TEXMATE

LEOPARD FAMILY

CE

NOW FEATURING OPTIONAL PLUG-IN RELAY OR SSR OUTPUT MODULES

DL-40F

Leopard Frequency Meter
4 Digit 0.56" or 0.8" LEDs
in a 1/8 DIN CASE

Large display option
0.8" red or green LED

An economically smart meter relay for frequency measurement.

General Features

- Frequency input. Easily user scaled.

- For RPM measurements, the recommended meter is the DL-40RPM meter which has been designed specifically for that purpose. Just enter the pulses per revolution and the DL-40RPM meter will calculate and display the RPM reading.

- Three frequency ranges of 99.99Hz, 999.9Hz and 9999Hz.

- 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 V AC / 95-370 V DC (PS1)** or 15-48 V AC / 10-72 V DC (PS2).

- Standard red or optional green or super bright red 4-digit LED

- Red or green 0.8" LED large display option.

- Four annunciator LEDs provide front panel alarm status indication for up to four setpoints.

- Optional relays. Two 10 Amp Form C and two 5 Amp Form A relay, or optionally four 5 Amp Form A relays are available.

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

There are 2 Plug-in Modular Input Signal Conditioners for this specialized frequency only member of the Leopard Family: IF05 & IF08.
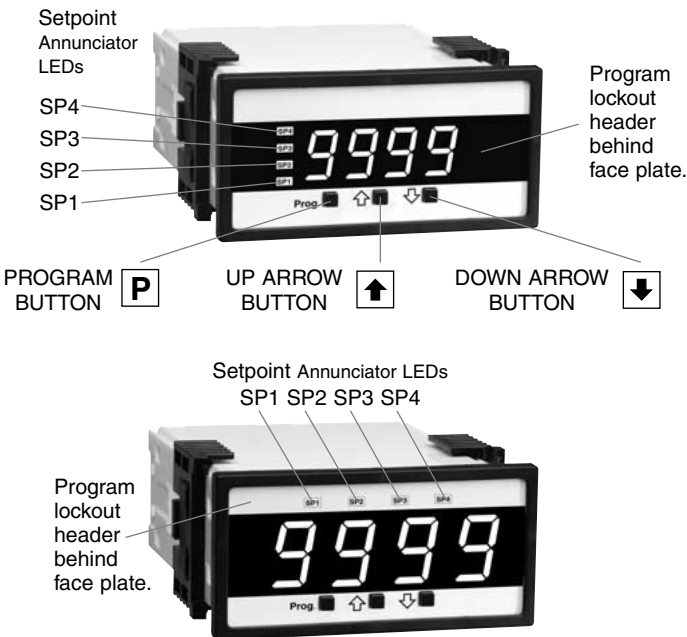
LEOPARD

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:	Automatic by resolution select XXX•X
Positive Overrange:	Top segments of digital display flash
Negative Overrange:	Bottom segments of digital display flash
Relay Output:	Two 5 Amp Form A relays and two 10 Amp Form C, or 5 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 / 95-370 VDC @ 2.5W max 3.5W**
PS2	15-48 VAC / 10-72 VDC @ 2.5W max 3.5W
Operating Temp.:	0 to 60 °C
Storage Temp:	–20 °C to 70 °C.
Relative Humidity:	95% (non condensing)
Case Dimensions:	11/8 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

Index

Setpoint Annunciator LEDs

SP4
SP3
SP2
SP1

Program lockout header behind face plate.

PROGRAM BUTTON [P]   UP ARROW BUTTON [↑]   DOWN ARROW BUTTON [↓]

Setpoint Annunciator LEDs
SP1 SP2 SP3 SP4

Program lockout header behind face plate.

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, but not change, the setting of **setpoint 1**.

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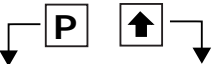
Down Button

When in the operational display, pressing the [↓] button alone allows you to view, but not change, the setting of **setpoint 2**.

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

To explain software programming procedures, logic diagrams are used to visually assist in following the programming steps. The fol-lowing symbols are used throughout the logic diagrams to represent the buttons and indicators on the meter:

Symbol	Explanation
8.8.8.8.	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".

Offset ⌐oFF5⌐ / 0 [↑↓]
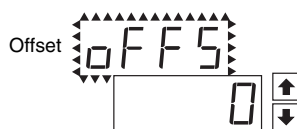
When two displays are shown together with bursts, this indicates that the display is toggling (flashing) between the name of the function and the value.

[ScLE]
[9999]

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.

0 [↑↓]
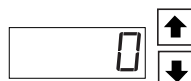
When the [↑] and [↓] buttons are shown together, the display value can be increased by pressing and releasing the [↑] button or decreased by pressing and releasing the [↓] button.

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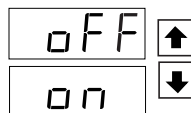
When the [↑] and [↓] buttons are shown with two displays, either display can be selected by pressing and releasing the [↑] or [↓] buttons.

hhh- [↑↓]
[LhL-]
[hLh-]
[LLL-]
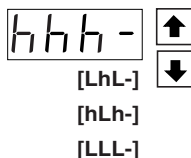
When there are more than two display selections they are shown in brackets below the first display and are also selectable by pressing and releasing the [↑] or [↓] buttons.

cLo / XXXX [↑↓] / P
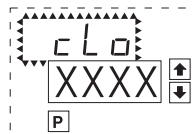
A dotted box indicates these functions are omitted or bypassed when the related hardware is not present

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

8.8.8.8. MAIN MENU Operational Display

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.

