



## **BX-B31**

Lynx Bargraph Meter 31 LED Segments in a 1/16 DIN Case

### A versatile, modular bargraph with optional single or dual setpoints.

#### **General Features**

- 31 segment AC/DC powered modular compact bargraph.
- 1/16 DIN (96 x 24mm) case easily mounts in thin or thick panels (up to 2").
- Red (std), green (optional) or amber (optional) colors.
- · Vertical or horizontal formats.
- External transmitters or signal conditioners can be eliminated by directly connecting the sensor to more than 33 **I-Series** Plug-in Input Signal Conditioning Modules that include:
  - AC Current Process
  - AC Voltage Prototype
  - DC Current Resistance
  - DC Voltage Strain-gage
  - Load Cell Temperature
  - Pressure 4 to 20 mA
- Pre-calibrated I-Series Input Signal Conditioning 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.
- 24 V DC excitation is available to power external transmitters and 5 or 10 V DC excitation is available for strain-gages, load cells and resistance bridge type sensors.
- High voltage power supply (PS1) 85 265VAC / 95 370VDC Low voltage power supply (PS2) 15 - 48VAC / 10 - 72VDC
- Optional single or dual setpoints with easy adjustment from the front.
- Dual 5A Form "A" relays or one 5A Form "A" and one 10A Form "C" relays.
- · Easy configuration of relays as high or low setpoints.
- Proportional brightness mode for increased effective optical resolution.

#### Input Module Compatibility

LYNX FAMILY: More than 33 different Plug-in I-Series Input Signal Conditioners are approved for Texmate's Lynx Family of meters. As shown on pages 4 to 5.

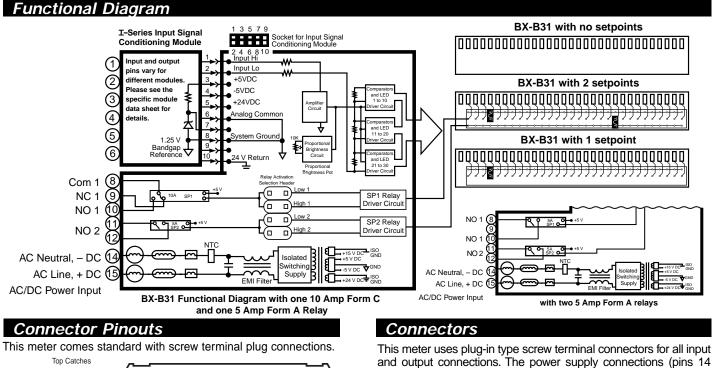


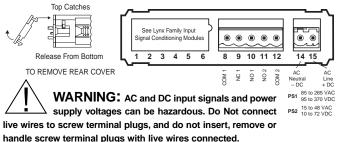
See www.texmate.com for an up to date listing.

### **Specifications**

nput Specs:Depends on input signal conditioner					
A/D Converter:					
Accuracy:	Accuracy:±(0.05% of reading + 3 counts)				
Temp. Coeff.:100 ppm/°C (Typical)					
Warm up time:2 minutes					
Display:Thirty-one 0.2" x 0.06" (5.08 x 1.52mm)					
	LED segments. Red display (std), green				
	(opt) or amber (opt)				
Positive Overrange:All segments flash.					
Negative Overrange:Zero segment flashes					
Power Supply:	AC/DC Auto sensing wide range supply				
PS1 (std)	85-265 VAC / 95-370 VDC @ 2.5W				
PS2	15-48 VAC / 10-72 VDC @ 2.5W				
Operating Temp.:0 to 60° C					
Storage Temp:20° C to +70° C					
Relative Humidity:95% (non condensing)					
Case Dimensions:	1/16 DIN, Bezel: 96x24mm(3.78"x0.95")				
	Depth behind bezel 122.2 mm (4.83")				
	Plus 12.7mm (0.5") for Right-angled				
	connector.				
Weight:	198 gms (7 oz)				
	255 gms (9 oz) when packed				

