Engineering Change Notice for Pyranometer Internal Humidity Indicator
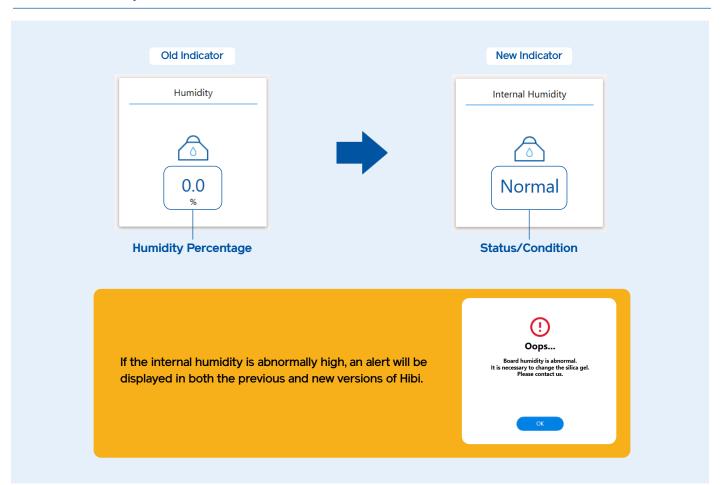
Product: **MS-40S and MS-60S Pyranometers**
Effective: **01/2022**

Thank you very much for using EKO products.

To help make product management and maintenance more manageable, we have made the following changes to the MS-40S and MS-60S Pyranometers.

- The 'Internal Humidity Indicator' has been replaced by a simplified 'Humidity Alert', making it clear whether humidity is an issue or not.
- Users can check the internal humidity condition via 'Hibi' or a designated Modbus RTU/SDI-12 address.
- Other updates to the data logging format and Modbus RTU/SDI-12 register map are shown in the 'Hibi: Data Logging Format' section of this document.
- While helping users understand their sensor's condition clearly, the new alert can also act as a prompt for service and maintenance, should it be necessary.

Hibi: Internal Humidity Indicator

Old Indicator

Humidity

0.0
%

Humidity Percentage

New Indicator

Internal Humidity

Normal

Status/Condition

If the internal humidity is abnormally high, an alert will be displayed in both the previous and new versions of Hibi.

⊗

Oops...

Board humidity is abnormal.
It is necessary to change the silica gel.
Please contact us.

OK

Hibi: Data Logging Format

Previous Format*

Sensor Type	MS-60S	
Serial Number	S18111xxx	
FW Version	4	
HW Version	7	
Sensitivity (uV/W/m2)	11.5	
Interval (sec)	5	
Average (sec)	5	

Date	Time	Irradiance (W / m2)	Detector temperature (degree C)	Electronics temperature (degree C)	Humidity (%)	Tilt (degree)	Roll (degree)
2021/11/9	9:15:15	302.3	0	24.9	16.8	0.1	0
2021/11/9	9:15:20	302.4	0	24.9	16.8	0.1	0
2021/11/9	9:15:25	302.4	0	24.9	16.9	0.1	0
2021/11/9	9:15:30	302.4	0	24.9	16.8	0.1	0
2021/11/9	9:15:35	302.4	0	24.9	16.9	0.1	0
2021/11/9	9:15:40	302.4	0	24.9	16.9	0.1	0
2021/11/9	9:15:45	302.4	0	24.9	17	0.1	0
2021/11/9	9:15:50	302.4	0	24.9	17	0.1	0
2021/11/9	9:15:55	302.3	0	24.9	17	0.1	0
2021/11/9	9:16:00	301.3	0	24.9	32.1	0.1	0
2021/11/9	9:16:05	299.2	0	24.9	67.6	0.1	0
2021/11/9	9:16:10	302.5	0	24.9	83.8	0.1	0
2021/11/9	9:16:15	303.1	0	24.9	83.9	0.1	0
2021/11/9	9:16:20	301.3	0	24.9	83.9	0.1	0
2021/11/9	9:16:25	299.2	0	24.9	83.9	0.1	0

New Format*

Sensor Type	MS-60S	
Serial Number	S19047571	
FW Version	4.203	
HW Version	7	
Sensitivity (uV/W/m2)	10.92	
Interval (sec)	5	
Average (sec)	-	

