9215

Technical Manual

INTRODUCTION

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

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

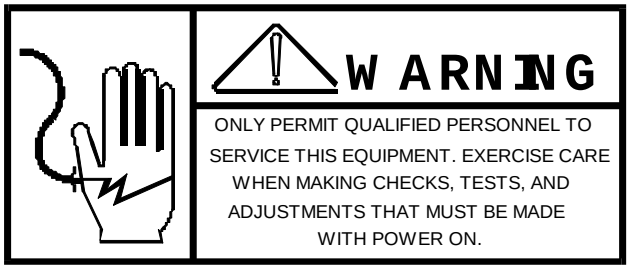
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

- **READ** this manual before operating or servicing this equipment.

- **ALWAYS REMOVE POWER** and wait at least 30 seconds **BEFORE** connecting or disconnecting any internal harnesses. Failure to observe these precautions may result in damage to, or destruction of the equipment.

- **ALWAYS** take proper precautions when handling static sensitive devices.



- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **SAVE** this manual for future reference.

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

- **ALWAYS DISCONNECT** this equipment from the power source before servicing.

- **CALL** METTLER TOLEDO for parts, information, and service.

CONTENTS

1.0 INTRODUCTION

The 9215 BATCHELOR gives a powerful, yet inexpensive way to quickly, accurately and automatically control batching operation(s). With 999 lines of formula storage capacoty that can be split up into a total of 99 formulas, the 9215 insures optimum utilizatoin of it's formula memory. There are twenty (20) standrd action codes to choose from for batch sequencing. These powerful commands can be entered in a formula in any order for total flexibility in meeting the batch process needs. The 9215 is capable of automatically controlling up to 16 materials with two (2) speed feed and discharge capability, and can provide discrete batching interlocks such as cycle complete, batch ready, ok to discharge, remorte start and stop, etc.

Operation of the 9215 is as easy as selecting a formula to be run and pressing <START>. The 9215 can be programmed to automatically check zero tolerance prior to starting a batch process as well as insuroing that the discharge gate is closed. The weighing of each material is based on net weight. The material tolerance is checked after each weightment to insure correct quantity of each ingredient efore proceeding to the next sequence. When the batch is totally weighed, a batch ready signal is generaed and a ceck of downstream status is made prior to actuially discharging the scale. These features are designed into the 9215 to eliminate waste and improve quality that can be lost due to human errors.

The 9215 can also provide additional information such as batchlog, batch summary, inventory and material usage information. material and formula files and system status through either the printer port, for hard copy documentation or the host port for data based systems.

1.1 STANDARD FEATURES

HIGH PERFORMANCE SCALE INSTRUMENTATION - the 9215 uses high quality instrumentation that can be used with either analog, DigiTOL® or High Precision bases.

ACCURATE TOLERANCE CHECKING - Independent tolerance checking for each material insures accuarcy for each material. Zero tolerance check and batch correction features further insures optimum batch quality and consistency.

SUPERIOR WEIGHT FILTERING - Protects against weighing inaccuracy. Gives true weight in less time and reduces fine-tuning installation costs.

MANUAL CONTROLS - The processor assisted controls provide flexibility to adjust batches manually and record the weightment.

PREACT AND AUTO PREACT ADJUST - Allows increased throughput without sacrificing accuracy. Even more precision is obtained is obtained with auto preact with auto preact adjustment.

BIDIRECTIONAL HOST COMPUTER PORT - Permits upload and download of formulas and materials for remote data storage. Each 9215 can be addressed to allow mulitple units to connect to an RS-422/485 network.

REMOTE I/O AND SmartLink NETWORK - Minimizes wiring which reduces installation costs. I/O devices controlled by the 9215 are wired to the SmartLink I/O Module installed close to these devices.

BUILT-IN SAFETY FEATURES - There are basic system interlocks for both feed and discharge including a watchdog timer circuits to automaticlly remove control power in the event of certain software of hardware failures.

POWER LOSS MEMORY PROTECTION - All formulas, material files and accumulator files are protected by battery backed-up RAM.

1.2 ADVANCED FEATURES

The 9215 has some advances capabilities that are only available through the “9215 BATCHeLOR Data Manager”. These features incluse: PC storage and maintenance of Formula and Material files, custom ladder logic programming, and custom format reports. Refer to “ADVANCED FEATURES” section for further details.

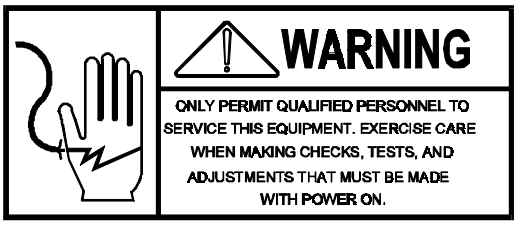
1.3 BATCHING TERMINOLOGY

This 9215 Technical Manual includes many concepts that are unique to automatic control in batch weighing so a Glossary in Section 11.0 is included to help the reader with unfamiliar terms and concepts.

1.4 OPTIONS

Printers: Strip, document or ticket printers may be used with the 9215.
Remote SmartLink I/O: Remote I/O may be provided to allow expansion capability up to a system maximum of 128 I/O.
Remote Weight Display: The Mettler Toledo model 8623 Remote Display may be used to provide remote gross scale weight indication.

1.5 SERVICE/TRAINING INFORMATION



SERVICE INFORMATION AND STARTUP ASSISTANCE

The service of a Mettler Toledo Technician are availble for assistance with installation, startup or maintenance. To obtain these services, contact your Mettler Toledo Sales Engineer, Mettler Toledo Service Office or your nearest Mettler Toledo Factory Authorized Distributor.

The following information should be available when contact one of the above for support.

a.) The name and telephone number of the person to contact.
b.) Location of the equipment and plant address.
c.) The Special Specification Number (SSN) and/or the Mettler Toledo Order Number (TON) of the control system if applicable.
d.) Purchase Order Number.
e.) Complete model number of the equipment. (MODEL 9215 **** where * is the model style.)

REPLACEMENT PARTS PROCUREMENT:

All replacement parts must be ordered through a Mettler Toledo service office Mettler Toledo authorized distributor. The above items must be available at the time an inquiry is requested or order placed. Refer also to the “DRAWINGS AND SPARE PARTS” section of this manual to help identify part numbers.

METTLER TOLEDO TECHNICAL TRAINING:

Mettler Toledo offers comprehensive, professional instruction for your maintenance personnel. All courses are taught by full time instructors, each with an extensive background in weighing systems and teaching methods. Professionally prepared course materials are provided for permanent reference for each student. Mettler Toledo technical training provides practical hands-on troubleshooting experience, along with the basic operating

principles of Mettler Toledo weighing and contol equipment.

1.6 COMPONENT PICTORIALS

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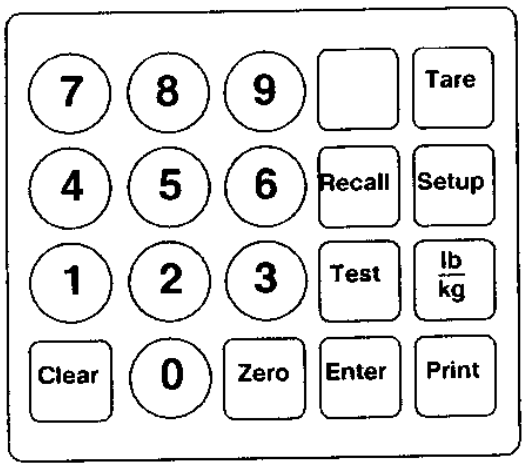
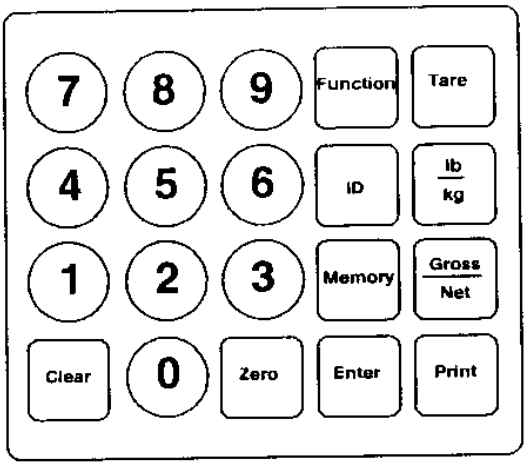
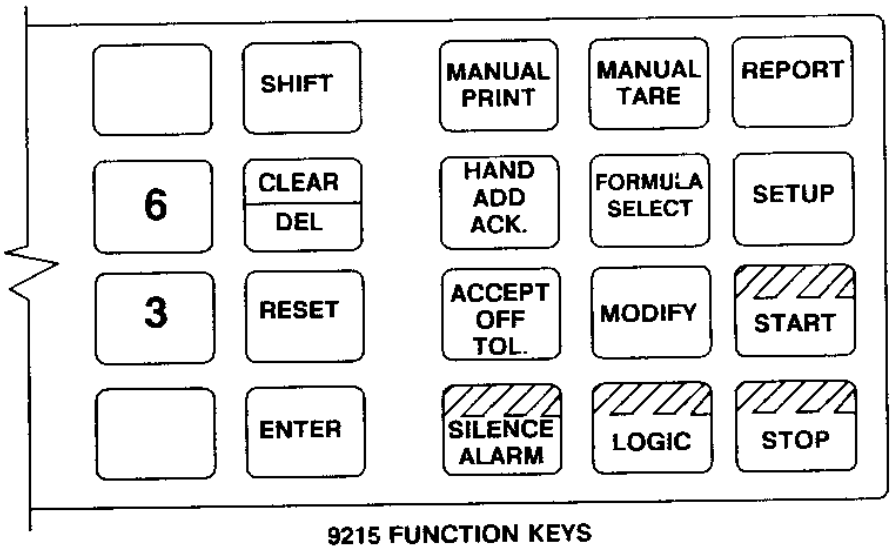


8142 KEYPAD



8530 KEYPAD



9215 FUNCTION KEYS

Figure 1.1 Keypad Layouts

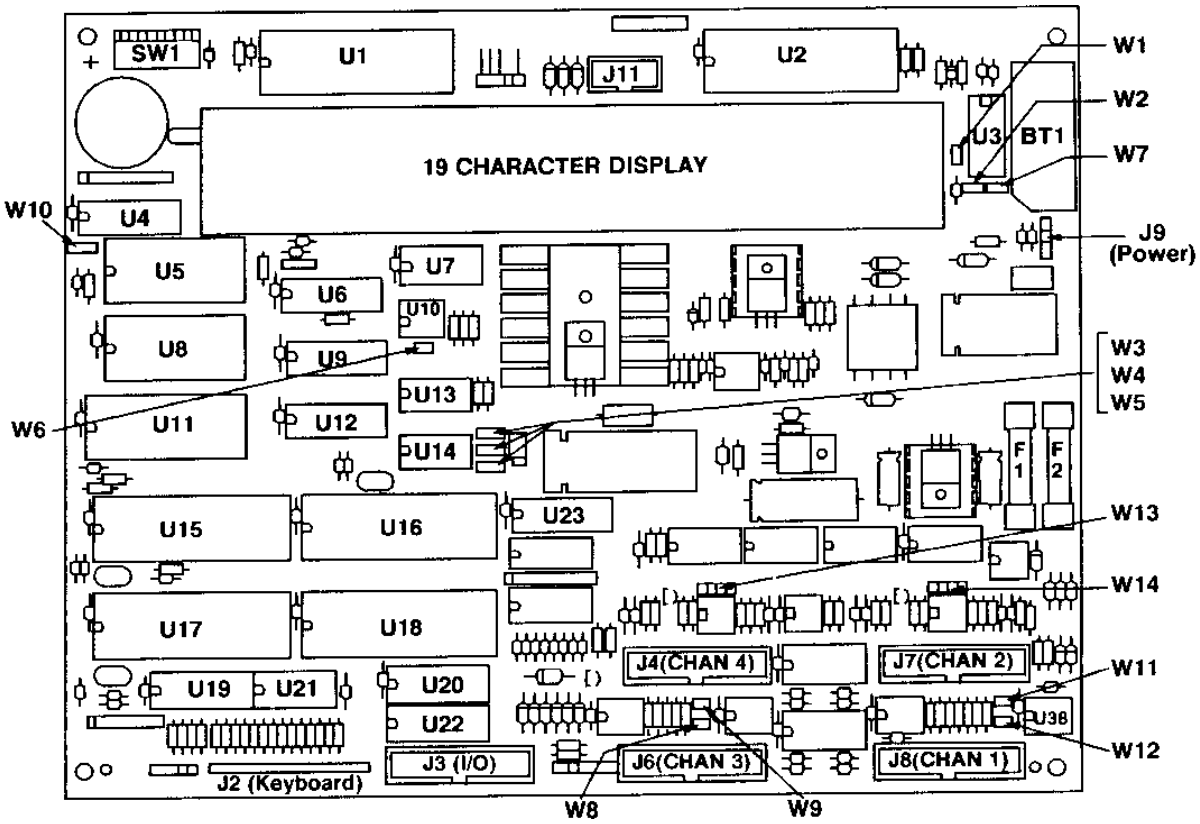


Figure 1.2 TSM-300 PCB Identifications

C90084100A Shown

SW1 - ALL SWITCHES OFF

W1 - OUT	W8 - OUT
W2 - OUT	W9 - OUT
W3 - OUT	W10 -2-3 (RAM)
W4 - 2-3	W11 - OUT
W5 - 1-2	W12 - OUT
W6 - OUT	W13 - 1-2 & 3-4
W7 - SOLDERED IN	W14 - 1-2 & 3-4

DEFAULT SWITCH AND JUMPER SETTINGS

(See Section 9.4 for Details)

