



# Innovative HVAC Flow and Energy Measurement Solutions



PRECISE, RELIABLE, TRUSTED  
**SOLUTIONS**





- CHILLED WATER
- HOT WATER
- DOMESTIC WATER
- CONDENSER WATER
- NATURAL GAS
- STEAM SYSTEMS



# Flow Measurement Applications

ONICON Incorporated has been a leading provider of the flow and energy measurement solutions required by the Building Automation and Controls industry for more than 30 years.

As the need for accurate and reliable information continues to grow, ONICON is committed to meeting this challenge by continually expanding our product offering. ONICON has the right technology to meet your application requirements.







Meter Series	F-1000 Series	F-3500	FT-3100	FT-3200
Product Image				
Meter Style	Inline/Insertion	Insertion	Inline	Inline
Insertion Meter Pipe Size Range	1.25" - 72"	1.25" - 72"		
Inline Meter Pipe Size Range	0.75" - 1"		0.25" - 24"	1" - 48"
Accuracy (% of Reading)	1%	1%	0.4%	0.2%
Bi-Directional Flow Capability	No	Yes	Yes	Yes
Overall Flow Range (Velocity)	0.17 - 30 ft/s	0.1 - 20 ft/s	0.1 - 33 ft/s	0.1 - 33 ft/s
Applications	Turbine Meters	Electromagnetic Meters		
Chilled Water	✓	✓	✓	✓
Heating Hot Water <280°F	✓	≤ 250°F	≤ 250°F	≤ 250°F
Heating Hot Water >280°F				
Condenser Water - Closed Loop	✓	✓	✓	✓
Condenser Water - Open Loop		✓	✓	✓
Domestic (Potable) Water	✓	✓	✓	✓
Gray Water / Surface Water		✓	✓	✓
Well Water		✓	✓	✓
Seawater		✓	✓	✓
Process Liquids			✓	✓
Steam Condensate (Pumped)	✓	✓	✓	✓
Steam				
Process Gases				
Compressed Air				
Natural Gas				



# The ONICON Difference

Delivering engineered products - ready to use right out of the box. All ONICON products are custom configured for your application and receive an industry traceable wet calibration.

Our goal is to provide industry leading application and technical support as well as exceptional sales and customer service assistance. Please contact our office if you require additional help.

F-4300	FP-4400	F-4600	F-2000 Series	F-1500	F-5000 Series	Meter Series
						<b>Product Image</b>
<b>Clamp-on</b>	<b>Portable Clamp-on</b>	<b>Inline</b>	<b>Inline/Insertion</b>	<b>Insertion</b>	<b>Inline/Insertion</b>	<b>Meter Style</b>
1/2" - 48"	1/2" - 48"		3" - 16"	3" - 16"	1.5" - 24"	<b>Insertion Meter Pipe Size Range</b>
		0.5" - 2.5"	0.5" - 8"		0.75" - 6"	<b>Inline Meter Pipe Size Range</b>
1%	1%	1%	1.5%	2%	1%	<b>Accuracy (% of Reading)</b>
Yes	No	No	No	No	No	<b>Bi-Directional Flow Capability</b>
1.5 - 40 ft/s	0.1 - 40 ft/s	0.025 - 12.5 ft/s	10 - 250 ft/s	6 ranges ≤ 205 ft/s	15 - 35,000 SFPM	<b>Overall Flow Range (Velocity)</b>
<b>Ultrasonic Flow Meters/ Thermal Energy Measurement Systems</b>			<b>Vortex Meters</b>	<b>Industrial Turbine Meters</b>	<b>Thermal Mass Meters</b>	<b>Applications</b>
✓	✓	✓				<b>Chilled Water</b>
≤ 250°F	≤ 250°F	≤ 250°F				<b>Heating Hot Water &lt;280°F</b>
			✓	✓		<b>Heating Hot Water &gt;280°F</b>
✓	✓	✓				<b>Condenser Water - Closed Loop</b>
✓	✓	✓				<b>Condenser Water - Open Loop</b>
✓	✓	✓				<b>Domestic (Potable) Water</b>
✓	✓	✓				<b>Gray Water / Surface Water</b>
✓	✓	✓				<b>Well Water</b>
✓	✓					<b>Seawater</b>
✓	✓	✓	✓	✓		<b>Process Liquids</b>
✓	✓	✓	✓			<b>Steam Condensate (Pumped)</b>
			✓	✓		<b>Steam</b>
					✓	<b>Process Gases</b>
					✓	<b>Compressed Air</b>
					✓	<b>Natural Gas</b>



# Liquid Applications

ONICON offers a full line of inline, insertion style and clamp-on meters for liquid flow applications. All ONICON flow meters are individually wet-calibrated, delivered fully programmed for your application, and ready to use. This attention to detail simplifies installation and maximizes performance.

