



# ***Belt-Way Scales***

*In Motion Weighing Solutions*

## **Input / Output Board Field Installation Manual**

Part No. BWIOKIT

# Input / Output Board Field Installation Manual

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## 1. Introduction

This manual is intended to help you successfully install the I/O Board Kit as an add-on item in the field. The following instructions will show you a step-by-step procedure to install the hardware required for the I/O Board.

Wiring and software setup will vary from application to application. The attached wiring diagram and I/O Board contact descriptions should be a guide in selecting the correct wire terminals for your application.

It is critical that you follow all Company and government **SAFETY** procedures when installing this component in the field.

After reading this manual if you require any assistance with the installation, wiring, and setup of the integrator please contact our technical support department.

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## 2. What is in the Box?

- 1 - I/O Board
- 4 - Screws
- 1 - 6 wire connector pre-wired to I/O Board
- 1 - X-pin ribbon cable
- 1 - 2 pin cable
- 1 - 4 pin cable
- 1 - 6 pin cable
- 1 - 8 pin cable



## 3. Tools & Supplies Needed

Phillips Screwdriver  
Small Flat Head Screwdriver

Lock-Out Tag  
Personal Protection Equipment

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## 4. Installation Procedure



### ***Before you start:***

1. Disconnect power to the integrator at the breaker or disconnect panel.
2. Lock out the supply power while installing the I/O Board.

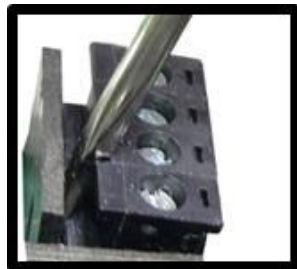
### **STEP 1**



Open the integrator

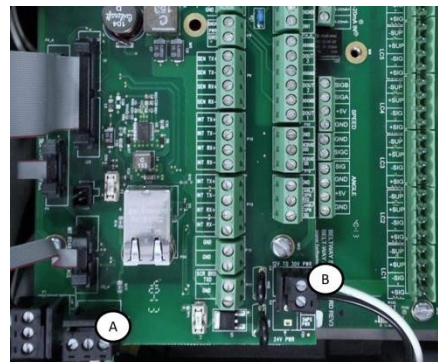
### **Step 2**

**(A)** IF 110-220 VAC power Supply is INSTALLED  
Remove the AC Supply power Connector  
inside the Integrator.



Remove the connector using a small flat-blade screwdriver as shown to avoid pin damage.

**(B)** IF 10-30 VDC power Supply is connected  
Remove the DC supply Power Connector  
inside the Integrator.



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## **STEP 3**



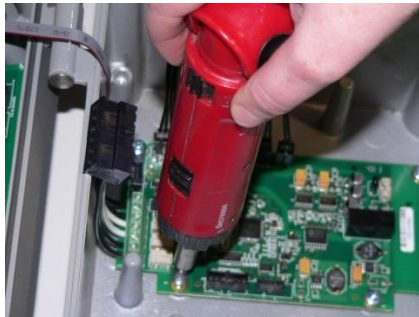
1. Remove the 4 screws in the mounting plate  
Leave the Terminal and Sensor Board attached to the mounting plate

## **STEP 4**



1. Remove the board stack

## **STEP 5**



1. Check that all cables are attached to the I/O board and connectors are seated.
2. Place the I/O Board on the mounting supports inside the box at the top and install 4 mounting screws.

## **STEP 6**



1. Re-install the board stack routing the cables from the I/O to the top of the board stack.
2. Remove the shield plate from the door of the integrator and plug ribbon cables into the processor board.

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## STEP 7



1. Re-install 4 mounting screws for the board stack.

## STEP 8



1. Plug in the cable connectors from the I/O Board as shown.

## STEP 9



1. Re-install the shield plate.

## STEP 10



Using the wiring diagrams and terminal descriptions at the end of this manual wire the terminals for the I/O board located on the terminal Board

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## 5. Integrator I/O Setup Instruction Guide

The following information will help you decide how to set up the Integrator for your application needs:



(The IO board wiring diagram is located at the back of the manual)



### Assign Inputs

Assign any one of the listed input functions to any of the 4 digital inputs. The digital inputs are optically isolated and accept 5-30 VDC.