Index							
Case Dimensions	Input Module Calibration Procedures						
Connector Pinouts	Input Module Component Glossary						
Connectors	Ordering Information						
Functional Diagram	Pin Descriptions						
I-Series Input Signal Conditioning Modules							





#### **Pin Descriptions**

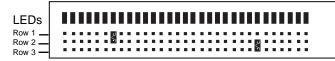
Pins 1 to 6 - Input Module: See the individual pin out of the input signal conditioning module selected. Usually Pin 1 is the Signal Input High pin and Pin 3 is the Signal Input Low pin. All calibration and scaling functions are performed on the individual input signal conditioner module. See pages 6 and 7.

Pin 8 - Common of 10 Amp Form C or 5 Amp Form A SP1 Relay.

Pin 9 - Normally Closed Contact of 10 Amp Form C SP1 Relay.

Pin 10 - Normally Open Contact of 10 Amp Form C or 5 Amp Form A SP1 Relay.

### Changing the Setpoints From the Front of the Meter



#### FRONT OF METER WITH BEZEL AND FILTER REMOVED

To adjust the setpoint on the BX-B31 with relays, remove the front bezel and faceplates. Use needlenose pliers to remove and reposition the setpoint jumper clips.

For Setpoint #1: Insert the jumper clip between Row #1 and Row #2, directly below the LÉD that you wish to activate.

For Setpoint #2: Insert the jumper clip between Row #2 and Row #3, directly below the LÉD that you wish to activate.



Low 2 ( Select High to energize the relay when the setpoint is

High 1 exceeded. Select Low to energize the relay when the display is below the setpoint. Low 1 ( 🗆

### Proportional Brightness Band Potentiometer

The Proportional Brightness Potentiometer superimposes a proportional brightness band to the leading edge of the bargraph which creates Pin 11 & Pin 12- Normally Open Contacts of 5 Amp Form A SP2 Relay.

Input Power

Screw Terminal Plug

Pin Socket

Right-angled

Screw Terminal Plug

and 15) have a unique plug and socket outline to prevent cross con-

nection. The main board uses standard right-angled connectors.

Pin 14 & Pin 15 - AC/DC Power Input: These pins are the power pins of the meter and they only accept a special polarized screw terminal plug that can not be inserted into any other input socket. The standard meter has a auto sensing AC/DC power supply that operates from 85-265 VAC/95-370 VDC (PS1 Std). An optional isolated low voltage power supply that operates from 15-48 VAC/10-72 VDC (PS2) is also available.

the optical appearance of a pointed arrow ∏Dr This feature produces a display of infinite resolution. The position of the signal in relation to any two adjacent segments and the scale on the faceplate can be accurately ascertained to within 1%. When the amplitude of the proportional band is adjusted counterclockwise to zero, the smooth proportional advance of the display will be replaced by a step by step movement as each bar is either turned full on or full off.

### Custom Face Plates



Pin Socket

## Texmate Produces Thousands of Custom OEM Face Plates

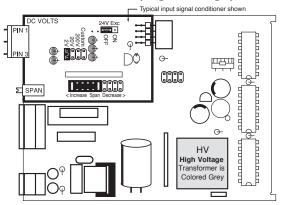
Have Texmate Design and Build a Custom Face Plate to Suit your Next project!

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

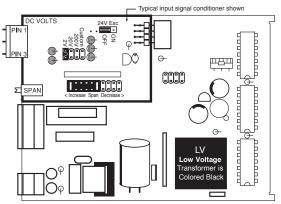
- Small Run or One-Off custom face plates incur an installation charge, and are generally printed on a special plastic film, which is then lami-nated to custom faceplate blanks as required.
- Large Run (250 pieces min): custom face plates are production silk screened, issued a part number, and held in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

### Component Layout

BX-B31-XX-PS1 (High Voltage)



### BX-B31-XX-PS2 (Low Voltage)



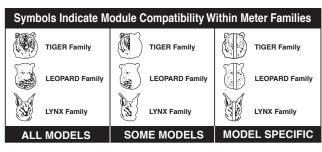
#### I-Series Input Signal Conditioning Modules

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

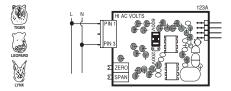
Precalibrated **I-Series** input modules, that have span or zero potentiometers, can be interchanged between any **I-Series** compatible meter, without recalibration, because all of the analog scaling and reference circuitry is self-contained within the module. Where appropriate, all the standard ranges shown are designed to be header selectable by the user, and Texmate's unique SPAN ADJUST Header facilitates scaling to almost any required

Calibration on pages 6 and 8.

