8530

DigiTOL® INDICATOR

Technical Manual

A13012500A
12/95

INTRODUCTION

This publication is provided solely as a guide for individuals who have received Technical Training in servicing the METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

METTLER TOLEDO Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

FCC NOTE

NOTE: This equipment has been tested and found to comply with the limits of the United States of America FCC rules for a Class A digital device, pursuant to Part 15 of the FCC Rules and the Radio Interference Regulations of the Canadian Department of Communications. 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.

This manual describes the installation and operation of the Model 8530 DigiTOL® Indicator with software part number [128831] and software revision level [L09]. The software part number and revision level are the second and third prompts displayed at power up.

If the software part number displayed at power up is [134621] then the 8530 contains the Vehicle Scale software version which this manual does not cover. Refer to the 8530 Vehicle Scale Technical manual TMVS8530 I00 for installation and operating instructions for this version of software.

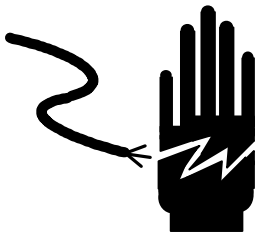
If the software revision level displayed at power up is [L08] or lower then this technical manual will describe several features which your unit does not provide. A software upgrade KOP, part number M128510 00A can be ordered and installed in the 8530 if the features of the latest version are required.

IMPORTANT!

It is most important that the correct part number is used when ordering parts. Parts orders are machine processed, using only the part number and quantity as shown on the order. Orders are not edited to determine if the part number and description agree.

PRECAUTIONS

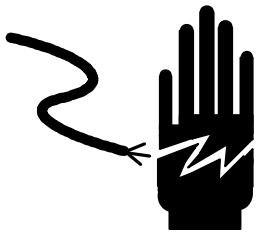
READ this manual BEFORE operating or servicing this equipment.



WARNING

ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.

FOLLOW these instructions carefully.

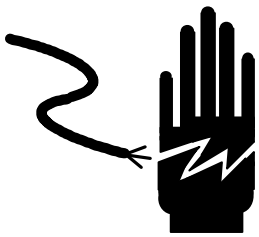


WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY.

DO NOT REMOVE THE GROUND PRONG.

SAVE this manual for future reference.



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

CAUTION

BEFORE CONNECTING/DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT, ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO, OR DESTRUCTION OF THE EQUIPMENT OR BODILY HARM.

ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

CONTENTS

1. GENERAL DESCRIPTION

The Model 8530 DigiTOL® is a multi-range, high performance indicator intended for use with METTLER TOLEDO scale single DigiTOL® load cell base Models 1996, 1997, 2096, 2097, 2196, 2197, the Model 2160 DigiTOL® Floor scale, and DigiTOL® J-box (Power Module). The 8530 is also compatible with the DigiTOL® Power Cells used in the DigiTOL® TRUCKMATE and RAILMATE vehicle scales, Models 7260, 7531, 7541, 7560, 7565 and the 760 DC.

The three enclosure styles available, permit the 8530 to be used in virtually any non-hazardous industrial environment. The desk enclosure version is intended for table top applications in typical office environments. The NEMA 4X rated, stainless steel wall mount enclosure is intended for wall or column mounting applications and also for wet or extremely dusty environments. The rack enclosure version is intended for rack or panel mount applications.

1.1 STANDARD FEATURES

- Operator input via a tactile feedback, 20 position membrane keyboard.
- Display of either gross or net weight on a seven digit, seven segment, blue-green, fluorescent display with 0.7" high digits.
- The 8530 provides keyboard calibration, setup and shift adjustment. Shift adjustment can be performed as sectional pairs or for individual cells.
- Span, zero, and shift adjust calibration data can be printed, recalled and entered from the keyboard in the setup mode.
- The 8530 supports pound (lb), kilogram (kg) or ton (t) weight units with units switching between lb and kg weight units.
- Keyboard entered tare and or pushbutton autotare are supported. Additive, chain tare is supported for repeated keyboard entered tare weight.
- Time and Date, Consecutive numbering, setpoint data, numeric ID, and stored tare weight data are stored in battery backed memory to prevent loss of data during a power outage.
- A digital filter provides a more stable weight reading in the presence of vibration.
- Auto zero maintenance (AZM) automatically compensates for small changes in gross zero.
- The pushbutton zero function is available to permit the operator to compensate for changes in gross zero. Pushbutton zero is limited to either ±2% or ±20% of programmed scale capacity as selected in setup.
- Auto zero capture at power up is available, over a range of either ±2% or ±10 of programmed scale capacity as selected in setup. Display or output of weight data is inhibited until zero has been captured after a power loss.
- The 8530 continuously tests its internal circuitry and the DigiTOL® load cells. Comprehensive error reporting assists in troubleshooting malfunctions.
- Over capacity blanking can be programmed independently of scale capacity, up to 5 increments above programmed scale capacity.

- The 8530 provides a motion (unstable weight) detector, selectable from ±0.5 increments to ±3 increments. AZM, pushbutton zero, tare and print functions are inhibited when the weight display is unstable.

- The 8530 provides 10, battery backed, memory address that can be used for temporary or permanent stored tare weights.

- The JN serial port provides RS-232C and 20mA current loop, bi-directional serial communication interfaces with demand or continuous data output formats.

- When a serial port is programmed for the continuous mode, a fixed format message with weight and status information is output every display update. The continuous output mode is intended for remote display, setpoint, or real time computer interfacing applications.

- The demand mode output provides a flexible ticket format that is compatible with METTLER TOLEDO Printers, Models 8806, 8844, 8856, 8860 and 8865.

- Print interlock prevents printing multiple copies of the same transaction. If print interlock is enabled, the weight on the scale must return to zero and a new weight be placed on the scale before printing can occur.

- Time, date, consecutive numbering, and a 12 digit numeric ID data field can be printed.

- Single ASCII character serial input commands, are accepted for remote CLEAR, PRINT, TARE and ZERO functions.

- The 8530 provides a subtotal and total accumulator selectable for net, gross or displayed weight with consecutive numbering.

- The 8530 provides four, single speed, setpoint cutoff outputs when combined with the METTLER TOLEDO Model 3015 Setpoint Controller. Setpoint operation requires the use of a serial port.

1.2 OPTIONAL FEATURES

- The optional JW port provides a second, bi-directional RS-232C serial interface selectable between demand, continuous or host output mode.

Note: Only one of the two ports JN or JW can be configured for demand mode output. Both the JN and JW ports can be configured for continuous mode output without a problem.

- The host interface mode of the optional JW port can be configured for use in a Master/Satellite network to permit up to eight 8530 indicators to be interfaced to one RS-485 serial port of a computer.

2. SYSTEM DESCRIPTION

The 8530 provides an unregulated +22 VDC supply for DigiTOL® Power Cells, and a regulated +20 VDC supply for single DigiTOL® load cells and the DigiTOL® J-Box (Power Module). DigiTOL® load cells contain an analog load cell, and analog to digital converter (A/D) and a microprocessor to handle the A/D conversion, error detection and digital communication with the 8530.

2.1 8530 MAJOR COMPONENTS

1 - Transformer: Steps down the AC power to lower voltages for use by the PCB's and DigiTOL® Load Cells.

2 - Main PCB: Contains the DC power Supplies, control logic, serial I/O ports, single fluorescent display, keyboard interface, Power Cell interface and single DLC interface.

3 - EPROM and Carrier: Contains the software that controls the operation of the 8530.

4 - Keyboard: Provides an operator interface for functions such as tare, print, clear, test units selection, accumulation and calibration/setup.

2.2 DIGITOL® POWER CELL VEHICLE SCALE SYSTEM DESCRIPTION

The 8530 uses a two wire, multi-drop, RS-485, Master/Satellite network to communicate with Power Cells in a DigiTOL® vehicle scale. Data communication takes place over two wires identified as COM A and COM B. The data lines are wired in parallel from the 8530 to all Power Cells. The 8530 update rate is fifteen weight readings per second.

2.2.1 Power Cell

Each Power Cell performs an A/D conversion and internal diagnostic self test and then waits for the 8530 to request data from that particular Power Cell. Each Power Cell has an internal resolution of 100,000 counts.

The 8530 requests a data transmission from the Power Cell fifteen times per second. An **[E8 XX]** error code (where XX = Power Cell address) will be displayed if a Power Cell does not respond to a request for data from the 8530.

Each Power Cell stores the address that is assigned to it in setup and outputs data only when the 8530 requests data from its address. The 8530 can initiate an analog verify operation at four hour intervals.

2.2.2 Pit Power Supply (NMOS Power Cells Only)

The pit power supply converts the +22 VDC supply from the 8530 to the +18.5 VDC and +8.5 VDC required by NMOS Power Cells. The pit power supply also supplies cable termination points for up to six Power Cells. Pit power supply expanders are added to supply additional cable termination points for systems that require more than six Power Cells.

Note: CMOS Power Cells can operate with the Pit Power supply or else operate directly from the +22 VDC supplied by the 8530, without requiring the Pit Power Supply.

2.2.3 Auxiliary Power Supply

The auxiliary power supply is required for vehicle scales with more than 10 NMOS Power Cells. The auxiliary power supply is not required for CMOS vehicle scales.

2.3 SINGLE DIGITOL LOAD CELL BASE DESCRIPTION

The 8530 uses an RS-422 interface to communicate with the single DigiTOL® load cell. Data communication takes place over three wires identified as TxD A, TxD B and RxD A. The 8530 update rate is nine weight reads per second.

The single DigiTOL® load cell performs an A/D conversion, an internal diagnostic self test and then outputs raw count weight data to the 8530. During calibration the 8530 can download span calibration values to the load cell in order to get more counts from the load cell.

2.4 MODEL 2160 DIGITOL® FLOOR SCALE AND DIGITAL J-BOX DESCRIPTION

The 8530 uses an RS-422 interface to communicate with the digital j-box inside the Model 2160 DigiTOL® Floor scale. Data communication takes place over four wires identified as TxD A, TxD B, TxD A and RxD B. The 8530 update rate is twelve weight reads per second.

The digital j-box converts two to four analog load cells into a DigiTOL® load cell signal that the 8530 can understand. The digital j-box performs an A/D conversion on the analog signal from each analog load cell. The digital j-box then performs a shift adjustment on the individual cell weight data to eliminate corner errors. The digital j-box then performs internal self tests and outputs the summed raw count weight data to the 8530.

2.5 MODEL 8530 FACTORY NUMBER REFERENCE

Factory Number	Enclosure Type	AC Power Input	Market Versions
8530-0001	Desk	120 VAC	USA
8530-1001	Wall Mount	120 VAC	&
8530-2001	Rack Mount	120 VAC	Canada
8530-0011	Desk	220/240 VAC	General
8530-1011	Wall Mount	220/240 VAC	Export
8530-2011	Rack Mount	220/240 VAC	
8530-0021	Desk	220/240 VAC	Export
8530-1021	Wall Mount	220/240 VAC	EC
8530-2021	Rack Mount	220/240 VAC	

Table 2-1 Factory Number Reference

3. SPECIFICATIONS

3.1 ENVIRONMENT

The 8530 operates from -10 to +45 degrees C (14 to 113degrees F) at 10 to 95% relative humidity, non-condensing. The 8530 storage temperature range is from -40 to+70 degrees C (-40 to +158 degrees F) at 10 to 95% relative humidity, non-condensing.

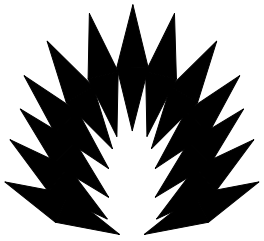
The desk and rack enclosure versions must not be used in wet or extremely dusty environments. The wall mount enclosure version meets NEMA 4X hosedown requirements.

3.2 HAZARDOUS AREAS

Single DigiTOL® load cell bases, NMOS Power Cell vehicle scales, CMOS Power Cell vehicle scales that do not use the 0917-0198 Intrinsic Safety Barrier, the Model 2160 DigiTOL® Floor scale, and the digital j-box are not intrinsically safe and **MUST NOT be operated in areas classified as Hazardous by the National Electrical Code (NEC) because of combustible or explosive atmospheres.**

The 8530 indicator combined with the 0917-0198 CMOS Intrinsic Safety Barrier can be operated with CMOS Power Cell vehicle scales that are located in hazardous areas. **The 8530 MUST be located in the non-hazardous area if used with the 0917-0198 Intrinsic Safety Barrier and CMOS Power Cell vehicle scale weighbridges.**

Contact Mettler-Toledo Inc. for more information about hazardous area vehicle scale applications. Refer to the 0917-0198 CMOS Intrinsic Safety Barrier installation instruction manual and the DigiTOL® Hazardous Area Wiring Diagram, TC100442, for installation and troubleshooting information.



WARNING

The Model 8530 DigiTOL® Indicator is not intrinsically safe! DO NOT operate the Model 8530 in locations classified as HAZARDOUS by the National Electrical Code (NEC) because of combustible or explosive atmospheres.

3.3 STANDARDS COMPLIANCE

The Model 8530 is U.L. listed to meet specifications 114, Office Appliances and Equipment.

The Model 8530 is certified by C.S.A. to meet standard C22.2 No. 143-1975, Office Machines.

The Model 8530 meets or exceeds both FCC docket 80-284 and VDE 0871 class B specifications for radiated and conducted emissions.

The 8530, with [128831] software, is NTEP approved and has Certificate of Conformance number 88-259 for legal-for-trade applications as a class II, III, or IIIL device.

3.4 POWER REQUIREMENTS

The 8530 requires clean AC power with a true earth ground for reliable operation. The power line for the 8530 must not be shared with equipment that generates line noise (such as motors, relays, heaters, copy machines, etc.). If adverse power conditions exits, a power line conditioner may be required. Versions of the 8530 are available for 120 or 220/240 VAC operation.

The 8530 meets the NIST H-44, Canadian Gazette Part 1 and OIML-SP7/SP2 line voltage variation specifications. The 8530-0001, 1001 and 2001 operate on 120 VAC (+10%, -15%) at a line frequency of 60 Hz (±2%). The 8530-0011, 1011 and 2011 operate on 220/240 VAC (+10%, -15%) at a line frequency of 50 Hz (±2%). Maximum power consumption is 75 watts.

Line Voltage Variation Specification	8530 Factory Number	AC Line Voltage			Line Frequency in Hz		
		Min	Nominal	Max	Min	Nominal	Max
NIST H-44	8530-0001 8530-1001 8530-2001	100	120	130	59.5	60	60.5
Canadian		108	120	132	58.2	60	61.2
OIML-SP7/SP2		102	120	132	58.8	60	61.2
OIML-SP7/SP2	8530-0011 8530-1011 8530-2011	187 204	220 240	242 264	49.0 49.0	50 50	51 51

Table 3-2 AC Line Voltage Variation Specifications

3.5 RADIO FREQUENCY INTERFERENCE

The 8530 meets U.S.A., Canadian and VDE 0871 class B requirements for RFI susceptibility specifications as listed with a maximum change of one displayed increment.

Specification	Frequencies in MHz	Field Strength
U.S.A.	27, 169 and 464	3 volts/meter
Canadian	27 and 464	4 watts at 2 meters
VDE 0871 class B	27, 144, 169 and 464	3 volts/meter

Table 3-3 Radio Frequency Interference Susceptibility

3.6 APPEARANCE AND DIMENSIONS

The desk mount versions are a charcoal black painted, two piece, die cast aluminum enclosure. The desk enclosure is 8.4" (213 mm) high, 12.6" (320 mm) wide by 6.5" (165 mm) deep. The desk enclosure version weighs 15 lb (6.8 kg).

The rack versions are a charcoal black painted, sheet metal enclosure with a black painted, die cast aluminum display bezel. The rack mount enclosure is 3.5" (89 mm) high, 17" (432 mm) wide by 9.3" (236 mm) deep. The rack enclosure version weighs 15.4 lb (7 kg).

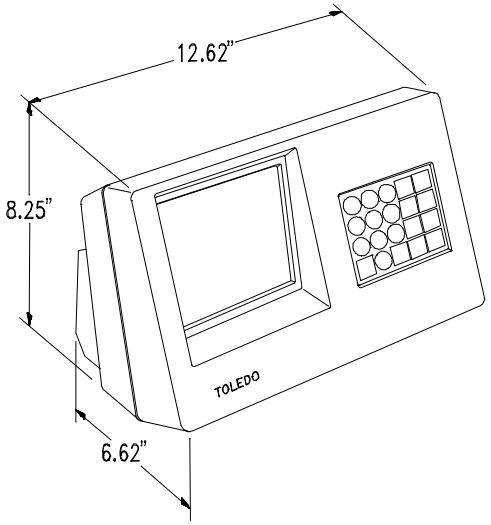


Figure 3-1 Desk Enclosure Dimensions

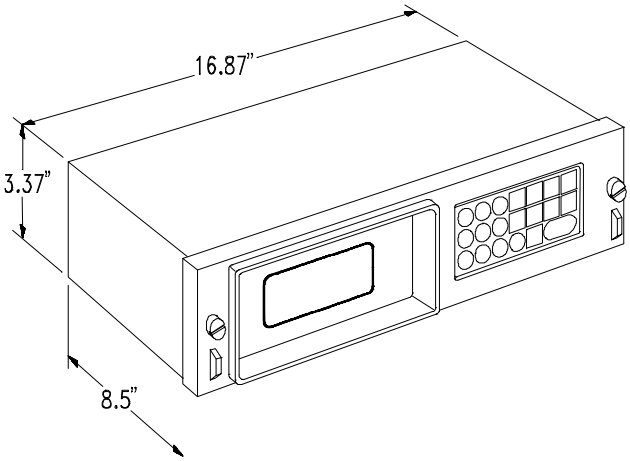


Figure 3-2 Rack Enclosure Dimensions

The wall versions are an unpainted, brushed stainless steel enclosure. The wall mount enclosure is 11.3" (287 mm) high, 13.9" (353 mm) wide by 5.5" (140 mm) deep. The wall mount enclosure can be wall or column mounted. The wall mount version weighs 19 lb (8.6 kg).

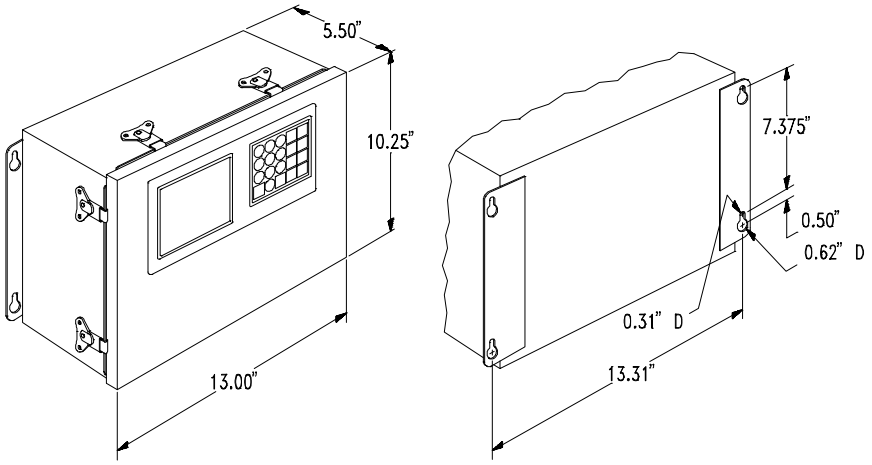


Figure 3-3 Wall Mount Enclosure Front and Rear Dimensions

The rack enclosure versions can be mounted into a panel with the optional panel mount KOP (0917-0005). Refer to Figure 3-4 for panel mounting cutout dimensions.

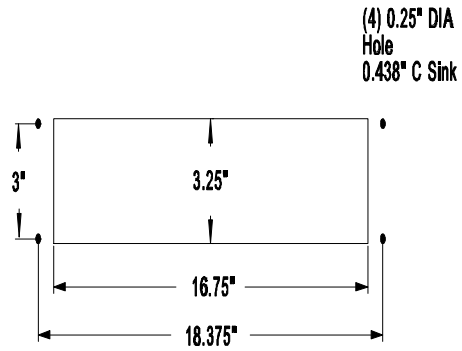


Figure 3-4 Panel Mounting Detail For Rack Mount Enclosure

3.7 JN PRINTER PORT

The 8530 provides the JN bi-directional serial port with RS-232C and 20 mA current loop interfaces. The JN port provides two modes of operation, demand and continuous. The demand mode output has three flexible ticket formats available that are compatible with METTLER TOLEDO Printers, Models 8806, 8843, 8856 and 8860.

3.7.1 Continuous Output

The Toledo® continuous format output is transmitted after every display update, 15 times per second. The continuous output is available from 1200 to 9600 baud. Refer to Section 6.7 for a complete description of the continuous mode output.

3.7.2 Demand Mode Output

The demand output is subject to print interlock if enabled. The data output is available from 300 to 9600 baud and can include expanded print format as well as an optional checksum character. Refer to Section 6.6 for a complete description of the demand mode output.

3.7.3 Remote ASCII Control Input

The 8530 can accept single ASCII characters into the serial port for remote CLEAR, PRINT, TARE and ZERO functions in either the demand or the continuous output mode.

3.8 OPTIONAL JW HOST PORT

The optional JW interface KOP provides a second bi-directional serial port with RS-232C and RS422/485 interfaces. The JW port provides three modes of operation: demand, continuous and host mode. The JW port continuous and demand modes output selection is identical to the JN port continuous and demand mode output. The JW port can accept single ASCII characters into the serial port for remote CLEAR, PRINT, TARE and ZERO functions in either the demand or the continuous output mode.

Note: Only one serial port (either JN or JW) can be programmed for demand mode output, the other serial port must be configured for continuous mode (or host mode for JW port).

The JW port Host mode provides a master/satellite network protocol for interfacing with a host computer. The host mode allows the host computer to read weight, status and setpoint data from the scale. The host mode also permits the host computer to upload and download tare and setpoint data to and from the 8530.

The JW port RS-232 interface can be used in the host mode for single scale interfacing applications. The JW port RS-422/485 interface can be used to connect up to eight 8530's to a single serial port on a host computer.

The host mode has been enhanced to provide greater functionality and troubleshooting capabilities. The host mode can now be used to read raw count output from individual Power cells in a vehicle scale, with error code information. Calibration data can also be uploaded and downloaded by means of the host port.

The original 8530 host mode is still available by setup selection to provide compatibility with existing applications.

4. INSTALLATION INSTRUCTIONS

4.1 UNPACKING

Inspect the shipping container and scale for loose or damaged parts. If any damage is found, immediately notify the freight carrier. Open the carton and continue the inspection, check for damaged or missing parts.

All versions are shipped with the following components:
Model 8530 Technical Manual, TM008530 I01
Model 8530 Operators Manual, OM008530 I02
Single DLC Adapter Harness, PN 131612 00A
Blank Key Overlay, PN 12281100A, Qty 4
Capacity Label, PN 136595 00A
Quality Feedback Card

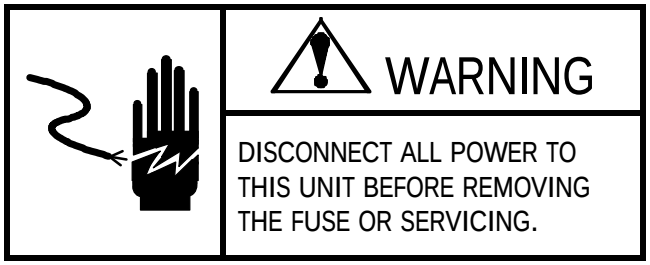
The wall enclosure version also includes:
Model 8530-10X1 Wall Mount Enclosure Indicator
Load Cell Cable Connector, PN 123492 00A
Tube, Gasket Sealant, PN 118251 00A
Cable Termination Instructions, PN 133528 00A

The desk enclosure version also includes:
Model 8530-00X1 Desk Enclosure Indicator
AC Line Cord, PN 109445 00A
DE-9-P Load Cell Cable Connector, PN 117599 00B
Load Cell Connector Shell, PN 125384 00A
5" of Embossed Copper Tape, PN 154360001

The rack enclosure version also includes:
Model 8530-20X1 Rack Enclosure Indicator
AC Line Cord, PN 103867 00A
DE-9-P Load Cell Cable Connector, PN 117599 00B
Load Cell Connector Shell, PN 125384 00A
3" of Embossed Copper Tape, PN 154360001

4.2 OPENING THE ENCLOSURE

Open the enclosure as described next. Verify that all internal harnesses are securely fastened.



4.2.1 Opening the Desk Enclosure

Removing the four screws from the corners of the rear cover opens the desk enclosure. Be careful not to damage the keyboard harness when removing the front cover. DO NOT over tighten the cover screws when reinstalling them.

4.2.2 Opening the Wall Enclosure

The wall enclosure is opened by flipping the wing type handle of each fastener up and turning them 180° counter clockwise. Loosen the hinge fasteners on the left side last (be sure to loosen them both at the same time to prevent jamming).

4.2.3 Opening the Rack Enclosure

Loosening the two front panel screws and sliding the chassis out of the outer case opens the rack enclosure. Remove the three inner cover retaining screws and the inner cover. Use caution reinstalling the front panel screws to prevent cross threading.

4.3 SELECT DigiTOL® LOAD CELL INTERFACE

DigiTOL® load cells, referred to from here as "DLC", use one of two different communication methods, single load cell and multiple load cells. The 8530 provides both the single DLC interface and the multiple DLC interface. The single and multiple DLC interfaces use different wiring pinouts and communication protocols and are not compatible. Selection between the single and multiple DLC interfaces is performed by software selection and by installing a DLC adapter harness between the load cell extension harness and the 8530 Main PCB.

The 8530 is compatible with the DigiTOL® Power Cells used in the DigiTOL® TRUCKMATE and RAILMATE vehicle scales, Models 7260, 7531, 7541, 7560, 7565 and the 760 DC when the multiple DLC adapter harness is installed.

The 8530 is compatible with single DigiTOL® Load Cell bases such as the Models 1996, 1997, 2096, 2097, 2196, 2197, the Model 2160 DigiTOL® Floor Scale and the digital j-box, when the single DLC adapter harness is installed.

The 8530 is shipped with the multiple DLC adapter harness installed and is ready to be used with DigiTOL® Vehicle scales. **If the 8530 is to be used with a single DLC base, the Model 2157 DigiTOL® floor scale or the digital j-box then the multiple DLC adapter harness must be removed from the 8530 and the single DLC adapter harness, part number 131612 00A, must be installed between the load cell extension harness and connector J3 on the 8530 Main PCB.**

CAUTION!

Single DLC scale bases, the Model 2160 Floor Scale and the digital j-box require the single DLC adapter harness be installed between the load cell extension harness and connector J3 on the 8530 Main PCB or else damage to the load cell may result.

REMOVE AC POWER FROM THE 8530 AND WAIT A MINIMUM OF 30 SECONDS BEFORE CONNECTING OR DISCONNECTING ANY HARNESSES FROM PCB'S OR LOAD CELLS OR ELSE DAMAGE MAY RESULT.

4.3.1 Install the Single DLC Harness, (If Required)

To convert the 8530 from the multiple DLC interface to the single DLC interface begin by removing AC power to the 8530. Unplug the multiple DLC adapter harness from the J7 connector on the 8530 Main PCB. Disconnect the inline, nine pin connector end of the multiple DLC adapter harness from the mating nine pin connector on the load cell extension harness. Refer to Figure 4-1.

Plug the inline, 9-pin connector end of the single DLC adapter harness (p/n 131612 00A), into the mating connector on the load cell extension harness. Plug the 16 pin, dual row connector end of the single DLC adapter harness into connector J3 on the 8530 Main PCB. Refer to Figure 4-1.

Note: The desk enclosure version of the 8530 requires that the Main PCB be removed from the enclosure in order to change the DLC adapter harness.

4.3.2 Install the Multiple DLC Harness, (If Required)

To convert the 8530 from the single DLC interface to the multiple DLC interface, begin by removing AC power to the 8530. Unplug the single DLC adapter harness from the J3 connector on the 8530 Main PCB. Disconnect the inline, nine pin connector end of the single DLC adapter harness from the mating connector on the load cell extension harness. Refer to Figure 4-1.

Plug the inline, nine pin connector end of the multiple DLC adapter harness, part number 131612 00A, into the mating connector on the load cell extension harness. Plug the 16 pin, dual row connector end of the multiple DLC adapter harness into connector J7 on the 8530 Main PCB. Refer to Figure 4-1.

Note: The desk enclosure version of the 8530 requires that the Main PCB be removed from the enclosure in order to change the DLC adapter harness.

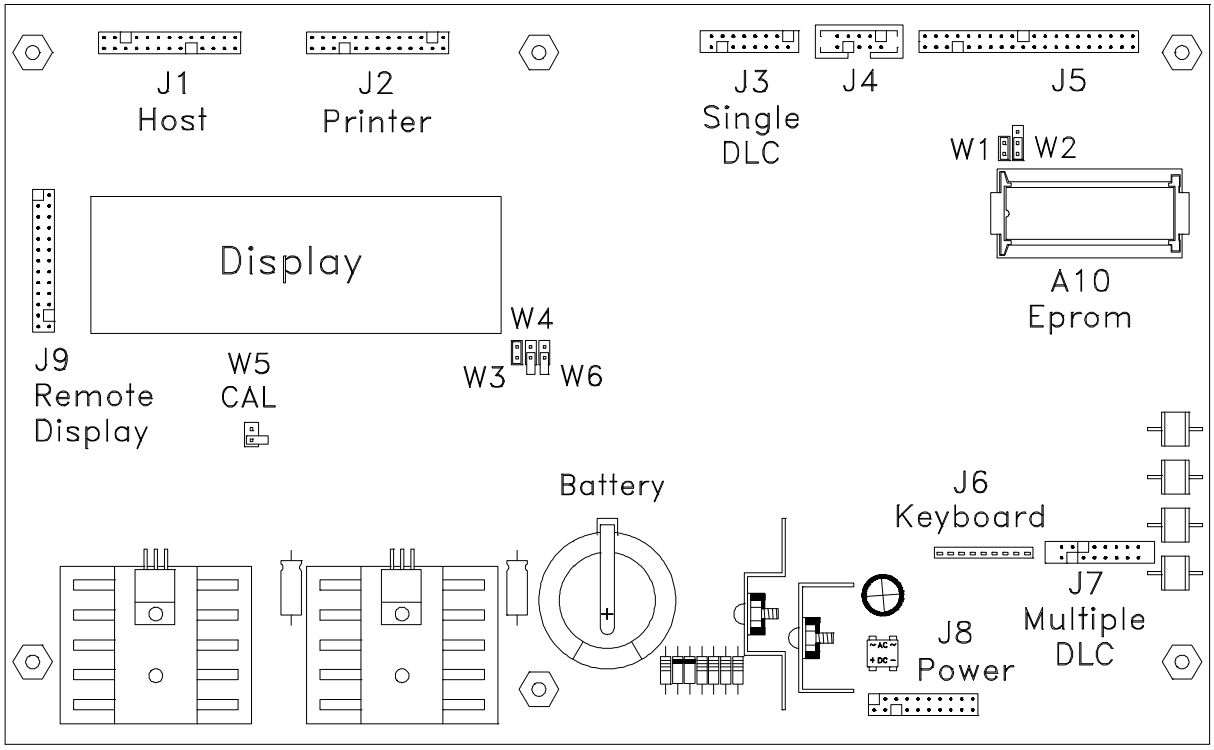


Figure 4-1 8530 Main PCB

4.4 AC POWER VOLTAGE SELECTION, EXPORT VERSIONS ONLY

USA and Canadian versions of the 8530, factory numbers 8530-0001, 1001, and 2001 are shipped configured for 120 VAC input only and are not selectable for 220/240 VAC operation. The voltage selection card in the AC line filter assembly of the desk and rack enclosure versions **MUST** be to 120. If the voltage input card in the line filter on these units is changed to anything other than 120 VAC the 8530 will not operate.

