

Tek-LCD 7804A

NEMA 4X Modbus® Scanner Indicator



Quick Start Guide

1. Before You Begin

This guide provides basic information to assist you in quickly getting started. Go to our website to download the full User Guide for detailed installation and other information.



Read complete instructions prior to installation and operation of the meter.



Failure to follow installation guidelines could result in death or serious injury.



Make sure only qualified personnel perform the installation.

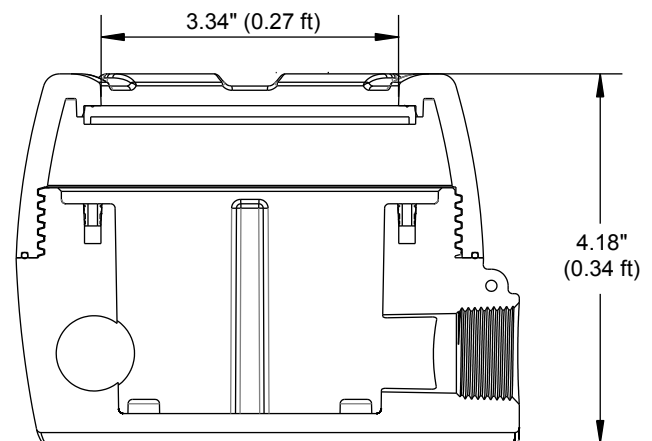
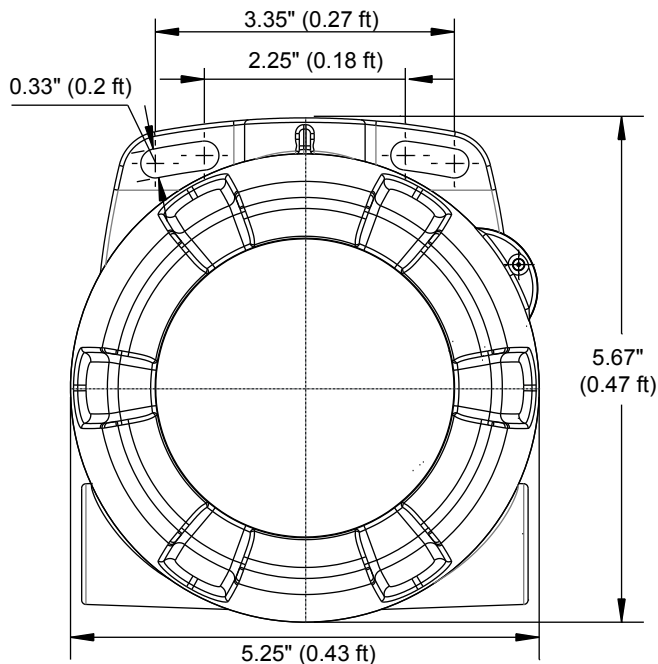


Risk of electric shock or personal injury.

2. Unpack

Tek-LCD 7804A NEMA 4X Modbus Scanner Indicator

3. Dimensional View



4. Mounting

Tek-LCD 7804A has two slotted mounting flanges that may be used for pipe mounting or wall mounting. Alternatively, the unit may be supported by the conduit using the conduit holes provided.



Do not attempt to loosen or remove flange bolts while the meter is in service.

5. Power Connections

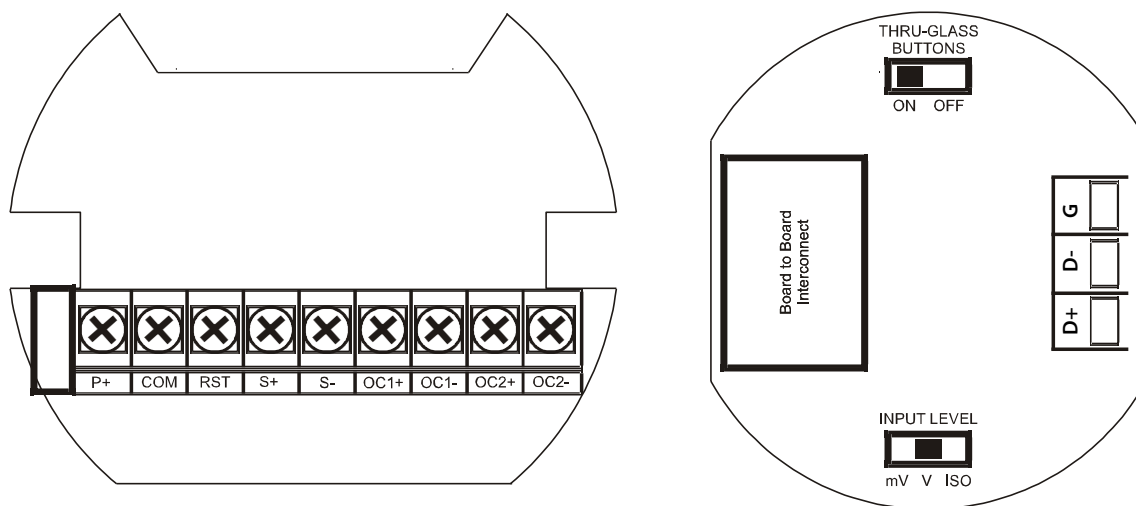


Fig. 1 Connector Board

D+	RS-485 data B (non-inverting) connection
D-	RS-485 data A (inverting) connection
G	RS-485 shield ground connection
P+	DC Power positive terminal connection
COM	DC power supply input return/negative, reset contact closure common
RST	Contact closure reset pull-up to 1.8 VDC
S+	Pulse signal input negative terminal connection
S-	Open collector output 1 positive terminal
OC1-	Open collector output 1 negative terminal
OC2+	Open collector output 2 positive terminal
OC2-	Open collector output 2 negative terminal



