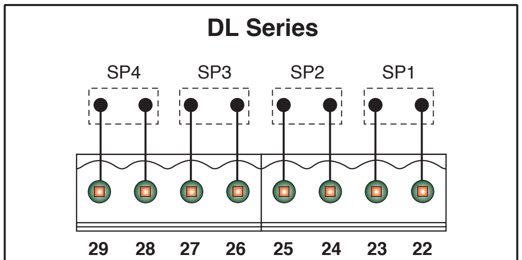
Pin 19 COMMON. To activate the LOCK or DIM functions from the rear of the meter, the respective pins have to be connected to the COMMON pin. This pin is connected to the internal power supply ground.

Pin 20 HOLD. By connecting the HOLD pin to the COMMON pin, the displayed reading is frozen, however, A/D conversions continue. When the HOLD pin is disconnected from the COMMON pin, the correct reading is displayed.

Pin 21 LOCK. By connecting the LOCK pin to the COMMON pin, the meter's programmed parameters can be viewed but not changed.

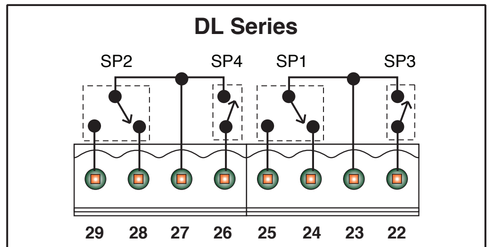
Pins 22 to 29 – Output Module Pins

Relay Modules with 4 Independent 300V (210mA DC only)



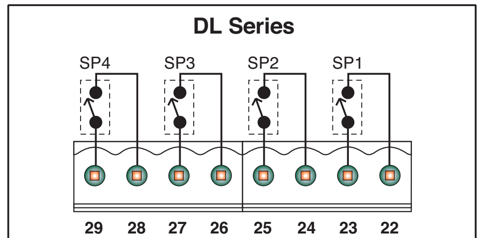
Order Code	Options			
	SP4	SP3	SP2	SP1
OR51	-	-	-	210mA
OR52	-	-	210mA	210mA
OR53	-	210mA	210mA	210mA
OR54	210mA	210mA	210mA	210mA

Relay Modules with 2 Non-Isolated 4A Form A Relays, and 2 Non-Isolated 9A Form C Relays



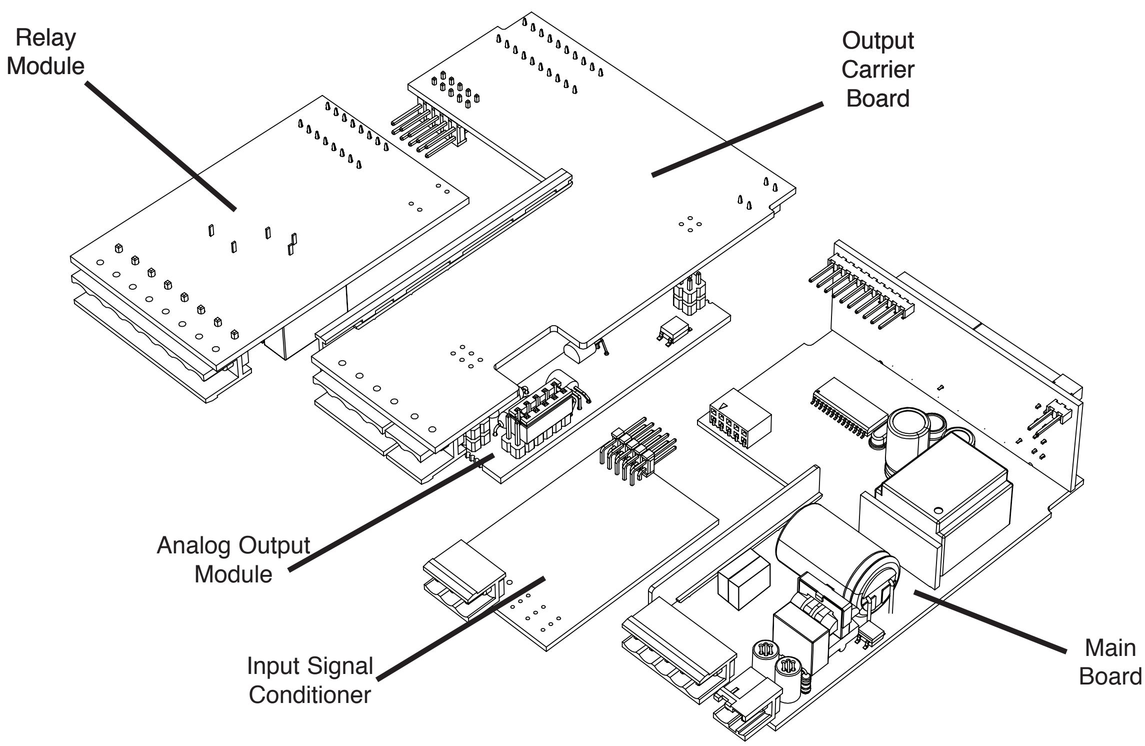
Order Code	Options			
	SP2	SP4	SP1	SP3
OR11	-	-	10A	-
OR12	9A	-	9A	-
OR23	9A	4A	9A	-
OR14	9A	4A	9A	4A
OR15	-	4A	9A	4A
OR16	-	4A	9A	-

Relay Modules with 4 Isolated 5A Form A Relays

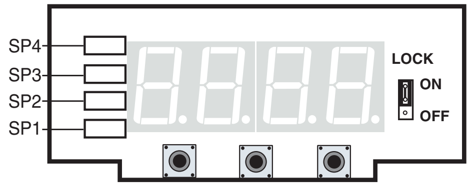


Order Code	Options			
	SP4	SP3	SP2	SP1
OR31	-	-	-	5A
OR32	-	-	5A	5A
OR33	-	5A	5A	5A
OR34	5A	5A	5A	5A