General export versions of the 8530, factory numbers 8530-0011, 1011, and 2011 are shipped configured for 220 VAC operation and are selectable for 240 VAC operation.

4.4.1 Desk and Rack Enclosure Versions AC Line Voltage Selection

Remove the AC power cord from the AC filter assembly located on the right side of the Desk enclosure or on the rear of the Rack enclosure. Refer to Figure 4-2.

Slide the clear plastic fuse cover to the side, exposing the fuse. Pull the handle labeled FUSE PULL and remove the fuse. With the fuse removed, use a small screwdriver or similar object and gently pry the voltage selection card straight out of the AC filter assembly. A small hole in the card is provided to assist removal.

Insert the voltage selection card so that the desired voltage marking is readable and located on the left side of the card. Reinstall the fuse in the fuse holder. Slide the fuse cover back into place and connect the AC power cord to the AC filter assembly.

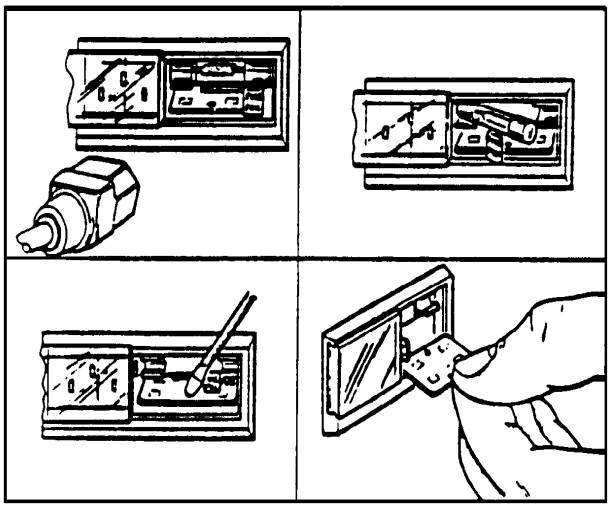


Figure 4-2 Export, Desk and Rack Version, AC Line Voltage Selection

4.4.2 Wall Enclosure Version AC Line Voltage Selection

AC voltage selection for the 8530-1011, is performed by rotating the voltage selection switch on the AC line filter fuse assembly, located in the bottom left corner of the 8530 enclosure. To switch between 220 and 240 VAC, first remove AC power to the 8530 and open the enclosure. Next, insert the blade of a small, flat-bladed screwdriver into the slot in the center of the voltage selection switch. Rotate the switch clockwise to select 220 VAC, rotate the switch counter-clockwise to select 240 VAC. Refer to Figure 4-3.

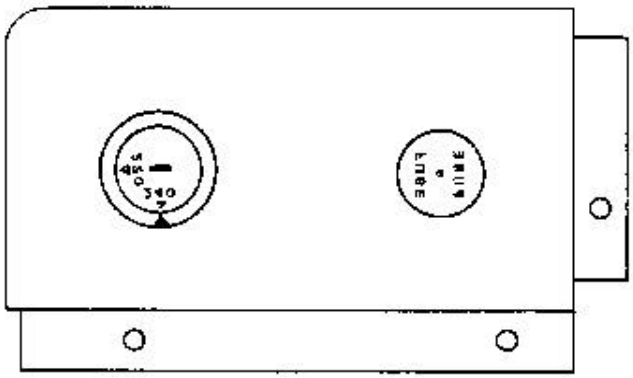


Figure 4-3 Export, Wall Mount Version, AC Line Voltage Selection

4.5 MAIN PCB PREPARATIONS

Remove the insulating paper from between the battery and battery clip on the 8530 Logic PCB. Refer to Figure 4-4 for battery location. Be careful not to touch the metal surface of the battery as corrosion caused by acids from your skin can cause the battery to fail.

If ASCII control characters are to be input to the JN serial port then jumper W6 must be set to match the JN port interface used. If ASCII control characters are to be received into the 20 mA current loop input then jumper W6 must be IN (shorting the two pins together). If ASCII control characters are to be received into the RS-232C interface then jumper W6 must be OUT (not shorting the two pins together). Refer to Figure 4-4 for jumper location.

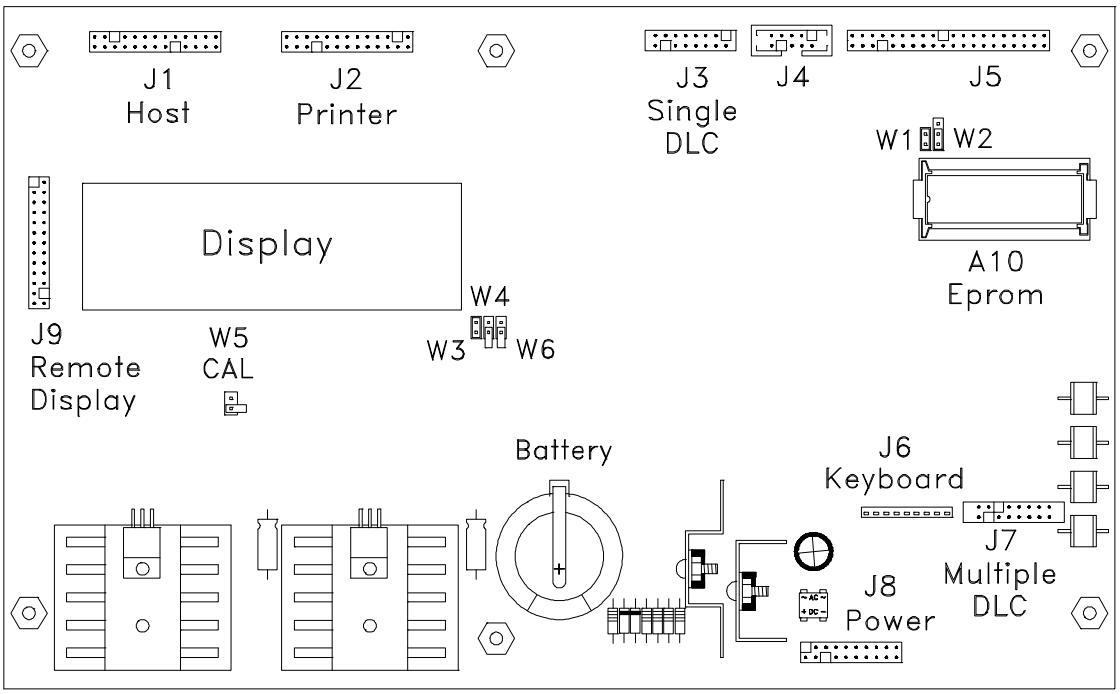


Figure 4-4 Main PCB, Battery and Jumper W6 Location

4.6 TERMINATE EXTERNAL WIRING

CAUTION!

The 8530 is compatible with DigiTOL® load cells only. The 8530 MUST NOT be connected directly to analog load cells as damage to the 8530 Main PCB may result. Analog load cells can be connected to the 8530 by using the digital j-box to convert the analog load cells into a DigiTOL® load cell compatible interface.

Damage to the DigiTOL load cell or the 8530 Main PCB may result if the 8530 is connected using the wrong DigiTOL load cell interface. Refer to Section 4.1.3 before connecting the 8530 to a scale base.

REMOVE AC POWER FROM THE 8530 AND WAIT A MINIMUM OF 30 SECONDS BEFORE CONNECTING OR DISCONNECTING ANY HARNESSES FROM PCB'S OR LOAD CELLS AS DAMAGE MAY RESULT.

4.6.1 Terminate Vehicle Scale Home Run Cable (If Used)

Verify that the multiple DLC adapter harness, part number 131613 00A, has been installed between the external load cell harness and the multiple DLC connector J7 on the 8530 Main PCB. Refer to Figure 4-4 for connector J7 location. If the single DLC adapter harness, part number 131612 00A, is installed at connector J3 on the main PCB then refer to Section 4.1.3.

Refer to Section 6.3 of this manual and to the weighbridge installation manual for weighbridge and home run cable wiring information.

4.6.2 Terminate Single DigiTOL® Load Cell Cable (If Used)

Verify that the single DLC adapter harness, part number 131612 00A, has been installed between the external load cell harness and the single DLC connector J3 on the 8530 Main PCB. Refer to Figure 4-4 for connector J3 location. If the multiple DLC adapter harness, part number 131613 00A, is installed at connector J7 on the main PCB then refer to Section 4.1.3.

Refer to Section 6.3. of this manual for load cell cable termination instruction.

4.6.3 Terminate JN Printer Port Interface Cable

Refer to section 6.4 for interface cable termination instruction if JN printer port is used.

4.6.4 Terminate JW Host Port Interface Cable

Refer to section 6.5 for interface cable termination instruction if JW host port is used.

4.7 NEW SCALE INSTALLATION NOTES

4.7.1 DigiTOL® Vehicle Scale Installation Notes

When installing a new vehicle scale refer to the installation manual supplied with the DigiTOL® weighbridge.

Once the weighbridge is physically installed, configure the 8530 according to the recommended setup parameters in the quick setup reference chart in Section 4.2.3. Refer to the indicator setup section of the weighbridge installation manual for the correct scale capacity, increment size and number of Power Cells.

After the 8530 has been configured, perform the Power Cell addressing procedure, setup step **[04]**. If problems occur during the addressing procedure then refer to the troubleshooting procedure in Section 7 of this manual.

Once the load cells have been successfully addressed, let the 8530 warm up for 30 minutes and record the raw count output of each Power Cell using setup step **[99]**. Refer to the indicator setup section of the weighbridge installation manual for maximum raw count deviation and final shimming instructions if necessary. Record and save the Power Cell raw count output readings after final shimming is completed, for future use.

Once the 8530 has been configured, the Power Cells have been addressed and correct Power Cell shimming has been verified, the scale is now ready for calibration. Perform sectional pair shift adjust, step **[18]**, with either a weight cart or the rear axles of your test truck. Immediately after shift adjust is completed, before you exit the setup mode, perform the calibration procedure, step **[19]** using the same weight used for shift adjust. Once the shift adjust and scale calibration have been performed successfully the first time, the shift adjust and scale calibration steps can be accessed independently without causing a problem.

Note: Steps **[18]** and **[19]** must be performed in order without leaving the setup mode, for first time installations. Do not perform the calibration procedure, step **[19]**, unless the shift adjust procedure, step **[18]**, has been successfully performed at least once. Do not perform the zero or span adjust, steps **[21]** or **[22]**, unless the calibration procedure, step **[19]**, has been successfully performed at least once.

After the shift adjust and calibration procedures, steps **[18]** and **[19]**, have been performed, exit the setup mode and verify weighing performance. Some installations may require individual load cell shift adjust to eliminate side to side errors.

If individual cell adjust is required, then select individual cell adjust, setup step **[02 1]**, and repeat the shift adjust procedure, step **[18]**. A weight cart or a large fork lift truck that can concentrate the weight directly over the load cell being adjusted will be much more effective during shift adjustment than the rear axle of a test truck.

If step **[18]** is unable to reduce shift errors to within required limits, use the manual shift adjust procedure, step **[96]**, to bring the shift errors within tolerance.

RECORD AND SAVE the calibration data from step **[97]** once scale calibration is completed. If the 8530 Main PCB is replaced then the calibration data saved from step **[97]** of the old Main PCB can be reentered into the new Main PCB at step **[97]** and the scale will not require calibration.

4.7.2 Single DLC, Model 2157, Model 2160/Digital J-box Installation Notes

Refer to the data plate located on the scale base for the recommended scale capacity and increment size. If you intend to use the recommended capacity and increment size printed on the data plate then refer to Section 4.8 for programming and calibration information.

The 8530 is capable of displaying up to a maximum of 60,000 displayed increments. If you intend to use an increment size that is smaller than the recommended increment size selection printed on the scale base data plate then the minimum increment size for the scale base must be determined before calibration. Refer to Section 4.7.2.1 for DigiTOL® J-Box minimum increment size. Refer to Section 4.7.2.2 for Model 2157 DigiTOL® Floor Scale minimum increment size. Refer to Section 4.7.2.3 for Bench and Portable Single DLC scale base minimum increment size.

Note: The minimum increment size selections listed in Sections 4.7.2.1, 4.7.2.2, and 4.7.2.3. are not legal-for-trade. **The increment size selected for a scale used in a legal-for-trade application MUST NOT BE SMALLER than the minimum increment size (e-min) listed on the scale base or load cell data plate.**

Note: Multi-range operation is also subject to the minimum increment size selection listed in Sections 4.7.2.1, 4.7.2.2, and 4.7.2.3.

4.7.2.1 Minimum Increment Size For DigiTOL® J-Box Applications

Table 4-1 lists the minimum increment size possible for the DigiTOL® J-Box when connected to the following Toledo/Masstron analog load cells. Find the individual capacity of the load cells you are connecting to the DigiTOL® J-Box in Table 4-1 and compare the desired increment size to the minimum increment size listed.

Rated Load Cell Capacity in lb	Load Cell Type	Minimum Increment Size	
		lb	kg
500	Bending Beam	0.1	0.05
1,000	Shear Beam	0.2	0.1
3,000	Shear Beam	0.5	0.2
5,000	Shear Beam	1.0	0.5
10,000	Shear Beam	2.0	1.0
20,000	Shear Beam	5.0	2.0
45,000	Shear Beam	20.0	10.0
50,000	Cap Check	10.0	5.0
75,000	Shear Beam	20.0	10.0
100,000	Cap Check	20.0	10.0
100,000	Dual Shear Beam	50.0	20.0

Table 4-1 DigiTOL® J-Box Minimum Increment Size

4.7.2.2 Minimum Increment Size For Model 2157, 2160 DigiTOL® Floor Scale

Table 4-2 lists the minimum increment size possible for the Model 2157 DigiTOL® Floor scale. Find the rated capacity of the scale base you are interfacing to in Table 4-2 and compare the desired increment size to the minimum increment size listed.

Rated Scale Capacity in lb	Individual Load Cell Capacity in lb	Minimum Increment Size	
		lb	kg
2,000	1,000	0.2	0.1
5,000	3,000	0.5	0.2
10,000	5,000	1.0	0.5
20,000	10,000	2.0	1.0

Table 4-2 Model 2157 DigiTOL® Floor Scale Minimum Increment Size

4.7.2.3 Minimum Increment Size for Bench and Portable Single DLC Scale Bases

Table 4-3 lists the minimum increment size possible for the DigiTOL® Bench and portable single DLC scale base models listed by factory number. Find the base you are connecting in Table 4-3 and compare the desired increment size to the minimum increment size listed.

Scale Base Factory #	Load Cell Capacity	Minimum Increment Size	
		lb	kg
1996-0001 1997-0001	30 kg	0.0005	0.0005
1996-0002 2096-0002	60 kg	0.001	0.0005
1997-0002 2096-0003 2097-0001	100 kg	0.005	0.002
1996-0003 2096-0001	140 kg	0.001	0.0005
2096-0002 2096-0004 2097-0002	300 kg	0.005	0.005
2196-0001 2196-0003 2197-0001	500 kg	0.01	0.005
2196-0002 2196-0004 2197-0002	1000 kg	0.02	0.01

Table 4-3 Single DigiTOL® Load Cell, Minimum Increment Size

4.8 PROGRAMMING AND CALIBRATION

WARNING	CAUTION
ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.	OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

4.8.1 Keyboard Functions During Setup

The keyboard is redefined as shown while in the setup mode.

Numeric The numeric keys (0 - 9) are used to enter data as required.

1 Press the **1** key to access a sequence or to select (YES).

0 Press the **0** key to select (NO) or to skip a step. The **0** key is also used to display the next selection when a menu of choices is presented.

CLEAR Press the **CLEAR** key to erase the current value and permit reentry of data.

ENTER Press the **ENTER** key to accept the displayed selection and to advance to the next setup step.

PRINT The **PRINT** key is used in step **[97]** to print just the calibration parameters.

ZERO Press the **ZERO** key to accept the displayed selection and back up to the previous setup step.

4.8.2 Access the Setup Mode

Remove AC power from the 8530. Place the W5 jumper (marked CAL) to the IN position (shorting the two pins together), on the 8530 Logic PCB. Refer to Figure 4-1 for W5 jumper location. Apply AC power to the 8530. After the power up display tests and the software part number and revision level is displayed, the 8530 enters the setup mode. Double dashes **[--]** are displayed, indicating the 8530 is in the setup mode.

Note: DO NOT remove the W5 (CAL) jumper or remove power from the 8530, while the 8530 is in setup mode, unless the 8530 is at the double dash **[--]** display. If the setup mode is exited incorrectly then the 8530 may display an **[E3]** error code on power up. Refer to Section 7 of this manual for clearing error codes.

4.8.3 Model 8530 Setup Quick Reference Chart

00	**SCALE GROUP**	
01	Load Cell Type	0 = Single DigiTOL® Load Cell ***1 = Power Cell Vehicle Scales*** 2 = Model 2157 or Digital J-box
02	Shift Adjust Mode	***1 = Sectional Pairs*** 0 = Independent DLC
03	Number of Load Cells (Note 3)	
04	Auto Address Power Cells (Note 3)	
05	Reset Shift Adjustment Values (Note 4)	
10	**CALIBRATION GROUP**	
11	Calibration Units	0 = kilograms ***1 = pounds***
12	Linearity Compensation	***0 = Linearity Disabled*** 1 = Linearity Enabled
13	Autorange (Note 2)	***1 = Single Range Mode*** 2 = Double Range Mode 3 = Triple Range Mode
14	Scale Capacity (Note 2)	
15	High Range Increment Size (Note 2)	
16	Mid Range Increment Size	
17	Low Range Increment Size	
18	Auto Shift Adjust Procedure (Notes 1 and 2)	
19	Calibration	
20	**ZERO AND FILTERING GROUP**	
21	Zero Adjustment	
22	Span Adjustment	
23	AZM Range (Note 2)	0 = Disable AZM ***1 = AZM Within ±0.5 Division*** 2 = AZM Within ±1.0 Division 3 = AZM within ±3 Divisions
23A	AZM in Net Mode	***0 = AZM in gross mode only*** 1 = AZM in net and gross mode
24	Powerup Zero Capture	0=Disable Zero Capture ***1=Zero Capture ±2%Capacity*** 2=Zero Capture ±10%Capacity
24A	Powerup Delay	***0 = Display weight at powerup*** 1 = Delay display 30 seconds
25	Pushbutton Zero Range	0 = Disable Pushbutton Zero ***1 = ±2% of Capacity*** 2 = ±20% of Capacity
26	Motion Detect (Note 2)	0 = Disable Motion Detection 1 = ±0.5 Increments 2 = ±1.0 Increments 3 = ±2 Increments ***4 = ±3 Divisions***
27	Display Filtering	0 = Disable Filtering 1 = Light Filtering 2 = Light-Medium Filtering 3 = Medium Filtering ***4 = Medium-Heavy Filtering*** 5 = Heavy Filtering
27A	Cell Filter (Note 2, 3)	0 = Disable Internal Cell Filter ***1 = Enable Internal Cell Filter***
28	Overcapacity (Note 2)	***Blank at Capacity+5 Increments***
29	Accumulator Mode	***0 = Accumulator disabled*** 1 = Accumulate Net Weight 2 = Accumulate Gross Weight 3 = Displayed Weight
30	**TARE GROUP**	
31	Tare Mode	0 = Disable Tare 1 = Autotare Only ***2 = Autotare and Keyboard tare***
32	Tare Interlock (Note 2)	***0 = Disable Tare Interlocks*** 1 = Enable Tare Interlocks
33	Manual Tare Mode	***0 = Manual Tare All Ranges*** 1 = Low Range Only
34	Autoclear Tare	***0 = Disable Autoclear Tare*** 1 = Enable Autoclear Tare
35	Gross/Net Switching	0 = Gross/Net key disabled ***1 = Gross/Net key enabled***
36	Function Key Enable	0 = Disable Function key ***1 = Enable all except setpoints*** 2 = All functions enabled
37	Stored Tare Memory	***0 = Memory Disabled*** 1 = Memory Enabled
38	Memory Mode	***0 = Permanent Memory*** 1 = Inbound/Outbound Memory

Notes:

1: Recommended default selections are shown in ***Bold Italics***.
2: These steps require specific selection for legal-for-trade applications.
3: These steps are for Power Cell Vehicle Scales only and are skipped for other load cell types.
4: These steps are for Model 2157 or digital j-box only and are skipped for other load cell types.

4.8.3 Model 8530 Setup Quick Reference Chart Continued

40 JN PORT GROUP SELECTION

41	Output Data Format	0 = Continuous Output ***1 = Demand Output*** 2 =<ENQ> Continuous Output
41A	Status Bytes Mode	***0 = Setpoint Data*** 1 = Increment Data
42	Baud Rate	***9600***
43	Parity Selection	0 = No Parity 1 = Odd Parity ***2 = Even Parity*** 3 = Parity always a "0"
44	Checksum	***0 = Disable Checksum*** 1 = Enable Checksum
45	Stop Bits	***1 = 1 stop bit*** 2 = 2 stop bits

50 JW PORT GROUP SELECTION

51	Port Output	***0 = Continuous output*** 1 = Original Host Mode 2 = Demand output 3 =<ENQ> Continuous Output 4 = Expanded Host Mode
51A	Status Bytes Mode	***0=Setpoint Data in continuous*** 1=Increment Type in continuous
52	Baud Rate	***4800***
53	Parity Bit	0 = 7 data bits, no parity 1 = 7 data bits, odd parity ***2 = 7 data bits, even parity*** 3 = 8 data bits, no parity
54	Checksum Enable	***0 = No checksum*** 1 = Checksum enable
55	Stop Bits	***1 = 1 stop bit*** 2 = 2 stop bits
56	Host Port Address	***02***
57	MultiDrop Mode Select	***0 = RS-485 (Multidrop)*** 1 = RS-422 (Single Drop)

60 PRINTER DEMAND GROUP SELECTION

61	Clear Tare After Print	***0 = Disable Autoclear*** 1 = Enable Autoclear
62	AutoPrint/Interlock	***0 = Demand Print*** 1 = Single Print 2 = Auto Print
63	Minimum Print	***0 = No minimum*** 1 = 10 increments 2 = 100 increments 3 = 500 increments
64	Net Sign Correction	***0 = Normal Net Weight Printing*** 1 = Net Sign Corrected Printing
65	Enable "STX"	0 = To Disable "STX" ***1 = To Enable "STX"***
66	Weight Format	***0= Single Line Displayed Weight*** 1= Single Line Gross, Tare, Net 2= Multiple Line Gross, Tare, Net
67	Expanded Size Print	***0 = Normal Weight Print*** 1 = Expanded Size Weight Print
68	Weight Units	***0=Print "lb" or "kg"*** 1=Print "g", gram units 2=Print "oz", ounce units 3=Print "oz t", Troy ounce units 4 = Print "t", ton units 5 = Disable weight units
69	Print I.D.	0 = Disable printing of I.D. ***1 = Print I.D.*** 2 = Print I.D. expanded
71	Clear I.D. after Print	***0 = Enable Autoclear of I.D.*** 1 = Disable Autoclear of I.D.
72	Print C.N.	0 = Disable printing of C.N. ***1 = Enable printing of C.N.***
73	Time/Date Format	***0 = No Time and Date*** 1 = MM DD YY 2 = DD.MM.YY 3 = YY MM DD 4 = HH:MM PM MM DD YY 5 = DD.MM.YY HH:MM 6 = YY MM DD HH:MM

Notes:
1: Recommended default selections are shown in ***Bold Italics***.
2: These steps require specific selection for legal-for-trade applications.
3: These steps are for Power Cell Vehicle Scales only and are skipped for other load cell types.
4: These steps are for Model 2157 or digital j-box only and are skipped for other load cell types.

4.8.3 Model 8530 Setup Quick Reference Chart Continued

74 Demand Output Format
- 1 = WT, ID, T&D, CN
- 2 = ID / T&D / WT, CN
- 3 = ID / T&D, CN / WT
- ***4 = ID*** / T&D / ***CN*** / ***WT***
- 5 = T&D / ID / CN / WT
- 6 = T&D / ID / WT, CN
- 7 = ID, T&D, CN / WT
- 8 = ID / T&D / CN, WT

80 INTERNATIONAL GROUP SELECTION

81 Analog/Display Verify (Note 5)
- ***0 = Disable Verification***
- 1 = Enable Verification

82 lb/kg Switching
- 0 = lb/kg switching Disabled
- ***1 = lb/kg Switching Enabled***

83 Power-Up Weight Units
- 0 = Power-Up in kg
- ***1 = Power-Up in lb***

84 Bracketed Weight Print
- ***0 = Print weights brackets***
- 1 = Print weights with brackets

85 Manual Tare Legend
- ***0=Print (TRH) after manual tare***
- 1=Print (PT) after manual tare

86 Remote ASCII Input
- ***0 = ASCII input disabled***
- 1 = ASCII input enabled

87 Remote Pulse Input
- 0 = Pulse input Disabled
- ***1 = Print output on pulse***
- 2 = Zero scale on pulse
- 3 = Tare scale on pulse

88 Zero Curser Mode
- ***0 = Gross zero only***
- 1 = Gross and net zero

90 DIAGNOSTIC GROUP

91 Manual Load Cell Addressing (Note 3)
92 Auto Replacement Load Cell Addressing (Note 3)
93 Shift Adjust an Individual Cell or Sectional Pair (Note 3)
94 Temporarily Set Shift Constants to "1" (Note 3)

95 Expanded Display Mode
- ***0 = Normal Weight***
- 1 = Display Minor Increments

96 Manual Shift (Note 3)
- ***0 = Manual shift adjust disabled***
- 1 = Manual shift adjust enabled

97 Access Calibration Data
- ***0=Bypass short cut calibration***
- 1=Access short cut calibration
- Print=Print calibration constants

98 Set Default Parameters
- ***0 = Skip default parameters***
- 1 = Set default parameters

99 Display Individual Load Cell Raw Count Output (Note 3)

Notes:
1: Recommended default selections are shown in ***Bold Italics***.
2: These steps require specific selection for legal-for-trade applications.
3: These steps are for Power Cell Vehicle Scales only and are skipped for other load cell types.
4: These steps are for Model 2157 or digital j-box only and are skipped for other load cell types.
5: Analog verify is for export Power Cell applications only.

4.8.4 Setup Parameters

[00] ACCESS LOAD CELL CONFIGURATION AND ADDRESSING

Enter the digits "0" then "0" to access this group. The 8530 begins at step **[01]** and can advance as far as step **[05]** if Digital j-box is selected.

[01 1] Select Load Cell Type

This step selects the type of DigiTOL® load cells the 8530 is to be used with. Refer to Section 4.3 of this manual before connecting the 8530 to the load cells.

Selection	Load Cell Type
0	Single DigiTOL® Load Cell
1	Power Cell Vehicle Scale
2	Digital J-box, Model 2160

Notes:
Steps **[02]**, **[03]**, **[04]**, and **[05]** are skipped if single DigiTOL® load cell is selected, **[01 0]**.
Step **[05]** is skipped if Power Cell Vehicle Scale is selected, **[01 1]**.
Step **[03]** is limited to 4 cells max and step **[04]** is skipped if digital j-box is selected, **[01 2]**.

[02 1] Shift Adjust in Sectional Pairs

Power Cells can be shift adjusted either in sectional pairs or individually. Sectional pairs shift adjust is faster and simpler than individual shift adjust. Individual shift adjust is used in installations that have excessive side to side shift errors.

Press:
0 - Select Individual Power Cell Shift Adjust
1 - Select Sectional Pairs Shift Adjust

Note: Shift adjust MUST be set to sectional pairs with 16 or more Power Cells.

[03 10] Number of Power Cells in Scale Base

Enter the total number of Power Cells used in the weighbridge. The 8530 can operate with up to 24 Power Cells maximum. If more than 16 power cells are used the 8530 MUST use sectional pairs shift adjust. The Auxiliary Power Supply must be installed if more than 10 NMOS Power Cells are used. The digital j-box will only accept entries of from 2 to 4 cells.

[04] Automatic Power Cell Addressing

Before a Power Cell can be used in a scale base the Power Cell MUST have a unique address programmed into it. All new load cells are sent from the factory with a default address of 240. Step **[04]** automatically prompts the technician through the addressing procedure for all of the load cells in the scale base. Automatic Power Cell addressing is normally begun with all Power Cells disconnected. Refer to the indicator setup section of the weighbridge installation manual for the correct location of Power Cell addresses in the weighbridge.

Press:

0 - To skip Power Cell addressing
1 - To access Power Cell addressing

Note: Power Cell addressing is normally performed during initial installation ONLY! Addresses are stored in the Power Cell. Power Cells do not need to be readdressed if the 8530 Logic PCB is replaced or the software is upgraded. Once a Power Cell has been successfully addressed it should never need to be addressed again. **IF A POWER CELL THAT HAS BEEN OPERATING IS NO LONGER COMMUNICATING, DISPLAYING AN [E8] ERROR, THEN DO NOT TRY TO READDRESS THE POWER CELL. THE PROBLEM IS MOST LIKELY DUE TO A BAD CABLE, A DEFECTIVE POWER CELL, OR A DEFECTIVE 8530 LOGIC PCB**. If a Power Cell has lost its address, then the Power cell is defective and **MUST** be replaced. The only reason to readdress a working Power Cell is if you wish to move it to a different location in the weighbridge.

