Profibus® DP

Indicator Interface for IQ plus® 800/810 and IQ plus® 310A Indicators

Version 1.0

Installation and Programming Manual

PROFI® PROCESS FIELD BUS BUS

RICE LAKE WEIGHING SYSTEMS

Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

50955

Contents

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About This Manual

This manual provides information needed to install and use the Rice Lake Weighing Systems Profibus® Indicator Interface. The Profibus Indicator Interface allows IQ plus® 800/810 and IQ plus 310A indicators to communicate with a Profibus master device using the Profibus-DP communications standard.[1]

The Profibus Indicator Interface is housed inside the NEMA 4X stainless steel indicator enclosure to permit use in washdown environments.

This manual applies to the following software versions:

- Profibus Indicator Interface, Version 1.0
- IQ plus 800/810, Version 3.1
- IQ plus 310A, Version 5.0

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

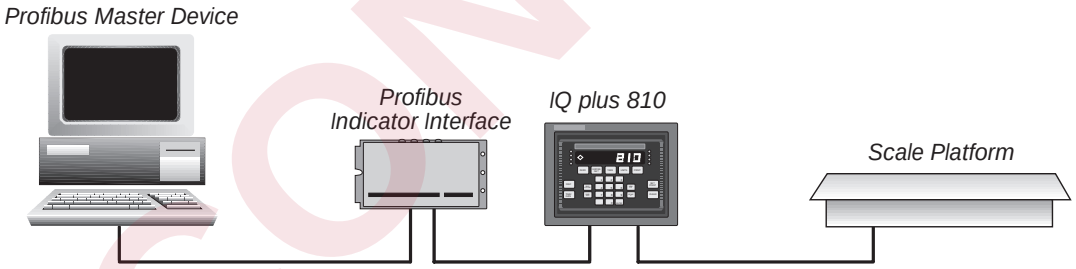
Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at www.rlws.com.

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

1.0 Introduction

The Profibus Indicator Interface provides full control of indicator functions to the PLC programmer and allows indicator weight and status data to be returned to the Profibus DP network. A diskette containing the GSD file used to configure the master device is supplied with the Profibus Indicator Interface (see Section 4.2 on page 16).

The following figure shows an example of the Profibus Indicator Interface used to connect an IQ plus 800/810 indicator to the master device on a Profibus DP network.



The Profibus Indicator Interface supports two sets of commands: 20-bit integer commands and 32-bit floating point commands (see Section 3.0 on page 8). Both sets are designed for use in demand mode: the master device sends a command to the Profibus Indicator Interface to request information from or pass data to the indicator; the indicator responds with weight data, status information, or an acknowledgement that the command was executed.

2.0 Installation

The Profibus Indicator Interface is designed to be mounted on a wall or other vertical surface, with the four status LEDs on top and the cable connections at the bottom. Before mounting the unit, attach the communications cables, select the termination resistance, and set the configuration DIP switches as described in the following sections.

2.1 Physical Connections

Initial setup and configuration of the Profibus Indicator Interface requires opening the Interface enclosure. The enclosure cover uses 16 screws to ensure proper seating of the cover gasket. Use the torquing pattern shown in Figure 2-1 to prevent deformation of the gasket when removing and replacing the cover. Torque screws to 15 in-lb when replacing the cover.

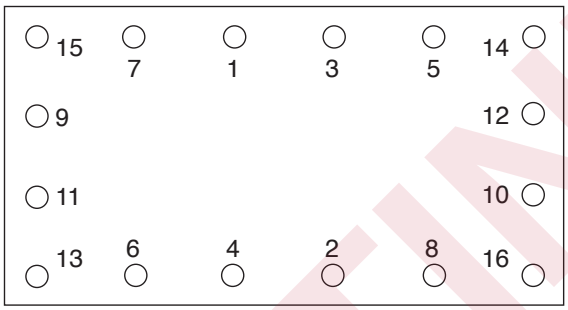


Figure 2-1. Torquing Pattern for Profibus Indicator Interface Enclosure

Figure 2-2 shows the layout of the Profibus Indicator Interface logic board. The following sections describe DIP switch configuration and cable connections to the PLC and indicator.

