WEIGH-TRONIX

TT-830 Bench Scale
Service Manual

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Specifications

Power Input	115 Volts AC, 50/60 Hz single phase *Optional* 230 Volts AC, 50/60 Hz single phase
Operational Keys	Zero, Tare, Print, Units, Select, Enter, Escape, Clear, 0-9, Decimal Point and Five Soft Keys labeled per selected operational routine.
Operational Annunciators	Displayed symbols indicate motion, center of zero, unit of measure and more.
Display	5" W x 1.33" H dot matrix LCD, cold cathode flourescent backlight (240 X 64 dot layout)
Display rate	Selectable, 0.1 to maximum readable updates
A to D Conversion Rate	60 times per second
Unit of Measure	Pounds, kilograms, grams, ounces, pounds and ounces and two selectable custom units
Capacity Selections	10 (5); 50 (25); 100 (50); lbs (kg)
Incremental Selections	Multiples and sub multiples of 1, 2, 5
Displayed Resolution	NTEP pending at 10,000d / configurable
Audio Output	Audio tone for key contact assurance or operational alarms
Time and Date	Battery protected real time clock is standard
Internal Resolution	1,000,000 counts analog, Quartzell™ transducer = 2,000,000
Harmonizer™ digital filtering:	Fully programmable to ignore noise and vibration
Standard input and outputs:	Four communications choices: Com 1: RS232, RS-485/422 Com 2: RS232, 20 mA current loop (*One bi-directional signal per port*)
Available Options	- DC operation at 10 to 32 VDC, 3.5 Amp - OPTO 22 I/O Modules - Remote Expanded Control Interface for 8, 16, 24, or 32 OPTO 22 I/O Modules - Alpha-numeric, PC style serial keyboard
Operating Temperatures	14 to 104° F (-10 to 40° C), 10 to 90% relative humidity
Dimensions	Platform: 12" x 14" (50- and 100-lb models) Platform: 8.5" dia. (10-lb models) Overall: 14" W x 17" D x 4.5" H (35.6cm W x 43.2cm D x 11.4cm H)
Weight	18.5 lb, 8.4 kg
Agencies	UL/CUL pending CE pending NTEP pending
Warranty	2 year

Introduction

About This Manual

This manual covers the information you need to configure and service your TT-830 bench scale.

Major sections of this manual are headed by titles in a black bar like *Introduction* above. Subheadings appear in the left column. Instructions and text appear on the right side of the page. Occasionally notes, tips, and special instructions appear in the left column.

Front Panel Keys and Functions

The front panel is shown in Figure 1.

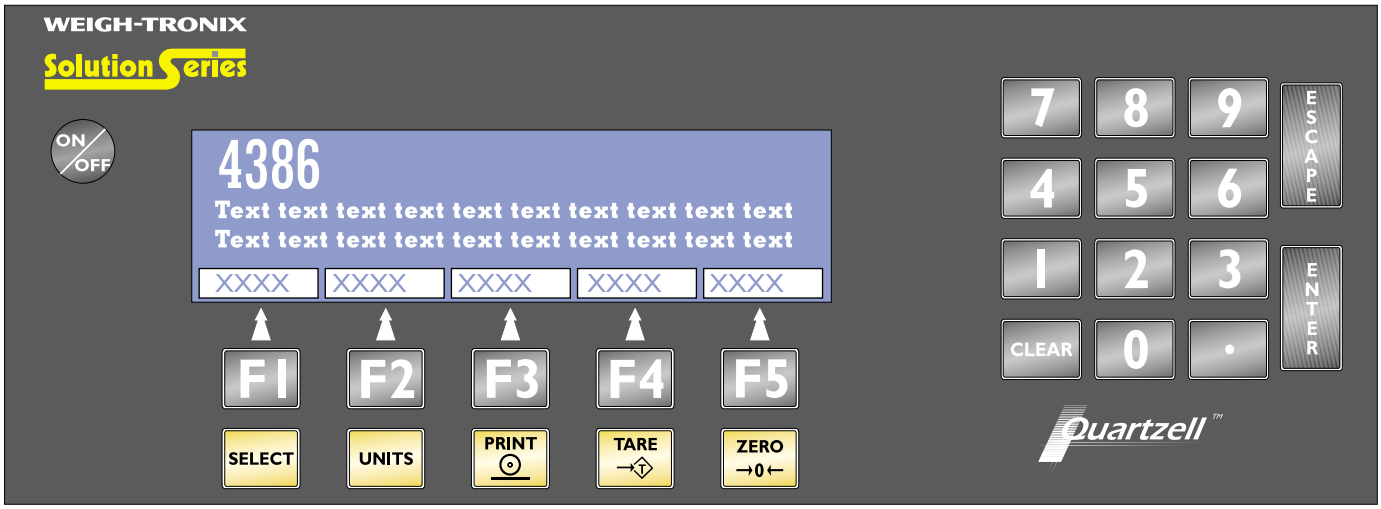


Figure 1
TT-830 Front Panel

Plug the TT-830 into an easily accessible grounded outlet only. Never use the unit without an appropriate earthground connection.

Hard Keys

Press any key to power up the scale.

The keys on the front panel of the TT-830 are of two types; hard keys and soft keys. Hard keys are labeled directly and soft key labels appear on the display. Soft keys function differently at different times so their labels change as needed.

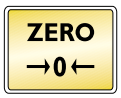
Below are brief descriptions for each of the hard key functions:

Repeatedly press the **SELECT** key to scroll through the available weight reading displays. (Examples - gross, net, tare, minimum, maximum, etc.)

Press the **UNITS** key to scroll through the available units of measure

Press the **PRINT** key to send data to a connected printer.

Press the TARE key to enter a tare weight, then press SELECT to see the net display mode.



Press the **ZERO** key to establish a zero reference. A center-of-zero icon will be displayed. During motion an M will appear below the center-of-zero icon.

Press the **ESCAPE** key to back out of menus or cancel a numeric entry without accepting the value.

Press the **CLEAR** to clear values from the display.

Press the **ENTER** key to enter a keyed in value or accept a displayed choice.

Press and hold the ON/OFF key for five seconds to turn the unit off. Press any key to power up the scale.

The numeric keypad is for entering numbers.

Soft Keys

Soft keys are so-called because their function is not fixed. Function can change as the mode of operation changes or as the program for your particular setup changes.

Their are five soft keys located directly below the display. If the keys are needed during any operation, a label for each active key appears in the display directly above. There are only five key labels available at one time but this does not limit the potential usefulness of these keys. Programs can be created to enable one key to access another level of operation with five more key names and functions.

Accessing Setup Levels

There are three levels of TT-830 setup you can access through the front panel:

User level

The first level is the **User** level. These are the most commonly changed values and parameters that you will use in the course of operating the TT-830.

Configuration level

The second level is the **Configuration** level. These items deal with some of the basic functions of the TT-830 and do not need to be accessed very often.

Calibration level

The third level is the **Calibration** level. This section will need to be accessed only when the scale is being calibrated, or if you change scale capacity or division size.

A different password is needed to access each level. Once you access the level you want, the display presents a series of soft key choices. By pressing the appropriate soft key and following text prompts on the display, you can set up your TT-830 to suit your needs.

Following are the instructions you need to access the setup of the TT-830.

1. Press and hold the **ESCAPE** key until the TT-830 beeps. . . The display asks for a password and looks like Figure 2.

You must key in the password within 5 seconds of accessing the password screen or the TT-830 returns to normal operation.

Figure 2
Password display

IMPORTANT NOTE
The TT-830 can be sealed for legal for trade use and the software protected from change by using switch S1. The current status is viewed in the USER menu.

Below are the passwords and details for the three setup levels.

User level

The User level is not affected by the Seal status of the scale.

The values under SELECT in the flowchart to the right are not saved after a power down and power up.

The default User password is 111.

Key in 111 and press **ENTER. . .** the screen in Figure 3 is displayed.

Figure3
User level main display

Figure 4 shows what soft keys or choices appear as you press the soft keys shown in Figure 3.

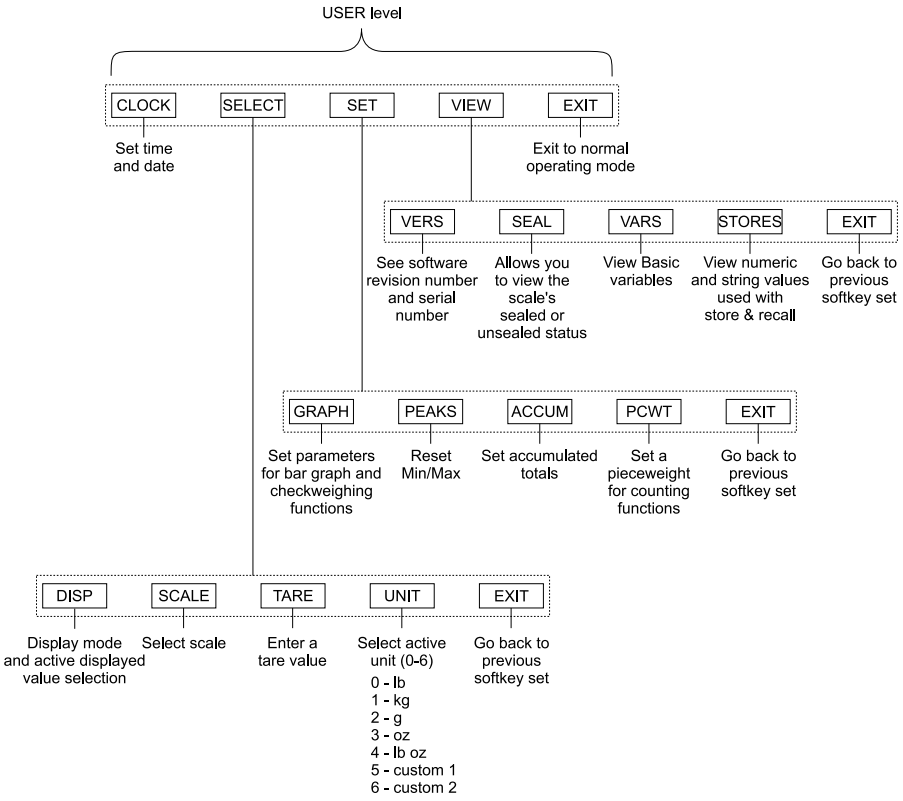


Figure 4
Soft keys in the User level

USER-CLOCK level

Press the **CLOCK** soft key to access the time and date setting function.

1. The display shows the current hour value. If this is not correct key in a new value and press **ENTER** or press **ENTER** to accept the current value. . . → The display shows the minutes value.

Enter the year using all four digits.

2. Repeat step 1 for minutes, seconds, year, month, and day. . . → Display returns to display shown in Figure 3.

USER-SELECT level

Press the **SELECT** soft key to access the USER-SELECT soft key group:

- **DISP** Press this key to set the current display mode.
- **SCALE** Press this key to select the scale number you want to use.
- **TARE** Press this key to enter a known tare weight.
- **UNIT** Press this key to select the active units of measure.
- **EXIT** Press this key to go back to the previous soft key set.

While in the this level the display will show USER-SELECT in the top left to remind you of where you are in the USER level.

Following is a detailed description of the four functions listed above.

DISP (Display Mode)

If you press the **DISP** soft key, follow these instructions:

The display mode you pick may not be the one that appears on the display. A display mode called out in the WT BASIC program overrides the setting you make through the front panel.

1. The display shows the current display mode number. Press **ENTER** to accept this value or key in a new number from the list in Appendix 1, then press **ENTER** to accept it. → The display asks for the ACTIVE VALUE. This is the active display value.

2. Choose one of the following active display values by keying in 0-13, then press **ENTER**. . . → The display returns to the USER-SELECT screen.

Variable (#11) is a variable value called out in a WT-BASIC program. ADC (#13) stands for Analog to Digital Counts.

0 = Gross	4 = Max	8 = Count Total	12 = Piece Weight
1 = net	5 = Rate of Change	9 = Trans Total	13 = ADC
2 = Tare	6 = Gross Total	10 = Count	
3 = Min	7 = Net Total	11 = Variable	

SCALE

You cannot select a scale number unless it has been activated in the SimPoser program and downloaded to the TT-830.

If you press the **SCALE** soft key the display will ask you to select a scale number. The currently active scale number is displayed. You can simply type a new scale number and press the **ENTER** key. If you have multiple scales attached to the indicator, this function chooses which scale's weight is displayed and which one the **ZERO** and **TARE** keys will affect.

TARE

The display will ask for a scale number if Multiscale is enabled.

If you press the **TARE** soft key the display will show the current tare value for the active scale. You may key in a new tare weight and press the **ENTER** key to override the previous tare weight.

UNIT

If you press the UNIT soft key the display will ask you to key in a number (0-6) which represents the value you want to be active. Below are the seven units to choose from and the corresponding number you need to key in for this function:

0- lb	4- lb oz
1- kg	5- custom 1
2- g	6- custom 2
3- oz	

Press the **EXIT** soft key to return to the USER level soft key group.

USER-SET Level

Press the **SET** soft key to access the USER-SET soft key group shown below:

- **GRAPH** Press this key to set the parameters for bar graph and checkweighing functions.
- **PEAKS** Press this key to reset the Min/Max.
- **ACCUM** Press this key to set the accumulator totals.
- **PCWT** Press this key to set the pieceweight for counting functions.
- **EXIT** Press this key to go back to the previous soft key set.

Following is a detailed description of the four functions listed above.

GRAPH

If you press the **GRAPH** soft key, follow these instructions:

1. The current MIN setting is displayed. Press **ENTER** to accept this value or key in a new value and press **ENTER**. . . The UNDER value is displayed.

2. Repeat step one, accept or change the value, for UNDER, OVER, MAX, and BASIS values. BASIS is same as the active values (0-13) shown below. These values now apply when using the bar graph or checkweighing display.

Variable (#11) is a variable value called out in a WT-BASIC program. ADC (#13) stands for Analog to Digital Counts.

0 = Gross	4 = Max	8 = Count Total	12 = Piece Weight
1 = net	5 = Rate of Change	9 = Trans Total	13 = ADC
2 = Tare	6 = Gross Total	10 = Count	
3 = Min	7 = Net Total	11 = Variable	

PEAKS

The display will ask for a scale number if Multiscale is enabled.

If you press the **PEAKS** soft key the display asks if you want to reset the MIN and MAX values now in memory. You are given the choice of YES or NO. After choosing the display returns to the USER-SET level display.

ACCUM

If you press the **ACCUM** soft key, follow these instructions:

1. The display shows you the current GROSS TOTAL in the accumulator. You can change this by keying in a new number and pressing **ENTER** or press **ENTER** to move to the next ACCUM value. . .

   The display shows the NET TOTAL value.

2. Repeat step 1 for NET TOTAL, COUNT TOTAL, and TRANS(action) TOTAL. . .

   The display returns to the USER-SET screen.

PCWT

If you press the PCWT soft key the display shows the current value for the piece weight. Accept this by pressing the **ENTER** key or key in a new piece weight and press **ENTER**.

Press the **EXIT** key to return to the USER level soft key group.

USER-VIEW Level

Press the **VIEW** soft key to access the USER-VIEW soft key group:

- **VERS** Press this key to see TT-830 firmware revision date and time. Serial number is currently not used. Configuration information is displayed if a program has been downloaded from SimPoser software.
- **SEAL** Press this key to view the sealed state the scale. Only while viewing this parameter can you toggle the sealed state using the S1 button under the sealed access hatch under the scale platter.
- **VARS** Press this key to view the BASIC variables.
- **STORES** Press this key to view the numeric and string values used with store and recall.
- **EXIT** Press this key to go back to the previous soft key set.

Following is a detailed description of the four functions listed above.

VERS

If you press the **VERS** soft key you will see the firmware version number. Serial number is currently not used. When you press any key, if you have never downloaded a file from SimPoser, you will see only the word CONFIGURATION and no other information. If you have downloaded a file, the following information is displayed:

License # of the SimPoser software.
Name of license holder.
Version number of the SimPoser software.
Name of the downloaded file (application program).
Time and date of the last download.

SEAL

The display will show ***Sealed*** or ***Unsealed***. Press S1 on the main board through the access hole in the load bridge to change the seal status.

VARS

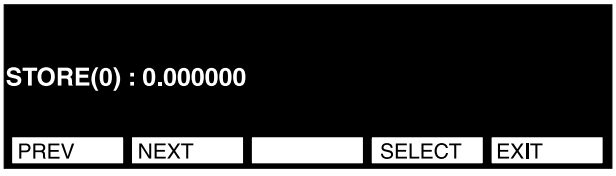
If you press the **VARS** soft key you will be able to scroll through the variables you have in your basic program. Press the **FIRST** soft key to see the first one and the **NEXT** soft key to scroll to the next one. Repeat this until you are through and press the **EXIT** soft key to return to the USER-VIEW level.

If no variables are defined the screen will show **NO VARIABLES DEFINED**.

STORES

If you press the **STORES** soft key, follow these instructions:

1. The display asks if you want to DISPLAY NUMERICS?, and gives you the choice of **YES** or **NO**. If you press **YES** the display will look like this:



There are two types of memory:
• Standard
• Expanded

Standard memory has locations 0-8191for numeric storage and 0-4095 for string storage.

Expanded memory has locations 8191-16383 for numeric storage and 4096-8191 for string storage.

If you do not have the expanded memory installed, the expanded memory location returns a zero.

2. Press **PREV** (previous) to see the previous numeric record. Press **NEXT** to see the next numeric record. Press **SELECT** and the display will let you enter a specific numeric record number. When you press **ENTER** that record number will be displayed.

3. If you press **NO** in step one the following screen is displayed:

4. This screen lets you view all the strings stored in your BASIC program. View them the same way you did the numeric values.

5. Press **EXIT** to return to the USER-VIEW level.

Press **EXIT** to return to the USER level. Press EXIT one more time and you are back to normal operation. You have now seen all the parts of the USER level. The next section of the manual covers front panel configuration.

Configure level

You must key in the password within 5 seconds of accessing the password screen or the TT-830 returns to normal operation.

When your changes are completed, secure and protect them by changing the seal status. See Seal *in the previous section*

The deafult password for the Configure level is 2045.

1. Press and hold the **ESCAPE** key for 3-5 seconds. You will hear a 2nd beep and the display will change. Key in 2045 and press **ENTER**. . .

