

Application Note ExPAC.1
Version 002
16 February 2026

Connect ADS Triton+ / ExPAC Wastewater Instrumentation to an AMI/AMR System Using the SCADAMetrics MBE Encodalizer™



The Triton+, Peak Combo Sensor, and ExPAC External Comms Unit (pictured left) form a core open-channel flow monitoring configuration offering from **ADS Environmental (Huntsville, AL, USA)**; and it is suitable for a broad range of wastewater flow metering applications.

The ExPAC Comms Unit features Modbus/RTU communications, and therefore can connect the monitoring system to a SCADA system for realtime monitoring.

The **FlexNet AMI System by Xylem (Sensus)** is unique in that it can provide not only persistent meter reading capabilities over its private, nationwide-licensed radio channel network, but it can also be expanded to provide SCADA-like utility monitoring and communication features.

Like most process monitoring instrumentation, the Triton+ and ExPAC units do not offer native AMI/AMR-compatibility. However, today, the latest release of the **SCADAMetrics Model MBE Modbus Encodalizer** now adds Sensus protocol to this important open-channel data transmitter, so that it may now be easily integrated into Xylem's FlexNet AMI/AMR systems.

The purpose of this Application Note is to provide technical assistance to the Triton+/ExPAC/Peak Combo Sensor User who wishes to connect his meter to a Sensus FlexNet AMI system.

The operational convenience of the MBE Encodalizer is based upon the principle that the User sets the Sensor Type (Make & Model) via Encodalizer DIP switches, connects the Encodalizer to the meter via Modbus/RTU (2-Wire RS.485), and the Encodalizer interacts with the target Sensor using the Sensor's factory default Modbus/RTU settings.

Except for activation of the ExPAC's Modbus/RTU Port and assignment of Modbus Device ID=2, no special setup of the ExPAC should be required beyond normal initialization procedures.

