9215

Technical Manual

TM009215I02
A90080500A
0965-0054
05/94

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:

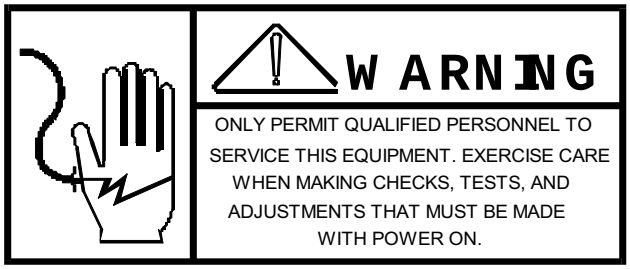
METTLER TOLEDO
Training Center
1150 Dearborn Drive
Worthington, Ohio USA 43085
(614) 438-4511

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. 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 capacity that can be split up into a total of 99 formulas, the 9215 insures optimum utilization of it's formula memory. There are twenty (20) standard 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, remote 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 insuring that the discharge gate is closed. The weighing of each material is based on net weight. The material tolerance is checked after each weighment to insure correct quantity of each ingredient before proceeding to the next sequence. When the batch is totally weighed, a batch ready signal is generated and a check of downstream status is made prior to actually 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 batch log, 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 accuracy 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 weighment.

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 multiple 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 automatically 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 include: 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.

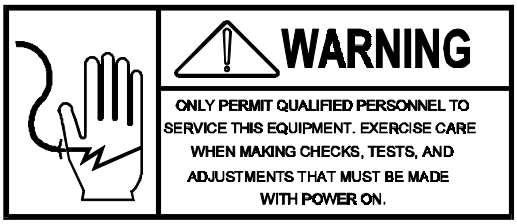
1.3 BATCHING TERMINOLOGY

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 available 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:

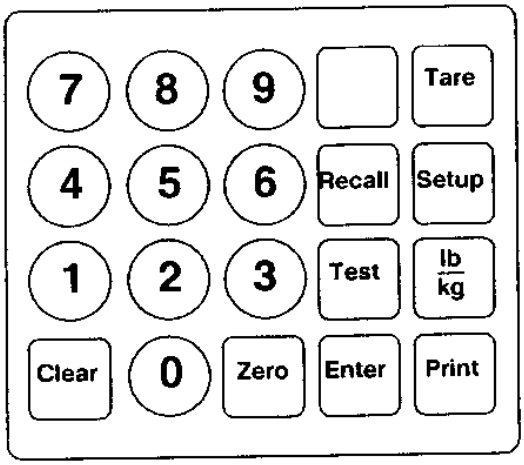
All replacement parts must be ordered through a Mettler Toledo service office Mettler Toledo authorized distributor. The above items must be available at the time an inquiry is requested or order placed. Refer also to the “DRAWINGS AND SPARE PARTS” section of this manual to help identify part numbers.

METTLER TOLEDO TECHNICAL TRAINING:

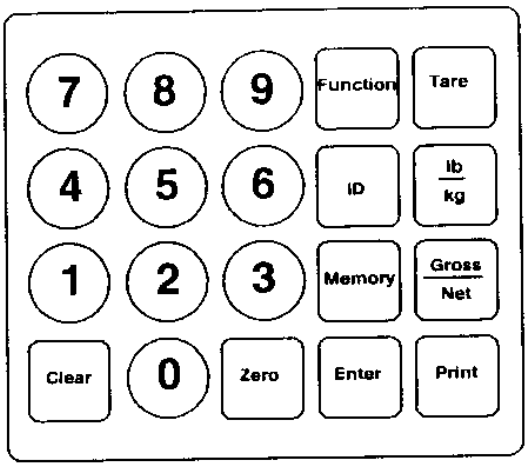
Mettler Toledo offers comprehensive, professional instruction for your maintenance personnel. All courses are taught by full time instructors, each with an extensive background in weighing systems and teaching methods. Professionally prepared course materials are provided for permanent reference for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

1.6 COMPONENT PICTORIALS

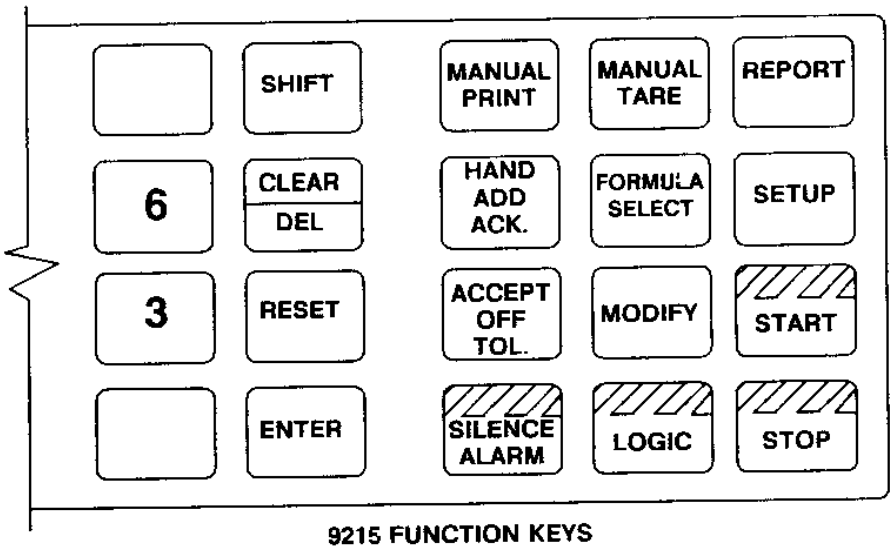
1.6 COMPONENT PICTORIALS



8142 KEYPAD



8530 KEYPAD



9215 FUNCTION KEYS

Figure 1.1 Keypad Layouts

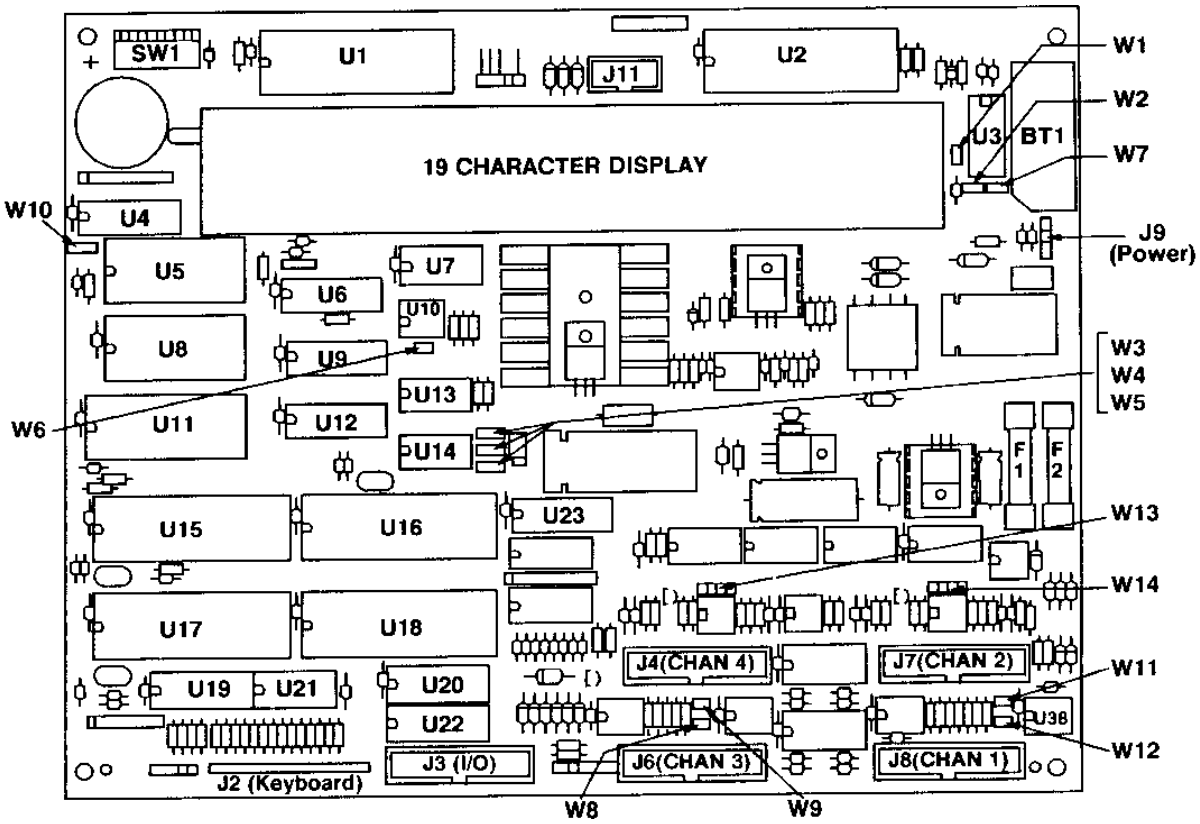


Figure 1.2 TSM-300 PCB Identifications

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)

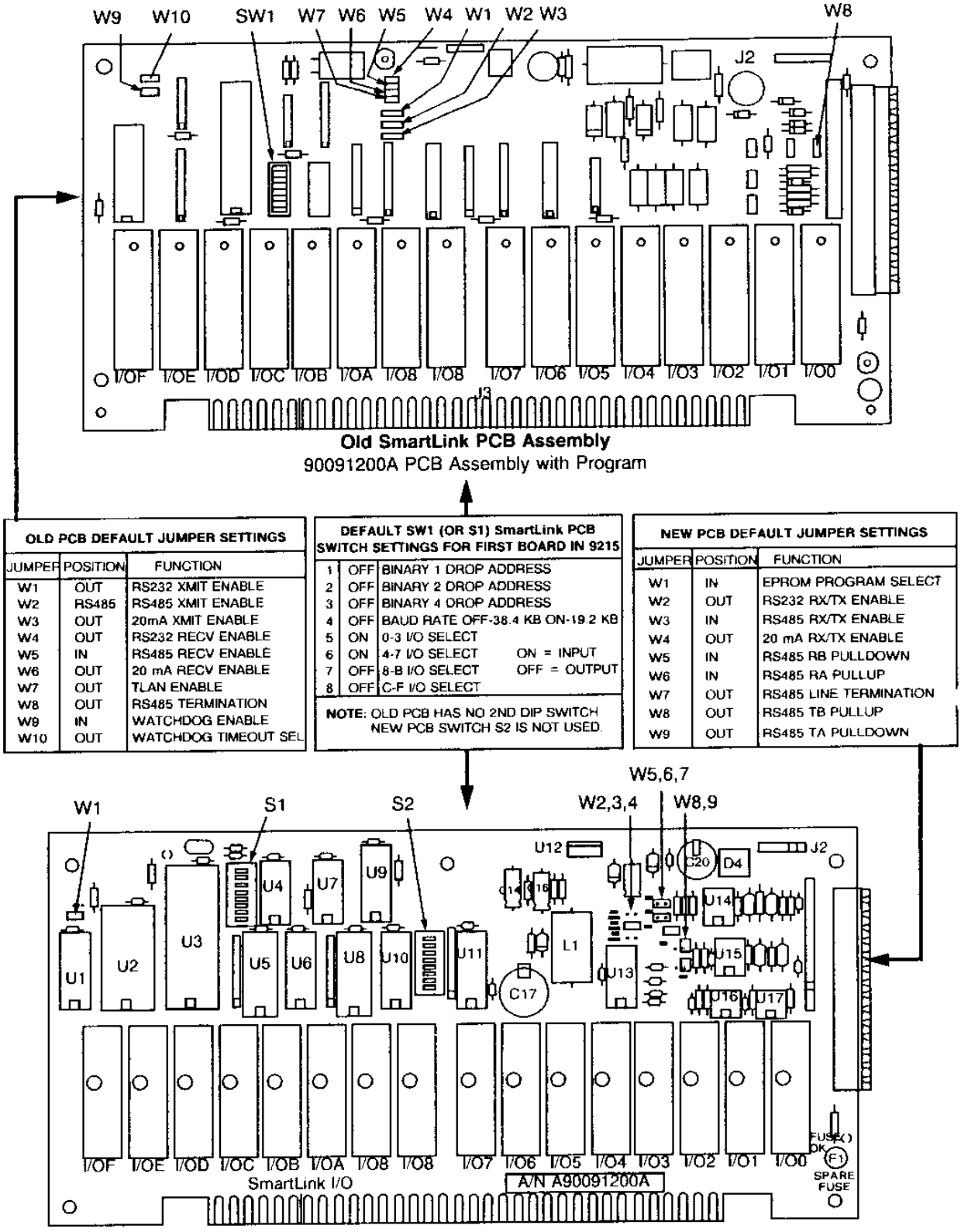


Figure 1.3 SmartLink PCB Identifications

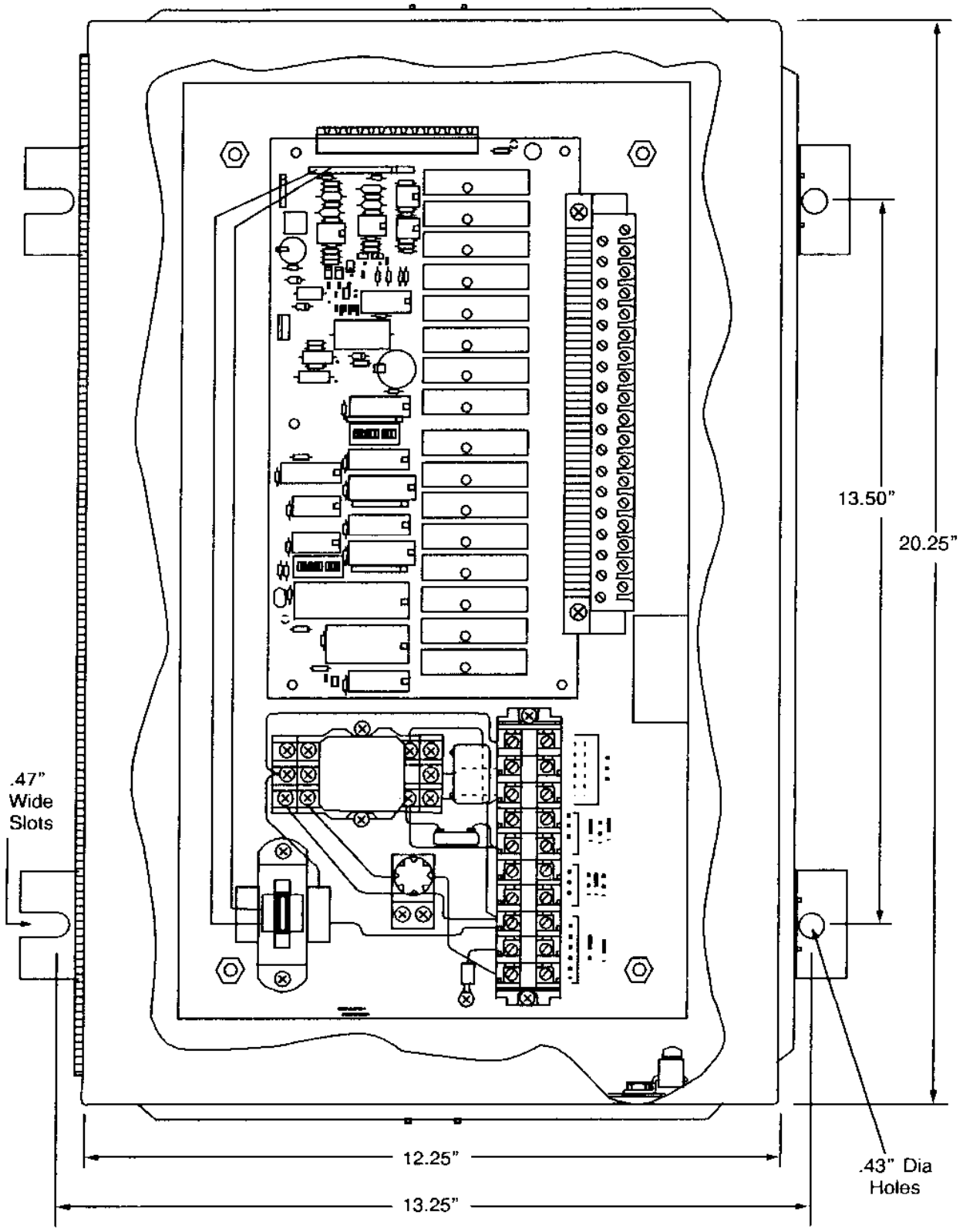


Figure 1.4 Wall Mount SmartLink Remote I/O Box

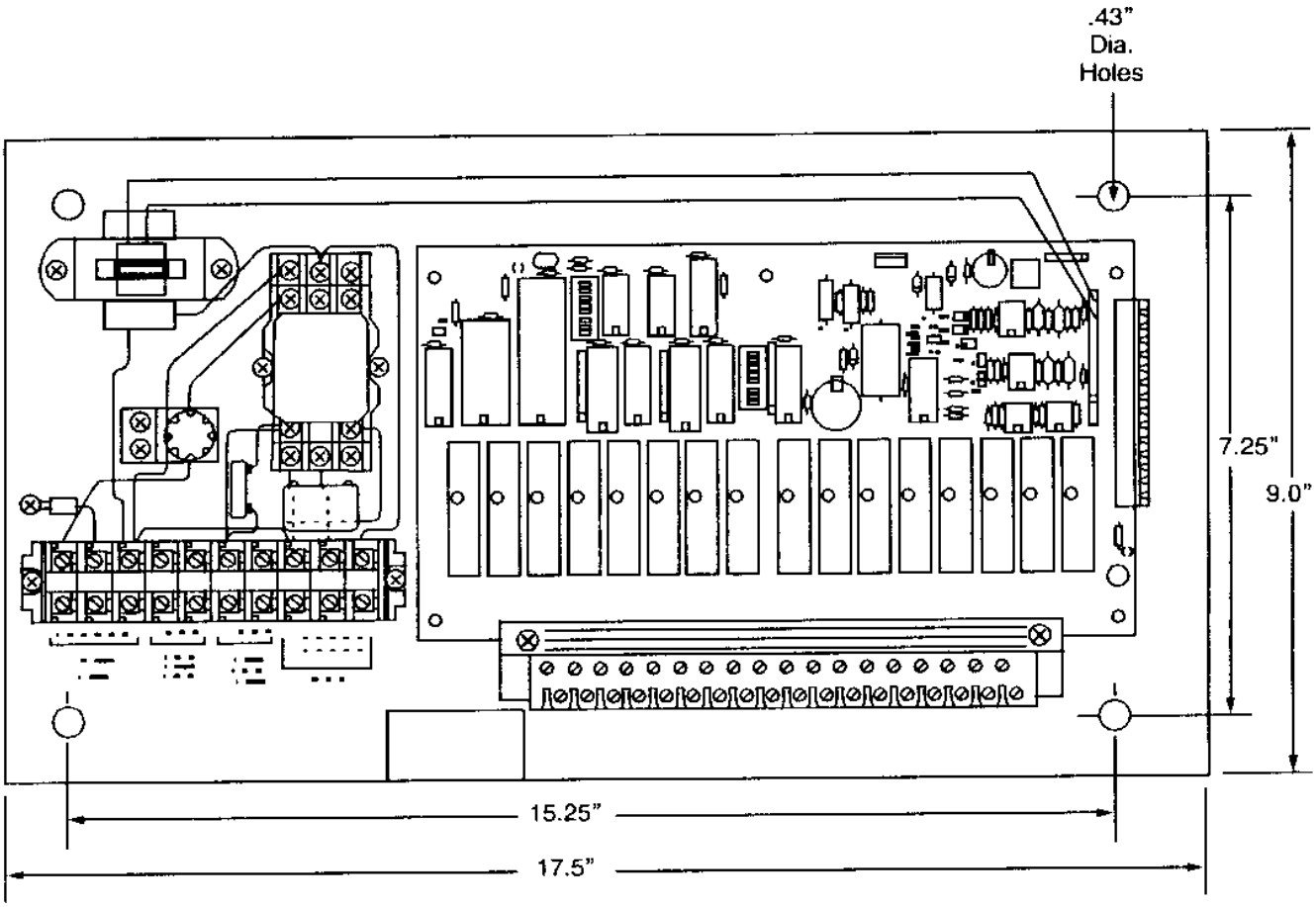
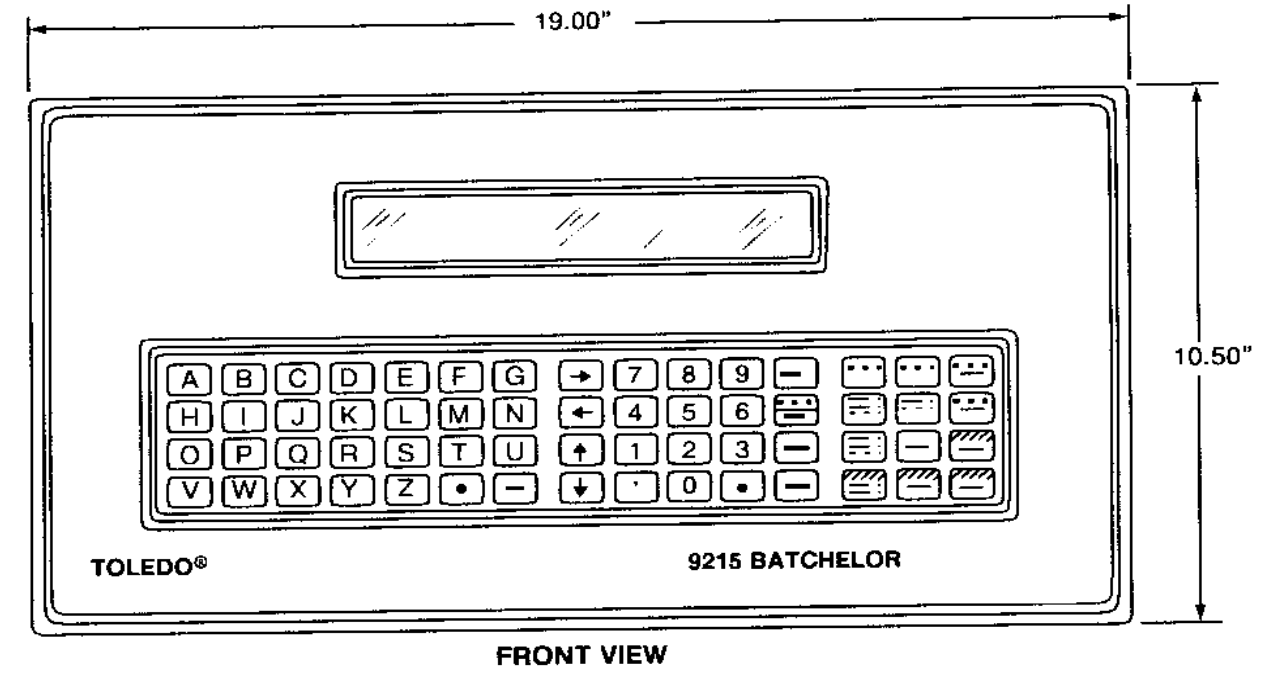
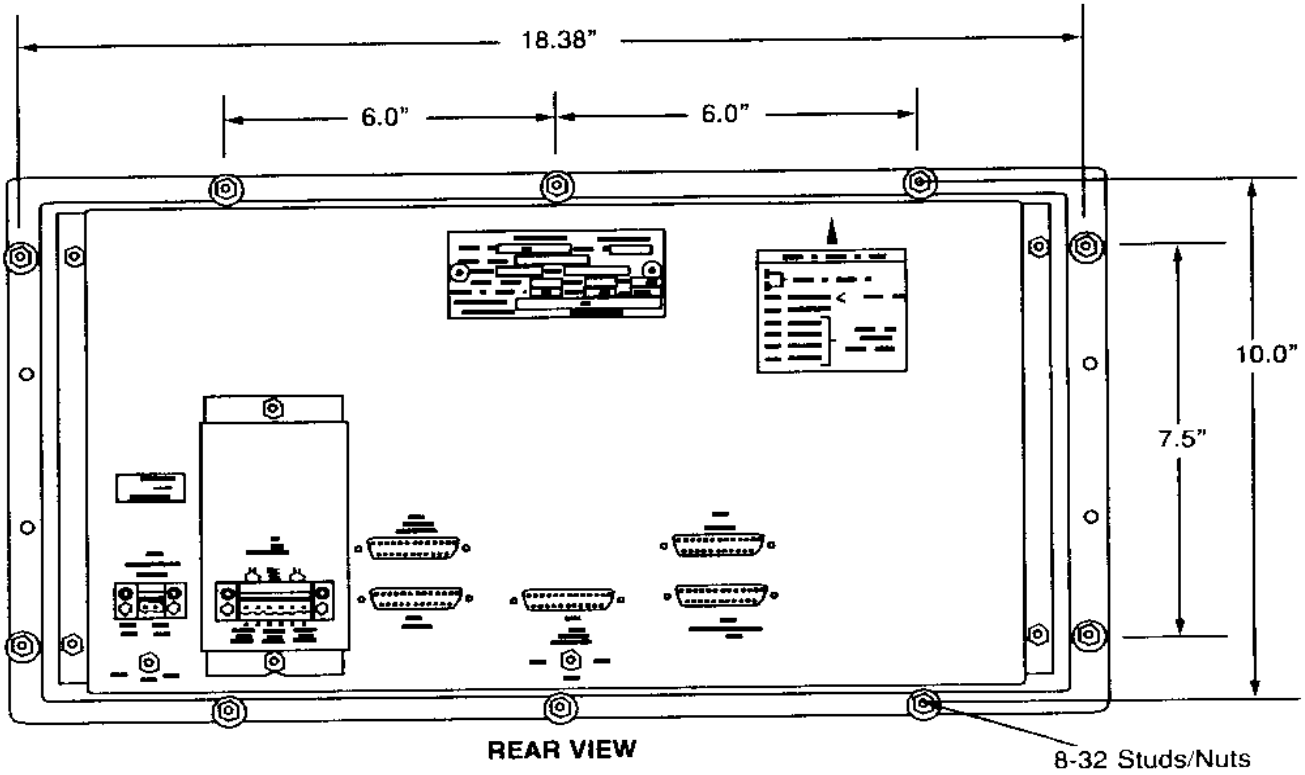