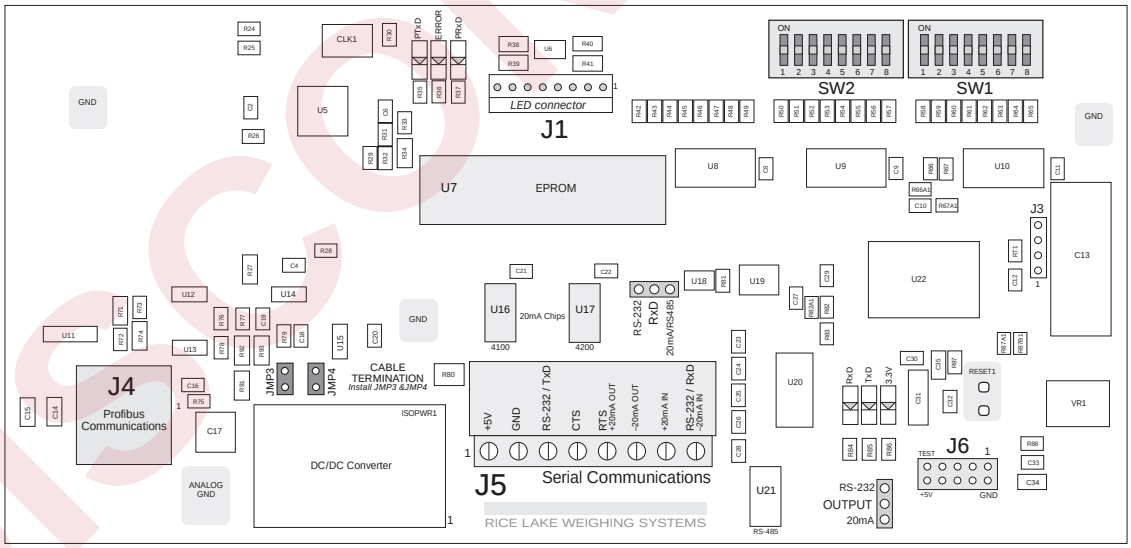


Figure 2-2. Profibus Indicator Interface Logic Board Layout

2.1.1 Serial Communications Jumpers

Two jumpers, labeled *RxD* and *OUTPUT*, determine whether the Profibus Indicator Interface uses RS-232 or 20 mA current loop for serial communications with the indicator. Leave the jumpers in the position shown in Figure 2-4 for RS-232 communications; move both jumpers to the *20mA* position if using the 20 mA current loop option. See Figure 2-2 on page 2 for board location of the jumpers.

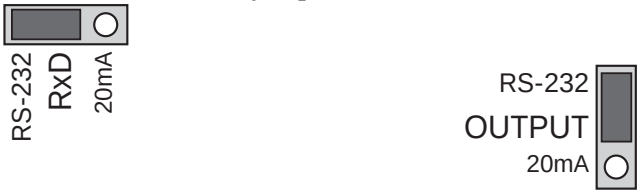


Figure 2-3. RxD and OUTPUT Jumpers, Showing Jumper Positions for RS-232 Communications

2.1.2 Serial Connections

Serial communications connections to the indicator are made at connector J5 on the Profibus board (see Figure 2-2 on page 2 for board location of J5). Figure 2-4 shows the J5 connector layout for the Profibus Indicator Interface. Table 2-1 shows the serial communications connections between the Profibus Indicator Interface and the IQ plus 800/810 indicators; Table 2-2 shows the serial communications connections between the Profibus Indicator Interface and the IQ plus 310A indicators.

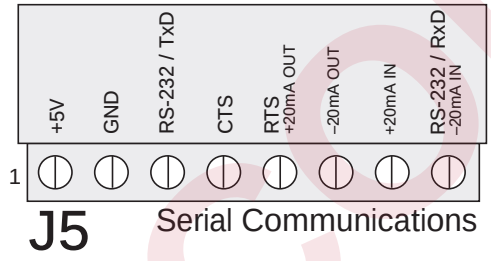


Figure 2-4. Serial Communications Connections

IQ plus 800/810 Indicator		Profibus Indicator Interface	
Pin	Signal	Signal	J5 Pin
J7-11	RS232/TxD	RS232/RxD	8
J7-12	RS232/GND	RS232/GND	2
J7-9	RS232/RxD	RS232/TxD	3
J7-10	–20mA/TxD	–20mA/RxD	8
J7-12	+20mA/TxD	+20mA/RxD	7
J7-8	–20mA/RxD	–20mA/TxD	6
J7-7	+20mA/RxD	+20mA/TxD	5

Table 2-1. IQ plus 800/810 Indicator-to-Profibus Serial Port Pin Assignments

NOTE: The 20 mA current loop interface connection requires that the 20 mA option be installed in both the Profibus Indicator Interface and the IQ plus 800/810. See Section 2.1.5 for information about installing the 20 mA option.

IQ plus 310A Indicator		Profibus Indicator Interface	
Pin	Signal	Signal	J5 Pin
J4-1	RS232/TxD	RS232/RxD	8
J4-2	RS232/GND	RS232/GND	2
J4-3	RS232/RxD	RS232/TxD	3

Table 2-2. IQ plus 310A Indicator-to-Profibus Serial Port Connections

2.1.3 Profibus Network Connections

Connections to the Profibus network are made at connector J4 on the Profibus board (see Figure 2-2 on page 2 for board location of J4). Table 2-3 shows the connections from J4 connector on the Profibus board to the DB-9 Profibus connector.

