



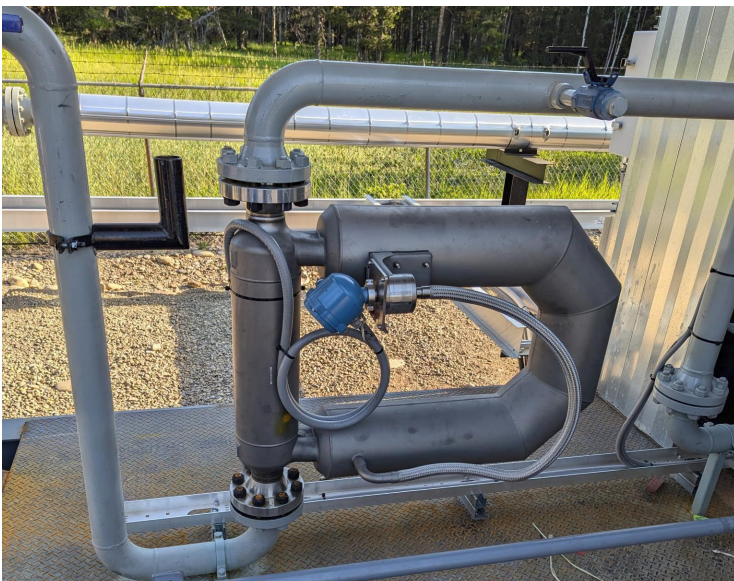
SpartanPRO™ NOC – Well Testing and LACT Using FB3000 Flow Computer

By Design

The FB300 Net Oil Computer (NOC) uses a Micro Motion Coriolis Meter as both a flow sensor and water cut analyzer to calculate net oil and water present in an emulsion stream. Mass flow rate is measured using the Coriolis principle. Density of the emulsion is continuously monitored by the Coriolis meter using the natural frequency and temperature of the vibrating element. Combining mass flow and density, the gross emulsion volume is computed in cubic meters. Water cut determination is made by comparing the measured emulsion density to the reference densities of free oil and water. The net oil computer calculates the temperature effect on volume using a solution based on Chapter 11 of the American Petroleum Institute, Manual of Petroleum Measurement Standards. Using the water cut and volume correction factors the emulsion flow is factored to determine net oil and water at standard conditions, 15 °C.

Optionally, a Phase Dynamics water cut analyzer can be paired with the NOC calculation to provide a higher certainty of water cuts at the low range of 0 – 5%.

The NOC is designed to work with a Micro Motion Coriolis meter and optional Phase Dynamics water cut analyzer.



- Provides oil, water and gas volumes
- Provides 0–100% water cut
- Up to two 2-phase or 3-phase separators
- Density and temperature compensation
- Compliant with:
 - AER Directive 017
 - API 20.1 or API 12.2 for petroleum quantities



Two Modes of Operation

The SpartanPRO™ NOC may be run in two modes of operation: Well Test and LACT modes.