#### Input options are listed below:

1. **Print Ticket** - Prints a ticket if a printer is connected to the integrator.
2. **Print then Clear** - Prints a ticket first and then resets the Accumulated Weight to zero.
3. **Enter Load** - Used with legacy remote start stop stations.
4. **PID Rate = Zero** - Momentarily stops the PID loop from calculating.
5. **Zero Calibration** - Initiates the dynamic Zero Calibration.
6. **Error Acknowledge** - Acknowledge and clear an error condition.



### Assign Outputs

Assign any one of the listed output functions to any of the 3 digital outputs. The digital outputs are optically isolated with a maximum of 30 VDC, 100 mA sinking.



A solid-state relay may be required to connect the output to a 110 / 220 VAC PLC input card.

#### Output Options are listed below:

1. **Pulsed Output** - Generates a pulse for each accumulated weight unit.

Pressing Enter will take you to the next setup screen where you must program the **Weight per Pulse** and **Pulse on Time** values.

#### Weight per Pulse

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This can be set to **.1, 1.0, 10, or 100** of the selected Weight Units. For example, if the Weight unit is Tons and the Weight per Pulse is set to **.1**, a pulse will occur each time **0.1** Tons is accumulated.



**Please note that small pulse values (.1 or 1.0) will not work with small Weight units (Lbs or Kgs) as an excessive number of pulses will be created!**

**Pulse on Time** controls how long the pulse remains on. The value is in **milliseconds**. This must be programmed properly so the control system can count each pulse.

2. **Quadrature Wave** - Allows a pulsed output to count positive or negative weight. This requires a second output to be programmed as the **Pulsed Output** channel.
3. **Error Alarm** - The alarm output will turn on when an error condition occurs.

Pressing the **ENTER** key will allow you to choose the error you wish to monitor with the output.

1. **Load Cell** - Activates when any load cell malfunctions.
2. **Angle Sensor** - Activates when the angle sensor malfunctions.
3. **Communications** - Activates when there is any communication error.
4. **Negative Rate** - Activates when the rate drops below the Negative Rate Limit.



The Negative Rate Limit is programmed in the [Admin / Settings](#) menu.

5. **Any Error** - Activates when any of the previously mentioned errors occur.
6. **Min/Max Speed** - Activates when the speed is above or below the programmed.

Pressing **Enter** takes you to the setup screen where you must program the **Min or Speed Setpoints**

**Min Speed Output** (Turns on when speed is below setpoint) or  
**Max Speed Output** (turns on when speed is above setpoint).

7. **Min/Max Rate** - Activates when the rate is above or below the programmed.



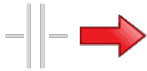
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Pressing **Enter** takes you to the setup screen where you must program the **Min** or **Max Rate Setpoint**

**Min Rate Output** (Turns on when the rate is below the setpoint) or  
**Max Rate Output** (turns on when rate is above setpoint).

8. **Batching / Loadout** - Activates when a batch is complete.
9. **Zero Calibration** - Activates when a Zero Calibration is in progress. Be sure to assign an input to initiate the Zero Calibration.



## **Assign Relays**

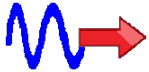
Any one of the previously listed output functions can be assigned to any of the 3 relay outputs.



The relays can accept a direct connection to a 100 / 240 VAC input.



**All digital output options EXCEPT the pulsed output are available as relay outputs.**



## **Analog Outputs**

Selection choices are **4-20 mA** or **0-20 mA** output. This output is used by a PLC system to monitor scale flow rate (tons per hour etc.) or to automatically control a material feed device in blending, rate control, or load control applications if configured to do so.

### **1. Analog 1 Function –**

Output **Default - Unassigned**

Selection choices available are:

#### **0-20 mA**

0 mA is the mA output when the scale rate is 0 (Tph, Kg's / Hr)

20 mA is the maximum output when the scale rate exceeds the **Max Rate** value.

#### **4-20 mA**

4 mA is the mA output when the scale rate is 0 (Tph, Kg's / Hr)

20 mA is the maximum output when the scale rate exceeds the **Max Rate** value.

