

# 882IS IO Module

*For Intrinsically Safe Systems*

## Installation Manual



An ISO 9001 registered company  
© Rice Lake Weighing Systems. All rights reserved.

Rice Lake Weighing Systems® is a registered trademark of  
Rice Lake Weighing Systems.

All other brand or product names within this publication are trademarks or  
registered trademarks of their respective companies.

All information contained within this publication is, to the best of our knowledge, complete and  
accurate at the time of publication. Rice Lake Weighing Systems reserves the right to make  
changes to the technology, features, specifications and design of the equipment without notice.

The most current version of this publication, software, firmware and all other product  
updates can be found on our website:

[www.ricelake.com](http://www.ricelake.com)

# Contents

<b>1.0 Introduction</b> .....	<b>1</b>
1.1 Overview .....	1
1.2 Safety .....	1
<b>2.0 Installation</b> .....	<b>2</b>
2.1 Unpacking .....	2
2.2 Open the IO Module .....	2
2.3 AC Wiring .....	2
2.4 RS-232/RS-422 Communications (Port 1) .....	2
2.5 USB Device Communications – (Port 2) .....	3
2.6 Ethernet Communications .....	3
2.7 Connecting the Fiber Optic Board to the IO Module .....	4
2.8 IO Module CPU Board .....	5
2.9 Fiber Optics Assembly .....	6
2.10 Board Replacement .....	6
2.11 IO Module Mounting .....	7
2.12 Battery Replacement .....	7
2.13 Replacement Parts .....	8
<b>3.0 Configuration</b> .....	<b>10</b>
3.1 Updating the IO Module Firmware .....	10
<b>4.0 Specifications</b> .....	<b>11</b>



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at [www.ricelake.com/training](http://www.ricelake.com/training) or obtained by calling 715-234-9171 and asking for the training department.



*Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit [www.ricelake.com/webinars](http://www.ricelake.com/webinars)*

# 1.0 Introduction

This manual is intended for use by service technicians responsible for installing and servicing the 882IS IO Module.



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

**Improper specification, installation, or service of this equipment could result in personal injury or property damage.**



Manuals and additional resources are available from the Rice Lake Weighing Systems website at [www.ricelake.com](http://www.ricelake.com)

Warranty information can be found on the website at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

## 1.1 Overview

The 882IS IO Module is an external device designed for use with the 882IS and 882IS Plus digital weight indicators. When placed in the safe area, its fiber optic interface allows it to provide remote functions for an indicator in a hazardous environment. The 882IS IO Module provides access to the indicator through the following:

- USB device connection
- Ethernet
- One comm port (RS-232 or RS-422)
- One option card slot

The 882IS IO Module operating parameters are stored in the attached 882IS indicator. After both the indicator and IO Module are connected and powered up, the indicator attempts to communicate with the IO module and download configuration parameters. The peripherals are operated by the indicator, which acts as the master device in the system.

## 1.2 Safety

### Safety Signal Definitions:



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



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



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



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

## General Safety



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



**Failure to heed could result in serious injury or death.**

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

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

**Do not make alterations or modifications to the unit.**

**Do not remove or obscure warning labels.**

## 2.0 Installation

This section describes procedures for connecting digital I/Os, fiber optic and serial communication cables from the 882IS IO Module.

### IMPORTANT

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

*It is mandatory to return the 882IS IO Module to Rice Lake Weighing Systems for circuit board level service. Component level repair is not permitted on UL-approved equipment by anyone other than the manufacturer.*

### 2.1 Unpacking

Immediately after unpacking, visually inspect the 882IS IO Module to ensure all components are included and undamaged. The shipping carton should contain the 882IS IO Module, parts kit and this manual. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

### 2.2 Open the IO Module

The 882IS IO module enclosure must be opened to connect cables for communications. Use a flat head screwdriver to open the two screws on the top of the enclosure.



### WARNING

*The IO module does not have an On/Off switch. Before opening the unit, ensure power to the unit is disconnected.*

### 2.3 AC Wiring

The IO Module is to be permanently mounted in a safe area with a readily accessible disconnect device incorporated in the building installation wiring. All wiring is to be done in accordance with the National Electric Code (NEC).

