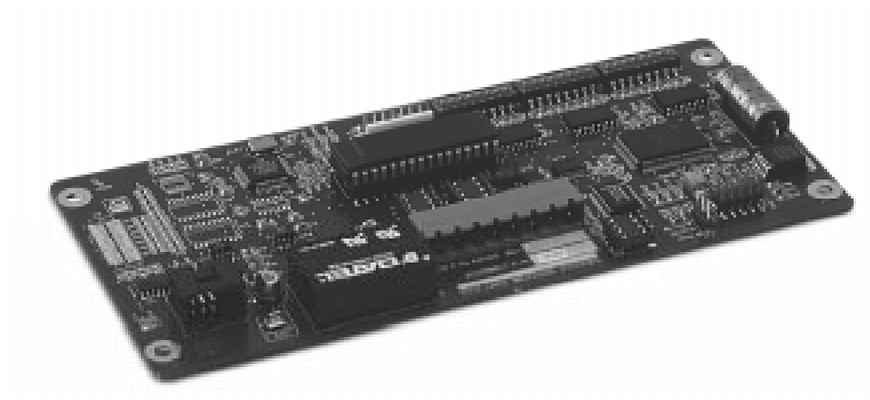
Profibus® DP

Indicator Interface for IQ plus® 510 and IQ plus® 710 Indicators

Version 1.0

Installation and Programming Manual



RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

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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 510/710 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.

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

This manual applies to the following software versions:

- Profibus Indicator Interface, Version 1.0
- IQ plus 510, Version 2.0
- IQ plus 710, Version 2.0

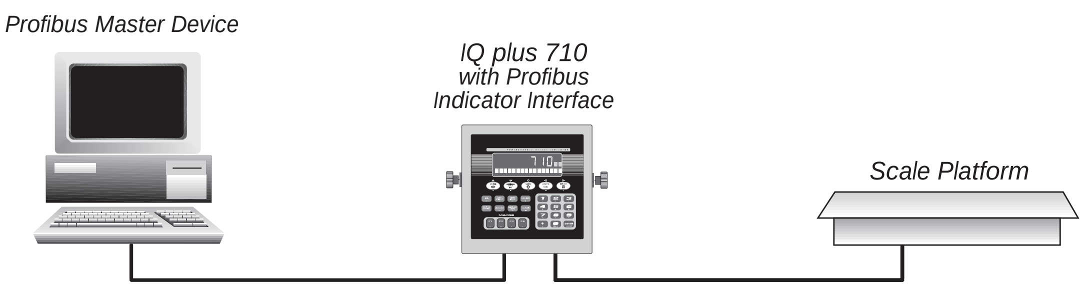
Warning *Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.*

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

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 17).

The following figure shows an example of the Profibus Indicator Interface used to connect an IQ plus 710 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 10). 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

This section describes the procedures used to install the Profibus Indicator Interface board into IQ plus 510/710 indicators, connect communications cables, and set the configuration DIP switches for the Profibus Indicator Interface.

Section 2.1 describes the procedure for replacing the standard IQ plus 510/710 backplate and installing the Profibus board inside the indicator enclosure. Section 2.2 on page 5 describes cabling for units with the Profibus board already installed.

2.1 Installing the Profibus Indicator Interface

To install the Profibus Indicator Interface board into the IQ plus 510/710 indicators, do the following:

2.1.1 Replace Backplate

1. Ensure power to the indicator is disconnected, then place the indicator face-down on an antistatic work mat. Remove the screws that hold the backplate to the enclosure body. Loosen cord grips then lift the backplate away from the enclosure and set it aside.