Figure 1.5 Panel Mount SmartLink Remote I/O PCB



FRONT VIEW

A A



REAR VIEW

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

Figure 1.6 9215 Panel Mount Main Unit

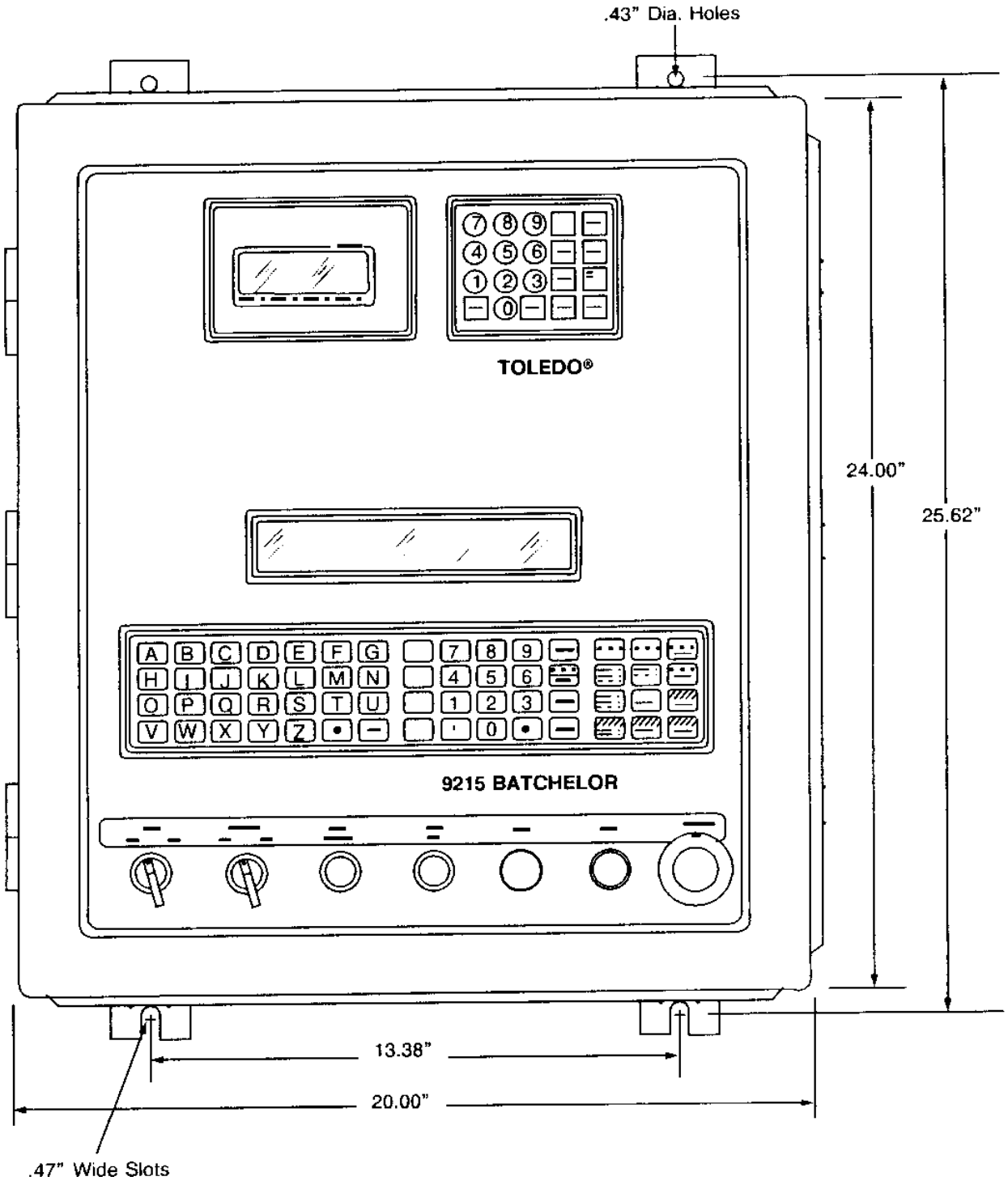
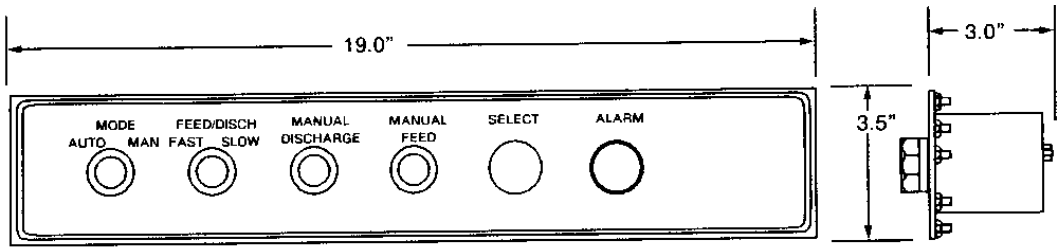
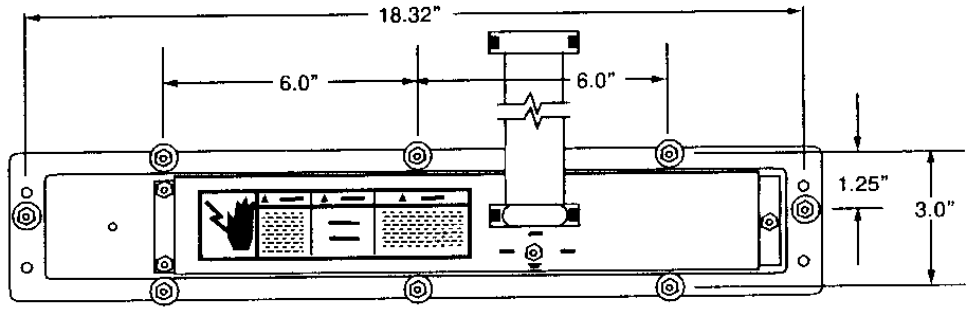


Figure 1.7 9215 Wall Mount Unit



Front View



Rear View

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

Figure 1.8 9215 Panel Mount Unit (Optional) Manual Operators

2. SPECIFICATIONS

This section covers the hardware and electrical specifications for the 9213 Batchelor 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 enclosure is provided 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 entry may be made on the top, bottom or right side (facing enclosure) using NEC code approved metal conduit. Mettler Toledo recommends that both power wiring entrances be made on the bottom of the enclosure (separate instrument and control power). The enclosure is not pre-punched so appropriate holes must be punched and conduit fittings installed by field personnel.

Mounting - "Feel" extend above and below the enclosure. The top feet had holes 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 enclosure 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 polyurethane finish. Suitable for 115 or 230 VAC.

Model 0964-0041 - Type 304L Ga. Stainless Steel construction suitable for use in indoor 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 hinge 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 mount to wall or frame.

2.2 electrical specifications

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

2.2.1 MAIN ENCLOSURE (Wall Mount)

The main enclosure requires 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 (solenoids 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 control 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 by a pilot relay 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 modules (0962-0035, Black Case) are solid state units rated by Mettler 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 ≤ 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 ≤ 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) have the following 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 characteristics 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 capabilities, the 8530 Indicator Main PCB is used. Its AC input power is operated 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 bi-directional 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 to the stop circuit interlock on the 9215 from the remote I/O circuitry. Therefore, the voltage rating of the watchdog 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 designed 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 separately 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 dependents upon 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. 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 sources 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 must 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 supply module). Any control power source for the I/O modules is remote.

3.1.1 INSTRUMENT POWER SOURCE

Provide a well regulated (+10%, -15%), isolated, noise free instrument power source. Ferro-Resonant Regulation/Isolation transformers are recommended by Mettler Toledo. Follow these 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 regulation 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 provide a properly fused source with disconnects.

3.1.2 CONTROL POWER SOURCE

The control power may be a standard 20 amp maximum fused branch circuit. Noise and voltage conditioning here is not necessary 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 discharge devices. Normally they are in close proximity to electrical noise, so it is important to keep this 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 scale indicators are furnished to accommodate this. Units with an 8142 indicator board will interface only to analog 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 shielded cable for up to 500 ft. runs. An alternate 20 gauge, 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 indicator 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 shielded cable which is dependent upon the type and quantity of cells involved. The understructure of scale base technical manual must be consulted for details. The following 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 Auxiliary Power Supply, Pit Power Supply or both. The “Home Run” cable will go from TB1 to either a pit power supply or to an auxiliary 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 auxiliary power supply has its own source of AC power allowing up to 24 Power Cells to be connected.

Use this table for Truckmate or Railmate scale power cells when used with dual auxiliary 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 Auxiliary 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 high level 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 assignments for the first SmartLink 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 Third 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 current loop be used whenever the specified printer will support it because of the isolation achieved. IF the RS 232 communication is used, do not exceed 50 feet in cable length.

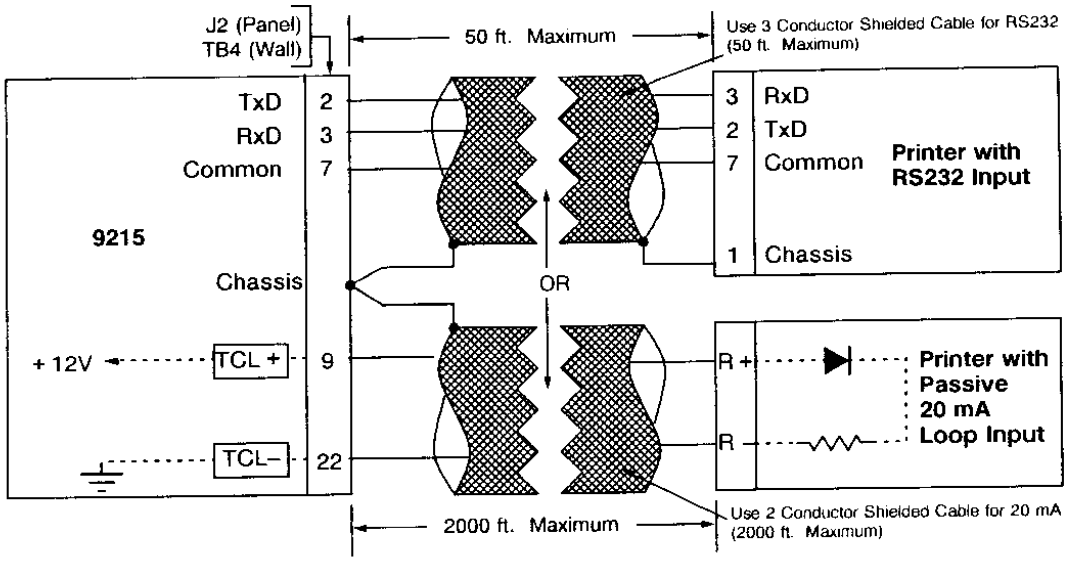


Figure 3.1 9215 Interface Connection to Printer

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 duplex operation is utilized. (RS232 cannot support multiple devices on a common parity line). If multiple 8215 control is desired, the host must 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).

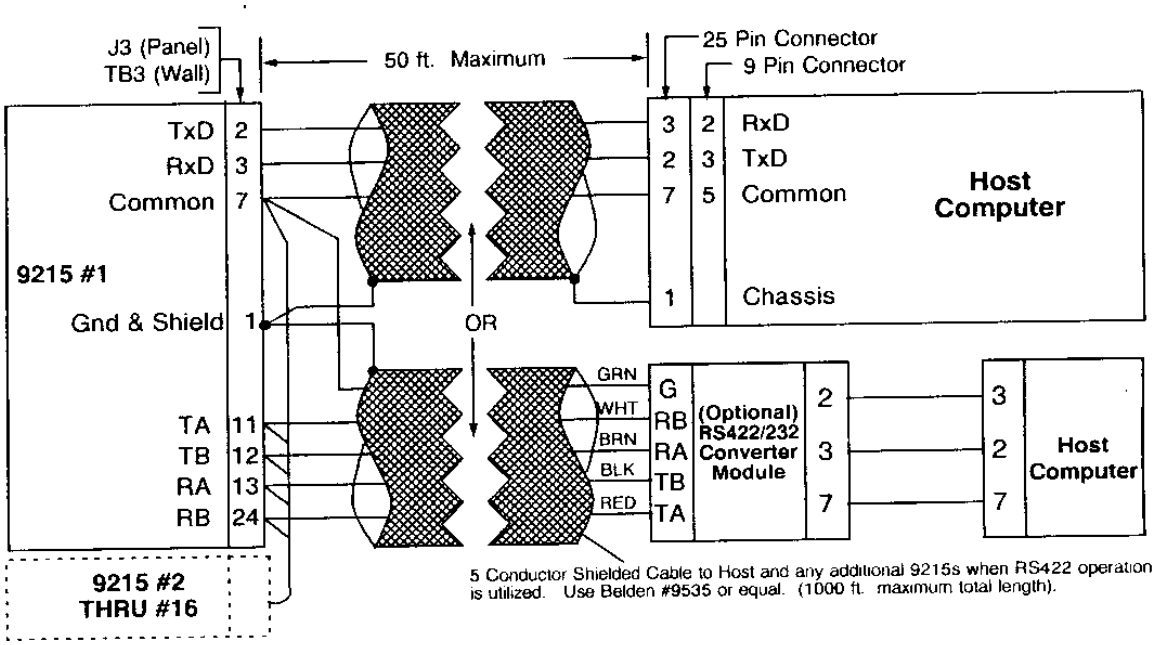


Figure 3.2 9215 Interface Connection to Host Computer

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 through 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 format 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:

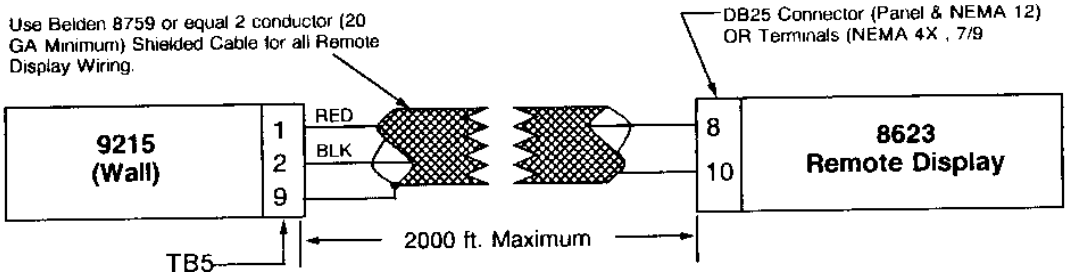


Figure 3.3 Remote Display Interface

3.3.2.4 SmartLink Network Interface

The I/O RS485 interface wiring is common to all SmartLink 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 supporting 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 shields) is very important. Do not share a conduit with any other high level logic. Required connections are:

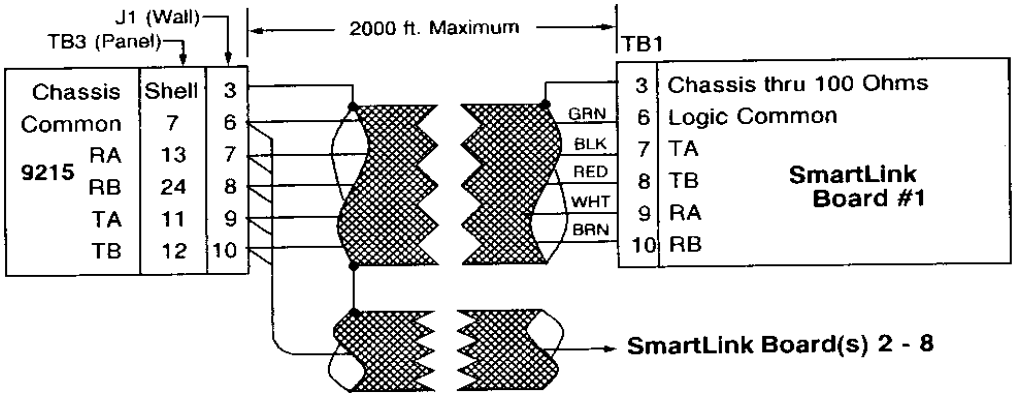


Figure 3.4

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 ground between units and do not exceed 50 foot cable length. Required connections are:

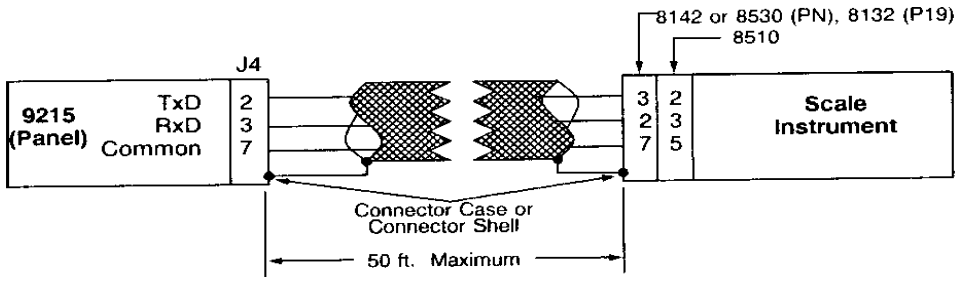


Figure 3.5 Panel Unit Interface (Only)

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.

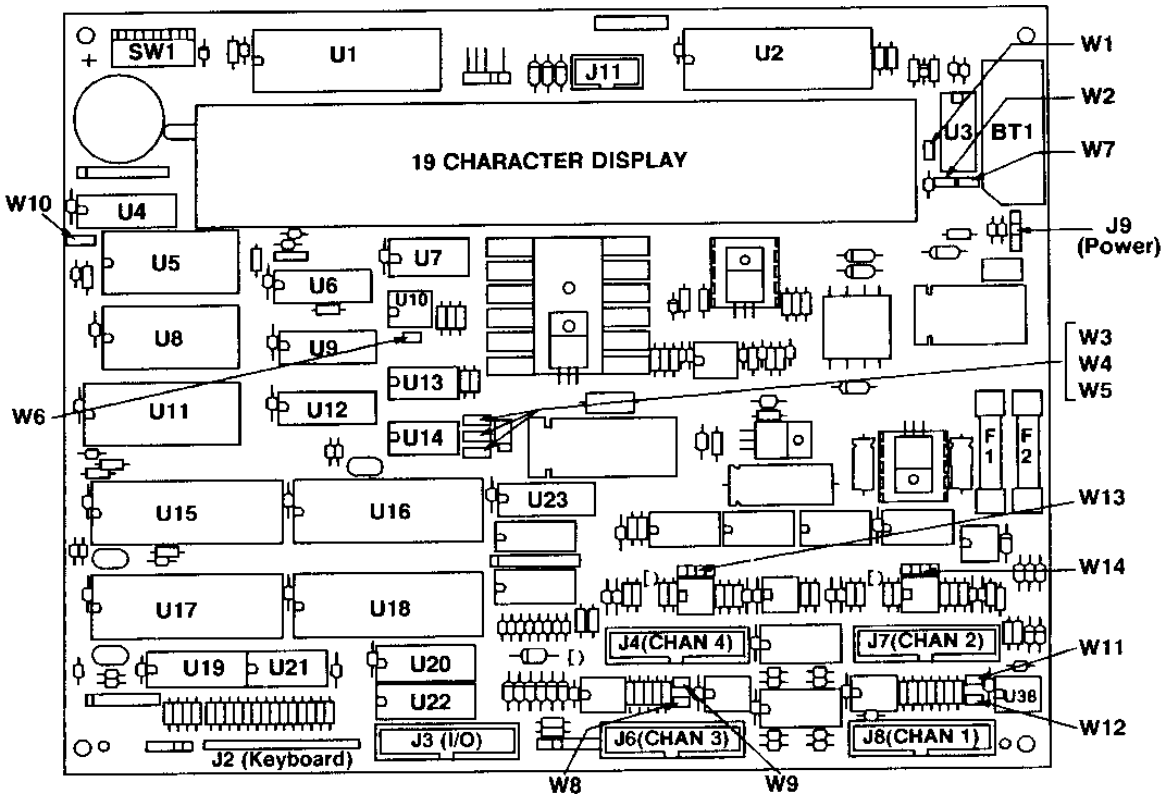


Figure 3.6 TSM-300 PCB Identifications
(C90084100A Shown)

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 is a 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 clearing of batching 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 advance to Statement #2 under section 4.2 Powerup.

3.6 general minimum/maximum scale capacities

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, calibration section 3 are not correct. The correct 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 actions 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 the Panel 9215 when a remote 8142 is used. This section is divided into five sub-sections each detailing 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 platform. It is a standard build, proceed with the installation of the scale, the microvolts 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 microvolt 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) Size 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: Mettler 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 Cells4	
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: $\frac{\text{1lb X 25mV X 1000}}{\text{2000 lb X 4}} = 3.125 \text{ uV}$

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

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

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 calibrated 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 access 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 jumper is shorting the two pins, a comma will 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 bolded 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 steps are allows in shortcut calibration only.

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

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

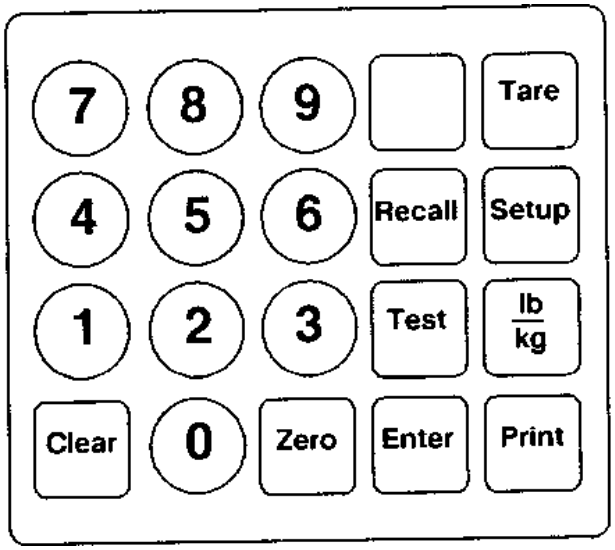


Figure 3.7 8142 Keypad

[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 below are the group headings and total steps in each 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 each step as a beginning point for initial 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 setup switch is ON.
To adjust span, answer "1" when this prompt appears. After the adjustment, the remainder of the setup 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 data 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 changed 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 is 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 installation evaluation & troubleshooting only. Print and AZM functions will be displayed in expand 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 calibration 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 will display negative weight until the limit is reached. This is determine by the total increments selected and mount of initial used. It is always at least 5% of total.

Press

"0" To blank the 8142 and display minus sign at any reading error than 5 displays under zero.
"1"" To allow the 8142 to display negative weight readings 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 scale is complete. Before calibration a "0" should be entered during 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 stepped 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% of the total increments (selected in calibration) of the zero value of the last 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 must 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 re-zeroing 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 it will subtract the displayed weight to a new zero setting. Should the scale, 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 will 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 Zero 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 Minor increments

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

AZM in this mode permits the 8142 to compensate for small changes in Zero 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 interval 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 greeted 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 one 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 dependent upon the number of full scale 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 being used in. The idea result is a stable nonfluctuating display. The heavier the filtering the slower the display will update. The selection should be sampled at installation, starting with 0 (no filtering) until required stability is achieved.

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" Advance 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 used 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 complement 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 to "1" when used with the 9215.

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

Selection of this function enables the Printer Port, P5, to receive single ASCII characters into its RS-232 RxD inputs. These characters allow remote control of the Zero, Print, Tare, and Clear Functions. If **[F5.17 2]** is selected, the printer port will output one continuous format message every time 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 work 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 warm up 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 the 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 main PCB
CAL E3	Calibration Error	1. Try to recalibrate 2. Replace main 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 capacity + 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 Batchelor. 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 displayed 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.

