

# Profibus DP Interface

*Interface for 880 Indicator*

## Installation and Programming Manual





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# About This Manual

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This manual provides information needed to install and use the Rice Lake Weighing Systems *Profibus®-DP Interface*. The *Profibus-DP Interface* allows indicator to communicate with a Profibus master device using the Profibus-DP communications standard.<sup>1</sup> See the indicator installation manual for additional installation information and detailed descriptions of indicator functions.

The *Profibus-DP Interface* is installed inside the indicator enclosure. Installation in NEMA 4X stainless steel enclosures permits use in washdown environments.



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



Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at [www.rlws.com](http://www.rlws.com).

## 1.0 Introduction

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The *Profibus-DP Interface* functions as a slave node to a Profibus-DP master. The Interface returns weight and status information from an indicator to a master device and provides limited control of indicator functions to the programmer. Indicator configuration and calibration cannot be performed through the *Profibus-DP Interface*.

The Profibus-DP master sends commands to the indicator through the *Profibus-DP Interface* by writing the commands in the output format. The *Profibus-DP Interface* returns the weight and status data in the input format. These actions are referred to as cyclic I/O. See Section 3.0 for descriptions of the cyclic I/O commands.

A CD-ROM containing the GSD file used to configure the master device is supplied with the Profibus-DP Interface.

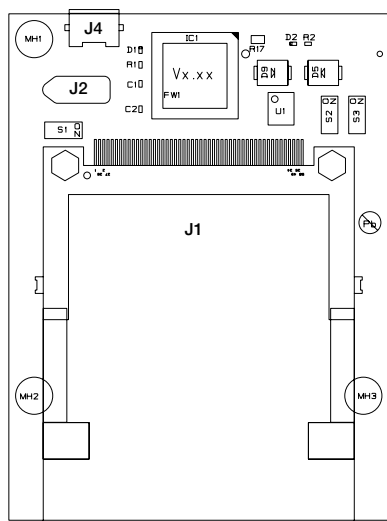
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1. Profibus® is a registered trademark of Profibus International.

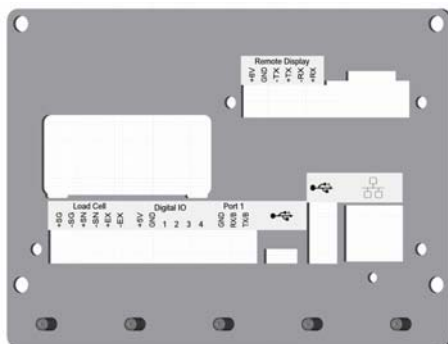
## 2.0 Installation

This section describes the procedures used to install the *Profibus-DP Interface* into the an indicator.

### 2.1 Installing the Profibus Interface



PN 153093 Option Card



PN 156669 Backplate, Controller



Also included in kit:

PN 14825 Screw, Mach 4-40NC x 1/4" Qty 4

PN 152358 Module, Profibus

Figure 2-1. Profibus Kit



**WARNING**

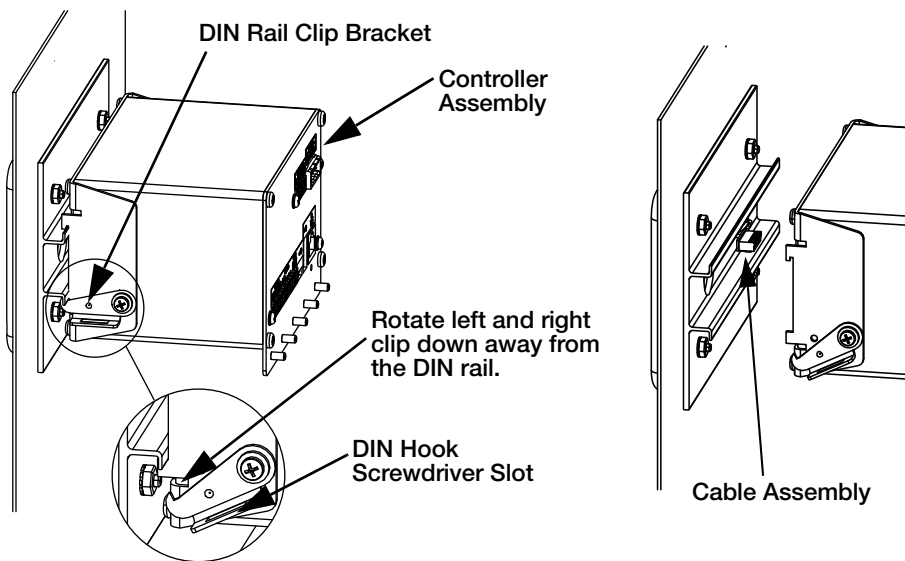
*Disconnect power before removing indicator backplate.*