Observe all safety regulations. Electrical wiring should be performed in accordance with all agency requirements and applicable national, state, and local codes to prevent damage to the meter and ensure personnel safety.

Quick Start Guide

RS-485 Signal Connections

The scanner includes a three-wire RS-485 serial connection. The cabling used for an RS-485 serial communications network should always be a high-quality cable such as Belden 8162 or Alpha 6203C. A three-wire system requires two twisted pairs (the extra twisted pair is needed for the signal ground).

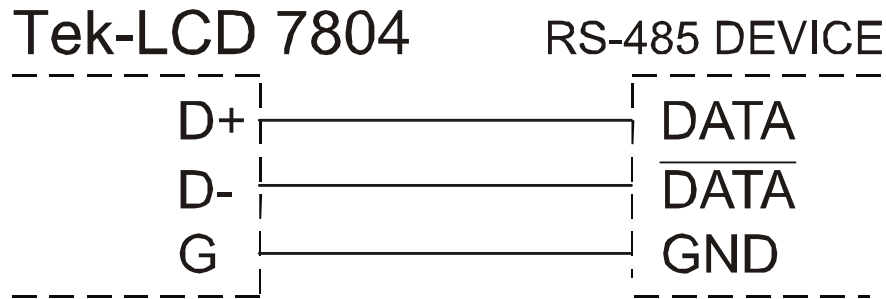


Figure 2. RS-485 Three-Wire Serial Connections

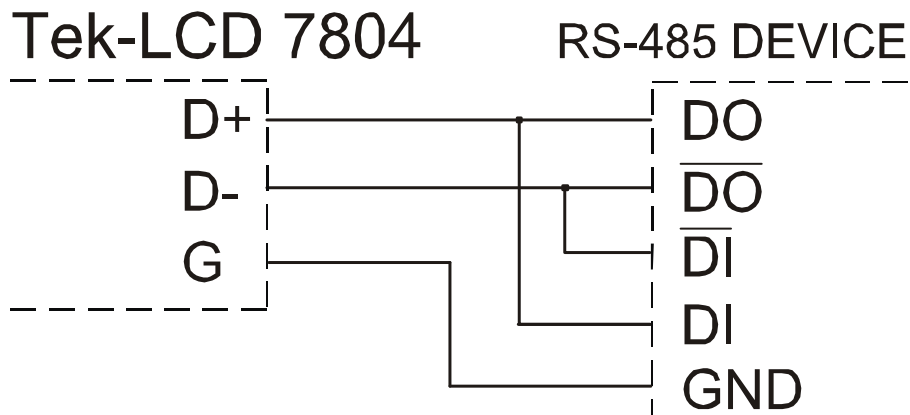
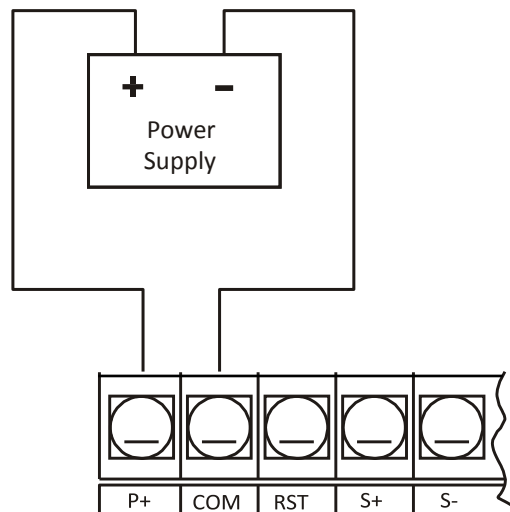


Figure 3. RS-485 Five-Wire Serial Connections

DC Power Connections

DC power is wired to terminals P+ and COM as shown in Figure 5. The same power supply may be used to power other circuits including a PNP-type sensor, however to maintain input isolation, a separate power supply must be used to power the Opto-Isolated Flowmeter as shown in Figure 8.



External Total Reset Connection

External total reset connections are made between RST and COM. Connect to a contact closure source such as a relay or a pushbutton as shown in Figure 5. Avoid extended contact closure to preserve battery life. The total is reset when the button is pressed. The scanner will start to totalize immediately. Holding down the button has no effect on the total.

