SUPERtrol-I LE

Economical Flow Totalizer, Ratemeter and Batcher

Features

- EZ Setup Feature Speeds Instrument Setup
- Setup Diskette
- Advanced Batching Features, Including Quick Batching Sequence
- Menu Selectable Hardware Features
- Two Line LCD, OLED or VFD Display
- 0-20mA or 4-20mA Analog Output
- Attractive Wall Mount Enclosure Option
- Isolated Pulse Output Standard
- RS-232 Port Standard, RS-485 Modbus RTU Optional
- Internal Communication Card Option
  Supports: BACnet IP, BACnet MS/TP, Metasys N2, Modbus TCP, AB Ethernet IP, AB DF1, LonWorks*
- Advanced Printing Capabilities

- Data Logging & Modem Remote Metering Support
- DIN Enclosure with Two Piece Connectors
- DDE Server & HMI Software Available

Description:
The SUPERtrol-I LE Flow Computer satisfies t he instrument requirements for a variety of pulse producing flowmeter types in liquid applications.

The alphanumeric display shows measured and calculated parameters in easy to understand format. Single key direct access to measurements and display scrolling is supported. An EZ Setup feature rapidly guides the user through the basic setup.

The SUPERtrol-I LE can be programmed for rate/total indication or batching. The various pulse inputs and outputs can be “soft” assigned to meet a variety of common application needs. The user “soft selects” the usage of each feature while configuring the instrument. A 0-20mA or 4-20mA analog output is standard.

The user can assign the standard RS-232 Serial Port for data logging, transaction printing, or for connection to a modem for remote meter reading. An optional RS-485 serial port using Modbus RTU protocol is available. An optional Ethernet port is available for BACnet IP, BACnet MS/TP, Metasys N2, Modbus TCP, AB Ethernet IP, AB DF1, LonWorks*.

A Service or Test mode is provided to assist the user during start-up system check out by monitoring inputs and exercising outputs. The system setup can also be printed.

* LonWorks protocol requires a different module assembly from the other available protocols. LonWorks is not field selectable.

Specifications

Environmental
Operating Temperature: 0°C to +50°C
Storage Temperature: -40°C to +85 C
Humidity : 0-95% Non-condensing
Materials: U.L. approved

Listing: UL/C-UL Listed (File No. E192404), CE Compliant

Display
Type: 2 lines of 20 characters
Types: Backlit LCD, OLED and VFD ordering options
Character Size: 0.2” nominal
User programmable label descriptors and units of measure

Keypad
Keypad Type: Membrane Keypad with 16 keys
Keypad Rating: Sealed to NEMA 4X / IP65

Enclosure
Depth behind panel: 6.5” including mating connector
Type: DIN
Materials: Plastic, UL94V-0, Flame retardant
Bezel: Textured per matt finish

Power Input
The factory equipped power option is internally fused. An internal line to line filter capacitor and MOV are provided for added transient suppression.
110 VAC Power Option: 85 to 127 Vrms, 50/60 Hz
220 VAC Power Option: 170 to 276 Vrms, 50/60 Hz
DC Power Option:
12 VDC (10 to 14 VDC)
24 VDC (14 to 28 VDC)

Flow Inputs:

Pulse Inputs:

Number of Flow Inputs: one (single or quadrature)
Input Impedance: 10 KΩ nominal
Pullup Resistance: 10 KΩ to 5 VDC (menu selectable)
Pull Down Resistance: 10 KΩ to common
Trigger Level: (menu selectable)
High Level Input
Logic On: 3 to 30 VDC
Logic Off: 0 to 1 VDC
Low Level Input (mag pickup)
Sensitivity:
10 mV or 100 mV
Minimum Count Speed:
User selectable (as low as 1 pulse/99 seconds)
Maximum Count Speed:
Selectable: 40 Hz, 3000 Hz or 20kHz
Overvoltage Protection: 50 VDC
Linearization: Average K or 16 Point linearization with separate forward and reverse tables

Control Inputs

Number of Inputs: 3
Switch Inputs are menu selectable for Start, Stop, Reset, Lock, Inhibit, Alarm Acknowledge, Print or Not Used.
Control Input Specifications
Input Scan Rate: 10 scans per second
Logic 1: 4 - 30 VDC
Logic 0: 0 - 0.8 VDC
Input Impedance: 100 KΩ
Control Activation:
Positive Edge or Pos. Level based on product definition for switch usage.

