# TEXMATE

**LEOPARD FAMILY**

# TL-F
## Leopard Series Frequency Transmitter and Controller

CE
RoHS

MADE IN U.S.A.

**Optional Remote Display Programmer**

**An economically smart programmable frequency transmitter with isolated 4 to 20 mA retransmission or relay control output capability for measurement and control applications.**

## General Features

- Frequency input. Easily user scales.
- Optional Isolated 16 bit analog output. User or factory scalable to 4 to 20 mA, 0 to 20 mA or 0 to 10 V.
- Auto-sensing AC/DC power supply. For voltages between **85-265 V AC / 95-300 V DC (PS1)** or 15-48 V AC / 10-72 V DC (PS2).
- 24 V DC excitation is available to power Proximity sensors.
- Remote Diplay Option only.

## Software Features

- Three-button programming from the optional remote display (UP, DOWN and PROGRAM buttons).
- Front panel selectable four-level brightness control of digital display, and setpoint LEDs when diplay is used.
- Two programmable setpoints.
- Relay activation can be selected to occur above (HI) or below (LO) each setpoint.
- Hysteresis, Delay on make and delay on break for both setpoints.
- Peak and Valley. View and Reset.(only when diplsya is used)

## Input Module Compatibility

☑ There are 2 Plug-in Modular input Signal Conditioners for this specialized frequency only member of the Leopard Transmitter 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)
**Remote Display**:.......**4 digit 0.56" Red LED Remote display. (Optional)**
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 9 Amp Form C 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 @ 3.5W**
  PS2 .......................15-48 VAC 50-400Hz / 10-72 VDC @ 3.5W
**Operating Temp.**: ......0 to 50 °C
**Storage Temp**:...........–20 °C to 70 °C.
**Relative Humidity**: ....95% (non condensing)
**Case Dimensions**: ....DIN Rail Mount
22.5mm x 102.4mm x 128.7mm (Width x Height x Depth)
Plus 11.8 mm (0.47") for Right-angled connectors.
**Weight**:.......................7.5 oz., 9.0 oz when packed

## Index

# Optional Remote Display for Field Programming and Setup is needed



SP2
SP1
Setpoint
Annunciator
LEDs

**Optional Remote Display Programmer**

PROGRAM BUTTON **P**    UP ARROW BUTTON **↑**    DOWN ARROW BUTTON **↓**

# 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.

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 following symbols are used throughout the logic diagrams to represent the buttons and indicators on the meter:

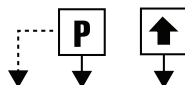**8.8.8.8.** This symbol represents the OPERATIONAL DISPLAY.
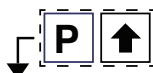
**P** This is the PROGRAM button.

**↑** 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 an alternative dotted line is shown, this indicates that an alternative logic branch will be followed when a particular option is present.

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.

**XXXX** If an X appears through a digit, it means that any number displayed in that digit is not relevant to the function being explained.

**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.
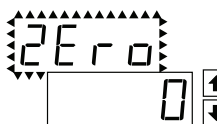
**2Ero / 0** When two displays are shown together with bursts, this indicates that the display is toggling (flashing) between the name of the function and the value.

**[Span]**
**[10000]**

**.dP**
[X·XXX]
[XX·XX]
[XXX·X]
[XXXX·]
[XXXX]

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 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.

The TL is an intelligent transmitter with a hierarchical software structue designed for easy programming and operation, as shown below in the software logic tree.