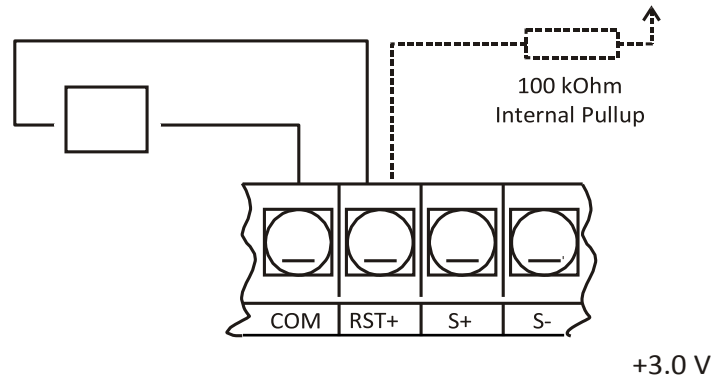


Figure 5. Reset Connections

Open Collector Output Connections

Open collector output 1 and 2 connections are made to terminals labelled OC1+ and OC1-, and OC2+ and OC2-. Connect the alarm or pulse input device as shown in Figure 6.

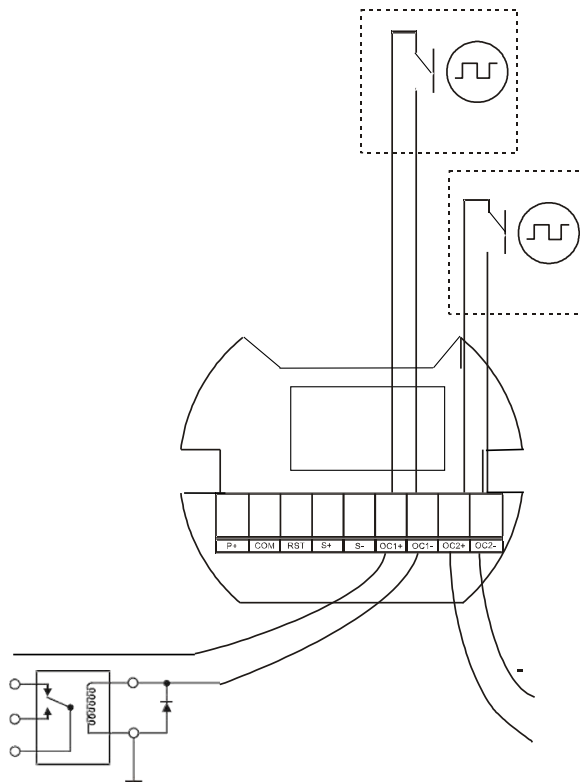


Figure 6. Open Collector Output Connections

Quick Start Guide

Pulse Input Signal Connections

Signal connections are made to a barrier terminal mounted in the base of the enclosure. Input level and type are configured using the slide switches on the bottom of the display module as shown in the lower right of the following figures.

Input level and type are configured using the slide switches on the bottom of the display module as shown in the lower right of the following figures.

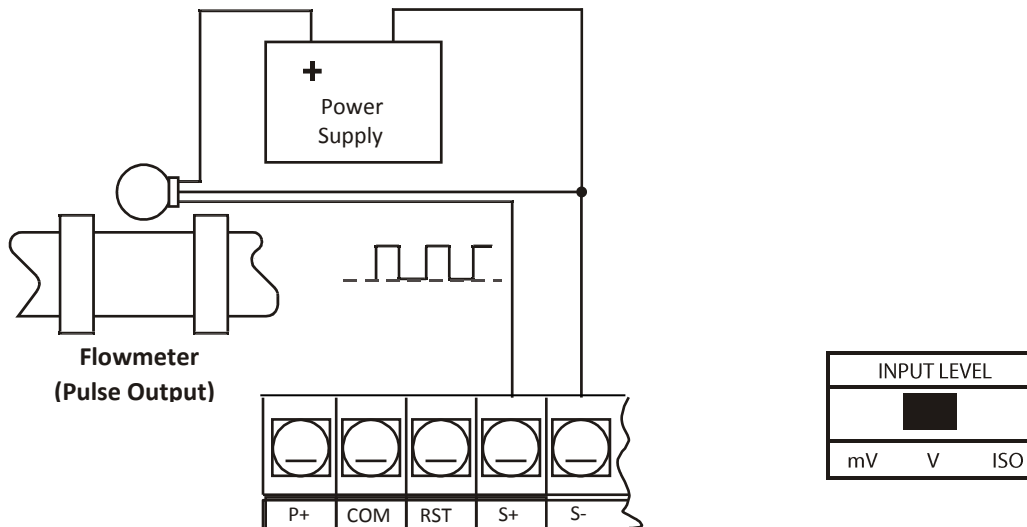


Figure 7: Flowmeter Powered by External Supply (Active)

