Application Note 027
Version 001
05 August 2019

Conversion from Neptune Tricon/E3 Analog Instrumentation – to EtherMeter® Digital Instrumentation.

The purpose of this Application Note is to describe the process and components required to replace Neptune Tricon/E3 Analog Instrumentation with an EtherMeter Digital Instrumentation Package.

A typical, legacy Neptune Meter and SCADA-integration package is illustrated in **Figure 1**. Note that the interface to the SCADA system is via a 4-20mA analog rate-of-flow signal, a pulse-per-volume contact closure signal, or both. It is noteworthy that the SCADA integration signals do not convey the meter's totalizer reading, and therefore place a burden upon the SCADA PLC or RTU to count pulses. Speaking from experience, the SCADA system totalizer will generally drift apart from the flow meter's totalizer reading, rendering it unusable for most EPA reporting purposes.

NEPTUNE HP TURBINE METER
WITH ANALOG TRICON/E3 INSTRUMENTATION.

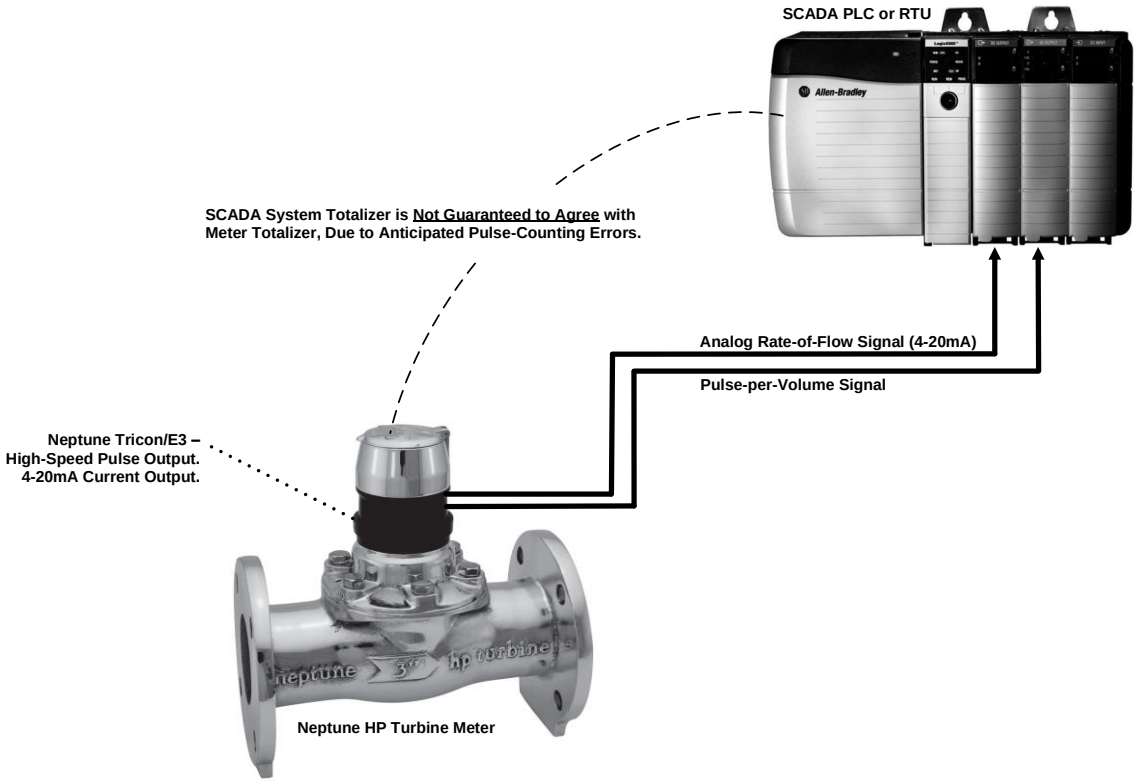


Figure 1. Neptune HP Turbine Meter and Associated Analog Instrumentation Package.

An EtherMeter-based Neptune HP Turbine Meter and SCADA-integration package is illustrated in **Figure 2.** Note that the interface to the SCADA system is via a single Ethernet cable, through which both totalizer and rate-of-flow information is digitally conveyed. The communication protocol can be either industry-standard Modbus or industry-standard Rockwell EtherNet/IP. This system leverages Neptune's absolute-encoder technology (E-Coder or Pro-Coder register) to ensure that the SCADA system's totalizer reading is an exact match to the meter's reading. The EtherMeter also supports Modbus/RTU and DF1 for SCADA systems that prefer a serial data link.

NEPTUNE HIGH-PERFORMANCE TURBINE METER WITH ETHERMETER® DIGITAL INSTRUMENTATION.