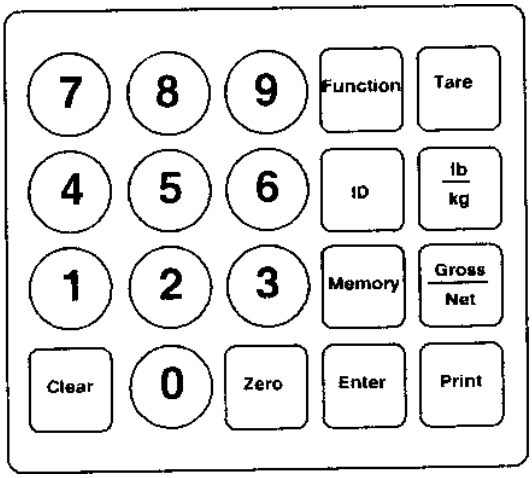


Figure 3.8 8530 Keypad.

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. input	-
	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-addressing 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 INC. SIZE	TOTAL SCALE CAPACITY RANGE 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 ENABLED)

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" pushbutton 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” pushbutton.
“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 DLC'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 readdressed 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. OPERATING THE 9215

This section describes use of the 9215 Batchelor, including 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 simplify 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 devices which 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 fluorescent display with 19 character positions. It is used to display prompts and messages and to “echo” operator entry into variable fields. Special characters are also used to designate the action of output devices which control equipment, such as feeds, valves, and gates, or the status of the execution 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 prompting 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 uppercase characters. 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 characters 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 described in Section 4.14.

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

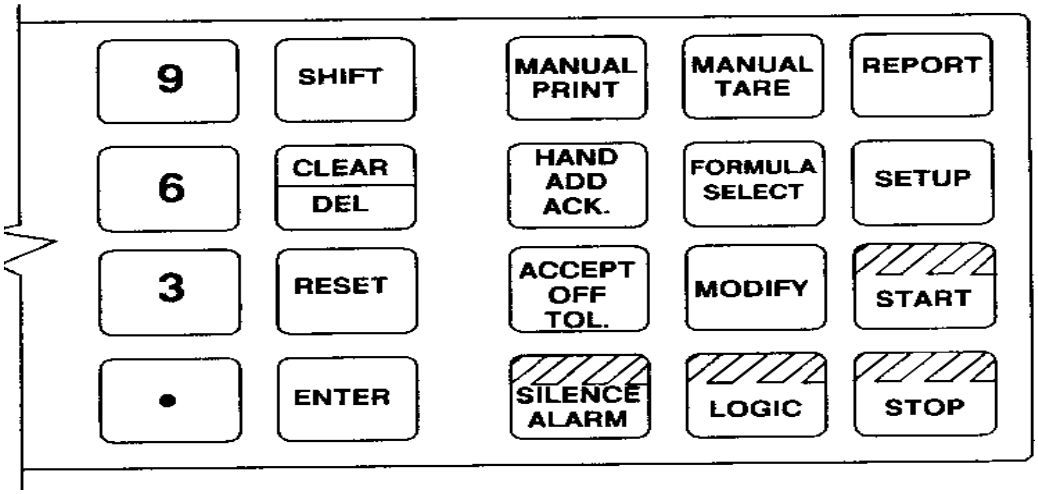


Figure 4.1 9215 FUNCTION KEYS

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 tolerance 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.

4.2 powerup (Statements 1 through 8c)

The following section describes the 9215 powerup sequence. upon applying power to the controller operation will begin from Statement #1. The powerup sequence includes extensive self diagnostics.

Statement Number **Operator Display**

1 **[*901917 900840]**

The display shows the 9215 program and language part numbers The program number is displayed on the left. The asterisk indicates that a letter designating the program revision level may be displayed. This display will appear for 15 seconds then the program will proceed to the next Statement.

Two types of test are performed when the 9215 starts or restarts. Ones is a validation of checksums of previously loaded tables used by batching. The other is a test of RAM memory not containing tables. At powerup, the RAM memory us first tested for corruption. If found corrupt it is cleared to zeros and a clearing of batching 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 RAM is OK, go to Statement #2.

2 **[System Checkout]**

The display indicates that the system is running a self diagnostics test on vital system resources. The tests performed are as follows.

Scale Communications Test The scale data output is read to make sure that the scale serial output is properly setup and that the scale is sending data with a valid checksum. If an error is detected the program will advance to Statement #3.

Scale Graduation Size Test The scale data output is read to make sure that the scale graduation size is valid. The scale graduation size cannot be smaller than 0.0001 (four places to the right of the decimal place). If an error is detected the program will advance to Statement #3.

Setup Parameters Validation Test The system will do a validation of the memory where the Setup Parameters are stored. If an error is detected, the program will advance to Statement 3#A.

System Initialization and Test The system initializes the serial communication ports, and does a validation of the memory where the formula , material, PLC formula select and report setup data is stored. If an error is detected the program will advance to Statement #3B.

System I/O Configuration Test The system does a validation of the memory where the I/O Configuration data is stored. If an error is detected, the program will advance to Statement #4.

System PLC Program Test The system does a validation of the memory where the System PLC Program is stored. If an error is detected, the program will advance to Statement #5.

Alarm Setup Test The system does a validation of the memory where the User Alarm Messages are stored. Alarm Message setup is accomplished through the 9215 Data Manager. IF an error is detected the program will advance to Statement #6.

Forced I/O Test The system does a check to see if any outputs are forced ON or OFF. Output forcing is a feature available with the 9215 Data Manager. If an input and/or output is currently being forced the program will advance to Statement #7.

If all of the diagnostic tests are passed the program will advance to Statement #10.

Statement Number | **Operator Display**

3 **[Check Scale Setup]**

If this message is displayed the 9215 has detected an error reading the scale or an invalid graduation size. Do not proceed until the problem has been corrected or until it is determined that the scale setup has been changed intentionally to new values. Refer to Section 3.6 or 3.7 in this manual for more information about setting up the scale indicator.

"RESET" Returns the program to Statement #1.
"UP ARROW" Returns the program to Statement #2.
"ENTER" Sets the system graduation size to the current indicator setup the returns the program to Statement #2 to continue the system checkout.

3A **[Configuration Err]**

If this message is displayed the 9215 has detected a checksum error in the memory area where the system configuration parameters are stored. This is a fatal error and indicates that it is not safe to run the system in it's current state.

"RESET" Returns the program to Statement #1.
"UP ARROW" Returns the program to Statement #2.
"ENTER" Advances the system to Statement #3B and forces a system cold start.

WARNING!!

A SYSTEM COLD START WILL CLEAR OUT (ERASE) ALL OF THE CURRENTLY STORED SETUP INFORMATION INCLUDING THE FORMULA AND MATERIAL FILES AND OTHER USER SETUP DATA.

3B **[System Cold Strt]**

The display indicates that the 9215 has been Cold Started. What this means is that the system configuration, setup, and memory has been reinitialized to a known state. All special user setup data has been cleared (erased).

"ENTER" Advances the program to Statement #10.

4 **[I/O Config Error]**

If this message is displayed the 9215 has detected a checksum error in the memory area where the system I/O configuration parameters are stored,

"ENTER" Advances the program to the next Statement.

4A **[Install Standard? N]**

The display is prompting the operator to determine if the system should load the standard system default I/O configuration.

"ENTER" While (N)o is displayed advances the program to Statement #10.
"ENTER" While (Y) is displayed caused the system to advance to the next Statement.

4B **[How Many Cards? 1]**

The display is prompting the operator to enter the quantity of SmartLink I/O boards in the system. Enter the appropriate number then press :ENTER: to continue the self diagnostics test. Refer to Sections 3.3.1 and 3.4.2. for more information about setting up the SmartLink I.O configuration.

Statement

Number	Operator Display
5	**[PLC Program Error]** If this message is displayed the 9215 has detected a checksum error in the memory area where the PLC program us stored. "ENTER" Advances the program to the next Statement.
5A	**[Install Standard? N]** The display is prompting the operator to determine if the system should load the standard system default PLC program. "ENTER" While (N) is displayed advances the program to Statement to #10. "ENTER" While (Y)es is displayed causes the default program to be loaded and the program will continue the self diagnostics test.
6	**[PLC Alarm Msg Err]** If the message is displayed the 9215 has detected a checksum error in the memory area where the used Alarm Message setup is stored. "RESET" Causes the program to retry this test "UP ARROW" Causes the program to retry this test. "ENTER" Causes the Alarm Message setup to be cleared and the program will continue the self diagnostics test.
7	**[I/O Force, Start? N]** The display prompts the operator to continue startup sequence even though inputs and/or outputs have been forced ON or OFF (through the 9215 Data Manager). "RESET" Causes the program to retry this test. "UPARROW" Causes the program to retry this test. "ENTER" While (Y)es is displayed the program advances to the next Statement.
7A	**[Password: ******]** If password protection is not enables, this program Statement will be skipped. The program will advance to Statement #10. Type in the current supervisor password (up to 6 characters) to allow the startup sequence to proceed and press "ENTER" to advance to Statement #10. A mismatch between the stored password and the entered password will return the program to Statement #7A.
8	**[Time? HH:MM:SS]** The current time will be displayed (HH:MM:SS 24-hour time is always used). If no change is required, enter the new time, then press "ENTER" to advance to the next Statement. If an error code is required, enter the new time, then press "ENTER" to advance to the next Statement. If an error is made while entering data, press the "DEL" key to delete the last character entered or press "SHIFT""CLEAR" to clear the entire entry, then continue. A decimal point or a minus sign are used to separate hours, minutes, and seconds during entry.
8A	**[Month? XX]** The current month will be displayed (XX is the numerical equivalent for the month; i.e. January = 01). Key in the value desired then press "ENTER" or press "ENTER" to accept the current value. The program will advance to the next Statement.
8B	**[Day XX]**

The current date of the month will be displayed (XX is the day of the month). Key in the desired day then press the “ENTER” key or press “ENTER” to accept the current value. The program will advance to the next Statement.

8C **[Year XX]**
The current year will be displayed (XX is the two digit year). Key in the desired year then press the “ENTER” key or press “ENTER” to accept the current value. The program will advance to Statement #10 if a valid date has been entered, otherwise, the program will return to Statement #8A.

4.3 function select (Statements 10 through 13)

The following section describes the 9215 Batchelor function select sequence. The function select sequence allows the operator to select the primary functions of the controller such as setup editors, reports, and batching.

Statement Number **Operator Display**

10 **[Select Function]**
Press the proper function key to select one of the following setup mode functions. This is the main menu. The green function keys may be used from this prompt to select “SETUP” operation, initiate a “REPORT”, or to “START” the batching operation.

“RESET”	Advances the program to Statement #11.
“UP ARROW”	Returned the program to Statement #8. (set time & date).
“SETUP”	The program will advance to Statement #20.
“REPORTS”	The program will advance to Statement #30.
“START”	The program will advance to Statement #1000.

The system also performs the following functions while Select Function is displayed:

I/O Communications The SmartLink I/O network is monitored for proper operation. If an error is detected the program will advance to Statement #12.

Remote Manual Input The remote manual mode input is monitored. If this input turns ON the program will advance to Statement #13.

Local Manual Mode Some models to the 9215 include a local switch to select the Automatic or Manual Mode or operation. If this switch is positioned to select the Manual Mode the program will advance to Statement #800.

11 **[Restart 9215? N]**
The display is prompting the operator to determine if the 9215 should be restarted. “ENTER” while (N)o is displayed will cause the program to return to Statement #10.

“ENTER”	While (Y)es is displayed causes the program to go to Statement #11A.

11A **[WITH SYSTEM INIT? N]**

“ENTER”	While (N)o is displayed returns to Statement #1.
“ENTER”	While (Y)es is displayed causes the display to prompt.

[PASSWORD _ _ _ _ _ _]
Since supervisor passwords are RAM resident they cannot be changed. Therefore this feature is protected with the Mettler Toledo back door password of “865336” only. All application memory is erased.

WARNING!
IF PASSWORD IS ENTERED MEMORY WILL BE CLEARED AND RETURN TO STATEMENT #1.

12 **[*** I/O COMM ERROR]**
If this message is displayed the 9215 has detected a failure on SmartLink I/O communication network.

An I/O board has failed to respond after several attempt by the system. All I/O logic operations are shut down. After acknowledgment of this alarm the message **[** I/O NOT READY **]** will be displayed. If the "START" key is pressed at this time the drop which is not ready will be displayed as **[I/O Drp X Not Ready],** with X as the drop number. The problem must be corrected then restart of the 9215 from the keyboard or by cycling power is required before the system can be used further for batching or I/O operations. The "SETUP' function key is also active to allow system setup corrections.

13 **[** REMOTE MANUAL **]**
This message is displayed when the 9215 Batchelor sees the remote manual input turn ON.

"RESET" Advances the program to the Statement #11.
"UP ARROW" Returns the program to Statement #8.
"SETUP" The program will advance to Statement #20.
"REPORTS" The program will advance to Statement #30.

4.3.1 SETTING TIME AND DATE

The 9215 internal clock is battery backed and will not require reset after a power failure. However, if it becomes necessary to change time and date press the "UP ARROW" when the display reads **[SELECT FUNCTION]** reference Statement 10 on page 4-7.

4.4 report selection (Statements 20 and 21)

The following section describes the 9215 Batchelor report selection sequence. This function allows operator selection of a report. Press the green "REPORT" function key to enter this section. Further information on the reports is detailed in Section 5.

Statement Number **Operator Display**

20 **[Password: ******]**
If password protection is not enables, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UP ARROW" Returns the program to Statement #10.

Type in the current password (up to 6 characters) to gain access to the report generator and press "ENTER" to advance to the next Statement. A mismatch between the stored password and the entered password will return the program to Statement #10.

21 This is the menu for report operations. By using the rotary select knob or the "UP ARROW" and "DOWN ARROW" keys you select which report you wish to generate. "CLEAR/DEL" toggles the entry between (Y)es and (N)o. With the desired selection displayed and (Y)es selected press "ENTER" to select this report. Some reports have a secondary prompt to allow selection of a particular record for the report. If a secondary prompt is required, it is detailed at the Statement indicated.

REPORT SELECTION PROMPT	**ACTION IF SELECTED**
[BATCH SUMMARY? N]	Prints Report
[PRODUCTION TOTALS? N]	Prints Report

[MATERIAL SETUP? N]	Go to Statement #22
[MATERIAL LIST? N]	Prints Report
[FORMULA SETUP? N]	Go to Statement #23
[FORMULA LIST? N]	Prints Report
[SYSTEM SETUP? N]	Prints Report REPORTS

The seven listed reports are supplied standard with the 9215. Eight reports are allowed. The default reports may be replaced or modified to generate custom reports. Custom report templates are designed and downloaded to the 9215 using the Data Manager.

22 **[MATERIAL ID: XX]**
Enter the two character ID for the material desired. If the ID exists the report will be generated and the program will return to Statement #10, otherwise, the program will advance to Statement # 24.

23 **[FORMULA ID: XXX]**
Enter the three character ID for the formula desired. If the ID exists the report will be generated and the program will return to Statement #10, otherwise, the program will advance to the next Statement.

24 **[* DATA NOT FOUND *]**
The selected record is not on file. Press any key to return to Statement #10.

4.5 setup editor selection (Statement 30)
The following selection describes the 9215 Batchelor setup editor selection sequence. This function allows operator selection of an editor. Press the green “SETUP’ function key to enter setup.

Statement Number	**Operator Display**
30	This is the menu for setup operations. By using the rotary select knob or the “UP ARROW” and “DOWN ARROW” keys you select which setup editor you wish to utilize. “CLEAR/DEL” toggles the entry between (Y)es and (N)o. With the desired selection displayed and (Y)es selected press “ENTER”. Each setup selection causes the program to advance to a set of Statement for that editor.

SETUP SELECTION PROMPT	**ACTION IF SELECTED**
[FORMULA SETUP? N]	Go to Statement #300 (Sec. 4.8)
[MATERIAL SETUP? N]	Go to Statement #200 (Sec. 4.7)
[CLEAR TOTALS? N]	Go to Statement #700 (Sec 4.12)
[SYSTEM SETUP? N]	Go to Statement #100 (Sec 4.6)
[SCALE SETUP? N]	Go to Statement #500 (Sec 4.10)
[SERIAL PORT SETUP? N]	Go to Statement #600 (Sec. 4.11)
[PLC SETUP? N]	Go to Statement #400 (Sec 4.9)

NOTE: Some setup selections are dependent on information found in other setup sequences. To enter a valid material, file, the number of materials needs to be entered in scale setup. To enter a valid formula, a valid material file must exist first. Therefore it is recommended that the operator enter scale setup first, then material setup, and finally formula setup to prevent invalid entry errors.

4.5.1 SYSTEM SETUP (Statements 100 to 199)
The following section describes the 9215 Batchelor system setup sequence. This function allows the operator to setup features of the controller such as a password protection, date format, and alarm and weight logging.

Statement

Number	Operator Display

100 **[Password: ******]**

If password protection is not enabled, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UP ARROW" Returns the program to Statement #30 (System Setup).

Type in the current supervisory password to gain access to the system setup editor and press "ENTER" to advance to the next Statement. A mismatch between the stored password and the entered password will return the program to Statement #30 (System Setup).

101 **[Password Protect? N]**

This prompt is asking the operator if password protection is to be used.

"ENTER" While (N)o is displayed enables password protection then advances to the next Statement.

There are two levels of password protection available.

SUPR- supervisor
USER- batch operator

The supervisor passwords allows entry into all of the setup selections, the report selection, startup when I/O has been forced, and the maintenance mode in manual operation. It can be used to accept and off tolerance condition during a batching sequence.

The user password allows entry into the formula setup, the material setup and the report selection. It also can be used to accept an off tolerance condition during a batching sequence.

Turning the password protect off clears both the supervisor and user passwords. If it should be enables again, the default password will be valid until a new password is entered.

You may elect to use all, any or none of the passwords. Maximum length of all passwords is 6 characters and these characters may be upper and lower case. The sequence and case of the characters must match exactly to advance from the password check. The 9215 has default passwords of 6 underscore characters.

Asterisks are displayed for added security while password characters are typed.

101 **[Set Supr Pass Wd ? N]**

The system is asking if the operator wishes t set the supervisor password.

"ENTER" While (N)o is displayed advances the program to Statement 105.
"ENTER" While (Y)es is displayed advances the program to the next Statement.

102 **[Password: ******]**

Type in the new supervisor password (up to 6 characters) and press "ENTER" accept the entry and advance to the next Statement.

103 **[Verify: ******]**

Type in the new supervisor password (up to 6 characters) and press "ENTER" to advance the program to Statement #105. If the two passwords do not agree the program will advance to the next Statement.

This is to verify the keyboard entry that you just made.

104 **[VERIFY ERROR]**
This message is displayed until “ENTER” is pressed. The program then returns to Statement #102.

105 **[Set User Pass Wd? N]**
The system is asking if the operator wishes to set the User password.

“ENTER” While (N)o is displayed advances the program to Statement 114.
“ENTER” While (Y)es is displayed advances the program to the next Statement.

106 **[Password: ******]**
Type in the new user password (up to 6 characters) and press “ENTER” accept the entry and advance to the next Statement.

107 **[Verify: ******]**
Type in the new user password (up to 6 characters) and press “ENTER” to advance the program to Statement #105. If the two passwords do not agree the program will advance to the next Statement.

This is to verify the keyboard entry that you just made.

108 **[VERIFY ERROR]**
This message is displayed until “ENTER” is pressed. The program then returns to Statement #106.

114 **[Protect Setup? N]**
The system is asking if you wish to place the setup functions behind the supervisor password.

“ENTER” While (N)o is displayed disables password protection for entry into setup editors, and advances the program to the next Statement.
“ENTER” While (Y)es is displayed enables the password protection for entry into setup editors, and advances the program to the next Statement.

114A **[Protect Modify? N]**
The system is asking if entry into Modify Mode is to be password protected.

“CLEAR/DEL” toggles the selection between Yes and No. Press “ENTER” while “Y” is displayed to password protect modify or while “N” is displayed to not restrict access to modify.

115 **[Protect Reports? N]**
The system is asking if you wish to place the report functions behind the supervisor password.

“ENTER” While (N)o is displayed disables password protection for requesting reports and advances the program to the next Statement.
“ENTER” While (Y)es is displayed enables the password protection for requesting reports and advances the program to the next Statement.

116 **[Protect Acc Tol? N]**
The system is asking if you wish to place the ability to accept off tolerance weights behind the supervisor password.

“ENTER” While (N)o is displayed disables password protection for accepting off tolerance weight, and advances the program to the next Statement.
“ENTER” While (Y)es is displayed enables the password protection for accepting off tolerance weights, and advances the program to the next Statement.

117 **[Date Format? X]**

Allows selection of the format for the date. Press the numeric key corresponding to the format required followed by the “ENTER” key or just “ENTER” to keep the existing value. The program will advance to the next Statement.

0 = MM/DD/YY (U.D. Format)
1 = DD-MM-YY (European Format)
2 = YY MM DD (Canadian Format)

Canadian month codes: JA, FE, MR, AL, MA,JN,JL, AU, SE, OC, NO, DE.

118 **[D.P. Character?]**
Allows selection of a decimal point (.) or a comma (,) for printing and display.

“CLEAR/DEL.” Toggles the prompt back and forth between decimal point (.) and comma (,).
“ENTER” While (.) is displayed will cause all weights to be displayed and printer using decimal points.
“ENTER” While (,) us displayed will cause all weights to be displayed and printed using commas.

119 **[Printer Enable? Y]**
Permits enabling or disabling of the printer.

“ENTER” While (N)o is displayed disables printing and advances the program to the Statement #123.
“ENTER” While (Y)es is displayed loads the system default report templates and advances to program to the next Statement.

CAUTION!!
IF THE DEFAULT REPORTS ARE LOADED WITH CUSTOM REPORTS IN PLACE, THE CUSTOM REPORTS WILL BE OVERWRITTEN. THE 9215 BATCHELOR DATA MANAGER ALLOW THE GENERATION OF CUSTOM REPORT TEMPLATES.

120 **[Alarm Logging? Y]**
Allows the enabling or disabling of alarm logging on the printer. Alarm logging creates an audit trail of alarm occurrences.

“ENTER” While (N)o is displayed disables printing of alarms during the batching cycle and advances to the next Statement.
“ENTER” While (Y)es is displayed enables printing of alarms during the batching cycle and advances to the next Statement.

121 **[Weight Logging? Y]**
Allows the enabling or disabling of weight logging on the printer. Weight logging creates an audit trail of the batch cycle as it occurs.

“ENTER” While (N)o is displayed disables printing of weighments during the batching cycle and advances to the next Statement.
“ENTER” While (Y)es is displayed enables printing of weighments during the batching cycle and advances to the next Statement.

122 **[Batch Summary? Y]**
Allows the enabling or disabling of the automatic printing of the batch summary report on the printer.

“ENTER” While (N)o is displayed disables printing of a batch summary at CYCLE COMPLETE. A batch summary may still be printed via the report generator. The program will then advance to the next Statement.

"ENTER" While (Y)es is displayed enables printing of a batch summary at CYCLE COMPLETE and advances the program to the next Statement.

123 **[Batch Numbering? Y]**
Allows enabling or disabling batch consecutive numbering on batch summary report.

"ENTER" While (N)o is displayed disables consecutive numbering on the batch summary report, and advances the program to Statement #125.
"ENTER" While (Y)es is displayed enables consecutive numbering on the batch summary report, and advances to the next Statement.

124 **[Batch Number: XXXX]**
A new starting value for the consecutive batch number (up to 4 digits) may be entered. Press "ENTER" to accept the entry and advance the program to the next Statement.

125 **[Modify Mode? X]**
Allows the selection of the mode of formula modification allowed.

During Automatic Batching, press the numeric key corresponding to the mode required followed by the "ENTER" key or just "ENTER" to keep the existing value. The program will advance to the next Statement.

0 = Scale the batch size by percent only.
1 = Adjust individual targets only.
2 = Allow either scaling of the formula or adjusting of the individual targets.

126 **[Tolerance Adj? N]**
Determines if the tolerance values are adjusted along with the setpoint values when the batch size is adjusted using the Modify function.

"ENTER" While (N)o is displayed disables adjustment to the tolerance values when a batch is modified using the MODIFY feature.
"ENTER" While (Y)es is displayed enables adjustment adjustment of the tolerance values by the same amount that a batch is modified by using the MODIFY feature.

127 **[Re-Cycle Time: XXXX]**
Where XXXX is the time in seconds that the unit will wait after CYCLE COMPLETE before starting a new batch. Type in the desired time delay value for the RECYCLE timer (up to 4 digits). Press "ENTER" to accept the entry and return the program to Statement #10.

If the formula running has an E-END action code as it's last formula line, the 9215 will automatically start the next scheduled batch after completing the current batch. Recycle time allows programming a time delay between automatically started batches.

4.5.2 MATERIAL SETUP (Statements 200 to 299)

The following section describes the 9215 Batchelor material setup sequence. This function allows the operator to enter materials, assign feeders, and setup material specific parameters.