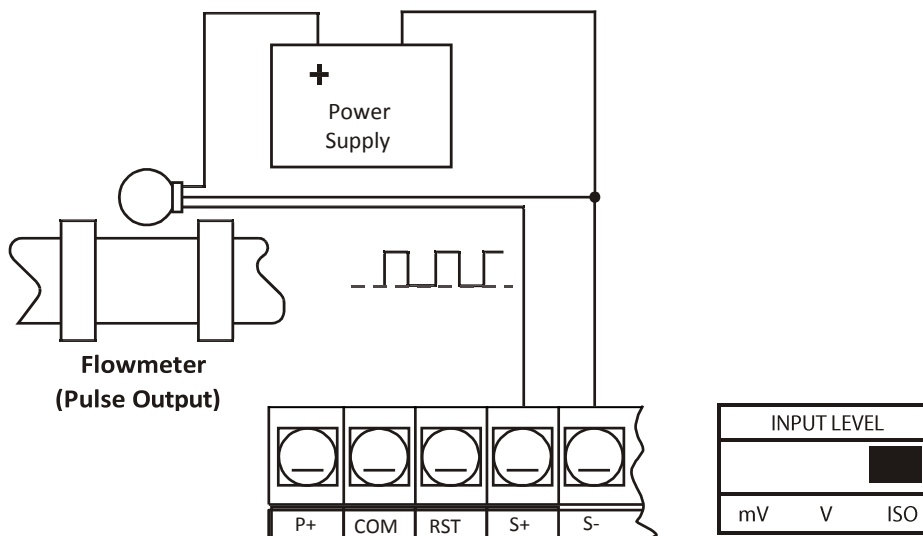


Figure 8: Isolated Flowmeter Powered by External Supply (ISO)

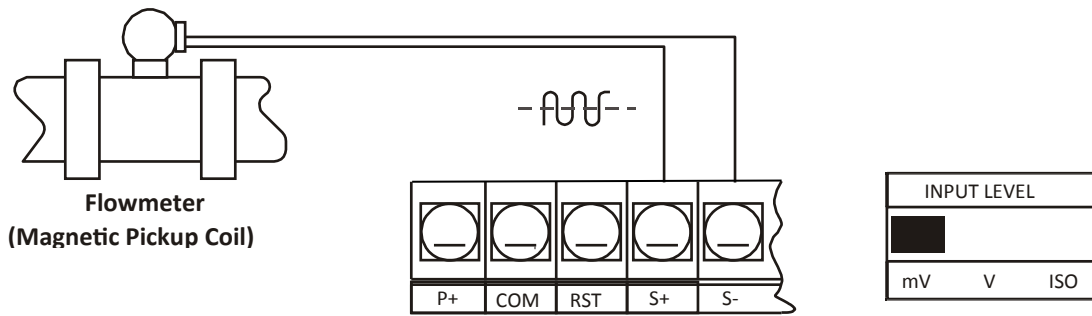


Figure 9: Self-Powered Magnetic Pickup Coil Flowmeter (Coil)

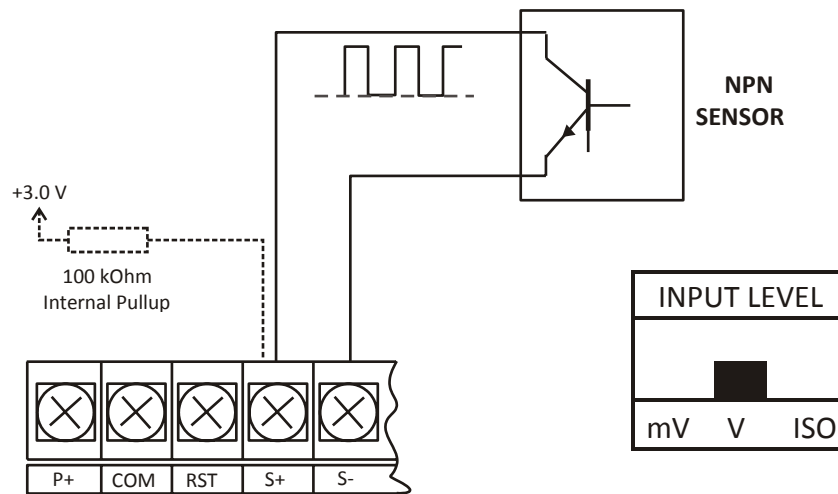


Figure 10: NPN Open Collector Input (NPN)

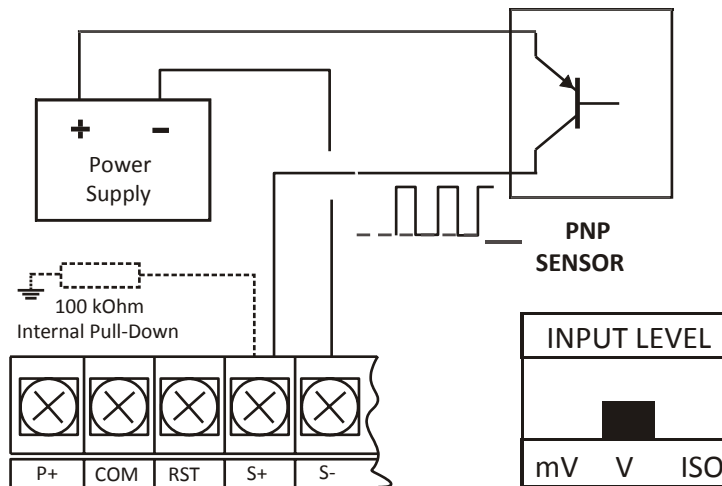


Figure 11: PNP Sensor with External Power (PNP)