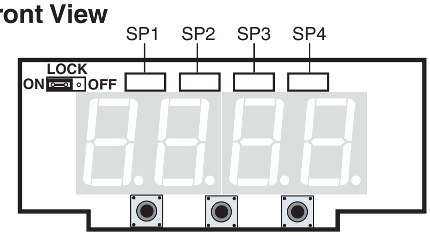
Component Layout



Display Board – Front View

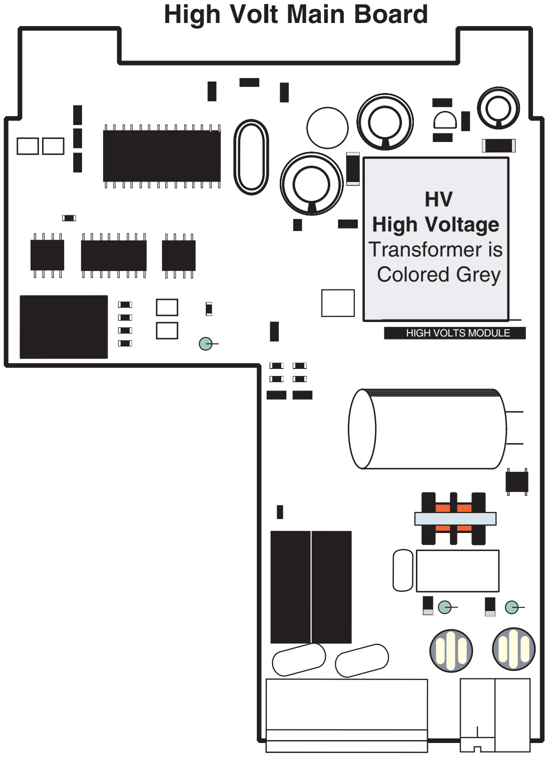


0.56" LED Display Board - Front View

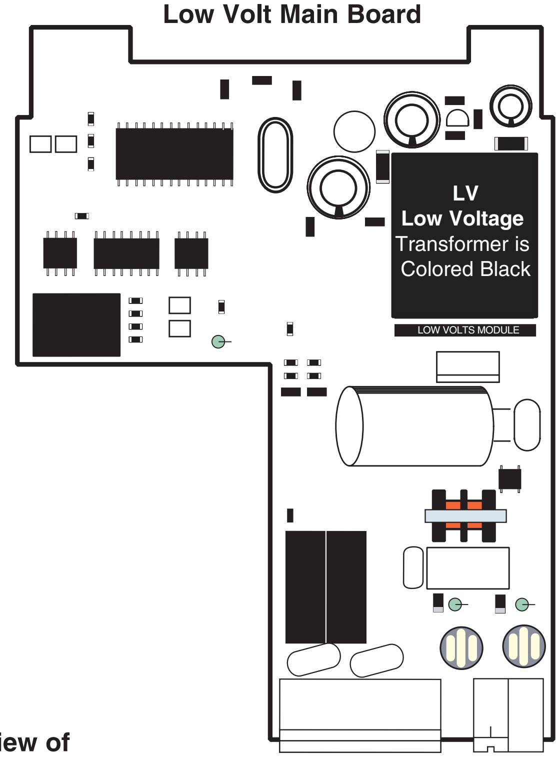


0.8" LED Display Board - Front View

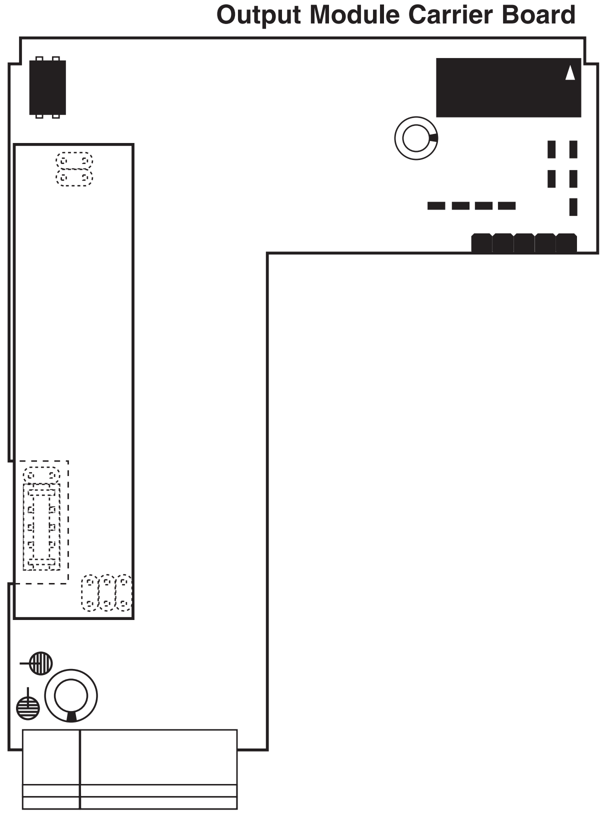
High Volt Main Board



Low Volt Main Board



Bottom View of Output Module Carrier Board



I-Series Input Signal Conditioning Modules

Many additional input modules are available and others are constantly being developed. Check with your local distributor or www.texmate.com for updated information.

Pre-calibrated **I-Series** input modules, that have span or zero potentiometers, can be interchanged between any **I-Series** compatible meter, without recalibration, because all of the analog scaling and reference circuitry is self-contained within the module. Where appropriate, all the standard ranges shown are designed to be header selectable by the user, and Texmate's unique SPAN ADJUST Header facilitates scaling to almost any required engineering unit. See Input Module Component Glossary and Calibration on pages 13 and 14. Also see Two Point Digital Calibration and Digital Calibration on page 4.

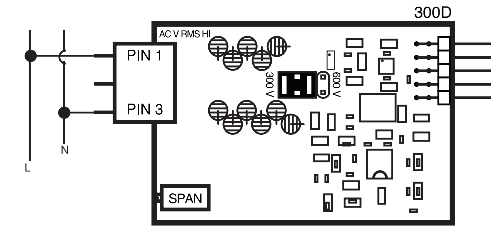
Unless otherwise specified Texmate will ship all modules pre-calibrated with factory preselected ranges and/or scalings as shown in **BOLD** type. Other pre-calibrated standard ranges or custom ranges may be ordered. Factory installed custom scaling and other custom options are also available (see Ordering Information, Special Options on last page).

Symbols Indicate Module Compatibility Within Meter Families		
TIGER Family	TIGER Family	TIGER Family
LEOPARD Family	LEOPARD Family	LEOPARD Family
LYNX Family	LYNX Family	LYNX Family
ALL MODELS	**SOME MODELS**	**MODEL SPECIFIC**

WARNING: AC and DC input signals and power supply voltages can be hazardous. Do Not insert, remove or handle modules with live wires connected to any terminal plugs.

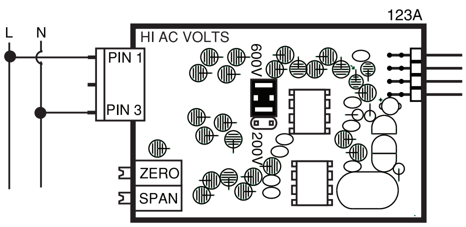
IA06: AC Volts True RMS, **300V AC**

TIGER
LEOPARD
LYNX



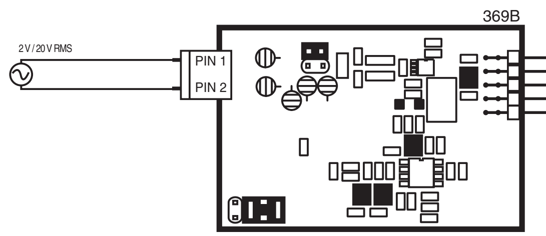
IA01: AC Volts Scaled RMS, 200/**300V** AC

TIGER
LEOPARD
LYNX



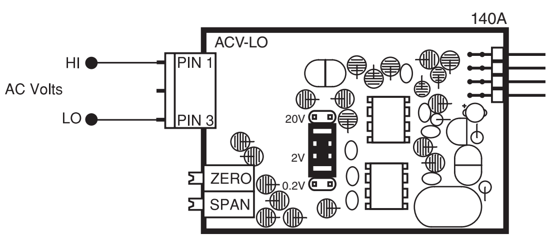
IA07: AC Volts True RMS, 200mV/**2V**/20V AC