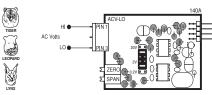
Options on last page).



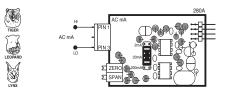
IA01 : AC Volts Scaled RMS, 200/600V AC



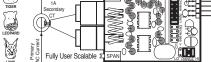
IA02: AC Volts Scaled RMS, 200mV/2V/20V AC



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



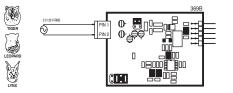
IA04 : AC Amps Scaled RMS, **1 Amp AC** IA05 : AC Amps Scaled RMS, **5 Amp AC** 



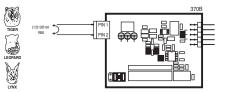
IA07 : AC Volts True RMS, 200mV/2V/20V AC

IA06 : AC Volts True RMS, 300/600V AC

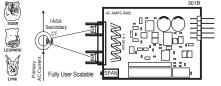
Y



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



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





engineering unit. See Input Module Component Glossary and

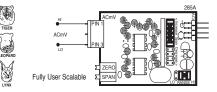
Unless otherwise specified Texmate will ship all modules precalibrated with factory preselected ranges and/or scalings as shown in

**BOLD** type. Other precalibrated standard ranges or custom ranges may be ordered. Factory installed custom scaling and other custom

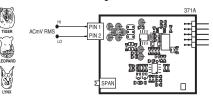
options are also available (see Ordering Information, Special

TIGEI IP07

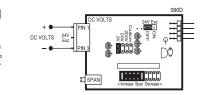
Y



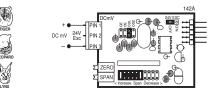
IA12 : AC Millivolt RMS Sigma Delta



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

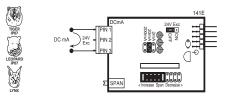


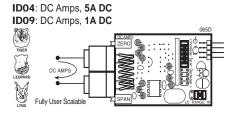
ID02 : DC Millivolts, 20/50/100/200mV DC w/24V DC Exc



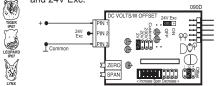
### I-Series Input Signal Conditioning Modules Continued

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

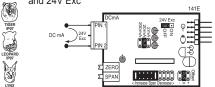




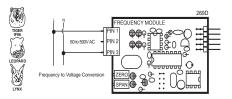
ID05: DC Volts 2/20/200/Custom V DC with Offset and 24V Exc.



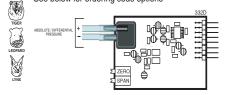
ID07: DC Milliamps, 2/20/200mA DC with Offset and 24V Exc



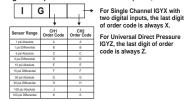
#### IF02: Line Frequency



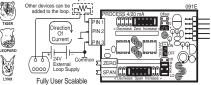
IGYZ: Universal Direct Pressure (Absolute or Differential/Gage) See below for ordering code options



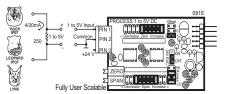
Ordering Code Options for Direct Pressure (IGYX, IGYY & IGYZ)



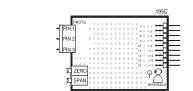
IP01: Process Loop, 4-20mA IP02: Process Loop, 4-20mA with 24VDC EXC



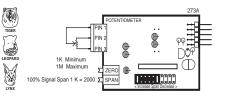
IP03: Process Input, 1-5V DC with Offset, 24V Exc



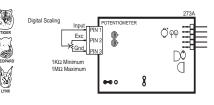
#### IPT1: Prototype Board for Custom Design



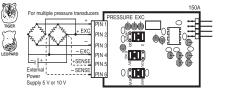
**IR02**: 3 wire Potentiometer 1K min (0-F.S.)



