INTRODUCTION

This document provides guidance on how to configure and use a Kipp & Zonen SUV5 for NRG's data loggers. The SUV5 is a smart radiometer measuring Irradiance on the UV spectrum, with temperature correction and linearization. SUV5 has an RS-485 interface with Modbus RTU communication protocol and an amplified analog signal output.

PARTS LIST/BOM

NRG Part Number	Part Description	Part Specification	Quantity
16408	Kipp & Zonen SUV5	UV radiometer	1
18384	SUV5/CF4 sensor cable	10m sensor cable	1
15498	Universal Pyranometer Mount	Aluminum pyranometer mounting plate	1

TOOL LIST

- Flat head screwdriver
- Small NRG flat head screwdriver
- Adjustable wrench

MOUNTING SENSOR TO UNIVERSAL PYRANOMETER MOUNT #15498

- If attached, remove the white sunshield from the SUV5 radiometer.
- With the sensor cable port pointed towards the nearest pole, align the sensor mounting holes with the corresponding holes found on the universal pyranometer mounting plate.
- Insert the included mounting hardware through the sensor and mounting plate, leaving loose to allow for leveling.
- Use the two leveling feet on the sensor to level using the built in bubble level as a guide.
- Once the sensor is leveled, use a flat head screwdriver and adjustable wrench to tighten mounting hardware securing the sensor to the mounting plate.
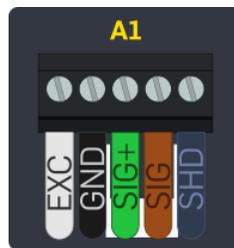- Connect sensor cable and replace shield. Ensure sensor is still level.

NRG LOGR-S INSTRUCTIONS

Wiring sensor to LOGR-S:

Note: Sensor should only be wired to logger with analog OR Modbus, not both

Analog Output:

Wiring Table - Analog		
Wire Color	**Function**	**COM Port Termination**
White	Power 5 to 30VDC (12 V recommended)	Exc.
Black	Power ground/RS485 Common	GND
Green	Analog Out	Sig+
Brown	Analogue Ground	Sig-
Thick Black	Shield	SHD

Modbus Output:

Wiring Table - Modbus		
Wire Color	**Function**	**COM Port Termination**
White	Power 5 to 30VDC (12 V recommended)	Exc.
Black	Power ground/RS485 Common	GND
Yellow	Modbus® RS-485 (+)	D+
Gray	Modbus® RS-485 (-)	D-
Thick Black	Shield	SHD

Programming LOGR-S:

Before attempting to connect to the LOGR-S ensure you have either a direct ethernet connection or are connected to the same local network. Enter the LOGR-S's IP address into the browser of your choice.

Analog output:

Add the SUV5 by browsing the Sensor Type drop-down menu and selecting Kipp & Zonen SUV5-V. Irradiance is the only analog output available.

Port A1-Ch 1

Enable Configuration

☑ Enabled

Sensor Type	Description	Units	Slope	Offset
Kipp & Zonen SUV5-V	Kipp & Zonen SUV5-V	W/m^2	500.00000	-100.00000

Serial Number	Height (m)	Elevation Angle	Azimuth Angle	Modbus Address
	1.20	0.0	0.0	10028

Modbus output:

- Make sure the Logger firmware is up to date to Version 1.06.06 or newer.
- In the Serial Sensor Setup, add the Kipp & Zonen SUV5-V to the desired COM port. It can be selected from the drop-down menu.
- Change the Client Address to 5

Serial Sensor Setup

Configured	Port	Sensor Type	Sensor Description	Client Address	Serial Number	Control Scheme
☑	COM-A	Kipp & Zonen SUV5-V	Kipp & Zonen SUV5-V	5	000001	No Control

- In the Serial Channels setup, Select Kipp & Zonen SUV5-V from the Sensor drop down menu. There are 3 measurands available for the SUV5.