TIGER
LEOPARD
LYNX



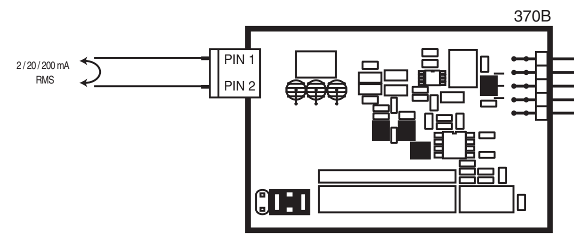
IA02: AC Volts Scaled RMS, 200mV/**2V**/20V AC

TIGER
LEOPARD
LYNX



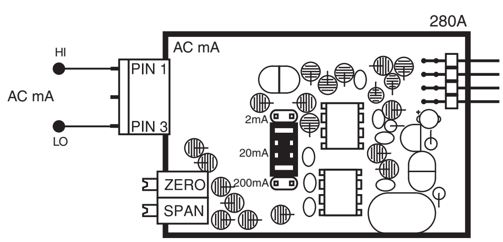
IA08: AC Milliamps True RMS, 2/**20**/200mA AC

TIGER
LEOPARD
LYNX



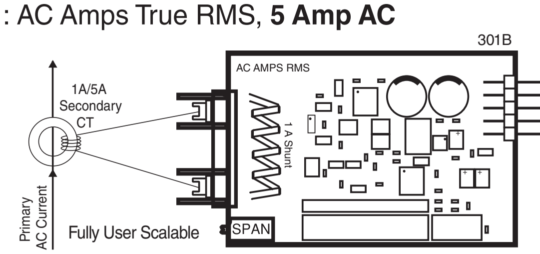
IA03: AC Milliamps Scaled RMS, 2/**20**/200mA AC

TIGER
LEOPARD
LYNX



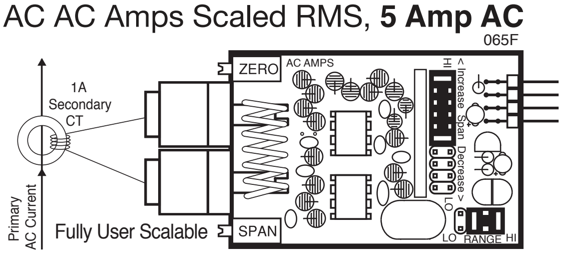
IA09: AC Amps True RMS, **1 Amp AC**
IA11: AC Amps True RMS, **5 Amp AC**

TIGER
LEOPARD
LYNX



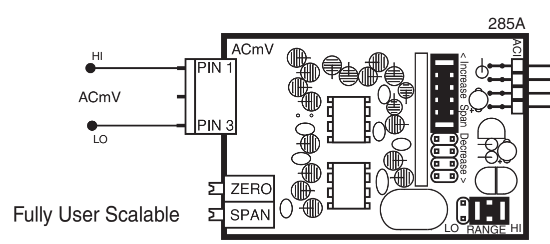
IA04: AC AC Amps Scaled RMS, **1 Amp AC**
IA05: AC AC Amps Scaled RMS, **5 Amp AC**

TIGER
LEOPARD
LYNX

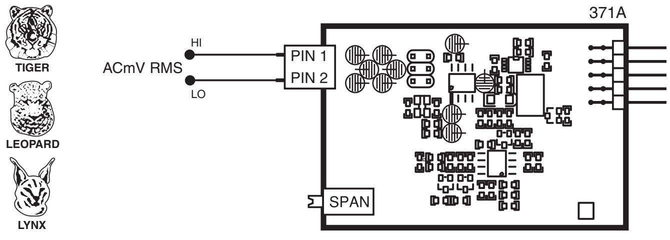


IA10: AC Millivolts, Scaled RMS, **100mV AC**

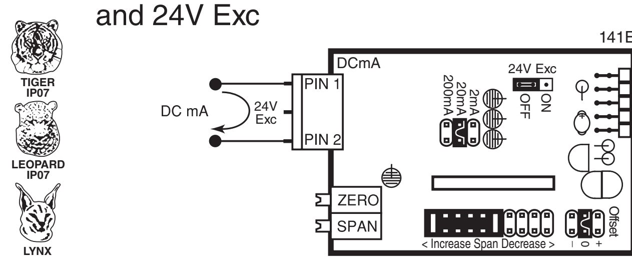
TIGER
LEOPARD
LYNX



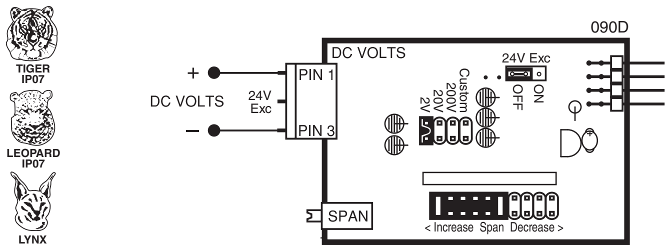
IA12: AC Millivolt RMS Sigma Delta



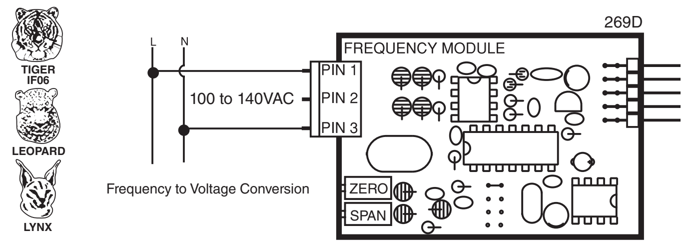
ID07: DC Milliamps, 2/20/200mA DC with Offset and 24V Exc



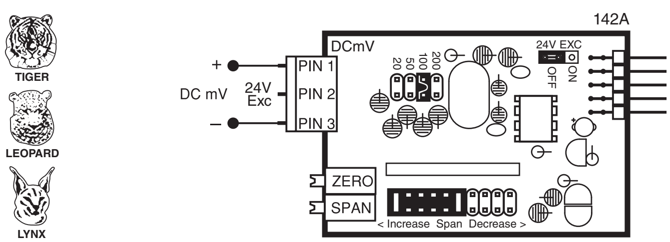
ID01: DC Volts, 2/20/200V/Custom w/24V DC Exc



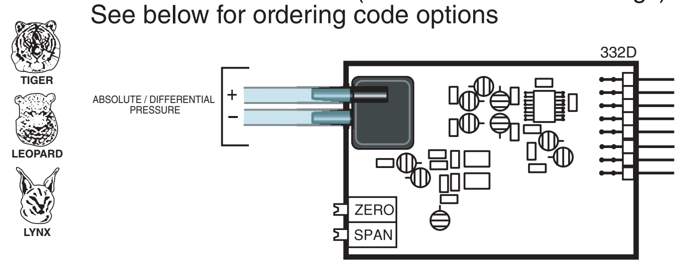
IF02: Line Frequency



ID02: DC Millivolts, 20/50/100/200mV DC w/24V DC Exc



IGYZ: Universal Direct Pressure (Absolute or Differential/Gage) See below for ordering code options



Direct Pressure (IGYX, IGYY & IGYZ) Ordering Code Options

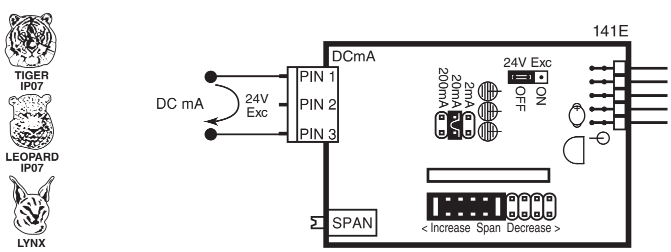
I	G		

For Single Channel IGYX with two digital inputs, the last digit of order code is always X.