**Operational Display**

**8.8.8.8.**

**MAIN MENU**

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

**P ↑ Sub-menu MODE**

**cAL** Calibration Mode
**oFF** ↑↓
**on**

**P**

**cAL**
Calibration
Output **out** ↑↓ **P**
Calibration
Input **iP**

**P**

**PEAK & VALLEY VIEW & RESET**

Peak **PEAk**
**XXXX**

**P ↑ ↓** Reset PEAK

Valley **VALY**
**XXXX**

**P ↑ ↓** Reset VALY

**BRIGHTNESS AND SETPOINT VIEW MODE**

**br**
**1** ↑
1 Dimmest
2 Dim
↓ **P** 3 Bright
4 Brightest

**SP1**
**0**
↓ **P**

**SP2**
**0**
↓ **P**

**SETPOINT SETTING AND RELAY CONFIGURATION MODE See Page 9**

Set Setpoint 1 [SP1] **SP1**
**0** ↑↓

**P**

Delay-on-Make [doM] **doM**
**0** ↑↓

**NOTE**: [dom] [dob] Functions are only available for SP1 **P** 0 to 9999 seconds

Delay-on-Break [dob] **dob**
**0** ↑↓

**P** 0 to 9999 seconds

Hysteresis [hYSt] **hYSt**
**0** ↑↓

**P**

**TWO POINT DIGITAL CALIBRATION MODE See Page 4**

offset (ZEro) **oFFS**
**0** ↑↓

**P**

Scale Factor (SPAn) **SCAL**
**9999** ↑↓

**P**

**TWO POINT ANALOG OUTPUT RANGE SETTING AND CALIBRATION See Page 5**

Calibrate Analog Output Lo
**4.00**
**cLo**
**XXXX** ↑↓

**P**

Calibrate Analog Output Hi
**20.00**
**chi**
**XXXX** ↑↓

**P** Back to Operational Display

**Pump On Pump Off**
When PUM is selected ON, and SP2 is set at a value higher than SP1, the SP1 relay will operate in a special "pump on pump off" Hysteresis mode. SP2 acts as the upper limit and SP1 acts as the lower limit of the Hysteresis Band.

**For filling applications**, rLYS should be set to LhLh. SP1 will then activate for inputs less than the SP1 setpoint, and remain ON until the SP2 setpoint is reached.

**For emptying applications**, rLYS should be set to hhhh. SP1 will then activate for inputs greater than the SP2 setpoint, and remain ON until the SP1 setpoint is reached.
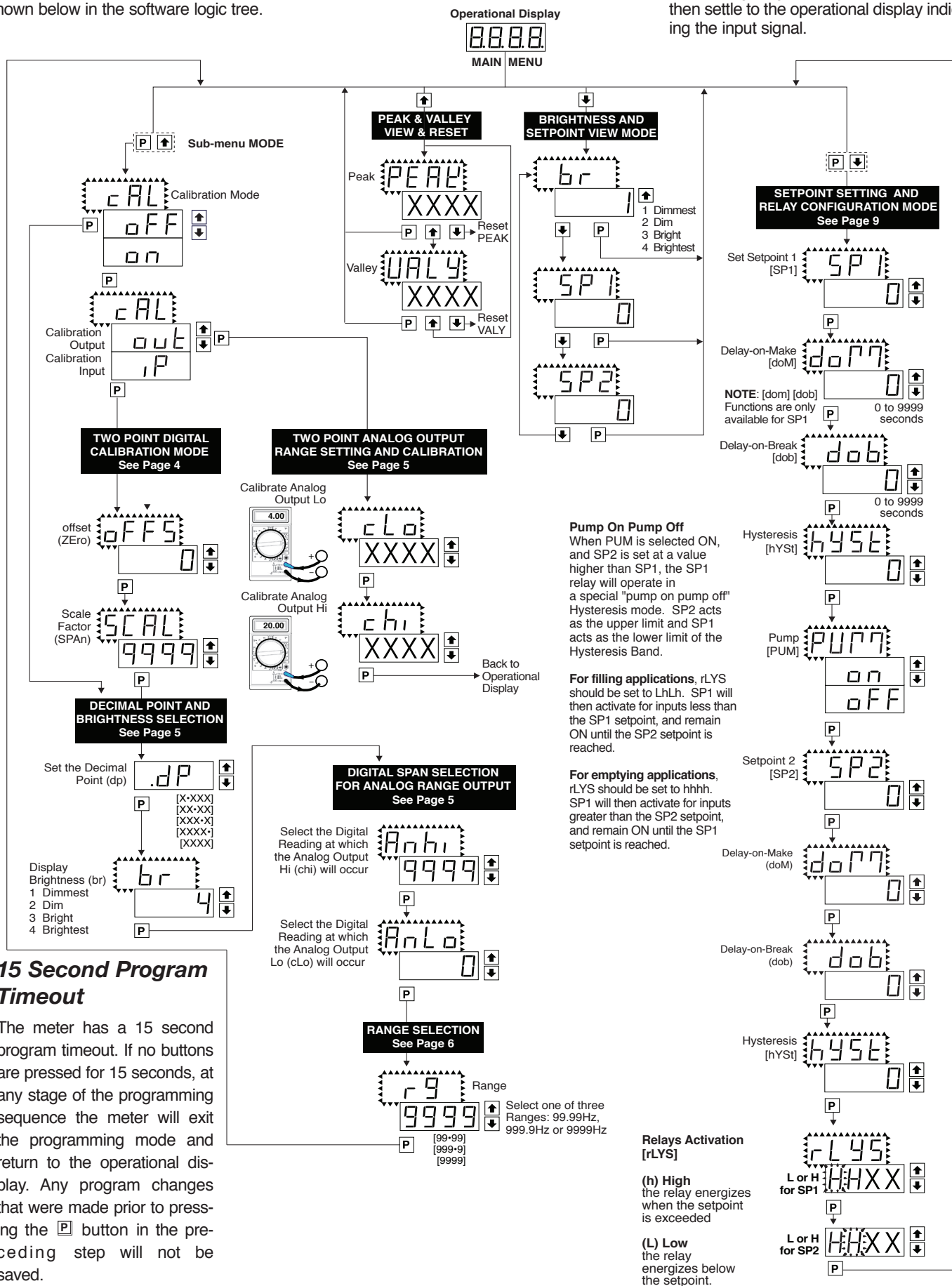
Pump [PUM] **PUM**
**on** ↑↓
**oFF**

