



EXO PAR

PHOTOSYNTHETICALLY ACTIVE RADIATION WITH THE EXO PLATFORM

EXO PAR

The information contained in this manual is subject to change without notice.

Effort has been made to make the information in this manual complete, accurate, and current.

The manufacturer shall not be held responsible for errors or omissions in this manual.

Consult YSI.com for the most up-to-date version of this manual.

Thank you for purchasing a YSI EXO PAR System. This manual covers setup, operation, and functionality of the EXO PAR system.

EXO PAR features include:

- Simple setup and operation
- Depth rating of 250 meters
- Single or dual sensor option
- Non-corrosive materials
- Data output in $\mu\text{mol s}^{-1} \text{m}^{-2}$
- Use with Kor or EXO handheld
- Easily removed for non-par applications

Safety Information


Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all precautionary statements. Failure to do so could result in serious injury to the operator or damage to the equipment. Do not use or install this equipment in any manner other than that specified in this manual.


The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Precautionary Symbols

NOTE: Information that requires special emphasis

NOTICE: Indicates a situation which, if not avoided, may cause damage to the instrument

 **CAUTION:** Indicates a potentially hazardous situation that may result in minor or moderate injury

 **WARNING:** Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury

Product Components

Carefully unpack the instrument and accessories and inspect for damage. If any parts or materials are damaged, contact YSI ISS at 727-565-2201 or authorized YSI distributor.

TABLE OF CONTENTS

1. Introduction

- 1.1 PAR Sensor
- 1.2 Overview
- 1.3 Components

2. Installation

- 2.1 Attach EXO Calibration Cup Extender
- 2.2 Attach the EXO PAR System Frame

3. Setup

- 3.1 Setup the Kor Software
- 3.2 Setup the EXO Handheld Display

4. Ordering

- 4.1 Ordering Replacement Components
- 4.2 Ordering



THIS IS AN
INTERACTIVE DOCUMENT

When viewing this document as an Adobe™ PDF, hovering your cursor over certain phrases will bring up the finger-point icon. Clicking elements of the Table of Contents, website URLs, or references to certain sections will take you automatically to those locations.



1. Introduction

1.1 PAR Sensor

Some users of the YSI EXO sonde may wish to incorporate a photosynthetically active radiation (PAR) sensor into their field monitoring equipment. This sensor can be added to the YSI EXO2 sonde in the form of a special adapter engineered by YSI's Integrated System & Services division. This appendix is designed to give potential users of this PAR adapter information on how the system is configured and the steps necessary to acquire and log PAR data with the EXO PAR adapter.

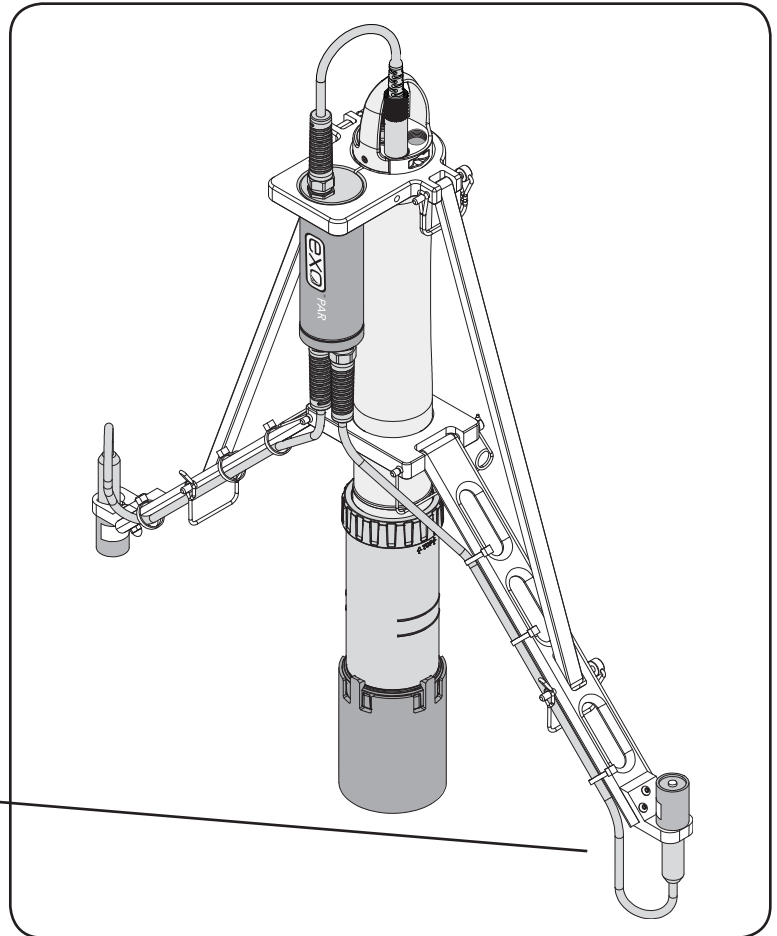
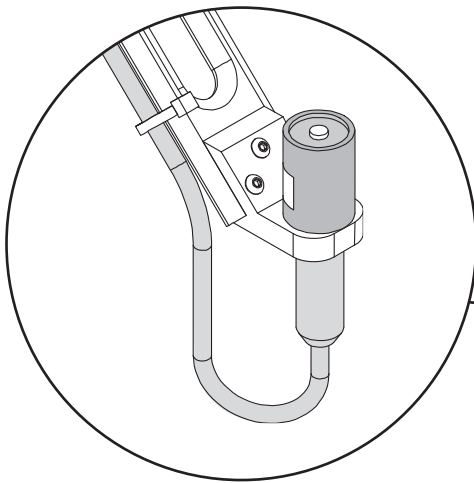


