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Avery Weigh-Tronix

Model 7800 Family

Weight Classifiers



User Instructions

AWT35-501540
Issue AE

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1 General information and warnings

1.1 About this manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1.1 and 1.1.1 headings. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.1.1 Text conventions

Key names are shown in **bold** and reflect the case of the key being described. This applies to hard keys and on-screen or soft keys.

Displayed messages appear in ***bold italic*** type and reflect the case of the displayed message.

1.1.2 Special messages

Examples of special messages you will see in this manual are defined below. The heading words have specific meanings to alert you to additional information or the relative level of hazard.



ELECTRICAL WARNING!
THIS IS AN ELECTRICAL WARNING SYMBOL.
ELECTRICAL WARNINGS MEAN THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES MAY RESULT IN ELECTROCUTION, ARC BURNS, EXPLOSIONS OR OTHER HAZARDS THAT MAY CAUSE INJURY OR DEATH.



CAUTION!
This is a Caution symbol.
Cautions give information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.



NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.2 Installation



DANGER: RISK OF ELECTRICAL SHOCK. NO USER SERVICEABLE PARTS. REFER TO QUALIFIED SERVICE PERSONNEL FOR SERVICE.



CAUTION: Installation, configuration, and servicing are only to be done by qualified service personnel as authorized by Avery Weigh-Tronix.

1.3 Electrical installation



CAUTION: The power cable must be connected to an earth-grounded electrical outlet. The electrical supply must have a circuit breaker with an appropriate rating to protect from over-current conditions.

For your protection, all electrical (110V or 230V) equipment used out of doors or in wet or damp conditions should be supplied from a correctly fused power source and protected by an approved ground fault protection device (RCD, GFCI etc.)

IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

1.3.1 Pluggable equipment

Pluggable equipment must be installed near an easily accessible socket outlet.

1.3.2 Wet conditions

Under wet conditions, the plug must be connected to the final branch circuit via an appropriate socket / receptacle designed for washdown use.

Installations within the USA should use a cover that meets NEMA 3R specifications as required by the National Electrical Code under section 410-57. This allows the unit to be plugged in with a rain tight cover fitted over the plug.

1.4 Routine maintenance

IMPORTANT: This equipment must be routinely checked for proper operation and calibration.
Application and usage will determine the frequency of calibration required for safe operation.

Always turn off the machine and isolate from the power supply before starting any routine maintenance to avoid the possibility of electric shock.

Make sure that it is placed securely on a flat and level surface.

1.5 Cleaning the machine



Table 1.1 Cleaning DOs and DON'Ts

DO	DO NOT
Wipe down the outside of standard products with a clean cloth, moistened with water and a small amount of mild detergent	Attempt to clean the inside of the machine
	Use harsh abrasives, solvents, scouring cleaners or alkaline cleaning solutions
Spray the cloth when using a proprietary cleaning fluid	Spray any liquid directly on to the display windows

1.6 Training

Do not attempt to operate or complete any procedure on a machine unless you have received the appropriate training or read the instruction books.

To avoid the risk of RSI (Repetitive Strain Injury), place the machine on a surface which is ergonomically satisfactory to the user. Take frequent breaks during prolonged usage.

1.7 FCC and EMC declarations of compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

2 Specifications

Description

The NCI 7800 models are digital electronic parcel bench scales specifically designed for shipping applications and are Legal-for-Trade. The scales have built-in intelligence that enables them to be easily interfaced with a computer or other data-processing device.

Capacity/Resolution

Model	Capacity (lb)	n(max)
7820-50	100 x 0.02 lb	5000d
7820-70	150 x 0.05 lb	3000d
7820-75	150 x 0.02 lb	7500d
7880-50	100 X 0.02 lb	5000d
7880-75	150 x 0.05 lb	3750d
7880-125	250 x 0.05 lb	5000d
7880-150	300 x 0.1 lb	3000d
7885-75	150 x 0.05 lb	3750d
7829-125	250 x 0.05 lb	5000d
7840-125	250 x 0.05 lb	5000d
7840-150	300 x 0.1 lb	3000d
7824-125	250 x 0.05 lb	5000d
7824-150	300 x 0.1 lb	3000d

Agency Certificates of Conformance



If unit is to be used as a commercial device, all local reporting and registration requirements must be followed.

Model 7820

United States: NTEP #95-070
Canada: Ministry of Industry #AM-5076
For use as a Class III device from +5°C through +40°C

Model 7885

United States: NTEP #02-069
Canada: Ministry of Industry (#AM-5507)
For use as a Class III device from +5°C through +40°C

Models 7824, 7829, 7840, 7880

United States: NTEP #95-121
Canada: Ministry of Industry #AM-5099
For use as a Class III device from +5°C through +40°C

Dimensions

Model 7820: 14" L x 12.5" W x 4.1" H
Model 7880: 18" L x 18" W x 4.6" H
Model 7885: 18" L x 18" W x 3.0" H
Model 7829: 20" L x 20" W x 5.3" H
Model 7840: 18" L x 24" W x 4.6" H
Model 7824: 24" L x 24" W x 4.6" H

Power Supply

UL/CSA approved in-line power supply with 6' line cord. (7885 uses wallmount style)
Input:120 VAC +10%-15%, Standard 3 wire w/ground
Output:15 VDC @.3 Amps DC

Frequency

60 Hz Standard

Power Requirements

0.1 amp maximum

Operating Temperature

42ºF – 104ºF (5ºC – 40ºC)
10% to 95% RH (non-condensing)

Construction

Model 7820: Die cast aluminum base with a stainless steel weigh platter.
Overload protection: Adjustable center stop, fixed corner stops.

Model 7885: Painted mild steel base with stainless steel weigh platter.
Overload protection: Fixed center and corner stops.

Models 7824, 7829, 7840, 7880: Painted mild steel base with stainless steel weigh platter. Overload protection: Adjustable center and corner stops.

Display

½" high, six-digit LCD. Internal display standard on all models except 7885 (remote only)
Key panel with **ZERO** and **TEST** keys.
Optional remote display with 7 ft. cable.

Scale Leveling

Level bubble located under weigh platter. Adjustable feet in each corner to level the scale.

Zero Window

Initial automatic zero setting is ±10% of maximum capacity—active at power up.
Manual zero setting range is ±2% of maximum capacity—active using the **ZERO** key.

Under Capacity Limits

Under capacity indication will be given with dashes appearing on the bottom line of the display whenever the display is more than 2 percent below the initial zero value.

