

transcell®



MODEL TI-1680

Digital Weight Indicator

Manual

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THIS EQUIPMENT CONTAINS NO USER SERVICEABLE COMPONENTS.

- Servicing of the equipment must only be carried out by trained and authorized personnel.
- Use only the internal AC adapter supplied with the indicator. Other power supplies may cause damage.



Routine maintenance

- Harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions should not be used, especially on the display window.
- The outside of the product may be sprayed with water as needed.

This manual covers the following product:

Model	Display	Enclosure	Power Source
TI-1680	LED	St. Steel	100-240 VAC, 50-60 Hz 0.8A

BASIC OPERATION

Getting Started

Simply plug the unit into a suitable AC wall outlet (100 – 240 VAC). After a brief initialization period, the scale will revert to a zero (“0”) weight display.

Your scale is now ready for operation!

Operation – TI-1680

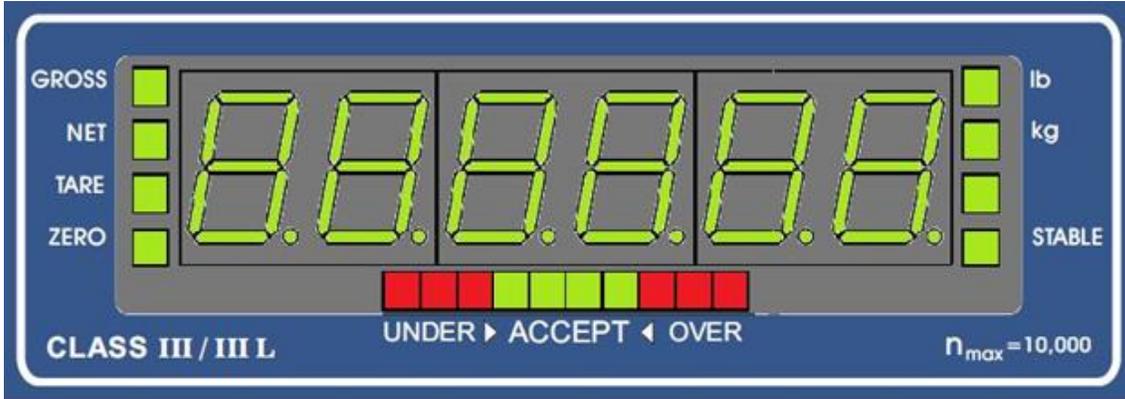
Before weighing it is necessary to check if the scale is unloaded and indicating zero weight in the desired unit of measure, for example lb for pounds.

If the indicator is not displaying the desired unit of measure, press the UNITS key a few times until it is indicated, e.g., lb for pounds, kg for kilograms, etc.

The indicator features an automatic zero correction meaning that small deviations will be zeroed automatically. If the indicator does not automatically determine the zero point, press the ZERO key once briefly.

DISPLAY & KEYPAD DETAILS

This model utilizes a 6-digit LED (Light Emitting Diode) display, an LED bar graph and eight (8) annunciators.



Annunciator	Display Indication
GROSS	The indicator is in Gross Weight mode.
NET	The indicator is in Net Weight mode.
TARE	A tare weight has been established in the system.
ZERO	Displays when the reading is at "Center of Zero".
lb	The displayed weight reading is in pounds (lb).
kg	The displayed weight reading is in kilograms (kg).
	The displayed reading is in pieces (piece counting). Also used to indicate that weight hold / peak hold mode is active.
STABLE	Displays whenever the indicator reading is not in motion.
UNDER	The weight of the item on the platform is below the target weight. (Checkweigher)
ACCEPT	The weight of the item on the platform is within the target weight range. (Checkweigher)
OVER	The weight of the item on the platform is above the target weight. (Checkweigher)

When not in Checkweigher mode, the LED bar graph shows the status of each one of the four digital outputs (O1 – O4):



The keypad comprises a total of twenty-four (24) keys: twelve (12) function keys and twelve (12) numeric keypad keys.



“Function Keys”

Key	Keypad Function
UNITS	Cycles the displayed weight indication among pounds (lb), kilograms (kg), and a selectable third unit. This key can be disabled.
ZERO	Zeroes the weight display reading, provided certain conditions are met.
MODE	Cycles the displayed weight indication among Gross weight, Net Weight, and Tare Weight.
TARE	Establishes a system Tare, provided certain conditions are met.
PRINT	Sends the displayed weight reading to the serial communication port, provided certain conditions are met.
C/CE	Exits current function. Can also be used as a backspace key during numeric entry.
F1	Main function key for a specification application, e.g., piece counting or peak hold
SET POINT	Used to enter the set points (target weights) into the system.
UNDER	Used to enter the minimum target weight for Checkweigher mode.
OVER	Used to enter the maximum target weight for Checkweigher mode.
ID	Used to enter an ID number into the system.
ENTER	Used to enter numeric data into the system.

Certain keys may be password protected. See Advanced Operation section for more details.

Conditional keypad functions:

TARE (Push button tare only)

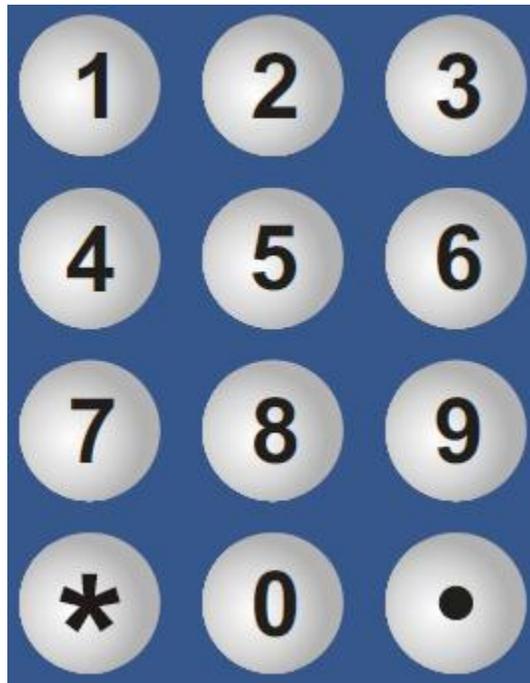
Indicator reading must not be in motion or displaying an error message. Gross weight must be greater than zero.

ZERO

Indicator reading must not be in motion or displaying an error message. Operation may be restricted by the Zero Reset Range setting (see F4 menu parameter).

PRINT

Indicator reading must not be in motion or displaying an error message.



“Numeric Keys”

Key	Keypad Function
0 – 9	Self-explanatory ... used when numeric data entry is required.
*	Temporarily display system information for a specific application.
.	Inserts a decimal point during numeric entry.

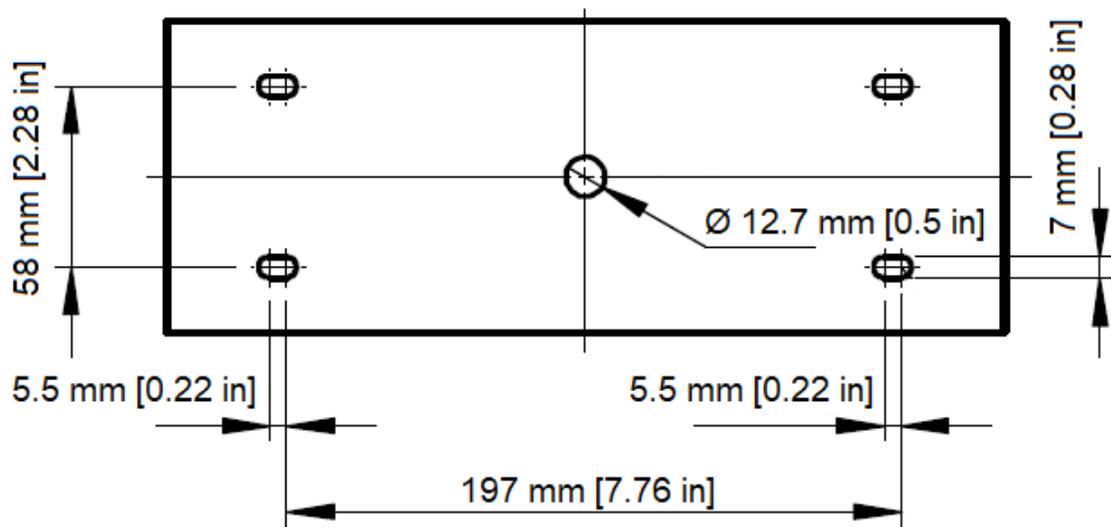
INSTALLATION & OVERVIEW

Remember that the installer is ultimately responsible to assure that an installation will be and remain safe and operable under the specific conditions encountered.

