

NUFLO™

# Scanner® 2000 microEFM

The NuFlo Scanner 2000 microEFM packs the gas and steam measurement capabilities traditionally found in large flow computers into a compact, low-power instrument. The explosion-proof instrument is simple to operate and can be powered for 1 year or longer with a lithium battery pack.

Simplicity and ease of use are integral to this instrument's design. Basic parameters can be configured quickly from the front panel keypad without the use of a computer. All other parameters are easily configured via the ModWorX™ Pro software provided free of charge to customers.

## The Scanner 2000 offers

- Low-power operation for remote installations
- Fully autonomous operation via lithium battery pack (1-year minimum)
- Explosion-proof enclosure
- Extremely accurate, stable and repeatable input readings using an integral MVT
- API 21.1 compliant
- Archives up to 16 user-selectable parameters
- Generous log capacity: 768 daily records, 2304 interval records, 1152 event/alarm records
- Fast data transfer: full archive download in approximately 3 minutes
- Two RS-485 communication ports
- Modbus® protocol
- Configurable inputs/outputs
- Easy-to-read LCD
- Quick and easy configuration and calibration (1 to 12 calibration points available for all inputs)
- Non-volatile memory
- Performs industry standard calculations: AGA-3, AGA-7, ISO 5167, AGA-8 (Detail and Gross), GPA 2172, Cone, and IF-97 (Steam)



## Applications

A single lithium battery pack can power the device, making it an ideal choice for installations where solar panels and external power supplies are impractical or cost-prohibitive.

The Scanner 2000 is an economical chart recorder replacement, a flow computer, and a stand-alone totalizer. Its measurement capabilities include compensated gas and steam measurements based on inputs from differential producers such as orifice plates or cone meters. A turbine input can be used for liquid measurement or compensated gas measurement in accordance with AGA-7. Modbus® protocol and two RS-485 communication ports allow remote communication to host systems. The instrument's ability to measure gas and water simultaneously is also a clear advantage for coalbed methane operators.

## Certification

- ATEX-certified, II 2 GD Ex d IIC T6 IP68 (-40°C to 70°C)
- CSA-certified for US and Canada
  - Class I, Div. 1, Groups B, C, D (explosion-proof), Type 4 enclosure

## Mounting Options

The Scanner 2000 microEFM can be mounted directly to an orifice meter run using a flange-by-flange manifold, or mounted directly to a Barton® 7000 Series turbine meter (shown). Alternatively, an optional hardware kit allows the instrument to be mounted to a 2-in. pole or bulkhead.

## Inputs

The Scanner 2000 features a highly accurate integral multi-variable transmitter, a process temperature input, a turbine meter input and a digital output that can be configured as a volumetric pulse output or an alarm.

## Display

- Two-line LCD with easy-to-read alphanumeric characters
  - 8-digit display of values (top line)
  - 6-digit display identifies each scrolling parameter and its engineering unit (bottom line)
- View up to 12 user-defined parameters
- View daily log data (99 days)
- User-selectable units of measurement
- Character height - 0.3 in.
- Adjustable contrast and update period

## Power Supply Options

- Lithium battery pack – 1-year minimum life (main or backup power supply)
- External power supply (6 to 30 VDC) with internal battery backup

## Calculations

- Flow rate
  - AGA-3
  - AGA-7
  - ISO 5167
  - Cone
- Fluid properties
  - AGA-8-92 (Detail and Gross)
  - GPA 2172
  - IF-97 (Steam)



- Wet correction (steam)
  - James (orifice)
  - Chisholm (orifice)
  - Steven (cone)

## Communications/Archive Retrieval

- Modbus (RTU) with two on-board RS-485 communications slave ports
  - COM 1 and COM 2 baud rates: 300 to 38.4K
- Enron Modbus compliant downloads
- User-defineable block reads allows the grouping of up to 25 floating point values for faster data transfer when used with a SCADA system
- Full archive download in approximately 3 minutes
  - 768 daily records
  - 2304 interval records
  - 1152 event/alarm records
- Explosion-proof control switch option
  - Push-button control of display parameters and daily log views
  - Eliminates need to open enclosure
- Explosion-proof communications adapter option
  - Quick connect to communications port for laptop
  - COM adapter installs in conduit opening for easy access
  - Eliminates need to open enclosure

## Inputs

### Turbine Meter Input

- Configurable sensitivity adjustment (20 mV to 200 mV, peak to peak)
- Frequency range: 0 to 3500 Hz
- Input amplitude: 20 mV to 3000 mV, peak to peak

### Process Temperature Input

- 100-ohm platinum RTD with 2-wire, 3-wire, or 4-wire interface
- Sensing Range: -40°F to 302°F (-40°C to 150°C)
- Accuracy: 0.2°C (0.36°F) over sensing range at calibrated temperature
- Temperature effect (Fahrenheit): 0.54°F over operating range of -40°F to 158°F
- Temperature effect (Celsius): 0.3°C over operating range of -40°C to 70°C
- Resolution: 24 bits
- User-adjustable sample time and damping