While we offer a full line of meters, ONICON is widely recognized for our innovative hand-insertable insertion style flow meters. This unique design has advantages not found in other meter types.

- Can be installed or removed without the need for specialized tools
- Ideal for Hot Tap installations where it is not practical to interrupt flow
- Priced independent of pipe size, making them an excellent value for larger pipes
- Use of our insertion style meters simplifies periodic flow calibration and maintains traceability in measurement accuracy

## TURBINE FLOW METERS

ONICON Turbine Flow Meters are designed for performance and value. Each meter is provided with highly linear low mass turbines, polished tungsten carbide turbine shafts, precision sapphire shaft bearings, and a patented turbine rotation sensing circuit that does not add drag.

### FEATURES:

- Accurate over a wide flow range and continues to operate at low flows that other meters cannot read
- Ideally suited for use in clean closed loop systems - provides many years of continuous service
- No system shut-down required
- Bluetooth® connectivity
- Approval: NSF/ANSI 61 and NSF/ANSI 372

## ELECTROMAGNETIC FLOW METERS

ONICON Electromagnetic Flow Meters are designed for the most demanding applications. Flow in all kinds of conductive liquids can be accurately measured by utilizing the pulsating magnetic fields. These meters are designed with advanced filtering and signal processing circuitry to maximize performance and reliability.

### FEATURES:

- Highly accurate over a wide flow range and with excellent low-flow performance
- Extremely reliable even with difficult to measure liquids
- Low maintenance - no moving parts
- Network interface options: BACnet MS/TP, BACnet/IP, MODBUS RTU, and MODBUS TCP/IP available on select models
- Approval: NSF/ANSI 61 for inline models  
NSF/ANSI 61 and NSF/ANSI 372 for insertion models



F-1200 Dual Insertion Turbine Flow Meter



FT-3000 Series Inline Electromagnetic Flow Meter



F-3500 Insertion Electromagnetic Flow Meter



F-4600 In-line Ultrasonic Flow Meter



F-4600 In-line Ultrasonic Flow Meter with Display

## INLINE ULTRASONIC FLOW METERS

ONICON In-line Ultrasonic Flow Meters accurately and reliably measure the flow of water and water glycol solutions in pipe sizes ranging from 1/2" to 2 1/2". These cost-effective meters have excellent low-flow measurement capabilities, and the unique flow tube design accurately measures flow in very limited straight run installations.

### FEATURES:

- Highly accurate over a wide flow range
- Low maintenance - no moving parts
- Ideal for domestic water applications - meets safe drinking water standards
- Network interface options: BACnet MS/TP\* and MODBUS RTU (RS485)
- Approval: NSF/ANSI 61 and NSF/ANSI 372

## PORTABLE CLAMP-ON ULTRASONIC FLOW METERS

ONICON Portable Clamp-on Ultrasonic Flow Meters are ideal for those applications where a temporary flow measurement is required.

### FEATURES:

- Ideal for retrofit applications
- Capable of measuring flow independent of the conductivity of the liquid
- Meets safe drinking water standards



FP-4400 Portable Clamp-on Ultrasonic Flow Meter

## CLAMP-ON ULTRASONIC FLOW METERS

ONICON Clamp-on Ultrasonic Flow Meters offer an ideal solution for liquid flow measurement in existing systems when it is impractical to install wetted style flow meters.

### FEATURES:

- Ideal for retrofit applications
- Built-in 128 MB data logger - Capacity for 26 million points
- Capable of measuring flow independent of the conductivity of the liquid
- BACnet MS/TP, MODBUS RTU (RS485) and optional MODBUS TCP/IP



F-4300 Clamp-on Ultrasonic Flow Meter



Typical Installation on Steel Pipe

**\*ONICON's F-4600 Flow Meter utilizes a BACnet MS/TP serial interface that is certified by the BACnet® Testing Laboratory (BTL).**



# Steam Applications



F-2600  
Inline Vortex  
Flow Meter



F-2700  
Insertion Vortex  
Flow Meter

F-1500  
Insertion Turbine  
Flow Meter

ONICON steam meters are designed to measure mass flow for saturated and superheated steam without the need for an external flow computer. Inline and insertion style meters are available, and all versions offer the same basic features, output signals and networking options: BACnet MS/TP or MODBUS RTU.