Figure 1 EXO PAR adapter with Sonde

1.2 Overview

Li-Cor PAR sensors are required for the EXO PAR adapter and these sensors can either be supplied to YSI by the customer (brass mounting screws provided with the sensor are required for installing on the par system) or can be purchased from YSI as part of the complete system. These sensors are then mounted to arms which extend from the sonde on either side. Output cables are then attached to the sensors which connect to the EXO PAR adapter, which in turn connects to the EXO2 Auxiliary port on the top of the sonde, as show in Figure 1.

Figure 1 shows the installation of two sensors (one pointing up, the other pointing down), but it is also possible to use a single PAR sensor in either an upward or downward looking configuration.

Your EXO PAR system is shipped separate from your EXO2 sonde and can be installed onto the EXO2 sonde following these easy steps.

1.3 Components

The EXO PAR Systems consists of 3 main parts: The EXO PAR adapter cylinder and cables, the black plastic frame system and calibration cup extender, and the Li-Cor PAR sensors.

The EXO PAR system attaches to the EXO2 sonde via an upper and lower clamp system. The EXO PAR adapter attaches to the AUX port on the top bulkhead of the EXO2 sonde. For shipment and storage, the EXO PAR system can fold its sensor and support arms in, along the body of the EXO2 sonde (figure 2).

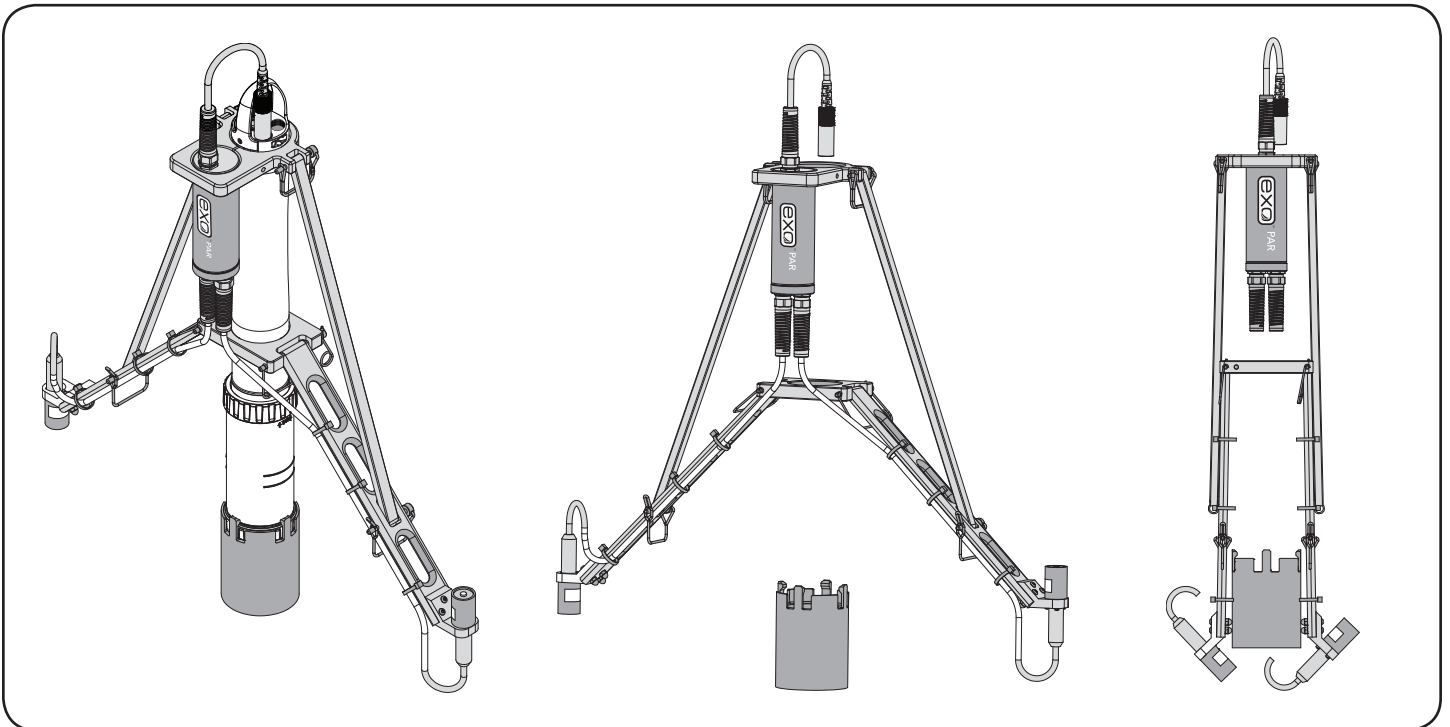


Figure 2 The EXO PAR system attaches to the EXO2 sonde via an upper and lower clamp system