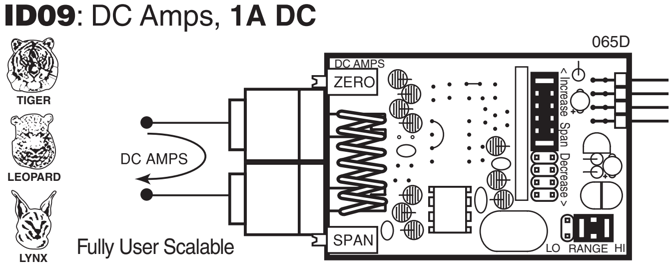
For Universal Direct Pressure IGYZ, the last digit of order code is always Z.

Sensor Range	CH1 Order Code	CH2 Order Code
1 psi Absolute	A	A
1 psi Differential	B	B
5 psi Absolute	C	C
5 psi Differential	D	D
15 psi Absolute	E	E
15 psi Differential	F	F
30 psi Absolute	G	G
30 psi Differential	H	H
100 psi Absolute	J	J
100 psi Differential	K	K

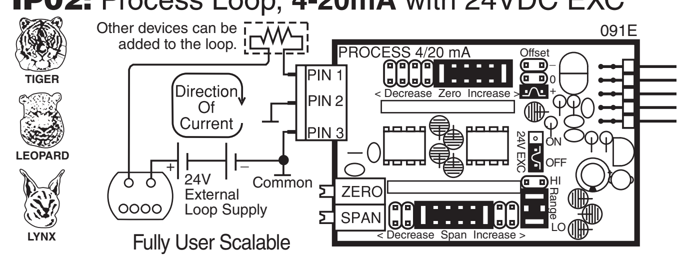
ID03: DC Milliamps, 2/20/200mA DC w/24V DC Exc



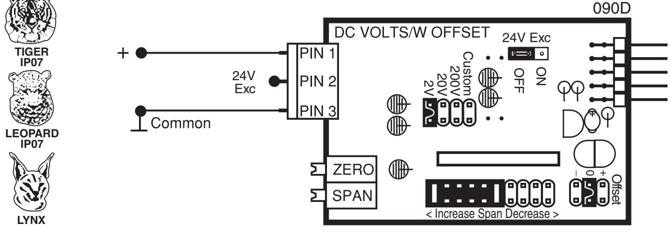
ID04: DC Amps, 5A DC
ID09: DC Amps, 1A DC



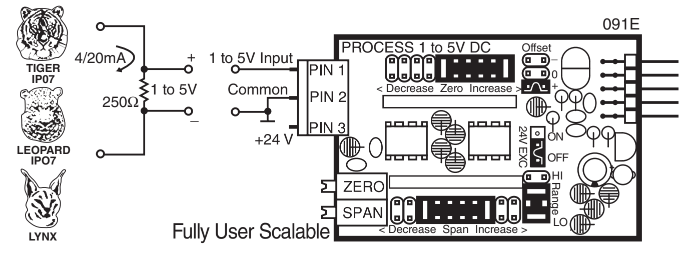
IP01: Process Loop, 4-20mA
IP02: Process Loop, 4-20mA with 24VDC EXC



ID05: DC Volts 2/20/200/Custom V DC with Offset and 24V Exc.

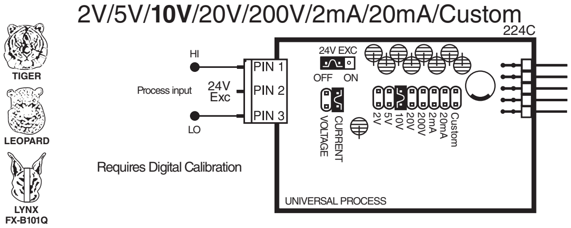


IP03: Process Input, 1-5V DC with Offset, 24V Exc

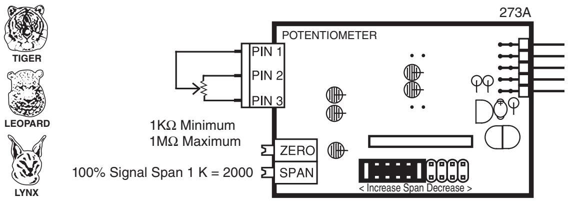


I-Series Input Signal Conditioning Modules

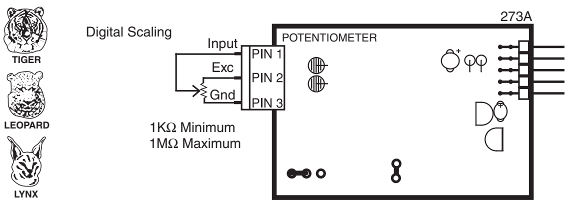
IP07: Universal Process Input
2V/5V/**10V**/20V/200V/2mA/20mA/Custom



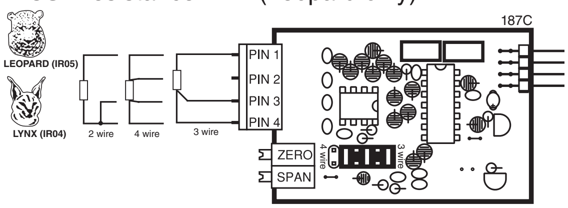
IR02: 3 wire Potentiometer 1KΩ min (0-F.S.)



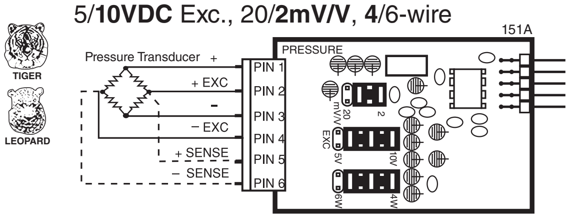
IR03: Linear Potentiometer 1KΩ min



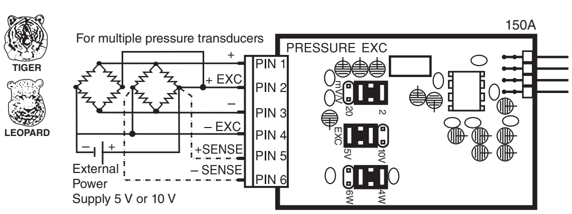
IR04: Resistance 2KΩ (Lynx only)
IR05: Resistance 2KΩ (Leopard only)



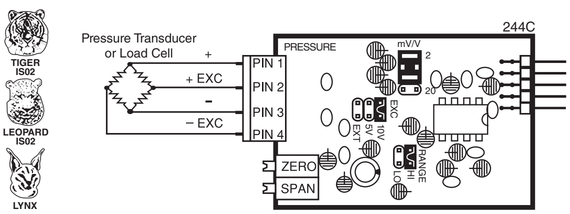
IS01: Strain Gage 5/**10VDC** Exc., 20/**2mV/V**, **4**/6-wire
IS02: Pressure/Load Cell
5/**10VDC** Exc., 20/**2mV/V**, **4**/6-wire