**CAUTION**

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

1. Disconnect indicator from power source.
2. Unplug all connectors from the back of the controller assembly.

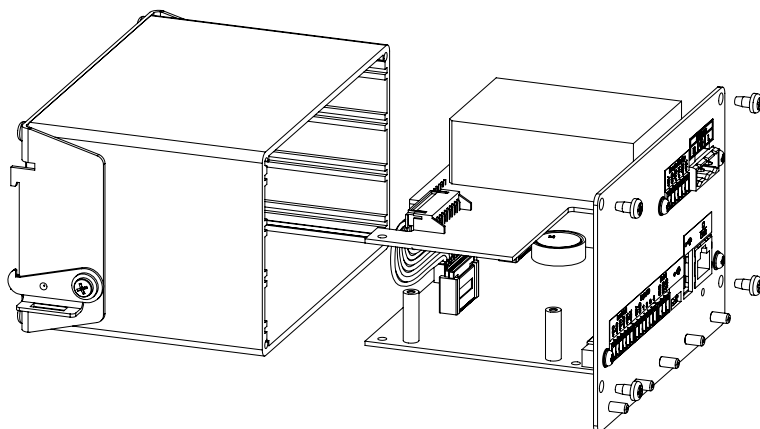


*Figure 2-2. Remove Controller Assembly*

3. Rotate left and right hooks away from the DIN rail clip.
4. Carefully remove the controller box from the DIN rail.
5. Disconnect the display cable harness.
6. Loosen the four corner screws and carefully pull the backplate straight out from the enclosure. The boards are still connected to the backplate and will slide out of the enclosure.



**Note** *All boards will slide out together, the power supply board and the CPU board are connected by a cable.*

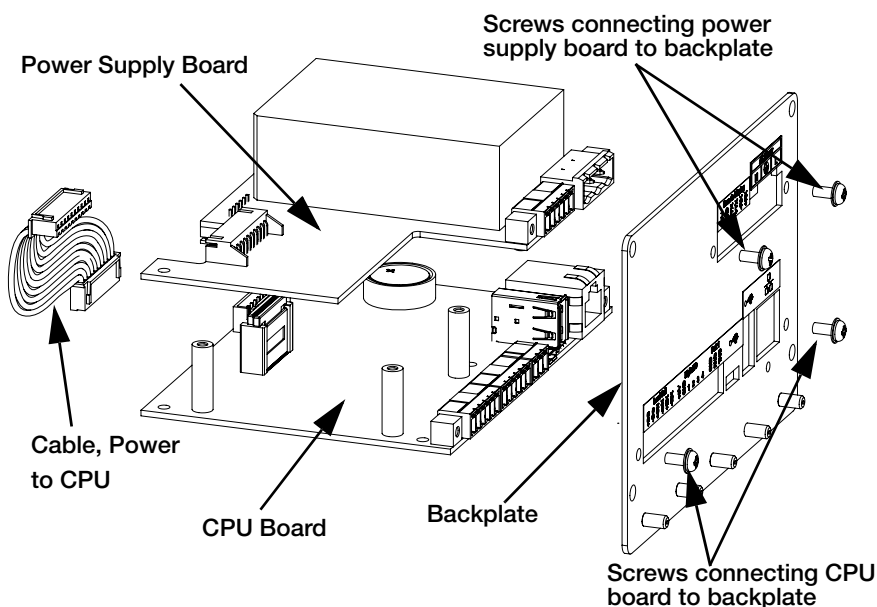


*Figure 2-3. Remove Backplate With Boards*

7. Remove the cable connecting the boards.
8. Remove the power board and CPU board from the back plate by loosening the screws holding them in place.