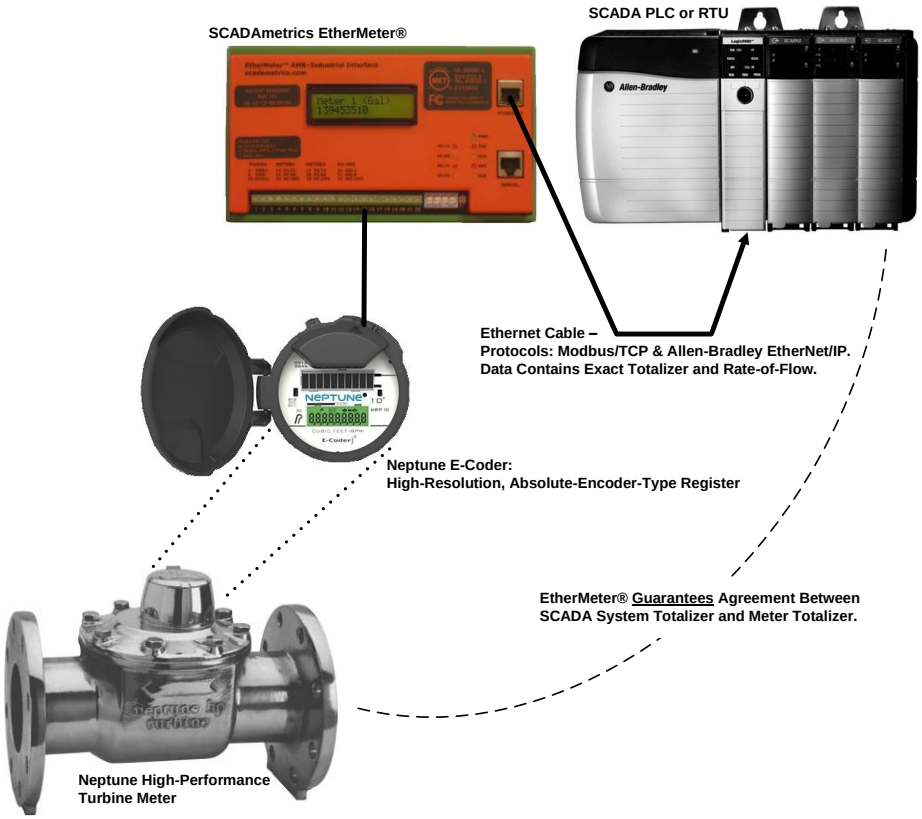


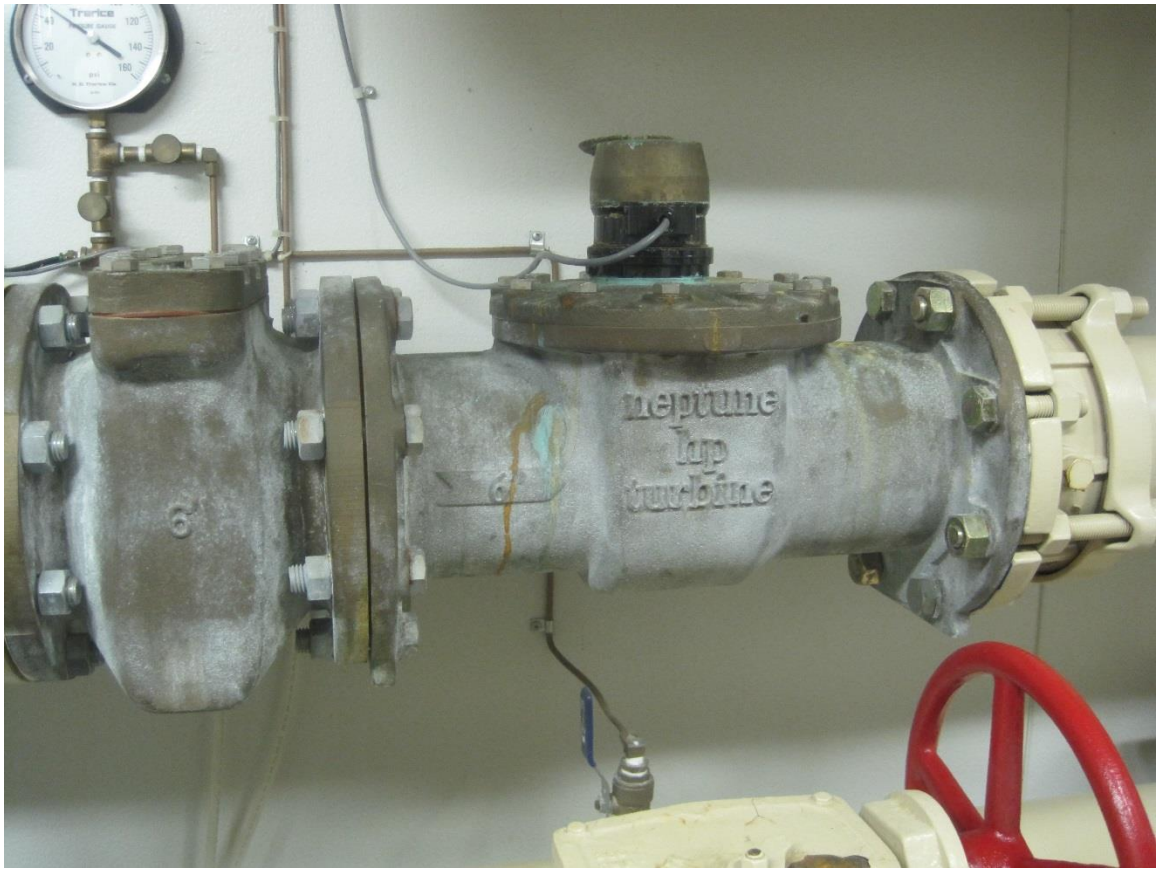
Figure 2. Neptune High-Performance Turbine Meter and Associated EtherMeter Digital Instrumentation Package.

