



IM 6000 Series In-Motion Scale System with FB3000

Model: IM 6000



Amendment Record

IM 6000 In-Motion Scale System

50792

Manufactured by Fairbanks Scales Inc.
821 Locust
Kansas City, Missouri 64106

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Disclaimer

Every effort has been made to provide complete and accurate information in this manual. However, although this manual may include a specifically identified warranty notice for the product, Fairbanks Scales makes no representations or warranties with respect to the contents of this manual, and reserves the right to make changes to this manual without notice when and as improvements are made.

Table of Contents

Section 1: General Specifications	
A. Introduction	4
B. Specifications	4
Section #1: General Information	
A. General Policy	6
B. Overview	6
C. Instrument Location	6
D. Safety	6
E. Grounding	7
Section 3: Programming	
A. Menu Navigation	8
B. General Programming Instructions	9
C. Options Menu	10
D. Configuration Menu	12
E. Service Menu	15
F. Special Functions Menu	17
System Backup	18
System Restore	19
Section 4: Operation	
A. Basic Operations Summary	21
Section 5: Service and Maintenance	
A. Errors	22
Section 6: Parts List	23
<i>APPENDIX I: Communications</i>	25

Section 1: General Specifications

A. Introduction

The Fairbanks IM 6000 is a high speed In-Motion weighing system and is the next generation of In-Motion weighing systems for Fairbanks Scales. The IM 6000 uses Fairbanks FB3000 instrument featuring a PC/104 internal structure which can process boxes at speeds of up to 360 ft/min depending upon conveyor and scale conveyor configurations.

B. Specifications

1. Instrument Specifications

CPU	VIA Ezra/Eden (ECBA package) 1 GHz processor
BIOS	Award® 256K Flash BIOS
Chipset	VIA VT8606 + VT82C686B
I/O Chipset	Built-in VT82C686B + Winbond 83977EF
Memory	One (1) 144-pin SDIMM socket support up to 512 MB SDRAM
Enhanced IDE	Support up to two (2) IDE devices (Ultra DMA 33/66/100)
FDD Interface	Supports up to two (2) floppy disk drives (34-pin header)
Parallel Port	One (1) Bi-directional parallel port. Supports SPP/ ECP/ EPP
Serial Port	Three (3) RS232 and one (1) RS232/ 422/ 485 serial ports
KB/ Mouse Connector	Supports PC/AT keyboard PS/2 mouse
Power Management	APM 1.1 Compliant
PC/104 Connector	One (1) PC/104 Connector
Digital I/O	Eight (8) digital inputs and outputs
Watchdog Timer	Can generate a system reset. Supports software selectable time-out interval.
Battery	Lithium battery for data retention up to ten (10) years under normal operating conditions.
Software Driver	Microsoft® XP Home
Ethernet Interface	PCI 100/10 Mbps Ethernet Controller

Chipset	Dual Intel® 82559ER
SDD Interface	One (1) 50-pin Compact Flash™ socket
Hard Drive	40 GB Industrial Hard drive backed by Compact Flash™.

2. Flat Panel/ CRT Interface

Resolution	Flat panel display support up to 1024 x 768 @ 18bpp TFT panel and CRT monitors to 1024 x 768 16bpp or 120 x 1024 @ 8bpp.
Interface	4x AGP VGA/LCD interface, support for 9,12,15,18,24,36 bit TFT and optional 15 or 24 bit DSTN panels.
Display Memory	Shares system memory 8/ 16 / 32MB.
Chipset	VIA Twister chip with integrated Savage 4 2D/ 3D/ Video Accelerator

3. Scale Specifications

Number of scales	Up to four (4) scales simultaneously.
Load cells	Up to forty (40) load cells maximum.
Display	10.4" SVGA Color LCD-TFT with Touch Screen.
Display Resolution	640 x 480
Remote Configuration	Integrated Web Browser allows for configuration from a remote location.
Display Rate	0.1 to 10 seconds in 0.1 intervals
Zero	Disabled, 2% or 100%

4. Environmental

Power Supply	+5 (4.75V to 5.25V), +12(11.4V to 12.6V)
Max Power Requirements	4A @ 5V, 200mA/ +12V (No Scale Attached)
Operating Temperature	-10 to 104 F (0 to 40 C) Fanless

Section 2: General Information

A. General Policy

It is the customer / operator's responsibility to ensure the equipment provided by Fairbanks is operated within the parameters of the equipment's specifications and protected from accidental or malicious damage. Other than the procedures authorized in the Operating manual, no service, repair, or adjustments may be performed by unauthorized / untrained service personnel. Any unauthorized repairs will void any verbal, implied, or written warranties.

B. Overview

1. These instructions apply to the instrument and its specific installation procedures. The procedures for instruments, printers and other peripherals are given in manuals specifically provided for those units.
2. Absolutely no physical, electrical or program modifications are to be made to this equipment. Electrical connections other than those specified may not be performed, and physical alterations (holes, etc.) are not allowed.

Note :

The equipment consists of printed circuit assemblies which must be handled using ESD handling procedures, and must be replaced as units. Replacement of individual components are not allowed. The assemblies must be properly packaged in ESD protective material and returned intact for replacement credit per normal procedures.