Statement Number **Operator Display**

200 **[Password: ******]**
If password protection is not enabled, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UP ARROW" Returns the program to Statement #30 (Material Setup).

Type in the current supervisory password to gain access to the material setup editor and press "ENTER" to advance to the next Statement. A mismatch between the stored password and the entered password will return the program to Statement #20 (Material Setup).

201 **[Material ID: XX]**
Type in a two-character (alphanumeric) Material ID and press "ENTER". If the ID is found the program will advance to the next Statement. IF the ID is not found the program will advance to Statement #206.

The rotary select knob may be used at this Statement to "scroll" through the available materials.

"RESET" may be pressed to exit the material setup sequence.

202 **[Delete Material? N]**
Allows deletion of the selected material from the material file.

"ENTER" While (N)o is displayed causes the program to advance to Statement # 205.
"ENTER" While (Y)es is displayed causes the material record to be deleted and the program to advance to the next Statement.

CAUTION!!

IF A MATERIAL RECORD IS DELETED IN ERROR IT CANNOT BE RECOVERED UNLESS THE OPERATOR REENTERS THE DATA. IT IS GOOD PRACTICE TO PRINT THE MATERIAL SETUP DATA AS A BACKUP PRIOR TO DELETING. IF A MATERIAL THAT IS DELETED IS BEING USED IN A FORMULA, THE FORMULA WILL NOT RUN AND AN ALARM WILL BE GENERATED.

203 **[MATERIAL DELETED]**
This message indicates that the material record has been deleted. Press any key to return to Statement #201.

205 **[Matl Feeder ID: XX]**
XX is the feeder ID number, between 01 and 16, that has been assigned to the material. If the material is a hand add, HA is displayed as the feeder ID. Press any key to advance to Statement #215.

206 **[NEW MATERIAL ID]**
The message is displayed is the material code is not already in memory. Pressing any key advances the program to the next Statement.

207 **[Auto Feed? Y]**
Does the material have an automatic feeder?

"ENTER" While (N)o is displayed causes the program to advance to the next Statement.
"DOWNARROW" or
"ENTER" While (Y)es is displayed causes the program to advance to Statement #210.

208 **[Hand Add? Y]**
Is the material a hand add?

"ENTER" While (N)o is displayed causes the program to return to the previous Statement.
"DOWNARROW" or
"ENTER" While (Y)es is displayed causes the program to check to make sure there is room in the material file to add another hand add material. If not, the program advances to the next Statement. Otherwise, the program will advance to Statement #215.

209 **[HA MATL FILE FULL]**
Press any key to return to Statement #201.

210 **[Matl Feeder ID: XX]**
Type in a feeder number from 1 to 16. The maximum number that may be entered is determined by the number of automatic materials selected in scale setup. A material ID may only be assigned to one feeder. Press "ENTER" to accept the entry. The program checks to see if the selected feeder is in use by another material. If it is, the program advances to the next Statement. Otherwise the program advances to Statement #215.

211 **[In Use-XXXXXXXXXXXX]**
XXXXXXXXXXXX is the name of the material using the selected feeder. Pressing any key advances to the next Statement.

212 **[Replace? N]**
Should the existing material that is assigned to this feeder be deleted and replaces by the new material?

"ENTER" While (N)o is displayed causes the program to return to Statement # 210.

"ENTER" While (Y)es is displayed causes the new material to be assigned to the selected feeder and the program advances to the next Statement.

CAUTION!!

IF A MATERIAL RECORD IS DELETED IN ERROR IT CANNOT BE RECOVERED UNLESS THE OPERATOR REENTERS THE DATA. IT IS GOOD PRACTICE TO PRINT THE MATERIAL SETUP AS A BACKUP PRIOR TO DELETING. IF A MATERIAL THAT IS DELETED IS BEING USED IN A FORMULA, THE FORMULA WILL NOT RUN AND AN ALARM WILL BE GENERATED.

215 **[Name: XXXXXXXXXXXX]**
Enter the desired material name (up to 12 characters alphanumeric). Press "ENTER" to accept the displayed name and advance the program to the next Statement.

216 **[Usage: XXXXXXXXXXXX]**
XXXXXXXXXXXX is current amount of selected material used since usage was last cleared. Material usage cannot be edited. Press "ENTER" to go to the next Statement.

217 **[Inv: XXXXXXXXXXXX]**

XXXXXXXXXXXX is the current amount of the selected material in the 9215 inventory. Press "ENTER" to advance to the next Statement.

218 [Add To Inv? N]
Should material be added to the inventory amount?

"ENTER" While (N)o is displayed causes the program to advance to the next Statement.
"ENTER" While (Y)es is displayed the program will advance to Statement #220.

219 [Subt From Inv? N]
Should the material be subtracted from the inventory amount?

"ENTER" While (N)o is displayed causes the program to advance to Statement #210 if the material is hand add. If it is an automatic material and 2 speed feed has been enabled in scale setup the program advances to Statement #222. Otherwise the program will advance to Statement #224.
"ENTER" While (Y)es is displayed the program will advance to Statement #220.

220 [Amount: XXXXXXXXXX]
Type in the amount to be added to or subtracted from the inventory amount (up to 10 digits). Press "ENTER" to advance the program to the nest Statement. If subtraction from the material inventory results in a negative value, a zero inventory will result.

221 [New Inv: XXXXXXXXXX]
Press any key to advance. If the material is a hand add material the program will return to Statement #201. If it is an auto material and 2 speed feed has been enabled in scale setup, the program will advance to the next Statement. Otherwise the program advances to Statement #224.

222 [Overlap Fast/Slow? N]
This applies only if you have two speed feed devices This setup is entirely dependent upon your feed devices. If the feeder for a material is defined as having "overlap" fast/slow feed, 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 is ON to feed and only the slow feed output will be ON to feed slow.

"ENTER" While (N)o is displayed selected non-overlap feed and advances to the next Statement.
"ENTER" While (Y)es is displayed selects overlap feed and advances to the next Statement.

223 [Dribble: XXXXXXX]
Enter the desired dribble value (up to 7 digits). Press "ENTER" to accept the displayed value and advance to the next Statement. A value of zero defaults operation to single speed feed. Dribble is the amount of material to be fed at slow speed after the fast feed has finished. This must be large enough to allow the flow rate of material to stabilize at its' slow feed rate prior to reaching cutoff. If the value is too large, then the fill cycle will be unnecessarily long.

224 [Preact: XXXXXXX]
Enter the desired Preact value (up to 7 digits). Press "ENTER" to accept the displayed value and advance to the next Statement. Preact is the amount of material that will enter the scale after the feed device has been turned off (the material in suspension). This value is dependent upon material and material handling equipment characteristics.

225 [Auto Preact %: XX]
Enter the desired Automatic Preact Adjustment Percent value (0 to 99%). Press "ENTER" to accept the displayed value and advance to the next Statement. An entry value of 0 disables automatic preact adjust. Auto Preact Adjustment is a feature of the 9215 which allows automatic adjustment to the current preact value. This becomes necessary because of changes in the flow

rate materials due to sir conditions (humidity, pump pressure, head pressure, supply bin material lever, or other factors.)

226 **[Auto Jog Time: X.X]**
Enter the desired Automatic Material Jog Pulse On Time (0.0 to 9.9) in seconds. press “ENTER” to accept the displayed value and advance to the next Statement. An entry value of 0 disables automatic jog. If the delivered weight is short of the target weight by more than the tolerance amount, the 9215 can automatically “jog” some more material into the scale and recheck tolerance. This jogging will continue until the weight is within the tolerance band.

227 **[Cycl Slo Rate: XX.X]**
Enter the anticipated feed rate in scale increments/sec. Press “ENTER” to accept the displayed value and return to Statement #201. An entry value of 0 defaults to 9999 seconds. The 9215 will complete the cycle slow time based on the following formula (see below). The 9215 will signal an alarm if the material fails to reach cutoff within the cycle slow time.

$$\text{Cycle Slow Time} = \frac{\text{(Target Weight - Dribble - Preact)}}{\text{Cycle Slow Rate}}$$

4.5.3 FORMULA SETUP (Statements 300 to 399)
The following section described the 9215 Batchelor formula setup sequence. This function allows the operator to enter formulas and setup formula specific parameters.

300 **[Password: ******]**
If password protection is not enabled, this program Statement will be skipped. The program will advance to the next Statement.

“RESET” Returns the program to Statement #10.
“UPARROW” Returns the program to Statement #30 (Formula Setup).

Type in the current supervisory password to gain access to the Formula setup editor and press “ENTER” to advance to the next Statement. A mismatch between the stored password and the entered password will return the program to Statement #30 (Formula Setup).

303 **[Formula ID: XXX]**
Type in the three character alphanumeric Formula ID for the formula to be added, deleted or edited. Press “ENTER” to accept the Formula ID displayed. The ID is found, the program will advance to the next Statement. If the ID is not found, the program will advance to the next Statement. If the ID is not found, the program will advance to Statement #305. The rotary select knob may be used at this time to “scroll” through the available formulas. The 9215 required three alphanumeric characters for it’s Formula ID. No special characters are acceptable. If a single character is used, the 9215 will fit in the spaces with underscores (i.e. FORMULA ID: A _ _). It must also see these underscores in the Formula ID when the Data Manager program is being used.

304 **[Delete Formula? N]**
Allows deletion of the selected formula file.

"ENTER" While (N)o is displayed causes the program to advance to Statement #307.
"ENTER" While (Y)es is displayed causes the formula record to be deleted and the program returns to Statement #303.

CAUTION!!
IF A FORMULA RECORD IS DELETED IN ERROR IT CANNOT BE RECOVERED UNLESS THE OPERATOR REENTERS THE DATA. IT IS GOOD PRACTICE TO PRINT THE FORMULA STEUP DATA AS A BACKUP PRIOR TO DELETING.

305 **[Enter New Formula? Y]**

Should the entered Formula ID create a new formula?

"ENTER" While (N)o is displayed returns the program to Statement #303.
"ENTER" While (Y)es is displayed causes the program to check to see if there is room to add another formula. If there is no room, the program will advance to the next Statement. If there is room, the program advances to Statement #307.

306 [FORMULA FILE FULL]
There is insufficient space in the memory area allocated for formula storage to add another formula Press any key to return to Statement #303.

307 [Name: XXXXXXXXXXXX]
Enter the desired formula name (up to 12 characters alphanumeric). Press "ENTER" to accept the displayed name and advance the program to the next Statement.

309 [Line WW: XX YY? Y]
WW is the formula line number, XX is the action code for the formula line, and YY is the Material ID for the action code. If there is data stored for the current line displayed:

"UPARROW" Returns the program to the previous formula line unless line #01 is displayed. If so, the program returns to Statement #303.
"DOWNARROW" or
"ENTER" While (N)o is displayed advances to the next formula line unless it is the last line in the formula. If so, the program advances to Statement #334.
"ENTER" While (Y)es is displayed advances the program to the next Statement or to Statement #313 if the line displayed is a blank line (XX = ____).

HINT: If editing an existing formula use "UPARROW" and "DOWNARROW" to position the desired formula line on the display. Press the "ENTER" key while (Y) is shown to edit the line or create a new line.

310 [Delete Line WW? N]
Should the current line number WW be deleted from the formula?

"ENTER" While (N)o is displayed advances the program to the next Statement.
"ENTER" While (Y)es is displayed deletes the formula line from the formula, and returns the program to Statement #309.

CAUTION!!

IF A FORMULA LINE IS DELETED IN ERROR IT CANNOT BE RECOVERED UNLESS THE OPERATOR REENTERS THE DATA. IT IS GOOD PRACTICE TO PRINT THE FORMULA SETUP DATA AS A BACKUP PRIOR TO DELETING FORMULA LINES.

311 [Insert Line WW? N]
Insert a new formula line ahead of the current formula line?

"ENTER" While (N)o is displayed advances the program to Statement #313.
"ENTER" While (Y)es is displayed inserts a new formula line in the formula and advances the program to Statement #313. If an attempt is made to inset more than 99 lines for a formula, the program will advance to the next Statement. If the memory space is insufficient to add another formula line the program will advance to Statement # 312A.

312 [MAX LINES EXCEEDED]
Formulas can contain a maximum of 99 lines. Press any key to return to Statement #309.

312A [FORMULA FILE FULL]

There is insufficient space in the memory area allocated for formula storage to add another formula. Press any key to return to Statement # 309.

313 **[WW: Action Code: XX]**

WW is the formula line number and XX is the current Action Code. Enter the appropriate Action Code for this formula line and press "ENTER" to advance to the Statement for the Action Code listed below.

NOTE: Single character action codes must be followed with an underscore character when entered via 9215 keyboard. When entering via Data Manager the "_" character is omitted.

ACTION CODE	STATEMENT	ACTION
W_	314	Feed Material (Weigh)
MW	314	Manual Weighment
HA	319	Hand Add
BC	314	Batch Check
WO	322	Weight Out
D_	326	Discharge
CH	327	Cycle Hold
H_	328	Hold
HE	329	Hold for Entry
TH	331	Timed Hold
E_	334	End of Formula
M1	335	Mixer Output ON
M0	336	Mixer Output OFF
TM	337	Timed Mixed ON
P1	338	PLC Output ON
P0	339	PLC Output OFF
PW	340	Wait for PLC Input
PC	341	Preset PLC Counter
ZC	343	Zero Check

W_,MW,BC

All codes within the double boxes as shown at left are the applicable action codes listed above.

314 **[WW: Material ID: XX]**

WW is the formula line number and XX is the two character material ID. This prompt allows operator selection of a material ID for the following action codes:

ACTION CODE	ACTION
W_	Feed Material (Weigh)
MW	Manual Weighment
BC	Batch Check

The significance of the material ID is different by action code.

W_ - Weigh, selected an automatic material, and hence the feeder for automatic feed. The material setup parameters are used for dribble, preact, job, and cycle slow. Usage and inventory are adjusted for this material.

MW- Manual Weight, selected a material which will be manually added to the scale. The Hand Add Acknowledge key is used to terminate the manual weighment. Usage and inventory are adjusted for this material.

BC- Batch Check, selected an automatic material which will be added to the scale to compensate for a total batch off tolerance condition. The material setup parameters are used for dribble, preact, jog, and cycle slow. Usage and inventory are adjusted for this material.

Enter the appropriate Material Code for this formula line and press “ENTER” to advance to Statement #316. If the material is not found the program advances to the next Statement.

315 **[MATERIAL NOT FOUND]**
The selected material is not on file. Press any key to return to the previous Statement.

316 **[WW: Setpt: XXXXXXX]**
WW is the formula line number and XXXXXXX is the setpoint. Enter the desired material setpoint (final cutoff weight) (up to 7 digits including a decimal point). Press “ENTER” to accept the displayed value and advance to the next Statement.

318 **[WW: Tol:XXXXXXX]**
WW is the formula line number and XXXXXXX is the tolerance entered in weight units. Enter the desired material tolerance on either side of the material setpoint (up to 7 digits including a decimal point). Press “ENTER” to accept the displayed value and return to Statement #309.

HA

319 **[WW: Material ID: XX]**
WW is the formula line number and XX is the two character material ID. This selects the material which will be hand added to the scale. The Hand Add Acknowledge key is used to terminate the Hand Add. Usage and inventory are adjusted for this material by the setpoint amount.

Enter the appropriate Material Code for this formula line and press “ENTER” to advance to Statement #321. Use material code ** for materials not in the material file. If the material is not ** and cannot be found in the material file, the program advances to the next Statement.

320 **[MATERIAL NOT FOUND]**
The selected material is not on file. Press any key to return to the previous Statement.

321 **[WW:Setpt:XXXXXXX]**
WW is the formula line number and XXXXXXX is the setpoint. Enter the material amount that will be hand added (up to 7 digits including a decimal point). Press “ENTER” to accept the displayed value and return to Statement #309.

WO

322 **[WW:WP Cycles:XX]**
WW is the formula line number and XX is the number of Weigh Out cycles to be repeated. Enter the desired number of cycles (1 to 99). Press “ENTER” to accept the displayed value and advance to the next Statement. A start command is required between each cycle.

323 **[WW:Setpt:XXXXXX]**
WW is the formula line number to be processed by the program and XXXXXXX is the setpoint. Enter the desired material weigh out setpoint (final cutoff weight)(up to 6 digits including a decimal point). Press “ENTER” to accept the displayed value and advance to the next Statement.

324 **[WW:Tol: XXXXXXX]**
WW is the formula line number to be processed by the program and XXXXXXX is the tolerance entered in weight units. Enter the desired material tolerance on either side of the material setpoint (up to 7 digits including a decimal point). Press “ENTER” to accept the displayed value and return to Statement #309.

D_

326 **[DISCHARGE]**
This message is displayed to confirm the action code entered. Press any key to return to Statement #309.

CH

327 **[END WITH CYCLE HOLD]**
This message is displayed to confirm the action code entered. Press any key to advance to Statement #343.

H_

328 **[WW:Message ID:XX]**
WW is the formula line number and XX is the user literal message number. Type in the desired ID of the user literal message to be displayed. An entry of 00 defaults to the message **[* Hold*].** The system will test for an entry between 00 and 10. An invalid entry will return the program to Statement #328. Press “ENTER” to return the program to Statement #309. NOTE: User literal messages themselves are only accessible via the optional 9215 Data Manager software package.

HE

329 **[WW:Prompt:XXXXXX]**
WW is the formula line number and XXXXXX is the prompt that will be displayed for the operator when this formula is executed. Type in the desired alphanumeric prompt (up to 6 characters) to be displayed. Press “ENTER” to advance the program to the next Statement.

330 **[WW:Variable #:XX]**
WW is the formula line number and XX is the user variable number where the operator’s input will be entered. Type in the desired user variable number (01 to 10). press “ENTER” to accept the displayed variable number and return the program to Statement #309.

TH

331 **[WW:Hold Time: XXXXXX]**
WW is the formula line and XXXXXX is the time delay in seconds for the timed hold. Type in the desired hold time (up to 6 digits). Press “ENTER” to accept the displayed hold time and return the program to Statement #309.

E_

332 **[END OF FORMULA]**
This message is displayed to confirm the action code entered. Press any key to advance to Statement #343.

M1

333 **[MIXER OUTPUT ON]**
This message is displayed to confirm the action code entered. Press any key to return to Statement #309.

M0

334 **[MIXER OUTPUT OFF]**
This message is displayed to confirm the action code entered. Press any key to return to Statement #309.

TM

335 **[WW:Mix Time:XXXXXX]**
WW is the formula line number and XXXXXX is the time that the mixer output will be turned on in seconds. Type in the desired mix time (up to 6 digits). Press “ENTER” to accept the displayed mix time and return to Statement 3309.

P1

336 **[WW: Output On:XX]**
WW is the formula line number and XX is the general purpose output that will be turned ON in the PLC program. Type in the desired output number (01 though 08). Press “ENTER” to accept the displayed output number and return to Statement #309.

NOTE: General purpose output 01 is used as the mixer output in the default condition.

P0

337 **[WW: Output Off: XX]**
WW is the formula line and XX is the general purpose output that will be turned OFF in the PLC program. Type in the desired output number (01 through 08). Press “ENTER” to accept the displayed output number and return to Statement #309.

PW

338 **[WW:Wait Input:XX]**
WW is the formula line and XX is the general purpose input from the PLC that will be monitored. The batch will not advance to the next formula line until this input turns on. Type in the desired input number (01 though 08). Press “ENTER” to accept the displayed input number and return to Statement #309.

PC

339 **[WW: Counter#:XX]**
WW is the formula line and XX is the PLC counter number that is to be preset. Type in the desired counter number (01 through 08). Press ‘ENTER” to accept the displayed input number and advance to the next Statement.

340 **[WW: Term Cnt:XXXXXX]**
WW is the formula line and XXXXXX us the terminal count with which the counter will be preset. Type in the desired counter termination value (1 to 32767). Press “ENTER” to accept the displayed input number and return to Statement #309.

ZC

341 **[WW:STPT:XXXXXXX]**
WW is the formula line and XXXXXXX is the setpoint value of the zero check. Type in the desired setpoint (up to 7 digits including a decimal point). Press “ENTER” to accept the displayed setpoint, and advance to the next Statement.

342 **[WW:TOL: XXXXXX]**
WW is the formula line and XXXXXXX is the tolerance value of the zero check. Type in the desired tolerance (up to 7 digits including a decimal point). Press “ENTER” to accept the displayed setpoint, and advance to the next Statement.

343 **[UPDATE FORMULA? Y]**
Should existing formula be replaces with the information just edited for that formula?

"ENTER" While (N)o is displayed returns the program to Statement #303 and the formula will not be modified with any edits just completed.
"ENTER" While (Y)es is displayed adds a new formula to the file or replaces the data for an existing formula with the data just edited. The program will return to Statement #303.

4.5.4 PLc setup (Statements 400 to 499)

The following section describes the 9215 Batchelor PLC setup sequence. This function allows the operator to setup features of the PLC such as PLC formula selection and default settings.

Statement Number	Operator Display

400 **[Password: ******]**

If password protection is not enables, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UPARROW" Returns the program to Statement #30 (PLC Setup).

Type in the current supervisory password to gain access to the PLC setup editor and press "ENTER" to advance to the next Statement. A mismatch between the stored password and the entered password will return program to Statement #30 (PLC Setup).

401 **[PLC Code: XXXX]**

The number displayed (XXXX) is a number generated by the system each time a ladder logic program is downloaded into application memory. This code is read only and cannot be changed. Press "ENTER" to advance to the next Statement.

402 **[PLC Run? Y]**

Should the PLC task run? I/O will not be updated unless the PLC is running.

"ENTER" While (N)o is displayed disables the ladder logic from running and allows downloading of new ladder logic from a PC running the 9215 Data Manager. The program then advances to the next Statement.
"ENTER" While (Y)es is displayed allows the ladder logic to run and returns the program to Statement #10.

403 **[PLC Formula Slct? N]**

Should formula selection come from the PLC program or from the 9215 front panel?

"ENTER" While (N)o is displayed disables formula select registers and enables selection of formulas using the SELECT FORMULA and MODIFY keys. The program then advances to Statement #405.
"ENTER" While (Y)es is displayed activates formula select registers in the batching task instead of keyboard selection and advances the program to the next Statement.

404 **[PLC Frml Reg X: YYY]**

X is the PLC formula select register (1 though 8) and YYY is the formula ID assigned to that register. Use the "UPARROW" and "DOWNARROW" keys to select the desired PLC formula select register. Enter the appropriate formula ID (3 characters) with the correct PLC formula select number displayed. Press "ENTER" to accept the display and advance to the next register or if register 8 to the next Statement.

405 **[Default Config? N]**

Should the default PLC configuration be loaded?

"ENTER" While (N)o is displayed advances the program to Statement #408 to allow custom I/O configuration if there is an existing I/O configuration table, otherwise, the program advances to Statement #410.

"ENTER" While (Y)es is displayed loads the default PLC configuration and advances the program to the next Statement.

WARNING!!

SELECTING THE DEFAULT CONFIGURATION WILL OVERWRITE ANY CUSTOM PLC CONFIGURAION WHICH HAS PREVIOUSLY BEEN ENTERED.

406 **[How Many Cards? 1]**

How many SmartLink PCBs are there in the system? The maximum supported by the default configuration is 3. Refer to section 3.3.1 for details of the default I/O assignments for SmartLink PCBs 1, 2 and 3. Enter the appropriate number of boards followed by "ENTER" to advance to the next Statement.

407 **[Default Logic? N]**

Should the default PLC logic program be loaded?

"ENTER" While (N)o is displayed advances the program to Statement #408.

"ENTER" While (Y)es is displayed loads the default PLC program and returns the program to Statement #402.

WARNING!!

SELECTING THE DEFAULT PLC PROGRAM WILL OVERWRITE ANY CUSTOM PLC PROGRAM WHICH HAS PREVIOUSLY BEEN LOADED FROM THE 9215 DATA MANAGER.

408 **[Drop Address? XX]**

XX is the drop address of the I/O board to be configured. A maximum of 8 I/O boards may be configured. Enter the address (00 to 07) of the board to be configured.

409 **[Delete Record? N]**

Delete the I/O configuration table for the selected drop address?

"ENTER" While (N)o is displayed advances the program to Statement #411.

"ENTER" While (Y)es is displayed deletes the current record for the I/O board selected and advances the program to the next Statement.

410 **[Add New Record? N]**

Add a new I/O configuration record for the selected I.O drop address?

"ENTER" While (N)o is displayed returns the program to Statement #402.

"ENTER" While (Y)es is displayed returns the program to Statement # 408.

411 **[Group 1 Input? Y] or [Group 1 Output? Y]**

Configure Group 1 (I/O points 0-3) as inputs or outputs on the selected drop address. Use the "DEL" key to toggle the selection between INPUT and OUTPUT. Press "ENTER" to accept the displayed configuration and advance to the next prompt.

412 **[Group 2 Input? Y] or [Group 2 Output? Y]**

Configure Group 2 (I/O points 4-7) as inputs or outputs on the selected drop address. Use the "DEL" key to toggle the selection between INPUT and OUTPUT. Press "ENTER" to accept the displayed configuration and advance to the next prompt.

