Ratemeter / Totalizer Tutorial

What is a Rate/Totalizer Indicator? This is a general purpose instrument which conditions the electrical signal generated by the flowmeter and scales the resulting flow information into a flow rate and flow total display in the units of measure desired by the end user. Additional functionality such as alarms, analog output, pulse output, and serial communications may also be provided. Also see the section on flow computers. See the figure below for a typical system configuration.

What capabilities should I look for to ensure compatibility with my type of flowmeter? Rate/Totalizers are available to work with most flowmeter types and most common electrical signals produced by flowmeters. Begin by selecting an instrument(s) that will accept the signal provided by the flowmeter. In some cases an amplifier or signal conditioner may be necessary. Next decide whether linearization will be required within the Rate/Totalizer and how the calibration will be represented within the instrument. Also determine if the Rate/Totalizer can provide the correct power required to operate the flow sensor (if needed).

What are basic areas of concern? Most customers begin a selection by looking for the instrument that has the type of information display they prefer, that will work with the available power, and is available in a package which can be mounted in the desired location.

What is an analog output and why is it used? Flow rate information is usually sent from one system to another as a 4-20mA signal. Some instruments permit the user to select what item of information is to be sent on the analog output. The corresponding span is user programmable. Additional features include programmable damping and user selectable ranges.

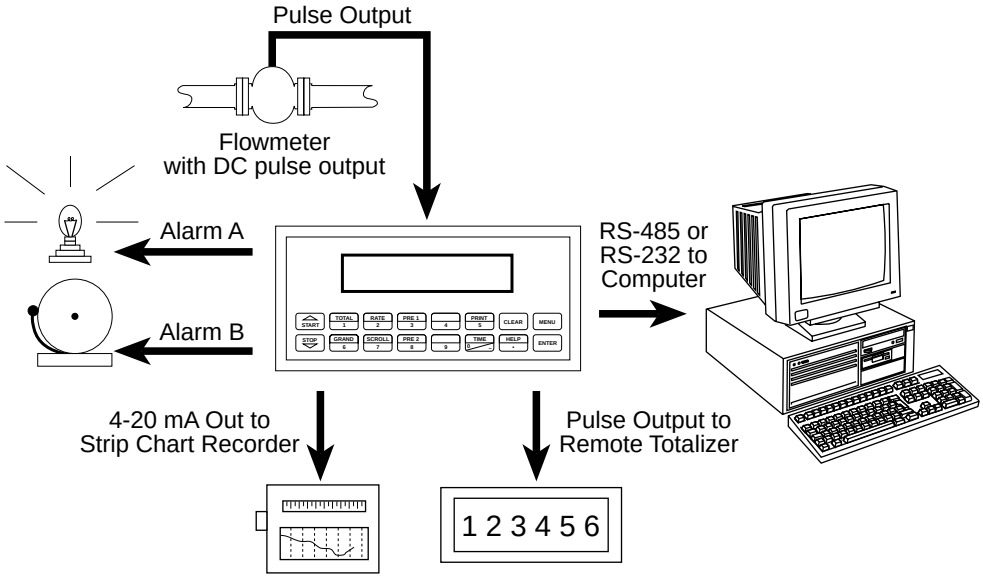
What is a pulse output and why is it used? Flow total information is usually sent from one system to another as a pulse which represents a quantity of flow. The remote system may sum these pulses to compute the flow total. Attributes of a pulse output include provisions for user scaling of the amount of flow each pulse represents, and the width of the pulse. Specifications will usually list the electrical drive ratings for the pulse output.

What is an alarm output and why is it used? Relays are often used as controls to activate alarms. A alarm will usually include a provision for setting the alarm point. Additional features may include a programmable delay before the alarm will activate, an programmable alarm duration, and/or a programmable alarm hysteresis.

What are remote inputs and how are they used? Often there is a need to connect a remote switch near the operator for such purposes as remote reset, or remote print. Many Rate/Totalizers offer a variety of capabilities as remote inputs.

What is serial communications and why is it used? Serial communications is used to transmit information between two computers, or between a computer and a printer. There are several commonly used standard hardware interfaces. These Include RS-232, RS-422, and RS-485. There are also a variety of communication protocols, or message formats, which are used. Some of these are unique to the equipment manufacturer, others are industry standards. See also the section on communication solutions.

What is temperature compensation? In some cases the temperature may also be used to estimate the fluid density from stored fluid properties. Many customers prefer to correct their flow readings to the equivalent mass or corrected volume at a desired reference temperature.

What are other areas of concern? Many areas where rate/totalizer indicators are installed are out of doors or are located in hazardous areas. Special purpose enclosures are available for many instruments to ensure that the equipment will be protected in these environments. A NEMA-4 rating is weather proof. A NEMA-7 rating is explosion proof.

Typical Ratemeter/Totalizer Application