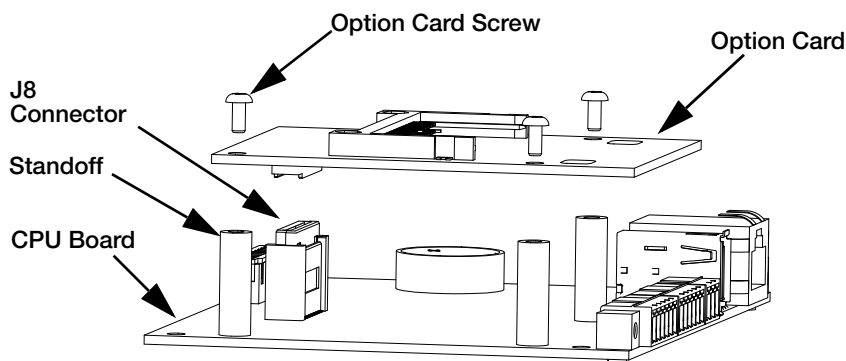


**Note** Retain the screws for installing boards to new backplate. Discard existing backplate.



*Figure 2-4. Boards Removed from Enclosure*

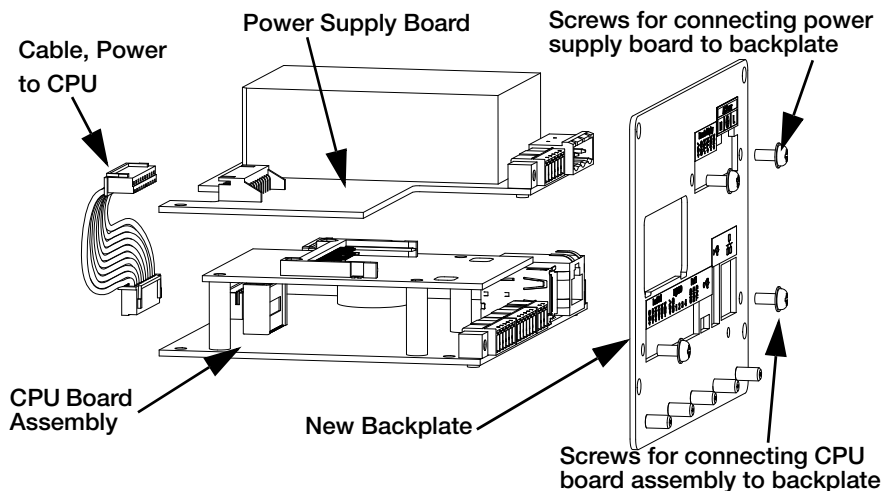
9. Install the option card on the CPU board standoffs, plugging it into the J8 connector on the CPU board.
10. Secure with option card screws.



*Figure 2-5. Install Option Card*



11. Connect the CPU board and the power supply board to the new backplate.
12. Connect cable assembly to CPU boards and power supply board.



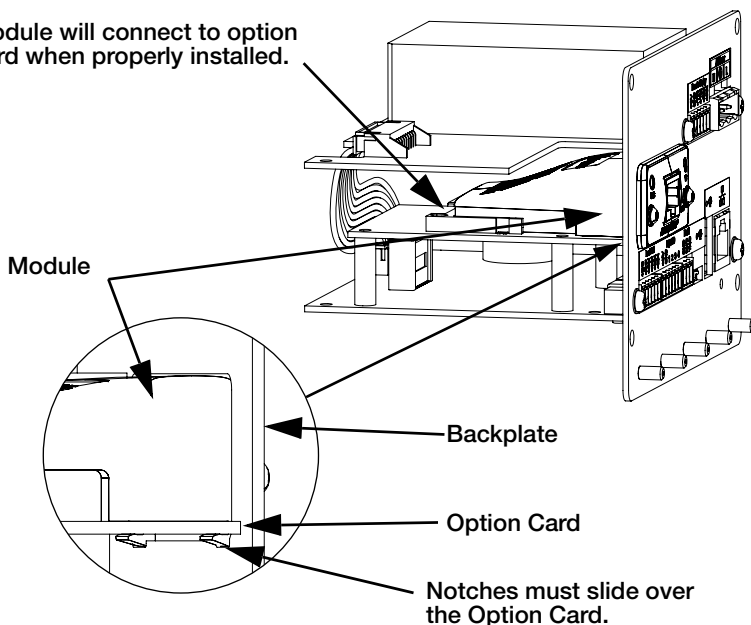
*Figure 2-6. Install Boards to New Backplate*

13. Slide the module into the slot provided until it connects to the option card, the notches on the bottom of the module must slide over the front of the card.



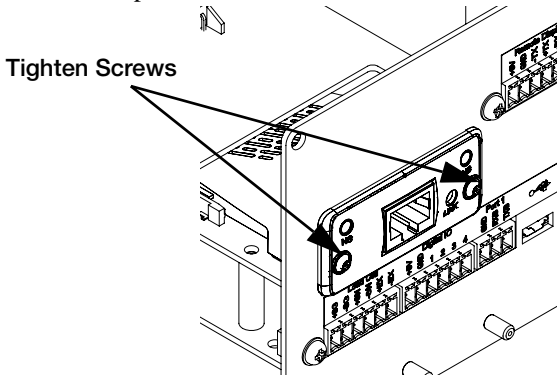
**Note** A slight pressure may need to be applied to the top of the module to ensure the notches slide onto the option card.