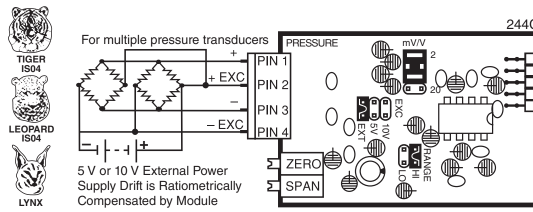
IS04: Pressure/Load Cell Ext Exc., 20/**2mV/V**, **4**/6–wire



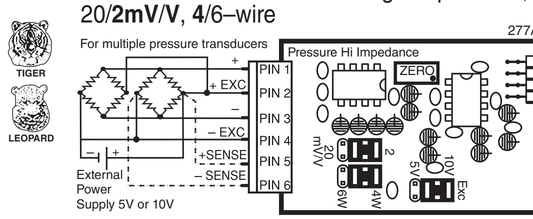
IS05: Pressure/Load Cell 20/**2mV/V**, 5/**10V** Exc 4-wire



IS06: Pressure/Load Cell Ext Exc., 20/**2mV/V**, 4-wire



IS07: Pressure/Load Cell Ext Exc. High Impedance,
20/**2mV/V**, **4**/6–wire



Installation Guidelines

Installation

1. Install and wire meter per local applicable codes/regulations, the particular application, and good installation practices.

2. Install meter in a location that does not exceed the maximum operating temperature and that provides good air circulation.

3. Separate input/output leads from power lines to protect the meter from external noise. Input/output leads should be routed as far away as possible from contactors, control relays, transformers and other noisy components. Shielding cables for input/output leads is recommended with shield connection to earth ground near the meter preferred.

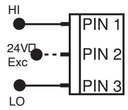
4. A circuit breaker or disconnect switch is required to disconnect power to the meter. The breaker/switch should be in close proximity to the meter and marked as the disconnecting device for the meter or meter circuit. The circuit breaker or wall switch must be rated for the applied voltage (e.g., 120VAC or 240VAC) and current appropriate for the electrical application (e.g., 15A or 20A).

5. See *Case Dimensions section* for panel cutout information.

6. See *Connector Pinouts section* for wiring.

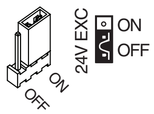
7. Use 28-12 AWG wiring, minimum 90˚C (HH) temperature rating. Strip wire approximately 0.3 in. (7-8 mm).

8. Recommended torque on all terminal plug screws is 4.5 lb-in (0.51 N-m).



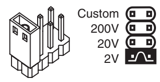
Input and Output Pins

On most modules Pin 1 is the Signal High input and Pin 3 is the Signal Low input. Typically Pin 2 is used for Excitation Voltage output.



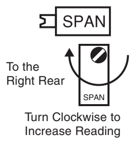
24V DC Output Header

On some modules this header enables a 24V DC 25mA (max) Excitation/Auxiliary output to be connected to Pin 2.



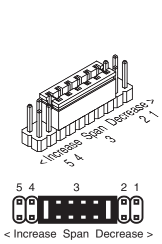
INPUT RANGE Header

Range values are marked on the PCB. Typically two to four positions are provided, which are selected with either a single or multiple jumper clip. When provided, a custom range position is only functional when the option has been factory installed.



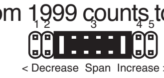
SPAN Potentiometer (Pot)

If provided, the 15 turn SPAN pot is always on the right side (as viewed from the rear of the meter). Typical adjustment is 20% of the input signal range.

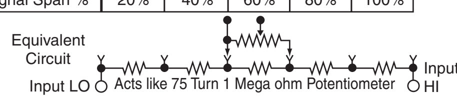


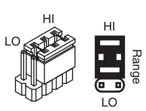
SPAN ADJUST Header

This unique five-position header expands the adjustment range of the SPAN pot into five equal 20% steps, across 100% of the input Signal Span. Any input Signal Span can then be precisely scaled down to provide any required Digital Display span from 1999 counts to 001 (one count).



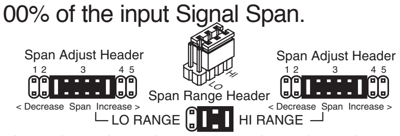
SPAN Adjust Header position	1	2	3	4	5
SPAN Pot %	20%	20%	20%	20%	20%
Signal Span %	20%	40%	60%	80%	100%



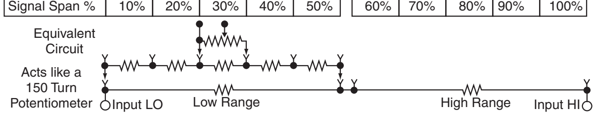


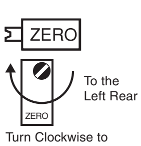
SPAN RANGE Header

When this header is provided it works in conjunction with the SPAN ADJUST Header by splitting its adjustment range into a Hi and a Lo range. This has the effect of dividing the adjustment range of the SPAN pot into ten equal 10% steps across 100% of the input Signal Span.



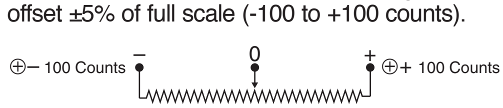
SPAN Adjust Header position	1	2	3	4	5	1	2	3	4	5
SPAN Pot %	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Signal Span %	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

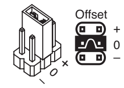




ZERO Potentiometer (Pot)

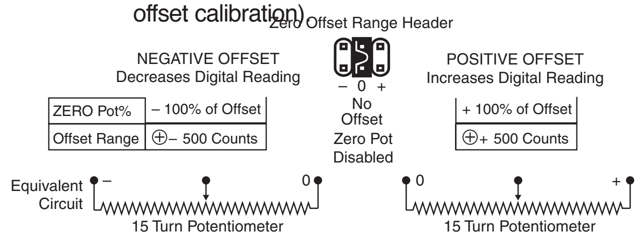
If provided, the ZERO pot is always to the left of the SPAN pot (as viewed from the rear of the meter). Typically it enables the input signal to be offset ±5% of full scale (-100 to +100 counts).



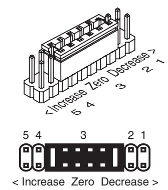


ZERO OFFSET RANGE Header

When provided, this three position header increases the ZERO pot's capability to offset the input signal, to ±25% of the digital display span. For example a Negative offset enables a 1 to 5V input to display 0 to full scale. The user can select negative offset, positive offset, or no offset (ZERO pot disabled for two step non-interactive span and offset calibration).

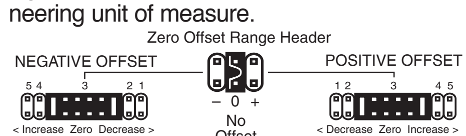


	NEGATIVE OFFSET	POSITIVE OFFSET
ZERO Pot%	– 100% of Offset	+ 100% of Offset
Offset Range	⊕– 500 Counts	⊕+ 500 Counts

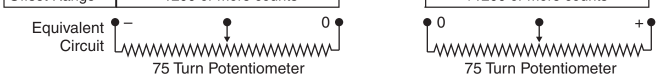


ZERO ADJUST Header

When this header is provided, it works in conjunction with the ZERO OFFSET RANGE Header, and expands the ZERO pot's offset capability into five equal negative steps or five equal positive steps. This enables virtually any degree of input signal offset required to display any desired engineering unit of measure.