Over Capacity Limits

Over capacity indication will be given with dashes appearing in the upper line of the display whenever the weighed item exceeds 9 divisions over the rated capacity of the unit. The scale will use the Initial zero value for reference for over capacity determination.

Sealing

Access to the calibration switch can be secured with a lead wire or pressure sensitive security seal. The remote and primary indicators have no metrological features that require the use of a security seal.

Internal Counts

The scale has 100,000 internal counts.

Dynamic Response

The time from when weight is applied to the scale until a stable weight display is displayed:

0–1000d 1.5 seconds
1000d+ 2.0 seconds
maximum mean average

Communications

Factory default settings: 9600 baud, 7 data bits, even parity, 1 stop bit.

Standard 9-pin pass through RS232 interface cable included. Not a null modem.

RS232 bidirectional, configurable 1200 to 19.2K baud. Transmits weight and scale status whenever ASCII “W” <CR> is sent by a remote device.

USB VCP

USB HID

Only one of these three interface devises (RS232, USB VCP or USB HID) can be used from the scale at a time.

3 Initial Setup

3.1 Unpacking the Scale

1. Remove contents of the shipping container.
2. Inspect the scale for evidence of shipping damage. Immediately report any damage to the shipper.

3.2 Installing the Scale

1. Mount the scale on a stable, level surface that is free from air currents and vibration. Be sure the scale platter does not touch any adjacent surfaces.
2. To install the scale surface flush with a countertop, use the dimensions on the following page to guide construction.

Model 7820

Scale Dimensions	**Min. Cut-Out Dimensions**
D	12.5 in. (31.7 cm)13.25 in. (33.7 cm)
W	14 in. (35.6 cm)14.75 in. (37.5 cm)
H	4.1 in. (10.4 cm)*

*Adjustable to 4.6 in. (11.7 cm)

Model 7880

Scale Dimensions	**Min. Cut-Out Dimensions**
D	18 in. (45.7 cm)18.75 in. (47.6 cm)
W	18 in. (45.7 cm)18.75 in. (47.6 cm)
H	4.6 in. (11.6 cm)*

*Adjustable to 5.1 in. (12.9 cm)

Model 7885 (RS232 only)

Scale Dimensions	**Min. Cut-Out Dimensions**
D	18 in. (45.7 cm)18.75 in. (47.6 cm)
W	18 in. (45.7 cm)18.75 in. (47.6 cm)
H	3.0 in. (7.6 cm)*

*Adjustable to 3.5 in. (8.9 cm)

Model 7829

Scale Dimensions	Min. Cut-Out Dimensions
D	20 in. (50.8 cm)20.75 in. (52.7 cm)
W	20 in. (20.8 cm)20.75 in. (52.7 cm)
H	5.3 in. (13.5 cm)*

*Adjustable to 5.8 in. (14.7 cm)

Model 7840

Scale Dimensions	Min. Cut-Out Dimensions
D	24 in. (61.0 cm)24.75 in. (62.9 cm)
W	18 in. (45.7 cm)18.75 in. (47.6 cm)
H	4.6 in. (11.7 cm)*

*Adjustable to 5.1 in. (12.9 cm)

Model 7824

Scale Dimensions	Min. Cut-Out Dimensions
D	24 in. (61.0 cm)24.75 in. (62.9 cm)
W	24 in. (61.0 cm)24.75 in. (62.9 cm)
H	4.6 in. (11.7 cm)*

*Adjustable to 5.1 in. (12.9 cm)

3. Loosen the collars or jam nuts on the leveling feet. Level the scale by using the level bubble under the scale platter as a guide. Be sure all four feet are in firm contact with the counter, then tighten all collars and jam nuts.

4. Make sure all power cords, remote display cables, etc., are not touching the live weighing surface.

5. Plug the unit into an appropriate voltage outlet that is properly grounded.

4 Operation

4.1 Power Up Test Sequence

If RAM or ROM error is reported, you must press the **TEST** *key to acknowledge the condition. See Error Codes and Troubleshooting on page 35.*

When the scale is first powered on, it will perform a test sequence. During this sequence, the display will show the following:

- The model number and the software revision level.
- A numeric counting test for all segments of the display. During this test, a test of Random Access Memory (RAM) and a test of Read Only Memory (ROM) is performed.

4.2 Performing a Normal Weighment

When first powered on, if the scale is outside the ± 10% zero window, center dashes are displayed, ***- - - -***

If necessary, reapply power to reset the initial zero setting. Refer to Error Codes and Troubleshooting on page 35 if the problem persists.

If everything is OK, the display will show zero weight and the scale is ready for use.

1. With the scale powered on, make sure the scale platter is empty and the display is at zero. If it is not, press the **ZERO** key …

   0.00 is displayed.

2. Place an item to be weighed on the scale platter …

   The scale will display the gross weight.

3. Remove the item from the scale platter.



Figure 4.1 7815 and 7820 display

4.3 Operation Controls

ZERO Key The **ZERO** key will zero the scale if weight is stable, and acts as the NO or SCROLL key in the Menu Mode and as the INCREASE key in the Gravity Mode.

TEST Key The **TEST** key can be used to perform the initial power-up test sequence, recall diagnostic routines, or view the configuration information. This key also functions as YES or ACCEPT in the Menu Mode and as the DECREASE key in the Gravity Mode.

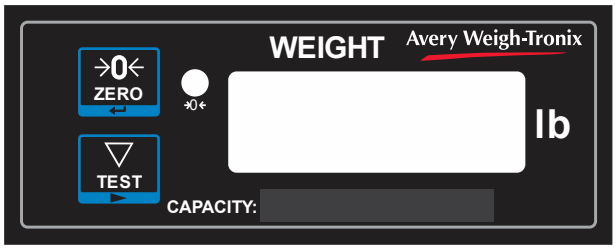


Figure 4.2 Optional Remote Display

All NCI 7800 bench scales, except the 7885, can have an optional remote display. If a remote display with keyboard is used, then Switch 3 (shown in Figure 1) determines which display keyboard is functional.

Switch 3 Settings:
Closed= internal display keys operational
Open= external display keys operational

The remote display must be connected to the RJ45 port (DISPLAY) prior to power up to operate properly.

5 Accessing the Menu Mode

The 7800 models power up ready for weighing operations. Access the Menu mode by setting Switch 1 shown in Figure 5.1 or Figure 5.2 to the OPEN or Menu mode position.

