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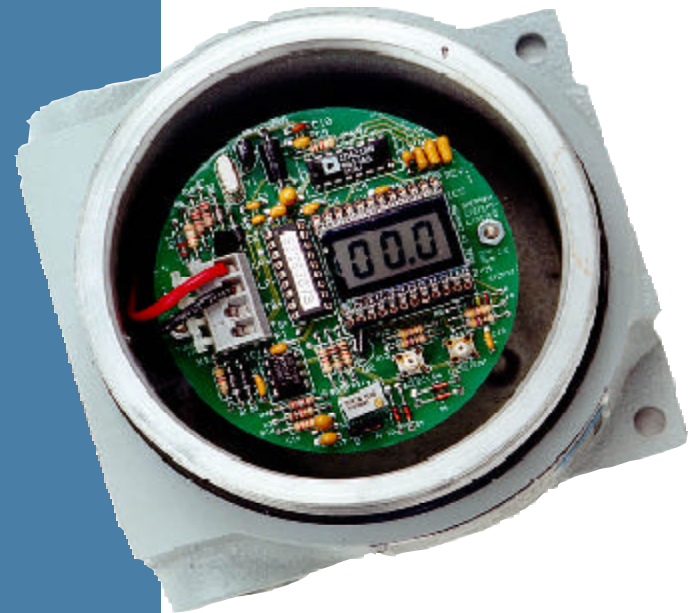


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SFT830

4-20mA Flow Rate Meter

Operation Manual



Specifications

Sft 830

Power:	Loop power, 9VDC to 28VDC
Current Consumption:	4 - 20 mA
Ambient Temperature:	-40°C to +70°C (-40°F to +149°F)
Humidity:	0% to 95% non condensing
Inputs:	Frequency: 1Hz to 10kHz Amplitude: 20mVRMS to 30VRMS
Outputs:	Range: 4 - 20mA Accuracy: ±0.3% over operating temp. range Resolution: 16 bits (244nA) Loading: 900Ω max. @24VDC
Program Memory:	10year battery backup for setup parameter retention
Enclosure:	CSA Class I, Division II, Groups B, C, & D, NEMA4X
Weight:	2.8kg (6.1lb)

SFT830

4-20mA Flow Rate Meter

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SFT830

WARRANTY STATEMENT

WARRANTY: Titan Logix Corp.warrants all equipment of its own manufacture to be free of defects in material and workmanship for a period of twelve (12) months from date of shipment. Titan Logix's sole obligation hereunder shall be expressly limited to repair or exchange free of charge, F.O.B. Edmonton, Alberta, Canada, of such defective equipment (alternatively, Titan Logix will, at its option, refund the purchase price). Titan Logix's obligation under this warranty is limited to the above and does not apply to exchange or repairs which are required as a result of improper installation, misuse, maladjustment, abnormal operating conditions or lack of routine maintenance. Nor does this warranty include the furnishing of service for maintenance or problems arising from the foregoing causes. No claims for labour, installation, removal, transportation, or other expenses will be recognized. Notwithstanding any stipulation of the purchaser to the contrary, all other obligations, representations, warranties and conditions, express or implied, statutory or otherwise, including any implied warranties or conditions of merchantability, quality or fitness are hereby excluded and Titan Logix shall not be liable for any loss, cost or damages, of any kind whatsoever, whether consequential, indirect, special or otherwise, arising out of or in connection with the equipment or any defect therein, even if caused by the negligence of Titan Logix, its employees or agents. The provisions hereof relating to the warranty and limitations hereon and limitation of liability shall continue to be enforceable between the parties notwithstanding termination of the within agreement for any reason including fundamental breach. Equipment not of Titan Logix manufacture will carry the vendor's or manufacturer's standard warranty.

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Troubleshooting

Problem	Possible Solution
No Loop Current	1. Verify proper loop connection polarity. See Installation section.
Loop Current Incorrect or Incorrect Rate Displayed	1. Verify the Turbine Full Scale parameter. 2. Verify turbine flow meter direction is correct. 3. Verify isolation between SFT830 common and input signal source common if not using a magnetic pickup.
Flow Rate is Erratic	1. Turbine input sensitivity may be too high. See the Installation section.
Display Shows Flashing 100	1. Flow rate is equal to or greater than 100%. 2. Turbine Full Scale parameter has not been set correctly. 3. SFT830 has just locked on to a full scale flow rate.
Display Shows 0.0 and Loop Current is 4.00mA When Fluid is Flowing	1. Check turbine input connecton. 2. If not using a turbine ensure the polarity is correct

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Volume Conversion Factors

The following volume conversion factors are provided to aid in calculating the correct K Factor from one unit of flow to another.