### 2.4 RS-232/RS-422 Communications (Port 1)

Connector J3 provides connections for the RS-232 or the two-wire RS-422 serial communications.

Pin	RS-232	RS-422
1	GND	GND
2	RX	B
3	TX	A

Table 2-1. J3 Pin Assignments (Port 1 Serial Communications)



### Note

*For RS-232, all four switches on the IO Module CPU board - SW3, must be in the off position (Figure 2-3 on page 5).*

*For RS-422, all four switches on the IO Module - SW3, must be in the on position (Figure 2-3 on page 5).*

## 2.5 USB Device Communications – (Port 2)



**Note** *If using Windows 7 or later, and the PC is connected to the Internet, the operating system may be able to install the drivers without operator interaction.*

Before the USB Device Port can be used, drivers must be installed on the PC.

1. Have power applied to the PC, the indicator and the IO module.
2. Connect a USB cable from the PC to the micro USB connector (J4) on the 882IS IO Module. The PC recognizes a device has been connected and will attempt to install the drivers needed to make it work. Those drivers can be downloaded from the Rice Lake Weighing Systems' website at [www.RiceLake.com](http://www.RiceLake.com) under downloads.
3. When the individual drivers are installed, a new COM Port designation is assigned for the USB port the 882IS is connected to on the PC.

*For example, if the PC already has two physical RS-232 COM Ports, they most likely are designated COM1 and COM2. When connecting the indicator to a USB port on the PC, it will be assigned the next available port designation, or in this case, COM3. When plugging into the same physical USB port on the PC, the port designation will again be COM3. If plugging into another physical USB port on the PC, it will be assigned the next available designation, in this case COM4.*

After the drivers are installed, use Windows Device Manager to determine the COM Port designation which was assigned to the USB port, or open the application which is used with the 882IS, such as Revolution®, and see which ports are available.

Configuration of the USB Device Port is done in the USB Communications sub-menu under **IO MODULE PORTS** in configuration mode.

The port can be configured as either a demand port for EDP commands and printing, or a data streaming port. Other settings include the termination character(s); enabling echoes and responses; adjust the end-of-line delay; and whether or not the indicator displays a 'print' message when a print format sends data out the port.



**Note** *If a computer application has an open communications connection through the USB Device Port, and the physical cable connection is interrupted, a soft reset is performed on the indicator or power is cycled to the indicator; the connection in the computer application must be disconnected and reconnected again before it will continue to communicate with the indicator.*

*For the USB Device Port, it does not matter what the settings are for Baud, Data Bits, Parity and Stop Bits in the computer software. The port will communicate in the same way regardless of these settings.*

*This port is not a host port and is not intended to be connected to other devices such as keyboards, memory sticks or printers.*

## 2.6 Ethernet Communications

The 882IS IO Module features Ethernet TCP/IP 10Base-T/100Base-TX communication using a standard RJ45 connector (J6 – see [Figure 2-1 on page 4](#)). It can support two simultaneous connections, one as a server, the other as a client.

Through an Ethernet network, software applications are able to communicate with the 882IS using the EDP command set (see the 882IS manual), or data can be streamed continuously from the indicator, or printed on demand.

The Ethernet port supports both DHCP and manual configuration of settings such as the IP and subnet. In addition, the TCP Port number, Primary and Secondary DNS, and the Default Gateway can be configured using the Ethernet sub-menu of the Ports setup menu. For more information on configuring the Ethernet port see the 882IS technical manual (PN 183532).

Physical connection to the 882IS IO Module Ethernet port can be made directly from a PC to the 882IS (AdHoc Network), or through a network router or switch. The port supports auto-sensing MDI/MDIX cable configuration (straight-through or crossover cables can be used).

The RJ45 Ethernet jack on the 882IS IO Module houses two LEDs to indicate the status and speed of the connection.