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## 2. Analog 1 Setpoint

### Default - 100%

The setpoint determines what portion of the 4-20 mA output is sent to the PLC or feed device. 100% sends the entire value,

50% sends half the value,

10% sends one-tenth of the value, etc.

The value should remain at 100% when the output is simply monitored by a control system. It should be programmed to the required value when the scale is used for blending.

3. **Analog 1 Max Rate** - The Max Rate establishes the 20 mA level for the analog output. **The default is 500.**



**The Max Rate MUST equal the PLC 20 mA value to make the scale and rate readings match.**

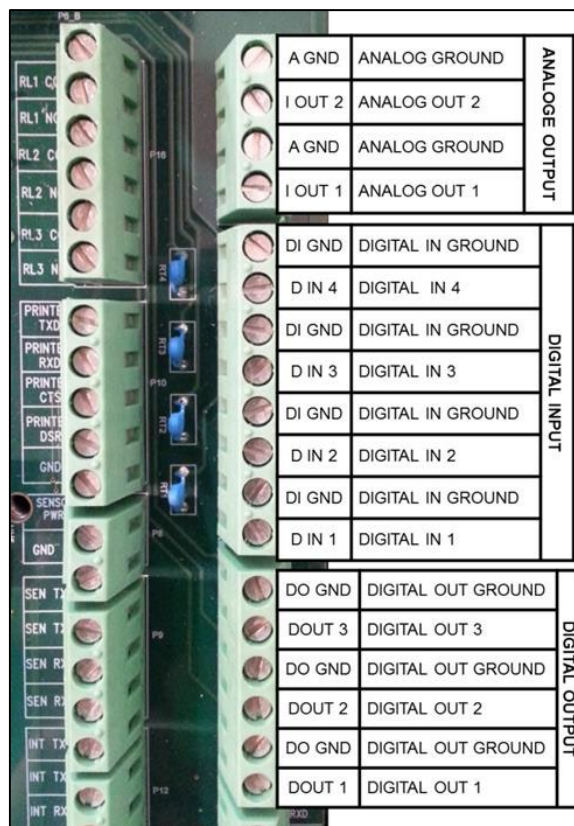
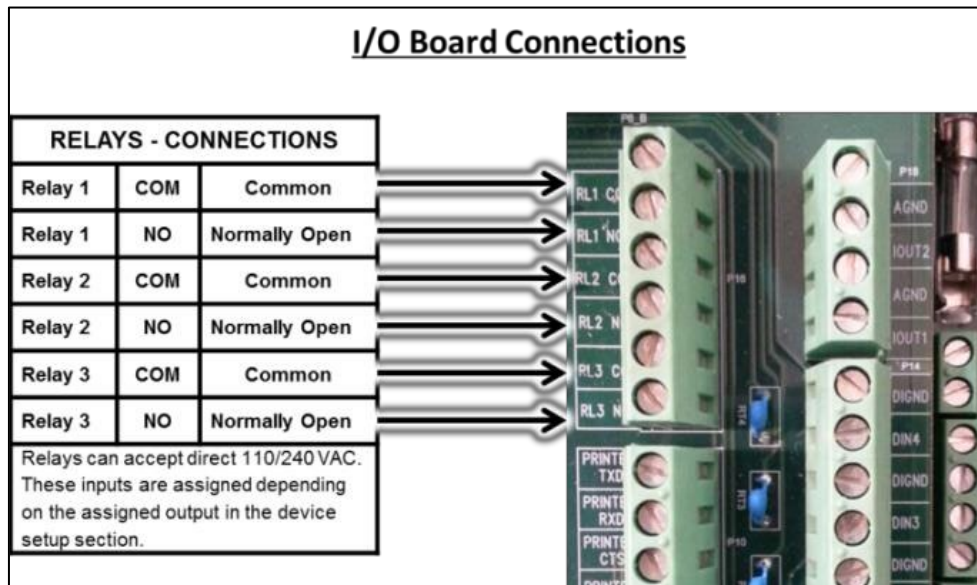
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## 6. Wire Terminals

The relays are NOT available to be used for Pulse output (Totalizing Tons). Please use an external solid-state Relay for this Purpose.

**(Belt-Way Part # REL0015)**

**All Analog, digital Inputs & Outputs are isolated for external Sources. There is no channel-to-channel isolation.**



## **Belt-Way Scales**

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