Profibus Network DB-9 Pin	Signal	Profibus Indicator Interface J4 Connector Pin
1	Shield ground/Earth ground	10
2	*Blank pin*	2
3	Profibus B	3
4	RTS	4
5	Power supply common	5
6	+5V	6
7	*Blank pin*	7
8	Profibus A	8
9	*Blank pin*	9
NC	NC/chassis ground	1
NOTE: If connecting the DB-9 shield ground (pin 1) to J4 pin 10 causes ground loop problems, disconnect.		

Table 2-3. Profibus Network Connections

2.1.4 Bus Termination Jumpers

If the Profibus Indicator Interface is the last device on the network bus, install jumpers JMP3 and JMP4 on the Profibus board (see Figure 2-2 on page 2 for jumper locations).

2.1.5 Installing the 20 mA Current Loop Option

The Profibus Indicator Interface can communicate with IQ plus 800/810 indicators using the 20 mA current loop interface if the option is installed in both the Interface and the indicator. Installing the 20 mA option disables RS-232 communications.

Use the following procedure to install the 20 mA option for the Profibus Indicator Interface:

1. Disconnect Profibus Indicator Interface from power source.
2. Remove enclosure cover.
3. Install 20 mA chips in sockets U16 and U17 on Profibus board (see Figure 2-2 on page 2).
4. Make cable connections to pins 5–8 on connector J5 (see Table 2-1).
5. Replace enclosure cover and tighten screws using torquing pattern shown in Figure 2-1.
6. Reconnect power to Profibus Indicator Interface.

2.2 DIP Switch Configuration

Two banks of DIP switches are used to configure the Profibus Indicator Interface for communication between the indicator and the network. Figure 2-5 shows the switch assignments for SW1–SW3.

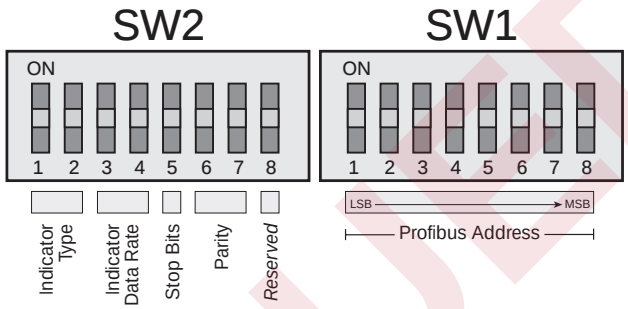


Figure 2-5. DIP Switch Assignments

Profibus Address

Switches SW1-1 through SW1-8 are used to set the address of the Profibus Indicator Interface. Use Table 2-4 to select the correct switch settings for the network address. Note that setting a switch OFF acts as a logical "0" and that SW1-1 represents the least significant bit (LSB) of the network address.

Switch	Decimal Value if Switch=ON
1-1	1
1-2	2
1-3	4
1-4	8
1-5	16
1-6	32
1-7	64
1-8	128

Table 2-4. SW1 Switch Values for Network Addressing

The configured address equals the sum of the values of the switches set on. For example, to set a network address of 19, SW1 switches would be set as shown in Table 2-5:

Switch	ON Value	Switch State	Value
1-1	1	ON	1
1-2	2	ON	2
1-3	4	OFF	0
1-4	8	OFF	0
1-5	16	ON	16
1-6	32	OFF	0
1-7	64	OFF	0
1-8	128	OFF	0
		Sum of ON switch values:	19

Table 2-5. SW1 Example for Network Address 19

For hexadecimal addressing, SW1 functions as shown in Table 2-6. Repeating the example from Table 2-4, decimal 19 is hexadecimal 13: Switch 1-5 (1 in byte 1) and switches 1-2 and 1-1 (2+1 = 3 in byte 0) would be set on for an address of hex 13.

Switch							
1-8	1-7	1-6	1-5	1-4	1-3	1-2	1-1
Byte 1				Byte 0			
8	4	2	1	8	4	2	1
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

Table 2-6. Switch Values for Hexadecimal Addressing

Indicator Type

Switches SW2-1 and SW2-2 set the type of indicator attached to the Profibus Indicator Interface.

Data Rate (bps)	SW2-1	SW2-2
IQ plus 310A	OFF	OFF
IQ plus 800/810	ON	OFF

Table 2-7. Indicator Type Switch Settings

Indicator Data Rate

Switches SW2-3 and SW2-4 set the data rate used for communications between the indicator and the Profibus Indicator Interface. Set to 9600 bps for the IQ plus 310A.

Data Rate (bps)	SW2-3	SW2-4
9600	OFF	OFF
19200	OFF	ON

Table 2-8. Network Data Rate Switch Settings

Stop Bits

Switch SW2-5 sets the number of stop bits used to communicate with the indicator. Set SW2-5 OFF for one stop bit, ON for two stop bits.

Parity

Switches SW2-6 and SW2-7 set the type of parity used to communicate with the indicator.

