

S-Series Pyranometer

MS-80S Pyranometer [ISO9060:2018 Class A]

MS-60S Pyranometer [ISO9060:2018 Class B]

MS-40S Pyranometer [ISO9060:2018 Class C]

Thank you for purchasing an EKO S-Series Pyranometer.

This Quick Start Guide provides basic instructions to help you setup and get started. Please see the **Instruction Manual** for more detailed information about this product.

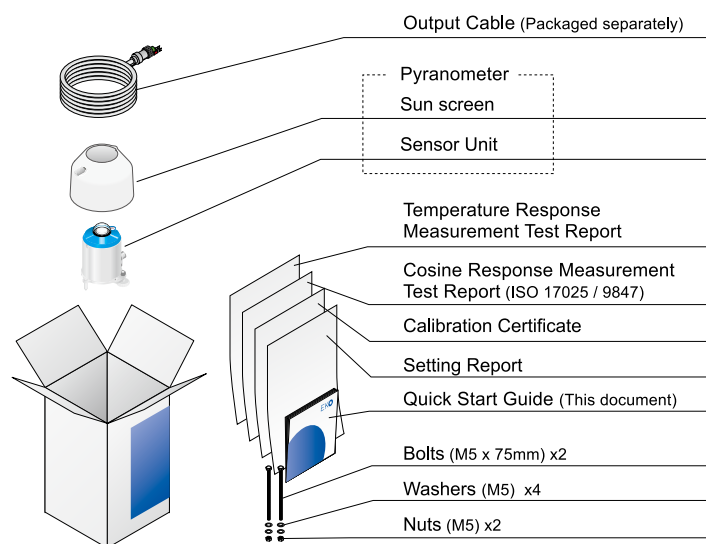
Product Warranty

Your EKO S-Series Pyranometer comes with a 5-year warranty.

For warranty terms and conditions, please consult the **Instruction Manual**, EKO Instruments, or your distributor for further information.

Please Note: All of our products are tested to ensure that they meet their published specifications. The warranty included in the conditions of delivery is valid only if the product has been installed and used in accordance with the instructions provided in the **Instruction Manual**.

1 In the Box



First, please check the package contents. If any part is missing or damaged, please contact EKO or your EKO distributor.

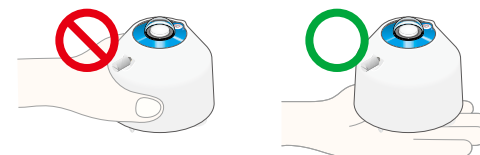
- Please download the instruction manual from the EKO website.

EKO MS-80S/60S/40S

- We recommend that you keep the original packaging for return shipping in case of recalibration or repair.

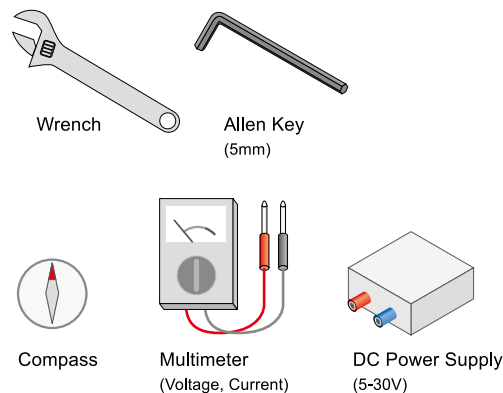
Handling Caution

- Always hold the pyranometer from the bottom when carrying
- Do not hold the sun screen part as the sensor unit may drop



2 Preparing to Install

1 Required Tools



2 Location & Setup Conditions

- Select a location with free horizon, without any obstructions and light reflections throughout the day
- Orientation of Fixing Holes on Installation Base
- Place the pyranometer with the Cable Connector facing the nearest pole

