

# Application Note:

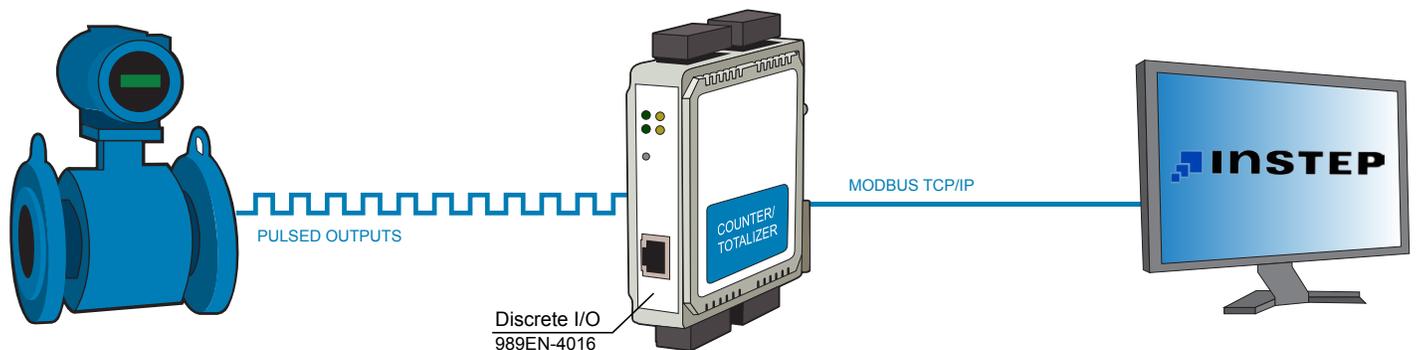
## Metering Project - Managing Energy Usage with Ethernet I/O

### Defining the Problem:

The university power plant produces both electricity and steam for campus facilities. The chilled water and steam condensate need to be monitored and recorded in order to totalize the pulsed outputs from magnetic, positive displacement, and vortex flowmeters. The volumetric flow rate, along with liquid heat lost during the steam-to-heat transfer process, is used to determine steam costs for managing energy used in a facility.

### System Requirements:

- Uncomplicated, reliable installations need to be duplicated across campus
- Communication with current data historian software, InStep eDNA, via Modbus TCP/IP over the campus Ethernet network



### Implementing the Solution:

1. Set up 989EN-4016 discrete I/O modules to receive pulsed output signals from the flowmeters.
2. Configure 1-3 discrete input channels on the 989EN modules to be counters that totalize the input pulses.
3. The InStep software periodically reads the totalized pulse count value of each input on the I/O modules using Modbus TCP/IP communication and records the amount of energy used over time.

### Featured Products:

BusWorks Discrete I/O [989EN-4016](#)

### Notes:

989EN-4016 modules have 16 discrete I/O where each channel can be an input or an output. Optionally, this model allows the first 8 channels to be used as non-volatile pulse counters with the remaining 8 channels available as local output alarms for input counters.

### Why Acromag:

Our 989EN-4016 modules offered an affordable, reliable solution with industrial-grade housing suited for harsh environments. Quick and simple installation allowed for easy setup throughout campus. Most importantly, the campus kept their software setup unchanged as communication with the data historian software was easily achieved.