5.1 Accessing the Gravity Mode

Access the Gravity setting mode by setting Switch 2, shown in Figure 5.1 and Figure 5.2, to the OPEN or Gravity mode position.

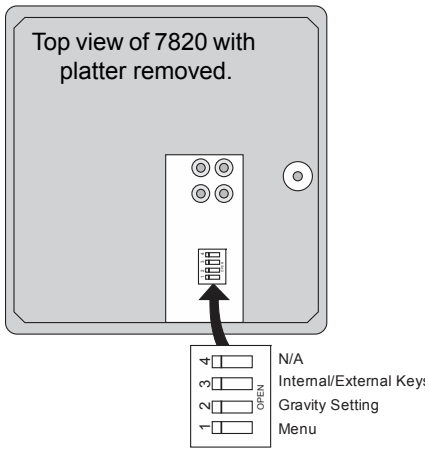


Figure 5.1 7820 switch location

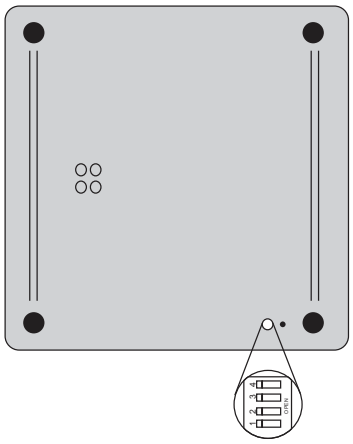


Figure 5.2 7824, 7829, 7840, 7880, 7885 switch location

5.2 Menu Mode

With Switch 1 in the Menu mode or OPEN position, there are four modes available to you. They are as follows:

DIAG (Diagnostic Mode)	To test areas of the scale's function
CONF (Configuration Mode)	To configure the scale for your application
CAL (Calibration Mode)	To calibrate the scale
RE-CAL (Recalibration Mode)	To change resolution and rounding type

The structure for these menus is shown in Figure 5.3. Specific information about each mode followed by step-by-step instructions for accessing them are described in the following pages.

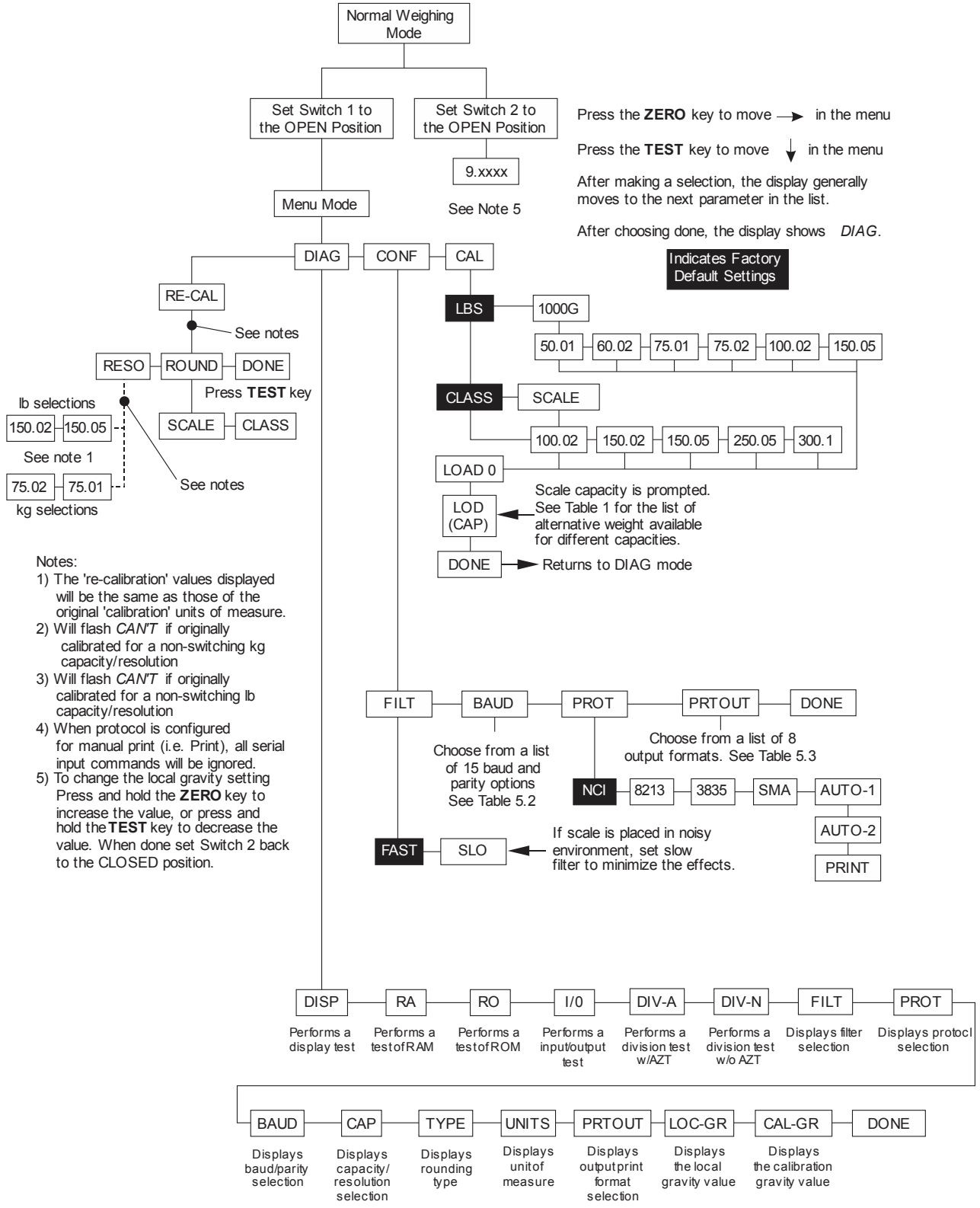


Figure 5.3 Menu

5.3 Gravity Mode

With Switch 2 in the Gravity Mode or OPEN position, you may increase the local gravity value by pressing the **ZERO** key, or decrease the value by pressing the **TEST** key.

5.4 Alternative Calibration Points

The NCI 7800 bench scales allow calibration using less than full capacity weights. See Table 5.1 for alternative weights that can be used to calibrate your scale for its designated capacity.