3 Installation

1 Mount the pyranometer on the installation base

2 Level the pyranometer

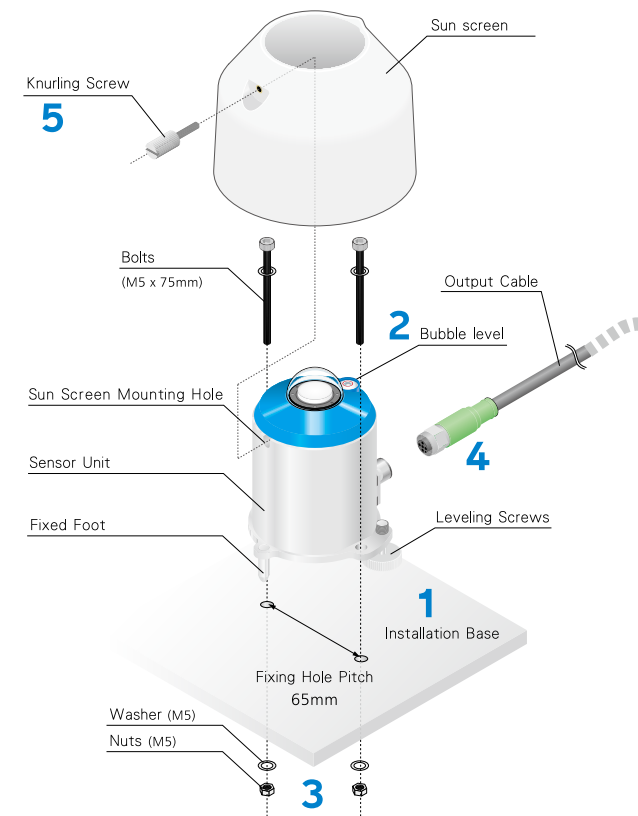


Horizontal surface:
Level the pyranometer by adjusting the leveling screws.

Inclined surface:
Install on an inclined surface after leveling the pyranometer by adjusting the leveling screws on a horizontal surface.

3 Fasten the pyranometer to the installation base

- For installation do not remove the leveling screws



4 Securely insert the output cable into the sensor unit

- Connect the power cable grounding wire to prevent electrical shocks
- Fix cable to prevent damage from high winds or other adverse weather conditions

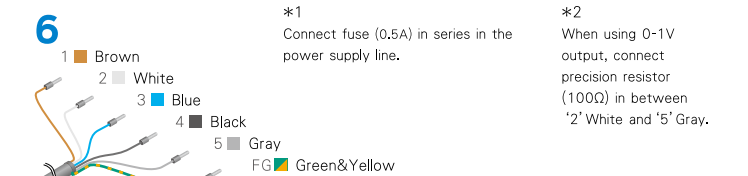
5 Attach the sun screen

- Place the sun screen in the proper position; insert the tab inside the sun screen to the groove on the sensor unit.
- Fasten the knurling screw, and check that it is secure.

6 Wiring

Connect the output cable to each terminal

Connect to	Digital Output		Analog Output	
	Modbus RTU	SDI-12	4-20mA Output	0-1V Output
1 ■ Brown*1	Power+	Power+	Power+	Power+
2 ■ White	Power-GND	Power-	Power-	Power-
3 ■ Blue	TD+A	SDI-12 Data	Output +	Output +
4 ■ Black	TD-B	(Not Required)	Output -	Output -
5 ■ Gray	(Not Required)	(Not Required)	(Not Required)	(Not Required)
FG ■ Green & Yellow	Grounding: Make sure to connect to ground or measurement error will occur due to noise on output signal.			



Approximate Output Values

Conditions	☁ Cloudy	☀ Partly Cloudy	☀ Clear
Solar Irradiance [W/m ²]	< 300	> 300	> 700
4-20mA Output [mA]	< 7.0	> 7.0	> 11.0
0-1V Output [V]	< 0.19	> 0.19	> 0.44

4 Measurement & Maintenance

Measurement Range

Set measurement range on the measuring instrument according to the below output range.

	0-1V Output	4-20mA Output	Digital Output Specification
Output Range	0 to 1 [V]	4 to 20 [mA]	Modbus RTU [®] Electrical Specification
Measurement Range	0 to 1 [V]	4 to 20 [mA]	EIA RS-485 or SDI-12

Calculate Solar Irradiance

Using the following formulas, pyranometer output value can be converted into solar irradiance.