Caution

- *Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.*
- *IQ plus 510/710 indicators use double pole/neutral fusing which could create an electric shock hazard. Procedures requiring work inside the indicator must be performed by qualified service personnel only.*
- *The supply cord serves as the power disconnect for the IQ plus 510/710. The power outlet supplying the indicator must be installed near the unit and be easily accessible*

2. Disconnect and remove any load cell, serial communications, and digital I/O cabling through the indicator backplate.
3. Disconnect power cord ground wire from enclosure ground stud, then disconnect ground wire from backplate. Cut cable tie that secures the line filter input wires to the inside of the indicator enclosure and remove power cord.
4. Remove cord grips from original backplate and reinstall in Profibus Indicator Interface backplate.
5. Route power cord, load cell, digital I/O, and communications cables through cord grips in Profibus Indicator Interface backplate.
6. Reconnect power cord wires to the line filter. Use a cable tie to secure the line filter wires to the cable tie mount. Reconnect backplate and power cord ground wires to enclosure ground stud.
7. Reconnect load cell, digital I/O, and communications cables to the appropriate connectors on the indicator CPU board.

2.1.2 Install Profibus Indicator Interface Board

8. Use the four 6-32NC kep nuts supplied to mount the three brackets as shown in Figure 2-3 on page 4.
9. Attach three cable tie mounts to the inside of the indicator enclosure.
10. Use cable ties to secure cable from the backplate LED annunciators to the Profibus Indicator Interface board. Allow enough slack in the wires to reach the location of connector J1 (see Figure 2-3 on page 4).
11. Remove connector J4 from the header on the indicator CPU board. Connect serial communications wires to the connector as shown in Table 2-1 and in Figure 2-3, then reinstall J4 on the indicator board.
12. Plug 10-pin ribbon cable into connector J15 on the indicator CPU board as shown in Figure 2-3. Ensure connector is oriented as shown in the drawing, with red wire of ribbon cable toward center of board.
13. Use the four 6-32NC x 1/4 machine screws supplied to mount the Profibus Indicator Interface board on the brackets as shown in Figure 2-3.

2.1.3 Connect Cables to Profibus Indicator Interface

14. Connect serial communications wires from the indicator J4 (or J12) serial connector to the J5 connector on the Profibus Indicator Interface board (see Table 2-1 below and Figure 2-6 on page 6).

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 2-1. Indicator-to-Profibus Serial Port Pin Assignments