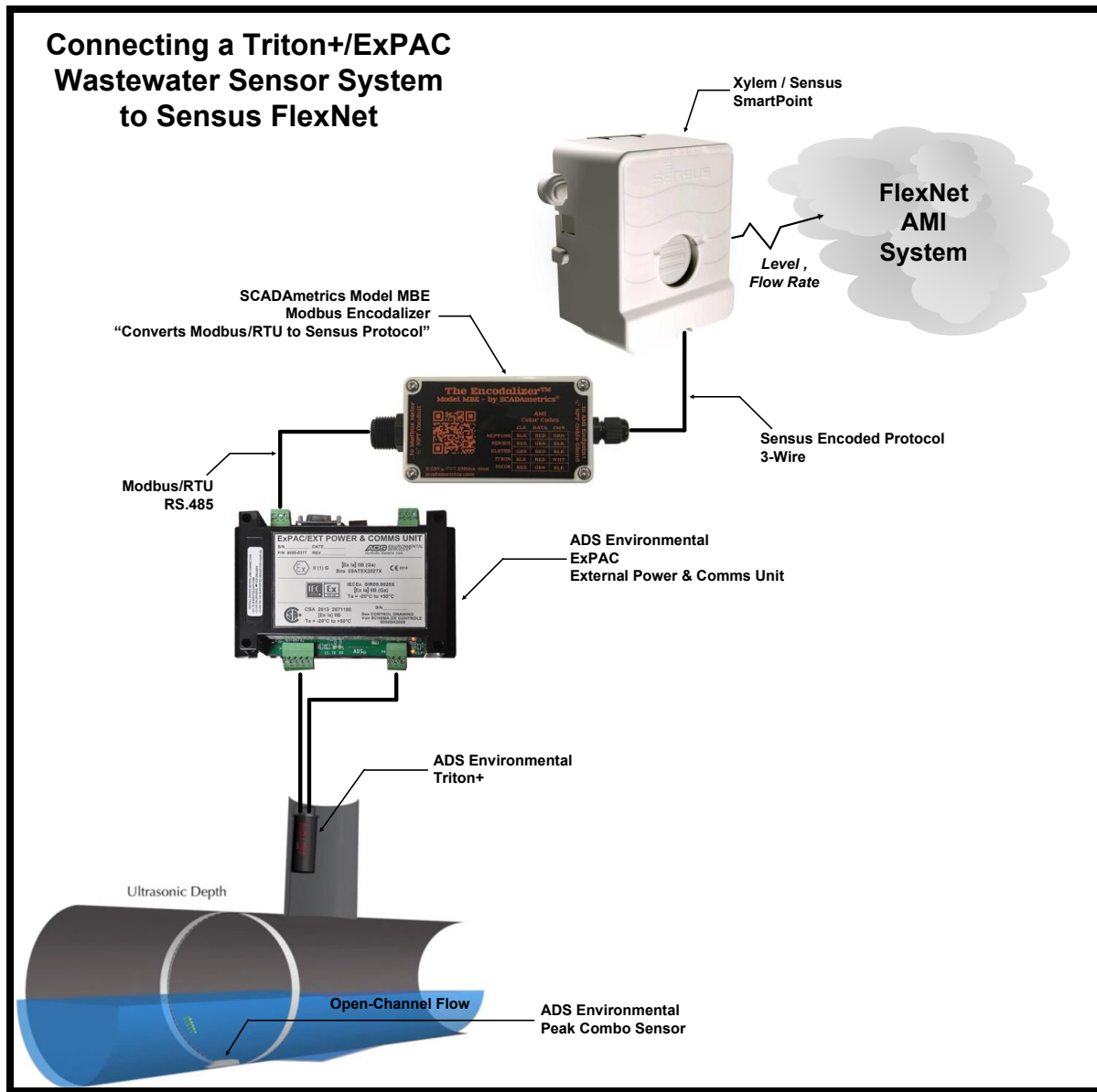


James Mimplitz, SCADAMetrics – 'Slim'



Model MBE Modbus Encodalizer™
By SCADAMetrics

Principle of Operation:



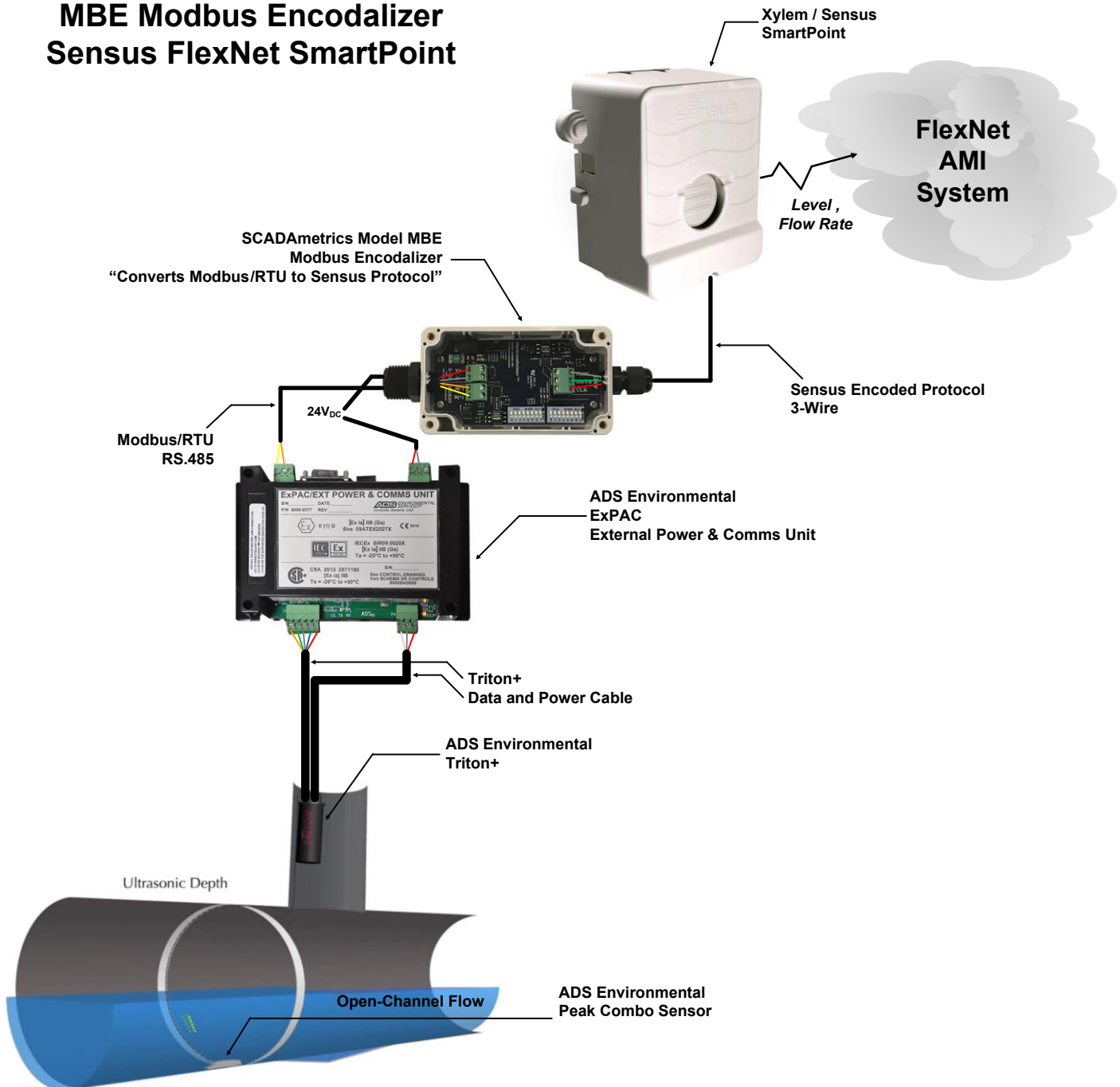
Encodalizer DIP Switch Settings:

- Set DIP Switches 1-6 Per Desired Data Points:
 - "ExPAC I" - 2 Fields:**
(DIP Switches 1,3,4,6=ON. DIP Switches 2,5=OFF. DIP Switches 7-16=OFF.)
 - Flow Rate 1 (gallons per minute, where peak flow<10KGPM).
Negative flows (which should never occur) reported as ZERO.
 - Pressure Depth 1 (inches)
 - "ExPAC II" - 2 Fields:**
(DIP Switches 2,3,4,6=ON. DIP Switches 1,5=OFF. DIP Switches 7-16=OFF.)
 - Flow Rate 1 (gallons per minute, where peak flow>=10KGPM).
Negative flows (which should never occur) reported as ZERO.
 - Pressure Depth 1 (inches)
- Simulation Mode: For testing out FlexNet comms when no ExPAC/Triton+ is connected, set DIP Switch #7 to ON.

ExPAC and Encodalizer Wiring:

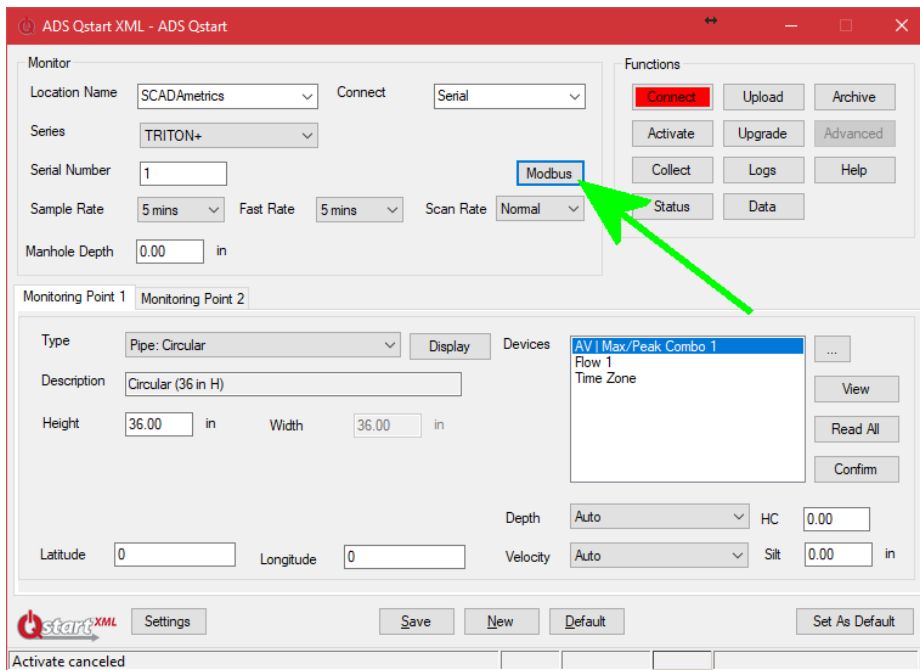
1. Connect Mains Power (24V_{DC}) to ExPAC. Connect Ground to ExPAC grounding terminal. The ExPAC bootstrap process completes after a few seconds.
2. Connect Encodalizer Modbus Terminals to ExPAC Modbus/RTU Terminals: A(-) to A(-), B(+) to B(+)
3. Connect DC Power to Encodalizer (24V_{DC}).
4. The Encodalizer LED should NOT blink RED. Red Blinks Denote a Configuration and/or Read Error.