2. Installation

2.1 Attach EXO Calibration Cup Extender

Once you've unpacked the EXO PAR system, attach the EXO calibration cup extender to the bottom of your calibration cup. It simply clicks on by inserting the bottom of the calibration cup into the top of the extender and pushing down on a hard surface (figure 3).

The calibration cup extender provides you the extra height you will need to prevent your PAR sensors and cables from impacting the ground. It's ideal for in lab use but we recommend using a lab stand as well for stability, to prevent your sonde and PAR system from tipping over and potentially causing damage.

! **CAUTION:** Potential pinch hazard, be mindful of fingers.

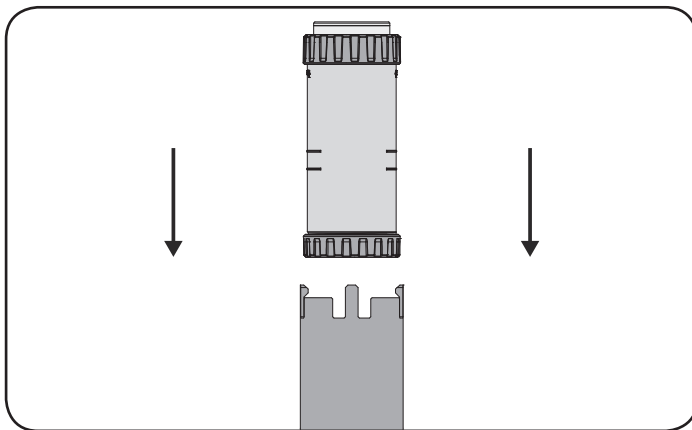


Figure 3 Push down to mate the extender onto the calibration cup.

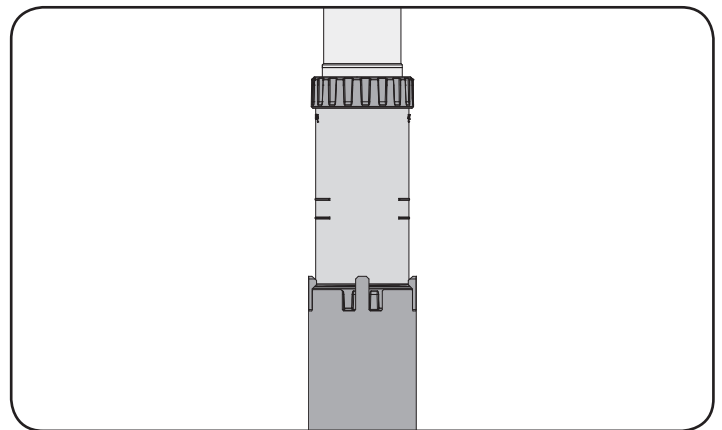


Figure 4 The extender merged with the calibration cup.

2.2 Attach the EXO PAR System Frame

Now that your calibration cup extender is installed, stand the sonde in an upright position and slide the EXO PAR system frame over the EXO2 sonde. The two clamps; upper and lower are fastened to the EXO2 sonde body via two, 5/16-18 x 2.75" socket cap bolts. You will need to use a 1/4" Allen wrench to secure these two bolts. Tighten the bolts until the clamp fits snug to the body of the sonde. Proper alignment of these clamps, as described below, should be followed as to not damage either system.

NOTE: Install the EXO PAR system with the EXO PAR adapter cylinder on the same side of the sonde where the AUX port connector is located. You will connect the EXO PAR adapter into this AUX port.

1. The top of the upper clamp should align with the yellow bulkhead of the sonde (where the blue meets the yellow). Proper alignment is necessary so that the PAR sensor arms are deployed at the correct angle

NOTICE: Proper alignment of clamps is necessary to prevent damage.