Yellow LED (left) indicates the status of the connection:

- Off for no link
- On for a link
- Blinking if there is activity

Green LED (right) is:

- Off for a 10Base-T connection
- On for a 100Base-TX connection

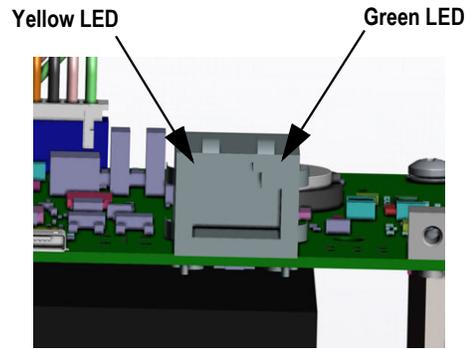


Figure 2-1. RJ45 Ethernet Jack

## 2.7 Connecting the Fiber Optic Board to the IO Module

This section describes the fiber optic board wiring and [Table 2-2](#) lists the connectors of the main board.

Connect the fiber optic J1 connector to J7 on the 882IS IO module CPU board.

J1 on Fiber Optic Board	Description	J7 on IO Module Board	Description
1	GND	1	TX+
2	+6V	2	TX-
3	GND	3	RX+
4	-6V	4	RX-
5	+6V	5	GND
6	GND	6	V+
7	RX-	7	V-
8	RX+	8	GND
9	TX-	9	VIN+
10	TX+	10	CGND

Table 2-2. Pin Assignments for Fiber Optic Connectors

The fiber optic connectors will then be connected to the 882IS indicator see [Section 2.9 on page 6](#).

