SCADA METER INTERFACE UNIT (SMIU)

The master meter shall be equipped with a **SCADA Meter Interface Unit (SMIU)** that will perform protocol conversion between the flow meter register and the connected SCADA System.

Flow Meter Ports.

The SMIU shall contain two (2) flow meter ports that are capable of reading encoder-based flow meters, in conformance with AWWA Standard C707-05. The flow meter communication protocol(s) shall be recognized automatically by the SMIU, without user-intervention. At a minimum, the SMIU shall be compatible with the following protocols:

a. Sensus Variable Length, 4 to 9 Digit.
b. Sensus Fixed Length, 4 to 6 Digit.
c. Neptune E-Coder, Pro-Coder, Mach10 Plus, 8 to 9 Digit.
d. Neptune ProRead Basic, 3-6 Digit.
e. K-Frame, 6 Digit.
f. Mechanical Contact Pulse, 2000 Hz. Max.
g. Solid-State Contact Pulse, 2000 Hz. Max.
h. Open-Collector Pulse, 2000 Hz. Max.

The flow meter ports shall be galvanically isolated to a rating of 1500V.

The SMIU shall automatically sample the flow meter(s) at pre-programmed intervals, and compute flow rate(s) based upon a delta-Volume/delta-Time finite difference calculation (fixed delta-Time or fixed delta-Volume).

For pulse-type meters, the SMIU shall provide a programmable, software-based debounce filter that is capable of filtering unwanted pulses that are due to mechanical contact bounce.

Serial Ports.

The SMIU shall contain the following serial ports:

a. One (1) RS-232C serial port with DB9 Male DTE Interface.
b. One (1) RS-485 serial port with Screwdown Terminal Block Interface.

The serial ports shall be capable of operating at speeds ranging from 300 bps up to 115200 bps.

The serial ports shall be galvanically isolated to a rating of 2500V.

The serial ports shall support the following handshaking methods:

a. Fixed RTS
b. Null Modem
c. RTS/CTS
d. None

The serial ports shall support the following data bit / parity / stop bit combinations:

a. 8N1
b. 7E1
c. 7O1
d. 7N2

Through the serial ports, the SMIU shall support the following automation protocols:

a. MODBUS®/RTU
b. MODBUS®/ASCII
c. DF1/RADIO-MODEM
d. DF1/FULL-DUPLEX
e. IRIDIUM SATELLITE SBD

The serial ports shall provide a dip-switch activated setup terminal interface. The terminal interface shall utilize ANSI terminal emulation, 25x80 characters, and operate at 9600 bps, 8 data bits, No parity, and 1 stop bit.

Ethernet Port.

The SMIU shall contain one (1) Ethernet port. The Ethernet port shall be 10BaseT and shall operate at a speed of 10 Mbps.

The Ethernet port shall be galvanically isolated to a rating of 1500Vrms.

Through the Ethernet port, the SMIU shall support the following automation protocols:

    a. MODBUS®/TCP
    b. MODBUS®/UDP
    c. ETHERNET/IP™

The Ethernet port shall be configurable so as to be compatible with both DHCP and Static IP addressing methods.

The Ethernet port shall contain an integral web server that, when interrogated, provides flow meter totalization and rate, statistics, and auxiliary I/O data.

The SMIU shall contain an integral ping server, and it shall respond to ARP ping requests.

The Ethernet port shall provide a telnet server interface that is available for remote management and setup. The telnet terminal interface shall utilize ANSI terminal emulation and 25x80 characters.

The SMIU shall be pre-programmed with a unique, valid, IEEE-approved MAC ID.

Auxiliary Inputs/Outputs.

The SMIU shall contain the following auxiliary inputs/outputs:

    a. Two (2) 4-20mA analog input channels.
    b. Three (3) discrete input/output channel (dry contact input, TTL output).
    c. One (1) loop power supply (+24VDC).

The following MODBUS® function codes shall be supported:

    a. 01 - Read Coil Status
    b. 02 - Read Input Status
    c. 03 - Read Holding Registers
    d. 04 - Read Input Registers
    e. 05 - Force Single Coil
    f. 06 - Write Single Holding Register
    g. 15 - Force Multiple Coils

The following DF1 and ETHERNET/IP™ (PCCC Encapsulation) functions shall be supported:

    a. Protected Typed Logical Read With 3 Address Fields
    b. Protected Typed Logical Write With 3 Address Fields

Mechanical/Environmental/Electrical.

The SMIU shall weigh 13.5 ounces or less, and its outer dimensions shall not exceed 8.125" x 4.625" x 1.9375".

The SMIU shall be capable of operating with a temperature range of -20C to +70C.

The SMIU shall contain an integral 2x16 character LCD display with a backlight.

The SMIU shall operate on a supply voltage within the range of 10 VDC to 36 VDC.

The supply current draw shall be 63mA or less at 24VDC, and 60mA or less at 24VDC with the backlight turned off.

The power consumed by the SMIU shall not exceed 2.5 Watts when supplied by a voltage within the range of 10 VDC to 36 VDC.

The power efficiency of the SMIU shall be 76% or more.

The terminal block of the SMIU shall support wire diameters within the range 16AWG to 26AWG.

The SMIU shall contain an integral overcurrent-protection fuse, and it shall also contain a minimum of ten (10) integral TVSS diodes.

The SMIU shall be ROHS-compliant and contain no lead.

The SMIU shall be manufactured in the USA.

Standards and Regulatory Compliances.

    a.   Safety (USA/Mexico)   - UL 60950-1
    b.   Safety (Canada)   - CSA C22.2 No. 60950-1
    c.   Meter Interface   - AWWA C707-05
    d.   Environmental   - ROHS Compliant, Lead-Free
    e.   Emissions (USA)   - FCC Part 15, Class A
    f.   Emissions (Canada)   - ICES-003

The SMIU shall be an EtherMeter®, Model#EM-100, as manufactured by SCADAmetrics®, or equal.