



BN-Series



## BN-35CL

Current Loop Meter  
3 1/2 Digit 0.56" LED  
in a 1/16 DIN Case



Isolated-Power Process Meter in Compact DIN 96x24mm Case.

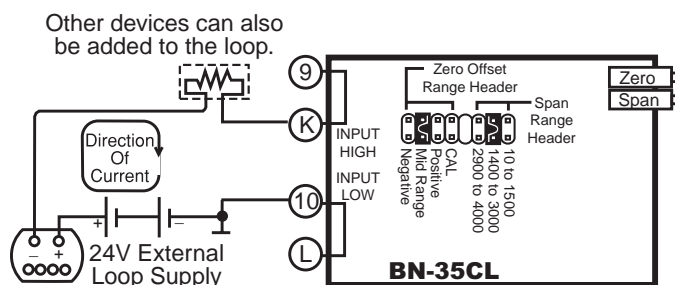
### General Features

- **INTERNALLY ISOLATED** 24VDC power (standard)
- Optional internally isolated 9V, 12V, or 15VDC power supply
- International standard DIN 96x24mm case
- Short depth case: 2.83" (72mm) behind panel
- 0.56" high red LEDs standard
- Adjustable display brightness
- Optional green or extra bright red LEDs available
- Display Hold and Test
- Auto zero and polarity
- Ideal for OEM applications

The BN-35CL is a streamlined 4 to 20mA current loop meter. It is specifically designed to be easily user-scaled and calibrated to almost any conceivable engineering unit, such as temperature, pressure, viscosity, or flow rates, etc. without requiring component changes. On site scaling and recalibration is facilitated by multiturn potentiometers that provide continuous adjustment within each of three header-programmable full scale ranges for span and zero offset.

The display is shipped standard with red LEDs, but green LEDs or super bright LEDs for high ambient light environments are also offered. Display Segment Test and Hold Reading are standard features.

### Typical Application Connections



### Compatibility

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



### Specifications

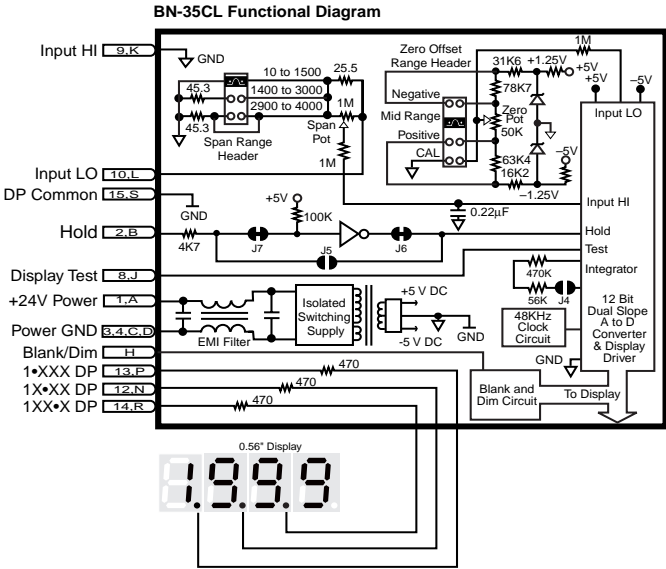
- Input Configuration:** .....Series connection to 4-20mA process loop.
- Full Scale Ranges:** .....User adjustable to any scaling between -1999 to +1999.
- Input Impedance:** .....70Ω. Maximum 1.4V drop
- A/D Converter:** .....12 bit dual slope
- Accuracy:** .....±(0.05% of reading + 2 counts)
- Temperature Coefficient:** 100 ppm/°C (Typical)
- Warm Up Time:** .....2 minutes to specified accuracy
- Conversion Rate:** .....3 conversions per second (Typical)
- Display:** .....0.56" High Efficiency red LEDs, Display Hold and Test provided. Optional green and super bright red LEDs.
- Polarity:** .....Assumed positive, displays negative sign
- Decimals:** .....User programmable to 3 positions
- Overload Indication:** .....When input exceeds full scale on any range being used, most significant "1" digit and polarity symbol are displayed with all other digits blank.
- Power Supply:** .....24VDC @ 90mA (standard) 9VDC @ 200 mA; 12VDC @ 160mA; 15VDC @ 120mA; depending on option selected
- Operating Temperature:** .....0°C to 60°C
- Storage Temperature:** .....-40°C to 85°C
- Relative Humidity:** .....95% (non condensing)
- Case Dimensions:** .....Bezel: 96X24 mm (3.62" X 0.95")  
Depth behind bezel: 56.5 mm (2.23")  
Plus 27 mm (1.06") for Push-On connector or plus 17.5 mm (0.68") for Edge connector
- Weight:** .....85 gms. (3 oz)  
125 gms. (4.4 oz) when packed