Wiring Detail: Triton+/ExPAC MBE Modbus Encodalizer Sensus FlexNet SmartPoint

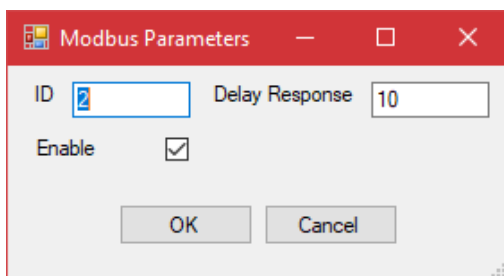


ExPAC Setup:

1. Execute ADS Qstart Setup Program to Configure the ExPAC for Modbus Slave Operation.
2. Set Modbus ID to 2.
3. Enable Modbus.
4. DO NOT MODIFY Any Other ExPAC Modbus Communication Defaults:
 - 19200 baud
 - 8 data bits
 - No Parity
 - 1 Stop Bit
 - 32-Bit Floating Point (2 Modbus Registers)
 - Word Order: Little-Endian



Execute ADS Qstart Setup Program



Set ID = 2
"Enable"

Connecting AMI Endpoint to MBE Modbus Encodalizer:

Function	Sensus FlexNet SmartPoint (Must Be 3-Wire Type – Not 2-Wire Touch-Coupler Type)
CLK	Red
DATA	Green
CMN	Black

Protocol Translation: ExPAC to Sensus Protocol

“ExPAC I” Mode

- Flow Rate 1 (gpm x1)
 - Sign digit (1=positive, 2=negative), plus 4-digit decimal integer
 - Negative Flow Always Conveyed as ZERO flow!
 - Based on ExPAC Flow Rate 1 (mgd) Register
 - Modbus Register 40025-40026 (32-Bit Floating Point, Little-Endian)
- Pressure Depth 1 (inches x10)
 - 4-digit decimal integer
 - Based on Pressure Depth 1 (inches) Register
 - Modbus Register 40005-40006 (32-Bit Floating Point, Little-Endian)

Example 1 (Simulation Mode. DIP Switch #7=ON):

V;RB 12677 123 ; NB 4 ; IS 01234567; <CR>

Flow Rate 1: 2677 gallons per minute (1 means positive: +2677 gpm... Also prevents a leading zero.)

Pressure Depth 1: 123.4 inches

“ExPAC II” Mode

- Flow Rate 1 (gpm x0.1)
 - Sign digit (1=positive, 2=negative), plus 4-digit decimal integer
 - Negative Flow Always Conveyed as ZERO flow!
 - Based on ExPAC Flow Rate 1 (mgd) Register
 - Modbus Register 40025-40026 (32-Bit Floating Point, Little-Endian)
- Pressure Depth 1 (inches x10)
 - 4-digit decimal integer
 - Based on Pressure Depth 1 (inches) Register
 - Modbus Register 40005-40006 (32-Bit Floating Point, Little-Endian)

Example 1 (Simulation Mode. DIP Switch #7=ON):

V;RB 11250 123 ; NB 4 ; IS 01234567; <CR>

Flow Rate 1: 1250 x10 gallons per minute (1 means positive: +12,500 gpm... Also prevents a leading zero.)

Pressure Depth 1: 123.4 inches

Testing:



If you experience any problems, use of a SCADAmetrics model TMD TheMeterDisplay™ is highly recommended. When the TMD is operated in DEBUG mode (dip switch #10 = ON), the raw Sensus Protocol ASCII data can be observed on the LCD display.

Connections:

TMD.Terminal.1 to → Encodalizer.Terminal.CLK
TMD.Terminal.2 to → Encodalizer.Terminal.DATA
TMD.Terminal.3 to → Encodalizer.Terminal.CMN