Serial Channels

Enabled	Channel	Sensor	Measurand	Slope	Offset
☑	101	Kipp & Zonen SUV5-V	Corrected Irradiance	0.01000	0.00000
☑	102	Kipp & Zonen SUV5-V	Raw Irradiance	0.01000	0.00000
☑	103	Kipp & Zonen SUV5-V	Body Temperature	0.10000	0.00000

LOGR-S Final Checks:

Double check that the sensor is outputting the numbers you expect, and that the units are labeled correctly. The Radiometer detects irradiance on the UV spectrum, which means that it is unlikely that it will be able to detect anything inside. It is a good idea to export a sample of the data to make sure that the data is being stored properly.

Analog output:

Channel Number	Type	Description	Data
1	Analog	Kipp & Zonen SUV5-V	2.58 W/m^2

Modbus output:

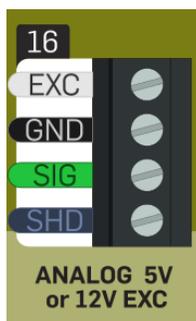|			
101	Serial	Kipp & Zonen SUV5-V-Corrected Irradiance	0.00 W/m^2
102	Serial	Kipp & Zonen SUV5-V-Raw Irradiance	0.00 W/m^2
103	Serial	Kipp & Zonen SUV5-V-Body Temperature	24.20 deg_C

NRG SYMPHONIEPRO INSTRUCTIONS:

Wiring Sensor to SymphoniePRO:

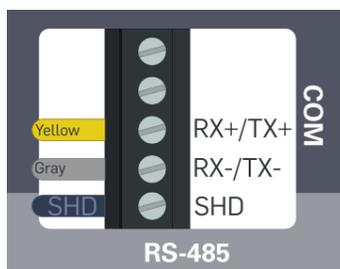*Note: Sensor should only be wired to logger with analog OR Modbus, not both*

Analog output:

Wiring Table - Analog		
Wire Color	**Function**	**COM Port Termination**
White	Power 5 to 30VDC (12 V recommended)	Exc.
Black	Power ground/RS485 Common	GND
Green	Analog Out	Sig+
Thick Black	Shield	SHD

Modbus output:

Wiring Table - Modbus		
Wire Color	**Function**	**COM Port Termination**
White	Power 5 to 30VDC (12 V recommended)	Exc.
Black	Power ground/RS485 Common	GND
Yellow	Modbus® RS-485 (+)	D+
Gray	Modbus® RS-485 (-)	D-
Thick Black	Shield	SHD

Wiring Serial Sensor to SymphoniePRO Power Supply (Optional)
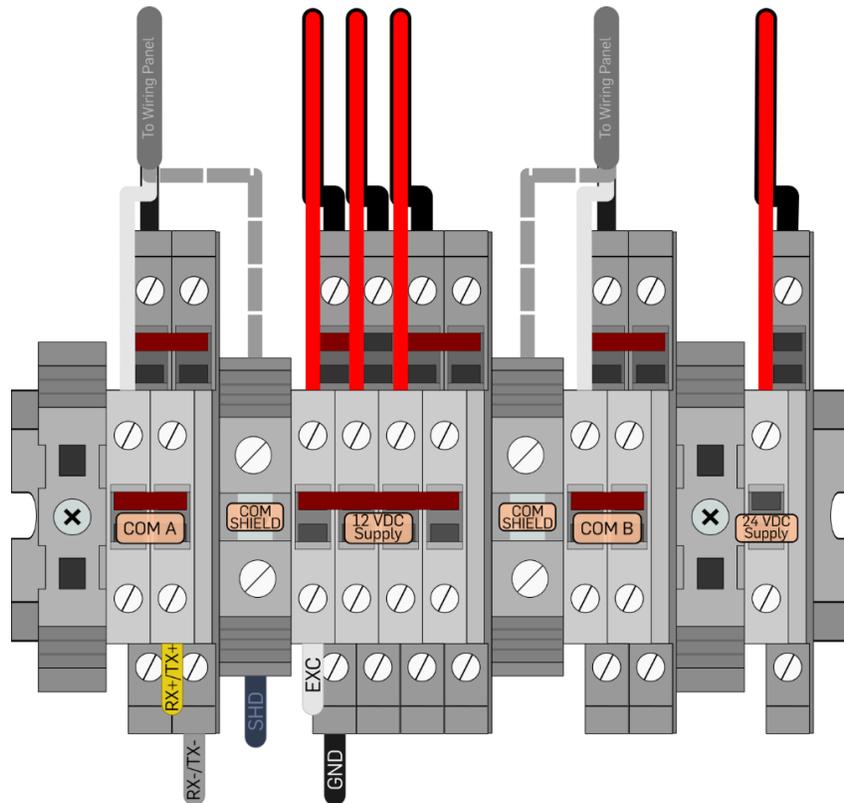
Programming SymphoniePRO:

Open the SymphoniePRO Desktop App, connect to the logger using a USB connection or remote connection with the Ipack's static IP address. From 'Fleet View' click into the logger and navigate to the Channels tab located on the left side.