Parity	SW2-6	SW2-7
NONE	OFF	OFF
EVEN	OFF	ON
ODD	ON	OFF

Table 2-9. Parity Switch Settings

2.3 LED Indicators

2.3.1 External LEDs

Four LEDs on the top of the Profibus Indicator Interface enclosure provide status information for the operator. Table 2-10 summarizes the function of the LEDs. See Section 4.1 on page 15 for more troubleshooting information.

LED	Color	Function	
Power	Red	On when external power applied	
ERROR	Red	System error	
		On when communications between indicator and Profibus Indicator Interface is lost	Check that baud rates configured at Profibus Indicator Interface and at the master are the same Check wiring at J5 connector
RxD	Green	Blinks when data is received from the indicator	May appear to be on steady when indicator is streaming data
TxD	Green	Blinks when data is sent to the indicator	

Table 2-10. Profibus Indicator Interface LED indicators

2.3.2 Onboard LEDs

Two groups of three amber LEDs on the Profibus board itself provide additional diagnostic flexibility:

- LEDs labeled *PTxD*, *ERROR*, and *PRxD* are mounted next to the J1 LED connector
- LEDs labeled *RxD*, *TxD*, and *3.3V* are mounted behind the OUTPUT jumper

Table 2-11 summarizes the function of these LEDs:

LED	Function
PTxD	Profibus communications status. Same functions as backplate LEDs.
ERROR	
PRxD	
RxD	Blinks when data received from indicator. Off indicates no transmission from the indicator to the Profibus Indicator Interface.
TxD	Blinks when data sent to the indicator. Off indicates no transmission from the Profibus Indicator Interface to the indicator.
3.3V	Off indicates possible failure of 3.3V or 5V power supply.

Table 2-11. Onboard Diagnostic LEDs

2.4 Indicator Setup

Indicators communicate with the Profibus Indicator Interface using the indicator EDP port. Both IQ plus 310A and IQ plus 800/810 indicators support RS-232 communications. The IQ plus 800/810 indicators can also use 20 mA current loop communications providing the 20 mA option is installed in both the indicator and the Profibus Indicator Interface.

2.4.1 IQ plus 310A Configuration

Table 2-12 shows the configuration parameters recommended for the IQ plus 310A indicator to communicate with the Profibus Indicator Interface. See the *IQ plus 310A Installation & Service Manual* for detailed information about configuring the indicator.

IQ plus 310A Configuration Settings			Notes
EDP	MODE	DEMAND	Required
	BAUD	9600	Must match DIP switch selection on Profibus Indicator Interface
	BITS	8 NONE	Required
	TERMIN	CR	
	EOL DLY	0 MS	
	FORMAT	REMOTE	
	CASE	UPPER	
	RESPOND	STATUS	
PRINTER	MODE	TICKET	Specify TICKET mode to improve indicator performance
SETUP	KEYBRD	DISABLE	Select to disable front panel (blind operation)
	TARE RS	REGULT	Required
	TARE FN	AUTO	

Table 2-12. IQ plus 310A Configuration Settings

2.4.2 IQ plus 800/810 Configuration

Table 2-13 shows the configuration parameters recommended for the IQ plus 800/810 indicators to communicate with the Profibus Indicator Interface. See the *IQ plus 800/810 Installation Manual* for detailed information about configuring the indicator.

IQ plus 800/810 Configuration Settings				Notes
CONFIG	FEATURE	A/B	ON	A/B FEATURE is enabled at the factory for indicators ordered with the Remote I/O option. If the A/B FEATURE is OFF, call RLWS for information about activating the feature.
SERIAL	EDP	BAUD	9600 or 19200	Must match DIP switch selection on Profibus Indicator Interface
		BITS	8 NONE	Required
		TERMIN	CR	
		EOL DLY	0 MS	
	ABSTRM	OFF		
	STREAM	OFF		

Table 2-13. IQ plus 800/810 Configuration Settings

3.0 Profibus Commands

The Profibus Indicator Interface uses 20-bit integer and 32-bit floating point commands to send and receive data from the indicator. This section describes the input and output data formats, commands, and status bit assignments, and provides examples of 20-bit and 32-bit command usage.

3.1 Integer (20-bit) Commands

3.1.1 Integer Command Formats

Tables 3-1 and 3-2 show the data formats used to send and receive 20-bit integer commands. Bit assignments as follows:

R	Reserved
s00-s08	Status data
cccc cccc	Command number
v00–v19	20-bit integer value

See Table 3-3 on page 9 for a listed of supported commands; see Section 3.3 on page 12 for status bit assignments.

NOTE: 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.