413 **[Group 3 Input? Y] or [Group 3 Output? Y]**

Configure Group 3 (I/O points 8-B) as inputs or outputs on the selected drop address. Use the "DEL" key to toggle the selection between INPUT and OUTPUT. Press "ENTER" to accept the displayed configuration and advance to the next prompt.

414 **{Group 4 Input? Y] or [Group 4 Output? Y]**
Configure Group 4 (I/O points C-F) as inputs or outputs on the selected drop address. Use the "DEL" key to toggle the selection between INPUT and OUTPUT. Press "ENTER" to accept the displayed configuration and advance to the next prompt.

The program will return to Statement #408 if there is another existing I/O configuration stored, otherwise, the program returns to Statement #410.

4.5.5 scale setup (Statements 500 to 599)

The following section describes the 9215 Batchelor scale setup sequence. This allows the operator to setup scale specific and batching parameters not associated with a particular material or formula.

Statement Number	**Operator Display**

500 **[Password: ******]**
If password protection is not enabled, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UPARROW" Returns the program to Statement #30 (Scale Setup).

Type in the current supervisor password to gain access to the scale setup editor and press "ENTER" to advance to the next Statement. A mismatch between the stored password and the entered password will return program to Statement #30 (Scale Setup).

501 **[Capacity: XXXXXXX]**
Enter the scale capacity (up to 7 digits including a decimal point). Press "ENTER" to accept the value displayed and advance to the next Statement.

501A **[Inventory Check? N]**
Should the 9215 check available material inventory prior to starting a new batch?

"ENTER" While (N)o is displayed disables inventory checking and advances the program to the next Statement.
"ENTER" While (Y)es is displayed enables inventory checking and advances the program to the next Statement.

502 **[Auto Materials: XX]**
How many automatic feeders are in the system? Enter the correct number (01 to 16) of feeder from which automatic materials can be fed. Press "ENTER" to accept the displayed value and to advance to the next Statement.

503 **[Two Speed Feed? N]**
Does the system have any two speed feeders?

"ENTER" While (N)o is displayed selects single speed feed and advances the program to the next Statement.
"ENTER" While (Y)es is displayed selects two speed feed and advances the program to the next Statement.

504 **[Settle Time: XXX]**
XXX is the setting time in seconds. How long should the 9215 delay after cutoff to jog before doing a tolerance check? Enter the appropriate setting time (000 to 999). The settling time

should be just long enough to allow the material flow to stop and the scale to stabilize. Press "ENTER" to accept the value displayed and to advance to the next Statement.

505 **[Two Speed Disch? N]**
Does the system have a two speed discharge feeder? Two speed discharge can be used for weigh out operations. This permits more accurate weigh out cutoff.

"ENTER" While (N)o is displayed selected single speed discharge and advances the program to Statement #507.
"ENTER" While (Y)es is displayed selects two speed discharge and advances the program to the next Statement.

506 **[WO Dribbl: XXXXXXX]**
Enter the desired Weight Out Dribble Value (up to 7 digits including a decimal point). Press "ENTER" to accept operation to single speed feed. Dribble is the amount of material to be feed at slow speed after the fast feed has finished. This must be large enough to allow the flow rate of material to stabilize and it's slow feed rate prior to reaching cutoff. If the value is too large, then the weigh cycle will be unnecessarily long.

507 **[WO Preact: XXXXXXX]**
Enter the desired Weigh Out Preact value (up to 7 digits including a decimal point). Press "ENTER" to accept the displayed value and advance to the next Statement. Preact is the amount of material that will leave the scale after the feed device has been turned off (the material in transit). This value is dependent upon material and material handling equipment characteristics.

508 **[D Cutoff: XXXXXXX]**
Enter the desired Discharge Cutoff value (up to 7 digits with a decimal point). Press "ENTER" to accept the displayed value and advance to the next Statement. The discharge cutoff is the point at which a discharge operation is terminated. This values should be set near zero to allow the vessel or hopper to completely empty.

509 **[Zero Tol: XXXXXXX]**
Enter the desired Zero Tolerance value (up to 7 digits with a decimal point). Press "ENTER" to accept the displayed value and advance to the next Statement. This is the allowed zero tolerance before start of batch and after discharge cutoff. Any indicator reading greater than this value will result in an alarm after the zero settling time has elapsed. Automatic Zero Check before the start of a batch may be enabled or disabled in Statement #511.

510 **[Zero Delay: XXX]**
Enter the desired Zero Tolerance check delay value (000 to 999) in seconds. Press "ENTER" to accept the displayed value and advance to the next Statement. This is the settling time in seconds after discharge cutoff before a zero tolerance check is made. This delay is to allow the discharge device to close and the scale to stabilize.

511 **[Auto Zero Check? Y]**
Should the 9215 test the scale weight prior to starting each batch to make sure that it is within zero tolerance?

"ENTER" While (N)o is displayed disables Auto Zero Check and advances the program to the next Statement.
"ENTER" While (Y)es is displayed enables Auto Zero Check and advances the program to the next Statement.

WARNING!!

IF THE AUTOMATIC TESTING OF THE SCALE FOR ZERO TOLERANCE PRIOR TO STARTING A BATCH IS DISABLED, A POTENTIAL EXISTS FOR MATERIAL TO BE IN THE SCALE AT THE START OF THE BATCH. THIS MATERIAL COULD CAUSE THE BATCH TO BE CONTAMINATED WITH INCORRECT MATERIALS OR WITH MATERIALS IN AN INCORRECT RATIO TO THE OTHER MATERIALS.

512 **[W Out Jog Time: X.X]**
Enter the desired Weigh Out Automatic Material Jog Pulse On Time (0.0 to 9.9) in seconds. Press “ENTER” to accept the displayed value and advance to the next Statement. An entry value of 0 disables automatic jog. If the delivered weight is short of the target weight by more than the tolerance amount, the 9215 can automatically “jog” some more material into the scale and recheck tolerance. This jogging will continue until the weight is within the tolerance band.

513 **[D Cycle Slow: XXXX]**
Enter the desired Discharged Cycle Slow Time (0 to 9999) in seconds. Press “ENTER” to accept the displayed value and return to Statement #10. The 9215 will signal an alarm id the material fails to reach discharge cutoff within the cycle slow time.

4.5.6 serial prt setup (Statements 600 to 699)
The following section describes the 9215 Batchelor serial port setup sequence. This function allows the operator to setup the serial port parameters such as the host drop number and host printer baud rates.

600 **[Password: ******]**
If password protection is not enables, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UPARROW" Returns the program to Statement #30 (Serial Port Setup).

Type in the current supervisory password to gain access to the scale setup editor and press "ENTER to advance the next Statement. A mismatch between the stored password and the entered password will return the program to Statement #30 (Serial Port Setup).

601 **[Host Address : X]**
X is the drop address (o though F) used for host communications interface as selected by the SIP switches. The drop address is set upon power up by reading the DIP switches. The drop address is read only and cannot be changed except by changing the DIP switch settings. Refer to section 3.3.2.2 for details about the host serial port connection and configuration and section 6 for host communications. Press “ENTER” to advance to the next Statement.

602 **[Host Baud: XXXX]**
What is the required baud rate for the host computer interface? Type in the desired baud rate. The available selections are 300, 1200, 2400, 4800 and 9600 baud. Press “ENTER” to accept the displayed value and to advance the program to the next Statement.

603 **[Printer Baud: XXXX]**
What is the required baud rate for the printer interface? Type in the desired baud rate. The available selections are 300, 1200, 2400, 4800 and 9600 baud. Press “ENTER” to accept the displayed value and to return the program to Statement #10.

4.5.7 Clear Totals (Statements 700 to 799)
The following sections describes the operation actions required to clear the production and usage totals.

Statement Number	Operator Display

700 **[Password: ******]**
If password protection is not enables, this program Statement will be skipped. The program will advance to the next Statement.

"RESET" Returns the program to Statement #10.
"UPARROW" Returns the program to Statement #30 (Serial Port Setup).

Type in the current supervisory password to gain access to the scale setup editor and press "ENTER to advance the next Statement. A mismatch between the stored password and the entered password will return the program to Statement #30 (Serial Port Setup).

701 **[Clear Production? N]**
Should the 9215 clear the production totals data?

"ENTER" While (N)o is displayed advances the program to Statement #703 without effecting production totals.
"ENTER" While (Y)es is displayed clears the production totals then advances to the nest Statement.

CAUTION!!

IF PRODUCTION TOTALS ARE CLEARED THEY CANNOT BE RECOVERED. IT IS GOOD PRACTICE TO PRINT PRODUCTION TOTAL INFORMATION AS BACKUP PRIOR TO CLEARING THE DATA.

702 **[Production Cleared]**
This message is displayed to confirm that the action has been taken. Press any key to advance to the next Statement.

703 **[Clear Usage? N]**
Should the 9215 clear the material usage totals data?

"ENTER" While (N)o is displayed returns the program to Statement #30 (PLC Setup?N) without effecting usage totals.
"ENTER" While (Y)es is displayed clear the material usage totals then advances to the next Statement.

CAUTION!!

IF MATERIAL USAGE TOTALS ARE CLEARED THEY CANNOT BE RECOVERED. IT IS GOOD PRACTICE TO PRINT MATERIAL USAGE TOTAL INFORMATION AS BACKUP PRIOR TO CLEARING THE DATA.

704 **[Usage Cleared]**
This message is displayed to confirm that the action has been taken. Press any key to return to Statement #10.

4.5.8 local manual (Statements 800 to 899)

The following section describes the operator actions required to operate the local manual controls from the switched on the lower front panel. Local manual is available whenever the 9215 Batchelor is not in automatic mode as long as the remote manual input is not used to override it. Local manual is selected with the Mode switch at the left end of the local manual panel. Control outputs in local manual are operational unless the remote stop input has been used to prevent the feeder or discharge outputs from operating. A remote stop condition must be removed by a remote start input to restore control capabilities.

Statement Number **Operator Display**

800 **[HAND_ADD____XXXXXXXX] or [MAT NO 1_____XXXXXXXX]**
This prompt is displayed to indicate the selected material. The default material “Hand Add” is selected when Statement #800 is first entered. The material that is selected will be displayed when Statement #800 is reached from any other 800 series Statement. Other materials may be selected by using the “UPARROW” and “DOWNARROW” keys or by using the rotary selector.

"HAND_ADD" will change to display the selected material's name. "XXXXXXXX" is the indicated weight and will default to the gross weight on the scale indicator when local manual mode is entered.

The blue function keys labeled "Manual Print" and "Manual Tare" are also active at this time. "Manual Tare" changes the indicated weight, on the 19 character operator display, to net weight, using the gross weight of the scale as a tare value. "Manual Print" will cause the material name and indicated weight to be printer if weight logging has been activated in the System Setup Editor (Statement #120). If the default "HAND_ADD" material is selected on the display, the program will advance to Statement #801 before the printout can start. The indicated weight will revert to gross weight when the "Manual Print" is pressed, regardless of the setup selection for weight logging.

The local switches labeled "Feed/Disch-Fast/Slow", "Manual Feed", and "Manual Discharge" are active in this mode when automatically fed materials are selected, or to discharge the scale. If the Discharge Gate Closed interlock is load when the manual feed pushbutton is pressed, the program will go to Statement #802.

If the Manual Discharge pushbutton is pressed the program will advance to Statement #803 if the Discharge OK interlock is present or to Statement #804 if it is not present.

If it is necessary to operate a feed or discharge output without either of these tow interlocks. The operator should contact the supervisor who can press the "SETUP" key to advance the program to Statement #805 for access to the maintenance mode.

If the remote manual input is activates the program will leave the local mode and enter the remote manual mode at Statement #13.

801 **[Name: HAND_ADD_____]**
Since "HAND_ADD" is a default name for manually handled materials, the operator is given the opportunity to enter a specific name of a material before printing. Pressing "RESET" will return the program to Statement #800 with no change in the indicated weight or stored tare value. Pressing "ENTER" either with or without a new name will initiate the printout with either "HAND_ADD" or a new name printed, respectively. The program the returns to Statement #800.

802 **[DISCHARGE GATE OPEN]**
While this message is displayed the discharge gate interlock is keeping the selected feeder OFF. Release the Manual Feed pushbutton to return to Statement #800.

803 **[MAIN DISCH XXXXXXXX]**
This is the standard display when a manual discharge is taking place. "XXXXXXXX" will display the gross weight during the discharge cycle and will leave the indicated weight in gross when the discharge pushbutton is released and the program returns to Statement #800.

Two-speed discharge operated with both the discharge outputs ON when fast has been selected. Slow discharges are done with only the discharge output ON. Single speed discharges use only the discharge output, independent of the fast/slow switch. All discharge outputs will turn OFF and the program will advance to Statement#804 if the downstream discharge permissive is removed (OFF).

804 **[DISCHARGE OK LOST]**
While this message is displayed the downstream discharge OK permissive has been removed and the discharge output(s) are forced OFF. Release the Manual Discharge pushbutton to return to Statement #800.

805 **[Maintenance Mode? X]**
The Maintenance Mode is a local manual mode in which the normal process interlocks are bypassed for extra ordinary reasons such as cleaning equipment or removing a jam. It is disables each time local manual is left and required the supervisor to enter a password to enable it. Once in the local manual mode, the operator presses "SETUP" to get to the display above. Change the

Yes/No character to the desired value and press “ENTER”. If “N” is selected the interlocks will be enabled again and the program will return to Statement #800. If “Y” is selected the program will advance to Statement #806. “RESET” returns the program to Statement #800 with the mode unchanged.

806 **[Password: ******]**
To enter the maintenance mode the supervisor must type in the necessary password and press “ENTER”. Password failure or pressing “RESET” will return the program to Statement #805 without the mode change to maintenance mode. A successful password entry enable maintenance mode and return the program to Statement #800.

4.6 automatic batching (Statement 1000 to 1099)

The following section describes the operator actions required to operate the 9215 in the automatic batching mode. There are two basic modes of operation available. In the first mode, the PLC program is able to select formulas from a predetermined list of eight formula ID’s. This mode is beyond the scope of the standard batching software and requires the use of the 9215 Data Manager program. The seconds mode, which is described in this section, is a mode where all selections are made by the operator from the keyboard. Mode selection between these two modes is done in the PLC Setup Editor, with keyboard formula selection as the default mode.

Formula selection from the keyboard is initiated from Statement #10 by pressing the “START” key on the main keyboard. The program will advance to Statement #1000 below to start the formula selection procedure. Once a formula is selected and started the display and operator interface are largely event driven. The batching sequence below is divided into sequence series which are categorized by the function they perform.

4.6.1 front panel function keys

In the automatic batching mode the following keys are active:

Key Description	Key Color
Formula Select	Dark Grey
Modify	Dark Grey
Logic	Dark Grey/Yellow Stripe
Start	Dark Grey/Green Stripe
Stop	Dark Grey/Red Stripe
Hand Add Ack.	Light Grey
Accept Off Tol.	Light Grey
Silence Alarm	Light Grey/Dark Grey Stripe
Manual Tare	Blue
Manual Print	Blue
Report	Green
Setup	Green

The function of these keys are described briefly in the following section. A detailed description of their operation is found in the batching sequence.

Formula Select Allows operator to stop a series of batches of a formula at the end of any currently running batch for a change in formula. The remaining batch count is cleared. (See Statement #1000).

Modify Allows the operator to suspend batching operation between batches to allow modification of the formula recipe. Modify is pressed during a batch to “schedule” a cycle hold at the end of the current batch. (See Statement #1005).

Logic Used in conjunction with the “Start”. “Stop” and “Reset” keys to pass a signal from the front panel keyboard to the PLC program. It has no effect on the Standard Batching Configuration other than disabling the three keys mentioned for a 3-second window from the batching task as assigns them to the PLC task. The operator can recognize this condition because the word “LOGIC: will appear in the display for the 3 seconds. Required the 9215 Data Manager for use by “LOGIC” will appear in the display for the 3 seconds. Required the 9215 Data Manager for use by the PLC program. Pressing this key once again during the 3-second window cancels the request.

Start Used to place automatic batching in a run condition, “Start” a selected formula running and recover from any keyboard or system generated “Stopped” condition.

Stop Used to “Stop” the batching process from the front panel and suspend further operation until a “Start” command is issued from the keyboard.

Hand Add Ack. Used to acknowledge to the 9215 from the front panel that the operator has finished and hand add or manual weigh operation. Primarily used when the remote hand add acknowledge pushbutton is not installed.

Accept Off Tol. Used to accept an off tolerance weighment from the front panel to allow the batch to proceed. This may require the use of a password.

Silence Alarm Used to acknowledge the current alarm condition and turn off the alarm output. A remote input is also available to silence the alarm.

Manual Print Invokes a printout of weight on the scale for the selected material manually weighed.

Manual Tare Invokes a tare of weight shown on prompting display when in the manual mode.

Report See Section 4.4.

Setup See Section 4.5.

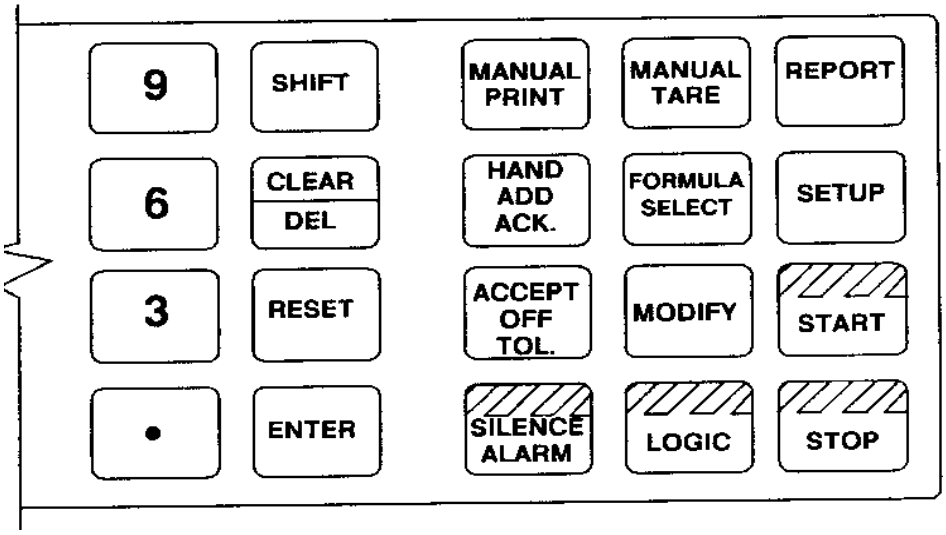


Figure 4.2 9215 Function Keys

4.6.2 batch selection sequencing (Statementss 1000 to 1020)

This series of sequence numbers are concerned with batch selection and management between batches. When a formula is selected the system loads the master recipe into a working buffer in memory and defaults to do a “run” of 1 batch. The operator can change the size of the run up to 99 batches. As a run is completes the system will queue up a new run of 1 batch. By always returning to a condition where a new run of 1 batch is ready to start, the operator can rerun a selected formula by simply pressing “START”, without re-entering the formula ID.

The makeup of individual batches can be changes between batches as well. The stored formulas are called master recipes and represent a batch size of 100%. The master recipe is always loaded into a working buffer to run batches. The formula in the working buffer can be changed without affecting the master recipe. It can be scaled from 10% to 200%. If it is left at 100% normal size, individual targets can be adjusted up or down to correct for variations in raw material properties that do not warrant a change to the master recipe.

To begin batching at the [SELECT FUNCTION] prompt, the operator can press “FORMULA SELECT” or “START”.

Statement Number	Operator Display

1000 **[Select Formula:_____]**

The operator is prompted to select a formula ID. If this Statement was reached by pressing “FORMUAL SELECT” during a previous batch, the old formula ID will be displayed. There are several ways to select the ID. The ID can be typed in directly; the rotary selector knob can be used to scroll through the list of available formulas; or the “UPARROW” and “DOWN ARROW” keys can be used to scroll through the list. When the desired formula ID is displayed the operator presses “ENTER” or “START”. If the formula is not found, the program will advance to Statement #1001. If the formula is found but is not executable the program advances to Statement #1002. The program will go to Statement #1004 is these two checks are successful.

NOTE: Pressing “START” allows the operator to initiate a quick start, bypassing the “modify” sequence. The sequence description lines will range from #1030 to #1089 depending on the stored formula sequence. Press “RESET” to leave batching and return to Statement #10.

1001 **[*FORMULA NOT FOUND*]**

This message is temporarily displayed and then the program returns to Statement #1000.

1002 **[INVALID FORMULA:XYZ]**

Press “ENTER” to advance the program to Statement #1003 to see the formula sequence line data which was found invalid.

1003 **[NNN: AA II SSSSSS]**

“NNN” is the formula sequence line number, “AA” is the action code; “II” is the Material ID serviced by the action code; and “SSSSSS” is the setpoint. Press “ENTER” to return the program to Statement #1000.

1004 **[Total Batch Cnt: 01]**

The operator may select from 1 to 99 batches of the formula to be run. Pressing “ENTER” advances the program to Statement #1005.

1005 **[XXX: Modify? N]**

If there is no need to change the batch size or formulation, press “ENTER” to advance the program to Statement #1010. Otherwise, change the “no” response to “yes” and press “ENTER” to advance the program to Statement #1006.

1005A **[Password: ******]**

To enter the modify mode the operator must type in the necessary password and press “ENTER”. Password failure or pressing “RESET” will return the program to Statement #1010. A successful password will enable modify mode and go to the next Statement.

1006 **[Pct Batch Size: 100]**

The operator decides whether the modification is to scale the batch size or adjust the individual targets. Press “ENTER” to advance the program to Statement #1008 to adjust individual targets. Enter a new percentage and press “ENTER” to advance the program to Statement #1007. Press “RESET” to advance the program directly to Statement #1010 with no adjustments.

1007 **[ADJUSTING SIZE]**

The program computes the scales up or down target weights and tolerances, as necessary, and then advances to Statement #1010.

1008 **[Correct Targets? N]**

If the overall batch size is left at 100% the operator has the opportunity to modify individual target weights, A “Yes” response takes the program to Statement #1009. A “No” response takes the program to Statement #1010.

1009 **[XX YY XXXXXXXX]**

Each weighment line is sequentially presented to the operator for target weight correction. XX is the action code of the type of weighment (auto, manual, or hand add), YY is the material ID, and XXXXXXXX is the target weight from the master recipe. The operator can enter a new target value and press “ENTER” to store the new value and fetch the next weighment. When all weighments have been presented the program will advance to Statement #1010. Press “RESET” to skip the remaining weighments at any point of the sequence and advance to Statement #1010.

1010 **[XYZ: Batch MM of NN]**

The system is ready to run a batch and may be started by pressing the “START” key or cycling the Remote Start input. The sequence description line will be in the range of #1030 to #1089, depending on the stored information sequence. Typically the batch will start at Statement #1030 if automatic zero checking is enabled. “MM” is the next batch number of the run and “NN” is the total number of batches selected at Statement #1004 or #1015. Press “UPARROW” to check for stop conditions preventing the start. The program will advance to Statement #1012 if a stop condition exists or to Statement #1011 if no stop condition exists.

Press “RESET” to return the program to Statement #10. Press “FORMULA SELECT” to return the program to Statement #1000 for a change of formula or to reload the existing formula with a batch size of 100%.

1011 **[XYZ: NNNNNNNNNNNN]**

The full formula name, NNNNNNNNNNNN, is temporarily displayed before the program returns to Statement #1010.

1012 **[REMOTE STOPPED]**
[KB STOPPED]
[KB + REMOTE STOPPED]

One of these messages will be temporarily displayed if a stop condition is in effect. The program then returns to Statement #1010. See the description of the 1090 series of Statement for details on the stop circuit.

1013 **[BATCH SIZE TOO BIG]**

If a batch size would exceed the capacity entered in 9215 [SCALE SETUP? N] this message appears and the batch is prevented from starting. Press “ENTER” to return the program to Statement #1010.
This message appears if an inventory check has been selected and insufficient material is found in the material file inventory to complete a formula sequence line. XX is the affected material. Press “ENTER” to return the program to Statement #1010.

1015 **[XXX: Modify? N]**

If there is no need to change the batch size or formulation, press “ENTER” to return the program to Statement #1010. Otherwise, change the “no” response to “yes” and press “ENTER” to advance the program to Statement #1016.

1016 **[Total Batch Cnt: MM]**

The current total batch count is displayed. The operator may enter another count between 01 and 99. If the selected number equals or exceeds the number of batches already competed in this run, the program will advance to Statement #1017 when “ENTER” is pressed. Otherwise, it advances to Statement #1018. “RESET” may be pressed to return directly to Statement #1010.

1017 **[MM BATCHES COMPLETE]**

The actual number of batches already competed in this run is displayed. Press “ENTER” to return the program to Statement #1010 with a new run of 1 batch ready to start.

