

Using the Kipp & Zonen CSD3 on NRG SymphoniePLUS and SymphoniePLUS3 Loggers

Introduction

Symphonie loggers support meteorological sensors using a choice of optional Signal Conditioning Modules (SCMs). The Kipp and Zonen CSD3 Sunshine Duration sensor provides outputs for Sunshine Duration and Direct Irradiance. The NRG logger collects and stores data in raw format; a scale factor needs to be calculated to convert the raw data to engineering units for each channel. This application note explains which SCM and scale factors to use with the CSD3, and also how to connect the sensor to SymphoniePLUS and SymphoniePLUS3.

SCM Selection

The NRG 0-1V SCM (Item 7758) is compatible with the CSD3 Sunshine Duration output, and the NRG SPN1 GHI/DIF SCM (Item 7757) is compatible with the CSD3 Direct Irradiance output. Be certain you have the correct SCMs before proceeding.

Sensor Scale Factor

The CSD3 provides a 0-1V output signal for Sunshine Duration. When the sunshine is below the WMO 120 W/m² threshold, the signal output is 0 Volts (+/- 0.1V) and, when the sunshine is above the WMO threshold, the signal output is 1 Volt (+/- 0.1V).

The CSD3 provides a 0 to 1.5 V output signal for Direct Irradiance in units of W/m², with 1mV = 1 W/m².

The Symphonie logger samples the sensor output voltage and converts it to a raw value in counts. The real-time display and the scaled data generated by SDR require a scale factor be applied to the raw value to obtain values in meaningful units (such as Minutes, W/m²).

Measurement	SCM Item	Symphonie Logger Channel Type	Slope	Offset	Units
Sunshine Duration	7758	Analog or flex	0.00977	0	Minutes
Direct Irradiance	7757	Analog or flex	1.467	0	W/m ²

Entering Sensor Information into the Logger

The Symphonie logger calculates and stores data in raw units; no scaling is applied to the data in the logger. The logger uses the descriptive and scaling information that you enter to display present values, and stores the scaling information in the data file headers for later use. Refer to your logger's User's Manual for more details

on entering values into the Symphonie logger. *Note that on SymphoniePLUS3 loggers, the user can enter the sensor information via the logger parameter editor in SDR when the logger is connected locally to a PC.*

When the logger is started, it will identify the sensor channel as an NRG 110S temperature sensor. Press [Home][4][2][9], then press [F1] to change channel 9 settings, for example.

Press [F1] and select "custom"; press [SET] to accept, and then edit the sensor description (to CSD3 Sun Dur). Press [SET] to see the current scale factor setting; enter the Scale Factor 0.00977. Press [SET] to see the Offset; and enter an offset of 0. Press [SET] to see the current Units setting, and enter "min". Press [SET]. Enter the sensor mounting height if desired, and then press [SET]. Enter the sensor serial number if desired. Press [SET] to complete the settings for channel 9.

Once these parameters are entered, press [Home][1], then use the [F1] key to display instantaneous sensor readings.

Data Processing

When importing data into Symphonie Data Retriever (SDR) software for the first time, the site parameters entered at the logger will be imported automatically. If the calculated scale factor was not entered into the logger, you should enter the scale factor for your sensor into the Site Information Editor in SDR before importing the site data. For sunshine duration, it is recommended to set the print precision on that channel to "0". This can be accomplished by using the Site>Edit Site menu in SDR.

Wiring

Kipp and Zonen CSD3 sensors are equipped with a multi-conductor cable, which carries signals from the sensor as well as power to the sensor. Please consult the documentation which came with the sensor. Note wire colors vary between manufacturers and sometimes change over time, so please cross check the wiring shown here with the sensor manual. Up to two logger channels can be used with the CSD3. If only one signal output is required, connect the supply ground and signal ground together at the logger terminal block.

Kipp and Zonen CSD3	Wire Color	Symphonie and SymphoniePLUS Logger	SymphoniePLUS3 Logger
Shield	Thick Black	Shield	SHD
Signal Ground	Blue	Connect to "-" terminal on first SCM channel	Connect to "GND" on first SCM channel
Sunshine Signal	Red	Connect to "sig" on the 0-1V SCM (7758) channel	Connect to "sig" on the 0-1V SCM (7758) channel
Direct Irradiance	Grey	Connect to "sig" on Direct Irradiance SCM (7757) channel	Connect to "sig" on Direct Irradiance SCM (7757) channel
Power Ground	Yellow	Connect to "-" terminal on first or second SCM channel	Connect to "GND" on first or second SCM channel
Power Supply	Brown	connect to "+" on one SCM Channel	connect to "EXC" on one SCM Channel

Mounting

Please carefully consult the Kipp and Zonen CSD3 documentation for detailed mounting instructions. Note that Renewable NRG Systems can supply a mounting arm for use with an NRG SRA tower.