C. Instrument Location

1. The Instrument should be positioned away from direct sunlight.

D. Safety

As is the case with any material handling equipment, certain safety precautions should be observed during operation:

1. Never load the platform beyond its rated capacity. Refer to the rating on the serial number plate of the platform.
2. Ensure that any structure which supports the platform is capable of withstanding the weight of the platform plus its rated capacity load.
3. Do not load the platform if there is any evidence of damage to the platform or supporting structure.

- 4.** Use safety chains or other suitable restraining devices if there is any possibility of the load shifting, falling, or rolling from its position on the platform.

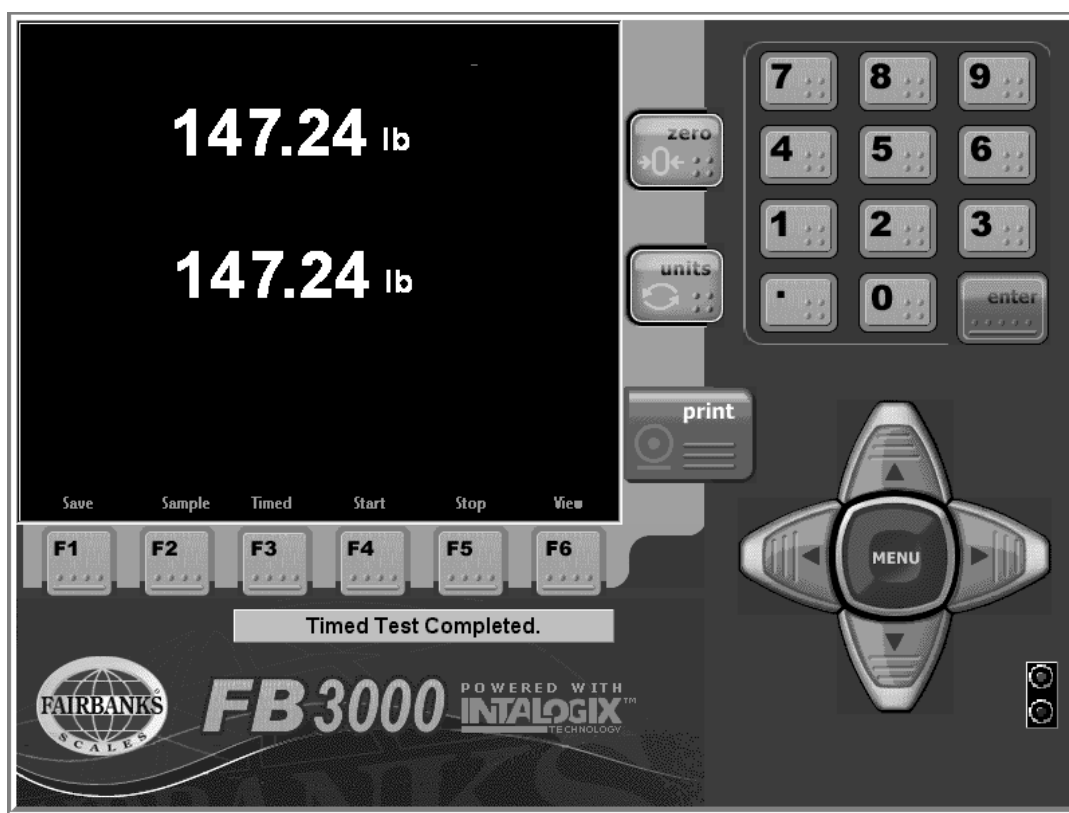
E. Grounding

For proper protection against damage, all of the components of the system must be properly grounded. The grounding system contains one (1) ground rod for the scale location. The following steps must be performed to correctly ground the system:

- a.** It is recommended to use 8 AWG or larger wire or braided ground straps.
- b.** All of the ground connections should be 2 feet or less.

Section 3: Programming

A. Menu Navigation



- Arrows** These keys move the cursor in the display in the direction indicated. They are also used for scrolling.
- Menu** This key changes the display to the Operation Menu. This key can also be used to return the display to the last menu screen that was shown.
- Zero** This key zeroes the scale.
- Print** When pressed, a Gross Weight ticket will be printed with a manually entered Tare and the Net will be calculated.
- Units** Changes the units of weight displayed, depending on the selection made in the Calibration Menu.
- 0 to 9** Used to enter numeric data, such as tares and IDs.

Enter	Used to store selections into memory during programming. The scale can be setup to operate in one of two modes: GROSS, TARE, NET weighing and IN/OUT weighing.
Lamps	
Green	The On scanner has detected a box being on the scale.
Red	The Off scanner has detected a box exiting the scale.
f1	Save As - Saves data file to your designated file name and location.
f2	Sample or Trace - Samples weight on the platform or traces box from on to off scanners.
f3	Timed Dependency Test - Performs a one (1) hour test of weights captured.
f4	Start - Time Dependency Test Start which can vary by entering duration time.
f5	Stop - Time Dependency Test End which will manually stop any test.
f6	View - Allows viewing of records of a test which was performed. Pressing the F6 a second time allows viewing of A/D counts from the PC104 card.

