• SYSTEM-10-MOD BTU METER •
MODBUS RTU or MODBUS TCP COMPATIBLE

DESCRIPTION

The System-10 BTU Meter provides highly accurate thermal energy measurement in chilled water, hot water and condenser water systems based on signal inputs from two matched temperature sensors (included) and any of ONICON's insertion or inline flow meters (ordered separately). The System-10-MOD provides energy, flow and temperature data on a local alphanumeric display and to the network via the MODBUS RTU or MODBUS TCP communications adapter. An optional auxiliary input is also available to totalize pulses from another device and communicate the total directly to the network.

APPLICATIONS

Chilled water, hot water and condenser water systems for:

- Commercial office tenant billing
- Central plant monitoring
- University campus monitoring
- Institutional energy cost allocation
- Performance/efficiency evaluations
- Performance contracting energy monitoring

FEATURES

MODBUS Compatible Serial Communications - Provides complete energy, flow and temperature data to the control system through a single MODBUS RTU network connection, reducing installation costs.

Simple Installation and Commissioning - Factory programmed and ready for use upon delivery. All process data and programming functions are accessible via front panel display and keypad.

Single Source Responsibility - One manufacturer is responsible for every aspect of the energy measurement process ensuring component compatibility and overall system accuracy.

N.I.S.T. Traceable Calibration with Certification - Each Btu measurement system is individually calibrated using application specific flow and temperature data and is provided with calibration certifications.

Precision Solid State Temperature Sensors - Custom calibrated and matched to an accuracy better than ±0.15°F over calibrated range.

Highly Accurate Flow Meters - ONICON offers a wide variety of insertion and inline type flow measurement technologies including turbine, electromagnetic and vortex sensing. Each type offers unique advantages depending on the application. All ONICON flow meters are individually wet calibrated and designed to operate over a wide flow velocity range with accuracies ranging from ±0.2% to ±2.0% of rate depending on the model.

Complete Installation Package - All mechanical installation hardware, color coded interconnecting cabling and installation instructions are provided to ensure error-free installation and accurate system performance.

ORDERING INFORMATION

The System-10 BTU Meter is sold complete with temperature sensors and standard thermowells. Flow meters are purchased separately.

ITEM #	DESCRIPTION
SYSTEM-10-MOD	System-10 BTU Meter MODBUS compatible
SYSTEM-10-OPT1	Add for 6" and larger pipes
SYSTEM-10-OPT2	Add for 2.5" - 3" copper tube
SYSTEM-10-OPT3	Add for 4" copper tube
SYSTEM-10-OPT4	Upgrade to outdoor thermowells (pair)
SYSTEM-10-OPT5	Upgrade to hot tap thermowells (pair)
SYSTEM-10-OPT8	High temperature sensors (over 200°F)
SYSTEM-10-OPT9	Add one analog output
SYSTEM-10-OPT10	Add four analog outputs
SYSTEM-10-OPT11	Auxiliary pulse input
Choose from the following flow meters:	
F-1100/F-1200	Insertion Turbine Flow Meter (1 1/4" - 72")
F-1300	Inline Turbine Flow Meter (2/3" - 1")
F-2000 Series	Full Bore Vortex Flow Meter
F-3000 Series	Full Bore Electromagnetic Flow Meter
F-3500	Insertion Electromagnetic Flow Meter (3"- 72")
Refer to catalog for flow meter installation kits. Consult with ONICON for additional flow meter types.	

UL LISTED
PROCESS CONTROL EQUIPMENT
3GF5

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SYSTEM-10-MOD BTU METER SPECIFICATIONS

CALIBRATION
Flow meters and temperature sensors are individually calibrated followed by a complete system calibration. Field commissioning is also available.

ACCURACY
Differential temperature accuracy ±0.15°F over calibrated range
Computing nonlinearity within ±0.05%

PROGRAMMING
Factory programmed for specific application
Field programmable via front panel interface

MEMORY
Non-volatile EEPROM memory retains all program parameters and totalized values in the event of power loss.