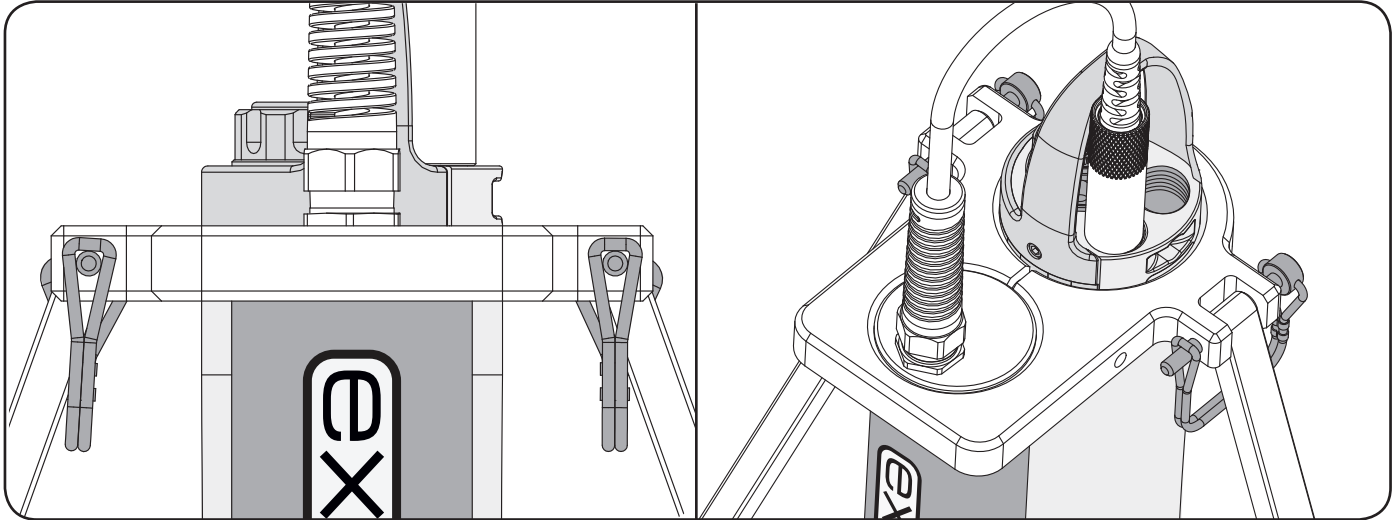


Figure 5 Align the upper clamps with the yellow bulkhead of the sonde

2. The bottom of the lower clamp should align with the upper edge of the top chamfer on the clear plastic section covered with the black "EXO²" sonde label. Again proper alignment is necessary so the PAR sensor arms are deployed so that the PAR sensor faces axis is parallel to the sonde axis.

NOTICE: Proper alignment of clamps is necessary to prevent damage.

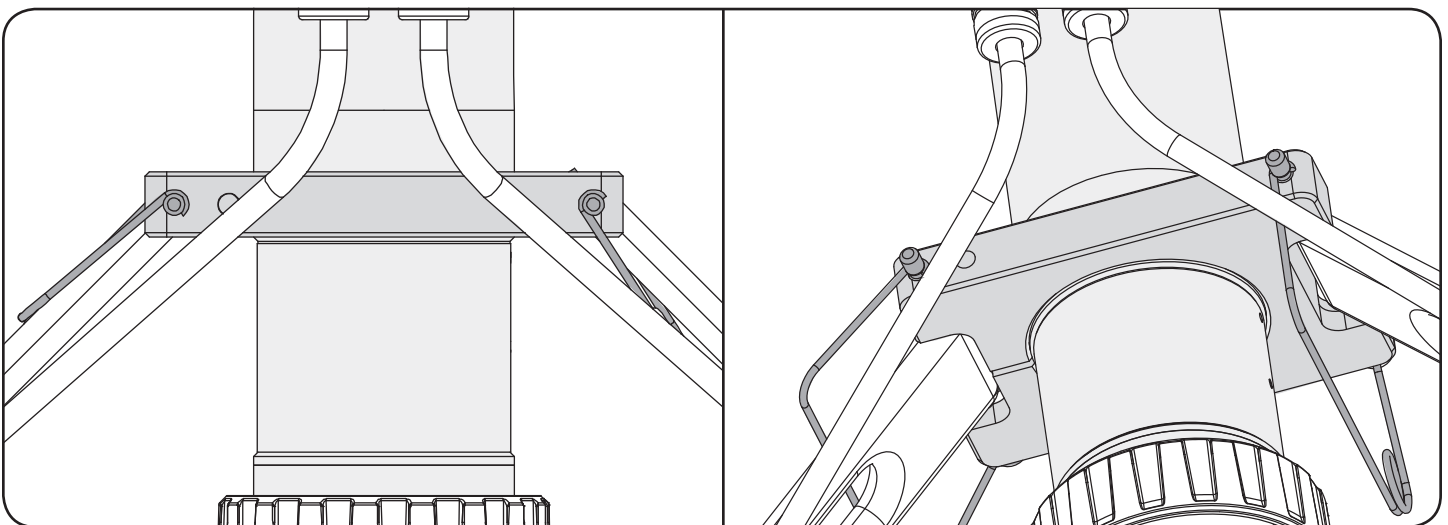


Figure 6 The lower clamp should align with the upper edge of the top chamfer on the clear plastic section

3. Once you have the EXO PAR system secured to the EXO2 sonde body it is time to deploy the sensor arms. To do so simply lift the arms and install the pins where the two arms meet, as shown (figure 7).