Table 5.1 Alternative Calibration Points

Capacity	Alternative Calibration Weights
100 x .02 lb	10, 50, 100 lb
150 x .05 lb	10, 50, 150 lb
150 x .02 lb	10, 50, 150 lb
250 x .05 lb	50, 100, 250 lb
300 x .1 lb	50, 100, 300 lb

5.5 Baud Rate and Parity Options



The databits and stop bits default values are 7 data bits and 1 stop bit. These are not configurable.

Table 5.2 Baud Rate and Parity Options

Display	Baud	Parity
12 E	1200	Even
24 E	2400	Even
48 E	4800	Even
*96 E	9600	Even
19.2 E	19.2K	Even
12 o	1200	Odd
24 o	2400	Odd
48 o	4800	Odd
96 o	9600	Odd
19.2 o	19.2K	Odd
12 n	1200	None
48 n	4800	None
96 n	9600	None
19.2 n	19.2K	None

*Default Factory Settings

5.6 Diagnostic (DIAG) Mode



Quickly and easily gain access to the Diagnostic mode directly from the front panel without opening the scale or setting switches as follows:

Press and hold the **TEST** *key. The display will flash* ***78--****, the program version, and then* ***_ _ _ _****. Now release the* **TEST** *key.*

To exit the Diagnostic mode press the **ZERO** *key until* ***DONE*** *is displayed, then press the* **TEST** *key to return to normal weighing mode.*

IMPORTANT*: Internal rocker switches will be ignored until you exit this special mode or power reset the scale.*

The Diagnostic (DIAG) Mode menu allows testing of specific areas of the scale's function and viewing of current configuration settings. Areas to test the scale's function are:

DISPLAY (DISP) – Shows the version and revision of the software, followed by a display segment test.

RAM (RA) – Performs a non-destructive test of RAM in the processor. Displays ***PASS*** or ***FAIL***.

ROM (RO) – Performs a checksum of all locations of ROM in the processor. Displays ***PASS*** or ***FAIL***.

INPUT/OUTPUT (I/O) – Data is output by the scale and through the use of a loopback connector. The data is immediately read back into the receive channel and verified against what was sent. ***PASS*** or ***FAIL*** is displayed. Requires a jumper (short) between transmit and receive data lines.

DIVISION TEST, w/AZT (DIV-A) – Weight data is normalized to 100,000 counts of displayed resolution. AZT is enabled.

DIVISION TEST, w/o AZT (DIV-N) – Weight data is normalized to 100,000 counts of displayed resolution. AZT is disabled.

Areas to view current configuration settings are: Filter, Protocol, Baud, Capacity, Type, Units, Prtout and Gravity Setting.

Follow these steps to access the tests in the DIAG menu.



If you encounter any failure in these tests, contact your local Avery Weigh-Tronix dealer.

1. From normal weighing mode, move Switch 1 to the MENU Mode or OPEN position. (See Figure 5.1 or Figure 5.2).

   DIAG is displayed.

2. Press the **TEST** key …

   DISP is displayed. This stands for display.

3. Press the **TEST** key to perform the display test described earlier …

   Display test is performed and the display shows ***DISP*** after the test is completed.

4. Press the **ZERO** key …

   RA is displayed. This stands for the RAM test.

5. Press the **TEST** key to perform the RAM test …

   PASS or ***FAIL*** is displayed briefly; then ***RA***.



Press the **ZERO** *key to scroll through lists of selections.*

6. Press the **ZERO** key …

   RO is displayed. This stands for the ROM test.

Press the **TEST** *key to make a selection.*

To skip a test, press the **ZERO** *key to scroll to the next test.*

7. Press the **TEST** key to perform the ROM test …

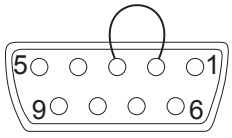
   PASS or ***FAIL*** is displayed briefly; then ***RO***.

8. Press the **ZERO** key …

   I/O is displayed. This stands for the INPUT/OUTPUT test.

9. With a loopback connector (see illustration below) in place, press the **TEST** key to perform the I/O test …

   PASS or ***FAIL*** is displayed briefly, then ***I/O***.



10. Press the **ZERO** key …

    DIV-A is displayed. This stands for the high resolution DIVISION TEST W/ AZT enabled.

DIAG *will flash every 15 seconds during the high resolution test as a reminder that you are doing a test and not seeing normal weight readings.*

11. Press the **TEST** key to perform this test …

    The display shows the weight on the scale at a resolution of 100,000 counts.

12. Press the **TEST** key to stop the test …

    DIV-A is displayed.

13. Press the **ZERO** key …

    DIV-N is displayed. This stands for the high resolution DIVISION TEST w/o AZT enabled.

14. Press the **TEST** key to perform this test …

    The display shows the weight on the scale at a resolution of 100,000 counts.

15. Press the **TEST** key to stop the test …

    DIV-N is displayed.

The remaining selections are for viewing current settings only. You can scroll through the menu to verify the settings, but to make changes, you must enter configuration or calibration.

16. Press the **ZERO** key …

    FILT is displayed. This stands for filtering.

17. Press the **TEST** key …

    The current filter setting, ***FAST*** or ***SLO***, is displayed.

18. Press the **ZERO** key …

    PROT is displayed. This stands for protocol.

19. Press the **TEST** key …

    The current serial protocol selection is displayed.

20. Press the **ZERO** key …

    BAUD is displayed. This stands for baud rate.

21. Press the **TEST** key …

    The current baud rate and parity selection is displayed.

22. Press the **ZERO** key …

    CAP is displayed. This stands for capacity.

23. Press the **TEST** key …

    The current capacity/resolution selection is displayed.

24. Press the **ZERO** key …

    TYPE is displayed. This stands for rounding type (classifier or scale).

25. Press the **TEST** key …

    The current rounding type, ***SCALE*** for standard rounding or ***CLASS*** for classifier rounding, is displayed.

26. Press the **ZERO** key …

    UNITS is displayed. This stands for unit-of-measure.

27. Press the **TEST** key …

    The current unit-of-measure ***LBS*** (for pounds) or ***1000G*** (for kilograms), is displayed.

28. Press the **ZERO** key …

    PRTOUT is displayed. This stands for output print format.

29. Press the **TEST** key …

    The current output print format is displayed. See Table 3 for details.

30. Pres the **ZERO** key …

    LOC-GR is displayed. This stands for local gravity.

31. Press the **TEST** key …

    The current local gravity setting is displayed.