B. General Programming Instructions

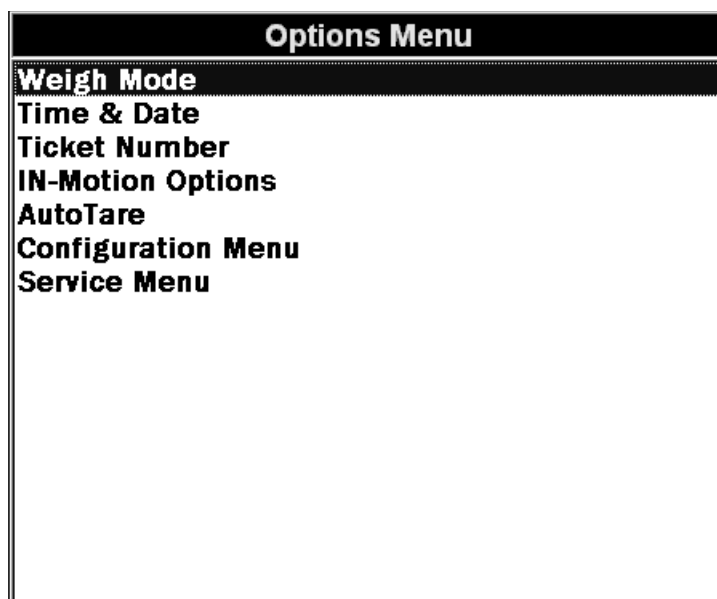
The programming menus that contain all of the parameters for the system are listed below.

1. **Options Menu** - Accessible without a password by pressing the MENU key. This menu is used for general weighing operations and accessing further programming menus.
2. **Configuration Menu** - This menu is used to enter the parameters for the Keyboard Tare, AutoTare, Select Scale, Format Ticket, and view the Load Cell Diagnostics. These adjustments are made *by authorized personnel only and is password protected*.
3. **Service Menu** - This menu is used to program the technical parameters of the system, such as scale capacity, span, and load cell data. These adjustments are made *by authorized personnel only and is password protected*.

4. The following instructions apply to all of the menus.

- a. In all menus, the UP or DOWN arrows move the cursor in the indicated direction.
- b. To make an entry, place the cursor beside the item to be selected and press the ENTER key. The operator will be prompted for the data to be entered.
- c. A Enter Password prompt means the menu item is locked and can only be accessed with a password.
- d. Data may be entered through the keypad.
- e. When the appropriate data has been entered, press the ENTER key to record the data into memory.
- f. Data may also be selected by pressing the right arrow key to toggle to the appropriate value.

C. Options Menu Programming



Weigh Mode Returns the display to the normal weight processing display.

Time & Date Highlight the desired date item, month, day or year, scroll or enter the desired value. The date may also be selected by scrolling to the desired month and year and select the day upon the calendar.

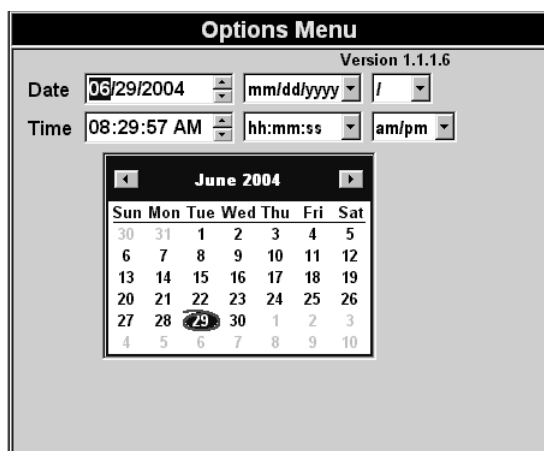
Select the desired date format from the drop down box list. Highlight the desired format and enter.

Select the desired date separator.

Highlight the desired time item, hour, minutes, or seconds, scroll or enter the desired value.

Select the desired date format from the drop down box list. Highlight the desired format and enter.

The revision number at the top right of the screen is the program version number



Ticket Number Enter the ticket number required via the indicator's numeric keypad or through a external keyboard accessory.

Options Menu

Enter
Ticket Number

4

IN-Motion Options These values adjust the performance of the systems operation. Once these are configured at installation, the values should not require any further changes. These adjustments should be made by *authorized factory trained personnel only*.