### BN-Series, For Those Applications Where Space Is A Premium

BN-35 .....0.2/2/20/200V DC ranges, 3.5 digit, 5V DC Powered  
 BN-35BCD .....Parallel or Multiplex BCD, 3.5 digit, 5V DC Powered  
 BN-35CL .....4 to 20mA, Isolated 24V DC, 3.5 digit  
 BN-35I .....0.2/2/20/200V DC ranges, Isolated 24V DC, 3.5 digit

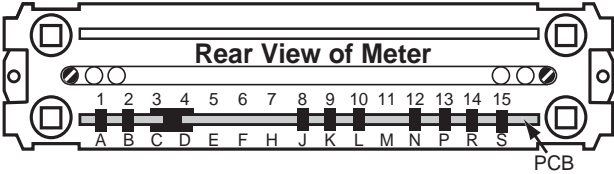
BN-40BCD .....Parallel or Multiplex BCD, 4.0 digit, 5V DC Powered  
 BN-45 .....2/20/200V DC ranges, 4.5 digit, 5V DC Powered  
 BN-45I .....2/20/200V DC ranges, Isolated 24V DC, 4.5 digit

# Functional Diagram



# Connector Pinouts

The Texmate model BN-35CL interconnects by means of a standard PC board edge connector having two rows of 15 pins, spaced on 0.156" centers. Texmate also offers a Push-On screw terminal connector that provides a great advantage in ease-of-use (see pg. 3). Connectors are available from Texmate.



## METER REAR WITH PCB EDGE CONNECTOR MOUNTED

(For mounting of screw terminal blocks see rear page)

COMPONENT SIDE PINS	SOLDER SIDE PINS
Positive DC Power Input - 1	A - Positive DC Power Input
Hold Reading - 2	B - Hold Reading
Negative DC Power Input - 3	C - Negative DC Power Input
Negative DC Power Input - 4	D - Negative DC Power Input
5	E
6	F
7	H
Display Test - 8	J - Display Test
Signal High Input - 9	K - Signal High Input
Signal Low Input - 10	L - Signal Low Input
11	M
Decimal Points - 12	N - Decimal Points
Decimal Points - 13	P - Decimal Points
Decimal Points - 14	R - Decimal Points
Decimal Select Common - 15	S - Hold/Test Common

FINE "SCRAPE OFF" TRACKS      SOLDER JUNCTION

**Pins 1 & A - Positive DC Power Input:** These pins are internally connected together. The positive end of the DC power is connected to these pins. The standard BN-35CL meter is designed to be powered from a 24VDC power supply. Optional 9V, 12V, or 15VDC powered models are also available. Before using the meter, make sure that the appropriate power is being applied. The BN-35CL meter generates a ±5V supply internally that is isolated from the applied DC power.

**Pins 2 & B - Hold Reading:** These pins are internally connected together. If these pins are left unconnected, the meter will operate in a free-running mode. When this pin is connected to the Common Pin S, the meter will latch up. A/D conversions will continue, but the display will not be updated until Pins 2 & B are disconnected from Pin S.

**Pins 3, 4, C, and D - Negative DC Power Input:** These

pins are internally connected together. The negative end of the DC power is connected to these pins. The standard BN-35CL is designed to be powered from a 24VDC supply. Optional 9V, 12V, or 15VDC powered models are also available. Before using the meter, make sure that the appropriate power is being applied. The BN-35CL meter generates a ±5V supply internally that is isolated from the applied DC power.

**Pins 8 and J - Display Test:** These pins are internally connected together. All numeric display segments will light up when this pin is connected to the Common Pin S.

**Pins 9 and K - Signal High Input:** These pins are internally connected together. Signal high input for the meter.

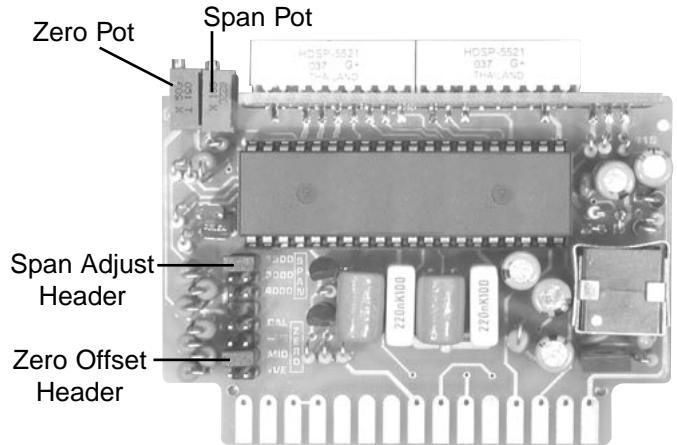
**Pins 10 and L - Signal Low Input:** These pins are internally connected together. Signal low input of the meter.