32. Press the **ZERO** key …

    CAL-GR is displayed. This stands for calibration gravity.

33. Press the **TEST** key …

    The current calibration gravity settings is displayed.

34. When you are finished, press the **ZERO** key, until ***DONE*** is displayed, then press the **TEST** key to return to the top menu level …

    DIAG is displayed.

Or close Switch 1 to return to normal weighing mode.

5.7 Configuration Mode

The Configuration (CONF) mode menu allows scale configuration for your specific application needs. The items you can configure are as follows:

FILTERING (FILT) Choose between FAST and SLO filtering. SLO should be chosen in areas susceptible to vibration. Choose FAST filtering for more stable conditions.

Baud (BAUD) Choose a baud and parity from Table 5.2 on page 19.

Protocol (PROT) Select the communication protocol to be used on the RS232 or USB VCP port. Only one protocol and port can be used at a time.

NCI	NCI standard
8213	8213 compatible (Mettler-Toledo)
3835	NCI 3835
SMA	Scale Manufacturing Association
AUTO-1	Auto print operation (Type-1)
AUTO-2	Auto print operation (Type -2)
PRINT	Manual print operation

PRTOUT Choose an output data format from Table 3 for use with AUTO-1, AUTO-2 or PRINT protocol selection.

Access the menu mode as described in *Accessing the Menu Mode on page 16*.

1. From the ***DIAG*** display, press the **ZERO** key until ***CONF*** is displayed, or from the normal weighing mode, move Switch 1 to the Menu Mode or the OPEN position; then press the **ZERO** key until ***CONF*** is displayed.

2. Press the **TEST** key …

   FILT is displayed.

3. Press the **TEST** key …

   The current setting, ***FAST*** or ***SLO***, is displayed.

4. Use the **ZERO** key to toggle between the two choices. Press the **TEST** key when the choice you want is displayed. The choice is accepted and the display shows ***FILT***.

5. Press the **ZERO** key …

   BAUD is displayed.

6. Press the **TEST** key …

   The current baud and parity choice is displayed.

7. Use the **ZERO** key to scroll the choices found in Table 5.2. When the choice you want is displayed, press the **TEST** key …

   The choice is accepted, and the display shows ***BAUD***.

8. Press the **ZERO** key until …

   PROT is displayed.

9. Press the **TEST** key …

   The current RS232 communication protocol is displayed.



See "Print Modes" for a description of the available autoprint and manual print modes of operation.

10. Press the **ZERO** key to scroll through the choices. When the choice you want is displayed, press the **TEST** key …

    The choice is accepted and the display shows ***PROT***.



The PRTOUT configuration selection (in the CONF menu) allows you to select the format of the data string that is transmitted during autoprint (AUTO-1 or AUTO-2) or the manual print (PRINT) modes. This does not apply to the other protocol modes.

11. Press the **ZERO** key …

    PRTOUT is displayed. This stands for printout.

12. Press the **TEST** key …

    The current printout format is displayed.

13. Press the **ZERO** key to scroll through the choices. When the choice you want is displayed, press the **TEST** key …

    Your choice is accepted and the display shows ***PRTOUT***.

Table 5.3 Output Print Formats

Formatted Output Data String					Selection Display
<LF>	WWW.WW	uu	<CR>	<LF>	LFuuLF*
<LF>	WWW.WW	uu	<CR>		LFuu—
<LF>	WWW.WW		<CR>	<LF>	LF—LF
<LF>	WWW.WW		<CR>		LF——
	WWW.WW	uu	<CR>	<LF>	—uuLF
	WWW.WW	uu	<CR>		—uu—
	WWW.WW		<CR>	<LF>	——LF
	WWW.WW		<CR>		———

*Default factory setting

Where:<LF> Represents the line feed character (ØA hex)

W Represents a weight digit character

uu Represents the unit-of-measure characters (lb)

<CR> Represents the carriage return character (ØD hex)

14. When finished configuring your scale, press the **ZERO** key until ***DONE*** is displayed; then press the **TEST** keys, or close Switch 1 to return to the normal weighing mode.

5.8 Print Modes

The 78XX provides three options for transmitting displayed weight without requiring a remote device to initiate the request for weight to the scale. These options are selectable in the CONF setup menu PROT and are as follows:

AUTO-1:

Weight is automatically transmitted after weight is removed from the scale platform. The last “stable” weight prior to removing the item will be “sent,” as soon as the displayed weight returns to within five display divisions (i.e. 5d). This option is normally used in applications where items are added to a box already placed on the scale, but where only one weight data transaction is to occur. See note below.



To avoid potential erroneous weight values from being transmitted, create enough instantaneous motion on the platform to avoid a recapture of a stable weight that might occur if the item were removed slowly.

AUTO-2:

Weight is automatically transmitted when the item is placed on the scale and the weight stabilizes. This option is normally used in an application where the item placed on the scale is sealed and ready for the shipment weight to be registered. The minimum stable weight required to trigger an auto SEND is set at five display divisions (i.e. 5d).

PRINT:

Weight is transmitted only when the **TEST** button on the display panel is pressed. The **TEST** button is redefined as a SEND key when in the normal weight mode only. **See Note 2 below.** On some specially modified units, the serial port connector or an additional internal connection to the display **TEST** button can also be used for a remote push button to initiate the manual send sequence.

NOTES:

1. The output print formats for AUTO-1, AUTO-2 and manual print operation are defined in Table 5.3 and set in the PRTOUT setting of the CONF menu.
2. The **TEST** button will retain its test function (i.e. will not be redefined as a SEND key) when displayed weight is at zero as indicated when the Center-Zero indicator is on.
3. While in AUTO-1, AUTO-2, or manual print modes, scale will not respond to external serial commands.

5.9 Calibration Mode

The Calibration (CAL) Mode menu lets you calibrate your scale. The items in the calibration menu are as follows:

POUNDS/KILOGRAMS (LBS or 1000 Gr) – Selects the unit of measure of your calibration test weights (lb or kg).

SCALE or CLASS – Selectable only when calibrated in LBS (lb) mode. Selection of ***SCALE*** rounds weight at 0.5 divisions. Selection of ***CLASS*** sets device up as a weight classifier rounding at 0.9 divisions.

5.9.1 Step-by-Step Instructions for CAL Mode

CAPACITY (100.02, 150.05, 250.05, 300.1, etc.) – Select the capacity of the scale.

Follow these steps to calibrate the scale. Refer to the *Menu on page 17*.