IN-MOTION OPTIONS

Enable Weight

0.2

Idle Counter

16

Spacing Adjustment

0

readings

Include a range of

10

readings

Performance Factor

1.000

Box Tolerance

0.0

%

☐ Use Peak Weight Only

A0

On Scanner 1

☒ Trim Peak

A1

On Scanner 2

☒ Trim Min

A2

Off Scanner

☐ Invert Sensors

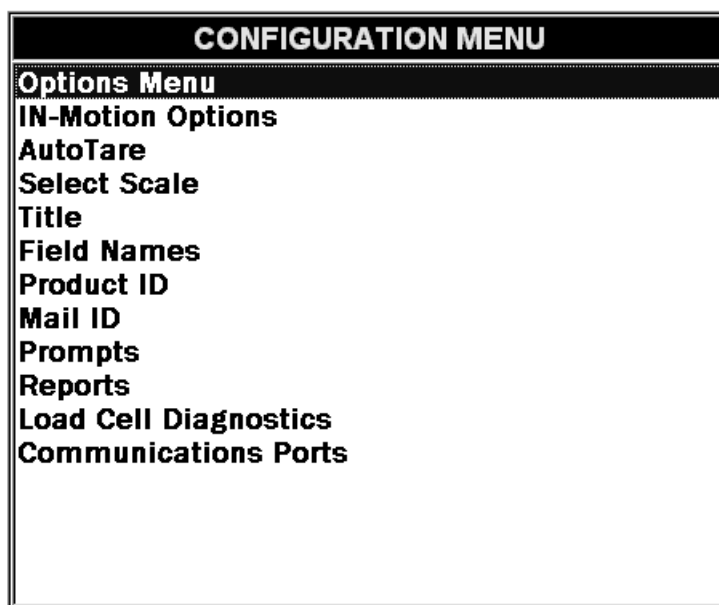
Enable Weight This value is the weight threshhold which begins the weighing process. This setting will enhance stability if the Gross weight is less than *Enable Weight*, the display will indicate 0.00 weight . Also if the Gross weight is less than the *Enable Weight* for a count equal to the *Idle Counter* setting, an Auto Zero is performed.

Idle Counter This value is dependant on the speed of the A/D and is used for Auto Zeroing.

Spacing Adjustment This value is used to shift the start and stop points for weights to be included in box weight calculations. A buffer of box weights (most recent at the top of the list) is kept for each box from the time it triggers the *On Scanner* to the time it triggers the *Off Scanner*. If there are two boxes on the scale at the same time a two box error is transmitted. The weights in the final calculation are offset to exclude two box weighments. The offset value cannot be greater than the spacing adjustment setting.

Range	The number of weights to include in the calculation before trimming.
Performance Factor	Default = 1.0000. If this value is not 1.0000, the final box weight calculation = box weight + (box weight * Performance Factor) . If the <i>Performance Factor</i> is greater than 1.0000, the final box weights are increased, if less than 1.0000, the final box weights are decreased.
Box Tolerance	If this value is other than the default value of 0.00, any weights read for the box on the scale that are outside the initial average box weight calculation for this box are discarded when the final box weight is derived.
Use Peak Weight Only	After <i>Trim Min/Peak</i> trimming has occurred, the <i>Peak Weight</i> of the remaining box weights are used as the final box weight calculation.
Trim Peak	The greatest box weight(s) gathered from <i>On to Off Scanner</i> is discarded.
Trim Min	The lightest box weight(s) gathered from <i>On to Off Scanner</i> is discarded.
On Scanner 1	Port setting on the Digital I/O card for the on sensor. Default setting: A0
On Scanner 2	Not Used. Port setting for a second on sensor. Default setting: [BLANK].
Off Scanner	Port setting on the Digital I/O card for the off sensor. Default setting: A2
Invert Sensors	This setting is for the various types of photoelectric sensors. Some sensors are NPN and others are PNP. NPN sensors = unchecked box. PNP = checked box.
<i>AutoTare</i>	This feature will store the tare of the item on the scale when selected. this feature is disabled for use with the in motion process. <i>This setting will effect scale performance. For authorized personnel only.</i>
<i>Configuration Menu</i>	This menu accesses general configuration functions of the indicator. <i>This setting will effect scale performance. For authorized personnel only.</i>
<i>Service Menu</i>	This menu accesses calibration and other metrological functions of the indicator. <i>This setting will effect scale performance. For authorized personnel only.</i>

D. Configuration Menu Programming



IN-Motion Options

See Options Menu for parameter descriptions and programming.

AutoTare

This feature will store the tare of the item on the scale when selected. *This setting will effect scale performance. For authorized personnel only.*

Select Scale

This feature will list the number of the scale the indicator is controlling.

Title

Not Available with the In Motion System configuration

Field Names

Not Available with the In Motion System configuration

Product ID

Not Available with the In Motion System configuration

Mail ID

Not Available with the In Motion System configuration

Prompts

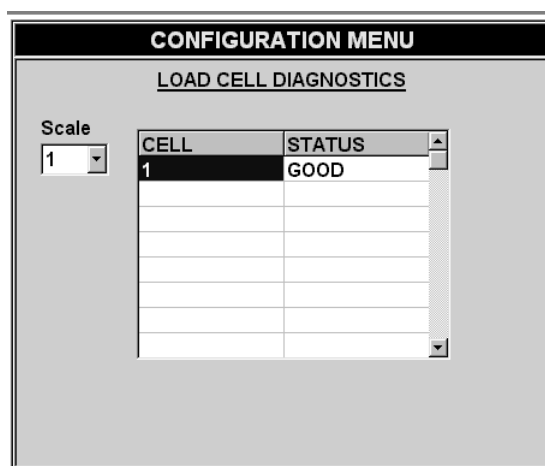
Not Available with the In Motion System configuration

Reports

Not Available with the In Motion System configuration

Load Cell Diagnostics

This is a diagnostic status display as to the functionality and programming of the load cell.



Communications Ports

The settings for the ports are fixed settings and are not accessible. The data output string for RS232 / RS422 is shown below:

Baud: 19200 Data Bits: 8 Parity: None Stop Bits: 1

<STX>[Sequence Number]<D>[Track Number][Error][Box Weight][CRC]<CR><LF*>

STX = 0x02

Sequence Number = one (1) character; 1-9 auto incrementing

D = 0x44

Track Number = six (6) characters (6); 1- 999999 auto incrementing

Error = one (1) character. See Error Codes.