**P**

Setpoint 2 [SP2] **SP2**
**0** ↑↓

**P**

Delay-on-Make (doM) **doM**
**0** ↑↓

**P**

Delay-on-Break (dob) **dob**
**0** ↑↓

**P**

Hysteresis [hYSt] **hYSt**
**0** ↑↓

**P**

**DECIMAL POINT AND BRIGHTNESS SELECTION See Page 5**

Set the Decimal Point (dp) **.dP** ↑↓
**P** [X•XXX]
[XX•XX]
[XXX•X]
[XXXX•]
[XXXX]

Display Brightness (br) **br** ↑↓
**4**
1 Dimmest
2 Dim
3 Bright **P**
4 Brightest

**DIGITAL SPAN SELECTION FOR ANALOG RANGE OUTPUT See Page 5**

Select the Digital Reading at which the Analog Output Hi (chi) will occur **Anhi**
**9999** ↑↓

**P**

Select the Digital Reading at which the Analog Output Lo (cLo) will occur **AnLo**
**0** ↑↓

**P**

**RANGE SELECTION See Page 6**

**r 9** Range
**9999** ↑↓ Select one of three Ranges: 99.99Hz, 999.9Hz or 9999Hz
**P** [99•99]
[999•9]
[9999]

## 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.

**Relays Activation [rLYS]**

**(h) High** the relay energizes when the setpoint is exceeded

**(L) Low** the relay energizes below the setpoint.

**rLYS**
**L or H for SP1 HHXX** ↑↓

**P**

**L or H for SP2 HHXX** ↑↓

**P**

## Digital Rescaling

The transmitter may be rescaled without applying an external signal by changing the Offset and Scale factor.

Offset is the reading that the meter will display for a zero input. The Offset may be set to any value from -1999 to +9999. The default value of the Offset is 0.

Scale factor is the gain of the meter. The displayed reading is directly proportional to the Scale factor. The default value of the scale factor is 9999, but it may be set to any value between -1999 and +9999.

For an input of 100Hz a calibrated meter will read 99.99 with the default Scale factor of 9999, 99.9 with a Scale factor of 999 and 99 with a Scale factor of 99.

If a linear scale is represented by mx + b, then the Scale Factor corresponds to the slope 'm' and the Offset corresponds to the intercept 'b'

## Digital Rescaling Procedure

**MAIN MENU**
**Operational Display**



**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].

**STEP B** **Select Two Point Digital Calibration of Input Signal**
1) Press the ⬆ or ⬇ button to select CAL [iP] for input signal calibration.

**STEP C** **Set the Offset (oFFS)**
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.

**STEP D** **Set the Scale Factor (SCAL)**
1) Display toggles between [SCAL] and the previous scale setting.
2) 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.
3) Press the P button.