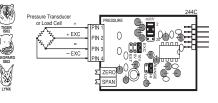
#### **IR03**: Linear Potentiometer $1K\Omega$ min



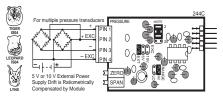
ISO4: Pressure/Load Cell Ext Exc., 20/2mV/V, 4/6-wire

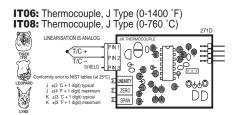


IS05: Pressure/Load Cell 20/2mV/V, 5/10V Exc 4-wire

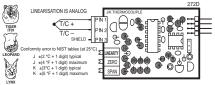


ISO6: Pressure/Load Cell Ext Exc., 20/2mV/V, 4-wire





**IT07:** Thermocouple, K Type (0-1999 °F) **IT09:** Thermocouple, K Type (0-1260 °C)



**IT03:** RTD, 100 Pt. 2/ **3**/4-wire (-200 to 800°C) **IT04:** RTD, 100 Pt. 2/ **3**/4-wire (-200 to 1470°F) **IT05:** RTD, 1000 Pt. 2/**3**/4-wire (-199.9 to 199.9°C) **IT14:** RTD, 1000 Pt. 2/**3**/4-wire (-199.9 to 199.9°C)

2000	Excitation is 1mA	187C	
(1)等約)	Up to 50 resistance in each	RTD a	
0.00	lead can be compensated		_
TIGER IT02			_
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
)(	N Pt-100 LN		
(1993)			
LEOPARD	A wire 3 wire		
\$ 1	LINEARISATION IS ANALOG		
150	Typical accuracy is		
832	±(0.3% + 1 digit) Σ	SPAN A CONTRACT	
LYNX	1(0.070 P T digit)		

### Input Module Component Glossary



### 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

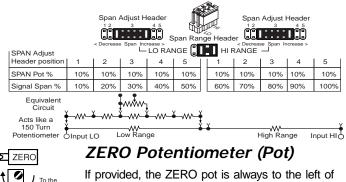
This unique five-position header expands the adjustment range of the SPAN pot into five equal 20% steps, across 100% of the input Signal Span. Any input Signal Span can then be precisely scaled down to provide any required Digital Display span from 19999 counts to 0001 (one count).

	(					
SPAN Adjust Header position	<1 1	Decrease Sp	an Increase	> 4	5	
SPAN Pot %	20%	20%	20%	20%	20%	
Signal Span %	20%	40%	60%	80%	100%	
Equivalent Circuit Input LO	Acts like		MWW M 1 Megaoh	m Potenti	ometer	Ini

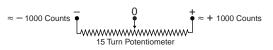
### SPAN RANGE Header



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.



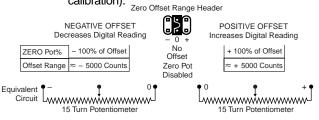
If provided, the ZERO pot is always to the left of the SPAN pot (as viewed from the rear of the meter). Typically it enables the input signal to be offset  $\pm 5\%$  of full scale (-1000 to +1000 counts).



### ZERO OFFSET RANGE Header



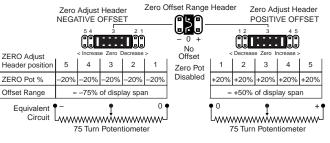
When provided, this three position header increases the ZERO pot's capability to offset the input signal, to  $\pm 25\%$  of the digital display span. For example a Negative offset enables a 1 to 5V input to display 0 to full scale. The user can select negative offset, positive offset, or no offset (ZERO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



### 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.



### Input Module Calibration



**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.

**Note:** I-Series modules with analog calibration and scaling capability can be interchanged between any compatible meter without recalibration. However, meters that also have software scaling and calibration capabilities such as meters in the Leopard and Tiger families or Lynx

Q-Series (Quickset programming), must have their software scaling set to unity gain.