The indicator must be properly configured and calibrated prior to use.

Installation of TI-1680 digital indicator

Find a suitable location for the indicator and use this handy guide to mount the included bracket to a wall or table:



CONNECTIONS

The rear cover must be removed to make the appropriate connections to the weighing platform and peripheral devices.

Caution! Disconnect the indicator from its power source prior to removing rear cover.

To remove the rear cover, simply remove the six (6) acorn nuts that secure it to the enclosure and set it aside.

Caution! The rear cover contains components which are wired to the main board.

Route all cables through the PGA9 cord grips (cable entry glands). All terminal blocks are spring loaded and are located on the main circuit board.

At each terminal, first strip away some insulation, and then push down on the orange release tab with a small screwdriver. Insert the wire into the terminal and then allow the orange release tab to spring back into its original position. For stranded wires, you may find that crimping on a ferrule will improve connection integrity, as will tinning it with solder.

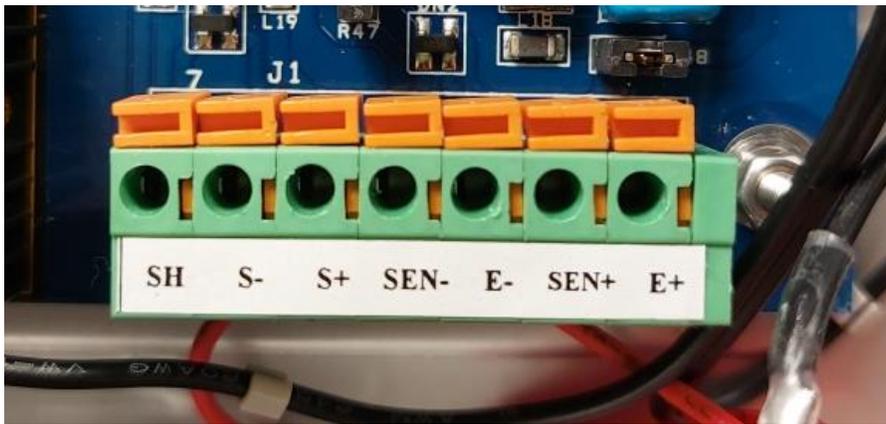
When all connections have been made, tighten the cord grips, re-install the rear cover, and then tighten the acorn nuts.

Load Cell Connections

Connect your shielded load cell cable to the load cell terminal block using the table below.

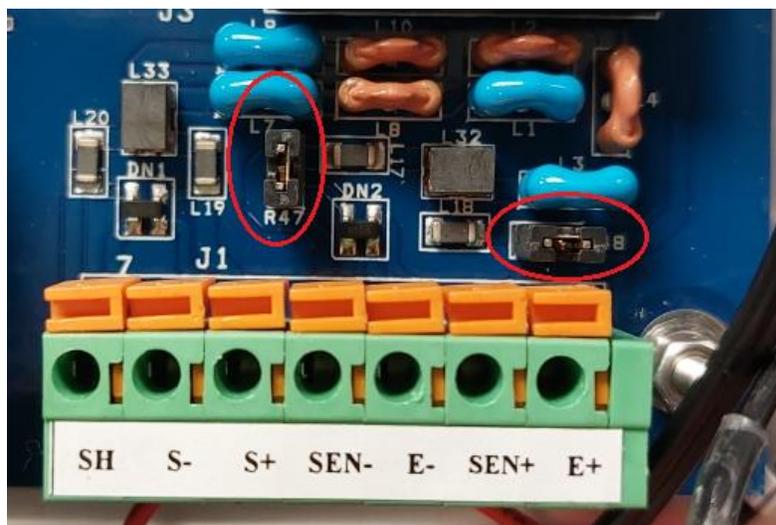
Load Cell Terminal Block (J1)

Marking	Function	Marking	Function
SH	Shield	E-	- Excitation
S-	- Signal	SEN+	+ Sense
S+	+ Signal	E+	+ Excitation
SEN-	- Sense		



Load Cell Terminal Block

From the Factory, the indicator is configured for 4-wire load cells. If you wish to utilize Sense wires, then you must remove the jumper blocks from R47 and R48, which are located adjacent to the Load Cell Terminal Block (J1), circled in red below:

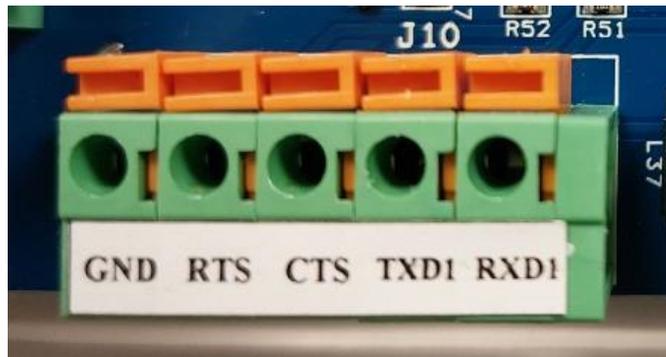


RS-232 Connections (COM1)

Connect your RS-232 serial cable to the COM1 / RS-232 terminal block using the table below.

COM1 / RS-232 Terminal Block (J10)

Markings	Function
GND	Signal Ground
RTS	Request to Send
CTS	Clear to Send
TxD1	Transmit Data
RxD1	Receive Data



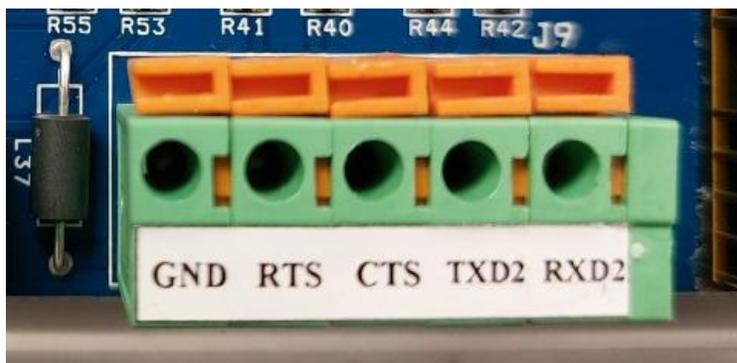
COM1 / RS-232 Terminal Block

RS-232 Connections (COM2)

Connect your RS-232 serial cable to the COM2 / RS-232 terminal block using the table below.

COM2 / RS-232 Terminal Block (J9)

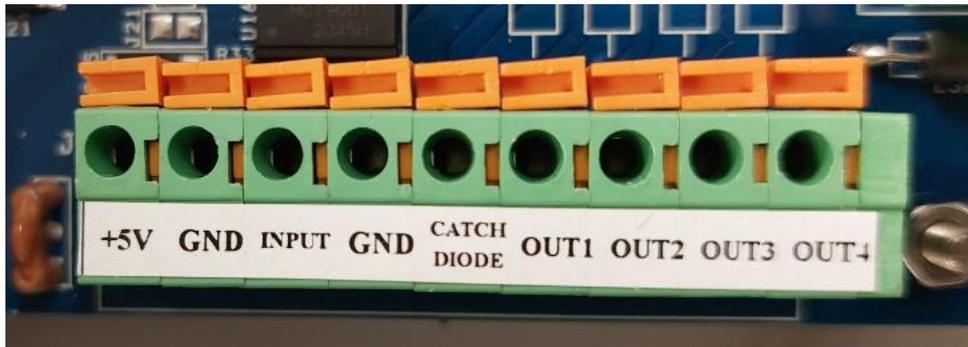
Markings	Function
GND	Signal Ground
RTS	Request to Send
CTS	Clear to Send
TxD2	Transmit Data
RxD2	Receive Data



COM2 / RS-232 Terminal Block

Digital I/O Connections

Connect your control cables to the Digital I/O terminal block (J4) using the diagrams below.



