FlexWeigh Systems 107, 108 and 109

Bulkweigher

Operation Manual

920i FlexWeigh Systems

RICE LAKE WEIGHING SYSTEMS

November 8, 2024

PN 151848 Rev G

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www.ricelake.com

Revision History

This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
F	April 03, 2024	Revision History Established; Updated Wiring Diagrams, Sequence of Operation, Digital I/O Ports, Input data from PLC and Setpoints
G	November 8, 2024	Updated electrical drawings

Table i. Revision Letter History

Contents

1.0 Introduction

This manual is intended for use by service technicians and operators responsible for installing and operating the FlexWeigh Bulkweigher Systems 107, 108 and 109. The *920i*® with custom programming can serve three different systems based on inputs that are wired when built.

Additional information on the actual hardware features of the 920i are explained in the 920i Installation and Operation Manual (PN 67887) and is included with this product.

Manuals are available from Rice Lake Weighing Systems at www.ricelake.com/manuals

Warranty information is available at www.ricelake.com/warranties

Safety Definitions:

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.

IMPORTANT: Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

WARNING

Failure to heed could result in serious injury or death.

Failure to heed may result in serious injury of death.

Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without all shields and guards in place.

Do not step on the unit.

Do not jump up and down on the scale.

Do not use for purposes other then weight taking.

Do not place fingers into slots or possible pinch points.

Do not use any load bearing component that is worn beyond 5% of the original dimension.

Do not use this product if any of the components are cracked.

Do not exceed the rated load limit of the unit.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning labels.

Do not use near water.

Before opening the unit, ensure the power cord is disconnected from the outlet.

Keep hands, feet and loose clothing away from moving parts.

1.1 FCC Compliance

United States

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

Canada

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

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

1.1.1 Radio Certificate Numbers

- US: R68WIPORTG
- Canada: 3867A-WIPORTG

1.2 Disposal

Product Disposal

The product must be brought to appropriate separate waste collection centers at the end of its life cycle.

Proper separate collection to recycle the product helps prevent possible negative effects on the environment and to health, and promotes the recycling of the materials. Users who dispose of the product illegally shall face administrative sanctions as provided by law.

1.3 Overview

Three FlexWeigh systems are supported by custom software.

- **920i *FlexWeigh Systems 107*** is a shipping mode bulkweigher, designed for basic shipping mode bulkweighing applications. In shipping mode, a scale is loaded and discharged repetitively until the accumulated total meets or exceeds the preset target.
- **920i *FlexWeigh Systems 108*** is designed for basic receiving mode bulkweighing applications. In receiving mode, a scale is loaded and discharged repetitively until there is no more product to receive.
- **920i *FlexWeigh Systems 109*** allows the user to select between shipping or receiving modes of operation.

1.4 Standard Features

The FlexWeigh Systems 107, 108 and 109 comes with the following standard features:

- Fill and discharge sequence controls
- Fill and discharge gate monitoring
- Printer available checking
- Weigh and surge hopper overfill monitoring
- Accumulated weight streaming

NOTE: The iRite program and source code that comprise the 920i FlexWeigh 107, 108 and 109 are property of the manufacturer. Modifications to this program and equipment must be performed by Rice Lake Weighing Systems. For more information on the iRite compiler utility program, refer to the 920i Installation and Operation Manual (PN 67887).

1.5 Button Functions

Front Panel Button	Function
E-Stop	Stops the filling process and removes power from the relays. It also puts the process into a paused state
Start/Resume	Starts the filling process from a paused state. Requires that the E-Stop is in a run position
End Cycle	Initiates completion of final draft
Ship/Recv	Selects between shipping mode or receiving mode operation on the FlexWeigh 109 model

Figure 1-1. Front Panel Button Functions

1.6 Operation Menu Softkeys

Operation menu softkeys are defined to provide the flexibility of operator functions for specific applications. Softkey assignments are listed on the tabs shown at the bottom of the LCD display. Softkey functions are activated by pressing the arrow keys below the softkey tabs. They are password protected and offer access to the following:

- Presets
- ID 1
- ID 2
- Setup menu

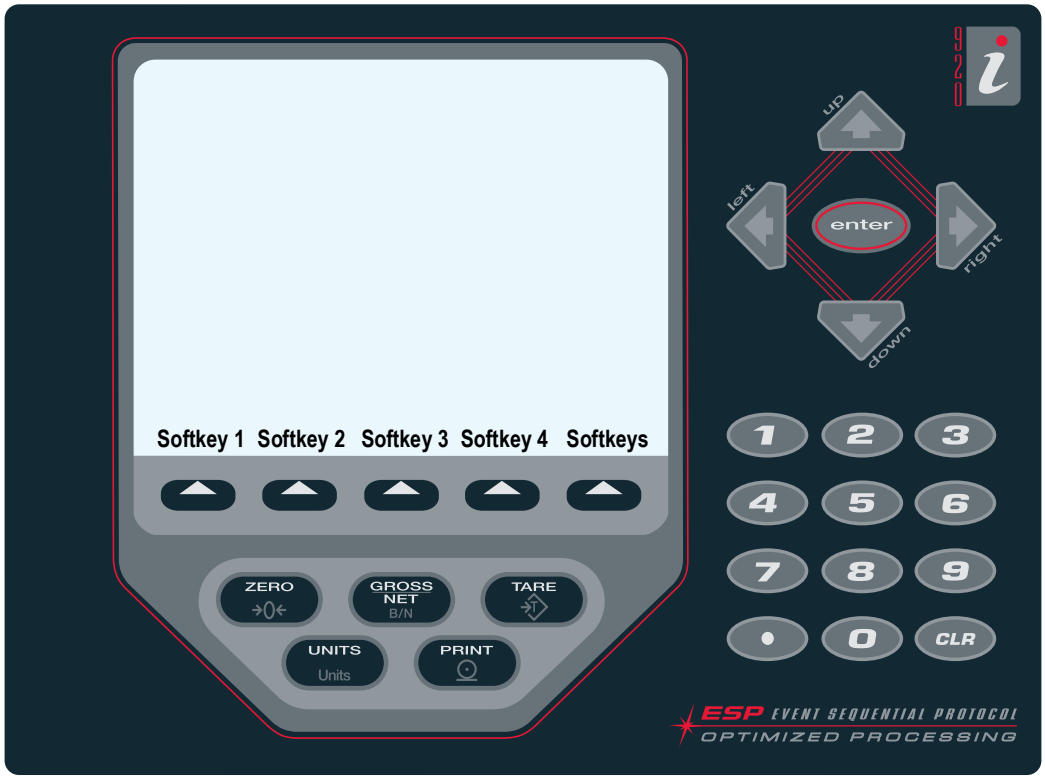

Figure 1-2. 920i Front Panel

The softkeys displayed are determined by the indicator configuration and program.

Softkey	Description
Presets	Allows operators to key in parameters prior to running the unit (see Section 3.7)
ID1 and ID2	Allows operators to log an extra data field. A softkey will appear on the main screen to allow the operator to enter more data (e.g: formula, ID truck, container, operator) (see Section 3.4)
Setup Menu	Allows operators to set configuration and time and date parameters (see Section 3.1)

Figure 1-3. Operation Menu Softkeys

2.0 Installation

This section describes procedures for setting up the FlexWeigh Systems 107, 108 and 109 to weigh.

CAUTION: Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.

The supply cord serves as the power disconnect for the unit. The power outlet supplying the indicator must be installed near the unit and be easily accessible.

WARNING: The FlexWeigh System has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

2.1 Unpacking and Assembly

Immediately after unpacking, visually inspect the unit to ensure all components are included and undamaged.

The shipping carton should contain a FlexWeigh Systems 107, 108 or 109 unit and this manual. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

2.2 Enclosure Disassembly

The FlexWeigh Systems 107, 108 or 109 must be opened to install option cards and to connect cables for installed option cards. Ensure power to the indicator is disconnected, then open the enclosure.

2.3 Cable Connections

The FlexWeigh Systems 107, 108 and 109 provide eleven cord grips for cabling into the indicator. The parts kit includes cord grip plugs to prevent moisture from entering the enclosure. Install these plugs into all cord grips that will not be used in your application.

Follow cable grounding instructions in the 920i Installation and Operation Manual (PN 67887) which is also included with this product.

NOTE: An additional adhesive label (PN 121108) is included in the parts kit and can be installed at the installer's discretion indicating correct terminal block numbering.