**The Digital Calibration Procedure is now complete**.
If the digital calibration was successfully completed, the menu branches to the Decimal Point and Brightness Selection (see page 5), and the display shows [dP] and the previous setting.
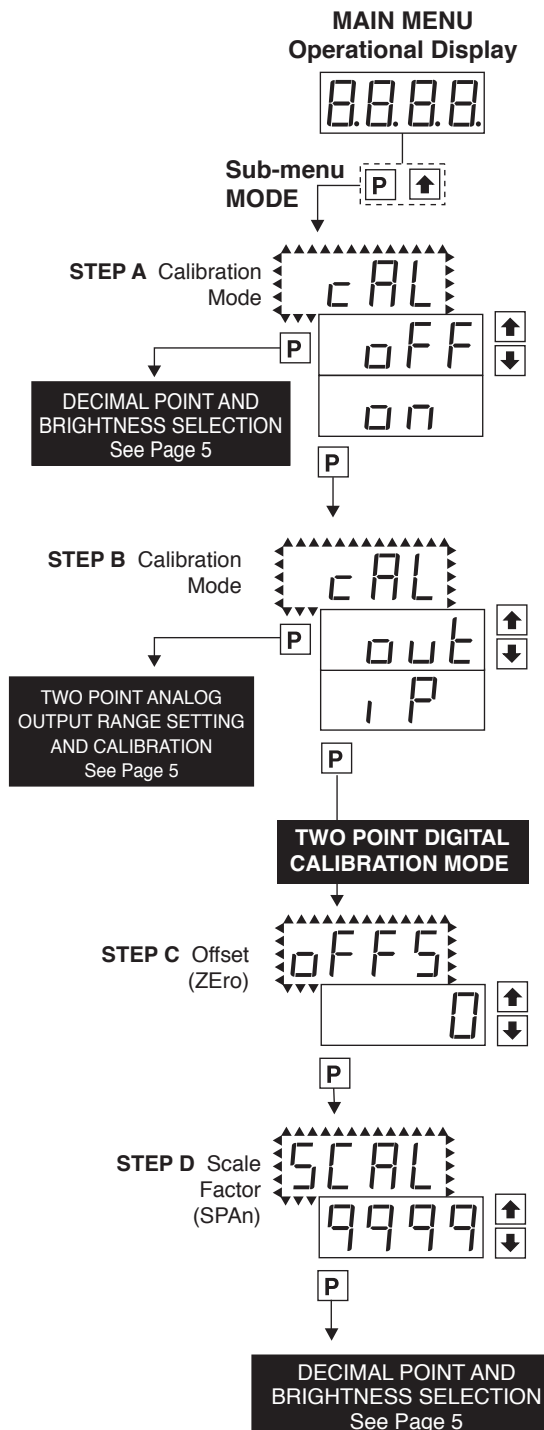
## Two Point Analog Output Range Setting and Calibration

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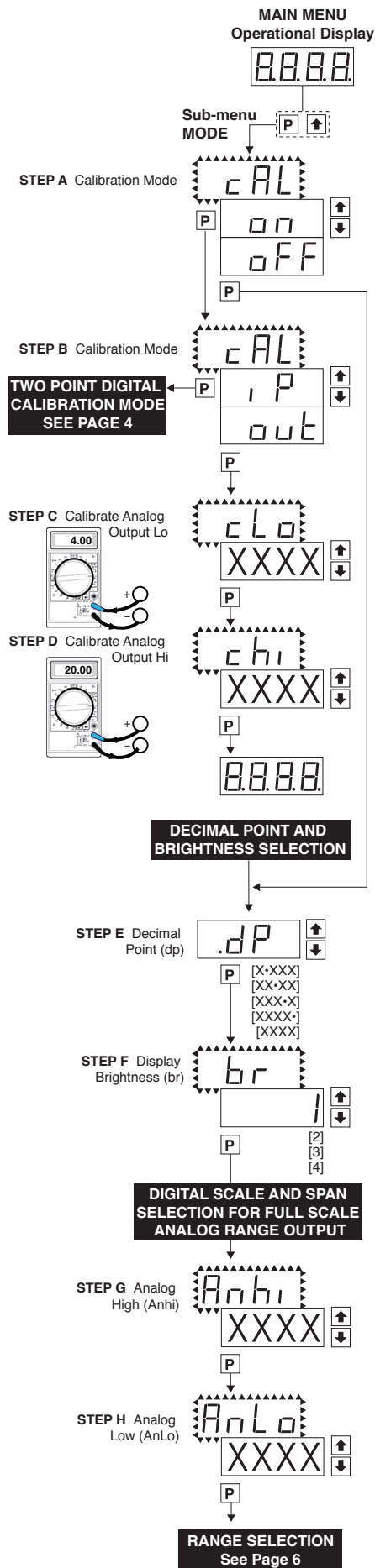1) Press the [P] button. Display toggles between [cLo] and an internal scale factor.

**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 t o g g l e s    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.

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**MAIN MENU**
**Operational Display**

8.8.8.8.

**Sub-menu MODE**   [P] [↑]

**STEP A** Calibration Mode
c AL
[P]   on / oFF   [↑][↓]
[P]

**STEP B** Calibration Mode
c AL
i P
out
**TWO POINT DIGITAL CALIBRATION MODE SEE PAGE 4**
[P]   [↑][↓]
[P]

**STEP C** Calibrate Analog Output Lo
4.00
c Lo
XXXX   [↑][↓]
[P]

**STEP D** Calibrate Analog Output Hi
20.00
c hi
XXXX   [↑][↓]
[P]

8.8.8.8.