Digital I/O Terminal Block

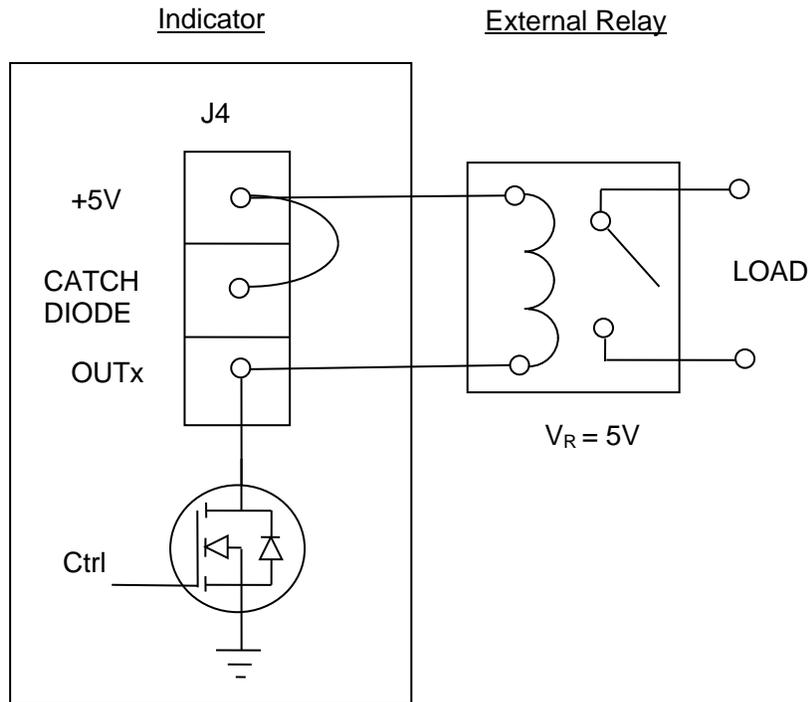
The outputs (**OUT1 – OUT 4**) can be wired to external relays (not included) to switch inductive loads on and off. The single remote input (**INPUT**) is triggered by simple contact closure.

There are two ways to drive the external relay(s):

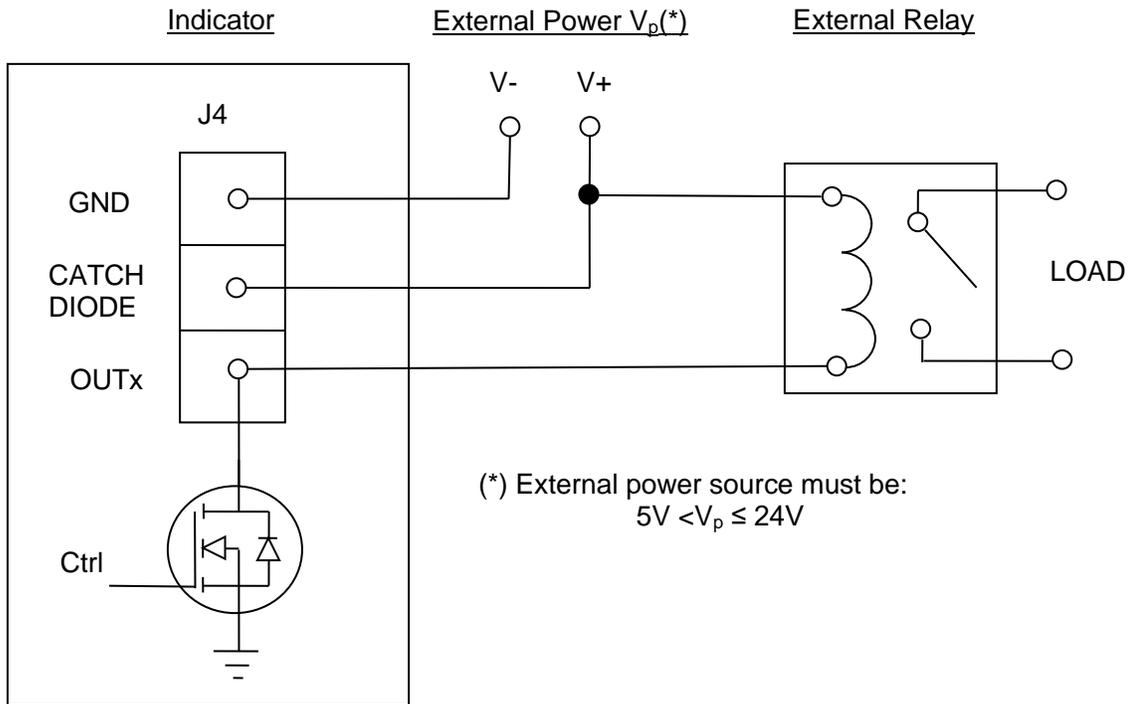
1. Using the internal power supply from the indicator
2. Using an external power supply (not included)

Internal Power Supply

Use the **+5V** terminal to drive the external relay. This terminal can supply up to 500 mA of current. The **CATCHDIODE** connection is not required when using solid-state relays.



External Power Supply



The CATCHDIODE connection is not required when using solid state relays.

Power Connections

The TI-1680 indicator ships with a pre-installed AC line cord. It has been pre-wired to Terminal Block J7 at the factory. Simply plug the unit into a standard wall outlet.

INDICATOR CONFIGURATION

Configuration Menus

The TI-1680 contains three (3) menus to configure the indicator:

Setup (“F”) Menu – Configures all scale-related parameters including calibration procedures.

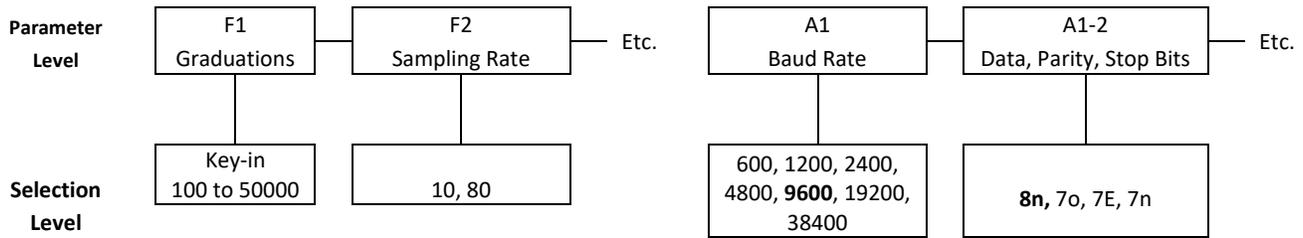
User (“A”) Menu – Configures the serial communication ports and enables some user options

Batching (“B”) Menu – Configures the I/O for process control and checkweigher functions.

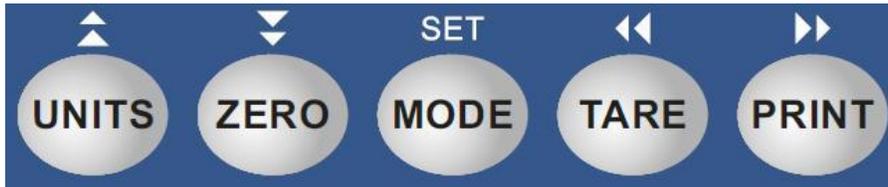
The configuration menus are laid out in the following vertical arrangement:

- Parameter level
- Selection level (or function level, e.g., span calibration)

Please review the following chart to get a feel for how to navigate among the various menus and parameters.



Use the directional keys shown below to move around in the Configuration Menus.



Entering the Setup (“F”) Configuration Menu

To access this menu, please follow these directions:

1. Unplug the indicator from the AC wall outlet.
2. Locate the slide switch on the rear cover and move it to the opposite position.
NOTE: A metal plate conceals the slide switch; remove the two drilled-head fasteners and cover plate to access the slide switch:



3. Plug in the indicator to the AC wall outlet. The display shows "PASS_".
4. Key-in the password (1397) and then press Enter key. The display shows "F 1".
5. Move from one "F" menu parameter to the next by using the TARE (left) or PRINT (right) keys. For example, to go from F1 to F2, press the PRINT key. To go from F2 back to F1, press the TARE key.
6. Once you have arrived at the proper "F" menu parameter, e.g., "F1", press the ZERO (down) key once to arrive at the selection level. The scale displays the current parameter setting.
7. If there is a selection list, scroll thru the available parameter settings, use the TARE (left) or PRINT (right) keys. Otherwise, use the front panel numeric keys to key-in the new value.
8. Once the setting you want is displayed on the screen, press the MODE (set) key to save this value and revert up to the parameter level, e.g., "F1".

Setup ("F") Menu Descriptions

This section provides more detailed descriptions of the selections found in the Setup Menu Chart. Factory-set defaults are shown in **bold** with a checkmark; (✓).