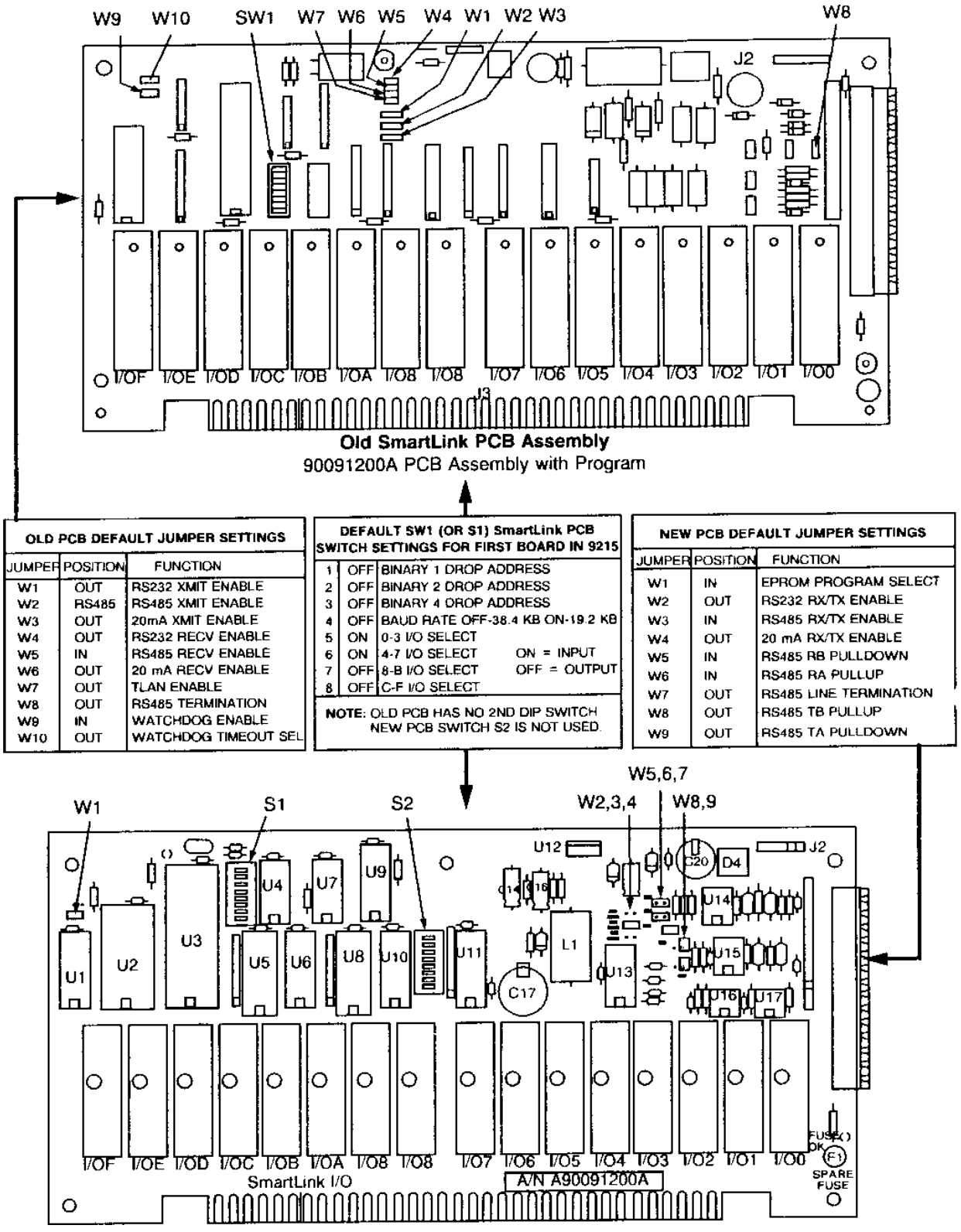


Figure 1.3 SmartLink PCB Identifications

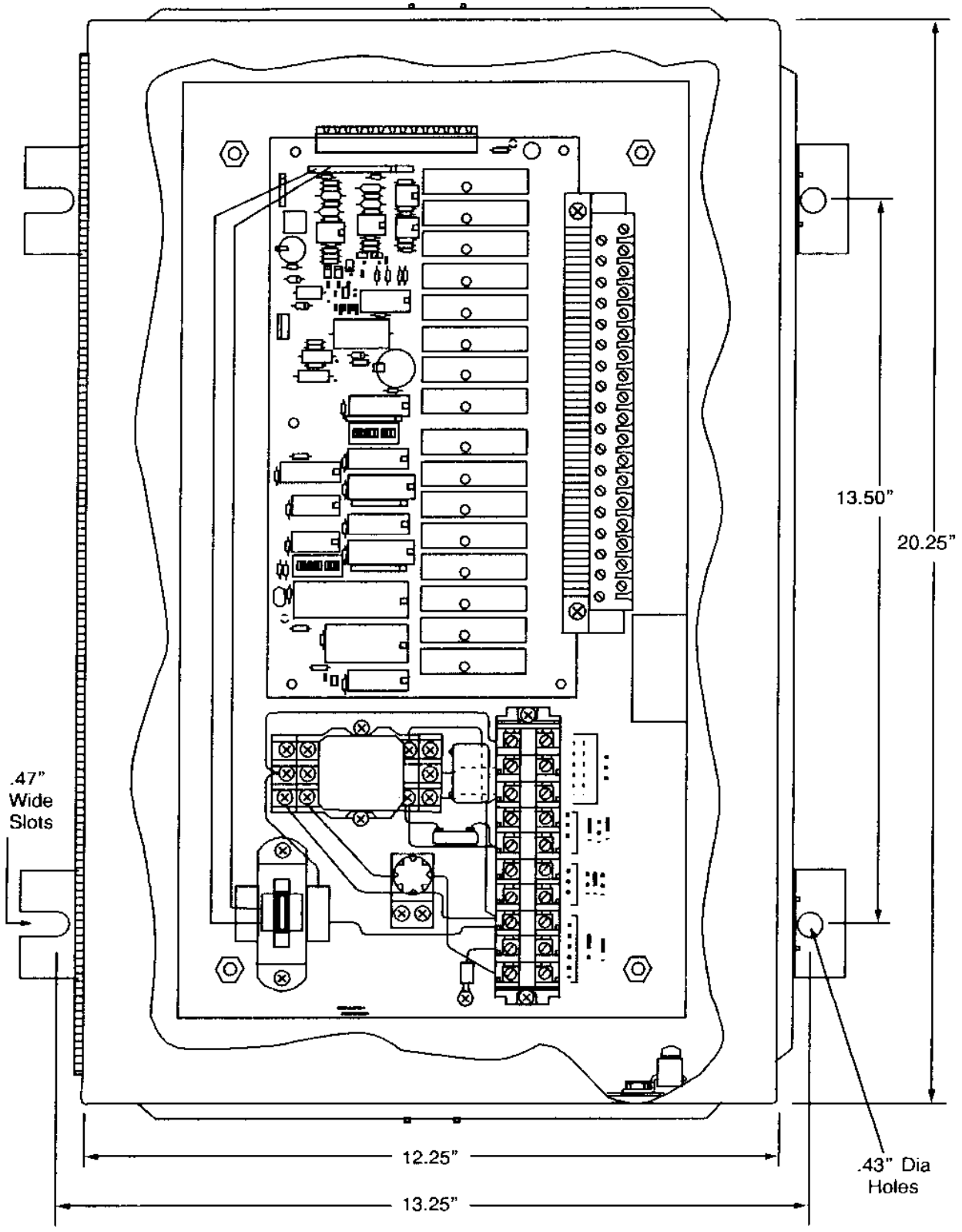

13.50"
20.25"
.47"
Wide
Slots
12.25"
13.25"
.43" Dia
Holes

Figure 1.4 Wall Mount SmartLink Remote I/O Box

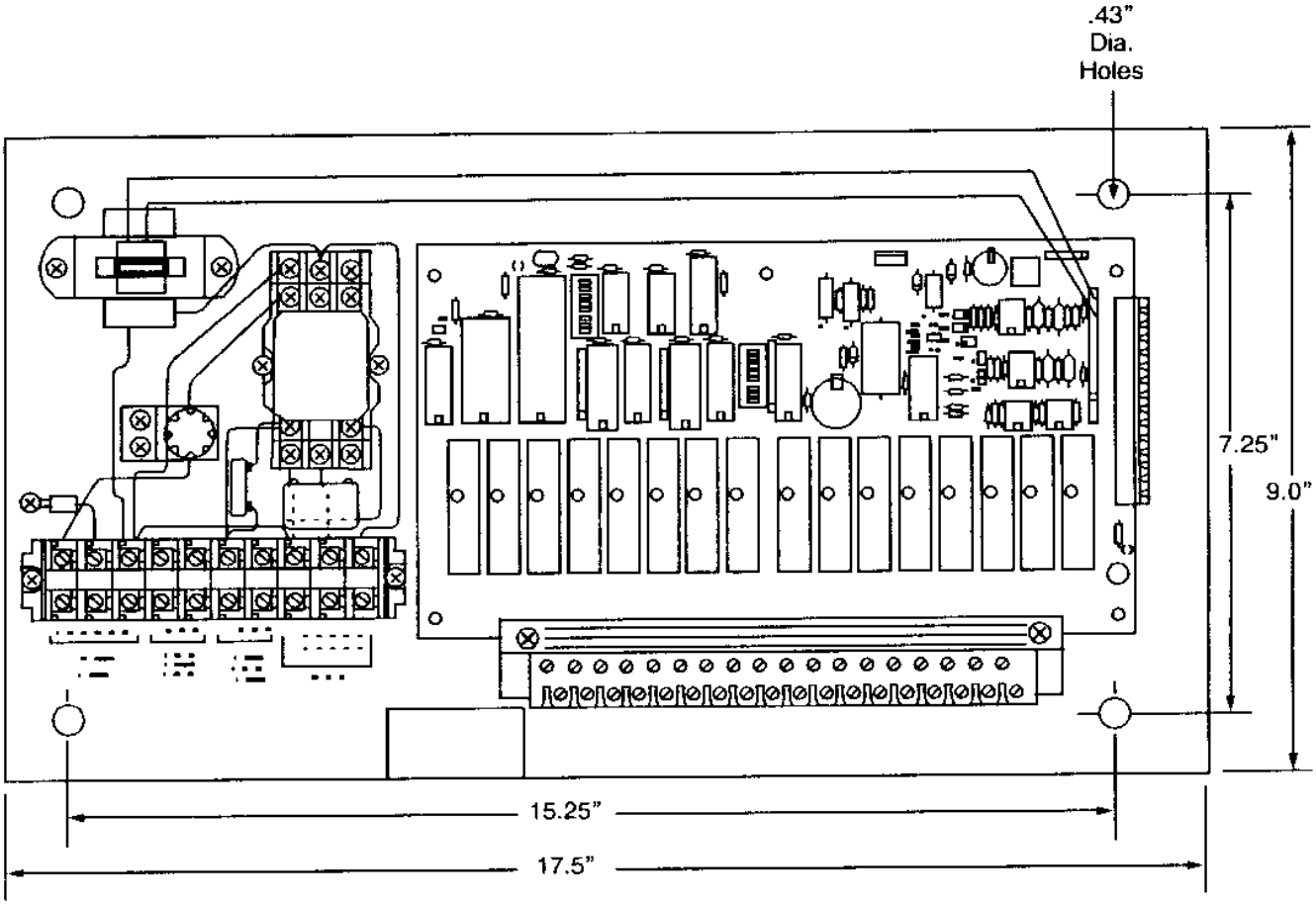
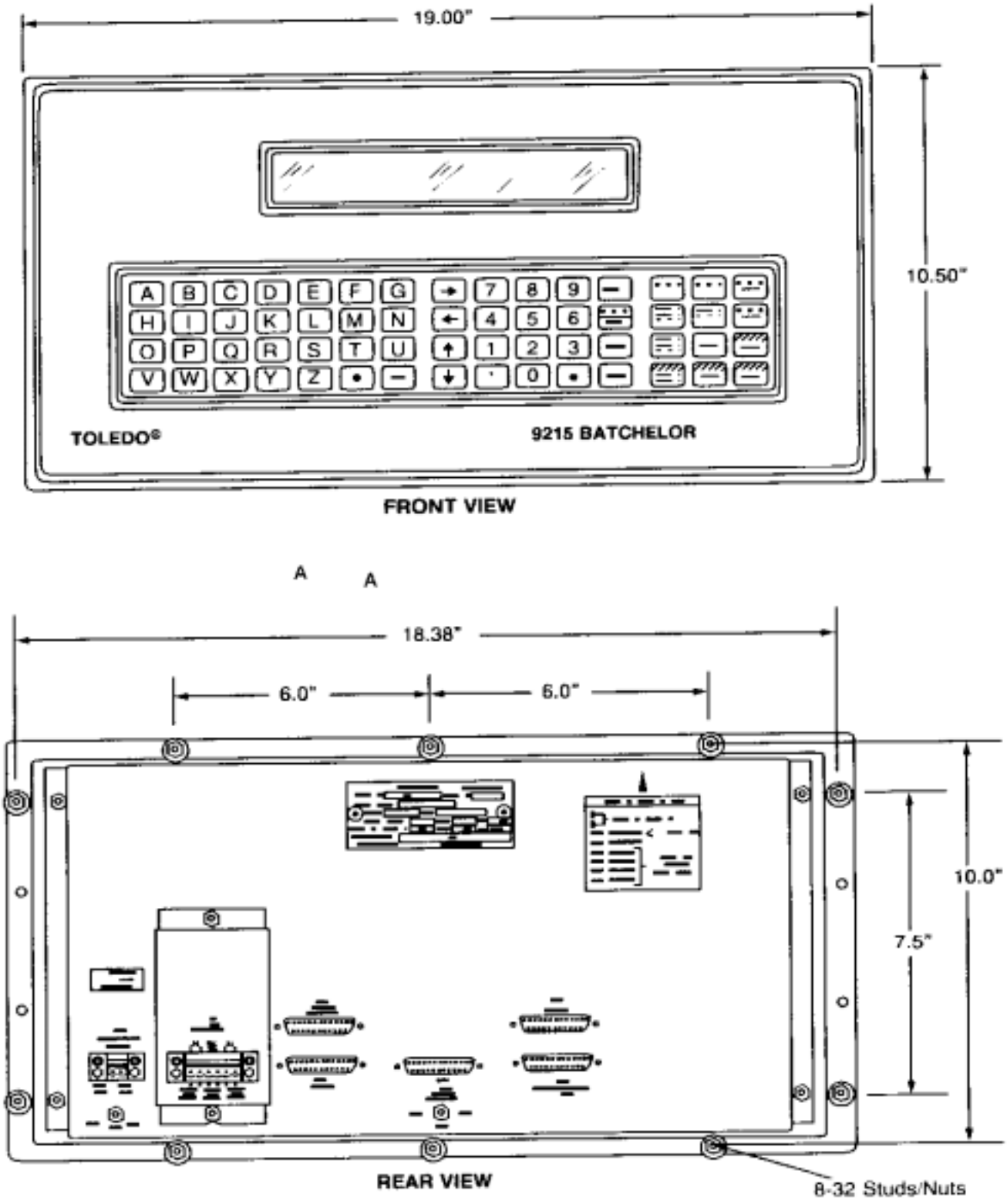


Figure 1.5 Panel Mount SmartLink Remote I/O PCB



NOTE: A 9.5" H x 17.38" W cutout is required.

Figure 1.6 9215 Panel Mount Main Unit

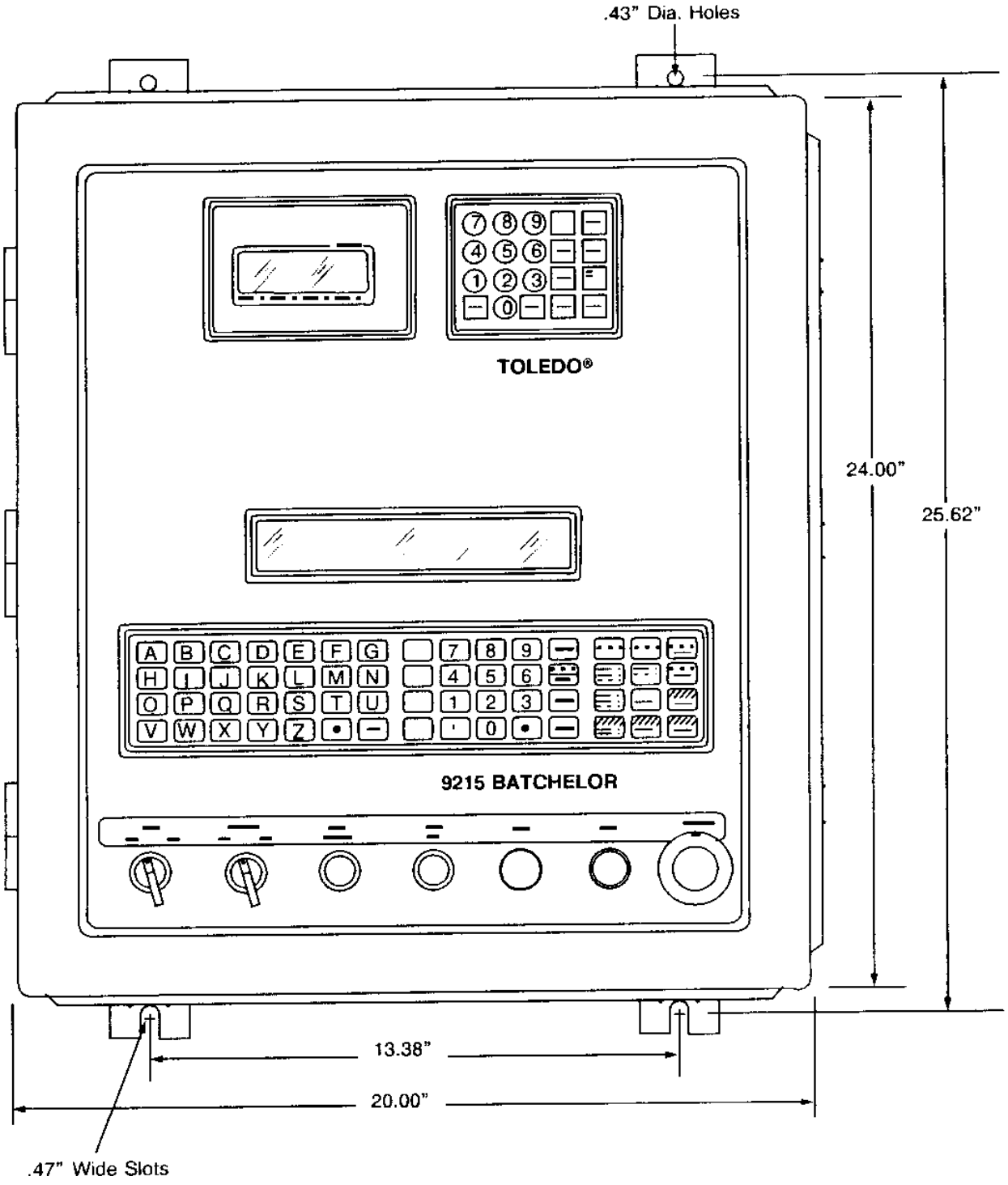
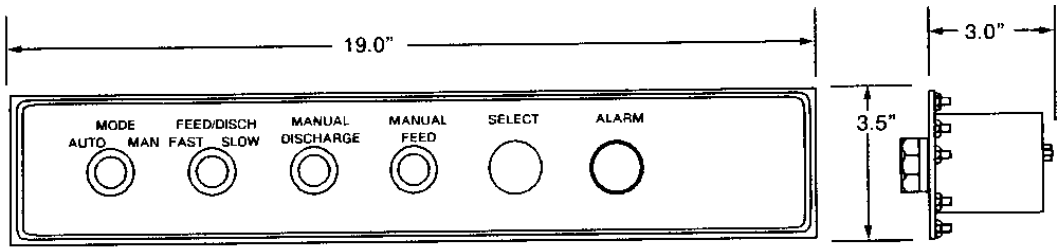
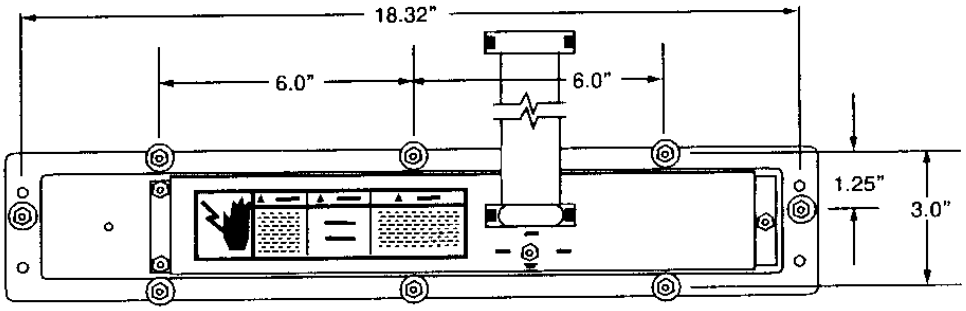


Figure 1.7 9215 Wall Mount Unit



Front View



Rear View

NOTE: A 2.5" H X 17.38"W cutout is required.

Figure 1.8 9215 Panel Mount Unti (Otional) Manual Operators

2.0 SPECIFICATIONS

This section covers the hardware and electrical specifications for the 9213 atchelor Main and Remote SmartLink I/O enclosures.

2.1 HARDWARE SPECIFICATIONS

This section describes the physical specifications of the 9215 Wall Mount and Panel Mount Main Enclosures and Remote I/O Enclosures.

2.1.1 WALL MOUNT MAIN ENCLOSURE

Includes the following Model Numbers:

Model	Supply Voltage	I/O Voltage	Indicator
9215-0011	115 VAC	115 VAC	8142
9215-1011	230 VAC	230 VAC	8142
9215-0111	115 VAC	115 VAC	8530
9215-1111	230 VAC	230 VAC	8530
9215-2011	115 VAC	24 VDC	8142
9215-3011	230 VAC	24 VDC	8142
9215-2111	115 VAC	24 VDC	8530
9215-3111	230 VAC	24 VDC	8530

Construction - Type 304L 16 Ga. Stainless Steel construction suitable for use in indoor washdown environments.

Size - 24" (600mm) H. x 20" (500mm) W. x 9" (225mm) D.

Door Latching - Secured with 5 spring loaded latches and 1 tool operating spring loaded latch on the vertical non-hinge side.

Weight - Approximately 70 lb. (32 kg)

Access - Front door has lift-off hinges on the left side which provide at least 180º of door swing. The wiring harnesses to the door include connectors allowing it to be completely removed. An open door allows easy service access to the I/O and terminal panel mounted to the inside back of the enclosure.

Field Wiring - A single terminal strip is provided or the first 16 I/O (standard). Provisions for a 2nd terminal strip for the next 16I/O within the enlosure is privided via an optional SmartLink kit of parts (Model 0942-0034). Each I/O point terminal accepts 22 to 12 AWG copper stranded or solid wire. Field I.O wiring enrtry may be made on the top, bottom or right side (facing enclosure) useing NEC cose approved metal conduit. Mettler Toledo recommends that both power wiring entrances be made onthe nottom of the ecnlosure (separate instrument and control power). The enclosure uis not pre-punched so appropriate holes must be punched and consuit fittings installed by field personnel.

Mounting - "Feel" entend ablove and below the enclosure. The top feet had foles and bottom feet have slots. Use 5/16 diameter (minimum) bolts (4 required) to mount to wall or frame.

ENVIRONMENT:

Operating - Ambient operating -10ºC to + 40ºC (+14ºF to +104ºF) @ 10% to 95% Relative Humidity non-condensing.

Storage - -40ºC to +65ºC (-40ºF to +150ºF) @ 10% to 95% Relative Humidity non-condensing.

2.1.2 PANEL MOUNT MAIN ENCLOSURE

General Purpose instrument aluminum enclosure with a gasketed stainless steel front panel suitable for mounting into a panel or a 19 inch wide standard EIA rack frame.

Size - 10.5" (266.7mm) H. x 19' (482mm) W. x 5.5" (140mm) D.

Weight - Approximately 10 lb (4.5kg)

The following model numbers are available:

Model	Supply Voltage	I/O Voltage	Indicator
9215-0221	115 VAC	115 VAC	* NONE
9215-1221	230 VAC	230 VAC	* NONE

* An external indicator (not supplied) with 4800 baud continuous "Mettler Toledo Data Format" is required.

Construction - Stainless steel front with aluminum chassis on the rear of the panel. When it is properly mounted into a UL listed NEMA 2 or 4x enclosure, it will assume the enclosure's rating.

2.1.3 REMOTE I/O ENCLOSURE (Optional)

The SmartLink Remote I/O may be supplied mounted in an enlcosure by Mettler Toledo. There are three models of remote 16 I/O's available: painted mild steel, stainless steel, and panel mount.

Construction:

Model 0964-0040 - Mild Steel Dust Tight painted charcoal black with a textured polyurathane finish. Suitable for 115 or 230 VAC.

Model 0964-0041 - Type 304L Ga. Stainless Steel construction suitable for use in indoow washdown environments. Suitable for 115 or 230 VAC.

Model 0964-0042 - Painted panel suitable for mounting in new or existing enclosures.

Size - 20"(508mm) H. x 12" (304mm) W. x 9"(228mm) D.

Door Latching - 3 wing type spring loaded latches and 1 tool operated spring loaded latch on the non-hinge side for wall mount units.

Weight - Approximately 30 lb.(13.6 kg) for wall mount units. Approximately 20 lb (13.6 kg) for panel mount.

Access - Front Door has a continuous honge on the left side (facing the enclosure with the long dimension vertical) and opens 180 º minimum. No components are on mounted on the door. A 16 I/O SmartLink PCB with a field terminal strip is mounted on the rear panel.

Field Wiring - A single terminal strip is provided for 16 I/O. Wire size range 22 to 12 AWG. Wiring entry may be made on any side (excluding back and door). A conduit fittings must be supplied and holes must be made by filed personnel.

Mounting - "Feet" are provided extending beyond each long side. One side has holes, the other slots. Use 5/16 diameter (minimum) bolts (4 required) to ount to wall or frame.

2.2 ELECTRICAL SPECIFICATIONS

Following are the electrical specifications for the Main Enlclosure and optional Remote I/O Enclosures.

2.2.1 MAIN ENCLOSURE (Wall Mount)

The main enclosure requres two separate sources of AC power. One must be a noise free, isolated, fused source for instrument power (electronics). The other may be a separate fused branch circuit (20 Amps or less) to power the SmartLink I/O as well as the I/O devices (solenoidsm motor starters, etc.) Provisions are made to allow external remote Emergency Stop pushbutton operators.

Instrument Power - Noise free, isolated, fused source separate (physically and electrically) from cotrol source is required. A computer grade power conditioning and isolating transformer is recommended.

Voltage = 115 VAC + 10% - 15% for 115 VAC Models,
230 VAC + 10% - 15% for 230 VAC Models

Frequency= 49 to 61.5 Hz

Consumption= 75 VA Maximum

Control Power - A standard fused branch circuit is required rated at 20 Amps or less. The circuit is fused for 6 amps (115 VAC, 230 VAC or DC) on the panel. On AC versions the control power is used to supple power for the SmartLink PCBs and the 9215 I/O. On DC versions , AC is used for the SmartLink PCB and Emergency Stop circuit only. The DC for the I.O is a separate power source switched buy a pilot relat operating from the interlocked AC control power source.

Voltage = 115 VAC + 10% - 15% for 115 VAC Models,
230 VAC + 10% - 15% for 230 VAC Models

Frequency= 49 to 61.5 Hz

Consumption= External device dependent. Not to exceed 6 Amps.

Emergency Stop - The 9215 is provided with an Emergency Stop pushbutton with terminals allowing additional remotely mounted operators. Each installation must be evaluated by the used to determine the need for additional operators. If used, they must be of the push-pull maintained type.

WARNING!!

THE EMERGENCY STOP PUSHBUTTON IS THE SINGLE MOST IMPORTANT OPERATOR IN A CONTROL SYSTEM. PUSHING THE EMEREGENCY STOP PUSHBUTTON WILL DE-ENERGIZE POWER TO ALL DEVICES WHICH CAN CONTROL MOVING MACHINERY. THE 9215 BATCHELOR EMERGENCY STOP CIRCUIT HAS BEEN DESIGNED TO ALOW THE ADDITION OF REMOTE EMERGENCY STOP OPERATORS SOTHAT THESE MAY BE LOCATED NEAR THE EQUIPMENT WHICH IS DIRECTLY OR INDIRECTLY CONTROLLED BY THE 9215. THE 9215 EMERGENCY STOP CIRCUIT MUST NEVER BE MODIFIED AND THE PROPER FUNCTIONING OF THE EMERGENCY STOP CIRCUIT MUST BE TESTED PRIOR TO OPERATION OF THE 9215 MANUAL OR AUTOMATIC MODE. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

I/O Modules - Mettler Toledo provides AC or DC input and output modules dependent upon 9215 model and are available as separate parts.

AC Outputs - The AC output modeults (0962-0035, Black Case) are solid state units rated by Metler Toledo as follows:

Voltage	=	24 to 280 VAC @ 50/60 Hz
Current	=	1 Amp continuous @ 115 or 230 VAC 50/60 Hz non-inductive
Off State Leakage $\leq$ 1mA @ 120 VAC		

DC Outputs - The DC output modules (0962-0038, Red Case) are solid state unites rated by Mettler Toledo as follows:

Voltage	=	5-60 VDC
Current	=	1 Amp continuous non-inductive
Off State Leakage $\leq$ 1mA @ 60 VDC		

115 VAC Input Modules - The 115 VAC input modules (0962-0036), Yellow Case) have the following characteristics:

Input Voltage Range	=	90 to 140 VAC
Input Current	=	Approximate 10 mA @ 120 VAC

230 VAC Input Modules - The 230 VAC input modules (0962-0037, Yellow Case) have the following characteristics:

Input Voltage Range	=	140 to 280 VAC
Input Current	=	Approximate 10 mA @ 240 VAC

DC Input Modules - The DC input modules (0962-0030, White Case) jave the follwoing characteristics:

Input Voltage Range	=	10 to 32 VAC
Input Current	=	Approximate 25 mA @ 24 VDC

2.2.1.1 Analog Scale Indicator 8142

When the 9215 is provided with analog load cell capabilities, the Mettler Toledo Model 8142 Single Display Indicator Main PCB is used. Its AC input power is obtained from the instrument power input terminals and consumes less than 25VA. The load cell interface characterists are summarized as follows:

Load Cell Excitation 12.5 VDC
Maximum Load Cells (6) 350 OHM Cells.
Load Cell Minimum Input 0.3 mV/increment.
Load Cell Maximum Input 43 mV/increment.
Load Cell Minimum Increments 600
Load Cell Maximum Increments 50,000 (10,000 maximum recommended)
Load Cell Zero Temperature coefficient 0.1µV/ºC maximum.
Load Cell Span Temperature coefficient 6 PPM maximum.

2.2.1.2 DigiTOL Scale Indicator 8530

When the 9215 is provided DigiTOL Load Cell Input capabilites, the 8530 Indicator Main PCB is used. Its AC input power is oerated from the instrument power input termination and consumes less than 50VA.

Load Cell Excitation- +20 VAC for single DigiTOL Power Cell or +24 VDC for up to 10 cells. An optional supply is available for applications with greater than 10 Power Cells.