Quick Start Guide

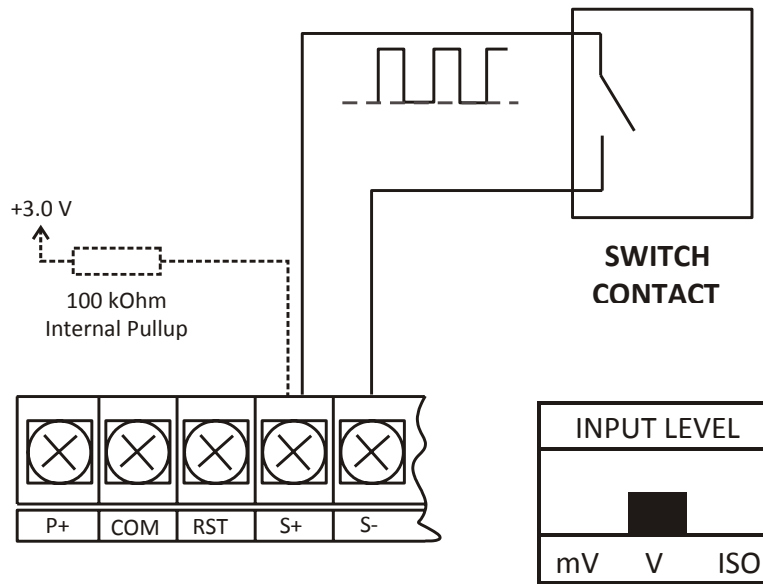








Figure 12: Switch Contact Input (Reed)

6. Display and Buttons



Button Symbols	Description
	Menu/ Through-Glass Awake
	Previous PV, Right Arrow, or Total/Grand Total Reset
	Up Arrow or Next PV
	Enter or Start/Pause Scanning

Display Symbols	Description
HI	High Alarm
LO	Low Alarm
SET	Total Alarm
	Settings Lockout Password Enabled
	Through-Glass Power Save/Disable Flashing: Temporarily Disabled Due to Mechanical Button
T	Total Display Flashing: Total Overflow Indication
GT	Grand Total Display Flashing: Total Overflow Indication
	13 Digit Total Overflow, 6 Most Significant Digits

Button Operation

Menu Button

- Hold the Menu through-glass button when in power save mode (display will show) to awaken through-glass buttons.
- Press the Menu button to enter Programming Mode.
- Press the Menu button during Programming Mode to return to the previous menu selections.
- Hold the Menu button for 1.5 seconds at any time to exit Programming Mode and return to Run Mode.
- Press and hold the Menu button for 3 seconds to access the Advanced Features menu.

Right / Previous Button

- Press Previous to manually display the previous PV or input display.
- Press the Right arrow button in programming mode to move to the next digit or decimal position.
- Press the Right arrow button in programming mode to go backward through most selection menus.

Up / Next Button

- Press Next to manually display the next PV or input display.
- Press the Up-arrow button in programming mode to scroll forward through the menus, decimal point, or to increment the value of a digit.

Enter / Scan Button

- Press Scan to pause automatic scanning.
- Press Scan to resume automatic scanning when paused.
- Press the Enter button in programming mode to access a menu or to accept a setting.

Quick Start Guide

7. Main Menu

Display Functions & Messages

The scanner displays various functions and messages during setup, programming, and operation. The following table shows the main menu MODE, SETUP, and COMM menu functions and messages in the order they appear in the menu.

Display	Parameter	Action/Setting
MODE	<i>Mode</i>	Enter <i>Mode</i> menu
MASTER	<i>Master Mode</i>	Select Master mode
PV NUM	<i>PV Number</i>	Enter the Modbus PV configuration menu
PV 1	<i>PV 1 – PV 16</i>	Enter PV1 to PV16 configuration menus
ENABLE	<i>Enable</i>	Enable the Modbus PV
SLAVE ID	<i>Slave ID</i>	Enter the slave Modbus ID
FUNCODE	<i>Function Code</i>	Set the Modbus function code
REG NUM	<i>Register Number</i>	Enter the slave register number
DATATYP	<i>Data Type</i>	Set the data type
FLOAT	<i>Float</i>	Float data type
SHORT	<i>Short</i>	Short integer data type
LONG	<i>Long</i>	Long integer data type
BINARY	<i>Binary</i>	Binary integer type
BCD	<i>BCD</i>	Binary coded decimal integer type
UNSIGNED	<i>Unsigned</i>	Unsigned integer type
SIGNED	<i>Signed</i>	Signed integer type
BYTE	<i>Byte</i>	Select the byte format
1234	<i>1243</i>	Big endian
4321	<i>4321</i>	Little endian
2143	<i>2143</i>	Big endian with byte swap
3412	<i>3412</i>	Little endian with byte swap
DISABLE	<i>Disable</i>	Disable the Modbus PV
T POLL	<i>Poll Time</i>	Set the Modbus PV poll time
TIMEOUT	<i>Response Timeout</i>	Set Modbus communication response timeout
RETRIES	<i>Retries</i>	Set number of retries before display a PV communication error
SLAVE	<i>Slave</i>	Select Slave mode
PV NUM	<i>PV Number</i>	Enter the Modbus PV configuration menu
PV 1	<i>PV 1 – PV 16</i>	Enter PV1 to PV16 configuration menus
ENABLE	<i>Enable</i>	Enable the Modbus PV
DISABLE	<i>Disable</i>	Disable the Modbus PV
TIMEOUT	<i>Response Timeout</i>	Set Modbus response error time
SNOOPER	<i>Snooper Mode</i>	Select Snooper mode
PV NUM	<i>PV Number</i>	Enter the Modbus PV configuration menu