CODE/NAME	DESCRIPTION	SELECTION LIST
F1 Graduations	Sets the number of full-scale graduations, i.e., max capacity ÷ display division (d). Pressing the ZERO key to scroll down one level begins the sequence.	Key-in 100 - 100000 10000 ✓
F2 Sampling Rate	Sets the sampling rate in Hertz (measurements per second). Use 10 Hz for most applications or use 80 Hz for extra fast response time.	10 ✓ 80
F3 Zero Track Band	Selects the range within which the scale will automatically zero. Selections are in display divisions per second (d/s).	0 (Off) 0.5 ✓ 1 3 5
F4 Zero Range	Selects the range within which the scale may be zeroed. Selections are expressed as a percentage of full-scale capacity.	100 ✓ 1.9 2 20
F5 Motion Band	Sets the level at which motion is detected. If motion is not detected, the scale can process a Print or Zero command. Maximum value varies depending on local regulations. Expressed as scale divisions per second (d/s). Pressing the ZERO key to scroll down one level begins the sequence.	Key-in 0.0 – 32.0 1.0 ✓
F6 Digital Filter	Averages weight readings to produce higher stability. Choose the speed that works best for your application. "FASt" = Fast "nnEd" = Medium "SLo" = Slow	FASt neEd ✓ SLo
F7 Overload Limit	Selects the desired formula which determines the point at which the indicator shows the overload message. All selections are based on the primary unit selected in F8. "FS" = Full scale capacity.	FS FS + 2% ✓ FS + 5% FS + 1d FS + 9d

CODE/NAME	DESCRIPTION	SELECTION LIST
F8 Calib. Unit	Selects the primary base unit to used in the calibration process and the default unit for normal operation. "1" = primary unit is lb "2" = primary unit is in kg	1 ✓ 2
F9 Display Divisions	Sets the interval value. Use together with F10.	1 ✓ 2 5
F10 Decimal Point	Sets the decimal point value. Use together with F9.	0 ✓ 00 0.0000 0.000 0.00 0.0
F11 Custom Unit Multiplier	Sets the multiplier for the custom unit, or the conversion factor that you would divide the calibration unit by to obtain the custom unit of weight. Pressing the ZERO key to scroll down one level begins the sequence.	Key-in 0.0001 - 1000 1.0 ✓
F12 Power On Zero (IZSM)	Allows you to enable or disable power-on zero (IZSM). The maximum range is 20% of FS. "0" = Disable IZSM "1" = Enable IZSM	0 ✓ 1
F13 Analog Output Function	Selects the function of the optional active analog output in Tare mode. "0" = Output NET weight "1" = Output GROSS weight	0 ✓ 1
F14 Units Key	Selects function of the Units key. "0" = Disabled "1" = Enabled	0 1 ✓
F15 Third unit selection	Allows you to select a third unit of measure 0" = No Third Unit, "1" = Grams, "2" = oz, "3" = custom unit	0 ✓ 1 2 3
F16 Zero Calibration	Places indicator into live zero-calibration mode. Scrolling down with the ZERO key one level begins the procedure.	Press ZERO key to begin sequence
F17 Span Calibration	Places indicator into live span calibration mode. Scrolling down with the ZERO key one level begins the procedure.	Press ZERO key to begin sequence
F18 View Calibration	Actuates the function that allows you to view both the zero and span calibration value. Scrolling down with the ZERO key one level begins the procedure.	Press ZERO key to begin sequence
F19 Key-in Zero	Allows you to key-in known zero calibration value. Scrolling down with the ZERO key one level begins the procedure.	Press ZERO key to begin sequence
F20 Key-in Span	Allows you to key-in a known span calibration value. Scrolling down with the ZERO key one level begins the procedure.	Press ZERO key to begin sequence
F21 Factory Reset (pounds)	This sub-menu will reset all parameters in the "F" and "A" menu to the default settings. It will not overwrite any previously saved calibration data. USE WITH CAUTION!	Press the ZERO key twice to execute

CODE/NAME	DESCRIPTION	SELECTION LIST
F22 Factory Reset (kilos)	This sub-menu will reset all parameters in the "F" and "A" menu to the default settings. It will not overwrite any previously saved calibration data. USE WITH CAUTION!	Press the ZERO key twice to execute
F23 Fine Tune 4-20 mA	Fine-tune the optional analog output board. Pressing the ZERO key to scroll down one level begins the sequence.	Press the ZERO key to begin sequence
F24 Analog Output Function	Selects the function of the optional active analog output. "0" = 4-20 mA "1" = 0-10V	0 ✓ 1
F30 Special Appli- cation	Enable a special application function. "0" = None (Gross/Net), "1" = Accumulation, "2" = Remote Display, "3" = Piece Count, "5" = Hold, "6" = Checkweigher, "7" = Batching, "8" Weigh-In/Weigh-Out	0 ✓ 1 2 3 5 6 7 8
F31 Gross Zero Band	Selects the range within which the scale will automatically clear the tare and switch to Gross mode. Note that the scale must be in standstill. Selections are in display divisions (d). Scrolling down with the ZERO key one level begins the procedure. "0" = Disabled	Key-in 0 - 10 0 ✓
F32 Center of Zero Band	Selects the range around gross zero within which the scale will display the Center of Zero annunciator. Selections are in display divisions (d).	0.25 ✓ 0.5
F34 Auto Print Min. Weight	Selects the minimum weight at which the auto print function will work if enabled. Selections are in display divisions (d). Scrolling down with the ZERO key one level begins the procedure. "0" = Disabled	Key-in 0 - 100 1 ✓
F35 Hold Mode	Selects the specific Hold Mode. F30 must be set to "5". "1" = Automatic Hold, "2" = Manual Hold, "3" = Peak Hold	1 2 3 ✓
F36 Percentage Hold Weight	Selects the percentage (of the displayed held value) of weight change before the scale automatically unlocks the held weight and relocks onto the new weight. Use together with F35.	Key-in 0 - 100 % 10 ✓
F37 Min. Hold Weight	Sets the minimum weight that can be captured and held; expressed in display divisions (d). Use together with F35.	1, 2, 5 ✓, 10, 20, 50, 100, 200, 500, 1000
F38 Permanent Tare	Allows a TARE to be stored with an ID number. Used for the Truck Weigh In/Weigh Out application. "0" = Disable "1" = Enable	0 1 ✓

Entering the User (“A”) Menu

To access this menu, please follow these directions:

1. Unplug the indicator from the AC wall outlet.
2. Locate the slide switch on the rear cover and move it to the opposite position.
NOTE: A metal plate conceals the slide switch; remove the two drilled-head fasteners and cover plate to access the slide switch:



3. Plug in the indicator to the AC wall outlet. The display shows “PASS_”.
4. Key-in the password (1793) and then press Enter key. The display shows “A 1”.
5. Move from one “A” menu parameter to the next by using the TARE (left) or PRINT (right) keys. For example, to go from A1 to A2, press the PRINT key. To go from A2 back to A1, press the TARE key.
6. Once you have arrived at the proper “A” menu parameter, e.g., “A1”, press the ZERO (down) key once to arrive at the selection level. The scale displays the current parameter setting.
7. If there is a selection list, scroll thru the available parameter settings, use the TARE (left) or PRINT (right) keys. Otherwise, use the front panel numeric keys to key-in the new value.
8. Once the setting you want is displayed on the screen, press the MODE (set) key to save this value and revert up to the parameter level, e.g., “A1”.

User (“A”) Menu Descriptions

This section provides more detailed descriptions of the selections found in the User Menu Chart. Factory-set defaults are shown in **bold** with a checkmark; (✓).

CODE/NAME	DESCRIPTION	SELECTION LIST
A1 Baud Rate	Selects the baud rate for data transmission through the serial ports. This menu selection has two sub-menus: “A1U1” (COM1) and “A1U2” (COM2), both with identical selections.	600, 1200, 2400, 4800, 9600 ✓, 19200, 38400
A2 Data Bits, Parity and Stop Bits	Selects the number of data bits and parity of serial transmission. This menu selection has two sub-menus: “A2U1” (COM1) and “A2U2” (COM2), both with identical selections. "8 n" = 8 data bits with no parity bit and one stop bit "7 o" = 7 data bits with odd parity bit and one stop bit "7 E" = 7 data bits with even parity bit and one stop bit "7 n" = 7 data bits with no parity bit and two stop bits	8 n ✓ 7 o 7 E 7 n

CODE/NAME	DESCRIPTION	SELECTION LIST
A14 Edit Output String	Edit the output string. This menu selection has two sub-menus: "A14U1" (COM1) and "A14U2" (COM2), both with identical selections. Pressing the ZERO key to scroll down one level begins the sequence.	Press ZERO key to begin sequence
A15 MP-20 Print Header	Selects the header mode for the MP-20 printer. This menu selection has two sub-menus: "A15U1" (COM1) and "A15U2" (COM2), both with identical selections. "0" = Do NOT Print Header "1" = Print Header	0 √ 1
A16 MP-20 Auto Label Feed	Selects the automatic label feed mode for the MP-20 printer. This menu selection has two sub-menus: "A16U1" (COM1) and "A16U2" (COM2), both with identical selections. "0" = Disable "1" = Enable	0 √ 1
A17 Set Point Password	Allows you to enable or disable the password prompt when entering new Set Point values, Over values and Under values. See B5. "0" = Disable the prompt "1" = Enable the prompt	0 √ 1
A18 Checkweigher Mode	Selects the Checkweigher Mode. "0" = Coarse "1" = Fine	0 1 √

Setting system time (A6)

NOTE: For versions 2.5 and higher, it is no longer necessary to enter the User Menu to set the system time. Simply press and hold the ENTER key while powering up the unit and then follow the directions as written below.