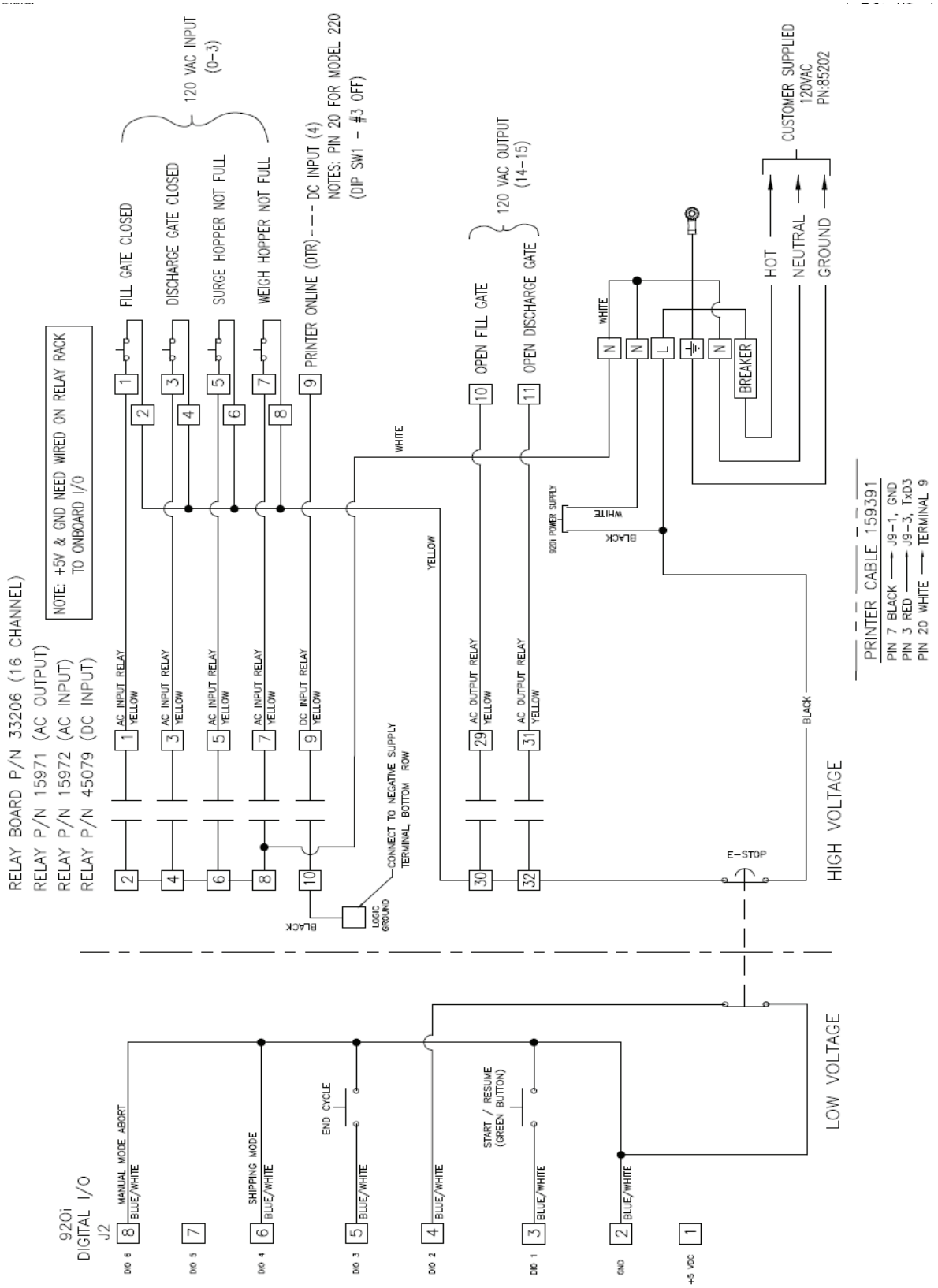

Table 2-1. 920i FlexWeigh System 107 Bulkweigher Block Wiring Diagram

NOTE: Circuit breaker = 4 A. All wires are 18 AWG unless otherwise specified. Dashed lines represent field wiring.

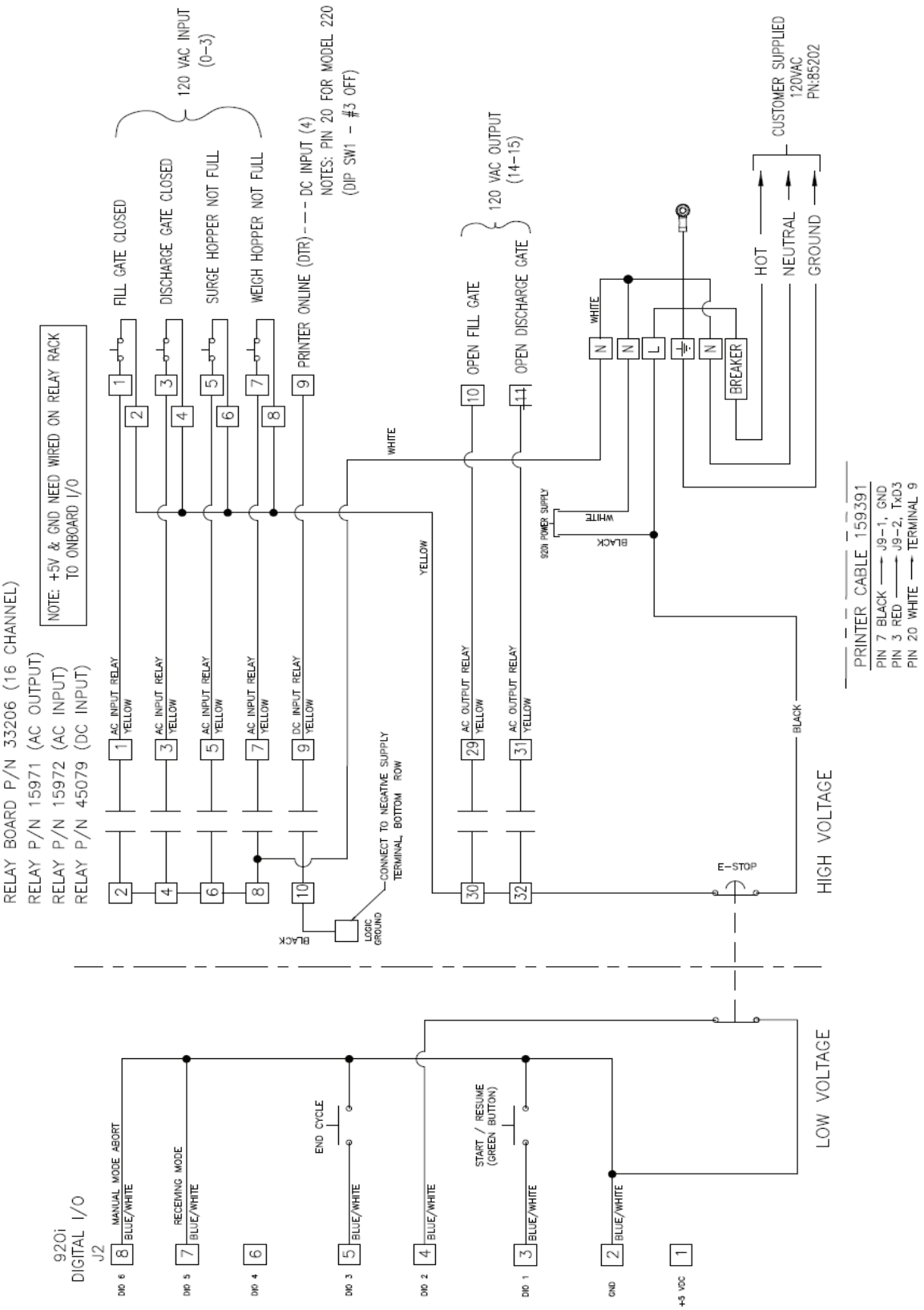

Table 2-2. 920i FlexWeigh System 108 Bulkweigher Block Wiring Diagram

NOTE: Circuit breaker = 4 A. All wires are 18 AWG unless otherwise specified. Dashed lines represent field wiring.

