Integrated Flow Computer IFC15

Extended Range Fluid Compensation Flowmeter Interface

Description

The IFC15 is the ultimate electronic processor, providing total compensation to enhance flowmeter accuracy, while extending the linear flow range. This compact design has dual rotor frequency inputs, temperature and pressure analog inputs for single or dual rotor turbine flowmeters. The IFC15 tracks all variables to compensate for viscous and inertial effects, due to fluid temperature and pressure variations. Our enhanced DSP technology allows exceptional signal characterization and fast response to output data in engineering units. Meeting the demanding requirements of the aerospace, automotive, process control and test and measurement industries, the IFC15 provides significant improvements in flowmeter accuracy under extreme temperature conditions.

Features

- Conformance to SAE ARP 4990 calculations
- Less than 1 mS response
- Blade averaging - to enhance low flow resolution
- Integral temperature and pressure amplifier
- Multiple outputs (freq, analog, RS485)
- Roshko and Strouhal correlation, using 16-bit resolution
- Configurable interface software allows fluid selection, configuration of outputs and data logging

IFC15 - Integral Flow Computer NEMA 4 Enclosure mounted on a dual rotor turbine flowmeter

Benefits

- Improved flow measurement accuracy and range
- Dynamic response, with fully compensated output
- Easy interface to DAQ System
- One device for multiple signals
- No external amplifiers or signal conditioners necessary

Applications

- Engine test cells and test stands
- Precision monitoring
- On-board automotive and aerospace testing
- Control loop
- Custody transfer

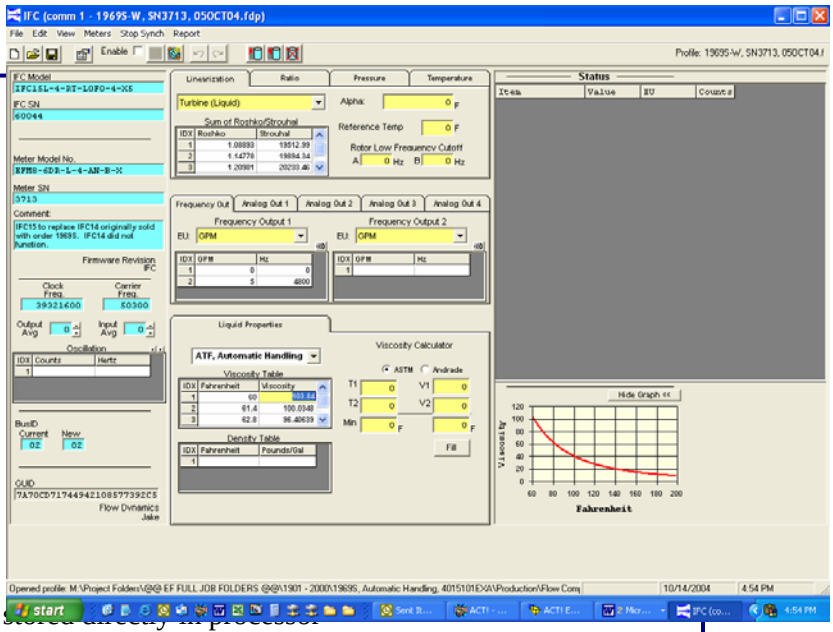
IFC15 - Integral Flow Computer Explosion Proof Enclosure mounted on a dual rotor turbine flowmeter

Options

- Rate and total display
- Batching and manifold systems
- Imbedded or remote mounting
- OEM flight and commercial designs
- High temperature - up to 125^{o} C
- Ethernet connectivity