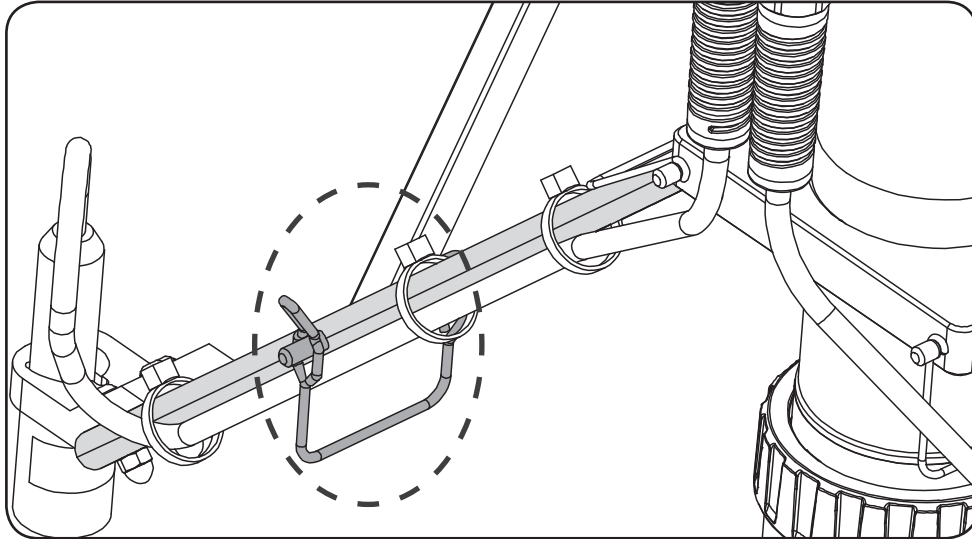


Figure 7 Lift the arms and install the pins where the two arms meet

 **CAUTION:** Potential pinch hazard, be mindful of fingers.

4. After you have installed the upper and lower clamps, it's time to address cable management. There are two cables that connect to your PAR sensors coming from the EXO PAR adapter cylinder. Supplied with your EXO PAR system will be several black, UV resistant Zip Ties. Fasten the sensor cables to the EXO PAR frame support arms as follows: (3 locations)

NOTE: *Dummy plugs are supplied for these cable's connectors, plug these connectors when sensors are removed or if only deploying 1 of your 2 PAR sensors. When not in use, the plugs can be stored in the calibration cup extension.*

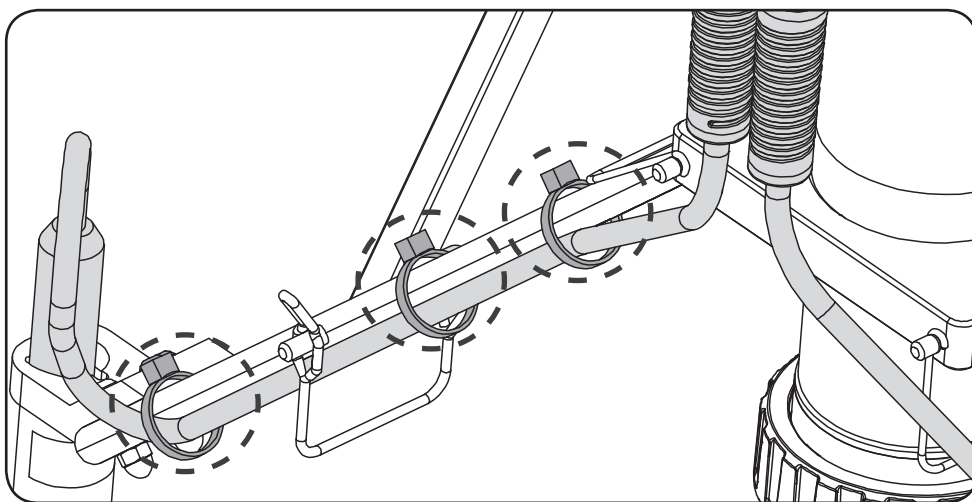


Figure 8 Fasten the sensor cables to the EXO PAR frame support arms

3.1 Setup the Kor Software

In the following steps we will cover the setup of the PAR sensor utilizing the YSI Kor software.

1. You will first need to enable the PAR(s) sensor in Kor. To do so you will need to select **File**, and then select **Settings**, and from the list of parameters select **PAR** and you will see figure 8 if done correctly. From this window you can enable either the PAR sensor or sensors by clicking the boxes shown.