The system time is displayed and set in military (24-hr) format or hh.mm.ss. For example, 09.00.00 is 9:00 AM and 17.00.00 is 5:00 PM.

1. While in the User ("A") Menu, scroll to "**A6**", and then scroll down once using the ZERO (down) key. The screen displays the current system time.
2. ***If the indicator is displaying the correct time, simply press the C/CE key to exit.***
3. Otherwise, press the MODE key to reset the display to zeroes (00.00.00).
4. Use the front panel numeric keys to key-in the new time and then press ENTER. If you make a mistake, use the C/CE key as a backspace key. The display will revert up to "**A6**".

Setting system date (A7)

NOTE: For versions 2.5 and higher, it is no longer necessary to enter the User Menu to set the system date. Simply press and hold the ENTER key while powering up the unit and then follow the directions as written below.

The system date is displayed and set in month/day/year format or mm.dd.yy. For example, 01.07.20 is January 7, 2020, and 11.30.20 is November 30, 2020.

1. While in the User ("A") Menu, scroll to "A7", and then scroll down once using the ZERO (down) key. The screen displays the current system date.
2. ***If the indicator is displaying the correct date, simply press the C/CE key to exit.***
3. Otherwise, press the MODE key to reset the display to zeroes (00.00.00).
4. Use the front panel numeric keys to key-in the new date and then press ENTER. If you make a mistake, use the C/CE key as a backspace key. The display will show revert up to "A7".

Diagnostics (A12)

Here is a brief description of each diagnostic test:

A12U1 Display Test – Lights up all display segments and counts down from 666666 to 11111. Test ends automatically when complete.

A12U2 ADC Test – Shows internal A/D converter counts – useful for troubleshooting weighing issues. End test manually by pressing the MODE (set) key. The ZERO key works in this test mode.

A12U3 Input Test – Displays the input logic of the Input terminal. "0" means input pin is shorted to ground; "1" means input pin is open. End test manually by pressing the MODE (Set) key.

A12U4 Output Test – Sets all four Output terminals to '0' for a few seconds, followed by '1' for a few seconds. Test repeats until ended manually by pressing the MODE (Set) key.

A12U5 Serial Test – Transmits a data string continuously out of both serial ports: "TEST1" on COM1 and "TEST2" on COM2. End test manually by pressing the MODE (set) key.

A12U6 Keyboard Test – Displays a keycode for each key pressed on the keypad. See Table below. End test manually by pressing the MODE (set) key.

Key	Keycode	Key	Keycode
UNITS	UnIt5	0	0
ZERO	2Ero	1	1
TARE	tArE	2	2
PRINT	PrInt	3	3
C/CE	CE	4	4
F1	F1	5	5
Set Point	SP	6	6
Under	UndEr	7	7
Over	ovEr	8	8
ID	Id	9	9
*	StAr	Enter	EntEr
Dec. Pt.	dP	Mode	SEt

Editing the output string (A14)

The indicator contains one customizable output string. Output strings are created by assigning a hexadecimal value to a decimal address. The addresses start at 00 and end at 94. The HEX value can be a printable ASCII character, or a manufacturer defined print command. All output strings must end with an End of String (EOS) character.

The programming format is AA__vv where AA is the address (00 to 94) and vv is the programming value.

1. While in the User Menu mode, scroll to "**A 14**", and then scroll down once using the ZERO key to the A14 U1 level.
2. Use the right arrow key (PRINT) to select the A 14 U1 or A14 U2 menu.
3. At the A14 Ux screen, scroll down once using the ZERO key to enter the edit output string menu. The display will show the programming format, e.g., 00 49 where "00" is address 0 and "49" is the current programming value in hex.
4. Use the right arrow key (PRINT) to increase the address by one. Use the left arrow key (TARE) to decrease the address by one.
5. After selecting the address you wish to change, press the MODE key. The programming value will start flashing. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO key. Pressing the PRINT key or the TARE key will change the position of the flashing digit.
6. After setting the exact programming value, press the MODE key to save. The indicator will automatically increment to the next address.
7. Repeat Steps 4 through 6 until the entire output string has been programmed.
8. Press the UNITS key to exit A14 menu mode.

You can find more information about this function in the Serial Port Information section of the manual.

Entering the Batching ("B") Menu

To access this menu, please follow these directions:

1. Unplug the indicator from the AC wall outlet.
2. Locate the slide switch on the rear cover and move it to the opposite position.
NOTE: A metal plate conceals the slide switch; remove the two drilled-head fasteners and cover plate to access the slide switch:



3. Plug in the indicator to the AC wall outlet. The display shows "PASS_".
4. Key-in the password (1234) and then press Enter key. The display shows "b 1".
5. Move from one "B" menu parameter to the next by using the TARE (left) or PRINT (right) keys. For example, to go from B1 to B2, press the PRINT key. To go from B2 back to B1, press the TARE key.
6. Once you have arrived at the proper "B" menu parameter, e.g., "B1", press the ZERO (down) key once to arrive at the selection level. The scale displays the current parameter setting.
7. If there is a selection list, scroll thru the available parameter settings, use the TARE (left) or PRINT (right) keys. Otherwise, use the front panel numeric keys to key-in the new value.

8. Once the setting you want is displayed on the screen, press the MODE (set) key to save this value and revert up to the parameter level, e.g., "B1".

Batching ("B") Menu Descriptions

This section provides more detailed descriptions of the selections found in the Batching Menu Chart. Factory-set defaults are shown in **bold** with a checkmark; (√).

CODE/NAME	DESCRIPTION	SELECTION LIST
B1 Input Function	Assigns a keypad function to the input terminal: J4:3. "0" = Print, "1" = Zero, "2" = Tare, "3" = Units, "4" = F1	0 √ 1, 2, 3, 4
B2 Input Logic	Assigns the "active" logic level to the input terminal: J4:3. "0" = Low logic, "1" = High logic	0 √ 1
B3 Batch Mode	Selects the specific Batch Mode. F30 must be set to "7". "0" = Manual, "1" = Automatic, "2" = Filling, "3" = Continuous	0 √ 1, 2, 3
B4 Output Logic	Assigns the "active" logic level to each of the four output terminals. This menu selection has four sub-menus: "B4U1" (OUT1), B4U2" (OUT2), B4U3" (OUT3), and B4U4" (OUT4), all with identical selections. "0" = Low logic, "1" = High logic	0 1 √
B5 Front Panel Access Pass- word	Assign the password to allow front panel access. Front panel access may be password protected. See A17.	Key-in 0 - 999999 336699 √
B6 Cutoff Delay	Assign a cutoff delay (in seconds) to each of the four output terminals. This is used for in-flight compensation. This menu selection has four sub-menus: "B6U1" (OUT1), B6U2" (OUT2), B6U3" (OUT3), and B6U4" (OUT4), all with identical selections.	Key-in 0.0 – 10.0 0 √

INDICATOR CALIBRATION

Calibration Overview

You will be calibrating an actual load sensor to the indicator using live test loads. You can have up to three span calibration points, denoted as C1 through C3. The value of each subsequent calibration point should be higher than the last, e.g., the C2 value should be greater than the C1 value, etc.

The calibration procedure comprises two steps: **zero** calibration (F16) and **span** calibration (F17). We recommend doing **zero** calibration (F16) first.