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	R	R	R	R	R	R	R	R	c	c	c	c	c	c	c	c
Word 1	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Word 2	R	R	R	R	R	R	R	R	R	R	R	R	v19	v18	v17	v16
Word 3	v15	v14	v13	v12	v11	v10	v09	v08	v07	v06	v05	v04	v03	v02	v01	v00

Table 3-1. Profibus 20-bit Integer Output Format

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Word 1	s15	s14	s13	s12	s11	s10	s09	s08	s07	s06	s05	s04	s03	s02	s01	s00
Word 2	R	R	R	R	R	R	R	R	R	R	R	R	v19	v18	v17	v16
Word 3	v15	v14	v13	v12	v11	v10	v09	v08	v07	v06	v05	v04	v03	v02	v01	v00

Table 3-2. Profibus 20-bit Integer Input Format

3.1.2 Integer Commands

Table 3-3 lists the integer commands that can be specified for IQ plus 800/810 and IQ plus 310A indicators. Valid commands for each indicator are indicated by a check mark (√). The number representing the indicator command is sent in the lower byte of word 0 (bits 0–7).

Hex	Decimal	Command	800/810	310A
00	00	Display Status	√	√
01	01	Display Channel 0	√	
02	02	Display Channel 1	√	
03	03	Display Channel 2	√	
04	04	Display Channel 3	√	
05	05	Display Channel 4	√	
06	06	Display Gross Weight	√	√
07	07	Display Net Weight	√	√
09	09	Acquire Tare	√	√
0A	10	Primary Units	√	
0B	11	Secondary Units	√	
0C	12	Select Pounds		√
0D	13	Select Kilograms		√
0E	14	Print Request	√	√
10	16	Clear Accumulator, Channel 0	√	
11	17	Clear Accumulator, Channel 1	√	
12	18	Clear Accumulator, Channel 2	√	
13	19	Clear Accumulator, Channel 3	√	
14	20	Clear Accumulator, Channel 4	√	
15	21	Clear Tare	√	√
16	22	Return Gross, Channel 0	√	
17	23	Return Gross, Channel 1	√	√
18	24	Return Gross, Channel 2	√	
19	25	Return Gross, Channel 3	√	
1A	26	Return Gross, Channel 4	√	
1B	27	Return Net, Channel 0	√	
1C	28	Return Net, Channel 1	√	√
1D	29	Return Net, Channel 2	√	
1E	30	Return Net, Channel 3	√	
1F	31	Return Net, Channel 4	√	
20	32	Return Tare, Channel 0	√	
21	33	Return Tare, Channel 1	√	√
22	34	Return Tare, Channel 2	√	
23	35	Return Tare, Channel 3	√	
24	36	Return Tare, Channel 4	√	
25	37	Return Currrent Display	√	√
26	38	Batch Start	√	
28	40	Batch Pause	√	

Table 3-3. IQ plus 800/810 and IQ plus 310A Integer Commands

Hex	Decimal	Command	800/810	310A
29	41	Batch Reset	√	
2A	42	Batch Status	√	
2B	43	Zero	√	√
2C	44	Enter Tare	√	√
2E	46	Return Accumulator, Channel 0	√	
2F	47	Return Accumulator, Channel 1	√	
30	48	Return Accumulator, Channel 2	√	
31	49	Return Accumulator, Channel 3	√	
32	50	Return Accumulator, Channel 4	√	
33	51	Return Rate of Change, Channel 0	√	
34	52	Return Rate of Change, Channel 1	√	
35	53	Return Rate of Change, Channel 2	√	
36	54	Return Rate of Change, Channel 3	√	
37	55	Return Rate of Change, Channel 4	√	
38	56	Return Peak, Channel 0	√	
39	57	Return Peak, Channel 1	√	
3A	58	Return Peak, Channel 2	√	
3B	59	Return Peak, Channel 3	√	
3C	60	Return Peak, Channel 4	√	
3D	61	Push Weight to Accumulator, Channel 0	√	
3E	62	Push Weight to Accumulator, Channel 1	√	
3F	63	Push Weight to Accumulator, Channel 2	√	
40	64	Push Weight to Accumulator, Channel 3	√	
41	65	Push Weight to Accumulator, Channel 4	√	
42	66	Lock Indicator Front Panel	√	
43	67	Unlock Indicator Front Panel	√	
44	68	Set Digital Output ON	√	
45	69	Set Digital Output OFF	√	

Table 3-3. IQ plus 800/810 and IQ plus 310A Integer Commands (Continued)

3.2 Floating Point (32-bit) Commands

Tables 3-4 and 3-5 show the data formats used to send and receive 32-bit floating point commands. Bit assignments are as follows:

R	Reserved
s00-s08	Status data
n00-n07	Channel number or setpoint number
c cccc cccc	Command number
v00–v31	32-bit floating point value

See Table 3-6 on page 12 for a list of supported commands; see Section 3.3 on page 12 for status bit assignments.

NOTE: Floating point commands support decimal point information with no special handling.