**DECIMAL POINT AND BRIGHTNESS SELECTION**

**STEP E** Decimal Point (dp)
. dP   [↑][↓]
[P]   [X·XXX] [XX·XX] [XXX·X] [XXXX·] [XXXX]

**STEP F** Display Brightness (br)
br
1   [↑][↓]
[P]   [2] [3] [4]

**DIGITAL SCALE AND SPAN SELECTION FOR FULL SCALE ANALOG RANGE OUTPUT**

**STEP G** Analog High (Anhi)
Anhi
XXXX   [↑][↓]
[P]

**STEP H** Analog Low (AnLo)
AnLo
XXXX   [↑][↓]
[P]

**RANGE SELECTION See Page 6**

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## 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 setpoints without relays are operational in software for tri-color control or display only purposes. To remove unwanted setpoint indications, set them to 9999 or -1999 depending on the relay activation mode selected.

**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 a 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**  **Select the Hysteresis [hYSt]**
   1) Using the [↑] and [↓] buttons, adjust the display to the desied hysteresis [hYSt] value.
   2) Press the [P] button. Display toggles between PUM and (on) or (oFF).

**STEP F**  **Select Pump [PUM] (on) or (oFF)**
   1) Using the [↑] and [↓] buttons, select the Pump to be ON or OFF. When PUM is selected ON, and SP2 is set at a value higher than SP1, the SP1 relay will operate in a special "pump on pump off" mode. SP2 acts as the upper limit and SP1 acts as the lower limit of the Hysteresis Band on the SP1 relay.

**For filling applications:**
[rLYS] should be set to [LhXX] (see step M). The SP1 relay and SP1 LED Annunciator will then activate for inputs less than the SP1 setpoint, and remain ON until the SP2 setpoint is reached.

**For emptying applications:**
[rLYS] should be set to [hhXX] (see step M). The SP1 relay and SP1 LED Annunciator will then activate for inputs greater than the SP2 setpoint, and remain ON until the SP1 setpoint is reached.
   2) Press the [P] button. Display toggles between [SP2] and the previous SP2 setting.

**STEP G**  **Set Setpoint 2 (SP2)**
**STEP H**  **Set the SP2 Delay-on-Make (doM) Delay Time Setting**
**SETP I**  **Set the SP2 Delay-on-Break (doB) Delay Time Setting**

**STEP J**  **Select the Hysteresis [hYSt] for Setpoint 2**
   1) Using the [↑] and [↓] buttons, adjust the display to the desied hysteresis [hYSt] value.
   2) Press the [P] button. Display toggles between [rLYs] and the previous relay setting.

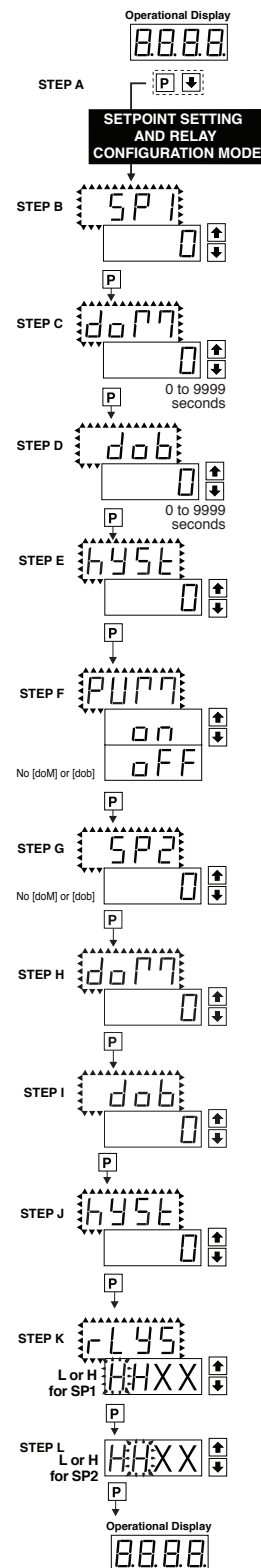**STEP K**  **Set Relay Activation mode [rLYS] for SP1**
   (h) High the relay energizes when the setpoint is exceeded. (L) Low the relay energizes below the setpoint. The setpoint is indicated from left to right SP1, SP2.
   1) Using the [↑] and [↓] buttons, select (L) or (h) for the first digit, which corresponds to SP1.
   2) Press the [P] button. The SP2 Relay Activation digit begins to flash, and its decimal point is lit.

**STEP L**  **Set High (h) or Low (L) for SP2**
   1) Using the [↑] and [↓] buttons, select (L) or (h) for the second digit, which corresponds to SP2.
   2) Press the [P] button.

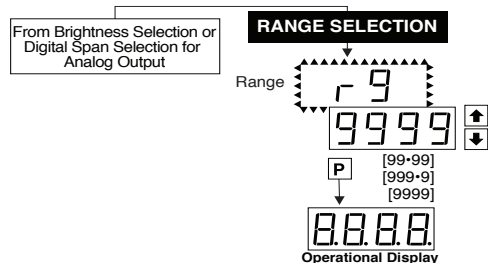The transmitter exits the setpoint mode and return to the operational display.