Box Weight = four (4) characters. 4 digit box weight. No decimal point.

CRC = four (4) characters. CRC check digit.

CR = 0x0D

LF* = 0x0A; Only added to data string if the file "Include.LF" exists in the c:\NewScale directory.

Error Codes

Bit 0 = 1 = too few box weighments.

Bit 1 = 1 = more than two (2) boxes on the scale.

Bit 2 = 1 = two (2) boxes on the scale.

Bit 3 = 1 = error calculating box weight.

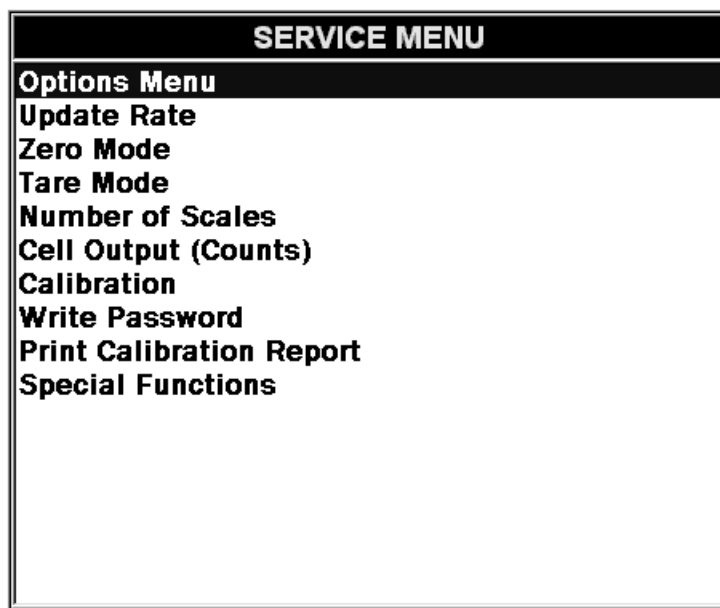
Bit 4 = 0 = always zero (spare bit)

Bit 5 = 0 = always zero (spare bit)

Bit 6 = 0 = always zero (spare bit)

Bit 7 = 1 = always one.

E. Service Menu Programming



Update Rate *This setting will effect scale performance. For authorized personnel only.*

Zero Mode *This setting will effect scale performance. For authorized personnel only.*

Tare Mode *This setting will effect scale performance. For authorized personnel only.*

Number of Scales *This setting will effect scale performance. For authorized personnel only.*

Cell Output (Counts) When this item is selected, the display will show "Calibration" zero counts and "Current" zero counts. This display is for diagnostic information only. Values cannot be changed from this display. The chart will list all of the cells by number. Cells which the internal diagnostics deem suspect or defective will be highlighted.

A screenshot of a device's service menu, specifically the "CELL OUTPUT (COUNTS)" screen. The screen has a black header bar with "SERVICE MENU" in white. Below it, a white box with a black border contains the text "CELL OUTPUT (COUNTS)". On the left side of the box, there is a "Scale" label and a dropdown menu showing "1". To the right of the dropdown is a table with three columns: "CELL", "CALIBRATION", and "CURRENT". The table has 10 rows. The first row is highlighted in black and contains the values "1", "300756", and "0". The remaining rows are empty. On the right side of the table, there is a vertical scrollbar.

CELL	CALIBRATION	CURRENT
1	300756	0

Calibration *This setting will effect scale performance. For authorized personnel only.*

Write Password This selection allows entry of a password which can be up to twelve (12) characters in length. The Write Password function secures the Configuration, Calibration and Special Functions programming areas. Upon entry of the correct value access is allowed to all of the secured menu areas. The security is reset upon exiting to the weight processing screen *This setting will allow changes to the password. For authorized personnel only.*

SERVICE MENU

WRITE PASSWORD

[Text Input Field]

Print Calibration Report

This selection will allow viewing or printing of the calibration and configuration parameters of the indicator. It is recommended a printed copy of this report be kept by the customer and a second copy retained by the Service Center.

CALIBRATION and CONFIGURATION RECORD						
CELL	SPAN ZERO	CELL ZERO	CELL OUTPUT	CELL WEIGHT	SPAN FACTOR	SENSE
1	300756	300799	0	0.00	0.00058	4
CALIBRATION						
SCALE	TIME	DATE	COUNT			
1	10:24:30 am	04/07/2004	01638			
CONFIGURATION						
SCALE	TIME	DATE	COUNT			
1	08:42:20 am	03/31/2004	09042			

Special Functions

This selections allows for special features and functions to be enabled or performed. See the Special Functions Menu Programming section for more details. *This setting will effect scale performance. For authorized personnel only.*