T RESP	<i>Response Time</i>	Set Modbus response error time
SETUP	<i>Setup Menu</i>	Enter <i>Setup</i> menu
DISPLAY	<i>Display</i>	Enter the <i>Display</i> menu
TOPDSP	<i>Top Display</i>	Set the function of the top display
PV	<i>PV</i>	Display Modbus PV
PV-U	<i>PV & Units</i>	Display Modbus PV and units
TAG-PV	<i>Tag & PV</i>	Display Modbus PV and tags
TG-PV-U	<i>Tag, PV, & Units</i>	Display Modbus PV, tags, and units
BOTDSP	<i>Bottom Display</i>	Set the function of the bottom display
TAG	<i>Tag</i>	Display tags
TAG-U	<i>Tag & Units</i>	Display tags and units
OFF	<i>Off</i>	Turn off display
UNITS	<i>Units</i>	Display units
PV SETUP	<i>PV Setup</i>	Enter the PV Setup menu
PV-1	<i>PV-1 to PV-16</i>	Select PV to configure, PV 1 to PV16
FORMAT	<i>Format</i>	Enter PV display format
TOPDSP	<i>Top Display</i>	Display PV on top display
BOTDSP	<i>Bottom Display</i>	Display PV on lower display
OFF	<i>Off</i>	Turn off PV display
TAG	<i>Tag</i>	Enter the PV tag
UNITS	<i>Units</i>	Enter the PV units
FLOAT.DP	<i>Float Decimal Point</i>	Set the float decimal point location (if PV is float data type only)
DISPDP	<i>Display Decimal Point</i>	Set the PV display decimal point
SCALE	<i>Scale</i>	Select the PV display scaling
FACTOR	<i>Conversion factor</i>	Conversion factor scaling
LINEAR	<i>Linear</i>	Linear scaling
MP-SCAL	<i>Multipoint Scaling</i>	Multipoint scaling for PV1
MATH	<i>Math</i>	Enter Math menu
CV-1	<i>CV1 to CV4</i>	Select math channel to configure CV 1 to CV4
FORMAT	<i>Format</i>	Enter CV display format
TAG	<i>Tag</i>	Enter the CV tag
UNITS	<i>Units</i>	Enter the CV units
DISP.DP	<i>Display Decimal Point</i>	Set the CV display decimal point
RATE	<i>Rate</i>	Enter the Rate menu
TOPDSP	<i>Top Display</i>	Display rate on the top display
BOTDSP	<i>Bottom Display</i>	Display rate on the bottom display
TAG	<i>Tag</i>	Enter the rate tag



Technology Solutions

T BASE	<i>Time Base</i>	Select the rate time base
MIN	<i>Minute</i>	Rate time base per minute
HOUR	<i>Hour</i>	Rate time base per hour
DAY	<i>Day</i>	Rate time base per day
SEC	<i>Second</i>	Rate time base per second
RATE U	<i>Rate Unit</i>	Enter the rate unit
GAL/M*	<i>Gallon/ Minute *</i>	Gallons per time base unit
L/M*	<i>Liter/ Minute *</i>	Liters per time base unit
IGAL/M*	<i>Imperial Gallon/ Minute *</i>	Imperial Gallons per time base unit
M3/M*	<i>Meters3/ Minute *</i>	Meters cubed per time base unit
BBL/M*	<i>Barrel/ Minute *</i>	Barrel per time base unit
BUSH/M*	<i>Bushels/ Minute *</i>	Bushels per time base unit
CUYD/M*	<i>Cubic Yards/ Minute *</i>	Cubic yards per time base unit
CUFT/M*	<i>Cubic Feet/ Minute *</i>	Gallons per time base unit
CUIN/M*	<i>Cubic Inches/ Minute *</i>	Gallons per time base unit
L1BBL/M*	<i>Liquid Barrels/ Minute *</i>	Gallons per time base unit
BBBL/M*	<i>Beer Barrels/ Minute *</i>	Gallons per time base unit
HECTL/M*	<i>Hectoliters/ Minute *</i>	Gallons per time base unit
CUST/M*	<i>Custom Volume/Minute*</i>	Custom volume/hour (enter custom rate conversion factor)
DEC.PT	<i>Decimal Point</i>	Set rate decimal point
OFF	<i>Off</i>	Turn rate display off
TOTAL	<i>Total</i>	Enter the Total menu
GRTOTAL	<i>Grand Total</i>	Enter the Grand Total menu
TOPDSP	<i>Top Display</i>	Display total or grand total on the top display
BOTDSP	<i>Bottom Display</i>	Display total or grand total on the bottom display
TAG	<i>Tag</i>	Enter the total or grand total tag
TOT U	<i>Total Unit</i>	Enter the total tag
GTOT U	<i>Grand Total Unit</i>	Enter the grand total unit
GAL	<i>Gallons</i>	Gallons
L	<i>Liters</i>	Liters
IGAL	<i>Imperial Gallons</i>	Imperial gallons
M3	<i>Meters3</i>	Meters cubed
BBL	<i>Barrels</i>	Barrels
BUSH	<i>Bushels</i>	Bushels
CUYD	<i>Cubic Yards</i>	Cubic yards
CUFT	<i>Cubic Feet</i>	Cubic feet
CUIN	<i>Cubic Inches</i>	Cubic inches
L1BBL	<i>Liquid Barrels</i>	Liquid barrels

