



Technology Solutions

TEK-LCD 7803B

Explosion-Proof Pulse Input Flow Rate/Totalizer Indicator



ACCESSORIES



Introduction

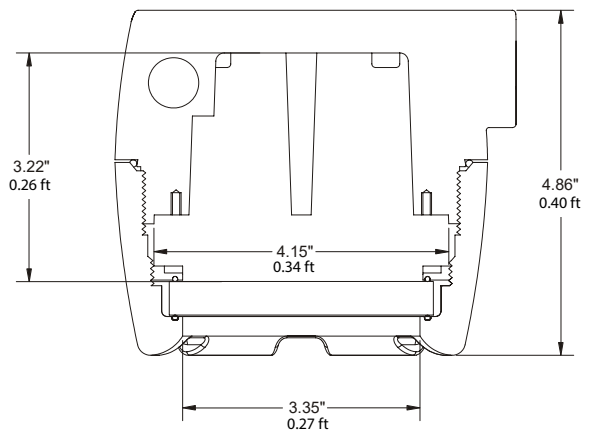
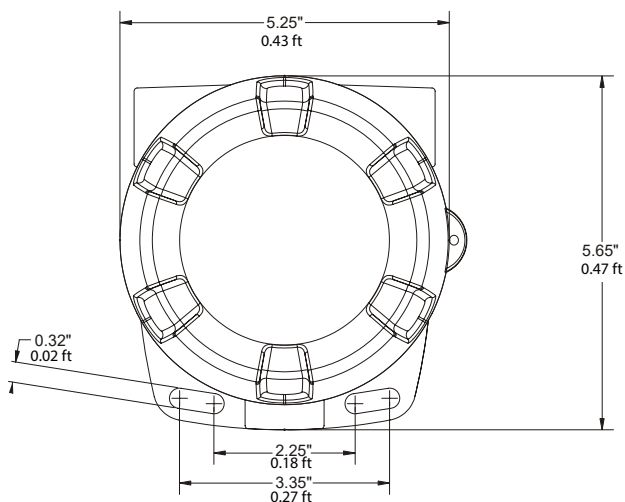
The Tek-LCD 7803B Explosion-Proof Pulse Input Flow Rate/Totalizer Indicator

The Tek-LCD 7803B is an explosion-proof flow rate/totalizer Indicator that can display flow rate and total from a pulse output flowmeter. Its display has a five digit upper line for rate, a seven alpha-numeric character lower line for total, and comes standard with a backlight. The Tek-LCD 7803B carries FM, CSA, ATEX, and IECEx approvals for use in hazardous areas. It can be powered from an included battery or a 24 VDC external power supply. Some features that really make the Tek-LCD 7803B flow rate/totalizer Indicator stand out are its automatic unit conversions from flowmeter k-factor units, ability to log up to 1024 data points, and SafeTouch® through-glass buttons. These buttons allow the Tek-LCD 7803B to be programmed and operated through the glass, thus eliminating the need to remove the cover in a hazardous area.

Features

- Automatic Rate, Total, and Grand Total Unit Conversions
- On-Board Data Logging
- Modbus Communications RS-485 Option
- All models Operates from -40°F to 158°F (-40 °C to 75 °C)
- Two Isolated Open Collector Pulse Outputs, Up to 5 kHz
- Open Collector, NPN, PNP, TTL, Switch Contact, Sine Wave (Coil), Square Wave, Opto-Isolated Inputs
- Isolated 4-20 mA Output for Rate, Total, or Grand Total
- Battery, DC, or Output Loop-Powered Models
- Explosion-Proof, IP68, NEMA 4X Enclosure
- 5-Digit 0.7" (0.05 ft) Top Display for Rate or Total
- 7 Alphanumeric Character 0.4" (0.03 ft) Lower Display for Rate, Total, Grand Total, Units, and Tag
- 13-Digit Totalizer with Total Overflow Feature