*Side diagram column:*

Operational Display
8.8.8.8.
STEP A
[P] [↓]
SETPOINT SETTING AND RELAY CONFIGURATION MODE
STEP B — SP1 — 0
P
STEP C — doM — 0 — 0 to 9999 seconds
P
STEP D — dob — 0 — 0 to 9999 seconds
P
STEP E — hYSt — 0
P
STEP F — PUM — on / oFF — No [doM] or [dob]
P
STEP G — SP2 — 0 — No [doM] or [dob]
P
STEP H — doM — 0
P
STEP I — dob — 0
P
STEP J — hYSt — 0
P
STEP K — rLYS — HHXX — L or H for SP1
P
STEP L — HHXX — L or H for SP2
P
Operational Display
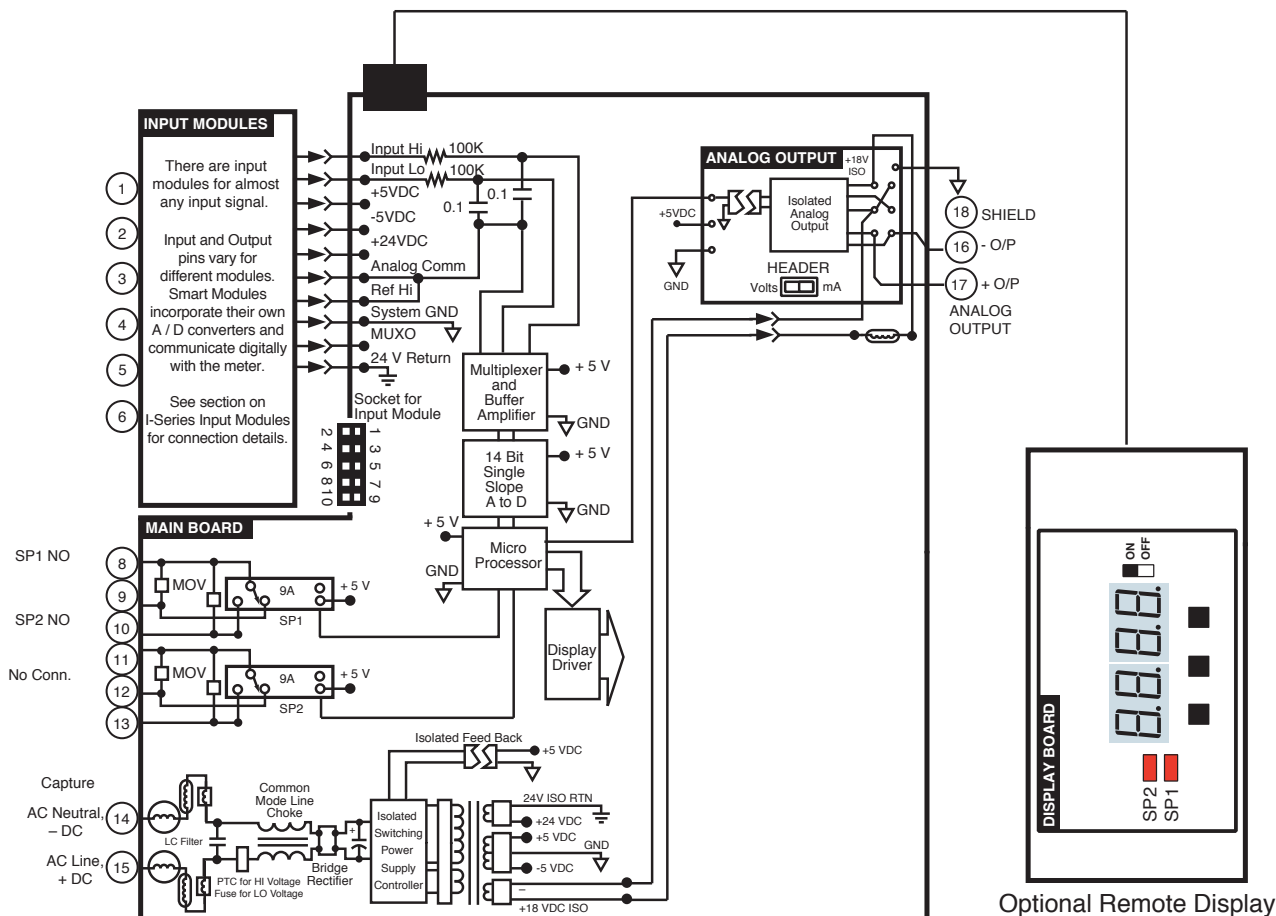8.8.8.8.