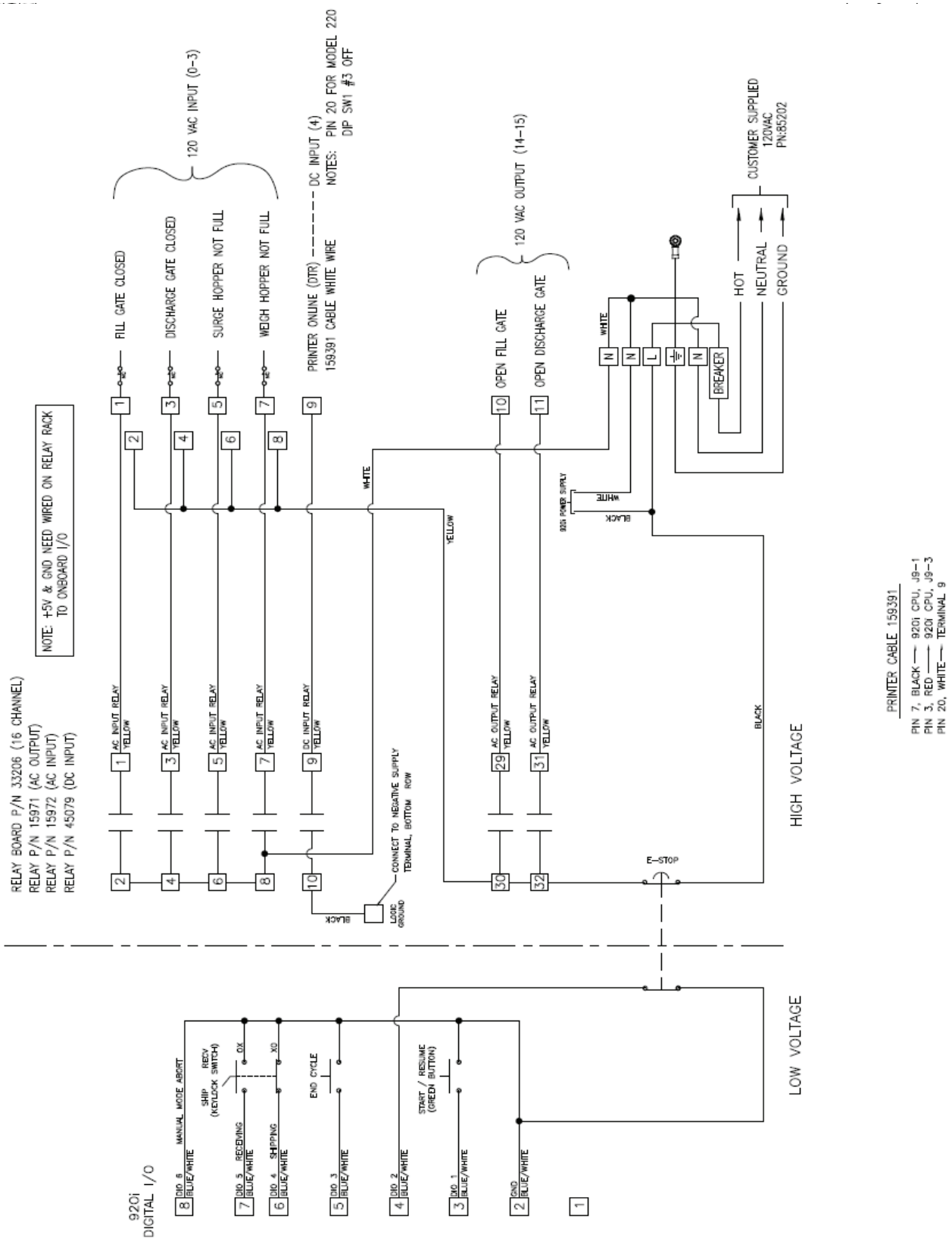

Table 2-3. 920i FlexWeigh System 109 Bulkweigher Block Wiring Diagram

NOTE: Circuit breaker = 4 A. All wires are 18 AWG unless otherwise specified. Dashed lines represent field wiring.

2.3.1 Cable Specifications

Cord Grip	Part Number	Diameter Range
PG9	15626	0.138 - 0.315 in (3.5 - 8 mm)
PG11	68600	0.197 - 0.394 in (5 - 10 mm)

Table 2-4. Cord Grip Specifications

Connector	Torque
Around cables	22 in-lb
Cord grip to enclosure	33 in-lb

Table 2-5. Cord Grip Torque Specifications

2.4 Cable Grounding

Cables routed through the cord grips should be grounded against the indicator enclosure. Follow cable grounding instructions in the 920i Installation and Operation Manual (PN 67887) which is also included with this product.

2.5 Parts Kit Contents

Table 2-6 lists the parts kit (121143) ontents for the FlexWeigh Systems 107, 108 and 109.

Part No.	Description	Qty.
14626	Kep nuts, 8-32NC	6
15133	Lock washers, No. 8, type A	6
15631	Cable ties (4 single A/D, 6 dual A/D)	4
15665	Reducing glands for 1/2 NPT cord grips	11
15887	6-position screw terminal for load cell connection (1-single A/D, 2-dual A/D)	1
19538	Cord grip plugs (10-single A/D, 9-dual A/D)	10
53075	Cable shield ground clamps	6
70599	6-position screw terminals for J2 and J10	2
71125	3-position screw terminal for J11	1
71126	4-position screw terminal for J9 and optional keyboard connection	2
94422	Capacity Label (1-single A/D, 2-dual A/D)	1

Table 2-6. Parts Kits Contents (PN 121143)

NOTE: See Figure 2-2 on page 17 for a list of replacement parts.

2.6 Option Cards

Table 2-7 list the available option cards that are used in the FlexWeigh Systems 107, 108 and 109. The single channel A/D card can be installed in slot 1 and the 24 channel I/O card in slot 2.

Slot	Type
1	Single Channel A/D Card
2	24 Channel I/O Card

Table 2-7. Option Card Locations

Digital I/O Ports

Slot	Bit	Description	Input/Output
0	1	Start/resume	Input
0	2	E-Stop/run switch	
0	3	End cycle button	
0	4	System 107 shipping mode	
0	5	System 108 receiving mode	
0	6	Auto/Manual	
2	1	Fill gate closed	Input
2	2	Discharge gate closed	
2	3	Lower surge hopper not full	
2	4	Weigh hopper not overfilled	
2	5	Printer online	
2	6-9	Unused	Off
2	10	Slow cycle alarm (option)	Output
2	11	Gate alarm (option)	
2	12	Scale overfill alarm (option)	
2	13	Lower surge backup alarm (option)	
2	14	Printer alarm (option)	
2	15	Open fill gate	
2	16	Open discharge gate	
2	17-24	Unused	off

Table 2-8. Digital I/O Assignments

Serial Ports

Port	Input	Output	Setup
1	Open	Open	9600 baud 8 bit None
2	Open	Open	115200 baud 8 bit None
3	Command	Audit Trail Printer	9600 baud 8 bit None
4	Command	Remote display ***NOTE: Total Drafted Weight streamed by User Program in CONDEC Format***	9600 baud 8 bit None