Dimensional Drawings



Specifications

General

Display	Top: Five digits (0 to 99,999), 0.7" (0.05 ft) high, 7-segment, automatic lead zero blanking. Bottom: Seven characters, 0.4" (0.03 ft) high, 14-segment automatic lead zero blanking. Symbols: Total, grand total, battery power/low battery, high & low alarm, password lock, and SafeTouch button sleep mode/disable.
Display Assignment	Top Display: Rate or total; Bottom Display: Combinations of rate, total, grand total, units, and custom tag.
Backlight	White LED, 10 sec auto-off when battery powered. Backlight deactivated below temperature $\approx -4^{\circ}\text{F}$ (-20°C)
Display Update Rate	Ambient $> -4^{\circ}\text{F}$ (-20°C): 1 Update/Second. Ambient $< -4^{\circ}\text{F}$ (-20°C): 1 Update/10 Seconds. Note: Update is dependent on gate settings.
Over Range	Display flashes 99,999
Display Orientation	Display may be mounted at 90° increments up to 270° from default orientation
Programming Method	Four SafeTouch through-glass buttons when cover is installed. Four internal push buttons when cover is removed.
Recalibration	Calibrated at the factory to read frequency in Hz. No recalibration required.
Max/Min Display	Max/Min readings reached by the process are stored until reset by the user or until power to the meter is cycled.
Password Menu Options	Three programmable password selections can be used for the following: restrict modification of settings, prevent resetting the total or grand total without the password, or permanently lock out the ability to change or reset the grand total or any grand total related settings(making a non-resettable grand total). Pass: Restricts modifications of programmed settings to require re-entering the password to make changes. Pass T: Restricts the reset of total to require re-entering the password. Disables the manual mode reset contact. Pass GT: Restricts the reset of grand total to require re-entering the password. May enable a non-resettable grand total and permanent lockout of grand total-related settings with a specific password.
Alarm Indication	Flashing display plus HI/LO indicators for rate alarms, SET for total alarms.
Non-Volatile Memory	All programmed settings and total are stored in nonvolatile memory for a minimum of ten years if power is lost.
Power Options	9-30 VDC, 2.2 W max; 4-20 mA Output Powered, 30 VDC max; battery power; 9-30 VDC power with battery backup; 4-20 mA Output Powered with Battery Backup
Operating Temperature Range	-40°F to 158°F (-40°C to 75°C)
Storage Temperature Range	-40°F to 158°F (-40°C to 75°C)
Battery	3.6 V Primary Lithium (Li-SOCl ₂), non-rechargeable Model PDABAT36C. Expected service life & recommended replacement interval is dependant on the operating conditions.
Isolation	All models: 500 V opto-isolated input-to-power/output with isolated input enabled.
Data Logging	Up to 1024 records, recorded 4/day at specific times or at defined time intervals. Record contains date, time, rate, total, grand total, and log number.
Relative Humidity	0 to 90% non-condensing
Connections	Screw terminals accept 12 to 22 AWG wire
Enclosure	Explosion-proof die-cast aluminum with glass window, corrosion resistant epoxy coating, color: blue. NEMA 4X IP68. Copper-free (0.3%). Three $\frac{3}{4}$ " NPT threaded conduit openings. One $\frac{3}{4}$ " NPT metal plug with 0.03 ft hex key fitting installed.
Connections	Screw terminals accept 12 to 22 AWG wire
Mounting	May be mounted directly to conduit. Two slotted flanges for wall mounting or NPS $1\frac{1}{2}$ " to $2\frac{1}{2}$ " or DN 0.13 to 0.21 ft pipe mounting.
Overall Dimensions	5.67" x 5.24" x 4.88" (W x H x D)(0.47 ft x 0.43 ft x 0.40 ft)
Weight	5.00 lbs (80 oz, 2.27 kg)

Serial Communications

Protocol	2-Wire RS-485 with Modbus RTU. Isolation optional.
Meter Address/Slave ID	1 - 247
Baud Rate	1,200; 2,400; 4,800; 9,600; 19,200; 38,400; 57,600; or 115,200 bps
Transmit Time Delay	Programmable between 0 and 199 ms
Parity/Stop Bit	Even, odd, none with 1 stop bit, or none with 2 stop bits
Byte-to-Byte Timeout	Max of 1.5 character times or 750 μs