Load Cell Communication - 2 wire bidriectional Digital Serial communications from Cell(s) to instrument via 4 wire cable.

2.2.2 ENCLOSURES (Panel Mount)

The 9215 Panel Mount enclosure requires 12 VDC to operate and is obtained from a supplied 115V or 230V to 12 VDC power supply module. Since all I/O is external to the 9215, a separate source of control power is not required. However, control power is routed back tothe stop circuit interlock on the 9215 from the remote I/O circuitry. Therefore, the voltage rating of thewatchdog OPTO module (on the back of the 9215 chassis) mist match the external control power source voltage.

Instrument Power - Noise free isolated fused source separate from the remote control power source is required.

AC Line Requirements:

Line Voltage	=	115 VAC +10% - 15% for 115 VAC models 230 VAC +10% - 15% for 230 VAC models
Frequency	=	49 to 61 Hz
Consumption	=	29VA maximum

DC Requirements:

Input Voltage	=	11 to 14 VDC
Current	=	1.5 amps maximum (1.0 amp type. @ 13 VDC)
Polarity	=	Positive hot, negative common ungrounded source is required. (Negative side is capacitively bypassed to ground.)

Emergency Stop - The panel mount 9215 does not include a built in Emergency Stop pushbutton. Because it is intended for a system integration, it is left up to the system desined to comply with all regulations regarding proper emergency stop circuitry. Mettler Toledo does provide the Emergency Stop pushbutton as a loose item in the KOP to be integrated into the user's circuitry.

WARNING!!

THE EMERGENCY STOP PUSHBUTTON IS THE SINGLE MOST IMPORTANT OPERATOR IN A CONTROL SYSTEM. PUSHING THE EMEREGENCY STOP PUSHBUTTON WILL DE-ENERGIZE POWER TO ALL DEVICES WHICH CAN CONTROL MOVING MACHINERY. THE 9215 BATCHELOR EMERGENCY STOP CIRCUIT HAS BEEN DESIGNED TO ALOW THE ADDITION OF REMOTE EMERGENCY STOP OPERATORS SOTHAT THESE MAY BE LOCATED NEAR THE EQUIPMENT WHICH IS DIRECTLY OR INDIRECTLY CONTROLLED BY THE 9215. THE 9215 EMERGENCY STOP CIRCUIT MUST NEVER BE MODIFIED AND THE PROPER FUNCTIONING OF THE EMERGENCY STOP CIRCUIT MUST BE TESTED PRIOR TO OPERATION OF THE 9215 MANUAL OR AUTOMATIC MODE. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

WARNING!!

DO NOT ATTEMPT TO BYPASS OR ELIMINATE THE REQUIRED SAFETY INTERLOCKS IN THIS EQUIPMENT. FOLLOW THE RECOMMENDATIONS ON THE EXTERNAL WIRING DIAGRAM(S). FAILURE TO OBSERVE THESE PRECAUTIONS MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

I/O Modules - All modules must be provided separately as required. The devices are OPTO 22 Inc. GENERATION4 modules intended to go into the Mettler Toledo SmartLink PCB available

seperately as a KOP (without modules). Specifications of each module are the same for wall mount unit (see Section 2.2.1 for details).

2.2.3 REMOTE I/O ENCLOSURE

The remote I/O enclosure required only one power source. It will operate with either the 9215 wall or panel mount Batchelor.

Voltage - 115 or 230 VAC 50/60 Hz (Factory set for 115 VAC operation). Field changeable to 230V by changing 1 primary transformer tap wire.

Current - Fused for 6 amp; the current is dependenst upo external devices. See also the control power specs for the main enclosure. For units using AC I/O, the control power is used to supply power for the SmartLink PCBs and the I/O. On DC versions the control power is still AC and is used for the SmartLink power source and Emergency Stop circuit only. The DC for the I.O is a separate remote power source.

3.0 CONNECTION AND CALIBRATION

This section when used with the External Wiring Diagrams includes the information required for connection of eternal devices to the 9215 Batchelor and for calibration of the scale. A list of drawing can be found in section 8.6.

3.1 POWER REQUIREMENTS

The main enclosure for the Wall Mount 9215 required two power soutces instrument and control. Both sources are terminated at the bottom of the enclosure on the I/O panel terminals. Provided are: X1 (Hot), X2 (Common), Ground for Instrument, L1 (Hot), L2 (Common), and ground for control power. All field wiring myst be UL approved 14 AWG (minimum), 300V (minimum) wired in conduit. Instrument and control power sources must not share the same conduit.

The Panel Mount 9215 also requires two power sources but only the instrument source connects to the 9215 (via the external power suply module). Any control power source for the I/O modules is remote.

3.1.1 INSTRUMENT POWER SOURCE

Provide a well regualted (+10%, -15%), isolated, noise free instrument power source. Ferro-Resonant Regulation/Isolation transformers are recommeded by Mettler Toledo. Dollow thee rules when selecting and installing the transformer.

1. Size the transformer so it is at least 20% loaded. The 9215 Wall Mount Batchelor logic requires 75 VA maximum do a 120 or 250 VA transformer is a good choice. (The Panel Mount 9215 is adequately isolated via its power supply. a regualtion transformer is not required.)

2. Never mount the transformer in or on the 9215 main or remote enclosure. Ferro-Resonant transformers get very warm during normal operation so only mount in a well ventilated area.

3. Do not source power to any other equipment common to this line. Mettler Toledo does not provide a disconnect means for this source so it is very important that the customer privide a properlyfused source with disconnects.

3.1.2 CONTROL POWER SOURCE

The control power may be a standatd 20 amp maximum fused branch circuit. Noise and voltage conditioning here is not necessart as long as it meets the needs of the controlled loads. on 9215's that use AC I/O this source supplies the power for the feed and dischage devices. Normally they

are in close proximity to electrical noise, so it is important to keep tjhis source physically isolated from instrument power. Run this line in a separate conduit.

The Panel Mount 9215 has no provisions for control power termination. All control power is remote.

3.2 LOAD CELL CONNECTIONS (FOR WALL MOUNT 9215'S)

The Wall Mount 9215 can be supplied for a number of different load cell and scale base arrangements. Different scle indicators are furnished to accomodate this. Units with an 8142 indicator board will interface only to analopg cells. Units with an 8530 indicator board will interface to Mettler Toledo DigiTOL load cells (or High Precision digital cells with optional adapter KOP.) The Panel Mount 9215 has no internal indicator so the load cell arrangement is confined to the particular external indicator used.

3.2.1 ANALOG LOAD CELLS

The Wall Mount 9215's equipped with the 8142 indicator are as follows:

Model	Supply Voltage	I/O Voltage
9215-0011	115 VAC	115 VAC
9215-1011	230 VAC	230 VAC
9215-2011	115 VAC	24 VDC
9215-3011	230 VAC	24 VDC

A maximum of six (6) ohm load cells may be connected used 16 gauge 6 connector dual shileded cable for up to 500 ft. runs. An alternate 20 guage, 6 conductor shielded cable may be used for up to 300 ft runs. Both have the same color code. Connect the cable wires to TB1 on the I/O panel according to the table below.

REFERENCE DRAWING 901300 SHEET 2 OF 6

TB1	WIRE COLOR	FUNCTION
1	WHITE	(+) EXCITATION (+12.5 VDC)
2	YELLOW	(+) SENSE
3	ORANGE	SHIELD
4	RED	(-) SHIELD
5	BLUE	(-)EXCITATION (GROUND)
6	-	NO CONNECTION
7	GREEN	(+) SIGNAL
8	BLACK	(-) SIGNAL
9	-	INNER SHIELD (if used)

Table 3-1 Load Cell Cable Wire Color Codes

The above cable must be run from the 9215 to load cells in a separate steel conduit (3/4" recommended minimum). No other wiring must share this conduit. The cable contains sensitive mV level signals, so isolation from foreign wiring is essential.

3.2.2 DigiTOL LOAD CELLS

The Wall Mount 9215's equipped with the 8530 DigiTOL inidicator are as follows:

Model	Supply Voltage	I/O Voltage
9215-0111	115 VAC	115 VAC
9215-1111	230 VAC	230 VAC
9215-2111	115 VAC	24 VDC
9215-3111	230 VAC	24 VDC

The DigiTOL load cell(s) are connected to TB1 via a single sheilded cable which is dependednt upon the type and quantity of cells involved. The understructure of scale base technical manual must be consulted for details. The followinfg serves only as a guide and summary: the specific manual will always supersede this information.

Single DigiTOL Load Cell Scale Bases - Maximum cable length from cell to TB1 shall not exceed 50 feet. The termination is as follows:

REFERENCE DRAWING 901300 SHEET 2 OF 6

TB1	WIRE COLOR	FUNCTION	1996,2096,2196 SCALE BASE J3
1	RED	RxD A	1
2	-	NO CONNECTION	-
3	-	NO CONNECTION	-
4	-	NO CONNECTION	-
5	GREEN	+20 VDC	5
6	YELLOW	TxD CONNECTION	6
7	BLUE	GROUND	7
8	BLACK	TxD A	8
9	-	NO CONNECTION	-

Table 3- Single DigiTOL Load Cell Cable Wire Color Codes

Multiple DigiTOL Power Cells - The multiple load cell installations will involve either an Auxillary Power Supply, Pit Power Supply or both. The “Home Run” cable will go from TB1 to either a pit power supply or to an auxillary power supply. The pit supply is used as a load cell connection junction point for up to 10 DigiTOL Power Cells and receives its power from the 8530 PCB. The auxillary power supply has its own source of AC poert allowing up to 24 Power Cells to be connected.

Use this table for Truckmate or Railmate scale power cells when used with dual auxillary power supply

TB1	WIRE COLOR	FUNCTION	INPUT TERMINAL STRIP AUXILLARY POWER SUPPLY
1	YELLOW	COM A	1
2	GREEN	GROUND	2
3	-	NO CONNECTION	-
4	-	COM B	-
5	BLUE	+24 VDC	4
6	WHITE	NO CONNECTION	5
7	-	NO CONNECTION	-
8	-	NO CONNECTION	-
9	-	NO CONNECTION	-

Table 3-3 Multiple DigiTOL Auxillary Power Supply Terminal Strip

Use this table for Truckmate or Railmate scale power cells when used with the pit power supply.

TB1	WIRE COLOR	FUNCTION	INPUT TERMINAL STRIP AUXILLARY POWER SUPPLY
1	YELLOW	COM A	8
2	GREEN	GROUND	4
3	-	NO CONNECTION	-
4	BLUE	COM B	7
5	WHITE	+24 VDC	1
6	BROWN	GROUND	5
7	BLACK	GROUND	6
8	RED	+24 VDC	2
9	ORANGE	+24 VDC	3

Table 3-4 Multiple DigiTOL J6 on Pit Power Supply

3.2.3 HIGH PRECISION - MultiRange Scales Only

TB1	WIRE COLOR	FUNCTION
1	BLUE	+ 28 VDC
2	GRAY	+ 8.5 VDC
3	PINK	GROUND
4	GREEN	RxD +
5	BROWN	TxD +
6	WHITE	TxD -
7	YELLOW	TxD +

Table 3-5 MultiRange scales Wire Color Codes

3.3 I/O CONNECTIONS

The Wall Mount 9215 main enclosure I/O (input and output) wiring connections are made to terminals on the I/O panel on the inside back of the enclosure. Removing the door allows easy access for installation and wiring.

The Panel Mount 9215 has DB25 female connectors for all I/O interfacing.

3.3.1 HIGH LEVEL I/O

The terminations for the highlevel I/O are made directly to the connector on the 16 I/o SmartLink board which have screw type wire terminals that will accept (2) #12 AWG copper wires on each terminal. The inputs and outputs are not terminated by Mettler Toledo, so wiring to the SmartLink I/O connector must be filed terminated in accordance with the External Wiring Diagram. A list of the drawing numbers for reference in Section 8.6.

Mettler Toledo provides the first 16 I/O SmartLink board complete with mating connector and 16 I/O modules (Wall Mount 9215 only). The first 8 (I/O 0 through 7) are input modules (115VAC, 230 VAC, or DC by model) and the second 8 I/O (8 through F) are output modules (115/230 VAC or DC by model). The Panel Mount 9215 does not include any SmartLink PCB's with the unit. Instead, all I/O must be specified separately as remote components.

The following table summarizes the default I/O assigments for the first SmarkLink board:

SmartLink PCB #1			
I/O Address	Terminals	Type	FUNCTION
00	31-32	INPUT	AUTO-MANUAL
01	29-30	INPUT	START
02	27-28	INPUT	STOP
03	25-26	INPUT	HAND ADD ACKNOWLEDGE
04	23-24	INPUT	ACCEPT OFF TOLERANCE
05	21-22	INPUT	SILENT ALARM
06	19-20	INPUT	OK TO DISCHARGE
07	17-18	INPUT	DISCHARGE GATE LIMIT SW
08	15-16	OUTPUT	ALARM
09	13-14	OUTPUT	HOLDING
0A	11-12	OUTPUT	BATCH READY
0B	9-10	OUTPUT	CYCLE COMPLETE
0C	7-8	OUTPUT	DISCHARGE
0D*	5-6	OUTPUT	FAST DISCHARGE/MIXER
0E*	3-4	OUTPUT	FAST FEED 1/MIXER
0F*	1-2	OUTPUT	FEED 1/OFF TOLERANCE

Table 3-6 SmartLink Default I/O Assignments

Above outputs marked with * have alternate functions as shown in the table on the next page and are dependent upon the setting of main PCB or SW1 switches 1 and 2.

	9215 MAIN PCB			Smartlink PCB #1
	SW1-1	SW1-2	I/O ADDRESS	FUNCTION
Factory Setting	OFF	OFF	OD OE OF	Fast Discharge Fast Feed 1 Feed 1
	OFF	ON	OD OE OF	Mixer Fast Feed 1 Feed 1
	ON	OFF	OD OE OF	Fast Discharge Mixer Feed 1
8 OR 16 Material	ON	ON	OD OE OF	Fast Discharge Mixer OFF Tolerance

Table 3-7 Alternate I/O Assignments for SmartLink PCB #1

The following tables summarize the default I/O assignments if the optional seconds and third SmartLink I/O PCB's are used (0964-0034):

SmartLink PCB #2			FUNCTION
I/O Address	Terminals	Type	
10	31-32	OUTPUT	** FEED 1
11	29-30	OUTPUT	** FEED 2
12	27-28	OUTPUT	** FEED 3
13	25-26	OUTPUT	** FEED 4
14	23-24	OUTPUT	** FEED 5
15	21-22	OUTPUT	** FEED 6
16	19-20	OUTPUT	** FEED 7
17	17-18	OUTPUT	** FEED 8
18	15-16	OUTPUT	FAST FEED 1
19	13-14	OUTPUT	FAST FEED 2
1A	11-12	OUTPUT	FAST FEED 3
1B	9-10	OUTPUT	FAST FEED 4
1C	7-8	OUTPUT	FAST FEED 5
1D	5-6	OUTPUT	FAST FEED 6
1E	3-4	OUTPUT	FAST FEED 7
1F	1-2	OUTPUT	FAST FEED 8

Table 3-8 Second Optional SmartLink Default I/O Assignments

SmartLink PCB #3			FUNCTION
I/O Address	Terminals	Type	
20	31-32	OUTPUT	** FEED 9
21	29-30	OUTPUT	** FEED 10
22	27-28	OUTPUT	** FEED 11
23	25-26	OUTPUT	** FEED 12
24	23-24	OUTPUT	** FEED 13
25	21-22	OUTPUT	** FEED 14
26	19-20	OUTPUT	** FEED 15
27	17-18	OUTPUT	** FEED 16
28	15-16	OUTPUT	FAST FEED 9
29	13-14	OUTPUT	FAST FEED 10
2A	11-12	OUTPUT	FAST FEED 11
2B	9-10	OUTPUT	FAST FEED 12
2C	7-8	OUTPUT	FAST FEED 13
2D	5-6	OUTPUT	FAST FEED 14
2E	3-4	OUTPUT	FAST FEED 15
2F	1-2	OUTPUT	FAST FEED 16

Table 3-9 Thrid Optional SmartLink Default I/O Assignments

FEED lines marked ** can be redefined as SLOW FEED in setup; refer to section 4.7, statement number 222. IF the feeder for a material is defined as having “overlap” fast/slow speed, both the FEED and FAST FEED outputs will be ON to feed fast and the FAST FEED output will turn off to feed slow. Otherwise, only the fast feed output will be ON to feed fast and the SLOW FEED output will be to feed slow.

NOTES:

- The power source for the hot side of the output module, except for the alarm output, must be wired through the “Emergency Stop” circuit. Refer to the External Wiring Diagram for details.

WARNING!!

THE EMERGENCY STOP PUSHBUTTON IS THE SINGLE MOST IMPORTANT OPERATOR IN A CONTROL SYSTEM. PUSHING THE EMEREGENCY STOP PUSHBUTTON WILL DE-ENERGIZE POWER TO ALL DEVICES WHICH CAN CONTROL MOVING MACHINERY. THE 9215 BATCHELOR EMERGENCY STOP CIRCUIT HAS BEEN DESIGNED TO ALOW THE ADDITION OF REMOTE EMERGENCY STOP OPERATORS SOTHAT THESE MAY BE LOCATED NEAR THE EQUIPMENT WHICH IS DIRECTLY OR INDIRECTLY CONTROLLED BY THE 9215. THE 9215 EMERGENCY STOP CIRCUIT MUST NEVER BE MODIFIED AND THE PROPER FUNCTIONING OF THE EMERGENCY STOP CIRCUIT MUST BE TESTED PRIOR TO OPERATION OF THE 9215 MANUAL OR AUTOMATIC MODE. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

- Wall Mount 9215 - SmartLink I/O PCB’s 2 and 3 are optional and are only supplied if purchased separately. they are furnished without I/O modules. The optional SmartLink kit of parts (0964-0034) allows mounting a second board in the main enclosure. This kit consists of a SmartLink PCB, interconnect harness, I/O connector/mounting hardware and instructions for field installation. I/O modules must be ordered separately.

- Panel Mount 9215 - All SmartLink I/O PCB(s) are supplied separately, if needed.

- Optional Remote I/O Enclosures (0964-0040 or 0964-0041) allow remote mounting of SmartLink I/O PCB(s). Refer to Section 2.1.3.

3.3.2 SERIAL I/O

The serial ports provided are:

PANEL	WALL	FUNCTION
J3	TB2	Host interface - RS232 or RS 422/485
J1	TB3	SmartLink I/O network - RS485
J2	TB4	Printer interface RS 232 & 20mA current loop.
-	TB5	Remote display interface - 20 mA current loop only

Table 3-10 Serial I/O

3.3.2.1 Printer Interface

The printer cable termination is made at TB4 on the I/O panel. RS232 or 20mA Current Loop (active transmit) are available. The receive input is supported for XON-XOFF on the RS232 interface only. (The 20mA Current Loop input is not software supported.) Data at this point is transmit only, so any printer attached here must have a buffer to prevent data overflow. Both RS232 and 20mA current loop connections are shown, however, only 1 may be used at a time. It is recommended that the cureent loop be used whenever the specificed prointer will support it becuase of the isolation acheived. IF the RS 232 communication is used, do not exceed 50 feet in cable length.

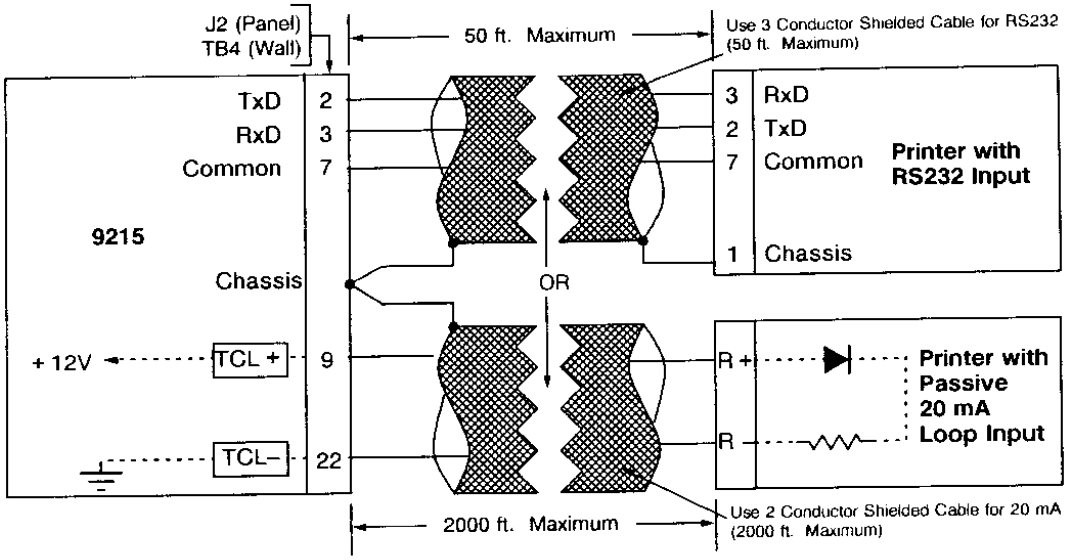


Figure 3.1 9215 Interface Connection to Printer

3.3.2.2 Host Network Interface

The host interface cable termination is made at TB2 on the I/O panel (wall) or J3 (panel). RS232 and RS422/485 full duplex are supported. It will support multidrop operation for multiple 9215's via a single host computer but only if the RS485 4 wire dpuplex operation is utilized. (RS232 cannot support multiple devices on a common parity line). If multille 8215 control is desired, the host muyst have RS 422/485 4 wire capability or use an RS232 to RS 422.485 adapter. Mettler Toledo can supply this converter as an external device if desired (0964-0038).