Excitation Voltage

Menu Selectable: 5, 12 or 24 VDC @ 100 mA (fault protected)

Data Logging

The data logger captures print list information to internal storage for approximately 1000 transactions. This information can be used for later uploading or printing. Storage format is selectable for Comma-Carriage Return or Printer formats.

Batching Features

Quick batching sequence, single or dual stage batching, slow fill, auto-batch restart and batch overrun compensation.

Serial Communication

The serial port can be used for printing, data logging, modem connection and communication with a computer.
RS-232:
Device ID: 01-99
Baud Rates: 300, 600, 1200, 2400, 4800, 9600, 19200
Parity: None, Odd, Even
Handshaking: None, Software, Hardware
Print Setup: Configurable print list and formatting.
Print Out: Custom form length, print headers, print list.
Print Initialization: Print on end of batch, key depression, interval, time of day or remote request.
RS-485: (optional 2nd COM port)
Device ID: 01-247
Baud Rates: 1200, 2400, 4800, 9600, 19200
Parity: None, Odd, Even
Protocol: Modbus RTU (Half Duplex)

Internal Multi-protocol Communication Card Option (Network Card Option 3)
Protocols:
BACnet MS/TP, BACnet IP, Modbus TCP, Metasys N2, AB DF1, AB EtherNet/IP, LonWorks

Relay Outputs

The relay outputs are menu assignable to (Individually for each relay) Low Rate Alarm, Hi Rate Alarm, Prewarn Alarm, Preset Alarm or General purpose warning (security).
Number of relays: 2 (4 optional)
Contact Style: Form C contacts
Contact Ratings: 5 amp, 240 VAC or 30 VDC

Isolated Pulse output

The isolated pulse output is assigned to Uncompensated Volume Total.
Pulse Output Form: Photomos Relay
Maximum On Current: 25 mA
Maximum Off Voltage: 30 VDC
Saturation Voltage: 1.0 VDC
Maximum Off Current: 0.1 mA
Pulse Duration:10 mSec or 100mSec (user selectable)
Pulse output buffer: 256
Fault Protection
Reverse polarity: Shunt Diode

Isolated Analog Output

The analog output is menu assignable to correspond to the Rate or Total.
Type: Isolated Current Sourcing
Available Ranges: 4-20 mA, 0-20 mA
Resolution: 12 bit
Accuracy: 0.05% FS at 20° C
Update Rate: 1 update/sec minimum
Temperature Drift: Less than 200 ppm/C
Maximum Load: 1000 ohms (at nominal line voltage)
Compliance Effect: Less than .05% Span
60 Hz rejection: 40 dB minimum
Calibration: Operator assisted Learn Mode
Averaging: User entry of damping constant to cause a smooth control action
Note: DC powered units are not isolated

Internal Multi-protocol Communication Card Option

FEATURES

- Internal communication card eliminates the need for external protocol converters.
- Supports: BACnet IP, BACnet MS/TP, Metasys N2, Modbus TCP, AB Ethernet IP, AB DF1, LonWorks*
- Easy to configure via the Web Interface.
- Dedicated internal LonWorks is also available
- Dedicated internal RS485 Modbus RTU is also available

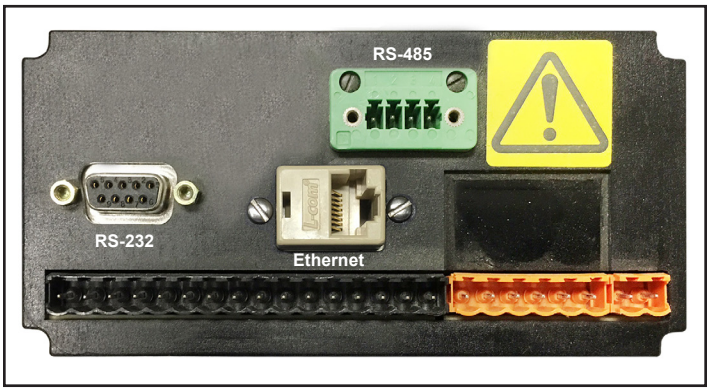
DESCRIPTION

The multi-protocol communication card is an internal, high performance, Building Management System communication solution for the ST1 flow computer family. The card provides an instant interface, enabling the KEP flow computers to communicate with multiple BMS protocols, including:

