

# SUPERtrol-X

## Explosion Proof, Multi-Function Flow Totalizer, Ratemeter & Batcher

### Features

- Explosion Proof Enclosure with LCD Display
- Rate/Total and Batching Functions
- Advanced Batching Features: Overrun Compensation, Print End of Batch, Slow Start of Batch Fill, Slow End of Batch Fill, 2 Stage Batching or Digital Control Valve
- Advanced Printing Capabilities
- “EZ Setup” Guided Setup for First Time Users
- Menu Selectable Hardware & Software Features
- Isolated Pulse, Analog and Relay Outputs Standard on AC Powered Models
- RS-232 Port Standard, Modbus RTU RS-485 Optional
- Windows™ Setup Software
- On Board Data Logging
- DDE Server & HMI Software Available
- User Definable Units of Measure
- Enhanced Modem Features for Remote Metering

### Description:

The SUPERtrol-X (STX) Flow Computer offers advanced batching features for all types of flow batching systems. The STX is compatible with a variety of flowmeter types in liquid applications. Multiple flow equations and instrument functions are available in a single unit with many advanced features.

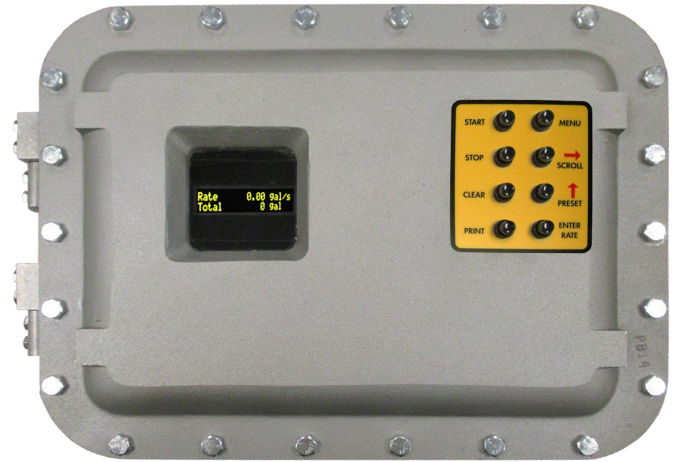
The alphanumeric display shows measured and calculated parameters in easy to understand format. Single key direct access to measurements and display scrolling is supported

The versatility of the SUPERtrol-X 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. Remote metering software available.

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.



### 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 (standard)

Extended Temperature: -20°C to +55°C (ET option)

Storage Temperature: -40°C to +85 C

Humidity : 0-95% Non-condensing

Materials: U.L. approved

#### Display

Type: 2 lines of 20 characters

Types: Backlit LCD, VFD & OLED (Yellow LED) options

Character Size: 0.2” nominal

User programmable label descriptors and units of measure

#### Keypad

Keypad Type: Explosion Proof Switches (8)

#### Enclosure

Size: See Dimensions

Weight: 60 lbs. (27.5 kg)

For use in Class 1, Division 1, Groups C & D

For use in Class 2 & 3, Division 1, Groups E, F & G

UL: FTRV.E81696

UL Canada: FTRV7.E81696

#### Real Time Clock

The SUPERtrol-X 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 filter 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: 0.02% 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 Broken

Calibration: 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 checking

Input Impedance: 10 K $\Omega$  nominal

Pullup 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: 1 sec. to 99 sec.

#### 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: 0.02% 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 Accuracy:  $\pm$  0.25°C

## Control Inputs

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, Digital Control Valve 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

### 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

TB-1												TB-2																																																						
1	DC OUTPUT	2	FLOW IN	3	PULSE IN 1	Vin +	4	PULSE IN 2	lin +	5	COMMON	6	RTD EXCIT +	Vin +	7	RTD SENS +	8	RTD SENS -	9	GNTR IN 1	10	GNTR IN 2	11	GNTR IN 3	12	COMMON	13	PULSE OUTPUT +	14	PULSE OUTPUT -	15	ANALOG OUTPUT +	4-20 mA	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 -
												COMMUNICATION																																																						
												RS-232		RS-485																																																				
1	TX	2	RX	3	COM	4	TX/RX +	5	TX/RX -	6	GND 180REF																																																							

\* Power Terminals 23 & 24 used for DC Input only when ordered with DC INPUT option