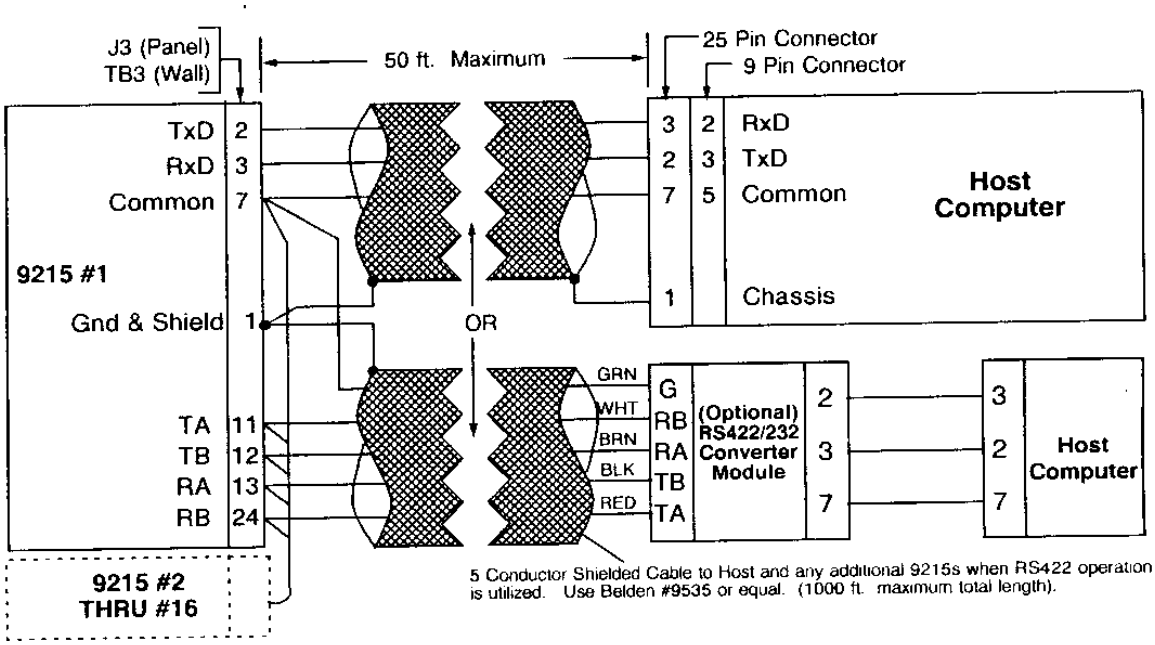


Figure 3.2 9215 Interface Connection to Host Computer

Baud rate is selectable at 300, 1200, 2400, 4800, 9600, 7 bit data plus an even parity. DTR (pin 20) is a +12 VDC source in the 9215 for use by the host as a “Power On” indicator if desired. Refer to Section 4.11 for details on the Host serial port setup.

The 9215 unit drop address, which is used in communications with a host computer, is set with the DIP switches SW1-5 thru 8 on the main TSM-300 PCB in the door. They set a binary address where switch SW1-5 is 8, SW1-6 is 4, SW1-7 is 2 and SW1-8 is 1. Refer to Section 6 for a discussion on the Host Port Communications. (Refer to Table 3-12 for switch and jumper functions).

3.3.2.3 Remote Display Interface

The remote display cable termination is made on TB5 on the I/O panel. Only active 20mA current loop is furnished. The data at this port is Mettler Toledo standard continuous data formt directly from the indicator (8142 or 8530) PCB. The baud rate and parity us set in the indicator setup and must be 4800 baud continuous even parity data. The only supported remote display is the Model 8623, which can be configured to display indicated gross weight only. Refer to the 8623 Remote Display Technical Manual for details. Typical connections are:

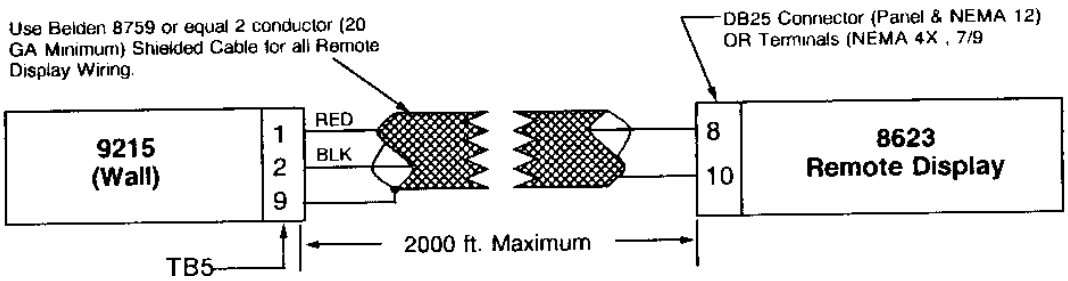


Figure 3.3 Remote Display Interface

3.3.2.4 SmartLink Network Interface

The I/O RS485 interface wiring is common to all SmarLink boards in the system both internal to the main enclosure (wall units) and in remote enclosures. It is a full duplex (4 wire) party line suppoting multidrop operation. All SmartLink boards in the system are connected in parallel. That is, all “receive” inputs are connected together and then connected to the 9215 output. Likewise, all “transmit” outputs are connected together then connected to the 9215 input. In this configuration, all 9215 transmitted requests are seen at all SmartLink boards but only the one addressed will respond. The 9215 always initiates the exchange, never the SmartLink. SmartLink network communication occurs at 38,400 baud so proper cable termination (particularly the sheilds) is very important. Do not share a conduit with any other high level logic. Required connections are:

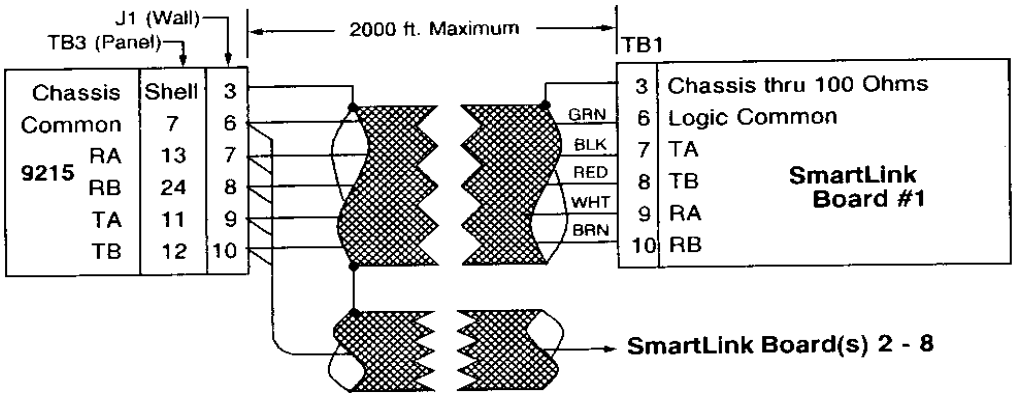


Figure 3.4

SmartLink Board(s) Interface

The following illustrates the required SmartLink PCB SW1 or S1* switch positions for each SmartLink PCB on the SmartLink network:

PCB	SmartLink	*SW1 or S1		
	Address	1	2	3
1	0	OFF	OFF	OFF
2	1	ON	OFF	OFF
3	2	OFF	ON	OFF
4	3	ON	ON	OFF
5	4	OFF	OFF	ON
6	5	ON	OFF	ON
7	6	OFF	ON	ON
8	7	ON	ON	ON

Table 3-11 Panel Units Interface (Only)

3.3.2.5 Scale Input Interface (Panel Units Only)

The 9215 Panel Units do not have an internal sale indicator so the same information must be received digitally via J4. This data can only be RS232 baud Mettler Toledo continuous format, so close proximity to the remote scale indicator is required. (Current loop operation at this port is not supported.) Maintain a good quality groundbetween units and do not exceed 50 foot cable length. Required connections are:

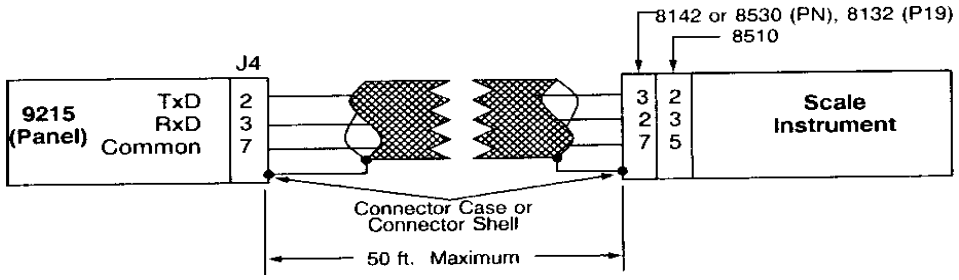


Figure 3.5 Panel Unit Interface (Only)

3.4 9215 TSM-300 BOARD AND SMARTLINK BOARD SETUP

3.4.1 TSM-300 BOARD SETUP

Before power is first applies to the equipment, the switch and jumper settings of the 9215 TSM-300 board should be checked for proper configuration. The switch on this board are read only upon powerup. Therefore, if it needs to be changed once power has been applied, the power will have to be cycled after the switch change.

	TSM-300 PCB		I/O	SmartLink PCB #1
	SW1-1	**SW1-2**	**ADDRESS**	**FUNCTION**
Factory Setting	OFF	OFF	OD OE OF	FAST DISCHARGE FAST FEED 1 FEED 1
	OFF	ON	OD OE OF	MIXER FAST FEED 1 FEED 1
	ON	OFF	OD OE OF	FAST DISCHARGE MIXER FEED 1
8 OR 16 Material	ON	ON	OD OE OF	FAST DISCHARGE MIXER OFF TOLERANCE

Table 3-12 Assignments for SmartLink PCB #1 (Outputs, OD, OE, OF)

SETTING		FUNCTION
SW3	OFF	38.4K Baud (Normal)
	ON	19.2K Baud (Test Only)
SW4	OFF = RUN ON = LOAD	PLC Logic

HOST DROP ADDRESS	SW1-5 (BIT 8)	SW1-6 (BIT 4)	SW1-7 (BIT 2)	SW1-8 (BIT 1)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

Table 3-13 TSM-300 PCB SW1 Setup Selections

JUMPER	POSITION	FUNCTION (*) = FACTORY SETTING
W1 & W2	BOTH OUT*	WATCHDOG TIMEOUT = 1.6 SEC. RESET = 50 MS
	1 IN 2 OUT	WATCHDOG TIMEOUT = 100 MS, RESET = 50 MS
	1 OUT 2 IN	WATCHDOG TIMEOUT = 1 SEC, RESET = 500 MS
	BOTH IN	WATCHDOG TIMEOUT & RESET DISABLED
W3	OUT* 1-2 2-3	DISABLE ALARM INTERRUPT ALARM INTERRUPT = RST 6.5 ALARM INTERRUPT = RST 5.5
W4	1-2 2-3*	UART #1 INTERRUPT = RST 6.5 UART #1 INTERRUPT = RST 5.5
W5	1-2* 2-3	UART #2 INTERRUPT = RST 6.5 UART #2 INTERRUPT = RST 5.5
W6	OUT* IN	POWER FAIL DETECT ENABLED POWER FAIL DETECT DISABLED
W7	OUT IN*	DISABLE WATCHDOG ENABLE WATCHDOG (SOLDERED JUMPER)
W8	OUT* IN	CHANNEL 3 RS485 TA PULLUP OUT CHANNEL 3 RS485 TA PULLUP IN
W9	OUT* IN	CHANNEL 3 RS485 TB PULLDOWN OUT CHANNEL 3 RS485 TB PULLDOWN IN
W10	1-2 2-3*	U5 EEPROM SELECT U5 SRAM SELECT
W11	OUT* IN	CHANNEL 1 RS485 TA PULLUP OUT CHANNEL 1 RS485 TA PULLUP IN
W12	OUT* IN	CHANNEL 1 RS485 TB PULLDOWN OUT CHANNEL 1 RS485 TB PULLDOWN IN
W13	1-2 & 3-4 2-3	CHANNEL 4 20 MA LOOP XMIT ACTIVE CHANNEL 4 20 MA LOOP XMIT PASSIVE
W14	1-2&3-4 2-3	CHANNEL 2 20 MA LOOP XMIT ACTIVE CHANNEL 2 20 MA LOOP XMIT PASSIVE

Table 3-14 TSM-300 Jumper Selection (A13820100A PCB)

* = Required Setting.

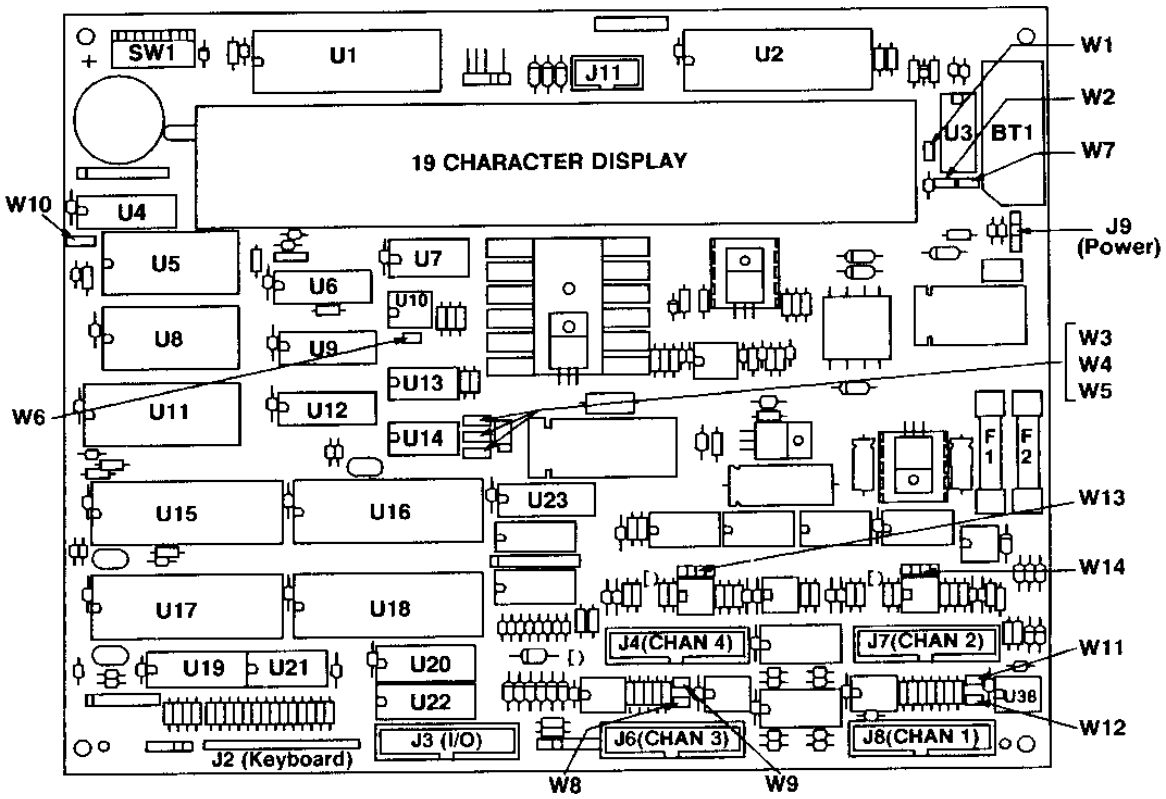


Figure 3.6 TSM-300 PCB Identifications

(C90084100A Shown)

3.4.2 SmartLink BOARD SETUP

The factory jumper settings for all I/O SmartLink boards are as follows:

OLD PCB DEFAULT JUMPER SETTINGS			NEW PCB DEFAULT JUMPER SETTINGS		
JUMPER	**POSITION**	**FUNCTION**	**JUMPER**	**POSITION**	**FUNCTION**
W1	OUT	RA232 XMIT ENABLE	W1	IN	EPROM PROGRAM SELECT
W2	RS485	RS485 XMIT ENABLE	W2	OUT	RS232 RX/TX ENABLE
W3	OUT	20 mA XMIT ENABLE	W3	IN	RS485 RX/TX ENABLE
W4	OUT	RS232 RECV ENABLE	W4	OUT	20mA RX/TX ENABLE
W5	IN	RS485 RECV ENABLE	W5	IN	RS485 RB PULLDOWN
W6	OUT	20mA RECV ENABLE	W6	IN	RS485 RA PULLUP
W7	OUT	TLAN ENABLE	W7	OUT	RS485 LINE TERMINATION
W8	OUT	RS485 TERMINATION	W8	OUT	RS485 TB PULLUP
W9	IN	WATCHDOG ENABLE	W9	OUT	RS485 TA PULLDOWN
W10	OUT	WATCHDOG TIMEOUT SEL			

Table 3-15 Default Jumper Settings

The SW1 switch setting vary with the application. The factory set 1st OCB settings are identified with an *.

SmartLink		SW1 or S1		
PCB No.	Address	1	2	3
1	0	OFF*	OFF*	OFF*
2	1	ON	OFF	OFF
3	2	OFF	ON	OFF
4	3	ON	ON	OFF
5	4	OFF	OFF	ON
6	5	ON	OFF	ON
7	6	OFF	ON	ON
8	7	ON	ON	ON

Table 3-16 Drop Address Assignments

BAUD RATE SELECTION		
S1-4 OR SW1-4	ON OFF*	19.2K BAUD (TEST ONLY) 38.4K BAUD (NORMAL)
I/O GROUPING ASSIGNMENTS		
S1-5 OR SW1-5:	ON* OFF	I/O 00-03 = INPUTS I/O 00-03 = OUTPUTS
S1-6 OR SW1-6	ON* OFF	I/O 04-07= INPUTS I/O 04-07 = OUTPUTS
S1-7 OR SW1-7	ON OFF*	I/O 08-0B = INPUTS I/O 08-0B = OUTPUTS
S1-8 OR SW1-8:	ON OFF*	I/O OC-OF = INPUTS I/O OC-OF = OUTPUTS

Table 3-17 Baud Rate Selection and Grouping Assignments

3.4.3 STANDARD SWITCH SETTINGS (9215 W/DEFAULT I/O)

BOARD 1		BOARD 2		BOARD 3	
S1 or SW1	DESCRIPTION		DESCRIPTION		DESCRIPTION
1:OFF	DROP ADD 1}0	1:ON	DROP ADD 1}0	1:OFF	DROP ADD 1}0
2:OFF	DROP ADD 2}0	2:OFF	DROP ADD 2}0	2:ON	DROP ADD 2}0
3:OFF	DROP ADD 4}0	3:OFF	DROP ADD 4}0	3:OFF	DROP ADD 4}0
4:OFF	38.4K BAUD	4:OFF	38.4K BAUD	4:OFF	38.4K BAUD
5:ON	I/O INPUT 00-03	5:OFF	I/O INPUT 10-1	5:OFF	I/O INPUT 20-23
6:ON	I/O INPUT 04-07	6:OFF	I/O INPUT 14-17	6:OFF	I/O INPUT 24-27
7:ON	I/O OUTPUT 08-0B	7:OFF	I/O OUTPUT 18-1B	7:OFF	I/O OUTPUT 28-2B
8:ON	I/O OUTPUT 0C-0F	8:OFF	I/O OUTPUT 1C-1F	8:OFF	I/O OUTPUT 2C-2F

NOTE: Old PCB has no 2nd dip switch. New PCB switch S2 is not used.

Table 3-18 SmartLink Board Default Configuration S1 or SW1 Switch Setup

3.5 9215 BATCHELOR POWERUPSEQUENCE

When power is first applied to this equipment, both the scale indicator and main display proceed through a powerup display sequence. The 8142 (or 8530) display will go through it's specific powerup test sequence. Following that sequence the indicator display will:

a) Display weight if load cell output is within range.
b) Display E E E if auto zero maintenance is ON and scale is not at zero.
If this condition is present, enter setup and disable auto zero maintenance.(This feature is NOT desired for batching applications.)

c) Display will blank if weight is out of range (minus bar will be ON for out of range below zero).
d) Display an error code [E*] where * is the error encountered. Refer to the proper indicator section for details.

At the same time, the 9215 main display will sequence as follows:

The display shows the 9215 Batchelor program and language part numbers. The program number is displayed on the left. A letter designating the program revision level may be displayed. The display will appear for 10 seconds then the program will proceed.

Two types of tests are performed when the9215 starts or restarts. One is a validation of checksums of previously loaded tubes batching. The other isa test of RAM memory not containing tables. Upon powerup the RAM memory is first tested for corruption. If found corrupt it is cleared to zeros and a cleaing of atching tables will follow. All PLC functions are contained in RAM so the ladder will be cleared out if RAM is cleared. When RAM corruption is detected the main display will indicate "**System Fault Init**". Press <ENTER> to proceed. If the test of RAM memory is OK, the powerup sequence will advace to statement #2 under section 4.2 Powerup.

Indicator Increment Size (2)	TOTAL SCALE CAPACITY (lb, kg, etc.)					
	MINIMUM		MAXIMUM (9215 Only)		MAXIMUM (9215 Data Manager)	
	8142	8530	8142	8530	8142	8530
.0001	-	-	5.0000	6.0000		
.0002	-	-	12.0000	12.0000		
.0005	-	-	25.0000	30.0000		
.001	.6	1	(3) 50.000	(4) 60.000	(6) 20.000	(6) 20.000
.002	1.2	2	(1) 100.000	(1) 120.000	(6) 40.000	(6) 40.000
.005	3	5	(1) 250.000	(1) 300.000	(1) 99.995	(1) 99.995
.01	6	10	(3) 500.00	(4) 600.00	(6) 200.00	(6) 200.00
.02	12	20	(1) 1000.00	(1) 1200.00	(6) 400.00	(6) 400.00
.05	30	50	(1) 2500.00	(1) 3000.00	(1) 999.95	(1) 999.95
.1	60	100	(3) 5000.0	(4) 6000.0	(6) 2000.0	(6) 2000.0
.2	120	200	(1) 10000.0	(1) 12000.0	(6) 4000.0	(6) 4000.0
.5	300	500	(1) 25000.0	(1) 30000.0	(6) 9999.9	(6) 9999.9
1	600	1000	(3) 50000	(4) 30000	(1) 20000	(1) 20000
2	1200	2000	(3) 10000	(4) 120000	(6) 40000	(6) 40000
5	3000	5000	(3) 250000	(4) 300000	(6) 100000	(6) 100000
10	6000	10000	(3) 500000	(4) 600000	(6) 200000	(6) 200000
20	12000	20000	(1) 999980	(1) 999980	(6) 400000	(6) 400000
50	30000	50000	(1) 999950	(1) 999950	(1) 999950	(1) 999950
100	60000	100000	(1) 999900	(1) 999900	(1) 999900	(1) 999900

Table 3-19 Total Scale Capacity

Number in parenthesis indicates key to maximum capacity limitation.

Some scale builds detailed in the connection, cablibration section 3 are not correct. The corect limitations are as follows:

1. Maximum 9215 display counts = 7 digits (including decimal point)
2. Minimum increment size = .0001
3. Maximum 8142 increments = 50,000
4. Maximum 8530 increments = 60,000
5. Maximum 9215 increments = 999,999
6. Maximum Data Manager increments = 20,000

3.7 8142 INDICATOR CALIBRATION

The following section describes the acitons required to setup and calibrate the 8142 analog scale indicator in the 9215 Wall Mount Batchelor. The information contained in this scion is also valid for tjhe Panel 9215 when a remote 8142 is used. This section is divided ito five sub-sections each deatiling specific parts of the calibration sequence.