- BACnet MS/TP
- BACnet IP
- Modbus TCP
- Metasys N2
- AB DF1
- AB EtherNet/IP
- LonWorks*

CONFIGURATION

Use a web browser to locate the internal web page and configure the settings. The detailed settings vary with the different communication protocols. Only one communication port/protocol can be used. A web browser is also used to configure the site specific settings for each instrument



Rear view of ST1LE case.
Communication ports are available for RS-485 and Ethernet

* LonWorks protocol requires a different module assembly from the other available protocols. LonWorks is not field selectable.

The Web Interface makes it easy to configure

Configuration Parameters

Parameter Name	Parameter Description	Value	
protocol_select	**Protocol Selector** Set to 1 for BACnet IP Set to 2 for BACnet MSTP Set to 3 for Metasys N2 Set to 4 for Modbus TCP Set to 5 for EtherNet/IP Set to 6 for DF1	1	Submit
node_offset	**BACnet Node Offset** This is used to set the BACnet device instance. The device instance will be sum of the Modbus device address and the node offset. *(0 - 4194303)*	50000	Submit
bac_ip_port	**BACnet IP Port** This sets the BACnet IP port of the Gateway. The default is 47808. *(1 - 65535)*	47808	Submit
bac_cov_option	**BACnet COV** This enables or disables COVs for the BACnet connection. Use COV_Enable to enable. Use COV_Disable to disable. *(COV_Enable/COV_Disable)*	COV_Disable	Submit
bac_bbmd_option	**BACnet BBMD** This enables BBMD on the BACnet IP connection. Use BBMD to enable. Use - to disable. The bdt.ini files also needs to be downloaded. *(BBMD/-)*	-	Submit