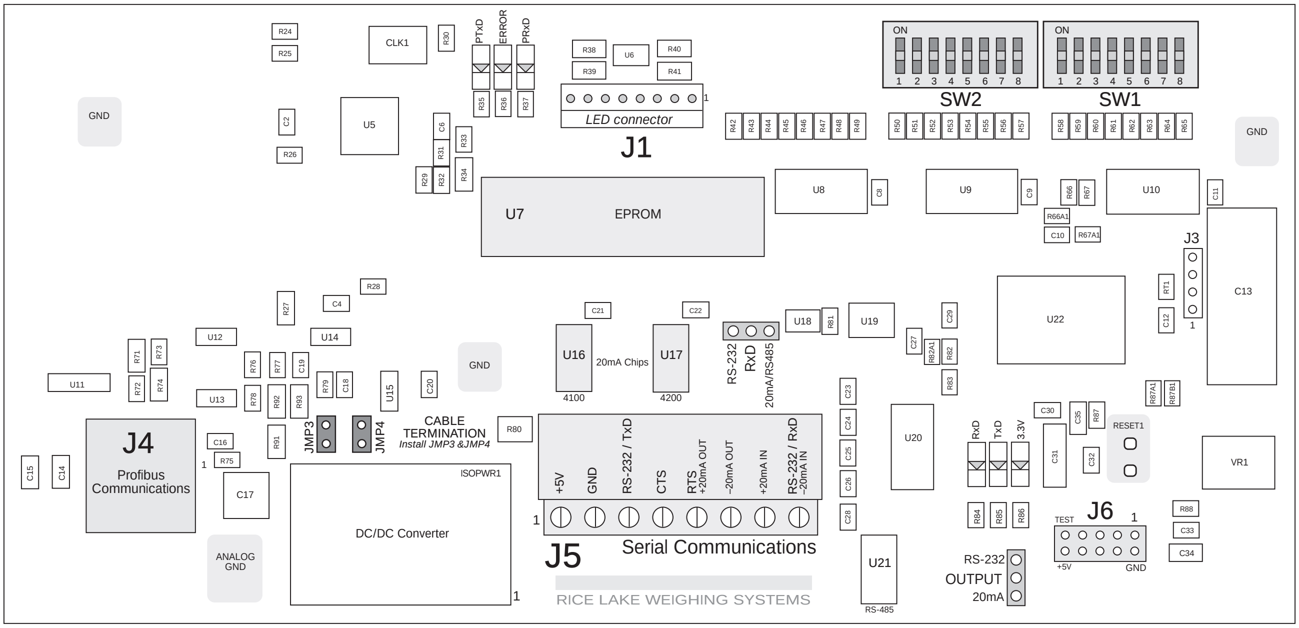


Figure 2-1. Profibus Indicator Interface Board

15. Set serial communications jumpers for RS-232 operation (see Section 2.2.2 on page 6).
16. Plug power supply ribbon cable connector from J15 on the indicator CPU board into connector J6 on the Profibus Indicator Interface board. Ensure cable is oriented as shown in Figure 2-3, with red wire of ribbon cable attached at pin 1 on the Profibus board.
17. Plug LED annunciator cable pairs into connector J1 on the Profibus board as shown in Table 2-2.

LED	J1 Pins*
TxD	1, 2
RxD	3, 4
ERROR	5, 6
Power	7, 8
*Connect black wire of each pair to the even-numbered pin.	

Table 2-2. LED Connections to J1

18. Feed Profibus network cable through cord grip. Allow enough cable for routing along inside of enclosure to J4 connector on the Profibus Indicator Interface board. Connect Profibus network cables into connector J4 on the Profibus board as described in Section 2.2.4 on page 6.
19. Use three cable ties to secure the LED and Profibus network cables to the cable tie mounts attached in step 9.
20. Set DIP switches as described in Section 2.3 on page 6.
21. If the interface is the last device on the network bus, install termination jumpers JMP3 and JMP4 (see Figure 2-1).

2.1.4 Reassemble Enclosure

22. Position the backplate over the enclosure and reinstall the backplate screws. Use the torque pattern shown in Figure 2-2 to prevent distorting the backplate gasket. Torque screws to 15 in-lb (1.7 N-m).