1017A **[Password? _____]**

To enter the modify materials section the operator must enter the necessary password and press "ENTER". Password failure or pressing "RESET" will return to Statement #1010. A successful password will allow modification and advance to the next Statement.

1018 **[Pct Batch Size: XX]**

The current batch size is displayed as a percent of the master recipe. If it is different than 100% the operator may not change it. He must return to Statement 31010 by pressing "ENTER". From there, "FORMULA SELECT" may be used to reload the master recipe, which may then be scaled as needed. IF the batch is at 100%, the operator may scale the batch size between 10% and 200%. After entering the desired size, press "ENTER" to take the program to Statement #1007. If the size is left at 100% , press "ENTER: to advance the program to Statement #1019.

1019 **[Correct Targets? N]**

A "Yes" response will allow the operator to review the current target corrections at Statement #1020. A "No" response will return the program to Statement #1010.

1020 **[XX YY ZZZZZZZZ]**

This Statement is identical in operation to Statement #1009. The difference is that the current adjusted target is shown in the display. The program returns to Statement #1010 when the operator is finished reviewing or changing the target conditions.

4.6.3 batch weight sequencing (Statements 1030 to 1049)

This series of sequence numbers is related to scale weight up operations. These includes zero checking, automatic weighing, manual weighing, hand adds, and batch corrections to a gross weigh target. Zero checking can be automatically enabled in Scale Setup, making it an implies first sequence line of every formula. It can also be put explicitly in a formula sequence, usually to check the empty tare weight of a vessel. Batch correction is an automatic weigh sequence in which the system computes the net weight of material to add based on a target weight and tolerance for the complete batch. If the batch is already within the tolerance specified in the batch correction sequence line, the entire batch correction step is skipped. Otherwise the batch correction is identical to the automatic weigh sequence with the display showing the net weight target computer by the system.

ACTION CODE	STATEMENT #
ZC	1030
W_	1035
BC	1040
MW	1045
HA	1046

NOTE: Single character action codes must be followed with an underscore when entered via 9215 keyboard. When entered via Data Manager the "_" character is omitted.

ZC

1030 **[ZERO CHECK]**

IF a zero check has been included explicitly in a formula sequence or implicitly though the Scale Setup Editor, the system will check the tolerance band after waiting for the zero settling time period. IF the zero check is successful, the system then advances the next line of the formula sequence. Otherwise, the program advances to Statement #1031.

1031 **[ZERO OFF TOLERANCE]**

Press the “ACCPET OFF TOL” key or cycle the Accept Odd Tolerance Input to advance the system to the next formula sequence line. The batch may be aborted with the “STOP” and “RESET” keys as explained in the 1090 series of Statements.

W_

1035 **[W_XX□WWWWWWW]**

During the automatic cycle the system displayed the material ID, XX, and the amount of material to be delivered. The clock character will rotate clockwise whenever the feed output is on. In two-speed feed systems it will rotate quickly during the fast feed portion of the cycle and then slow down as the fast feed outputs turns off and the feed output finishes the weighment. In single-speed systems the character will rotate quickly whenever the feed output is on. After preact cutoff is reached the system will run a settling timer before taking a final weight reading. If the reading is within tolerance, the system will advance to the next formula sequence line. IF it is over tolerance the program advances to Statement #1048. If the settled scale reading is below the lower tolerance limit, the action of the system depends on the Material Setup parameters for the specified material. If the auto job time value is set to zero the program will advance to Statement #1048. If a non-zero value is present, the system will turn the feed output on for that time period to jog in material. After a new settling period the weight is checked again. This process is repeated until the material falls within the acceptable tolerance band. The “clock” character will rotate during each jog cycle until an in tolerance condition is reached, indicated by the “clock” becoming a solid square. The system then advances to the next formula sequence line.

The operator also has available a manual mode selector in most 9215 Batchelor configurations. This allows him to regulate the rate of material feed by cycling the feed output. Cycling will often break loose any material jams that may occur due to material bridging in storage. Turning the mode switch to the Manual position during the discharge will advance the program to Statement #1049.

At any time the “UPARROW” key may be pressed to see the full material name at Statement #1047.

BC

1040 **[BC XX □ WWWWWWW]**

If a resulting batch (total of all net weighments) is less than the specified batch check amount, the display will show [BC XX TTTTTT WWWWWWW]. XX will be the material ID and WWWWWWW will be the calculated (by the 9215) amount of material required to complete the batch. The material will be automatically added to the batch.

1041 **[BATCH TARGET:_TTTTTT]**

IF a resulting batch (total of all net weighments) is greater than the batch check amount, the program will display [OFF TOLERANCE]. Pressing the “SILENCE ALARM” key will cause the following to display: [BATCH TARGET:_TTTTTT]. TTTTTT is the specified total batch weight. Press the “ACCEPT OIFF TOLERANCE” key or cycle the remote Accept-Off-Tolerance input to allow the batch to continue.

MW

1045 **[MW XX ≈ WWWWWWW]**

The Manual Weight sequence may used any of the materials in the material file. Normal automatic materials are included so that a formula which normally uses automatic feeding can be processed manuals with no loss of material usage records in the event of a feeder failure. An open Diamond appears before the net weight to be added WWWWWWW. When the material falls within the acceptable tolerance band the open diamond will fill in solid. Press the “HAND ADD ACK” key or cycle the Remote Hand Add Acknowledge Input to advance the system to the next formula sequence line. If either of these inputs is used while out of tolerance the program will advance to Statement #1048.

HA

1045 **[HA XX ≈ WWWWWWW]**

The Hand Add operation is identical to the Manual Weigh with on exception. The open diamond never becomes solid because there is no tolerance check. Hand Adds often are small quantities that may not register on the scale. Statement #1048 can never be reached from a Hand Add.

1047 **[XXXXXXXXXXX]**

The full name of the designated material is temporarily displayed. The program then returns to the Statement from which it came.

1048 **[OFF TOLERANCE]**

An off tolerance condition is waiting for an operator action. If it can be manually corrected the operator can press “UPARROW” to return the program to the Statement from which it came for a new tolerance check. Otherwise, the operator can press the “ACCEPT O.T.” key or cycle the Accept Off Tolerance Input to allow the formula sequence to advance to the next line with the off tolerance material remaining in the scale; or, abort the batch by using “STOP” and “RESET”.

1049 **[MN XX ≡ WWWWWWW]**

With the front panel mode switch in Manual, the system shuts off the feed outputs and waits for a feed command from the front panel speed switch and feed pushbutton. The “clock” character will be an open square. When the feed pushbutton is pushed, the “hand” of the clock will appear and rotate clockwise. The speed of rotation will match the setting of the speed switch. The clock will change to a solid square when the material in tolerance band is reached.

The operator may also use the rotary selector knob to change the material being fed. This allows another feeder to finish a batch in the even of a feeder failure. Since the second feeder may have a different material that the original feeder, an “M” is printed behind the final weighment on the batch log to indicate a manual mode entry for a material in an automatic sequence line.

When the mode switch is returned to Automatic the program returns to Statement #1035 or #1040, but leaves the feed outputs off and enters a [stopped] condition at Statement #1091. This forces the operator to decide when to restart the automatic cycle.

4.6.4 batch event sequencing (Statements 1050 to 1069)

This series of sequence numbers is related to batching “events” which do not directly use the scale but rather support it. It includes such items as I/O events, like turning the mixer ON or OFF, and holding the cycle for operator input or inspection. With the exception of Timed Hold (TH), all actions advance the formula sequence after a brief message on the display. These action codes beginning with the letter “P” interact directly with the PLC program and require the 9215 Data Manager program for support.

ACTION CODE	STATEMENT #
H_	1050
HE	1055
TH	1057
TM	1060
M1	1061
M0	1062
P1	1063
P0	1064
PW	1065
PC	1066
E_	1067
CH	1067

NOTE: Single character actions codes must be followed with an underscore character when entered via 9215 keyboard. When entered via Data Manager the “_” character is omitted.

H_

1050 **[*HOLD*]**
A Hold has been places in the formula sequence which required the operator to acknowledge with the “START” key or by cycling the Remote Start Input to advance to the next formula sequence line. The hold message will be displayed unless the next formula sequence line is a discharge operation. In that case the program will advance to Statement #1070 or #1080. as appropriate displaying instead the batch ready message. Press the “STOP” key to advance the program to Statement #1093 to stop the batch.

HE

1055 **[PPPPPP_____]**
The formula sequence is holding for data entry by the operator. A prompting message, PPPPPP, is displayed for the operator to identify what data to enter. For example, it could be a lot number or an operator ID. Use of this data is only supported thought the 9215 Data Manager program. Press “ENTER” to advance the formula sequence or “STOP” to stop the sequence at Statement #1093.

TH

1057 **[HOLD TIME TTTTT]**
A Timed Hold is entered with TTTTT as the time interval in seconds. TTTTT will display the time remaining as the timer counts down to zero. When the timed hold in completed the program will advance to the next line in the formula sequence. To override the hold timer the operator should press the “RESET” key to advance the program to Statement #1058.

1058 **[Are You Sure? N]**
The operator is given 3 seconds to respond to this verification Statement before an automatic return to Statement #1057. A “yes” response will cancel the remaining hold time and advance the program to Statement #1059. A “no” response will return the program to Statement #1057 to complete the timer hold interval. The hold timer is not stopped whole waiting at Statement #1058.

1059 **[KB START to Advance**]
By canceling the remaining hold time the operator has taken control of the pacing of the batch. The operator should press the “START” key to resume the batch when ready. The formula sequence will advance to the next line.

If the operator must abort the batch he should press the “STOP” key or cycle the Remote Stop Input to advance the program to Statement #1092 or #1093.

TM

1060 **[MIXER TTTTT]**
Similar to a timed hold, the timed mixed cycle also begins with a display of the time in seconds to be counted. The difference is that once the mixer has started the formula sequence will continue on to the next step, without waiting for the mixer timer to time out.

M1

1061 **[MIXER ON]**
This message is displayed as the mixer is turned on before the program advances to the next formula sequence line.

M0

1062 **[MIXER OFF]**

This message is displayed as the mixer is turned off before the program advances to the next formula sequence line.

P1

1063 **[PLC OUTPUT _X ON]**
This message is displayed as the designated PCL coil is turned on before the program advances to the next formula sequence line.

P0

1064 **[PLC OUTPUT _X OFF]**
This message is displayed as the designated PLC coil is turned off before the program advances to the next formula sequence line.

PW

1065 **[WAIT FOR PLC INPUT _X]**
This message is displayed as the system waits for the designated PLC coils to turn on before the program advances to the next formula sequence line. This sequence step is only supported through the 9215 Batchelor Data Manager program. Use “STOP” and “RESET” to abort the batch (Statement #1093) if not supported in the installed PLC I/O program.

PC

1066 **[PLC CNTR_X_TO_TTTTT]**
This message is displayed when the formula sequence seats a termination count in the PLC program before advancing to the next formula sequence line. It has no effect on the standard batching program. This sequence step is only supported through the 9215 Batchelor Data Manager program.

E,CH

1067 **[MIXER HOLD TTTTT]**
If a Timed Mixer step was previously started but it was not completed prior to the end of the formula sequence list, this message will be displayed with the time remaining, TTTTT, shown counting down to zero. If there was no TM step or it has already been completed, the program will advance directly to the appropriate Cycle Complete Statement without displaying this Statement. The Cycle Hold (CH) sequence step will also cause the system to hold up the remaining batches in a run until restarted by an operator.

If the recycle timer has been configures to space out the batches by a fixed time interval, the program will advance to Statement #1097. Otherwise, the program advances to Statement #1099.

4.6.5 batch scale weighout sequencing (Statements 1070 to 1089)
This series of sequence numbers are related to scale weigh out or discharge operations. These includes automatic weigh out (dosing) and scale discharging. The stop inputs may be used at any Statement to transfer control to the 1090-1099 series of sequence numbers.

Automatic weighout has two modes of operation. In the firs mode, the dose count is set to zero. This tells the system to dose until less than one complete dose remains in the scale. The system will then of to cycle complete, skipping any remaining formula sequence lines that follow it. the partial dose becomes the “zero” for the next batch so that it is added to the full amount of the new batch when the new batch starts dosing. The automatic zero check feature should be disabled in

the Scale Setup Editor to operate in this mode without nuisance alarms at the start of batches with partial doses in the weigh hopper.

The second mode is used when the number of doses between 1 and 99 is specified. IN this mode the system doses to the specified number of doses and leaves any remaining material in the scale. Unlike the first mode, the system can execute additional formula sequence lines after the weigh out. Usually these include a discharge line to empty the residual material. IF there is ever insufficient material in the weigh hopper to complete the specified number of doses the operator will be given the option of weighing out the partial does or leaving it in the weigh hopper, before advancing to the remaining formula sequence lines.

ACTION CODE	STATEMENT #
D_	1070
WO	1080

NOTE: Single character action codes must be followed with an underscore character when entered via 9215 keyboard. When entered via Data Manager the "_" character is omitted.

D_

1070 [BATCH MM of NN RDY]

The current batch, number MM, of a run of NN batches is at a batch ready condition and the Batch Ready Output is turned on. The Batch Ready message and output will remain until any hold is acknowledged by pressing "START" and the OK to Discharge Input is on. The program then advances to Statement #1071. If there is no hold and the OK to Discharge Input is already on, the sequence will hold at this Statement for 1 seconds before advancing to Statement #1071.

1071 [DISCHARGE ≡_WWWWWW]

The discharge display message shows the "clock" character, and the gross weight in the scale, WWWWWW. If two-speed feed has been selected for the discharge mode, both discharge and fast discharge outputs will turn on. In single-speed mode only the discharge output turns on. The "clock" character will rotate counterclockwise and the gross weight should drop as the material leaves the scale. When the gross weight reaches the discharge cutoff point, the discharge output(s) will shit off and the settling timer will be started. As the gross weight falls within the zero tolerance range, the "clock" character will turn into a solid square. If the final weight after settling is within tolerance the formula sequence will advance. Otherwise, a zero off tolerance alarm will be generated. The operator can accept the off tolerance with the "ACCEPT OFF TOL" key or by cycling the Remote Accept Off Tolerance Input. The operator may also attempt to correct the off tolerance condition and press the "UPARROW" key to reread the scale and do a new tolerance check.

If the OK to Discharge Input is lost during the discharge cycle the program will advance to Statement #1073.

The operator also has available a manual mode selector in most 9215 Batchelor configurations. This allows him to regulate the rate of material discharge by cycling the discharge output. Cycling will often break loose any material jams that may occur, especially if the scale cannot reach the zero tolerance band due to material bridging in the weigh hopper. Turning the mode switch to the Manual position during the discharge will advance the program to Statement #1072.

1072 [MAIN DISCH≡_WWWWWW]

With the front panel mode switch in Manual, the system shuts off the discharge outputs and waits for a discharge command from the front panel speed switch and discharge pushbutton. The "clock" character will be an open square. When the discharge pushbutton is pushed, the "hand" of the clock will appear and rotate counterclockwise. The speed of rotation will match the setting of the speed switch. The clock will change to a solid square when the zero tolerance band is reached.

When the mode switch is returned to Automatic the program returns to Statement #1071, but leaves the discharge outputs off and enters a stopped condition at Statement #1091. This forces the operator to decide when to restart the automatic cycle.

1073 **[DISCHARGE OK LOST]**

The downstream permissive to discharge the scale has been lost. The system will shut off the discharge outputs until the OK to Discharge Input is restored. The program will then return to Statement #1071 and resume the discharge cycle. The Stop circuits may be used to abort the batch if necessary.

WO

1080 **[BATCH MM of NN RDY]**

All weighouts doses begin from Statement #1080. The OK to Discharge Input must be present before the system will react to a start command. The operator can press the “START” key or cycle the Remote Start Input to begin one dose. If there is insufficient material for the dose the system will advance to Statement #1081. If there is not enough material in the scale, the program will advance to Statement #1097 or #1099 for cycle complete in the continuous weighout mode or to Statement #1083 if in the fixed dose count mode.

1081 **[W OUT ≡ WWWWWWW]**

The system turns on the appropriate discharge outputs and displays the dose weight to be dispensed WWWWWWW. The “clock” character rotates counter clockwise until the dispensed weight reaches the tolerance band for the dose and then changes to a solid square. If the final weight after settling is within tolerance the formula sequence will advance. Otherwise, an off tolerance alarm will be generated. The operator can accept the off tolerance with the “ACCEPT OFF TOL” key or by cycling the Remote Accept Off Tolerance Input. The operator may also attempt to correct the off tolerance condition and press the “UPARROW” key to reread the scale and do a new tolerance check.

If the OK to Discharge Input is lost during the weigh out cycle the program will advance to Statement #1084.

After the dose is completed the program will return to Statement #1080 if additional doss are required. If the specified dose count has been reached, the system will leave any remaining weight in scale and advance to the next formula sequence line.

The operator also has available a manual mode selector in most 9215 Batchelor configurations. This allows him to regulate the rate of material discharge by cycling the discharge output. Cycling will often break loose any material jams that may occur due to material bridging in the weigh hopper. Turning the mode switch to the Manual position during the discharge will advance the program to Statement #1082.

1082 **[MN WO ≡ WWWWWWW]**

With the front panel mode switch in Manual, the system shuts off the discharge outputs and waits for a discharge command from the front panel discharge pushbutton. The “clock” character will be an open square. When the discharge pushbutton is pushed, the “hand” of the clock will appear and rotate counter clockwise. The speed of rotation will match the setting of the fast/slow speed switch. The clock will change to a solid square when the in tolerance band has been reached.

When the mode switch is returned to Automatic the program returns to Statement #1081, but leaves the discharge outputs off and enters a stopped condition at Statement #1091. This forces the operator to decide when to restart the automatic cycle.

1083 **[[W OUT _ TTTTT≡SHORT]**

The system has compared the weight in the scale to the minimum acceptable dose weight and determined that there is not enough material for one dose. The operator has two options. Press “ACCEPT OT” or cycle the Remote Accept Off Tolerance Input to dispense a, partial dose from

the scale before advancing to the next formula sequence line; or, press “START” or cycle the Remote Start Input to advance directly to the next formula sequence line.

1084 **[DISCHARGE OK LOST]**
The downstream permissive to discharge the scale has been lost. The system will shut off the discharge outputs until the OK to Discharge Input is restored. The program will then return to Statement #1081 and resume the weigh out cycle. The Stop circuits may be used to abort the batch if necessary.

4.6.6 batch terminations (Statements 1090 to 1099)

The 1090 series of Statements are concerned with the stopping or termination of a batch. They are typically reached by the operator interrupting the normal flow of the batch sequence of through completion of the batch cycle. Operator interruption can be through a stopping of the batch cycle from the various stop inputs or through the emergency stop hardware that shuts down I/O operations in addition to batching. The mixer output is treated as an I/O operation that is only started or stopped by the batching sequence. So the mixer will not be turned off by stopping the batching sequence. An emergency stop will shut off the mixer.

There are two portions to the stop circuit. One is controlled by the “START” and “STOP” keys on the main keyboard. The other is controlled by the remote Start and Stop inputs. Both halves of the stop circuit must be satisfied for batching operations to continue or start. This prevents an operator at the keyboard from starting or resuming a batch sequence that has been stopped by another operator using the remote Stop input; or vice versa. Once a Stop key or input has been activated, its corresponding start input must be cycled to remove the stop condition. Cycling both stop, inputs would require both start inputs to be cycled to resume the batch sequence. Further, the Remote Stop input will override the Remote Start input, providing additional security for maintained switches.

Statement Number	Operator Display
1090	**[EMERGENCY STOP]** The automatic cycle is in a stopped state due to an emergency stop condition. When is corrected, the program will advance to Statement # 1091.
1091	**[STOPPED]** The automatic cycle remains stopped after an emergency stop condition has been corrected. The operator has the option of resuming the automatic cycle by pressing the “START” key on the main keyboard or by pressing the Remote Start pushbutton; or, the option of aborting the batch by pressing “RESET” on the main keyboard. This will advance the program to Statement #1095.
1092	**[REMOTE STOPPED]** The Remote Stop Input has been cycled or de-energized. If the Remote Stop Input has been re-energized, press the Remote State input to resume the batch cycle. Press the “RESET” key to advance to program to Statement #1095 to abort the batch cycle.
1093	**[KB STOPPED]** The “STOP” key on the main keyboard has stopped the batch cycle. Press the “START” key to resume the batch cycle. Press “RESET” to advance the program to Statement #1095.
1094	**[KB + REMOTE STOPPED]** Both stop inputs have stopped the batch cycle. Each half of the circuit must be started as described in Statements #1092-1093 to resume the batch cycle. When one of the two halves of the stop circuit is satisfied the program will go to Statement #1092 or 1093 as appropriate. The

operator may also press “RESET” to advance the program to Statement #1095 to abort the batch cycle.

1095 [Are You Sure? N]

The operator has requested a batch reset which will abort the current batch. Statement #1095 provides a 3 second time period in which to verify the request. The system requires a “yes” response to continue. A “no” response or waiting for the 3 seconds will return the program to the Statement in use prior to the operator pressing “RESET”. A “yes” response will abort the batch, generating the alarm message, [*** Batch Aborting] bypassing the Cycle Complete output, leaving the batch count at the count found prior to the aborted batch, and will return the program to Statement #1010 where the operator may repeat the batch if appropriate.

1097 [CYCLE COMPLETE TTT]

The recycle timer configured in the System Setup Editor will start at Cycle Complete. The time remaining, TTT, will count down to zero. When zero is reached the program will advance to Statement #1099. IF the operator wishes to bypass the remaining recycle time, he may press “RESET” to advance to Statement #1098.

1098 [Are You Sure? N]

The operator is given 2 seconds to respond to this verification Statement before an automatic return to Statement #1097. A “Yes” response will cancel the remaining recycle time and advance the program to Statement #1099. This sets a cycle hold to prevent the next batch from starting automatically after canceling the remaining recycle time. A “n” response will return the program to Statement #1097 to complete the recycle time interval. The recycle timer is not stopped while waiting at Statement #1098.

1099 [CYCLE COMPLETE]

The Cycle Complete output will turn on and remain on until the start of the next batch. The Cycle Complete message will be temporarily displayed and then the program will return to Statement #1010 if the :MODIFY” and “FORMULA SELECT” keys have **NOT** been pressed during the batch. If there are no addition batches scheduled to run the program will schedule a run of one additional batch so that the operator only had to press “START” to run another batch.

If Statement #1099 has been reached from a Cycle Hold (CH) formula sequence step, the operator will also be required to press “START” to run any remaining batches in a run.

If the “MODIFY” key was pressed during the batch just finishing, a cycle hold will have been created by the system and the program will return to Statement #1015 instead of Statement #1010.

If the “FORMULA SELECT” key was pressed during the batch just finishing, the program returns to Statement #1000 with the current formula ID displayed. All batch size data and target corrections will be discarded if the current formula ID is reused. The size will be 100% and the target corrections will be zero. When Statement #1005 is reached, new adjustments can be made.

3. 5.0 REPORTS

This section illustrates the standard reports which are included with the 9215 Batchelor as defaults. Each report is generated by the 9215 from a report template that is stored in memory which may be loaded from the 9215 keyboard. Refer to Section 4.6 Statement #119A for a description of how to load default reports.

5.1 CUSTOM REPORT TEMPLATES

The 9215 Data Manager may be used to create custom report templates. A total of 8 different report templates may reside in the 9215. These may be any combination of standard default reports or custom reports. The 9215 also allows the report selection menu to be customized to correspond with custom reports which are created. For a complete discussion of custom report templates refer to the Advanced Features in Section 9.0.

5.2 standard default reports

Seven Standard Default Report Templates are supplied with the 9215. These standard reports will satisfy the requirements of many batching system reporting requirements and are designed such that they may be printed on a 40 column stop printer such as the Mettler Toledo Model 8855.

The reports illustrated on the following pages are as follows:

BATCH SUMMARY
PRODUCTION TOTALS
MATERIAL SETUP
MATERIAL LIST
FORMULA SETUP
FORMULA LIST
SYSTEM SETUP

5.2.1 BATCH SUMMARY REPORT

The Batch Summary Report may be selected from the report selection menu or it may be set up to print automatically at the end of the formula sequence. Refer to Section 4.6 Statement #122 for a description of how to enable automatic Batch Summary reporting.

The prompt appears as **[BATCH SUMMARY? Y].**

BATCH SUMMARY

FORMULA: 222 **DATE: 10/29/91**
NAME:222222222222 **TIME: 19:02**
BATCH:0003 **SIZE: 100%**

MATERIAL	TARGET	ACTUAL	TOLR
11111	1000	1030	
222222222222	1000	1110	*
11111	1000	920	

TOTAL BATCH WEIGHT 3060 LB

5.2.2 PRODUCTION TOTALS REPORT

The prompt appears as **[PRODUCTION TOTALS? Y].**

PRODUCTION TOTAL

TIME: 18:54 DATE: 10/29/90

ID	PRODUCT	COUNT	WEIGHT
ABC	ABC RESIN	26	179145.00
123	123 GLUE	11	12473.00

5.2.3 MATERIAL SETUP REPORT

After selection of this report, the operator is prompted to enter the Material ID for the appropriate report.