The screen in Figure 5 is displayed. If not displayed your system is sealed or you've used an incorrect password.

Figure 5
Configuration level display

Under Misc. (print format) in the flowchart to the right, the default print format 0 shows gross, tare and net weights. If you choose another print format (1-16) you need to define the format in SimPoser and download it to the TT-830.

Figure 6 is a flowchart showing what soft keys or choices appear as you press the soft keys shown in Figure 5.

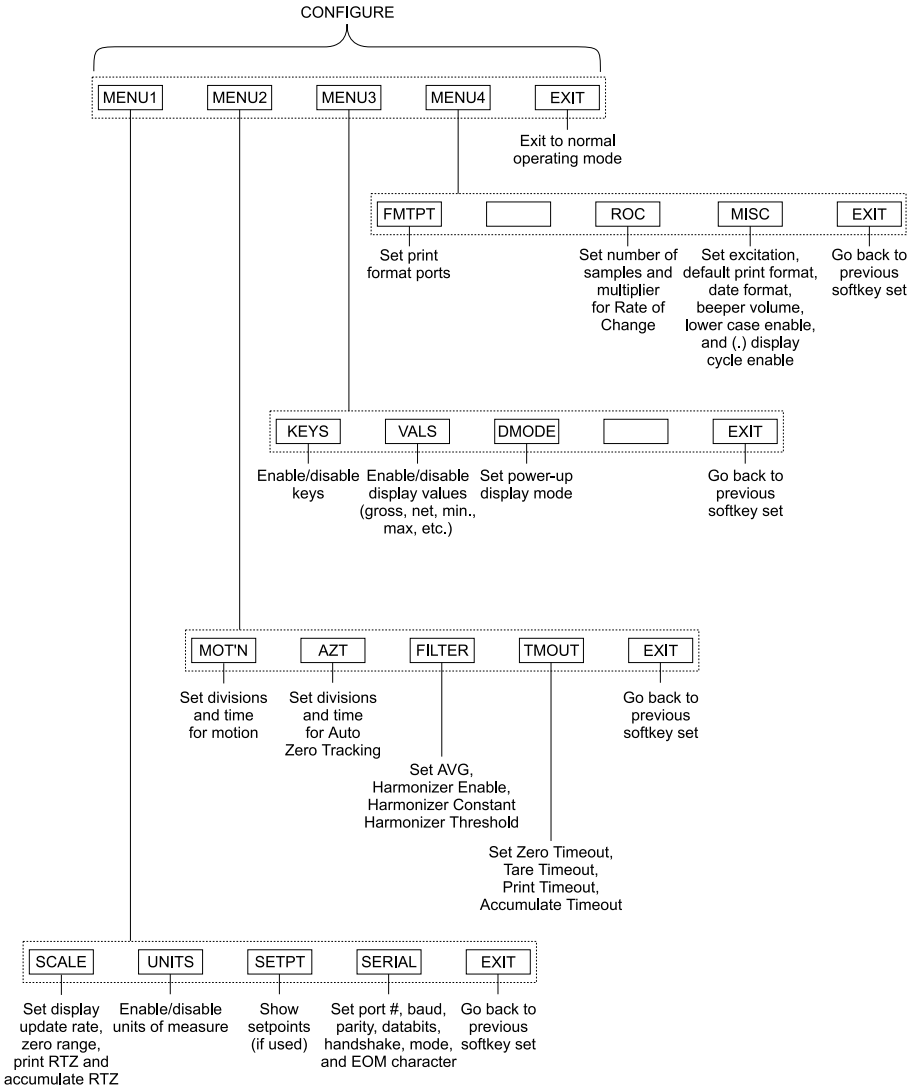


Figure 6
Soft key flowchart for Configure level

CONFIGURE-MENU 1 Level

When your changes are completed, secure and protect them by changing the seal status. See Seal in the previous section

Press the **MENU1** soft key to access the following soft key group:

- **SCALE** Press this key to set display update rate, zero range, print return to zero, and accumulate return to zero.
- **UNITS** Use this key to enable/disable units of measure.
- **SETPT** Use this key to show setpoints, if used.
- **SERIAL** Use this key to set port #, baud rate, parity, databits, handshake, mode, and EOM character.
- **EXIT** Press this key to go back to the previous soft key set.

Following are detailed instructions for setting these parameters.

SCALE

If you press the **SCALE** soft key, follow these instructions (see note at left):

The display will first ask for a scale number if Multiscale is enabled.

1. The display will show the *current display rate* (.1, .25, .5, 1, 2, 99). Accept this by pressing the **ENTER** key or key in a new value and press the **ENTER** key. . .

Any value for display update rate greater than 2 will be considered as the maximum update rate or 99.

The display shows the zero range value. If a non-valid number is keyed in the value will default to 99.

2. Repeat step one for *zero range* (0-100% allowed). . .

This is the percentage of capacity that you are allowed to zero using the **ZERO** key.

By default, when the **PRINT** *key is pressed, a print operation and an accumulation take place. If you do not want the accumulation to occur, a WT-BASIC program assigning only the DO PRINT command to the* **PRINT** *key needs to be downloaded to the TT-830. A WT-BASIC program can also define an ACCUM. soft key and assign accumulation to that key only.*

3. Repeat step one for *print return to zero* (0-100% of cap. allowed). . .

If you press the PRINT key, the weight must fall below this percentage of scale capacity before another print operation will be allowed.

4. Repeat step one for *accumulate return to zero* (0-100% allowed). . .

If you perform an accumulation, the weight must fall below this percentage of scale capacity before another accumulation operation will be allowed.

UNITS

If you press the **UNITS** key, follow these instructions:

Custom unit names must be defined by SimPoser software program.

1. The display asks if you want to enable the LB unit of measure and shows you the current state (ON or OFF). If the condition is as you want it, simply press the **ENTER** key. If you want to change the condition, press the YES or NO soft key, then the ENTER key to move to the next unit of measure. . .

The custom conversion factor is the number to be multipied by the weight (in calibration units) to get the desired custom unit. Example: 1 lb = 5 inches of a certain steel rod. Custom unit is inches. Calibration unit is lb. Conversion factor is 5. With six lbs of weight on the scale, 30 inches would be displayed.
(Six lbs x 5 = 30 inches of steel)

The kilogram unit of measure is the next one shown.

2. Repeat step 1 for kilograms, grams, ounces, pounds & ounces, and custom units 1 and 2. The display asks for the conversion factor for each custom unit. Key in a value and press **ENTER**. . .

The display returns to the CONFIGURE-MENU1 display.

SETPT

If you press the **SETPT** soft key the display asks you SHOW SETPOINTS? What this means is, if you say yes, the display will show when setpoints turn on and off by lighting small dots in the upper right corner. Press the **YES** soft key if you want to see these dots, and press **NO** if you do not.

Setpoint operations must be defined by the TT-830 SimPoser software program.

SERIAL

If you press the **SERIAL** soft key, follow these instructions:

1. The display prompts you for serial port # to configure. Press **ENTER** if displayed port is OK or key in a new port number and press **ENTER**. . .

   The baud rate code number is displayed.

2. Press **ENTER** to accept the baud rate or key in a new baud rate code number from the table below and press **ENTER**. . .

   The parity code number is displayed.

   Baud Rate Codes

0 = 300	4 = 9600
1 = 1200	5 = 19,200
2 = 2400	6 = 38,400
3 = 4800	7 = 56,700

3. Press **ENTER** to accept the parity or key in a new parity code number from the table below and press **ENTER**. . .

   The databits setting is displayed.

   Setting this parameter to SET will simulate 2 stop bits and no parity detection.

   Parity Codes

0 = NONE	3 = SET
1 = ODD	4 = CLEAR
2 = EVEN	

4. Press **ENTER** to accept the databits setting or key in the new databits value (7 or 8) and press **ENTER**. . .

   The handshake protocol code number is displayed.

5. Press **ENTER** to accept the handshake protocol setting or key in a new code number for the handshake from the table below and press **ENTER**. . .

   The mode code number is displayed.

   CTS is a hardware handshake (ready/busy) which requires two extra wires in your cable.

   Xon/Xoff is a software handshake requiring no additional hardware.

   Handshake Protocol Codes

0 = NONE	2 = Xon / Xoff
1 = CTS	3 = BOTH

6. Press **ENTER** to accept the mode setting or key in a new code number from the table below and press **ENTER**. . .

   The EOM (end of message) value is displayed.

Serial Mode Codes (Port 1)	**Serial Mode Codes (Port 2)**
0 = BASIC control	0 = BASIC
1 = Keyboard	1 = Keyboard
2 = Disabled	2 = Disabled
	5 = Split
	6 = Dual

BASIC Control - Control of the serial port is through the BASIC program executing in the TT-830.

Keyboard - Control of the serial port is through an attached keyboard.

Disabled - The serial port is not in use for this configuration.

Split - Port 2 is split between two devices; keyboard and BASIC control.

Dual - Port 2 allows detecting for data on two input lines for BASIC control.

7. Press **ENTER** to accept the EOM character or key in a new number from 0-256 and press **ENTER**. . . The display returns to the CONFIGURE-MENU1 display.

EOM ASCII code #13 is carriage return.

This completes the instructions for all the parameters of Menu 1.

CONFIGURE-MENU 2 Level

Press the **MENU2** soft key to access the following soft key group (See note at left):

For all the parameters in the this menu level the display will ask for a scale number if Multiscale is enabled.

- **MOTION** Use this key to set the motion detection window size in divisions and the time window in seconds.

  For example: If you set divisions to 3 and seconds to 1, if the weight value does not change more than 3 divisions in one second, the scale or weight is considered stable.

- **AZT** Use this key to enable AZT. If you enable AZT you can set the division size and seconds. The division size you pick defines a range above and below zero. When scale weight is inside this range for the number of seconds you picked, ½ of the weight will be zeroed. The indicator will repeat removing ½ the weight every X seconds. X being the number of seconds you have picked.

- **FILTER** Use this key to set up the Harmonizer filtering. A full explanation is given below. See Appendix 2 for tips on using Harmonizer.

  In the SimPoser software the Harmonizer constant choices are 0 through 10. This setting is to be made in the "real world" on a working system so there are more levels available from the front panel.

  For a remote analog base the A-D weight conversion happens 60 times per second in the TT-830. AVG is the number of conversions you want to average. For example, if you pick 30, the unit will average the weight values from the last 30 conversions or ½ second and uses that value for displayed data.

  The next choice you have is for turning the Harmonizer filtering on or off. If you turn the Harmonizer filtering on you need to set the Harmonizer Constant. Typical values are between 0-10. Set the number low for small vibration problems and higher for more dampening effect.

  The purpose of the Harmonizer Threshold is so the indicator will respond quickly to large weight changes. Harmonizer Threshold is the amount of weight change, in calibration units, beyond which the Harmonizer will be temporarily disabled. For example, if you set this to 10

lbs, a weight change over 10 pounds occuring during the sample time (½ sec. in our example) will disable the Harmonizer until the weight change during the sample time drops below 10 lbs.

- **TMOUT** Use this key to set Zero Timeout, Tare Timeout, Print Timeout and Accumulate Timeout. This is the amount of time the TT-830 will wait for motion to cease and perform the function after the key is pressed.

  For example, if Zero Timeout is set to 3 seconds, when the **ZERO** key is pressed the unit will zero the scale if there is no motion. If there is motion and motion ceases within 3 seconds the unit will zero the scale. If motion doesn't cease the key press is ignored.

- **EXIT** Press this key to go back to the previous soft key set.

Following are detailed instructions for setting these parameters.

MOT'N (motion)

If you press the **MOT'N** soft key, follow these instructions:

The display will ask for a scale number if Multiscale is enabled.

1. The current value for the motion window size, in divisions, is shown. Press **ENTER** to accept this value or key in a new value and press **ENTER**. . . — The current time window in seconds is displayed.
2. Press **ENTER** to accept this time period or key in a new value and press **ENTER**. . . — The display returns to the CONFIGURE-MENU2 display.

AZT (auto zero tracking)

If you press the **AZT** soft key, follow these instructions:

The display will ask for a scale number if Multiscale is enabled.

1. The current value for the AZT window size, in divisions, is shown. Press **ENTER** to accept this value or key in a new value and press **ENTER**. . . — The current time window in seconds for AZT is displayed.
2. Press **ENTER** to accept this time period or key in a new value and press **ENTER**. . . — The display returns to the CONFIGURE-MENU2 display.

FILTER

If you press the **FILTER** soft key, follow these instructions:

The display will ask for a scale number if Multiscale is enabled.

1. The display shows the current value for the number of samples to average. Press **ENTER** to accept this value or key in a new value and press **ENTER**. . . — The display shows the state of the Harmonizer filtering(ON or OFF).

When your changes are completed, secure and protect them by changing the seal status. See **Seal**.

2. Press **YES** to enable Harmonizer or **NO** to disable the Harmonizer parameter, then press **ENTER** . . . — The current Harmonizer Constant value is displayed.

3. Press **ENTER** to accept this value or key in a new value and press **ENTER**. . . — The current Harmonizer Threshold value is displayed. This value is in calibration units.

4. Press **ENTER** to accept this value or key in a new value and press **ENTER**. . . — The display returns to the CONFIGURE-MENU2 display.

TMOUT (timeout)

If you press the **TMOUT** soft key, follow these instructions:

The display will ask for a scale number if Multiscale is enabled.

1. The current value for Accumulate Timeout is displayed. Press **ENTER** to accept this value or key in a new value and press **ENTER**.

2. Repeat step 1 for Print Timeout, Zero Timeout, and Tare Timeout. . . — The display returns to the CONFIGURE-MENU2 display.

Press the **EXIT** soft key to return to the CONFIGURE display.

CONFIGURE- MENU 3 Level

Press the **MENU3** soft key to access the following soft key group:

- **KEYS** Press this key to enable or disable front panel keys.
- **VALS** Press this key to enable or disable the display values (gross, net, min., max., ect.)
- **DMODE** Press this key to pick a power-up display mode from the over 35 available. See *Appendix 1: Display Samples*.
- **EXIT** Press this key to go back to the previous soft key set.

Following are detailed instructions for setting these parameters.

KEYS

If you press the **KEYS** soft key, follow these instructions:

1. The current setting (enabled ON or OFF) for the **SELECT** hard key is displayed. Press **YES** to enable the key or **NO** to disable the key, then press **ENTER** . . — The current setting for the **UNITS** hard key is displayed.

2. Repeat step 1 for **UNITS**, **PRINT**, **TARE**, **ZERO**, **AUTOTARE**, and **KEYPAD TARE**. . .

The display returns to the CONFIGURE-MENU3 display.

If you press the **VALS** soft key, follow these instructions.

VALS

1. The current setting (enabled ON or OFF) for the **GROSS** display value is displayed. Press **YES** to enable the active value or **NO** to disable this active display value, then press **ENTER** . .

The current setting for the **NET** active value is displayed.

2. Repeat step 1 for all the display values (NET, TARE, MIN., MAX., ROC, G-TOT, N-TOT, C-TOT, #-TOT, COUNT, VARIABLE, PCWT, and ADC. . .

The display returns to the CONFIGURE-MENU3 display.

DMODE

If you press the **DMODE** soft key, press **ENTER** to accept the display mode number shown or key in a new number (see *Appendix 1*) and press ENTER.

The display returns to the CONFIGURE-MENU3 display. Press the **EXIT** key to return to the CONFIGURE display.

CONFIGURE-MENU 4 Level

Press the **MENU4** soft key to access the CONFIGURE-MENU 4 soft key set.

FMTPT

If you press the **FMTPT** soft key, follow these instructions:

The default print format 0 shows gross, tare and net weights. If you choose another print format (1-16) you need to define the format in SimPoser and download it to the TT-830.

1. The current serial port number assigned to Format 1 is displayed. Press **ENTER** to accept this serial port or key in a new serial port number and press **ENTER**. . .

The serial port assignment for Format 2 is displayed.

2. Repeat step 1 for up to 16 print formats and press the **ENTER** key. . .

The display will ask for a scale number if Multiscale is enabled.

The display returns to the CONFIGURE-MENU4 display.

ROC

If you press the **ROC** soft key, follow these instructions:

The display will ask for a scale number if Multiscale is enabled.

1. The display shows the current value for SAMPLES. Press **ENTER** to accept the current value or key in a new one and press **ENTER**. . . — The current multiplier value is displayed.

2. Press **ENTER** to accept the current value or key in a new one and press **ENTER**. . . — The display returns to the CONFIGURE-MENU4 display.

ROC Examples:

If pounds is your calibration unit, pick a sample value of 60 and a multiplier of 1. The display will show the rate of change in pounds/second.

$$\frac{\text{Cal Unit}}{\text{Custom Unit weight in Calibration Units}} = \frac{1}{8} = 0.125$$

For gallons of water/second set the sample value at 60 and the multiplier to 0.125. Water = 8 lbs/gallon (8 lbs is close enough for our example) so their are 0.125 gallons per pound. See formula to the left.

To get gallons/minute, do not change the sample size but rather multiply the 0.125 by 60 to get a value equal to gallons/pounds/minute (7.5). The display will then show you a rate of change in gallons per minute. (This is the flow over the last second not over a whole minute's time.)

MISC

If you press the **MISC** soft key, follow these instructions.

1. The display shows current setting for the AC excitation. Press ENTER to accept the current setting or key in a new setting from the table below and press **ENTER**. . . — The display shows the default print format.

   AC Excitation
   0 = DC 2 = 600 Hz
   1 = 300 Hz 3 = 1200 Hz

The default print format 0 shows gross, tare and net weights. If you choose another print format (1-16) you need to define the format in SimPoser and download it to the TT-830.

2. Press **ENTER** to accept the current print format as the default for the PRINT key or key in a new format (0-16) and press **ENTER**. . . — The display shows the date preference format.

3. Press **ENTER** to accept the date format or key in a new one from table below and press **ENTER**. . . — The display shows the beeper volume setting.

   Date Preference Format
   0 = MMDDYY 1 = DDMMYY 2 = YYMMDD

When your changes are completed, secure and protect them by changing the seal status. See **Seal**.

4. Press **ENTER** to accept the current volume level or key in a new level (see table below) and press **ENTER**. . .

   The display shows the current type style selection for screen text.

   Beeper Volume
   0 = OFF 2 = Medium
   1 = Low 3 = High

5. Press **ENTER** to accept the current type style selection or key in a new style from the table below and press **ENTER**. . .

