

• **SYSTEM-10-BAC-IP BTU METER** •  
**BACnet/IP COMPATIBLE**



**FEATURES**

**BACnet Compatible Serial Communications -**

Provides complete energy, flow and temperature data to the control system through a single BACnet/IP 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  $\pm 0.15^\circ$  F over calibrated range.

**A Variety of Accurate Flow Meters -** ONICON has flow meters for every application. In the most demanding applications, the F-3000 series in-line electromagnetic meters offer accuracies of  $\pm 0.2\%$  of reading in limited straight pipe runs. Insertion turbine meters offer outstanding value with  $\pm 1.0\%$  of reading accuracy and are priced independent of pipe size. F-2000 series in-line vortex meters offer  $\pm 1.0\%$  of reading accuracy for very high temperature applications.

**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.

**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 in-line flow meters (ordered separately). The System-10-BAC-IP provides energy flow and temperature data on a local alphanumeric display and to the BACnet/IP network via the BACnet/IP communications driver. An optional auxiliary input is also available to totalize pulses from another device and communicates the total directly to the BACnet/IP 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

**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-BAC-IP	System-10 BTU Meter BACnet/IP 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
<b>Choose from the following flow meters:</b>	
F-1100/F-1200	Insertion Turbine Flow Meter (1¼"-72")
F-1300	Inline Turbine Flow Meter (¾" - 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.	



# SYSTEM-10-BAC-IP BTU METER SPECIFICATIONS



## CALIBRATION

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

## ACCURACY

Differential temperature accuracy  $\pm 0.15^\circ\text{F}$  over calibrated range  
 Computing nonlinearity within  $\pm 0.05\%$

## 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 temperature and return temperature  
 Alpha: 16 character, 0.2" high; Numeric: 6 digit, 0.4" high

## OUTPUT SIGNALS

BACnet/IP Points List (Complies with Annex J)

Name	BACnet Object Type	Units
Total Energy	Analog Value	Btu, kW-hrs or ton-hrs
Energy Rate	Analog Input	Btu/hr, kW or tons
Total Flow	Analog Value	gallons, liters or meters <sup>3</sup>
Flow Rate	Analog Input	gpm, gph, mgd, l/s, l/m, l/hr or m <sup>3</sup> /hr
Supply Temperature	Analog Input	$^\circ\text{F}$ or $^\circ\text{C}$
Return Temperature	Analog Input	$^\circ\text{F}$ or $^\circ\text{C}$
Energy Total Reset	Binary Value	Not applicable
Flow Total Reset	Binary Value	Not applicable
Auxiliary Input Total	Analog Value	Pulse Accumulator
Auxiliary Input Reset	Binary Value	Not applicable

Network Connection: 10BaseT, 10Mbps, RJ45 connection  
 Isolated solid state dry contact for energy total  
 Contact rating: 100 mA, 50V  
 Contact duration: 0.5, 1, 2, or 6 sec  
 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: 40° to 120° 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 isolation
- 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 SYSTEM-10-BAC-IP INSTALLATION