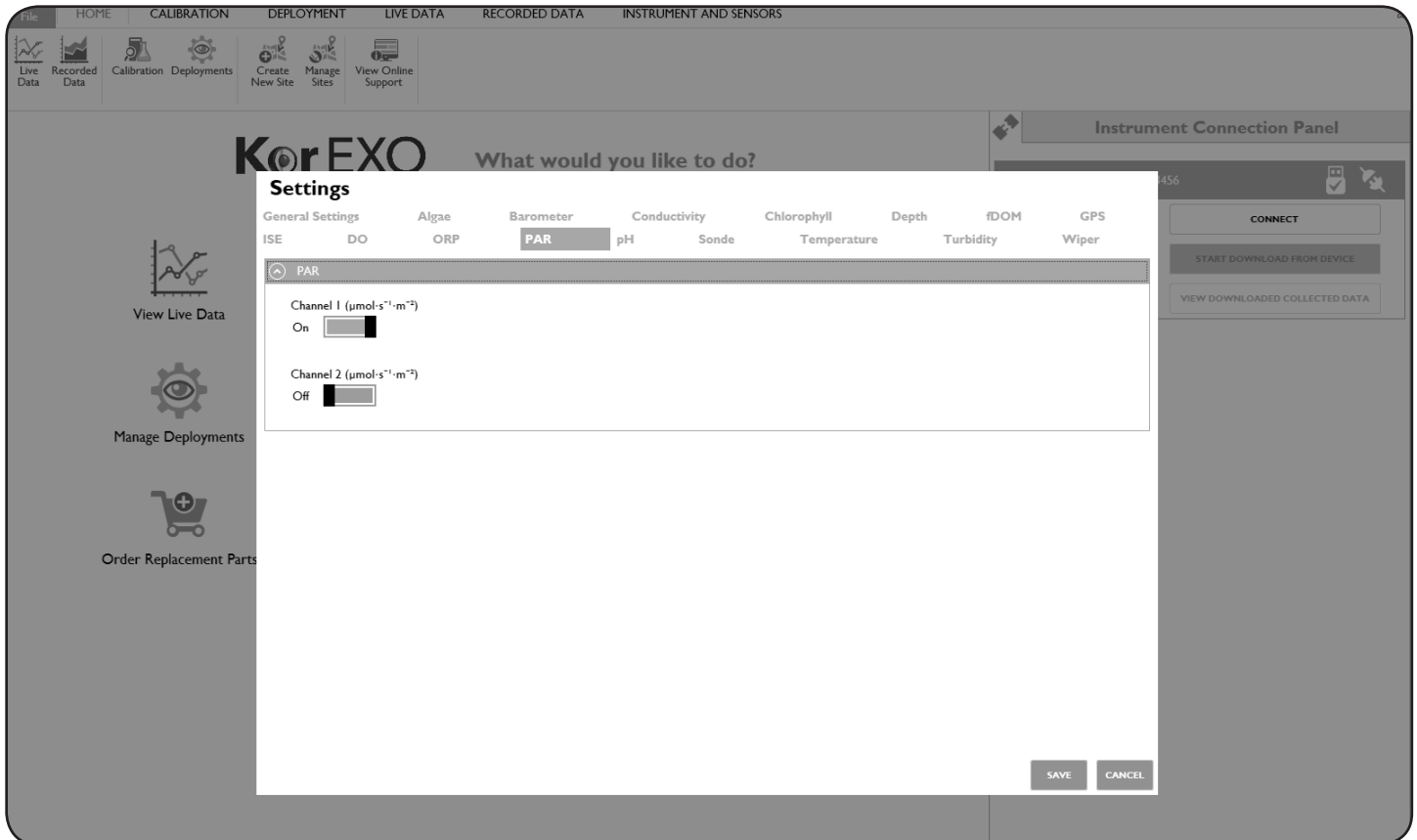


Figure 10 Enable the PAR sensor in Kor

2. Using the Calibration Certificate supplied with your Li-Cor PAR sensor, you will now enter the multipliers into YSI's Kor software. To do so first select **Instruments and Sensors** and from the list of sensors displayed select **PAR** sensor. If successful you will see the screen shown in figure 11. From the Calibration Certificate you will use the **In-Water** multiplier that is listed under the **Handheld Meters and Loggers section**. You will enter the multipliers exactly as they are on the certificates in the fields shown for **Channel 1** and **Channel 2**. If you are only using one PAR sensor, the default channel will be **Channel 1**. Leave the default value in **Channel 2**, which will be (1).