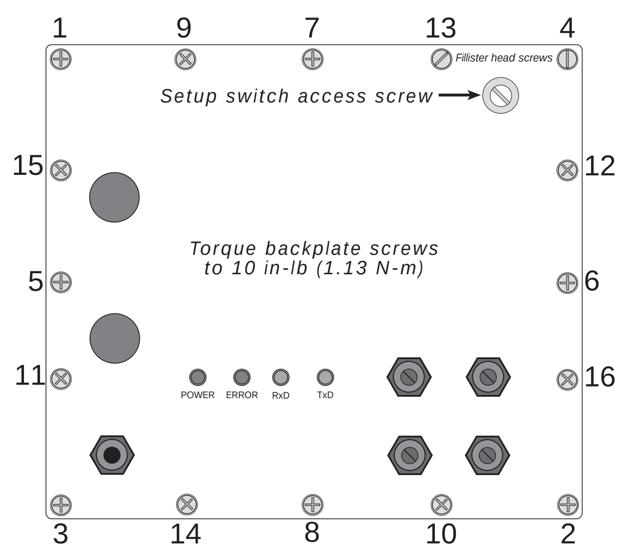


Figure 2-2. IQ plus 510/710 / Profibus Backplate

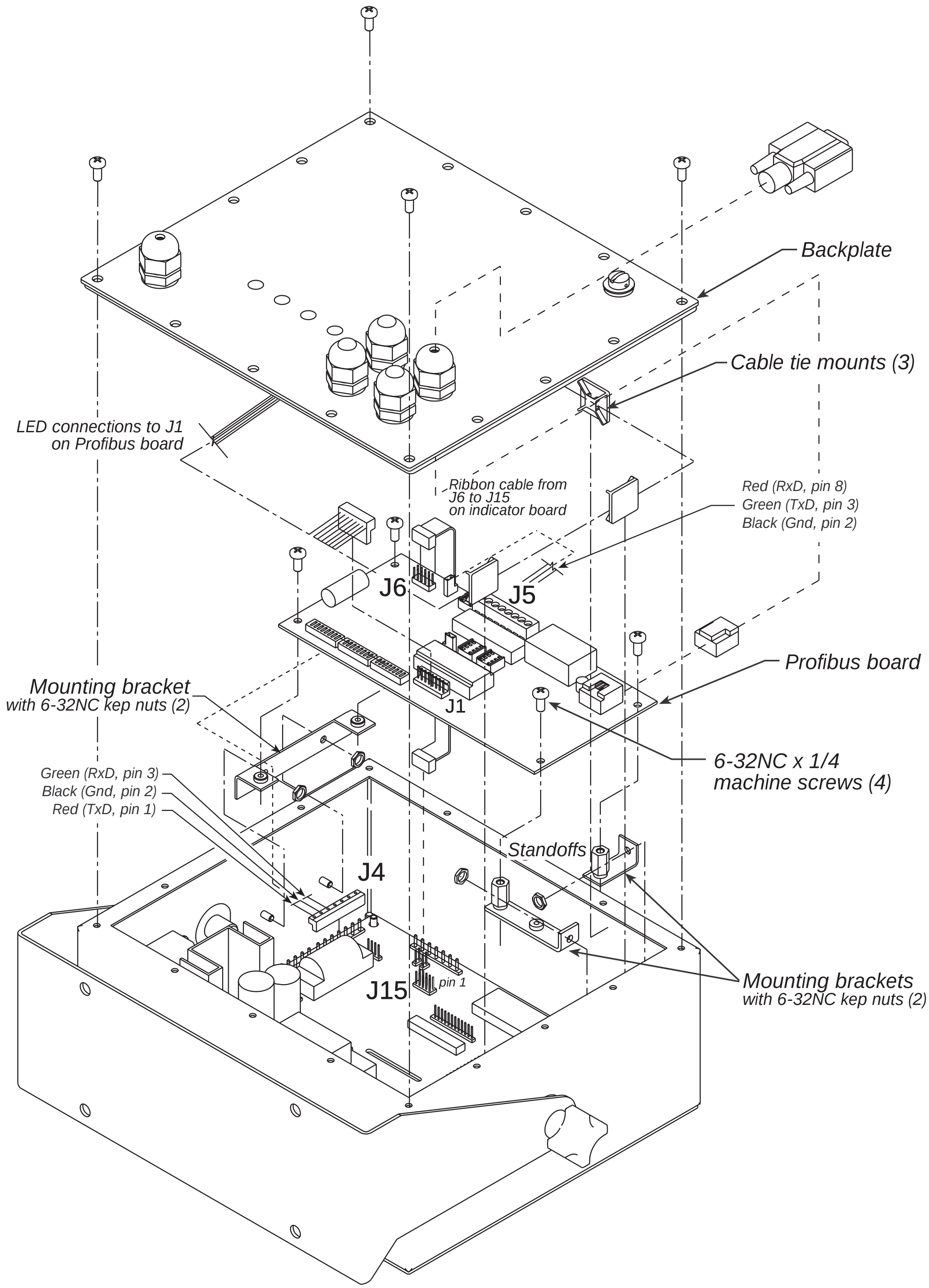


Figure 2-3. Profibus Indicator Interface Board Installation and Wiring

2.2 Physical Connections for Installed Boards

Use the following procedure when connecting cables to a Profibus board already installed in the indicator.