## INLINE VORTEX FLOW METERS

ONICON Inline Vortex Flow Meters are the perfect choice for mass flow measurement of steam. The low-mass cantilevered flow sensor design maximizes sensitivity while minimizing the noise commonly associated with vibration. This allows the meter to operate reliably at lower flow rates. Inline flow tubes feature all welded 316 stainless steel construction for maximum reliability. They are available in sizes ranging from 1/2" to 8" with ANSI class flanges.

### FEATURES:

- Cost-effective, accurate and reliable
- A one-piece design that is simple to install and operate
- Delivered fully programmed and ready to use
- Network interface options: BACnet MS/TP and MODBUS RTU (RS485)

## INSERTION VORTEX FLOW METERS

ONICON Insertion Vortex Flow Meters are a cost-effective alternative to the inline version of the meter in larger line sizes and retrofit installations.

### FEATURES:

- Cost-effective, accurate and reliable
- A one-piece design that is simple to install and operate
- Delivered fully programmed and ready to use
- No system shut-down required
- Network interface options: BACnet MS/TP and MODBUS RTU (RS485)

## INSERTION TURBINE FLOW METERS FOR STEAM

ONICON Insertion Turbine Flow Meters for steam offer the advantage of flexibility in selecting the operating range of the meter. They can be particularly useful where flow rates are too low for vortex meters.

### FEATURES:

- Cost-effective, accurate and reliable
- A one-piece design that is simple to install and operate
- Delivered fully programmed and ready to use
- No system shut-down required
- Ideal for measuring low flow in larger line sizes
- Network interface options: BACnet MS/TP and MODBUS RTU (RS485)



# Gas and Compressed Air Applications

ONICON Thermal Mass Flow Meters provide accurate, reliable flow measurement of natural gas, compressed air and other industrial gases. Thermal mass meters have no moving parts and measure the mass of the fluid directly. This allows them to report standardized volumetric flow rates and totals without the need for temperature or pressure compensation.

ONICON thermal mass meters utilize proprietary direct digital control sensing circuitry. This design allows for accurate flow measurement over a very wide operating range (over 1000:1 for the inline version).

## THERMAL MASS FLOW METERS

Thermal Mass Flow Meters are available as inline and insertion style meters, with or without a local display. The insertion meter with display is also provided with a unique method for simple field validation of the existing calibration.

### FEATURES:

- Ideal for retrofit applications - insertion version can be installed without disrupting gas service
- Low maintenance - no moving parts
- Capable of accurately measuring very low flow rates
- Network interface options: BACnet MS/TP and MODBUS RTU (RS485)



F-5500 Insertion and Inline Thermal Mass Flow Meters





# Energy Measurement Technologies



System-20 BTU Meter

ONICON offers a variety of BTU metering systems designed for measuring thermal energy in water based systems. All ONICON thermal energy measurement systems are delivered fully programmed for your application and are ready to use right out of the box.

ONICON BTU Measurement Systems require three inputs for measuring energy: two temperature inputs are provided by a matched pair of temperature sensors for the temperature differential and one input for flow rate. Depending on the product below, a flow meter may be required in addition to the BTU meter.

## SYSTEM-20 BTU METERS

The System-20 is designed to measure the thermal energy associated with the most common systems found in today's HVAC applications and communicate directly with the BMS/BAS. This flexible design will provide energy, flow and temperature data on the local display and over the BACnet MS/TP or MODBUS RTU networks. In addition, the System-20 provides an analog output signal, pulse outputs, and auxiliary pulse inputs, all of which are configurable via an intuitive user interface.

### FEATURES:

- Delivered fully calibrated, programmed, and ready to use
- Provides the most common communication options and outputs used in the HVAC industry
- Network interface options: BACnet MS/TP\* and MODBUS RTU (RS485)

## SYSTEM-40 BTU MEASUREMENT SYSTEM

The System-40 is a complete BTU measurement system ideally suited for sub-metering applications. It includes a pair of matched temperature sensors, an integral inline ultrasonic flow sensor, and local/remote display. It communicates via BACnet<sup>®</sup> MS/TP or MODBUS<sup>®</sup> RTU. A configurable output array consisting of a combination of pulse outputs, an optional analog output, and three auxiliary pulse inputs that provide a means for other devices, such as utility meters, to connect to the BAS through the System-40's serial network connection.