Software Interface

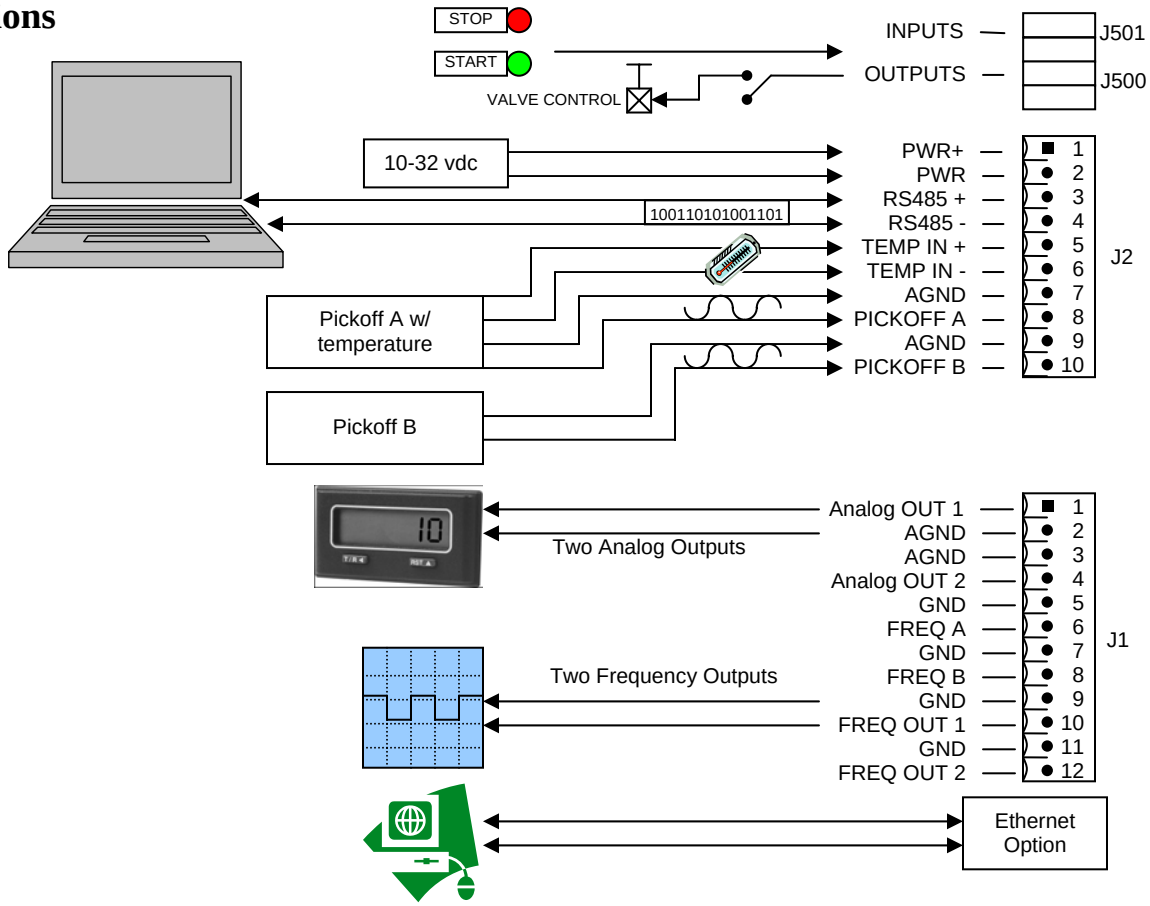
IFC15 software graphical user interface is intuitively easy and allows powerful characterization of the process signals, output signals and liquid properties.



Provides:

- Identification and comments
- Input linearization
- Output characterization
- Instantaneous data
- Liquid properties
- Data logging
- Configuration and service history is stored already in processor
- Stores and recalls configuration software compatible with Windows 95 or newer operating system

Connections



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Specifications

Input Power

- 24 VDC nominal
  - 10–32 VDC, 0.120 amps max, (excluding 4–20 mA)

Note: 18–32 VDC power required for 4–20 mA output

Flowmeter Input Type

- Pulse TTL
  - Frequency range: 1 Hz to 16 kHz
  - Impedance: 5.8 K ohms to +5 VDC
- RF Carrier
  - Frequency range: 5 Hz to 3KHz
  - Inductance: 1 mH
  - Oscillator frequency: 55–65 kHz