## Outputs

### Digital Output

- Configurable as pulse output or alarm output
- Solid-state relay
- Output rating: 60 mA max @ 30 VDC
- Pulse output
  - Configurable pulse duration
  - Configurable pulse representation (1 pulse = 1 MCF)
  - Based on any accumulator (flow run or turbine inputs)
- Alarm output
  - Low/high
  - Out-of-range
  - Status/diagnostic
  - Latched/unlatched
  - Normally open/normally closed

## Memory

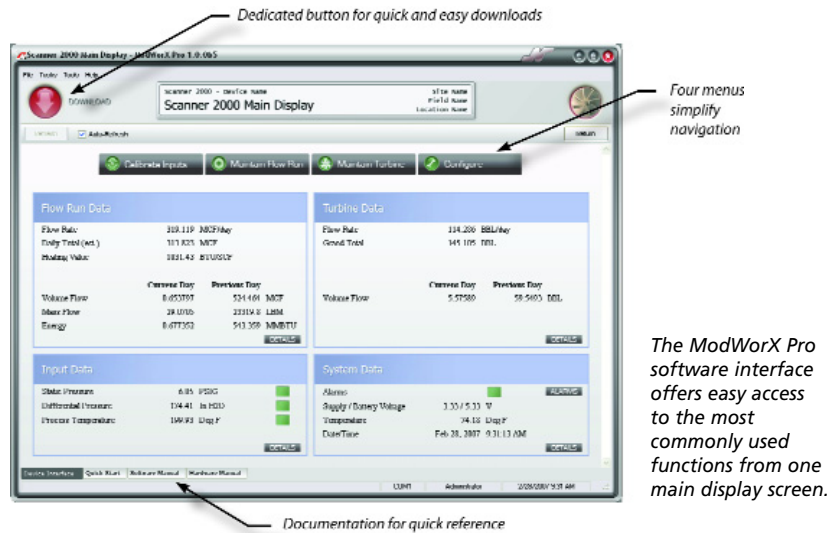
- Non-volatile memory for configuration and log data
  - 256 KByte
  - Data stored for 10 years without power



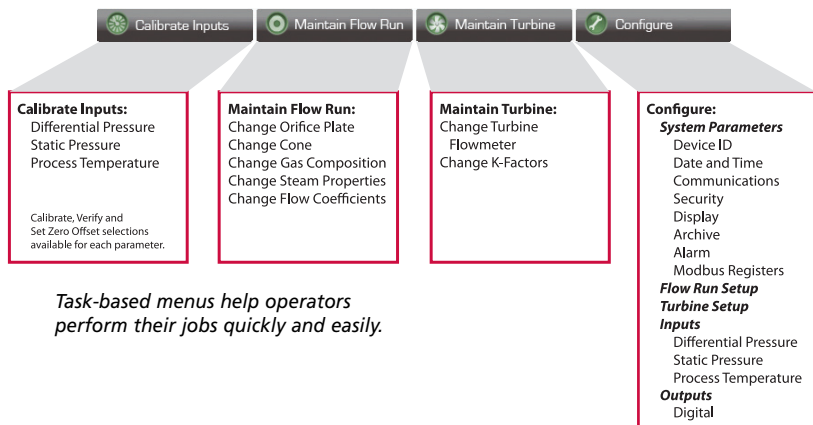
**Interface Software**

- Provided at no charge
- Easy to use
- Real-time data polling
- Complete configuration
  - Configuration upload tool for configuring multiple units
- Multi-level security
- Field calibration
  - 1 to 12 calibration points for each parameter
  - Three methods: multi-point, set zero point, and verify
  - Inputs are automatically locked during calibration
- Maintenance
  - Change plate
  - Change cone (linearization: 1 to 12 points)
  - Change gas composition
  - Change steam properties
  - Change flow coefficients
  - Change K-factor (linearization: 1 to 12 points)
  - Change turbine flowmeter

- Archive data downloads
  - Configurable downloads of "all" or "new" records
  - Download types: daily, interval, and event/alarm records
  - Downloads are automatically saved in uneditable binary (SDF) files
  - Exports to .xls, .csv, .rtf, .html, and Flow-Cal® formats
- Reporting
  - Daily logs (table or trend graph)
  - Interval logs (table or trend graph)
  - Event/alarm logs
  - Configuration settings
  - Calibration settings
  - Snapshot of current status data and calculated parameters
- Online documentation
  - Quick Start guide
  - Hardware manual
  - Software manual



*The ModWorX Pro software interface offers easy access to the most commonly used functions from one main display screen.*



*Task-based menus help operators perform their jobs quickly and easily.*

**MEASUREMENT SYSTEMS**

Formerly: NuFlo Measurement Systems • Barton Instrument Systems • Caldon, Inc.

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