### FEATURES:

- Accurate, reliable, no-moving-parts, wetted ultrasonic flow sensor
- Individually wet-calibrated and delivered fully programmed and ready to use upon delivery
- Network interface options: BACnet MS/TP\* and MODBUS RTU (RS485)



System-40 BTU Measurement System

*\*ONICON's System-20 and System-40 BTU Meters utilize a BACnet MS/TP serial interface that is certified by the BACnet<sup>®</sup> Testing Laboratory (BTL).*





F-4300 Clamp-on  
Ultrasonic Thermal Energy  
Measurement System

## CLAMP-ON ULTRASONIC THERMAL ENERGY MEASUREMENT SYSTEM

ONICON Clamp-on Ultrasonic Thermal Energy Measurement Systems offer an ideal solution for liquid flow and energy measurement in existing systems when it is impractical to install wetted style flow meters.

### FEATURES:

- Ideal for retrofits and baseline monitoring
- Built-in 128 MB data logger - Capacity for 26 million points
- Capable of measuring flow and energy independent of the conductivity of the liquid
- NIST Traceable Certificate of Calibration
- BACnet MS/TP, MODBUS RTU (RS485), and optional MODBUS TCP/IP
- Pair of matched, high precision temperature sensors
- Easy to use installation hardware - No factory start up required



Typical Installation  
on Steel Pipe



System-10 BTU Meter

## SYSTEM-10 BTU METERS

The System-10 is the most versatile energy (BTU) measurement system ONICON offers. It utilizes a matched pair of calibrated temperature sensors combined with one of ONICON's custom configured flow meters (ordered separately). The versatile design is available with a vast array of output options which include RS485 and IP serial networks, multiple pulse outputs, auxiliary pulse inputs and multiple analog outputs.

### FEATURES:

- Configured to match the accuracy and performance requirements of the application
- Delivered fully calibrated, programmed and ready to use
- Network interface options:  
BACnet MS/TP, BACnet/IP (UDP/IP)\*  
MODBUS RTU (RS485), MODBUS TCP/IP  
LonWorks (FTT-10)  
Siemens P1  
JCI N2

## Networked Display Module



D-100  
Display Module

## D-100 Network Display

The D-100 is a flexible platform designed to solve difficult data acquisition problems. The basic model provides a totalizing input for almost any flow meter. Additionally, analog rate and pulse input options are available making the D-100 ideal for providing network access to utility metering data. The D-100 is available with a wide variety of serial communications options for connection to data acquisition and control networks.

### FEATURES:

- Delivered fully calibrated, programmed and ready to use
- Network interface options:  
BACnet MS/TP, BACnet/IP (UDP/IP)\*  
MODBUS RTU (RS485), MODBUS TCP/IP  
LonWorks (FTT-10)

**\*ONICON's System-10 BTU Meter and D-100 Display Module both utilize a BACnet/IP serial interface module (Full Function Ethernet, FPC-F03) that is certified by the BACnet® Testing Laboratory (BTL).**



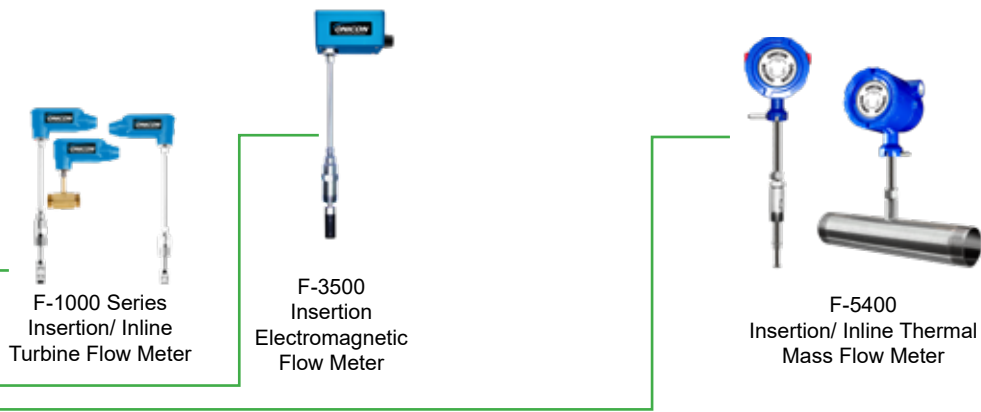
# Flow and Energy Measurement System

## SYSTEM-1000 FLOW AND ENERGY MEASUREMENT SYSTEM

The System-1000 is a multi-input interface that provides a single network point for up to eight devices. Its innovative design allows dual channel energy measurement and is the ideal solution to accurately measure and report thermal energy usage, flow, temperatures, and efficiency.