1 US gallon = 0.00379 cubic meters

1 US gallon = 3.79 litres

1 cubic meter = 263.85224 US gallons

1 cubic meter = 6.289 barrels

1 cubic meter = 35.31 cubic feet

1 litre = 0.26385 US gallons

1 barrel = 42 US gallons = 0.159 cubic meters

1 cubic foot = 0.00283 cubic meters

Example:

A turbine meter produces 14727.27 pulses for 1 US gallon. How many pulses from this same turbine equals 1 cubic meter? 1 US gallon = 0.00379 cubic meters.

$$\frac{14727.27 \text{ pulses per US gallon}}{0.00379} = 3885823$$

3885823 would be the K Factor to use for this particular turbine if the SFT830 was to indicate total flow in cubic meters.

K Factor to Turbine Full Scale Conversion

The Turbine Full Scale parameter is measure in pulses per second. This requires that a conversion be performed on the K Factor for the turbine in use. To determine the value for the Turbine Full Scale two things must be known: the K Factor, and the full scale flow rate. The K Factor and full scale flow rate must be in the same volume units to calculate a valid Turbine Full Scale value. See the Volume Conversion Factors section of this manual for information on converting the K Factor.

The full scale flow rate must be converted to units / second. To do this simply divide the desired full scale flow rate by one of the rate time bases shown below.

If the full scale rate is in units / day, rate time base = 86400
hour, rate time base = 3600
minute, rate time base = 60
second, rate time base = 1

For example; the full scale rate is 100 cubic meters / day

$100 \text{ cubic meters per day} \div 86400 \text{ seconds/day} = 0.0011574 \text{ cubic meters / second}$

To determine the Turbine Full Scale value multiply the K Factor by the full scale rate in units / second.

For example: A turbine produces 761233 pulses per cubic meter, and the full scale rate is 100 cubic meters / day

$761233 \text{ pulses / cubic meter} \times 0.001157 \text{ cubic meters / second} = 881 \text{ pulses / second}$

The Turbine Full Scale value entered for this example would be 0881.

Introduction

About This Manual

This instruction manual provides information specific to the Titan Logix's SFT830. Other Peripheral equipment should be supplied with its own instruction manual and that manual should be referred to for proper operation of the peripheral equipment.

It is essential that this manual be read and understood for proper operation of your SFT830.

This manual includes:

<i>INTRODUCTION:</i>	Briefly describes the key features of the SFT830.
<i>INSTALLATION:</i>	Detailed description of mounting and wiring of external equipment. Also has a description of normal operation.
<i>PROGRAMMING:</i>	Describes the procedure for setting the Turbine Full Scale parameter for the SFT830.
<i>TROUBLESHOOTING:</i>	Describes several quick problem solving techniques.
<i>SPECIFICATIONS:</i>	Describes the physical and operational characteristics.

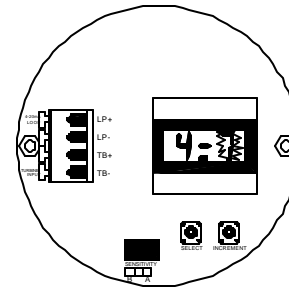
About the SFT830

The SFT830 is a loop powered Flow Rate Meter. The SFT830 accepts pulses from a turbine meter, and uses those pulses to calculate the flow rate in a pipeline. The SFT830 displays the flow rate as a percentage of maximum flow rate on a built in LCD display. For remote monitoring the SFT830 is equipped with a 4-20mA output.

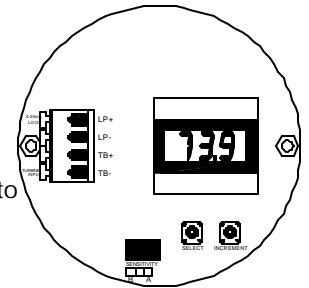
Please refer to the Installation section of this manual for directions on how to connect and set up the SFT830.

Main Features

- Enclosure: Class I, Division II, Groups B, C, & D, Nema4
- Input / Output: Turbine input from 1Hz to 10kHz at 20mVRMS minimum. Adjustable pulse input sensitivity for use in noisy environments. Flow rate is shown on a built in LCD display. 4-20mA loop output for connection to a standard RTU or PLC analog input.
- Reliability: Built using industrial specified components to ensure long life and reliability even in harsh conditions.
- Programming: The SFT830 has one programmable parameter. The Turbine Full Scale rate can be programmed manually or by locking on to a specified maximum flow rate.