1. From the ***DIAG*** display, press the **ZERO** key until ***CAL*** is displayed, or from the normal weighing mode, move Switch 1 to the Menu mode or OPEN position. Press the **ZERO** key until ***CAL*** is displayed.
2. Press the **TEST** key …

   LBS (lb) or ***1000G*** (kg) is displayed.

3. Press the **ZERO** key to toggle between the choices. When the choice you want is displayed, press the **TEST** key to accept …

   The choice is accepted.

   If ***LBS*** (lb) was selected, the scale will display ***CLASS***.

   If ***1000G*** (kg) was selected, scale displays the present capacity setting. Proceed to Step 5.

4. Press the **ZERO** key to toggle between ***SCALE*** and ***CLASS***. When the choice you want is displayed, press the **TEST** key …

   That choice is accepted and a scale capacity is displayed.

   Example: 100.02

   If a different capacity selection is desired, press the **ZERO** key to scroll through the choices.



The capacity selected must correlate with the rated capacity of the scale noted on the serial tag.

5. When the desired capacity is displayed, press the **TEST** key …

   That choice is accepted and ***LOAD 0*** is displayed.

6. Clear all weight from the scale platter and press the **TEST** key …

   After a brief wait LOAD xx is displayed. Alternate calibration points can be chosen using the **ZERO** key to scroll between choices (see Table 1).



If this procedure is attempted without any calibration weights applied, the scale will abort the process and retain the original calibration data.

7. Place the appropriate calibration weights on the scale and press the **TEST** key. After a brief wait …

   DONE is displayed.

8. Remove all calibration weights from scale.

9. Press the **TEST** key …

   DIAG is displayed, or return Switch 1 to the closed position. The scale returns to normal weighing mode. The scale is now tested, configured, and calibrated. It is ready for use in your application.

5.10 Gravity Mode

The Gravity Mode feature provides a means of adjusting the scale's internal calibration factors to compensate for variations in acceleration due to gravity at different geographic locations. These differences can cause a given mass to indicate a slightly different weight at an end-user's (local) site than it did at the Calibration (CAL) site.

To make the adjustment, you must know the value of the gravity constant for the local site. This value is expressed in meters per second, per second (i.e., m/s2). It is not necessary to calibrate the scale, therefore, no calibration weights are needed to make this adjustment.



*The **CAL-GR** and **LOC-GR** values may be viewed anytime. See Review/Test Scale Setting section.*

Warning: Using this feature in "sealed" applications may be subject to approval by the appropriate governing agency at the end-users site.

Gravity value roles 'over' at 9.8400 and rolls 'under' at 9.7700.

The scale maintains two gravity setting values. The first is the "calibration-site" value known as CAL-GR. The second is the end-user or "local-site" value and is known as LOC-Gr. When the scale was originally calibrated at the factory, the CAL-GR and LOC-GR values were both set to 9.8040 which is the gravity constant for the manufacturing site.

To adjust the displayed weight value, you must enter the local gravity value.

To enter the Gravity Mode, set Switch 2 to the OPEN position. The display will indicate the current "local" gravity value. Press the **ZERO** key to increment the value or the **TEST** key to decrement the value. The gravity value will change in steps of .0002. When the correct value is displayed, simply return Switch 2 to the CLOSED position. The scale will now use this new relationship between calibration and local gravity for its weight calculations.

5.11 Re-Calibration Mode

The re-calibration RE-CAL mode menu lets you change the scale resolution (150lb / 75kg capacities only) or rounding method without using any calibration weights. If you want to change the unit of measure operation, you must perform a full calibration using test weights.

For a scale originally calibrated in the lb. mode, you may also change rounding methods (i.e., scale or classifier).

5.11.1 Step-by-Step Instructions for RE-CAL mode

Follow these steps to re-configure your scale (without weights). Refer to the *Menu on page 17*.

10. From the normal weighing mode, move Switch 1 to the Menu mode or OPEN position …

    DIAG is displayed.



Return to normal operating mode by pressing the SW-1 switch.

11. Press the **ZERO** key until …

    RE-CAL is displayed.

12. Press the **TEST** key …

    ROUND is displayed.

    To change the weight rounding method, press the **TEST** key. The current rounding method is displayed.

13. Press the **ZERO** key to toggle between ***SCALE*** and ***CLASS***.

14. When the choice you want is displayed, press the **TEST** key.

15. To change the capacity/resolution, press the **ZERO** key until ***RESO*** is displayed.

16. Press the **TEST** key. The current capacity/resolution setting is displayed.

17. Press the **ZERO** key until desired capacity/ resolution is displayed.

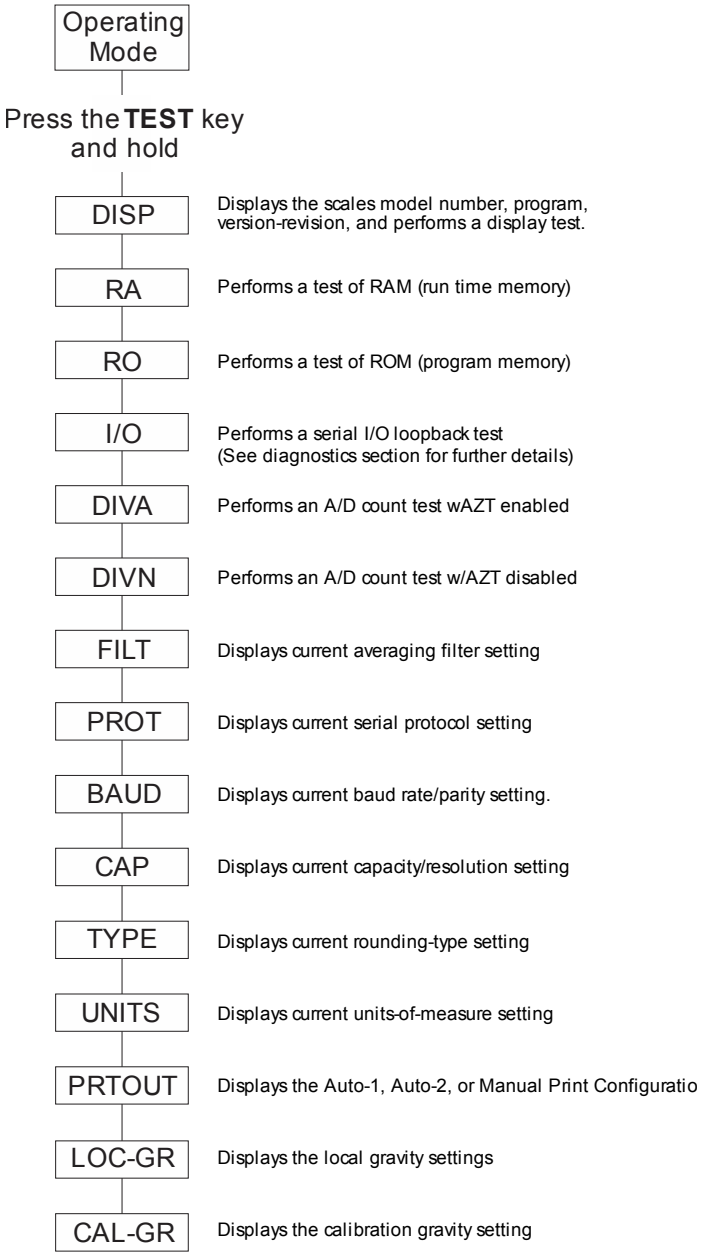
18. Press the **TEST** key to select a new capacity/resolution.

