

Choosing Between

# Loop-Powered vs Line-Powered

Digital Panel Meters



# Presenter



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VP of Sales & Marketing

# What You Will Learn



Understanding  
Loop & Line  
Powered Meters



Differences Between  
Loop and Line-powered  
Meters



How to Choose the  
Best Meter for your  
Application



Unique Features of  
Precision Digital's  
new Loop Leader  
Panel Meter

# Getting to Know You

- Where are you located?
- What is your industry?
- What is your level of expertise?



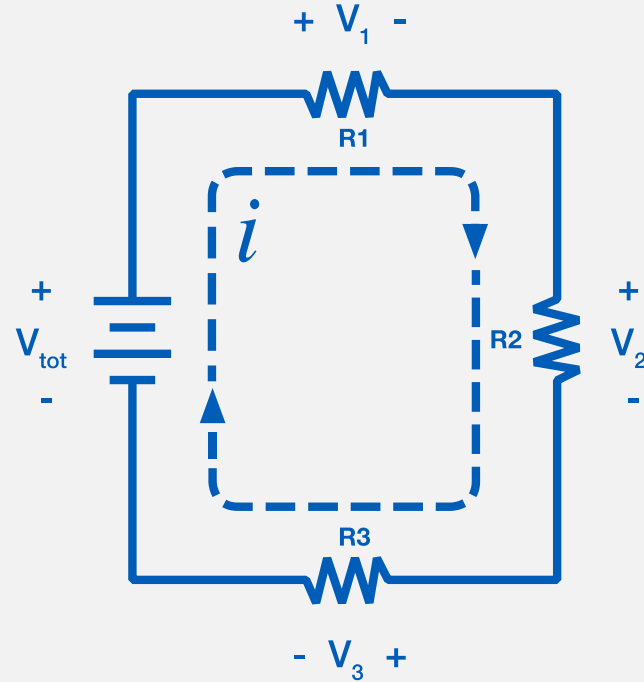
# Understanding Loop & Line-Powered Meters

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## Ohm's Law – Why It Matters

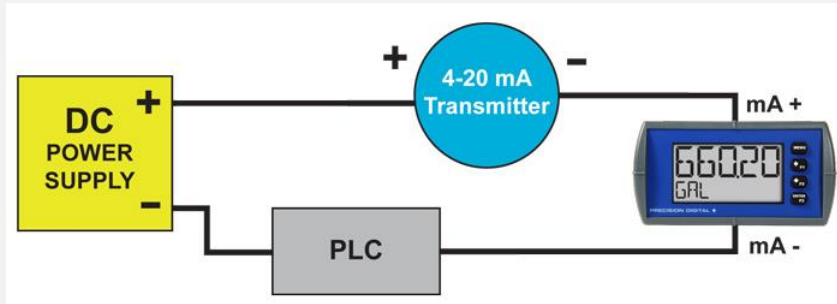
$$V = IR$$

Voltage = Current x Resistance

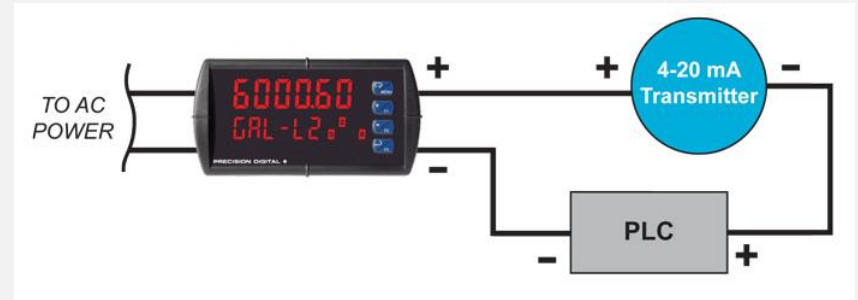


# Understanding Loop & Line-Powered Meters

The wiring diagrams for these two types of meters illustrates their most basic difference:



- Loop-powered meters derive their power from the loop, so only two connections are needed
- Connections for power and signal are combined



- Line-powered meters power the transmitter, so four connections are needed
- 2 connections for power and 2 connections for signal

# Getting to Know You



- What is your primary application?





# Differences Between Loop & Line-Powered Meters

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	 <b>Loop-Powered Meters</b>	 <b>Line-Powered Meters</b>
<b>Display Type</b>	LCD (Better in direct sunlight; not so good in dimly lit areas unless backlit)	LED (Brighter, see from farther away, wider viewing angle, generally easier to read)
<b>Display Characters</b>	Often 14 segments for better letter representations. Example: TRnk	Often 7 segments many letters do not manifest well on the display, such as N's. Example: ERnH
<b>Cost</b>	Usually lower price than line-powered devices	Usually higher cost than loop-powered devices
<b>Installation</b>	Simpler (only two wires to connect, no separate power supply needed)	Not as simple (signal and power connections)
<b>Transmitter Power</b>	Separate power supply	Can be powered from the meter
<b>Relays</b>	Most loop-powered meters don't have relay options (Loop Leader does, though)	Relays available
<b>Serial Communications</b>	Not commonly available	Commonly available