The procedure for auto assigning Power Cell addresses is as follows:

Power down the 8530 and verify that all Power Cells are disconnected from the scale base. Place the W5 CAL jumper on the 8530 Logic PCB to the IN position, (shorting the two pins together), and apply power to the 8530. Press the **0** key twice, the 8530 display will then show **[02 1]**. Press the **ENTER** key two times until the 8530 is displaying **[04]**. Press the **1** key to access cell addressing. The 8530 will display **[04 1]** briefly and then display **[Add 1]**. At this time connect load cell #1 to the scale and press the **ENTER** key.

The 8530 then displays **[LC 1]** while load cell #1 is being addressed. If the load cell is successfully addressed the 8530 will then display **[Add 2]** to prompt the technician to connect load cell #2 and repeat the addressing procedure. This procedure is repeated until all remaining load cells have been addressed.

If the 8530 is unable to communicate with a load cell during the addressing procedure an **[E8 XX]** error code is displayed, (XX = load cell that was not addressed). Press the **CLEAR** key to clear the error code and reset the 8530 back to the **[--]** display. Refer to Section 7. of this manual for troubleshooting information.

Once the source of the cell communication problem is corrected then remove power to the 8530 and connect all load cells that have already been successfully addressed. Enter the setup mode and restart step **[04]**. The 8530 will check for the presence of correctly addressed load cells. When the 8530 detects a missing load cell address, this display will hold on **[04 XX]** (XX = next load cell to be addressed) for a few seconds then display **[Add XX]** to prompt the technician to connect load cell XX and continue the addressing procedure. This procedure is then repeated until all cells have been addressed.

[05] ERASE SHIFT ADJUSTMENT VALUES

The step lets you erase any current shift adjust values that are stored in the digital j-box. This step should be performed when first installing a digital j-box.

Press:
- **0** - Retain current shift adjustment values
- **1** - Erase current shift adjustment values

[10] ACCESS SCALE CALIBRATION GROUP

Enter the digits "1" then "0" to access this group. The 8530 begins at step **[11]** and advances though step **[19]**.

[11 0] WEIGHT UNITS

Select the weight units the 8530 will use during calibration and for display of weight. Setup step **[F68]** selects the weight units printed in the demand mode.

Selection	Weight Units	Units Symbol
0	kilograms	kg
1	pounds	lb

[12 0] LINEARITY COMPENSATION

Linearity compensation corrects for nonlinearity in weighing performance of the load cell. This is accomplished by recording a weight reading at zero, full scale capacity and at half scale capacity. In order for linearity compensation to work correctly, it is important to use test weight that are as close to the programmed full scale and half scale capacity as possible.

Press:
- **0** - Disable Linearity Compensation
- **1** - Enable Linearity Compensation

[13 1] AUTORANGE® SELECTION

The 8530 can be programmed for one, two or three display increment sizes. Enter the number of weight display ranges the 8530 is to use: **[1]**, **[2]**, or **[3]**. Refer to section 5.7. for a detailed description of Autorange® operation.

Press:
- **1** - Select Single Range Mode
- **2** - Select Dual Range Mode
- **3** - Select Triple Range Mode

[14] [XXXXXX] SCALE CAPACITY

Enter the total scale capacity **[XXXXXX]** in the weight units selected in step **[11]**. Enter the desired capacity using the digits on the numeric keyboard of the 8530 then press the **PRINT** key. Press the **CLEAR** key to clear the display if an error is made during entry.

[15 X0] HIGH RANGE INCREMENT SIZE

The 8530 displays the current increment size and decimal point selection of the high range increment size. If the displayed data is not correct, press the "0" key until the desired decimal point position is displayed then press the increment size digit (either "1", "2" or "5") on the keyboard to terminate the entry. This will select both the decimal position and increment size in one step. The standard increment size for vehicle scales is 20 lb, 10 kg, or 0.01 t. If Autorange® is being used with a combination rail/truck scale then select a high range increment size of 50 lb, 20 kg, or 0.02 t.

Press:

- **0** - Toggles the display through all available decimal point positions.
- **1** - Selects an increment size of 1 after the decimal point has been selected.
- **2** - Selects an increment size of 2 after the decimal point has been selected.
- **5** - Selects an increment size of 5 after the decimal point has been selected.

[16 X0] MID RANGE INCREMENT SIZE

The display will show the increment size and decimal point position of the mid range increment size used when the 8530 was last calibrated. If the displayed data is not correct, use the procedure described for setup step **[15]** to select a new mid range increment size.

Note: Step **[16]** is skipped if single range weighing is selected, step **[13 1]**.

[17 X0] LOW RANGE INCREMENT SIZE

The display will show the increment size and decimal point position of the low range increment size used when the 8530 was last calibrated. If the displayed data is not correct, use the procedure described for setup step **[15]** to select a new low range increment size.

Note: Step **[17]** is skipped if single or dual range weighing is selected, step **[13 1]** or **[13 2]**.

[18] ACCESS AUTO SHIFT ADJUST

Shift adjustment is used to compensate for differences in weight readings as a load is applied at different positions on the scale platform. For new installations, drive the test truck across the weighbridge three to five times in both directions to seat the Power Cells and receivers before performing the shift adjust procedure.

Vehicle Scale Shift Adjust Procedure:

If the 8530 is not in the setup mode then power down the 8530. Place the W5 CAL jumper on the 8530 Logic PCB to the IN position, (shorting the two pins together), and apply power to the 8530. The 8530 will then display **[--]**. Press the **1** key then the **8** key, the 8530 will then display **[18 0]**.

Press:
0 - Skip shift adjust procedure.
1 - Access shift adjust procedure.

The 8530 displays **[E SCL]**. Verify the scale is empty and press the **ENTER** key.

The 8530 then counts down from **[16 CAL]** to **[01 CAL]** as zero reading is recorded.

The 8530 then displays **[SEC 01]** or **[CELL 01]**. Center the test cart (or rear axle of the test truck) over section 1 or cell 1. Make sure the test cart or truck axle is centered from side to side over the section. After coming to a complete stop on the section, release the brakes. If the truck rolls, put the truck in gear and shut off the engine rather than holding position with the brakes. Wait 15 seconds after the truck stops moving to let the weighbridge settle, then press the **ENTER** key.

The 8530 then counts down from **[16 CAL]** to **[01 CAL]** as the weight reading for section 1 is recorded.

The 8530 then displays **[SEC 02]**. Reposition the test cart (or test truck) over section 2 (Power Cells 3 and 4) and continue as before. Repeat this procedure for each section in the weighbridge.

Notes: Some installations may require individual load cell shift adjust to eliminate side to side errors. If individual cell adjust is required, then select individual cell adjust, setup step **[02 1]**, and repeat the shift adjust procedure, step **[18]**. If individual cell adjust is used the 8530 will prompt for **[CELL XX]** instead of **[SEC XX]** (XX = Power Cell or section number). Place the test cart directly over the Power Cell specified. A weight cart or a large fork lift truck that can concentrate the weight directly over the load cell or section being adjusted will be more effective during shift adjustment than the rear axle of a test truck.

If step **[18]** is unable to reduce shift errors to within required limits then use the manual shift adjust procedure, step **[96]**, to bring the shift errors within tolerance. Problems with shift adjustment are usually caused by: a mechanical bind in the weighbridge, an incorrectly shimmed weighbridge, or not concentrating the test weight over the section or Power Cell during shift adjust.

Model 2160 DigiTOL® Floor Scale Shift Adjust Procedure:

If 8530 is not in the setup mode then power down the 8530. Place the W5 CAL jumper on the 8530 Logic PCB to the IN position, (shorting the two pins together), and apply power to the 8530. The 8530 will then display **[--]**. Press the **1** key then the **8** key, the 8530 will then display **[18 0]**. Press:

0 - Skip shift adjust procedure.
1 - Access shift adjust procedure.

The 8530 then displays **[E SCL]**. Verify the scale is empty and press the **ENTER** key.

The 8530 then counts down from **[16 CAL]** to **[01 CAL]** as the zero reading is recorded.

The 8530 then displays **[CEL 01]**. Place the test weight over load cell #1 then press the **ENTER** key. Refer to Figure 4-5.

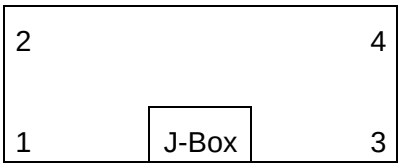


Figure 4-5 Model 2157 Load Cell Location in Deck

The 8530 then counts down from **[16 CAL]** to **[01 CAL]** as the weight reading for load cell #1 is recorded. The 8530 then displays **[CEL 02]**. Move the test weight to directly over load cell #2 and press the **ENTER** key.

The 8530 then counts down from **[16 CAL]** to **[01 CAL]** as the weight reading for load cell #2 is recorded. The 8530 then displays **[CEL 03]**. Move the test weight to directly over load cell #3 and press the **ENTER** key.

The 8530 then counts down from **[16 CAL]** to **[01 CAL]** as the weight reading for load cell #3 is recorded. The 8530 then displays **[CEL 04]**. Move the test weight to directly over load cell #4 and press the **ENTER** key.
The 8530 will then count down form **[16 CAL]** to **[01 CAL]** as the weight reading for load cell # 4 is recorded.

[19] ACCESS CALIBRATION PROCEDURE

Full calibration is used to set the initial zero (initial) reference and to set span. Full calibration can be performed either with a known vehicle weight or with certified test weights. If a known vehicle weight is used for full calibration, then span adjust, step **[22]**, should be performed after calibration with certified test weights to ensure accurate calibration.

Note: For Power Cell Vehicle Scale installations this step MUST be performed immediately after performing shift adjust, step **[18]**, for the first time. Do not exit the setup mode or power down the 8530 without first performing a full calibration, step **[19]**, or else the shift adjust data calculated in step **[18]** will be lost and an error code will be displayed. Full calibration is not required for subsequent shift adjust after a full calibration has been successfully performed at least once.

To perform full calibration:

If 8530 is not in the setup mode then power down the 8530. Place the W5 CAL jumper on the 8530 Logic PCB to the IN position, (shorting the two pins together), and apply power to the 8530. The 8530 will then display **[--]**. Press the **1** key then the **9** key, the 8530 will then display **[19 0]**.

Press:
- **0** - Skip calibration procedure.
- **1** - Access calibration procedure.

The 8530 will follow one of two calibration procedure depending on how linearity compensation enable is selected, step **[12]**. If linearity compensation is enabled then the 8530 will prompt for an additional calibration step. Linearity compensation will give the best results if test weights equal to 100% and 50% of programmed capacity are used.

Calibration Procedure, Linearity Compensation Disabled (Step [12 0]

[E SCL] EMPTY SCALE

Remove all weights from the scale platform then press the **ENTER** key. The display then counts down from 16 to 1 as a zero reference weight is recorded for the scale.

[Add Ld] ADD LOAD

Apply test weight to the scale platform. Press the **ENTER** key.

[.] ENTER TEST WEIGHT VALUE

Enter the known weight of the test truck or the value of the test weights, using the numeric keys on the 8530 keyboard. Press the **ENTER** key to terminate entry. The test weight value entered must agree with the increment size used by the scale. The display then counts down from 16 to 1 while span is recorded.

[CAL d] CALIBRATION DONE

This prompt is displayed for a few seconds to indicate that calibration was successful, then the display returns to the **[--]** prompts.

Note: If an **[E36]** error code is displayed during calibration of a Power Cell® vehicle scale then check the shift adjust coefficients in step **[97]**. If the shift adjust coefficients are equal to zero **[0.000000]** then the 8530 will not calibrate. Either perform the shift adjust procedure **[18]** or enter a shift adjust value of **[1.000000]** for each section or cell in step **[97]**.

Note: Single DigiTOL® Load Cell Scale bases may perform an additional **[E SCL]** count down sequence after the **[Add Ld]** step if calibrated with an increment size smaller than the recommended increment size.

Calibration Procedure, Linearity Compensation Enabled (Step [12 1])

[E SCL] EMPTY SCALE

Remove all weights from the scale platform then press the **ENTER** key. The display then counts down from 16 to 1 as a zero reference weight is recorded for the scale.

[Add FL] ADD FULL LOAD

Apply full capacity test weight to the scale platform. Test weights used should be as close to 100% of full scale capacity as possible. Press the **ENTER** key.

[.] ENTER FULL TEST WEIGHT VALUE

Enter the value of the test weights, using the numeric keys on the 8530 keyboard. Press the **ENTER** key to terminate entry. The test weight value entered must agree with the increment size used by the scale. The display then counts down from 16 to 1 while span is recorded.

[Add LO] ADD LOW LOAD

Apply half capacity test weight to the scale platform. Test weights used should be as close to 50% of full scale capacity as possible. Press the **ENTER** key.

[.] ENTER LOW TEST WEIGHT VALUE

Enter the value of the test weights, using the numeric keys on the 8530 keyboard. Press the **ENTER** key to terminate entry. The test weight value entered must agree with the increment size used by the scale. The display then counts down from 16 to 1 while span is recorded.

[CAL d] CALIBRATION DONE

This prompt is displayed for a few seconds to indicate that calibration was successful, then the display returns to the **[--]** prompts.

Note: If an **[E32]** error code is displayed during calibration of a Power Cell® vehicle scale then check the shift adjust coefficients in step **[97]**. If the shift adjust coefficients are equal to zero **[0.000000]** then the 8530 will not calibrate. Either perform the shift adjust procedure **[18]** or enter a shift adjust value of **[1.000000]** for each section or cell in step **[97]**.

Note: Single DigiTOL® Load Cell Scale bases may perform an additional **[E SCL]** count down sequence after the **[Add Ld]** step if calibrated with an increment size smaller than the recommended increment size.

[20] ACCESS FILTERING, AZM GROUP

Enter the digits "2" then "0" to access this group. The 8530 begins at step **[21]** and advances though step **[29]**.

Note: Steps **[21]** and **[22]** can't be accessed until the 8530 has been calibrated with step **[19]** and is displaying weight when the setup is entered.

[21] ZERO ADJUSTMENT

Press:
- **0** - Skip zero adjustment.
- **1** - Record the current weight as the new zero reference.

[22] SPAN ADJUSTMENT

This step adjusts the span reference recorded in step **[19]**. Place a known test weight on the scale platform before entering the setup mode.

Press:
- **0** - Skip span adjustment.
- **1** - Access span adjust. Enter the value of the weight on the scale using and press the **PRINT** key. Span adjust value entered must agree with the increment size of the scale.

[23 3] AUTO ZERO MAINTENANCE (AZM)

AZM removes small changes in zero caused by temperature change or build up of material on the platform. This step selects the range of weight around zero that AZM operates in. AZM will adjust for zero changes at the rate of 0.03 increments per second when the weight is within the AZM range. AZM will operate up to total weight equal to the pushbutton zero range selected in setup step **[25]**, ±2% or ±20 of scale capacity.

Selection	AZM Range	Legal-For-Trade Applications
0	AZM Disabled	Not Applicable
1	±0.5 Increment	Animal, Food and Retail Scales
2	±1 Increment	All other Industrial Scales
3	±3 Increment	Vehicle Scales

[23A 0] AZM IN NET WEIGHT MODE

If this step is enabled, AZM will operate anytime the weight on the scale is within the AZM range selected at step **[23]**. If this step is disabled then AZM is disabled in the net weight mode.

Press:
- **0** - AZM in gross weight mode only
- **1** - AZM in gross and net weight mode

[24 1] AUTO ZERO CAPTURE AT POWER UP

If this step is enabled, the 8530 will attempt to capture zero at power up. Flashing **[E E E]** or **[-E E E]** is displayed if the 8530 is unable to capture zero at powerup.

Press:
- **0** - Disable Auto Zero Capture at Power Up
- **1** - Enable Auto Zero Capture, limited to ± 2% of Scale Capacity
- **2** - Enable Auto Zero Capture, limited to ± 10% of Scale Capacity

Note: USA and Canadian legal-for-trade applications limit zero capture at power up to ±2%.

[24A 0] POWERUP DISPLAY TIMER

If this step is enabled the weight display will remain blank and the cursors will blink for 30 seconds after powerup to allow the circuitry to warmup before displaying weight.

Press:
- **0** - Disable Powerup Display Timer
- **1** - Enable Powerup Display Timer

[25 2] PUSHBUTTON ZERO RANGE

Pushbutton zero recaptures the center of zero reference. This function is used to compensate for material build up on the scale. Zero capture is inhibited if the scale is in motion.

Press:
- **0** - Disable Pushbutton Zero
- **1** - Enable Pushbutton Zero Capture, limited to ± 2% of Scale Capacity
- **2** - Enable Pushbutton Zero Capture, limited to ± 20% of Scale Capacity

Note: Canadian legal-for-trade applications are limited to ±2% pushbutton zero operation.

[26 4] MOTION DETECT WINDOW

The Model 8530 includes an stability detector (weight in motion) which requires three successive weight readings within the motion detect window for a "no motion" signal. Zero, tare and demand mode printing are inhibited during motion. Vehicle scales use selection 4, ±3 increments

Press:
- **0** - Motion Detect Disabled, not legal-for-trade.
- **1** - Motion Detected for weight change greater than ±0.5 Increment.
- **2** - Motion Detected for weight change greater than ±1 Increment.
- **3** - Motion Detected for weight change greater than ±2 Increment.
- **4** - Motion Detected for weight change greater than ±3 Increment.

[27 4] DISPLAY FILTERING RATE

The Model 8530 has a low pass, multi-pole vibration filter that is selectable for various conditions. The display settling time will be slowed as heavier filtering is selected. Valid selections are from 0 (no filtering) to 5 (very heavy filtering). Filtering should be disabled for setpoint and filling applications that a require a fast response to weight change.

[27A 1] DigiTOL© LOAD CELL INTERNAL FILTER

This step disables the internal filter in a single DigiTOL® Load cell or digital j-box. The internal filter should be disabled for setpoint and filling applications that a require a fast response to weight change.

0 - Disable internal load cell filter
1 - Enable internal load cell filter

Note: This step is skipped if Power Cell load cell type is selected, step **[01 1]**.

[28] [XXXXXX] OVERCAPACITY BLANKING VALUE

Enter the weight value **[XXXXXX]** at which the 8530 indication will blank over capacity. Press the **ENTER** key to accept entry. Legal-for-trade applications must not exceed 105% of scale capacity. Default selection is capacity plus five increments.

[29 0] SCALE ACCUMULATOR

The scale accumulator adds the selected weight data to the total and subtotal accumulators when data is printed.

Press:
0 - Accumulator Disabled
1 - Accumulate Net Weight
2 - Accumulate Gross Weight

Note: The **FUNCTION** key must be enabled, setup step **[36 1]** or **[36 2]**, and print interlock or autoprint must be selected, setup step **[62 1]** or **[62 2]**, to permit accumulation. Units switching should be disabled, setup step **[82 0]**, when accumulation is used.

[30] TARE AND DISPLAY TIMER GROUP

Enter the digits "3" then "0" to access the tare and display group. The 8530 begins at step **[31]** and advances through step **[39]**.

[31 2] Tare Mode

Tare is used to subtract the empty weight of the container or vehicle from the gross weight on the scale. Tare is inhibited if the scale is in motion. Refer to Section 5 for tare explanation.

Press:
1 - Tare Disabled.
2 - Pushbutton Tare Enabled, Keyboard Tare Disabled.
3 - Pushbutton Tare Enabled, Keyboard Tare Enabled.

[32 0] TARE INTERLOCKS

Tare interlocks meet legal-for-trade requirements by including the following restrictions:
Tare weights can be cleared only at gross zero. Tare can only be entered when the scale is the gross mode. Keyboard tare can be entered only at gross zero. Previous tare values must be cleared before a new tare value can be entered. Multiple or chain tares are inhibited.

Press:
- **0** - Disable Tare interlocks.
- **1** - Tare interlock enabled.

Note: Tare interlocks should be disabled for setpoint or filling applications.

[33 0] KEYBOARD TARE IN LOW RANGE ONLY

Press:
- **0** - Keyboard tare is allowed up to total (high range) scale capacity.
- **1** - Keyboard tare may not exceed the low weight range capacity.

[34 0] AUTOCLEAR TARE

Press:
- **0** - Disable Autoclear Tare.
- **1** - Tare is automatically cleared when weight on the scale returns to within ±0.25 increments of gross zero.

[35 1] GROSS/NET SWITCHING

Gross/net switching permits the operator to display the gross weight on the scale without losing the current tare weight. Press the **GROSS/NET** key to toggle the display between the gross and net weight.

Press:
- **0** - Disable **GROSS/NET** key.
- **1** - Enable **GROSS/NET** key.

Note: **GROSS/NET** key is disabled if Autorange® is selected, step **[13 2]** or **[13 3]**.

[36 1] FUNCTION KEY ENABLE

This step selects the functions that can be accessed through the Function mode during normal operation. Time, date, consecutive numbering, and setpoints can only be accessed by using the **FUNCTION** key.

Press:
- **0** - Disable **FUNCTION** key.
- **1** - Enable **FUNCTION** key for all Functions except Setpoints.
- **2** - Enable **FUNCTION** key for all Functions.

[37 0] STORED TARE MEMORY ENABLE

This step enables the **MEMORY** key and permits up to 10 tare weights to be stored in memory. Stored tare weights can be used for inbound/outbound weighing transactions or for one pass permanent stored tare weighing.

Press:
- **0** - Disable **MEMORY** key.
- **1** - Enable **MEMORY** key.

[38 0] MEMORY MODE

This step switches between permanent stored tare weights and temporary inbound/outbound weight memories. If temporary inbound/outbound memories is selected, the operator stores an inbound weight into the next available memory location by pressing the **MEMORY** key followed by the **PRINT** key. If the permanent stored tare weight mode is selected the operator selects the memory location the tare weight is to be stored into.

Press:
- **0** - Permanent Memory.
- **1** - Inbound/Outbound Temporary Memory.

[40] JN PORT GROUP

Enter the digits "4" then "0" to access the JN port group. The 8530 begins with step **[41]** and advances through step **[45]**.

[41 1] OUTPUT DATA FORMAT

The JN port supplies three modes of data output: continuous, demand or <Enq> continuous.

The continuous mode is a fixed format message of weight and status information output every display update. The continuous mode is normally used with remote displays, setpoint controllers or BCD/Analog converters.

The demand mode output is a configurable format output that is normally used to drive a printer. The demand mode data is output only when a print request occurs either by pressing the **PRINT** key, an autoprint function or by an external print request. Demand mode output is inhibited if the weight on the scale is unstable, out of range or if zero has not been captured after powerup.

The <Enq> continuous mode is a variation of the continuous output mode that is intended for interfacing to computers. The computer sends an ASCII <Enq>, hex 05, to request one continuous format output. The 8530 will only output data when requested by the computer.

Press:
- **0** - Select Continuous Format Output
- **1** - Select Demand Mode Output
- **2** - Select <Enq> Continuous Format Output

[41A 0] JN PORT CONTINUOUS FORMAT STATUS BYTE MODE SELECT

The 8530 continuous output includes three status bytes that indicate the operating conditions in the 8530. There are two different versions of the status bytes, setpoint and nonsetpoint. The 3015 setpoint controller requires setpoint mode status bytes. The 9325 Analog Output converter requires nonsetpoint mode status bytes.

Press:
- **0** - Setpoint Mode Status Bytes
- **1** - NonSetpoint Mode Status Bytes

Note: This step is skipped if the JN port is not configured for continuous.

[42 9600] BAUD RATE

Select the desired baud rate for the JN port by toggling through the available selections using the **0** key. When the desired baud rate is displayed, press the **1** key or the **ENTER** key to accept the selection. Baud rate selections are: 300, 1200, 2400, 4800 and 9600.

[43 2] DATA BITS, PARITY BIT

Select the desired data format for the JN port. METTLER TOLEDO products normally use 7 data bits, even parity. 7 data bits, even parity is required for Models 307, 8806 and 8860 printers to operate.

Press:
- **0** - 7 Data Bits, No Parity Bit
- **1** - 7 Data Bits, Odd Parity Bit
- **2** - 7 Data Bits, Even Parity Bit
- **3** - 8 Data Bits, No Parity Bit

[44 0] CHECKSUM

Checksum is used to detect errors in the transmission of data. Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> characters. The checksum calculation for multiple lines of data includes the <LF> character from the previous line of data.

Press:
- **0** - Disable Checksum
- **1** - Enable Checksum

[45 1] STOP BITS

Press:
- **1** - Select 1 stop bit.
- **2** - Select 2 stop bits.

[50] JW PORT GROUP

Enter the digits "5" then "0" to access the JW port group. The 8530 begins with step **[51]** and advances through step **[55]**. If host mode is selected then steps 56 and 57 are accessible.

[51 0] OUTPUT DATA FORMAT

The JW port supplies the continuous, demand and <Enq> continuous modes the same as the JN port. In addition the JW port adds a host interface mode. The host interface mode has been enhanced with extended features to permit remote troubleshooting. The original 8530 host mode is still available for compatibility with existing applications.

Press:
- **0** - Select Continuous Format Output
- **1** - Select Original Host Mode
- **2** - Select Demand Mode Output
- **3** - Select <Enq> Continuous Format Output
- **4** - Select Enhanced Host Mode

Note: The 8530 will permit only one of the two serial ports to be configured for demand mode output. Both ports can be configured for continuous mode without any conflict.

[51A 0] JW PORT CONTINUOUS FORMAT STATUS BYTE MODE SELECT

The 8530 continuous output includes three status bytes that indicate the operating conditions in the 8530. There are two different versions of the status bytes, setpoint and nonsetpoint. The 3015 setpoint controller requires setpoint mode status bytes. The 9325 Analog Output converter requires nonsetpoint mode status bytes.

Press:
- **0** - Setpoint Mode Status Bytes
- **1** - NonSetpoint Mode Status Bytes

Note: This step is skipped if the JW port is not configured for continuous mode.

[52 4800] Baud Rate

Select the desired baud rate for the JW port by toggling through the available selections using the **0** key. When the desired baud rate is displayed, press the **1** key or the **ENTER** key to accept the selection. Valid baud rate selections are: 300, 1200, 2400, 4800 and 9600.

[53 2] DATA BITS, PARITY BIT

Select the desired data format for the JW port. METTLER TOLEDO products normally use 7 data bits, even parity. 7 data bits, even parity is required for Models 307, 8806 and 8860 printers to operate.

Press:
- **0** - 7 Data Bits, No Parity Bit
- **1** - 7 Data Bits, Odd Parity Bit
- **2** - 7 Data Bits, Even Parity Bit
- **3** - 8 Data Bits, No Parity Bit

[54 0] CHECKSUM

Checksum is used to detect errors in the transmission of data. Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> character. The checksum calculation for multiple lines of data includes the <LF> character from the previous line of data.

Press:
- **0** - Disable Checksum
- **1** - Enable Checksum

[55 1] STOP BITS

Press:
- **1** - Select 1 stop bit.
- **2** - Select 2 stop bits.

[56 2] HOST PORT ADDRESS

This step selects the address the 8530 will respond to in the host interface mode. The 8530 host port can be used in a multidrop network. Each 8530 on the network must have a unique address from 2 to 9 inclusive. Press the key that corresponds to the desired address.

[57 0] HOST PORT MULTI-DROP MODE SELECT

The JY port supplies both RS-232 and RS-422/485 serial interfaces. The RS-422/485 interface can be used in either a four wire, full duplex, single-drop mode or a two wire, half duplex, multi-drop mode. This selection has no effect on the RS-232 host mode interface.

Press:
- **0** - Select RS-485 multi-drop host interface mode.
- **1** - Select RS-422 single-drop host interface mode.

Note: Steps **[56]** and **[57]** are skipped if JY port is configured for demand or continuous mode.

[60] DEMAND MODE OUTPUT GROUP

Enter the digits "6" then "0" to access the demand mode output group. The 8530 begins with step **[61]** and advances through step **[75]**. Step 70 is skipped. If neither serial port is selected to demand mode then only steps **[61]**, **[62]** and **[63]** are accessible, all other steps are skipped.

[61 0] AUTOCLEAR TARE AFTER PRINT

Press:
- **0** - Tare is retained after printing, tare must be manually cleared.
- **1** - Tare is automatically cleared after printing.

[62 0] PRINT INTERLOCK/AUTOPRINT

Print interlock prevents repeat printing. If enabled, print interlock requires that the weight on the scale return to zero (or below the minimum print selection) and then settle to a weight greater than the minimum print selection before a subsequent print request is acted on.

Autoprint causes a print request to occur every time the weight on the scale settles on a positive value larger than the minimum print selection. **DO NOT USE AUTOPRINT WITH A MINIMUM PRINT SELECTION OF 0, THIS WILL CAUSE ERRATIC OPERATION OF AUTOPRINT.**

Press:
- **0** - Normal Print
- **1** - Select Print Interlock
- **2** - Select Autoprint

[63 0] MINIMUM PRINT

The displayed weight must exceed the minimum print selection to allow a print function to occur. Minimum print also controls resetting autoprint and print interlock.

Press:
- **0** - No Minimum Print
- **1** - Minimum Print = 10 Increments
- **2** - Minimum Print = 100 Increments
- **3** - Minimum Print = 500 Increments

NOTE: Minimum print must be set to a non-zero value for autoprint to operate properly.

[64 0] NET SIGN CORRECTION

This step allows storage of a gross weight as well as a tare weight in the tare register. When the tare weight value is larger than the weight currently on the scale, the demand mode printer output is rearranged so that the larger value is the gross weight, the smaller value is the tare weight and the net difference is positive. The display will show a negative net weight value but the data printed is a positive net weight.

Press:
- **0** - Net sign correction is disabled.
- **1** - Net sign correction is enabled.

[65 1] ENABLE STX CHARACTER

Demand mode output normally has an ASCII Start of Text <STX> character, hex 02, at the beginning of the data transmission. The leading <STX> character can be inhibited for application that are not compatible with the <STX> character. The <STX> character is required for use with Mettler-Toledo Scale Printers Models 307, 8806 and 8860.

Press:
- **0** - Do not sent <STX> character.
- **1** - Send the <STX> character.

[66 0] WEIGHT DATA LINE FORMAT

This step selects whether the 8530 will print displayed weight (gross or net) or gross, tare and net weight. This step also selects single or multiple line printing.

Press:
- **0** - Print displayed weight only.
- **1** - Print gross, tare and net weight on a single line.
- **2** - Print gross, tare and net weight on separate lines.