   The decimal display cycle is shown.

   Type Style
   0 = no lowercase 1 = lowercase

If the decimal display is ON you can scroll through all the display modes (see Appendix 1) by pressing the decimal (.) hard key on the indicator. Only the text supplied by your BASIC application program will be displayed.

6. Press **ENTER** to accept the current decimal display cycle setting or key in a new value from the table below and press **ENTER**. . .

   The display shows the current low battery indicator setting.

   Decimal Display Mode
   0 = OFF 1 = ON

Low Battery indicator flashes "LO BATT " when battery voltage is low.

7. Press **ENTER** to accept the current low battery indicator setting or key in a new value from the table below and press **ENTER**. . .

   The display shows the current sleep timer setting.

   Low Battery Indicator
   0 = OFF 1 = ON

8. Press **YES** to enable the sleep timer or press **NO** to disable the timer. Press **ENTER** to accept the choice. . .

   If you press **YES**, go to step 9.
   If you press **NO**, skip to step 11.

9. The display asks you to set the sleep timer in minutes. Key in the number of minutes of inactivity before the sleep mode starts and press **ENTER**. . .

   The display shows the current sleep warning setting.

When your changes are completed, secure and protect them by changing the seal status. See **Seal**.

10. Select **NO** to disable the sleep warning and **YES** to enable it. The sleep warning gives an audio and visual signal one minute before the scale goes to sleep. Press **ENTER**. . .

    The display shows the current setting for the Auto Backlight Timer.

11. The backlight timer turns just the backlight off after a set number of minutes. Press **YES** to enable the timer and **NO** to disable it. Press ENTER. . .

    If you press **NO** the display will return to the CONFIGURE-MENU4 display.

    If you press **YES** you are asked to set the timer length in minutes.

12. Key in the number of minutes and press **ENTER**. . .

    The display returns to the CONFIGURE-MENU4 display.

When your changes are completed, secure and protect them by changing the seal status. See **Seal**.

Press **EXIT** twice to return to normal operation. If you changed the configuration you will be asked if you want to save changes. Press **YES** if you do. **NO**, if not.

Calibrate level

You must key in the password within 5 seconds of accessing the password screen or the TT-830 returns to normal operation.

The default password for the Calibrate level is 30456.

1. Press and hold the **ESCAPE** key for 3-5 seconds. You will hear a 2nd beep and the display will change. Key in 30456 and press **ENTER. . .**

   The screen in Figure 7 is displayed.

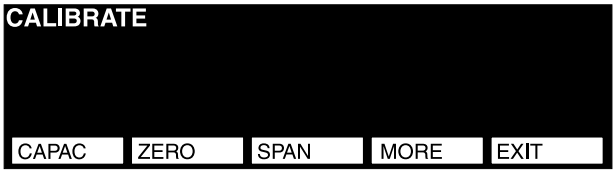


Figure 7
Calibrate level display

Figure 8 is a flowchart showing what soft keys or choices appear as you press the soft keys shown in Figure 7.

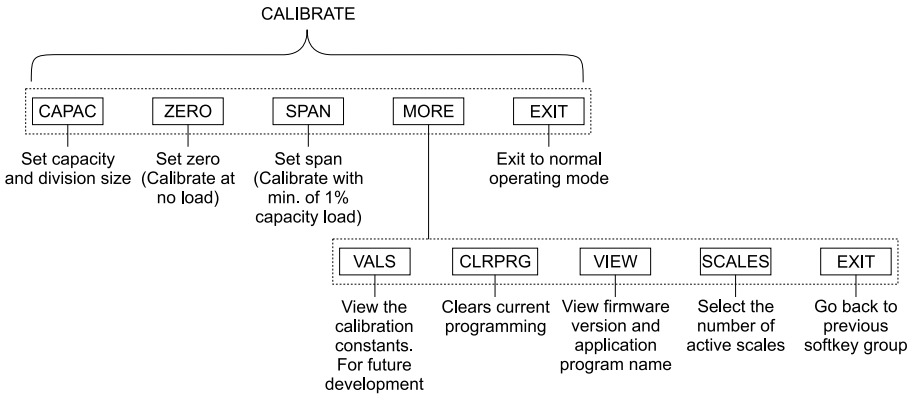


Figure 8
Soft key choices for Calibrate level

The display will ask you to enter a scale # upon entering this menu when multiscale is configured.

To calibrate another scale you must exit calibration and re-enter.

*In Legal for Trade applications the number of Active Scales **must** reflect the number of physical scales to be calibrated at the time the TT-830 is sealed.*

Press the **CAPAC** soft key to set the capacity and division size of the scale.

Press the **ZERO** soft key to set the zero reference (calibrate at no load).

Press the **SPAN** soft key to set the span (calibrate with load).

Press the **MORE** soft key to access the following soft key group:

- **VALS** Press this key to see the calibration constants. These numbers are for future development.
- **CLRPRG** Press this key to clear the BASIC program and the configuration of your TT-830. **DO THIS ONLY WHEN ABSOLUTELY NECESSARY**.
- **VIEW** Press this key to view the firmware version.
- **SCALES** Press this key to select the number of active scales.
- **EXIT** Press this key to go back to the previous soft key group.

Following are detailed instructions for setting or viewing the above parameters.

CAPAC (capacity)

If you press the **CAPAC** soft key, follow these instructions:

1. The display shows the current value for the capacity. Press **ENTER** to accept this value or key in a new capacity and press **ENTER**. . . — The current division size is displayed.
2. Press **ENTER** to accept the division size or key in a new one and press **ENTER**. . . — The display returns to the CALIBRATE display.

ZERO

If you press the **ZERO** soft key the display asks you to remove all weight from the scale then press **ENTER**. After the indicator has calibrated the zero point, the display says DONE and asks you to press any key. Above the text you will see the weight displayed. It should read zero in the increments you've chosen. If not you should perform this step again. The display then returns to the CALIBRATE display.

SPAN

If you press the **SPAN** soft key, follow these instructions:

1. The current span calibration weight is displayed. Press **ENTER** to accept this weight or key in a new one and press **ENTER**. . .

   The display prompts you to apply the test weight load to the scale.

You may use as little as 1% of full capacity to span the system but Weigh-Tronix recommends using as close to 100% of full capacity as possible.

2. Apply the test weight load to the scale and press **ENTER**. . .

   The indicator determines the span and tells you when it is done. Above the text, the display should show you the correct test weight. If not perform the span again.

3. Press any key to return to the CALIBRATE display.

The soft key group and functions accessed by the **MORE** soft key are explained on the previous page.

As you try to exit the calibration section the display will ask if you want any changes saved. Press the **YES** key if you want changes saved, **NO** if you do not.

This concludes the calibration section of the manual.

Test Menu

There is one more menu that you can access for testing purposes. Hold the **ESCAPE** key for 5 seconds then key in 911 at the prompt. These softkeys appear:

KEYPAD This test lets you check each front panel key for proper operation.

BASES This key allows you to view the output from the selected base. (**Local**, **Remote 1** and **Remote 2**, if connected).

For Quartzell bases you will see a screen similar to this:

This screen shows you:

- the serial number of the Quartzell in the currently selected base
- the raw counts from the cell (which should be stable ±200 counts and increase when weight is applied)

- the tension frequency (Ft) and compression frequency (Fc) (Both should be approximately 50,000 counts and stable ±200 counts and within 2000 counts of each other. As weight increases the tension count should increase and the compression count should decrease.
- Cell size (30Kg for example)/Display resolution for maximum efficiency (10000 is shown)
- Software version of the cell (vD.A in this example)

For analog bases you are shown:

- a raw count value and its equivalent mV/V value. (These values should be positive and increase as weight is applied.

SERIAL Use this to test your ports. Select Port #1 or 2 then short the TX and RX on the selected port. The display will change from NO LOOP to LOOP indicating the port is good.

Port 1 is Comm1, a 9-pin connector. Short pins 2 and 3 for Loop/No Loop test. Short pins 7 and 8 for Ready/Busy test.

Port 2 is Comm2, a 15 pin connector. Short pins 3 and 5 for Loop/No Loop test on RS-232-A. Short pins 2 and 5 for Loop/No Loop test on RS-232-B.

Port 3 is the local Quartzell. Use the local base test to verify current cell communication.

MORE Accesses the following keys:

INPUTS The same as Outputs except you are activating an input setpoint device such as a switch or contact closure remotely and monitoring it with this menu.

OUTPUTS Allows you to Activate/Deactivate any output setpoints you are using on the SSCU8 to verify correct hardware operation during installation or for troubleshooting purposes.

DISPLAY This test continuously cycles the display through various patterns.

Disassembly and Reassembly Instructions

Warning

WARNING! Be sure to counter the torque force applied when loosening or tightening bolts connected to the weight sensor, or weight sensor damage may result. Always lay the palm of your hand on the aluminum top plate when you break loose the top screws.

If it is necessary to service the TT-830, follow this checklist for disassembly and re-assembly.

❒ 1. Disconnect the scale from the power source and remove the scale shroud.

SEE WARNING TO THE LEFT.

❒ 2. Remove the sealed access cover and the two hex head bolts holding the load bridge to the weight sensor. **If you break a seal you must have the scale recertified before using in a legal for trade application.** Lift off the top plate.

To Remove the PC Board

❒ 3. Disconnect the power cable, display cable and Quartzell cable from the pc board.

❒ 4. Remove the screws holding the pc board to the base and lift it out.

To Remove the Weight Sensor

❒ 5. Turn the scale over and remove the hex head bolts holding the weight sensor to the base.

To Remove the Display

❒ 6. Remove the grounding screw from the bottom of the display support.

❒ 7. Press the round locking button on the bottom of the display housing and slide the display housing off the support. Disconnect the display cable fromthe display housing.

❒ 8. Remove the five screws holding the display housing together to access the display boards.

Resassembly

Reverse the disassembly procedure. Be sure the weight sensor bolts are torqued to 90 inch/lbs.

Appendix 1: Display Samples

#1

#2

#3

#4

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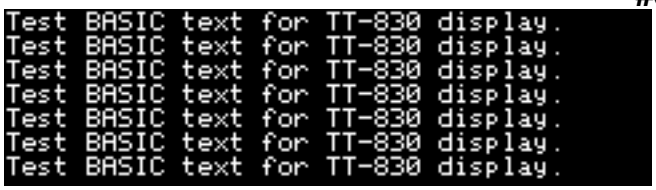
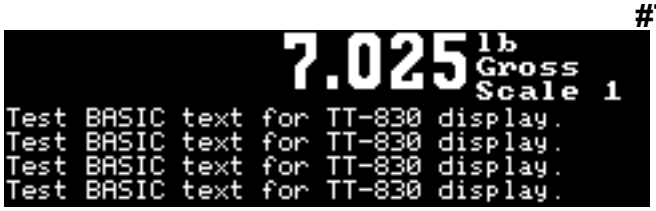
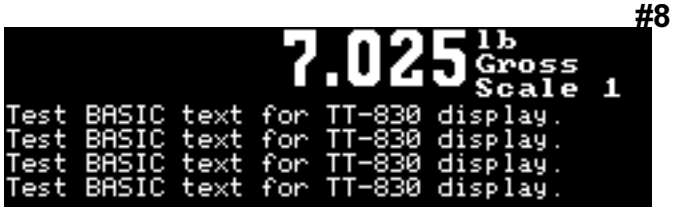
#6



#7



#8



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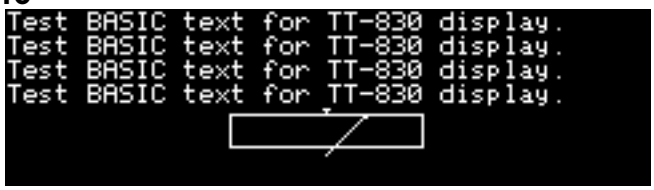

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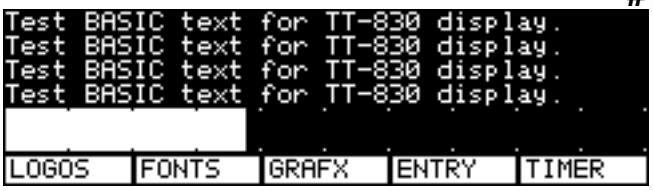

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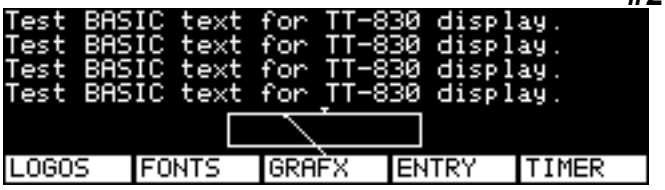
#21



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Appendix 2: Tips on Using Harmonizer

To find the best settings for your filter needs, follow the steps listed below.

1. **What to Do:** Determine the amount of positive and negative force exerted by the vibration on the scale.

   How to Do It: Set Threshld to 0.0, Constant to OFF, and Samples to Average to 1.0 A-Ds. Return to weigh mode and observe the weight swings. Record the difference between the highest and lowest displayed weight values. Add 30 to 50% to this value. This is a good starting value for the Threshld setting. Do not set your indicator to this value until told to in step 7.

2. Setting the Average to higher values increases the filtering effect.

   What to Do: Set Threshld to 0.0, Constant to OFF and Samples to Average to 15.0 A-Ds. Check the stability of the scale.

   How to Do It: Save changes and exit to normal weight mode. Observe the Center of Zero light. If it is on all the time your scale is stable within ¼ division. If the Center of Zero light blinks more filtering is required. Go to step 3.

3. Repeat step 2 but increase the Samples to Average by 15.0 A-Ds. Keep repeating steps 2 and 3 until the scale is stable or you've tried the entire range of Samples to Average (60 A-Ds). If the scale is still not stable go to step 4.

4. Setting the Constant to higher values increases the filtering effect.

   What to Do: Set Threshld to 0.0, Constant to 1.0 and Samples to Average to 60 A-Ds. Check the stability of the scale.

   How to Do It: Save changes and exit to normal weight mode. Observe the Center of Zero light. If it is on all the time your scale is stable within ¼ division. If the Center of Zero light blinks more filtering is required. Go to step 5.

5. Repeat step 4 but increase the Constant by 1.0. Keep repeating steps 4 and 5 until the scale is stable or you've tried the entire range of Constant (10). If the scale is still not stable, decrease your display update rate and start over at step 1 using the new, slower display rate.

6. After the Constant value is established you may wish to lower the Samples to Average value to improve display response time.

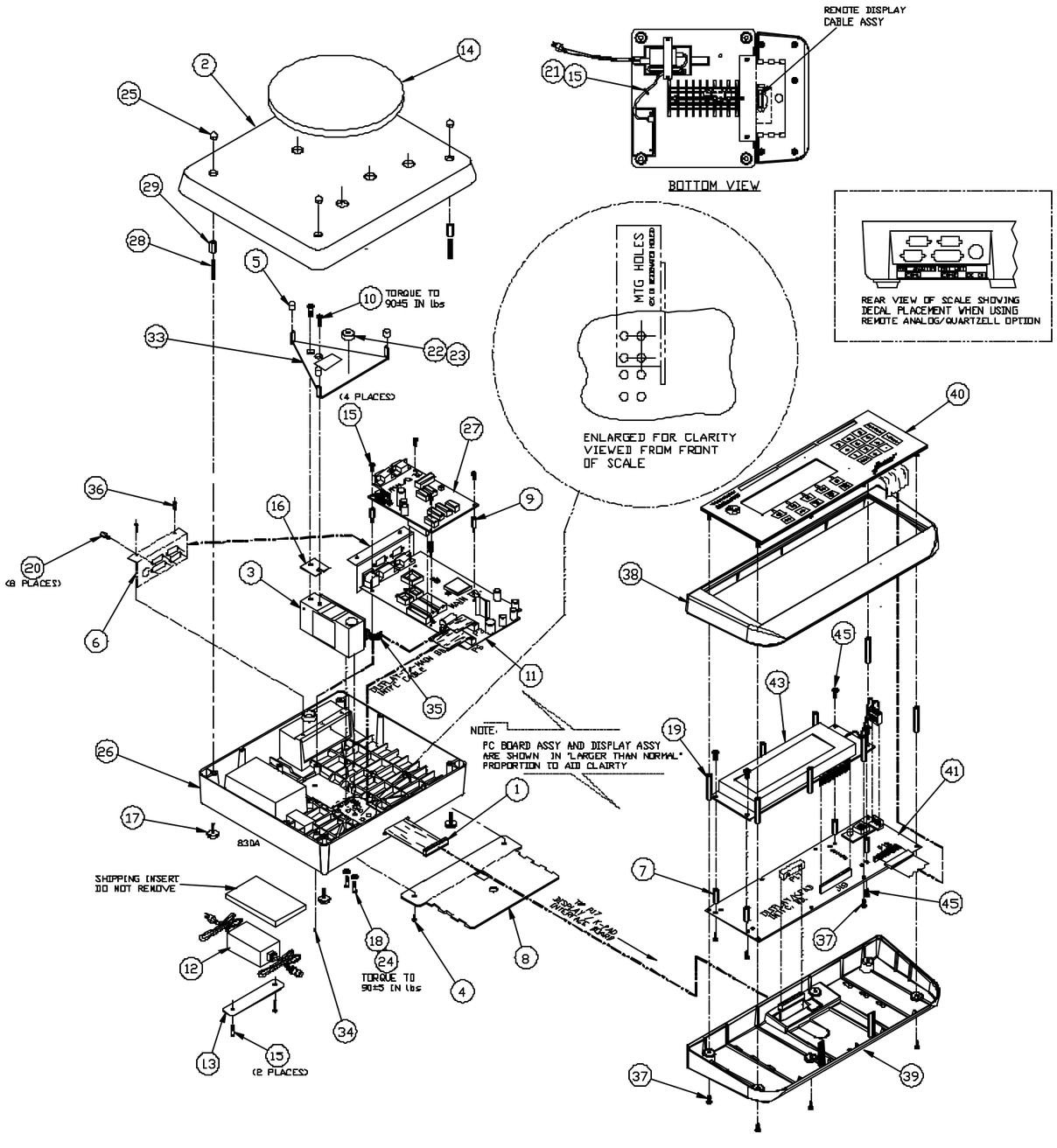
7. After a final value for Constant and Samples to Average has been set, enter the Threshld value established in step 1. If this value is too small your scale will act as if the filtering is off or not working. Increase the Threshld value until your scale stabilizes.