# Questions & Answers



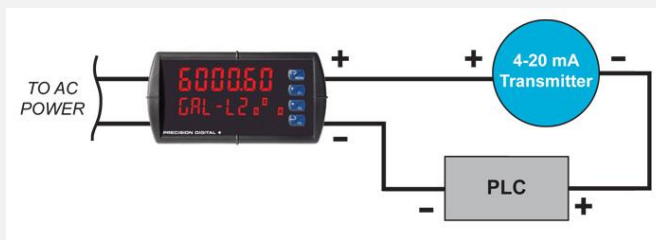
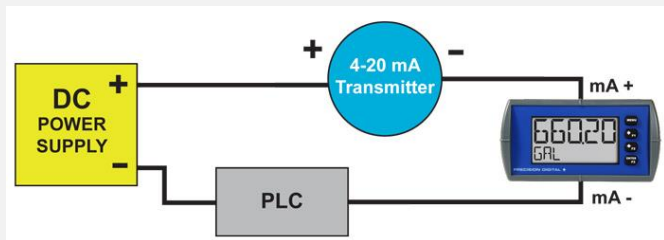
- Please enter your questions in the 'Questions' window – on the tab at the bottom of your control panel on the right side of your screen.
- Apologies if we do not get to your question today. We'll contact you offline with a response as soon as possible.

# How to Choose the Best Meter for Your Application

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## Simplified Wiring vs Powering the Transmitter

The wiring diagram for these two types of meters illustrates their most basic difference:



- Loop-powered meters derive their power from the loop, so only two connections are needed
- Loop-powered meters require no additional power
- Loop-powered meters are convenient for installing into existing loops

- Line-powered meters power the transmitter, so four connections are needed
- Line-powered meters need a separate AC or DC power supply
- Line-powered meters are more complicated to wire



### Conclusion

Use Loop-powered meters for existing loops because they are easier to install.

Use Line-powered meters for new loops so meter can power the transmitter.

# How to Choose the Best Meter for Your Application

## General Purpose vs Hazardous Area Applications

The location of the meter is a big factor in the selection process:



- Loop-powered meters can be installed in both general purpose and hazardous areas<sup>1</sup>
- Line-powered meters can only be installed in general purpose areas<sup>2</sup>

1. With proper approvals 2. As stand-alone products



Precision Digital's new Loop Leader can be installed in a wide variety of hazardous areas:

- UL and C-UL certified; ATEX approved
- CI I, Div 1 intrinsically safe; CI I Div 2 nonincendive



### Conclusion

For hazardous area applications use loop-powered meters.

For general purpose applications, either loop or line-powered meters will work.

# How to Choose the Best Meter for Your Application

## Descriptive Display vs Bright, Clear Display

The most basic function of a digital panel meter is to display data, so is it more important to:

- See visual representations of the data like a bargraph, flashing red display, and readable letters? (Loop-powered – LCD display)
- See the display from a distance and wide angles? (Line-powered – LED display)



LCD display with red backlight to indicate alarm, bargraph, and letters that always look like letters. Compare TANK 1 here with TANK 1 below in the line-powered meter.



LED displays are brighter and easier to read from a distance and at angles; but can have problems with some letters, such as K.



### Conclusion

For a display with more and better representation of data, go with a loop-powered meter and its LCD display.

For a display that can be seen from a distance and wider angles, go with a line-powered meter and its LED display.

# How to Choose the Best Meter for Your Application

## Important Features to Consider

**Voltage Drop:** Since Loop-powered meters are powered from the loop and there is only a limited amount of power in the loop (24 VDC typical), and there are typically other devices in the loop that need power, a meter with a low voltage drop in the 1.0 to 2.0 V range is desirable.

**Front Panel:** If the meter is to be mounted in an industrial application, a NEMA 4X, IP65 front panel is the best. Look for meters that have approval from NRTL such as UL Type 4X to indicate they have passed official testing.

**Operating Temperature Range:** Loop-Powered meters, especially hazardous area approved ones, can be installed virtually anywhere so look for an operating temperature range down to -40 °C and up to +75 °C. Conformally coated PCBs will also help with humidity protection.

**Programming:** Potentiometers are OK for simple meters, but once you get into full-featured meters with advanced capabilities, PC-based programming software really simplifies things.

**Alarm Capability:** If you want your loop-powered meter to indicate alarm conditions, specify one that has solid-state relays and the ability to change the display to red on alarm.

**Div 2 Approval:** Div 2 areas are the most common hazardous area, so if you want to install your loop-powered meter in a Div 2 area with no additional protective devices, specify a meter with nonincendive approval.

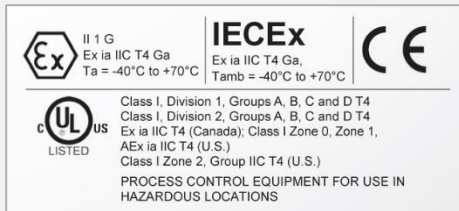


# Unique Features of PDC's Loop Leader Series

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Available as General Purpose and with these approvals:



- Starting at \$204 and In-Stock
- 4-20 mA Input
- 1.5 Volt Drop
- Red Backlight for Alarm
- NEMA 4X, IP65 Front Panel
- -40 to 167°F (-40 to 75°C) Safe Area Range
- Free PC-Based USB Programming Software
- Two Open Collector Outputs
- Optional Solid-State Relays
- Optional 4-20 mA Analog Output
- Conformal Coated PCBs Humidity Protection

## For more information



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