- 0-1V Output**

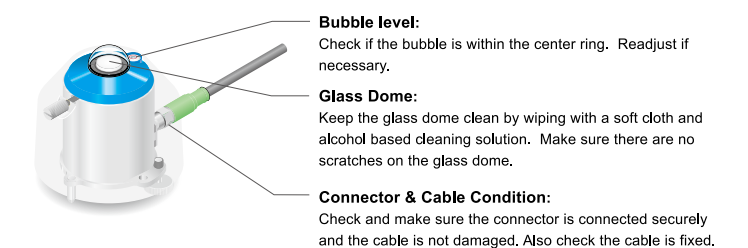
$$I_{[W/m^2]} = E_{[V]} \times 1600$$

I : Solar Irradiance [W/m²]
 E : Pyranometer Output Voltage [V]
- 4-20mA Output**

$$I_{[W/m^2]} = (I_{out} [mA] - 4) \times 100$$

I : Solar Irradiance [W/m²]
 I_{out} : Pyranometer Output Current [mA]
- Digital Output**
 Conversion is not necessary as the output can be obtained as solar irradiance in W/m².

Periodic Maintenance



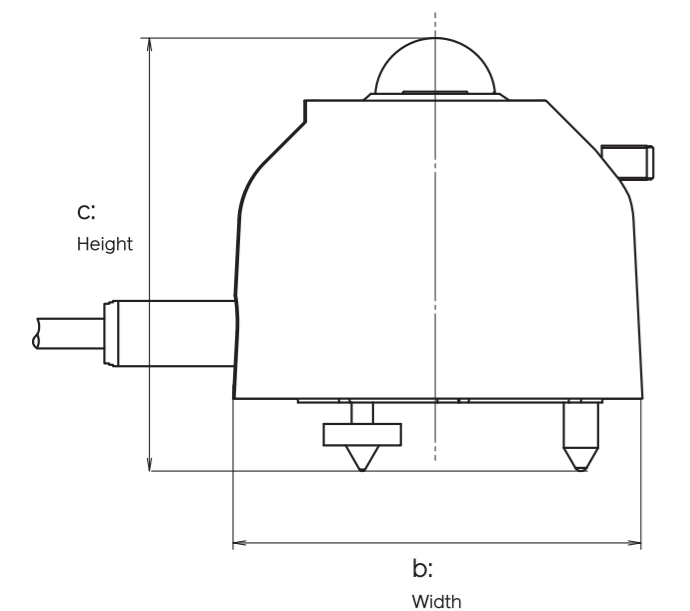
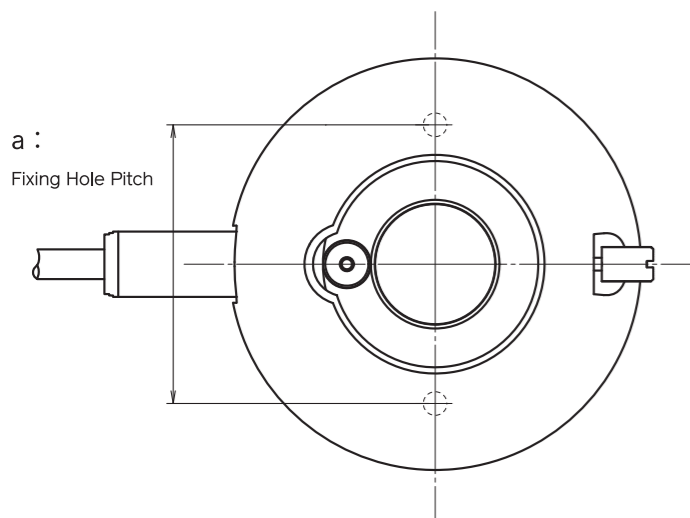
Recalibration & Desiccant Replacement

To maintain the highest levels of measurement accuracy we recommend periodic recalibration of your product. Every 5-years for the MS-80S, and every 2-years for the MS-60S. Please contact EKO Instruments for more information about our 'Recalibration Service'.