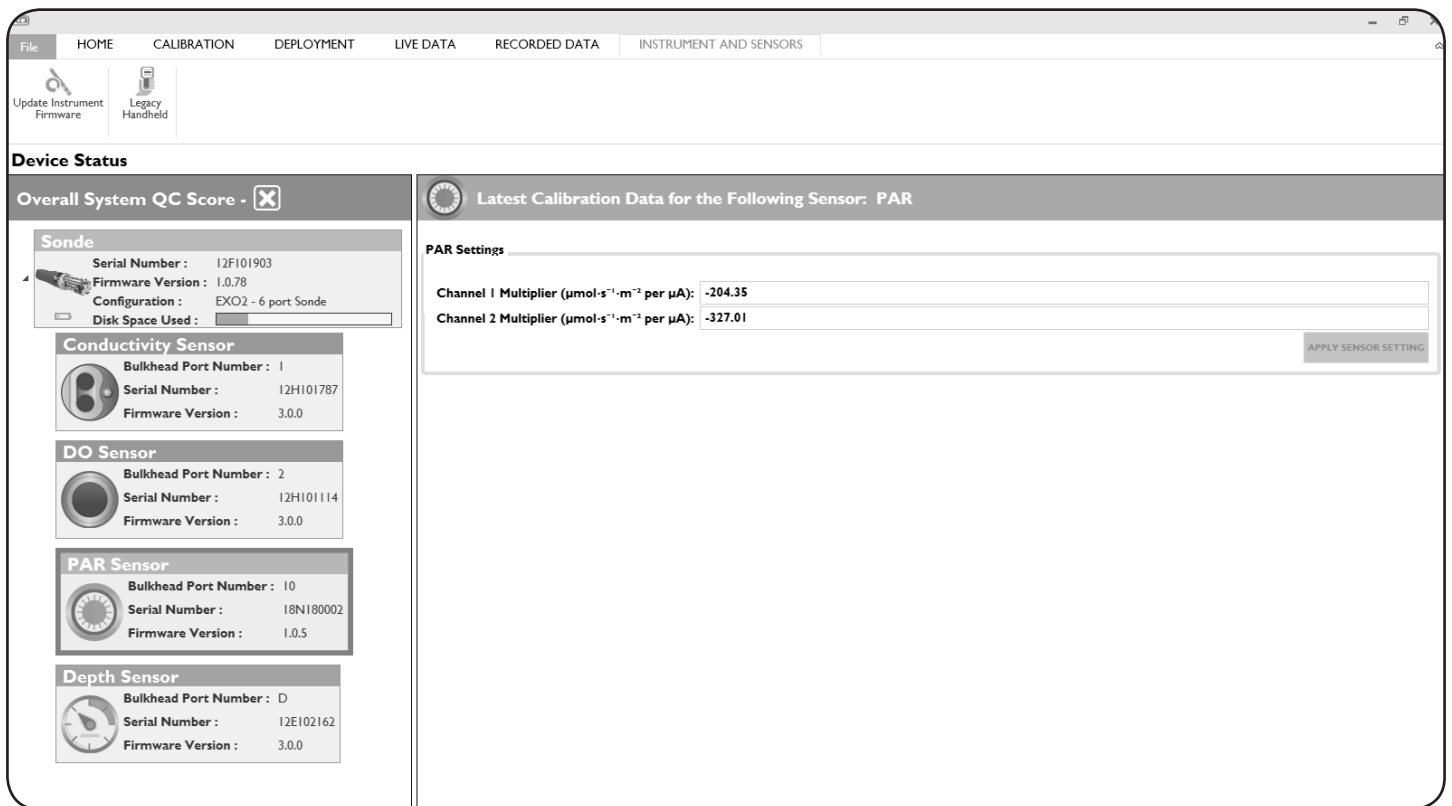


Figure 11 Enter the multipliers into YSI's Kor software.

- Now your PAR sensor(s) are ready to use. You can now see PAR data begin to show up in your Kor Dashboard (example shown in figure 12).

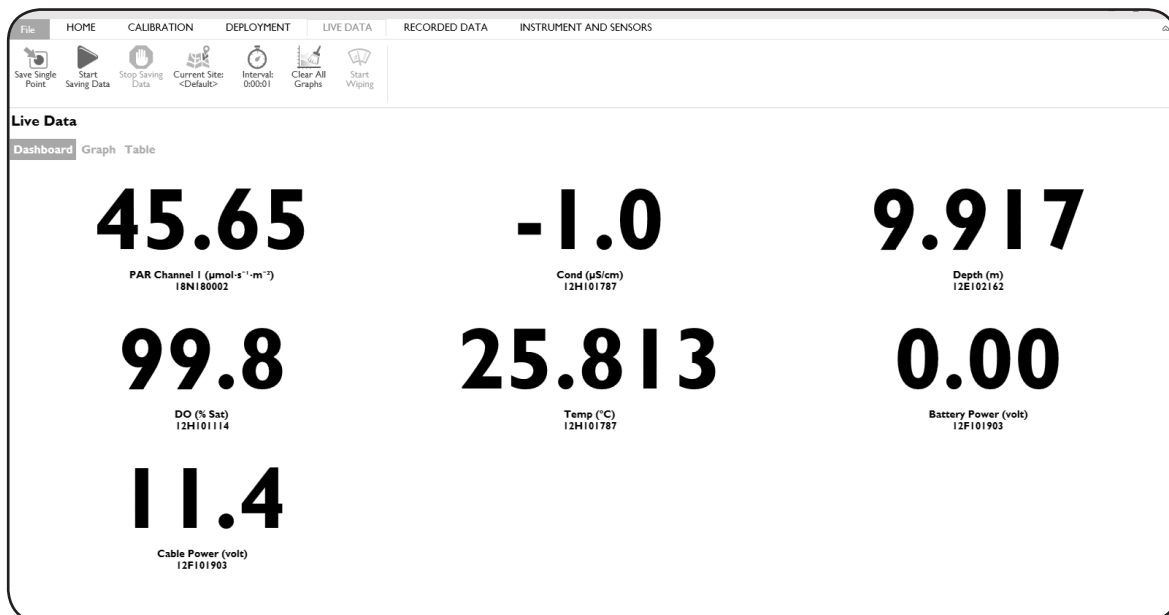


Figure 12 PAR data will begin to show up in your Kor Dashboard

3.2

Setup the EXO Handheld Display

In the following section we will cover setting up EXO PAR utilizing the EXO Handheld Display.