Date	Time	Irradiance (W / m2)	Detector temperature (degree C)	Electronics temperature (degree C)	Humidity (%)	Tilt (degree)	Roll (degree)	Internal humidity
2021/12/10	11:03:20	423.3	0	26.6	-1	0.1	0	Normal
2021/12/10	11:03:25	423.4	0	26.6	-1	0.1	-0.1	Normal
2021/12/10	11:03:30	423.3	0	26.6	-1	0.1	0	Normal
2021/12/10	11:03:35	423.6	0	26.6	-1	0.1	0	Normal
2021/12/10	11:03:40	423.6	0	26.6	-1	0.1	0	Normal
2021/12/10	11:03:45	423.6	0	26.6	-1	0.1	0	Normal
2021/12/10	11:03:50	423.4	0	26.7	-1	0.1	-0.1	Normal
2021/12/10	11:03:55	423.6	0	26.6	-1	0.1	0	Normal
2021/12/10	11:04:00	423.6	0	26.6	-1	0.1	0	Normal
2021/12/10	11:04:05	423.4	0	26.7	-1	0.1	0	Normal
2021/12/10	11:04:10	423.4	0	26.7	-1	0.1	0	Normal
2021/12/10	11:04:15	423.6	0	26.8	-1	0.1	0	Normal
2021/12/10	11:04:20	423.6	0	26.8	-1	0.1	0	Caution
2021/12/10	11:04:25	423.6	0	26.8	-1	0.1	-0.1	Caution
2021/12/10	11:04:30	423.6	0	27	-1	0.1	0	Caution
2021/12/10	11:04:35	423.6	0	27	-1	0.1	0	Caution
2021/12/10	11:04:40	423.6	0	26.9	-1	0.1	0	Caution

Numerical data of humidity is always (-1)

Internal Humidity status (Normal/Caution) will be recorded.

*Screenshots of data exported from software to CSV format

Modbus RTU register map

Previous Format*

#	Register for:	Format	Description
22	Internal temperature	F32	Temperature measured by the internal temperature sensor
23			Unit: (° C / °F / K)
24	Internal humidity	F32	Relative humidity measured by the internal humidity sensor
25			Unit: RH %
26 to 49 are Reserve			

New Format*

#	Register for:	Format	Description
22	Internal temperature	F32	Temperature measured by the internal temperature sensor
23			Unit: (° C / °F / K)
24 to 25 are Reserve			
26	Internal humidity alert	U32	An alert that notifies abnormal humidity inside the pyranometer.
27			Fine condition: 0, Abnormal: 1
28 to 49 are Reserve			

SDI-12 Register Map

Previous Format*

Command	Response	Description
aD0!	a+1000.0<CR><LF>	Request to send data to the device with address number "a".
aD1!		The output value is always appended with a sign (+ or -).
aD2!		If there is more than one output, the sign is also the delimiter.
aD3!		D0: Irradiance (W/m2) 1 digit after decimal point
		D1: Sensor output voltage (mV) 4 digits after decimal point and Sensor temperature (Celsius) 2 digits after decimal point
		D2: X-axis tilt angle (degree) 1 digit after decimal point, forward/backward with connector facing back, positive value when back is up, Y-axis tilt angle (degree) 1 digit after decimal point, left/right with connector facing back, negative value when left is down
		D3: Temperature inside enclosure (° C) 1 digit after the decimal point, Humidity inside the enclosure (RH %) 1 digit after the decimal point.
		If the pre-measurement command is "MC", then three CRC characters are followed, please refer to SDI-12 standard for the content of CRC characters.

New Format*

Command	Response	Description
aD0!	a+1000.0<CR><LF>	Request to send data to the device with address number "a".
aD1!		The output value is always appended with a sign (+ or -).
aD2!		If there is more than one output, the sign is also the delimiter.
aD3!		D0: Irradiance (W/m2) 1 digit after decimal point
aD4!		D1: Sensor output voltage (mV) 4 digits after decimal point and Sensor temperature (Celsius) 2 digits after decimal point
		D2: X-axis tilt angle (degree) 1 digit after decimal point, forward/backward with connector facing back, positive value when back is up, Y-axis tilt angle (degree) 1 digit after decimal point, left/right with connector facing back, negative value when left is down
		D3: Temperature inside enclosure (° C) 1 digit after the decimal point, Fixed value -1.0 (no unit). 1 digit after the decimal point.
		D4: An alert that notifies abnormal humidity inside the pyranometer. Fine condition: 0, Abnormal: 1
		If the pre-measurement command is "MC", then three CRC characters are followed, please refer to SDI-12 standard for the content of CRC characters.

Impacted Models

MODEL	SERIAL NUMBER
MS-40S	S21072201
MS-60S	S21094101

Feel free to contact us with any questions or if additional support is needed.