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	R	R	R	R	R	R	R	c	c	c	c	c	c	c	c	c
Word 1	R	R	R	R	R	R	R	R	n07	n06	n05	n04	n03	n02	n01	n00
Word 2	v31	v30	v29	v28	v27	v26	v25	v24	v03	v22	v21	v20	v19	v18	v17	v16
Word 3	v15	v14	v13	v12	v11	v10	v09	v08	v07	v06	v05	v04	v03	v02	v01	v00

Table 3-4. Profibus 32-bit Floating Point Output Format

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	R	R	R	R	R	R	R	c	c	c	c	c	c	c	c	c
Word 1	s15	s14	s13	s12	s11	s10	s09	s08	s07	s06	s05	s04	s03	s02	s01	s00
Word 2	v31	v30	v29	v28	v27	v26	v25	v24	v03	v22	v21	v20	v19	v18	v17	v16
Word 3	v15	v14	v13	v12	v11	v10	v09	v08	v07	v06	v05	v04	v03	v02	v01	v00

Table 3-5. Profibus 32-bit Floating Point Input Format

3.2.1 Floating Point Commands

Table 3-6 lists the floating point commands that can be specified for IQ plus 800/810 and IQ plus 310A indicators. Valid commands for each indicator are indicated by a check mark (√). The number representing the indicator command is sent in word 0 (bits 0–8).

Hex	Decimal	Command	800/810	310A
101	257	Set Tare	√	√
102	258	Read Tare	√	√
103	259	Read Accumulator	√	
104	260	Read Gross	√	√
105	261	Read Net	√	√
106	262	Set Setpoint Value	√	
107	263	Set Setpoint Hysteresis	√	
108	264	Set Setpoint Bandwidth	√	
109	265	Set Setpoint Preact	√	
10A	266	Read Setpoint Value	√	
10B	267	Read Setpoint Hysteresis	√	
10C	268	Read Setpoint Bandwidth	√	
10D	269	Read Setpoint Preact	√	
10E	270	Set Batching State	√	

Table 3-6. IQ plus 800/810 and IQ plus 310A Floating Point Commands

3.3 Status Data

Table 3-7 shows the remote function status data format; Table 3-8 shows the batch status data format. The batch status format is used in response to command 42 (hex 2A), Batch Status.

Bit	Status Data	
	Value=0	Value=1
s00	No Error	Error
s01	Tare not entered	Tare entered
s02	Not zero	Center of zero
s03	Weight OK	Weight invalid
s04	Standstill	In motion
s05	Primary units	Secondary units
s06	Tare not acquired	Tare acquired
s07	Gross weight	Net weight
s08	Channel 0 or 1	Channel 2, 3, or 4
s09	*Not used*	
s10		
s11	Positive weight	Negative weight
s12	*Not used*	
s13		
s14		
s15		

Table 3-7. Run Status Word Format

Bit	Status Data	
	Value=0	Value=1
s00	No Error	Error
s01	DIGIN 3 = OFF	DIGIN 3 = ON
s02	DIGIN 2 = OFF	DIGIN 2 = ON
s03	DIGIN 1 = OFF	DIGIN 1 = ON
s04	Batch paused	Batch not paused
s05	Batch running	Batch not running
s06	Batch not stopped	Batch stopped
s07	*Not used*	
s08		
s09		
s10		
s11		
s12		
s13		
s14		
s15		

Table 3-8. Batch Status Word Format

3.4 Command Examples

This section provides examples of 20-bit integer and 32-bit floating point commands used to send and receive indicator data.

3.4.1 Retrieve Net Weight Data (20-bit)

Table 3-9 shows a binary representation of the 20-bit output data used to retrieve net weight from the indicator using command 28. The output format includes only the command number, in byte 0 of word 0 (0001 1100 = hex 1C, decimal 28).

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	R	R	R	R	R	R	R	R	0	0	0	1	1	1	0	0
Word 1	*Not used*															
Word 2	*Not used*															
Word 3	*Not used*															

Table 3-9. 20-bit Integer Output to Send Command 28, Return Net Weight, Channel 1

Table 3-10 shows the input data returned by the previous command:

- The status bits in word 1 (see Section 3.3 on page 12) show that a tare has been performed and the indicator is in net mode.
- Weight data is returned in word 3 (0000 0111 1101 0101 = hex 07D5 = decimal 2005). Assuming the indicator is configured to display pounds, with one decimal position, the net weight is interpreted as 200.5 LB.

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Word 1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
Word 2	R	R	R	R	R	R	R	R	0	0	0	0	0	0	0	0
Word 3	0	0	0	0	0	1	1	1	1	1	0	1	0	1	0	1

Table 3-10. 20-bit Integer Input with Returned Net Weight Data

3.4.2 Retrieve Net Weight Data (32-bit)

Table 3-11 shows a binary representation of the 32-bit output data used to retrieve net weight from channel 2 of an IQ plus 800/810using command 261. The output format includes the command number, in byte 0 of word 0 (0001 0001 1100 = hex 105, decimal 261), the channel number (0100, decimal 2) in the lower byte of word 1.

	Byte 1								Byte 0							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1
Word 1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Word 2	*Not used*															
Word 3	*Not used*															

Table 3-11. 32-bit Floating Point Output to Send Command 261, Read Net Weight

Table 3-12 shows the input data returned by the previous command:

- The command number for which the data is returned is included in word 0 (command 261).
- The status bits in word 1 (see Section 3.3 on page 12) show that a tare has been performed and the indicator is in net mode.
- Weight data returned in words 2 and 3 must be copied into a floating point storage location before being read.