3.7.1 8142 PRELIMINARY CALCULATIONS

Before connecting the 9215 to a load cell or load cell junction box, it should be determined if the load cell(s) are of a size and quantity that will work correctly with the instrument and platfom. It is a standard build, proceed with the installation of hte scale, the micorvolts per increment should be calculated. Calculate microvolts per increment, then check with the chart to make sure the proposed load(s) are the correct size.

To find the micorvolt per increment build, first find:

a) Scale capacity (lb or kg)
b) Increment size (lb or kg)
c) Number of load cells or total level ratio
d) Zise of load cell(s) (lb or kg)
e) Cell output rating in millivolts/volt

Find total load cell output in millivolts. Multiply cell mV/V output rating by the 8142 excitation voltage of 12.5V.

NOTE: Metller Toledo cells are 2mV/V. Others may be 1, 1.75, or 3 mV/V.

$$\frac{\text{Increment Size X Total Load Cell Output (mV) X 1000}}{\text{Individual Load Cell Capacity X Number of Cells}} = \text{uV/Increment}$$

Example to find microvolt/increments for:

Scale Capacity	5000 lb
Increment Size	1 lb
Number of Cells	4
Size of Cell	2000 lb
Cell Output Rating	2 mV/V
8142 Excitation	12.5V

Step 1) Find total load cell output (mV): 2mV/V X 12.5 V = 25mV

Step 2) Apply the above formula: $\frac{1\text{lb X } 25\text{mV X } 1000}{2000\text{ lb X } 4} = 3.125\text{ uV}$

Step 3) Divide scale capacity by increment size to find programmed increments:

$$\frac{5000\text{ lb}}{1\text{lb}} = 5000\text{ Increments}$$

Step 4) Check the microvolt/increment chart of the next page to see if the build (uV) fits within the 5000 increment range. it does, so this is a satisfactory build.

MICROVOLT CHART FOR 8142 PCB'S WITH JUMPERS W7 SET BETWEEN PINS 1 AND 2 (2mV/V)			MICROVOLT CHART FOR 8142 PCB'S WITH JUMPERS W7 SET BETWEEN PINS 2 AND 3 (3mV/V)		
Number of Increments	**Minimum uV/Inv****	**Maximum uV/Inc***	**Number of Increments**	**Minimum uV/Inv****	**Maximum uV/Inc***
600	5.0	43.3	600	5.0	63.3
1,000	3.0	26.0	1,000	3.0	38.0
1,200	2.5	21.7	1,200	2.5	31.7
1,500	2.0	17.3	1,500	2.0	25.3
2,000	1.5	13.0	2,000	1.5	19.0
2,500	1.2	10.4	2,500	1.2	15.2
3,000	1.0	8.7	3,000	1.0	12.7
4,000	0.75	6.5	4,000	0.75	9.5
5,000	0.6	5.2	5,000	0.6	7.6
6,000	0.5	4.4	6,000	0.5	6.4
8,000	0.38	3.3	8,000	0.38	4.8
10,000	0.3	2.6	10,000	0.3	3.8
12,000	0.3	2.2	12,000	0.3	3.2
15,000	0.3	1.7	15,000	0.3	2.5
16,000	0.3	1.6	16,000	0.3	2.4
20,000	0.3	1.3	20,000	0.3	1.9
25,000	0.3	1.0	25,000	0.3	1.5
30,000	0.3	0.87	30,000	0.3	1.3
32,000	0.3	0.81	32,000	0.3	1.2
35,000	0.3	0.74	35,000	0.3	1.1
40,000	0.3	0.65	40,000	0.3	0.95
45,000	0.3	0.58	45,000	0.3	0.84
48,000	0.3	0.54	48,000	0.3	0.80
50,000	0.3	0.52	50,000	0.3	0.76

Table 3-20 Microvolt Per Increment Charts

Notes: * The 8142 cannot be calibratd for builds that are greater than the voltage shown for the maximum uV/increments.

** The 8142 should never be programmed to less than 0.3uV/increment. Note, however, that even though builds less than 0.5uV/increment are achievable, they may result in unacceptable stability.

JUMPER DESCRIPTIONS

W1 External ROM Enable. It must be in place shorting the two pins.

W2 Store Enable (J2)

The setup switch is connected across W2. Turn ON to accress the setup mode. It must be turned OFF to exit the setup routine. When this is referenced on the display on the display of the 8142, it will be shown as J2.

W3 Comma. When this jimper is shorting the two pins, a comma wil be displayed instead of a decimal point in the 8142 display only.

W4 Not Used.

W5 Not Used

W7 Load Cell Output Selection

2mV/V When using 2mV/V load cells, this jumper must be between pins 1 and 2

3mV/V When using 3mV/V load cells, this jumper must be between pins 2 and 3

3.7.2 8142 PROGRAMMING PROCEDURE INTRODUCTION

This section of the technical manual describe programming of the operating modes, features and self-calibrating procedures.

Sample displays are shown with programming prompts. Described with each sample display are acceptable programming selections with the effect it will have on the operation.

At powerup, the display will advance through the display test. Then the program part number is displayed followed by the revision level.

Example: **[128896]** then **[3]**. The 3 corresponds to "C" revision software. It is the lowest revision level that can be used with the 9215.

NOTE: Throughout the remaining sections of this manual information that is displayed will be presented within brackets and bloded like this: **[Example]**.

WARNING!!

THE 9215 WILL NOT OPERATE PROPERLY WITH AN 8142 PCB EARLIER THAN "C" REVISION. DO NOT OPERATE THE 9215 WITH AN EARLIER VERSION 8142 PCB. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN DAMAGE TO EQUIPMENT OR PROCESS OR MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

Three front panel keys will have the same function throughout the programming procedure. They are:

Zero - To backup the programming routine one step. It will not function during calibration or at **[S FILE]**.

NOTE: Previous steos are allows in shortcut calibration only.

Setup - This will accept data entered so far and wil go to the last step [S FILE].

Enter - The data display will be accepted and the routine wil proceed to the next step.

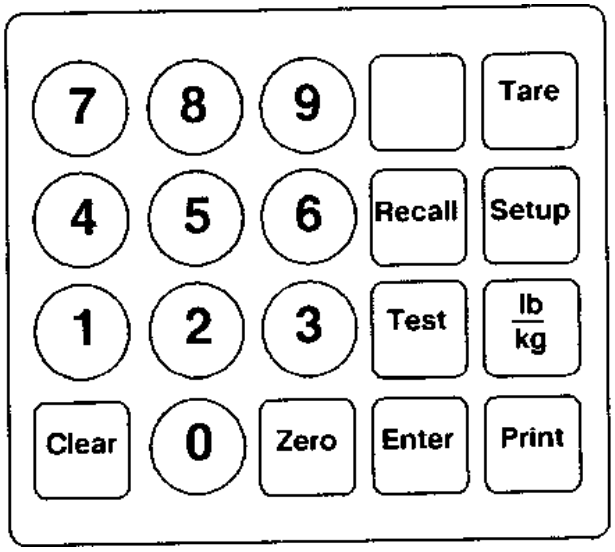


Figure 3.7 8142 Keypad

[FA.A X] Will enclose what should be displayed on the 8142. A.A is the Step Number and X is a numeric character to designate the choice and is application dependent.
“” will enclose key(s) to be pressed.

The setup procedure menu is broken into groups of programming steps. Each group has a general theme. Listed beloware the group headings and total steps in eah group.

GROUP HEADING		TOTAL STEPS
[F2.0]	Tare Functions	5
[F3.0]	Powerup Functions	7
[F4.0]	Averaging and AZM Functions	5
[F5.0]	Data Output Functions	7

Table 3-21 Group Programming Steps

3.7.3 8142 QUICK REFERENCE CHART

Use the following chart for a programming description quick reference. Also listed is the recommended selection for eacch step as a beginning point for inital setup. Verify each selection to be certain it coincides with actual usage before attempting calibration. Included at the right of the list are the suggested settings for switches about “Legal for Trade” applications. Be sure to confirm the latest government agency regulations having jurisdiction over the 8142 application before relying upon any suggested setting.

STEP	DESCRIPTION	*Initial Setup	*9215 REQUIRED	*LEGAL FOR TRADE
F2.0	TARE FUNCTIONS			
	F2.1 Tare Active?	1		
	F2.2 Tare Interlock On?	0		1
	F2.3 Auto Clear Tare?	0		
	F2.4 Zero Cursor Enabled?	0		1
	F2.5 Keystroke Timeout Enabled?	0		
F3.0	POWERUP FUNCTIONS			
	F3.1 Powerup Timer On?	0		
	F3.2 Powerup in Pounds?	1		
	F3.3 LB/KG Switching?	1		
	F3.4 Expand Mode On?	0	0	0
	F3.5 Span Adjust Enabled?	0	0	
	F3.6 Display On Under Zero?	0	1	0
	F3.7 Store New Zero Ref. Adjust?	0		
F4.0	AVERAGING AND AZM FUNCTIONS			
	F4.1 Auto Zero Capture			
	F4.2 Motion Sensitivity	05		
	F4.3 Motion Detection	07		00 to 30
	F4.4 Digital Filtering	03		06/30
	F4.7 Zero Pushbutton Range Select	01		
		0		1
F5.0	DATA OUTPUT FUNCTIONS			
	F5.1 Demand Mode	1	2	
	F5.2 RS-422 Enabled?	1	0	
	F5.3 Baud Rate	2400	4800	
	F5.4 Checksum Enabled?	0	1	
	F5.17 ASCII Remote Input Enabled?	1		
	F5.18 Enable Print Interlock	1		

Table 3-22 Programming Description Quick Reference

*** NOTE:** 1 = Yes and 0 = No answers only to description functions that represent questions (?).

3.7.4 8142 PROGRAMMING PROCEDURE

Turn the internal setup switch to ON. Press “Setup” to access the programming routine. (At this point the display will advance to **[CAL AJ]**). The cursor will be illuminated under the setup legend. If setup switch must be turned to ON to proceed.

[CAL AJ] CALIBRATION ADJUST

This prompt will occur only if Step F3.5 is “1” and the setupswitch is ON.
To adjust span, answer “1” when this prompt appears. Ater the adjustment, the remainder of the stup will be skipped. To continue with the setup mode but not adjust span, press “0”.

[PRINT ?] PRINT SETUP?

Press

“0” The setup parameters will not be printed.
“1” All programmed setup data in the 8142 will be printed if printer is attached.

NOTE: The 8142 will exit if the setup switch is OFF or continue to Step F2.0 is ON.
NOTE: This printout will not be correct if the 8142 is programmed for continuous data via Step F5.1 as needed by the 9215. other format or print problems may occur if an 8806 printer is attached and it is programmed for accumulation. If a print is required, first set Step 5.1 to “1”, print daa and then return to 51 to “2”. Also reset baud rate to 4800 if it was changed. An 8855 printer is recommended to print the setup selections. Use the remote display port (TB5).

8142 [F2.0 ?] ACCESS TARE FUNCTION GROUP?

Press

“0” To skip the tare setup. The display proceeds to Step F3.0
“1” To enter the setup routine for all tare functions

[F2.1 1] TARE ACTIVE

Press

“0” To disable tare. Setup will go to F2.2 and skip F2.3
“1” To enable the keyboard, pushbutton, and remote tares.
“2” Pushbutton and remote tare only.

[F2.2 0] TARE INTERLOCK

Press

“0” To disable the interlock. Tare may be cleared or charnged at any weight indication. Multiple tares are accepted. 8142 will power up with a non-flashing weight display.
“1” To enable the interlock. indication must be at gross zero before tare can be removed. Previous tare must be cleared before another tare can be entered. Weight display is disabled at “powerup”. It is [E E E] until true zero is captured. Digital tare can only be entered when scale is at true zero.

NOTE: If this function is disabled the weight cursor (LB or KG) will turn off with motion on the scale. If enabled, the cursor will stay on at all times.

[F2.3 0] AUTO CLEAR TARE

Press

“0” Tare must be manually cleared with the “Clear” Key.

"1" Tare clears automatically when indication returns to gross zero after setting to a no motion condition at a weight greater than ± 10 increments.

[F2.4 0] ZERO CURSOR ENABLE
Press

"0" Zero cursor is illuminated only at gross zero.
"1" Zero cursor illuminates at both gross and net zero.

[F2.5 0} KEYSTROKE TIME OUT ENABLE
Press

"0" To disable timeout. The scale will wait for operator entry with no time limit.
"1" To enable 2 second keyboard entry timeout.

Setup steps **[F2.6]** and **[F2.7]**, have been added to meet French weights and measures legal-for-trade requirements. These steps are not intended for and MUST NOT BE USED in domestic applications.

8142 [F3.0 ?] ACCESS POWERUP FUNCTION GROUP?

Press

"0" To bypass setup for these functions and proceed to F4.0
"1" To enter powerup options and LB/KG switching functions.

[F3.1 0] POWERUP TIMER
Press

"0" No delay at powerup before the weight is displayed.
"1" Weight display remains blank and legend indicators blink until the timeout period of 30 seconds has elapsed to allow the electronics to warm up.

[F3.2 1] POWERUP POUNDS
Press

"0" The 8142 will power up in kilogram mode.
"1" The 8142 will powerup in pounds.

[**F3.3 0] LB/KG SWITCHING**
Press

"0" lb/kg is disabled.
"1" Pounds and kilogram switching ise possible via keyboard.

NOTE: Set this step to 0 (zero) when used with the 9215.

[F3.4 0] EXPANDED DISPLAY MODE
Press

"0" The weight display will not be expanded.
"1" The weight display will be expanded. Tare is disabled.

NOTE: The 8142 must not be left in expand mode for weighing. This is used for installatio evaluation & troubleshooting only. Print and AZM functins willbe displayed in ecpland mode.

[F3.5 0] SPAN ADJUST
Press

"0" To disable the span adjust feature.
"1" To enable the span adjust feature without total recalibration.
Complete the standard calibraion first to provide a reference point before using this step.

[F3.6 1] **DISPLAY UNDER ZERO**

If disabled, the 8142will bank the weight display a minus sign for negative weights greater than 5 displayed increments. If enabled, the 8142 iwill dislplay negative weight until the limit is reached. This is determine bythe total increments selected and mount of initial used. if it akwaus at least 5$ og totwl

Press

"0" To blank the 8142 and displayu minus sign at any reading error than 5 displaeys under zero.
"1"" To allow the 8142 to dislay negaictve weight readinings greater than 5 displayed increments (recommended.).

[F3.7 0] **ZERO REFERENCE ADJUST**

Enabling this function allows ±20% adjustment of the Gross Zero Reference (the weight on the load cell or cells with no weight on the scale) **AFTER CALIBRATION** of the scae is complete. Before calibrqtion a "0" should be entered surijg setup to pass over this function. After the scale is calibrated (or precalibrated with a load cell simulator) and the gross zero reference needs to be changed, the setup mode must be entered and steppred through until **[F3.7]** is displayed. With the scale at the new gross zero reference:

Press

"0" or "Enter" To accept the currently stored value.
"1" To accept and store the new zero reference.

NOTES: the new zero reference **MUST** be within ±20% og the total increments (selected in calibration) of the zero value of the lat full calibration or the 8215 will need to be recalibrated to attain the desired new zero.

Zero adjust is not functional when the 8214 is over or under capacity with blanked display. If F3.7 has not been used to adjust zero, and zero must be adjusted a second time, the F3.7 sequence mst be done **TWICE.** Exit then reenter Setup, i.e. operator enters Setup,proceeds to F3.7, enters a "1", exits Setup, enters a "1" for **[SAVE FILE],** reenters Setup and repeats the sequence entering "1" for F3.7 and "1" for **[SAVE FILE]**.

8142 [F4.0 ?] ACCESS DIGITAL AVERAGING/FILTERING AND AZM?

Press

"0" to skip these parameters. The 8142 proceeds to Step F5.0
"1" To enter the AZM and filtering selections.

[F4.1 05] **AUTO ZERO CAPTURE**

Auto Zero Capture is defined as rezeroing the scale after the scale has settled to a no-motion condition at 10 displayed increments or greater, then return to a number within the selected ± Auto Zero Capture range* of zero. once the 8142 senses a no-motion condition iut will subtract the displayed weight to a new zero setting. Showld the sclae, displaying a zero weight, experience a sudden weight increase greater than 0.1 increment per second, the 8142 will *capture zero* after the weight settles if the weight is within the range set.

***NOTE**: If the weight settles to a reading outside of the selected ± Auto Zero Capture range the 8142 wil not zero the display.

At this point Auto Zero Maintenance comes into effect adjusting any zero changes at a rate of 0.1 increments / second or less. Auto Zero Maintenance is disabled if 00 is selected.

Press

"0" To step to the next displayed selection.
"1" To accept the displayed selection.

SELECTIONS are:

00 = Auto Aero Capture and Auto Zero Maintenance should be disabled for 9215 applications.
05 = ± 5 Minor increments
10 = ± 10 Minor increments
20 = ± 20 Minor increments
30 = ± 30 Minot increments

[F4.1A 0] AZM IN GROSS WEIGHT MODE OR GROSS AND NET WEIGHT MODE

AZM in this mode permits the 8142 to compensate foir small changes in Aero and anytime the scale is at Gross Zero Even though it is in the Net Mode.

Press

"0" To perform AZM only at Gross Zero in Gross Mode only.
"1" To perform AZM at Gross Zero in Gross or Net Mode.

[F4.2 07] MOTION SENSITIVITY

An A/D cycle is the intercalk required for the processor to sample the analog load cell voltage and convert it to a corresponding digital value. Detected motion is the difference in weight between successive A/D cycles that is greated than the minor increments selected in F4.1 (minor inc. = 0.1 of a displayed inc.). This ± value is the no-motion window. Selections are 0-30 minor increments with 07 recommended as a starting value. Use the keyboard to enter the number. If only oine digit is entered, press "Enter" to proceed. If two digits are entered, the program will advance automatically. Press "Clear" to display the previous value.

NOTE: If 0 is entered, there is no motion detection and step [F4.3] will be skipped.

[F4.3 03] MOTION DETECTION

Once motion occurs, Print, Tare, Clear, Auto Zero Maintenance, and "Zero" functions are disabled. If the 8142 is in the continuous mode [F5.5 2] a bit in the data transmission is set to a logic 1 flagging motion condition. The 8142 will monitor A to D cycles comparing the weights until a no-motion condition occurs. The number entered for F4.3 is the number of consecutive A to D cycles with weight changes less than F4.2 entry before no-motion is acknowledged. All functions disabled during motion are enabled once no-motion occurs.

NOTES: The update rate of the 8142 (A/D cycles per second) is dependant upon the number of full sclae increments and the amount of initial weight per application.

For Batching applications a selection of 5 or 6 for F4.3 & no filtering is recommended as a starting point.

[F4.4 X] DIGITAL FILTERING

The filtering has 5 selections. it's purpose is to filter vibrations or motion inherent to the area (or application) the scale is beign used in. The idea result is a stable nonfluctiating display. The heavier the filtering the slower the display will updaye. The selection should be sampled at installation, starting with 0 (no filtering) until required stability is acheived.

Press

"0" To increment to the next filtering selection.
"1" or "Enter" To accept the displayed selection.

0 = No FIltering
1 = Light Filtering
2 = Medium Filtering
3 = Heavy Filtering
4 = Very Heavy Filtering

[F4.7 0] **PUSHBUTTON ZERO RANGE ADJUST**
Press

"0" To increment to the next range.
"1" or "enter" to accept the displayed range.

0 = Pushbutton zero disabled
1 = ± 2% of full scale increments
2 = ± 20% of full scale increments

NOTE: If ±20% is selected and the Zero Reference Adjust [F3.7] is using an amount approaching 20%, the full 20% requested in F4.7 will not be available in some 8142 combinations of total increments.

8142 [F5.0 ?] ACCESS DATA OUTPUT FUNCTION GROUP?

Press

"0" To bypass the data output setup and the program will proceed to the calibration **[CAL ?]** section.
"1" To access printer program setup for data output.

[F5.1 2] **DEMAND MODE**
Press

"0" To advance to the next selection.
"1" or "Enter" To accept the displayed mode.

1 = Demand Mode
2 = Mettler Toledo Continuous Mode
3 = Masstron Continuous Mode
4 = Mettler Toledo Continuous Short Mode Format

NOTE: This step must be "2" when used with the 9215.

[F5.2 0] **RS422 ENABLE**
Press

"0" If 20mA current loop is Rs--232 is used at printer port P5.
"1" If Rs-422 will be used at printer port P5.

NOTE: This step must be a "0" when used with the 9215.

[F5.3] **BAUD RATE**
[3 4800]

Press

"0" Advanbce to next baud rate. Choices: 1200,2400,4800,9600(continuous mode selections).
"1" If the value displayed is the correct baud rate.

NOTE: 4800 baud must be selected when ised with the 9215.

[F5.4 1] **CHECKSUM**
Press

"0" No checksum is transmitted.
"1" Checksum character will be transmitted.

Checksum is defined as the 2's conplement of the 7 low order bits of all characters preceding the checksum including STZ and CR. Bit 8 is parity for the 7 low order checksum bits.

NOTE: Set this step tpp "1" when used with the 9215.

[F5.17 1] **ASCII REMOTE INPUT ENABLE**

Selection of this function enables the Printer Port, P5, to recceive single ASCII characters into iuts RS-232 RxD inputs. These characters allow remote chontrol of the Zero, Print, Tare, and Clear Functions. If **[F5.17 2]** is selected, the printer port will output one continuous format message everytime a <CR> character is received at the input.

The ASCII Must be UPPER case characters 11 bit format with:

1 start bit, 7 data bits, 1 even parity bit, 2 stop bits

Press

"0" To disable the ASCII input.
"1" To enable the ASCII input.
"2" To enable the DEMAND/CONTINUOUS mode.

NOTE: This step must be set to "1" when used with the 9215.

[F5.18 1] **PRINT INTERLOCK ENABLE**
Press

"0" To advance to the next selection.
"1" To accept the displayed selection.

1 = No print interlock or autoprint
2 = Enable print interlock
3 = enable autoprint

NOTE: These choices have no effect on 9215 operation. Select "1".

[F5.19] **ADDITIONAL LINEFEEDS BETWEEN PRINTOUTS**
NOTE: This step is skipped if step 5.1 is properly set to wirk with the 9215. Go back and set step 5.1 to "2" before proceeding.