Module will connect to option card when properly installed.



*Figure 2-7. Install Module*

14. Once the module is properly seated, tighten the screws on the front to 0.25Nm using a T8 Torx bit (PN 158153, not included), to secure the module to the option card.

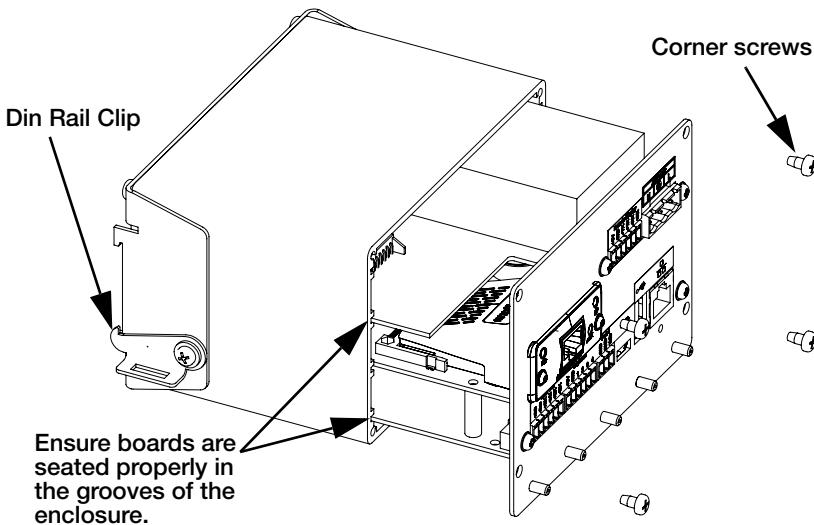


*Figure 2-8. Secure Module to Option Card*

15. Slide backplate with boards into enclosure, ensure that each board is seated correctly in the grooves of the enclosure.



**Note** Ensure the enclosure is in the upright position, otherwise the connector for the display will not align with the front cutcut. The DIN Rail clips will be at the bottom.



*Figure 2-9. Boards Installed in Controller Assembly Enclosure*

16. Reassembly control box to the DIN rail.
17. Reconnect all connectors to the back of the controller assembly.
18. Reconnect power to the indicator.

The indicator automatically recognizes all installed option cards when the unit is powered on. No hardware-specific configuration is required to identify the newly-installed card to the system.

## 2.2 Profibus LED Status Indicators and Connector

An LED array on the *Profibus* module provides status information for troubleshooting.

- LED 1 provides network status;
- LED 2 provides status indication for the *Profibus* module.



Figure 2-10. Profibus Status LED Module

### Operation Mode LED (Item 1)

Status	Description
Off	No powered or not online
Steady Green	Data exchange
Flashing Green	Clear
Flashing Red (1-flash)	Parametrization error
Flashing Red (2-flash)	Profibus configuration error

### Module Status LED (Item 2)

Status	Description	Comments
Off	Not initialized	Anybus state = 'SETUP' or 'NW_INIT'
Steady Green	Initialized	Anybus module has left the 'NW_INIT' state
Flashing Green	Initialized, diagnostic event(s) present	Extended diagnostic bit is set
Steady Red	Exception error	Anybus state = 'EXCEPTION'

### Connector DB9F (Item 3)

Pin	Signal	Description
1	-	
2	-	
3	B Line	Positive RxD/TxD, RS485 level
4	RTS	Request to send
5	GND Bus	ground (isolated)
6	+5 V Bus Output	+5 V termination power (isolated, short-circuit protected)
7	-	
8	A Line	Negative RxD/TxD, RS485 level
9	-	
Housing	Cable Shield	Internally connected to the Anybus protective earth via cable shield filters according to the PROFIBUS standard.

# 3.0 Commands

Commands are used by the master device to send and receive data from the interface as integer or floating-point data. The master sends eight bytes in the output format (used to write commands to the indicator) and reads eight bytes in the input format (used to read data from the indicator).

## Decimal Point Handling

Integer commands return no decimal point information to the master. For example, a value of 750.1 displayed on the indicator is returned to the master as 7501. Floating point commands support decimal point information with no special handling.