[67 0] EXPANDED SIZE WEIGHT PRINT ENABLE

This step selects whether an ASCII shift out <SO>, and an ASCII shift in <SI>, character is inserted in the data transmission to select double width printing for the gross weight field (net weight field if a tare has been taken). Model 307, 8804, 8806, 8855, 8856 and 8860 printers use the <SO><SI> characters to select expanded size printing.

Press:
- **0** - Disable expanded size printing.
- **1** - Enable expanded size printing.

[68 0] PRINTED WEIGHT UNIT DESCRIPTION

This step selects the weight unit symbol that will be printed immediately after the weight fields.

Press:
- **0** - Print "lb" or "kg" weight units as selected by display weight units.
- **1** - Print "g" for gram weight units.
- **2** - Print "oz" for ounce weight units.
- **3** - Print "oz t" for troy ounce weight units.
- **4** - Print "t" for ton weight units.
- **5** - Disable weight units printing.

Note: Selections 1 through 5 disable lb/kg switching and extinguish the weight units cursor.

[69 1] PRINT ID ENABLE

This step selects whether the identification ID is printed. This step also permits the ID field to be printed with the ASCII <SO> and <SI> characters to select double width printing for ID

Press:
- **0** - Disable ID printing.
- **1** - Print ID.
- **2** - Print ID with expanded size print.

[71 0] CLEAR ID AFTER PRINT

Press:
- **0** - ID must be manually cleared.
- **1** - ID is automatically cleared after a print.

[72 1] ENABLE CONSECUTIVE NUMBERING

Press:
- **0** - Disable consecutive numbering.
- **1** - Enable consecutive numbering.

[73 0] Time/Date Format Selection

This step selects the time and date format printed. Time is entered in Function 6 as 24 hour military time. Date is entered in Function 7 in the format selected here.

Press:
- **0** - No TIme and Date
- **1** - MM DD YY
- **2** - DD.MM.YY
- **3** - YY MM DD
- **4** - HH:MM PM MM DD YY
- **5** - DD.MM.YY HH:MM
- **6** - YY MM DD HH:MM

Note: Selection 4 is a 12 hour time format with AM or PM. Other selections are 24 hour format.

[74 4] DEMAND OUTPUT FORMAT

This step selects the order that data is printed in the demand mode output. The weight field is either displayed weight or gross, tare and net weight in the format selected in step **[66]**.

Press:

- **1** - WT, ID, T&D, CN
- **2** - ID
T&D
WT, CN
- **3** - ID
T&D, CN
WT
- **4** - ID
T&D
CN
WT
- **5** - T&D
ID
CN
WT
- **6** - T&D
ID
WT, CN
- **7** - ID, T&D, CN
WT
- **8** - ID
T&D
CN, WT

Note: WT = weight fields, CN = consecutive numbering, T&D = time and date, ID = Identification.

[80] INTERNATIONAL GROUP

Enter the digits "8" then "0" to access the demand mode output group. The 8530 begins with step **[81]** and advances through step **[89A]**.

[81 0] ANALOG AND DISPLAY VERIFY

European legal-for-trade applications require analog and display verification. The display test continuously checks the display segments for proper functioning, an **[E5]** error code is displayed if the display verify test is failed. The analog verify test is a check on the analog to digital converters in the Power cells. The analog verify test is performed every four hours, an **[E6]** error code is displayed if the analog verify test is failed.

Press:
- **0** - Disable analog/display verify tests.
- **1** - Enable analog/display verify tests.

[82 0] lb/kg UNITS SWITCHING

Press:
- **0** - Disable lb/kg switching
- **1** - Enable lb/kg switching

Note: lb/kg switching is inhibited until zero has been captured after power up. lb/kg switching should be disabled for accumulation, setpoint or stored tare applications. If power up kg is selected and lb/kg switching is disabled the decimal point in the demand mode output will be replaced with a comma

[83 1] POWERUP WEIGHT UNITS

Press:
- **0** - Select kg powerup weight units.
- **1** - Select lb powerup weight units.

Note: If power up kg is selected and lb/kg switching is disabled the decimal point in the demand mode output will be replaced with a comma

[84 0] MEASURED WEIGHT BRACKETED PRINTING

European legal-for-trade applications require a leading "<" and a trailing ">" bracket around printed weights if the weight is an actual measured value rather than a keyboard "hand" entered value. If both the gross and tare weight values are actual, measured values then the net weight field will also have brackets printed around it.

- **0** - Disable Measured Weight Brackets.
- **1** - Enable Measured Weight Brackets.

[85 0] PRINT "PT" FOR KEYBOARD ENTERED TARE

Certain export legal-for-trade applications require printing the abbreviation "TRH" after keyboard "hand" entered tare weights and the abbreviation "NETC" after net weights that result from keyboard entered tare. German legal-for-trade applications use the abbreviation "PT" to indicate hand (keyboard) entered tare. "THR", "PT" and "NETC" abbreviations are only printed if power up kg with lb/kg switching disabled is selected, **[82 0]** and **[83 0]**.

0 - Print "TRH" after hand entered tare.
1 - Print "PT" after hand entered tare.

[86 0] REMOTE ASCII INPUT CHARACTER

Both the JN and JW ports on the 8530 can be use to accept ASCII control characters to emulate the **CLEAR**, **PRINT**, **TARE** and **ZERO** keys on the 8530 keyboard.

Note: The W6 jumper on the 8530 Main PCB MUST be (OUT), not shorting the pins together, for the RS-232 interface of the JN serial port to accept ASCII characters.

Press:
0 - Disable ASCII input for both JN and JW port.
1 - Enable ASCII input for both JN and JW port.

[87 1] CONTACT CLOSURE INPUT

The JN port 20 mA current loop input can be used as a contact closure input to emulate the **PRINT**, **TARE** or **ZERO** keys on the 8530 keyboard. The contact closure input is a momentary contact (0.3 to 3 seconds). The contact closure input must be disabled for ASCII character input to the JN port, **[86 1]**. Refer to Section 6.2. for wiring information on the contact closure input.

Press:
0 - Disable contact closure input.
1 - Select remote **PRINT** key function.
2 - Select remote **ZERO** key function.
3 - Select remote **TARE** key function.

[88 0] NET ZERO CURSOR

Press:
0 - Zero cursor is illuminated at gross zero only.
1 - Zero cursor is illuminated at both gross and net zero.

Notes: US and Canadian legal-for-trade applications require zero cursor at gross zero only. Australian legal-for-trade applications require zero cursor at gross and net zero.

[90] DIAGNOSTICS GROUP

The steps in diagnostics are accessed individually. The diagnostics group includes steps **[91]** through **[99]**. Enter the digits of the specific step you wish to access. The diagnostic steps are normally accessed only during initial installation or in the event of a malfunction. Diagnostic steps **[91]**, **[92]**, **[93]**, **[94]** and **[96]** are accessible for Power Cell vehicle scale bases only.

[91] MANUAL ADDRESSING AN INDIVIDUAL POWER CELL (Power Cell Vehicle Scales Only)

Step **[91]** is used to manually force an address into a Power cell that already has been addressed. Step **[91]** can also be used to clear the addresses of all Power cells to the factory default address of 240. An **[E8]** error code is displayed if step **[91]** is unsuccessful in addressing a Power cell.

With the 8530 displaying **[--]**, Press the **9** then the **1** key. The 8530 then displays **[91]**.

Press:

0 - To skip manual Power cell addressing and return to double dash display, **[--]**.
1 - To access manual Power cell addressing and advance to the **[LC OFF]** display.

[LC OFF] LOAD CELL POWER OFF

When **[LC OFF]** displayed, the 8530 has removed all power to the Power cells. Disconnect all Power cells except the Power cell that is to be readdressed. Press the **ENTER** key.

[CELL] ENTER CELL ADDRESS

Enter the new address (from 01 to 24) for the Power cell. Enter an address of **[00]** to readdress the power cell to the default factory address of 240.

Note: If step **[91]** is accessed with more than one Power cells connected, then the Power cell with the current highest address is readdressed. If **[00]** is entered for a new address at the **[CELL]** display prompt, then all Power cells connected to the 8530 are readdressed to the default factory address of 240.

[LC OFF] LOAD CELL POWER OFF

When **[LC OFF]** is displayed, the 8530 has removed all power to the Power cells. If finished with addressing Power cells then reconnect all Power cells. Press the **ENTER** key. The 8530 will then return to the double dash **[--]** prompt. If more Power cells are to be addressed then reenter **[91]**.

Note: Power Cell addressing is normally performed during initial installation ONLY! Addresses are stored in the Power Cell. Power Cells do not need to be readdressed if the 8530 Logic PCB is replaced or the 8530 software is upgraded. Once a Power Cell has been successfully addressed it should never need to be addressed again. If a Power Cell has lost its address, then the Power cell is defective and **MUST** be replaced. The only reason to readdress a working Power Cell is if you wish to move it to a different location in the weighbridge.

IF A POWER CELL THAT HAS BEEN OPERATING IS NO LONGER COMMUNICATING, DISPLAYING AN [E8] ERROR, THEN DO NOT TRY TO READDRESS THE POWER CELL. THE PROBLEM IS MOST LIKELY DUE TO A BAD CABLE, A DEFECTIVE POWER CELL, OR A DEFECTIVE 8530 LOGIC PCB.

[92] AUTOMATIC ADDRESSING A REPLACEMENT POWER CELL (Power Cell Vehicle Scales Only)

This step is used to address a replacement Power Cell. This step automatically addresses a new (default address of 240) Power Cell to the same address as the Power Cell that is being replaced. This step will work correctly only if there is only one Power cell to be replaced and if the replacement Power Cell has an address of 240. If more than one Power cell is to be replaced or the replacement Power Cell has already been addressed then use step **[91]** to manually address the replacement Power cell.

With the 8530 displaying **[--]**, Press the **9** then the **2** key. The 8530 then displays **[92]**.

Press:
- **0** - To skip automatic Power cell addressing and return to double dash display, **[--]**.
- **1** - To access automatic Power cell addressing and advance to the **[LC OFF]** display.

[LC OFF] LOAD CELL POWER OFF

When **[LC OFF]** is displayed, the 8530 has removed all power to the Power cells. Disconnect the defective Power cell and connect the replacement Power cell.

Press the **ENTER** key. The 8530 applies power to the Power cells. The 8530 then checks for a missing cell address. Once the 8530 has identified the missing Power cell address it then programs the address into the replacement Power Cell. After the replacement Power Cell has been installed and addressed then the perform step the automatic single section shift adjust, step **[93]**, for the replacement Power cell.

[93] AUTOMATIC SINGLE SECTION SHIFT ADJUST (Power Cell Vehicle Scales Only)

Individual automatic shift adjust provides the ability to perform a shift adjust for a single section (or individual Power Cell if step individual cell shift adjust mode has been selected, step **[02 0]**). Shift adjust does not require the use of certified test weights, but the load used must be concentrated directly over the section or cell for best results.

With the 8530 displaying **[--]**, Press the **9** then the **3** key. The 8530 then displays **[93]**.

Press:
- **0** - To skip automatic single section shift adjust and return to double dash display, **[--]**.
- **1** - To access automatic single section shift adjust procedure.

[SEC] or [CELL] ENTER SECTION OR CELL TO BE SHIFT ADJUSTED

Enter the section or Power cell address to be shift adjusted and press the **ENTER** key.

[E SCL] EMPTY SCALE

Remove all weights from the scale platform then press the **ENTER** key. The display then counts down from 16 to 1 as a zero reference weight is recorded for the scale.

[LOAD XX] PLACE THE TEST LOAD OVER SECTION OR CELL TO BE SHIFT ADJUSTED

Place the load to be used for the shift adjustment directly over the specified section or Power cell and press the **ENTER** key. The display then counts down from 16 to 1 as a weight reading is recorded.

[LOAD XX] PLACE THE TEST LOAD OVER COMPARISON SECTION OR CELL

Place the load to be used for the shift adjustment directly over the specified section or Power cell and press the **ENTER** key. The display then counts down from 16 to 1 as a weight reading is recorded.

[E SCL] EMPTY SCALE

Remove all weights from the scale platform then press the **ENTER** key. The display then counts down from 16 to 1 as the zero reference weight is verified. The 8530 then returns to the double dash display **[--]**.

The section or cell has now been shift adjusted. Exit the setup mode and retest the weighbridge for shift errors. If shift errors persist then the test weight you are using during the shift adjust may not by concentrated sufficiently over the sections or cell. Verify that the raw count output of the individual Power cells is within the range specified in the indicator setup section of the weighbridge installation manual for maximum raw count deviation. Perform final shimming as described in the instructions weighbridge installation manual if necessary and repeat the shift adjust procedure as necessary.

[94 0] TEMPORARILY RESET SHIFT CONSTANTS (Power Cell Vehicle Scales Only)

This step permits you to observe the weighbridge weighing performance as though no shift adjust compensation had been performed. Using this function does not erase the actual shift adjust coefficients they are simply not used while this step is enabled. If power is cycled to the 8530 or if calibration is attempted, step **[19]**, then this step is automatically disabled.

With the 8530 displaying **[--]**, Press the **9** then the **4** key. The 8530 then displays **[94 0]**.

Press:

0 - Normal operation, shift adjust coefficients are used.
1 - Test mode enabled, shift coefficients are not used.

[95 0] DISPLAY EXPANDED COUNTS (Power Cell Vehicle Scales Only)

This step gives access to an expanded display. The number displayed is equal to the number of increments that would normally be displayed times ten. For example a displayed weight of 10,000 lb is actually 500, 20 lb increments (500 X 20 = 10,000). If step 95 is enabled and 10,000 lb is placed on the weighbridge then the 8530 would display 5000 with each count being equal to 2 lb.

With the 8530 displaying **[--]**, Press the **9** then the **5** key. The 8530 then displays **[95 0]**.

Press:

0 - Display normal weight.
1 - Display increments times ten.

[96 0] MANUAL SHIFT ADJUST (Power Cell Vehicle Scales Only)

Manual shift adjust is used as a last resort to remove shift errors that the automatic shift adjust, steps **[18]** or **[93]**, can't eliminate. Problems with shift adjustment are usually caused by: a mechanical bind in the weighbridge, an incorrectly shimmed weighbridge, or an insufficient concentration of the test weight over the section or Power Cell during shift adjust.

With the 8530 displaying **[--]**, Press the **9** then the **6** key. The 8530 then displays **[96 0]**.

Press:

0 - Skip manual shift adjust and return to double dash display, **[--]**.
1 - Enable manual shift adjust and return to double dash display, **[--]**.

Note: The shift adjust procedure is performed in the normal weight mode. The manual shift adjust procedure is a trial and error method of adjusting the shift compensation. The procedure may have to be repeated several times in order to achieve the desired weight reading. Each time the procedure is repeated, enter a different value for the **[LOAD A]** prompt. Once the **[LOAD B]** value has been entered, it is not necessary to re-enter if. When the 8530 prompts for **[LOAD B]**, press the **ENTER** key.

Manual Shift Adjust Procedure:

To use manual shift adjust, enter the setup mode and enable manual shift adjust, step **[96 1]**, then exit the setup mode. Once the setup mode is exited, the 8530 will display expanded weight at ten times the normal resolution, (displayed weight resolution will be by 2 lb increments if 8530 is programmed for 20 lb increments).

Place the test weight over the section or cell to be adjusted. The weight value displayed is the **LOAD B** value used during the shift adjust procedure, record this number.

Press the **FUNCTION** key then the **0** key.

[SEC] or [CELL] ENTER SECTION OR CELL TO BE SHIFT ADJUSTED

Enter the section number or Power cell address to be shift adjusted and press the **ENTER** key.

[LOAD A] ENTER THE TARGET WEIGHT VALUE

Enter the desired target value (actual weight of the test weight on the weighbridge), and press the **ENTER** key.

[LOAD B] ENTER THE ORIGINAL INCORRECT WEIGHT VALUE

Enter the original weight value displayed when the test weight was first placed on the weighbridge, then press the **ENTER** key.

After a few seconds the 8530 will display a new weight reading which will be closer to the correct weight.

If a mistake is made during entry, press the **ZERO** key to back-up a step. Pressing the **ZERO** key at the **[CELL]** or **[SEC]** display to abort the manual shift adjust procedure.

Note: Manual shift adjust may not totally correct the shift error on the first attempt. If the displayed weight value is still out of tolerance after performing the manual shift adjust, repeat the manual shift adjust procedure until the weight reading is correct.

Once the shift adjustment is completed, enter the setup mode and disable manual shift adjustment, step **[96 0]**. The 8530 will then display **[SA CAL]**. Press the **1** key to permanently store the new shift constants. If you press the **0** key at this point the changes made with manual shift adjustment are lost and the shift constants will revert back to their previous values.

After the manual shift adjust procedure is completed, it may be necessary to recalibrate the scale as span or zero may have been affected. Verify that all sections weigh within tolerance and then recalibrate the scale using step **[19]** if necessary.

Manual Shift Adjust Example:

Displayed value with weight concentrated over section 1 is equal to 13458 lb. The target value (actual test weight value) is equal to 13500 lb, with a resulting error of 42 lb.

Press the **FUNCTION** key then the **0** key.

Enter **01** for section number followed by the **ENTER** key.
After **[LOAD A]** is displayed, enter "13500", and press the **ENTER** key.

After **[LOAD B]** is displayed, enter "13458", and press the **ENTER** key.

The adjusted weight is now displayed. If the displayed weight did not reach the desired target value of 13500, then repeat the procedure and enter a larger value for the **[LOAD A]** value. If the displayed weight is over the desired target value then repeat the procedure and enter a smaller **[LOAD A]** value.

[97] ACCESS SHORT CUT CALIBRATION DATA

This step provides direct access to the span, zero calibration coefficients. Power Cell vehicle scales bases also permit access the shift adjust coefficients. In the event the 8530 Main PCB is replaced, the 8530 can be recalibrated by entering the previously recorded short cut calibration data. **SHIFT ADJUST AND RECALIBRATION WITH TEST WEIGHTS IS NOT REQUIRED**, if the short cut calibration data is entered into a replacement 8530 Main PCB.

With the 8530 displaying **[--]**, Press the **9** then the **7** key. The 8530 then displays **[97]**.

Press:
0 - Skip Short Cut Calibration and return to double dash **[--]** display.
1 - Access Short Cut Calibration Display and or Modify.
PRINT - Print Short Cut Calibration Values.

[97A] DISPLAY SPAN VALUE
[X.XXXXXX]

The span value is displayed. Enter a new value if desired. Press the **ENTER** key to accept the displayed value.

[97B] DISPLAY ZERO VALUE
[XXXXXXX]

The zero offset value is displayed. Enter a new value if desired. Press the **ENTER** key to accept the displayed value.

[SEC 01] or [CELL 01] DISPLAY SHIFT VALUE FOR SECTION 01 OR POWER CELL 01

The shift adjust value for section 01 is displayed, (or for cell 01 if individual cell adjust is selected, step **[02 0]**). Enter a new value if desired. Press the **ENTER** key to accept the displayed value.

[SEC XX] or [CELL XX] DISPLAY SHIFT VALUE FOR LAST SECTION OR POWER CELL

The shift adjust value for the next section (XX) is displayed, (or for cell (XX) if individual cell adjust is selected, step **[02 0]**). Enter a new value if desired. Press the **ENTER** key to accept the displayed value. Each time the **ENTER** key is pressed this step is repeated for each section or cell in the weighbridge.

[SA CAL] SAVE CALIBRATION DATA ?

Press the **1** key to permanently store the entered calibration data. If you press the **0** key at this point all calibration values entered are lost and the calibration data will revert back to their previous values.

[98 0] LOAD DEFAULT PARAMETERS

If this step is enabled, the default "factory" settings will replace the current setup parameters. Items marked with an "*" are not affected by step **[98]** and will retain their current values.

With the 8530 displaying **[--]**, Press the **9** then the **8** key. The 8530 then displays **[98 0]**.

Press:
- **0** - Bypass load default parameters
- **1** - Advance to **[LOAd]** prompt

[LOAd] ARE YOUR SURE YOU WANT TO LOAD DEFAULT PARAMETERS?

Press:
- **0** - A second chance to bypass load default parameters
- **1** - Load default parameters as listed in Table 4-4.

Default Parameters					
Parameter	Value	Parameter	Value	Parameter	Value
02	*	34	0	63	0
03	*	35	1	64	0
04	*	36	1	65	1
11	*	37	0	66	0
13	*	38	0	67	0
14	*	41	1	68	2
15	*	41A	0	69	1
16	*	42	9600	71	1
17	*	43	2	72	1
23	3	44	0	73	4
23A	0	45	1	74	*
24	1	51	0	75	*
24A	0	51A	0	81	*
25	2	52	4800	82	0
26	4	53	2	83	*
27	4	54	0	84	0
28	*	55	1	85	0
29	0	56	2	86	0
31	2	57	0	87	0
32	0	61	0	88	0
33	0	62	0		

Table 4-4 Load Default Parameters

Note: Items marked with a * are not effected by load default parameters, setup step **[98]**.

[99] DISPLAY RAW COUNT OUTPUT OF INDIVIDUAL POWER CELLS

This step displays the raw count output of individual Power cells. Step **[99]** is used to verify that the 8530 is communicating with individual Power cells and to determine that the Power cells have been shimmed correctly. An error code is displayed if the 8530 is unable to communicate with the specified Power cell.

With the 8530 displaying **[--]**, Press the **9** then the **9** key. The 8530 then displays **[99]**.

Enter the address of the Power cell you wish to view (01 to 24) then press the **ENTER** key. The raw count output of the cell is then displayed. Press the **ENTER** key to display the raw count output of the next cell. Press the **CLEAR** key to return to the double dash **[--]** display. If a cell address of 00 is entered, the 8530 will return to the double dash **[--]** display.

Note: It is highly recommended that the raw count output of each cell be recorded after installation is completed. This data can be very useful troubleshooting information if a weighing problem occurs later.

4.9 FINAL INSTALLATION INSTRUCTIONS

4.9.1 Record Setup Parameters

Once the 8530 has been configured and calibrated then it is important to record the raw count output of the load cells at step **[99]**, and either record or print out the calibration parameters. Save the raw count outputs and calibration information for future use.

4.9.2 Remove the Setup Jumper

Remove the shorting block from the CAL jumper W5. Place the shorting block back onto one of the two pins of jumper W5.

4.9.3 Closing the Desk Enclosure

Carefully secure the front cover to the rear cover with the four screws in the corners of the rear cover. Be careful not to pinch the keyboard tail between the front and rear covers. **DO NOT** over tighten the cover screws when reinstalling them.

4.9.4 Sealing The NEMA 4X Wall Mount Enclosure

A small tube of sealant (*118251 00A) is included with the stainless steel wall mount enclosure version of the 8530. This sealant MUST be applied to the cover gasket before final closure of the wall mount enclosure to ensure a water tight seal.

Clean the gasket, located on the inside of the door of the enclosure, with a clean cloth to remove any debris. Apply an even bead of sealant to the gasket.

Smooth out the sealant with the tip of a finger so it is applied in an even, thin coat completely covering the gasket.

Close the door. Be careful to avoid pinching the keyboard extension harness between the enclosure and the door.

Snap each of the fasteners over the lip of the front cover. Tighten the wing type handle of each fastener by turning 180° clockwise. The lower right latch does not have a wing-type handle. Use an 11/16" wrench to tighten this latch.

Wipe off any excess sealant and snap the wing type handles down. Apply AC power to the indicator. The scale is now ready to use.

Clean the gasket, located on the inside of the door of the enclosure, with a clean cloth to remove any debris.

4.9.5 Closing the Rack Enclosure

Replace the inner cover and the 3 inner cover retaining screws.

Slide the chassis back into the outer case.

Use caution when reinstalling the front panel screws to prevent cross threading. Do not overtighten the front panel screws.

5. OPERATING INSTRUCTIONS

5.1 DISPLAY

5.1.1 Display Description

The 8530 has a gray display lens with a seven digit, blue-green, seven segment, vacuum fluorescent display. Cursors are provided for function, zero, lb, kg, gross, net and tare.

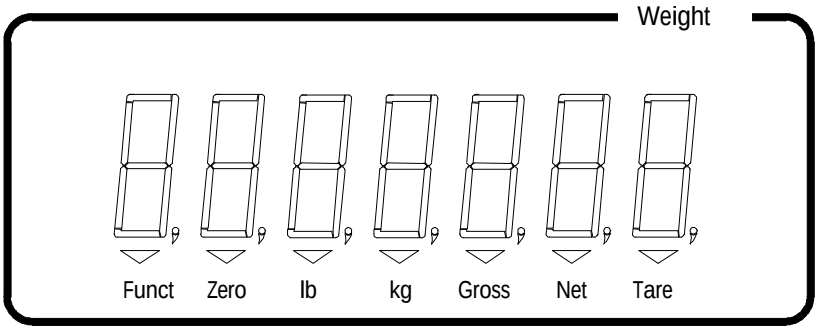


Figure 5-1 Weight Display and Cursors

5.1.2 Display Cursors

Funct - The Function cursor illuminates to indicate that the **FUNCTION** key has been pressed.

Zero - The Zero cursor illuminates to indicate that the weight on the scale is within ±0.25 increments of gross zero and that the 8530 is in the gross weight mode. If net zero cursor is enabled, step **[88 1]**, then the zero cursor also indicates when the weight on the weighbridge is within ±0.25 increments of gross or net zero.

lb - The lb cursor illuminates to indicate a that pound weight units are in use and that the weight on the scale is stable.

kg - The kg cursor illuminates to indicate that kilogram weight units are in use and that the weight on the scale is stable.

Gross - The Gross cursor illuminates to indicate that a gross weight value is being displayed.

Net - The Net cursor illuminates to indicate that a tare has been entered and that a net weight is being displayed.

Tare - The Tare cursor illuminates to indicate that a tare weight is being displayed. The tare cursor is illuminated when the displaying the stored tare value of a permanent register.

5.2 KEYBOARD

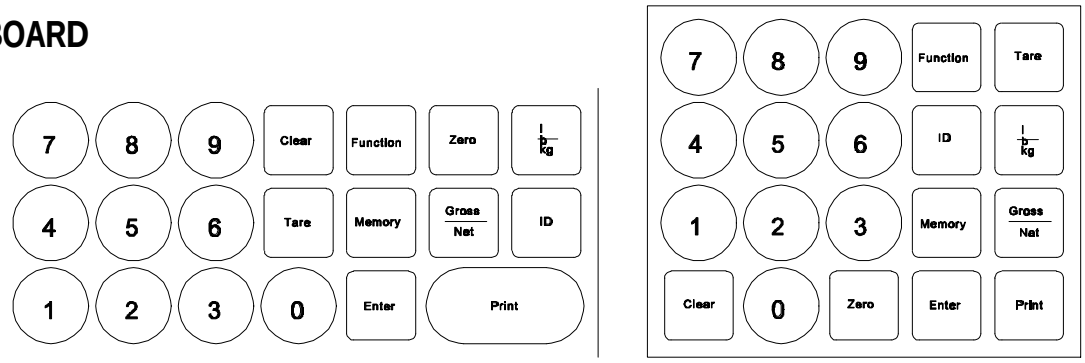


Figure 5-2 Keyboard Layout

CLEAR - The **CLEAR** key is used to clear a tare weight and return to gross weight mode. The **CLEAR** key also erases incorrect data entries and permits reentry of data.

ENTER - The **ENTER** key is used to terminate numeric data entry for consecutive numbering, time, date and setpoints.

ID - The **ID** key is used to enter a 12 digit numeric identification value.

GROSS/NET - The **Gross/Net** key is used to toggle between net and gross weight display. This key has no affect if the 8530 is in the gross weight mode.

Function - The **Function** key is used with the numeric keys to enter consecutive numbering, time, date, setpoint and accumulator data.

lb/kg - The **lb/kg** key toggles the 8530 between pound and kilogram weight units, if lb/kg switching is enabled, step **[82 1]**. The increment size and decimal point of the displayed weight are adjusted to the nearest equivalent when switching between units. For example: 1 lb increment size changes to 0.5 kg, 2 lb increment size changes to 1 kg, 5 lb increment size changes to 2 kg, etc.

MEMORY - The **MEMORY** key is used to access the 10 stored tare weight memories.

Numeric Digits (0-9) - The numeric keys are used to enter numeric data for tare, ID, time, date, setpoints, special functions, and other numeric entries.

PRINT - The **PRINT** key is used to request a demand mode output. If the weight on the scale is unstable when a print request occurs the print request is saved and a data is output when the weight on the scale is stable.

TARE - The **TARE** key is used to request the 8530 take an autotare. The 8530 will not take an autotare if the weight on the scale is unstable or at gross zero. The **TARE** key is also used to terminate a keyboard (numeric) tare entry. The least significant digit (LSD) of a keyboard tare entry must correspond to the displayed increment size of the 8530 or else the tare value entered is not accepted. If tare interlocks are enabled, step **[32 1]**, then a keyboard tare can only be entered at gross zero.

ZERO - **ZERO** captures a new center of zero reference. The weight on the scale must be stable and within the pushbutton zero range (either ±2% or ±20% of the full scale capacity, as selected in setup step **[25]**) for a zero reference to be captured.

5.3 POWERUP SEQUENCE

The 8530 performs internal self tests on all internal memory devices, display drivers and load cell communication during the power up procedure. At powerup the 8530 displays the following prompts in the order listed.

- The top segments of all seven display digits are illuminated for one second.
- The software part number, **[128831]** is displayed for a second.
- The revision level of the software is displayed for a second. For example: **[L09]** is the revision level displayed for the 9th revised version of the software.
- All segments of all seven display digits **[8888888]** are illuminated for a second.
- All cursors are illuminated.
- All decimal points are illuminated.
- The 8530 will display **[E E E]** or **[-E E E]** while attempting to capture zero. Once zero is successfully captured the 8530 displays weight. If autozero capture and tare interlocks are disabled, the 8530 will display the current weight without attempting to capture zero.

Note: Zero MUST be captured after powerup before a demand mode data output can occur or before lb/kg switching can occur. This requirement is not eliminated by disabling autozero capture or tare interlocks.

5.4 FUNCTION KEY DESCRIPTIONS

Several of the 8530's special features are accessed by means of pressing the **FUNCTION** key followed by one of the numeric keys. Refer to Table 5-1.