Continue using the Select and Increment buttons to set the remaining values.

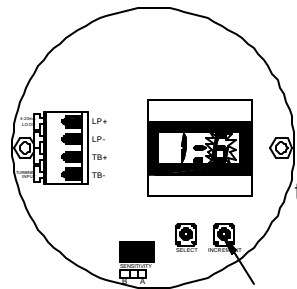
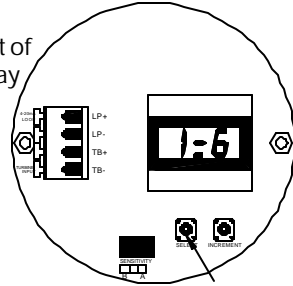


Once the last value is entered, the display will return to the Flow Rate in percent.

Programming Manually

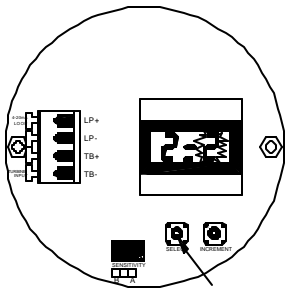
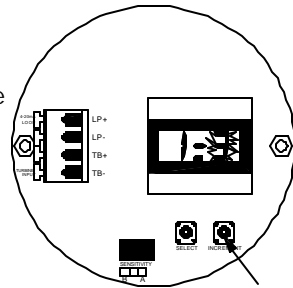
The Turbine Full Scale value can also be entered manually. To do this follow these steps:

Press the Select button until the least significant digit of the Turbine Full Scale parameter appears on the display (1=x).



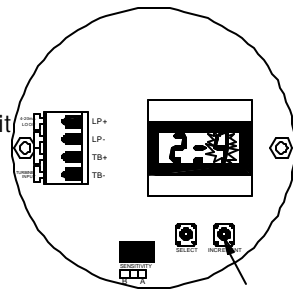
Press and hold the Increment button until the digit begins to flash (About 5 seconds).

Release the Increment button and then use the Increment button to set the digit to the desired value.



Press the Select key to advance to the next digit.

Use the Increment button to adjust the value (the digit should already be flashing).



Installation

Installation should only be performed by qualified personnel, and in accordance with local governing regulations.

!WARNING!

To prevent ignition of hazardous atmosphere, disconnect circuits or prove the area to be nonhazardous before removing cover.

CURLEE ETEFC63 Enclosure

Seals are required within 6" of the enclosure on all conduits if being installed in a hazardous area.

APPLETON GRC-100 Enclosure

Seals are required within 2" of the enclosure on all conduits if being installed in a hazardous area.

Environmental

Choose a mounting location suited to the SFT830 enclosure.

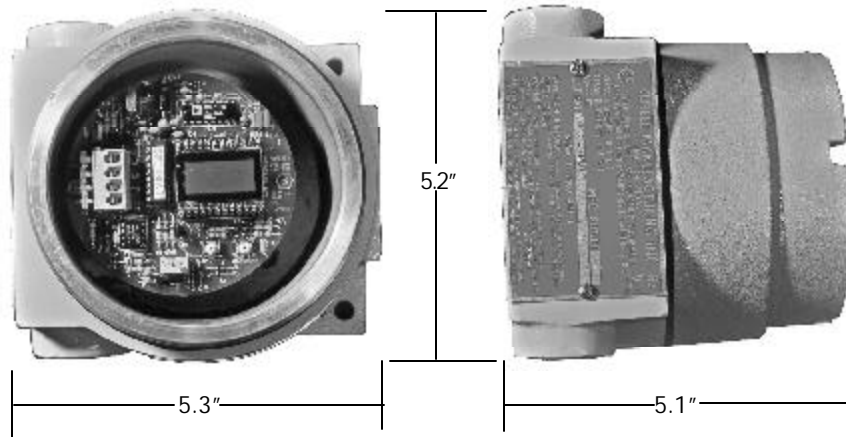
The ideal mounting location is where the:

1. Turbine pick-up is as close as possible.
2. Mounting surface has minimal vibration.
3. Ambient temperature is always within -40°C to $+70^{\circ}\text{C}$ (-40°F to $+149^{\circ}\text{F}$)
4. Cable lengths are minimal.

Avoid mounting locations where the SFT830 is:

- Vibrating
- Close to high voltage / current runs, contactors, SCR control devices, or frequency inverters.

Outline



Mounting

The SFT 830 is designed to be mounted directly on to a 3/4" NPT fitting. For additional support when mounting the unit is also equipped with two 5/16" mounting holes spaced 4" apart.