1. You will first need to enable the PAR(s) sensor in the EXO Handheld. To do so you will need to select **Handheld**, and then select **Display**, and from the list of **Units** select PAR and you will see figure 13. On the next screen you can enable either the PAR sensor or sensors by clicking the boxes shown, figure 14.



Figure 13 Select PAR from the list of Units

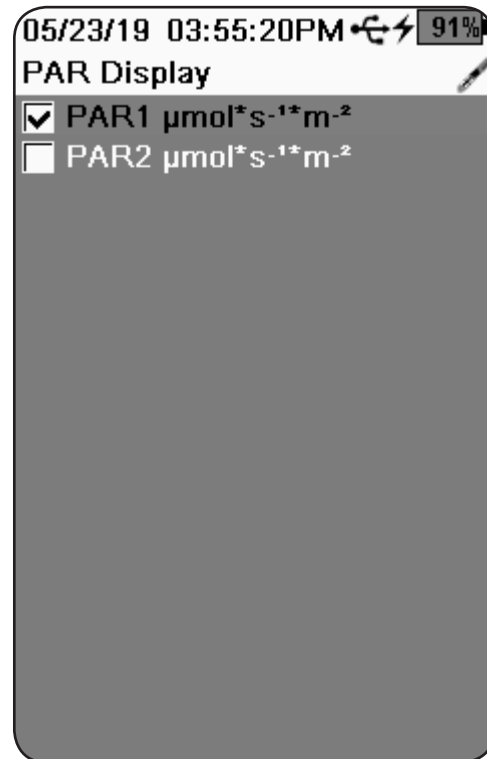


Figure 14 Enable sensors

2. Using the Calibration Certificate supplied with your Li-Cor PAR sensor, you will now enter the multipliers into EXO Handheld Display. To do so first select **Calibration** and from the list of sensors displayed select PAR sensor. If successful you will see the screen shown in figure 15. From the Calibration Certificate you will use the In-Water multiplier that is listed under the Handheld Meters and Loggers section. You will enter the multipliers exactly as they are on the certificates in the fields shown for Channel 1 and Channel 2 shown in figure 16. If you are only using one PAR sensor, the default channel will be Channel 1. Leave the default value in Channel 2, which will be (1).

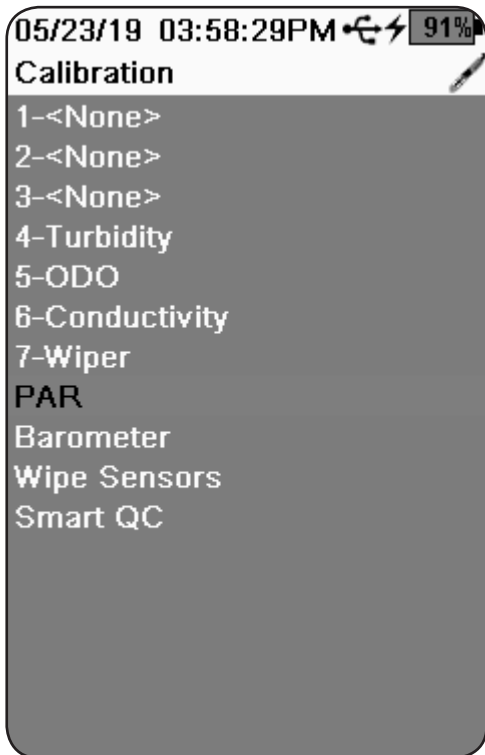


Figure 15 Select calibration, then PAR from the list of sensors



Figure 16 Enter the multipliers exactly as they are on the certificates

- Now your PAR sensor(s) are ready to use. You can now see PAR data begin to show up in your EXO Handheld Display (example shown in figure 17).



Figure 17 PAR data on EXO Handheld Display

4. Ordering

4.1 Ordering Replacement Components

YSI Item #	Description
351070	EXO PAR Adapter Assembly
351073	EXO PAR, Upper Clamp
351074	EXO PAR, Lower Clamp
351075	EXO PAR, Wide Extension Arm (Lower)
351076	EXO PAR, PAR Sensor Bracket
351077	EXO PAR, Narrow Extension Arm (Upper)
351087	EXO PAR, Clip on Calibration Cup Extender

4.2 Ordering

Telephone: 727 565 2201 (USA)

Monday through Friday

8:00 AM to 5:00 ET

Fax: 866 778 8431 (orders)

Email: YSISystemsOrders@Xyleminc.com

Mail: YSI Inc - Systems & Services Division

Attn: Order Entry

7100 Business Park Drive, Suite B

Houston, TX 77041

When placing an order please have the following available:

1. YSI account number (if available)
2. Name and phone number
3. Purchase Order or Credit Card number
4. Copy of Quote (if applicable)
5. YSI Item Number or brief description
6. Billing and shipping addresses
7. Quantity

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- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.


We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

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