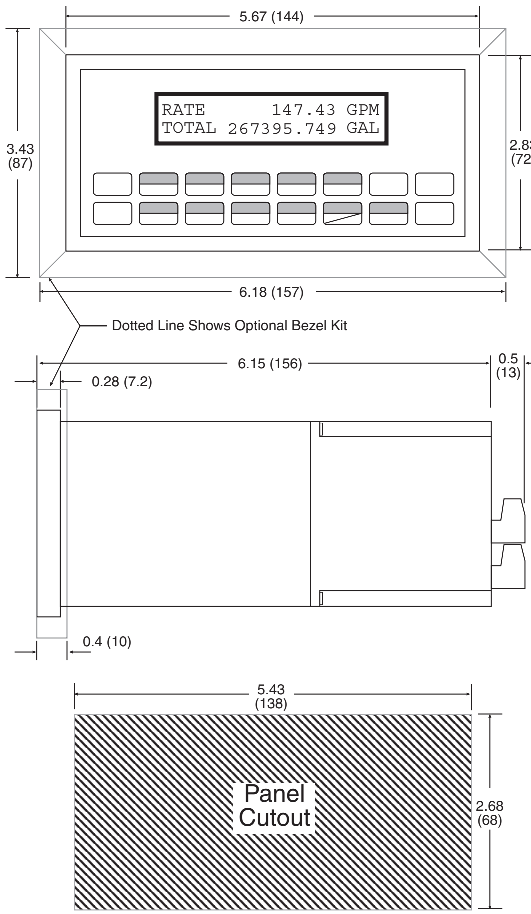
Active profiles

Nr	Node ID	Current profile	Parameters	
1	1	BAC_IP_SUPERtrol_II		Remove

Add

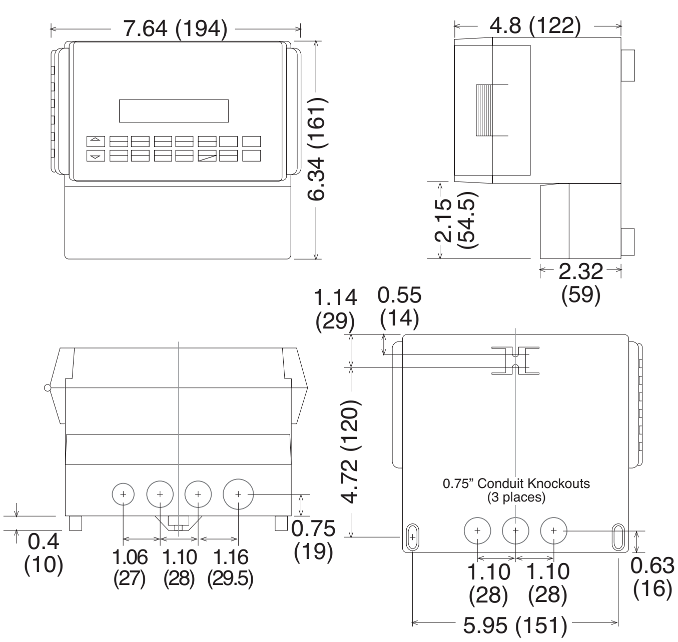
Sample screen shot of web interface configuration

Fig. 1: Standard Dimensions



Dimensions are in inches (mm)

Fig. 2: Wall Mount ("W" mounting option) Dimensions



Terminal Designations

Terminal	Designation	Group
1	DC OUTPUT	FLOW IN
2	PULSE IN 1	
3	PULSE IN 2	
4	COMMON	
5	DO NOT USE	
6	DO NOT USE	
7	DO NOT USE	
8	DO NOT USE	
9	CNTR IN 1	SEE USER MANUAL
10	CNTR IN 2	
11	CNTR IN 3	
12	COMMON	
13	PULSE OUTPUT +	
14	PULSE OUTPUT -	
15	ANALOG OUTPUT +	
16	ANALOG OUTPUT –	
17	NC	
18	COM RLY1	
19	NO	
20	NC	
21	COM RLY2	
22	NO	
23	AC LINE	
24	AC LINE	
25	NC	
26	COM RLY3	
27	NO	
28	NC	
29	COM RLY4	
30	NO	
DC +	POWER IN	
DC -		

Ordering Information

Example ST1LE L 1 A 0 P ET

Series:
- ST1LE = SUPERtrol-I LE

Display Type:
- L= LCD
- O= OLED
- V= VFD

Input Type:
- 1= 110 VAC
- 2= 220 VAC
- 3= 12 VDC (10 to 14 VDC)
- 4= 24 VDC (14 to 28 VDC)

Relays:
- A= 2 SPDT Relays
- B= 4 SPDT Relays

Network Card:
- 0= None (STD)
- 2= RS485/Modbus (optional 2nd COM port)
- 3= COM CARD with Multi-Protocol
  Specify protocol (example: **3 BAC/IP**)
  BAC/IP = BACnet IP
  BACMS/TP = BACnet MS/TP
  MOD/IP = Modbus TCP/IP
  METASYS/N2 = Metasys N2
  ABDF1 = AB DF1
  ABETH/IP = AB EtherNet/IP
- 4= COM CARD with LonWorks Protocol
  Specify protocol (example: **4 LONWORKS**)
  Factory configuration of network card settings

Mounting:
- **P**= Panel Mount ....(see Fig. 1)
- N= NEMA 4 Wall Mount ....(see MS811)
- W= NEMA 12/13 Wall Mount w/ Clear Cover ....(see Fig.2)
- E= Explosion Proof (No Button Access) ....(see XHVD 7/4)

Options:
- TB = RS485 Terminal Block for Panel Mount Enclosure for Network Card Option 2 (RS485)
- ET = Extended Temperature .... (consult factory) -4°F to 131°F (-20°C to 55°C)
- IM = Internal Modem
- M = Modem Power Option

Accessories:
OPC/DDE Server for RS232 Port available, see EX5-UCOND-NA00
OPC/DDE Server for Modbus Suite available, see EX5-MDBUS-NA00
Modem Available, see MPP-2400N
Serial printer available, see P20, P220, P295
Ethernet Port Server available, see IEPS
RS-422/485 to RS-232 Communication Adapter available, see CA285
RS232 Extender Cable: P/N=13220-<length in inches>
Remote metering and data collection software available, see TROLlink