Sub-menu MODE P ↑

Calibration Mode cAL / on / oFF

SETPOINT VIEW ONLY MODE

- Setpoint 1 (SP1) — SP1 / XXXX
- Setpoint 2 (SP2) — SP2 / XXXX
- Setpoint 3 (SP3) — SP3 / XXXX
- Setpoint 4 (SP4) — SP4 / XXXX

PEAK & VALLEY VIEW & RESET

- Peak — PEAK / XXXX — Reset PEAK
- Valley — VALY / XXXX — Reset VALY

Calibration Mode cAL / out / iP

TWO POINT ANALOG OUTPUT RANGE SETTING AND CALIBRATION SEE PAGE 4

- Calibrate Analog Output Lo — cLo / XXXX
- Calibrate Analog Output Hi — chi / XXXX

TWO POINT DIGITAL CALIBRATION MODE SEE PAGE 4

- Offset — oFFS / 0
- Scale Factor — ScLE / 9999

RANGE, DECIMAL POINT AND BRIGHTNESS SELECTION See Page 5

- Range — rG / 9999 — [99•99] [9999] [999•9]
- Decimal Point (dp) — .dP — [X•XXX] [XX•XX] [XXX•X] [XXXX•] [XXXX]
- Display Brightness (br) — br / 1 — [2] [3] [4]

DIGITAL SPAN SELECTION FOR ANALOG RANGE OUTPUT See Page 5

- Anhi / 9999
- AnLo / 0

SETPOINT SETTING AND RELAY CONFIGURATION MODE See Page 6

- Set Setpoint 1 (SP1) — SP1 / XXXX
- Delay-on-Make (doM) — doM / 0
- Delay-on-Break (dob) — dob / 0
- Hysteresis (hYSt) — hYSt / 0
- Setpoint 2 (SP2) — SP2 / XXXX
- Delay-on-Make (doM) — doM / 0
- Delay-on-Break (dob) — dob / 0
- Hysteresis (hYSt) — hYSt / 0
- Setpoint 3 (SP3) — SP3 / XXXX
- Hysteresis (hYSt) — hYSt / 0

NOTE: [dob] [dom] Functions are only available for SP1 and SP2

- Setpoint 4 (SP4) — SP4 / XXXX
- Hysteresis (hYSt) — hYSt / 0

Relays Activation [rLYS]
(H) High the relay energizes when the setpoint is exceeded. (L) Low the relay energizes below the setpoint. Setpoint are indicated from left to right SP1, SP2, SP3, SP4

rLYS / LLLL — [LhLh] [hLhL] [hhhh]

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.

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].

Note: If at this point the display skips directly to toggle between [ScLE] and the previous Scale factor setting (STEP D) then the software is detecting that the optional analog output hardware is NOT installed.

STEP B   Enter the [oUT] Analog Output Calibration 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
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
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 display points between which the analog output will occur. (See Digital Span Selection below).

Digital Calibration Mode

STEP E   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].

Note: If at this point the display skips directly to toggle between [ScLE] and the previous scale setting (STEP D) then the software is detecting that the optional analog output hardware is NOT installed.

STEP F   Set the Scale Factor
1) Press the ⬆ or ⬇ button. Display changes from [out] to [iP].
2) Press the P button. Display toggles between [ScLE] and the previous scale setting.
3) For direct frequency measurement, set the scale to 9999.
If a display that is scaled to read in engineering units is required, this scale factor may be set to any value from 0 to 9999.

STEP G   Set the Offset
1) Press the P button. Display toggles between [oFFS] and the previous offset setting. For direct frequency measurement, set the offset to 0.
If a display that is scaled to read in engineering units is required, this offset may be set to any value from -1999 to +9999.
2) Press the P button. Display toggles between [rG] and the previous setting. (See page 5 for setting range, decimal point and brightness)

MAIN MENU
Operational Display

Sub-menu
MODE P ⬆

STEP A Calibration Mode
cAL
oFF ⬆⬇
P
on

Calibration Mode
cAL
P out ⬆⬇
iP
P

STEP B   **TWO POINT ANALOG OUTPUT RANGE SETTING AND CALIBRATION**

STEP C Calibrate Analog Output Lo
cLo
XXXX ⬆⬇
P

STEP D Calibrate Analog Output Hi
chi
XXXX ⬆⬇
P

STEP E   **DIGITAL CALIBRATION MODE**

STEP F Scale Factor
ScLE
9999 ⬆⬇
P

STEP G Offset
oFFS
0 ⬆⬇
P

RANGE, DECIMAL POINT AND BRIGHTNESS SELECTION
See Page 5
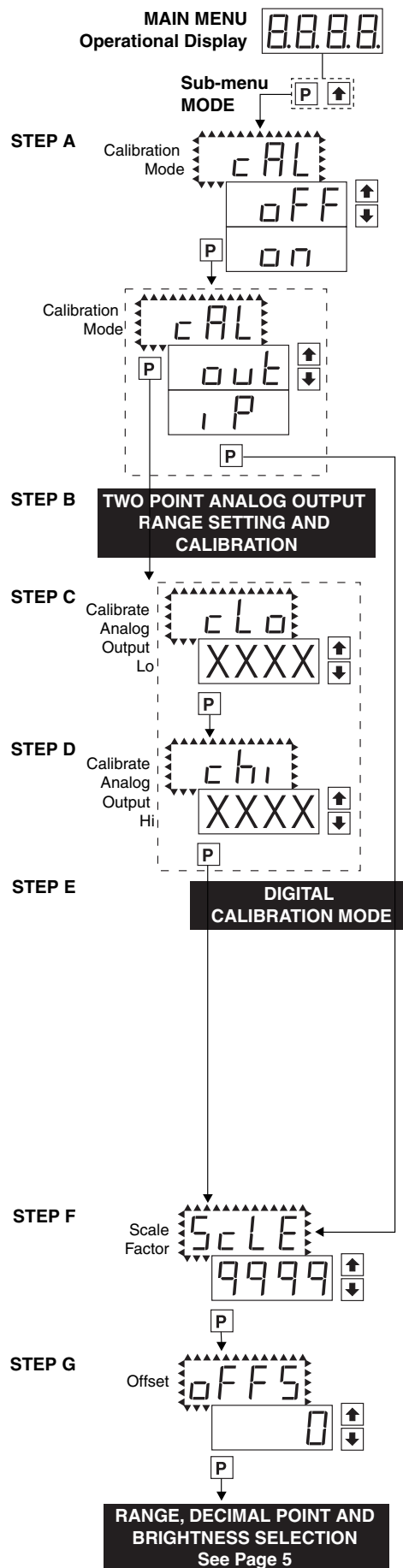
Range, Decimal Point and Brightness Selection

STEP H   Enter the Range Selection 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 toggles between [rG] and the previous range setting.