Rate Input

Pulse Input	Field selectable; Sourcing or sinking pulse or square wave 0-5 V, 0-12 V, or 0-24 V; TTL; NPN or PNP transistor; Open collector 100 kΩ pull-up to 3 V; Switch contact 100 kΩ pull-up to 3 V; PNP transistor 100 kΩ pull-down to ground (COM); Active input 100 kΩ to battery level, 10kΩ to power. Maximum Frequency: 64 kHz. Minimum Pulse Width: 5 μs.
Opto-Isolated Input	Sourcing or sinking pulse or square wave 0-5 V, 0-12V, or 0-24 V; Logic High: 2-24 V, Logic Low: < 1 V
Maximum Frequency	20 kHz
Minimum Pulse Width	20 μs.
Input Current	1 mA @ 5 V, 2.5 mA @ 12 V, 5 mA @ 24 V
Minimum Input Frequency	0.0001 Hz. Minimum frequency is dependent on high gate setting (rate display).
Input Impedance	Pulse input: Greater than 75 kΩ @ 1 kHz
Open collector/switch input	100 kΩ pull-up to 3 V
Total Reset Delay	Programmable from 0 to 99,999 seconds
Input K-Factor Units	Gallons, liters, imperial gallons, cubic meters, barrels, bushels, cubic yards, cubic feet, cubic inches, liquid barrels, beer barrels, hectoliters, or custom.
K-Factor	Field programmable K-Factor used to define custom input units. May be programmed from 0.000001 to 9,999,999 pulses/unit.
Accuracy	±0.03% of calibrated span ±1 count
Temperature Drift	Rate display is not affected by changes in temperature.
Low-Flow Cutoff	0-99,999 (0 disables cutoff function)
Decimal Point	Up to four decimal places or none: 4.4444, 33.333, 222.22, 1111.1, or 00000
Calibration	May be calibrated using K-Factor, scale without signal source, or by applying an external calibration signal.
Calibration Range	Input 1 signal must be ≥: 1 Hz; input 2 signal may be set anywhere above input 1 setting. Minimum input span is 1 Hz. An Error message will appear if the input 1 and input 2 signals are too close together.
Input Contact Debounce Filter	Programmable. Input signal frequency speed selections of Hi (no filter), Med (250 Hz max input, 2 ms pulse width), and Low. (100 Hz max input, 5 ms minimum pulse width).
Time Base	Second, minute, hour, or day
Gate	Low gate: 1-99 seconds; High gate: 2-9,999 seconds

Rate/Totalizer

Display Assignment	The Top display is assigned to rate or total. The Bottom display is programmable to display total; total and units; total and tag; total, total units, and rate units; grand total; grand total and grand total units; grand total and tag; grand total, grand total units, and rate units; rate units; rate; rate and total units; rate and rate units; rate and tag; rate units; total units; a custom tag; or be off (blank).
Rate Display Units	Gallons, liters, imperial gallons, cubic meters, barrels, bushels, cubic yards, cubic feet, cubic inches, liquid barrels, beer barrels, hectoliters, or custom.
Rate Display Time Base	Display rate may be calculated in terms of units per second, minute, hour, or day
Total/Grand Total Display Unit Multiplier	x1, x100 (h), x1000 (k), or x1,000,000 (M) multiplier (and prefix) applied to total or grand total display units. Setting is independent for each.
Total/Grand Total Decimal Points	Up to six decimal places or none: 6.666666, 55.55555, 444.4444, 3333.333, 22222.22, 111111.1 or 0000000. Total and grand total decimal points are independently programmed, and are independent of rate decimal point.
Totalizers	Calculates total and grand total based on rate and field programmable multiplier to display total in engineering units. Time base must be selected according to the time units in which the rate is displayed. The total and grand total utilize the same time base, with different conversion factors and resets.
Totalizer Reset	Via SafeTouch RESET button, mechanical button (cover off), external contact closure (total only), automatically via user selectable preset value and time delay (1 – 99,999 sec). Manual reset may be disabled or protected by password for the total and grand total. Total and grand total reset independently.
Total Overflow & Rollover	The total can display up to 9,999,999,999,999. Up to 9,999,999 can be displayed on the lower display normally. An overflow display will toggle between the first six digits and last seven digits (999999 <> 9999999) for a 13-digit total. The total will rollover beyond thirteen digits. The T indicator on the display will flash to indicate total overflow, and the six most significant digits (first six numbers of the total) are indicated with the flashing overflow symbol.
Grand Total Overflow & Rollover	The grand total can display up to 9,999,999,999,999. Up to 9,999,999 can be displayed on the lower display normally. An overflow display will toggle between the first six digits and last seven digits (999999 <> 9999999) for a 13-digit total. The grand total will rollover beyond thirteen digits. The GT indicator on the display will flash to indicate grand total overflow, and the six most significant digits (first six numbers of the grand total) are indicated with the flashing overflow symbol.
External Reset Contact	External total reset connections are made between RST and COM. Logic High: 1.4 V, 3.3V max; Logic Low: < 0.8 V. 32 ms debounce.

4-20 mA Transmitter Output

Output Source	Rate/process, total, grand total, or disabled.
Scaling Range	4.000 to 20.000 mA for any display range.
Calibration	Factory calibrated: 0.0 to 1000.0 = 4-20 mA output
Under Range	3.8 mA
Over Range	Display Overrange: 20.5 mA, Output Overrange: 20.5 mA
Accuracy	$\pm 0.05\%$ span ± 0.004 mA
Temperature Drift	33.4 $\mu\text{A}/^\circ\text{F}$ max from -40°F to 158°F (-40°C to 75°C) ambient
External Loop Power Supply	30 VDC maximum
Output Loop Resistance	24 VDC, 10-750 Ω ; 30 VDC 100-1100 Ω Note: Loop-powered backlight subtracts 150 Ω from maximum resistance figures above.