Conclusion: The Neptune Meter & EtherMeter SCADA solution provides a superior end-product, with the following advantages over a legacy Tricon/E3 SCADA solution:

1. Guaranteed Meter Reading Match, Thereby Eliminating Truck Rolls to Retrieve Correct SCADA Meter Readings.
2. Less Expensive Components.
3. Supports a Parallel AMI/AMR Hookup, if Desired.

Notes: Before performing a conversion from an Analog Tricon/E3-based system to a Digital EtherMeter-based system, please contact your SCADA system integrator to inquire whether your SCADA system is capable of supporting the EtherMeter – which can be succinctly described as a Modbus/TCP/RTU slave device, and/or Allen-Bradley EtherNet/IP/DF1 slave device.

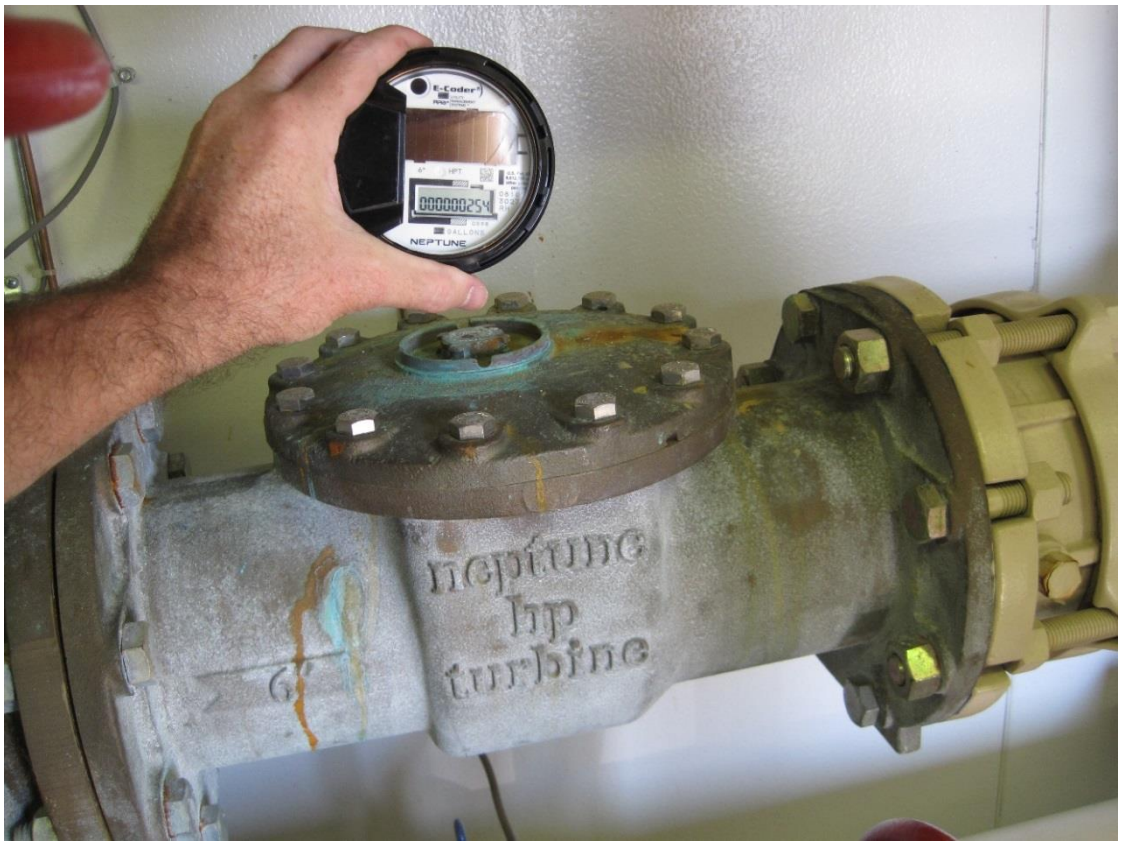
Appendix 1:
Application Photos



Neptune 6" HP Turbine Meter with Tricon/E3 Analog Instrumentation and Direct-Read Register

Top-View of Direct-Read Register

Removal of Direct-Read Register and Tricon/E3 Instrument



Neptune E-Coder Register (Absolute Encoder), Pre-Installation.
Note – Also works with Neptune Pro-Coder Register.

Neptune 6-Inch High-Performance Turbine Meter, with E-Coder (Absolute-Encoder) Register

SCADAmetrics EtherMeter, Flow Meter Gateway Between Neptune 6 Inch HP Turbine and SCADA System. SCADA Connection Medium: Modbus/RTU (RS-485)