STEP I   Select the Range
1) Using the ⬆ and ⬇ buttons, select the required range. There are three ranges of 99.99Hz, 999.9Hz and 9999Hz
2) Press the P button. Display shows the previous [dp] decimal point selection.

STEP J   Select the Decimal Point
1) Using the ⬆ and ⬇ buttons, adjust the display to the desired decimal point setting.
2) Press the P button. Display toggles between [br] and the previous brightness setting.

STEP K   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 L   Set the Display Corresponding to the Analog High Output
1) Using the ⬆ and ⬇ buttons, adjust the display to the desired value at which the selected analog high output will occur.
2) Press the P button. Display toggles between [AnLo] and previous [AnLo] setting.

STEP M   Set the Display Corresponding to the Analog Low Output
1) Using the ⬆ and ⬇ buttons, adjust the display to the value 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 points from –1999 to 9999 can be selected for which the specified analog output occurs. The display values for analog high and analog low can be reversed for reversed 20-4 mA output. The difference between the two display points can be as small as two counts however small spans cause the 16 bit D to A to increment in staircase steps.

STEP H — RANGE, DECIMAL POINT AND BRIGHTNESS SELECTION

STEP I — Range (rG) — rG — 1 — P [99•99] [9999] [999•9]

STEP J — Decimal Point (dp) — .dP — P [X•XXX] [XX•XX] [XXX•X] [XXXX•] [XXXX]

STEP K — Display Brightness (br) — br — 1 — P [2] [3] [4]

DIGITAL SPAN SELECTION FOR ANALOG RANGE OUTPUT

STEP L — Analog Hi (Anhi) — Anhi — 9999 — P

STEP M — Analog Lo (AnLo) — AnLo — 0 — P

8.8.8.8.

Operational Display
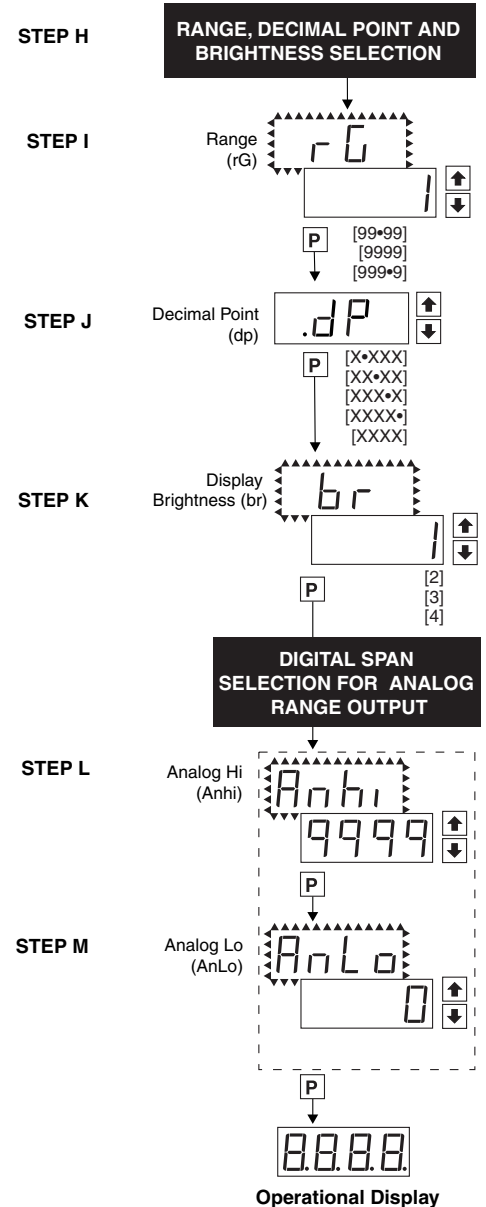
Setpoint Setting and Relay Configuration Mode

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.

MAIN MENU
Operational Display

8.8.8.8.

STEP A   [P ▼]

SETPOINT SETTING AND
RELAY CONFIGURATION MODE
See Page 6

STEP B Set Setpoint 1 (SP1)   SP1 / XXXX

STEP C Delay on Make (doM)   doM / 0

STEP D Delay on Break (dob)   dob / 0

STEP E Hysteresis (hYSt)   hYSt / 0

STEP F Setpoint 2 (SP2)   SP2 / XXXX

STEP G Delay on Make (doM)   doM / 0

STEP H Delay on Break (dob)   dob / 0

STEP I Hysteresis (hYSt)   hYSt / 0

STEP J Setpoint 3 (SP3)   SP3 / XXXX

STEP K Hysteresis (hYSt)   hYSt / 0

NOTE: [dob] [dom] Functions are only available for SP1 and SP2

STEP L Setpoint 4 (SP4)   SP4 / XXXX

STEP M Hysteresis (hYSt)   hYSt / 0

STEP N Relays Activation [rLYS]   rLYS / LLLL

[LhLh] [hLhL] [hhhh]

8.8.8.8.

Socket for Input Signal Conditioning Module

1 3 5 7 9
2 4 6 8 10

INPUT MODULES

There are input modules for almost any input signal.

Input and Output pins vary for different modules. Smart Modules incorporate their own A / D converters and communicate digitally with the meter.

See section on I-Series Input Modules for connection details.