Keys	Description
FUNCTION 0	Access Manual Shift Adjust
FUNCTION 1	Access Setpoint 1 (6 digits max)
FUNCTION 2	Access Setpoint 2 (6 digits max)
FUNCTION 3	Access Setpoint 3 (6 digits max)
FUNCTION 4	Access Setpoint 4 (6 digits max)
FUNCTION 5	Enter Consecutive Numbering
FUNCTION 6	Enter Time (HHMMSS)
FUNCTION 7	Enter Date (DDMMYY)
FUNCTION 8	Access Subtotal and Total Accumulators

Table 5-1 Function Key Definitions

5.4.1 FUNCTION 0 - Manual Shift Adjust (Power Cell Vehicle Scales Only)

To access the manual shift adjust procedure, press the **FUNCTION** key and then the **0** key. Refer to Section 4.2, setup step **[96]**, for manual shift adjust procedure description.

5.4.2 FUNCTION 1 THROUGH FUNCTION 4 - Display/Change Setpoint Data

To display the setpoint value, press the **FUNCTION** key and then the number of the setpoint to be displayed, (1 through 4). The 8530 will then display the current value of the setpoint for five seconds. Setpoint functions are only accessible if setpoints are enabled, setup step **[36 2]**.

To change the displayed setpoint value, enter a new setpoint value while the 8530 is displaying the current setpoint value. Press the **ENTER** key to accept the displayed setpoint value and return to the weight display mode.

Note: The least significant digit of the setpoint value entered must match the displayed increment size selected in setup. If the setpoint value entered does not match the increment size then the setpoint entry is ignored.

5.4.3 FUNCTION 5 - Display/Change Consecutive Numbering (CN)

To display the consecutive numbering counter, press the **FUNCTION** key and then the **5** key. The 8530 will then display the current CN value for five seconds.

To change the displayed consecutive numbering value, enter a new CN value while the 8530 is displaying the current CN value. Press the **ENTER** key to accept the displayed CN value and return to the weight display mode.

5.4.4 FUNCTION 6 - Display/Set Time

To display the current time, press the **FUNCTION** key and then the **6** key. The 8530 will then display the current time for five seconds.

To change the time, enter a new time while the 8530 is displaying the current time. Time is entered in a 24 hour format including seconds, "HHMMSS". For example: 2:35 PM would be entered as "143500". Press the **ENTER** key to accept the displayed time and return to the weight display mode.

5.4.5 FUNCTION 7 - Display/Change Date

To display the current date, press the **FUNCTION** key and then the **7** key. The 8530 will then display the current date for five seconds.

To change the date, enter a new date while the 8530 is displaying the current date. Date is entered in the format selected at setup step **[73]**. Press the **ENTER** key to accept the displayed date and return to the weight display mode.

5.4.6 FUNCTION 8 - Print/Clear Accumulators

The 8530 is equipped with two nine digit accumulators. One accumulator functions as a subtotal weight accumulator and the other functions as a total weight accumulator. The 8530 can accumulate gross weight, net weight or displayed weight as selected in setup step **[29]**. Weight data is accumulated every time a print request occurs.

To access the subtotal and total accumulators, press the **FUNCTION** key and then the **8** key. The 8530 will then display the prompt **[ACC]** to indicate you are accessing the accumulators.

With the 8530 displaying **[ACC]**, press the **PRINT** key to print the contents of the subtotal and total accumulators. The subtotal accumulator is cleared when totals are printed. To clear the total and subtotal accumulators, press the **CLEAR** key while the 8530 is displaying **[ACC]**. Both the subtotal and total accumulators are cleared.

5.5 SCALE MEMORY

The 8530 provides ten memory location that can be used for either permanent or temporary stored vehicle weights that can be recalled to complete a transaction and print a ticket with gross, tare and net weight. The available memory locations are numbered 0 though 9. Tare memories must be enabled, setup step **[37 1]** to permit stored tare weight operation. Step **[38]** selects permanent or inbound/outbound stored tare mode.

To view a stored weight value, press the **Memory** key and then the memory location (0 through 9) that the tare weight is stored in. The 8530 will then display the current contents of the memory location for five seconds and then return to the weigh mode. If you press the **MEMORY** key while the 8530 is displaying a tare memory then the 8530 will display the next tare memory.

5.5.1 Permanent Stored Tare Weight Operation, Setup Step [38 0]

Permanent stored tare weight registers are normally used when the user has a fleet of vehicles with known empty (tare) weights and can use a fixed tare value. The loaded vehicle is driven on the scale, the tare weight is recalled by ID from memory and a ticket is printed.

Permanent stored tare weights can be entered either by manually entering the known empty weight of the vehicle using the keyboard or by storing the current weight on the scale.

5.5.1.1 Manually Entering a Tare Weight Into a Permanent Memory Location

To manually enter a known tare weight, into a permanent memory location perform the following procedure:

- Press the **Memory** key and then the memory location (0 through 9) that the tare weight is to be stored into. The 8530 will then display the current contents of the memory location for five seconds.

- Enter the desired stored tare value using the numeric keys, while the 8530 is displaying the current stored tare weight value. Press the **Enter** key to terminate the tare entry. The tare value entered will be held in memory until manually replaced or cleared.

Note: Manually entered permanent stored tare weights replace the current value stored in memory.

5.5.1.2 Storing an Empty Truck Weight Into a Permanent Memory

To store the current weight on the scale into a permanent memory location, perform the following procedure:

- Drive the empty vehicle on the scale platform and verify the 8530 is in the gross mode.

- Press the **Memory** key and then the memory location (0 through 9) that the tare weight is to be stored into. The 8530 will then display the current contents of the memory location for five seconds.

- Press the **Enter** key while the 8530 is displaying the contents of the memory location to store the current weight into the memory location.

Note: This mode of tare entry can only be used with a memory location that is empty, displaying a stored tare value of **[000000]** when recalled. If a nonzero tare weight value is displayed for the memory location selected then the contents of this memory location will have to be cleared before you can store the weight on the scale into this memory location. Refer to Section 5.5.1.4 for instructions on how to clear a permanent memory location. Repeat the weight storing procedure once the memory location has been cleared.

5.5.1.3 Retrieving a Permanent Stored Tare Weight from Memory

To retrieve a permanent stored tare weight from memory, perform the following procedure:

- Verify the 8530 is in the gross mode, then drive the loaded vehicle onto the scale platform.

- Press the **Memory** key and then the memory location (0 through 9) that the tare weight for this vehicle is stored in. The 8530 will then display the current contents of the memory location for five seconds.

- Press the **Tare** key while the 8530 is displaying the contents of the memory location to recall the stored weight into the tare weight register and display the difference between the weight currently on the scale and the stored tare weight as a net weight.

- Press the **Print** key to print a ticket. The weight value recalled from memory will have the memory location in parentheses printed after it. Refer to Figure 5-3.

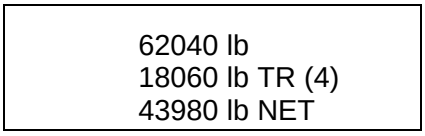


Figure 5-3 Example Ticket Printout of Tare Weight Recalled From Memory Location 4

5.5.1.4 Clearing a Permanent Stored Tare Weight from Memory

To clear a permanent stored tare weight from memory, perform the following procedure:

- Press the **Memory** key and then the memory location (0 through 9) that is to be cleared. The 8530 will then display the current contents of the memory location for five seconds.

- Press the **Clear** key while the 8530 is displaying the contents of the memory location to erase the current contents of the memory location.

5.5.2 Inbound/Outbound Temporary Stored Weight Operations, Setup Step [38 1]

The inbound/outbound weighing mode is most commonly used with random, over the road haulers that are delivering or picking up product. The vehicle is weighed twice, once inbound and once outbound. The inbound weight is stored in a temporary register. When the outbound vehicle is weighed, the stored inbound weight is recalled from memory and used to calculate the net weight of the contents of the vehicle. Once an inbound stored tare weight is recalled the memory location is cleared and is free to store a new inbound weight.

Net sign correction permits a temporary memory register to be used for both shipping and receiving. If net sign correction is enabled, setup step **[64 1]**, then the stored inbound weight can be either the full or the empty weight of the vehicle. When the inbound weight is recalled from memory, the 8530 will automatically select the larger of the two weights (current weight on the scale or the inbound weight recalled from memory) as the gross weight. The smaller weight becomes the tare weight and the difference between the two is a positive net weight.

5.5.2.1 Storing an Inbound Vehicle Weights

To store the current weight on the scale into an temporary memory location, perform the following procedure:

- Drive the inbound vehicle on the scale platform and verify the 8530 is in the gross mode.

- Press the **Memory** key and then the **Print** key. The 8530 will store the current weight on the scale into the next available memory location (0 through 9) and print the inbound weight with the memory location in parentheses printed after it. Refer to Figure 5-4.

```
12540 lb (1)
```

Figure 5-4 Example Inbound Ticket Printout of Inbound Weight Stored in Memory Location 1

Note: If all ten memory locations are already full and the operator attempts to store an additional inbound weight the 8530 will display **[FLL]** to indicate that no more inbound weights can be entered into memory until memory locations are emptied.

5.5.2.2 Retrieving an Inbound Stored Vehicle Weight

To retrieve an inbound stored vehicle weight from memory, perform the following procedure:

- Verify the 8530 is in the gross mode, then drive the loaded vehicle (or unloaded vehicle if net sign correction is enabled) onto the scale platform.

- Press the **Memory** key and then the memory location (0 through 9) that the inbound weight for this vehicle was stored in. The memory location (0 through 9) was printed in parentheses after the inbound weight, when the weight was stored. The 8530 will then display the current contents of the memory location for five seconds.

- Press the **Tare** key while the 8530 is displaying the contents of the memory location to recall the stored weight into the tare weight register and display the difference between the weight currently on the scale and the stored tare weight as a net weight.

- Press the **Print** key to print a ticket. The weight value recalled from memory will have the memory location in parentheses printed after it. Refer to Figure 5-5.

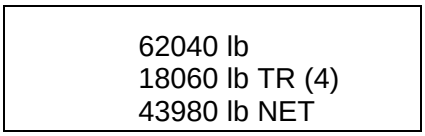
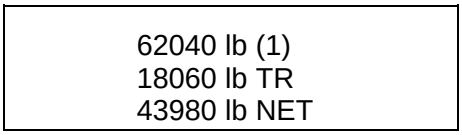
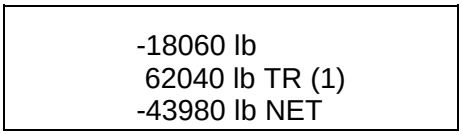


Figure 5-5 Example Ticket Printout of Tare Weight Recalled From Memory Location 4

Note: If net sign correction is enabled and the inbound weight was larger than the outbound weight then the 8530 will swap the gross and tare weight values on the printed ticket so that the larger weight is the gross weight and the smaller weight is the tare weight and difference between them is printed as a positive net weight. Refer to Figures 5-6 and 5-7.





Figures 5-6 and 5-7 Example Ticket Printouts with and without Net Sign Correction

5.6 BASIC WEIGHING CONCEPTS

This section explains some of the specialized terminology and concepts that are used in the weighing industry.

5.6.1 Zero

Zero is the empty weight of the scale platform or weighbridge. The gross zero reference is recorded during the calibration procedure.

Pushbutton Zero is a way for the operator to capture a new gross zero reference point. The weight on the scale must be stable and be within the pushbutton zero capture range, typically ±20 % of full scale capacity. The zero of the scale can change because material buildup on the scale or because of temperature change.

Auto zero maintenance (AZM) is a way for the 8530 to gradually rezero itself in order to compensate for small changes in zero. Class IIIL, legal-for-trade vehicle scales use an AZM range of ±3 displayed increments about gross zero. AZM is active any time the weight on the scale is stable and is within the AZM range about gross zero.

5.6.2 Tare

Tare is the empty weight of the vehicle. Tare is normally used to determine the net weight of the contents of the vehicle. Tare is used in several different ways.

Autotare

An autotare is taken by pressing the **TARE** key with the empty vehicle on the scale. The 8530 then displays a zero weight with the net cursor illuminated. The vehicle is loaded and driven back on the scale. The 8530 then displays the net weight of the contents. If the **TARE** key is pressed with the 8530 in the net mode then the current weight on the scale becomes the new tare value. Tare interlocks inhibits replacement autotare.

Keyboard Tare

Keyboard entered tare is used when the empty weight of the vehicle is a known value. The known tare weight is entered using the numeric keys and the **TARE** key is pressed. The 8530 will then display the net weight of the contents of the vehicle.

Chain Tare

Chain tare is a rarely used mode of keyboard entered tare. If a tare is entered using the numeric keypad when the 8530 is already in the net weight mode then the tare value entered is added to the existing tare weight value. Tare interlocks inhibit this mode.

Tare Interlocks

Tare interlocks are a set of restrictions on how tare can be used, that are required by some local weights and measures regulations. If tare interlocks are enabled, then the 8530 must be at gross zero to clear a tare weight or to enter a keyboard tare. Tare interlocks also prevent the 8530 from replacing an existing tare with a new autotare.

5.6.3 Sections

Vehicle scale weighbridges are normally divided up into what are called "sectional pairs" or sections. A section is a pair of load cells that are side by side in the weighbridge. For example the two load cells that are at one end of the scale make up a section. Refer to Figure 5-8. Sections are primarily a consideration when dealing with shift errors.

Section 1	Section 2	Section 3	Section 4	Section 5
1	3	5	7	9
2	4	6	8	10

Figure 5-8 Load Cells and Sections in a Typical Vehicle Scale

5.6.4 Setpoints

Setpoints are on/off outputs that indicate whether the displayed weight on the scale is greater than or less than a preprogrammed weight value. Setpoints are typically used in material filling applications in order to fill a vehicle to a preset weight. The 8530 provides 4, single speed, setpoint capability. The 8530 does not provide discrete electrical outputs. The setpoint information is coded into the continuous serial data output. In order to use the 8530 setpoint capabilities an additional piece of equipment that understands the continuous format data output is required. The METTLER TOLEDO Models 3015 Filing controller and the Model 9215 Batching controller are examples of devices that understand the continuous format data output and can convert the setpoint data into high level on/off outputs designed to control material feeders.

5.6.5 Inbound/Outbound Weighing

Vehicle scales are often used in an inbound/outbound mode of operation where the vehicle is loaded or unloaded at the users site. In the inbound/outbound mode the vehicle empty (tare) weight is not known so the vehicle must be weighed twice, once empty and once loaded. In the past this was normally done by printing the inbound weight, printing the outbound weight and then hand calculating the difference or net weight.

The 8530 simplifies inbound/outbound weighing by permitting the operator to store the inbound vehicle weight in memory and then recalling that weight at a later time. Once the inbound weight is recalled, the 8530 calculates the net weight and prints an outbound ticket.

5.6.6 Net Sign Correction

Net sign correction is a feature that permits the 8530 to be used for both shipping (inbound empty) and receiving (inbound loaded) operations. If net sign correction is enabled, the 8530 will swap the gross and tare weight field on the printed ticket, if necessary, so that larger weight is the gross weight, the smaller weight is the tare weight, and the difference is always a positive net weight.

5.6.7 One Pass Weighing

One pass weighing is a mode where the user has a fleet of vehicles with known empty (tare) weight. The tare weight is recalled by ID with the loaded vehicle on the scale.

5.7 AUTORANGE OPERATION

Range switching occurs when the total number of displayed increments for a range is equal to the total number of displayed increments of the high range. Refer to following Autorange example, the 8530 is programmed as follows:

[11 0] Calibrate in pounds
[13 2] Dual range operation is selected.
[14] [400000] Scale Capacity
[15] [50] High Range Increment Size
[17] [20] Low Range Increment Size

Refer to equations 5-1 and 5-2 to calculate the largest weight that can be displayed in the lower ranges. Refer to the indicator setup section of the weighbridge installation manual for the correct scale capacity, and minimum increment size selection.

$$\text{Low Range Capacity} = \frac{\text{Scale Capacity, Step [14]} \times \text{Low Range Increment Size, Step [17]}}{\text{High Range Increment Size, Step [15]}}$$

Equation 5-1 Low Range Capacity Calculation

$$\text{Mid Range Capacity} = \frac{\text{Scale Capacity, Step [14]} \times \text{Mid Range Increment Size, Step [16]}}{\text{High Range Increment Size, Step [15]}}$$

Equation 5-2 Mid Range Capacity Calculation

Display	Displayed Increment Size	Range Calculation Formula	Active Weight Range
Low Increment Range	20 lb	Capacity X Low Increment ÷ High Increment = Low Increment Range (400,000 X 20) ÷ 50 = 160,000 lb	0 lb to 160,000 lb
High Increment Range	50 lb	From Top of the Low Increment Range to Capacity	160,050 lb to 400,000 lb

Table 5-3 Autorange Operation Example

Note: Autorange works on the displayed weight value. Once a tare is taken the net weight is displayed in the low increment size until the net weight exceeds the low increment range. If the gross, tare and net weight are not all in the same increment range then the total of the net and tare weight may not exactly equal the gross weight. Example: A tare weight of 46,020 lb is taken. The net weight of the contents of the vehicle is 180,050 lb. The total of the tare and net weight is 226,070 lb, which is an invalid increment size. The 8530 will use the valid increment size for the gross weight which in this case would be by 50 lb increments resulting in a printed gross weight of 226,100 lb. This value is the same gross weight that would be displayed if the tare weight was cleared.

6. INTERFACING AND I/O CONNECTORS

6.1 MAIN PCB CONNECTIONS AND JUMPERS

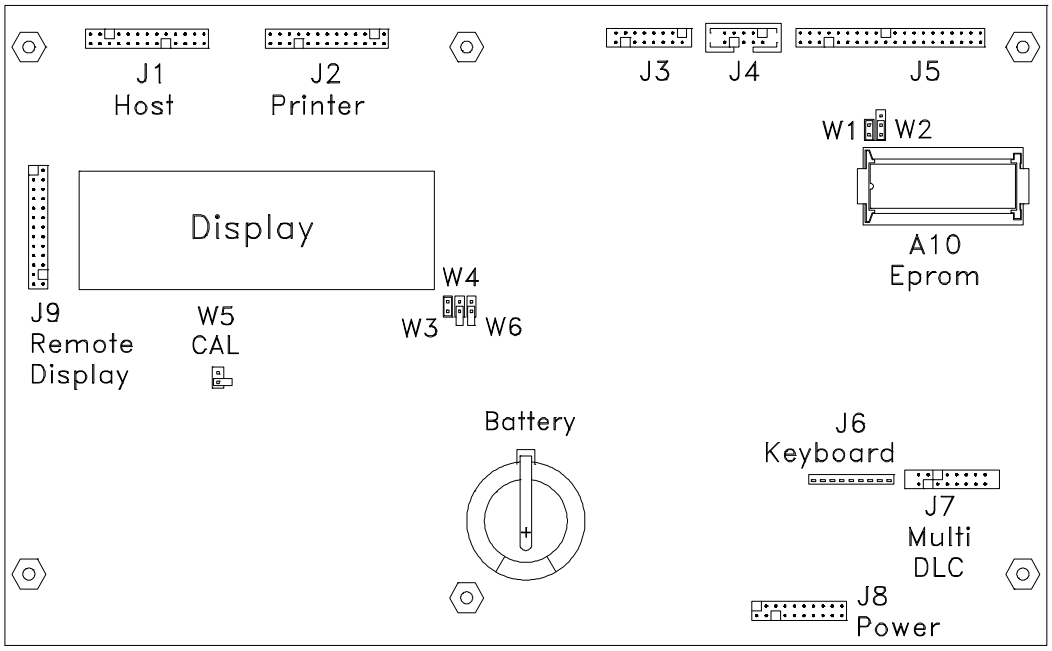


Figure 6-1 Main PCB

Main PCB Jumpers

W1 - OE Jumper (IN)

W2 - EPROM Select Jumper (2-3)

W3 - Filament Jumper (IN)

W4 - Comma Jumper (Out)
(Out) = Period for Decimal Point
(IN) = Comma for Decimal Point

W5 - Cal Jumper (Out)
(IN) = Access Setup Mode
(OUT) = Normal Operation

W6 - Receive Data Jumper (Out)
(IN) = Select 20 mA RxD
(OUT) = Select RS-232 RxD

Main PCB Connectors

J1 - JW Host Port
J2 - JN Printer Port
J3 - Single DLC
J4 - Keyboard/Barcode (Not Used)
J5 - Data Bus (Not Used)
J6 - Keyboard
J7 - Multi DLC
J8 - Power
J9 - Remote Display

6.2 ENCLOSURE CONNECTOR LOCATIONS

6.2.1 Desk Enclosure (Rear View)

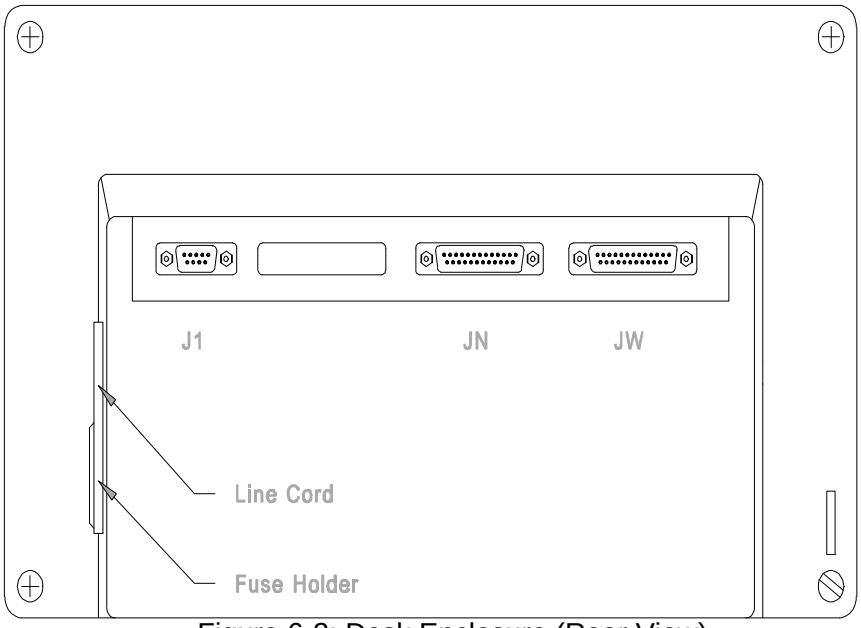


Figure 6-2: Desk Enclosure (Rear View)

J1 - Load Cell
JN - Printer Port
JW - Optional Host Port

6.2.2 Wall Enclosure (Bottom View)

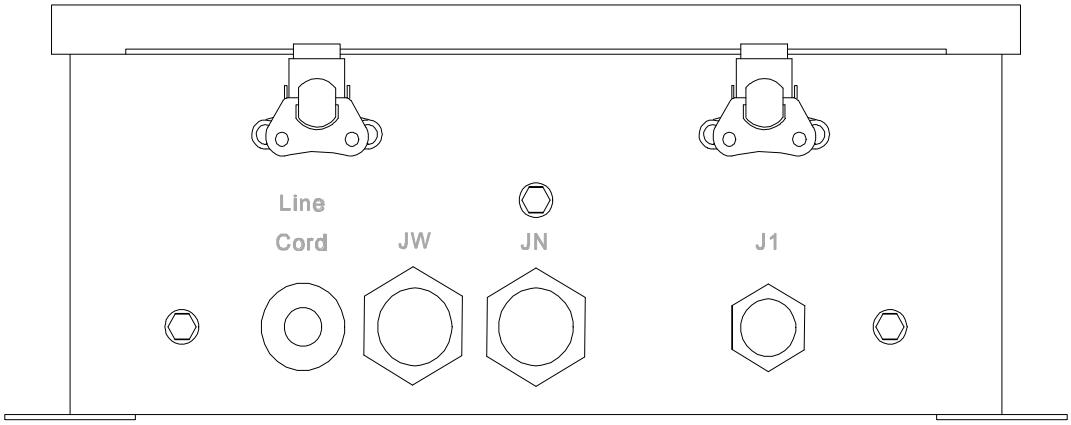


Figure 6-3: Wall Enclosure (Bottom View)

JW - Optional Host Port
JN - Printer Port
J1 - Load Cell

6.2.3 Rack Enclosure (Rear View)

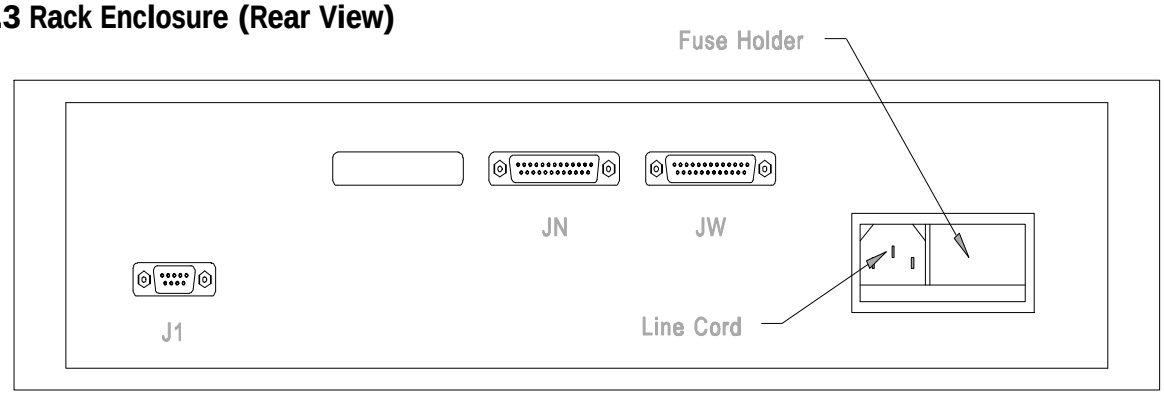


Figure 6-5: Rack Enclosure (Rear View)

J1 - Load Cell
JN - Printer Port
JW - Optional Host Port

6.3 LOAD CELL INTERCONNECT

The 8530 is compatible with the DigiTOL® Power Cells used in the DigiTOL® TRUCKMATE and RAILMATE vehicle scales, Models 7260, 7531, 7541, 7560, 7565 and the 760 DC when the multiple DLC adapter harness is installed.

The 8530 is compatible with single DigiTOL® Load Cell bases such as the Models 1996, 1997, 2096, 2097, 2196, 2197, the Model 2160 DigiTOL® Floor Scale and the digital j-box, when the single DLC adapter harness is installed.

The 8530 is shipped with the multiple DLC adapter harness installed and is ready to be used with DigiTOL® Vehicle scales. **If the 8530 is to be used with a single DLC base, the Model 2160 DigiTOL® floor scale or the digital j-box then the multiple DLC adapter harness must be removed from the 8530 and the single DLC adapter harness, part number 131612 00A, must be installed between the load cell extension harness and connector J3 on the 8530 Main PCB.** Refer to Section 4.3 for load cell adapter harness installation instructions.

CAUTION!

Single DLC scale bases, the Model 2160 Floor Scale and the digital j-box require the single DLC adapter harness be installed between the load cell extension harness and connector J3 on the 8530 Main PCB or else damage to the load cell may result.

REMOVE AC POWER FROM THE 8530 AND WAIT A MINIMUM OF 30 SECONDS BEFORE CONNECTING OR DISCONNECTING ANY HARNESSES FROM PCB'S OR LOAD CELLS OR ELSE DAMAGE MAY RESULT.

The 8530 uses two different types of load cell connectors. The desk and rack enclosures use a DE-9 connector, the wall enclosure version uses a 10 pin twist lock connector. Refer to Section 6.3.1 for connector termination information.

6.3.1 Load Cell Connector Installation Instructions

For wall enclosure version mating load cell connector termination instructions refer to the load cell connector installation instructions, PN 133528 00A, packed with the 8350.

Note: The wall enclosure load cell connector uses letters to identify pins instead of numbers.

For desk and rack enclosure versions load cell connector termination, refer to the following instructions:

- The J1 load cell connector has a key plug installed in pin 3. Refer to Figure 6-6 for key pin location. This key is installed to insure that an analog scale base cannot be plugged into this connector. This key pin **MUST NOT** be removed. The mating DE-9-P connector, PN 117599 00B, included with the 8530 has pin 3 removed. If a different connector is used it will be necessary to remove pin 3 of the mating connector. To accomplish this, grab as much of the pin as possible with a pair of needle nose pliers and bend the pin back and forth until it breaks off. Verify that all adjacent pins are straight after you finish.

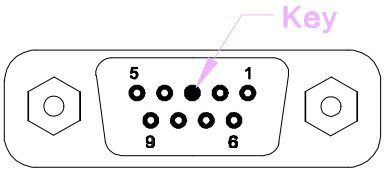


Figure 6-6 DigiTOL® Load Cell Connector

- Slide the snuggest fitting rubber grommet from the connector shell assembly (PN 125384 00A) over the un-terminated end of load cell cable.

- Strip back about 1¼" of the cable jacket and push the braided shield back over the rubber grommet. Refer to Figure 6-7.

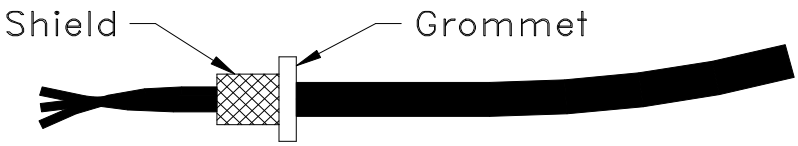


Figure 6-7 Cable Shield Termination

- Solder the load cell cable wires to the pins of the mating connector. Refer to Section 6.3.2 for vehicle scale Power Cell wiring information. Refer to Section 6.3.3 for single DLC cable wiring information.

- Remove the paper backing from the embossed copper tape, PN 154360001, and wrap the copper tape around the braided shield that was pushed back over the rubber grommet. Trim any excess braided shield that extends past the edge of the copper tape.

- Install the connector shell, PN 125384 00A, onto the DE-9-P mating connector. The rubber grommet will fit into a recess in the connector shell to provide strain relief for the cable wiring and ground termination through the connector shell for the braided shield.

6.3.2 Vehicle Scale, Power Cell Home Run Cable Termination

Verify that the Multiple DLC adapter harness, part number 131613 00A, has been installed between the external load cell harness and the multi DLC connector J7 on the 8530 Main PCB. Refer to Figure 6-1 for connector J7 location.

If the Single DLC harness, part number 131612 00A, is installed between the external load cell harness and the single DLC connector J3 on the 8530 Main PCB then remove the single DLC load cell harness and install the multi DLC harness between the external load cell harness and connector J7 on the 8530 Main PCB as described in Section 4.3 of this manual.