Quick Start Guide

BBBL	<i>Beer Barrels</i>	Beer barrels
HECTL	<i>Hectoliters</i>	Hectoliters
CUST	<i>Custom Volume</i>	Enter custom total or grand total unit
X 1	<i>x 1</i>	No total multiplier
X 100 H	<i>x 100 (h Prefix)</i>	Total multiplier one-hundred (h prefix)
X 1000 K	<i>x 1000 (k Prefix)</i>	Total multiplier of one-thousand (k prefix)
X 1000 M	<i>x 10⁶ (M Prefix)</i>	Total multiplier of one-million (M prefix)
TOT-CF	<i>Total conversion factor</i>	Total conversion factor for custom units
TOTAL.DP	<i>Total decimal Point</i>	Set total decimal point
GT-CF	<i>Grand total conversion factor</i>	Grand total conversion factor for custom units
GRTOT.DP	<i>Grand total Decimal Point</i>	Set grand total decimal point
OFF	<i>Off</i>	Turn off total or grand total display
TANKSZ	<i>Tank Size</i>	Enter tank level indicator full value (in feet for Ft & In version)
T-TAG	<i>Tag Time</i>	Enter tag display time
T-UNITS	<i>Units Time</i>	Enter unit display time
T-SCAN	<i>Scan Time</i>	Enter scan cycle time (e.g. PV dwell time)
INPUT	<i>Input</i>	Enter Input type selection menu
ACTIVE	<i>Active</i>	Set active input type
NPN	<i>Npn</i>	Set NPN input type
PNP	<i>Pnp</i>	Set PNP input type
REED	<i>Reed</i>	Set reed switch input type
COIL	<i>Coil</i>	Set coil input type
ISO	<i>Isolated</i>	Set isolated input type
ACTLO	<i>Active Low</i>	Set active input type with low threshold
NPNLO	<i>NPN Low</i>	Set NPN input type with low threshold
PNPLO	<i>PNP Low</i>	Set PNP input type with low threshold
DISABLE	<i>Disable</i>	Disable pulse input features
KFACTOR	<i>K-Factor</i>	Enter the K-Factor menu
F-UNIT	<i>K-Factor Units</i>	Enter the K-Factor units
P/GAL	<i>Pulses/Gallon</i>	Set K-factor in pulses per gallon
P/L	<i>Pulses/Liter</i>	Set K-factor in pulses per liter
P/IGAL	<i>Pulses/Imp Gallon</i>	Set K-factor in pulses per imperial gallon
P/M3	<i>Pulses/Meter3</i>	Set K-factor in pulses per meter cubed
P/BBL	<i>Pulses/Barrel</i>	Set K-factor in pulses per barrel
P/BUSH	<i>Pulses/Bushel</i>	Set K-factor in pulses per bushel
P/CYD	<i>Pulses/Cubic Yard</i>	Set K-factor in pulses per cubic yard
P/CUFT	<i>Pulses/Cubic Feet</i>	Set K-factor in pulses per cubic foot
P/CUIN	<i>Pulses/Cubic Inch</i>	Set K-factor in pulses per cubic inch
P/LIBBL	<i>Pulses/Liquid Barrel</i>	Set K-factor in pulses per liquid barrel
P/BBBL	<i>Pulses/Beer Barrels</i>	Set K-factor in pulses per beer barrel
P/HECTL	<i>Pulses/Hectoliter</i>	Set K-factor in pulses per hectoliter
P/VOL	<i>Pulses/Custom</i>	Set K-factor custom unit

Quick Start Guide



DEC.PT	<i>K-Factor Decimal Point</i>	Set the number of decimal points in the K-factor
KFACTOR	<i>K-Factor Value</i>	Set the K-factor for custom units
COMM	<i>Communications</i>	Enter the Communications menu
SCAN ID	<i>Scanner ID</i>	Enter the scanner's Modbus ID
BAUD	<i>Baud Rate</i>	Select baud rate
TXDELAY	<i>Transmit Delay</i>	Enter the transmit delay
PARITY	<i>Parity</i>	Select parity mode
EVEN	<i>Even</i>	Even parity
ODD	<i>Odd</i>	Odd parity
NONE 1	<i>None, 1 Stop Bit</i>	No parity, 1 stop bit
NONE2	<i>None, 2 Stop Bits</i>	No parity, 2 stop bits

* Rate time base shows as minute for example only.