   If the Threshld value is too high your scale will react slowly to weight changes.

   When Harmonizer is properly adjusted the scale will be stable at zero and will rapidly display a stable test weight value.

TT-830 SOLUTION SERIES BENCH SCALE

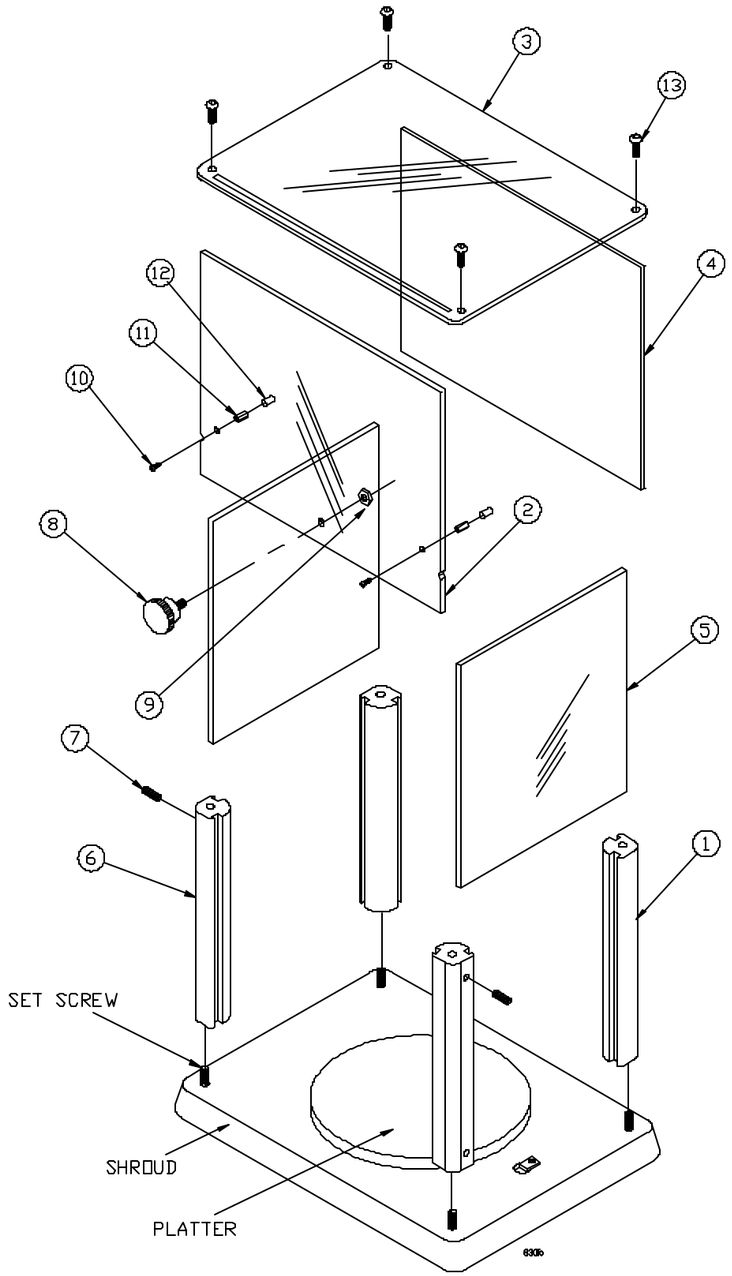
10 lb / 5 kg cap. , 12” x 14” BASE
PARTS AND ASSEMBLY



ITEM NO.	DESCRIPTION	W-T P/N	QTY
1	Main Bd.-to- Display, Cable Assy	51751-0012	1
2	Shroud *(10 lb.)*	1076-16136	1
3	Quartzell Assy	7153-15694-05	1
	Quartzell EPROM, Programmed *(not shown)*	52036-0017	1
4	Screw, #10-32 x 3/8"L	1006-02039	3
5	Vinyl Cap	1051-13968	3
6	I/O Connector Mtg Bracket	1067-16154	1
7	Standoff, f/f, #6 x ¼" HX x 9/16"L	1044-16184	4
8	Display Mtg Plate	1069-16135	1
9	Standoff, m/f #6 x 1/4"HX x 9/16"L	15437-5000	4
10	Screw, Flat Head, Hex Soc, 1/4-20 X 1.00"L	1018-11594	2
11	Main Computer and I/O Pc Board	50908-0016	1
12	Power Supply,120VAC/14VDC, 0.7 amp	1148-16069	1
	Power Supply,230VAC/14VDC, 0.7 amp	1148-16070	1
13	Pwr Supply Mtg Bracket	1067-15647	1
14	Platter	1076-14702	1
15	Screw, #6 x .38"L	1009-05758	7
16	Aluminum Spacer	1043-13977	1
17	Foot Assy	7075-16213	4
18	Capscrew, 1/4 x .1.00"L	1007-02617	2
19	Standoff,f/f #6 x 1/4 HEX x 1 1/4"L	1044-16185	8
20	Standoff,m/f #4 x 3/16 HEX x 3/16"L	1044-01085	8
21	Cable Clamp	1074-00392	1
22	Level Bubble	1083-00095	1
23	Level Bubble Tape	1045-15177	1
24	Flat Washer, 1/4"	1029-80008	2
25	Acorn Nut, #10	1028-16157	4
26	Base	7069-16183-02	1
27	Remote Analog/QDT PC Board *(optional)*	50916-0016	1
	Kit for above *(Incl. Board,hardware & decal)*	52107-0011	1
28	Slotted Stud, 1/4-20 x 2.00"L	1015-14427	4
29	Shroud Spacer	1043-14426	4
33	Loadbridge	1066-16179	1
34	Screw, Locking Hex Socket,	1011-15213	1
35	Cable Assy *(Quartzell-to-main)*	7140-15668	1
36	Screw,#6-32 x ¼"L	1009-10039	2
37	Screw,#6-32 x 3/8"L	1006-02604	8
38	Display Enclosure, Top	1069-15966	1
39	Display Enclosure, Bottom	1069-15967	1
40	Keypad / Backer Plate Assy	51938-0026	1
41	Display / Keypad Interface.Pc Board Assy	50912-0028	1
43	Display Assy, LCD w/ Backlite	48622-1021	1
44	Display ClearView Protective Cover *(not shown)*	50996-0019	1
45	Screw, #6 x ¼"L	1002-01394	8
	Optional items not shown		
	Remote QDT Base cable Assy,10 ft. length	49387-0026	1
	Bar Code Gun w/ cable, *(high visibility)*	48549-1013	1
	Bar Code Gun w/ cable	48549-1021	1
	Standard Keyboard, alpha-numeric	47853-0017	1
	Tufkey *(spill resistant)* Keyboard, alpha-numeric	47854-0016	1
	External Battery,BP-25R, 12vdc w/Charger (see system block diagram for connection location)	46839-0018	1
	Interface Cable *(to 830)* for BP-25R, 6 ft long	46850-0012	1
	Internal Battery Kit,12vdc,w/Charger PC. Bd	51799-0016	1
	Cable,9-pin,RS-232*(computer or scanner)*	51800-0013	1
	Cable,25-pin RS-232 Null Modem *(printer)*	51800-0021	1
	Cable, 9-pin *(SSCU only)*	51800-0039	1
	Cable, PC serial keyboards	51800-0047	1
	2-Device Cable, *(9-pin Scanner and 25-pin Printer)*	51800-0054	1
	4-Device Cable, *(9-pin Scanner, 25-pin Printer,9-pin SSCU, PC keyboard)*	51800-0112	1

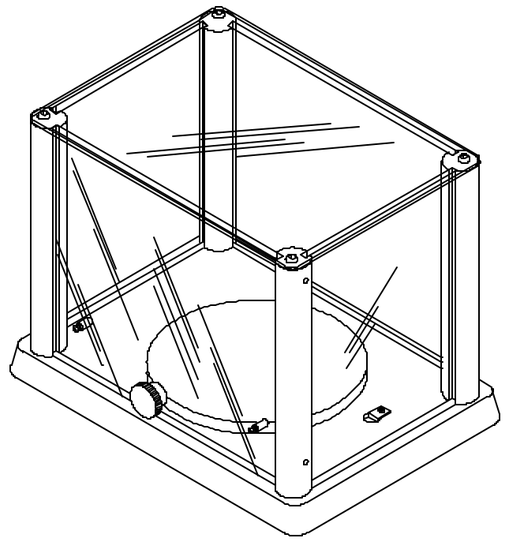
TT-830 SOLUTION SERIES BENCH SCALE

DRAFT SHIELD *(optional)* (10 lb./ 5 kg 12” x 14” base only)
PARTS AND ASSEMBLY



NOTES:

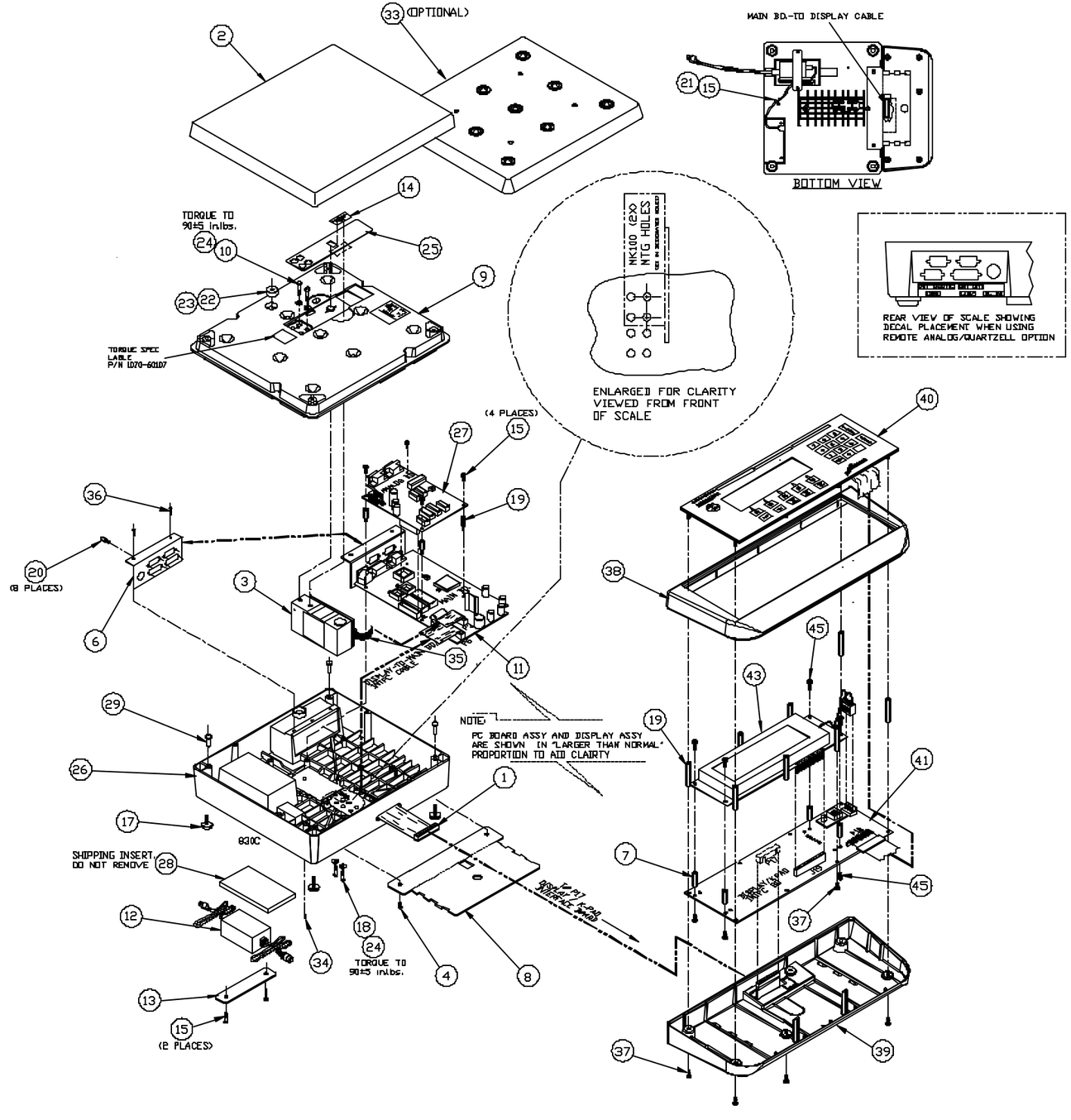
TO INSTALL DRAFT SHIELD, THE HEXNUT AND PLASTIC CAP AT THE CORNERS OF THE SHROUD NEED TO BE REMOVED AND DISCARDED BEFORE ATTACHING CORNER RODS.



ITEM NO.	DESCRIPTION	W-T P/N	QTY	QTY
1	SUPPORT POST	1058-15413	2	2
2	SHIELD DOOR	1069-15404	1	1
3	SHIELD TOP PANEL	1069-15403	1	1
4	SHIELD REAR PANEL	1069-15406	1	1
5	SHIELD SIDE PANEL	1069-14604	2	2
6	SUPPORT POST w/SIDE HOLE	1058-14424	2	2
7	THREADED SPRING / PLUNGER	1068-14610	2	2
8	KNOB	1091-14144	1	1
9	HEX NUT, #10-32	14506-0059	1	1
10	SCREW, #6-32 x .31” LG	1001-13790	2	2
11	STANDOFF, #6-32 x .31” LG	1044-00121	2	2
12	VINYL CAP	1051-13968	2	2
13	SCREW, .25”-20 x .50” LG	1007-00538	4	8

TT-830 SOLUTION SERIES BENCH SCALE

50 lb / 25 kg *AND* 100 lb / 50 kg cap. , 12” x 14” Base
PARTS AND ASSEMBLY



ITEM NO.	DESCRIPTION	W-T P/N	QTY
1	Main Bd.-to- Display, Cable Assy	51751-0012	1
2	Shroud, Flat Top, Polycarbonate	1076-15256	1
	Shroud Dished, Stainless (optional)	1076-14741	1
3	Quartzell Assy (50lb / 25kg cap.)	7153-15694-32	1
	Quartzell Assy (100lb / 50kg cap.)	7153-15694-50	1
	Quartzell EPROM, Programmed (not shown)	52036-0017	1
4	Screw, #10-32 x 3/8"L	1006-02039	2
5	Standoff, m/f #6 x 1/4"HX x 9/16"L	15437-5000	4
6	I/O Connector Mtg Bracket	1067-16154	1
7	Standoff, f/f, #6 x ¼" HX x 9/16"L	1044-16184	4
8	Display Mtg. Plate	1069-16135	1
9	Loadbridge	1066-15993	1
10	Capscrew, Hex, 1/4-20 X 1.00"L	1007-02617	4
11	Main Computer and I/O Pc Board	50908-0016	1
12	Power Supply, 120VAC / 14VDC, .07amp	1148-16069	1
	Power Supply,230VAC/14VDC, 0.7 amp	1148-16070	1
13	Pwr Supply Mtg Bracket	1067-15647	1
14	Sealing Cover Label	1070-60103	1
15	Screw, #6 X .38"L	1009-05758	7
17	Foot Assy	7075-16213	4
18	Bolt, ¼" x 1.0"L	1007-02617	4
19	Standoff, f/f, #6 x ¼" HX x 1 ¼"L	1044-16185	4
20	Standoff,m/f #4 x 3/16HEX x 3/16"L	1044-01085	8
21	Cable Clamp	1074-00392	1
22	Level Bubble	1083-00095	1
23	Adhesive Tape (for bubble)	1045-13049	1
24	Flat Washer, 1/4"	1029-80008	4
25	Access / Security Cover	1069-15766	1
26	Base	7069-16183-01	1
27	Remote Analog/QDT PC. Board *(optional)*	50916-0016	1
	Kit for Above (Incl. Board,hardware,decal)	52107-0011	1
28	Shipping Block	1084-15131	1
29	Load Stop Pin,White *(for 50lb / 25kg)*	1070-60074-32	4
	Load Stop Pin, Black (for100lb / 50kg)	1070-60074-50	4
33	Ball Top Shroud (optional)	7076-15118	1
34	Screw, Locking Hex Socket,	1011-15213	1
35	Cable Assy (Quartzell-to-main)	7140-15668	1
36	Screw,#6-32 x ¼"L	1009-10039	2
37	Screw,#6-32 x 3/8"L	1006-02604	8
38	Display Enclosure, Top	1069-15966	1
39	Display Enclosure, Bottom	1069-15967	1
40	Keypad / Backer Plate Assy	51938-0026	1
41	Display / Keypad Intfc Board Assy	50912-0028	1
43	Display, LCD w/ Backlite	48622-1021	1
44	Display ClearView Protective Cover *(not shown)*	50996-0019	1
45	Screw, #6 x ¼"L	1006-02598	8
	Optional items not shown		
	Remote QDT Base cable Assy,10 ft. length	49387-0026	1
	Bar Code Gun w/ cable, (high visibility)	48549-1013	1
	Bar Code Gun w/ cable	48549-1021	1
	Standard Keyboard, alpha-numeric	47853-0017	1
	Tufkey (spill resistant) Keyboard, alpha-numeric	47854-0016	1
	External Battery,BP-25R, 12vdc w/Charger (see system block diagram for connection location)	46839-0018	1
	Interface Cable (to 830) for BP-25R, 6 ft long	46850-0012	1
	Internal Battery Kit,12vdc,w/Charger PC. Bd	51799-0016	1
	Cable,9-pin,RS-232(computer or scanner)	51800-0013	1
	Cable,25-pin RS-232 Null Modem (printer)	51800-0021	1
	Cable, 9-pin (SSCU only)	51800-0039	1
	Cable, PC serial keyboards	51800-0047	1
	2-Device Cable, (9-pin Scanner *and* 25-pin Printer)	51800-0054	1
	4-Device Cable, (9-pin Scanner, 25-pin Printer,9-pin SSCU, PC keyboard)	51800-0112	1