19. Close Switch 1 to return to normal weighing mode.

5.12 Review/Test Scale Settings

The **TEST** key located on the front panel lets you perform some basic system diagnostics, as well as review the current system settings without having to access switches inside the scale.

If you press and release the **TEST** key, the display will show the scales model number, version-revision, and performs a display test. To review the current system settings, press and hold the **TEST** key until the display shows, **- - - - -**.



Press the **ZERO** key to move to the next item in the menu

Press the **TEST** key to select the displayed item to run or view.

IMPORTANT: Internal rocker switches will be ignored until you exit this special mode or power reset the scale.

When finished running tests or viewing the settings, press the **ZERO** key until ***DONE*** is displayed. Then press the **TEST** key to return to normal (i.e., weighing) mode of operation.

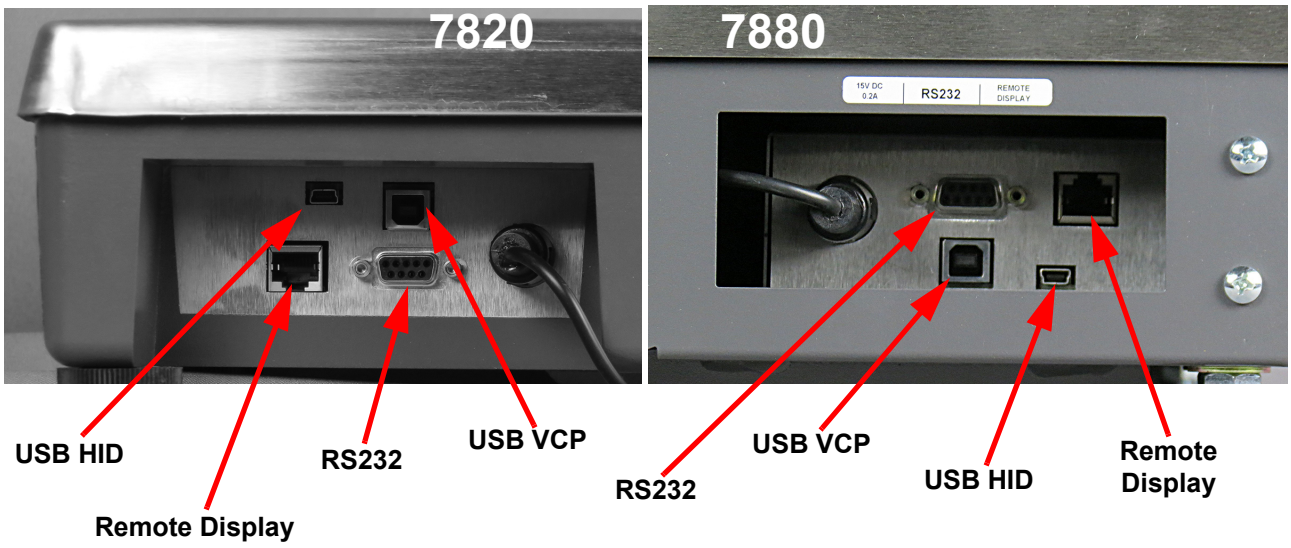
6 Communication

The 7800 family scales come factory configured with one communication port, however the data can be transfered out of the base using one of the following interface devises:

1 serial RS232, 1 USB VCP or 1 USB HID

Only one of these interface devises can be used from the scale at a time.

Below are the connections present on a 7820 and a 7880. Other models will have one of these two layouts except for the 7885, which does not have either of the USB connectors.



Due to height restrictions on the low profile 7885, this model only comes with one RS232 interface device.

RS232

There is one 9-pin DE type female connector accessible at the rear of the unit. The functional pinout of this connector is compatible with a standard PC with a pass through cable.

Scale baud and parity needs to be set to the default setting 96E (baud 9600, Parity: even) as shown in *Baud Rate and Parity Options on page 19*.

USB VCP

Allows the base to connect directly to PC using the USB port connection.

PC USB port still needs to be setup to match scale baud rate communications.

Scale baud and parity needs to be set to the default setting 96E (baud 9600, Parity: even) as shown in *Baud Rate and Parity Options on page 19*.



Driver required when connected to a PC. Download driver from the password protected portion of www.averyweigh-tronix.com.

USB HID

Used to connect to a dedicated PC terminal where the Avery Weigh-Tronix OPOS or UPOS (POS.NET) drivers have been integerated into a 3rd party software application.



Once a computer is connected to the USB HID port, the RS232 and USB VCP ports will be inactive until the computer is disconnected and power is cycled on the scale.

The Baud should be set to 9600, Even Parity and the Protocol needs to be set to NCI.

6.1 Communications Enabled

Serial commands will be responded to only when the scale is in the normal operating mode and Switch 1 on the main board is in the CLOSED position.

6.2 Interface Cable Specifications



JMP 1 Pins 1, 4 and 6, and JMP 2 Pins 7 and 8 are internally jumpered inside the scale.