The pinout of the J1 load cell connector, located on the rear of the desk and rack enclosure or on the bottom of the wall enclosure is as listed in Table 6-1. Refer to the weighbridge installation manual for weighbridge and home run cable wiring information.

J1 Pin #		Function	Color Code
1	A	COM A	Yellow
2	B	Ground	Green
3	C	Not Used	
4	D	COM B	Blue
5	E	+24 VDC	White
6	F	Ground	Brown
7	G	Ground	Black
8	H	+24 VDC	Red
9	J	+24 VDC	Orange
	K	Not Used	

Table 6-1 J1, Vehicle Scale Power Cell Connector Termination

Note: The J1 connector for desk and rack enclosure versions uses pin numbers, the wall enclosure version uses pin letters.

6.3.3 Single DigiTOL® Load Cell TerminationError! Bookmark not defined.

Verify that the Single DLC adapter harness, part number 131612 00A, has been installed between the external load cell harness and the single DLC connector J3 on the 8530 Main PCB. Refer to Figure 6-1 for connector J3 location. Refer to Section 4.3 of this manual for Single DLC adapter harness installation instructions.

The Single DLC interface of the 8530 provides a single DigiTOL® load cell interface to permit operation with the Models 1996, 1997, 2096, 2097, 2196, 2197 DigiTOL® Bench and Portable scale bases, and the Model 2157 Digital J-Box Floor Scale. The Models 1996, 2096, and 2196 bases include a 10' interface cable, part number 130115 00A. The Models 1997, 2097, and 2197 bases supply an integral 10' cable. The 8530 single DLC input is compatible with up to four analog load cells when used with the digital j-box. The maximum length for a DLC home run cable is 300', use cable part number 510624-370, ordered by the foot.

Model 8530			DigiTOL® Single DLC Scale Base Connector			
			Function	1996 2096 2196	1997 2097 2197	Model 2160 Digital J-Box
J-1 Pin		Color		Pin	Color	TB-5
1	A	Red	RxD A	1	Red	3
2	B		Not Used			
3	C	Key Pin	Not Used			
4	D	White	RxD B	Not Used	Not Used	4
5	E	Green	+20 VDC	5	Green	6
6	F	Yellow	TxD B	6	Yellow	2
7	G	Blue	Ground	7	Blue	5
8	H	Black	TxD A	8	Black	1
9	J		Not Used			
	K		Not Used			

Table 6-2 DigiTOL® Scale Base Interconnect

CAUTION!

The white wire **MUST NOT** be connected to Model 1996, 1997, 2096, 2097, 2196 and 2197 bases or damage to the DigiTOL® load cell and single DLC input may result!

6.3.3.1 Digital J-Box and Model 2160 Floor Scale Termination

Connect the open end of the digital load cell cable to terminal strip TB5 of the digital j-box as listed in Table 6-2. Refer to Figure 6-8 for terminal strip TB-5 location.

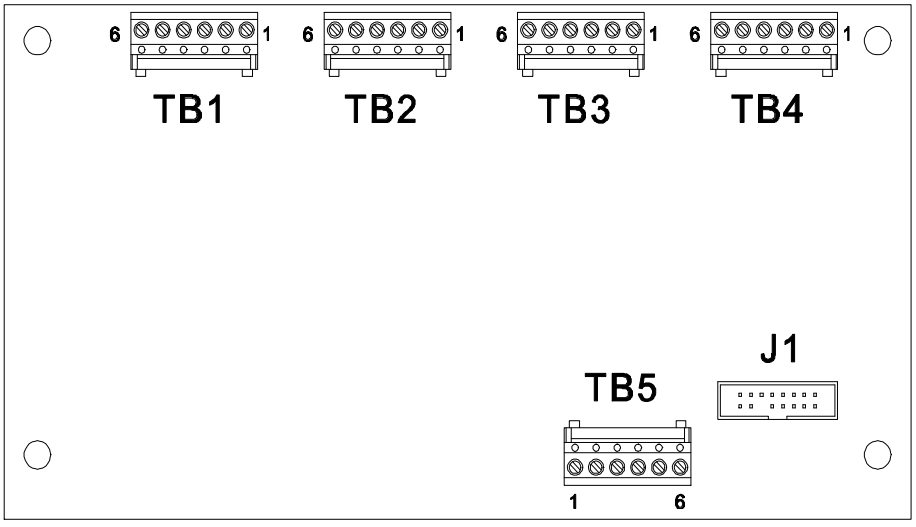


Figure 6-8 Digital J-Box PCB

The Model 2160 is shipped with the four analog load cells already connected to the digital j-box PCB. If using the digital j-box with Flexmount or Centerline load cells then connect from two to four analog load cells to Terminal strips TB1 through TB4 of the digital j-box PCB. If two load cells are used they must be connected to terminal strips TB1 and TB2. If three load cells are used they must be connected to terminal strips TB1, TB2 and TB3. Refer to Table 6-3 for analog load cell cable wiring information.

Digital J-Box Analog Load Cell Connectors		Analog Load Cell Cable Color Code		
Pin Number	Function	Six Wire	Four Wire With Sense Jumpers	
1	- Excitation	Blue		Black
2	- Sense	Red		
3	- Signal	Black		Red
4	+ Signal	Green		White
5	+ Sense	Yellow		
6	+ Excitation	White		Green

Table 6-3 Digital J-Box Analog Load Cell Connectors (TB1, TB2, TB3, and TB4)

Note: Sense leads for six wire load cell cables are connected to terminal strip TB1 only. Disconnect and tape back the sense leads on all other six wire load cell cables. Four wire load cell cables will require a jumper wire connecting +Excitation to +Sense and a second jumper wire connecting -Excitation to -Sense at TB1.

Be sure to install a jumper wire between pins 3 and 4 of any unused analog load cell inputs.

6.4 JN SERIAL PORT

The 8530 JN serial port supplies 20 mA current loop (CL) and RS-232 interfaces for both input and output of serial data in either demand or continuous format output. Serial data is formatted as either 7 data bits, 1 parity bit and 1 stop bit or as 8 data bits, no parity bit and 1 stop bit. A selectable checksum character ensures integrity of the data transmission. Refer to Tables 6-4, 6-5 and 6-6 and Figures 6-9 and 6-10 for JN Port interconnect information. Refer to Section 8.2. for a list of available printer interface cables and mating connectors.

Note: Only one of the serial ports, JN or JW can be configured for demand mode output. Either or both of the ports can be configured for continuous mode output.

Both the 20 mA CL and RS-232 interfaces output data simultaneously and are usable at the same time. This lets the 8530 to send data to two different devices at the same time.

Serial ASCII command characters for remote **CLEAR**, **TARE**, **PRINT** and **ZERO** are accepted into either the RS-232 or the 20 mA CL interfaces. Only one of the interfaces, RS-232 or 20 mA CL can be used to receive ASCII characters (selected by jumper W6 on the 8530 Main PCB.

The 20 mA CL input can also be configured as a momentary contact input to provide a remote **PRINT**, **TARE** or **ZERO** key input. This mode does not interfere with receiving ASCII control characters into the RS-232 port.

6.4.1 JN Port Printer Interconnect

8530 JN Port	Signal Description	301 307	8806 8860	8860 WD	8844	8856 8865
2	TxD RS-232C					3
3	RxD RS-232C					
7	GND/-TxD 20 mA	6				7
8	+RxD 20 mA		11			
9	+20 mA Supply		16	H	25	
10	-RxD 20 mA		22			
13	+20 mA Supply					
22	+TxD 20 mA	7	18	K	23	
24	Logic Ground					
None	Jumpers	None	12-23	None	J101(B-C)	None

Table 6-4 JN Port Printer Interface Cable Interconnect

Printer Interface Cable Notes:

- The 8806/8860 pin numbers are for the 8806 printer and the desk version of the 8860 using the adapter plug supplied with the 8860. The 8860 WD pin letters are for the washdown version of the 8860 printer.
- The jumper shown between pins 12 and 23 must be installed in the 8806 end of the interface cable and remote print pulse input must be enabled, setup step **[87 1]**, for the remote print button on the Model 8806 printer to operate.
- The J101 jumper shown for the 8844 document printer is located on the serial interface PCB inside the 8844 printer.

8530 JN Port	Signal Description	8614 8616	8623	8617 9323 9325	9330	9360 *
		TB1	PN or PY	TB2	TB2	CH 2 or 4
2	TxD RS-232C					
3	RxD RS-232C					
7	Logic GND/-TxD 20 mA					
8	+RxD 20 mA				4	9
9	+20 mA Supply	2	8	8		8
10	-RxD 20 mA				2	22
13	+20 mA Supply	3				
22	+TxD 20 mA	1	10	9		10
24	Logic Ground					
None	Jumpers	None	None	W2-20 mA	None	None

Table 6-5 JN Port Accessory Interface Cable Interconnect

Accessory Interface Cable Notes:

- The W2 jumper shown for the Model 8617 Scoreboard Display, the Model 9323 BCD Converter and the Model 9325 Analog Output Converter is located on the serial interface PCB inside the accessory.
- ASCII input must be enabled, setup step **[86 1]**, and jumper W6 on the 8530 Main PCB must be (**IN**), shorting the pins together, for the 9330 remote ASCII 20 mA CL input to work.
- Recommended JN port connection to the 9360 is by 20 mA current loop. Channels 2 and 4 on the 9360 provide 20 mA current loop interfaces.

8530 JN Port		PC Compatible Computer	
Pin	Description	DB-25-S	DB-9-S
2	TxD RS-232	3	2
3	RxD RS-232	2	3
7	Logic Ground	7	5
PC Interface Cable Jumpers		4 5 6 8 20	1 4 6 7 8

Table 6-6 JN Port Computer Interface Cable Interconnect

PC Compatible Interface Cable Notes:

- The jumpers shown in table 6-6 are located in the computer end of the interface cable.
- ASCII input must be enabled, setup step **[86 1]**, and jumper W6 on the 8530 Main PCB must be (**OUT**), not shorting the pins together, for bidirectional RS-232 communication between the 8530 and the computer to work.

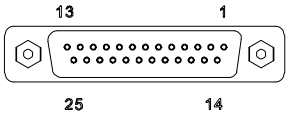


Figure 6-9 Desk and Rack Enclosure DB-25 Serial Connector

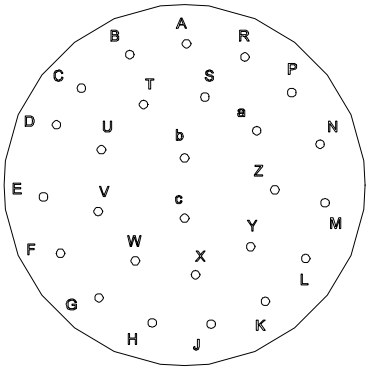


Figure 6-10 Wall Enclosure 26 Pin Twist Lock Serial Connector

6.4.2 Remote Contact Closure Input

The JN port 20 mA RxD input can be used for a remote contact closure input for the function selected in setup step **[87]**. The contact closure input can be used as a remote **PRINT**, **TARE** or **ZERO** key if connected to a momentary contact pushbutton.

The remote pushbutton can be located up to 2000 feet from the 8530. Use a shielded, twisted pair, data cable and ground the shield of the cable to the shell of the DB-25 connector on the 8530 end of the cable. Figure 6-11 details the remote contact closure input wiring.

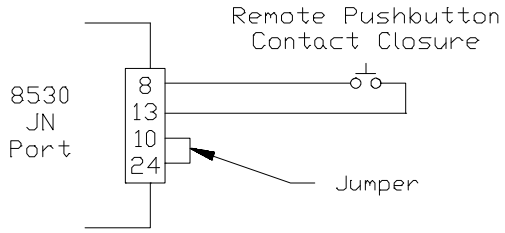


Figure 6-11 20 mA Remote Print Pushbutton

6.5 JW OPTION PORT

The optional JW port supplies RS-232 and RS-422/485 interfaces for both input and output of serial data in demand, continuous or host mode. Serial data is formatted with either 7 data bits, 1 parity bit and 1 stop bit or as 8 data bits, no parity bit and 1 stop bit. A selectable checksum character ensures integrity of the data transmission.

Refer to Tables 6-7, 6-8, 6-9 and 6-10 and Figures 6-9 and 6-10 for JW Port interconnect information. Refer to Section 8.2. for a list of available interface cables and mating connectors.

Both the RS-232 and the RS-422 interfaces output demand or continuous data simultaneously and are usable at the same time. This lets the 8530 to send output data to two different devices at the same time.

Serial ASCII command characters for remote **CLEAR**, **TARE**, **PRINT** and **ZERO** are accepted into either the RS-232 or the RS-422/485 interfaces. Only one of the interfaces RS-232 or RS-422 can be used to receive ASCII characters.

The Host mode interface provides advanced computer interfacing capabilities to permit a remote computer to access weight, setpoint and status information from the 8530. Control bytes permit remote operation of the 8530 by the computer. Setpoint and tare weight data can be uploaded to the 8530.

The host mode uses the RS-232C interface for short distance (50' or less) single scale to computer interfacing applications. The host mode can use the RS-422, 4 wire, full duplex interface for long distance (up to 4000') single scale to computer interfacing applications. The host mode can also use the RS-485, 2 wire, half duplex interface to connect up to eight, 8530 indicators in a multidrop network to a single, RS-485 interface of a host computer. Both the single scale and multidrop host mode interfaces use the same communication protocol. The host mode will only operate with one of the interfaces at a time, either RS-232 or RS-422/485.

8530 JW Port	Signal Description	8806 8860	8860 WD	8843, 8844 8856, 8865
2	TxD RS-232C	3	C	3
3	RxD RS-232C			
4	RTS RS-232C			
5	CTS RS-232C			
7	Logic GND	7	G	7
10	(+) RxD B RS-422			
11	(-) RxD A RS-422			
12	(+) TxD B RS-422			
13	(-) TxD A RS-422			
20	DTR			

Table 6-7 JW Port Printer Interface Cable Interconnect

Printer Interface Cable Notes:

- The 8806/8860 pin numbers are for the 8806 printer and the desk version of the 8860. DO NOT use the adapter plug supplied with the 8860 when using RS-232.

8530 JW Port	Signal Description	8617 9323 9325	9330	9360	
				Desk Mount Channels 1 or 3	Wall Mount Terminal Strips J20 or J24
		TB2	TB2		
2	TxD RS-232C				
3	RxD RS-232C				
4	RTS RS-232C				
5	CTS RS-232C				
7	Logic GND				
10	(+) RxD B RS-422			11	1
11	(-) RxD A RS-422			12	2
12	(+) TxD B RS-422	6	2	13	3
13	(-) TxD A RS-422	7	3	24	4
20	DTR				
None	Jumpers	W2: RS-485	None	None	None

Table 6-8 JW Port Accessory Interface Cable Interconnect

Accessory Interface Cable Notes:

- The W2 jumper shown for the Model 8617 Scoreboard, the Model 9323 BCD Converter and the Model 9325 Analog Converter is located on the serial interface PCB inside the accessory.

- Recommended JW port connection to the 9360 is by RS-422. Channels 1 and 3 on the 9360 supply RS-422.

8530 JW Port		PC Compatible Computer	
Pin	Description	DB-25-S	DB-9-S
2 3 7	TxD RS-232 RxD RS-232 Logic Ground	3 2 7	2 3 5
PC Interface Cable Jumpers		4 5 6 8 20	1 4 6 7 8

Table 6-9 JW Port Computer Interface Cable Interconnect

PC Compatible Interface Cable Notes:

- The jumpers shown in Table 6-9 are located in the computer end of the interface cable.
- ASCII input must be enabled, setup step **[86 1]**, for bidirectional communication between the 8530 and the computer to work.

8530 JW Port	Signal Description	Host Computer	
		RS-422 Single Drop	RS-485 Multidrop
2 3 4 5 7 10 11 12 13 20	TxD RS-232C RxD RS-232C RTS RS-232C CTS RS-232C Logic GND (+) RxD B RS-422 (-) RxD A RS-422 (+) TxD B RS-422 (-) TxD A RS-422 DTR	(+) TxD B (-) TxD A (+) RxD B (-) RxD A	COM B (+) COM A (-)
8530 JW Port Jumpers		None	10 12 11 13

Table 6-10 JW Port RS-422 and RS-485 Host Mode Interconnect

Host Interface Cable Notes:

- The jumpers shown in Table 6-10 are located in the 8530 end of the interface cable.
- Single drop RS-422 or multidrop RS-485 mode is selected by setup step **[57]**.

6.6 DEMAND MODE OUTPUT

Demand mode output will occur any time a print request occurs either by pressing the **Print** pushbutton, an AutoPrint function, or a remote print command from either a remote print pushbutton, a host protocol command, or a single ASCII command character input from a host computer. The line format, baud rate and checksum are selectable in the setup mode.

Demand output is inhibited when the scale is "in motion", when the weight is under gross zero or over capacity. If the demand output is inhibited because of motion or an over capacity or under zero condition then the print request will be stored and acted upon as soon as the 8530 is no longer inhibited to output data. Demand mode output can also be inhibited by minimum print and print interlock. Zero must be captured at powerup before a demand mode output can occur.

6.6.1 Weight Field Format

6.6.6.1 Displayed Weight Format (Gross or Net)

Gross Weight

Data	STX	SO	MSD	-	-	-	-	-	LSD	SP	Units	SI	CR	CKS	LF
Note	A	B	C							D	E	B	F	G	H

Net Weight

Data	STX	SO	MSD	-	-	-	-	-	-	LSD	SP	Units	SP	N	E	T	SI	CR	CKS	LF
Note	A	B	I								D	E	D	J			B	F	G	H

6.6.1.2 Single Line: Gross, Tare, Net

Single line gross weight format is output if no tare weight has been taken.

Single Line: Gross, Tare, Net

Data	STX	MSD	-	-	-	-	-	LSD	SP	Units	SP	MSD	-	-	-	-	-	LSD	SP	Units
Note	A	C							D	E	D	C							D	E

Single Line: Gross, Tare, Net (Continued)

Data	SP	T	R	SP	SO	MSD	-	-	-	-	-	-	LSD	SP	Units	SP	N	E	T	SI	CR	CKS	LF
Note	D	J		D	B	I								D	E	D	J			B	F	G	H

6.6.1.3 Multi Line: Gross, Tare, Net

If no tare weight has been taken only the gross weight field is output.

Gross Weight

Data	STX	SP	MSD	-	-	-	-	-	LSD	SP	Units	CR	CKS	LF
Note	A	D	C							D	E	F	G	H

Tare Weight

Data	SP	MSD	-	-	-	-	-	LSD	SP	Units	SP	T	R	CR	CKS	LF
Note	D	C							D	E	D	J		F	G	H

Net Weight

Data	SO	MSD	-	-	-	-	-	-	LSD	SP	Units	SP	N	E	T	SI	CR	CKS	LF
Note	B	I								D	E	D	J			B	F	G	H

6.6.1.4 Demand Format Notes:

A - ASCII Start of Text <STX> character, hex value 02. Selectable in setup. <STX> character is required by the Models 8806, 8860 and 8865 printers.

B - ASCII Shift Out <SI> and Shift In <SO> characters, hex values 0E / 0F, select expanded print when the 8530 is connected to the 8806, 8856 and 8860 printers.

C - The gross weight and tare weight data fields are padded with leading spaces to 7 digits. A temporary stored inbound weight is printed with the memory location it was stored into after it. If power up kg is selected and lb/kg switching is disabled the decimal point in the demand mode output will be replaced with a comma

D - ASCII Space <SP> character, hex value 20.

E - Weight units (LB, kg, g, oz, oz t, or t). As selected in setup and by the lb/kg key.

F - ASCII Carriage Return <CR> character, hex value 0D.

G - Checksum character: Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> character. The checksum calculation for multiple lines of data includes the <LF> character from the previous line of data.

H - ASCII Line Feed <LF> character, hex value 0A.

I - The net weight field is right justified and padded with spaces to 8 digits.

A negative net weight is indicated by a minus character before the most significant digit of the weight value. For example a weight of -5500 is printed with three leading spaces: $^{S}_{P}{}^{S}_{P}{}^{S}_{P}$-34.5 ($^{S}_{P}$ = Space).

If bracketed printing is enabled, all truly measured weight values (instead of hand entered values) are preceded by an ASCII **<** character and followed by an ASCII **>**.

If power up kg is selected and lb/kg switching is disabled the decimal point in the demand mode output will be replaced with a comma

J - Weight field descriptors. The TR and Net legends are printed after the tare and net weight fields to identify them, the gross weight field does not have a legend.

6.6.2 Time and Date Format

The time and date format is output as listed in Table 6-11. The abbreviations in Table 6-11 are defined as:

MM = month
DD = day of month
YY = years
HH = hours
MM = minutes
PM = AM or PM
$^{S}_{P}$ = Space

Step **[73]** Selection	Time and Date Format	Clock Format
1	MM$^{S}_{P}$DD$^{S}_{P}$YY	None
2	DD.MM.YY	None
3	YY$^{S}_{P}$MM$^{S}_{P}$DD	None
4	HH:MM$^{S}_{P}$PM$^{S}_{P}$MM$^{S}_{P}$DD$^{S}_{P}$YY	12 Hour
5	DD.MM.YY$^{S}_{P}$HH:MM	24 Hour
6	YY$^{S}_{P}$MM$^{S}_{P}$DD$^{S}_{P}$HH:MM	24 Hour

Table 6-11 Time and Date Output Formats

6.6.3 Print Interlock

When print interlock is enabled, only one print per weighment is permitted. The weight on the scale must return to a stable that is less than the minimum print value to reset the interlock. After the interlock has reset, the weight on the scale must settle to a stable weight greater than minimum print value before another print can occur.

6.6.4 Autoprint

Autoprint enables the 8530 to automatically print a ticket when the weight on the scale settles to no motion greater than the minimum print value. After an autoprint, the net weight on the scale must return to a weight value less than the minimum print value to reset the autoprint feature. The **PRINT** key is disabled when autoprint is enabled.

6.6.5 Net Sign Correction

Net sign correction enables the Model 8530 to store a tare value which is greater than the gross weight on the scale and print a positive net weight. This is done by swapping the gross and tare weight values so that the larger value is the gross weight and the smaller value is the tare weight. Net sign correction only effects the demand mode data output. The continuous or host data output will continue to show a negative net weight value.

Net sign correction example:	Data output is:
Weight on the scale = 35100 lb	64080 lb
Tare weight entered = 64080 lb	35100 lb TARE
Displayed weight = -28980 lb	28980 lb NET

6.7 CONTINUOUS OUTPUT MODE

The continuous output format is output every display update (approximately 15 per second for Power Cells, approximately 9 per second for single DLC bases and approximately 12 per second for digital j-box). The continuous output format is fixed except for baud rate, parity and the selectable checksum character. The continuous output mode provides compatibility with Mettler-Toledo Scale products that require real time weight data such as the Model 8614, 8616, 8617, 8623, 9323, 9325, and 9360 accessories.

Note: Continuous data output at 1200 baud rate will slow the 8530 update rate to 6.67 updates per second. Use 4800 baud or faster to maintain the maximum update rate for batching or filling applications.

The 8530 continuous output includes three status bytes that indicate the operating conditions in the 8530. There are two different versions of the status bytes, setpoint and non-setpoint. The 3015 setpoint controller requires setpoint mode status bytes. The 9325 Analog Output converter requires non-setpoint mode status bytes.

Character	1	Status			Indicated Weight						Tare Weight						17	18
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Data	STX	SWA	SWB	SWC	MSD	-	-	-	-	LSD	MSD	-	-	-	-	LSD	CR	CHK
Notes	A	B			C						D						E	F

Table 6-12 Continuous Format Output

Continuous Format Output Notes:

A - ASCII Start of Text <STX> character, hex value 02.

B - SWA, SWB and SWC: Status Words A, B and C. Refer to Tables 6-13, 6-14 and 6-15 for setpoint mode status bytes. Refer to Tables 6-16, 6-17 and 6-18 for non-setpoint mode status bytes.

C - Displayed Weight: Six digits of displayed weight. No decimal point in field.

D - Tare Weight: Six digits of tare weight data. No decimal point in field.

E - ASCII carriage return <CR> character, hex value 0D.

F - Optional Checksum character. Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> character.

6.7.1 Status Byte Definition, Setpoint Mode [41A 0] or [51A 0]

Function	Decimal Point Selection	Bit 2	Bit 1	Bit 0
Decimal Point or Dummy Zero	X00	0	0	0
	X0	0	0	1
	X	0	1	0
	0.X	0	1	1
	0.0X	1	0	0
	0.00X	1	0	1
	0.000X	1	1	0
	0.0000X	1	1	1

Function	Bit
Setpoint 1, Feeding = 0	3
Setpoint 2, Feeding = 0	4
Always a 1	5
Setpoint 3, Feeding = 0	6

Table 6-13 Status Word A Bit Definitions

Function	Bit
Gross/Net, Net = 1	0
Under Zero, Negative = 1	1
Overcapacity = 1	2
Motion = 1	3
lb/kg, kg = 1	4
Always a 1	5
Powerup Not Zeroed = 1	6

Table 6-14 Status Word B Bit Definitions

Function	Bit
Always a 0	0
Always a 0	1
Always a 0	2
Print Request = 1	3
Setpoint 4, Feeding = 0	4
Always a 1	5
Hand Tare, Metric = 1	6

Table 6-15 Status Word C Bit Definitions

6.7.2 Status Byte Definition, Non-setpoint Mode [41A 1] or [51A 1]

Function	Selection	Bit 6	5	4	3	2	1	0
Decimal Point or Dummy Zero	X00	ALWAYS A	ALWAYS A	*		0	0	0
	X0					0	0	1
	X					0	1	0
	0.X					0	1	1
	0.0X					1	0	0
	0.00X					1	0	1
	0.000X					1	1	0
	0.0000X					1	1	1
Increment Size	X = 1	1	1	0	1	*		
	X = 2			1	0			
	X = 5			1	1			

Table 6-16 Status Word A Bit Definitions
(*) Bits Not Applicable to Function

Function	Bit
Gross/Net, Net = 1	0
Under Zero, Negative = 1	1
Overcapacity = 1	2
Motion = 1	3
lb/kg, kg = 1	4
Always a 1	5
Powerup Not Zeroed = 1	6

Table 6-17 Status Word B Bit Definitions

Function	Bit
Always a 0	0
Always a 0	1
Always a 0	2
Print Request = 1	3
Expanded Weight = 1	4
Always a 1	5
Hand Tare, Metric = 1	6

Table 6-18 Status Word C Bit Definitions

6.7.3 <ENQ> Continuous Format Mode

The <ENQ> continuous format mode is a special version of the continuous output mode that is output only when requested by sending an ASCII <ENQ> character, hex value 05. Each time an ASCII <ENQ> is received by the 8530 one continuous format message is output. The message format is identical to the standard continuous format, the status bytes are still selectable between setpoint and non-setpoint versions. The <ENQ> continuous format output is not inhibited by an unstable or out of range weight.

6.8 HOST MODE INTERFACE PROTOCOL

The JW port never transmits without a command to do so from the host computer. The RS-485 interface provides a master/satellite protocol to permit up to eight 8530's to be connected in a daisy chain network to a single host device. Each 8530 is assigned a unique scale address in setup, from 2 to 9, to distinguish one 8530 from another. The RS-232 interface can be used to connect one 8530 to one computer using the same protocol as the multidrop interface.

There are 2 basic types of communication that occur between the host and the 8530.

Upload The host requests information from the 8530, and the 8530 responds to the request.
Download The host transmits new data to the 8530.

The host interface mode has been enhanced with extended features to permit remote troubleshooting of the scale system. The original 8530 host mode is also available for compatibility with existing applications.

6.8.1 Host Mode Data Packet Format

All transmissions by the host or the 8530 are in the format shown in Table 6-19.

Data	STX	ADR	DIR	FCT	Data Field	CR	CHK
Notes	A	B	C	D	E	F	G

Table 6-19 Host Interface Message Format

Host Interface Message Format Notes:

A - <STX> ASCII Start of Text Character, Hex 02.

B - <ADR> 8530 scale address selected in setup, valid addresses are from 2 to 9 (from 32 hex to 39 hex).

C - <DIR> Data Direction, "U" = Upload (8530 to Host), "D" = Download (Host to 8530)

D - <FCT> Function code, refer to Function Code Table 6-20.

E - <Data Field> The data field is either the uploaded data from the 8530 or the downloaded data from the host. Not all function codes use the data field.

F - <CR> ASCII Carriage Return, hex value 0D.

G - <CKS> Optional Checksum Character. Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> character.

6.8.2 Host Port Function Codes

The function code character <FCT> in the message sent to the 8530 determines what operation or data is to be assessed. The codes for the various functions are listed in Table 6-20. Some functions are upload only or download only. Some functions can be both upload or download. The valid direction of the communication (upload or download) and the length of the transmitted data field is also included in Table 6-20.

No error detection beyond checksum is provided for downloads. If the 8530 ignores any command it does not understand. When critical data such as setpoint data is downloaded from the host to the 8530, it is recommended that the host device upload (read back) the data downloaded to the 8530 to verify that the data was received correctly.

Function Code Description	Function Code		Direction	Data Field Length
	Hex	ASCII		
Read All Functions	41	A	U	116
Displayed Weight	42	B	U	8
Gross Weight	43	C	U	8
Tare Weight	44	D	U/D	8
Net Weight	45	E	U	8
Time and Date	46	F	U/D	12
Next Consecutive Number	47	G	U/D	6
Status Bytes	49	I	U	2
Setup Bytes	4A	J	U/D	2
Control Bytes	4B	K	D	2
Setpoint 1	4C	L	U/D	7
Setpoint 2	4D	M	U/D	7
Setpoint 3	4E	N	U/D	7
Setpoint 4	4F	O	U/D	7
ID	50	P	U/D	12
Subtotal Accumulator	51	Q	U	11
Total Accumulator	52	R	U	11

Table 6-20 Standard Host Interface Function Codes (Setup Step **[51 1]**)

Function Code Description	Function Code		Direction	Data Field Length
	Hex	ASCII		
Status Bytes	49	I	U	9
Setup Bytes	4A	J	U/D	147
Control Bytes	4B	K	D	2
Cell #1 Raw Count Weight	53	S	U	7
.	54	T	U	7
.	69	i	U	7
Cell #24 Raw Count Weight	6A	j	U	7

Table 6-21 Expanded Host Interface Additional or Modified Function Codes (Setup Step **[51 4]**)

6.8.2.1 Read All Functions (Upload Only)

Host Transmission					
ASCII	STX	2	U	A	CR
Hex	02	32	55	41	0D

8530 Response					
STX	2	U	A	All Functions 116 Byte Data Field	CR
02	32	55	41		0D

The All Functions Data Field Consists of:

Displayed Weight: (8 Bytes) Gross Weight: (8 Bytes) Tare Weight: (8 Bytes) Net Weight: (8 Bytes) Time/Date: (12 Bytes) Next Consecutive Number: (6 Bytes) Status Bytes: (2 Bytes) Setup Bytes: (2 Bytes)	Setpoint 1: (7 Bytes) Setpoint 2: (7 Bytes) Setpoint 3: (7 Bytes) Setpoint 4: (7 Bytes) ID: (12 Bytes) Subtotal Accumulator: (11 Bytes) Total Accumulator: (11 Bytes)

Note: Weight data fields will include decimal point and sign character if required.