Thanks to the advanced design of your sensor, there is no need to change the desiccant, and any user attempts to change the desiccant may void your warranty.

Specifications

	MS-80S	MS-60S	MS-40S
a : Fixing Hole Pitch	65 mm		
b : Width	Φ96 mm		
c : Height	101 mm	107.5 mm	101 mm
Mass	0.41 kg	0.43 kg	0.40 kg
Operating Temperature	-40 to 80 °C		
Input Power	Modbus :	4.75 to 30 V DC	
	0-1V/4-20mA :	8 to 30 V	
	SDI-12 :	9.6 to 16 V DC	
Power Consumption	Digital Output :	< 0.2 W	
	Analog Output :	< 0.7 W	

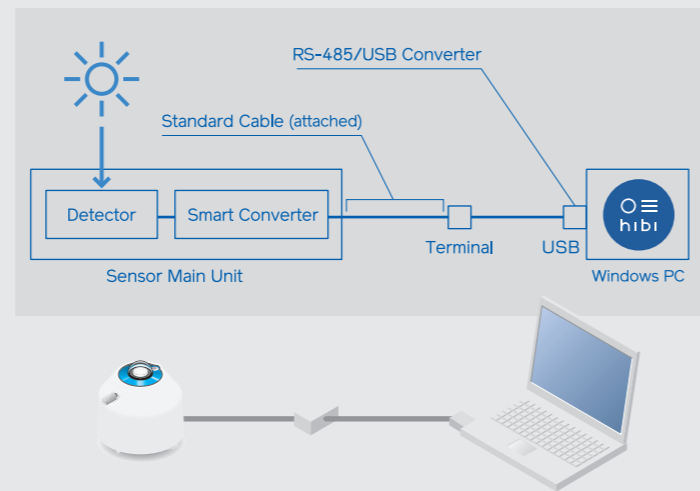


Quick Start Guide Hibi Software



Meet Hibi

Hibi, available for Windows from the EKO website, is a free to download programme designed to help you get the most from your sensor. Use Hibi to visualise detection signals, change settings, set communication parameters, check the status of your pyranometer, and rapidly troubleshoot any issues.



What can Hibi do?

- Change your sensor's signal converter settings**
 Manage the communication protocol and output signal settings.
- Realtime display of measurement values and sensor conditions**
 Get instant, easy to read measurement values and live information on the condition of your sensor (temperature, humidity, tilt).
- Record measurement data**
 Measurement data can be recorded and output to CSV (comma delimited).

1 Preparation

1 Download



Download Hibi from the MS-80S/MS-60S product page on the EKO website.

2 Install

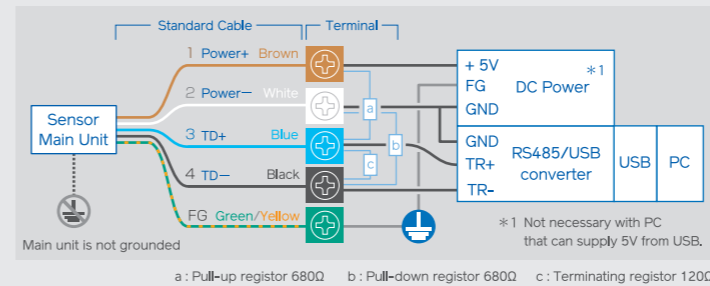
Execute the installer file (.exe) and install Hibi on your PC.

3 Connect sensor and PC using cable

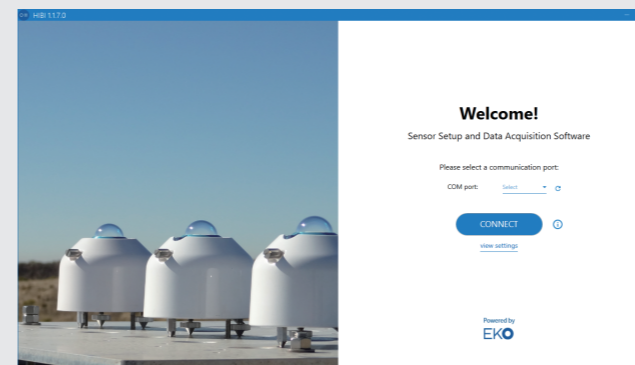
Connect 5 cable terminals as shown in the Communication Cable Wiring Diagram.

