# Totalcomp Smart Remote Display

## Installation Manual

### I. DESCRIPTION

The Totalcomp Smart Remote Display (TSR) is an intelligent remote display device for use with weighing indicators which transmit a continuous RS-232 or 20 mA current-loop serial signal with asynchrous ASCII data format.

The TSR features a "Learn" function with automatic serial data communications line characteristic detection, storage, and recall for ease of installation and setup. The "Learn" feature allows the TSR to capture the communication parameters and message formats used by the indicator. These parameters and formats are stored in the TSR's memory and recalled on each power-up. The "Learn" Function is protected under US Patent Number 6,049,888.

### II. INSTALLATION

Install the TSR by first securely mounting the enclosure, then connecting line power, and then connecting the serial signal cable from the indicator's terminals.

**TSR-0.4L**

1. The 1/8 DIN plastic enclosure is panel mounted using the enclosed hardware. The panel mount cutout size is 45 mm by 92 mm.
2. A 120 VAC power cord should be attached to the two position screw barrier terminal block on the back of the enclosure.
3. The two-conductor serial signal cable should be securely connected to the plug-in connector by tightening the two connector screws

**TSR-1L**

1. The 1/2 DIN desktop/panel mount enclosure can be used on a desktop by attaching a self adhesive rubber foot to each corner of the bottom of the enclosure (4 rubber feet are provided in a plastic bag). The enclosure can also be panel mounted using the hardware attached to the enclosure. The panel mount cutout size is 92 mm x 186 mm.
2. A grounded six foot 120 VAC power cord is attached to the back of the display. Plug the cord into a three-wire grounded outlet.
3. The two-conductor serial signal cable should be securely connected to the two-position screw terminal on the back of the enclosure

**TSR-1.5M, -4M, -6M, -2L, -4L**

1. Attach the TSR securely to a wall, post, table top, or other surface using appropriate screws or bolts installed through the six 1/4" diameter holes (four holes on the TSR-1.5M) in the mounting bracket (screws are not provided).
2. The display is equipped with a six foot 120 VAC grounded line cord which plugs into a three-wire grounded outlet. The line cord may be removed and replaced with another 120 VAC power cord.
3. The two-conductor serial signal cable should be fed through its cable strain relief in the enclosure lower wall and securely connected to the plug-in connector located on the printed circuit board inside the enclosure by tightening the two connector screws. If the signal cable does not fit snugly inside the cable strain relief in the enclosure wall, wrap the cable with electrician's tape to assure that no dust or water will enter the enclosure through the strain relief.

### III. SETUP

The indicator serial output must be set for **continuous** data transmission, either RS-232 or 20 mA current-loop, active or passive. Any line speed from 300 to 9600 baud is acceptable for RS-232 signals; 20 mA current-loop signals should transmit at speeds of 2400 baud or less

After connecting power and the serial communications line to the display, apply power to the display. The display should power up with: "HELLO".

With a continuous serial signal being transmitted from the indicator, press the LEARN BUTTON to initiate the "Learn" sequence. The LEARN BUTTON is a momentary contact push button located on the front panel of the TSR-0.4L and TSR-1L displays and on the internal circuit board of all other displays. The TSR goes through a pre-programmed sequence to analyze received data to determine the serial data communications line characteristics. The progress of the "Learn" sequence can be observed by the messages displayed during the learning process.

1. Determination of RS-232 or 20 mA signal and line polarity. The display sequences through "L1", "L1-", "L2", "L2-" until the signal type and polarity is detected. The sequence then reports the transmission mode: "L1" is RS-232 positive polarity, "L1-" is RS-232 negative polarity, "L2" is 20 mA active, "L2-" is 20 mA passive.

*Error Condition* - If the "L1", "L1-", "L2", "L2-" sequence continues to be displayed, the indicator is not continuously transmitting or the wiring is not correct. Turn off power, check the wiring, determine whether the indicator is continuously transmitting, and restart.

2. Determination of the line speed. When the speed is determined, it is displayed in units of 100 baud (9600 baud is displayed as 96, 300 baud as 3, etc.).

*Error Condition* - If the TSR fails to display a speed and remains blank for more that 50 characters, then traffic on the line is likely outside its speed range. Turn off power, check wiring, check indicator transmission speed, and restart.

3. Determination of transmission characteristics. The TSR analyzes incoming data to learn parity, data bits, and stop bits. Approximately 50 characters are required for this step. At the end of the sequence, a display with a first character "P" displays the parity as the second character ("E" for Even Parity, "O" for Odd Parity, "-" for None), a blank as the third character, the number of data bits as the fourth character, a blank as the fifth character, and the number of stop bits as the sixth character. Note that the displayed characteristics may differ from the indicator characteristics as there are several characteristic combinations which provide equivalent results.

*Error Condition* - If the TSR displays "HELLO" and stops, push the learn button again. If the TSR again displays "HELLO" and stops, check that the transmitted data is a standard serial ASCII format.

4. Determination of transmission data format. The TSR examines data for control characters such as Line Feed and Carriage Return to determine the display operating mode. At the end of the sequence, the display returns to "HELLO" as the display memory is updated. When memory is updated, the "Learn" sequence is complete, and the transmitted data is displayed.

*Error Condition* - If the TSR displays "HELLO" and stops, contact the Totalcomp service technician with a description of your transmitted signal format.

The transmission characteristics are retained in non-volatile memory until the LEARN BUTTON is pushed to initiate another "Learn" sequence. On power-up, the stored characteristics are retrieved, and the TSR begins to display data.

## IV. SERVICE

If a display appears to be defective, please contact the Totalcomp Service Department with a description of the problem.



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