There are many applications in which it is desirable to connect one or more Seametrics flow sensors to a PLC, and the sensors are well suited for this. In many cases the digital pulse of a Seametrics sensor can be connected directly, or with a minimum of components.

The Seametrics products most commonly chosen for use with a PLC are IP and TX insertion sensors, WT turbine meters, and S-Series low flow sensors. These units, which have three wires, use Hall-effect technology. They need 5-24 Volts DC and up to 8 mA current, and they are current sinking (NPN) devices.

These devices can connect directly to the PLC if:

1. The sensor power provided by the PLC is 6 - 24 Vdc (24 Vdc is typical.)
2. The sensor power supply can provide at least 8mA (100 mA is typical.)
3. The sensor input on the PLC can accept a current sinking device.

If the PLC input only accepts current sourcing devices, a pull-up resistor must be added. Connection of this resistor is shown in Figures 3 & 5. Typically, on a 24 Vdc input a 2.2 K Ohm resistor will be effective.

See Figure 1a for connections.

Seametrics uses reed switches on two products, the MJR, MUHR, MJNR, and WJ meters. While these are infrequently used with PLC’s, the wiring is very straightforward. Reed switches, which have two wires, do not need a power supply to operate. They can be connected in the same way as any other mechanical switch or contact closure. While they will handle up to 50 mA AC current, in general using a reed switch with 115 Vac input modules is not recommended, both for reasons of safety and of switch life.
Since the three-wire, Hall-effect units are solid state, they do not exhibit switch bounce and can be used at relatively high frequencies. Reed switches, like most mechanical switches, tend to have considerable bounce and it may be necessary to take precautions against this.

Any input module will have certain frequency limitations. The table below gives maximum frequency that a particular flow sensor or meter could be expected to produce.

<table>
<thead>
<tr>
<th>Flow Sensor Type</th>
<th>Maximum Frequency (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WJ-Series</td>
<td>20</td>
</tr>
<tr>
<td>MJ-Series</td>
<td>45</td>
</tr>
<tr>
<td>S-Series</td>
<td>140</td>
</tr>
<tr>
<td>WT-Series</td>
<td>150</td>
</tr>
<tr>
<td>IP-Series</td>
<td>400</td>
</tr>
<tr>
<td>TX-Series</td>
<td>250</td>
</tr>
</tbody>
</table>

If the PLC is equipped with a 4-20 mA analog input module, it is necessary to order the flow sensor with some form of 4-20 mA transmitter. Two options are the AO55 blind transmitter and FT440 with 4-20 mA option. See Figure 1b, follow the connection diagrams for these products to connect to the analog input.

**Figure 2**  
PLC input designed for current sinking (NPN) devices

**Figure 3**  
PLC input designed for current sourcing (PNP) devices

**Figure 4**  
PLC input designed for current sinking (NPN) devices

**Figure 5**  
PLC input designed for current sinking (NPN) devices

**Figure 6**  
Any DC input

**NOTE:** Be aware that the - Power, - Pulse Out 1 and - Pulse Out 2 are all connected, and that care will need to be taken to connect both the 4-20 loop and pulse output. For more information see Technical Bulletin “Interfacing FT440 Output to Inputs”.

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