## 3.1 Output Data Format

To perform a command, the master uses the output command format to send four 16-bit words to the interface. These four words contain the command and any parameters necessary to execute it. The output command format is shown in Table 3-1.

Word	Description
Word 1	Command number
Word 2	Parameter
Word 3	Value (MSW)
Word 4	Value (LSW)

Table 3-1. Output Data Format



**Note** See Section 3.1.1 for *BYTE swapping parameters*.

The contents of each output command format word are described in Table 3-2.

## Command number

The number representing the indicator command is sent in the first word. Table 3-2 lists the commands that can be specified for indicators. Some commands may not be available on all indicators.



**Note** *A lockout feature that looks for any change in the output format data is incorporated into the indicator receive mechanism to prevent inundation by the same command (affected commands noted in Table 3-1). Repeated commands must be separated by any other valid command/parameter/value combination.*

Decimal	Hex	Command
0	0x000	Return Status and Weight (integer)
1	0x001	Display Channel
2	0x002	Display Gross Weight
3	0x003	Display Net Weight
9	0x009	Gross/Net key press (toggle)
10	0x00A	Zero (see note)
11	0x00B	Display Tare (see note)
12	0x00C	Enter Tare (see note)
13	0x00D	Acquire Tare (see note)
14	0x00E	Clear Tare (see note)
16	0x010	Primary Units
17	0x011	Secondary Units
18	0x012	Tertiary Units
19	0x013	Units key press (toggle units)
20	0x014	Print Request
21	0x015	Display Accumulator
22	0x016	Clear Accumulator
23	0x017	Push Weight to Accumulator
32	0x020	Return Gross (integer)
33	0x021	Return Net (integer)
34	0x022	Return Tare (integer)
37	0x025	Return Current Display (integer)
38	0x026	Return Accumulator (integer)
95	0x05F	Set Batching State
96	0x060	Batch Start
97	0x061	Batch Pause
98	0x062	Batch Reset
99	0x063	Batch Status
112	0x070	Lock Indicator Front Panel
113	0x071	Unlock Indicator Front Panel
114	0x072	Set Digital Output ON
115	0x073	Set Digital Output OFF
116	0x074	Read Digital I/O Status
128	0x80	Enable Bus Command Handler
253	0x0FD	No operation
254	0x0FE	Reset Indicator
256	0x100	Return Status and Weight (float)
268	0x10C	Enter Tare (float)
288	0x120	Read Gross (float)
289	0x121	Read Net (float)
290	0x122	Read Tare (float)
293	0x125	Read Current Display (float)
294	0x126	Read Accumulator (float)

*Table 3-2. Remote Commands*

Decimal	Hex	Command
304	0x130	Set Setpoint Value (float)
305	0x131	Set Setpoint Hysteresis (float)
306	0x132	Set Setpoint Bandwidth (float)
307	0x133	Set Setpoint Preact (float)
320	0x140	Read Setpoint Value (float)
321	0x141	Read Setpoint Hysteresis (float)
322	0x142	Read Setpoint Bandwidth (float)
323	0x143	Read Setpoint Preact (float)

*Table 3-2. Remote Commands (Continued)*

## Parameter value

To allow communication with a multi-scale indicator, the scale number is sent in the second word of the output command format. Zero (0) represents the current scale. Certain commands require a parameter other than a scale number, such as a slot number, setpoint number, or other selection parameter. See the command descriptions in Section 3.3 on page 14 for specific command requirements.

## Value

The third and fourth words of the output format are used to pass value data on certain commands. Values entered in these words are treated as unsigned long integers or floating-point values, depending on the command.

### 3.1.1 BYTE Swapping



**Note** See the Ports Menu in the 880 Technical/Service manual (PN 158387)

The 880 indicator sends out and receives data in integer format.

The standard format would be as follows for all input and output values:

High BYTE – Low BYTE

If the Parameter in the 880 FLDBUS/SWAP parameter is set to YES then the BYTE order changes to:

Low BYTE – High BYTE

Example:

If the weight on the scale reads 10 lbs and a value of 2560 is displayed in your PLC, either swap the BYTES in your PLC or change the SWAP parameter to YES.

## 3.2 Input Data Format

In response to a command, the interface returns data and status information to the master as four 16-bit words. This information is returned in the input command format shown in Table 3-3.

The value type can be set for those commands that do not specify integer or floating point data by sending a command 0x000 to specify integer data or command 0x100 for floating-point data. The value type is returned in the status word (bit 14) of the input format.