TT-830 SOLUTION SERIES BENCH SCALE

SYSTEM WIRING BLOCK DIAGRAM

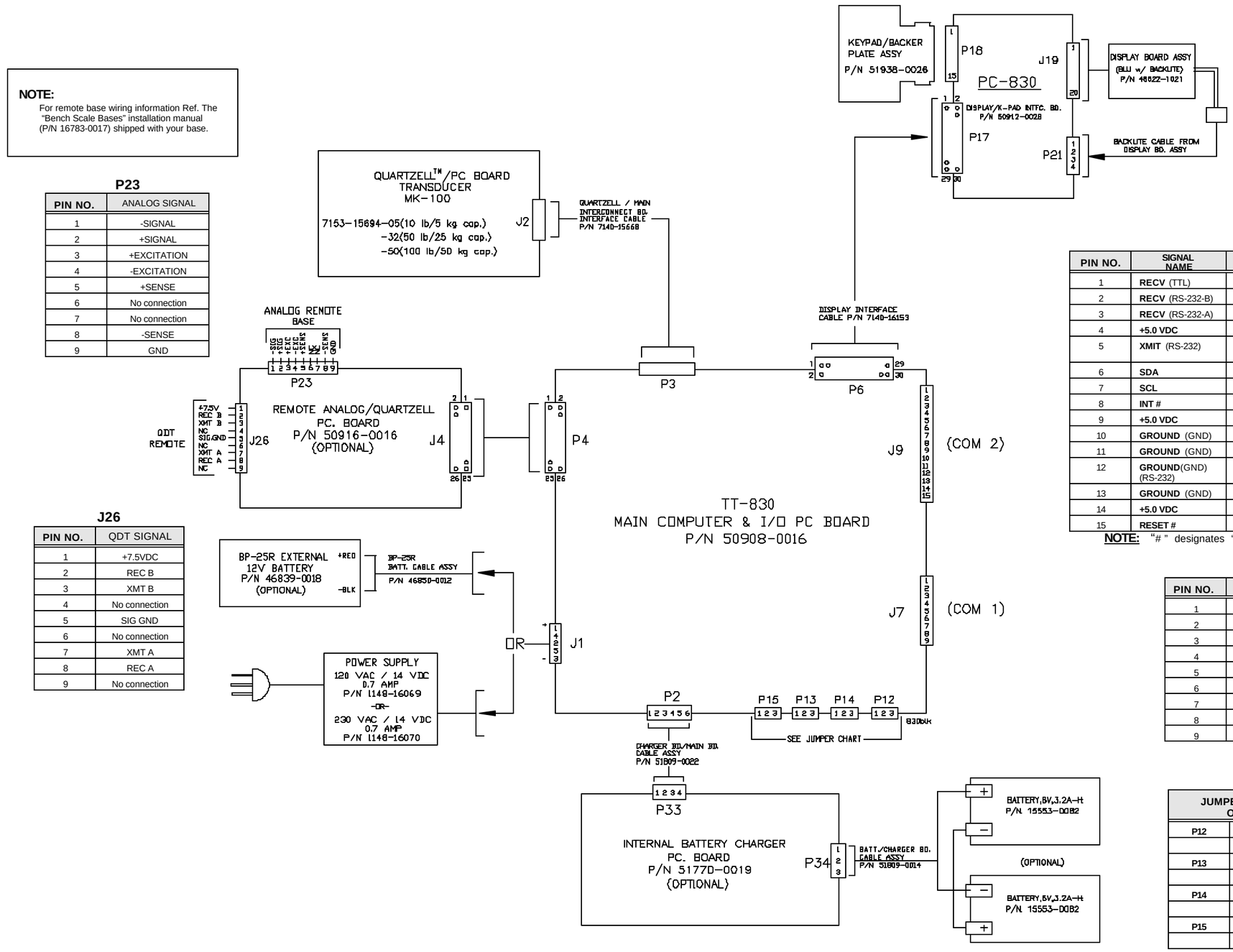
NOTE:
For remote base wiring information Ref. The "Bench Scale Bases" installation manual (P/N 16783-0017) shipped with your base.

P23

PIN NO.	ANALOG SIGNAL
1	-SIGNAL
2	+SIGNAL
3	+EXCITATION
4	-EXCITATION
5	+SENSE
6	No connection
7	No connection
8	-SENSE
9	GND

J26

PIN NO.	QDT SIGNAL
1	+7.5VDC
2	REC B
3	XMT B
4	No connection
5	SIG GND
6	No connection
7	XMT A
8	REC A
9	No connection



COM 2 (J9)

PIN NO.	SIGNAL NAME	DEVICE USED WITH	SPECIAL NOTES :
1	**RECV** (TTL)	**Keyboard:** TTL	DATA IN (do not gnd)
2	**RECV** (RS-232-B)	**Magnetic Card Reader, Keyboard:** RS-232	DATA IN (do not gnd)
3	**RECV** (RS-232-A)	**Scanner:** RS-232	DATA IN (do not gnd)
4	**+5.0 VDC**	**Scanner**	(do not gnd)
5	**XMIT** (RS-232)	**Printer, Computer, Remote Displ.,Modem, RF link, IR link:** RS-232	DATA OUT
6	**SDA**	**SSCU**	EXTERNAL I/O CONTROL
7	**SCL**	**SSCU**	EXTERNAL I/O CONTROL
8	**INT #**	**SSCU**	EXTERNAL I/O CONTROL
9	**+5.0 VDC**	**Keyboard**	
10	**GROUND** (GND)	**Keyboard**	
11	**GROUND** (GND)	**Scanner**	
12	**GROUND**(GND) (RS-232)	**Printer, Computer, Remote Displ.,Modem, RF link, IR link:** RS-232	
13	**GROUND** (GND)	**SSCU**	EXTERNAL I/O CONTROL
14	**+5.0 VDC**	**SSCU**	EXTERNAL I/O CONTROL
15	**RESET #**	**SSCU**	EXTERNAL I/O CONTROL

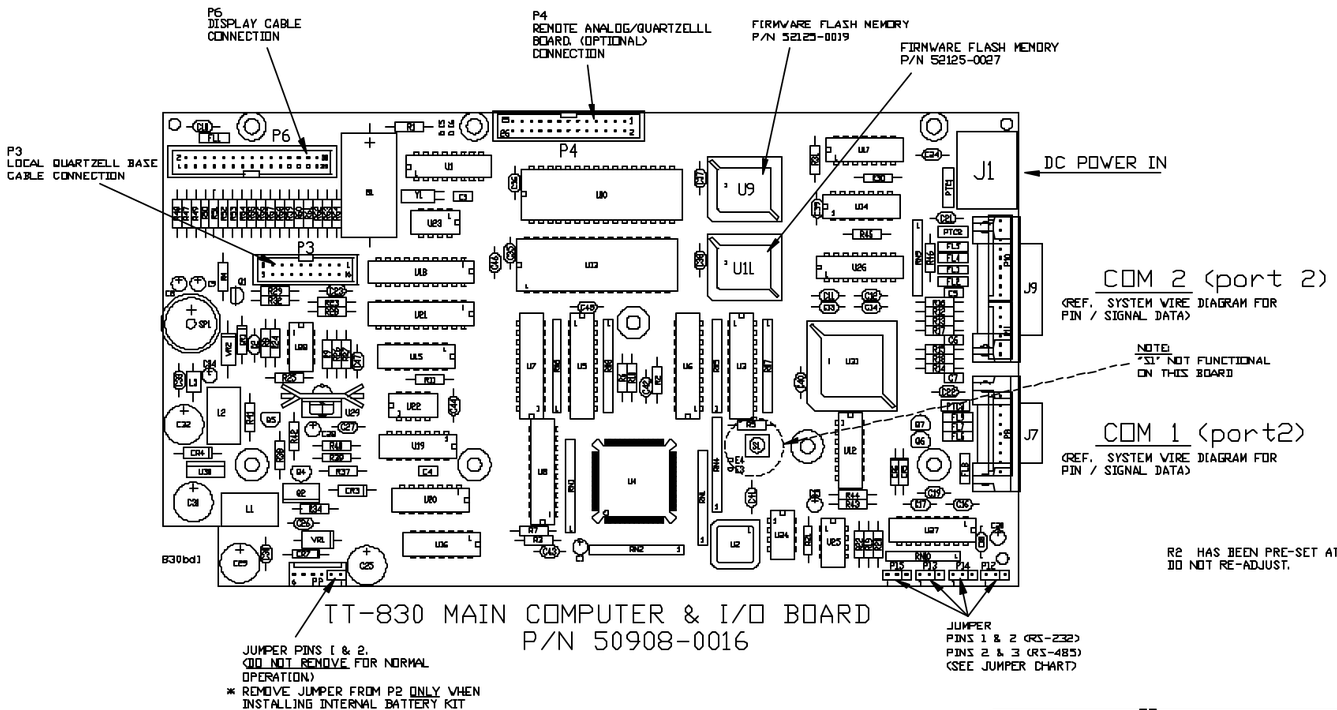
NOTE: "# " designates "Active Low Signal"

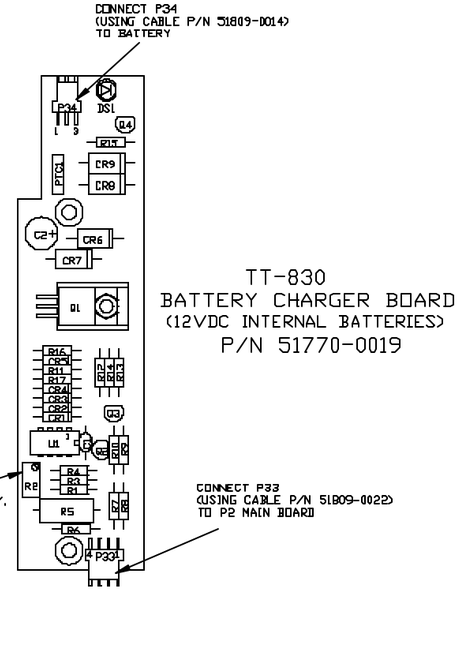
COM 1 (J7)

PIN NO.	RS-232	QDT
1	No conn.	+7.5 VDC
2	RECV	RECV B (RS485)
3	XMIT	XMIT B (RS485)
4	No conn.	No connection.
5	Sig gnd	Sig gnd
6	+5.0 VDC	No connection.
7	RTS	XMIT A (RS485)
8	CTS	REC A (RS485)
9	No conn.	No connection.

COM 1 (J7) **JUMPER CHART**

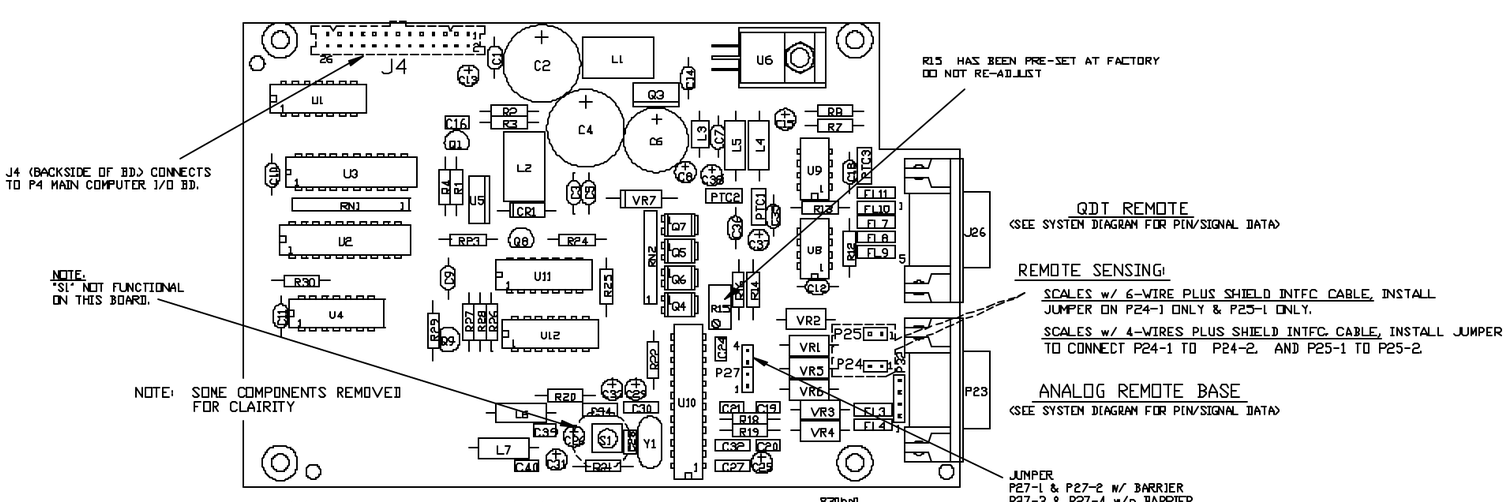
JUMPER PINS ON:		RS-232	RS-485
P12	1 & 2	RTS	------
	2 & 3	------	XMIT A
P13	1 & 2	XMIT	------
	2 & 3	------	XMIT B
P14	1 & 2	CTS	------
	2 & 3	------	RCV A
P15	1 & 2	RCV	------
	2 & 3	------	RCV B

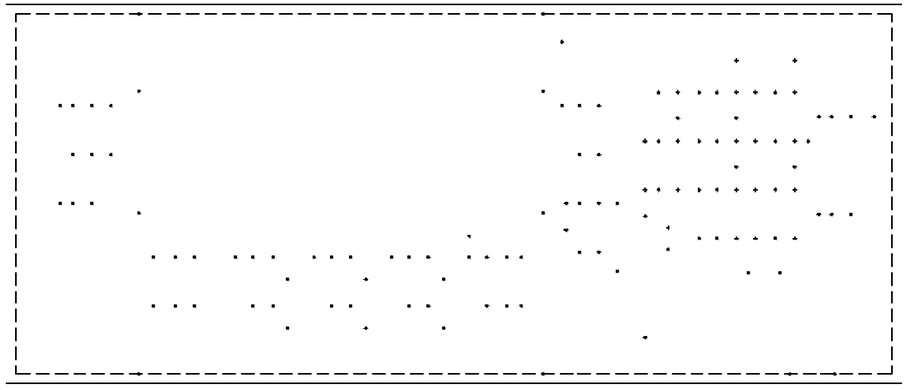




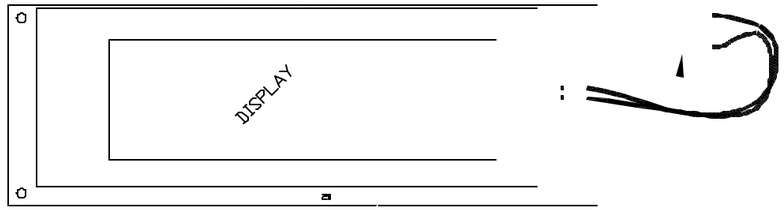
COM 1 (J7) **JUMPER CHART**

JUMPER PINS ON:		RS-232	RS-485
P12	1 & 2	RTS	------
	2 & 3	------	XMIT A
P13	1 & 2	XMIT	------
	2 & 3	------	XMIT B
P14	1 & 2	CTS	------
	2 & 3	------	RCV A
P15	1 & 2	RCV	------
	2 & 3	------	RCV B

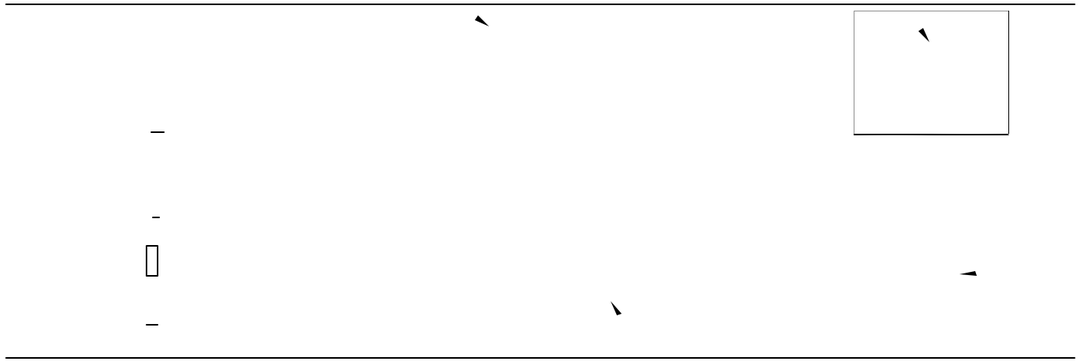




DISPLAY BOARD, TT-830 w/ BLUE & BACKLITE
P/N 48622-1021
(DISPLAY SIDE SHOWN)



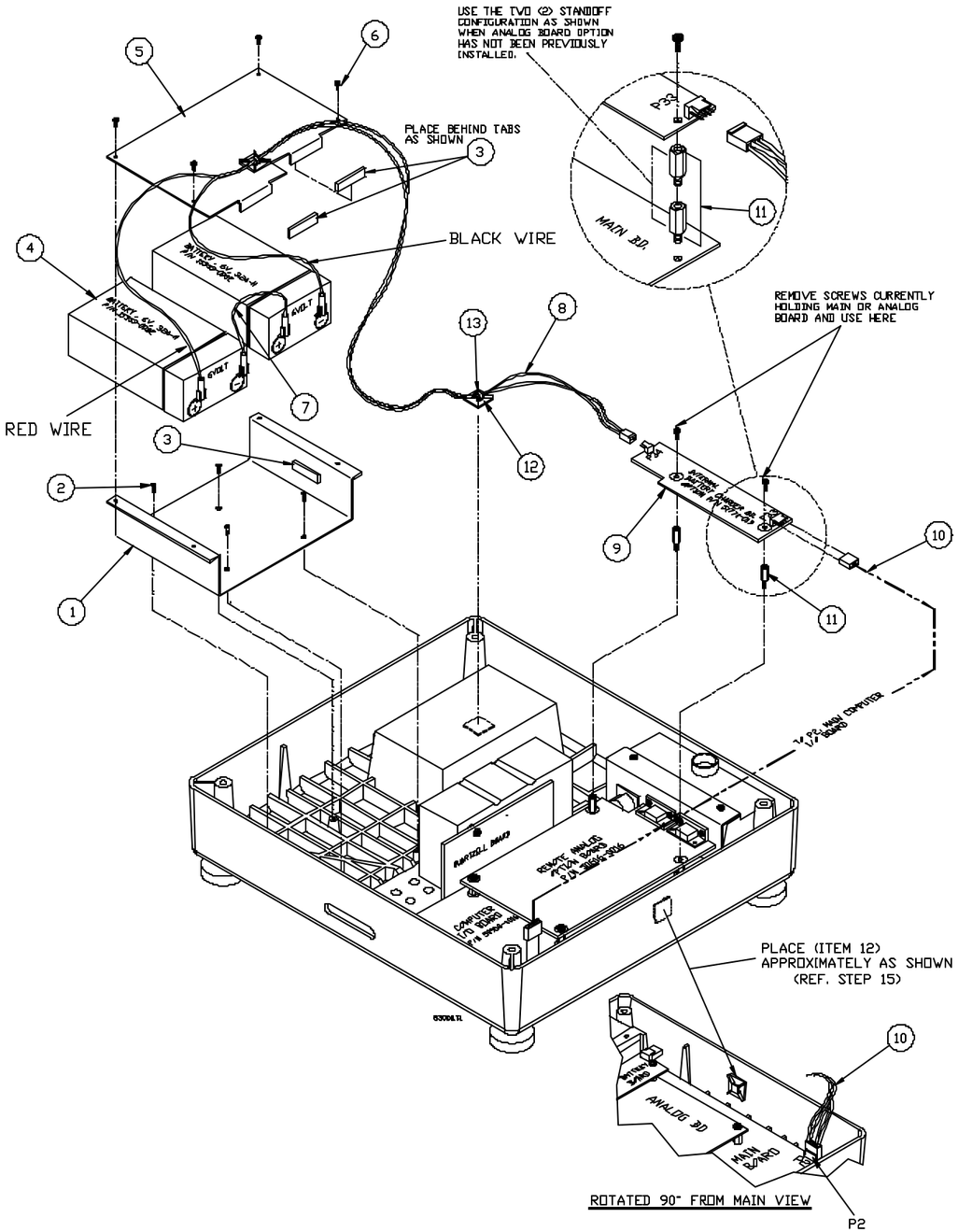
CONNECT TO J19
DISPLAY INTERFACE
BOARD



TT-830 DISPLAY & INTERFACE BOARD
P/N 50912-0028 (TT-830, w/ backlite & blue)