**Pins 12 & N, 13 & P and 14 & R - Decimal Points:** These are the decimal point pins. Connecting any of these pins to the Decimal Select Common Pin 15 makes that particular decimal point come on.

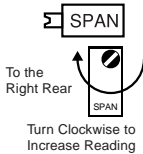
**Pin 15 - Decimal Select Common:** This pin is the internal supply ground which is isolated from Pins C, D, 3, and 4. The decimal point pins must be connected to this pin to come on.

**Pin S - Hold/Test Common:** This pin is connected to the internal supply ground which is isolated from Pins C, D, 3 and 4. The Hold and Test pins must be connected to this pin to be activated.

# Component Layout



# Signal Conditioning Components

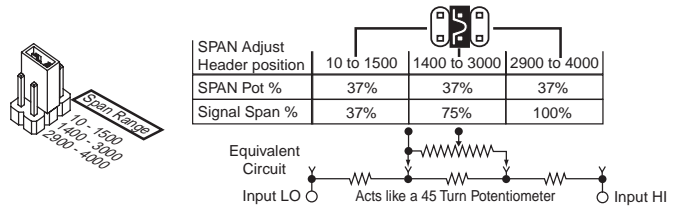


## SPAN Potentiometer (Pot)

The 15 turn SPAN Pot is always between the distiller and the zero pot (as viewed from the front of the meter). Typical adjustment is 37% of the input signal range.

## SPAN ADJUST Header

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





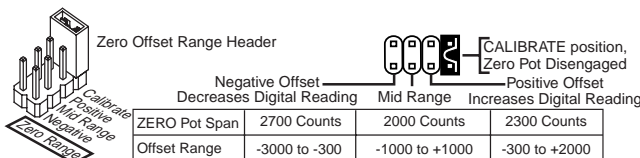
Turn Clockwise to Increase Reading

## ZERO Potentiometer (Pot)

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

## ZERO OFFSET RANGE Header

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



## Calibration Procedure

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

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

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

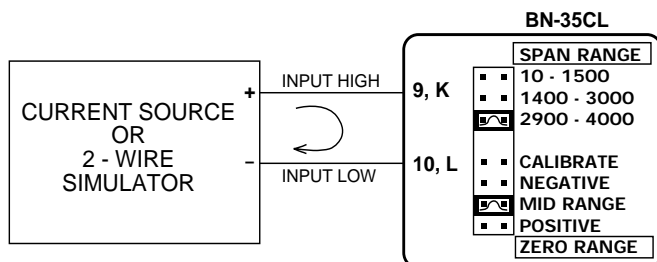
The second step is to select a Zero Offset Range and offset the Digital Display Span with the ZERO Pot, until the desired reading is displayed.

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

**For example:** A 4 to 20mA input to read -40.0 to +199.9

Signal Span = 16mA, Digital Display Span = 2400 counts.

1. Remove the meter from its case and set the Zero Offset Range Header to the Calibrate position. Select the 1400 – 3000 position on the Span Adjust Header and slide the meter back into the case.



2. Connect power to the meter and apply 4mA (25% of 16mA). Adjust the SPAN Pot until the display reads +600 (25% of 2400). The meter is now scaled for a Signal Span of 16mA and a Digital Display Span of 2400 counts. In the example 4mA should read -400 and 20mA read 1999, therefore the Digital Display Span should be offset by -1000.
3. Disconnect power and remove the meter from the case, select the Negative offset position on the ZERO OFFSET RANGE Header, and slide the meter back into the case.
4. Connect power to the meter, apply 4mA and adjust the ZERO Pot until the display reads -400. With the Digital Display Span now offset by -1000 counts, the meter will read -400 for a 4mA input, and read +1999 for a 20mA input. Select decimal point 1XX.X to display -40.0 to +199.9.