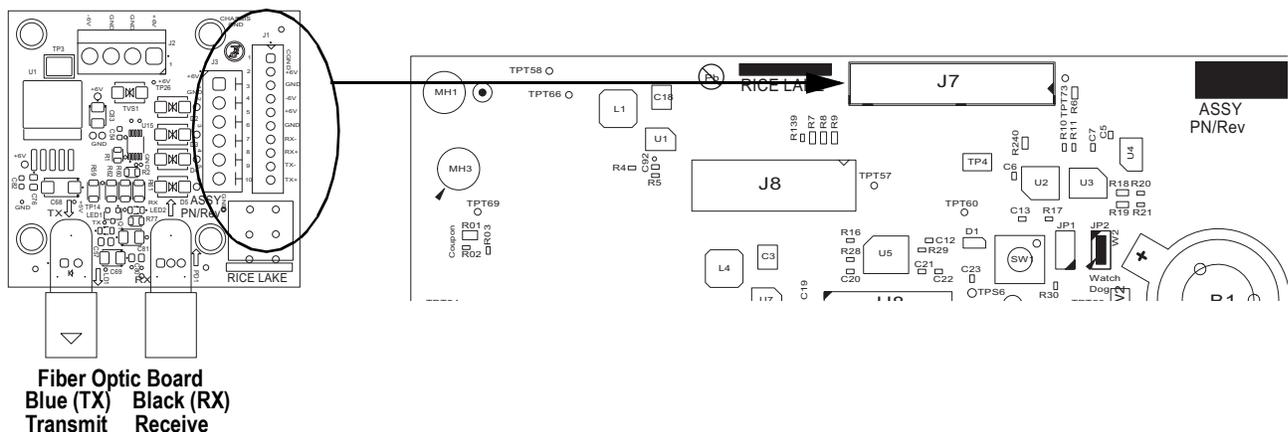


Figure 2-2. Connecting the Fiber Optic Board

## 2.8 IO Module CPU Board

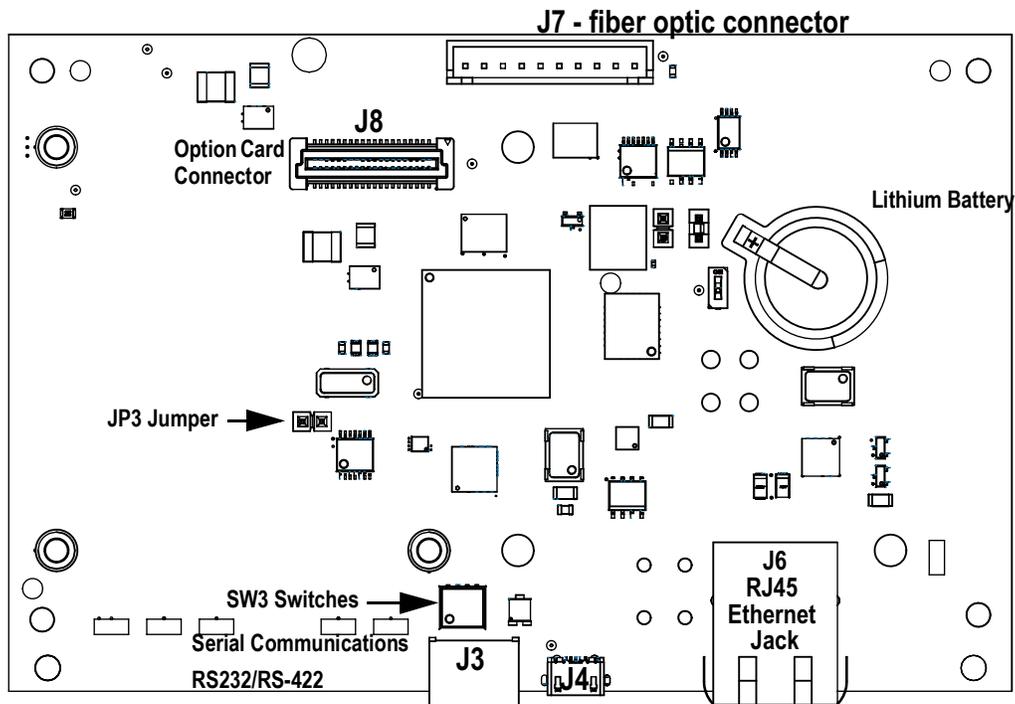


Figure 2-3. IO Module Board

The 882IS IO Module must be installed in a safe area. The internal power supply unit provides DC voltage for the 882IS IO Module main board and 882IS IO Module fiber-optic board. The DC power requirements of the IO module are as follows:

- Nominal input voltage: 7.5V
- Peak current consumption: 930mA
- Average input current: 630mA

## 2.9 Fiber Optics Assembly

The 882IS IO Module is equipped with a duplex fiber optic port for communicating with an 882IS or 882IS Plus located in the safe or hazardous area. It provides electrical isolation and eliminates the use of IO barriers commonly used in intrinsically safe systems. The optical fibers are plastic and the terminate ends must be properly polished prior to installation. Refer to POF Polishing kit (PN 197384), for complete instructions on polishing the fiber-optic ends. See [Figure 2-3 on page 5](#) for the location of the fiber optic connector in the 882IS IO Module.



**The fiber optic connections between the 882IS and 882IS Plus indicator and the 882IS IO Module needs to be cross-linked. The optical output of the indicator should be attached to the input of the 882IS IO Module, and the indicator's input to the module's output.**

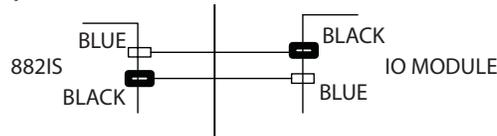


Figure 2-4. Fiber-Optic Cross Connection

Use the following steps for assembling the fiber-optic connectors of the 882IS IO Module:

1. Cut off the ends of the fiber-optic cable (150 ft length maximum), with a proper cutting tool such as a fiber-optic hot knife (PN 85548), ensuring no bends 90° or greater are in the cable.



**The cut end of the fiber-optic cable must be cut flush so that the core and outside insulation are equal. Core exposure can lead to failure.**

2. Polish the fiber ends per the fiber polishing kit.
3. Insert the fiber-optic cable through the locking nut and into the connector until the core tip seats against the internal micro-lens; then back it out 1/16" (1 mm).
4. Screw the connector locking nut down to a snug fit, locking the fiber cable in place.