Word	Description
Word 1	Command number
Word 2	Status
Word 3	Value (MSW)
Word 4	Value (LSW)

*Table 3-3. Input Data Format*




**Note** See Section 3.1.1 for *BYTE* swapping parameters.

### 3.2.1 Command number

The first word echoes the command number. If the command fails or is not recognized, the negative of the command number is returned to signal the error.

### 3.2.2 Status Data

Indicator status data is returned in the second word (see Table 3-4). Batch commands return batch status in place of the low byte (see Table 3-5). Setpoint commands return batch status in the low byte of the status word and the setpoint number in the high byte.

Word 2 Bit	Indicator Status Data	
	Value=0	Value=1
00	Error ** (see See "Bit-0 Errors" on page 13.)	No error
01	Tare not entered	Tare entered
02	Not center of zero	Center of zero
03	Weight invalid	Weight OK
04	Standstill	In motion
05	Primary units	Other units
06	Tare not acquired	Tare acquired
07	Gross weight	Net weight
08	<div>  <b>Note</b> <i>Least significant bit first.</i> </div>	
09		
10		
11		
12		
13	<i>Not used</i>	
14	Integer data	Floating point data
15	Positive weight	Negative weight
** This error condition does not necessarily mean the weight being reported is invalid. Refer to the "Weight invalid" bit.		

*Table 3-4. Indicator Status Data Format*



Bit-0 Errors

- PLC command failed to execute.
- No configuration has taken place.
- Scale parameter is out of range.
- Print error has occurred.
- Load error has occurred.
- Memory error has occurred.
- Analog to digital converter error.
- Tare error.
- Scale over range error.
- Scale under range error.
- Non-recoverable configuration store error.
- Indicator in configuration mode.

Word 2 Bit	Batch Function Status Data	
	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 3-5. Batch Function Status Data Format

3.2.3 Value

Weight data is returned to the master in the third and fourth words of the input command format, depending on the command and the value type. The weight data returned is the displayed weight after the command is executed, unless the command specifies otherwise.

A negative value will be returned in the two’s compliment format.

### 3.2.4 Setting a Float Value:

Setting 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 two integer values.

The following is what is needed in the output words to set the value of Setpoint #1 to 10000.

Command word = 304

Parameter word = 1

MSW = 17948

LSW = 16384

### 3.2.5 Reading a Float Value:

When a float value is read it will be returned in two integers that will represent the float value.

The PLC will need to combine MSW and LSW integer values back into a float value.

The following is what will be returned in the input words if the weight on the scale is 800.5.

Command Word = 288

Status word = Scale status

MSW = 17480

LSW = 8192

## 3.3 Command Descriptions

### Return Status and Current Weight as Integer

Command: 0, 0x000

Parameter: Scale number

Command 0 returns the status and gross or net scale weight (per scale configuration) of the specified scale in integer format, without changing the display. This command also causes the format-independent commands to return a value in the integer format.

### Display Channel

Command: 1, 0x001

Parameter: Scale number

Command 1 causes the weight of the specified scale to be displayed and returned in its current mode and format.

### Display Gross Weight

Command: 2, 0x002

Parameter: Scale number

Command 2 causes the gross weight of the specified scale to be displayed and returned.

### Display Net Weight

Command: 3, 0x003

Parameter: Scale number

Command 3 causes the net weight of the specified scale to be displayed and returned.

### Gross/Net Key Press (toggle mode)

Command: 9, 0x009

Parameter: Scale number

Command 9 toggles between gross and net mode (and count mode, if enabled). If a scale number other than 0 is specified, the action will not be seen until the specified scale is displayed.

### Zero

Command: 10, 0x00A

Command 10 performs a **ZERO** operation on the current scale.

## **Display Tare**

Command: 11, 0x00B

Parameter: Scale number

Command 11 causes the tare weight on the specified scale to be displayed. If a scale number other than 0 is specified, the indicator first causes the specified scale to be displayed. Display returns to the prior mode after checking the indicator.

## **Enter Tare (integer)**

Command: 12, 0x00C

Parameter: Scale number

Value: Tare weight

Command 12 enters a tare for the scale selected. Tare data must be in integer format. The indicator continues to return weight data in the current mode for the specified scale.

## **Acquire Tare (simulate TARE key press)**

Command: 13, 0x00D

Parameter: Scale number

Command 13 acquires a tare based on the weight currently on the specified scale. The indicator continues to return weight data in the current mode for the specified scale.

## **Clear Tare**

Command: 14, 0x00E

Parameter: Scale number

Command 14 clears the tare for the specified scale. The indicator continues to return weight data in the current mode for the specified scale.