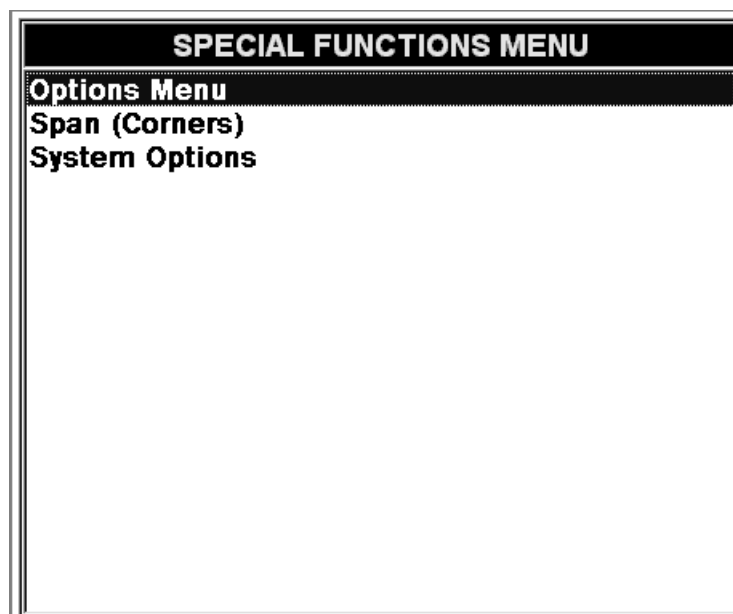
SPECIAL FUNCTIONS MENU

Options Menu

Span (Corners)

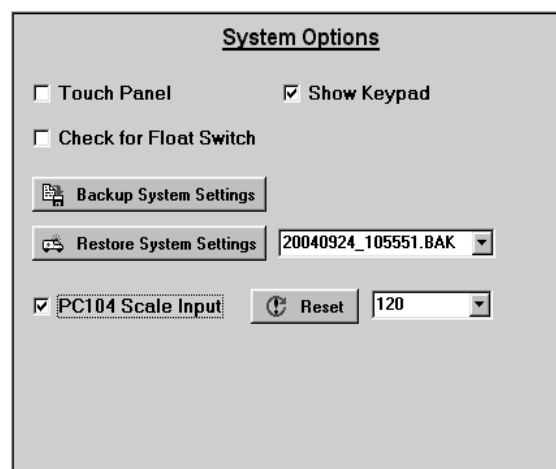
System Options

F. Special Functions Menu Programming



Span (Corners) This setting will effect calibration. For authorized personnel only

System Options This selection allows the keyboard display to be viewed or hidden. The selection for Touch Panel (screen) enable or disable is made in this screen. A check box for the enabling of float switch detection is also available for heavy capacity scales. The Backup and Restore utilities are located in this menu also. This utility will perform back ups and will also restore transactions and the configuration of the system.

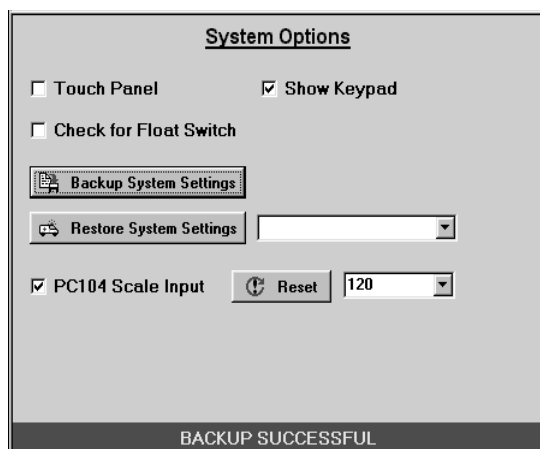


1. System Backup Procedure

1. Press MENU key and select the Service Menu choice.
2. Select the Special Functions Menu item.
3. Choose System Options.
4. Press the Backup System Settings button. The system will automatically name the backup file by date and time performed (yyyymmdd_hhmm.bak).

example: 20041129_1730.bak (November 29, 2004@5:30pm)

The screen will display the backup status.



5. Upon a successful backup, press the MENU key repeatedly until the display is in the weightment processing screen.
6. The scale is ready to process weights.

2. System Restore Procedure

1. Press MENU key and select the Service Menu choice.
2. Select the Special Functions Menu item.
3. Choose System Options.
4. Press the down arrow in the data box beside the Restore System Settings button. Select the backup file required. The box will list the backups by date and time performed (yyyymmdd_hhmm.bak).
example: 20041129_1730.bak (November 29, 2004@5:30pm)

SPECIAL FUNCTIONS MENU

System Options

☐ Touch Panel ☒ Show Keypad

☐ Check for Float Switch

Backup System Settings

Restore System Settings 20041206_160700.BAK ▼
20041206_160700.BAK

☒ PC104 Scale Input Reset 120 ▼

5. Upon selection of the backup file, press the Restore System Settings button to restore the settings.

SPECIAL FUNCTIONS MENU

System Options

☐ Touch Panel ☒ Show Keypad

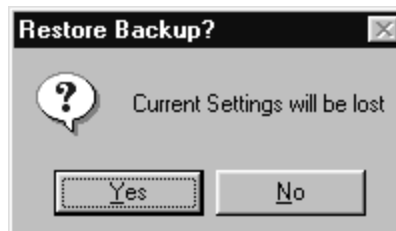
☐ Check for Float Switch

Backup System Settings

Restore System Settings 20041206_160700.BAK ▼

☒ PC104 Scale Input Reset 120 ▼

6. Press the Yes button to confirm the restore process. **Warning ! This will change the system settings to the values in the backup file selected.**



7. The Backup files will be restored in to the scale system. The instrument will re-initialize and return to the weigh processing screen.