The indicator enclosure must be opened to connect cables and set DIP switches for the Profibus Indicator Interface. Ensure power to the indicator is disconnected, then place the indicator face-down on an antistatic work mat. Remove the screws that hold the backplate to the enclosure body, then lift the backplate away from the enclosure and set it aside.

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

The Profibus board (see Figure 2-1) is mounted on brackets above the indicator CPU board. Connections between the two boards are as follows:

- Power supply ribbon cable from connector J15 on the indicator CPU/power supply board (see Figure 2-4 on page 5) to connector J6 on the Profibus board.
- Serial communications wiring from the indicator EDP port on connector J4 to connector J5 on the Profibus board.

Once wiring and DIP switch configuration (see Section 2.3 on page 6) are complete, position the backplate over the indicator enclosure and reinstall the backplate screws. Use the torque pattern shown in Figure 2-2 on page 3 to prevent distorting the backplate gasket. Torque screws to 10 in-lb (1.13 N-m).

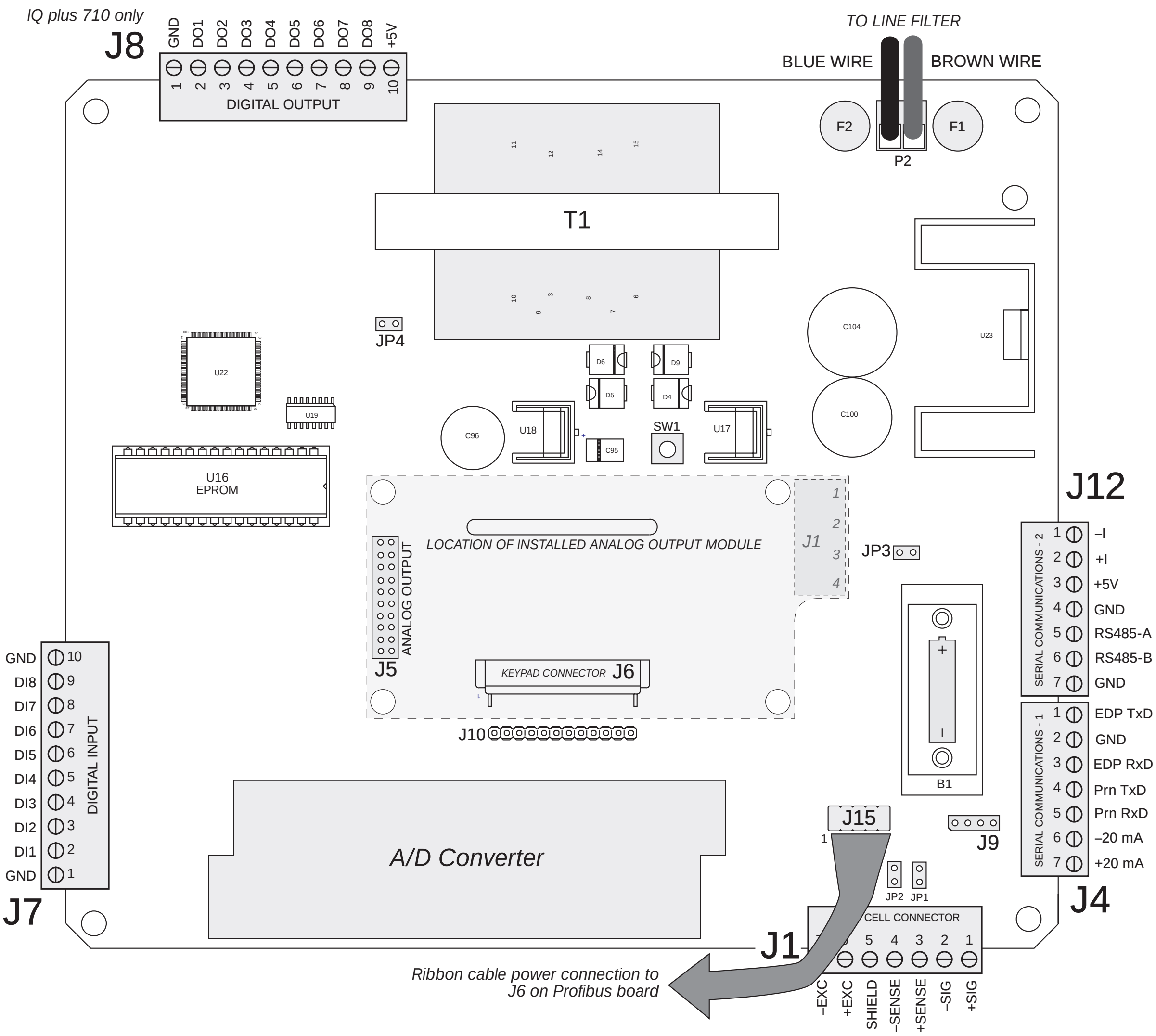


Figure 2-4. IQ plus 510/710 CPU and Power Supply Board

2.2.1 Power Connections

Power to the Profibus Indicator Interface is supplied by the indicator, using a ribbon cable attached from connector J15 on the indicator to connector J6 on the Profibus board. Note that the red wire strand of the ribbon cable must connect pin 1 at each connector.

2.2.2 Serial Communications Jumpers