DISPLAY
Alphanumeric LCD displays total energy, total flow, energy rate, flow rate, supply temp. and return temp.
Alpha: 16 character, 0.2" high; Numeric: 6 digit, 0.4" high

OUTPUT SIGNALS

Network Interface:
Protocol: MODBUS RTU
Connection: RS485: 2-wire (half duplex)
TCP/IP: 10 Base T, 10 Mbps, RJ45 Connection
Baud Rate for RS485: 4800, 9600, 19200, 38400 and 76800

Partial MODBUS Holding Register List:

NAME	Available Units
Total Energy	Btu, kW-hrs & ton-hrs
Energy Rate	Btu/hr, kW & tons
Total Flow	Gallons, liters & meters^3
Flow Rate	gpm, gph, mgd, l/s, l/m, l/hr & m^3/hr
Supply & Return Temperature	°F and °C
Operating Mode	Single, Dual or Bi-directional
Mode Status	Heating/Cooling or Forward/Reverse Flow
Auxiliary Input Total	Not Applicable
Energy Total Reset	Not Applicable
Flow Total Reset	Not Applicable
Auxiliary Total Reset	Not Applicable

Optional Interval Data Logging:
This option provides up to 24 hours of rate and total data logging in 15 minute intervals. Data includes date/time stamp, measured value & scaling factors when appropriate.

Isolated solid state dry contact for energy total:
Contact rating: 100mA, 50V
Contact duration: 0.5, 1, 2, or 6 seconds

Optional analog Output(s) (4-20 mA, 0-10 V or 0-5 V):
One or four analog output(s) available for flow rate, energy rate, supply/return temps or delta-T.

LIQUID FLOW SIGNAL INPUT
0-15 V pulse output from any ONICON flow meter.

TEMPERATURE SENSORS
Solid state sensors are custom calibrated using N.I.S.T. traceable temperature standards.
Current based signal (mA) is unaffected by wire length.

TEMPERATURE RANGE
Liquid temperature range: 32° to 200° F
Optional liquid temperature range: 122° to 302° F
Ambient temperature range: -20° to 140° F

MECHANICAL

Electronics Enclosure:
Standard: Steel NEMA 13, wall mount, 8"x10"x4"
Optional: NEMA 4 (Not UL listed)
Approximate weight: 12 lbs

Temperature Thermowells:
Standard: 1/2" NPT brass thermowells (length varies with pipe size) with junction box
Note: 6" pipes and larger require SS thermowell option.
Optional:
- 1/2" NPT stainless steel thermowells
- Outdoor junction box with thermal insulation
- Hot tap thermowells with isolation valves are available in plated brass or stainless steel.

ELECTRICAL

Input Power*:
Standard: 24 VAC 50/60 Hz, 500 mA
Optional: 120 VAC 50/60 Hz, 200 mA
230 VAC, 50 Hz, 150 mA
*Based on Btu meters configured for network connection without the optional analog outputs

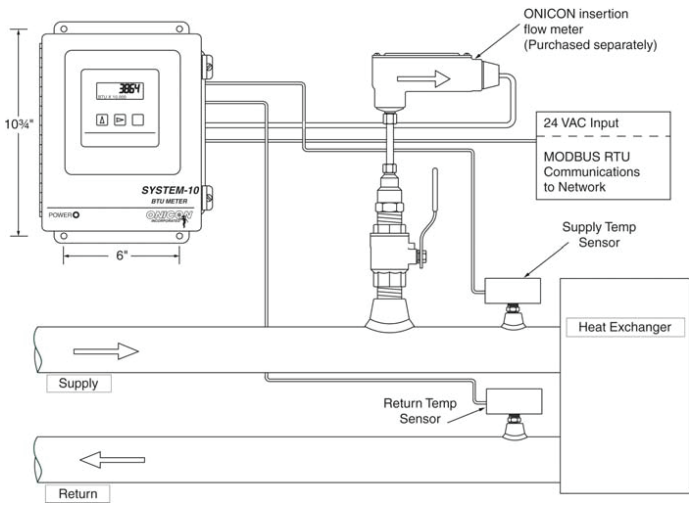
Internal Supply:
Provides 24 VDC at 200 mA to electronics and flow meter

Wiring:
Temperature signals: Use 18-22 ga twisted shielded pair
Flow signals: Use 18 - 22 ga shielded - see flow meter specification sheet for number of conductors

Note: Specifications are subject to change without notice.

TYPICAL INSTALLATION

Insertion turbine flow meter shown. Any ONICON flow meter may be used with the System-10 BTU Meter. Consult with ONICON for additional flow meter types.



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