Zero Calibration Instructions (F16)

1. While in the Setup mode, scroll to "**F 16**", and then scroll down once using the ZERO (down) key. The display will momentarily show "**2Ero**" followed by a value. This value is the internal A/D count and can prove useful when trying to troubleshoot setup problems.
2. Assure a no-load condition on the scale platform and then press the ZERO key again to zero the display reading. Do NOT skip this step!
3. Press the MODE (set) key to save the zero-point value. The display will show "**SEt**" and "**EndC0**" momentarily, and then revert up to F16.

Span Calibration Instructions (F17)

1. While in the Setup mode, scroll to "**F 17**", and then scroll down once using the ZERO (down) key. The indicator will briefly display '**C 1**' and then prompt you to enter the data for the span calibration point (C1).
2. Place the actual calibration load (weights) onto the scale platform.
3. Use the numeric keys to key-in the actual test weight value. There is no need to enter a decimal point since it is fixed on the display. If you make a mistake, use the C/CE key as a backspace key.
4. Press the MODE (set) key to save the value. The indicator briefly displays '**SEt**' and then moves to the next calibration point (C2).
5. Repeat steps 2 through 4 to enter data for the remainder of the calibration points. **You need not enter data for all three calibration points. To cease entering additional calibration points, simply enter zero for the new value, e.g., 0.0 lb.**
6. At the conclusion of C3 (or the last calibration point), the indicator will revert up to "F17".

If the calibration was *not* successful, one of the following error messages will appear.

- **"Err0"** - The calibration test load or the keyed-in load is larger than the full capacity of the instrument. Change the calibration test load or check the input data.
- **"Err1"** - The calibration test load or the keyed-in load is smaller than 1% of the full capacity of the instrument. Change the calibration test load or check the input data.
- **"Err2"** – There is not enough signal from the force sensor to complete the calibration process. Most common causes include incorrect force sensor wiring, a mechanical obstruction or a faulty (damaged) force sensor.

Take the indicated action to correct the problem, and then perform a new calibration.

ADVANCED OPERATION

Entering an ID Number

The indicator stores one ID number which is retained in memory, even when unplugged from the AC wall outlet. The default ID number is 123456.

1. Press the ID key. The display will display the currently stored ID number value.
2. ***If the indicator is displaying the correct ID Number, simply press the C/CE key to exit.***
After approx. 8 seconds, the indicator will automatically exit this screen and resume normal operation.
3. If the displayed value needs to be changed, key-in the new value and then press ENTER. If you make a mistake, the C/CE key will function as a backspace key.

Application Summary (F30)

The following table summarizes the various parameters and operation for each application in the F30 setup menu:

F30 Setting	Set Point Key	Over/Under Keys	Digital Outputs	* Key	F1 Key
Gross/Net/Tare (0)	Active	Not active	Standard	No function	No function
Accumulation (1)	Not active	Active	Checkweigher	Display running total	Total out
Remote Display (2)	Not active	Not active	Not active	No function	No function
Piece Counting (3)	Not active	Active	Checkweigher	No function	Sample
Hold (5)	Not active	Active	Checkweigher	No function	Activate Hold
Checkweigher (6)	Not active	Active	Checkweigher	No function	Target Weight
Batching (7)	Active	Not active	Batching	No function	Start/Stop Batching
Weigh-in/ Weigh-out (8)	Not active	Clear ID's	Not active	No function	Weigh-in/ Weigh-out

Programming Set Points (SP1-SP4)

The indicator stores up to four set points or target weights. The set point values are retained in memory, even when the indicator is unplugged from the AC wall outlet. The value of each subsequent set point should be higher than the last, e.g., the SP2 value should be greater than the SP1 value, etc.

Notes about this programming sequence:

- Will be locked out for certain applications. (See Application Summary on previous page)
 - May be password protected (see B5 menu).
1. Press the Set Point key. The display will show “SP 1” briefly, followed by the current set point #1 value. The decimal point position is fixed.
 2. If the displayed value is correct, simply press the ENTER to move to the next set point. Or you can press the C/CE key to exit this sequence and resume normal operation.
 3. If the displayed value needs to be changed, key-in the new value and then press ENTER. If you make a mistake, the C/CE key will function as a backspace key. The display will show “SET” and “SP2” briefly, followed by the current set point #2 value.
 4. Repeat Steps 2 and 3 until all four values are programmed. If you do not wish to utilize a certain set point, then set its value to zero. The indicator resumes normal operation at the completion of this programming sequence.

Programming Over/Under Weights

The indicator stores Over and Under target weights. These values are retained in memory, even when the indicator is unplugged from the AC wall outlet.

Notes about this programming sequence:

- Will be locked out for certain applications. (See Application Summary on previous page)
 - May be password protected (see B5 menu).
1. Press the Under key. The display will show “UndEr” briefly, followed by the current under value. The decimal point position is fixed.
 2. If the displayed value is correct, simply press the C/CE key to exit this sequence and resume normal operation.
 3. If the displayed value needs to be changed, key-in the new value and then press ENTER. If you make a mistake, the C/CE key will function as a backspace key. The display will display “SET” briefly and then resume normal operation.
 4. Press the Over key. The display will show “ouEr” briefly, followed by the current over value. The decimal point position is fixed.
 5. If the displayed value is correct, simply press the C/CE key to exit this sequence and resume normal operation.
 6. If the displayed value needs to be changed, key-in the new value and then press ENTER. If you make a mistake, the C/CE key will function as a backspace key. The display will display “SET” briefly and then resume normal operation.

Gross/Net/Tare (F30 = 0)

Gross weight refers to the total weight of a product and its packaging. Conversely, **net weight** refers to the weight of the product alone, discounting the weight of its container or packaging; and **tare weight** is the weight of the packaging alone.

Push Button Tare

1. Place the empty container onto the scale's platter.
2. Allow the weight indication to stabilize, and then press the TARE key. The display shows zero weight, and the NET annunciator is activated.
3. Place the object to be weighed on the scale's platter and allow the weight indication to stabilize. The reading shown is the net value of the applied load.

Entering a Known Tare Weight

1. Select the weighing unit (lb or kg) of the known tare weight by pressing the UNITS key until that unit is indicated on the display.
2. Use the front panel numeric keys (0-9) to enter the known tare weight.
Note: The decimal point position is fixed
3. Press the TARE key. The display switches to NET weighing mode.
Note: If the entered tare weight is out of range, for example if it exceeds scale capacity, then the tare weight will be rejected.
4. Place the object to be weighed on the scale's platter and allow the weight indication to stabilize. The reading shown is the net value of the applied load.

Use the MODE key to cycle the displayed weight indication among Gross weight, Net Weight, and Tare Weight.

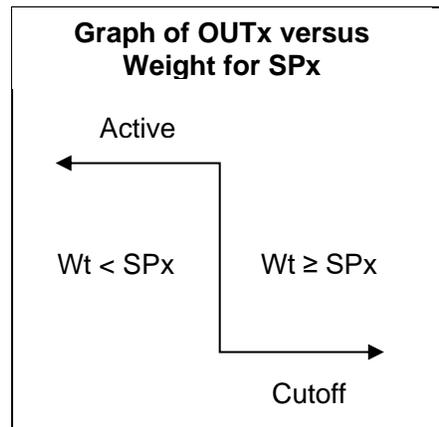
To clear a Tare Weight, simply use the MODE key to return to Gross weight mode and then press the ZERO key.

Standard Digital Outputs

For the Gross/Net/Tare application, the digital outputs continuously track the displayed weight. Specifically, each digital output tracks its corresponding set point: OUT1 tracks Set Point 1 (SP1); OUT2 tracks Set Point 2 (SP2), etc.

- When the displayed weight is below the set point, the digital output is Active.
- When the displayed weight is equal to or greater than the set point, the digital output is Inactive (Cutoff).

Here is an illustration:



Accumulation (F30 = 1)

The function adds multiple weighments together to obtain a total weight. Use the Over and Under keys to program in a Total Weight target for the checkweigher.

1. Apply the load to the scale platform.
2. Press the PRINT key to add the current load to the weight accumulator. The display briefly shows the message "Add" and then automatically returns to live weighing mode. If a printer is installed, then a printout will be made.
3. Repeat Steps 1-2 for additional loads to be added
Note: Weights cannot be recorded twice, i.e., the scale needs to return to Zero before another load can be added.
4. While at Zero, press the * key to display the running total. Here is the sequence:
Gross Weight Total => Net Weight Total => No. of Weighments
5. Press the F1 key to "Total Out":
If a printer is installed, then a Total printout will be made.
The display briefly shows "CLr", and the accumulator is reset to Zero.

Tip: Use the Over and Under keys to program a target pieces value for the checkweigher.