Input Hi 100K
Input Lo 100K
+5VDC
-5VDC
+24VDC
0.1 0.1
Analog Comm
Ref Hi
System GND
MUXO
24 V Return

MAIN BOARD

Multiplexer and Buffer Amplifier + 5 V GND

14 Bit Single Slope A to D + 5 V GND

+ 5 V
GND
Micro Processor

Display Driver

SP1 NO 8
9
MOV 5A + 5 V SP1

SP2 NO 10
11
MOV 5A + 5 V SP2

No Conn. 12

Capture

AC Neutral, – DC 14
LC Filter

AC Line, + DC 15
PTC for HI Voltage Fuse for LO Voltage

Common Mode Line Choke

Bridge Rectifier

Isolated Switching Power Supply Controller

Isolated Feed Back +5 VDC

24V ISO RTN
+24 VDC
+5 VDC GND
-5 VDC
–
+18 VDC ISO

Chassis Ground Tab for Optional Metal Case

PROCESSOR BOARD
DIM
Lock
Analog Output
Hold
N/C
SP4
SP3
GND
+5 V
N/C

DISPLAY BOARD

ON OFF

SP4 SP3 SP2 SP1

CARRIER BOARD

1 2 3 4 5 6 7 8 9 10

ANALOG OUTPUT
+18V ISO
Isolated Analog Output Dual or Single
+5VDC
GND
HEADER
Volts mA

Output pins vary for different relay output modules.

RELAY MODULES

SP2 10A + 5 V
SP4 5A + 5 V
MOV's

SP1 10A + 5 V
SP3 5A + 5 V
MOV's

29 NO2
28 NC2
27 COM 2 & 4
26 NO4
25 NO1
24 NC1
23 COM 1 & 3
22 NO3

21 LOCK
20 HOLD
19 COMMON
18 DIM
17 - O/P
16 + O/P
ANALOG OUTPUT

August 13, 2002

Connector Pinouts

Pinout Diagram

The Rear View of the Meter diagram shows the meter with the relay configuration: dual 10 Amp Form C and dual 5 Amp Form A relays. An analog output module is also shown as installed.

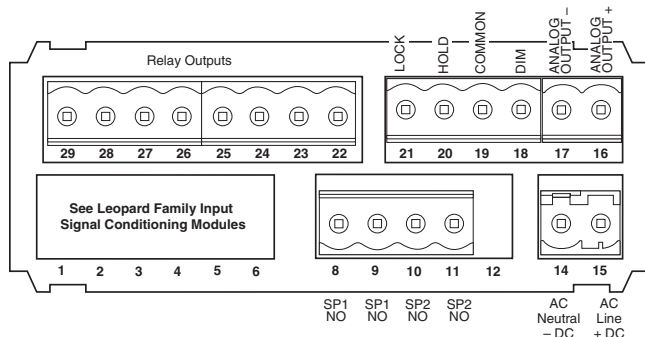The DL-40F uses plug-in type screw terminal connectors for all input and output connections. The power supply connections (pins 14 and 15) have a unique plug and socket outline to prevent cross connection. The main board and input signal conditioner use right-angled connectors as standard. The output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

Relay Outputs

LOCK HOLD COMMON DIM ANALOG OUTPUT – ANALOG OUTPUT +

29 28 27 26 25 24 23 22   21 20 19 18   17 16

See Leopard Family Input Signal Conditioning Modules

1 2 3 4 5 6   8 9 10 11 12   14 15

SP1 NO | SP1 NO | SP2 NO | SP2 NO
AC Neutral – DC | AC Line + DC

Auto-sensing AC/DC power supply. For voltages between 85-265 V AC / 95-370 V DC (PS1) or 18-48 V AC / 10-72 V DC (PS2).

Standard plug-in screw terminal connectors provided by Texmate:

Pin Socket
Input Power Screw Terminal Plug

Pin Socket
Right-angled Screw Terminal Plug

Pin Socket
Straight-thru Screw Terminal Plug
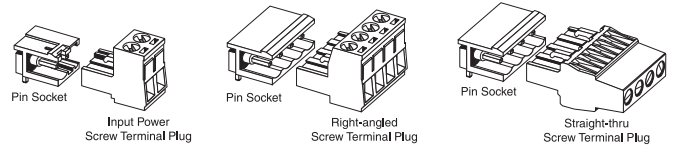
Input Signal – Pins 1 to 6

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

Pins 8 to 12 – Relay Output Pins

Note: If relays for setpoints 1 & 2 are installed on the main board, and a relay output module is used that also has relays in the setpoints 1 & 2 positions, the duplicate relays will operate in unison.

Pin 8 **SP1 NO.**
Pin 9 **SP1 NO.** Normally Open 5 Amp Form A.
Pin 10 **SP2 NO.**
Pin 11 **SP2 NO.** Normally Open 5 Amp Form A.
Pin 12 **NO CONNECTION.**

Pins 14 and 15 – AC/DC Power Input

Auto-sensing AC/DC power supply. For voltages between 85-265 V AC/95-370 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

Pins 16 and 17 – Analog Output

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.

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.

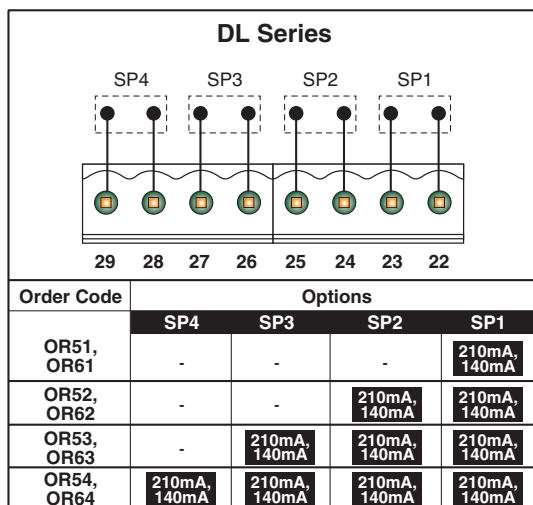**Pin 19** **COMMON.** To activate the LOCK or DIM functions from the rear of the meter, the respective pins have to be connected to the COMMON pin. This pin is connected to the internal power supply ground.