8142 CALIBRATION GROUP

[CAL] **CALIBRATION ACCESS?**

Allow at least 15 minutes for warmup before attempting 8142 calibration. This is to stabilize the load cell(s) and electronics.

CAUTION!!
ANYTIME **[CAL]** IS DISPLAYED "0" **MUST** BE PRESSED TO **EXIT** SETUP. PRESSING "ENTER", "1", OR "SETUP" WILL ENTER THE CALIBRATION SECTION AND ERASE THE CURRENTLY STORED GROSS ZERO VALUE. SCALE REZEROING WILL BE REQUIRED.

Press

"0" To bypass scale calibration and go to last step [S FILE].
"1" To access thye scale calibration mode.

When calibrating the 8142, it MUST remain closed or drifting will occur and cause errors. Calibration error codes are as follows:

ERROR	DESCRIPTION	CORRETIVE MEASURES
E1	ROM Error	1. Try power down/wait/powerup. 2. Replace main PCB
E2	RAM Error	1. Try power down/wait/powerup. 2. Replace main PCB
E3	NOVRAM Error	1. Try power down/wait/powerup. 2. Replace main PCB
E4	Printer Error	Check printer and cables.
E5	Display Verify Error	Replace main OCB.
E6	Analog Verify Error	Scale has not returned to zero.
E7	A/D Missing	1. Check load cells and cables 2. May be faulty wiring 3. Replace main PCB.
E8	Analog Verify Error	1. Recalibrate scale. 2. Replace main PCB
E13	NOVARAM Error	1. Try power down/wait/powerup. 2. Replace main PCB
CAL E1	Scale IN Motion	Detected during calibration.
CAL E2	Calibration Error	1. Try to recalibrate 2. Replace mina PCB
CAL E3	Calibration Error	1. Try to recalibrate 2. Replace mina PCB
CAL E4	Scale Over Capacity	Reduce test weights
CAL E5	Capacity Error	Microvolt build too small.
CAL E6	Insufficient Test Wt.	Increase test weight value.
CAL E8	Illegal Test Wt.	Use a test weight less than value entered 125% of full scale.
EEE	Zero Capture	See Step **[F2.2]**Tare Interlock for details.

Table 3-23 Error Codes and Descriptions

[C1] **TOTAL INCREMENTS**
[10000]

Press

"0" If the number displayed is not ok. Press "Zero" to display the next selection. Valid selections are 600, 1000, 1200, 1500, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10000, 12000, 15000, 16000, 20000, 25000, 30000, 32000, 35000, 40000, 45000, 48000, and 50000.
"1" If the number displayed is ok. Program goes to the next step.

[C2 2] **INCREMENT SIZE**
Press

"0" If the number displayed is NOT ok. Press "zero" to display the next selection. Valid values are X1, X2 and X5.

"1" If the numbered displayed is ok.

[C3] **DECIMAL POSITION**
[0.01]

Press

"0" If decimal position is NOT ok. Press the "zero" to display the next selection. Valid selections are 0.0001,0.001,0.01,0.1,1,10, and 100.
"1" If decimal position is ok.

NOTE: 0.00002 decimal position is not valid for the 9215.

[C5 0] **OVERLOAD BLANKING INCREMENTS**
This step allows entry of the maximum number of increments that will be displayed before the scale display will blank.

Press

"ENTER" To accept the current overload blanking programming.
"0" To select the default overload blanking, 9full capcity + 5 increments).
"1" To manually program overload blanking increments.

[ ] Enter the maximum number of increments that can be displayed before blanking the weight display. This entry can consist of up to 5 digits. Press "ENTER" to advance to the next programming step.

[E SCL] **EMPTY SCALE**
Remove all weight from the scale platform. Press "ENTER".

[15 CAL] **TIME OUT**
The 8142 counts down from 15 to 0 while zero is reset..

[Add Ld] **ADD LOAD**
Place the selected test weight on the scale platform. This should be a value close to the scale capacity. Use as much weight as practical but not less than 10% or more than 125%. Press "Enter".

[HPG] **TEST WEIGHT**
The display will blank and the value of weight used must be entered. Fractions or decimal weights are not accepted. Press "Enter" to continue.

[15 CAL] **TIME OUT**
The 8142 will count down from 15 to 0 while span is set.

[E SCL] **EMPTY SCALE**
Remove the weight and press "Enter"/ The 8142 will recheck zero.

[15 CAL] **TIME OUT**
The 8142 will count down from 15 to 0 while zero is reset.

[CAL d]CALIBRATION DONE
The display will appear for approximate 3 seconds. If analog verify is selected, display will be up to 10 seconds during AV zero capture.

[S FILE] **SAVE FILE?**
Is the programming just entered to be saved in a non volatile memory?

Press

"0" If the programming is to be used only until power loss.
"1" To store all steps in nonvolatile memory.

[J2 ON?] **JUMPER 2 ON?**
Turn setup switch OFF. Press "ENTER" to exit the setup routine. It is recommended that it be left OFF to inhibit inadvertent program changes.

3.7.5 8142 SPAN ADJUSTMENT

This feature allows an adjustment to span without repeating the entire calibration procedure. This is especially useful on large capacity tank and hopper scales where buildup procedures are used for calibration. Before span adjust can be used, the standard calibration must be performed. The requirement for the test weight value to be a minimum of 10% of capacity has been removed. However, it is suggested that as much weight as practical be used for calibration. The procedure is as follows:

a. Place a known test weight on the scale. If an adjustment is necessary, proceed to the next step.
b. Turn setup switch ON and press "SETUP". Go to step F3.5 and enter "1" (Yes).
c. Exit setup by pressing "SETUP" and answer "1" (Yes) to **[S FILE].** Turn setup switch OFF and press "ENTER".
d. Turn ON the setup switch and press "SETUP". The display will show **[CAL AJ]** with the display cursor flashing slowly. Only the SETUP key and numerals 1 and 0 will function. If any other key is pressed, the 8142 will exit the step.
e. To make a span adjustment, answer "1" (Yes) to **[CAL AJ]** then enter the correct test weight value when the display blanks. All digits should be entered including those to the right of the decimal point. Press "ENTER" to enter this value and the 8142 will exit the setup routing. This differed from standard calibration where only numbers to the left of the decimal point are entered.
f. The weight display should now show the correct weight value. This procedure may be repeated several times during a buildup procedure.
g. After all span adjustments are complete, reenter the setup mode by pressing "SETUP" and answer "0" (No) to step F3.5. Exit the setup mode then answer "1"(Yes) to **[S FILE].** Turn setup switch OFF and press "ENTER".

This procedure will work correctly when in the net mode. This is useful if a device to hold the test weights is required. Simply attach the holding device then press “TARE”. Add test weights then follow the span adjustment procedure. After one adjustment tare must be cleared then reentered if required again.

Weights entered in values other than multiples of the increment size will not be accepted.

3.8 8530 INDICATOR CALIBRATION

The following section describes the actions required to setup and calibrate the 8530 scale indicator in the 9215 Wall Mount Bathelor. The information contained in this section is also valid for the Panel 9215 when a remote 8530 is used.

3.8.1 8530 PRELIMINARY CALCULATIONS

In order to determine if a particular combination of increment sizes and scale capacity is acceptable, the following calculations must be made.

$$\text{Required Counts} = \frac{\text{(Desired Scale Capacity) x 10}}{\text{(Desired Increment Size)}}$$

$$\text{Actual Counts} = \frac{\text{(Desired Scale Capacity) X (Output Counts in Chart 1)}}{\text{Rated Capacity}}$$

Find the model number of digital bases used in Chart 1 then note the output counts at rated capacity for the particular capacity of base used. Use these values for the calculation of actual counts.

CHART 1*		
SCALE BASE MODEL NO.	**RATED CAPACITY**	**OUTPUT COUNTS AT RATED CAPACITY**
1992-0002	100 lb	525,000
1992-0003	140 kg	505,000
2096-0001	140 kg	525,000
2096-0002	300 kg	525,000
2196-0001	500 kg	525,000
2196-0002	1000 kg	525,000
2097-0001		
2097-0002		
2197-0001		
2197-0002		
DigiTOL J.Box		

Table 3-24 8530 Preliminary Calculations

* Table 3-24 will be expanded as additional Mettler Toledo digital Load Cell Bases are released.

Results:

1. If the Required Counts are less than or equal to the Actual Counts, the scale will calibrate correctly.
2. If the Required Counts are no more than twice the Actual Counts, the 8530 will adjust the integration ` factors in the digital load cell so that the scale will calibrate correctly.
3. If the Required Counts are more than twice the Actual Counts, either the Scale Capacity must be lowered or the Increment Size must be increased so that the Required Counts are less than twice the number of Actual Counts.

NOTE: The number of required counts cannot exceed 600,000 when a digital load cell is used. IF the calculated required counts exceeds 600,000 counts, the scale capacity must be increased so that a recalculation is less than 600,00 counts.

Load Cell Capacity	Minimum Increment		Scale Base Factory Numbers
	lb	kg	
60 kg	0.001	0.0005*	1992-0002, 2097-0001
100 kg	0.002	0.001	1998-0002, 2097-0001
140 kg	0.005	0.002	1996-0003, 2096-0001
300 kg	0.005	0.005	2096-0002, 2097-0002
500 kg	0.01	0.005	2196-0001, 2197-0001
1000 kg	0.02	0.01	2196-0002, 2197-0002

Table 3-25 DigiTOL Bench & Portable Bade Minimum Increment Size Selection

***NOTE: THE 9215 WILL NOT ACCEPT AN INCREMENT SIZE LESS THAN .0001**

NOTE: The minimum increment size selection shown in Table 3-25 are the smallest increment size selection possible for each given load cell capacity. The builds that result from using these selections may not meet Legal-For-Trade requirements. Consult the appropriate technical manual for the model base in question to determine the correct increment size election for Legal-For-Trade applications.

Load Cell Capacity	Minimum Increment		Scale Base Factory Numbers
	lb	kg	
8,000 lb	0.2	0.1	2157XXX02
12,000 lb	0.5	0.2	2157XXX05
20,000 lb	1	0.5	2157XXX10
40,000 lb	2	1	2157XXX20

Table 3-26 DigiTOL Floor Scale Minimum Increment Size Selections.

3.8.2 8530 PROGRAMMING PROCEDURE INTRODUCTION

With the setup switch “ON”, apply AC power. The 8530 will sequence throughout the following prompts”

```
[----------  ]
[128831  ]      These number will chance with software revisions.
[L08     ]      L08 is the lowest valid number to operate properly with the 9215. (version H).
[        ]
[........ ]     The lower cursors will all be lit.
[        ]
[--      ]
```

If any error codes are experienced during setup, press and hold “Clear” pushbutton until the error is cleared, then proceed to the Error Code Messages Section.

Entering the correct responses and data is done via the front panel keyboard. To accomplish this the following keys are functional in the Setup Mode as described:

KEY DESCRIPTION	CONTROL FUNCTION
“ENTER”	Terminates data entries and accepts dispalyed data.
“ZERO”	Backup to previous step.
“CLEAR”	Clears data from display to permit data reentry.
“1”	Yes, or Enable
“0”	No, or Disable

Table 3-27 Key Descriptions

The Setup procedure menu is broken into programming step Groups each having a general theme. Table 3-28 lists the Group readings and total steps in each group.

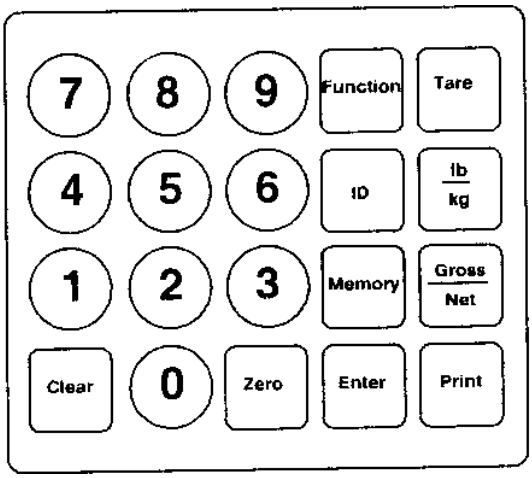


Figure 3.8 8530 Keypad.

GROUP HEADING		TOTAL STEPS
[00]	SCALE BASE INFORMATION.	[01] - [01]
[10]	SCALE SETUP & CALIBRATION.	[11] - [19]
[20]	FILTER, SPAN, ZERO, ZERO MAINTENANCE.	[21] - [28]
[30]	TARE PARAMETERS	[31] - [39]
[40]	PORT JN	[41] - [45]
[50]	PORT JW (NOT USED W/9215)	[51] - [57]
[60]	PRINTER PARAMETERS	[61] - [74]
[80]	INTERNATIONAL	[81] - [86]
[90]	LOAD CELL REPLACEMENT	[91] - [99]

Table 3-28 Programming Steps

Notice that in Table 3-29 each group has a number in brackets to the left. [00] for SCALE BASE INFORMATION for example. Anytime [--] is displayed the two digits to the left of the Group Heading in Table 3-28 will be entered and the 8530 will go to the first step in that group. [01 X] in this example. It will proceed through each step in this group then return to [--] display.

The operator may also observe or change single steps in the program without having to go through all steps in that group. This is done by entering a specific step number, “0” and “1” at the [--] display. The 8530 will display [01 X]. After the proper selection is entered the 8530 will go back to the [--] display.

Pressing the “Enter” pushbutton allows a group to be stepped through observing entries but not changing them.

Programming Setup Definitions.

Throughout this section of the technical manual:

[AA X] will enclose what should be displayed on the 8530. AA is the Step Number.

X signifies that a character is present. The specific character is application dependent. A number here is the default value.

“” will enclose the proper key(s) to be pressed.

DLC stands for digital load cell.

3.8.3 8530 QUICK REFERENCE CHART

The following chart can be used as a quick reference for programming descriptions. Verify each selection, such as calibration in pounds, to be certain it coincides with your requirements before attempting calibration.

MAJ GRP	STEP	DESCRIPTION	FACTORY SETTING	MAJ GRP	STEP	DESCRIPTION	FACTORY SETTING
00		**Scale Base Information**		40		**Port JN Group**	
	01	Single/multi DLC base	1		41	Demand output enable	0
	*02	Independ DLC or sect pair	0		42	Baud rate selection	4800
	*03	Quantity of DLC's	1		43	Parity selection	2
	*04	Auto DLC addressing	-		44	Enable checksum	1
	*05	Reset shift adj. to 1	0		45	Stop bit selection	1
		*multiple DLC's only					
				80		**International Group**	
10		**Scale Setup &**			81	Enable analog/dsp. ver.	0
	11	**Calibration**	1		82	Enable lb/kg switching	0
	12	Calibrate in lb or kg	0		83	Enable powerup in lb	1
	13	Linearity compensation	1		84	Enable print bracket wt.	-
	14	Autorange enable	2000		85	Enable PR for hand tare	-
	15	Scale capacity	1		86	Enable 1 ASCII rem. imput	-
	16	Increment & dp selection	-		87		
	17	Mid-range inc. & dp select	-		88	Net zero cursor	0
	18	Low-range inc & dp select	-		89		
	19	Shift compensation	-				
		Calibration		90		**DLC Replacement Group**	
20					91	Re-adressing a DLC	-
		Filter Selection, Span, Zero Adj., Zero			92	replacing a DLC	-
					93	DLC shift adjustments	-
	21	**Maintenance**	-		94	Set shift const. to "1"	-
	22	Zero adjust	-		95	Enable expanded display	0
	23	Span adjust	1		96	Enable function "0"	-
	24	Auto zero maintenance	0		97	Ent/disp. span.init., shift	-
	25	Auto zero capture/powerup	1		98	Load default parameters	-
	26	Pushbutton zero range	3		99	Display individual DLC wt.	-
	27	Motion detection	0				
	28	Filter selection	2005				
	29	Overload blanking wt.	0				
		Accumulation					
30							
	31	**Tare Mode Group**	2				
	32	Tare enable	0				
	33	Tare interlock					
	34	Not used	0				
	35	Autoclear tare	1				
	36	Pushbutton function select	0				
	37	Switch between net/gross	0				
	38	Function pushbutton select	0				
	39	Memory pushbutton enable	0				
		Auto assign of tare memory					

Table 3-29 Quick Reference Chart

3.8.4 8530 PROGRAMMING PROCEDURE

8530[00] SCALE BASE INFORMATION GROUP

This section of Setup deals with the number of load cells being used. If more than 1 cell is in the system, steps 02 though 04 will be accessed.

With **[--]** on the display, press the "0" key twice. This display will become **[01 X]** beginning the scale base information group setup.

[01 0] SINGLE/Multiple DLC Base

Define the number of digital load cells in the scale base. Steps 02-04 will be skipped if the scale uses only one digital load cell.

Press
"0" 8530 is connected to a single DLC scale base. (Bench & Portable Scales).
"1" The 8530 is connected to multiple DLC Truckmate scale (all systems with DigiTOL Power Cells)
"2" The 8530 is connected to a Model 2157 power module (and Digital J-Box).

NOTE: Steps 02-05 skipped if [01 0] is selected.
Step 05 is skipped if [01 1] is selected.
Step 02 is skipped if [01 2] is selected.
Step 03 will not accept an entry greater than 4 if [01 2] is selected.

[02 X] INDEPENDENT DLC OR SECTIONAL PAIRS
If more than one DLC is used, the 8530 must be programmed to accept DLC shift adjustments individually or in sectional pairs. Refer to the specific scale base technical manual for further shift adjustment details.

Press

"0" For Independent DLC shift adjustments
"1" For Section Pair shift adjustments

NOTE: A "1" must be entered for this step if the scale has more than 16 DLC's.

[03 XX] QUANTITY OF DLC'S
This step records the total number of DLC's in the scale. The 8530 then assigned an address to each cell of the group in Step 04. Enter the number of DLC's in the scale base and press "Enter".

[04] AUTOMATIC DLC ADDRESSING
A unique address must be assigned each DLC to allow communication separately. This Step assigns a unique address to each DLC.

The 8530 will communicate with all DLC's only if each DLC is addressed. If DLC 3 has been newly addressed, the 8530 will first communicate with DLC 2 than DLC 1 to be sure that they were not affected when DLC 3 was addressed.

NOTE: If error **[E8]** appears indicating unsuccessful DLC address communication, enter Step 91 and reset all DLC addresses to 240. Then repeat this step.

Press

"0" to assign new addresses and go to **[--]** prompt.
"1" to skip assignment and go t the **[04 01]** prompt.

[04 01]
With **[04 01]** on the 8530 display, connect only the DLC to be assigned address 01. (All DLC power is off). This **MUST** be the only DLC connected to the 8530.

Press "Enter". The 8530 will assign address 01 then display the next prompt.

NOTE: any DLC with an address number other than the factory assigned number of 240, must be readdressed to 240 in step 91.

[04 02]
Power is shut off again. Connect the DLC to be assigned 02 (DLC 01 can remain connected).

Press "Enter". The 8530 will assign address 02 to the DLC then display the next address number up to the limit in step **[03].**

After the last address the display will show **[--]** and exit step 04.

[05 0] RESET SHIFT ADJUSTMENT VALUES TO "1"

Select the desired function for resetting the shift values to "1". If done, it will erase any adjustment from step 18.

Press

"0" To store current shift adjustment values.
"1" To clear all previous values and reset to 1.

NOTE: Available only when **[01 2]** is selected for DigiTOL power module/2157.

8530[10] SCALE SETUP AND CALIBRATION GROUP

This group of prompts set up the scale capacity & increment size, performs shift adjust where appropriate and performs calibration.

NOTE: Analog Verify Step 81 should be enabled PRIOR to beginning the calibration procedure in Group 10. This section deals with calibration of the 8530 with the assigned scale case. There will be two variations of this calibration sequence depending on whether Linearity Compensation is disables of enabled. For best results, use test weights as close to the selected Scale Capacity as possible.

If any error codes are experiences during calibration, see the Error Code Messages in Section 3.7.5.

At the **[--]** prompt, press "1" then "0". The display will show **[11 X]** beginning the Scale Setup and Calibration Group.

[11] CALIBRATE IN LB OR KG.
This step tells the 8530 that the weight values entered during calibration are in lb or kg.

NOTE: If this steps is changed after calibration, the 8530 MUST be recalibrated with the correct lb. or kg. weights.

Press

"0" To calibrate in kilograms (kg).
"1" To calibrate in pounds (lb).

[12.0] LINEARITY COMPENSATION
This step enables linearity compensation. It is a selectable feature built into the 8530 software that calibrates once at a low weight and once at a high weight during the calibration procedure. This allows the 8530 to adjust for any DLC system nonlinearity. Select this step toe execute the two step procedure discussed in Step 19.

Press

"0" To disable.
"1" To enable.

[13 1] AUTORANGE ENABLE

Autorange allows up to 3 ranges within the capacity of one scale base. Range switch will occur when the total number of displayed increments in a given range is equal to the total number of displayed increments of the high range.,

Press

"1" For single range (no autorange).
"2" For 2 range autorange.
"3" For 3 range autorange.

NOTE: It is required that "1" be selected here when used with the 9215.

[14 10] SCALE CAPACITY

This step enters the scale weight capacity. Proper selection of scale capacity here and increment size in Step 15 should be based on the required weight for the specific application. The required weight capacity must **NOT** exceed recommended scale capacities.

Another important consideration is Total increments. Total increments is the number of increments between no weight on the scale and the selected scale capacity. the total increments of a specific application are determined by the following formula:

$$\text{Total Increments} = \frac{\text{Selected Scale Capacity}}{\text{Increment Size}}$$

The resultant number **MUST** be between 1,000 and 60,000 (except for applications using increment sizes of 20, 50 or 100). Refer to Table 3-30. The total increments number is calculated automatically by the 8530 after it is given the scale capacity and increment size in steps 14 and 15.

SELECTED	TOTAL SCALE CAPACITY RANGE	
INC. SIZE	**Minimum**	**Maximum**
0.0001	-	6
0.0002	-	12
0.0005	-	30
0.001	1	60
0.002	2	120
0.005	5	300
0.01	10	600
0.02	20	999
0.05	50	999
0.1	100	6000
0.2	200	9999
0.5	500	9999
1	1000	60000
2	2000	99999
5	5000	99999
10	10000	600000
20	20000	*999980
50	50000	*999950
100	1000000	999900

The increment size selection is in the left column.

The minimum selectable scale weight capacity is in the center column.

The maximum selectable scale weight capacity is in the center column.

***NOTE**: The three increment sizes are not equal to the maximum 60000 increments because of the 6 digit weight display limitation.