Piece Counting (F30 = 3)

This function calculates ("counts") the number of items you have placed onto the scale platform. To ensure accuracy, the items you wish to count must be consistent in weight.

If you already know the average piece weight (APW) of the items you wish you count, simply key-in the value. If the unit weight of the items you wish to count is too light for your scale to process accurately, you will see an error message ("Lo"), and piece counting will not be allowed.

1. Ensure that the indicator is displaying the correct unit of measure, e.g., lb or kg.
2. Press the Enter key; the display flashes "APW" three times and then shows "0" on the screen.

3. Key-in the APW value and then press Enter. The indicator now displays the number of pieces on the platform and the unmarked annunciator is lit.
4. Press the * key to briefly display the APW (Average Piece Weight).

If the average piece weight (APW) is unknown, use the sampling method. When sampling items, always count the items in your hand and place them onto the platform all at once. If the unit weight of the items you wish to count is too light for your scale to process accurately, you will see an error message (“Lo”), and piece counting will not be allowed. However, you can try a larger sample size.

1. If the items you will be counting require a container, you must first tare the container off by pressing the TARE key.
2. Press the F1 key. The screen shows “10” which is the default sample size.
3. Key-in the actual sample size (if different), e.g., 20, 50, 100, etc.
4. Place the sample items onto the scale platform all at once and allow the weight indication to stabilize.
5. Press the ENTER key to take the sample. The indicator now displays the number of pieces on the platform and the unmarked annunciator is lit.
6. Press the * key to briefly display the APW (Average Piece Weight).
7. To exit piece counting mode, press the C/CE key.

NOTE: The APW will NOT remain in scale memory when you exit piece counting mode.

Weight Hold (F30 = 5)

This function captures an unstable load by freezing the weight reading on the display. Use the Motion Band (F5), Percentage Hold (F36) and Minimum Hold Weight (F37) settings to adjust this operation to your specific application.

There are two weight hold modes, selected via the F35 setting:

AUTOMATIC HOLD (F35 = 1) – The unmarked annunciator turns ON to indicate that weight hold is active. When the live load stabilizes within the value defined by the Motion Band (F5) setting, the reading automatically freezes on the screen. If the live load exceeds the value defined by the Percentage Hold (F36) setting (e.g., 10%) then the indicator unlocks the previous reading and locks onto the new weight. This occurs during both increasing and decreasing load values.

MANUAL HOLD (F35 = 2) – Press the F1 key to activate this mode. The unmarked annunciator turns ON. When the live load stabilizes within the value defined by the Motion Band (F5) setting, the indicator will freeze the reading on the screen. If the live load exceeds the value defined by the Percentage Hold (F36) setting (e.g., 10%), then the indicator unlocks the held reading and relocks onto the new weight. This occurs during increasing load values only. Press the F1 key again to disarm manual hold. Repeat this procedure as required.

Peak Hold

This function captures and holds the peak weight (force) value measured during a specific process. A common application is testing a part or assembly to determine its breaking point. To activate this mode, set F30 to “5” and F35 to “3” in the Setup Menu.

PEAK HOLD (F35 = 3) – Press the F1 key to activate this mode. The unmarked annunciator turns ON. The display updates during increasing load values only. Press the F1 key again to return to live weighing mode and clear the peak value. Repeat this procedure as required.

Static Checkweigher (F30 = 6)

This function helps ensure that the items being weighed meet, exceed, or fall short of the target weight. These conditions correspond to ACCEPT, OVER and UNDER respectively.

There are two checkweigher modes, selected via the A18 setting:

COARSE (A18 = 0) – Once the values are programmed, all LED bars stay lit according to the current condition.

FINE (A18 = 1) – Once the values are programmed, each vertical bar on the LED represents one scale graduation, e.g., if two LED bars are lit in the UNDER range, then the items you are weighing are two graduations away from meeting the target weight (ACCEPT).

There are two ways to program the target weight values. A password is required for each method:

TARGET –Place an item onto the scale platform and then press the F1 key to store it.

OVER/UNDER – The upper and lower limits for the ACCEPT range are programmed into the scale thru the corresponding keys on the front panel. For instructions, see previous section Programming Over/Under Weights.

TI-1680 static checkweigher operation:

When the displayed weight is less than the Low (Min) value:

- Digital output #2 (OUT2) is activated
- Three LEDs above UNDER are ON

When the displayed weight is greater than the High (Max) value:

- Digital output #1 (OUT1) is activated
- Three LEDs above OVER are ON

When the displayed weight (net or gross) is within the acceptable range:

- Digital output #3 (OUT3) is activated
- Three LEDs above ACCEPT are ON

Batching (F30 = 7)

The function facilitates gain-in-weight batching by utilizing the set points (SP1-SP-4) and the digital outputs (OUT1-OUT4). Up to four materials can be combined using in-flight compensation and up to two materials using fast/slow valves.

There are three batching modes, selected via the B3 setting:

MANUAL (B3 = 0) – The F1 key must be used to step thru each set point.

AUTOMATIC (B3 = 1) – The F1 key must be pressed to start the batching process and the indicator completes the process automatically. Use the F1 key to cancel batching at any time. Once the batch is complete, dump it and press the F1 key again to start a new batch.

FILLING (B3 = 2) – Same as Automatic Mode except for the digital output logic (see table below).

CONTINUOUS (B3 = 3) – Same as Automatic Mode except that you need not press the F1 key to begin each batch.

Here is a summary table of the digital output states for all modes except Filling:

Weight Reading	OUT1	OUT2	OUT3	OUT4
$wt \leq SP1$	ON	OFF	OFF	OFF
$SP1 < wt \leq SP2$	OFF	ON	OFF	OFF
$SP2 < wt \leq SP3$	OFF	OFF	ON	OFF
$SP3 < wt \leq SP4$	OFF	OFF	OFF	ON
$SP4 < wt$	OFF	OFF	OFF	OFF

Here is a summary table of the digital output states for **Filling mode**:

Weight Reading	OUT1	OUT2	OUT3	OUT4
$wt \leq SP1$	ON	ON	ON	ON
$SP1 < wt \leq SP2$	OFF	ON	ON	ON
$SP2 < wt \leq SP3$	OFF	OFF	ON	ON
$SP3 < wt \leq SP4$	OFF	OFF	OFF	ON
$SP4 < wt$	OFF	OFF	OFF	OFF

Note: ON means “Active” and OFF means “Cutoff”

LEDs on the front panel designate which digital output is Active:



Weigh-In/Weigh-Out (F30 = 8)

The function captures both the inbound and the outbound weights of vehicles. As part of the weigh-out process, the net gain or loss is calculated, and a report is automatically printed. Up to 256 individual vehicle weights can be stored via ID number.

Use the C/CE key at any time to exit a function. If no key entry is made within a few seconds, the indicator automatically reverts to normal operating mode.

Weigh-In

1. With the truck on the scale, press the F1 key. “Ent Id” will be displayed.
2. Key-in in the vehicle ID number (up to 999999) and then press Enter. The indicator will display “In”.
3. If a printer is connected, a ticket will automatically be printed.

Weigh-Out

1. With the truck on the scale, press the F1 key. "Ent Id" will be displayed.
2. Key-in in the vehicle ID number (up to 999999) and then press Enter. The indicator will display "OUt".
3. If a printer is connected, a ticket will automatically be printed.

Print all ID numbers

1. Press the ID key. The indicator will display "Prt Id".
2. Press the Enter key to print all stored ID numbers.

Clear one ID number

1. Press the Under key. The indicator will display "CLr Id".
2. Press the Enter key to begin.
3. Key-in the ID number you wish to delete and then press the Enter key. The ID number will be deleted.

Clear all ID numbers

1. Press the Over key. The indicator will display "CLrALL".
2. Press the Enter key. All ID numbers will be deleted.

Duplicate print-out

1. Press the Print key. The last ticket will be re-printed.

For the following functions, make sure F38 (permanent tare) is set to '1':

Weigh-In – Store keyboard tare weight

1. With the truck on the scale, press the F1 key. "Ent Id" will be displayed.
2. Key-in an ID number and then press the Tare key. The indicator will display "In" and "TArE".
3. Press the Enter key. The indicator will display "Ent tr".
4. Key-in the tare weight and then press Enter. The tare weight is now saved.
5. If a printer is connected, a ticket will automatically be printed.