## **Primary Units**

Command: 16, 0x010

Parameter: Scale number

Command 16 switches the current format of the specified scale to the primary units configured for that scale.

## **Secondary Units**

Command: 17, 0x011

Parameter: Scale number

Command 17 switches the current format of the specified scale to the secondary units configured for that scale.

## **Tertiary Units**

Command: 18, 0x012

Parameter: Scale number

Command 18 switches the current format of the specified scale to the tertiary units configured for that scale, if available.

## **Units Key Press (toggle units)**

Command: 19, 0x013

Parameter: Scale number

Command 19 toggles between primary and secondary units of the specified scale.

## **Print Request**

Command: 20, 0x014

Parameter: Scale number

Command 20 causes the indicator to execute a print command for the current scale.

## **Display Accumulator**

Command: 21, 0x015

Parameter: Scale number

Command 21 causes the value of the accumulator for the specified scale to be displayed and returned. This command is only valid if the accumulator for the specified scale is enabled.

## **Clear Accumulator**

Command: 22, 0x016

Parameter: Scale number

Command 22 clears the value of the accumulator for the specified scale. This command is only valid if the accumulator for the specified scale is enabled.

## **Push Weight to Accumulator**

Command: 23, 0x017

Parameter: Scale number

Command 23 adds the net weight on the specified scale to the value of the accumulator for the specified scale. The scale must return to net zero between accumulations. The indicator returns the accumulated weight data for the specified scale. This command is only valid if the accumulator for the specified scale is enabled.

## **Return Gross as Integer**

Command: 32, 0x020

Parameter: Scale number

Command 32 returns the gross weight value for the specified scale as an integer.

## **Return Net as Integer**

Command: 33, 0x021

Parameter: Scale number

Command 33 returns the net weight value for the specified scale as an integer.

## **Return Tare as Integer**

Command: 34, 0x022

Parameter: Scale number

Command 34 returns the tare weight value for the specified scale as an integer.

## **Return Current Display as Integer**

Command: 37, 0x025

Parameter: Scale number

Command 37 returns the weight value for the specified scale as currently displayed. This may include gross, net, tare, or accumulator values, as enabled.

## **Return Accumulator as Integer**

Command: 38, 0x026

Parameter: Scale number

Command 38 returns the accumulator value for the specified scale. This command is only valid if the accumulator for the specified scale is enabled.

## **Set Batching State**

Command: 95, 0x05F

Parameter: State (0 = off; 1 = auto; 2 = manual)

Command 95 sets the batching (BATCHNG) parameter. Indicator status is returned with the current weight for the last scale specified.

## **Batch Start**

Command: 96, 0x060

Parameter: Scale number

Command 96 starts a batch program from the current step after a stop, pause, or reset. Batch status is returned with the current weight for the specified scale.

## **Batch Pause**

Command: 97, 0x061

Parameter: Scale number

Command 97 pauses a batch program at the current step. Batch status is returned with the current weight for the specified scale.

## **Batch Reset**

Command: 98, 0x062

Parameter: Scale number

Command 98 stops a batch program and resets it to the first batch step. Batch status is returned with the current weight for the specified scale.

## **Batch Status**

Command: 99, 0x063

Parameter: Scale number

Command 99 returns the status of a batch. Batch status is returned with the current weight for the specified scale.

## **Lock Front Panel of Indicator**

Command: 112, 0x070

Parameter: Scale number

Command 112 disables all the keys on the front panel of the indicator. Indicator status is returned with the current weight for the specified scale.

## **Unlock Front Panel of Indicator**

Command: 113, 0x071

Parameter: Scale number

Command 113 re-enables all the keys on the front panel of the indicator. Indicator status is returned with the current weight for the specified scale.

## **Set Digital Output ON**

Command: 114, 0x072

Parameter: Slot number

Value: Bit number

Command 114 sets the specified digital output ON (active). Use slot number 0 for onboard digital outputs. Indicator status is returned with the current weight for the last scale specified.

## **Set Digital Output OFF**

Command: 115, 0x073

Parameter: Slot number

Value: Bit number

Command 115 sets the specified digital output OFF (inactive). Use slot number 0 for onboard digital outputs. Indicator status is returned with the current weight for the last scale specified.

## **Read Digital I/O**

Command: 116, 0x074

Parameter: Slot number

Command 116 returns the status for all digital I/O in the specified slot in words 3 and 4. Use slot number 0 for onboard digital I/O. Indicator status is returned in the status area for the last scale specified.

