Test report Hioki LR8450-01 data logger

Hioki MEMORY HiLOGGER LR8450-01 used with Hukx heat flux and temperature sensors

The Hioki data logger is easy to use. It can measure up to 120 channels and display the heat flux and temperatures simultaneously. Our test shows that the latest FHF heat flux and temperature sensors have excellent compatibility with the Hioki LR8450-01. FHF sensors are versatile: they have an integrated temperature sensor, have thermal spreaders to reduce thermal conductivity dependence, and are applicable over a temperature range from –70 to +120 °C. Our high temperature foil heat flux sensor FHF06 is even suitable for temperatures up to 250 °C.
The combined measurement of heat flux and temperature, offers you a full picture of the thermal behavior of a system.

Introduction

Hukx offers a wide range of sensors for heat flux and temperature measurement. The thermopile heat flux sensor and thermocouple temperature sensor are both passive sensors; they do not require power.

Conclusion of testing

Hioki LR8450-01 data logger has plug-in modules and wireless modules. Using multiple modules, a total of 165 Hukx FHF sensors such as FHF05 series or FHF06 can be connected to the Hioki LR8450-01. The heat flux in W/m^2 is calculated by dividing the heat flux sensor's output, a small voltage, by its sensitivity. The sensitivity is provided with the sensor on its certificate and can be found on the label at the end of the cable.

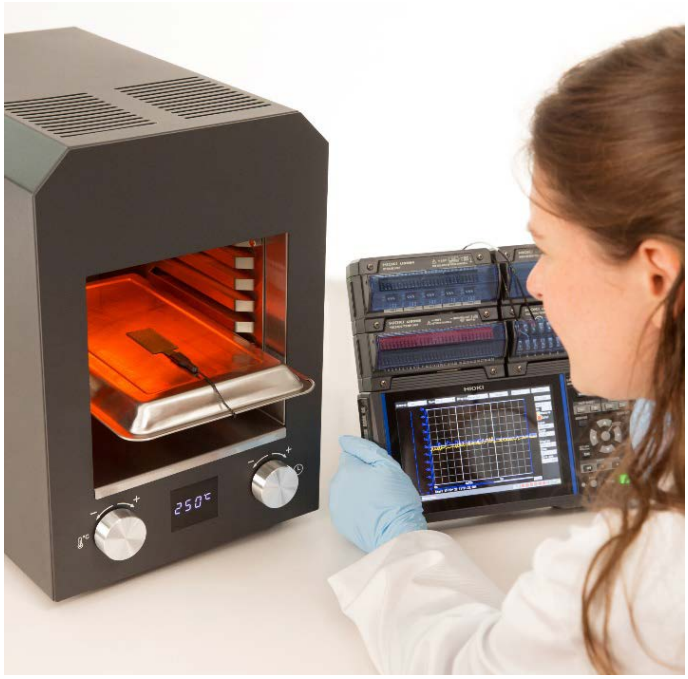

Figure 1 High temperature foil heat flux sensor model FHF06-25X50 used with Hioki LR8450-01.

Specifications

Hioki LR8550-01 can display heat flux and temperature data of multiple sensors simultaneously. Table 1 shows a summary of the most important specifications of the Hioki LR8450-01 when used with FHF05 series or FHF06 heat flux sensors. Contact Hukx for a final check of your proposed solution.

Figure 2 Hioki LR8450-01 data logger with two plug-in modules installed. The logger can connect to wireless units and can handle 165 heat flux sensors each with its own temperature measurement.

Getting started

The following text describes how to install the sensors and the data logger. For more information read the sensor manual on our website or the Hioki user brochure. Visit also the Hukx YouTube channel for a quick introduction to heat flux or learn more about separation of radiation and convection.

Before use

Connect the plug-in or wireless units 'voltage/temp unit' to the main logger. Define the number of sensors you need. There are units with 30 channels or 15 channels, suitable for respectively 15 or 7 FHF's.

Step 1

Suggested wire connection of FHF05 series or FHF06:
– Ch 1 +: red (heat flux +)
– Ch 1 -: black (heat flux -)
– Ch 2 +: thermocouple (type T +)
– Ch 2 -: thermocouple (type T -)

Step 2

Specify your measurement:
– Estimate the maximum heat flux.
– Calculate the output range of heat flux sensor in [× 10^{-6} V] and program it into the logger; sensitivity x maximum flux.
– For Ch 1 choose as input 'voltage' and program the sensitivity of the sensor as scaling factor for heat flux measurements.
– For Ch 2 select as input 'Tc' and then type T for temperature measurements.
Repeat previous steps in case more sensors are used.

Table 1 Most important specifications of Hioki LR8450-01 used with a Hukx FHF sensor.

	LR8450
no. of input channels	330
no. of plug-in channels	up to four
no. of wireless modules	up to seven
temperature	y
voltage	y
heat flux	y, via scaling factor
voltage measurement accuracy	0.1 x 10^{-6} V
estimated heat flux resolution with FHF heat flux sensors	0.01 W/m^2
temperature measurement accuracy	± 0.8 °C
wireless/Bluetooth	only wireless modules
battery powered use	optional with battery pack

Step 3

Start your measurement:
– Press the start button.
– Heat flux and temperature are displayed simultaneously on the same screen.
– Optimize using display settings.

Step 4

Store data:
– USB flash drive or connection to computer
– SD card

Suggested use

Heat flux + temperature sensors and loggers are used to analyze the cause of temperature change. FHF05 series and FHF06 are heat flux sensors for general-purpose heat flux measurements, often applied as part of a larger test- or measuring system. Also, they are used to validate mathematical CFD simulations. Read more about Hioki data logger LR8450-01 and FHF05 series in Battery EV Thermal Management.

Figure 3 Hioki LR8450-01 can display voltage and temperature data of multiple sensors simultaneously on screen.

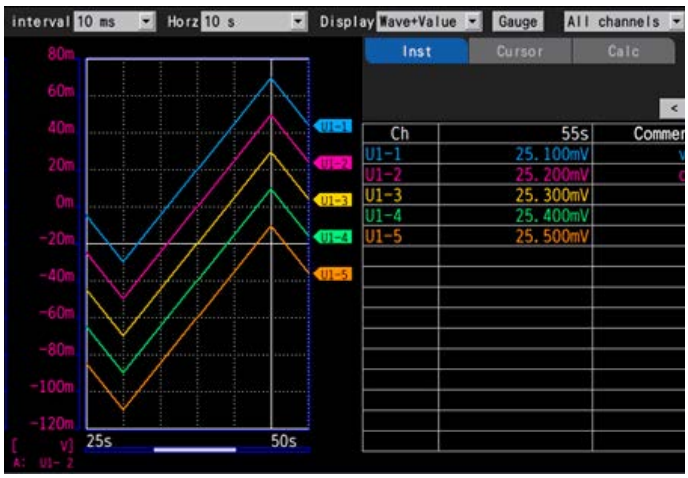

Figure 4 Heat flux and temperature can be displayed simultaneously in the same graph.

About Hukx

Hukx is the leading innovator in solar radiation and heat flux sensor technology. We are proud to set the standard in high-accuracy measurement, and to be working at the heart of the energy transition.

Customers worldwide rely on our bestselling pyranometers and heat flux sensors. From sensor design and selection to supply and recalibration, we support you across the entire lifecycle.

Hukx is headquartered in the Netherlands, with locally owned representative sales offices in the USA, Brazil, India, China, Southeast Asia, and Japan.

Let us help you select the best sensor for your application.
Get in touch with our experts today via: info@hukx.com

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