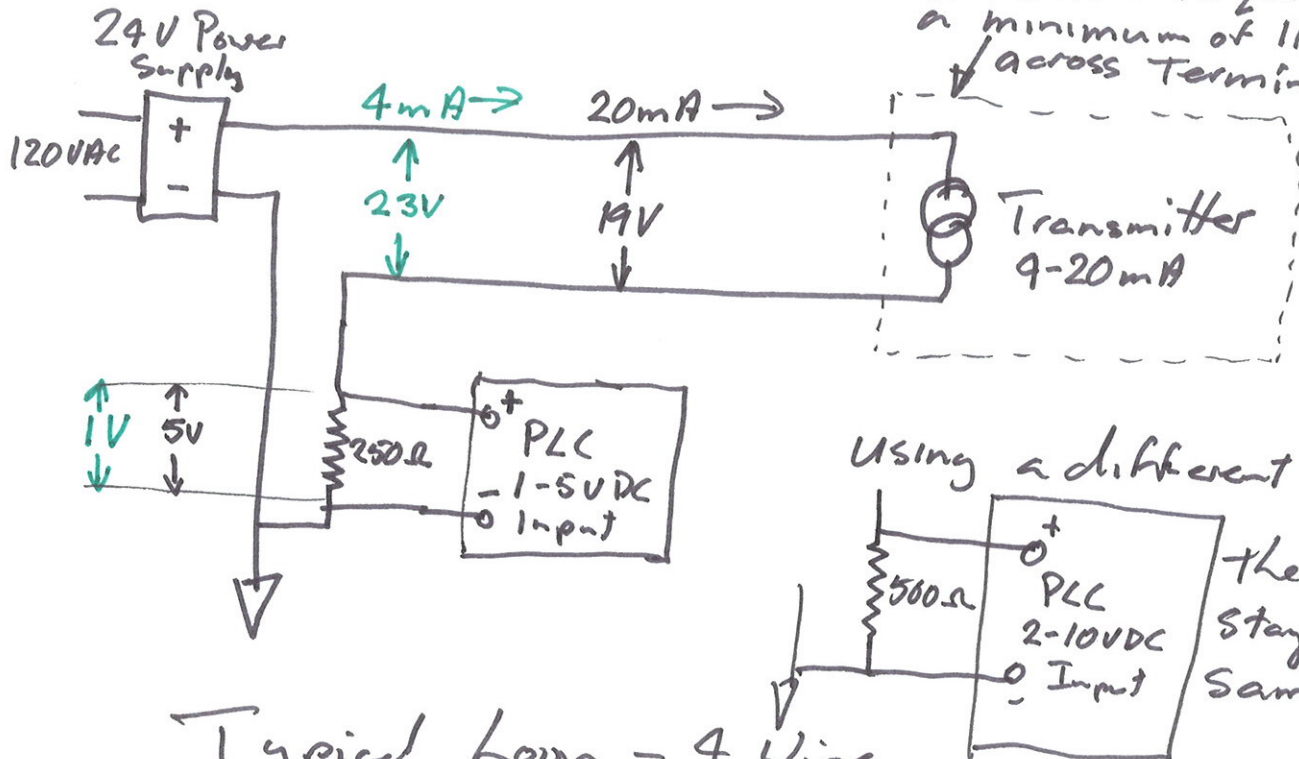
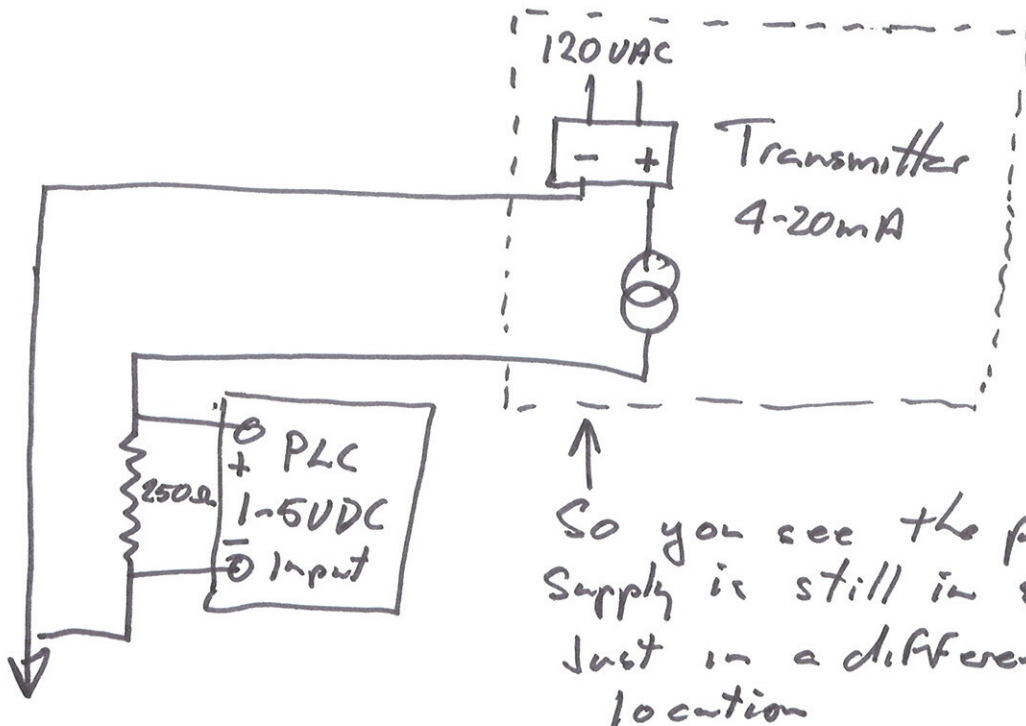