DE-9 Female Scale			DE-9 Male Host		
Pin	**Name**	**Direction**	**Pin**	**Name**	**Direction**
1.	JMP 1	-	1.	DCD	IN
2.	TXD	OUT	2.	RXD	IN
3.	RXD	IN	3.	TXD	OUT
4.	JMP 1	-	4.	DTR	OUT
5.	SG	-	5.	GRD	-
6.	JMP 1	-	6.	DSR	IN
7.	JMP 2	-	7.	RTS	OUT
8.	JMP 2	-	8.	CTS	IN
9.	NC	-	9.	RI	IN

6.3 NCI Serial Communications Protocol

SYMBOL KEY:

<ETX> End of text character (Ø3 hex)

<LF> Line feed character (ØA hex)

<CR> Carriage return character (ØD hex)

<SP> Space (2Ø hex)

x Character from display including minus sign.

hh Two status bytes

uu Unit of measure (lb, kg, oz, g, etc. using ANSI standard abbreviations)

6.4 Standard Commands

W<CR>
Scale Response
<LF>xxxx.xxuu<CR>
<LF>hh<CR><ETX>
Results
Returns decimal weight with units plus scale status.

S<CR>
Scale Response
<LF>hh<CR><ETX>
Results
Returns to scale status.

Z<CR>
Scale Response
<LF>hh<CR><ETX>
Results
Scale is zeroed, returns status.

6.5 Optional Commands

H<CR>
Scale Response
<LF>xxxx.xxxuu<CR>
<LF>hh<CR><ETX>
Results
Returns decimal wt in 10x with units plus scale status.

d<CR> (for factory diagnostics only)
Scale Response
xxxxxx (div-A) <CR>
or
xxxxxx (div-n) <CR>
Results
Returns weight normalized to 100,000 division with AZT on/off. Protocol must be set for NCI and the scale must be in the “DIAG” (diagnostics) sub-menu.
Otherwise, the scale will respond with the unrecognized command response.

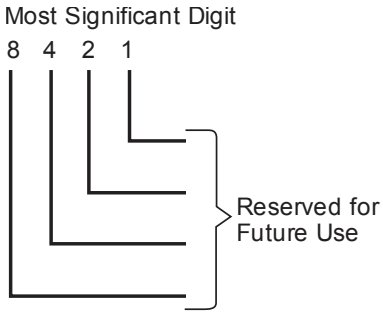
All other commands
Scale Reponse
<LF>?<CR><ETX>
Results
Unrecognized command

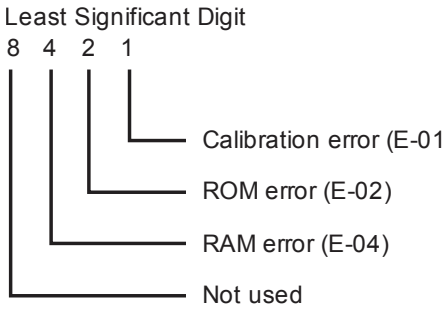
Contact Customer Service for protocol details or visit our website at www.averyweigh-tronix.com.

7 Error Codes and Troubleshooting

Any system errors detected by the scale will be displayed as the letter E followed by a two-digit error code. Press the **TEST** key to continue operation. If a calibration error occurs, the only way to clear it is by recalibrating the scale.

The error codes are broken down into two hexadecimal numbers, with each bit defining a single error condition. The error codes are defined as follows:





7.1 Troubleshooting

Perform the following steps in the order presented until the described problem is corrected. If the problem cannot be corrected, contact your Avery Weigh-Tronix service provider.

No Power (Display is Blank)

1. Check that the primary side of the cord is plugged into the AC outlet, and the secondary side is properly connected to the power jack on the back of the scale.
2. Replace the power supply.
3. Replace the display board.
4. Replace the main board.

Missing or extra segments on display

1. Replace the display board.
2. Replace the main board.

Scale will not return to zero, or incorrect weight is displayed

1. Press the **ZERO** key.
2. Check for interference of weighing platform.
3. Power off, remove all items from the platter, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. Replace the main board.

Display shows unrecognized characters

1. Check software PROM for proper insertion.
2. Check display cables for the proper connection.
3. Replace PROM.
4. Replace the display board.
5. Replace the main board.

Display shows under _ _ _ _ _ dashes

(Indicates that the scale is below zero or under capacity.)

1. Verify that weigh platter is on the scale.
2. Press the **ZERO** key.
3. Power off, remove any items from the platter, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. Replace the main board.

Display shows center - - - - - dashes

(Indicates that the scale is outside zero capacity of ±2%.)

1. Verify that weigh platter is on the scale.
2. Press the **ZERO** key.
3. Power off, remove any items from the platter, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. Replace the main board.

Display shows upper – – – – dashes

(Indicates the scale is over capacity.)

1. Remove all items from the scale.
2. Press the **ZERO** key.
3. Power off, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. Replace the main board.

Scale is not transmitting data to the host device

1. Check cable connection at both the rear of the scale and the host device.
2. Check communication setting and baud rate on both scale and software.
3. Perform I/O loopback test.
4. Replace the cable.
5. Replace the main board.

The ZERO key and the TEST key do not function

1. Open display enclosure and verify that the keypad cable is still installed correctly.
2. Verify internal/external switch setting. See *Operation Controls on page 15*.
3. Replace the display panel.
4. Replace the display PCB.
5. Replace the display cable.
6. Replace the main PCB.

8 Spare parts

DESCRIPTION	PART NUMBER
7820 Keyboard Panel	AWT25-501979
7824, 7829, 7840, 7880 Keyboard Panel	AWT25-501978
Display PCB	7405-15465
PCB ASSY Main RS232 USB Option	AWT25-501295
PCB ASSY, 78XX 2X USB Option	AWT25-501976
PCB ASSY MAIN 9P RS232 (7885 Only)	7405-14704-2
Power Supply - in-line	1148-15536
Power Supply - wallmount (7885 only)	1148-15535
RS232 Cable	1140-13842
7820-50 Loadcell	7154-16335-50
7820-70 Loadcell	7154-16333-100
7820-75 Loadcell	7154-16335-100
7880-50 Loadcell	7154-16365-75
7880-75 Loadcell	7154-16365-100
7885-75 Loadcell	7154-16335-100
7880-125, 150 Loadcell	7154-16365-150
7829-125 Loadcell	7154-16365-150
7840-125, 150 Loadcell	7154-16365-150
7824-125, 150 Loadcell	7154-16365-150
Kit, Remote Display, 6 digit, 7’ cable	AWT05-508631
Kit, Remote Display, 6 digit, 1’ post	AWT05-508632
7820 Feet	7075-15475-02
7880, 29, 40, 24, 85 Feet	7075-13082

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