# 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.
- 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. The Lynx family of Q meters can accept negative signals also, and may be scaled for inputs from -50% to +100% of the range selected on the input signal conditioning module.

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.

Turn Clockwise to

Increase Reading

Left Rear

### Input Module Calibration Procedures Continued

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 Display Span from full scale to the smallest viewable unit.

If the module has an INPUT RANGE Header, and the required full scale Display Span (digital counts or bargraph segments) 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 Display Span can be reached by calibration with the SPAN pot.

Example A: Using a BX-B31 bargraph meter

Input signal 0 to 10 V to read zero to full scale.

Signal Span = 10 V, Display Span = 30 segments

- Select the 2 V INPUT RANGE Header position. The standard direct scaling will provide a display of 30 segments with an input of only 2 V which is (2÷10) =20% of the examples 10 V Signal Span.
- 2 To scale down the Signal Span to 20% 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 full scale.

#### 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 Display Span. The second step is to set the ZERO ADJUST and or ZERO OFFSET RANGE Header to provide a positive or negative offset so that calibration with the ZERO pot will offset the Display Span to produce the required display reading.

Example B: Using a BX-B31 Bargraph meter.

Input signal 1 to 5 V to read zero to full scale.

Signal Span = 4 V, Display Span = 30 segments

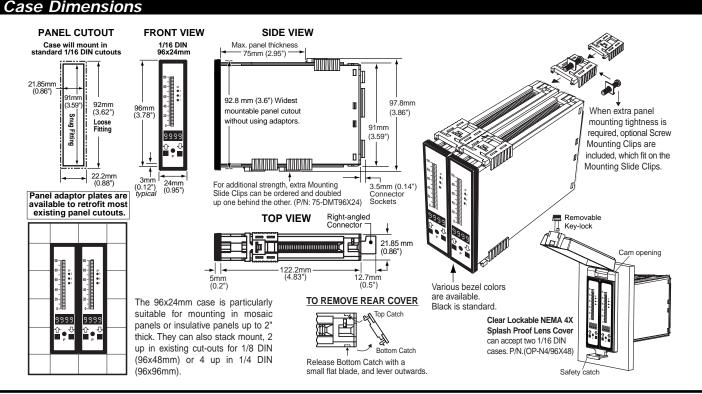
- 1 If the module has an INPUT RANGE Header the 2 V position should be selected. This will provide a display of 30 segments for an input of 2 V which is (2 ÷ 4) = 50% of the examples 4 V signal span. To scale down the Signal Span to 50% select the next higher 60% Signal Span position on the SPAN ADJUST Header (position 3).
- 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 display of 30 segments for an input of 4 V which is 100% of the examples 4 V 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 8.5 segments . A 4 V input would then read 30 segments.
- 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 ≈ 25 segments. Apply 1 V and adjust the ZERO pot until the display reads zero. Apply 5 V and check that the display reads full scale.

Example C: Using a BX-B31 Bargraph meter

Input signal 4 to 20 mA to read zero to full scale

Signal Span = 16 mA, Display Span = 30 segments

- 1 The full scale Signal Span of the Process Input 4-20 mA modules is 0 to 20 mA for a full scale Display Span of 0 to 30 segments.
- 2 Select the (Lo 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 8.5 segments. A 16 mA input would then read 30 segments.
- 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  $\approx$  -8.5 segments. Apply 4 mA and adjust the ZERO pot until the display reads zero. Apply 20 mA and check that the display reads full scale.





For product details visit www.texmate.com

Local Distributor Address

1934 Kellogg Ave. Carlsbad, CA 92008 Tel: 1-760-598-9899 • USA 1-800-839-6283 • That's 1-800-TEXMATE

EXMATE INC

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

Copyright © 2018 Texmate Inc. All Rights Reserved.