System-1000 Flow and Energy Measurement System

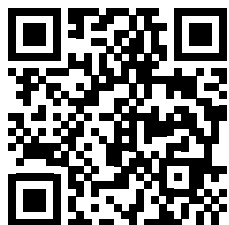


### FEATURES:

- Total System Integration
- Multiple Flow Meter and Temperature Sensor Options
- Single Output Network Connection for up to 8 Meters
- Wall Space Reduction
- Simple Installation & Commissioning
- Limited Straight Run Solution



# Quote Requests & Ordering



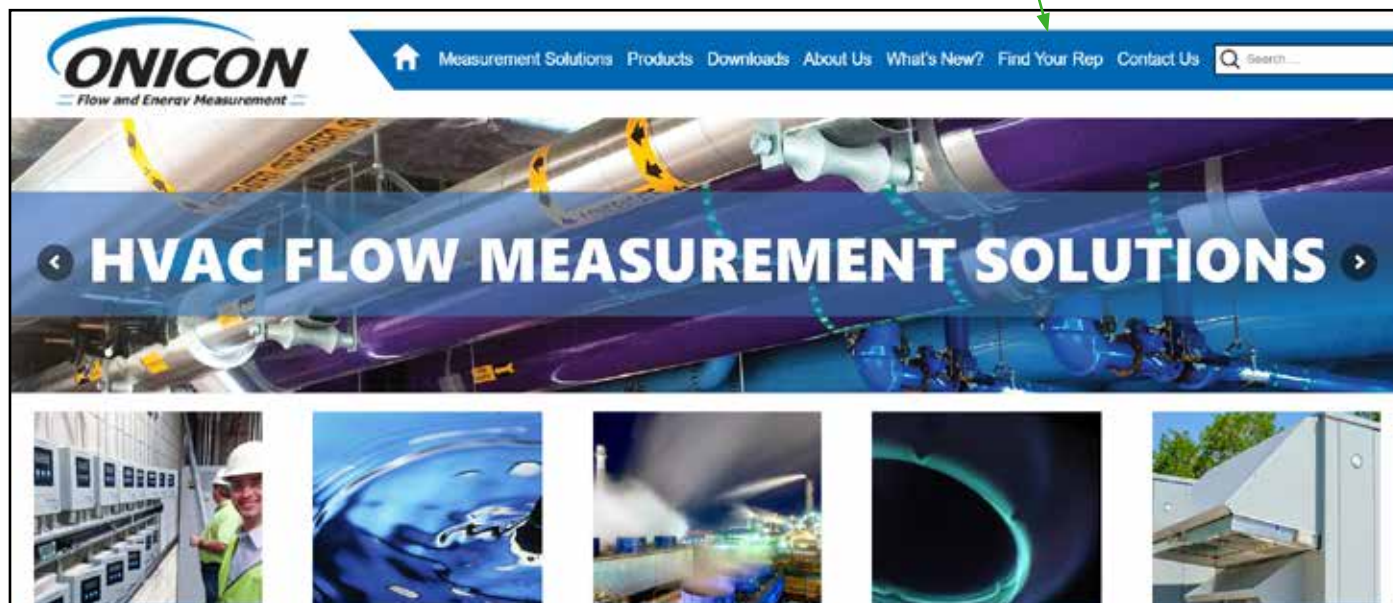
Find Your Rep

## *How do I get help with selecting the right meter or help with placing an order?*

ONICON has a global network of factory trained independent representatives who are ready to assist you. Use the "Find a Representative" tool on our web site to find your rep today. You can also call our office and ask to be contacted by your local representative.

Additionally, you can contact ONICON directly. ONICON has an experienced staff of knowledgeable sales engineers standing by to assist you. Call today or contact us online at [www.onicon.com](http://www.onicon.com). Send us an e-mail, use our online quote tool or send us a completed order form to request assistance at any time. Send your inquiry, quote request or completed order form to [sales@onicon.com](mailto:sales@onicon.com) today.

Find a Representative





We believe in our products, so should you.

**1 YEAR NO FAULT WARRANTY**  
**3 YEAR MANUFACTURER WARRANTY**



**READY TO GO...**

ONICON meters are wet-calibrated and configured to your specifications, **right out of the box.** This attention to detail simplifies installation and maximizes performance.

**LEADING THE WAY**  
**SINCE 1987**



For over 35 years, ONICON has been delivering quality engineered flow and energy measurement instruments for hydronic heating and cooling systems. Our flow meter technologies include: electromagnetic, turbine, ultrasonic, thermal, and vortex. We also offer BTU (energy) meters that integrate flow inputs from the technology of your choice. Experience the ONICON Difference today.