Table 2-9. Serial Port Setup

2.7 Product Dimensions

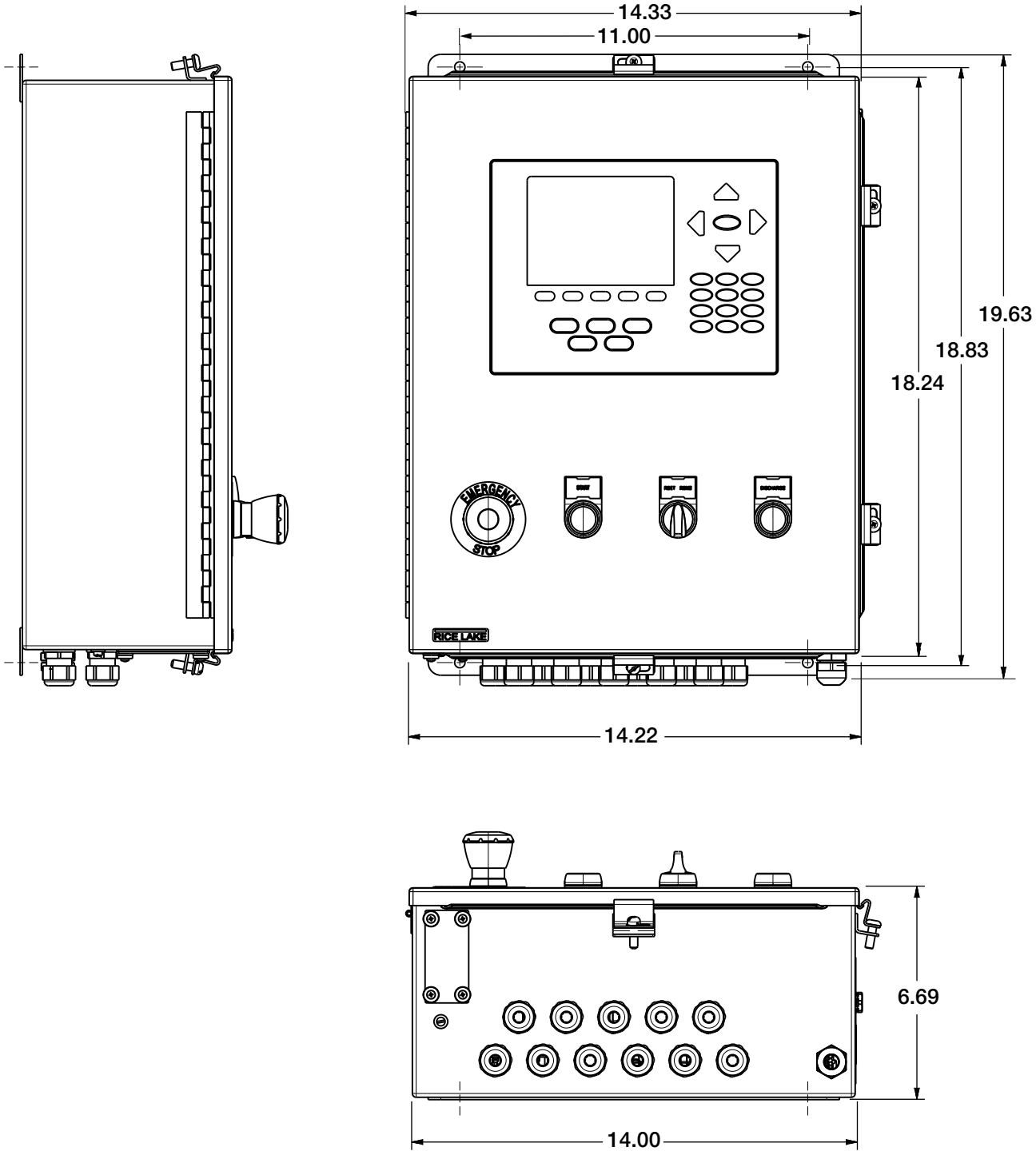

Figure 2-1. FlexWeigh Systems 107, 108 and 109 Enclosure Dimensions

2.8 Replacement Parts

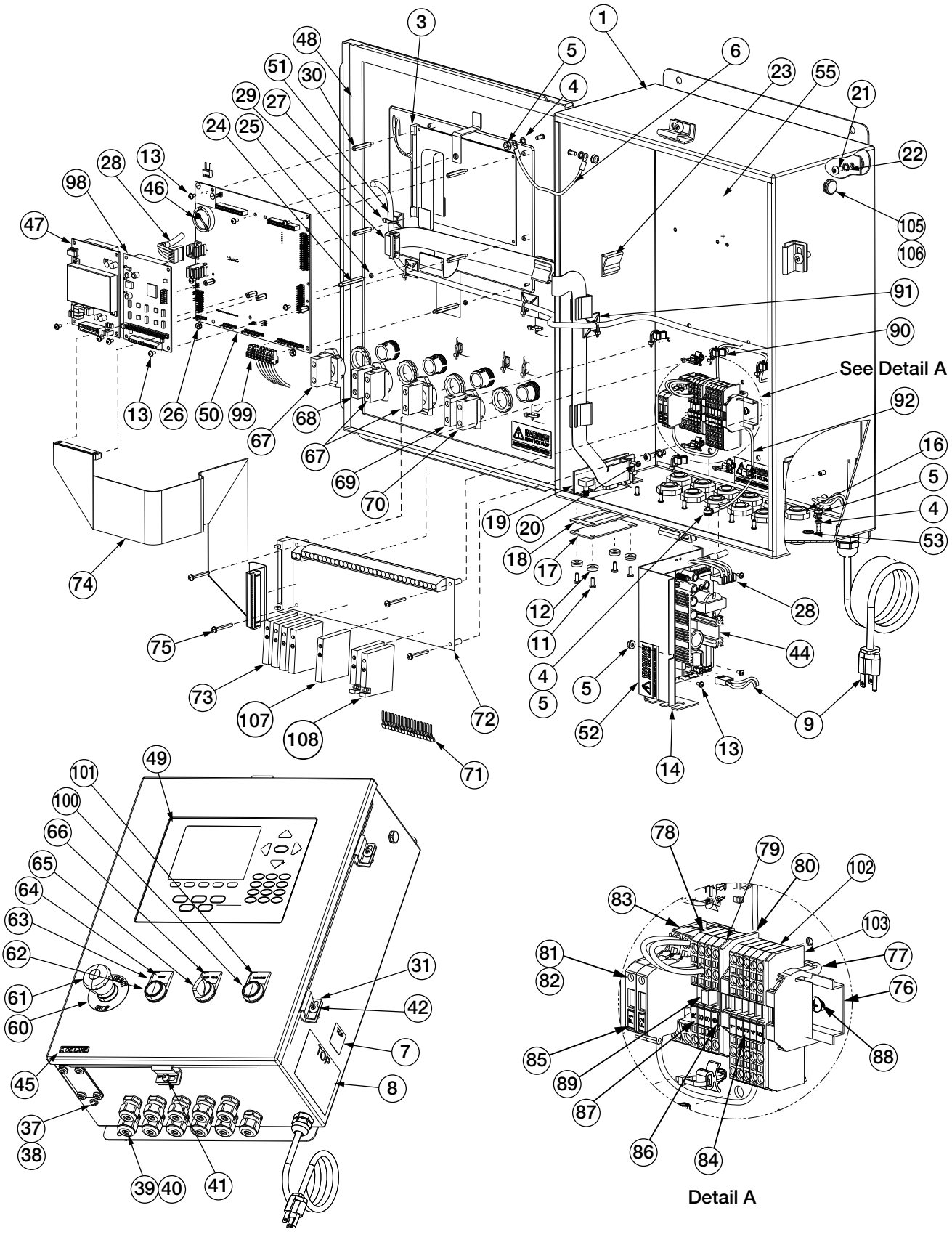

Figure 2-2. Replacement Parts Illustration

Item No.	Part No.	Description	Qty.
1	120426	Enclosure, Wall Mount	1
3	67614	Display, LCD Module, 920i	1
4	15134	Lock Washers, No 8, Type A	4
5	14626	Kep Nuts, 8-32NC Hex	4
6	15601	Ground Wire, 6 in w/No. 8	1
7	53308	Label, 1.25 x 1.25 8000T	1
8	53307	Label, 4.000 x 2.875	1
9	85202	Power Cord Assembly, 120 VAC	1
11	14845	Machine Screws, 6-32NC x 3/8	8
12	45042	Washer, Bonded Sealing SS	8
13	14822	Machine Screws, 4-40NC x 1/4	13
14	69538	Power Supply Bracket	1
16	15630	Locknuts, 1/2 NPT Black	11
17	67530	Interface Board Plate	1
18	67535	Interface Board Gasket	1
19	67869	920i Inteface Board	1
20	55708	Machine Screws, 4-40NC x 3/8	2
21	14875	Machine Screws, 10-32NF x 3/8	4
22	15140	Lock Washer, No. 10, Type A	4
23	46192	Flat Ribbon Cable Clamp	4
24	68661	Standoffs, Male-FEM, 4-40NC	2
25	69898	Nylon Washer ID 0.112	2
26	14618	Kep Nuts, 4-40NC Hex	2
27	15631	Cable Tie, 3 in Nylon	18
28	71431	Cable Assembly, 65W power	1
29	71436	Ribbon Cable Assembly, 28 in	1
30	67886	Standoffs, Long, Male 4-40NC	4
31	71739	Cinching Enclosure Clip	4
37	42640	Machine Screw, 1/4 - 28NF x 1	1
38	59250	Washer, .255 ID x .437 OD	1
39	30376	Sealing Ring, 1/2 NPT, Nylon	11
40	15628	Cord Grip, 1/2 NPT, Black	11
41	71455	Machine Screws, 1/4-28NF x .75	1
42	71447	Machine Screws 1/4-28NF	3
44	71333	920i Power Supply Board	1
45	68216	Metal Nameplate	1
46	69290	3V Coin Lithium Batter	1
47	67610	Single Channel A/D Card	1
48	68724	920i Cover Gasket	1
49	66502	Overlay, Membrane Switch	1
50	109549	920i CPU Board Assembly	1
51	15650	Cable Tie Mount 3/4 in	7
52	16861	Label, High Voltage	3
53	16892	Label, Earth Ground	1
55	120423	Back Panel Component	1
60	94274	Legend Plate, Emergency Stop	1
61	94273	Red Mushroom Switch	1
62	94277	Switch, Push Button Green	1
63	94316	Legend Plate Holder	3
64	114695	Legend Plate, Start	1
65	94298	3-Position Switch	1
66	120728	Legend Plate, Reset/Resume	1
67	94310	Contact Block	2
68	94311	Contact Block, Switch On	1
69	94312	Contact Block, Switch On	1
70	94313	Contact Block, Switch On	1
71	41035	16 Position Jumper Strap	1
72	33207	8-Channel Mounting Relay Board	1
73	15972	DC Output Relay Module	4
74	70780	50 Pin Flat Ribbon Cable	1
75	120762	Machine Screw, 6-32NC x 1 - 1/4	4
76	43636	DIN Rail	1
77	61141	Screwless WAGO End Stop	3
78	62964	WAGO Terminal Block	7
79	62966	WAGO Terminal Block	1
80	62968	Intermediate End Plate	3
81	62969	WAGO Fuse Terminal Block	2
82	54215	Time Delay Fuse, 3.15 amp	2
83	66190	Intermediate End Plate	1
84	62959	Label, WAGO Terminal Strip	1
85	65007	Label, WAGO Terminal Block	1
86	62967	Label, WAGO Terminal Block	1
87	66034	Label, WAGO Terminal Block	1
88	22087	Machine Screw, 6-32NC x 3/8	2
89	55337	Jumper, Series 280, Insulated	1
90	80590	Arrowhead Cable Tie Mount	8
91	15658	1 Inch Cable Tie Mount	2
92	121069	9 Inch Ground Assembly Wire	1
98	67608	Card, Digital I/O	1
99	77180	Conn, 8 Pos Screw Terminal	1
100	94276	Switch, Push Button	1
101	121037	Legend Plate, Discharge	1
102	62975	Plate, End Intermediate	1
103	62973	Block, Terminal WAGO 4	6
105	88733	Vent, Breather Sealed	1
106	88734	Nut, Breather Vent	1
107	45079	Relay Module	1
108	15971	Fused Relay Module	2
NS	54215	Fuse Between Din Rail/Relay Rack	1
NS	117901	Foam, Mixture High Density	1

Table 2-10. Replacement Parts List

3.0 Setup Menu

This section describes the various setup parameters for the FlexWeigh 107, 108 and 109 Systems.