The prompt appears as **[MATERIAL SETUP? Y]**

MATERIAL SETUP

MATERIAL: 01 **DATE: 10/29/90**
TIME: 18:55

NAME **RED STONE**
INVENTORY **41890.00**

USAGE	**9672.00**
FEEDER	**01**
*** OVERLAP**	**YES**
*** DRIBBLE**	**11**
*** PREACT**	**72**
*** PREACT CORR. (%)**	**33**
*** JOG TIME (SEC)**	**1.0**
*** CYCLE SLOW (SEC)**	**120**

*** NOTE**: THESE ARE NOT PRINTED IF FEEDER = HA

5.2.4 MATERIAL LIST REPORT

The prompt appears as **[MATERIAL LIST? Y]**

MATERIAL LIST

TIME: 18:55 **DATE: 10/29/91**

NO.ID	MATERIAL	USAGE	INVENTORY
01 RE	RED STONE	2352.00	12370.00
02 GR	GREEN STONE	12349.00	4876.00
HA **	HAND ADD	324.00	11130.00

5.2.5 FORMULA SETUP REPORT

After this selection the operator is prompted to enter the Formula for the appropriate report.

The prompt appears as **[FORMULA SETUP? Y].**

FORMULA SETUP

FORMULA: 111 **DATE: 10/29/91**
NAME: TEST BATCH **TIME: 18:55**

LINE	ACTION	ID	SETPT	TOLR
1	W	RE	800	10
2	W	GR	77	3
3	TH		5	0
4	W	RE	342	6
5	D			0
6	E			0

5.2.6 FORMULA LIST REPORT

The prompt appears as **[FORMULA LIST? Y]**

FORMULA LIST

TIME: 18:55 **DATE: 10/29/91**

ID	FORMULA NAME
111	TEST BATCH
ABC	ABC RESIN
123	123 GLUE

5.2.7 SYSTEM setup report

The prompt appears as **[SYSTEM SETUP? Y]**

```
                    SYSTEM SETUP

TIME: 18:56                                          DATE: 10/21/91
PASSWORD PROTECTION   OFF
   SETUP                                                    NO
   REPORTS                                                  NO
   ACCEPT OFF TOLERANCE                                     NO

SCALE SETUP (LB)
   GRAD SIZE                                                10
   CAPACITY                                                 100000
   NUMBER OF FEEDERS                                        4
   FEEDER SPEEDS                                            2
   INVENTORY CHECK                                          NO
   AUTOMATIC ZERO CHECK                                     NO
   ZERO TOLERANCE                                           1.0
   SETTLING DELAY (SEC)                                     1.0
   DISCHARGE SPEEDS                                         1
   WEIGH OUT DRIBBLE                                        0.0
   WEIGH OUT PREACT                                         1000
   WEIGH OUT JOG TIME (SEC)                                 1.0
   DISCH CUTOFF                                             50
   DISCH CYCLE SLOW (SEC)                                   0
   MODIFY RANGE                                             ONE
   TOLERANCE ADJUST                                         NO
   RECYCLE TIME                                             0

PRINTER SETUP
   PRINTER IN USE                                           YES
   BAUD RATE                                                9600
   LOG ALARMS                                               YES
   LOG WEIGHTS                                              YES
   PRINT BATCH SUMMARY                                      YES
   DATE FORMAT                                              MM/DD/YY
   DEC. PT. CHARACTER                                       .
   BATCH NUMBERING                                          YES
   CURRENT BATCH NUMBER                                     0003

HOST SETUP
   DROP ADDRESS                                             0
   BAUD RATE                                                9600

I/O SETUP
   DROP        GRP1    GRP2    GRP3    GRP4
   00          IN      IN      OUT     OUT

LOGIC SETUP
   INSTALLATION CODE                                        871A
   PLC FORMULA SELECTION                                    OFF
```

(See Section 4.9 Statement 401 for detail of Installation Codes).

5.3 run time logging

The 9215 can print a run time audit trail of the Formula sequence and Alarm occurrences. These logging features must be enabled. Refer to Section 4.6 Statement #120 and #121 for details.

```
18:59:00    AUTOMATIC MODE
18:59:29    *** BATCH ABORTING
19:00:42    REMOTE MANUAL
19:00:48    AUTOMATIC MODE
19:01:28    11111_____1030
19:01:40    *** MATERIAL O.T.
19:01:43    222222222222___1110
19:02:08    *** CYCLE CLOW
19:02:18    *** ZERO OFF TOLER.
19:02:59    222222222222____1060
19:03:10
            11111_____93
            0
19:04:49    MANUAL MODE
19:05:17    AUTOMATIC MODE
19:06:02    STOP
19:06:08    START
19:06:59    *** SCALE FAULT
19:08:01    *** I/O DIRECTN ERR
19:08:53    *** I/O COMM ERROR
```

Lines printed with the *** identifier are alarm messages.

4. 6.0 HOST PORT COMMUNICATIONS

The 9215 Batchelor supports host communications over either an RS232 or an RS422/485 link. In both cases the same protocol and message formatting is used. The difference is that the RS232 line only supports a connection between the host computer and one 9215 while the RS422/485 link can support the host computer serving up to (16) 9215's. This section summarizes the capabilities of the host link. The "Programmer's Guide" is provided in Section 10 which provides an in depth treatment of the subject.

6.1 protocol

A multidrop protocol was necessary for the 9215 host link. The one selected subscribes to ANSI Standard X3.28. Users attempting to program a host computer to communicate with the 9215(s) should be familiar with this standard. Each transaction is broken into two procedures. The first is the Establishment Procedure which established the connection between the host computer and a particular 9215. A drop address for each 9215 is set on the SIP switched at the top of it's main board and is used by the 9215 to decide if it should respond during the Establishment Procedure. The Establishment Procedure used is covered by Subcategory 2.5 of ANSI X3.28.

Once the connection is established, only the designated 9215 will be online with the hot computer and all messages associated with the Message Transfer Procedure are directed to or from the designated 9214. Subcategory E.3 is used for message transfer. A single EOT character is used to break a connection.

The standard also designates certain timers to be used for error recovery on the data link. All of the protocol requirements are found in the companion document mentioned above.

6.2 message format

This section describes the various commands available to the host computer for communication with the 9215. All commands start with a two-character code. The first character is a letter specifying a particular code group and the second character is an alphanumeric character (typically numeric) specifying a particular command within the selected group. The simplest commands will have only the two-character ID while more complex commands may be followed by additional parameters. If a response required data to be sent, the reply message will also contain this message code.

6.2.1 formula codes

These codes support the transfer of formula file data to or from the 9215. Certain codes must be executed in a prescribed order for proper operation.

F0	UPLOAD FORMULA SPACE
F1fff	DELETE DESIGNATED FORMULA (fff = ‘ ‘ FOR ALL)
F2fff	UPLOAD DESIGNATED FORULA NAME (fff = ‘ ‘ FOR ALL)
F3fffnn...nn	DOWNLOADING FORMULA NAME
F4fff	UPLOAD FORMULA SEQUENCE
F5fffss...ss	DOWNLOAD FORMULA SEQUENCE

6.2.2 MATERIAL CODES

These codes support the transfer of material file data to or from the 9215.

M0	UOLOAD MAXIMUM NUMBER OF AUTOMATIC MATERIALS
M1mm	DELETE DESIGNATED MATERIAL (mm = ‘ ‘FOR ALL)
M2	reserved
M3mm	UPLOAD DESIGNATED MATERIAL (mm = ‘ ‘ FOR ALL)
M4mmdd...dd	DOWNLOAD MATERIAL

6.2.3 plc codes

These are the codes associated with the manipulation of the I/O logic over the host link.

P0	VERIFY EXISTING PLC CODE (INSTALLS PRESETS IN REGISTERS)
P1	START PLC CODE (VERIFIES FIRST)
P2	STOP PLC CODE (STOPS CODE AND CLEAR I/O & ELAPSED CNT &TIME)
P3wwcc..cc	REPLACE PLC CODE (ww words) WITHOUT CHANGING I/O & REGS (IN MONITOR MODE)
P4aaaa	POINT TO OFFSET ADDRESS aaaa IN PLC CODE
P5cc...cc	DOWNLOAD PLC CODE TO CURRENT PRINTER
P6cc...cc	UPLOAD PLC CODE FROM CURRENT PRINTER
P7ll..ll	DOWNLOAD LIST OF MONITORED I/O ADDRESSES
P8vv..vv	UPLOAD MONITOR VALUES (1 CHAR EA.:”0” OFF, ‘1’ ON)
P9	LOAD DEFAULT LADDER CODE INTO RAM
PApps	FORCE I/O POINT pp TO STATE s
PBpp	UNFORCE I/O POINT(S) pp (pp GREATER THAN 7F TO UNFORCE ALL)
PC	READ PLC INSTALLATION CODE AND STATUS
PDf	UPLOAD PLC FORMULA ID(S)
PEfiii..ii	DOWNLOAD PLC FORMULA ID(S)
PG	UPLOAD REGISTER VALUES
PH	UPLOAD PLC ALARM MESSAGES
PLaa...aa	DOWNLOAD ALARMS
PJ	UPLOAD FORCE TABLE
PK	UPLOAD FORCE VALUES

6.2.4 REPORT TEMPLATE CODES

These are the codes used to retrieve and load report templates used by the printer from the report generator.

R0	INSTALL DEFAULT REPORT TEMPLATES
R1rnn...nn	UPLOAD REPORT NAME(S) FOR DESIGNATED REPORT(S)
R2rnn..nn	DOWNLOAD REPORT NAME(S) FOR DESIGNATED REPORTS(S)
R3r	DELETE DESIGNATED REPORT OR ALL REPORTS
R4rtt..tt	DOWNLOAD REPORT TEMPLATE
R5rtt..tt	UPOAD REPORT TEMPLATE
R6ss	UPLOAD TEMPLATE TABLE SPACE AVAILABLE
R7	UPLOAD USER LITERALS
R8ll..ll	DOWNLOAD USER LITERALS

6.2.5 STATUS CODES

These codes are used to obtain status information from the 9215. Certain codes have been reserved for future use that currently generate error code E1 if requested.

S0	reserved
S1	reserved

S2	UPLOAD SCALE AND STATUS DATA
S3	reserved
S4	reserved
S5	UPLOAD PRODUCTION SUMMARY
S6n	UPLOAD BATCH SUMMARY (n = '0' last report; N = '1' new report only)
S7	reserved

6.3 ERROR CODES

The following error codes may be generated if the 9215 is unable to comply with a host request. Error recovery techniques must be implemented in the host software to assure proper data transfer.

E0	DATA NOT AVAILABLE
E1	UNRECOGNIZED COMMAND
E2	IMPROPER DATA LENGTH
E3	INVALID DATA
E4	DATA IN USE
E5	BLOCK ID MISMATCH
E6	POINTER OUT OF RANGE
E7	INVALID CONFIGURATION
E8	DATA TABLE FULL
E9	ACCESS DENIED

5. 7.0 ALARMS

This section describes the alarm monitor for the 9215 Batchelor that operated independently from the batching and I/O logic. It received inputs from both of these tasks as well as the hardware in general. The alarm messages are always output to the main display of the 9215 and can be output to the printer if it has been configured to support alarm logging. When an alarm occurs, it is acknowledged though the front panel **<SILENCE ALARM>** key or through the remote "silence Alarm" input available from the I/O.

7.1 alarm structure

Since only one alarm at a time can be displayed on the 19-character display of the 9215, the alarms have been prioritized so that the most important alarm, that has not been acknowledged by the operator, is displayed. As each alarm is acknowledged, any lower priority alarm that has not been previously acknowledged will be brought to the display. Acknowledging an alarm does not cause it to be corrected. This is a function of the logic that triggered the alarm in the first place. Critical logic such as batching which generate certain alarms requiring additional operator actions will also display a status message after the alarm itself has been acknowledged. Only after the logic causing the alarm determines that it has been corrected is the alarm actually cleared. Each alarm has to be cleared in this manner before it can be reasserted. **The 9215 does not provide a means of redisplaying previously acknowledged alarms that are still in effect.**

It is also possible that an alarm that occurs simultaneously with a higher priority alarm may be corrected before the operator acknowledges the higher priority alarm. In this even the operator would never see the lower priority alarm on the 19-character display since it would already be cleared. To overcome this situation and to provide a means of permanently recording all alarms that have occurred, the 9215 has alarm logging as an output function of the printer port which may be configured in the Setup Editor. Alarm logging has a unique place in memory for each possible alarm where the time and date of each alarm is recorded. When alarm logging is activated, each occurring alarm will have its time and date stored in its own location and this information will be printed as soon as the printer is free. Usually this is immediately printed unless the printer is busy with some other job such as a batch summary report. in this case the alarm log will follow the end of the report being printed. Since each alarm has its own storage location, no alarms will go unnoticed.

In systems with no printer, it is also possible to add a CRT terminal that is connected to the printer port of the 9215 instead of the printer. This would allow the alarm log to scroll before the operator so that he could always see the last 20 to 25 alarms that have occurred, depending on the monitor selected. If a current loop hardware configuration is chose for the printer port, both a printer and CRT terminal could be driven together.

7.2 alarm messages

Two groups of alarm messages are possible. The first group of 10 messages are standard with every system and are listed below. These have the highest priority in the system/ The second group of 8 messages are created by

the user of advanced features of the 9215 and are discussed in Section 9.0. This second group is of lower priority when they occur simultaneously with alarms from the first group. When an alarm message is displays it is always preceded by three asterisks (***). This leaves 16 characters for the text of the alarm message. The asterisks provide a means of distinguishing between an alarm message an a status message due to the normal display output. The following are the standard alarm messages arranged by order of priority with the highest priority first and the lowest priority last:

1) ***EMERGENCY STOP

Power to the emergency stop circuit has been interrupted. Batching logic is stopped and must be restarted.

2) * I/O LOGIC ERROR**

The logic program controlling the I/O has failed a checksum test. in standard systems the default logic must be reloaded from the PLC Editor. Nonstandard logic must be reloaded as described in the Advanced Features Manual.

3) * I/O COMM ERROR**

An I/O board has failed to respond after several attempts by the system. All I/O logic operations are shut down. After acknowledgment of this alarm the message **** I/O NOT READY**** will be displayed. If the start key is pressed at this time the drop which is not ready with be displayed as **I/O Drop X Not Ready**, with X as the drop number. The problem must be corrected then restart of the 9215 from the keyboard or by cycling power is required before the system can be used further for batching or I/O operations. The <SETUP> function key is also active to allow system setup corrections.

4) * I/O DIRECTION ERR**

An interrogation of I/O boards at startup has indicated that the direction switches on the I/O boards that determine the input or output direction of each group of 4 I/O points is not in agreement with the configuration table specified in the PLC Editor. A 9215 restart will be required.

5) * SCALE FAULT**

Output data has been lost from the 8142 or 8530 PCB or the PCB itself has determined a problem with its own data.

6) * BATCH ABORTING**

When a batch is terminated (aborted) without reaching cycle complete this message is displayed. This can be due to some sort of system problem or by the operator stopping a batch and forcing a reset of it.

7) * MATERIAL O.T.**

An automatically-fed material has cutoff outside the acceptable tolerance band. The off tolerance condition must be accepted or a manual correction must be made to the batch with a repeat of the tolerance check yielding in tolerance before the batch can continue.

8) * ZERO OFF TOLER.**

A zero check has failed with the scale weight outside of an acceptable range.

9) * CYCLE SLOW**

If a material feeder jams or runs out of material so that it no longer feeds to cutoff in the prescribed time or if the flow from the discharge gate is blocked for a specified period of time, a cycle slow condition will exist.

10) * DISCHARGE GATE OPEN**

This alarm occurs when the discharge fate closed input is not satisfied prior to feeding. Also occurs if the gate fails to close at the end of the discharge cycle.

6. 8.0 9215 MAINTENANCE AND TROUBLESHOOTING

This section is broken down into 7 basic groups.

8.1 8142 Scale Related Items
8.2 8530 Scale Related Items
8.3 TSM-3000 (Main Board) Related Items
8.4 SmartLink Related Items
8.5 Spare Parts
8.6 Drawings

Information contained within a specific group may also have significance in another group. Therefore, it is advised that familiarity with all subject matter be acquired.

REQUIRED TOOLD AND SUPPLIES
The following items are recommended for proper maintenance and repair. Common hand tools are also required.

20,000 ohms/volt Volt-Ohm Meter or digital voltmeter
Analog Load Cell Simulator (Part No. 100865 00A) for 8142
or
DigiTOL Load Cell Simulator (Part No. 964-0033) for 8530
Cleaning cloth, Static Bag, Static Wrist Wrap

SCHEDULE
The recommended frequency at which normal cleaning and inspection should be performed, when installed in a clean office environment, should be once per year. However, if the unit is subjected to a dusty or a dirty environment the frequency should be increased as required.

CLEANING
Clean the keyboard and display window with a soft cloth that has been dampened with a mild window type cleaner. **DO NOT USE ANY TYPE OF INDUSTRIAL SOLVENT. DO NOT SPRAY CLEANER DIRECTLY ONTO THE UNIT.**

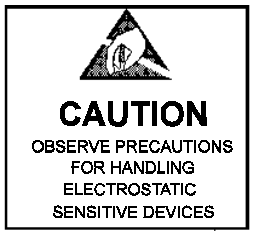
WARNING!!

THIS MODULE AND ITS ASSOCIATED EQUIPMENT MUST BE INSTALLED, ADJUSTED, AND MAINTAINED BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF ALL EQUIPMENT IN THE SYSTEM AND THE POTENTIAL HAZARDS INVOLVED.

FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN BODILY INJURY AND/OR PROPERTY LOSS.

GENERAL TROUBLESHOOTING PROCEDURES

a. If operational difficulties are encountered, obtain as much information as possible regarding the particular trouble. This may eliminate a lengthy, detailed checkout procedure later.
b. Check fuses, primary power lines, external circuit elements and related wiring for possible defects. Failures and malfunctions often may be traced to simple causes such as loose connectors, poor power supply and connections or fuse failure.
c. Use the electrical interconnecting diagrams as an aid to locating trouble causes. They contain various voltage measurements that are average for normal operation. Use instrument probes carefully to avoid causing short circuits and damaging circuit components.
d. Malfunctions in the Instrument PCB's are best located by substitution. A printed circuit board believed to be defective must be checked by replacing it with a known good PCB, and then observing whether the problem is corrected. WHEN HANDLING A PCB, USE A "VELOSTAT" STATIC BAG FOR BOTH THE NEW AND DEFECTIVE PCB.



e. To verify the problem, replace the defective PCB and retest. This simple test will eliminate the possibility of replacing a good PCB because of a poor or loose connection.
f. Be sure to consult the other sections of this manual for proper programming. Do not automatically program the replacement PCB like the suspected faulty PCB as the problem may be a programmable error.
g. Exchange PCB's are available from an authorized Mettler Toledo representative.

8.1 maintenance

The 8142 Digital Indicator is designed to require a minimum of maintenance and service. This section provides instructions and procedures for this indicator PCB.

8142 ERROR CODE SUMMARY

Error codes will be displayed by the 8142 when certain malfunctions are detected. The following chart describes each code and some suggestions for corrective measures.

ERROR	DESCRIPTION	CORRECTIVE 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 PCB.
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	NOVRAM 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 Main PCB

CAL E3	Calibration Error	1. Try to recalibrate 2. Replace Main 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 8-1 8142 Error Code Summary

VOLTAGE MEASUREMENTS

Refer to Mettler Toledo drawing # 900826 for all measurements below. Voltages are taken with a 20,000 OHMS/VOLT VOM or DVM. AC line voltage = 115 VAC.

MEASUREMENT		VOLTAGE	
FROM	TO	RANGE	NOTES:
CR1-AC (RED)	CR1-AC (RED)	9.9 TO 12.0 VAC	
J3-7 (BLU)	J3-9 (BLU/WHT)	18.4 TO 19.3 VAC	
J3-8 (BLU)	J3-9 (BLU/WHT)	18.4 TO 19.3 VAC	
J3-7 (BLU)	J3-8 (BLU)	26.8 TO 38.6 VAC	
C1(+) (ORN)	CT(-) (WHT)	8.0 TO 12.0 VAC	200mV max ripple
TB1-5 (BLU)	TB1-1 (WHT)	12.0 TO 12.8 VAC	Measure with load cell connected

Table 8-2 Voltage Measurements

8.2 voltage measurements

The 8530 is designed to require a minimum of maintenance and service. This section provides a guide toward troubleshooting the 8530 Indicator section.

8530 SELF TEST

The following areas are automatically tested once AC power is applied to the 8530:

a. Automatic Display Verification

Automatic verification of the weight display is performed for every A/D update. Display verification operated by comparing the segments turned “on” to the data that should be displayed. If the correct segment current is not detected, error message “E5” is displayed and the indicator becomes inoperative until corrective action is taken.

b. Data Memory, Program Memory, and NOVRAM Checks

Ram and Eprom memories checked continuously, so that all of the memory is checked at least once for each 10 minutes of system operation. If an error is detected, the appropriate error code is displayed (E1,E2,E3, or E4).

c. Analog Verify

NOTE: This test is selectable in setup via Step #81 and should be disabled for all U.S. applications.

Analog verification is automatically performed approximately every 4 hours by injecting a signal at the Digital Load Cell that generates an output value equal to about 30 to 40% of full load. The resulting weight data is compares to a preset register reading (loading during the Calibration routine). If the test reading is within the allowable tolerance of the preset register reading, the test is successful. If the reading differs by more than the tolerance, the error message “E6” is displayed and the indicator becomes inoperative until a corrective action is taken. This feature is selectable in SETUP mode. The analog verify tolerance is ± 1 for builds less than 2000 total increments and ± 2 displayed increments for builds greater than or equal to 2000 total increments.

d. DLC Verification

Communications between the 8530 and DLC is constantly monitored. If data loss or any other DLC error is detected the appropriate error code is displayed.

8530 VOLTAGE MEASUREMENTS

a. AC Voltage Checks

115 VAC The AC Line Voltage supplied to the 8530 should be within 100 to 130 VAC. AC voltage measures between earth ground and AC common of the AC Power supplied should both exceed 1 VAC. If the voltage is greater than 1 VAC the ground path has enough impedance to develop noise spikes to problem levels and should be corrected.

b. Transformer Secondary AC Voltage Checks

This section checks the transformer output that drives the 8530 Logic PCB. The transformer secondary that is used to make the unregulated DC for the +5VDC Supply is covered in the following section, “DC Voltage Checks”.

CAUTION!!
AC POWER SHOULD NEVER BE APPLIED WITH P8 UNPLUGGED FROM J8 OF THE 8530 LOGIC PCB. IF THIS OCCURS THE CAPACITOR EXTERNAL TO THE MAIN LOGIC PCB WILL BE CHARGED AND WILL NOT DISCHARGE UNTIL PLUGGED INTO THE MAIN LOGIC PCB POSSIBLY DAMAGING THE PCB.

c. J8 Test Points measure the AC Voltage across the two pins of J8. The MIN/MAX numbers below the J8 pin numbers are the acceptable measured AC voltage ranges.

J8	J8	J8	J8
6 to 8	6 to 12	8 to 12	14 to 16
MIN MAX	MIN MAX	MIN MAX	MIN MAX
2.70 3.53	1.35 1.77	1.35 1.77	15.5 20.3

d. DC Voltage Checks

The 8530 Logic PCB is supplied with one unregulated DC supply. This is measured with the plus lead of the DC voltmeter at C1+ and the minus lead at C1(-).

MIN	MAX
18.0 VDC	24.0 VDC (250MV MAX Ripple)

If the unregulated DC voltage check was outside the accepted MIN/MAX range, check the AC driving the rectifier that is mounted on the main chassis as follows:

1. Remove AC Power to the 9215.
2. Remove the two red wired going to the terminals marked “AC” on CR1.
3. Apply AC power and measure the AC voltage across these two wires. AC voltage readings should be:

MIN	MAX
14.0 VDC	18.2 VDC

e. Battery Voltage

The battery voltage is checked by removing the 8530 Logic PCB and measuring from battery holder to logic common. The battery should read 2.4VDC minimum. If the voltage measured is less, the battery should be replaced. So not remove the battery from the PCB, or setup parameters will be lost.

f. Voltage to the DLC's

Single DLC Applications

The DC voltage supplied to DLC comes from the Main Logic PCB of the 8530. To measure this voltage, place the minus letter meter lead on TB1-7 and the plus lead on TB1-9.

MIN	MAX
17.5 VDC	19.0 VDC

AC Ripple should be less than 30mVAC.

g. Multiple DLC Applications

The DLC voltage supplied to multiple DLC scales comes from the Main Logic PCB of the 8530. To measure this voltage, place the minus meter lead on TB1-6 or 7. The plus lead should be placed on TB1-8 or 9. The DC voltage should measure within the following range.