## Opening Back Panel

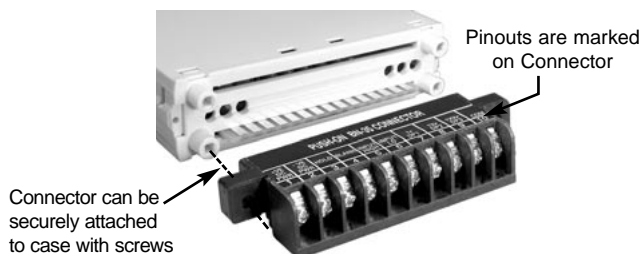
Unscrew the knurled collars, and remove the mounting clips. Snap out the rear plastic plate. The BN-35CL printed circuit board can then be easily removed by sliding it out from the rear of the case.

## Power Supply

The BN-35CL ships from the factory with an isolated 24VDC power supply.

## Push-On Screw Terminals

They provide the greatest convenience and ease of use. Texmate's exclusive optional Push-On Connectors combine an edge card connector and a 10 position screw terminal block. Push-On Connectors are ordered preconfigured for each specific power supply voltage and each optional power supply available for the BN-Series.

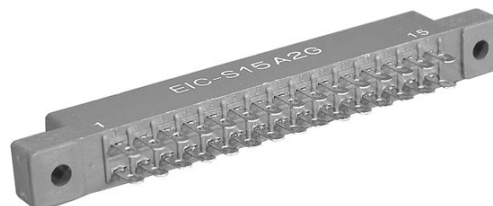


CN-PUSH/BN

## Optional PCB Edge Connector

### PCB Edge Connector

A standard 30-pin edge connector (two rows of 15 pins on 0.156" centers) may be used to connect the BN-35CL meter. Order part no. CN-L15.



## Custom Face Plates



### Texmate Produces Thousands of Custom OEM Face Plates

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

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

# BN Case Dimensions and Panel Cutouts

**PANEL CUTOUT**

Case will mount in standard 1/16 DIN cutouts

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

For additional strength, extra Mounting Slide Clips can be ordered and doubled up one behind the other.  
P/N:(75-DMT96X24)

When extra panel mounting tightness is required, optional Screw Mounting Clips are included which fit on the Mounting Slide Clips.

**FRONT VIEW**

1/16 DIN (96x24mm)

**SIDE VIEW**

Push-On Connector P/N:(CN/PUSH/BN)

**TO REMOVE REAR COVER**

Release Bottom Catch with a small flat blade, and lever outwards.

**TOP VIEW**

96mm (3.78")

25.4mm (3.78")

Max. panel thickness

92.8 mm (3.6")

Widest mountable panel cutout without using adaptors.

97.8mm (3.86")

91mm (3.59")

Various bezel colors are available. Black is standard.

The 96x24mm case is particularly suitable for mounting in mosaic panels or insulative panels. They can also stack mount, 2 up in existing cut-outs for 1/8 DIN (96x48mm) or 4 up in 1/4 DIN (96x96mm).

## Ordering Information

### Standard Options for this Model Number

Part Number	Description
▶ <b>BASIC MODEL NUMBER</b> Includes standard display and standard power supply unless optional versions are ordered.	
BN-35CL	.....3.5 digit, Isolated 24VDC Power, 4-20mA input
▶ <b>DISPLAY</b>	
STANDARD	.....Red LEDs, 0.56 inch high
BN-GREEN	.....Green LED, 0.56 inch high
BN-BRIGHT	.....Super bright Red LEDs, 0.56 inch high
▶ <b>POWER SUPPLY</b>	
STANDARD	.....Isolated 24VDC
V0-ISO/PS-09	.....Isolated 9V DC
V0-ISO/PS-12	.....Isolated 12V DC
V0-ISO/PS-15	.....Isolated 15V DC

### Special Options and Accessories

Part Number	Description
▶ <b>SPECIAL OPTIONS (Specify Inputs or Outputs &amp; Req. Reading)</b>	
CB-FS35	.....Non-Std Range and Scale Changes, 3.5 Digit Meters
▶ <b>ACCESSORIES</b>	
CN-L15	.....PCB Edge Connector, Solder Type, Dual Row 15 Pins
CN-PUSH/BN	.....BN Series Push-on Screw Terminal Block Connector
75-DMTC96X24	.....Side Slide Brackets, extra set (96x24mm only)
75-DBBZ96X24	.....Black Bezel for 96x24mm Case, BN and AM series
DN.CAS96X24	.....Din Case 96 X 24 Short Depth with Bezel

Prices subject to change without notice.

### WARRANTY

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

### USER'S RESPONSIBILITY

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

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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](http://www.texmate.com)

Local Distributor Address