A password protected supervisor mode is provided to support configuration of the application, setting time and date, or changing the password. To enter configuration mode, press the Setup Menu softkey on the unit. If a non-zero password is in effect, the operator is prompted to enter the password. Key in the password and press the enter key to enter the supervisor mode.

A default password of BLANK or 0 is defined for the system. Setting the password value to zero disables password checking.

The password is valid as long as the operator remains in setup mode. After that time, the password must be re-entered when entering the supervisor mode.

In setup mode, a list of items is presented. Use the more and back softkeys to select a category and use the corresponding softkey to access the selected item.

Softkey Function	Default	Description
Abort Cycle		Press the Abort Cycle softkey to abort the current batch.
Delay after discharge	3 seconds	Specifies the delay after discharge in seconds to allow the scale to settle and gate to mechanically close. At the end of this time delay, the gate closed switch is checked. If it is not closed, the system enters into an error condition. No further operation will be allowed until the condition is cleared.
Delay after fill	3 seconds	Specifies the delay after fill (in seconds) to allow the scale to settle and the gate to mechanically close. At the end of this time delay, the gate closed switch is checked. If not closed, the system enters into an error condition. No further operation is allowed until the condition is cleared.
Discharge Delay	3 seconds	The Discharge Delay softkey specifies the length of time in seconds that discharge output remains on after the discharge has reached empty weight. The default time is 3 seconds. To change the default, enter the new time and press enter to save the value.
Draft Subtotals		Specifies the number of drafts between the subtotal printout.
Enabling ID#1 and ID#2		Allows the operator to log an extra data field. A softkey appears on the main screen that allows the operator to enter more data (formula, ID truck, container, operator).
PLC Control via Setpoints	**Disabled**/Enabled	Allows operator to enable or disable the PLC setpoint option.
Password	*********	To change the password, select the Password item in configuration mode. The indicator prompts *Key in new password*. Key in the new password and press enter. The indicator prompts *Rekey new password* to verify. Key in the new password again and press enter. If valid, the indicator momentarily displays *Password accepted*.
Slow cycle timer	45 seconds	Specifies the period of time allowed to complete a fill or discharge cycle. The purpose of the slow cycle timer is to detect starved or blocked product flow. If a fill or discharge cycle is started that does not complete within the selected slow cycle time period, a slow cycle alarm is displayed and a slow cycle alarm output is turned on. The system remains in a slow cycle alarm state until the fill or discharge cycle is completed, until the end cycle switch input is turned on, or until a manual mode switch input is turned on.
Test Digital I/O		Refer to Section 3.5 for detailed information on these functions.
Time		Set system time and date.
Date		

Table 3-1. Setup and Configuration Parameters

3.1 Entering the Setup Menu

NOTE: The front panel E-stop button must be in the stopped position (pushed in) to enable the following keypad entries.

1. Press the **Setup Menu** softkey on the main menu screen and the system performs one of the following actions.
   - If a system password is entered, proceed to Step 2
   - If no system password is entered, the ***Setup Menu Main Screen*** displays (Figure 3-2)
2. Press the **Setup Password** softkey. The system prompts with ***Enter Password***.

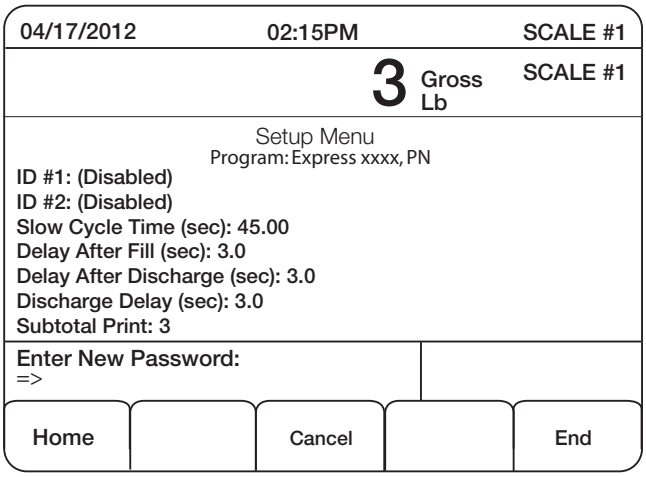

Figure 3-1. Setup Menu Enter Password

3. Enter the password and press the **Enter** key on the 920i. The system checks the entered value against the system password and performs one of the following actions:
   - If the password is valid, the ***Setup Menu Main Screen*** displays (Figure 3-2)
   - If the password is invalid, ***Invalid password*** displays momentarily and display exits the operation

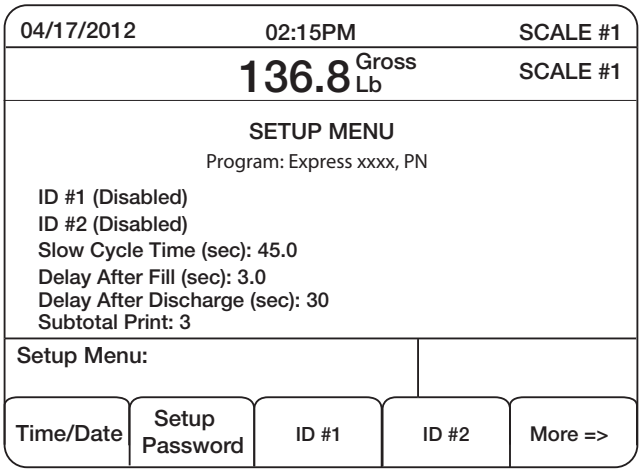

Figure 3-2. Setup Menu Main Screen

3.2 Setting the System Time and Date

Use the following steps to set up the system time and date.

1. From the ***Main Setup Menu Screen***, press the **Time/Date** softkey.

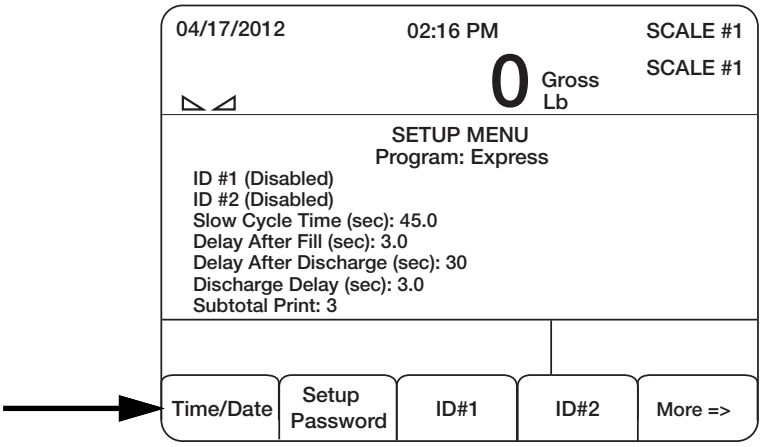

Figure 3-3. Select Time/Date Softkey

2. Use the arrow keys on the 920i and the numeric keypad to modify the time and or date.
3. Press the **Enter** key to save the settings.

Figure 3-4. Time and Date Main Screen

NOTE: The Cancel softkey can be pressed at any time to exit this sequence without saving any changes.

3.3 Modifying the Setup Password

Use the following steps to modify the setup password.

1. From the ***Main Setup Menu Screen***, press the **Setup Password** softkey.
2. The system prompts, ***Enter New Password***.

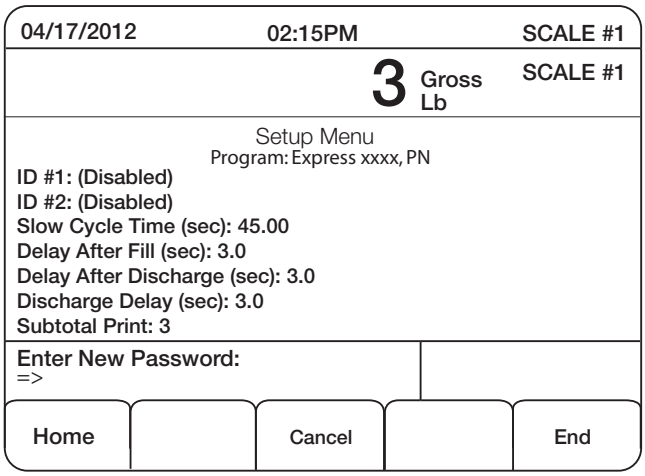

Figure 3-5. Enter New Password

3. Enter the new password and press the **Enter** key.
4. The system prompts ***Re-enter password*** to verify.
5. Re-enter the password and press the **Enter** key again. The system performs one of the following actions.
   - If the passwords match, the system displays ***Password Changed.***
   - If the passwords do not match, the system displays ***Passwords Did Not Match*** and exits the operation.

3.4 Enabling/Disabling Additional Data Fields

Use the following steps to enable or disable additional data fields.

1. From the ***Main Setup Menu Screen***, press the **Setup Password** softkey (Figure 3-2 on page 20).

NOTE: A setup password is not required if it has never been set or if you are already in Setup mode.

2. Press the **ID #1** or **ID #2** softkey. The system displays ***Enable ID #1 or ID #2*** while displaying **Yes** or **No** softkeys or ***Disable ID #1 or #2***.