MIN	MAX
15 VDC	30 VDC

h. Pit Power Supply Output

The Pit Power Supply output furnished two DC supplies to the DLC's. The DC supplied are +8VDC and +18VDC> These voltages can be tested at J1, J2, J3, J5, J7 or J8 or the Pit Power Supply Expander.

The +8 VDC Supply is tested by putting the red meter lead on pin 4 & the black meter lead on pin 5. The voltages should be between:

MIN	MAX
17.2 VDC	19.0 VDC

The +18VDC Supply can be tested by putting the red meter lead to pin 3 and the black meter lead to pin 5. The voltages should range from:

MIN	MAX
17.2 VDC	9.0 VDC

8530 PARTS REPLACEMENT

1. Replacing the Battery

Remove AC power from the unit.

Put on the gloves supplied with the Lithium Battery Kit, Part No. 13352600A. The gloves must be worn by the installer to protect the conductive surface on the battery from any foreign substance that will deteriorate the surface. Hand oils will seriously affect the connection reliability between battery and clip.

Carefully slide out the battery to be replaces then slide in the replacement with the "+" side of the battery showing outward. Be careful not to smudge the battery with any foreign material that will deteriorate the battery to PCB connections.

Battery replacement will result in the loss of ID, CN, Tare Values, Time and Date, Setpoints, Accumulators, and Entirety Compensation Factors. These features, if enabled in Setup and required for the application, must be reentered before resuming normal operation.

If Linearity Compensation is enabled [12 1] the scale **MUST** be recalibrated.

2. Replacing the 8530 Logic PCB

NOTE: The part number for the Logic PCB DOES NOT include the EPROM. The EPROM is mounted into an EPROM Carrier that is designated to make the EPROM easy to remove and install. The EPROM and Carrier assembly is a separate part number from the Logic PCB.

The Logic PCB is replaced as follows:

a. Remove AC power.
b. Remove the two Phillips head screws that hold on the display lens.
c. Set the lens aside being careful not to smudge or scratch the lens.
d. Remove the cable assemblies from the Main Logic PCB.
e. Remove the two standoffs and FOUR Phillips screws holding the Main Logic PCB in.
f. Remove the EPROM and Carrier Assembly from the Main Logic PCB being replaced.
g. Install the EPROM and Carrier Assembly into the replacement PCB.
h. Remove the white insulator card (P/N 13227700A) from between the lithium battery "+" holder and the lithium battery on the replacement PCB and insert it into the same position on the Main Logic PCB being replaced.

***NOTE:** If the replacement PCB is not available the EPROM and Carrier Assembly should be stored in a static bag or equivalent.

8530 ERROR CODE SUMMARY

The Error Codes are detailed in the 8530 Calibration Section 3.7.5 and are only summarized here.

ERROR	DESCRIPTION	CORRECTIVE MEASURES
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. Replace Main Logic PCB.
E4	RAM Memory Error	Replace Main Logic PCB.
E5	Display Verify Error	Replace Main Logic PCB. Display PCB in panel mount 9215 could also be defective.
E6	Analog Verify Error	Replace DLC.
E7	DLC Format Error	Recalibrate the DLC
E8 XX	No DLC Data	Press “CLEAR” while error is displayed to recycle DLC power. Replace the DLC.
E9 XX	DLC Out of Range Error	Replace the DLC.
E10 XX	DLC RAM Memory Error	Replace the DLC.
E11 XX	DLC ROM Memory Error	Replace the DLC.
E13 XX	DLC NOVRAM Error	Replace the DLC.
E14 XX	Loss of battery Backed RAM	The battery must be replaced. Press “CLEAR” when AC power is restored.
E16	Math Overflow Error	Press “ENTER” to display the alphanumeric value and record. Press “CLEAR” to reset the scale.
E21	Illegal Scale Capacity	Press “CLEAR” and reenter scale capacity & increment.
E26	Illegal Low Range Increment	Press “CLEAR” and enter the proper increment size.
E27	Illegal Overcapacity Value	Press “CLEAR” and enter a weight value that is within the high range.
E32	Insufficient Calibration Weight	Press “CELAR” 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	Press “CLEAR” to restart the entire calibration procedure.
E37	Calibration Checksum Error	Enter setup and press “CLEAR” and recalibrate. Replace the Main Logic PCB.
EEE	Scale Not Zeroed	Remove weight on scale and press “ZERO”. Enter setup and disable calibration step 24 and 32. Enter Setup and establish a new zero value via calibration step 21.
-EEE	Scale Not Zeroed	Check scale for binding or DLC damage. Remove weight on scale and press “ZERO” Enter setup and disable calibration step 24 and 32. Enter Setup and establish a new zero value via calibration step 21.
Acc FL	Accumulator Error	Enter setup and set step 29 and 36 to 0 to disable accumulators.

Table 8-3 8530 Error Code Summary

8.3 tsm3000 maintenance

The TSM3000 PCB is a microprocessor based single board computer which is the main processor PCB in the 9215 Batchelor. It receives scale weight data as well as external inputs so the information can be intelligently processed and properly sequence the outputs. Information in this section provides instructions and procedures to properly maintain this processor PCB and diagnose possible faults.

ERROR CODES / ALARMS

There are numerous error codes and alarm messages that may appear on the display. The alarms which may be displayed are listed in Section 7.0 and relate to system I/O, communications, and operational faults or failures. See Section 10.7 for application error codes.

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

* = Required Setting

Table 8-4 Jumper Settings and Functions

VOLTAGE MEASUREMENTS

Refer to drawing *900826 (8215 with 8142), or *900849 (9215 with 8530) or *901215 (panel 9215) for measurements below. Voltages are taken with a 20,000 OHMS/Volt VOM or DVM. AC line voltage is 115VAC 60 Hz.

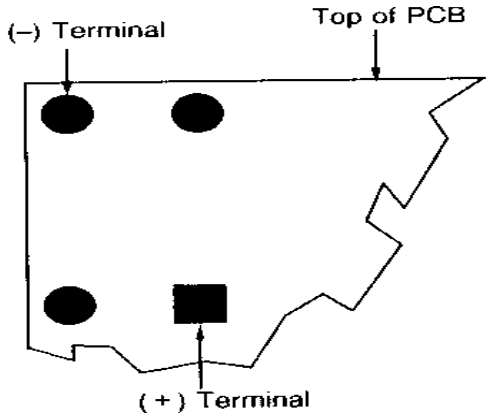
*May have letter prefix **Panel Units only ***Wall Units only

MEASUREMENT		VOLTAGE	
FROM	TO	RANGE	NOTES:
CR2-AC (YEL)	CR2-AC (YEL)	11.0 to 14.0 VAC***	
C2 + (ORN)	C2- (WHT)	11.5 to 14.5 VDC***	200mV MAX RIPPLE
ALARM LITE -X2	CHASSIS	11.5 to 14.5 VDC***	IF 0, CHECK F1
(RED)	CHASSIS	4.0 to 5.0 VDC***	IF 0, CHECK F2
SELECT FS1 (ORN)	POWER CONNECTOR P6-2	11.0 to 15.0 VDC**	IF 0, CHECK P.SUPPLY
POWER			
CONNECTOR P6-1			

Table 8-5 Voltage Measurements

BATTERY VOLTAGE

The battery is permanently affixed to the PCB and not replaceable. In normal service it is trickle charges from the +5VDC logic supply on the PCB. There are no defined test points on the PCB, so checking this voltage involves placing the meter probed on the PCB pads (see diagram below). Viewed from the back, locate the battery pads in the upper left corner of the PCB. Measure from the square pad to the diagonally opposite pad above it.



Upper left corner of PCB viewed from rear.
VOLTAGE = 2.7VDC ±0.2VDC with a fully charged battery & the circuit power applied.

Replace the entire PCB if the battery voltage is below 2.4VDC after the PCB has been removed from the system for at least an hour.

CIRCUIT BOARD LAYOUT AND JUMPER IDENTIFICATION

If the TSM3000 PCB needs replacement, it is very important to inspect the jumper positions and verify the proper positions. If the jumper positions on the replaced board differ from the settings on the replaced board, verify the correct positions before installing the new board. See also section 3.4 for SOFTSWITCHES1 configurations.

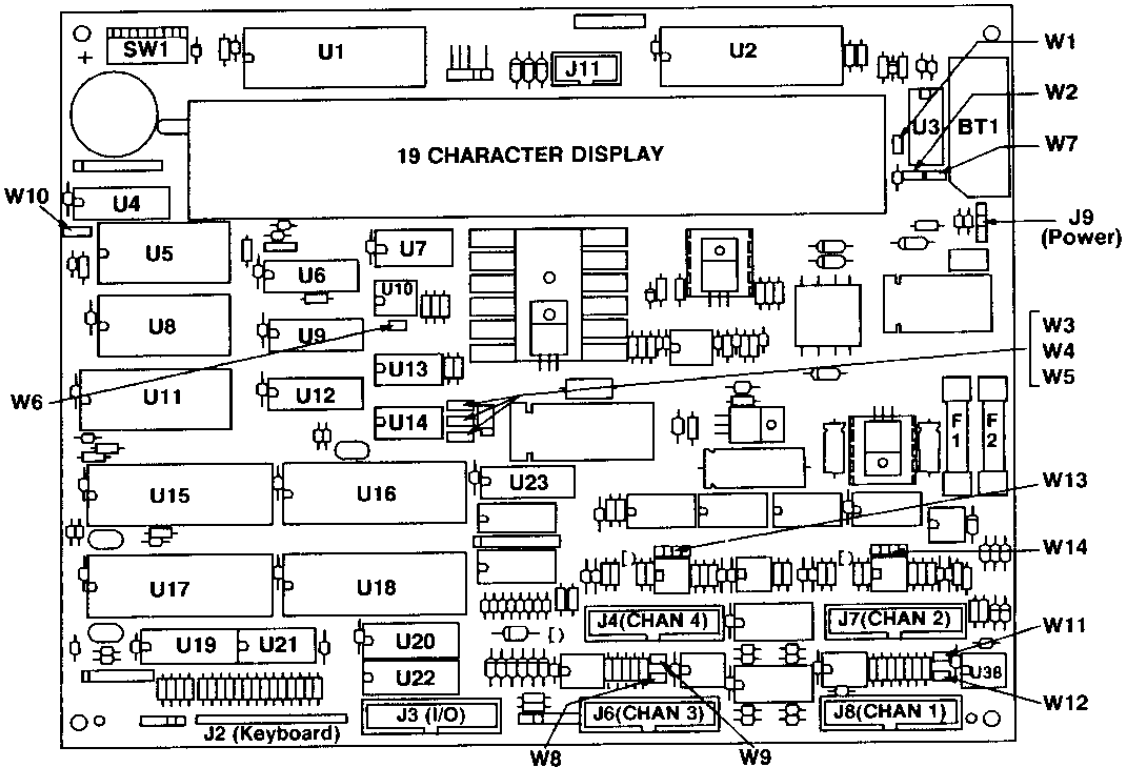


Figure 8.1 TSM3000 PCB Identifications
(C90084100A Shown)

8.4 smartlink maintenance

The SmartLink PCB operated independently from the rest of the system. While the indicator and TSM3000 PCB are driven from the instrument power source, the SmartLink PCB derives it's power from the L1, L2 control power source through the transformer on the I/O panel. The 12VAC from the transformer is rectified and filtered on the board to produce 5VDC required by the internal logic.

During normal operation, D10 LED (90072600A) or 12 LED (90112200A) illuminates when 5 VDC is present if a good fuse is in the spare fuse socket. (The LED also serves as a fuse tester).

VOLTAGE REQUIREMENTS

Refer to drawing *900825 (I/O panel) or *900933 (Remote I/O box). Voltages are taken with a 20,000 ohm/volt VOM or DVM. AC line voltage is 115VAC 60Hz.

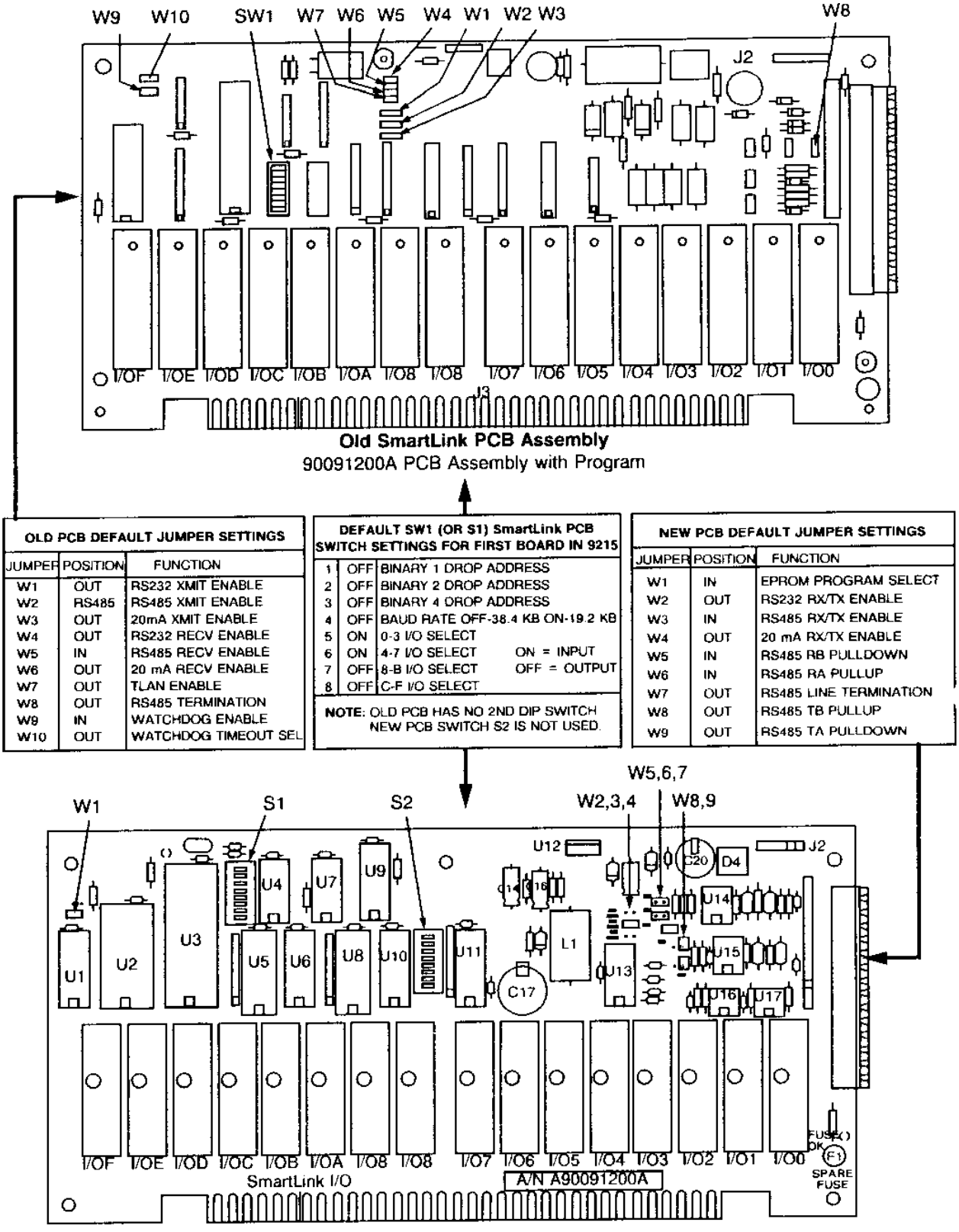
*May have letter prefix.

MEASUREMENT		VOLTAGE	
FROM	TO	RANGE	NOTES:
TB1-1 J2-6	TB1-2 J2-2	11-13 VAC 4.8-5.2 VDC	(-) PROBE ON J2-2

Table 8-6 SmartLink Voltage Measurement

CIRCUIT BOARD LAYOUT AND JUMPER IDENTIFICATION

When this board is replaced, it is very important to verify the correct jumper positions of all jumpers. Use the following diagram to aid jumper identification.



OLD PCB DEFAULT JUMPER SETTINGS

JUMPER	POSITION	FUNCTION
W1	OUT	RS232 XMIT ENABLE
W2	RS485	RS485 XMIT ENABLE
W3	OUT	20mA XMIT ENABLE
W4	OUT	RS232 RECV ENABLE
W5	IN	RS485 RECV ENABLE
W6	OUT	20 mA RECV ENABLE
W7	OUT	TLAN ENABLE
W8	OUT	RS485 TERMINATION
W9	IN	WATCHDOG ENABLE
W10	OUT	WATCHDOG TIMEOUT SEL

DEFAULT SW1 (OR S1) SmartLink PCB SWITCH SETTINGS FOR FIRST BOARD IN 9215

1	OFF	BINARY 1 DROP ADDRESS	
2	OFF	BINARY 2 DROP ADDRESS	
3	OFF	BINARY 4 DROP ADDRESS	
4	OFF	BAUD RATE OFF-38.4 KB ON-19.2 KB	
5	ON	0-3 I/O SELECT	
6	ON	4-7 I/O SELECT	ON = INPUT
7	OFF	8-B I/O SELECT	OFF = OUTPUT
8	OFF	C-F I/O SELECT	

NOTE: OLD PCB HAS NO 2ND DIP SWITCH
NEW PCB SWITCH S2 IS NOT USED.

NEW PCB DEFAULT JUMPER SETTINGS

JUMPER	POSITION	FUNCTION
W1	IN	EPROM PROGRAM SELECT
W2	OUT	RS232 RX/TX ENABLE
W3	IN	RS485 RX/TX ENABLE
W4	OUT	20 mA RX/TX ENABLE
W5	IN	RS485 RB PULLDOWN
W6	IN	RS485 RA PULLUP
W7	OUT	RS485 LINE TERMINATION
W8	OUT	RS485 TB PULLUP
W9	OUT	RS485 TA PULLDOWN

Figure 8.2 SmartLink PCB Assembly

8.5 spare parts

The comparison of spare parts kept on hand are dependent upon the critical nature of the installation and the down time that may be tolerated while a repair is being made. Mettler Toledo recommends that at least the following items be kept on hand. They are all available through an authorized Mettler Toledo representative. Refer to the drawings in Section 8.6 for identification of items not listed here.

QTY	9215 COMMON PARTS DESCRIPTION	USED WITH		PART NUMBER
		WALL	PANEL	
1	KEYBOARD INSERT 9215	X	X	(#)90081100 A
1	PUSHBUTTON OPERATOR,MAN. FEED-DISCH	X		(#)90086400A
1	PUSH-PULL OPERATOR, EMERGENCY STOP	X		(#)90086700A
1	SELECTOR SWITCH OPERATOR	X		(#)90086300A
1	CONTACT BLOCK, NORM. OPEN	X		(#)90086100A
1	CONTACT BLOCK, NORM. CLOSED	X		(#) 90086200A
1	PCB, 9215 MAIN WITH PROGRAM	X	X	(#) 90191900A
1	PCB, WATCHDOG I/F	X	X	(#) 90083000A
1	PCB, SmartLink WITH PROGRAM	X	X	(#) 90091200A
1	KEYBOARD ASSY, 9215	X	X	(#) 90080900A
1	SWITCH, ROTARY OPTICAL ENCODER	X		(#) 90081800A
1	RECTIFIER, BRIDGE	X	X	(#) 09394300A
5	FUSE, OPTO MODULE - 4 AMP	X	X	(#) 13637500A
1	PILOT LAMP, ALARM - 12V	X		(#) 90082300A
1	CONNECTOR, 36 PIN - SmartLink	X	X	(#) 90081400A
5	FUSE, 6 AMP SLO-BLO	X		(#) 12468100A
1	RELAY, 115VAC - 10 AMP CONTACT	X	X	KT665008DAF*
1	SOCKET, RELAY	X	X	KT665008XAJ*
5	FUSE, .25 AMP SLO-BLO	X	X	(#) 09592000A

* Used in Remote I/O enclosure only.

QTY	ADDED PARTS FOR 9215 (WALL) 8142 VERSION DESCRIPTION	PART NUMBER
1	PCB, 8142 MAIN (“C” revision or later)	C12889400A
1	KEYBOARD ASSEMBLY WITH OVERLAY, 8142	(#) 12582400A

QTY	ADDED PARTS FOR 9215 (WALL) 8530 VERSION DESCRIPTION	PART NUMBER
1	***PCB, 8142 MAIN (without eprom)	13460400A
1	KEYBOARD ASSEMBLY WITH OVERLAY, 8530	(#) 13012000A

** THIS PCB MYST HAVE H12883100A EPROM CARRIER ASSEMBLY OR LATER TO PROPERLY FUNCTION WITH THE 9215.

(#) INDICATED MAY HAVE REVISION LEVEL PREFIX LETTER.

QTY	ADDED PARTS FOR 9215 (WALL) 115 VAC INSTRUMENT/CONTROL DESCRIPTION	PART NUMBER
5	FUSE, .6 AMP SLO-BLO	(#) 09510000A
1	FAN ASSEMBLY, 115 VAC (OPTIONAL)	*(#) 90216400A
1	OPTO MODULE, 115 VAC INPUT	(#) 13636300A
1	OPTO MODULE, 24-280 VAC OUTPUT	(#) 13636700A

QTY	ADDED PARTS FOR 9215 (WALL) 230 VAC INSTRUMENT/CONTROL DESCRIPTION	PART NUMBER
5	FUSE, .3 AMP SLO-BLO	(#) 11707800A
1	FAN ASSEMBLY, 230 VAC (OPTIONAL)	*(#) 90216500A
1	OPTO MODULE, 230 VAC INPUT	(#) 13636400A
1	OPTO MODULE, 24-280 VAC OUTPUT	(#) 13636700A

QTY	ADDED PARTS FOR 9215 (WALL) 230 VAC INSTRUMENT/ 24VDC CONTROL DESCRIPTION	PART NUMBER
5	FUSE, .3 AMP SLO-BLO	(#) 11707800A
1	FAN ASSEMBLY, 230 VAC (OPTIONAL)	*(#) 90216500A
1	OPTO MODULE, 10-32 VAC INPUT	(#) 13636500A
1	OPTO MODULE, 5-60 VAC OUTPUT	(#) 13636800A

QTY	ADDED PARTS FOR 9215 (PANEL) 115 VAC CONTROL DESCRIPTION	PART NUMBER
1	OPTO MODULE, 115 VAC INPUT	(#) 13636300A
1	OPTO MODULE, 24-280 VAC OUTPUT	(#) 13636700A
1	POWER SUPPLY, 115 VAC - 12VDC	(#) 13216000A

QTY	ADDED PARTS FOR 9215 (PANEL) 230 VAC CONTROL/24 VDC I/O DESCRIPTION	PART NUMBER
1	OPTO MODULE, 230 VAC INPUT	(#) 13636400 A
1	OPTO MODULE, 24-280 VAC OUTPUT	(#) 13636700A
1	OPTO MODULE, 5-60 VDC OUTPUT	(#) 13636800A
1	OPTO MODULE, 10-32 VDC INPUT	(#) 13636500A
1	POWER SUPPLY, 230 VAC - 12VDC	(#) 13379500A

* BEFORE 7-1-94 FAN ASSEMBLIES ARE INCLUDED IN MAIN ENLCOSURE (NOT OPTIONAL) AND ARE AS FOLLOWS:

90089600A FOR 115 VAC FAN
90089600B FOR 230 VAC FAN

(#) INDICATES MAY HAVE A REVISION LEVER PREFIX LETTER.

8.6 DRAWINGS

The following list includes major drawings for the 8142 and 8530 version of the wall mount 9215 Batchelor. All drawings listed are included in the print pocket at the end of this manual.

*NEW	OLD	
901300	901300	External Wiring Diagram
900825	900825	Schematic, 8215 I/O Panel
901866	900849	Schematic, 9215 Door Logic with 8530
901907	900826	Schematic, 9215 Door Logic with 8142
90189100A	90081000A	Major Assy, 9215 with 8142
90197100A	90085400A	Major Assy, 9215 with 8530
90189200A	90083100A	9215 I/O Panel Assembly

The following list includes major drawings for the panel mount 9215 Batchelor. All drawings listed are included in the print pocket at the end of this manual.

901228	External Wiring Diagram
901215	Schematic - Panel 9215 and Manual Panel
90122500A	Major Assembly - 9215 Panel
90122600A	Major Assembly - Manual Panel

The following list includes major drawings for the single I/O board remote enclosure.

900933	Schematic, I/O box
90093300A	Major Assembly - Single I/O Board Panel

* “NEW” REFER TO WALL 9215 UNITS BUILT AFTER APPROXIMATELY 7-1-94.
DRAWINGS SHOWN ARE INLUDED IN THE READ POCKET OF THIS MANUAL.

“OLD” REFERS TO WALL UNITS BUILT PRIOR TO 7-1-94.
DRAWINGS SHOWN ARE FOR REFERNCE ONLY AND ARE NOT INCLUDED IN THE REAR POCKET OF THIS MANUAL.