Two jumpers, labeled *RxD* and *OUTPUT*, determine whether the Profibus Indicator Interface uses RS-232 or 20 mA current loop (available as an option for IQ plus 800/810 indicators only) for serial communications with the indicator. Leave the jumpers in the position shown in Figure 2-5 for RS-232 communications. See Figure 2-1 on page 3 for board location of the jumpers.

Figure 2-5. RxD and OUTPUT Jumpers, Showing Jumper Positions for RS-232 Communications

2.2.3 Serial Connections

Serial communications connections to the indicator are made at connector J5 on the Profibus board (see Figure 2-1 on page 3 for board location of J5). Figure 2-6 shows the J5 connector layout for the Profibus Indicator Interface. Table 2-1 on page 2 shows the serial communications connections between the Profibus Indicator Interface and the IQ plus 510/710 indicators.

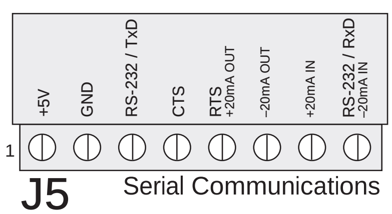


Figure 2-6. Serial Communications Connections

2.2.4 Profibus Network Connections

Connections to the Profibus network are made at connector J4 on the Profibus board (see Figure 2-1 on page 3 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

2.2.5 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 2-1 on page 3 for jumper locations).

2.3 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 2-7 shows the switch assignments for SW1–SW3.

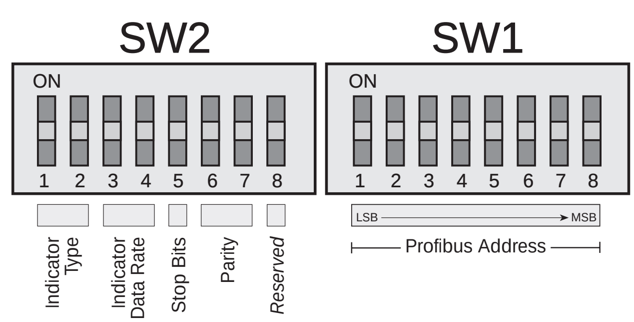


Figure 2-7. DIP Switch Assignments

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. Set SW2-1 OFF and SW2-2 ON for IQ plus 510/710 indicators.

Indicator Data Rate

Switches SW2-3 and SW2-4 set the data rate used for communications between the indicator and the Profibus Indicator Interface.