## Range Selection Mode

**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. The display exits the calibration mode and returns to the operational display.

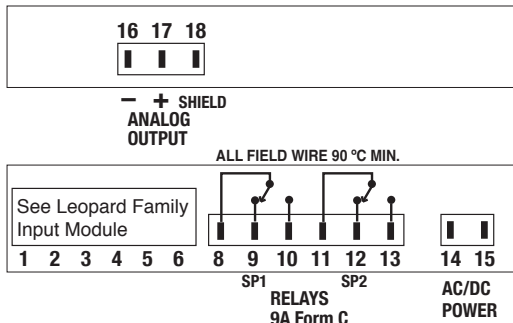**The Display/Bargraph settings are now complete.**

*Side diagram column:*

From Brightness Selection or Digital Span Selection for Analog Output
RANGE SELECTION
Range — r 9
9999
P — [99•99] [999•9] [9999]
8.8.8.8.
Operational Display

**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
Analog Comm
Ref Hi
System GND
MUXO
24 V Return

Socket for Input Module

**ANALOG OUTPUT**

+18V ISO
Isolated Analog Output
+5VDC
GND
HEADER
Volts / mA

18 SHIELD
16 - O/P
17 + O/P
ANALOG OUTPUT

Multiplexer and Buffer Amplifier
+ 5 V
GND

14 Bit Single Slope A to D
+ 5 V
GND

+ 5 V

Micro Processor
GND

Display Driver

**MAIN BOARD**

SP1 NO
8
9
MOV  9A  + 5 V
SP1
SP2 NO
10
11
No Conn.
12
MOV  9A  + 5 V
SP2
13

Isolated Feed Back  +5 VDC

Capture
AC Neutral, – DC  14
LC Filter
Common Mode Line Choke
Bridge Rectifier
PTC for HI Voltage
Fuse for LO Voltage
Isolated Switching Power Supply Controller
AC Line, + DC  15

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

DISPLAY BOARD
ON OFF
SP2 SP1

Optional Remote Display

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## 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 TL Series Transmitter 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.



16 17 18
– + SHIELD
ANALOG OUTPUT

ALL FIELD WIRE 90 °C MIN.

See Leopard Family Input Module
1 2 3 4 5 6    8 9 10 11 12 13    14 15
SP1  SP2
RELAYS 9A Form C
AC/DC POWER

Auto-sensing AC/DC power supply. For voltages between 85-265 V AC / 95-300 V DC (PS1) or 15-48 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
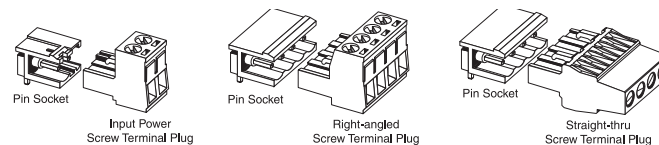
## Input Signal – Pins 1 to 6

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

## Relay Output Pins- Pins 8 to 13

| | |
|---|---|
| **Pin 8-10** | **SP1 Normally Open** |
| **Pin 8-9** | **SP1 Normally Close** |
| **Pin 11-13** | **SP2 Normally Open** |
| **Pin 11-12** | **SP2 Normally Close** |

## 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 15-48 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.

## Analog Output- Pins 16 and 18

Pins 16 and 17 are the analog output pins on the optional output module. Their pin definitions are:

**Pin 16**   Negative (–) analog output.
**Pin 17**   Positive (+) analog output.
**Pin 18**   Shield.

## 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 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).

⚠ **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.

**IF05:** Universal Frequency / RPM



LEOPARD
BL-40F
BL-40RPM
DL-40F
DL-40RPM
FL-B101D40F
FL-B101D40RPM
TL-F
TL-RPM

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

330B

High Accuracy Digital Measurement

**IF08:** Line Frequency



LEOPARD
BL-40F
DL-40F
FL-B101D40F
TL-F

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

316A

High Accuracy Digital Frequency Measurement
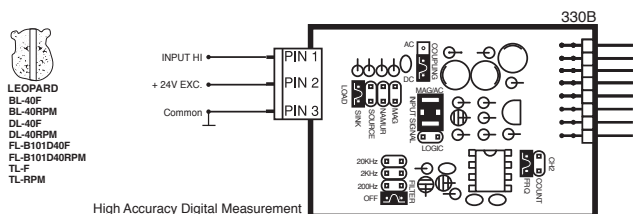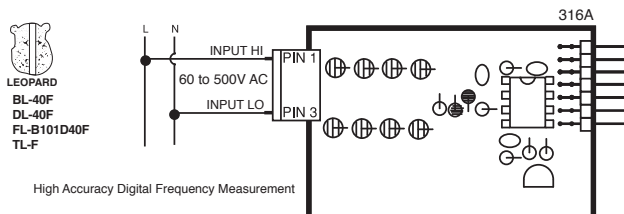
## Installation Guidelines