ZERO Adjust Header position	5	4	3	2	1	Zero Pot Disabled	1	2	3	4	5
ZERO Pot %	–20%	–20%	–20%	–20%	–20%		+20%	+20%	+20%	+20%	+20%
Offset Range	–1200 or more counts						+1200 or more counts				



Input Module Analog Calibration

In addition to the analog calibration capabilities that enable many modules to be interchanged between different meters without loss of accuracy the Leopard Family of meters have enhanced Digital Calibration functions. See Page 4

Basic standard range calibration of direct reading modules that utilize either Auto Zero or a ZERO pot, an INPUT RANGE Header and or a SPAN pot.

1 If the module has an INPUT RANGE Header, reposition the jumper clip to select the desired input signal range.

2. Apply a zero input or short the input pins. The display will auto zero, or if the module has a ZERO pot, it should be adjusted until the display reads zero.

3 Apply a known input signal that is at least 20% of the full scale input range and adjust the SPAN pot until the display reads the exact input value. For negative inputs, Leopard Family Meters will display negative overrange at 50% of full scale range.

4 Decimal Points. The selection or positioning of decimal points has no effect on the calibration of the modules

Wide range scaling, in engineering units not requiring offsets, with modules that utilize auto-zero or a ZERO pot, a SPAN RANGE Header and or a SPAN ADJUST Header.

Texmate's unique SPAN ADJUST and SPAN RANGE Headers provide the circuit equivalent of an ultra-precision one megohm 75 or 150 turn potentiometer that can infinitely scale down any Input Signal SPAN to provide any full scale Digital Display Span from 1999 (counts) to 001 (one count).

If the module has an INPUT RANGE Header, and the required full scale Digital Display Span (counts) is to be larger than the directly measured value of the input Signal Span, then the next lower range on the INPUT RANGE Header should be selected. The resulting over range Signal Span is then scaled down, by selecting the position of the SPAN RANGE Header and or the SPAN ADJUST Header, which will reduce the input Signal Span to a percentage, that the required Digital Display Span can be reached by calibration with the SPAN pot.

Example A: 0 to 10 V to read 0 to 1800 gallons.

Signal Span = 10V, Digital Display Span = 1800 counts

1 Select the 2 V INPUT RANGE Header position. This will provide a digital display of 1800 counts with an input of only 1.8 V which is (1.8÷10)=18% of the examples 10 V Signal Span.

2 To scale down the Signal Span to 18% select the 20% Signal Span position on the SPAN ADJUST Header (position 1) or if the module has a SPAN RANGE Header, select (LO Range) and 20% Signal Span position on the SPAN ADJUST Header (position 2).

3 Apply a zero input or short the input pins. The display will auto zero, or if the module has a ZERO pot, it should be adjusted until the display reads zero.

4 Apply 10 V and adjust the SPAN pot until the display reads 1800.

Large offset scaling and calibration of process signal inputs with modules that utilize ZERO ADJUST Headers and or ZERO OFFSET RANGE Headers.

Texmate's unique ZERO OFFSET RANGE Header enables the use of a simple two step scaling and calibration procedure for those process signals that require large offsets. This eliminates the back and forth interaction, between zero and span settings, that is often required to calibrate less finely engineered products.

The first step is to set the ZERO OFFSET RANGE Header to the center position (No Offset) and scale down the Input Signal Span to a percentage that will enable calibration with the SPAN pot to reach the required Digital Display Span.

The second step is to set the ZERO ADJUST and or ZERO OFFSET RANGE Header to provide a positive or negative offset of sufficient counts that calibration with the ZERO pot will offset the Digital Display Span to produce the required digital reading.

Example B: 1 to 5 V to read –100 to 1500 °C.

Signal Span = 4V, Digital Display Span = 1600 counts

1 If the module has an INPUT RANGE Header the 2 V position should be selected. This will provide a digital display of 1600 counts for an input of 1.6 V which is (1.6 ÷ 4) = 40% of the examples 4 V signal span. To scale down the Signal Span to 40% select the 40% Signal Span position on the SPAN ADJUST Header (position 2).

2 If the module is a Process Input 1-5 V DC type, select the (Hi Range) position on the SPAN RANGE Header and the 100% Signal Span position on the SPAN ADJUST Header (position 5, max increase). This will provide a digital display of 1600 counts for an input of 4V which is 100% of the examples 4V Signal Span.

3 Set the ZERO OFFSET RANGE Header to the center position (no offset). Apply 1 V and adjust the SPAN pot until the display reads 400 . A 4V input would then read 1600 counts.

4 Set the ZERO OFFSET RANGE Header to the negative offset position. If the module has a ZERO ADJUST Header select the position that will provide a negative offset of ≈ –500 counts. Apply 1 V and adjust the ZERO pot until the display reads –100. Apply 5 V and check that the display reads 1500.

Example C: 4 to 20 mA to read 00.0 to +100.0%

Signal Span = 16 mA, Digital Display Span = 1000 counts.

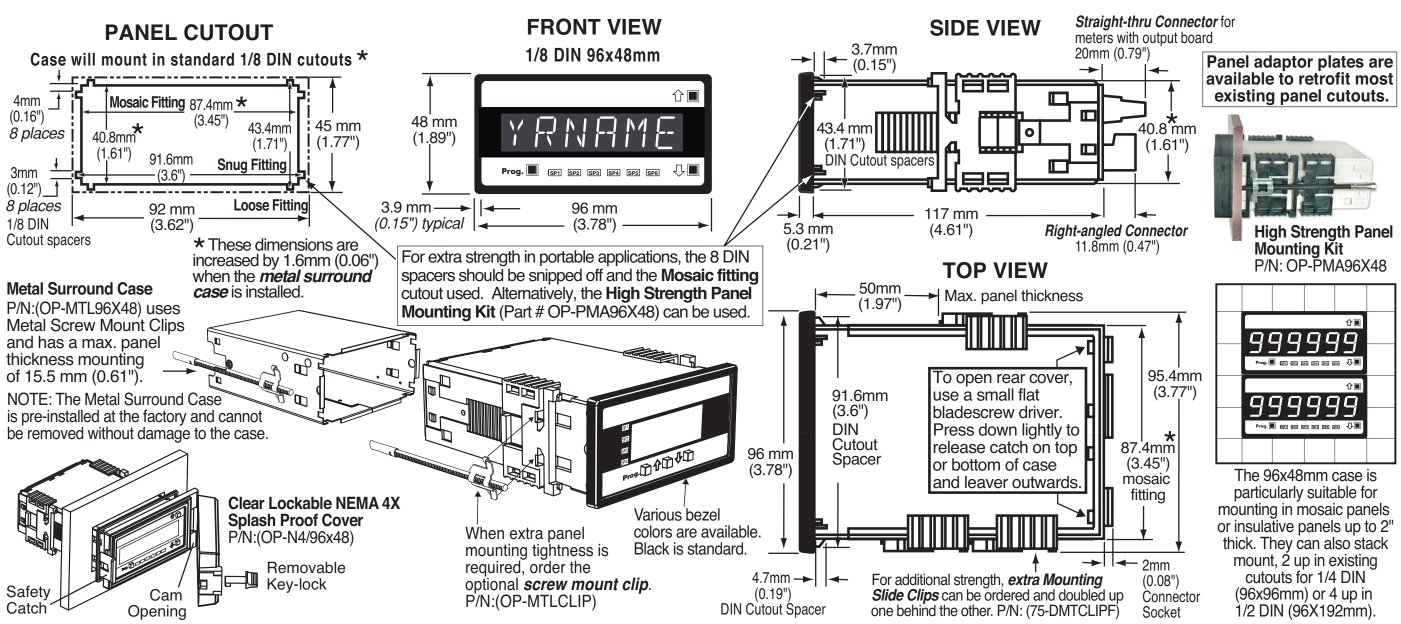
1 The full scale Signal Span of the Process Input 4-20 mA modules is 0 to 20 mA for a full scale Digital Display Span of 0 to 2000 counts. This will provide a digital display of 1000 counts with an input of only 10 mA which is (10÷16)=62.5% of the examples 16 mA signal span.

