Series 2300 Btu Monitor

The Data Industrial 2300 is a versatile, microprocessor based, BTU monitor. This device accepts the inputs of one flow sensor, and two temperature sensors and calculates the energy being produced or consumed between the two thermal measurement points.

The compact sized panel meter, 192 mm X 96 mm, is rated NEMA 4X and conforms to standard DIN dimensions for meter sizes and panel cut-outs. The 2300 is also available in a NEMA 4 or NEMA 4X wall mount versions.

The display contains two lines of sixteen alpha-numeric characters. The user may configure the display to simultaneously show any combination of flow rate or total, energy rate or total, temperature inputs, temperature differential or relay status.

The 2300 will accept flow inputs from any Data Industrial impeller type flow sensor. Additionally, the monitor will accept input signals from any digital, pulse, sine wave or analog sensor, including non-linear and logarithmic signals. Like all Data Industrial flow monitors, the Model 2300 may be calibrated in the field. For Data Industrial sensors, a “K” and an “offset” value are entered. Other flow sensors are calibrated by entering “K” factors, entering up to sixteen points for linearization, or other analog scales.

Temperature measurement may be made with a variety of thermistors or RTDs. The 2300 software will accept several popular curves or may be programmed for custom inputs.

Programming is menu driven and all data is entered using five, front panel mounted keys.

A software lock allows the user to enter a password that prevents changing totals, calibration information or control settings. Programming flexibility extends to the measurement units. The Model 2300 software contains nineteen units for rate of flow and seven units for total flow. Temperatures can be shown in Fahrenheit or Celsius scales, while energy may be displayed in five units of rate or two total units. There is also the provision for adding custom units for each.

Also written into the software is a self-diagnostic program that assists the operator in troubleshooting.

The 2300 provides a standard pulse output to interface with external data collection devices. The resolution of the TTL compatible signal may be programmed from the front keypad.

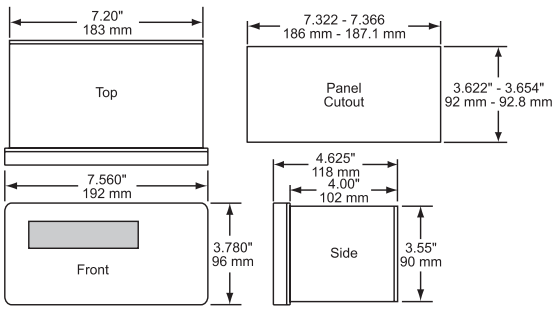
All calibration information, units of measure, totals and control parameters are stored in a non-volatile memory that does not require battery back-up.

Options Include

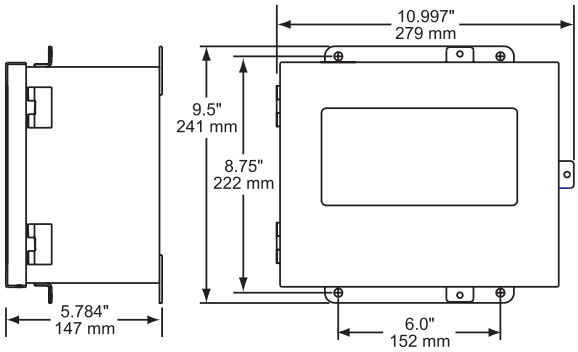
- Power supplies: 12-36 VDC, 24 VAC, 115 VAC or 230 VAC.
- Display backlighting with adjustable contrast.
- Mechanical counters, one or two integral, seven digit, non-resettable, counters may be programmed to totalize flow or energy.
- Control relays, either two or four, independently programmed from the keypad for flow, energy or temperature inputs to provide rate(alarm) or totalizer(counter) functions.

Expansion slots are available to add a maximum of two of the following card options

- Analog input, 4-20 mA, 0-20 mA, 0 to 1 VDC, 0 to 5 VDC, 0 to 10 VDC inputs allows the use of other types of flow sensors.
- Digital/Sine wave input, for use with other magnetic generator or pulse and contact type flow sensors.
- Analog outputs, isolated 4-20 mA, 0-20 mA, 0 to 1 VDC, 0 to 5 VDC or 0 to 10 VDC outputs, programmed from the keypad to transmit flow, energy, temperature rates or temperature differential.
- RS 232/485 serial communications card.



Panel Mount



Wall Mount

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Specifications: Series 2300

Power:
- power supply options:
  10-26 VAC/12-36 VDC(24 VAC/12-36 VDC option), or 115/230 VAC, 50/60Hz (115/230 VAC option), or
  10.6-16 VDC (12 VDC option)
- power consumption:
  8.5 Watts maximum

Display:
- 16 characters by two lines, alphanumeric, dot matrix LCD display with variable contrast
- large 0.32" character height
- STN (Super-Twisted Nematic) display type with +/- 20 degree viewing angle
- optional backlighting

Operating Temperature:
+32°F to +158°F (0°C to +70°C)

Storage Temperature:
-40°F to +185°F (-40°C to +85°C)

Dimensions:
- Panel Mount
  7.56"W x 3.78"H x 4.625"D
- Wall Mount
  10.997"W x 9.5"H x 5.784"D