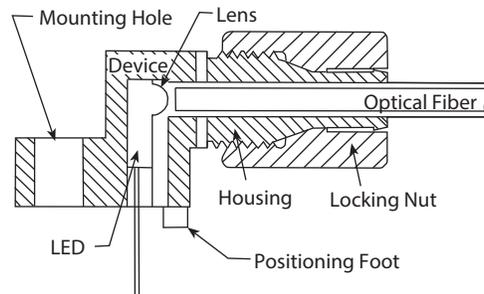


Figure 2-5. Fiber Optic Connector

## 2.10 Board Replacement

Use the following procedure to replace the main board of the 882IS IO Module:

1. Disconnect power to the board.
2. Unplug all connectors.
3. Remove the four screws holding the main board then lift the board out of the enclosure.

To replace the board, reverse the above procedure. Be sure to reinstall cable ties to secure all cables inside the enclosure.

## 2.11 IO Module Mounting

The 882IS IO Module is capable of being mounted to a surface in the safe area using the mounting holes of the enclosure. Use 1/2" or larger mounting hardware.

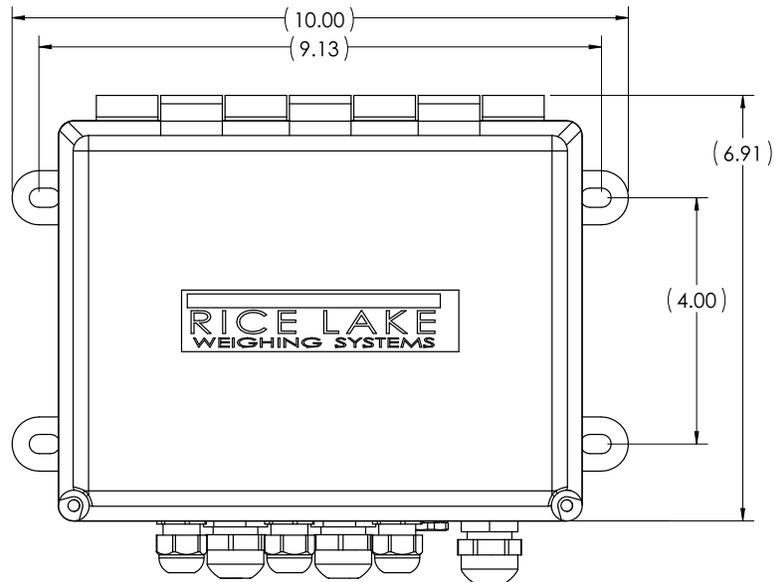


Figure 2-6. 882IS IO Module Enclosure Dimensions (noted in inches)



**Note**

*Mounting surface must be capable of holding four times the weight of the 882IS IO Module and wiring.*

## 2.12 Battery Replacement

The lithium battery on the 882IS IO Module board maintains the real-time clock when it is not connected to AC power. See [Figure 2-3 on page 5](#) for battery location and orientation (positive side up).



**WARNING**

*Risk of explosion if battery is replaced with incorrect type. Dispose of batteries per manufacturer instructions.*