2 To scale down the Signal Span to 62.5% select the (Hi Range) Position on the Span Range Header and the 70% Signal Span position on the SPAN ADJUST Header (position 2).

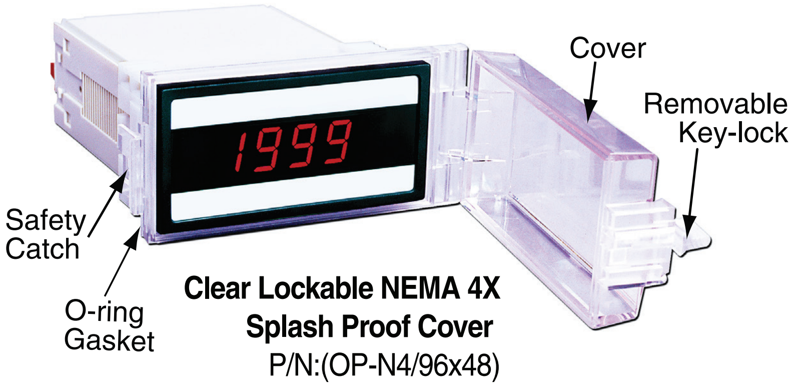
3 Set the ZERO OFFSET RANGE Header to the center position (no offset). Apply 4 mA and adjust the SPAN pot until the display reads 250 . A 16 mA input would then read 1000 counts.

4 Set the ZERO OFFSET RANGE Header to the positive offset position. If the module has a ZERO ADJUST Header select the position that will provide a negative offset of ≈ –250 counts. Apply 4 mA and adjust the ZERO pot until the display reads 000. Apply 20 mA and check that the display reads 1000. Select decimal point XXX•X to display 00.0 to 100.0.

Case Dimensions

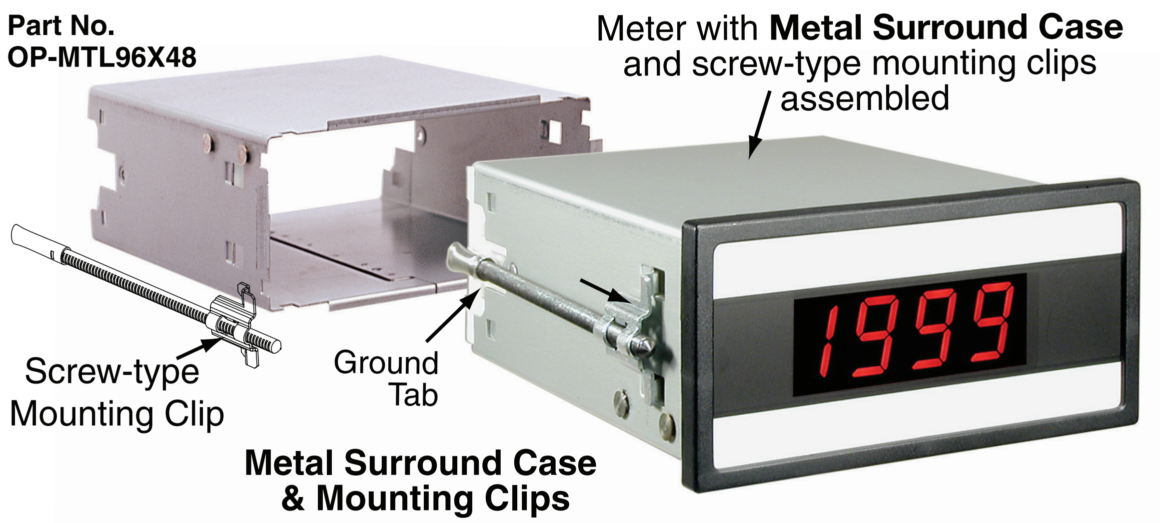


Clear Lockable Water-proof Lens Cover OP-N4X/96X48



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.

Metal Surround Case Option OP-MTL96X48



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.

Ordering Information

BASIC MODEL #	DISPLAY	POWER SUPPLY	INPUT MODULES	ANALOG OUTPUT*	RELAY OUTPUT*	OPTIONS / ACCESSORIES
DL-40 –	–	–	–	–	–	OA____

Add to the basic model number the order code suffix for each standard option required. The last suffix is to indicate how many different special options and or accessories that you may require to be included with this product. *Except when when R1 or R2 relay output is selected, a meter ordered with an analog output or a relay output module requires an Output Module Carrier Board which should be automatically included with the order, with an additional charge of $7. (See special Options and Accessories section)

Ordering Example: DL-40-DR-PS1-IA01-AIC-R1-OA2, the 2 OA's are, CR-CHANGE and a OP-N4X/96X48

▶ BASIC MODEL NUMBER

DL-40 . . . . 96x48, Leopard, 4 Digit. . . . .

Standard Options for this Model Number

Order Code Suffix — *Description* — *List*

▶ DISPLAY

DR. . . . . . Red LED, 0.56 inch high . . . .
DB. . . . Super–bright Red LED, 0.56 inch high. . . . .
DG . . . Green LED, 0.56 inch high. . . . .
LG. . . . Large Green LED, 0.8 inch high. . . . .
LR. . . . Large Red LED, 0.8 inch high . . . .

▶ POWER SUPPLY

PS1. . . 85 - 265VAC / 95 - 300VDC. . . . .
PS2. . . 18 - 48VAC / 10 - 72VDC. . . . .