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

Table 2-7. 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 2-8. Parity Switch Settings

2.4 LED Indicators

2.4.1 Backplate LEDs

Four LEDs on the IQ plus 510/710 backplate provide status information for the operator (see Figure 2-2 on page 3). Table 2-9 summarizes the function of the LEDs. See Section 4.1 on page 16 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 2-9. Profibus Indicator Interface LED indicators

2.4.2 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 2-10 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 2-10. Onboard Diagnostic LEDs

2.5 Indicator Setup

The IQ plus 510/710 indicators communicate with the Profibus Indicator Interface board using RS-232 communications with the indicator EDP port.

Table 2-11 shows the SERIAL menu configuration parameters recommended for the IQ plus 510/710 indicators to communicate with the Profibus Indicator Interface. See the indicator *Installation Manual* for detailed configuration information.

Indicator Configuration Settings			Notes
EDP or PRN	BAUD	9600 or 19200	Must match DIP switch selection on Profibus Indicator Interface
	BITS	8 NONE	
	TERMIN	CR	
	EOL DLY	0	Required
	HANDSHK	OFF	
	ADDRESS	0	
	BUS	ON	Required. For indicators running Version 1.x software, set the AB-RIO parameter ON.
	STREAM	OFF	Required

Table 2-11. IQ plus 510/710 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 and commands, 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 11 for a list of supported commands; see Section 3.3 on page 13 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 510 and IQ plus 710 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	510	710
00	00	Display Status	√	√
06	06	Display Gross Weight	√	√
07	07	Display Net Weight	√	√
09	09	Acquire Tare	√	√
0A	10	Primary Units	√	√
0B	11	Secondary Units	√	√
0E	14	Print Request	√	√
11	17	Clear Accumulator		√
15	21	Clear Tare	√	√
17	23	Return Gross	√	√
1C	28	Return Net	√	√
21	33	Return Tare	√	√
25	37	Return Currrent Display	√	√
26	38	Batch Start		√
28	40	Batch Pause		√
29	41	Batch Reset		√
2A	42	Batch Status		√
2B	43	Zero	√	√
2C	44	Enter Tare	√	√
2F	47	Return Accumulator		√
3E	62	Push Weight to Accumulator		√
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 510/710 Integer Commands

3.2 Floating Point (32-bit) Commands

3.2.1 Floating Point Command Formats

Tables 3-4 and 3-5 show the data formats used to send and receive 32-bit floating point commands. Bit assignments 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 13 for a list of supported commands; see Section 3.3 on page 13 for status bit assignments.

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

Bit	Byte 1								Byte 0							
	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

Bit	Byte 1								Byte 0							
	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

3.2.2 Floating Point Commands

Table 3-6 lists the integer commands that can be specified for IQ plus 510 and IQ plus 710 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	510	710
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 510/710 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

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

- The status bits in word 1 (see Section 3.3 on page 13) 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 the indicator using command 261. The output format includes only the command number, in byte 0 of word 0 (0001 0001 1100 = hex 105, decimal 261).

	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	*Not used*															
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 13) 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 2.5 on page 9 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 2.5 on page 9 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 2.3 on page 6).
2. Power down,then power up the indicator.
3. Ensure the Profibus master device is set to send a command to the slave. Commands are listed in Section 3.0 on page 10.
4. Check the *OUTPUT* and *RxD* jumpers to ensure they are set for RS-232 communications (see Section 2.2.2 on page 6).
5. Check the wiring from connector J4 on the indicator board to connector J5 on the Profibus board (see Section 2.1.3 on page 2).
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 connectors J6 on the Profibus board and J15 on the indicator board for loose or incorrect connections (see Figure 2-1 on page 3 and Figure 2-4 on page 5). If the LED is still not lit, the indicator power supply may be bad.
9. Locate EPROM U7 found in the middle of the Profibus board (see Figure 2-1 on page 3). 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

Power Requirement

5 VDC, 250 mA, provided by indicator power supply

Communications Specifications

Profibus Network Communications:

Twinaxial cable attachment to Profibus network

Serial Communications:

Interface: RS-232C

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)

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.

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