8. The restore process is now complete.

9. The scale calibration should be verified before processing weights. Upon verification, the system will be ready to process weights

Section 4: Operation

A. *Basic Operations Summary*

There are two options available, In-Motion Gross Weighing and Static Gross-Tare-Net Weighing.

1. In-Motion Gross Weighing

- a. Press the ZERO key to zero the scale.
- b. Place the object to be weighed on the approach conveyor. The object will be moved by the conveyor onto the scale and where it will pass the On Scanner. The In-Motion system will begin the weighing process and derive a weight based upon the In-Motion configuration parameter settings. The final processed weight will be displayed upon the object passing the Off Scanner. The final weight will be stored in the transaction record file and a record will be sent to a monitoring computer.

2. Static Gross Weighing

- a. Press the ZERO key to zero the scale.
- b. Place the container on the platform.
- c. Manually record the weight.
- d. Remove the container from the platform.

Section 5: Service and Maintenance

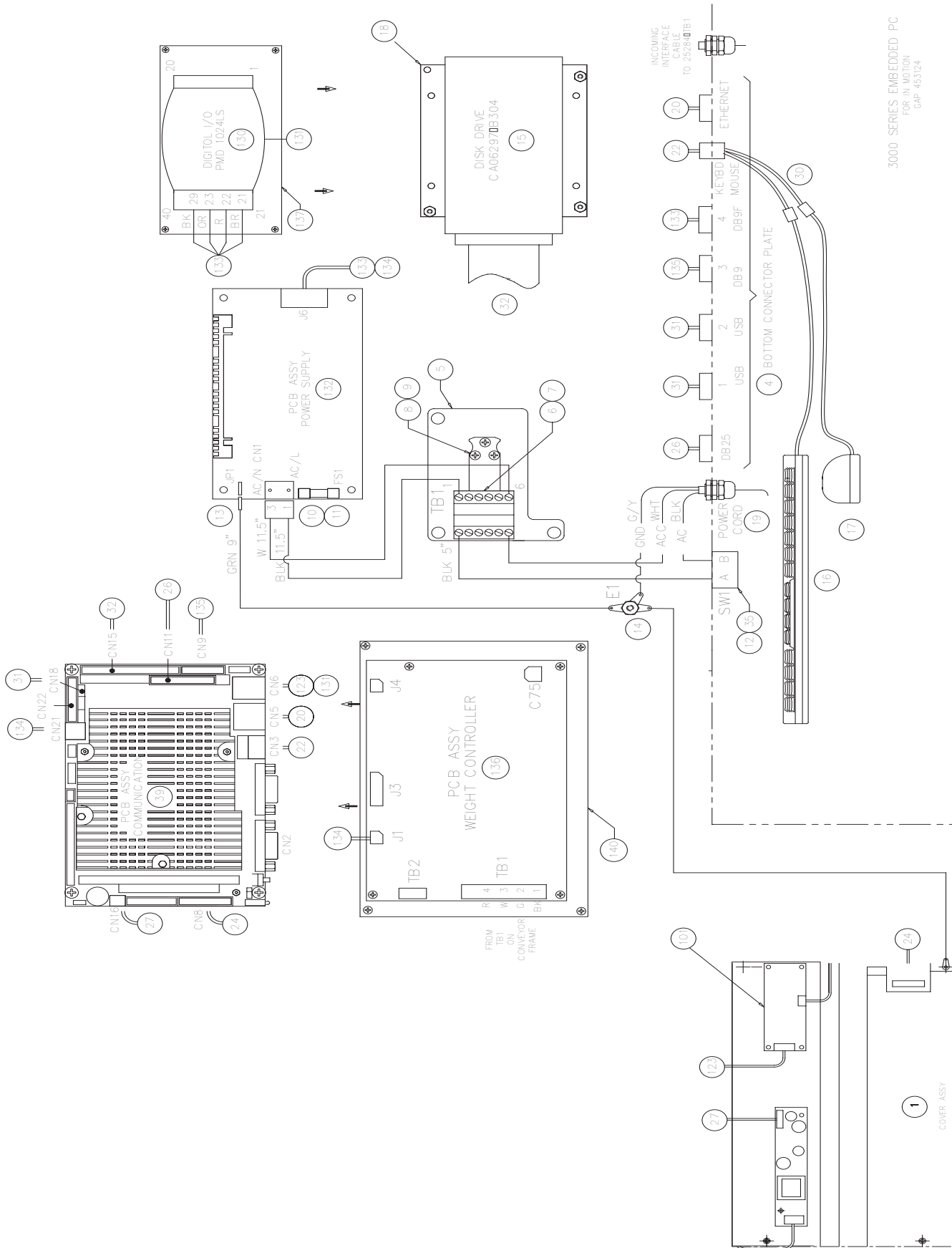
A. Errors

<i>Symptom</i>	<i>Solution</i>
Load Cell Failure(s)	Weight is behind zero by a large amount. Check for binds in the platform. Load cell has failed. Replace cell.
No indication from Green or Red Lamps for Scanners	Check for +12vdc. Check sensor wiring connections or check for damage.
No Scale Port Found...	Check output from High Speed A/D. Check interface cable for broken wires. Check COM 2 for proper operation.
More than two boxes on the scale	Check for loose interface connections
Two boxes on the scale	Check sensor wiring connections or check for damage.
Error calculating box weight	Check physical box spacing and spacing programming.
	Check scale calibration.