6.8.2.2 Displayed Weight (Upload Only)

Host Transmission					
ASCII	STX	2	U	B	CR
Hex	02	32	55	42	0D

8530 Response					
STX	2	U	B	Displayed Weight 8 Byte Data Field	CR
02	32	55	42		0D

6.8.2.3 Gross Weight (Upload Only)

Host Transmission					
ASCII	STX	2	U	C	CR
Hex	02	32	55	43	0D

8530 Response					
STX	2	U	C	Gross Weight 8 Byte Data Field	CR
02	32	55	43		0D

6.8.3.4 Tare Weight (Upload/Download)

Upload Example:

Host Transmission					
ASCII	STX	2	U	D	CR
Hex	02	32	55	44	0D

8530 Response					
STX	2	U	D	Tare Weight 8 Byte Data Field	CR
02	32	55	44		0D

Download Example:

Host Transmission						
ASCII	STX	2	D	D	Tare Weight 8 Byte Data Field	CR
Hex	02	32	44	44		0D

Note: Downloaded tare weight value must match the displayed increment type and size programmed into the 8530 or else the downloaded value is ignored.

6.8.3.5 Net Weight (Upload Only)

Host Transmission					
ASCII	STX	2	U	E	CR
Hex	02	32	55	45	0D

8530 Response					
STX	2	U	E	Net Weight 8 Byte Data Field	CR
02	32	55	45		0D

6.8.3.6 Time/Date (Upload/download)

Upload Example:

Host Transmission					
ASCII	STX	2	U	F	CR
Hex	02	32	55	46	0D

8530 Response					
STX	2	U	F	Time and Date 12 Byte Data Field	CR
02	32	55	46		0D

Download Example:

Host Transmission						
ASCII	STX	2	D	F	Time and Date 12 Byte Data Field	CR
Hex	02	32	44	46		0D

Note: Host Mode time and date format is [HHMMSSDDMMYY] HH = hours, MM = minutes, SS = seconds, DD = day, MM = month and YY = year.

6.8.3.7 Next Consecutive Number (Upload/Download)

Upload Example:

Host Transmission					
ASCII	STX	2	U	G	CR
Hex	02	32	55	47	0D

8530 Response					
STX	2	U	G	Next Consecutive Number 6 Byte Data Field	CR
02	32	55	47		0D

Download Example:

Host Transmission						
ASCII	STX	2	D	G	Next Consecutive Number 6 Byte Data Field	CR
Hex	02	32	44	47		0D

Note: Host command function code H (hex value 48) is not used with the 8530 host interface.

6.8.3.8 Status Bytes (Upload Only)

Status bytes 1 and 2 provide information about the operation of the 8530. In addition if the expanded host mode is selected, setup step **[51 4]**, setup bytes 3 through 9 include any displayed error codes.

Standard Host Mode Status Bytes:

Host Transmission					
ASCII	STX	2	U	I	CR
Hex	02	32	55	49	0D

8530 Response					
STX	2	U	I	Status Bytes: 2 or 9 bytes	CR
02	32	55	49		0D

Function	Bit
Gross/Net, Net = 1	0
Negative Weight = 1	1
Overcapacity = 1	2
Motion = 1	3
lb/kg, kg = 1	4
Always a 1	5
Powerup Not Zeroed = 1	6

Status Byte 1 Bit Definitions

Function	Bit
Setpoint 1 Feeding = 1	0
Setpoint 2 Feeding = 1	1
Setpoint 3 Feeding = 1	2
Setpoint 4 Feeding = 1	3
Print Request = 1	4
Expanded Weight Display = 1	5
Always = 1	6

Status Byte 2 Bit Definitions

Status bytes 3 through 9 are used for displayed error codes. These bytes will be all spaces when the 8530 is in the normal weighing mode. If the 8530 is in an error condition displaying an error code then these bytes will contain the ASCII characters that are displayed on the 8530. Refer to Section 7.3.3 for error code descriptions.

6.8.3.10 Setup Bytes (Upload/Download)

Setup bytes permits the host computer to change the demand mode output on the fly. if the expanded host mode is selected, setup step **[51 4]**, the status bytes will also include the number of active Power Cells, span, zero and shift adjust calibration coefficients.

Upload Example:

Host Transmission					
ASCII	STX	2	U	J	CR
Hex	02	32	55	4A	0D

8530 Response					
STX	2	U	J	Setup Bytes 2 or 147 Byte Data Field	CR
02	32	55	4A		0D

Download Example:

Host Transmission						
ASCII	STX	2	D	J	Setup Bytes 2 or 147 Byte Data Field	CR
Hex	02	32	44	4A		0D

Function	Bit	Function	Bit	
			1	0
Enable ID Autoclear = 1	2	Don't Print ID	0	0
Print CN = 1	3	Print ID Normal Size	0	1
Shift Adjust Sectional Pairs = 1 *	4	Print ID Expanded Size	1	0
Always a 0	5			
Always a 1	6			

Setup Byte 1 Bit Definition

Note: (*) Bit 4 of setup byte #1 is determines shift adjust mode (individual cell adjust or sectional pairs) same as setup step **[02]**, if expanded host mode is selected, setup step **[51 4]**.

Bit	Print Format Step 74 Selection	Bits			Time and Data Format Step 73 Selection	Bits		
6		5	4	3		2	1	0
A	1	0	0	0	0	0	0	0
l	2	0	0	1	1	0	0	1
w	3	0	1	0	2	0	2	0
a	4	0	1	1	3	0	2	1
y	5	1	0	0	4	1	0	0
s	6	1	0	1	5	1	0	1
=	7	1	1	0	6	1	1	0
1	8	1	1	1				

Setup Byte 2 Bit Definition

The expanded host mode adds the number of Power Cells selected at setup step **[03]**, and the span, zero and shift adjust calibration coefficients from setup step **[97]** to the setup byte command. The additional setup data fields are defined as follows:

Number of Power Cells: (2 Bytes) Span Multiplier: (8 Bytes) Zero Offset: (7 Bytes) Shift 1 Multiplier: (8 Bytes) Shift 2 Multiplier: (8 Bytes) Shift 3 Multiplier: (8 Bytes) Shift 4 Multiplier: (8 Bytes) Shift 5 Multiplier: (8 Bytes) Shift 6 Multiplier: (8 Bytes) Shift 7 Multiplier: (8 Bytes)	Shift 8 Multiplier: (8 Bytes) Shift 9 Multiplier: (8 Bytes) Shift 10 Multiplier: (8 Bytes) Shift 11 Multiplier: (8 Bytes) Shift 12 Multiplier: (8 Bytes) Shift 13 Multiplier: (8 Bytes) Shift 14 Multiplier: (8 Bytes) Shift 15 Multiplier: (8 Bytes) Shift 16 Multiplier: (8 Bytes)

Note: Span, zero and shift adjust calibration coefficients can only be downloaded when the 8530 is in the setup mode, (displaying the double dash **[--]** prompt).

6.8.3.11 Control Bytes

Only 1 control byte function can be used at a time. If more than 1 control byte function is desired then repeat the control byte function once for each function required.

Download:

Host Transmission							
ASCII	STX	2	D	K	CB1	CB2	CR
Hex	02	32	44	4B			0D

Function	Bit
Print Request = 1	0
Switch to lb = 1	1
Switch to kg = 1	2
Clear tare = 1	3
Autotare = 1	4
Zero = 1	5
Always a 1	6

Control Byte 1 Bit Definitions

Function	Bit
Clear Accumulators = 1	0
Reload Default Parameters = 1 *	1
Always a 0	2
Always a 0	3
Always a 0	4
Always a 0	5
Always a 1	6

Control Byte 2 Bit Definitions

Note: (*) Bit 1 of control byte #2 will reload default setup parameters only if expanded host mode is selected, setup step **[51 4]**.

Control Byte 1 example:		Control Byte 2 example:	
Print:	A @ (41, 40 hex)	Autotare:	P @ (50, 40 hex)
Switch to lb:	B @ (42, 40 hex)	Zero:	` @ (60, 40 hex)
Switch to kg:	D @ (44, 40 hex)	Clear Accumulators:	@ A (40, 41 hex)
Clear tare:	H @ (48, 40 hex)	Set Default Parameters:	@ B (40, 42 hex)

6.8.3.12 Setpoints 1, 2, 3 and 4 (Upload/Download)

The setpoint values for setpoints 1, 2, 3 or 4, are accessed individually by function codes "L", "M", "N" or "P", (hex values 4C, 4D, 4E or 4F) for setpoints 1, 2, 3 or 4.

Upload Setpoint 1 Example:

Host Transmission					
ASCII	STX	2	U	L	CR
Hex	02	32	55	4C	0D

8530 Response					
STX	2	U	L	Setpoint 1 7 Byte Data Field	CR
02	32	55	4C		0D

Download Setpoint 1 Example:

Host Transmission						
ASCII	STX	2	D	L	Setpoint 1 7 Byte Data Field	CR
Hex	02	32	44	4C		0D

Note: Downloaded setpoint value must match the displayed increment type and size programmed into the 8530 or else the downloaded value is ignored. It is highly recommended that you upload the setpoint data after a download to verify that the 8530 has accepted the downloaded setpoint value.

6.8.3.13 Numeric ID (Upload/Download)

Upload:

Host Transmission					
ASCII	STX	2	U	P	CR
Hex	02	32	55	50	0D

8530 Response					
STX	2	U	P	ID 12 Byte Field	CR
02	32	55	50		0D

Download:

Host Transmission						
ASCII	STX	2	D	P	ID 12 Byte Field	CR
Hex	02	32	44	50		0D

6.8.3.14 Subtotal Accumulator (Upload Only)

Host Transmission					
ASCII	STX	2	U	Q	CR
Hex	02	32	55	51	0D

8530 Response					
STX	2	U	Q	Subtotal Accumulator 11 Byte Field	CR
02	32	55	51		0D

6.8.3.15 Total Accumulator (Upload Only)

Host Transmission					
ASCII	STX	2	U	R	CR
Hex	02	32	55	52	0D

8530 Response					
STX	2	U	R	Total Accumulator 11 Byte Field	CR
02	32	55	52		0D

6.8.3.16 Read Load Cell Raw Count Output (Upload Only)

The expanded host mode permits the host computer to read the raw count output of each of the Power Cells in a vehicle scale. If a load cell is in an error condition then the error code is output instead of the raw count. The raw count output of each load cell is accessed individually by means of functions codes "S", "T", "U" ... "h", "i" or "j", (hex values 53, 54, 55 ... 68, 69 or 6A), for load cell addresses 1, 2, 3 ... 22, 23, or 24.

Verify the number of active load cells listed in setup bytes 3 and 4 before attempting to read the raw count output of the load cells. The 8530 will respond with a raw count value of 0000000 if you attempt to read the raw count output of a cell that does not exist.

Read Cell #1 Raw Count Output Example:

Host Transmission					
ASCII	STX	2	U	S	CR
Hex	02	32	55	53	0D

8530 Response					
STX	2	U	S	Cell 1 Raw Count 7 Byte Data Field	CR
02	32	55	53		0D

Read Cell #10 Raw Count Output Example:

Host Transmission					
ASCII	STX	2	U	\	CR
Hex	02	32	55	5C	0D

8530 Response					
STX	2	U	\	Cell 10 Raw Count 7 Byte Data Field	CR
02	32	55	5C		0D

Note: If the load cell you are attempting to read raw count data from is in an error condition the error code for that condition is sent instead of the raw count output. Refer to Section 7.3.3 for error code descriptions.

7. PREVENTIVE MAINTENANCE

This section provides instructions and procedures for maintenance of the 8530, as well as a troubleshooting guide to aid in the correction of malfunctions.

7.1 REQUIRED TOOLS AND SUPPLIES

Volt-Ohm Meter
Multiple DLC Simulator 0964-0033
Single DLC Simulator 0917-0178
Soft, Lint Free, Cleaning Cloth
Static Protection Bags for PCB's
Static Wrist Strap

7.2 CLEANING

Clean the keyboard and covers with a clean, soft cloth that has been dampened with a mild glass cleaner. Do not use any type of industrial solvent or the finish of the unit may be damaged. Do not spray cleaner directly onto the unit.

7.3 TROUBLESHOOTING PROCEDURES

If problems occur, record as much information as possible about the symptoms the scale is exhibiting before attempting to repair the scale. Perform the troubleshooting tests described next in the order listed to determine the cause of the malfunction. Always check power supply voltages before replacing any components in the scale. If the 8530 is displaying an error code then record the error code and refer to Section 7.3.3.

7.3.1 AC Power and Ground Tests

Check the AC input power. The 8530 is rated to operate at an AC line voltage of 120 VAC +10%, -15% (102 to 130 VAC). Operation with line voltage outside this range may damage the 8530 Main PCB or transformer. AC line voltages close to these minimum or maximum values indicate a marginal power source that could cause unreliable operation.

Check for AC voltage between neutral and ground on the AC input. Neutral to ground voltages greater than 0.1 VAC indicate that the ground supplied to the 8530 is low quality. The 8530 requires a high quality, true earth ground for reliable operation. Neutral to ground voltage is an indication of the quality of the power ground. Refer to the weighbridge installation manual for proper grounding procedures.

If the AC line voltage is incorrect or if there is excessive neutral to ground voltage then have a qualified electrician correct the AC power. In cases of low or high line voltage a power line conditioner may be required to correct the adverse power condition.

7.3.2 Cabling and External Equipment Tests

Visually inspect all interconnect cables for signs of damage. If an abraded or pinched cable is found, replace the damaged cable and retest the scale.

Disconnect all nonessential external equipment (printers, computers, remote displays, remote contact closure input) and retest the scale. If the problem is corrected then try reconnecting the external equipment, one piece at a time to determine the source of the problem.

7.3.3 Error Codes

If an error code is displayed then record the error code, disconnect AC power to the 8530, wait 15 seconds, then reconnect AC power. If this does not clear the error then perform the corrective measures recommended in Tables 7-1, 7-2 and 7-3.

If more than one corrective measure is listed for an error code then perform the corrective measures in the order listed and retest between measures. Check the 8530 power supplies as described in Section 7.3.4 before replacing any parts. A malfunctioning 8530 Main PCB could be due to an incorrect power supply voltage.

Error	Error Description	Corrective Measures
E1	Fatal Rom Error	1. Replace EPROM and Carrier. 2. Replace Main PCB.
E2	Fatal Internal RAM Error	1. Replace Main PCB.
E3	Corrupt SETUP Memory Error	1. Enter setup and reprogram. 2. Replace Main PCB.
E4	Fatal External RAM Error	1. Replace Main PCB.
E5	Display Verify Error	1. Replace Main PCB.
E6 E7 E8 E9 E10 E11 E13	Load Cell Analog Verify Load Cell Data Format Load Cell no communication Load Cell out of range under Load Cell RAM fault Load Cell ROM fault Load Cell NOVRAM fault	Refer to the appropriate Load Cell Error Table. Table 7-2 is for Vehicle Scale Power Cells. Table 7-3 is for Single DLC bases.
E14	Battery Backed Ram Memory Lost	1. Replace Battery 2. Check 8530 Power Supply Voltages. 3. Replace Main PCB.
E16	Math Overflow Error	1. Enter setup and reprogram. 2. Replace Main PCB.
E21	Incorrect scale capacity	Press **CLEAR** key, then enter correct capacity.
E24	Illegal high range division	Press **CLEAR** key, then enter correct division size.
E25	Illegal mid range division	Press **CLEAR** key, then enter correct division size.
E26	Illegal low range division	Press **CLEAR** key, then enter correct division size.
E27	Illegal Overcapacity Entry	Press **CLEAR** key, enter legal overcapacity value.
E32	Insufficient Test Weight Calibration Error	1. Verify correct capacity has been entered. 2. Use more test weight.
E34	Test weight larger than capacity Calibration Error	Press **CLEAR** key, test weight must be less than 105% of capacity. Verify correct capacity has been entered
E35	Incorrect Test Weight Increment Calibration Error	Press **CLEAR** key, test weight value entered must match the increment size entered in setup.

Table 7-1 Error Codes

Error	Error Description	Corrective Measures
E36	Insufficient Counts or Build to small for load cell capacity Calibration Error	1. Press **CLEAR** key to clear. 2. Check weighbridge for mechanical bind. 3. Verify correct capacity and increment size has been entered. 4. (Power Cell Scales Only) 4A. Verify shift adjust values at step **[97]** not = 0.000000 4B. Check pit power supply voltages. 5. Recalibrate with larger test weight. 6. Verify raw count cell output increases as load increases. 7. Replace Main PCB.
E37	Calibration Data Checksum Error	1. Recalibrate 8530. 2. Check 8530 Power Supply Voltages. 3. Replace Main PCB.
E50	Illegal Power Cell Command	1. Verify AC power and ground. 2. Check 8530 Power Supply Voltages. 3. Replace Main PCB.
E E E or -E E E	Scale not zeroed	1. Press **ZERO** key. 2. Check weighbridge for mechanical bind. 3. Recalibrate scale.

Table 7-1 Error Codes Continued

Load cell errors are handled differently for Power Cells and single DLC scale bases. Power Cell errors codes are followed by a two digit number to identify the Power Cell at fault. Table 7-2 describes Power Cell error codes.

The recommended corrective measures listed in Table 7-2, assume that the load cell cable for the effected load cell cable and the pit power supply voltages are checked before any parts are replaced. **Most load cell errors are caused by defective load cell cables**.

Error	Error Description	Corrective Measures
E7 XX	Data format error in Power Cell XX	1. Recalibrate scale. 2. Replace load cell. 3. Replace Main PCB.
E8 XX	No communication Power Cell XX	1. Refer to Sections 7.3.6 and 7.3.7.
E9 XX	Power Cell XX out of range under	1. Check weighbridge for mechanical bind. 4. Refer to Section 7.3.6.
E10 XX	RAM fault in Power Cell XX	1. Verify Eprom is L08 revision or higher. 2. Replace Power Cell XX. 3. Replace Main PCB.
E11 XX	ROM fault in Power Cell XX	1. Replace Power Cell XX. 2. Replace Main PCB.
E13 XX	NOVRAM fault in Power Cell XX	1. Replace Power Cell XX. 2. Replace Main PCB.

Table 7-2 Vehicle Scale Power Cell Error Codes

Error	Error Description	Corrective Measures
E6	Single DLC Analog Verify	1. Recalibrate scale. 2. Check load cell cable. 3. Check 8530 Power Supply Voltages. 4. Check 8530 Main PCB with Single DLC Simulator. 4A. If 8530 OK with DLC Simulator then replace load cell. 4B. If error with DLC Simulator, then replace 8530 Main PCB
E7	Single DLC Format Error	1. Check load cell cable. 2. Check 8530 Power Supply Voltages. 3. Check 8530 Main PCB with Single DLC Simulator. 3A. If 8530 OK with DLC Simulator then replace load cell. 3B. If error with DLC Simulator, then replace 8530 Main PCB
E8	No communication with Single DLC	1. Check load cell cable. 2. Check 8530 Power Supply Voltages. 3. Check 8530 Main PCB with Single DLC Simulator. 3A. If 8530 OK with DLC Simulator then replace load cell. 3B. If error with DLC Simulator, then replace 8530 Main PCB
E9	Single DLC out of range under	1. Check platform for mechanical bind. 2. Check load cell cable. 3. If Digital J-box verify valid increment size selection. 4. Recalibrate scale 5. Check 8530 Power Supply Voltages. 6. Check 8530 Main PCB with Single DLC Simulator. 6A. If 8530 OK with DLC Simulator then replace load cell. 6B. If error with DLC Simulator, then replace 8530 Main PCB
E10	Single DLC RAM fault	1. Check load cell cable. 2. Check 8530 Power Supply Voltages. 3. Check 8530 Main PCB with Single DLC Simulator. 3A. If 8530 OK with DLC Simulator then replace load cell. 3B. If error with DLC Simulator, then replace 8530 Main PCB
E11	Single DLC ROM fault	1. Check load cell cable. 2. Check 8530 Power Supply Voltages. 3. Check 8530 Main PCB with Single DLC Simulator. 3A. If 8530 OK with DLC Simulator then replace load cell. 3B. If error with DLC Simulator, then replace 8530 Main PCB
E13	Single DLC NOVRAM fault	1. Check load cell cable. 2. Check 8530 Power Supply Voltages. 3. Check 8530 Main PCB with Single DLC Simulator. 3A. If 8530 OK with DLC Simulator then replace load cell. 3B. If error with DLC Simulator, then replace 8530 Main PCB

Table 7-3 Single DLC Error Codes

Note: The Digital J-box will display an E9 error after calibration if an increment size is selected that is smaller than the minimum increment size listed in Section 4.7.2 of this manual. If an invalid increment size was selected then select a valid increment size and recalibrate the 8530.

7.3.4 Main PCB Voltage Checks

The transformer assembly provides AC and DC power supply voltages to the 8530 Main PCB. The 8530 Main PCB converts the AC and DC power supply voltages from the transformer assembly into the power supply voltages required for scale operation.

All DC voltages listed are measured with respect to logic ground, black meter lead connected to V1 on the 8530 Main PCB. Refer to Table 7-4 and Figure 7-1. The Power Cell supply voltage is not regulated and the value measured is determined by both the number of Power Cells in the weighbridge and the AC line voltage. The DC voltage values are based on a power AC line voltage of from 103 to 130 VAC.

Voltage	Description	Acceptable DC Voltage		Maximum AC Ripple	Plus Meter Lead	Notes
		Minimum	Maximum			
+24 VDC	Raw Supply +22	+17 VDC	+28.5 VDC	0.2 VAC	R41	1
+22 VDC	Power Cell Supply	+16.5 VDC	+28 VDC	0.2 VAC	V4	2
+18 VDC	Single DLC Supply	17 VDC	21 VDC	.05 VAC	+C40	3
+5 VDC A	+5 Logic Supply	+4.75 VDC	+5.25 VDC	0.01 VAC	+C31	4
+5 VDC B	+5 Logic Supply	+4.75 VDC	+5.25 VDC	0.01 VAC	+C32	5
+12 VDC	Raw +5 Supply + RS-232 Supply	+9.5 VDC	+14 VDC	0.2 VAC	A1-Pin 14	6
-12 VDC	- RS-232 Supply	-10 VDC	-14.5 VDC	0.2 VAC	A1-Pin 1	7
-37 VDC	Display Supply	-33 VDC	-38 VDC	0.02 VAC	-CR26	8
Battery	RAM Memory	+2.4 VDC	+3 VDC	0.02 VAC	+Battery	9
COM A	Power Cell Data Line	+1.9 VDC	+2.7 VDC	N.A.	V2	10
COM B	Power Cell Data Line	+1.9 VDC	+2.7 VDC	N.A.	V3	

Table 7-4 Main PCB DC Power Supply Voltage Checks

Main PCB DC Voltage Notes:

1 - **+24 VDC**: Raw Power Cell supply voltage, measured at top end of resistor R41.

2 - **+22 VDC**: Power Cell supply voltage, measured at left end of V4. The +22 volt supply is switched off during cell addressing, setup steps **[04]**, **[91]** and **[92]**.

3 - **+18 VDC**: Single DLC supply voltage, measured at positive (top) end of capacitor C40.

4 - **+5 VDC A**: Regulated control logic supply, measured at positive end of capacitor C31.

5 - **+5 VDC B**: Regulated display logic supply, measured at positive end of capacitor C32.

6 - **+12 VDC**: + RS-232 and raw +5 VDC supply, measured at pin 14 of IC A1.

7 - **-12 VDC**: - RS-232 Supply, measured at pin 1 of IC A1.

8 - **-37 VDC**: Display voltage, measured at negative end of diode CR26.

9 - **Battery**: Battery Backed RAM Memory, measured at positive terminal of battery with AC power disconnected.

10 - **COM A and COM B:** The Power Cell COM A and COM B data lines are toggling between ground and +5 VDC approximately 375,000 times per second. The COM line will measure about 2.4 VDC with the home run load cell cable disconnected from the J1 load cell connector the 8530 indicator. Replace the 8530 Main PCB if the COM voltages are incorrrect with the home run cable disconnected.

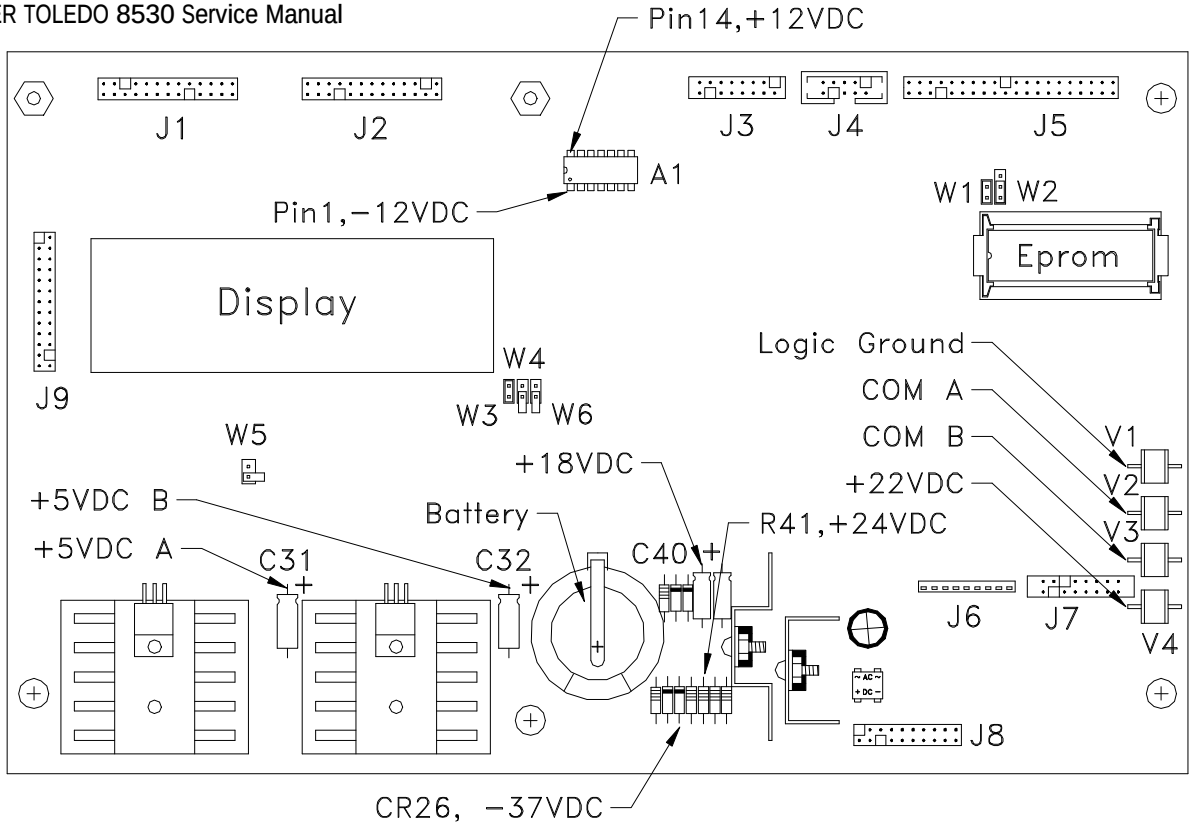


Figure 7-1 8530 Main PCB Test Points

7.3.5 Transformer Assembly Power Supply Tests

If any of the Main PCB DC voltages listed in Section 7.3.4 are missing or incorrect, or if the 8530 display is totally blank, then check the AC transformer voltages.

The transformer assembly supplies three AC supply voltages and the raw +24 VDC Power Cell supply to the 8530 Main PCB. All AC supply voltage checks are measured across the pins indicated in Table 7-5 and Figures 7-2 and 7-3.

CAUTION!

Do not apply AC power to the 8530 with the transformer assembly unplugged from the J8 connector on the 8530 Main PCB. The 22,000 µF capacitor in the Transformer Assembly will be charged and will retain a charge after the AC power is disconnected.

If this situation occurs, measure the DC voltage across the 22,000 µF capacitor. Wait for the charge on the capacitor to totally dissipate before plugging the Transformer Assembly back into the J8 connector on the 8530 Main PCB.

Damage to the 8530 Main PCB could occur if the Transformer Assembly is plugged into the J8 connector on the 8530 Main PCB while the 22,000 µF capacitor is still charged.