## 2.13 Replacement Parts

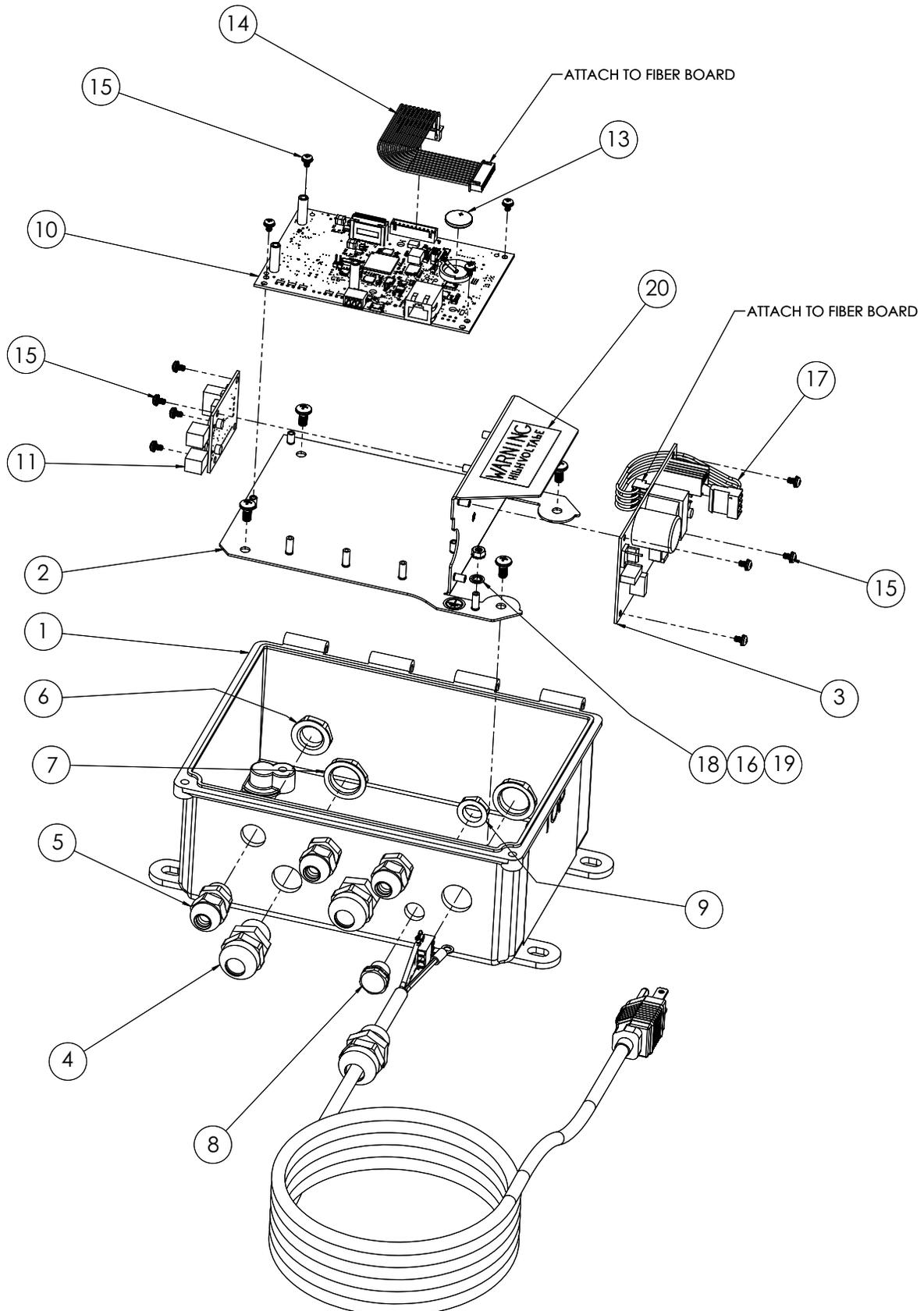


Figure 2-7. 882IS IO Module Assembly

Item No.	Part No.	Description	Quantity
1	177750	Enclosure, FRP Milled 882IS IO Module	1
2	177549	Boards Plate, 882IS IO Module	1
3	67613	Power Supply Board, 7.5V 25W	1
4	68600	Cord Grip, PG11	2
5	15626	Cord Grip, PG9 Plastic	3
6	15627	Lock Nut, PG9 Plastic	3
7	68601	Nut, PG11 Black Nylon	2
8	88733	Vent, Breather Vent Sealed Gortex Membrane, Black Plastic	1
9	88734	Nut, Breather Vent, M12 x 1 Thread	1
10	176922	Board Assembly, 882IS IO Module	1
11	180633	Indicator Option, Fiber Optic RX/TX	1
12	85202	Power Cord Assembly, 120 VAC x/ PG11 Cord Grip and SL-156-Connector	1
13	69291	Battery, 3V Coin Lithium, 16 mm diameter	1
14	163998	Cable Assembly, CPU Board to Power Supply	1
15	180824	Machine Screw, M3 x 0.5 x 5 mm Phillips Pan Head	12
16	180826	Nut, Kep M 4.0 x 0.7 External Tooth Lock Washer 18-8 SST	1
17	180855	Cable Assembly, Power Supply	1
18	15134	Locke Washer, No. 8 Type A w/ Internal Tooth Steel, Zinc Plated	1
19	16892	Label, Ground Protection, Earth, Adhesive	1
20	16861	Label, Warning, High Voltage, Adhesive	1

Table 2-3. 882IS IO Module Replacement Parts

## 3.0 Configuration

Configuration of the external 882IS IO Module is done through the SETUP menu of the attached 882IS indicator acting as the primary device.