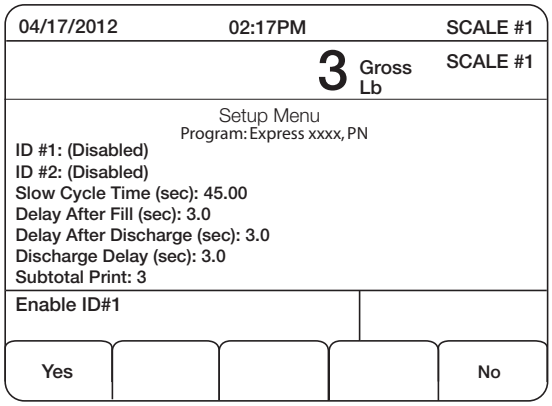

Figure 3-6. Enabling IDs

3. The operator does one of the following:

   Press the **Yes** softkey, the system prompts ***Enter Extra Data #1 Name***. Enter the name and press the **Enter** key on the 920i. A new data field appears on the main display and as a softkey so that the operator can change it. To enter alpha characters, press the **Up** navigation key to access a pop up alphabet.

   Press the **Yes** softkey and this returns the operator back to Step 1.

3.4.1 Delay After Fill

The Delay After Fill softkey specifies the delay after fill in seconds to allow the scale to settle and the gate to mechanically close. At the end of this time delay, the gate closed switch is checked. If not closed, the system enters an error condition. No further operation is allowed until the condition is cleared. The default is 3.0 seconds. To change the default, enter the new time and press enter to save the value.

3.4.2 Delay After Discharge

The Delay After Discharge softkey specifies the delay after discharge in seconds to allow the scale to settle and the gate to mechanically close. At the end of this time delay, the gate closed switch is checked. If it is not closed, the system enters an error condition. No further operation will be allowed until the condition is cleared. The default is 3.0 seconds. To change the default, enter the new time and press enter to save the value.

3.4.3 Discharge Delay

The Discharge Delay softkey specifies the length of time in seconds before the gate opens and the scale starts discharging.

The default time is 3.0 seconds. To change the default, enter the new time and press enter to save the value.

3.4.4 Slow Cycle Time

Specifies the period of time allowed to complete a fill or discharge cycle. The purpose of the slow cycle timer is to detect starved or blocked product flow. If a fill or discharge cycle is started that does not complete within the selected slow cycle time period, a slow cycle alarm is displayed and a slow cycle alarm output is turned on.

The system remains in a slow cycle alarm state until the fill or discharge cycle does complete, until the end cycle switch input, until the reset switch input, or until a manual mode switch input.

3.4.5 Draft Subtotals

Specifies the number of drafts between the subtotal printout.

3.5 Test Digital I/O

Press the **Test Digital I/O** softkey to test and toggle through any of the softkeys to manually control the selected I/O.

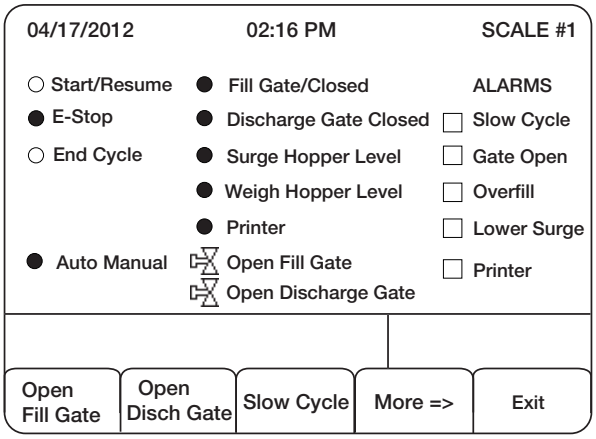

Figure 3-7. Test Digital I/O

3.6 Abort Cycle

Press the **Abort Cycle** softkey to abort the current batch.

3.7 Presets

Press the **Presets** softkey to display the presets menu for draft weight, empty weight, preact weight, and target weight.

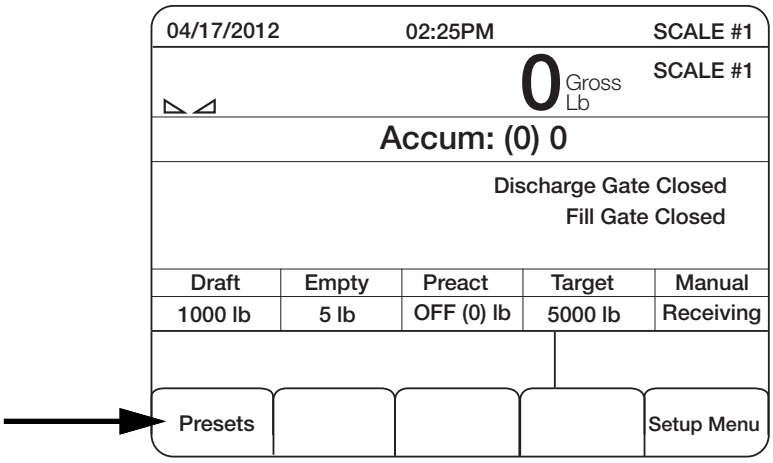

Figure 3-8. Enter Preact Weight

The preset softkeys displays.

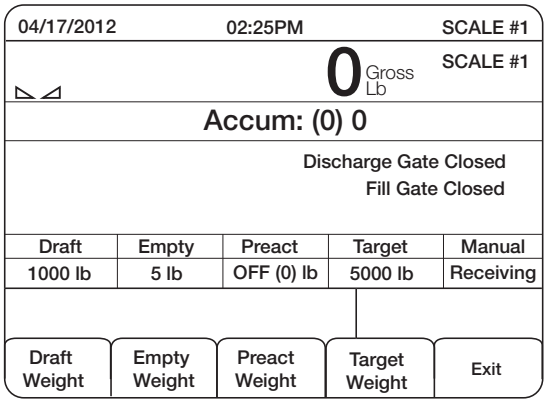

Figure 3-9. Presets Softkeys

Press one of the softkeys and enter a desired weight value pressing **enter** to save that value.

3.8 Preact

Preact provides some scale overfill protection on the first draft of a cycle when the upper garner may be full and the surge of flow on the first draft might be overwhelming. The preact value entered may be exceptionally large and is the fixed value in effect on every first draft that occurs after pressing Start or after recovering from a stop by pressing Resume. On subsequent fills during the cycle, the preact self learns and makes large auto preact adjustment corrections of 50% whenever the final fill weight is more than 2% of the fill weight preset.

Press the Preact Mode softkey to access that screen. Select a preact option. Press the **Preact** Mode softkey to toggle between *ON, OFF,* and *LEARN*.

Enter the preact weight by pressing the Preact Weight softkey. Press **Enter** to save that selection.

4.0 Sequence of Operation

FlexWeigh System operation varies depending on model where:

- **920i *FlexWeigh Systems 107*** is a shipping mode bulkweigher, designed for basic shipping mode bulkweighing applications. In shipping mode, a scale is loaded and discharged repetitively until the accumulated total meets or exceeds the preset target.
- **920i *FlexWeigh Systems 108*** is designed for basic receiving mode bulkweighing applications. In receiving mode, a scale is loaded and discharged repetitively until there is no more product to receive.
- **920i *FlexWeigh Systems 109*** allows the user to select between shipping or receiving modes of operation.

NOTE: Changing the selection of the shipping/receiving switch during an ongoing bulkweighing process is disregarded and displays an error. Switching between shipping and receiving modes is only permitted when the system is in the idle state between completing a bulkweighing process and pressing the Start/Resume button to initiate a new bulkweighing process.

4.1 Configure Weight Parameters

The following instructions describe parameter configuration for the FlexWeigh Systems Bulkweigher.

NOTE: The front panel E-Stop button must be in the stopped position (pushed in) to enable any of the following keypad entries.

Perform the following to edit Draft Weight, Empty Weight, Preact Weight, Target Weight (receiving), ID#1, or ID#2 settings:

1. Push the **E-Stop** button.
2. Press the **Presets** softkey. Presets menu for draft weight, empty weight, preact weight, and target weight displays.
3. Press one of the following softkeys and enter a desired weight value:
   - **Draft Weight:** Edits Draft Weight
   - **Empty Weight:** Edits Empty Weight
   - **Preact Weight**: Sets Preact parameters, where:
     - **Preact Mode:** Toggles between ON, OFF and LEARN.
       - ON – Preact weight is fixed and system fills to **Draft** – **Preact Weight**.
       - OFF – Preact weight is disabled and system fills to **Draft** weight.
       - LEARN – System automatically adjusts the **Preact** adjustments of 50% whenever the final fill weight is greater than 2% of the **Draft Weight**.
     - **Preact Weight:** Edits the **Preact Weight**.
     - **Exit:** Returns to Presets screen.
   - **Target Weight:** Edits Target weight. Disabled in receiving mode.

NOTE: LEARN preact provides some scale overfill protection on the first draft of a cycle when the upper garner may be full and the surge of flow on the first draft might be overwhelming. The preact value entered may be exceptionally large and is the fixed value for every first draft that occurs after pressing Start or after recovering from a stop by pressing Resume. On subsequent fills during the cycle, the preact makes automatic adjustment corrections of 50% whenever the final fill weight is more than 2% of the fill weight preset.