Analog output:

For channels 16 – 19, "Analog 5V or 12V Excitation," use the following configuration:

- Description: Kipp & Zonen SUV5
- Scale Factor: 500
- Offset: -100
- Units: W/m^2
- Mode: Constant On
- Voltage 12V
- Add the sensor serial number and height

				Description		Height	Boom Bearing	Scale Factor	Offset	Units	Live Data
+	16	Statistics	Analog	Soil Isc		0.00m	0.0 ° (N)	6.0606	0	A	0 A
+	17	Statistics	Analog	Soil Voc		0.00m	0.0 ° (N)	101	0	V	0.01 V
−	18	Statistics	Analog	SUV5		0.00m	0.0 ° (N)	500	-100	W/m^2	27.83 W/m^2

Modbus output:

Make sure that the SymphoniePRO Desktop Application software is the most up to date version (or includes **KZ-SUV5.config.json** file).

Program the SymphoniePRO serial channel (channels 27-50) as shown:

- COM Port: A or B
- Slave Address: 5
- Device: Kipp & Zonen SUV5-V
- Measurand: Raw Irradiance or Body Temperature
- Add the sensor serial number and height

	Channel	Mode	Type	Description	Serial Number	Height	Boom Bearing	Scale Factor	Offset	Units	Live Data
+	34	Statistics	Modbus RTU	Port B: Slave 10; WS500-Ext. Precip	TS-9999	100.00m	90.0 ° (E)		5	mm	5 mm
+	35	Statistics	Modbus RTU	Port B: Slave 9; WS600-Precip		0.00m	0.0 ° (N)		0	mm	0 mm
+	36	Statistics	Modbus RTU	Port A: Slave 5; SUV5-Body Tempera		0.00m	0.0 ° (N)	.1	0	C	23.1 C
−	37	Statistics	Modbus RTU	Port A: Slave 5; SUV5-Raw Irradianc		0.00m	0.0 ° (N)	.01	0	W/m^2	33.3 W/m^2
+	38	Statistics	Modbus RTU	Port A: Slave 5; SUV5-Corrected Rac		0.00m	0.0 ° (N)	.01	0	W/m^2	33.2 W/m^2

SymPRO Final Checks

Double check that the sensor is outputting the numbers you expect, and that the units are labeled correctly. When examining the digital output, the temperature should read around room temperature. A UV light may also be used on the SUV5 to demonstrate the Irradiance is reading properly.

Analog output:

Analog 5 V or 12 V Excitation										
+	16	Statistics	Analog	Soil Isc	0.00m	0.0 ° (N)	6.0606	0	A	0 A
+	17	Statistics	Analog	Soil Voc	0.00m	0.0 ° (N)	101	0	V	0.01 V
−	18	Statistics	Analog	SUV5	0.00m	0.0 ° (N)	500	-100	W/m^2	27.83 W/m^2

Modbus output:

	Channel	Mode	Type	Description	Serial Number	Height	Boom Bearing	Scale Factor	Offset	Units	Live Data
+	34	Statistics	Modbus RTU Port B: Slave 10; WS500-Ext. Precip		TS-9999	100.00m	90.0 ° (E)		5	mm	5 mm
+	35	Statistics	Modbus RTU Port B: Slave 9; WS600-Precip			0.00m	0.0 ° (N)		0	mm	0 mm
+	36	Statistics	Modbus RTU Port A: Slave 5; SUV5-Body Temper:			0.00m	0.0 ° (N)	.1	0	C	23.1 C
−	37	Statistics	Modbus RTU Port A: Slave 5; SUV5-Raw Irradianc			0.00m	0.0 ° (N)	.01	0	W/m^2	33.3 W/m^2