Typical Loop - 2 Wire

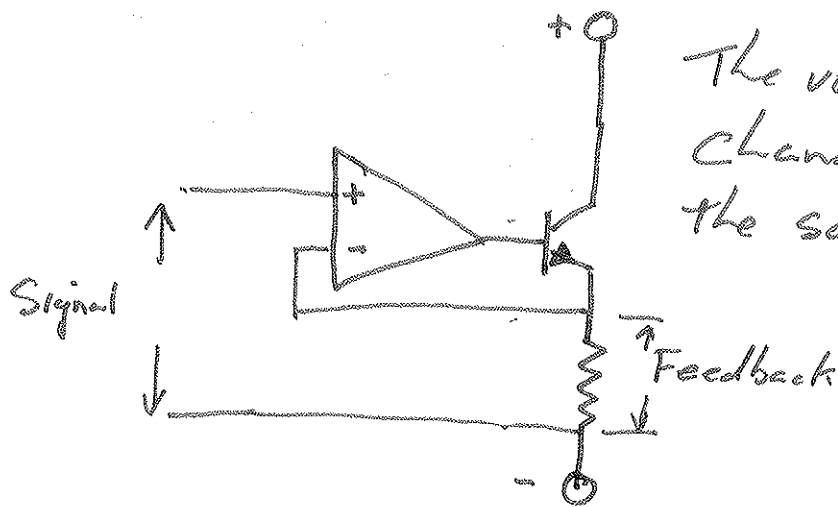
A typical 2 wire transmitter requires a minimum of 11 Volts across terminals



Typical Loop - 4 Wire



Typical Transmitter Output



The voltage between \oplus & \ominus can change but the current stays the same for any given signal

The 4mA provides enough power to power the electronics.

If you analyze this circuit you will see that the feedback voltage will always equal the signal voltage \therefore for any given signal the current stays the same any excess voltage is dropped across the transistor.

Rosemount 3051

Typical Transmitter Spec

Zero and Span Adjustment Requirements (HART and Low Power)

Zero and span values can be set anywhere within the range limits stated in Table 1 and Table 2.

Span must be greater than or equal to the minimum span stated in Table 1 and Table 2.

Service

Liquid, gas, and vapor applications

4–20 mA (Output Code A)

Output

Two-wire 4–20 mA, user-selectable for linear or square root output. Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

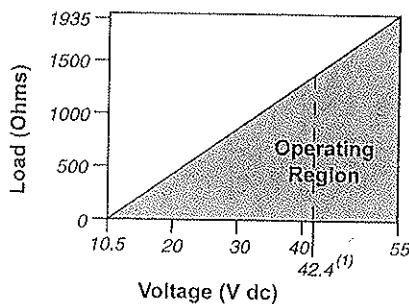
Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 55 V dc with no load.

Load Limitations

Maximum loop resistance is determined by the voltage level of the external power supply, as described by:

$$\text{Max. Loop Resistance} = 43.5 (\text{Power Supply Voltage} - 10.5)$$



Communication requires a minimum loop resistance of 250 ohms.

(1) For CSA approval, power supply must not exceed 42.4 V.

FOUNDATION fieldbus (output code F) and Profibus (output code W)

Power Supply

External power supply required; transmitters operate on 9.0 to 32.0 V dc transmitter terminal voltage.

Current Draw

17.5 mA for all configurations (including LCD display option)

The maximum loop resistance allowed is calculated using this formula

There is no minimum loop resistance unless you want to use HART which requires a minimum resistance (this is a whole different topic)

So you see from the formula you can use any voltage between 10.5 and 55 provided you don't exceed the "maximum loop resistance"