Table 3-30 Increment Range

[15.001] INCREMENT AND DECIMAL POINT SELECTION

If autorange is not selected in Step 13, this step enters decimal point position and increment size. Step 17 will then be skipped.

[XXXXXX]
Press

“0” to Display the next increment size selection.

A different selection is shown after each actuation of the “0” key. The “” in the display is where the 1,2 or 5 increment size will be entered once the proper decimal point or zeros selection is displayed. When the correct increment size is entered, the 8530 will proceed to the next step.

The following is the increment menu:

[0.0000]
[0.000]
[0.00]
[0.0]
[0.]
[ ]
[0]
[00]

[16] MID RANGE INCREMENT SIZE AND DECIMAL POINT LOCATION
NOTE: This step is skipped when step 13 is set for “1”. If this step is accessed, go back to step 13 and select “1”.

[17] LOW RANGE INCREMENT SIZE AND DECIMAL LOCATION
NOTE: This step is skipped when step 13 is set for “1”. If this step is accessed, go back to step 13 and select “1”.

[18] SHIFT COMPENSATION
This step skipped for single DLC applications. See Step 01.

A test weight of 10% to 100% of the DC capacity must be used for shift compensation. The closer the test weight is to 100% capacity, the better the results. This procedure is performed to allow the 8530 to adjust for DLC and sectional weight differences. The end result being uniform weight readings during normal scale operation with the same weight places at different points on the scale surface. Each independent DLC or sectional pair will be shift adjusted one at a time during this procedure. Refer the vehicle scale technical manual for details on assigned address locations of DLC’s. The exit this step before all cells are shift adjusted, press “Zero” to back up one sequence at a time until **[18]** is displayed. Then press “0” to proceed to Step 19.

[18]
Press

“0” To proceed to [19] Calibration.
“1” To enter the shift compensation prompts.

[E SCL] Empty the scale then Press the “ENTER” key.
The display will decrement from [16 CAL] to [01 CAL] then display one of the following:

[CELL XX] For independent DLC’s or
[SEC XX] For sectional pairs.
Place the test weight as close as possible to the displayed independent DLC or sectional pair.
The display will decrement from [16 CAL] to [01 CAL]

[CELL XX] or [SEC XX] prompt will be displayed for the next DLC or sectional pair. Repeat until all DLC’s or Sectional Pairs have been shift compensated.

NOTE: The “ZERO” pushbutton may be pushed at this point to step back to the previously adjusted cell or section.

The display will proceed to the next step when the last DLC or section is completed.

[19] CALIBRATION (WITH LINEARITY COMPENSATION <u>DISABLED</u>)

Press

“0” To exit the Calibrate Mode and proceed to **[--]**
“1” To proceed to **[E SCL]** prompt.

[E SCL] Empty the scale. Press “Enter”.
[16 CAL] The 8530 will count down from **[16 CAL]** to **[01 CAL]** then proceed to **[Add Ld**].

[Add Ld] Place a known test weight on the scale. Press “Enter”/
[ ] Enter actual test weight value on the scale. Press “Enter”.

The least significant digit of the value entered must agree with the increment size selected in Step 15 (Step 15 and Step 17 for Autorange applications) or Error Code 35 will result.

[16 CAL] The 8530 will decrement from **[16 CAL]** to **[01 CAL]** then proceed to **[--]** ending the calibration procedure or it will go to the following prompt.

[E SCL] Empty the scale. Press “Enter”.

[16 CAL] The scale will decrement from **[16 CAL]** to **[01 CAL]** then proceed to **[CAL d].**

[CAL d]is displayed briefly then

[--] ending calibration.

[19] CALIBRATION (WITH LINEARITY COMPENSATION <u>ENABLED</u>)

This procedure is used when linearity from zero to maximum capacity is critical, or when the scale exhibits nonlinearity after calibration. Nonlinearity is varying weight from zero to full scale weight. Example: a nonlinear scale could be 1 increment heavy at mid-range, and 1 increment light at max. Calibrating scale with L.C. enabled will help correct this.

This procedure required an additional weight calibration. The display will first show **[Add F1]** calling for a weight as close to selected Scale Capacity as possible to establish scale output at the high end of the range. Next **[Add Lo]** is displayed which is a weight as close as possible to 50% of the Scale Capacity as possible to establish scale output at mid-range. These 2 weights and scale zero determine the total correction curve. If linearity compensation does not totally correct this situation, the DLC(s) may need replacement.

Press

“0” To exit the Calibrate Mode and process to **[--].**
“1” To proceed to **[E SCL].**

[E SCL] Empty the scale. Press “Enter”.
[16 CAL] The 8530 will count down from **[16 CAL]** to **[01 CAL]** then proceed to **[Add FL].**

[Add FL] Place a known test weight on the scale as close as possible to the selected scale capacity in Step 14. Press “Enter”.
[ ] Enter actual test weight value on the scale. Press “Enter”.

[Add LO] Place a known test weight on the scale that is approximately equal to 50% of scale capacity in Step 14. Press “Enter”.

[ ] Enter actual test weight value on the scale. Press “Enter”.

[16 CAL] The 8530 will decrement from **[16 CAL]** to **[01 CAL]** then to **[--]** ending the calibration procedure or go to the following prompt.

[E SCL] Empty the scale. Press “Enter”.

[16 CAL] The scale will decrement from **[16 CAL]** to **[01 CAL]** then proceed to **[CAL d]**

[CAL d] is displayed briefly then **[--]** ending calibration.

8530 [20] FILTER SELECT, SPAN/ZERO ADJUST AND ZERO MAINTENANCE GROUP

This group containing Filtering Select, Span and Zero Adjust, Zero Maintenance, Pushbutton Zero Range, Motion Detection Range, and Overload Blanking features.

At the **[--]** prompt press “2” then “0”. The display will chance to **[21]** beginning the filter, span, zero, and zero maintenance group setup.

[21] ZERO ADJUST

This step allows changing the zero value stored during calibration. It can be used when adding additional weight to the scale after calibration such as a hopper or tank. The weight of these are to be considered part of the scale platform with only the content of a tank, for an example, to be weighed as part of the process. Here, the tank would be mounted to the scale platform. The weight of this tank will then be added to the existing stored zero value. The new zero value is stored as the revised zero value.

“0” or “Enter” to bypass zero adjust and go to the next prompt.
“1” To store the current weight on the scale as true zero.

NOTE: This step can be accessed only after the 8530 has been fully calibrated and displaying the scale weight.

CAUTION!!

ANY WEIGHT PUT ON THE SCALE, AND ZEROED WITH THE ABOVE STEP WILL BE SUBTRACTED FROM THE USEABLE CAPACITY OF THE SCALE.

[22] SPAN ADJUST

This step is used to adjust or “fine tune” the span (gain) of the previously calibrated 8530. It is an alternative to total recalibration of the scale when periodically putting test weights on the scale indicated a need for minor span adjustments.

EXAMPLE: Adding 1000 lb to the scale displays 999.6 lb. Enter Setup and go to Span Adjust. With 1000lb of weight on the scale, Press “1” and enter the test weight value. Span will be adjusted so that 1000lb of weight on the scale will cause the display to read exactly 1000.

NOTE: The 9215 uses weight displayed just before entering the Setup Mode for the Span Adjust value. The test weight MUST be on the scale before entering setup. This step is accessed only after the 8530 has been filly calibrated and displaying scale weight.

Press

“0” To skip Span Adjust and go to the next step.
“1” To proceed with Span Adjust.

NOTE: This display will have a decimal pint at the proper position selected in Step 15.

After selecting "1" above, enter the test weight value on the scale and press "Enter". The least significant digit of the entered weight value must agree with the increment size (1,2 or 5) in Step 15 for single range applications. For autorange applications, the increment size must match the selected increment size for that test weight range.

[23 1] AUTO ZERO MAINTENANCE (AZM)

Auto Zero Maintenance maintains a zero weight display, with no weight on the scale for weight changes of .1 inc./second or slower (single DLC scales) and .5 inc.second or slower (multiple DLC vehicle scales). This maintains the 9215 zero within ± 1/4 displayed inc. It will maintain this zero display for gradual changes up to the selected range in Step 25. If sudden weight changed occur equal to or less than the increment range, and motion settled to within the range selected in Step 26, the weight is reduced toward zero at a rate of 0.1 inc. second (single DLC) or 0.5 inc. second (multiple DLC).

Press

"0" To disable AZM (Use this setting for batching).
"1" To enable AZM with a ± 0.5 increment range.
"2" To enable AZM with a ± 1 increment range.
"3" To enable AZM with a ± 3 increment range.

[24 0] AUTOMATIC ZERO CAPTURE AT POWERUP

Enable this function to auto zero the 8530 weight at powerup. If the weight is greater than the selected range, it will display **[E E E]** until brought within this range of zero.

Press

"0" To disable auto zero capture.
"1" To enable a ± 2% range.
"2" To enable a ± 10% range.

NOTE: It is recommended that "0" be selected here when used with the 9215.

[25 1] PUSHBUTTON ZERO RANGE

Enable this function to disable the "Zero" pushbutton or selection of the "Zero" pushbutton weight range. The weight range is selectable between ± 2% or ± 20% of the scale capacity in Step 14. Example: If the scale capacity is 10,000, 20% equals 2,000. The "Zero" Pushbutton range would be ± 2000 if zero. The "Zero" Pushbutton is active when the Expanded Mode is enabled in Setup 95.

This section is also the weight range selected for Auto Zero Maintenance in Step 23.

Press

"0" Disable to "Zero" Pushbutton
"1" Enable the "Zero" Pushbutton with a ± 2% range.
"2" Enable the "Zero" Pushbutton with a ± 20% range.

[26 3] MOTION DETECTION

This step disables or enables motion detection. If enabled, weight changes on the scale are monitored for containment within the selected motion window. If the motion is within this window for approximately 1/2 second of successive weight readings, a no-motion condition is established. "Zero", "Tare", and "Print" pushbutton functions are enabled. If motion increases beyond this window, a motion condition is flagged and the functions are disabled.

Press

“0” Disable motion detection.
“1” Enable A ± 0.5 increment motion window.
“2” Enable A ± 1 increment motion window.
“3” Enable A ± 2 increment motion window.
“4” Enable A ± 3 increment motion window.

[27 0] FILTER SELECTION
Filtering is available to separate scale vibration or motion from the true weight. The ideal result is a stable nonfluctuating weight display. the heavier the filtering the slower the weight will change form update to update.

The selections should be samples at installation, starting with selection “0” (No Filtering) and progressing toward “5” until the required display stability is achieved.

Press

“0” For no filtering.
“1,2,3,4 or 5” for display filtering. the filtering increases with the number selection.

NOTE: Filter selections “4” and “5” are recommended for multiple DLC vehicle scale ONLY. They are normally not recommended for 9215 batching applications.

[28 2005] OVERLOAD BLANKING WEIGHT
The weight value entered here will cause the weight display to blank at this value + 5 increments. It can be any value from one to a number greater than the selected scale capacity. For autorange applications, it cannot be **LESS** than the minimum high range value.

[XXXXXX] This display will show the previously entered weight value or the scale capacity + 5 increments.

Press “Enter” to accept the existing displayed weight or reenter the desired overload weight value and press “Enter”.

[29 0] ACCUMULATION
This step allows accumulation of net, gross, or displayed weight.

NOTE: Step **[36]** Disable Function & Step **[62]** Print Interlock must both be programmed for a **[1]** or a **[2]** to allow weight accumulation to occur. Set this step to “0” when used with the 9215.

Press

“0” Disable Accumulation
“1” Accumulate Net Weight Only
“2” Accumulate Gross Weight Only.
“3” Accumulate Displayed Weight.

[27A] DigiTOL LOAD CELL FILTER

“0” Disable Filter (Must be disables for batching applications.)
“1” Enable Filter.

8530 [30] TARE MODE GROUP
This group allows setup of the various tare functions, negative weight blanking, and programming of the “Function” Key.

At the **[--]** prompt, press “3” then “0”. The display will change to **[31]** beginning the Tare Mode Group Setup.

[31 2] TARE ENABLE
Entering a TARE weight refers to zeroing the weight display to NET zero.

Example: The net weight of a bag of cement is the weight of only the cement and the bag weight is the TARE weight.

Press

"0" To disable all tare functions.
"1" To enable Auto tare and disable Keyboard Tare.
"2" To enable both Auto Tare and Keyboard Tare.

[32 0] TARE INTERLOCK
Enabling the Tare Interlock function foes the following:

a. Disables clearing the Tare weight and changing the 8530 from the net mode to the gross mode if the 8530 is not gross zero.
b. Restricts auto tare entry to gross mode only.
c. Restricts auto tare entry to gross zero only.
d. Enables the "Gross/Net" pushbutton at gross zero only.
e. the lb (or kg) cursor stays illuminated during motion.

Press

"0" To disable tare interlock.
"1" To enable tare interlock.

[33] IS NOT ASSIGNED

[34 0] AUTOCLEAR OF TARE
Enabling this function causes the 8530 to automatically clear a tare weight and change from net to gross mode after both of the following occur:

a. The 8530 settles to a no-motion condition at some weight greater than 10 increments above et zero.

b. the 8530 returns to gross zero and a no-motion condition occurs.
Press

"0" To disable Autoclear of tare.
"1" To enable Autoclear of tare.

[35 1] SWITCHING BETWEEN GROSS AND NET MODES
This function allows the 8530 to toggle between the net mode and the gross mode. In the net mode and displaying net weight, pressing the "Gross/Net" pushbuton causes the 8530 to store the net weight as a tare weight and switch to the gross mode. Pressing it a second time will recall the stored tare weight and display the net weight.

NOTE: The Gross/Net pushbutton will not function and this step is skipped if Autorange in Step 13 is selected.

Press

"0" To disable the "Gross/Net" pushbutton.
"1" To enable the "Gross/Net" pushbutton.

[36 0] FUNCTION PUSHBUTTON SELECT

This step selects functions that can be accessed with the “Function” pushbutton. They are Manual Shift Adjust, Setpoint(s), Consecutive Number, Time, Date, and Accumulators.

Press

“0” To disable all functions.
“1” To enable all functions except Setpoint. (9215 will not work if “1” is selected.)
“2” To enable all functions.

NOTE: Since continuous mode of operation must be selected for the 8530 to communicate with the 9215 control logic “0” must be selected.

[37 0] MEMORY PUSHBUTTON ENABLE
With the “Memory” pushbutton enabled, specific tare weights can be stored in the 8530, then quickly recalled without reentering the tare weight. A total of 10 tare weights can be stored. If Step 38 has a “0” entered, press the “Memory” pushbutton and enter a number from 0 through 9. That will become the storage location.

NOTE: This feature cannot be used with the 9215. Please select “0” here.

[38 0] AUTOMATIC ASSIGNMENT OF TARE MEMORIES
This step programs the 8530 to automatically assign tare weights to 8530 memory locations. The operator still pressed the “Memory” pushbutton but ht 8530 will assign the memory location to be used.

Press

“1” To enable automatic assignment of tare memory locations.
“0” To disable automatic assignment of tare memory.

NOTE: This feature cannot be used with the 9215. Please select “0” here.

8530 [40] PORT JN GROUP

At the **[--]** prompt press “4” then “0”. the display will change to **[41]** beginning the Port JN Group Setup.

[41 0] DEMAND OUTPUT ENABLE
Entering “1” for this step programs the JN Port for Demand Mode.

Selecting a “0” enables the continuous mode. The 8530 will automatically transmit data with each weight update from the scale.

NOTE: This post MUST be selected for continuous mode when used with the 9215. The data output here is ready by the Batching Control Logic PCB. Please select “0” here.

Press

“0” To select the Mettler Toledo Continuous Mode.
“1” To select the Demand Mode.

[42 4800] BAUD RATE SELECTION
This baud rate selection is for both the input and output.
NOTE: This MUST be set for 4800 baud operation when used with the 9215. Possible selections are 300, 1200, 2400, 4800, and 9600 baud.

Press

“1” To accept the displayed baud rate and go to the next step.
“0” To display the next baud rate selection.

[43 2] PARITY SELECTION
The parity selection is odd, even, no parity, or zero parity.
NOTE: This selection MUST be "2" for even parity when used with the 9215.

Press

"0" To select no parity (7 data bits total)
"1" To select odd parity (7 data bits plus odd parity bit).
"2" To select even parity (7 data bits plus even parity bit).
"3" To select zero parity (7 data bits plus a 0 parity bit).

[44 1] ENABLE CHECKSUM
Entering a "1" for this setup programs the 8530 to transmit a checksum character. This checksum character is defined as:

The sum of the 7 data bits of all ASCII characters preceding the checksum character including STX and CR. Drop all bits that carry past the 7 least significant bits and take the 2;s compliment of these 7 bits. The eighth bit is the parity bit of the 7 bits per the selection in Step 43.

NOTE: The checksum MUST be enabled when used with the 9215.

Press

"0" To disable checksum.
"1" To enable checksum.

[45 1] STOP BIT SELECTION
Step 45 allows the selection of one or two stop bits after the last character for transmitted and received data.

NOTE: Set this parameter to "1" stop but when used with the 9215.

Press

"0" To select two stop bits.
"1" To select one stop bit.

8530 [50] PORT JW GROUP
This Group is not used and is not hardware accessible when the 8530 is used with the 9215.

8530 [60 - 70] PRINTER DEMAND GROUP
This group is skipped is step 41 is zero. If this group is accessible, go back to step 41 and set it for "0".

8530 [80] INTERNATIONAL GROUP
This group of selections pertains mainly to international concerns such as lb/kg switching, analog/display verifications and powerup in lb or kg. Included is JW port ASCII input control.

At the [--] prompt, press "8" then "0". The display will change to [81] beginning the international group setup.

[81 0] ENABLE ANALOG/DISPLAY VERIFY
This step selects two functions.

One is verification of the weight display to ensure that the correct combination of segments is lit for each digit. If this test fails an error code "E5" will be displayed and he 8530 will not allow a valid weight display until the problem is corrected, This test is performed with each new DLC weight transmission.

This second is analog verify test. The DLC injects a signal that results in a specific number transmitted from the DLC. If this test fails an error code “E6” is displayed. If enabled, the test is performed approximately every 4 hours of scale operation.

Press

“0” To disable Analog/Display Verify.
“1” To enable Analog/Display Verify.
NOTE: Step 81 should be disabled for units installed in the U.S and Canada.

[82 0] ENABLE LB/KG SWITCHING
If enabled, this step allows the operator to switch between display weight in lb or kg. The operator pushes the “lb/kg” pushbutton and the display will switch to the alternate units. lb and kg cursors also switch to illuminate appropriate descriptor.

Press

“0” To disable to “lb/kg” pushbuton.
“1” To enable the “lb/kg” pushbutton.

NOTE: This function must be set to “0” disabling switching when used with the 9215.

[83 1] ENABLE POWERUP IN LB
This step determines the lb or kg powerup mode.

Press

“0” To program the 8530 to powerup in kg.
“1” To program the 8530 to powerup in lb.

[84 0] ENABLE BRACKETED WEIGHT PRINTED

Enabling this step will program the 8530 to insert brackets before and after any transmitted true weight field so a distinction can be made between applied weight and hand entered or derived hand entered weight. This functions only in demand mode.

NOTE: This step is omitted when Step 41 is “0”. If this step is accessible, go back to Step 41 and set it for “0”.

[85 0] ENABLE “PT” FOR HAND ENTERED TARE

When operating in KG ONLY and DEMAND MODES, hand entered tare will have specific characters transmitted after it to indicate hand entered data.

NOTE: This step is omitted when Step 41 is “0”. If this step is accessible, go back to Step 41 and set it for “0”

[**86 X] ENABLE SINGLE ASCII CHARACTER REMOTE INPUT CONTROL**

This step selected whether or not the JW port remote print input acts as CTPZ input control. The JW port is not hardware available when used with the 9215, so this selection is not used.

[87 X] REMOTE PULSE INPUT

This step selects the JW port single contact remote print, tare, or zero input. The JW port is not hardware available when used with the 9215, so this selection is not used.

[88 0] NET ZERO CURSOR

If enabled, the zero cursor will be illuminate at both gross zero and net zero.

Press

"0" Gross Zero only
"1" Gross and Net Zero.

8530 [90] DLC REPLACEMENT GROUP

This group deals with the replacement of SLC's in multiple DLC vehicle scale applications. When setting up 8530's that are used in single DLC applications only Step 95 has any possible benefit.

At the **[--]** prompt, press "9" then "0", The display will change to **[91]** beginning the DLC Replacement Group setup.

[91] MANUAL REPLACEMENT DLC ADDRESSING

In this step a DLC can be given a specific address. Replacement DLC's come from the factory with address 240. If so, it will not need address assignment here. Bypass this step and go to Step 92.

If the replacement DLC has an address assigned other than 240, this step, reassigns the DLC address to 240. The 8530 automatically assigns the correct address number in Step 92. To assign it address 240, cell number entered must be "00".

If the address of the defective DLC is known, change the address of the replacement DLC to match to the address of the new DLC.

Press

"0" To skip this step and proceed to Step 92.
"1" To proceed to the **[LC OFF]** prompt.

CAUTION!!

TO AVOID DLC DAMAGE, DO NOT PLUG OR UNPLUG A DLC WITH AC POWER ON OR WITHIN 5 SECONDS OF REMOVING AC POWER UNLESS TOLD TO DO SO IN THE FOLLOWING INSTRUCTIONS.

[LC OFF]

At this point all DLC power is off. Unplug all the DLC's at the appropriate connectors (J1, J2, J3, J5, J7 and J8) in the Pot Power Supply Box (and/or Pit Power Supply expander Box for scales with more than 6 DLC's).

Connect DLC to be addressed to appropriate connector. Press "Enter".

[CELL]

Enter the address of the replacement DLC. Press "Enter".

NOTE: If address "00" is entered, all DLC's connected to the 8530 will be forced to the default factory address of 240. Do this is **[E8]** error appears or to repeat Step 04.

[LC OFF]

All power is removed. Inset all DLC connectors at the appropriate positions then press "Enter" to restore power.

[92] AUTOMATICALLY ASSIGNING A REPLACEMENT OF DLC ADDRESS

This step allows replacement of DLC(s) in multiple DLC scale applications.

If more than 1 DLC required replacement, this sequence must be repeated for each, starting with the lowest address number.

The sequence is as follows:

a. The 8530 will turn off power to the DLC's upon command.
b. The defective DLC is replaced by a replacement DLC from the factory having a generic address of 240.
c. The 8530 reapplies AC power to the DLC's upon command.
d. The 8530 attempts to communicate with each DLC in the scale.
e. The 8530 "contacts" the 240 DLC and changes it's address to the number of the DLC not responding in the prior step.