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.
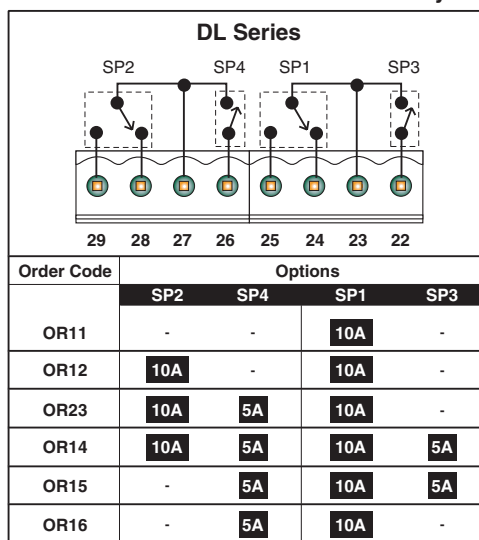
Pin 21 **LOCK.** By connecting the LOCK pin to the COMMON pin, the meter's programmed parameters can be viewed but not changed.
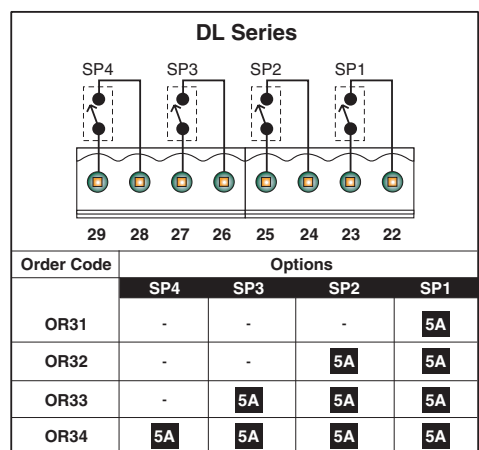
Pins 22 to 29 – Output Module Pins

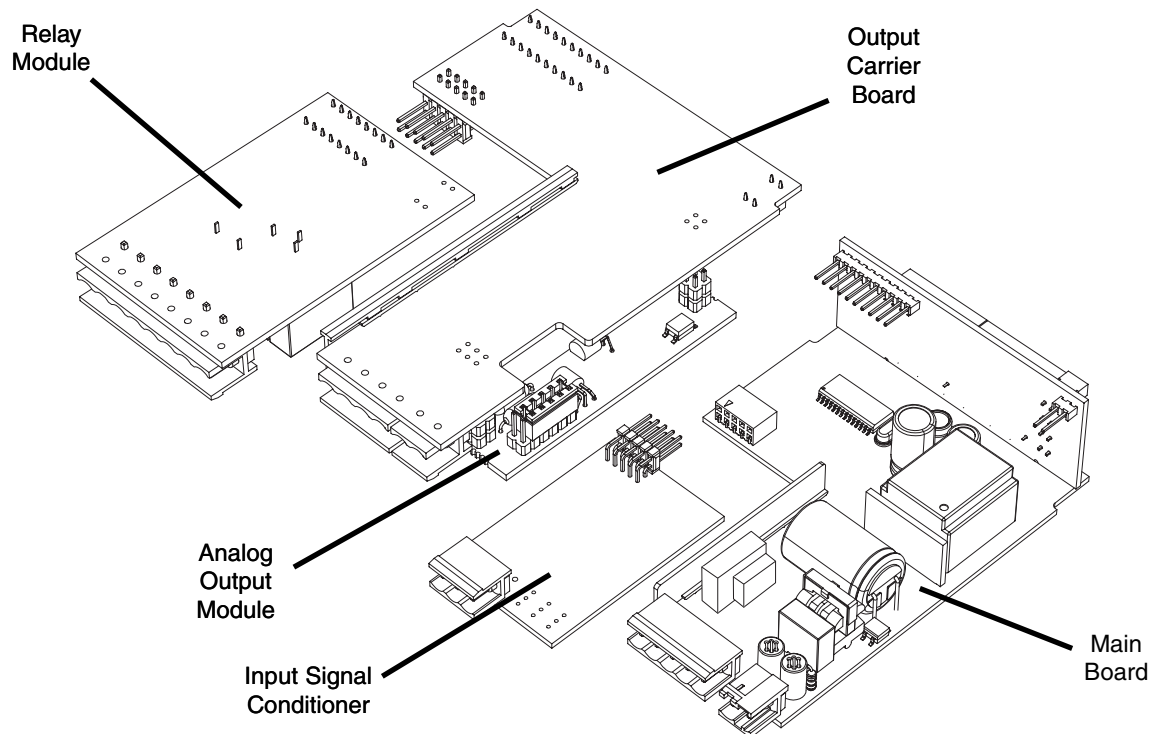**Relay Modules with 4 Independent 400V (210mA DC only) or (140mA AC/DC) SSRs**

DL Series

SP4   SP3   SP2   SP1

29 28 27 26 25 24 23 22

Order Code	Options			
	SP4	SP3	SP2	SP1
OR51, OR61	-	-	-	210mA, 140mA
OR52, OR62	-	-	210mA, 140mA	210mA, 140mA
OR53, OR63	-	210mA, 140mA	210mA, 140mA	210mA, 140mA
OR54, OR64	210mA, 140mA	210mA, 140mA	210mA, 140mA	210mA, 140mA

Relay Modules with 2 Non-Isolated 5A Form A Relays, and 2 Non-Isolated 10A Form C Relays

DL Series

SP2   SP4   SP1   SP3

29 28 27 26 25 24 23 22

Order Code	Options			
	SP2	SP4	SP1	SP3
OR11	-	-	10A	-
OR12	10A	-	10A	-
OR23	10A	5A	10A	-
OR14	10A	5A	10A	5A
OR15	-	5A	10A	5A
OR16	-	5A	10A	-

Relay Modules with 4 Isolated 5A Form A Relays

DL Series

SP4   SP3   SP2   SP1

29 28 27 26 25 24 23 22

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

Component Layout

Relay Module

Output Carrier Board

Analog Output Module

Input Signal Conditioner

Main Board

Display Board – Front View

SP1 SP2 SP3 SP4

SP4
SP3
SP2
SP1

LOCK
ON
OFF

LOCK
ON   OFF
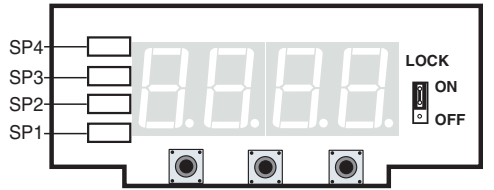
0.56" LED Display Board - Front View
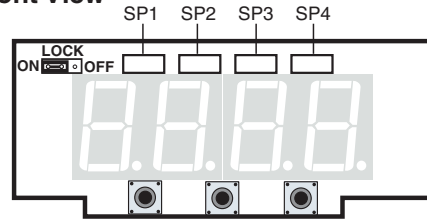
0.8" LED Display Board - Front View