▶ INPUT MODULES (Partial List. See www.texmate.com)

Unless otherwise specified Texmate will ship all modules precalibrated with factory preselected ranges and/or scalings as shown in **BOLD** type

IA01. . AC-Volts Scaled RMS, 200/**600V** AC . . . .
IA02. . AC-Volts Scaled RMS, 200mV/**2V**/20V AC . . . .
IA03. . AC-mA Scaled RMS, 2/**20**/200mA AC. . . . .
IA04. . AC-Amps Scaled RMS, **0-1 Amp AC (0-100.00)** . . . .
IA05. . AC-Amps Scaled RMS, **0-5 Amp AC (0-100.00)** . . . .
IA06. . AC-Volts True RMS, 200/**600V** AC . . . .
IA07. . AC-Volts True RMS, 200mV/**2V**/20V AC . . . .
IA08. . AC-mA True RMS, 2/**20**/200mA AC . . . .
IA09. . AC-Amps True RMS, **0-1 Amp AC (0-100.00)**. . . . .
IA10. . AC-Millivolt, Scaled RMS, **100mV AC** . . . .
IA11. . AC-Amps True RMS, **0-5 Amp AC (0-100.00)**. . . . .
IA12. . AC-Millivolt, True RMS, **100mV AC** . . . .
ID01 . DC-Volts, **2**/20/200V/Custom w/24V DC Exc . . . .
ID02 . DC-Millivolt, 20/50/**100**/200mV DC w/24V DC Exc . . . .
ID03 . DC-Milliamp, 2/**20**/200mA DC w/24V DC Exc . . . .
ID04 . DC-Amps, **5A DC** . . . .
ID05 . DC-Volts **2**/20/200/Custom V DC w/Offset and 24V Exc. . . .
ID07 . DC-Milliamp, 2/**20**/200mA DC w/Offset and 24V Exc. . . . . . .
ID09 . DC-Amps, **1A DC** . . . .
IF02. . Line Frequency, 50-500VAC, 199.9Hz, or optional 400Hz . .
IGYZ* . Universal Direct Pressure. . . . .

***View the IG- Ordering Code on page 11 to determine the value for Y & Z (IGAZ to IGKZ)**

IP01. . Process Loop, **4-20mA(0-100.00)**. . . . .
IP02. . Process Loop, **4-20mA(0-100.00)** w/24VDC Exc . . . .
IP03. . Process Input, **1-5V DC(0-100.00)** w/Offset, 24V Exc . . . . . .
IP07. . Universal Process 2V/5V/**10V**/20V/200V/2mA/20mA/Custom
IPT1 . Prototype Board for Custom Design . . . .
IR02 . . 3-Wire Potentiometer 1KΩ min (0-F.S.). . . . .
IR03 . . Linear Potentiometer, 3-wire, 1KΩ min . . . .
IR05 . Resistance 2KΩ . . . .
IS01. . Strain Gage 5/10VDC Exc., 20/**2mV/V**, **4**/6-wire . . . .
IS02. . Pressure 5/10VDC Exc., 20/**2mV/V**, **4**/6-wire. . . . .
IS04. . Pressure Ext Exc., 20/2mV/V, **4**/6–wire . . . .
IS05. . . Pressure/Load Cell 20/2mV/V, 5/10V Exc 4-wire . . . .
IS06. . . Pressure/Load Cell Ext Exc., 20/2mV/V, 4-wire . . . .
IS07. . Pressure 20/2mV/V with High Impedance and External Excitation

▶ ANALOG OUTPUT *Add $7 for an Output Module Carrier Board

AIC . . . Isolated 16 Bit Current Output, 4-20mA . . . .
AIV . . . Isolated 16 Bit Voltage Output, 0-10VDC . . . .

▶ RELAY OUTPUT

Note: R1 and R2 are located on the main board, and are generally used when only two Form A Relays or less are required and an Analogy Output is not required.

R1. . . . Single 5A Form A Relay . . . .
R2. . . . Dual 5A Form A Relays . . . .

▶ RELAY OUTPUT MODULES

Note: If a meter is ordered with a Relay Output Module, but without Analog Output, an Output Module Carrier Board for $7 should be automatically added to the order.

OR11 . One 10 Amp Form C Relay, Isolated . . . .
OR15 . One 10 Amp Form C and Two 5 Amps Form A Relays . . . .
OR16 . One 10 Amp Form C and One 5 Amp Form A Relays . . . .
OR12 . Two 10 Amp Form C Relays, Isolated . . . .
OR14 . Two 10 Amp Form C and Two 5 Amps Form A Relays . . . .
OR23 . Two 10 Amp Form C and One 5 Amp Form A Relay, Isolated. .
OR31 . One 5 Amp Form A Relay, Isolated . . . .
OR32 . Two 5 Amp Form A Relays, Isolated . . . .
OR33 . Three 5 Amp Form A Relays, Isolated . . . .
OR34 . Four 5 Amp Form A Relays, Isolated . . . .

Solid State Relay (SSR) Output Modules DC Only

OR51 . One 400V DC Solid State Relay (SSR) 210mA. . . . .
OR52 . Two 400V DC Solid State Relays (SSR) 210mA . . . .
OR53 . Three 400V DC Solid State Relays (SSR) 210mA. . . . .
OR54 . Four 400V DC Solid State Relays (SSR) 210mA. . . . .

Special Options and Accessories (OA's)

Part Number — *Description* — *List*

▶ SPECIAL OPTIONS (Specify Inputs or Outputs & Req. Reading)

Output Module Carrier Board

*One carrier board must be ordered with any meter that includes any one or more of the following options: Analog Output and/or Relay Output Modules.

SA-DL/OM-CB . . . Output Module Carrier Board, DL series . . . .
CR-CHANGE . . Range Change from Standard Range shown in **BOLD** type
CS-3/3.5/4 . . . . Custom display scaling within standard ranges . . .
COA-3/3.5/4 . . . Custom scaling of analog output for digital meters & bargraphs
CCL-SETUP . . . NRC to set-up Custom Configuration file and issue serial #
CCL-INSTL. . . . . . Installation of custom configuration, specify serial #CCL-
CSR-SETUP. . . . . NRC to set-up custom selectable range . . . .
CSR-INSTL. . . . . . Factory installation - custom configuration, specify serial # CSR-
CSS-SETUP. . . . . NRC to set-up custom special scaling. . . . .
CSS-34/INSTL . . . Installation - for 3.5 and 4.0 meters, specify serial # CSS-.
COR-SETUP . . . . NRC to set-up Relays in non-standard locations. . . . . . .
COR-INSTL . . . . . Installation - Relays in non-standard locations , specify serial # COR-

▶ ACCESSORIES (Specify Serial # for Custom Artwork Installation)

75-DBBZ9648F. . . . Black Bezel for 96x48mm Case. . . . .
75-DMTCLIPF . . . . Side Slide Brackets (2 pc) - extra set, extra strength . .
76-DL40G-N4 . . . . . "Touch" Green LED Faceplate, NEMA 4, Factory install
76-DL40LG-N4 . . . . "Touch" Large Green LED Faceplate, NEMA 4, Factory install
76-DL40LR-N4 . . . . "Touch" Large Red LED Faceplate, NEMA 4, Factory install
76-DL40R-N4 . . . . . "Touch" Red LED Faceplate, NEMA 4, Factory install. .
ART-FS-S/D/C . . . . NRC for artwork & set-up Faceplate/Desc/Co.Logo . . .
ART-FS-S/D . . . . . . NRC for artwork & set-up Faceplate/Desc. . . . .
ART-FS-001 . . . . . . Install Custom Faceplate per meter - 1 color. . . . .
OP-MTLCLIP . . . . . Screw Mounting Clips (2 pc) - to screw tighten slide brackets
OP-MTL96X48 . . . . Metal Surround Case, includes screw mounting clips . .
OP-N4X/96X48. . . . 96x48mm clear lockable front cover–NEMA 4X, splash proof

Prices subject to change without notice.

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.

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.

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