Bit	Byte 1								Byte 0							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Word 0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1
Word 1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
Word 2	0	1	0	0	0	0	1	1	1	1	1	1	1	0	1	0
Word 3	1	1	0	1	1	0	0	1	1	0	0	1	1	0	1	0

Table 3-12. 32-bit Floating Point Input with Returned Net Weight Data

3.4.3 Send Setpoint Value (32-bit)

Table 3-13 shows a decimal representation of the 32-bit output data used to set the value of setpoint 1 to 100.5. Note that the setpoint value is not readable as 100.5: The value data must be copied to words 2 and 3 from a floating point storage location.

After sending the command, use the Read Setpoint Value command (decimal 266) to verify that the indicator received the correct setpoint value.

Word	Value (Decimal)	Description
0	262	Command number
1	1	Setpoint number
2	17097	Setpoint value (MSW)
3	0	Setpoint value (LSW)

Table 3-13. 32-bit Floating Point Output to Send Command 262, Send Setpoint Value

3.4.4 Read Setpoint Value (32-bit)

Table 3-14 shows the output data used to read the value of setpoint 1.

Word	Value (Decimal)	Description
0	262	Command number
1	1	Setpoint number
2	0	*Not used*
3	0	*Not used*

Table 3-14. 32-bit Floating Point Output to Send Command 266, Read Setpoint Value

Table 3-15 shows the data returned by the previous command. Again, the value data returned in words 2 and 3 must be copied into a floating point storage location to be read.

Word	Value (Decimal)	Description
0	266	Command number
1	0	*Not used*
2	17097	Setpoint value (MSW)
3	0	Setpoint value (LSW)

Table 3-15. 32-bit Floating Point Input with Returned Setpoint Value Data

4.0 Appendix

4.1 Troubleshooting

The following section provides information for diagnosing communications problems between the indicator and the Profibus master. The status of the LEDs on the Profibus Indicator Interface can be used to diagnose the general area of difficulty, as shown in Table 4-1.

Symptom	Possible Cause
POWER LED not lit	No power to Profibus board. Ensure connector J6 on the Profibus board is properly seated.
RxD LED flashes constantly; TxD LED not lit	Indicator is streaming data to the Profibus slave. Check indicator configuration. See Section 2.4 on page 7 for indicator configuration information.
TxD LED flashes every two seconds; RxD LED not lit	Serial connection between the indicator and the Profibus Indicator Interface is not correct. See Section 2.4 on page 7 for indicator configuration information.

Table 4-1. Troubleshooting Symptoms Indicated by LEDs

If there is no communication between the indicator and the master device, do the following:

1. Ensure DIP switches on the Profibus board are set correctly (see Section 2.2 on page 4).
2. Power down,then power up the Profibus Indicator Interface.
3. Ensure the Profibus master device is set to send a command to the slave. Commands are listed in Section 3.0 on page 8.
4. Check the *OUTPUT* and *RxD* jumpers to ensure they are set for RS-232 communications (see Section 2.1.1 on page 3).
5. Check the wiring from the indicator to connector J5 on the Profibus board (see Section 2.1.2 on page 3).
6. Ensure the indicator configuration is correct.
7. Check that the master is set up correctly to communicate with the slave device.
8. On the Profibus board, ensure that the 3.3V LED is lit. If it is not, check connector J6 for a loose or incorrect connection (see Figure 2-2 on page 2). If the LED is still not lit, replace the Profibus Indicator Interface power supply.
9. Locate EPROM U7 found in the middle of the Profibus board (see Figure 2-2 on page 2). Ensure that the chip is seated by pressing down on the chip.
10. Check that the connector J4 on the Profibus board is firmly connected.
11. If no problems are found in the checks above, replace the Profibus board.