TT-830 SOLUTION SERIES BENCH SCALE

INTERNAL BATTERY & CHARGER PC. BOARD
PARTS *AND* ASSY ***(KIT P/N 51799-0016)***



PARTS LIST

ITEM NO.	DESCRIPTION	W-T P/N	QTY
1	Battery Bracket	51793-0012	1
2	Screw,flat hd #6-32 x 3/8"L	16254-0249	4
3	Weather Stripping, (cut into 3 pieces as shown)	15366-0022	1
4	Battery, 6V, 3.2A-H	15553-0082	2
5	Battery Cover	51792-0013	1
6	Screw,pan hd #4-40 x 3/8"L	14473-0124	4
7	Battery Jumper Cable Assy	51809-0030	1
8	Battery –to- Charger Bd. Cable Assy	51809-0014	1
9	Battery Charger Board Assy	51770-0019	1
10	Charger Board –to- Main Board Cable Assy	51809-0022	1
11	Standoff, m/f, #6 x ¼" HX x 9/16"L	15437-5000	4
12	Mounting Device	17887-0010	3
13	Cable Tie	13762-0019	3

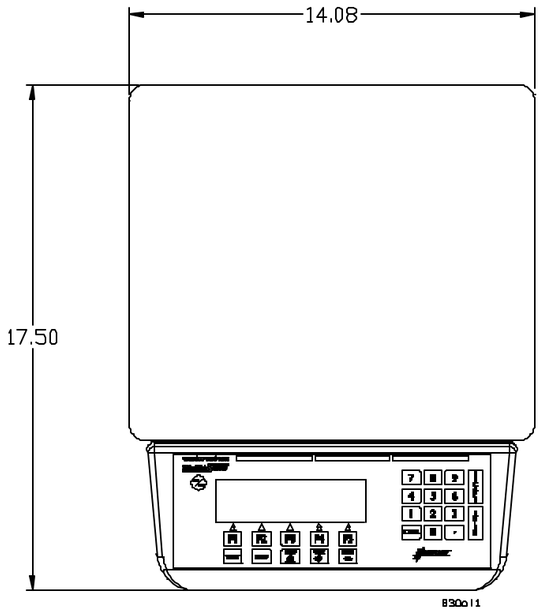
Internal Battery / Battery Charger PC Board Installation Instructions

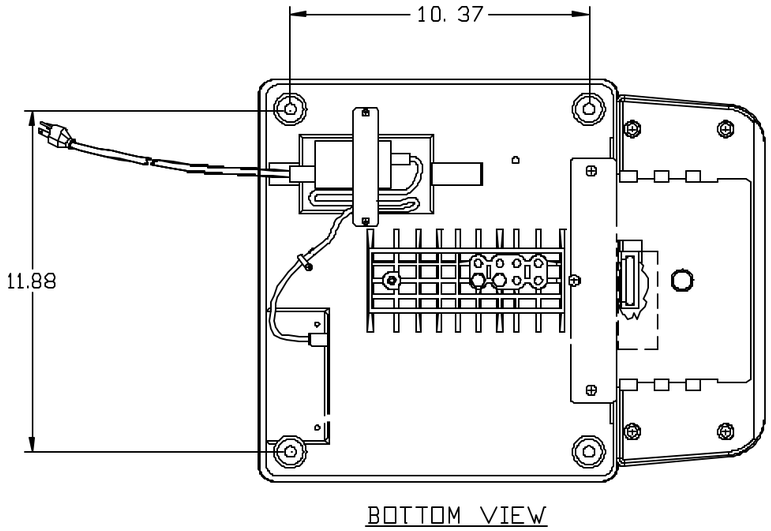
1. Remove shroud. *(refer to "parts & ass'y" pages in this manual when needed)*
2. Remove loadbridge by removing bolts attaching loadbridge to quartzell. *(torque wrench required to re-assemble)*
3. Remove the two screws from main board *(or analog board if installed)* where battery charger pc board will be installed *(see illustration)*. These screws will be used to install battery charger pc board.
4. Install standoffs *(item 11).* Use two if you have analog board., or four if not using analog board). *(see illustration)*
5. Install battery charger board, *(item 9)* on standoffs using screws referred to in step 3.
6. Install battery bracket *(item 1)* with four screws *(item 2)* as shown in illustration.
7. Cut weather stripping *(item 3)* into desired lengths and apply as shown.
8. Place batteries into battery bracket and install cover *(item 5)* on battery bracket using four screws *(item 6).*
9. Place the three mounting devices *(item 12)* as shown.
10. Remove the 2-pin jumper from P2-1 / P2-2 on main board.
11. Connect batteries with battery jumper cable assy *(item 7)* as shown.
12. Using battery-to-charger board cable assy *(item 8),* connect red wire to positive terminal of one battery, then connect black wire to negative terminal of other battery as shown. Now connect the 3-pin connector to P34 on charger board *(item 9).*
13. Connect battery charger board to main board using charger board-to-main board cable assy *(item 10)* as shown.
14. Attach cable assemblies *(items 7,8 & 10)* to the already attached mounting devices *(item 12)* with cable ties *(item 13)* as shown. DO NOT FULLY TIGHTEN CABLE TIES AT THIS TIME.
15. Verify that the wires in cable assemblies do not touch the quartzell or loadbridge, or be pinched by them in any way, then finish tightening the cable ties. *(REF: step no.14)*
16. Make sure scale is unplugged from wall outlet. Press any key to verify that scale turns on and operates.
17. Press "off" key to verify scale turns off.

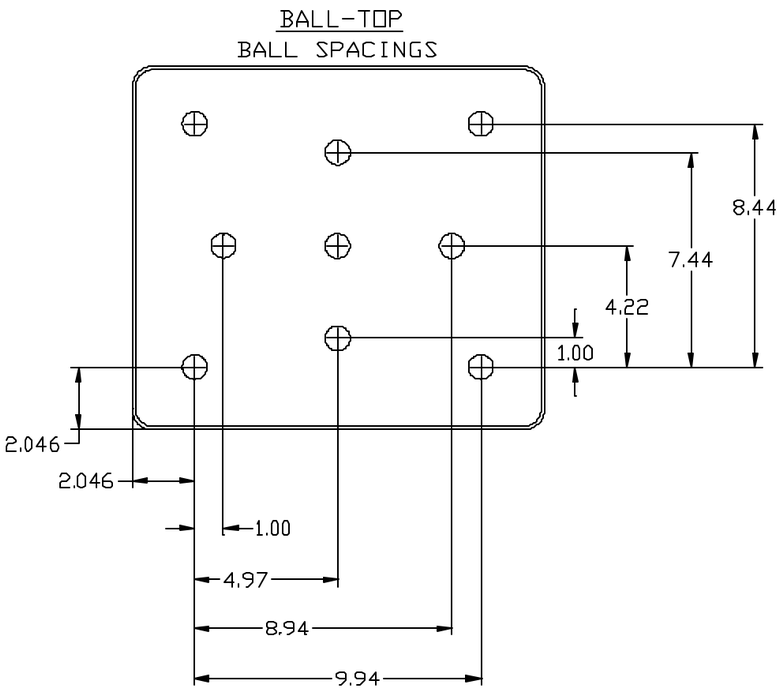
IMPORTANT: SCALE MUST BE PLUGGED IN TO WALL OUTLET, AND TURNED OFF TO PERFORM VOLTAGE CHECK AND/OR CHARGE THE BATTERIES.

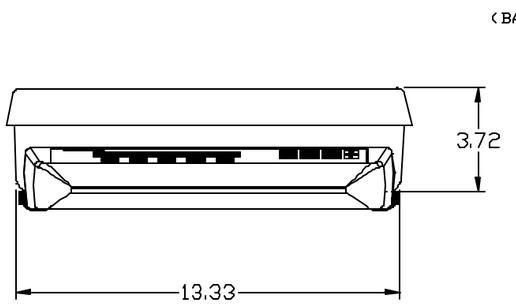
18. Connect power cord to wall outlet and verify that the battery voltage is higher than 12.5 VDC, and is increasing.
19. When the battery is 90% of full charge, the green LED (DS1) on charger board will flash on and off. When fully charged the LED will stay on continuously. BATTERY DOES NOT NEED TO BE 100% CHARGED. Normal charging time is approx. 4-6 hr. If battery is totally discharged, a longer charging time may be necessary. The charger system will automatically shut off when battery is fully charged.
20. When the green LED begins to flash, unplug the scale and reinstall the loadbridge and shroud. Using a torque wrench tighten the load bridge bolts to specs *(90±5 ft. lbs).*

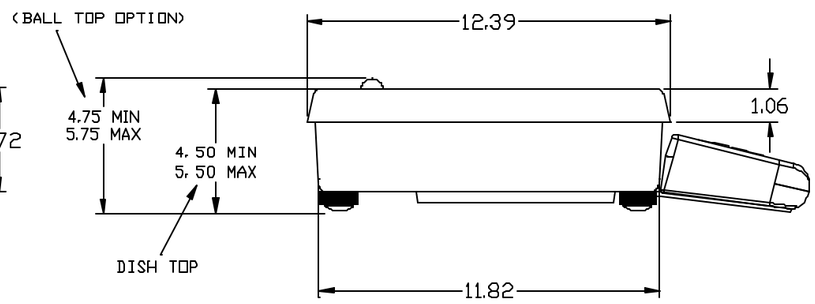
TT-830 SOLUTION SERIES BENCH SCALE
SCALES *AND* BASES
DIMENSIONAL OUTLINE *FOR* 12” x 14” BASE



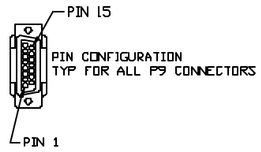


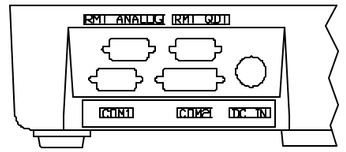






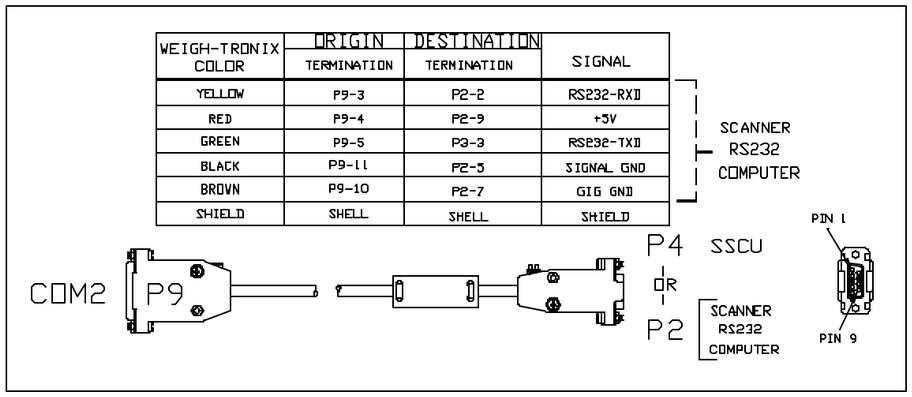
DESCRIPTION	P/N
SINGLE CABLE OPTIONS (9-in.)	
BI-DIRECTIONAL RS232, 9-PIN (COMPUTER OR SCANNER)	51800-0013
BI-DIRECTIONAL RS232, NULL MODEM 25-PIN (PRINTER)	51800-0021
SSCU, 9-PIN (SSCU ONLY)	51800-0039
PC SERIAL KEYBOARD	51800-0047
TWO DEVICE CABLE OPTIONS (9-in.)	
9-PIN SCANNER AND 25-PIN PRINTER	51800-0054
9-PIN SSCU, PC SERIAL KEYBOARD	51800-0104
FOUR DEVICE CABLE OPTIONS (9-in.)	
9-PIN SCANNER, 9-PIN SSCU, 25-PIN PRINTER, PC SERIAL KEYBOARD	51800-0112





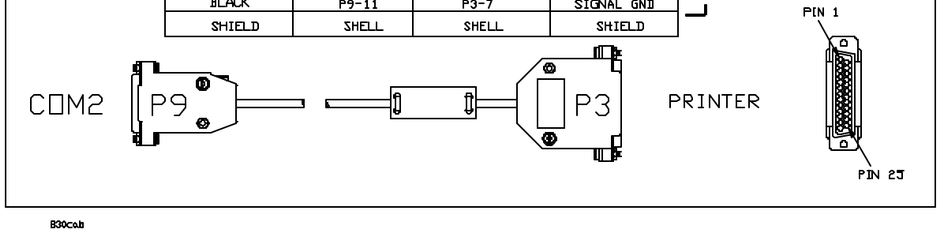
(REAR VIEW, 830 SCALE)

WEIGH-TRONIX COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
YELLOW	P9-3	P2-2	RS232-RXD
RED	P9-4	P2-9	+5V
GREEN	P9-5	P3-3	RS232-TXD
BLACK	P9-11	P2-5	SIGNAL GND
BROWN	P9-10	P2-7	CTS GND
SHIELD	SHELL	SHELL	SHIELD



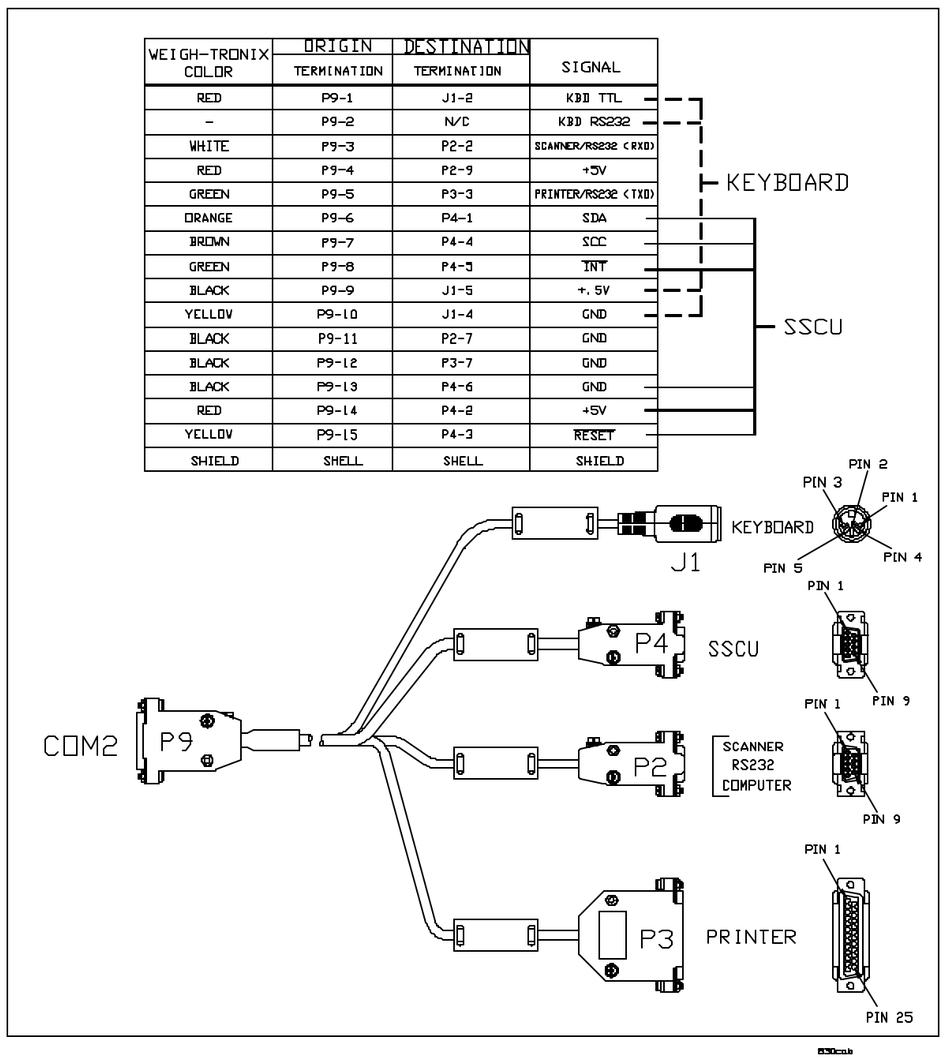
830cab

WEIGH-TRONIX COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
WHITE	P9-3	P3-2	RS232-RXD
GREEN	P9-5	P3-3	RS232-TXD
BLACK	P9-11	P3-7	SIGNAL GND
SHIELD	SHELL	SHELL	SHIELD



830cab

WEIGH-TRONIX COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
RED	P9-1	J1-2	KBD TTL
-	P9-2	N/C	KBD RS232
WHITE	P9-3	P2-2	SCANNER/RS232 (RXD)
RED	P9-4	P2-9	+5V
GREEN	P9-5	P3-3	PRINTER/RS232 (TXD)
ORANGE	P9-6	P4-1	SDA
BROWN	P9-7	P4-4	SCC
GREEN	P9-8	P4-3	INT
BLACK	P9-9	J1-5	+.5V
YELLOW	P9-10	J1-4	GND
BLACK	P9-11	P2-7	GND
BLACK	P9-12	P3-7	GND
BLACK	P9-13	P4-6	GND
RED	P9-14	P4-2	+5V
YELLOW	P9-15	P4-3	RESET
SHIELD	SHELL	SHELL	SHIELD

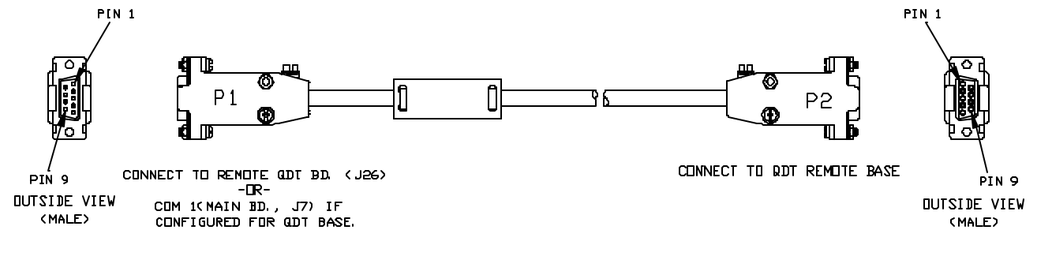


830cab

830-TO-QUARTZELL BASE CABLE ASSEMBLY, P/N 49387-0026 (10ft.)