4. Press the **Exit** softkey when finished to return to the main screen.
5. Press the **ID** softkey to enter the ID number setup if the IDs are to be changed.
   - To disable an ID, press the corresponding **ID Off** softkey.
   - To enable an ID key in the ID number, press the corresponding **ID On** softkey.
   - To change an ID value key in the new ID number, press the selected New ID softkey.
6. Press the **Exit** softkey when finished to return to the main screen.

4.2 Operating Sequence

The following instructions describe a basic sequence of operation for a 920i FlexWeigh Systems 107 Bulkweigher (Shipping Mode operation) and 920i FlexWeigh Systems 108 (Receiving Mode operation).

NOTE: System continually streams the Total Drafted Weight to a remote display (Port 4 – CONDEC Format).

1. Ensure that the E-Stop button is in the out position and Presets and ID# data entry are inhibited.
2. Press the **Start/Resume** button.
3. The system checks for the following inputs to all be in initial ON state: discharge gate closed, fill gate closed, surge hopper not full, weigh hopper not full, printer online. If any inputs fail the initial start test, an appropriate error message flashes and the sequence defaults to Step 2.
4. The system clears the indicator display of the accumulated total weight and draft count remaining for view from the previous cycle.
5. System does one of the following based on Mode:
   a. Shipping – Starts **Slow Cycle** time and continues to Step 6.
   b. Receiving - Captures and Prints a stable gross weight, starts **Slow Cycle** time and continues to Step 6.
6. System turns the **Open Fill Gate** on to open the fill gate. The system monitors the **Discharge Gate Closed** during the filling to ensure the discharge gate does not open. Also, the system monitors **Weigh Hopper Full** during filling to ensure material does not fill above the level. If so, the system will pause and display an error message.
7. When the gross weight reaches **Draft - Preact Weight** the **Open Fill Gate** is turns off/closes. The system waits for the **Delay After Fill** for the **Fill Gate Closed** to activate (indicating it successfully closed). If the time expires before that happens the system pauses and displays an error message.
8. System does one of the following based on Mode:
   a. Shipping – Captures and Prints a stable gross weight and continues to Step 9.
   b. Receiving – Captures and Prints a stable gross weight, updates accumulators, prints subtotal/total and continues to STEP 7 Step 9.
9. System adjusts **Preact** if set to LEARN.
10. System monitors the **Lower Surge Full** to ensure the surge hopper can accommodate the material. If unable, the system pauses and displays an error message.
11. System activates **Open Discharge Gate** output to discharge product from the weigh hopper. The system monitors **Fill Gate Closed** while discharging to ensure the fill gate does not open.
12. When the weight drops below **Empty Weight**, **Open Discharge Gate** is turned off and after the **Discharge Delay** closes the discharge gate. The system waits for **Delay After Discharge** and **Discharge Gate Closed** to activate (indicating it successfully closed). If the time expires before that happens, the system pauses and displays an error message.
13. System does one of the following based on Mode:
    a. Shipping – Captures and Prints a stable gross weight, updates accumulators, prints subtotal/total and continues to Step 14.
    b. Receiving – Continues to Step 14.
14. System repeats Step 5 – Step 13 based on the Mode:
    a. Shipping – If **End Cycle** was pressed during the discharge sequence, the system will exit the sequence when the discharge is complete. If **End Cycle** was pressed during the fill, the system immediately goes to the discharge sequence. If the **Target** is reached the system will also exit the sequence like the end cycle operation.
    b. Receiving – If **End Cycle** was pressed during the discharge sequence, the system will exit the sequence when the discharge is complete. If **End Cycle** was pressed during the fill, the system immediately goes to the discharge sequence

NOTE: If at any time during the sequence the printer goes offline, the printer offline error state will be shown.

4.2.1 Pause, Resume, Abort or Reset a Fill/Discharge

1. Press the **E-Stop** button.
2. System turns off all outputs and displays System Paused.
3. Perform one of the following steps:
   a. Press the **Start/Resume** switch and then release the **E-Stop** to resume where the batch left off.
   b. The **Abort Cycle** softkey immediately aborts the sequence.

4.3 Audit Trail Print

Record keeping is an important part of any system. The FlexWeigh Systems 107, 108 and 109 connects to a printer (Port 3) for printing detailed records on batches, cycle runs, cycle paused, etc.

The preferred printer to integrate with the FlexWeigh Systems 107, 108 and 109 is the TMU-220 Tape Printer, however, the system easily integrates with other strip printers.

Connect the printer to the FlexWeigh Systems 107, 108 and 109 per printer manual instructions.

Tape samples below can be printed using the FlexWeigh Systems 107, 108 and 109 and the TMU-220 Tape Printer.

Ticket

```
3-15-22
Product: Gravel Customer: Rice Lake

3427 lb Full
  1 lb Empty
                    1        3425 lb net
3420 lb Full
  20 lb Empty
                    2        3400 lb net
3425 lb Full
  10 lb Empty
                    3        3407 lb net
3425 lb Full
  15 lb Empty
                    4        3410 lb net
3424 lb Full
  20 lb Empty
                    5        3404 lb net
4110 lb Full
Scale Overfill      03-15-22      11:02AM
Cycle Resume        03-15-22      11:15AM
  16 lb Empty
                    6        4094 lb net
3423 lb Full
  17 lb Empty
                    7        3406 lb net
-------------------------------------------------------------------------------
SUBTOTAL            24546 lb
-------------------------------------------------------------------------------

4200 lb Full
Fill Gate Error                10-22-10
11:20am
Scale OVerfill      03-15-22      11:20AM
Cycle Resume        03-15-22      11:25AM
  18 lb Empty
                    8        4182 lb net
Disch Gate Error               10-22-10
11:21am
Cycle Resume        03-15-22      11:28AM

3172 lb Full
  10 lb Empty
                    9        3154 lb net
3170 lb Full
  20 lb Empty
                    10       3150 lb net
-------------------------------------------------------------------------------
TOTAL:              35550 lb      03-15-22
11:32am
Product: Gravel   Customer: Rice Lake
-------------------------------------------------------------------------------
```

Receiving Ticket

```
                                                              r.txt
                        01:49 pm 08/29/22
MMMMM TTTTTTT

    0 lb Empty
1010 lb Full
                    1        1010  lb net
    0 lb Empty
1006 lb Full
                    2        1060  lb net

    0 lb Empty
1000 lb Full
                    3        1000  lb net
-------------------------------------------------------------------------------
SUBTOTAL        3016 lb
-------------------------------------------------------------------------------

Complete Cycle              01:51PM 08/29/2022
-------------------------------------------------------------------------------
TOTAL:     3016 lb          01:51PM 08/29/2022
MMMMM  TTTTTTT
-------------------------------------------------------------------------------
```

```
                    Product Gravel Customer RLWS

    1000 lb Full
       5 lb Empty
                    1        995  lb net
*Discharge Gate Open        02:50PM 03/21/2022
  Cycle Restarted           02:50PM 03/21/2022
*Scale Overfill             02:50PM 03/21/2022
  Cycle Restarted           02:50PM 03/21/2022
*Lower Surge                02:50PM 03/21/2022
  Cycle Restarted           02:50PM 03/21/2022
*Printer                    02:50PM 03/21/2022
  Cycle Restarted           02:50PM 03/21/2022
 1004 lb Full
*Fill Gate Open
  Cycle Restarted           02:50PM 03/21/2022
       5 lb Empty
                    2        999  lb net

    245 lb Full
       0 lb Empty
                    3        245  lb net
-------------------------------------------------------------------------------
TOTAL:  2239 lb             02:51PM 03/21/22
Product Gravel Customer RLWS
-------------------------------------------------------------------------------
```

Figure 4-1. Tape Printer Example

5.0 Appendix

The section provides additional information for the FlexWeigh Systems 107, 108 and 109.

5.1 Error Messages

The following error conditions are explained below.

5.1.1 Weigh Hopper Overfill

Weigh hopper overfill is detected if either the weigh hopper or high bindicator goes off or the scale weight exceeds the overfill weight preset during a fill cycle or at the start of a sequence.

It can also be detected if the weight increases after resuming after a weigh hopper overfill.

The operation is paused if this condition is detected before or during a fill operation. If this condition is detected during the sequence, it is recorded on the printed record.

5.1.2 Lower Surge Backup

Lower surge backup is detected if the lower surge or high indicator goes off during the discharge cycle or it is off at the start of the sequence.

The operation is stopped if this condition is detected before or during a discharge operation. If this condition is detected during the sequence, it is recorded on the printed record.

5.1.3 Printer Error

The printer error condition is detected if an attempt is made to print data and the printer is either offline or in an error status that will not allow printing. The operation will be stopped.

The operation is paused if this condition is detected. If this condition is detected during the sequence, it is recorded on the print record when the ability to print is restored.

5.1.4 Gate Error

The gate error condition is detected if:

- Either gate is open when the sequence is started.
- The fill gate does not close within the specified delay after fill time.
- The discharge gate does not close within the specified delay after discharge time.
- The discharge gate closed signal goes off during a fill operation.
- The fill gate closed signal goes off during a discharge operation.

