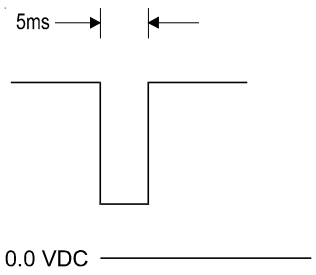
| Series 200/PLC Interface | Series 200/PLC Interface Using 24V Circuit | Technical Brief |
|---|---|---|

Data Industrial has developed new sensor electronics. This redesign, necessary for FM approval for use in hazardous locations, incorporates other features as well. One feature is the ability to operate at voltage levels as high as 24 Volts DC. Since many industrial PLCs (Programmable Logic Controllers) have an internal 24VDC Power Supply, this allows the sensor to interface directly. Current limiting circuitry in the sensor offers protection from mis-wiring or transient surges for both the PLC and the sensor.

The following describes our circuitry and recommendations for interconnection.

When wired to a PLC as shown below, the signal across our sensor will be as follows.



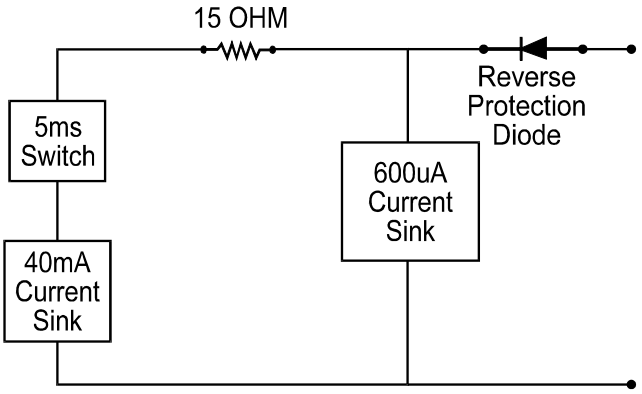

V HIGH - equal to the PLC INPUT OPEN CIRCUIT VOLTAGE - Less drop resulting from the 600uA leakage current. 8VDC -35 MAX
8VDC Minimum - 35VDC Maximum

V LOW - equal to PLC INPUT SHORT CIRCUIT CURRENT, applied across 15Ω
MAX. 1.2VDC @ 40mA limit

V HIGH and V LOW will be a function of the PLC input circuitry, the PLC input circuitry as stated above.

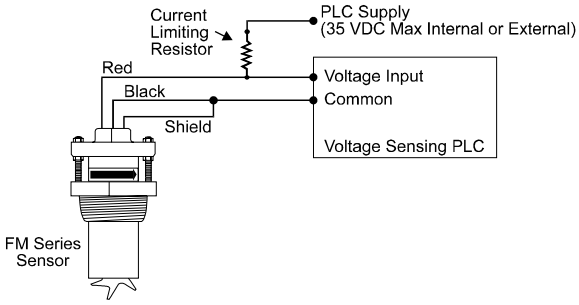
Care must be taken to insure that the input threshold levels of the PLC are reliably crossed, and that the 5ms pulse width is long enough to be recognized by PLC circuitry.

**\INTERNAL BLOCK DIAGRAM OF FM SERIES FLOW SENSOR**




See back side for PLC wiring recommendations

HIGH IMPEDANCE
VOLTAGE INPUT
PLC



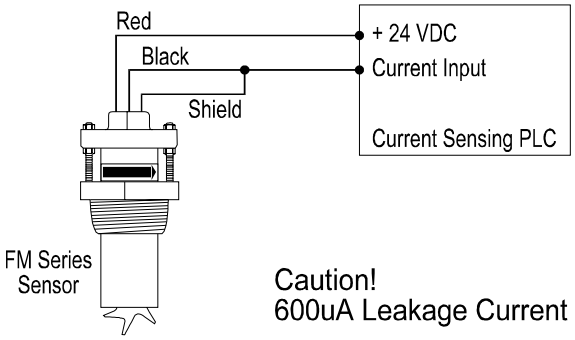

The Current Limiting Resistor should be selected such that $V_{HIGH}$ will cross the $V_{IN}$ Logic 1 threshold level, and $V_{LOW}$ wi
cross the $V_{IN}$ Logic 0 threshold level with the sensor. For example with a 24VDC Power supply a 2KΩ resistor, and a P
with a 10KΩ input impedance.

$V_{HIGH}$ would be Supply Voltage - (Sensor Current + PLC Current) * 2K =
24VDC - (2.0 + 0.6mA) * 2K = 18.8VDC.

$V_{LOW}$ would be ((Sensor Current) * Sensor Impedance) + Internal Diode =
((24VDC/2.015K) * 15Ω) + 0.6VDC = 0.778VDC

In this example PLC trigger threshold levels would have to be absolutely no less than 18.8VDC for a Logic 1, and no m
that 0.18VDC for a Logic 0. If the thresholds are to be reliably crossed allowance for system tolerances must also be
accounted for. Careful review of PLC specifications is required to determine the allowances required.

CURRENT DETECTING (PLC with Current Pulse input only)




For example, if this sensor was connected to a PLC with an opto-isolator input, with a input impedance of 3K plus one
diode drop. Then the trigger thresholds would have to be absolutely no less than 600uA for a Logic 0, or more than
(24VDC-1.2VDC-0.6)/3K = 7.4mA for a Logic 1. If the thresholds are to be reliably crossed allowance for system tolera
must also be accounted for. Careful review of PLC specifications is required to determine the allowances required.

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