Temperature Input Type

- Thermistor 10k Ohm
- Current 4–20 mA
- Voltage 0–10 VDC or 0–5 VDC

Linearization

- Flowmeter K-factor
  - Number of Points: 2–200
  - Interpolation Method: Linear
  - Correlation: Strouhal - Roshko (per ARP4990 publication)
- Temperature
  - Number of Points: 2–50
  - Interpolation Method: Linear
- Viscosity
  - Number of Points: 2–100
  - Interpolation Method: Linear
  - Correlation: ASTM D341-93, Andrades Equation or user-defined
- Density
  - Number of Points: 2–50
  - Interpolation Method: Linear

Outputs

- Variables available for output
  - Linearized Volume Flow Rate
  - Linearized Mass Flow Rate
  - Flow Total
  - Temperature
  - Pressure
  - Frequency (2 frequency output channels)
    - 0 to 5 V TTL, 0.6 to 20,000 HZ
    - Transmission Distance: 250 ft. maximum
- Analog (2 analog output channels)
  - 0 to 5 VDC, 0 to 10 VDC, or 4 to 20 MA
  - Voltage: Linearized, scaled
    Zero offset: Less than 5 mV
  - Current: Linearized, scaled
    Maximum load: 500 ohm max. load resistance
- RS485 (Volume/Mass Flow, Temperature, Other)
  - Baud Rate: 115K
  - Update Rate: Selectable, 0.1 sec minimum
  - Data Bits: 8
  - Stop Bit: 1
  - Parity: None

Performance

- Accuracy
  - Linearized Frequency: 0.1% of reading
  - Linearized Analog: 0.1% of full scale
  - Thermistor: ±0.5 °C (does not include sensor uncertainty)
  - Analog Input (Temperature): 16 Bit A/D resolution
- Linearization Latency 0.8–2.0 ms + period of input

Batching

- 2 I/O ports for control, batching, manifolding
  - 1 input port
  - 1 output port

Environment

- Temperature
  - Operating: -40 to 185 °F (-40 to 85 °C)
  - Optional operating: -40 to 257 °F (-40 to 125 °C)
  - Storage: -67 to 257 °F (-55 to 125 °C)
- Humidity 0 to 85% RH non-condensing
- Enclosure NEMA 4 or NEMA 4 CLI GR.CD CL II GR.EFG CL.III WET LOC. Aluminum

Communication

- Interface RS485, serial USART connection to personal computer (with serial cable)
- Baud
  - Output: 115K
  - Programming: 115K
  - Data Bits: 8
  - Stop Bit: 1
  - Parity: Non

Model Number

IFC15 – 4 – R T – 0 0 0 0 – 2 – N – XXX

Power
3 = 5 VDC
4 = 9 to 32 VDC

Flow Meter Input
R = RF, 10 Ohm, 1 mH Coil
P = 0 to 5 VDC TTL Pulse

Temperature Input
T = 10K Ohm Thermistor
V = Voltage 0-10 VDC
L = Voltage 0-5 VDC
C = Current 4-20 mA

Frequency 1 and 2 Outputs
L = Linearized Flow Rate Out
T = Flow Total Out
U = Temperature Out
0 = Not used

Special Code
Blank = Standard Configuration

Enclosure
N = NEMA 4 Aluminum
X = NEMA 4 CLI GR.CD CL II GR.EFG CL.III WET LOC. Aluminum

Communications
1 = RS232, Modbus Protocol
2 = RS232, ASCII Protocol
3 = RS485, Modbus Protocol
4 = RS485, ASCII Protocol

Analog 1 and 2 Outputs
F = 0 to 5 VDC Linearized Flow Rate Out
G = 0 to 10 VDC Linearized Flow Rate Out
M = 4 to 20 MA Linearized Flow Rate Out
T = 0 to 5 VDC Temperature Out
U = 0 to 10 VDC Temperature Out
V = 4 to 20 MA Temperature Out
0 = Not used