8. Troubleshooting

The rugged design and the user-friendly interface of the meter should make it unusual for the installer or operator to refer to this section of the manual. If the meter is not working as expected, refer to the recommendations below.

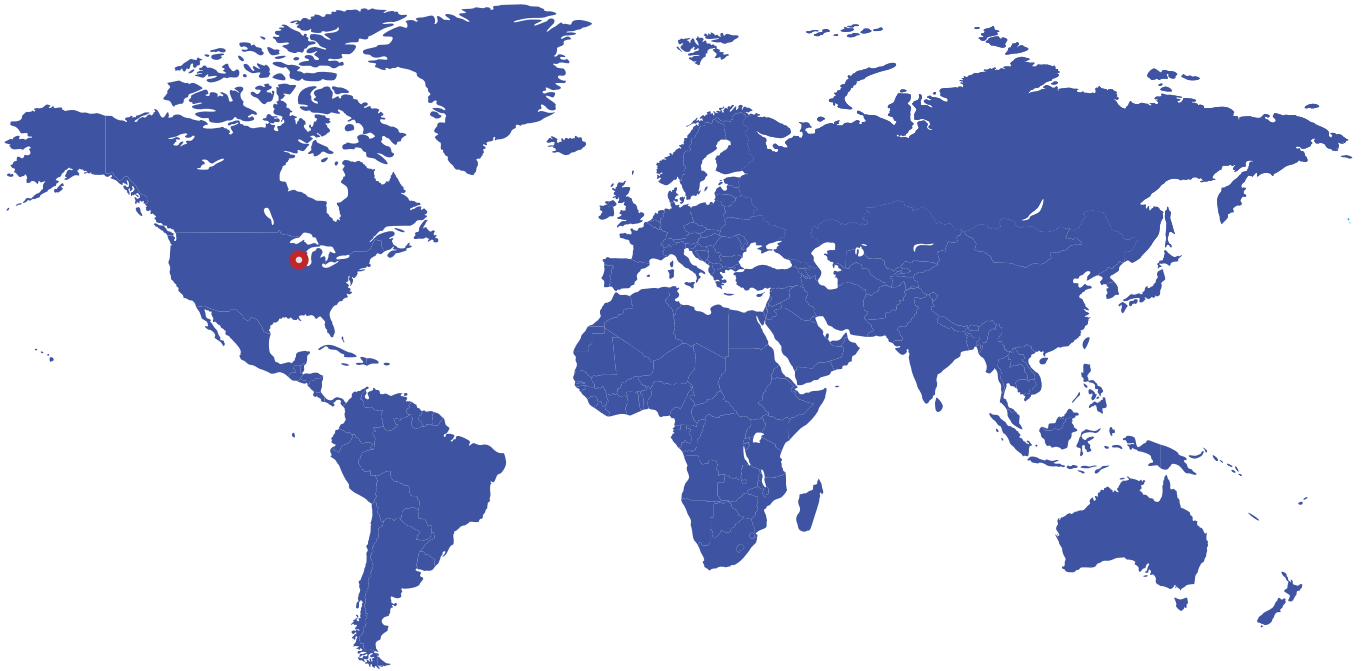
Troubleshooting Tips

Symptom	Check/Action
No display or faint display	Check power connection. Press and hold Menu key for 5 seconds to check for Standby mode. If "WAKEUP?" is displayed, press the Enter key to awaken the scanner from Standby mode.
Through-glass buttons do not respond	If  is displayed, hold Menu through-glass button to leave power save mode. If  is flashing, wait 60 seconds to leave mechanical pushbutton lockout mode. If the cover was recently tightly secured, you may need to wait up to 2 minutes for buttons to self-calibrate to the new cover position due to reflection of light off the polycarbonate window. Verify Through-glass Button switch on display module is in ON position. Sunlight can interfere with the sensors. It is recommended to shield the window while operating the buttons by standing so as to block direct sunlight.
Scanner channel display NONE	Verify that the polling parameters (slave address, register, etc.) are correct. If the channel is a math channel CV, verify the chosen math function does not include any NONE selections or un-programmed Modbus PVs.
Long time between channel value updates	Verify all channels are communicating. Errors, combined with long timeouts and high allowable number of failures when polling Modbus devices, will combine to significantly delay the polling speed. Reduce the number of allowable timeout errors to check that communications are successful, and if there are errors, reduce the timeout if possible.
Rate display unsteady	Increase low gate setting in Advanced menu.
Scanner displays span error message during scaling	Verify minimum input span requirements
Scanner flashes maximum display	Check slave device registers are valid. Check math channels are not exceeding maximum possible display. Check input signal is within scaled range of 99999.

Note: Certain sequences of events can cause unexpected results. To solve these issues, it is best to start fresh from factory defaults and map changes ahead of time, rather than at random.



Technology Solutions



796 Tek Drive
Crystal Lake, IL 60014
USA

Tel: +1 847 857 6076

Fax: +1 847 655 6147

Email: tektrol@tek-trol.com

www.tek-trol.com

Tek-LCD 7804A