### Ordering Information

**Example STX-ST1 L 1 A 0 X ET**

**Series:** STX-ST1= Supertrol-1 Explosion Proof

**Display Type:**  
 O= OLED (STD)  
 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)

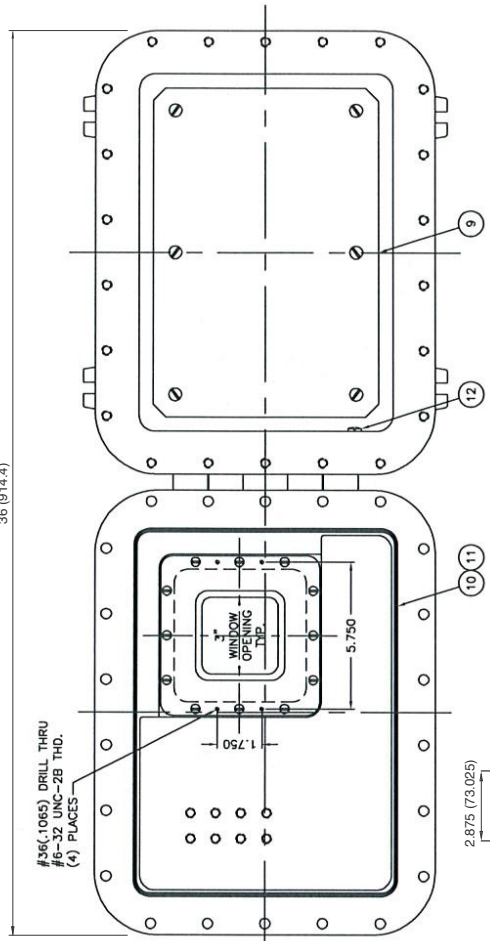
**Relays:**  
 A= 2 SPDT Relays  
 B= 4 Relays (consult factory)

**Network Card:**  
 0= None (STD)  
 2= RS485/Modbus (optional 2nd COM port)

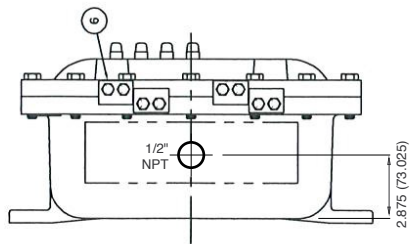
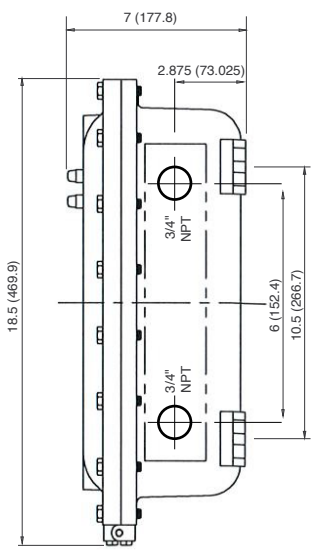
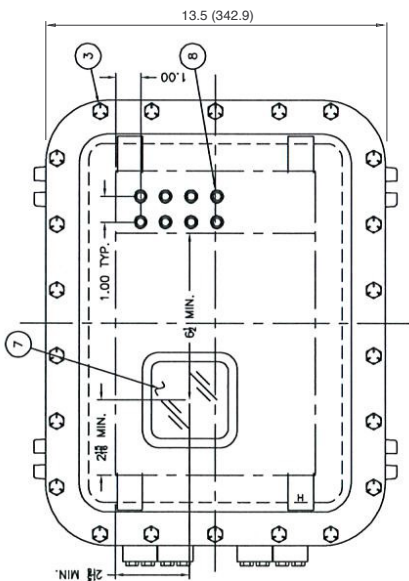
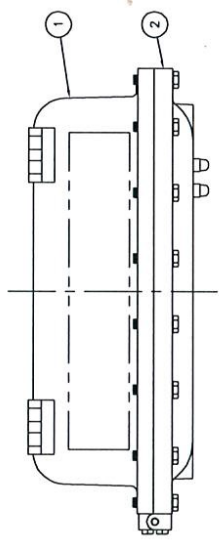
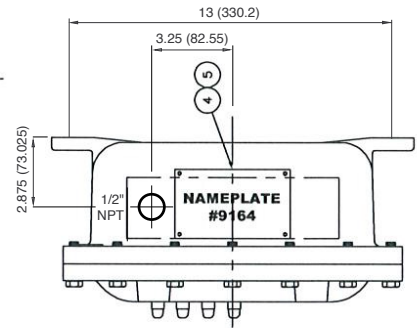
**Mounting:**  
 X= Explosion Proof

**Options:**  
 ET= Extended Temperature LCD Display  
 -4°F to 131°F (-20°C to 55°C)  
 IM = Internal Modem  
 M = Modem Power Option

**Accessories:**  
 OPC/DDE Server for RS232 Port  
 OPC/DDE Server for Modbus Suite  
 Modem Available, see MPP-2400N (requires M option)  
 Serial printer available, see P1000, P295  
 Ethernet Port Server available, see IEPS for RS232 port  
 Ethernet Port Server Modbus TCP available, see ADAM4572  
 RS-422/485 to RS-232 Communication Adaptor available, see CA285  
 Remote metering and data collection software available, see TROLlink  
 Quencharc 32145 - Relay Contact Protection



**SHOWN WITH COVER OPEN**



Dimensions are in inches (mm)