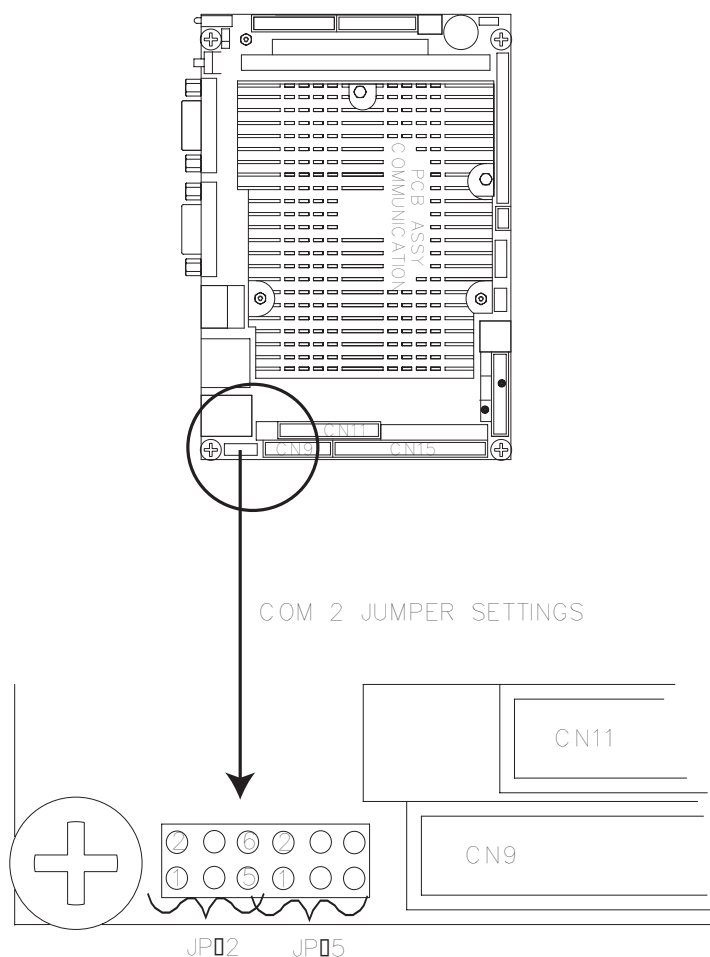
Section 6: Parts List

A. Replacement Parts

<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1	24713	Cover assembly
2	24712	Enclosure
3	24836	Instrument bracket
4	25765	Connector plate
5	25428	Power terminal block plate
6	25362	Terminal block; 6 terminals
7	25363	Terminal block plug; 6 terminals
8	10919	Lock washer int. tooth No. 4
9	10890	Machine screw 4-40 x.25
10	25482	Connector; 3 pos.
11	25483	Contact, female
12	25369	Rocker switch
13	11212	Fully insulated quick disconnect
14	11164	Lug
15	25617	Hard Disk Drive
16	25498	Mini keyboard
17	25499	Mouse
18	25212	Disk drive plate
19	25645	Power cord assembly
20	24117	RJ45 - RJ45 cable assembly
	25548	Cable Kit Assembly includes:
22	24890	<i>Keyboard extension cable</i>
24	24892	<i>LVDS Data cable assembly</i>
26	24894	<i>LPT cable assembly</i>
27	24895	<i>LCD Backlight cable assembly</i>
30	25404	<i>PS2 Keyboard- Mouse cable assembly</i>
31	25470	<i>USB cable assembly</i>
32	25388	<i>IDE cable assembly</i>
33	12342	O-ring
34	17534	Liquid tight connector
35	25504	Fully insulated quick disconnect
39	26152	Embedded SBC pcb 1GHz
101	24888	Touchscreen controller pcb
123	24891	Touchscreen cable assembly
130	25109Q	USB Digital I/O Interface pcb
131	25389Q	USB A-B cable assembly
132	25754	Power supply pcb
133	25769Q	Sensor power and signal cable assembly
134	25768Q	Power and signal cable assembly
135	25387	COM 2 cable assembly
136	25285	Weight controller pcb
137	25213Q	Digital I/O mounting plate
138	15745	Knob
139	12621	Retainer washer
140	25793	Weight controller mounting plate
141	15169	3/4" hole plug
142	25347	1/2" hole plug
N/S	25876Q	Load cell damped 50 kg capacity 2 mv/v
N/S	94384	Load cell Junction board
N/S	25674Q	Source Sensor
N/S	25675Q	Detector Sensor



Appendix I: Communications



COM 2 Mode Select JP2 Settings Definition

1-2	RS-232
3-4	RS-422
5-6	RS-485

RI / Voltage Select COM 2 JP5 Settings Definition

1-2	RI (Default for RS232 and RS422)
3-4	+ 5V
5-6	+ 12V

Definition	COM 2 (A) RS232 DB9	or	COM 2 (B) RS422/485 DB9
DCD	1		
DSR	6		
RX	2		
RTS	7		
TX	3		
CTS	8		
DTR	4		
RI 5V 12V	9		
Ground	5		
NC			5
485 TX +			2
485 TX -			1
485 RX +			3
485 RX -			4