Voltage	Acceptable Voltage		Plus Meter Lead	Minus Meter Lead	Notes
	Minimum	Maximum			
9.5 VAC	8 VAC	11 VAC	J8-14	J8-11	1
9.5 VAC	8 VAC	11 VAC	J8-16	J8-11	
37 VAC	30 VAC	40 VAC	J8-1	J8-3	2
1.7 VAC	1.4 VAC	1.8 VAC	J8-6	J8-12	3
1.7 VAC	1.4 VAC	1.8 VAC	J8-8	J8-12	
17 VAC	14 VAC	19 VAC	CR1-AC	CR1-AC	4

Table 7-5 Transformer Assembly AC Voltage Checks

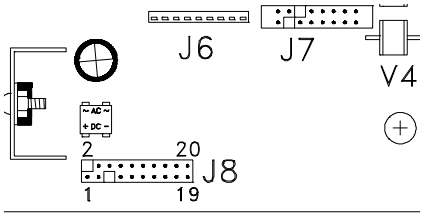


Figure 7-2 Main PCB J8 Connector

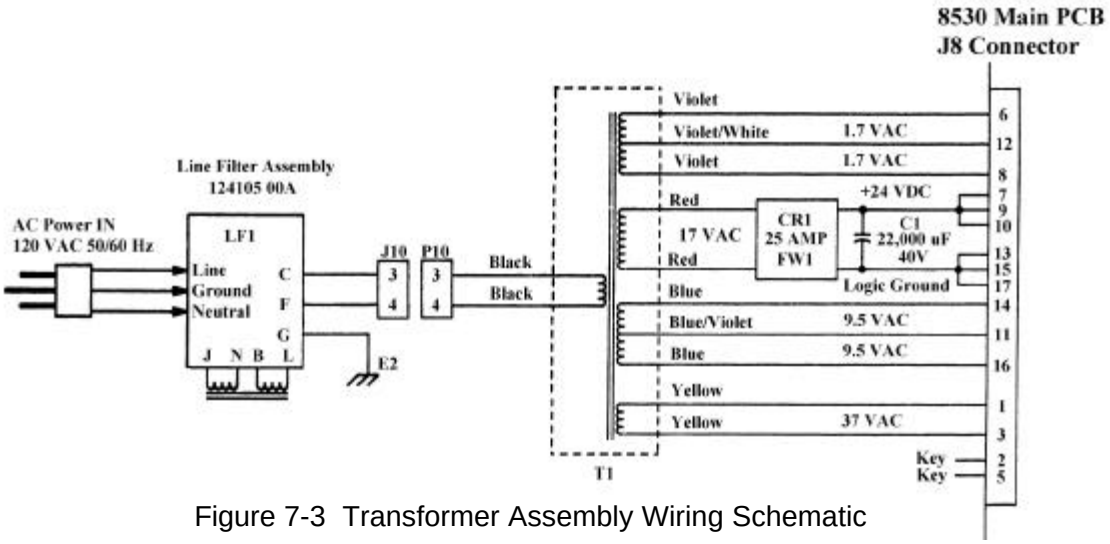


Figure 7-3 Transformer Assembly Wiring Schematic

Transformer AC Voltage Checks Notes:

1 - **9.5 VAC**: Raw AC supplies for the ±12 VDC supplies, measured across pins 14 and 11, and across pins 16 and 11, of the J8 connector on the 8530 Main PCB.

2 - **37 VAC**: Raw AC supply for the -37 VDC display supply, measured across pins 1 and 3 of the J8 connector on the 8530 Main PCB.

3 - **1.7 VAC**: Filament voltages for display tube, measured across pins 6 and 12, and across pins 8 and 12, of the J8 connector on the 8530 Main PCB.

4 - **17 VAC**: Raw AC supply for the +24 VDC Power Cell supply, measured across the AC terminals of the bridge rectifier CR1, located behind the 8530 Main PCB. **Check the 17 VAC power supply only if the +24 VDC Power Cell supply is missing or incorrect.**

7.3.6 Power Cell Weighbridge Troubleshooting

There are two type of Power Cells used in DigiTOL® weighbridges, the NMOS Power Cell and the CMOS Power Cell. The CMOS Power Cell is a new type of cell that can operate directly from the +22 VDC supply from the 8530 and does not require the Pit Power Supply PCB. The CMOS Power Cell can be used to replace a NMOS Power Cell in an existing weighbridge and will operate with the Pit Power Supply PCB. The NMOS Power Cell can not be used in CMOS weighbridges that do not have the Pit Power Supply PCB.

The CMOS Power Cells can also be used with the Intrinsic Safety Barrier, Model Number 0917-0198 in areas classified as Hazardous by the National Electrical Code (NEC) because of combustible or explosive atmospheres. **The 8530 indicator MUST be located in the nonhazardous are if used with the CMOS Power Cell and the intrinsic safety barrier**. Refer to the 0917-0198 CMOS Intrinsic Safety Barrier installation instruction manual and the DigiTOL® Hazardous Area Wiring Diagram, TC100442, for troubleshooting information.

The 8530 communicates with the Power Cells using a master/satellite, two wire, half duplex, multi-drop communication protocol at 375,000 baud. The 8530 is the master and the Power Cells are satellites that transmit data only when the 8530 requests data. The COM A and COM B data lines from the 8530 are wired in parallel, to all Power Cells. A shorted data line can result in **[E8]** error codes for some or all Power Cells in the weighbridge.

7.3.6.1 NMOS Weighbridges (Pit Power Supply PCB)

The home run cable from the 8530 terminates in the weighbridge at the Pit Power Supply PCB. The Pit Power Supply converts the +22 VDC Power Cell supply from the 8530 into the +18.5 VDC and +8.5 VDC power supplies required by NMOS Power Cells. The Pit Power Supply has connections for six Power Cells. Weighbridges with more cells use the Pit Power Supply Expander PCB to provide more Power Cell connections.

All DC voltages listed are measured with respect to logic ground, black meter lead connected to pin 5 of Terminal strip J6 on the Pit Power Supply PCB. The +22 VDC Power Cell supply voltage is not regulated and the value measured is determined by both the number of Power Cells in the weighbridge the AC line voltage and the length of the home run cable. The DC voltage values are based on a power AC line voltage of from 103 to 130 VAC. Refer to Table 7-6 and Figure 7-4 for test points.

Voltage	Description	Acceptable DC Voltage		Maximum AC Ripple	Plus Meter Lead	Notes
		Minimum	Maximum			
+22 VDC	Power Cell Supply	+16 VDC	+28 VDC	0.2 VAC	J6-Pin 1	
+8.5 VDC	Cell Logic Supply	+7.5 VDC	+9 VDC	0.2 VAC	J1-Pin 4	1
+18.5 VDC	Cell Analog Supply	+17 VDC	+19 VDC	0.2 VAC	J1-Pin 3	
COM A	Data Line	+1.9 VDC	+2.7 VDC	N.A.	J6-Pin 8	2
COM B	Data Line	+1.9 VDC	+2.7 VDC	N.A.	J6-Pin 7	
Chassis Ground	Chassis Ground	-1 VDC	+1 VDC	1 VAC	Ground Pad	3

Table 7-6 Pit Power Supply PCB Voltage Checks

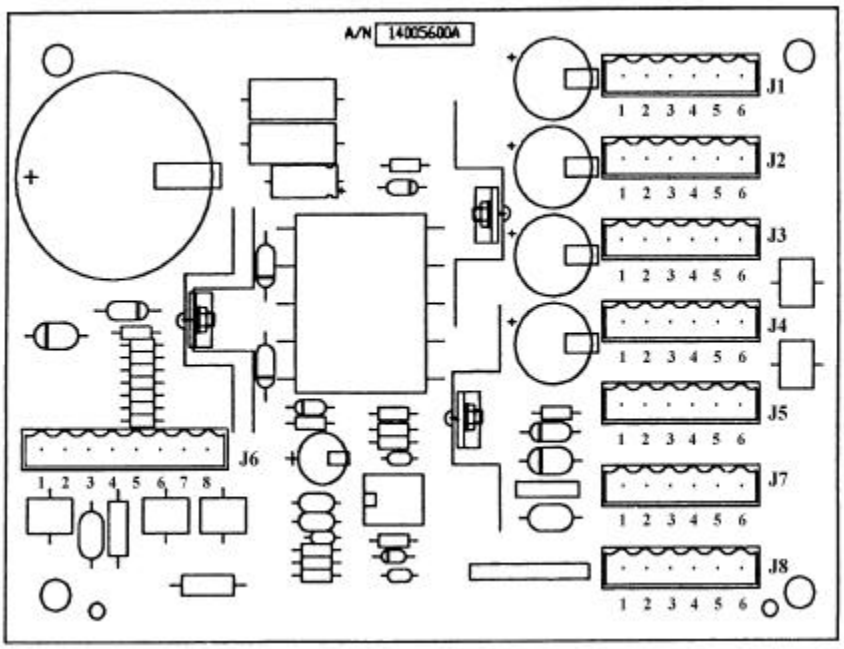


Figure 7-4 Pit Power Supply PCB

Pit Power Supply Voltage Checks Notes:

1 The Pit Power Supply is short circuit protected, if the +8.5 or +18.5 VDC power supplies are shorted to ground, the Pit Power Supply PCB will shut down to prevent damage. When the short is removed the power supply voltage will come back. If the +8.5 or the +18.5 VDC power supply voltages are missing or very low, disconnect all Power Cells and cell cables from the Pit Power Supply and retest. If the missing power supply voltage is now ok, reconnect one Power Cell and cable at a time to find the fault.

2 The COM A and COM B data lines are toggling between ground and +5 VDC at 375,000 times per second. A voltmeter will measure the average voltage of the COM line which should be about 2.3 VDC. The actual level of the voltage measured is not critical, the important thing is that the COM lines are the same and are not high or low. If one of the COM lines is high or low, then disconnect all of the Power Cells and load cell cables from the Pit Power Supply and measure the COM line voltages again. If the COM line voltages tested ok at the 8530 Main PCB but are bad with the Pit Power Supply connected then Pit Power Supply is probably defective.

The Pit Power Supply includes surge voltage suppression devices on the power supply lines and on the COM A and COM B data lines to protect the Power Cells and 8530 from lightning induced surge voltages. The surge suppression devices can fail by shorting to chassis ground. Testing the Pit Power Supply PCB requires a digital multimeter that has a diode test setting.

A good Pit Power Supply will measure as an open circuit between the COM lines and chassis ground when using the diode test setting on you digital multimeter. Reverse the polarity of your meter leads and recheck between the COM lines to chassis ground, you should get the same open circuit reading. If the diode test setting on your digital multimeter shows a measurable resistance between chassis ground and either of the COM A or COM B data lines, then the Pit Power Supply is defective.

3 An excessive voltage between chassis ground and logic ground (greater than 1.5 volts) can cause a problem with intermittent **[E8]** error codes. This condition is aggravated by connecting to the RS-232 interface on either the JN or JW serial port. Voltage between chassis ground and logic ground is typically caused by leakage between the +18.5 VDC supply and chassis ground. Disconnect any external equipment from the 8530 and disconnect all Power Cells and cell cables from the Pit Power Supply and retest. Reconnect one Power Cell and cable at a time to find the source of the chassis ground to logic ground voltage.

7.3.6.2 CMOS Weighbridge (Nonhazardous Area Version Only)

CMOS Power Cell Weighbridges use a Connector PCB in place of the Pit Power Supply. The home run cable from the 8530 terminates at terminal strip J8 of the Connector PCB. The Connector PCB has terminations for six CMOS Power Cells. Weighbridges with more that six cells add a second or third Connector PCB in a daisy chain fashion with terminal strip J1 of the first Connector PCB wired to terminal strip J8 on the next Connector PCB.

All DC voltages are measured with respect to logic ground, black meter lead connected to terminal strip J2-GND on the Connector PCB. The DC voltage values listed in Table 7-7 are based on a power AC line voltage of from 103 to 130 VAC. Refer to Table 7-7 and Figure 7-5 for test points.

Voltage	Description	Acceptable DC Voltage		Maximum AC Ripple	Plus Meter Lead	Notes
		Minimum	Maximum			
+22 VDC	Power Cell Supplies: +VA, +VB and +VC	+16 VDC	+28 VDC	0.2 VAC	J2-VA J3-VB J4-VC	1
COM A	Data Line	+0.8 VDC	+2.7 VDC	N.A.	J2-A	2
COM B	Data Line	+0.8 VDC	+2.7 VDC	N.A.	J2-B	
Ground	Chassis Ground	-1 VDC	+1 VDC	1 VAC	J2-CGND	3

Table 7-7 Connector PCB Voltage Checks

Note: Intrinsically Safe versions use a reduced Power Cell supply voltage that will typically measure between 8.0 to 10.5 VDC.

Intrinsically Safe versions Power Cell COM A and COM B data line voltages will typically measure 0.5 VDC with 6 Power Cells connected to a home run cable.

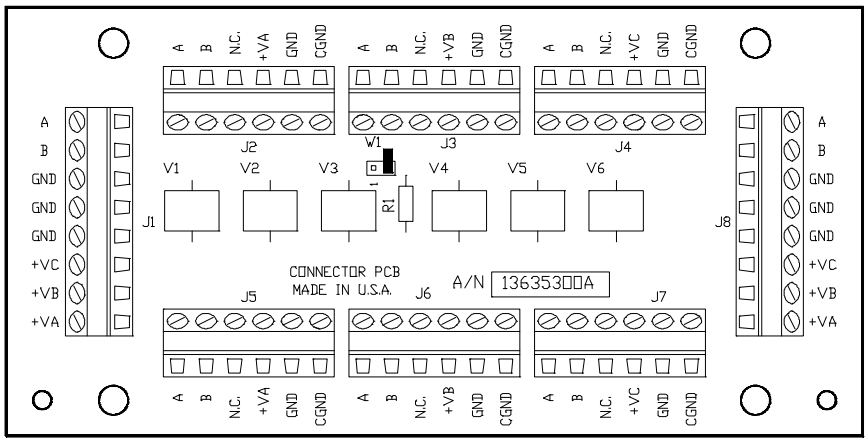


Figure 7-5 CMOS Power Cell Connector PCB Test Points

CMOS Power Cell Connector PCB Voltage Checks Notes:

1 The +22 VDC Power Cell Supply voltage is split into three, +22 VDC supply lines +VA, +VB and +VC. Each +22 VDC power supply is wired and measured independently.

2 The COM A and COM B data lines are toggling between ground and +5 VDC 375,000 times per second. The average DC voltage measured between the COM lines and ground for the CMOS Power cells varies with the number of Power Cells in the system. COM line voltage will vary from 2.5VDC (with no cells connected) to 0.8 VDC, with 12 cells connected). The COM A and COM B voltage will drop with each successive load cell plugged into the system. The actual level of the voltage measured is not critical, the important thing is that the COM lines are close to the same value and are not high or low.

If one of the COM lines is high or low, then disconnect all of the Power Cells and load cell cables from the Connector PCB and measure the COM line voltages again. If the COM line voltages tested ok at the 8530 Main PCB but are bad with the Connector PCB connected then Connector PCB is probably defective.

The Connector PCB includes surge voltage suppression devices on the power supply lines and on the COM A and COM B data lines, to protect the Power Cells and 8530 from lightning induced surge voltages. The surge suppression devices can fail by shorting to chassis ground. To test the Connector PCB requires a digital multimeter with a diode test setting. A good Connector PCB will measure as an open circuit between the COM lines and chassis ground when using the diode test setting on you digital multimeter. Reverse the polarity of your meter leads and recheck between the COM lines to chassis ground, you should get the same open circuit reading. If the diode test setting on your digital multimeter shows a measurable resistance between chassis ground and either of the COM A or COM B data lines, then the Connector PCB is defective.

3 An excessive voltage between chassis ground and logic ground can cause a problem with intermittent **[E8]** error codes. This condition is aggravated by connecting to the RS-232 interface on either the JN or JW serial port. Voltage between chassis ground and logic ground is typically caused by leakage between the +22 VDC supply and chassis ground. Disconnect any external equipment from the 8530 and disconnect all Power Cells and cell cables from the Connector PCB and retest. Reconnect one Power Cell and cable at a time to find the source of the chassis ground to logic ground voltage.

7.3.7 Troubleshooting Intermittent Power Cell [E8] Error Codes

A reoccurring problem with intermittent E8 error codes displayed on the 8530 display may result from several different problems. Listed below are suggestions to assist you in eliminating intermittent E8 error codes.

1 Visually inspect all load cell cables and load cell connectors for damage. Flex the load cell cable where the cable comes out of the load cell connector and observe the 8530 for errors. Any load cell cable that is bent very sharply at the load cell connector may be damaged internally. Verify that all load cell connectors are clean and greased and show no signs of corrosion. A damaged load cell cable may also result in intermittent **[E9]** error codes.

2 Verify that all cable wiring is tightly terminated at j-box terminal strips. Gently pull on individual wires and tighten any loose terminal strip screws in the pit power supply and pit supply expanders. Check for corrosion on cable wiring.

3 For NMOS Power Cells check the +18.5 VDC, +8.5 VDC power supplies from the pit power supply. The pit power supply is short circuit protected and DC output voltages turn off automatically if a short occurs. The output voltages turn back on automatically when the short is removed. For CMOS Power Cells check the +22 VDC power supply to the Connector PCB.

4 Disconnect ALL external equipment such as scoreboards, printers, computers, etc. from the 8530 and determine if the intermittent E8 error codes are eliminated. Connection of the 8530 communication ports to external equipment can result in intermittent E8 error codes. Data cables routed in the same conduit as AC power lines can cause erratic operation and **[E8]** error codes to be displayed on the 8530. There is another possible problem with external equipment connected to the 8530 by means of the RS-232 or RS-422/485 interfaces:

Most computers and printers connect logic ground to chassis ground. The 8530 is designed with a floating logic ground for increased protection from lightning damage. When the RS-232 interface of the 8530 is connected to a computer that connects logic ground to chassis ground this also connects the logic ground of the 8530 to chassis ground. This logic ground to chassis ground connection can cause intermittent "E8" errors in the 8530.

Caution: Connecting the logic ground of the 8530 to chassis ground will degrade the lightning immunity of the 8530.

If the RS-232 or RS-422/485 interfaces are the cause of the **[E8]** error codes or if there is a history of lightning related damage, an optical isolator should be installed between the 8530 and the external device. Contact technical support at 1-(800)-786-0040, for optical isolator recommendations for RS-232 or RS-422/485 interfacing. The JN Port 20 mA current loop interface is optically isolated and does not require additional isolation.

5 Measure between the COM A to ground and COM B to ground. The COM lines toggle between 0 and +5 VDC. A typical DVM will read between 1.9 VDC and 2.7 VDC between a COM line and ground for NMOS Power Cells (0.8 to 2.7 for CMOS Power Cells) when the 8530 and Power Cells are communicating properly. If one of the COM lines is disconnected from the 8530, a common symptom is a constant **[E8]** error code for a particular cell which suddenly changes to a constant **[E8]** error code for a different cell.

If one of the COM lines is "dead" (sitting solid at a voltage near 0 VDC or +5 VDC) and is not toggling, then the 8530 Main PCB may be defective. A "dead" COM line can also be caused by a damaged pit power supply, a shorted cell cable or a damaged cell. Try disconnecting part of the scale from the indicator (example: disconnect the expander PCB) and see if the "dead" COM line voltage becomes active.

6 Check the +22 VDC supply from the 8530 at the pit power supply terminal strip TB6. If the +22 VDC supply is below +16.5 VDC then refer to the weighbridge installation manual and for the maximum cable length allowed for scale base used. Also verify the AC line voltage. Low AC line voltage can cause intermittent **[E8]** error codes. Large office machines such as photocopiers or refrigerators can cause a low line voltage if powered from the same AC power source as the 8530. A constant voltage AC power source should be installed if low AC line voltage is detected. Contact technical support at 1-(800)-786-0040 for constant voltage power source recommendations.

7.3.8 Weighing Problems with Single DigiTOL© Load Cell

If there is a problem with a single DigiTOL© load cell that is unstable, changing weight readings, or displaying a cell error code, first check the +18 VDC cell excitation supply. Refer to Section 7.3.4 for power supply voltage checks. If the load cell excitation voltage is correct then the problem is most likely either a mechanical problem in the scale base or a defective cell. To verify that the problem is in the base replace the scale base with the Single DLC simulator. The single DLC interface will only work with the single DLC simulator, factory number 0917-0178. The multiple load cell simulator, factory number 0964-0033, will not work with the single DLC interface.

If the 8530 operates correctly with the load cell simulator then the problem most likely is either a defective or incorrectly wired load cell cable or a malfunction in the DigiTOL© load cell. If the 8530 has the same weighing problem when connected to a load cell simulator then the problem is most likely due to a defective Main PCB.

7.3.9 Other Problems

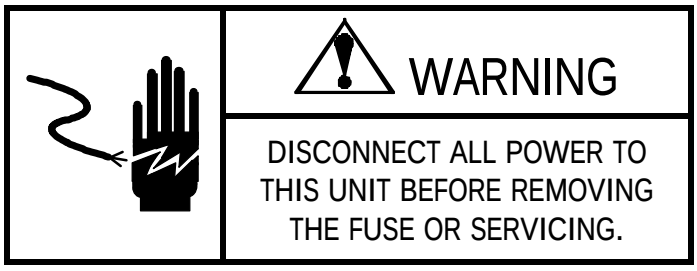
Operational or data output problems may be due to incorrect setup. Verify setup parameters, jumper selections and operating procedures as described in Sections 4 and 5 of this manual. If the problem is with data output, verify that the interconnect cable is wired correctly. Refer to Section 6.3 and 6.4.

Malfunctions in the 8530 can often be located most quickly by parts substitution. Verify all indicator power supply voltages as described in Section 7.3.4 before replacing any components in the 8530. Refer to the Interconnect Diagram in Section 10. for additional troubleshooting information.

Replacing it with a known good PCB, and then observing whether the problem is corrected can check a printed circuit board believed to be defective. Do not automatically program the replacement PCB like the suspect PCB as the problem could be caused by a programming error. Refer to Section 4 for programming information.

Use a properly grounded static wrist strap when handling PCBs. Use an antistatic bag to store both the new and the suspect PCB. Once the problem is corrected, reinstall all replaced PCBs, one at a time and retest. This step will eliminate replacing good PCBs. Exchange PCBs or sub-assemblies are available from your authorized METTLER TOLEDO representative.

7.4 MAIN PCB REPLACEMENT



Open the enclosure as described in Section 4.2 of this manual.

Remove the Main PCB by removing the six phillips head PCB retaining screws. Remove the two display mask standoffs. Disconnect all harnesses from the Main PCB.

There is a EPROM and chip carrier near the right top edge of the Main PCB. A red adhesive label on top of the IC (integrated circuit) designates it with the part number 12883100A. Grab the ends of the carrier assembly and lift the carrier and EPROM from the mating socket on the PCB.

Install the EPROM and chip carrier assembly into the replacement Main PCB. Remove the white insulator card from the battery holder. Verify Main PCB jumper settings.

Reinstall the Main PCB into the 8530 enclosure, reconnect all harnesses and seal the enclosure.

7.5 NOVRAM BATTERY REPLACEMENT

Time and date, stored tare weights, setpoint values, ID, CN and accumulated data is stored in battery backed nonvolatile RAM to prevent loss of data if AC power is removed.

If the 8530 loses battery backed data when the AC power is removed, then the lithium battery on the Main PCB may have failed. Refer to Section 7.3.3 for battery voltage test points.

Open the enclosure as described in Section 4.2 of this manual.

Put on the rubber gloves provided with the lithium battery kit. The gloves are to protect the battery surface from oils and acids from your skin. **The conductive surface of the battery MUST be kept clean or the battery will fail prematurely**.

Carefully slide the battery out of the holder. Slide the replacement battery into the holder. Be sure to install the new battery with the plus side of the battery showing. Be careful not to contaminate the surface of the new battery.

Enter the setup mode and reprogram the 8530. Time and date, stored tare weights, setpoint values, ID, CN and accumulated data will be lost and will need to be reentered.

8. GENERAL INFORMATION

8.1 RECOMMENDED SPARE PARTS

It is recommended that these spare parts be kept in stock in order to keep downtime to a minimum. Contact your local authorized METTLER TOLEDO service representative.

Part Number	Description	Qty.
134604 00A	Main PCB	1
128150 00A	EPROM and Carrier	1
130119 00A	Keyboard Assembly	1
134054 00A	Replacement Lithium Battery (RAM memory backup)	1
112509 00A	Fuse, 1 A, Slow Blow	1

Note: Part Numbers listed may have a letter prefix

In addition to the items listed, an 8530 Parts Catalog, part number PC008530 I00, should be ordered to have on hand for replacement of items not listed.

8.2 CABLES AND MATING CONNECTORS

To remove wall version connectors press the connector in toward the enclosure and twist the connector counterclockwise.

8.2.1 Desk and Rack Versions Mating Connectors

Connector	Part Number	Factory Number
J1 Load Cell Connector Kit	125819 00A	0917-0117
J1 Load Cell Pigtail Adapter	TA100357-C	N.A.
Serial I/O Connector JN, JW	128881 00A	0917-0144

8.2.2 Wall Versions Mating Connectors

Connector	Description	Part Number	Factory Number
Load Cell: J1	Connector	125820 00A	0917-0118
Serial, JN	Connector KOP	126232 00A	0917-0121
Serial, JW	Connector	128860 00A	0917-0138

Note: Wall mount connectors require cleaning and potting KOPs, refer to Section 8.3.2.

8.2.3 Desk/Rack Enclosure Printer Interconnect Cables

Model	Cable Length	Interface Used	Part Number	Factory Number
307	6' 20'	20 mA CL	119714 00A 119715 00A	0900-0191 0900-0199
8806, 8860 Desk	6' 20'	20 mA CL	115544 00A 115545 00A	0900-0136 0900-0137
8843, 8844	6'	20 mA CL	138216 00A	n/a
8855	6' 20'	20 mA	119722 00A 119723 00A	0900-0197 0900-0198
8856, 8865	6'	RS-232	128220 00A	0900-0214

Notes:

Part Numbers listed may have a letter prefix

8860 Desk version cables require the 20 mA CL adapter plug supplied with 8860.

The cable listed for the 8843 and 8844 document printers uses the 20 mA CL interface, the 8843 is shipped from the factory configured for RS-232. The serial interface PCB in the document printer must be configured for 20 mA CL to be used with the 8530. Refer to the 8843 and 8844 technical manuals, TM008843 I00 or TM008844 I00, for serial interface PCB configuration instructions.

8.2.4 Wall Enclosure Printer Interconnect Cables

Model	Length	Interface	Part Number	Factory Number
307	6' 20'	20 mA CL	122570 00A 122571 00A	0900-0180 0900-0181
8806, 8860 Desk	6' 20'	20 mA CL	122574 00A 122575 00A	0900-0188 0900-0189
8855	6' 20'	20 mA	122578 00A 122579 00A	0900-0186 0900-0187
8856, 8865	20'	RS-232	128221 00A	0900-0215
8860 WD	25'	RS-232	125058 00A	0900-0203

Note: Refer to Desk/Rack Enclosure printer interconnect cable notes in section 4.2.3

8.3 OPTIONAL ACCESSORIES

8.3.1 Desk Enclosure Optional KOPs

Option Description	Part Number	Factory Number
JW Serial Port	130109 00A	0917-0146
Base Mounting Plate	124159 00A	0901-0178
Panel Mounting KOP	133149 00A	0917-0201

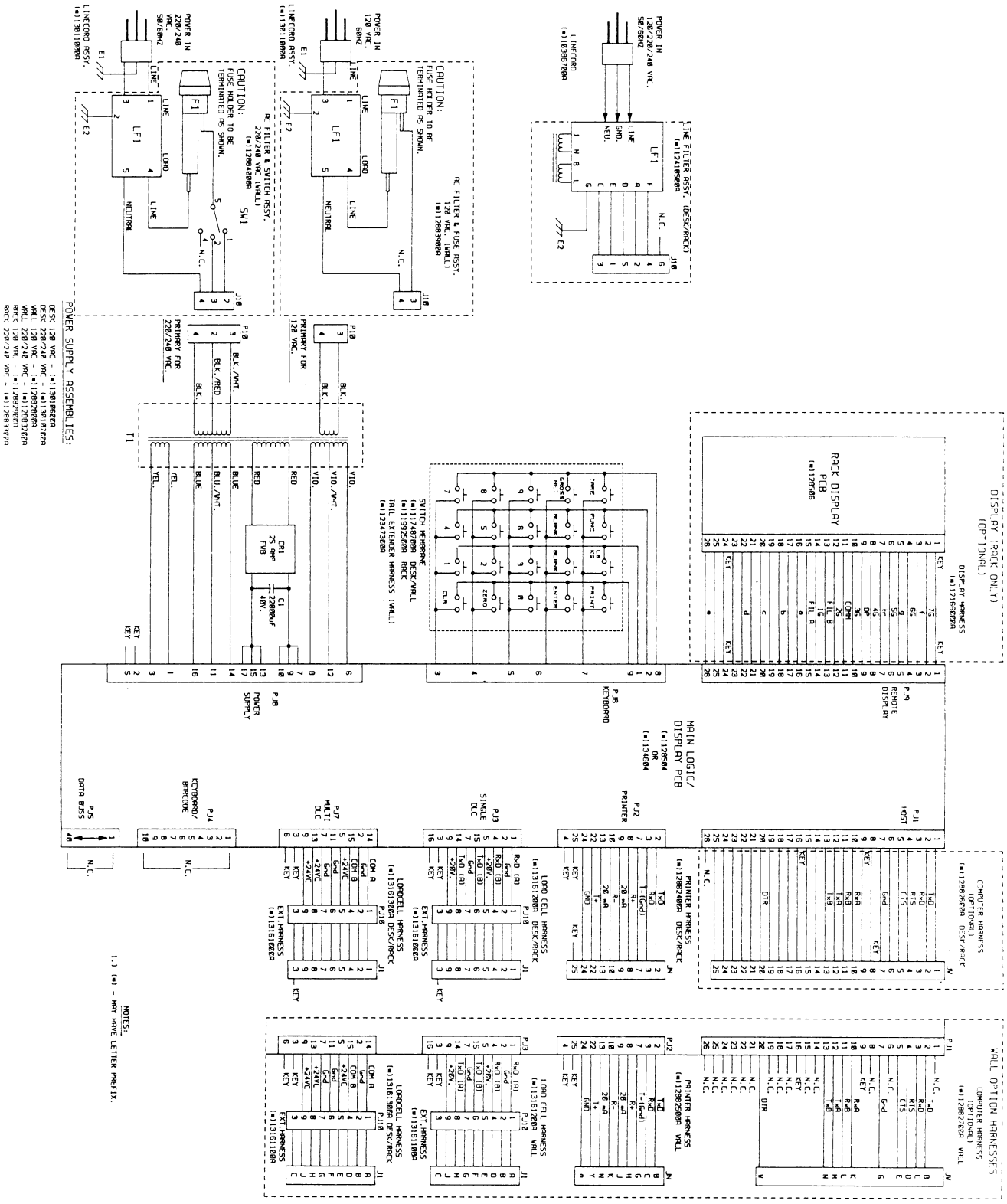
8.3.2 Wall Enclosure Optional KOPs

Option Description	Part Number	Factory Number
JW Serial Port	130108 00A	0917-0145
Connector Potting KOP	125839 00A	0901-0194
Connector Potting KOP Refills	125874 00A	0901-0195
Connector Cleaning KOP	125875 00A	0901-0196

8.3.3 Rack Enclosure Optional KOPs

Option Description	Part Number	Factory Number
Panel Mount KOP	106299 00A	0917-0005
JW Serial Port	130109 00A	0917-0146

9. INTERCONNECT DIAGRAM



METTLER TOLEDO
Scales & Systems
350 W. Wilson Bridge Road
Worthington, Ohio 43085-2273
(614) 438-4511

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