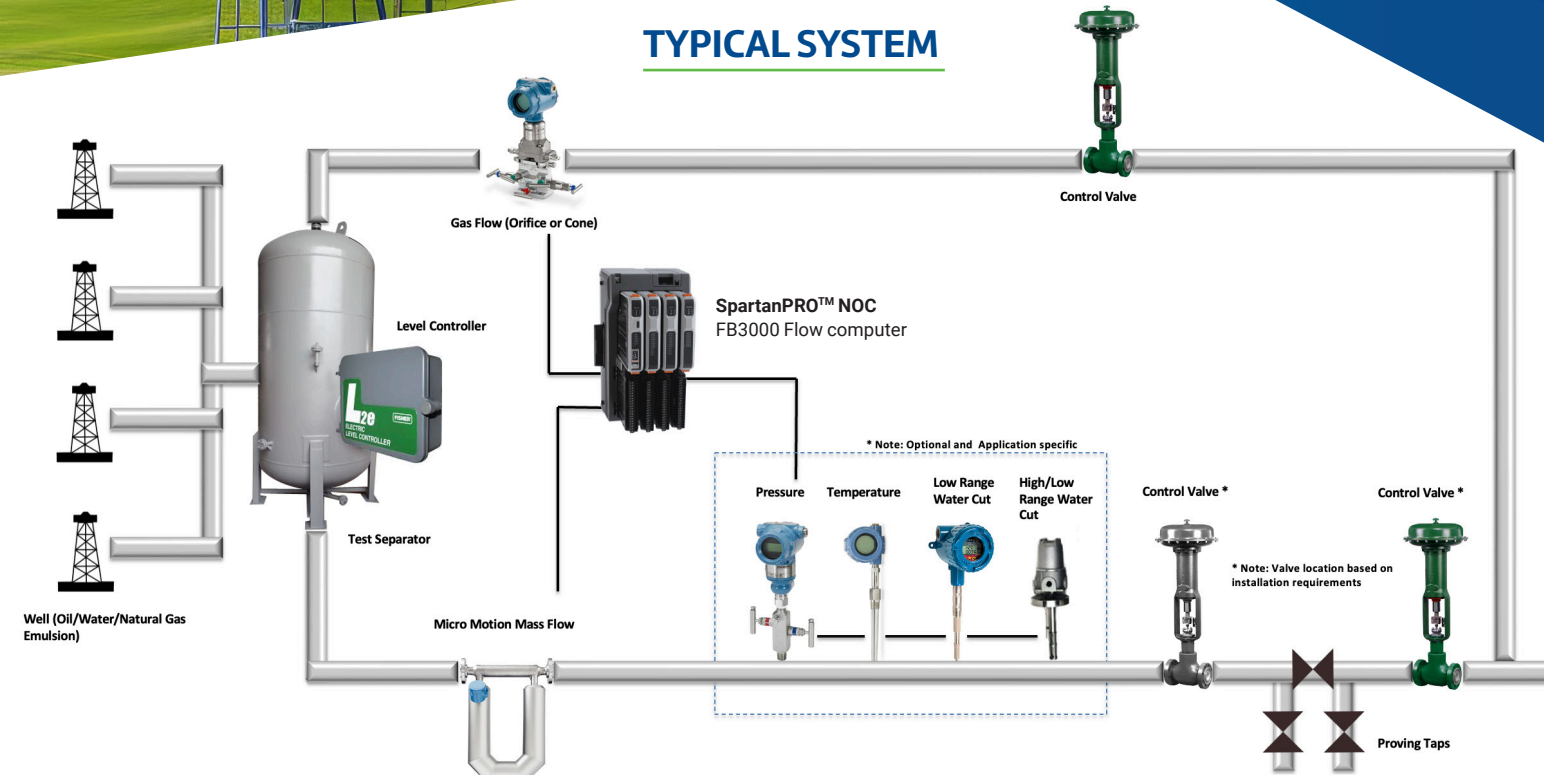
In Well Test mode the test runs for 24 hours and then automatically stops or if the test is stopped within 24 hours all totals are prorated to 24 hours. The ProductionManager™ Well Test & ProductionManager™ Equipment Module software is required to manage the well test functionality.

In LACT mode the daily test data is stored every 24 hours (into a monthly running total) using required API volumetric flow corrections.

Standard Specifications

Well Database:	24 with independent shrinkage factors
Historical Records:	Well test mode: 400 Transactional records
LACT Mode:	Minimum 1 year of daily records
Access/Inputs:	MODBUS, 4-20mA Micro Motion, Temperature, Pressure Inputs (4-20mA), Optional Phase Dynamics or Drexelbrook Input Supports 1 or 2 separators
Cut Measurement:	0 to 100% water
Accuracy:	
Cut :	±1.0% water typical
Gross Volume:	±0.1%
Density:	±0.5 kg/m3
Mass:	±0.1%
Recommended Minimum Density Difference:	100 Kg/M3 when using density for inferred water cut
Pressure Drop:	≤ 35 kPa (5 Psi)
Operating Temperature:	-40 to 70 °C

TYPICAL SYSTEM



PRODUCT SELECTION

The Micro Motion meter can be ordered with Meter Verification diagnostics to eliminate or minimize meter proving for well production measurement.

Per Directive 17 Exception 2.6.1 if a meter used to measure fluids at flow-line conditions is a type that uses no internal moving parts (e.g., orifice meter, vortex meter, cone meter, Coriolis meter, ultrasonic meter), it does not require proving. Please consult Directive 17 to see what conditions may apply.

Note: For live fluids a shrinkage factor has to be implemented to account for stock tank conditions if the shrinkage is not accounted in the meter factor. Consult Spartan Controls or the AER for details.

Part Number	Description
SpartanPRO™ NOC	NOC software with FB3000 4slot
F or Elite Micro Motion meter & transmitter	Sizing required
Rosemount 2088 Pressure and 644 Temperature w/RTD	Optional, but required for proper compensation
Rosemount 4088 3-1 Gas Flow Meter	Sizing required
PMEQMRV & PMWTX1V-(x2 for 24 wells)	ProductionManager™ Equipment Module & Well Test
STDPANEL-FB3000	Optional: Class 1 Division 2 Group C,D T3

Note: (SIZING REQUIRED) is to insure the correct hardware is specified for installation.