Open Collector Outputs

Output Assignment	Two open collector pulse outputs Out 1 and Out 2. Individually programmable for rate, total, or grand total alarms; rate, total, or grand total pulse outputs; or retransmitting of pulse inputs; constant timed pulse output; quadrature outputs (requires Out 1 and Out 2); or off.
Rating	Isolated open collector, off: 24 VDC max; on: $<1\text{V}$ @ 150 mA max.
Alarm Outputs	Assign to rate for high or low alarm trip point. Assign to total or grand total for total or grand total summation alarms.
Alarm Deadband	0-100% FS, user selectable
Alarm Acknowledge	Enter button resets output and LCD indication.
Pulse Output K-Factor (Count)	K-factor (COUNT) programmable from 0.000001 to 9999999. Rate pulses are generated as a scaled output of the rate input with one output pulse per K-factor (count) number of input pulses. Total and grand total pulses are generated for every total or grand total increment selected. (e.g. K factor value of 100 will generate one pulse every time the total is incremented by 100 units) Rate retransmission pulses one to one for input pulses, up to maximum output speed. K-factor is not used for retransmitting outputs.
Pulse Output Maximum Frequency	5 kHz; 50% duty cycle. If the maximum would be exceeded, the meter will display "PULSE OVERRNG"
Pulse Rate Retransmit Output	The output will generate 100 to 130 us pulses at the falling edge of every input pulse.
Maximum retransmit frequency	5 kHz
Quadrature Output	Output set to quadrature will lag the other pulse output by 90° (1/4 duty cycle) at output frequency. Minimum 1 Hz
Timer Output	Programmable on and off time, repeating cycle. Minimum period 0.1 second, maximum 100,000 seconds. Minimum pulse time 0.01 second, maximum 10,000 seconds.

Product Ratings and Approvals

FM	Explosion-proof for use in Class I, Division 1, Groups B, C, D. Class II, Division 1, Groups E, F, G. Class III, Division 1; T6. Class I, Zone 1, AEx d IIC T6 Gb. Zone 21, AEx tb IICT 185°F. Ta = -40°F to 158°F (-40°C to 75°C). Enclosure: Type 4X & IP66. Certificate number: 3040391
ATEX	II 2 G D. Ex d IIC T6 Gb. Ex tb IICT 185°F Db IP68. Ta = -40°F to 158°F (-40°C to 75°C). Certificate number: Sira 10ATEX1116X
CSA	Class I, Division 1, Groups B, C, D. Class II, Division 1, Groups E, F, G. Class III, Division 1; T6. Class I, Zone 1, Ex d IIC T6. Ta = -40°F to 158°F (-40°C to 75°C). Enclosure: Type 4X & IP66. Certificate number: 11 2325749

Installation

Direct Mounting

The Tek-LCD 7803B is designed to easily mount directly to a flowmeter. The example below shows it mounted to a turbine flowmeter. This particular Tek-LCD 7803B model (BM0) is battery-powered. Even though battery-powered, it does have a backlight; but to conserve battery power, it only turns on while SafeTouch® buttons are in use.



Installation Flexibility

The Tek-LCD 7803B rotatable display, along with three available conduit connections, provide for numerous installation options. The display can be rotated in 90° increments. Rotate it 90° for horizontal mounting. Wiring can be routed to the most convenient conduit connection(s). One metal conduit plug is supplied per unit. Additional plugs are available if needed.

Popular Models

Model Number	Description
7803B-AP0	Explosion-Proof Pulse Input Flow Rate/Totalizer

Accessories

Model Number	Description
7800A-6846	Steel Pipe Mounting Kit
7800A-6846SS	Stainless Steel Pipe Mounting Kit
7800B-002	¾" M-NPT to ½" F-NPT Approved Reducer

Customer Service and Support



TEKMATION LLC reserves the right to change the designs and/or materials of its products without notice. The contents of this publication are the property of TEKMATON and cannot be reproduced by any other party without written permission. All rights reserved. Copyright © 2016 TEKMATON LLC
DOC # TEK/PO/CAT/200303/7803B/r01
TEKMATION LLC



www.tek-trol.com

Tek-Trol is a fully owned subsidiary of TEKMATON LLC. We offer our customers a comprehensive range of products and solutions for process, power, and oil and gas industries. Tek-Trol provides process measurement and control products for Flow, Level, Temperature and Pressure Measurement, Control Valves and Analyzer systems. We are present in 15 locations globally and are known for our knowledge, innovative solutions, reliable products, and global presence.

Tek-Trol LLC

796 Tek Drive Crystal Lake, IL 60014 USA
Tel: +1 847 857 6076, +1 847 655 7428 Fax: +1 847 655 6147
Email: tektrol@tek-trol.com
www.tek-trol.com