Programming

The SFT830 has one programmable parameter. This parameter is the Turbine Full Scale parameter. The Turbine Full Scale parameter sets the flow rate at which the SFT830 will display 100% and output 20.0mA. There are two methods of programming the Turbine Full Scale parameter, if a maximum flow rate can be generated the SFT830 can lock onto that rate and generate its own Turbine Full Scale rate, or the parameter can be entered manually.

Locking On To a Flow Rate

If a maximum flow rate can be produced in the turbine being used with the SFT830 the unit can lock on to this and set its own Turbine Full Scale rate. When locking on to a flow rate the SFT830 samples the input frequency once per second for 5 seconds and averages the results. This averaged value will be stored in memory as the new Turbine Full Scale value. To lock on to a flow rate follow these steps:

1. Produce a maximum flow rate in the pipeline
2. Press the Select button until the flow rate in percentage is displayed
3. Press and hold the Increment button until the display shows 100 (should be about 6 seconds)
4. Once the unit has locked on to the flow rate the display will flash 100 and the output will be set to 20.0mA.

To see the new Turbine Full Scale parameter press the Select key to cycle through the 4 digits.

Input Sensitivity Adjustment

NOTE: The input sensitivity is preset at the factory to 20mVRMS. This is sufficient for most applications that the SFT830 is designed for. The input sensitivity should not need to be adjusted.

Other sources of poor signals should be explored before adjusting the sensitivity.

If the SFT830 appears to be too sensitive (picking up electromagnetic interference, noise, or improper flow rate) the input sensitivity may need to be decreased. To decrease the sensitivity turn the Input Sensitivity Adjustment counter clockwise until the correct flow rate appears. The Input Sensitivity Jumper may also be used to set the input sensitivity to 1V.

Note: Before removing the cover of the SFT830 to make adjustments, prove the area to be nonhazardous.

Operation

When operating correctly, the SFT830 will display the current flow rate as a percentage of the Turbine Full Scale rate. This will appear on the LCD display. The unit will also output a signal on the 4-20mA output. This signal will be a current value relative to the percentage of Turbine Full Scale being measured. Should the flow rate being measured equal or exceed the Turbine Full Scale parameter the unit will begin flashing 100.

To view the current setting for the Turbine Full Scale rate press the Select button and each digit of the value will be displayed individually. The digits will appear in the form of d=v (where d = the digit and v = the value).

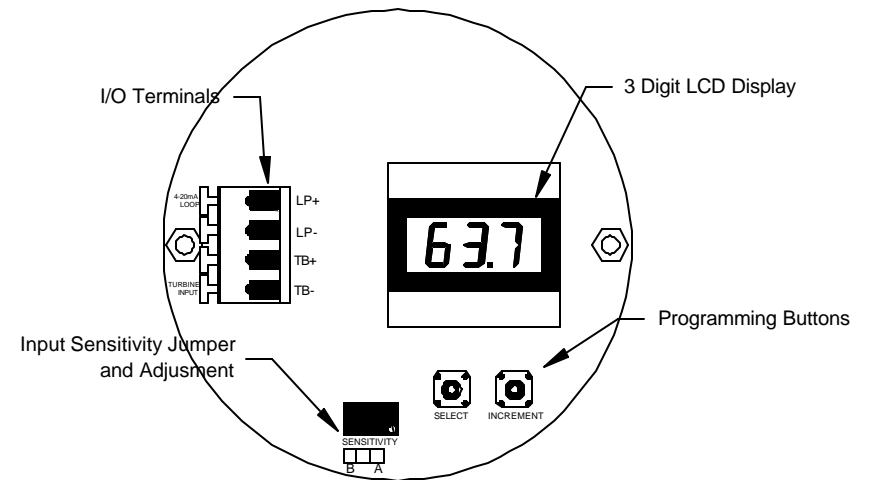
For example a Turbine Full Scale value of 6295 would appear as follows:

Display Shows	Flow Rate in %
Press Select	
Display Shows	1=5
Press Select	
Display Shows	2=9
Press Select	
Display Shows	3=2
Press Select	
Display Shows	4=6
Press Select	
Display Shows	Flow Rate in %

Interconnection

Perform all wiring in accordance with local governing regulations.

Please refer to the diagram below for the location of the programming buttons, sensitivity jumper, and I/O terminals.



To connect external wiring to the terminal blocks, feed instrumentation cables through the cable channel, on the left-hand side of the unit, up to the terminal blocks. To install the wires into the vibration resistant terminal blocks, use a small flat head screwdriver (or other device that fits) and place it in the terminal block lever, press down, insert wire, then release.