High Volt Main Board
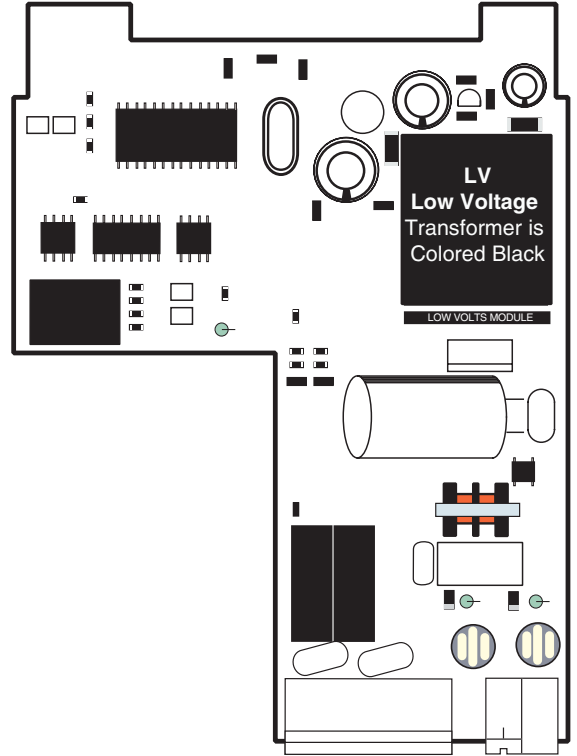
HV
High Voltage
Transformer is
Colored Grey

HIGH VOLTS MODULE

Low Volt Main Board

LV
Low Voltage
Transformer is
Colored Black

LOW VOLTS MODULE

Output Module Carrier Board
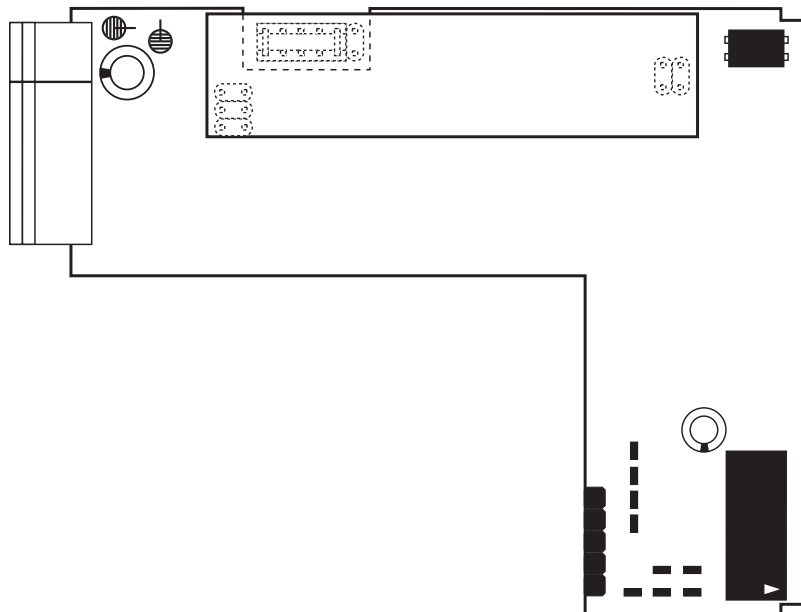
Symbols Indicate Module Compatibility Within Meter Families

TIGER Family	TIGER Family	TIGER Family
LEOPARD Family	LEOPARD Family	LEOPARD Family
LYNX Family	LYNX Family	LYNX Family
ALL MODELS	**SOME MODELS**	**MODEL SPECIFIC**

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 ran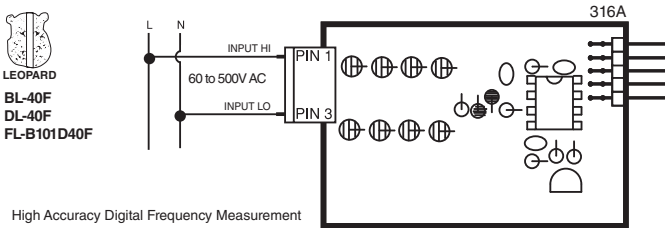ges or custom ranges may be ordered. Factory installed custom scaling and other custom options are also available (see Ordering Information, Special Options on last page).

IF05: Frequency with 24V Exc.