Communication Cable Wiring Diagram

How to connect to PC when using general purpose RS-485/USB cable.

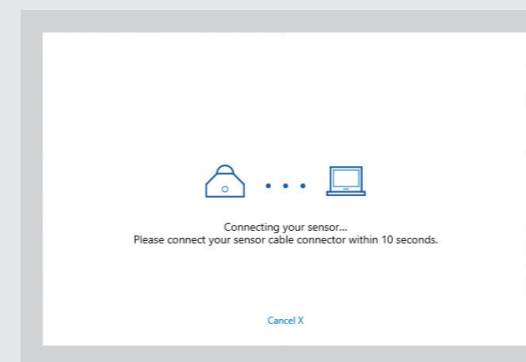


4 Start up Hibi



5 Reconnect Cable

To automatically connect, remove the cable from the sensor, click CONNECT, then reconnect the cable within 10 seconds.



Hibi cannot operate without an established connection to the sensor.

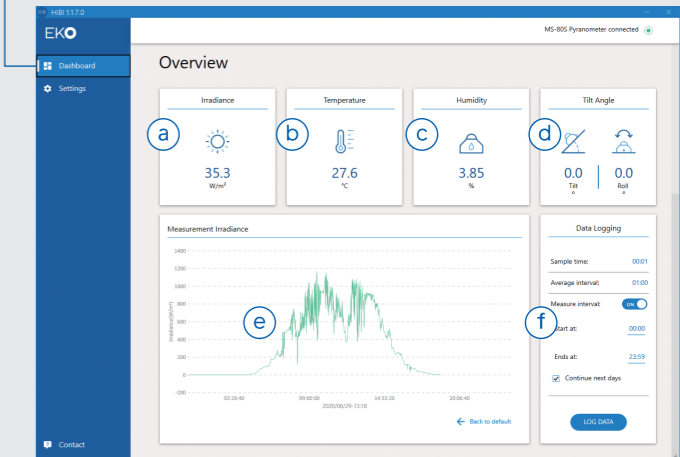
2 Operation

Once the connection between Hibi and the sensor is established, the Hibi dashboard will automatically load. See manual for more detailed information.

1 Dashboard

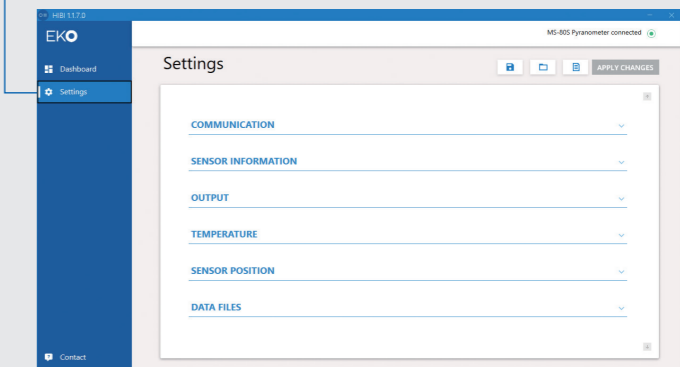
Current sensor output value is displayed in realtime.

- a Irradiance (Instantaneous Value)
- b Internal Temperature
- c Internal Humidity
- d Tilt Angle
- e Irradiance Graph
- f Data Logging Setting



2 Settings

- COMMUNICATION**
 Communication methods can be changed [Modbus/SDI-12] (Default: Modbus)
- SENSOR INFORMATION**
 Sensor information, such as serial number and calibration value can be viewed.
- OUTPUT**
 Output Signal [4-20mA / 0-1V] (Default: 4-20mA)
 Output signal can be changed.
- TEMPERATURE**
 Temperature Unit [°C / °F / K] (Default: °C)
- SENSOR POSITION**
 Tilt sensor zero-point adjustment
- DATA FILES**
 Save location of measurement data and setting data



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