All operating parameters are stored in the host indicator's EEPROM memory, and can be edited after placing the indicator in SETUP mode. See the indicator installation or operation manual for instructions on editing configuration parameters.

The 882IS IO Module works as the secondary device of the indicator and will not work as a stand-alone unit. After both the 882IS indicator and 882IS IO Module are powered up, the 882IS attempts to communicate with the IO Module through the fiber optic port and all necessary working parameters are sent to the 882IS IO Module. All inputs and outputs function as peripherals of the indicator. Communication must remain constant between the two devices for data to be transferred through the various ports.

### 3.1 Updating the IO Module Firmware

The firmware for the 882IS IO Module can be updated using a PC with an RS-232 serial port, and the Revolution® Indicator configuration software package.

\* *Firmware updates can only be done through the RS-232/RS-422 port. Updates through the USB and Ethernet ports are not supported.*

1. Download the new IO Module firmware from [www.ricelake.com](http://www.ricelake.com).
  - IO Module firmware file – **156650-880CPUFirmwareVx-xx-xx.S19**
2. Connect the RS-232 Port (J3) from the CPU board to a PC.
3. Place a jumper on JP3 while applying power to put the IO Module into **BOOT** mode.



**Note** *To access JP3, installed option cards needs to be removed.*

4. Remove the jumper from JP3.
5. Start the Revolution software on the PC.
6. Under file, select **NEW**.
7. Select the 882IS IO Module applicable for the current version of firmware.
8. Under Tools select *Options/Communications/AutoDetect*.
9. Select the **Auto Detect Settings** check box and click OK.
10. Under Communications, select *Connect*. Revolution will establish communications with the IO module.



**Note** *If it fails to connect, check the connections.*

11. Once connected, select **Update CPU Firmware** or **Update Display Firmware** in the indicator information menu.
12. Select the file for the Firmware being updated.

The program will proceed to load the new firmware. This may take several minutes, while in progress do not leave the Revolution window or interrupt the power to the indicator. The progress of the download will be indicated on the Indicator Information screen.

When the download is complete, the program indicates if it was successful or not.



**Note** *If it was not successful, turn off the power to the IO module, return to step 3, and try the entire procedure again. If problems persist, contact Rice Lake Weighing Systems for technical assistance at 1-800-234-9171.*

## 4.0 Specifications

### Power

Line Voltages	110 or 240 VAC
Power Frequency	50/60 Hz
Consumption	100-175 mA (.25 Watts)

### Optical Port

Physical Medium	2.2 mm plastic fiber @ 640 nm
Maximum	
Transmission Length	150 ft. (46 m)
Transmission Type	Full duplex

### EDP Ports

Supported Standards	RS-232/RS-422 USB Device Ethernet
---------------------	---

### Environmental

Operating Temperature	-10 to +40°C (Legal-for-Trade applications); (14°F to 104°F) -10 to +50°C (industrial applications); (14°F to 122°F)
Storage Temperature	-25 to +70°C (13°F to 158°F)
Humidity	0-95% relative humidity

### Enclosure

Enclosure Dimensions	10.00 in x 6.91 in x 4.41 in
(W x H x D)	254.0 mm x 175.5 mm x 112.0 mm

### Battery Replacement

Panasonic (PN 69291)	CR1632, 16 mm 3V, Lithium Coin, 125mAH
----------------------	---

### Certifications and Approvals



AM-6124C



CoC Number 19-015



File number: E151461-A23-UL







© Rice Lake Weighing Systems Specifications subject to change without notice.  
Rice Lake Weighing Systems is an ISO 9001 registered company.

230 W. Coleman St. • Rice Lake, WI 54868 • USA  
U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0)26 472 1319