WEIGH-TRONIX WIRE COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
RED	P1-1	P2-1	+7 5 v
BLUE	P1-2	P2-2	REC B
YELLOW	P1-3	P2-3	XMT B
BLACK	P1-5	P2-5	GROUND
GREEN	P1-7	P2-7	XMT A
WHITE	P1-8	P2-8	REC A
DRAIN WIRE	SHELL	SHELL	SHIELD

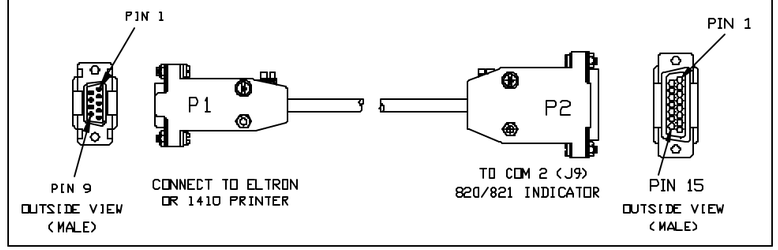
SIGNAL NAMES ARE FROM INDICATOR



830cab2

PRINTER-TO-830 CABLE ASSY P/N 52002-0017

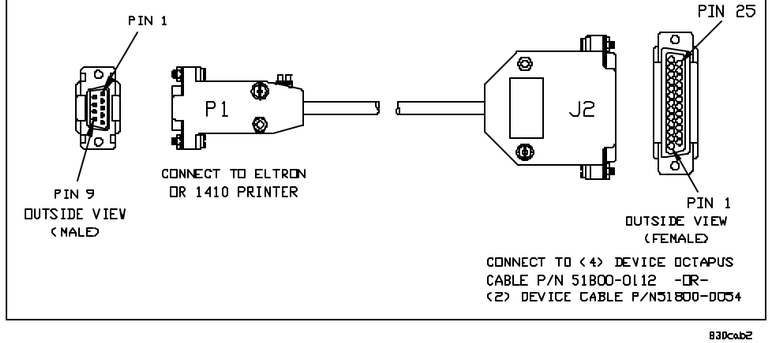
WEIGH-TRONIX WIRE COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
DRAIN WIRE	NC	NC	SHIELD
RED	P1-3	P2-5	TXD
BLACK	P1-5	P2-10	GND



830cab2

'PRINTER-TO-OCTAPUS CABLE' CABLE ASSY P/N 52001-0018

WEIGH-TRONIX WIRE COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
DRAIN WIRE	NC	NC	SHIELD
RED	P1-3	J2-3	TXD
BLACK	P1-5	J2-7	GND

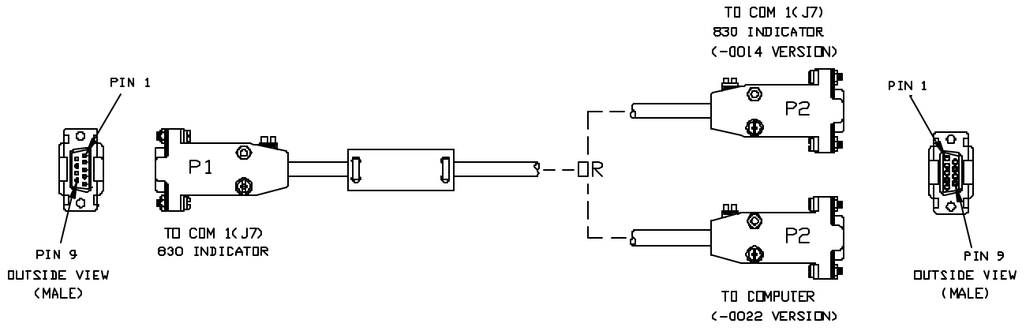


830cab2

'COM 1' CABLE ASSEMBLIES, P/N 52039-0014 AND -0022

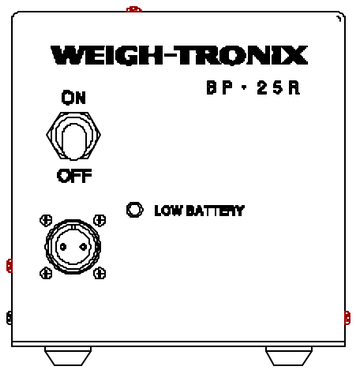
WEIGH-TRONIX WIRE COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
YELLOW	P1-2	P2-3	SCALE RXD
GREEN	P1-3	P2-2	SCALE TXD
BLACK	P1-5	P2-5	SIGNAL GROUND
ORANGE	P1-7	P2-8	SCALE RTS
BROWN	P1-8	P2-7	SCALE CTS
DRAIN WIRE	SHELL	SHELL	SHIELD

SIGNAL NAMES ARE FROM INDICATOR

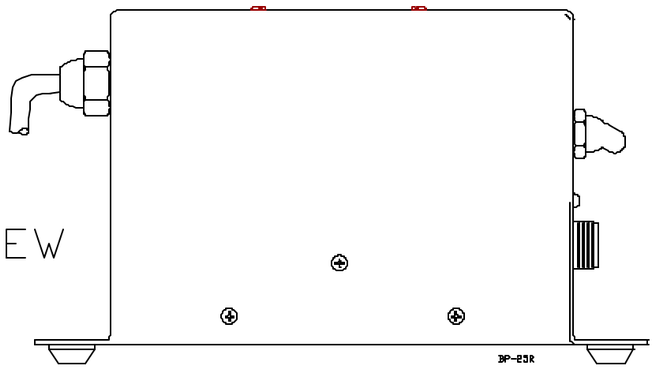


830cab2

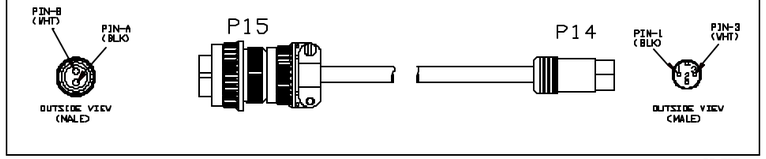
FRONT VIEW



SIDE VIEW



BP-25R-TO-830 CABLE ASSY P/N 46850-0012			
WEIGH-TRONIX WIRE COLOR	ORIGIN TERMINATION	DESTINATION TERMINATION	SIGNAL
BLK	P15-A	P14-1	+ 12V
WHT	P15-B	P14-3	RETURN



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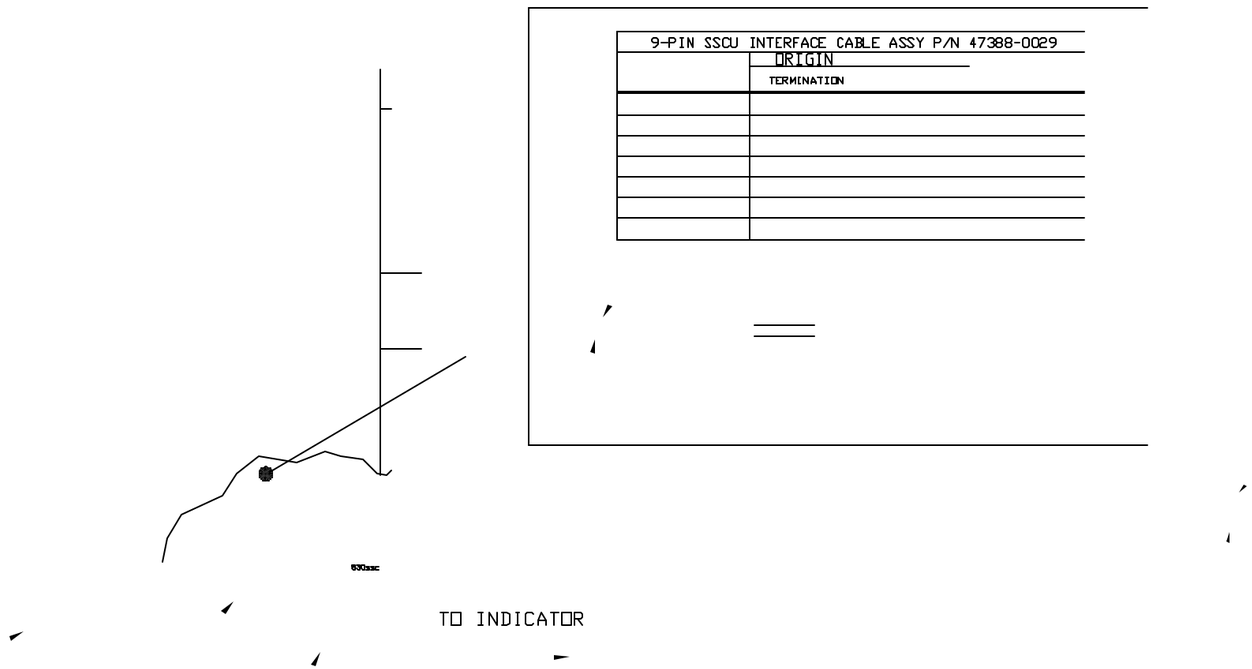
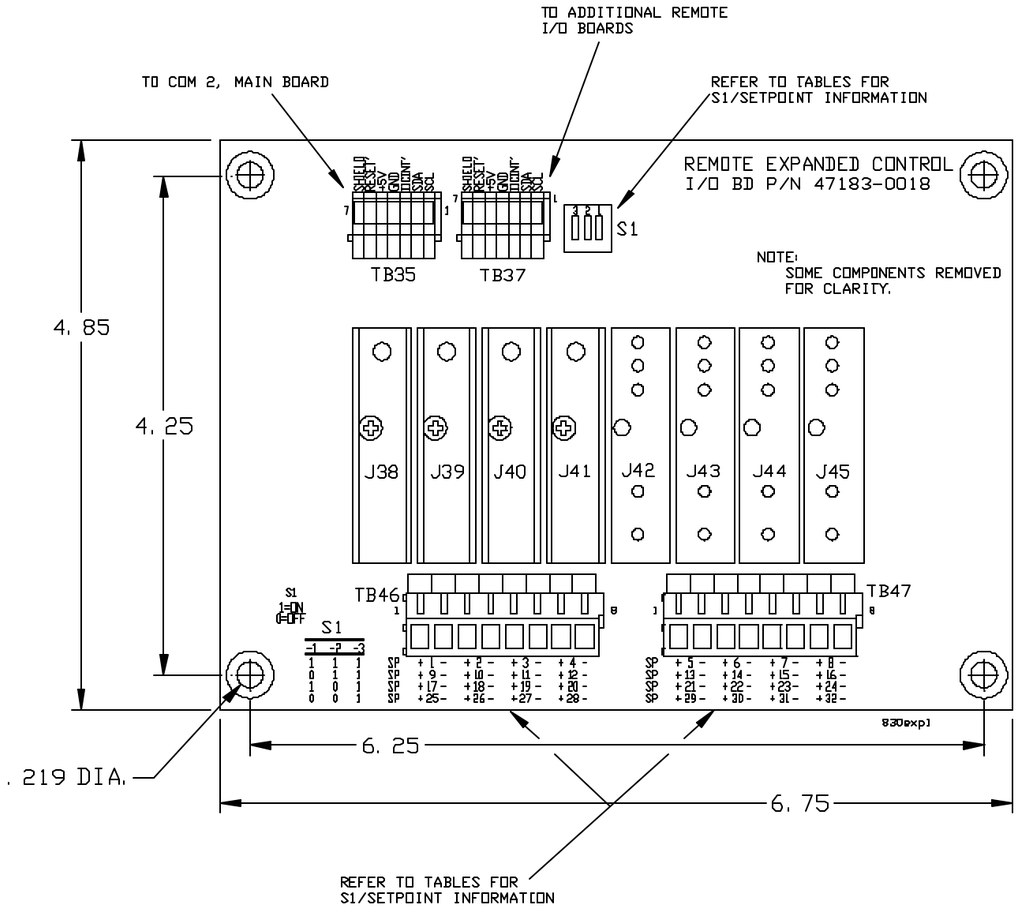
ITEM NO.	DESCRIPTION	W-T P/N	QTY
1	Strain Relief	22380-0053	1
2	Strain Relief	15257-0024	2
3	Sscu Interface Cable (9-pin)	47388-0029	1
	Sscu Interface Cable (15-pin)	47388-0037	1
4	Enclosure (Steel, Painted)	47665-0031	1
5	Enclosure (Stainless)	47665-0049	1
6	Remote 16 TTL Control I/O Pc Bd	49853-0013	1
	Remote 8 Solid State Control I/O Pc. Bd.	47183-0018	1
7	Lock Nut (Self Sealing)	22381-0011	1



TT-830 SOLUTION SERIES BENCH SCALE
SSCU-8 REMOTE EXPANDED CONTROL I/O BOARD
P/N 47183-0018



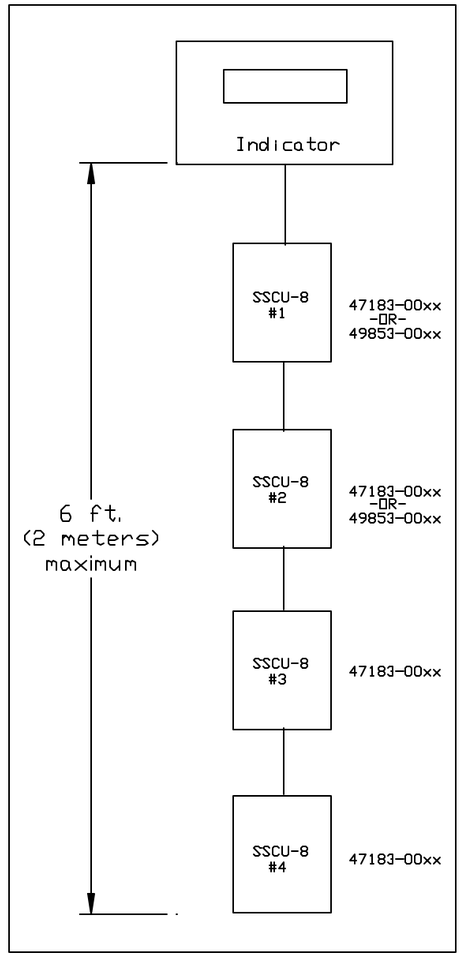


Table 1: Setpoints 1 thru 8

SW1 (1)ON	(2)ON	(3)ON
SETPOINT #	TB #	PIN #
1 (+)	46	1
1 (-)	46	2
2 (+)	46	3
2 (-)	46	4
3 (+)	46	5
3 (-)	46	6
4 (+)	46	7
4 (-)	46	8
5 (+)	47	1
5 (-)	47	2
6 (+)	47	3
6 (-)	47	4
7 (+)	47	5
7 (-)	47	6
8 (+)	47	7
8 (-)	47	8

Table 2: Setpoints 9 thru 16

SW1 (1)OFF	(2)ON	(3)ON
SETPOINT #	TB #	PIN #
9 (+)	46	1
9 (-)	46	2
10 (+)	46	3
10 (-)	46	4
11 (+)	46	5
11 (-)	46	6
12 (+)	46	7
12 (-)	46	8
13 (+)	47	1
13 (-)	47	2
14 (+)	47	3
14 (-)	47	4
15 (+)	47	5
15 (-)	47	6
16 (+)	47	7
16 (-)	47	8

Table 3: Setpoints 17 thru 24

SW1 (1)ON	(2)OFF	(3)ON
SETPOINT #	TB #	PIN #
17 (+)	46	1
17 (-)	46	2
18 (+)	46	3
18 (-)	46	4
19 (+)	46	5
19 (-)	46	6
20 (+)	46	7
20 (-)	46	8
21 (+)	47	1
21 (-)	47	2
22 (+)	47	3
22 (-)	47	4
23 (+)	47	5
23 (-)	47	6
24 (+)	47	7
24 (-)	47	8

Table 4: Setpoints 25 thru 32

SW1 (1)OFF	(2)OFF	(3)ON
SETPOINT #	TB #	PIN #
25 (+)	46	1
25 (-)	46	2
26 (+)	46	3
26 (-)	46	4
27 (+)	46	5
27 (-)	46	6
28 (+)	46	7
28 (-)	46	8
29 (+)	47	1
29 (-)	47	2
30 (+)	47	3
30 (-)	47	4
31 (+)	47	5
31 (-)	47	6
32 (+)	47	7
32 (-)	47	8

Note:

The Solid State Control Unit (SSCU-8) option boards require that the total cable length from The indicator to the last SSCU-8 box/card be two meters (approx. six ft.) maximum. Noise Problems & intermittent communications with the SSCU-8 card will occur if this guideline is Not followed