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

2. Install transmitter 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 transmitter 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).
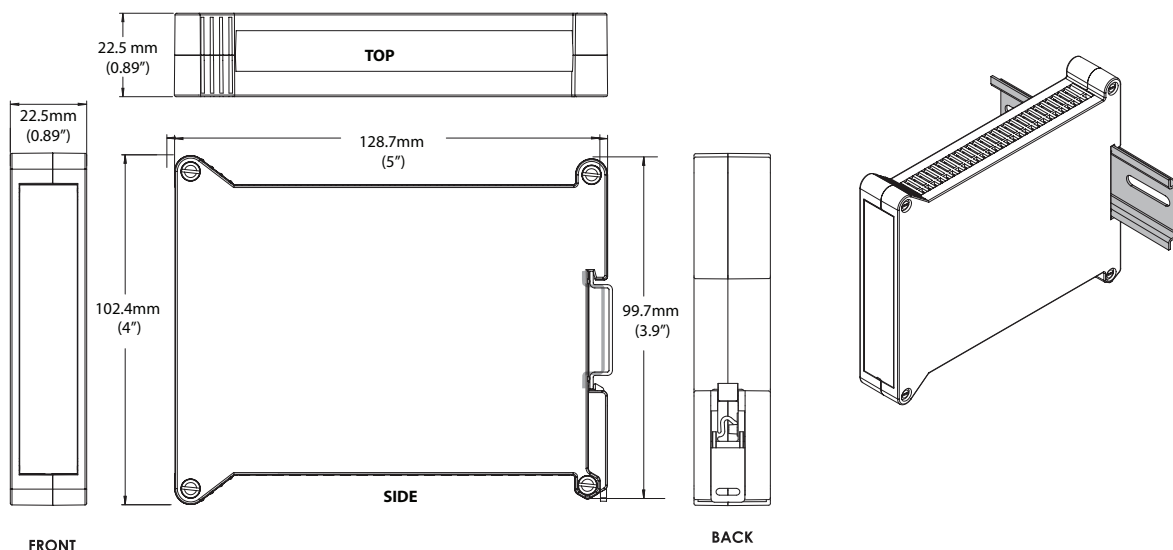
5. See *Connector Pinouts section* for wiring. ⚠

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

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

## Case Dimensions

## Ordering Information

| * Selection Required | BASE MODEL # | POWER SUPPLY | INPUT MODULES | ANALOG OUTPUT | RELAY OUTPUT | OA____ |
|---|---|---|---|---|---|---|
| | * | * | * | * | | |

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### ▶ BASE MODEL NUMBER

**TL-F . . . . . Frequency Transmitter and Controller . . . . . . .**

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### ▶ POWER SUPPLY
**PS1 . . . . . . 85-265VAC/95-300VDC** . . . . . . . . . . . . . . . . . . . . .
PS2 . . . . . 15-48VAC/10-72VDC. . . . . . . . . . . . . . . . . . . .

### ▶ INPUT MODULES

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

IF05. . .Frequency with 2mV/5V with Excitation . . . . . . . . . . . . . .
IF08. . .Line Frequency. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

### ▶ ANALOG OUTPUT
OIC . . Isolated 16 Bit Current Output, 4-20mA . . . . . . . . . . .
OIV . . Isolated 16 Bit Voltage Output, 0-10VDC. . . . . . . . . . .

### ▶ RELAY OUTPUT
R11. . Single 9A Form C Relay . . . . . . . . . . . . . . . . . . . . . . .
R12. . Dual 9A Form C Relays . . . . . . . . . . . . . . . . . . . . . . .

## SPECIAL OPTIONS

### ▶ SPECIAL OPTIONS

**Range Change and Custom Scaling**
Customer must specify the input signal range or digital span and the desired display range, or output signal range. Multiple inputs or multiple displays require a separate range change or custom scaling part number and a specified channel for each input or display.

**Range Change** and calibration to another header selectable standard range
CR-CHANGE . . . Range Change from Standard Range shown in **BOLD** type . .

**Output - Custom Scaling** within standard ranges of analog output.
COA-3/3.5/4 . . .Custom scaling of analog output . . . . . . . . . . . . .

**Short Depth 96x48 Remote Display/Programmer**
OP-TL/RDISP . .Remote Display/Programmer w/Cable . . . . . . . . .
and Belt Clip Carrying Case



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We have authorized distributors throughout the USA and in 28 other countries.

**For product details visit www.texmate.com**
**Local Distributor Address**

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