4.2 Profibus Indicator Interface GSD File

```
;=================================================================
; GSD-File for Profibus Indicator Interface
; Rice Lake Weighing Systems
;
;           Version V0.3
;
; Date    : 01.02.2000
; File    : RLWS088C.GSD
;=================================================================
#Profibus_DP

; <Unit-Definition-List>
GSD_Revision        = 1    ; Needed to tell that this file works with text readers.
Vendor_Name         = "Rice Lake Weighing Systems    "; Used to tell whose file this is.
Model_Name          = "Profibus Indicator Interface  "; Tells what is supported by this
file.
Revision            = "V1.1                          "; Tells what version GSD file this is.
Ident_Number        = 0x088B; Seperates one manufacturers different part numbers.
Protocol_Ident      = 0    ; Profibus DP protocol
Station_Type        = 0    ; This is a slave device
FMS_supp            = 0    ; No FMS support
Hardware_Release= "Rev B  "; Tells that this works with hardware Rev B, not required.
Software_Release= "Rev1.00"; Tells that this file works with Software release 1.00, not
                             required.
9.6_supp            = 1    ; These baud rates with a "1" are supported, "0" is not
19.2_supp           = 1
93.75_supp          = 1
187.5_supp          = 1
500_supp            = 1
45.45_supp          = 1
1.5M_supp           = 1
3M_supp             = 1
6M_supp             = 1
12M_supp            = 1
MaxTsdr_9.6         = 60   ; This is the time delay needed after a message is sent.
MaxTsdr_19.2        = 60
MaxTsdr_93.75       = 60
MaxTsdr_187.5       = 60
MaxTsdr_500         = 100
MaxTsdr_45.45       = 120
MaxTsdr_1.5M        = 150
MaxTsdr_3M          = 250
MaxTsdr_6M          = 450
MaxTsdr_12M         = 800
Redundancy          = 0    ; Redundancy not supported
Repeater_Ctrl_Sig   = 2    ; Repeater control signal TTL RTS (2) not connected (0).
24V_Pins            = 0    ; 24 V pins not connected.
Implementation_Type ="SPC3"; Slave-Specification:
Freeze_Mode_supp    =0     ; Freeze mode is not supported.
Sync_Mode_Supp      = 0    ; Sync-mode is not supported.
Auto_Baud_supp      = 1    ; Auto baud rate detection supported.
Set_Slave_Add_Supp  = 0    ; Supports function Set_Slave Add
Min_Slave_Intervall = 100  ; Sets the value (multiples of 100us) between two slave poll
                             cycles of the same slave
Modular_Station     = 1    ; Indicates that this is a modular device (device can be set up
                             multiple ways.)
Max_Module          = 1    ; indicates the number of ways -1 that this can be set up.
Max_Input_Len       = 128  ; Indicates the max number of bytes of a modular station.
Max_Output_Len      = 128  ; Indicates the maximum number of output bytes of a modular
                             station.
Max_Data_Len        = 256  ; Indicates the maximum number of data transferred in bytes to or
from the device.
; Unit_Diag_Bit(0)  =      ; Usable to indicate status or error messages (bitwise).

Fail_Safe           = 0;1  ; Tells if fail safe mode is supported (1) or not (0).
; Max_Diag_Data_Len= 29
Modul_Offset        = 0    ; Tells how many to add to "module" number for module numbers.
Slave_Family        = 3@TdF@OTHER; USED BY COM PROFIBUS TO SET UP IN SLAVE MODULES MENU

; Below useable for RS485 Adresses?
```

```
; UserPrmData: Length and Preset:
; User_Prm_Data_Len = 0
; User_Prm_Data     = 0x40,0x60,0x00
; Max_User_Prm_Data_Len=171


; <Module-Definition-List>
; FixPresetModules  =1
Module                    = "4 words I/O consistent" 0xD3,0xE3
1
; Preset                  = 1
EndModule
```

4.3 Profibus Indicator Interface Specifications

Electrical Specifications

Voltage: 115 or 230 VAC (–10%/+15%)

Frequency: 50 or 60 Hz

Fusing: Two fast-acting 250 mA @ 250V subminiature fuses for 115 VAC operation

Two fast-acting 125 mA @ 250V subminiature fuses for 230 VAC operation

Communications Specifications

Profibus Network Communications:

Twinaxial cable attachment to Profibus network

Serial Communications:

Interface: RS-232C, 20mA current loop (optional)

Data rate: 9600 or 19.2 Kbps

ASCII encoding: 1 start bit, 8 data bits, 1 stop bit

Environmental Specifications

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

Dimensions

See diagrams below:

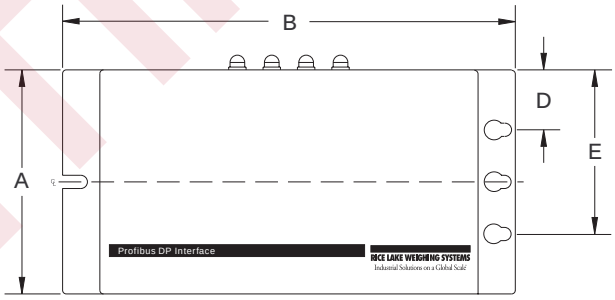
A: 4.88” (123.9 mm)

B: 9.88” (250.9 mm)

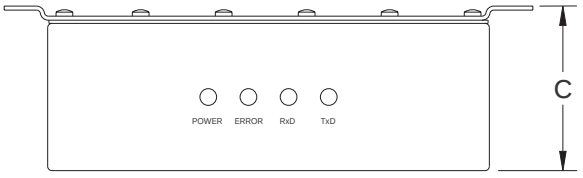
C: 3.13” (79.5 mm)

D: 1.19” (30.2 mm)

E: 3.70” (93.9 mm)



FRONT VIEW



TOP VIEW

Profibus Indicator Interface Limited Warranty

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'S 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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