Test report Hioki LR8432

Hioki heat flow logger LR8432 used with Hukx heat flux + temperature sensors

The Hioki heat flow logger is easy and convenient in use. It can measure up to ten channels and display the data of heat flux, voltage and temperature simultaneously. Our test shows that the latest FHF sensors have excellent compatibility with the Hioki LR8432 data logger. FHF sensors are very versatile: integrated temperature sensor, thermal spreaders to reduce thermal conductivity dependence, applicable over a temperature range from –70 to +120 °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

A total of five FHF sensors such as FHF05 series can be connected directly to the Hioki LR8432. 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 programmed directly into the data logger.

Figure 1 FHF's with BLK and GLD sticker used with Hioki LR8432.

Specifications

Table 1 shows a summary of the most important specifications of the Hioki LR8432 when used with Hukx FHF05 series. Contact Hukx for a final check of your proposed solution.

Figure 2 Hioki LR8432 can handle five heat flux sensors each with its own temperature measurement and display the results simultaneously on screen.

Getting started

The following text helps you to install the sensors to the data logger and get along. For more information see 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

– Charge the internal battery pack for 2.5 hours continuous use or use the AC adapter.

Step 1

Suggested wire connection for FHF05 series:
– Ch 1 +: red (heat flux +)
– Ch 1 -: black (heat flux -)
– Ch 2 +: thermocouple (type T +)
– Ch 2 -: thermocouple (type T -)
Channels 5 to 10 can be used for four (4) additional FHF sensors.

Table 1 Most important specifications of Hioki LR8432 used with a Hukx FHF05 series.

	LR8432
no. of input channels	10
temperature	y
heat flux	y
voltage measurement accuracy	0.1 x 10^{-6} V
estimated heat flux resolution with FHF05	0.01 W/m^2
temperature measurement accuracy	± 0.8 °C
wireless/Bluetooth	n
battery powered use	y

Step 2

Specify your measurement:
– Describe the purpose of the experiment.
– Estimate the output range of heat flux sensor in [× 10^{-6} V] and program it into the logger.
– For Ch 1 choose as input ‘heat’ and enter sensitivity of heat flux sensor.
– For Ch 2 select as input ‘Tc’ and then type T for temperature measurements.
– Repeat previous steps in case more sensors are used.

Step 3

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

Step 4

Store data:
– USB flash drive
– USB connection to computer
– CF Card

Suggested use

Heat flux + temperature sensors and loggers are used to analyze the cause of temperature change. The five models of FHF05 series are 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 and FHF05 series in Battery EV Thermal management.

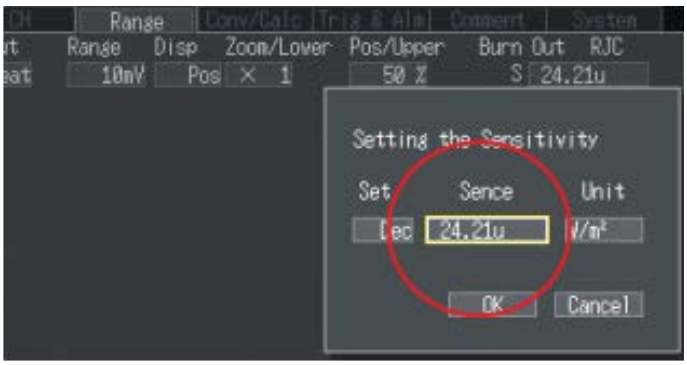

Figure 3 Avoid troublesome calculations by simply entering the sensitivity of the heat flux sensor in the logger.

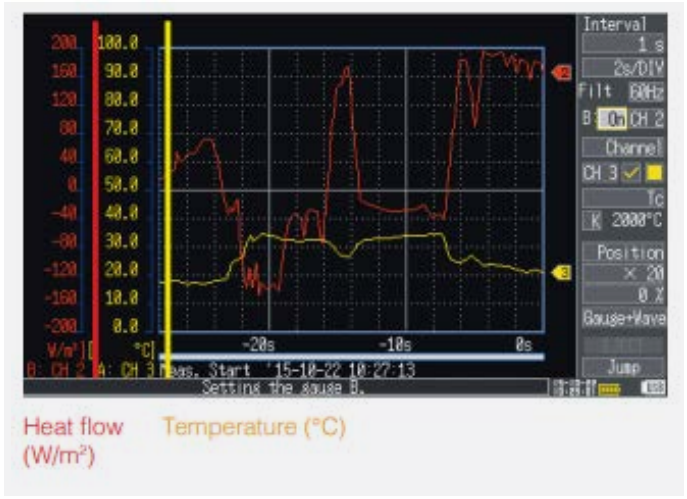

Figure 4 Heat flow and temperature can be displayed simultaneously in the same graph.

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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