NOTE: If replacement DLC has had an address assigned other than the original factory 240 address, it must be reassressed to 240 in Step 91 prior to performing this step.

Press

"0" To skip this step and proceed to Step 93.
"1" To proceed to the **[LC OFF]** prompt.

[LC OFF]
At this point all power to the DLC(s) is off. Unplug the DLC to be replaced at the connector in the Pit Power Supply Box (or Pit Power Supply Expander Box for scales with more than 6 DLC's).

Connect the replacement DLC to the appropriate connector in the Pit Power Supply Box (or Pit Power Supply Expander Box for scales with more than 6 DLC's).

Press "Enter" to restore power to the DLC's.

The 8530 will then address all DLC's , determine which is the replacement DLC, and assign the correct DLC address.

[93 X] INDIVIDUAL DLC SHIFT ADJUSTMENT
Here the 8530 will shift adjust replacement DLC(s).

The sequence is as follows:

a. Tell the 8530 which DLC or section requires shift adjustment.
b. The 8530 will step through the sequence via display prompts.
c. The 8530 will compare this section with a section already adjusted to establish a reference.

Press
"0" To skip this step and proceed to **[--].**
"1" To proceed to the **[CELL]** or **[SEC]** prompt.

[CELL] (For independent cells **[02 0]** applications.)

[SEC] (For sectional pair **[02 1]** applications).

[E SCL]
Empty the scale and press "Enter".

[16 CAL]
The 8530 will decrement from **[16 CAL]** to **[01 CAL].**

[LOAd XX]
The displayed "XX" corresponds to the sectional pair or cell to be shift adjusted. Place the load over the cell or section.

[16 CAL]
The 8530 will decrement from **[16 CAL]** to **[01 CAL].**

[LOAd XX]
Place the shift load over a second cell or sectional pair to get a reference then press “Enter”.

[16 CAL]
The 8530 decrement from **[16 CAL]** to **[01 CAL].**

[E SCL]
Empty the scale and press “Enter”.

]16 CAL]
The 8530 will decrement from **[16 CAL]** to **[01 CAL].**

NOTE: Steps 94,95, 96 and 99 will not be prompted in sequence after Step 93. these steps can only be entered when the 8530 is displaying **[--]**. Press the two numeric pushbuttons that correspond to the step desired.

[94 X] SET SHIFT CONSTANTS TO “1”
This step temporarily erases the shift adjustments done at calibration for troubleshooting.

Press

“0” Use shift constants calculated during shift adjust.
“1” To temporarily replace shift constants with a “1”.

[95 0] ENABLE EXPANDED DISPLAY MODE
This step gives access to an expanded display. The expanded display is equal to the number of displays increments times ten.

Example: The scale is calibrated for 120,000 lb with an increment size of 20lb. If 10,000 lb is applied to the scale the display shows 10,000 which equals 500 displayed 20lb increments (10,000/20 = 500). Putting the 8530 into the expanded mode would display 5,000 which is 500 (the number of displayed increments) times ten.

Press

“0” To display normal weight.
“1” To enable expanded weight display.

[96 X] ENABLE FUNCTION “0” MANUAL SHIFT ADJUST
Enabling this step allows manual shift adjustment of a DLC for a multiple DLC vehicle scale.

NOTE: The scale MUST be recalibrated after a manual shift adjustment. New constants are stored at the end of procedure.

NOTE: Enable Step 95 before performing manual shift adjustments to provide an expanded display and precise adjustments.

Press

“0” To skip this step and go to **[--]** prompt.
“1” To enable Function “0”

Remove AC power and turn the setup switch to “ON”. Apply AC power. The 8530 display will show the expanded scale weight.

Place the amount of test weight to be used over the DLC to be adjusted and record the number on the 8530 display for use during the adjustment procedure. Leave the weight over the DLC and proceed with the adjustment.

Determine the appropriate number that is to be entered after the brief display **[LOAD A].** This number should also be the number displayed after this shift adjust procedure has been successfully completed.

EXAMPLE: With the scale calibrated for 120,000 lb by 20 lb increments, the weight placed over the DLC for manual shift adjust is 10,000 lb. This will cause a display of 5000 since the 8530 has been put into the expanded display mode for the shift adjustment. The number 5000 should be entered after the **[LOAD A]** display. To determine the number to enter:

a. Divide test weight by increment size used in scale setup.
   1000/20 = 500

b. Multiply the answer by 10.
   500 X 10 = 5000.
c. Enter 5000 after the **[LOAD A]** display.

Press "Function" then "0" in sequence. The display will show **[CELL]** or **[SEC].**

NOTE: Pressing the "Zero" pushbutton in response to the **[CELL]** or **[SEC]** prompts aborts the procedure.

Enter the DLC or section address number then press "Enter". IF a mistake is made after the data is entered press "Zero" to back up and enter the correct data.

The display will now show **[LOAD A]** briefly then **[ ].**

Enter the number of increments the 8530 should display considering the amount of test weight being used. (8530 is still in the expanded display mode). See the example above to help determine this number.

Press "Enter" once the correct number is entered.

The display will now show [LOAD b] then **[ ].**

The 8530 is asking for the actual number displayed when the test weight was places over the DLC being shift adjusted. This is the number that was recorded prior to beginning this procedure.

Enter the number then press "Enter".

The 8530 will compensate the DLC reading then display the resultant number. If the number bow displayed is not the calculated number that was entered after the **[LOAD A]** prompt, the manual shift adjust must be repeated. Enter a larger number of the **[LOAD A]** prompt if the number displayed at the end of the procedure was smaller than calculated, or smaller number, if the displayed number was larger.

This sequence may need repeated tried until the resultant number displayed at the end agrees with the calculated number.

When the manual shift adjust is completed, reenter the Setup Mode and enter a "0" for Steps 95 and 96. After entering a "0" for Step 96 the 8530 will display:

[SA CAL]

Press
"0" To return to the original shift constants.
"1" To permanently store the new shift constants.

NOTE: Entering a "1" in response to [SA] prompt will erase the original shift constants and store new constants. The scale MUST be recalibrated using Step 19.

[97] DISPLAY, PRINT, OR ENTER SPAN, ZERO , AND SHIFT CONSTANTS.
NOTE: Skip this step for single DLC applications.

[01 0]
This step allows the operator to view, print, or change stored span, zero, and shift constants. This information is used by the 8530 to convert the weights transmitted from the DLC's into an accurate displayed weight. This step is only available for multiple DLC applications.

Enter this step immediately after a successful calibration procedure to record these values. Should the Main Logic PCB fail and require replacement, or 8530 memory be lost for any reason, the 8530 would not need recalibration if these values were reentered into the Main Logic PCB via Stop 97.

Press

"0" To exit this step.
"1" To proceed to **[97A]** prompt.

"Print" To print the span, zero, and shift information. Demand operation must be selected.

"0" To delete newly entered values and se existing values.
"1" To store newly entered values and delete old ones..

[97A] Will be displayed for about 2 seconds.

[X.XXXXXX] Will then be displayed. This is the Span constant. At this point the technician can either enter a new span constant and press "Enter", or record the number then press "Enter" to proceed.

[97b] Will be displayed for about 2 seconds.

[XXXXXXX] Will then be displayed. This is the current zero value. Either enter a new value and press "Enter" to terminate the entry, or record the number then press "Enter" to proceed.

[CELL 01] or **[SEC 01]** Will be displayed for approximately 2 seconds.

[X.XXXXXX] Will then be displayed. This is the current shift constant value for cell or section 01. Either enter a new value and press "Enter" or record the number then press "Enter" to proceed.

The cell or section number will continue to increment until all cells or section shift constant values have been displayed.

Press

"0" To delete the newly entered value and use existing values.
"1" To store the newly entered values and delete the old ones.

[98] LOAD DEFAULT PARAMETERS

If this step is enables, the "factory" settings will replace the current setup parameters. Items are marked with an "*" are not affected by step **[98]** and will retain current values. Items in ( ) are values that MUST be set for proper operation with the 9215.

Parameter	Value	Parameter	Value	Parameter	Value
01	*	31	2	61	0
02	*	32	0	62	0

03	*	33	0	63	0
04	*	34	0	64	0
05	*	35	1	65	1
		36	(0) 1	66	0
11	*	37	0	67	0
12	*	38		68	0
13	*			69	1
14	*	41	(0) 1	71	0
15	*	42	4800	72	1
16	*	43	2	73	0
17	*	44	(1) 0	74	1
		45	1		
23	1			81	*
24	1	51	0	82	(0) 1
25	1	52	4800	83	*
26	3	53	2	84	0
27	0	54	0	85	0
28	*	55	1	86	1
29	0	56	2	87	0
		57	0	88	0

Table 3-31 Load Default Parameters

NOTE: Since the 9215 requires JN Port set for continuous operation, the print function is not operable. If it is desired to print this data, Step 41 must be set to "1". Connect a 20mA loop printer to the remote display port, adjust baud rate and print. Restore setup to original values before existing setup.

[99] DISPLAY INDIVIDUAL DLC WEIGHT]
This step gives access to each DLC transmission individually. It is very useful when troubleshooting multiple DLC vehicle scales with a slowly drifting or erratic display. Each DLC can be viewed to determine while DLC(s) are causing the problem. Used this step to record each individual DLC number for comparison with displayed DLC numbers in case of future problems.

Enter to two digit address number of the DLC to be displayed, and press "Enter".

The 8530 will temporarily display **[CELL XX]** to identify the DLC address then display the number being received from the DLC.

NOTE: The number displayed is the number sent from the DLC.

Press

"Enter" To step to the next DLC.
"Clear" To return to the **[--]** prompt.

If at some point during this step an **[E8 XX]** occurs, press and hold the "Clear" pushbutton until a **[--]** prompt occurs. The 8530 is reestablishing communications with the cell. If the error code reoccurs there is a problem with the communications between the cell and the Main Logic PCB. Refer to the troubleshooting section of this manual.

EXITING THE SETUP MODE:
With **[--]** on the 8530 display, return the installation setup switch to the "OFF" position.

3.8.5 8530 ERROR CODE MESSAGES
The following is a list of error codes that the 8530 will display to indicate a problem,

[E1] Program Memory Error. Replace EPROM and carrier.
[E2] RAM Memory Error. Replace Main Logic PCB.
[E3] EPROM Memory Error. Check program setup and reenter as necessary. If error persists replace Main Logic PCB.
[E4] RAM Memory Error. Replace Main Logic PCB.
[E5] Display Verification Error. (Note 1) Replace Main Logic PCB. Display PCB in panel mount 9215's could be defective also.

NOTE: For error codes E6, E8-10, E11, and E13, "XX" indicates the DLC number in multiple DLC applications. Single DLC applications display only the error code number.

[E6 XX] Analog Verification Error. Replace DLC (Note 1).

NOTE: Error codes E5 and E6 should be disabled in Step 81 ([81 1]) for all domestic units.

[E7] DLC Format Error {Note 2).
[E8 XX] No DLC Data. DLC not transmitting data to the 8530. Press "Clear" while error is displayed to recycle DLC power. If this does not clear error, replace the DLC. Other possible problems: Interface PCB in single DLC scale bases and Main Logic PCB. See Setup Step 91.

[E9 XX] DLC Out of Range error.

[E10 XX] DLC RAM Memory Error (Note 2.)
[E11 XX] DLC ROM Memory Error (Note 2).
[E13 X] DLC Novram Error. (Note 2).

NOTE 2: Error codes E7, E10, E11, and E13 may display briefly then clear automatically t a normal 8530 display. IF the error code is consistent or occurs on a regular basis, the DLC may need replacement.

[E14 XX] Loss of Battery Backed Ram. The battery must be replaced. When AC Power is restored "CLEAR" must be pressed.

NOTE: Battery failure will result in the loss of ID, CN, Tare Values, Time and Date, Setpoints, Accumulators, and Linearity correction constants.

[E16] Math Overflow Error. Press "Enter" to display the alphanumeric value. Record the value. Press "Clear" to reset the scale. If this error occurs during calibration repeat calibration. If the error reoccurs contact Mettler Toledo service. This indicates a shift adjust or calibration error.

[E21] Illegal Scale Capacity. The entered scale capacity and increment size combination is not within the 8530 parameters. Press "Clear" and reenter scale capacity and increment size.

[E24] Illegal High Range Increment. The increment size selection is not within the Autorange mode ` 8530 parameters. Press the "Clear" key and enter the proper increment value. Refer to calibration Steps 14 through 16 for correct increment size selections.

[E26] Illegal Low Range Increment. The increment size selection is not within the Autorange mode 8530 parameters. Press "Clear" and enter the proper increment value. Refer to Calibration Steps 14 through 16 for correct increment size selections.

[E27] Illegal Overcapacity Value. This error code occurs in the Autorange Mode. The number entered is not within the selected high range. Press "Clear" and enter a weight value that is within the high range. Refer to Calibration Step 13 for details.

[E32] Insufficient Calibration Weight. The value entered is not a sufficient weight for the scale capacity selected. Press "Clear" and enter a larger weight value.

[E34] Calibration Weight Too Large. Press “Clear” and use a calibration weight value that is less than 105% of selected scale capacity.

[E35] Illegal Test Weight. Press “Clear: and reenter a test weight that matches the selected scale increment value in Calibration Step 15.

[E36] Incorrect Build. The selected increment size and scale capacity does not allow for accurate calibration. Press “Clear” to restart the whole calibration procedure.

Refer to Calibration Steps 14 and 15 for details on proper scale capacity and increment size combinations.

[E37] Calibration Checksum Error. Stored data has changed in the calibration section. Enter setup and press “Clear”. Recalibration is required. FI the error code reoccurs after recalibration, replace the Main Logic PCB.

[E E E] Scale Note Zeroed. Tare Interlock **[32 1]** and/or Automatic Zero Capture at Power-up [24 1 or 2] is enabled and weight is greater than selected maximum zero value. To clear:

1. Weight on the scale must be removed to within the 8530 zero capture range. Press “Zero”.
2. Enter Setup and disable Calibration Step 24 and 32.
3. Enter Setup and establish a new zero value via Calibration Step 21.

[-E E E] Scale Not Zeroed. IF this occurs prior to scale calibration, disregard and proceed with calibration. After calibration the scale reading should not be this far under zero unless a change has occurred in the scale zero reference. Check the scale for binding or DLC damage. The same steps can be used for this error code as listed for the **[E E E]** error code.

[Acc FL] One of the accumulators has exceeded its 9 digit capacity.

Enter setup and set Step 29 and 36 to 0 to disable the accumulators.

4.0 OPERATING THE 9215

This section describes use of the 9215 Batchelor, incuding startup, setup, reporting, and batching, from the operator's perspective. This is described as a sequence of operation which leads the operator step-by-step through the prompts, displays, and inputs necessary to perform a desired function. It also includes a detailed description of the display and operator inputs which are experienced during execution of a formula. The sequence of operations is divided into sections with an overview at the beginning of each section.

WARNING!!
THIS OPERATOR INTERFACE SECTION MUST BE READ AND UNDERSTOOD BY ANYONE WHO INSTALLS, OPERATES, OR MAINTAINS THE 9215 BATCHELOR.

WARNING!!
THIS MODULE AND ITS ASSOCIATED EQUIPMENT MUST BE INSTALLED, ADJUSTED, AND MAINTAINED BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE CODSTRUCTION AND OPERATION OF ALL COMPONENTS IN THE SYSTEM AND THE POTENTIAL HAZARDS INVOLVED. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

4.1 OPERATOR INTERFACE TYPES

There are several types of operator interface devices used with the 9215 Batchelor. These interface devices are either on the front panel of the main control enclosure (local) or located remotely from the main control enclosure (remote).

4.1.1 LOCAL OPERATOR INTERFACE

The 9215 main control enclosure includes three groups of operator interface devices.

Scale Indicator Display and Keypad. The scale indicator weight display is used to provide a constant gross weight indication of the scale. The scale setup and calibration are covered in detail in Section 3.6 and 3.7 of this manual.

Main Display and Keypad. The main processor includes a nineteen character display and full alphanumeric keyboard with special function keys. These provide for operator prompting and display and operator input for setup and control. A detailed description of the Main Display and Keyboard is found in Section 4.1.3.

Operators. The Wall mount model includes industrial type pushbutton, selector switch, and pilot light operators. A special rotary selector switch is also supplied to simplifyu and speed selection and entry of commonly used commands. These same operators are available as an option on the Rack/Panel mounted models.

4.1.2 OPTIONAL REMOTE OPERATOR INTERFACE

The 9215 has provisions for three types of remote operator interface devices.

External Operators. Inputs and outputs are available to allow operators, pilot lights, and alarm devices to be "hardwired" to the 9215. These devices may be supplied by Mettler Toledo, on custom system orders, or by others.

Remote Gross Weight Display. An optional remote display may be added for remote gross weight scale indication. Refer to Section 3.3.2.3 for a description of this option.

9215 Batchelor Data Manager. An optional Data Manager program is available to allow a personal computer to be used for setup and special programming. It is described in the 9215 Data Manager manual included with the Data Manager software package.

4.1.3 MAIN DISPLAY, KEYBOARD, AND ROTARY SELECT KNOB

The Main Display and Keyboard and Rotary Select Knob are the front panel deviceswhice provide for operator input of configuration parameters, setup of the data base, and 9215 control.

Nineteen Character Display. The main display is a dot matrix, alphanumeric, vacuum flourescent dispolay with 19 character positions. It is used to display promts and messages and to “echo” operator entry into variable fields. Special characters are also used to designate the aciton of output devices which control equipment, such as feeeds, valves, and gates, or the status of the exectution of a formula line.

The display contents are illustrated in this sequence of operation as a highlighted and bracketed field.

For example:

[Time? HH:MM:SS] is prmopting the operator to enter the current time to set the internal system clock. You will notice that the prompt [Time? is the left most field and the variable entry field, in the case HH:MM:SS], is the right most entry field.

Another convention which is used that prompts which allow operator input into a variable are generally displayed as uppercase and lowercase whereas information only messages are generally all uppsercase charcters. There are some exceptions to this convention.

A special character called an underscore is used to designate an empty variable field character position. To use the above sample again, if the “SHIFT” “CLEAR” key combination is used the display would appear as **[Time? _____]** indicating that the time entry field has been cleared. Variable entry fields will only accept input of charactes appropriate for the field. For example, numeric fields will only allow use of the numeric keys and the decimal point key. It is necessary to press the decimal point key to enter numbers to the right of the decimal point. Alphanumeric fields will accept upper and lower case alpha, numeric, and special character input.

Additional special characters which are generated as certain formula lines are executed as desribed in Section 4.14.

Main Keyboard. The main keyboard is a tactile feedback mylar covered keyboard with 60 keys. These keys incluyde a group with the alphs characters, minus sign, and space keys; a group of numeric keys with arrow keys and general purpose finction keys; and a group of color coded special function keys below.

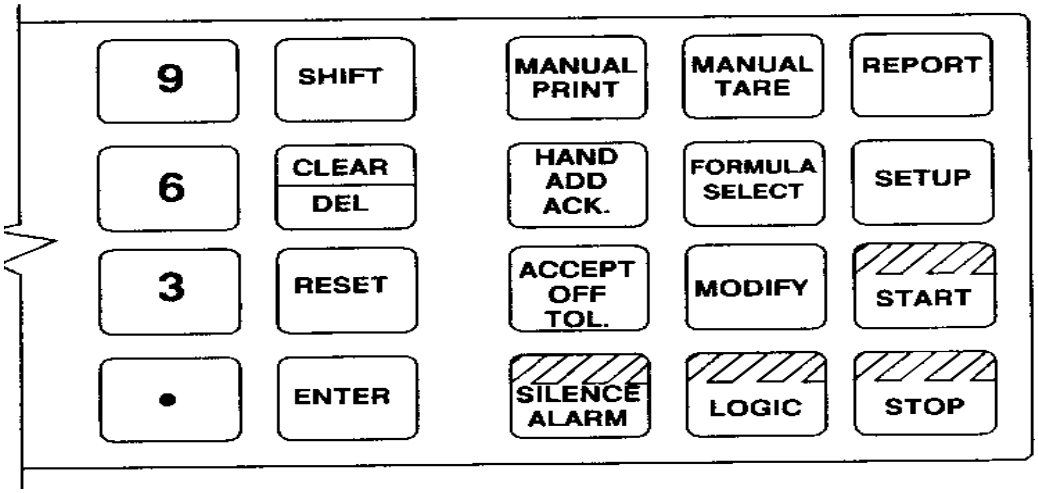


Figure 4.1 9215 FUNCTION KEYS

The use of the special function keys is introduced throughout this sequence of operation as they are needed. These general purpose keys are described as follows:

"SHIFT" If followed by an alpha key will select the lower case character or by other keys, as listed below, a special character.

"RESET" Terminates the current statement and returns the operator to the beginning of the current sequence.

"UPARROW" Terminates the current statement and returns the program to the previous statement.

"DOWNARROW" Terminates the current statement and advances the program to the next statement.

"ENTER" Terminates the current statement and advances the program to the next statement.

"CLEAR/DEL" Deleted the last character entered or toggles the entry between (**Y**)es and (**N**)o.

Special characters may be generated by using the "**SHIFT**" key followed by another key as follows.

"SHIFT" then KEY #	**CHARACTER GENERATED**
-	+
,	*
.	#
0	@
1	%
2	?
3	:
4	=
5	"
6	"
7	$
8	^
9	/

"MANUAL PRINT" Allows operator to initiate a print while using the 9215 in the manual mode.

"MANUAL TARE" Allows operator to tare weight from the scale while using the 9215 in the manual mode.

"REPORT" Allows the operator to enter the report selection sequence (see Section 4.4).

"HAND ADD ACK." Used to advance the system to the next formula sequence line at the end of a manual weigh or hand add operation.

"FORMULA SELECT" Used to select a stored formula sequence to begin batching (see Section 4.6.2).

"SETUP" Allows the operator to enter the setup selection sequence (see Section 4.5).

"ACCEPT OFF TOL." Used to accept an off telerance condition and advance the system to the next formula sequence line during batching.

"MODIFY" Used to change the batch size or formulation(see Section 4.6.2, Statement # 1005).

"START" Used to begin or resume batching operation.

"SILENCE ALARM" Used to silence alarm or turn off alarm output.

"LOGIC" Used to "signal" the PLC program (see Section 4.6.1).

"STOP" Used to stop the batching process.

Rotary Select Knob The Rotary Select Knob can be used to rapidly scroll through a list, such as setup and report menus and material or formula ID's. Statements which use the Rotary Select Knob are noted.