



• **SYSTEM-10-LON BTU METER** •  
**LONMARK® CERTIFIED**



**DESCRIPTION**

The System-10-LON 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 LONWORKS® model provides energy, flow and temperature data to the LonTalk® network using standard network variable types (SNVT). Local indication on energy flow and temperature data is also available through an alphanumeric display located on the front of the System-10-LON BTU Meter. An optional auxiliary input is also available to totalize pulses from another device and communicate the total directly to the network.

**FEATURES**

**LON® Compatible Serial Communications** - Provides complete energy, flow and temperature data to the control system through a single LONWORKS 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** - Insertion turbine and inline turbine flow meters are accurate to within ±0.5% of rate at the calibrated typical flow rate and within ±2% of rate over an extended 50:1 turndown range (0.4 - 20ft/s).

**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.

**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-LON BTU Meter is sold complete with temperature sensors and standard thermowells. Flow meters are purchased separately.

ITEM #	DESCRIPTION
SYSTEM-10-LON	System-10 BTU Meter, LON 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 (1 1/4" - 72")
F-1300	Inline Turbine Flow Meter (3/4" - 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.	



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# SYSTEM-10-LON 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  $\pm 0.15^{\circ}\text{F}$  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

### LONWORKS® Output Points: (TP/FT-10F)

Variable Description	Units	SNVT Name
Energy Total	Btu	SNVT_btu_f
Energy Rate	Watts	SNVT_power_f
Flow Rate	Liters/Sec	SNVT_flow_f
Supply Temperature	$^{\circ}\text{C}$	SNVT_temp_f
Return Temperature	$^{\circ}\text{C}$	SNVT_temp_f
Flow Total	Liters	SNVT_vol_f
Auxiliary Input	No Units	SNVT_count_f

### Isolated solid state dry contact for energy total:

Contact rating: 100mA, 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:  $32^{\circ}$  to  $200^{\circ}\text{F}$   
Optional liquid temperature range:  $122^{\circ}$  to  $302^{\circ}\text{F}$   
Ambient temperature range:  $40^{\circ}$  to  $120^{\circ}\text{F}$

## 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, 250 mA  
230 VAC, 50 Hz, 250 mA

\*Based on Btu meters configured for network connection without the optional analog outputs

### Internal Supply:

Provides 24 VDC at 400 mA to electronics and flow meter

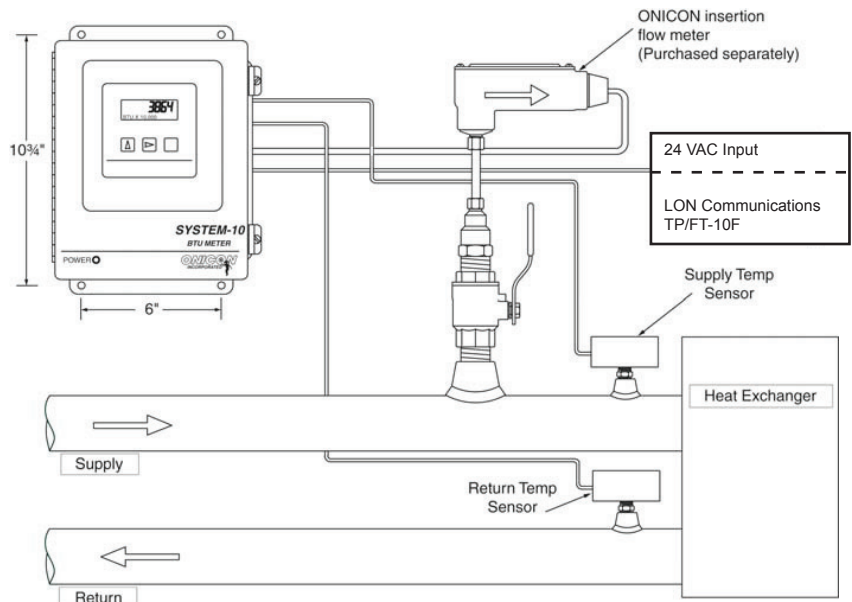
### Wiring:

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. LONMARK®, LonTalk®, LON® and LONWORKS® are registered trademarks of Echelon® Corporation.

## TYPICAL SYSTEM-10-LON 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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