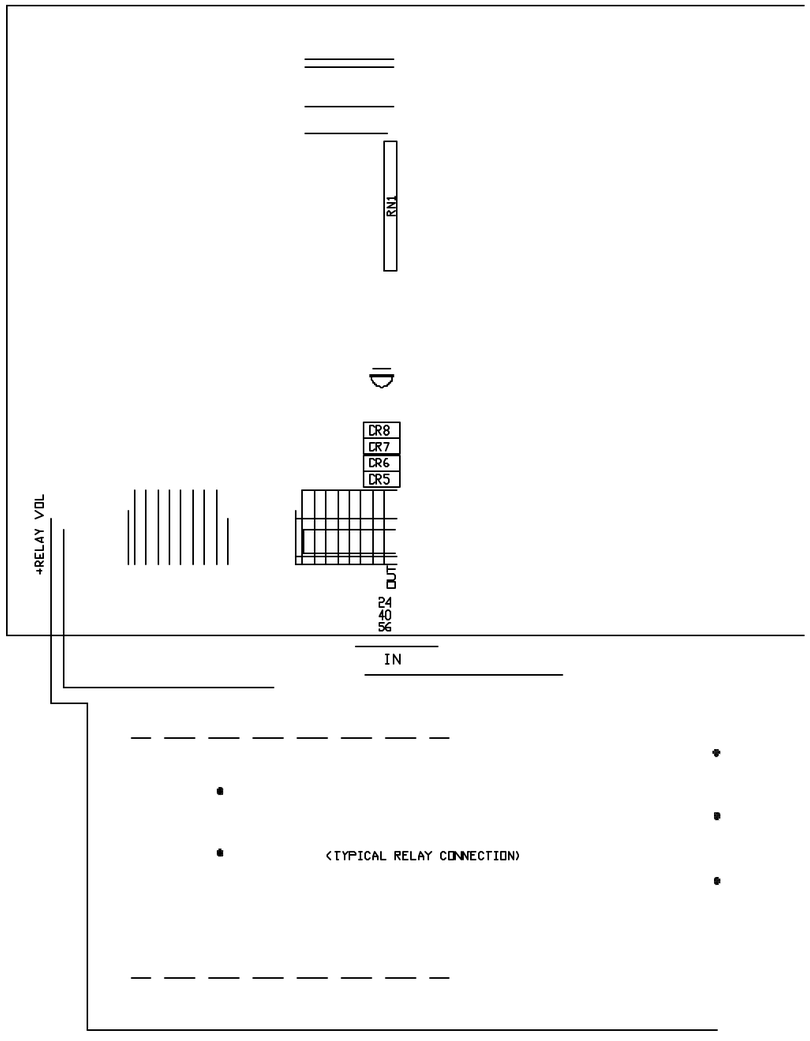


Table 1: Setpoints 1 thru 16

SW1	(1)ON	(2)ON
SETPOINT #	TB #	PIN #
1 (input)	39	1
1 (output)	39	2
2 (input)	39	3
2 (output)	39	4
3 (input)	39	5
3 (output)	39	6
4 (input)	39	7
4 (output)	39	8
5 (input)	40	1
5 (output)	40	2
6 (input)	40	3
6 (output)	40	4
7 (input)	40	5
7 (output)	40	6
8 (input)	40	7
8 (output)	40	8
9 (input)	41	1
9 (output)	41	2
10 (input)	41	3
10 (output)	41	4
11 (input)	41	5
11 (output)	41	6
12 (input)	41	7
12 (output)	41	8
13 (input)	42	1
13 (output)	42	2
14 (input)	42	3
14 (output)	42	4
15 (input)	42	5
15 (output)	42	6
16 (input)	42	7
16 (output)	42	8

Table 2: Setpoints 17 thru 32

SW1	(1)OFF	(2)ON
SETPOINT #	TB #	PIN #
17 (input)	39	1
17 (output)	39	2
18 (input)	39	3
18 (output)	39	4
19 (input)	39	5
19 (output)	39	6
20 (input)	39	7
20 (output)	39	8
21 (input)	40	1
21 (output)	40	2
22 (input)	40	3
22 (output)	40	4
23 (input)	40	5
23 (output)	40	6
24 (input)	40	7
24 (output)	40	8
25 (input)	41	1
25 (output)	41	2
26 (input)	41	3
26 (output)	41	4
27 (input)	41	5
27 (output)	41	6
28 (input)	41	7
28 (output)	41	8
29 (input)	42	1
29 (output)	42	2
30 (input)	42	3
30 (output)	42	4
31 (input)	42	5
31 (output)	42	6
32 (input)	42	7
32 (output)	42	8

Note:

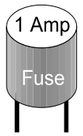
The Solid State Control Unit (SSCU-16) option boards require that the total cable length from The indicator to the last SSCU-16 box/card be two meters (approx. six ft.) maximum. Noise Problems & intermittent communications with the SSCU-16 card will occur if this guideline is Not followed

Setpoint Operation

If setpoints 1 & 2 are programmed in SimPoser as inputs, the physical location for these will always be on the motherboard TB14. The setpoint location for setpoints 1 & 2 on the option card(s) will then be invalid, and do not function.

If setpoints 1 & 2 are programmed in SimPoser for outputs, the TB14 location on the motherboard will act in parallel to the physical location of setpoints 1 & 2 (set by switches on remote expanded control PCBs) on the option card(s).

When only using TB14 modules (2 maximum) on the main board without any setpoint option cards, they can be used as either inputs or outputs.



Opto-22 Output Module Fuse Table

W-T P/N 46618	Rated Current (amp)	Wickmann TR5-F P/N	W-T P/N 46618	Rated Current (amp)	Wickmann TR5-F P/N
-0015	.050	19373K-50A	-0122	.630	19373K-630A
-0023	.063	19373K-63A	-0130	.800	19373K-800A
-0031	.080	19373K-80A	-0148	1.0	19373K-1A
-0049	.100	19373K-100A	-0155	1.25	19373K-1,25A
-0056	.125	19373K-125A	-0163	1.6	19373K-1,6A
-0064	.160	19373K-160A	-0171	2.0	19373K-2A
-0072	.200	19373K-200A	-0189	2.5	19373K-2,5A
-0080	.250	19373K-250A	-0197	3.15	19373K-3,15A
-0098	.315	19373K-315A	-0205	4.0	19373K-4A
-0106	.400	19373K-400A	-0213	5.0	19373K-5A
-0114	.500	19373K-500A	-0221	6.3	19373K-6,3A

OPTO-22 CONTROL INTERFACE DEVICES
Specifications

The OPTO-22 Generation 4 I/O modules can be used on the mainboard (max. 2) or on the optional Remote Expanded Control Interface Boards (max. 32).

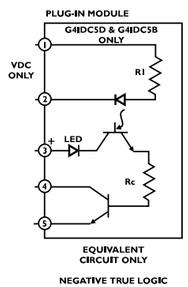
NEW P/N 48552	OLD P/N 46571-	OPTO-22 P/N	I/O Type AC or DC Input or Output	Color	External circuit voltage range	External circuit Max. Current	Turn on time msec.	Turn off time msec.	I/O operating temperature range
-0019	-0010	G4IDC5D	DC only (input)	White	2.5-28 vdc only	30mA	1.0	1.5	-30°Cto 70°C
-0027	-0028	G4IDC5B	DC only (input)	White	4.0-16 vdc only	45mA	0.05	0.1	-30°Cto 70°C
-0035	-0036	G4IDC5	AC/DC (input)	White	12-32	25mA	5	5	-30°Cto 70°C
-0043	-0044	G4IDC5G	AC/DC (input)	White	35-60	25mA	10	15	-30°Cto 70°C
-0050	-0051	G4IAC5	AC/DC (input)	Yellow	90-140	11mA	11	20	-30°Cto 70°C
-0068	-0069	G4IAC5A	AC/DC(input)	Yellow	180-280	6.5mA	2	20	-30°Cto 70°C
-0076	-0077	G4ODC5	DC ouput N.O. Normally Open	Red	5-60 vdc only	3A@45°C 2A@70°C	100	750	-30°Cto 70°C
-0084	-0085	G4ODC5A	DC (output) N.O. Normally Open	Red	5-200 vdc only	1A@45°C 0.55A@70°C	100	750	-30°Cto 70°C
-0092	-0093	G4OAC5	AC (output) N.O. Normally Open	Black	12-140 AC only	3A@45°C 2A@70°C	---	---	-30°Cto 70°C
-0100	-0101	G4OAC5A	AC (output) N.O. Normally Open	Black	24-280 AC only	3A@45°C 2A@70°C	---	---	-30°Cto 70°C
-0118	-0119	G4OAC5A5	AC (output) N.C. Normally Closed	Black	24-280 AC only	3A@45°C 2A@70°C	---	---	-30°Cto 70°C
-0126	-0127	G4ODC5R	AC/DC (output) N.O. Dry contact Normally Open	Red	130VAC/100VDC	1.5A	500	500	0°C to 70°C
-0134	-0135	G4ODC5R5	AC/DC (output) N.C. Dry contact Normally Closed	Red	130VAC/100VDC	1.5A	500	500	0°C to 70°C

Each I/O module has an LED that lights indicating an active state. The output modules also have a replaceable fuse for circuit protection. These modules are LOW CURRENT devices. Refer to OPTO-22 data specifications for additional information.

Below is a diagrm of the different I/O control modules:

A	B	C	D	E
46571-0010	46571-0036, 46571-0044	46571-0077	46571-0093	46571-0127
46571-0028	46571-0051, 46571-0069	46571-0085	46571-0101	46571-0135
			46571-0119	

A



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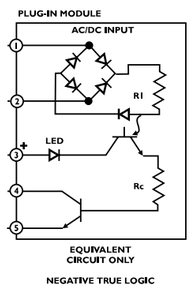
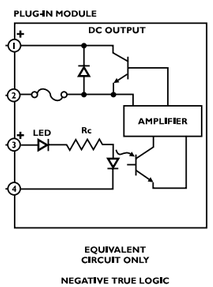


C



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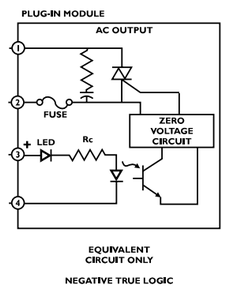

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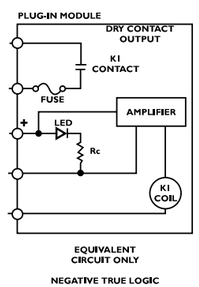
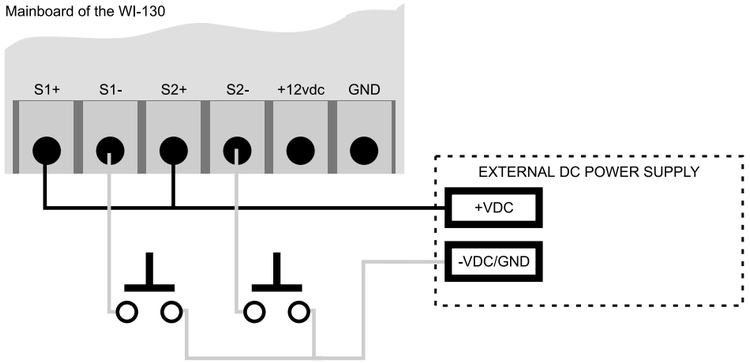
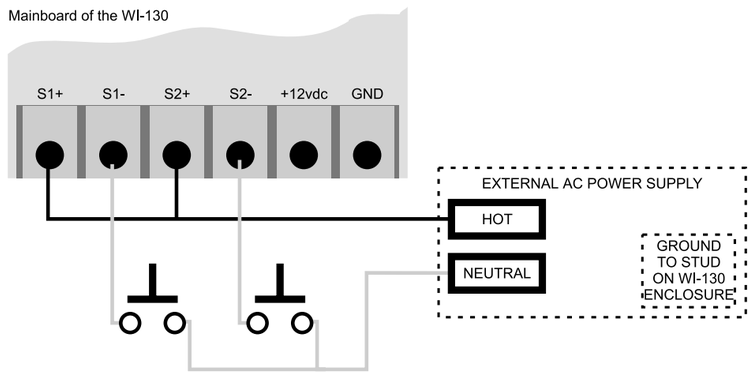
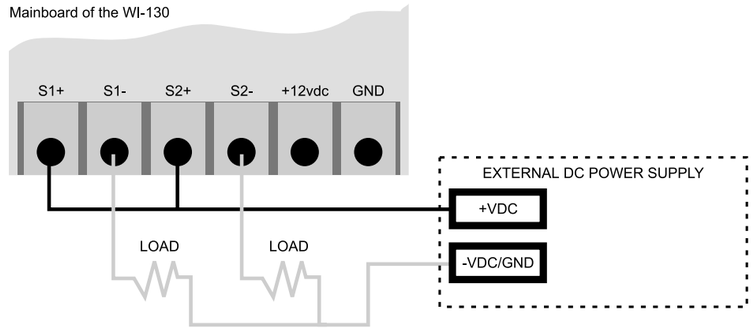


WIRING DIAGRAM FOR INPUT MODULES



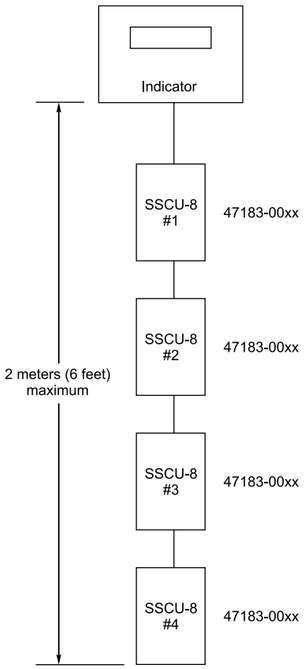


WIRING DIAGRAM FOR OUTPUT MODULES

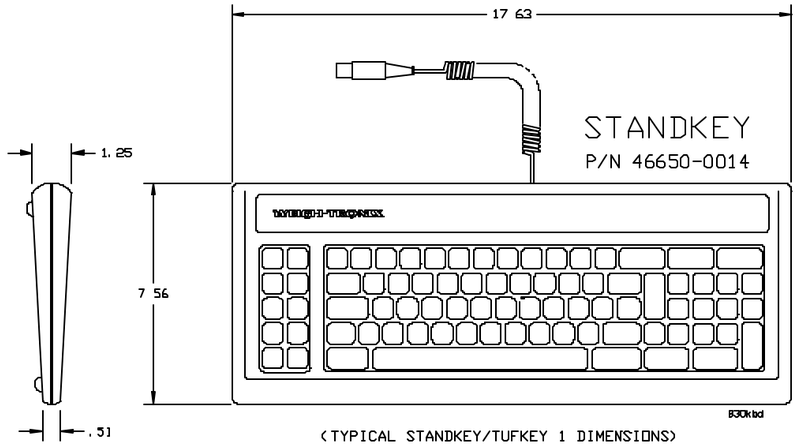


SSCU-8 Caution!

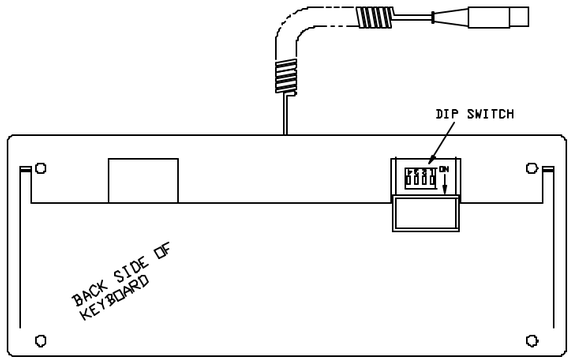
The Solid State Control Unit 8 (SSCU-8) option boards require that the total cable length from the indicator to the last SSCU-8 box/card be two meters (approx. six feet) maximum. Noise problems and intermittent communications with the SSCU-8 card will occur if this guideline is not followed.



TT-830 SOLUTION SERIES BENCH SCALE
REMOTE (TTL) KEYBOARD OPTIONS



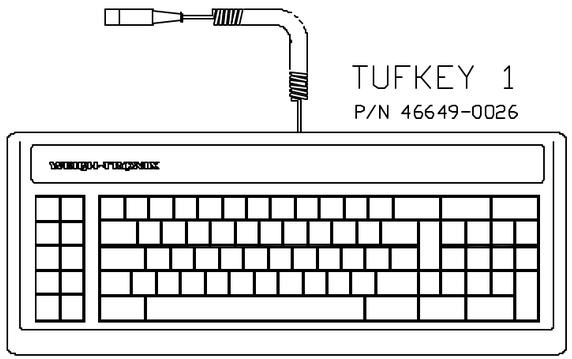
(TYPICAL STANDKEY/TUFKEY 1 DIMENSIONS)

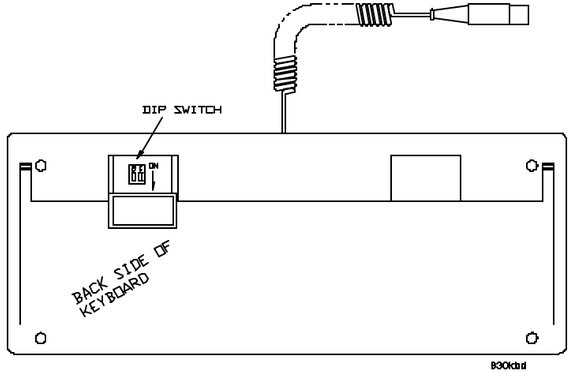


BAUD RATE / DIPSWITCH SETTINGS
FOR **STANDKEY** (TTL) KEYBOARD

BAUD RATE	SWITCH SETTINGS			
	1	2	3	4
300	ON	OFF	ON	OFF
1200	OFF	OFF	ON	OFF
9600	ON	OFF	OFF	OFF

KEYBOARD SPECIFICATIONS
Environmental: 32°f to 130°f (0°c to 55°c).
Communication Output: 1 start bit, 8 data bits, 1 step bit TTL asynchronous serial, selectable baud rates.
Weight: 2lb. / 9kg nominal





BAUD RATE/DIP SWITCH SETTINGS
FOR **TUFKEY-1** *(TTL)* KEYBOARD

BAUD RATE	SWITCH SETTINGS	
	1	2
300	ON	ON
1200	ON	OFF
9600	OFF	ON

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