Weigh-In - Store current weight as the tare weight

1. With the truck on the scale. Press the F1 key. "Ent Id" will be displayed.
2. Key-in an ID number and then press the Tare key. The indicator will display "In" and "TArE".
3. Press the Tare key. The indicator will display the current weight.
4. Press the Enter key. The indicator will display "SEt". The tare weight is now saved.
5. If a printer is connected, a ticket will be printed.

Weigh-Out - Using Stored Tare Weight

1. With the truck on the scale, press the F1 key. "Ent Id" will be displayed.
2. Key-in an ID number and then press the Enter key. The indicator will display "Out".
3. If a printer is connected, a ticket will be printed.

SERIAL (COM) PORT INFORMATION

SERIAL PORT MODES

DEMAND DUPLEX MODE

The Demand Duplex Mode provides a two-way serial transmission mode. In this mode, the output information is transmitted on demand; either by pressing the PRINT key or upon receiving a recognized command from a host.

NOTE: Ensure that your cabling has a crossover (null modem) and contains the proper handshaking lines.

CONTINUOUS DUPLEX MODE

The Continuous Duplex Mode provides a two-way serial transmission mode. In this mode, the output information is transmitted continuously making it a popular choice for remote displays and other remote devices requiring a constant data stream. The transmission automatically occurs at the end of each display update.

RECOGNIZED HOST COMMANDS

ASCII code (Hex)	Symbol	Action by the instrument
50	P	Transmit the displayed weight through the serial port.
5A	Z	Zero the scale
54	T	Tare the scale
47	G	Puts the scale into Gross display mode
4E	N	Puts the scale into Net display mode
43	C	Change the displayed unit of measure, e.g., lb or kg

Please note that host commands may be ignored if the scale is in motion, in positive overload or in negative overload.

AUTO PRINT MODE

The Auto Print Mode provides a one-time serial transmission once a non-zero, stable condition has been achieved.

OUTPUT STRINGS

All output strings are editable via the A14 function. Here is a summary table of the Print Commands.

Dec	Hex	Printing Action	(Abbrev.)	Parameter
128	80	Gross weight	(GWT)	
129	81	Net weight	(NWT)	
130	82	Tare weight	(TWT)	
131	83	Print the data on screen	(CWT)	
132	85	Units (lb, kg, PCS, etc.)	(UN)	
133	86	Date	(DAT)	
134	87	Time	(TIM)	
135	88	'O' = Over/Under; 'M'=Motion	(STAT)	
136	89	Gross/Net flag: 'G/N'	(GN)	
137	8A	MP20 printer to print header info.	(MP20)	
149	8C	Print out ID number.	(PRID)	
140	8D	No. of line feeds.	(PRLF)	1-99 (Dec)
141	8E	No. of spaces.	(PRSPS)	1-99 (Dec)
142	90	Unit flag: 'L/K'	(LK)	
143	91	Unit flag: 'LB/KG'	(LBKG)	
144	92	Gross/Net flag: 'GR/NT'	(GRNT)	
145	93	Gross Total Weight	(GTOT)	
146	94	Net Total Weight	(NTOT)	
147	95	Transaction Number	(TRANS)	
148	96	Pieces	(PRPCS)	
149	97	Percentage	(PRPCT)	
0	00	Null	(NUL)	
255	FF	End of String	(EOS)	

Print Commands

Text Print Ticket

The Text Print Ticket is designed specifically for a serial line printer.

```

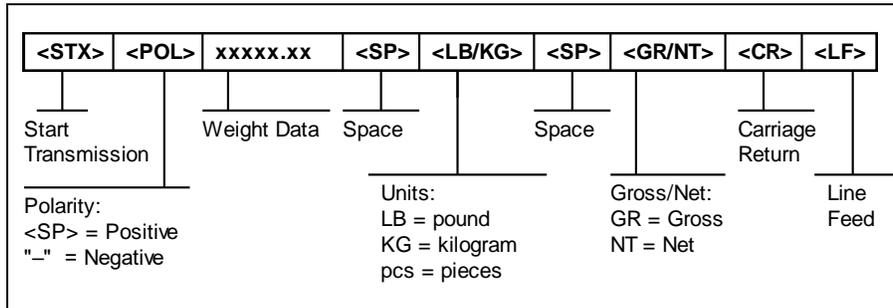
ID.NO.      123456
DATE        11/28/22
TIME        10:23 AM
GROSS       1067 lb
TARE        67 lb
NET         1000 lb
  
```

Use the following parameter settings to customize further:

- A5: Handshaking
- A8: Time format
- A9: Date format
- A10: Decimal point format
- A15: Print Header (MP-20 only)
- A16: Automatic label feed (MP-20 only)

Condec Demand String

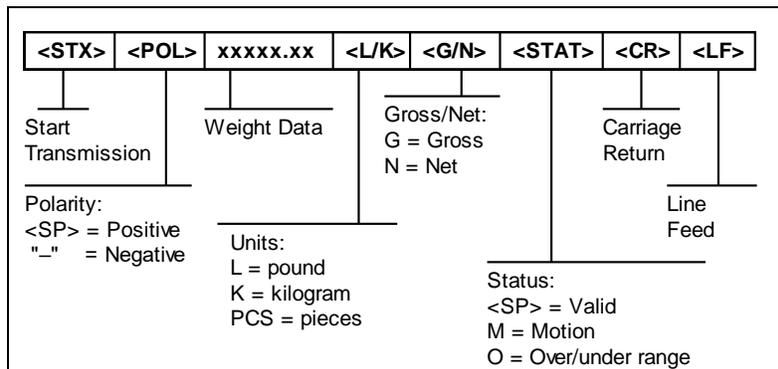
Condec Demand String is designed for two-way communication.



Address (Dec)	Value (Hex)	Chart	Address (Dec)	Value (Hex)	Charts
00	02	STX	04	20	‘ ’
01	83	(CWT)	05	92	(GRNT)
02	20	‘ ’	06	0D	CR
03	91	(LBKG)	07	0A	LF

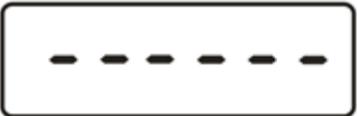
Condec Continuous String

Condec Continuous String is designed for one-way communication.



Address (Dec)	Value (Hex)	Chart	Address (Dec)	Value (Hex)	Charts
00	02	STX	04	88	(STAT)
01	83	(CWT)	05	0D	CR
02	90	(LK)	06	0A	LF
03	89	(GN)	07	FF	EOS

ERROR MESSAGES

	The weighing capacity of the scale has been exceeded. (Gross overload)
	The weight on the scale is below Gross zero. Press the ZERO key.
Err 3	Non-volatile memory read error.
Err 4	Non-volatile memory write error.
Err 6	Keyboard tare value exceeds scales capacity.
Err 9	Span calibration values have been lost.
Err 10	Not in Gross mode. (Weigh-in/weigh-out application)
Err 11	Scale is displaying a negative weight value. (Weigh-in/weigh-out application)

SPECIFICATIONS

Enclosure: Stainless Steel (IP67)

Display: 1" (25 mm) 7-segment, LED, 6 Digit

A-to-D converter: AD-01

Resolution: Approximately 400,000 counts at 3mV/V input

Sampling Rate: 10 Hz or 80 Hz, selectable

Excitation Voltage: +5 VDC, 12 x 350Ω load cells

Input Signal Range: ±3.125 mV/V

Serial Ports: Two (2) Full Duplex RS-232C

Operating Temperature: 14°F to 104°F (-10°C to 40°C)

Power: 100-240 VAC, 50-60 Hz, 0.8A

TROUBLESHOOTING

Issue / Recommendation

Weight reads out lower at one end of the weighing platform than the other end.

- Check for any type of mechanical binding or impingement of scale that is displaying the lower weight
- Check underneath the scale for any obstructions or foreign debris
- Make sure that the scale feet are not screwed in so far as to restrict downward movement of the scale.
- Adjust platform corners using variable trimmer junction box (if supplied)

Indicator displays six small zeros.

- Scale is overloaded. Remove weight from scale.
- Cut, damaged, loose, pinched cable between indicator and platform or within platform with multiple load cells
- Load cell damaged on scale platform
- Internal fault with indicator; call Transcell Tech Support

Display is erratic.

- Check underneath the scale platform for any obstructions or foreign debris
- Check AC power (brownout and/or noisy)
- Electromagnetic interference (EMI)

Transcell Tech Support: (847) 419-9180

Limited 12-month Warranty

This product is warranted by Transcell Technology against manufacturing defects in material and workmanship under normal use for twelve (12) months from the date of purchase. For complete warranty details and service information, please contact us at the address below.

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