LEOPARD

BL-40F
BL-40RPM
DL-40F
DL-40RPM
FL-B101D40F
FL-B101D40R

INPUT HI — PIN 1
+ 24V EXC. — PIN 2
Common — PIN 3

FREQUENCY
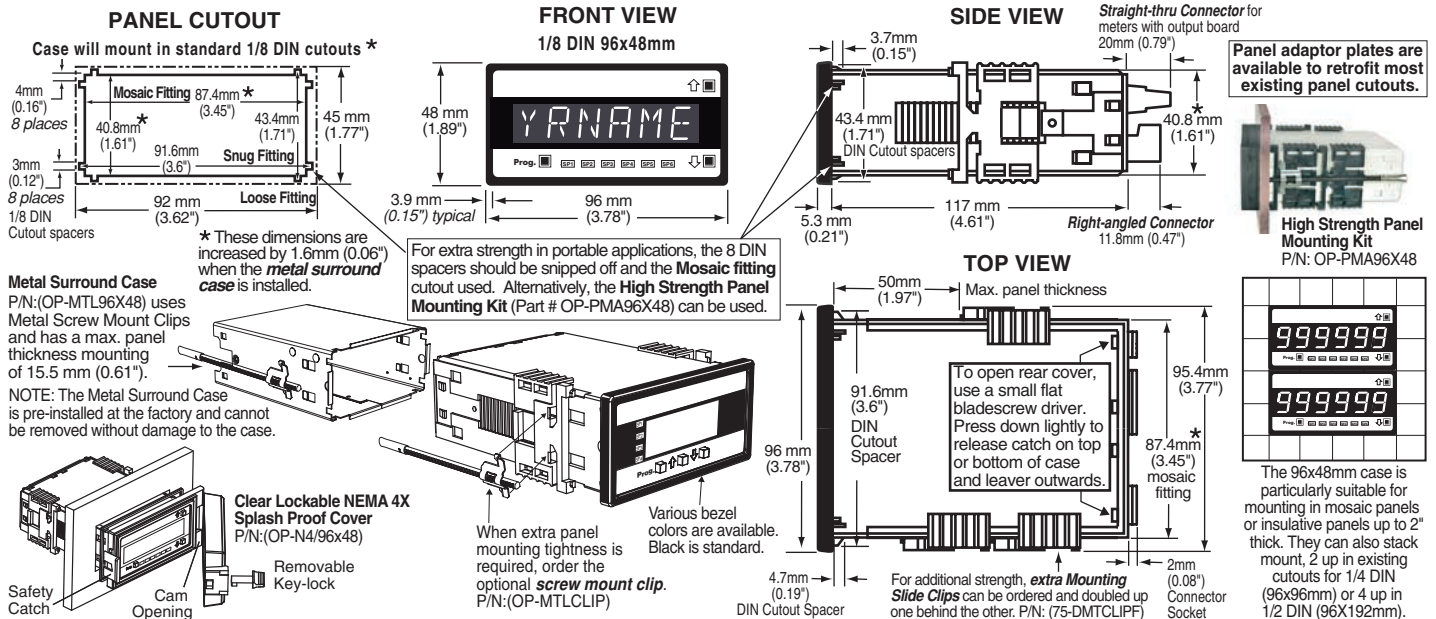
High Accuracy Digital Measurement

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.

IF08: Line Frequency

LEOPARD

BL-40F
DL-40F
FL-B101D40F

L   N
INPUT HI — PIN 1
60 to 500V AC
INPUT LO — PIN 3

316A

High Accuracy Digital Frequency Measurement

Case Dimensions

PANEL CUTOUT
Case will mount in standard 1/8 DIN cutouts ★

4mm (0.16") 8 places
Mosaic Fitting 87.4mm ★ (3.45")
40.8mm (1.61")
43.4mm (1.71")
45 mm (1.77")
3mm (0.12") 8 places
91.6mm (3.6")
Snug Fitting
92 mm (3.62")
Loose Fitting
1/8 DIN Cutout spacers

★ These dimensions are increased by 1.6mm (0.06") when the *metal surround case* is installed.

Metal Surround Case
P/N:(OP-MTL96X48) uses Metal Screw Mount Clips and has a max. panel thickness mounting of 15.5 mm (0.61").
NOTE: The Metal Surround Case is pre-installed at the factory and cannot be removed without damage to the case.

Clear Lockable NEMA 4X Splash Proof Cover
P/N:(OP-N4/96x48)

Removable Key-lock

Safety Catch
Cam Opening

When extra panel mounting tightness is required, order the optional *screw mount clip*. P/N:(OP-MTLCLIP)

FRONT VIEW
1/8 DIN 96x48mm

48 mm (1.89")
Y R N A M E
Prog.
3.9 mm (0.15") typical
96 mm (3.78")

Various bezel colors are available. Black is standard.

SIDE VIEW

Straight-thru Connector for meters with output board
20mm (0.79")

3.7mm (0.15")
43.4mm (1.71") DIN Cutout spacers
40.8 mm (1.61")
5.3 mm (0.21")
117 mm (4.61")
Right-angled Connector 11.8mm (0.47")

For extra strength in portable applications, the 8 DIN spacers should be snipped off and the **Mosaic fitting** cutout used. Alternatively, the **High Strength Panel Mounting Kit** (Part # OP-PMA96X48) can be used.

TOP VIEW

50mm (1.97")   Max. panel thickness

91.6mm (3.6") DIN Cutout Spacer
96 mm (3.78")

To open rear cover, use a small flat bladescrew driver. Press down lightly to release catch on top or bottom of case and leaver outwards.

95.4mm (3.77")
87.4mm (3.45") mosaic fitting

4.7mm (0.19") DIN Cutout Spacer

For additional strength, *extra Mounting Slide Clips* can be ordered and doubled up one behind the other. P/N: (75-DMTCLIPF)

2mm (0.08") Connector Socket

Panel adaptor plates are available to retrofit most existing panel cutouts.

High Strength Panel Mounting Kit
P/N: OP-PMA96X48

999999
Prog.
999999
Prog.

The 96x48mm case is particularly suitable for mounting in mosaic panels or insulative panels up to 2" thick. They can also stack mount, 2 up in existing cutouts for 1/4 DIN (96x96mm) or 4 up in 1/2 DIN (96X192mm).

Lens Cover OP-N4X/96X48

The lens cover is designed to be dust and water proof to NEMA-4 standards. The lens cover consists of a base and cover with a cam hinge and key-lock locking device.

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 capillary seal with a tapered ridge on the base. Turning the key-lock tightens the cover to the base, ensuring seal integrity. A safety catch keeps the cover closed even when the key is turned to the open position and removed. The keyhole can also be used to attach a safety seal clip, preventing unauthorized opening.
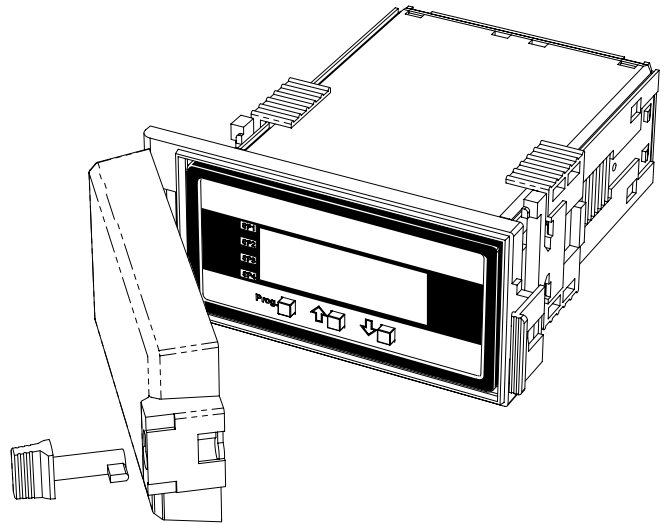
Metal Surround Case OP-MTL96X48

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. Once the metal case has been fitted to the polycarbonate case it cannot be removed.