## **Enable Bus Command Handler**

Command: 128, 0x80

Parameter: None

Command 128 enables the bus command handler in a user program. While this handler is enabled, all other PLC commands are disabled.

## **No Operation**

Command: 253, 0x0FD

Parameter: Scale number

Command 253 provides a command to use between operations, as necessary, without causing the indicator to perform any action. Indicator status and weight for the specified scale is returned.

## **Reset Indicator**

Command: 254, 0x0FE

Parameter: None

Command 254 provides a command to remotely reset the indicator. No data is returned.

## **Return Status and Current Weight as Float**

Command: 256, 0x100

Parameter: Scale number

Command 256 returns the status and weight of the specified scale in floating-point format, without changing the display. This command also causes the format-independent commands to return a value in the floating-point format. Returns current weight at a floating-point format.

## **Enter Tare as Float**

Command: 268, 0x10C

Parameter: Scale number

Value: Tare weight

Command 268 enters a tare for the scale selected in floating-point format. The indicator returns the tare weight as taken, or 0 for no tare.

## **Read Gross Weight as Float**

Command: 288, 0x120

Parameter: Scale number

Command 288 returns the gross weight value for the specified scale in floating-point format.

## **Read Net Weight as Float**

Command: 289, 0x121

Parameter: Scale number

Command 289 returns the net weight value for the specified scale in floating-point format.

## **Read Tare as Float**

Command: 290, 0x122

Parameter: Scale number

Command 290 returns the tare weight value for the specified scale in floating-point format.

## **Read Current Display as Float**

Command: 293, 0x125

Parameter: Scale number

Command 293 returns the weight value for the specified scale as currently displayed in floating-point format. This may include gross, net, tare, or accumulator values, as enabled. The weight value is returned in the mode used to display a scale widget.

## **Read Accumulator as Float**

Command: 294, 0x126

Parameter: Scale number

Command 294 returns the accumulator value for the specified scale in floating-point format. Batch status is returned in place of the indicator status.

### **Set Setpoint Value as Float**

Command: 304, 0x130

Parameter: Setpoint number

Value: Setpoint value

Command 320 sets the setpoint value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a setpoint value. Batch status is returned in place of the indicator status.

### **Set Setpoint Hysteresis as Float**

Command: 305, 0x131

Parameter: Setpoint number

Value: Hysteresis value

Command 305 sets the hysteresis value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a hysteresis value. Batch status is returned in place of the indicator status.

### **Set Setpoint Bandwidth as Float**

Command: 306, 0x132

Parameter: Setpoint number

Value: Bandwidth value

Command 306 sets the bandwidth value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a bandwidth value. Batch status is returned in place of the indicator status.

### **Set Setpoint Preact as Float**

Command: 307, 0x133

Parameter: Setpoint number

Value: Preact value

Command 307 sets the preact value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a preact value. Batch status is returned in place of the indicator status.

### **Read Setpoint Value as Float**

Command: 320, 0x140

Parameter: Setpoint number

Command 320 returns the target value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a target value. Batch status is returned in place of the indicator status.

### **Read Setpoint Hysteresis as Float**

Command: 321, 0x141

Parameter: Setpoint number

Command 321 returns the hysteresis value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a hysteresis value. Batch status is returned in place of the indicator status.

### **Read Setpoint Bandwidth as Float**

Command: 322, 0x142

Parameter: Setpoint number

Command 322 returns the bandwidth value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a bandwidth value. Batch status is returned in place of the indicator status.

### **Read Setpoint Preact as Float**

Command: 323, 0x143

Parameter: Setpoint number

Command 323 returns the preact value for the specified setpoint in floating-point format. This command is only valid if the setpoint is configured and requires a preact value. Batch status is returned in place of the indicator status.

## 4.0 Profibus Interface Specifications

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### Power Requirements

*Bus Adapter Card with Profibus Module, DC Power:*

Supply voltage: 6 VDC

Typical current draw: 100 mA

Maximum current draw: 300 mA

Typical power consumption: 0.6 W

Maximum power consumption: 1.8 W

### Communications Specifications

Up to 12 Mbit/s

### Environmental Specifications

Temperature:                    -10° to +40° C (14° to 104° F)



# Profibus Interface Limited Warranty

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Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for one year.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, "Protecting Your Components From Static Damage in Shipment," available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

**THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

**RLWS AND BUYER AGREE THAT RLWS' SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.**

**SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.**

**NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.**

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# Notes

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