

# SUPERtrol-I

## Multi-Function Flow Totalizer, Ratemeter and Batcher

### Features

- "EZ Setup" Guided Setup for First Time Users
- Rate/Total and Batching Functions
- Menu Selectable Hardware & Software Features
- Environmental Compliance Monitoring and Report Generation
- Universal Viscosity Curve (UVC) and API Eq.
- Advanced Batching Features: Overrun Compensation, Autobatch Start, Print End of Batch, Slow Fill, 2 Stage Batching
- Isolated Outputs Standard
- RS-232 Port Standard, Modbus RTU RS-485 Optional
- Advanced Printing Capabilities
- Windows™ Setup Software
- DIN Enclosure with Two Piece Connectors
- On Board Data Logging
- DDE Server & HMI Software Available
- Enhanced Modem Features for Remote Metering

### Description:

The SUPERtrol-I Flow Computer satisfies the instrument requirements for a variety of flowmeter types in liquid applications. Multiple flow equations and instrument functions are available in a single unit with many advanced features.

The alphanumeric display shows measured and calculated parameters in easy to understand format. Single key direct access to measurements and display scrolling is supported

The versatility of the SUPERtrol-I permits a wide measure of versatility within the instrument package. The various hardware inputs and outputs can be "soft" assigned to meet a variety of common application needs. The user "soft selects" the usage of each input/output while configuring the instrument.

The isolated analog output can be chosen to follow volume flow, corrected volume flow, mass flow, temperature, or density by means of a menu selection. Most hardware features are assignable by this method.

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.

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

**Trend, Alarm and Log  
your SUPERtrol Data with  
Infilink HMI Software!**  
See Special Flow Instruments Section



### Specifications:

#### Flow Meters and Computations

Meter Types: All linear and square law meters supported including: vortex, turbine, magnetic, PD, target, orifice, venturi, v-cone and many others

Linearization: Square root, 16 point table or UVC table

Computations: Volume, Corrected Volume & Mass

Fluid Computations: Temperature, Density, Viscosity and API 2540 for petroleum.

#### 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 and VFD ordering options

Character Size: 0.3" nominal

User programmable label descriptors and units of measure

#### Keypad

Keypad Type: Membrane Keypad with 16 keys

#### Enclosure

Size: See Dimensions

Depth behind panel: 6.5" including mating connector

Type: DIN

Materials: Plastic, UL94V-0, Flame retardant

Bezel: Textured per matt finish

#### Real Time Clock

The SUPERtrol-I is equipped with a battery backed real time clock with display of time and date.

Format: 12 or 24 hour time display

Day, Month, Year date display

#### 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: 85 to 127 Vrms, 50/60 Hz

220 VAC Power: 170 to 276 Vrms, 50/60 Hz

DC Power: 12 VDC (10 to 14 VDC)

24 VDC (14 to 28 VDC)

Power Consumption:

AC: 11.0 VA (11W)

DC: 300 mA max.

**Flow Inputs:****Analog Input:**

Accuracy: 0.01% FS at 20° C

**Ranges**

Voltage: 0-10 VDC, 0-5 VDC, 1-5 VDC

Current: 4-20 mA, 0-20 mA

Basic Measurement Resolution:

16 bit

Update Rate: 4 updates/sec

Automatic Fault detection: Signal over/under-range,  
Current Loop BrokenCalibration: Software Calibration (no trimmers) and Auto-  
zero Continuously

Extended calibration:

Learns Zero and Full Scale of each range using special  
test mode.

Fault Protection:

Reverse Polarity: No ill effects

Over-Voltage Limit: 50 VDC Over voltage protection

Over-Current Protection: Internally current limited  
protected to 24VDC**Pulse Inputs:**Number of Flow Inputs: one with or without quadrature or  
pulse security checkingInput Impedance: 10 K $\Omega$  nominalPullup Resistance: 10 K $\Omega$  to 5 VDC (menu selectable)Pull Down Resistance: 10 K $\Omega$  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:

Menu selectable

Maximum Count Speed:

Menu Selectable: 40Hz, 3000Hz or 20 kHz

Overvoltage Protection: 50 VDC

**Auxiliary / Compensation Input**

The auxiliary/compensation input is menu selectable for temperature, density or not used. This input is used for the compensated input when performing compensated flow calculations. It can also be used as a general purpose input for display and alarming.

Operation: Ratiometric

Accuracy: 0.01% FS at 20° C

Basic Measurement Resolution:

16 bit

Update Rate: 1 update/sec minimum

Automatic Fault detection:

Signal Over-range/under-range

Current Loop Broken

RTD short

RTD open

Fault mode to user defined default settings

Fault Protection:

Reverse Polarity: No ill effects

Over-Voltage Limit (Voltage Input): 50 VDC

Available Input Ranges

Voltage: 0-10 VDC, 0-5 VDC, 1-5 VDC

Current: 4-20 mA, 0-20 mA

Resistance: 100 Ohms DIN RTD

100 Ohm DIN RTD

(DIN 43-760, BS 1904):

Three Wire Lead Compensation

Internal RTD linearization learns ice point resistance

1 mA Excitation current with reverse polarity protection

Temperature Resolution: 0.01 C

Switch Inputs are menu selectable for Start, Stop, Reset, Lock, Inhibit, Alarm Acknowledge, Print or Not Used.