With the metal case in place, the meter's plastic ratchet-type mounting clips can no longer be used. A pair of screw-type mounting clips are inserted into holes on the side of the metal case and used to mount the meter in the panel. A ground tab on the metal case provides a ground connection between the meter's main board and the metal case.

* Metal Surround Case must be factory installed.

Metal Surround Case

Meter with metal surround case and screw-type mounting clips assembled

Ground Tab

Screw-type Mounting Clip
P/N: OP-MTLCLIP

Metal Surround Case
P/N: OP-MTL96X48
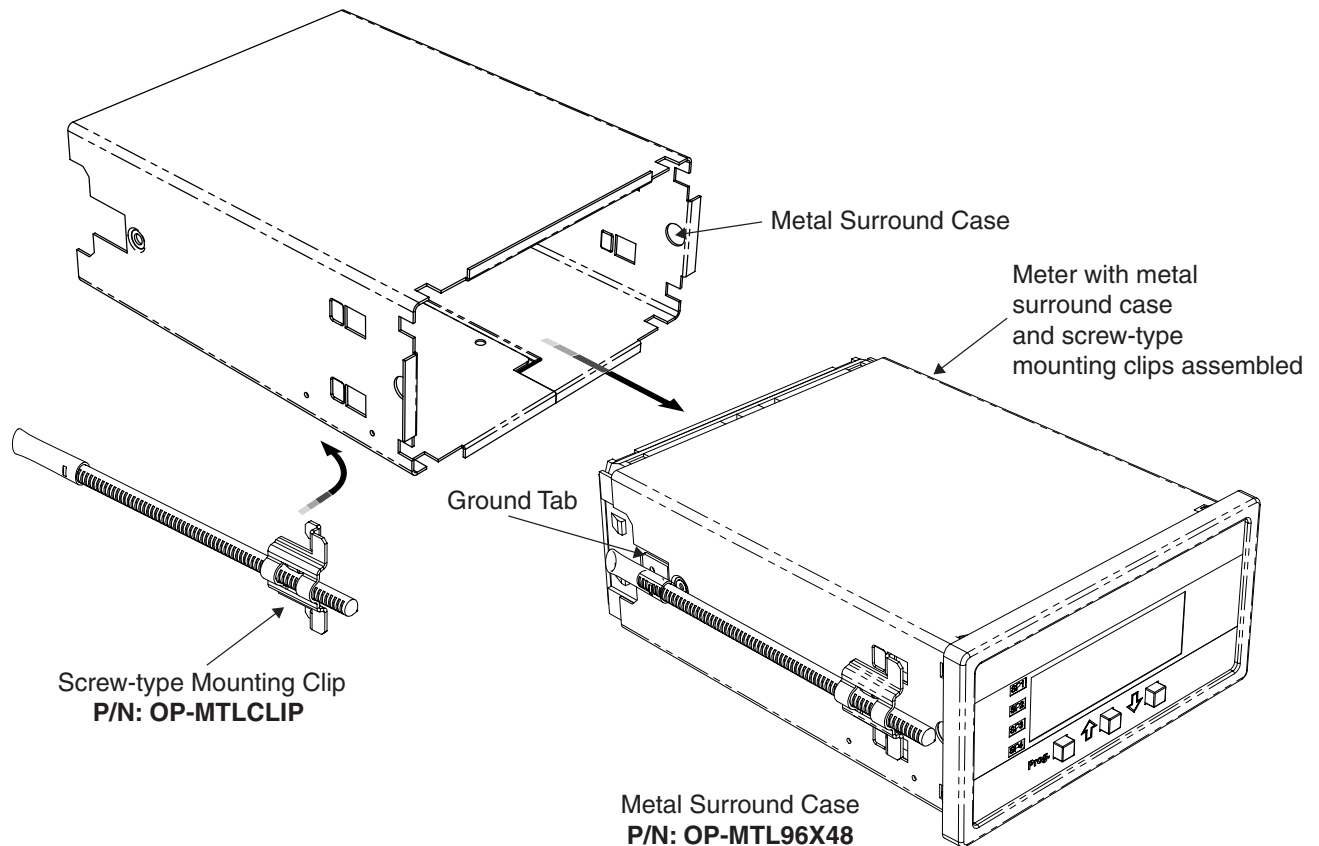
Ordering Information

BASIC MODEL #	DISPLAY	POWER SUPPLY	INPUT MODULES	ANALOG OUTPUT*	RELAY OUTPUT*	OPTIONS / ACCESSORIES
DL-40F —	—	—	—	—	—	**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. (See special Options and Accessories section)

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

▶ **BASIC MODEL NUMBER**
DL-40F . . . . 96x48mm, Leopard, 4 Digit, Frequency/RPM

Standard Options for this Model Number

Order Code Suffix   *Description*

▶ **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 - 370VDC
PS2 . . . .15 - 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.

IF05 . . .Frequency with 24V Excitation. **99.99**/999.9/9999Hz
IF08 . . .Line Frequency

▶ **ANALOG OUTPUT**
AIC . . . .Isolated 16 Bit Current Output, 0-20mA and 4-20mA, pls. specify
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 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

Solid State Relay (SSR) Output Modules AC/DC
OR61 . .One 400V AC/DC Solid State Relay (SSR) 140mA
OR62 . .Two 400V AC/DC Solid State Relays (SSR) 140mA
OR63 . .Three 400V AC/DC Solid State Relays (SSR) 140mA
OR64 . .Four 400V AC/DC Solid State Relays (SSR) 140mA

Special Options and Accessories (OA's)

Part Number   *Description*

▶ **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.

TEXMATE INC

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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