Weight:
- 3 pounds maximum (panel mount with DIN draw mounting brackets)
- 9.2 pounds maximum wall mount

Sensor Input:
- digital pulse input
- input impedance:
  14 kΩ
- signal amplitudes:
  3 to 15 VDC (high)
  open or 0 to 1 VDC (low)
- frequency input range:
  0 to 10 kHz

Sensor Calibration:
- Data Industrial "K" and "offset" numbers or 16 point linearization with 7 digit floating point "K" Factor and frequency table entries

Units Of Measure:

Flow Rate:
- 19 standard, 1 custom programmable
- standard flow rate units:

GPM	gallons/minute
GPS	gallons/second
GPH	gallons/hour
MGD	millions of gallons/day
L/SEC	liters/second
L/MIN	liters/minute
L/HR	liters/hour
FT3/SEC	cubic feet/second
FT3/MIN	cubic feet/minute
FT3/HR	cubic feet/hour
CM/SEC	cubic meters/second
CM/MIN	cubic meters/minute
CM/HR	cubic meters/hour
ACF/SEC	acre-feet/second
ACF/MIN	acre-feet/minute
ACF/HR	acre-feet/hour
BBL/SEC	barrels (oil)/second
BBL/MIN	barrels (oil)/minute
BBL/HR	barrels (oil)/hour

Btu Rate Units:

KBTU/HR	1000 Btu/hour
BTU/MIN	Btu/minute
KW	kilowatts
TONS	tons of refrigeration
J/SEC	joules/second

Custom Flow and Btu Rate Units:
- 7 character label
- 7 digit floating point conversion from gallons/minute to custom unit
- 7 digit floating point conversion from 1000 Btu/hour to custom unit

Flow Total:
- 1 standard, 1 custom programmable
- standard flow total units:

GAL	gallons
MG	millions of gallons
LIT	liters
FT3	cubic feet
CM	cubic meters
ACF	acre-feet
BBL	barrels (oil)

Btu Total Units:

KBTU	kBtu
KWH	kilowatt-hours

custom flow and Btu Total Units:
- 4 character label 7 digit floating point conversion from gallons to custom unit
- 4 character label 7 digit floating point conversion from 1000 Btu to custom unit

Temperature Units:
- °F degrees Fahrenheit
- °C degrees Centigrade

Totalizer:
- 0 to 1,000,000,000 units

Data Update Rate:
- adjustable 0.5 seconds to 5.0 seconds in 0.5 second increments
- adjustable averaging function for smoothing erratic flow rates

Pulse Output:
- open collector transistor pulse in any standard or custom flow total units
- adjustable 100 mS to 5.0 second pulse output width in 100 mS increments
- maximum sinking current:
  300 mA @ 36 VDC

Option Specifications

Relays:
- 2 or 4 optional relays
- SPDT contacts, 6.0 amps @ 250 VAC or 30VDC maximum resistive load
- user configurable totalizer, high rate alarm, or low rate alarm functions for each individual relay
- adjustable 0 to 120 second delay (in 0.5 second increments) until activation for alarm functions
- 0 to 50% (of set point) hysteresis foralarm functions

Mechanical Totalizer:
- two 7 digit, non-resettable, electro-mechanical counters
- user configurable output in any standard or custom flow total units

Temperature Sensor Types:
- 100Ω platinum RTD, DIN calibration curve
- 100Ω platinum RTD, REF calibration curve
- 500Ω nickel RTD
- 1000Ω platinum RTD, DIN calibration curve
- 1000Ω platinum RTD, REF calibration curve
- 3000Ω thermistor
- 5000Ω thermistor
- 10 kΩ thermistor
- one user definable sensor type

Series 2300 Ordering matrix

	EXAMPLE:	2300	-	x	x	x	x	-	x	x	x
SERIES											
Btu Monitor (Single Channel)		2300									
Btu Monitor w/12 Point Linearization		2310									
CARD OPTION 1											
Temperature Input Board				0							
CARD OPTIONS 2 and 3 (select one option for each column)											
No Option					0	0					
Analog Output					1	1					
Analog Input					2	2					
Digital/Sine Wave Input - 10VDC Excitation					3	3					
Digital/Sine Wave Input - 24VDC Excitation					4	4					
RS-232 Serial Communications Output					5	5					
RS-485 Serial Communications Output					6	6					
OPTIONS-RELAY											
No Relays							0				
2 Relays							1				
4 Relays							2				
INPUT VOLTAGE / BACKLIGHTING											
12 VDC - Only Without LCD Illumination									A		
24 VAC / 12-36 VDC Without LCD Illumination									B		
115 VAC Without LCD Illumination									C		
230 VAC Without LCD Illumination									D		
12 VDC - Only With LCD Illumination									E		
24 VAC / 12-36 VDC With LCD Illumination									F		
115 VAC With LCD Illumination									G		
230 VAC With LCD Illumination									H		
COUNTER											
No Mechanical Counter										0	
One Mechanical Counter										1	
Two Mechanical Counters										2	
MOUNTING											
Panel Mount NEMA 4X Front Panel											0
Wall Mount NEMA 4X Hinged Polymer Enclosure											3
Wall Mount NEMA 4 PreWired Hinged Metal Enclosure											4

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