Number of Control Inputs: 3

Control Input Specifications

Input Scan Rate: 10 scans per second

Logic 1: 4 - 30 VDC

Logic 0: 0 - 0.8 VDC

Input Impedance: 100 K $\Omega$ 

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)**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), low temperature/high temperature.

Number of relays: 2 (4 optional)

Contact Style: Form C contacts

Contact Ratings: 5 amp, 240 VAC or 30 VDC

**Serial Communication**

The serial port can be used for printing, datalogging, 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 items.Print Initialization: Print on end of batch, key depression,  
interval, time of day, control input or  
serial request.

RS-485: (optional 2nd COM port)

Device ID: 01-247

Baud Rates: 2400, 4800, 9600, 19200

Parity: None, Odd, Even

Protocol: Modbus RTU (Half Duplex)

**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.

**Isolated Analog Output**

The analog output is menu assignable to correspond to the Uncompensated Volume Rate, Corrected Volume Rate, Mass Rate, Temperature, Density, Volume Total, Corrected Volume Total or Mass 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**Control Inputs**

### Isolated Pulse output

The isolated pulse output is menu assignable to Uncompensated Volume Total, Compensated Volume Total or Mass 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 100 mSec (user selectable)  
Pulse output buffer: 256  
Fault Protection  
Reverse polarity: Shunt Diode

### Terminal Designations

1	DC OUTPUT	2	PULSE IN 1	3	PULSE IN 2	4	COMMON	5	RTD EXCIT +	6	RTD SENS +	7	RTD SENS -	8	CNTR IN 1	9	CNTR IN 2	10	CNTR IN 3	11	COMMON	12	PULSE OUTPUT +	13	PULSE OUTPUT -	14	ANALOG OUTPUT +	15	ANALOG OUTPUT -	16	NC	17	COM RLY1	18	NO	19	NC	20	COM RLY2	21	NO	22	NC	23	AC LINE	24	AC LINE	25	DC +	26	DC -	27	POWER IN	28	POWER IN	29	POWER IN	30	POWER IN
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Fig. 1: Standard Dimensions

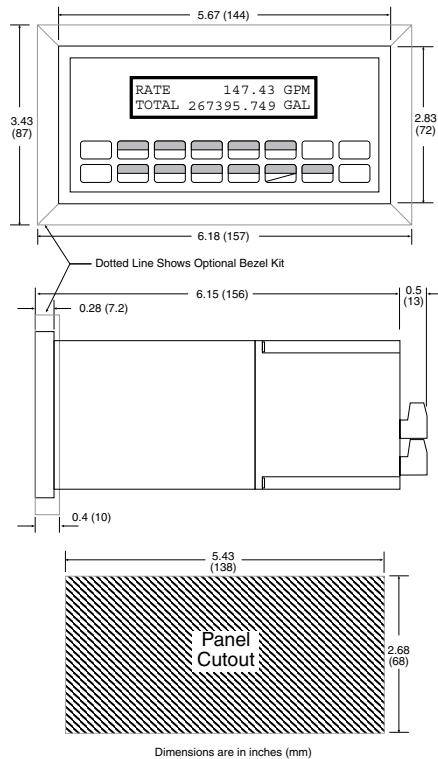
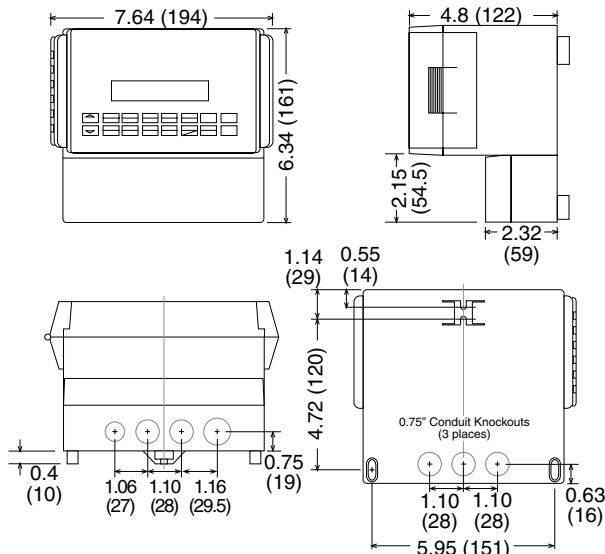


Fig. 2: Wall Mount ("W" mounting option) Dimensions



### Ordering Information

**Example** ST1 L 1 A 0 P TB

**Series:** ST1= Supertrol-1

**Display Type:** L= LCD  
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)

**Mounting:** P= Panel Mount ..... (see Fig. 1)  
N= NEMA 4 Wall Mount ..... (see NEMAtr01ST4X)  
W= NEMA 12/13 Wall Mount w/ Clear Cover ..... (see Fig. 2)  
E= Explosion Proof (No Button Access) ..... (see XHVD 7/4)  
X= Explosion Proof (with Button Access) ... (see XTROL 7/4)

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

**Accessories:**  
KEPS-KEP1-32  
KEP RS232 for SUPERtr01, SUPERtr01LE,  
SUPERtr02 and LEVELtr02 • 32 Bit OPC/DDE Server  
KEPS-MBS32  
Supports RS485 for ST1, ST1LE, ST2,  
LT2, MRT, DRT & MB2 (Modbus RTU)  
Modem Available, see MPP-2400 and MPP-2400N (requires M option)  
Serial printer available, see P1000, P295  
Ethernet Port Server available, see IEPS  
RS-422/485 to RS-232 Communication Adaptor available, see CA285  
Remote metering and data collection software available, see TROLLink