5.1.5 Error Recovery

On entry to the stopped state, the fill and discharge outputs are set to off and all error conditions are checked.

Once in stopped state, the system remains stopped until all error conditions are cleared (all gate closed signals are on, the printer is online, and the lower surge not high signal is on). At that point the system enters into a paused state.

On entry to a paused state, the fill and discharge output are set to off. Press the **Start/Resume** button or the **Resume** softkey on the display.

All detected errors are printed along with their detected date and time.

If the resume was following a weigh hopper overfill error, the system resumes at Step 6 in System 108 instructions or Step 7 in System 107 instructions. All other resumes will be at the step they were recognized in.

5.2 Options

Several options are available with the 920i FlexWeigh Systems Bulkweighers:

- Manual/off/auto selector — 3-position key lock
- Manual fill on/jog selector, spring jog
- Manual discharge on/jog selector, spring jog

Manual Mode Front Panel Push Button

- Manual fill

Maintained Return Buttons

- Fill — on/jog
- Fill — fast/slow

Optional Front Panel Event Pilot Lights

- Filling
- Discharging
- Printer error
- Surge backup
- Overfill error
- Gate error
- Slow cycle

5.3 PLC Outputs and Inputs

This section includes setpoint outputs and inputs specific to FlexWeigh 107, 108, 109 systems. For information setpoints, see 920i Installation and Operation Manual (PN 67887).

5.3.1 Output from PLC

Setpoint	Description
60	Processed status bits: • 0: 0= Stopped/Paused & 1 = Running • 1: 0 = No Alarms & 1 = Alarm • 2: 1 = Filling • 3: 1= Discharging • 4: 1 = Draft Complete • 5: 1 = Fill Complete. Resets to 0 when filling restarts • 6: 0 = Receiving Mode & 1=Shipping Mode ***Note: Setpoint 60 returns as a floating point value in the PLC. To read the correct status of the bits, this value frequently needs to be converted to a 32 bit integer value in the PLC.***
61	Target Value
62	Draft Value
63	Preact Value
64	Empty
65	Current Draft Number
66	Subtotal Value (Current Draft Weight)
67	Total Value (Total Drafted Weight)
68	Value bits: • 0 = PLC Option Disabled • 1 = PLC Option Enabled

Figure 5-1. Output Data to PLC

5.3.2 Input Data from PLC

Setpoint	Description
80	Value bits: • 0: Do nothing • 1: Start/Resume (set back to zero after started or resumed) • 2: Stop Process • 3: Reset Process • 4: Clear Alarm • 5: Clear Subtotals (current draft weight) • 6: Clear Total/Subtotals (current draft weight and total drafted weight) • 7: New or updated data (notifies system to update setpoint 81, 82, 83 and 84 when not running)
81	Set Target Value
82	Set Draft Value
83	Set Preact Value
84	Set Empty Weight

Figure 5-2. Input Data to PLC

5.3.3 Configuring a Setpoint Value:

Configuring a float value in a setpoint requires the Value to be sent in two separate integer values. Most PLCs have a mechanism to take a float value and separate it into to integer values. The following is required in output words to set the value of Setpoint #7 to 10000. The AB PLC uses the copy command to copy a float value into the two integer values most significant word (MSW) and Least significant word (LSW):

Output Word 1	Command word = 304
Output Word 2	Parameter word = 7
Output Word 3	MSW = 17948
Output Word 4	LSW = 16384

The MSW and LSW are usually written from an floating point value converted to two integers.

1280 / 920I Responds with these values:

Output Word 1	Command word = 304
Output Word 2	Status = xxxx
Output Word 3	MSW = 17948
Output Word 4	LSW = 16384

5.3.4 Reading a Setpoint Value:

When a value is read it returns two integers that represent the float value. The PLC combines MSW and LSW integer values back into a float value. The following is returned in the input words if the value in Setpoint#1 is 800.5. The AB PLC uses the copy command to copy the MSW and LSW into a Float value. Only the MSW is used, the copy command knows it needs to use the next integer to make up the float:

Output Word 1	Command word = 320
Output Word 2	Parameter word = 1
Output Word 3	MSW = 0
Output Word 4	LSW = 0

1280/920i returns the following for a setpoint value of 800.5:

Output Word 1	Command word = 320
Output Word 2	Parameter word = xxxx
Output Word 3	MSW = 17480
Output Word 4	LSW = 8192

The PLC should read the “Setpoint Number” status bits to verify the correct number is returned. These bits are binary for the setpoint number.

Examples:

If Setpoint #1 is returned then Bit #8 will be set to a 1 and all other equal 0.

If Setpoint #2 is returned then Bit #9 will be set to a 1 and all other equal 0

If Setpoint #3 is returned then Bit #8 will be set to a 1 and bit #9 will be set to 1.

Word 2 Bit	Batch Function Status Dat	
	Value=0	Value=1
00	Digital Input 4 Off	Digital Input 4 On
01	Digital Input 3 Off	Digital Input 3 On
02	Digital Input 2 Off	Digital Input 2 On
03	Digital Input 1 Off	Digital Input 1 On
04	Batch not paused	Batch paused
05	Batch not running	Batch running
06	Batch not stopped	Batch stopped
07	Alarm off	Alarm on
08	Setpoint Number	
09		
10		
11		
12		
13	Not used	
14	Integer data	Floating point data
15	Positive weight	Negative weight

Table 5-1. Batch Function Status Data Format

5.4 Serial Commands

This section includes serial commands specific to FlexWeigh 107, 108, 109 systems. For information regarding how enter serial commands, see 920i Installation and Operation Manual (PN 67887).

Command	Description	Values
F#1=BA	Current Batch Mode	1=Running 2=Complete 3=Paused
F#1=OM	Gets Operating Mode	0=Shipping 1=Receiving
F#1=STA	Starts or Restarts a Batch Process	-
F#1=STP	Stops the Batch Process	-
F#1=ABT	Aborts a Batch Process	-
F#1=CA	Clears Alarms	-
F#1=RT	Clear Totals (Clears Current Draft Weight and Total Drafted Weight)	-
F#1=RS	Clear SubTotals (Clears Current Draft Weight)	-
F#1=TGWWWWWWW	Set Target Weight	WWWWWWW=Target Value 920i Responds with “OK”
F#1=DRWWWWWWW	Set Draft Weight.	WWWWWWW=Draft Value 920i Responds with “OK”
F#1=PRWWWWWWW	Set Preact Weight	WWWWWWW=Preact Value 920i Responds with “OK”
F#1=EMWWWWWWW	Set Empty Weight.	WWWWWWW=Empty Value 920i Responds with “OK”
F#1=CT	Gets Current Target Weight 920i Responds with CT=WWWWWWW	-
F#1=CB	Gets Current Total Batched Weight 920 Responds with CB=WWWWWWW	-
F#1=DN	Gets Current Draft Number 920 Responds with DN=XXXXX	

Figure 5-3. Serial Commands

6.0 Compliance

EU DECLARATION OF CONFORMITY

EU-KONFORMITÄTSERKLÄRUNG
DÉCLARATION UE DE CONFORMITÉ

Rice Lake Weighing Systems
230 West Coleman Street
Rice Lake, Wisconsin 54868
United States of America

RICE LAKE WEIGHING SYSTEMS

Type/Typ/Type: 820i and 920i series

English We declare under our sole responsibility that the products to which this declaration refers to, is in conformity with the following standard(s) or other regulations document(s).

Deutsch Wir erklären unter unserer alleinigen Verantwortung, dass die Produkte auf die sich diese Erklärung bezieht, den folgenden Normen und Regulierungsbestimmungen entsprechen.

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EU Directive	Certificates	Standards Used / Notified Body Involvement
2014/30/EU EMC	-	EN 61326-1:2013, EN 55011:2009+A1:2010, EN 61000-6-1:1995, EN 61000-6-2:2007
2014/35/EU LVD	-	IEC 60950-1 ed.2
2011/65/EU RoHS	-	EN 50581:2012

Signature: Richard Shipman

Type Name: Richard Shipman

Title: Quality Manager

Place: Rice Lake, WI USA

Date: May 3, 2019

RICE LAKE WEIGHING SYSTEMS

UKCA

UK DECLARATION OF CONFORMITY

Rice Lake Weighing Systems
230 West Coleman Street
Rice Lake, Wisconsin 54868
United States of America

RICE LAKE WEIGHING SYSTEMS

Type: 820i and 920i series

English We declare under our sole responsibility that the products to which this declaration refers to, is in conformity with the following standard(s) or other regulations document(s).

UK Regulations	Certificates	Standards Used / Approved Body Involvement
2016/1101 Low Voltage	-	IEC 60950-1 ed.2
2016/1091 EMC	-	EN 61326-1:2013, EN 55011:2009+A1:2010, EN 61000-6-1:1995, EN 61000-6-2:2007
2012/3032 RoHS	-	EN 50581:2012

Signature: Brandi Harder

Name: Brandi Harder

Title: Quality Manager

Place: Rice Lake, WI USA

Date: December 30, 2021

Form 0291 New 07/2021

Approved by: Quality Department

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