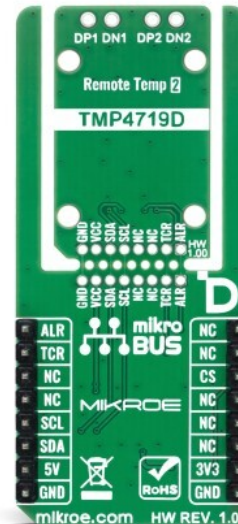
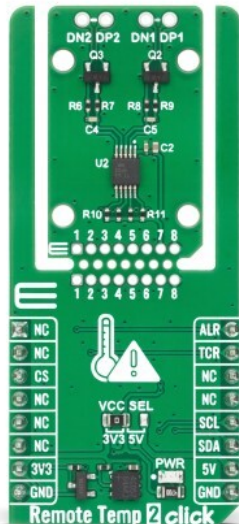


Remote Temp 2 Click



PID: MIKROE-6996

Remote Temp 2 Click is an add-on board designed for multi-point monitoring in embedded systems where local and remote feedback is required. This board is based on the [TMP4719DGSR](#), a three-channel temperature sensor from [Texas Instruments](#). It combines one local sensor with two remote sensing channels for diode-connected transistors or on-chip thermal diodes, supporting -40°C to +125°C operation, up to $\pm 0.8^\circ\text{C}$ remote accuracy, 12-bit remote resolution, I2C communication, ALERT and T_CRIT outputs, series resistance cancellation, η -factor correction, digital filtering, and diode fault detection. It is suitable for server motherboards, smart NICs, base stations, BBUs, software-defined radios, and FPGA thermal monitoring.

For more information about **Remote Temp 2 Click** visit the official [product page](#).

How does it work?

Remote Temp 2 Click is based on the TMP4719DGSR from Texas Instruments, a digital temperature sensor designed for multi-point thermal monitoring in embedded systems. The device integrates one local temperature sensor and two remote temperature sensing channels, allowing the board to monitor temperature both at the Click board location and at two external thermal points. The remote channels can be connected to diode-connected transistors or to thermal diodes integrated inside processors, microcontrollers, ASICs, and FPGAs, making the Click suitable for designs where internal IC temperature must be tracked without placing a separate sensor directly on the monitored component. The TMP4719 provides remote temperature measurement with up to $\pm 0.8^\circ\text{C}$ accuracy and 12-bit resolution, while the local channel provides $\pm 1^\circ\text{C}$ accuracy with 8-bit resolution, covering thermal monitoring needs across the -40°C to +125°C operating range.

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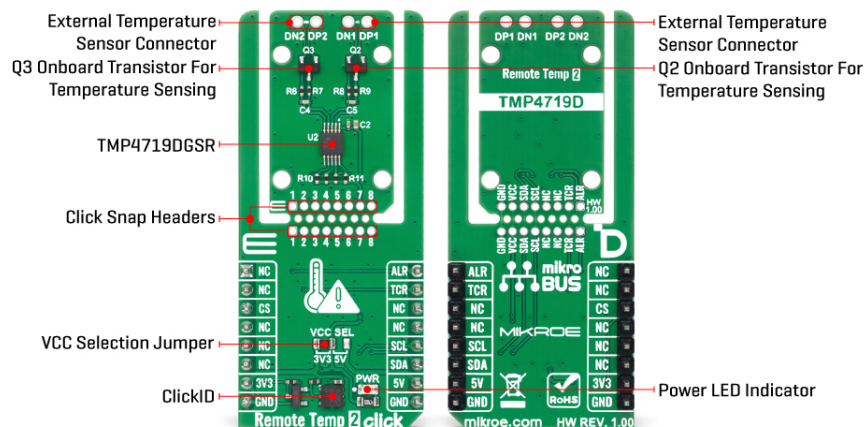
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The TMP4719 includes several functions that improve measurement reliability in demanding thermal environments. Series resistance cancellation helps reduce errors caused by routing resistance between the sensor and the remote diode, while programmable η -factor correction allows the measurement path to be adjusted for different diode characteristics. A programmable digital filter improves noise immunity, which is useful when remote sensing traces are routed near switching circuits or high-speed signals. The device also supports configurable temperature limits and remote diode fault detection, so the host system can detect abnormal thermal conditions or connection problems and react before the monitored hardware reaches a critical operating point.

Remote Temp 2 Click communicates with the host MCU through the I2C interface, using the mikroBUS™ SCL and SDA pins for clock and data lines. Through this interface, the host can read local and remote temperature values, configure conversion and filtering options, set temperature limits, and monitor status registers. In addition to the I2C lines, the Click uses the PWM pin as the ALERT output and the INT pin as the T_CRIT output. Both signals are open-drain temperature warning outputs that can be used to indicate programmable alert events or critical temperature conditions directly to the host MCU. The CS pin is used for ClickID communication, allowing compatible systems to identify the board automatically. The board includes two onboard MMBT3904 diode-connected transistors, marked as Q2 and Q3, which serve as remote temperature sensing elements for evaluating both remote channels of the TMP4719. The remote diode connections are also routed to dedicated DP1/DN1 and DP2/DN2 connection points, allowing the user to connect external thermal diodes or place the sensing points closer to the monitored hardware.

The remote sensing paths include series resistors and filtering capacitors to support stable measurements and improve noise behavior on the diode lines. Remote Temp 2 Click also features a Click Snap layout for separating the sensing section when temperature must be measured away from the mikroBUS™ host area, a PWR LED indicator for visual confirmation of the selected supply, and a VCC SEL jumper for choosing the operating voltage level.

Remote Temp 2 Click can operate with either 3.3V or 5V power rails selected through the VCC SEL jumper, making it suitable for development systems that use different mikroBUS™ logic levels. The selected rail powers the onboard circuitry and defines the board's logic voltage for communication with the host MCU. This Click board™ comes with a ready-to-use code example and supporting software library, allowing users to download the example, initialize the device, read local and remote temperature channels, configure alert limits, and quickly integrate thermal monitoring into their application.

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Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

Type	Temperature & humidity
Applications	Ideal for server motherboards and smart NICs, base stations and BBUs, software-defined radios, heavy-load processing hardware, and FPGA thermal monitoring
On-board modules	TMP4719DGSR - high-accuracy digital temperature sensor from Texas Instruments
Key Features	One local and two remote temperature sensing channels, remote sensing, up to $\pm 0.8^{\circ}\text{C}$ remote temperature accuracy with 12-bit resolution, ALERT and T_CRIT open-drain temperature warning outputs, series resistance cancellation, programmable η -factor correction, remote diode fault detection, and more
Interface	GPIO, I2C
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V, 5V

Pinout diagram

This table shows how the pinout on Remote Temp 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	ALR	ALERT Output
	NC	2	RST	INT	15	TCR	TCRIT Output
ClickID	CS	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	6	MOSI	SDA	11	SDA	I2C Data
Power Supply	3.3V	7	3.3V	5V	10	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

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Label	Name	Default	Description
LD1	PWR	-	Power LED indicator showing the presence of the selected board supply
JP1	VCC SEL	Left	Power/logic voltage level selection 3.3V/5V: left position 3.3V, right position 5V
J1	J1	-	External temperature sensor connector
J2	J2	-	External temperature sensor connector
Q2	Q2	-	Onboard transistor for temperature sensing
Q3	Q3	-	Onboard transistor for temperature sensing

Remote Temp 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	1.62	-	5.5	V
Operating temperature	-40	-	125	°C
I2C standard mode	1	-	100	kHz
I2C fast mode	1	-	400	kHz

Software Support

[Remote Temp 2 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

Example Description

This example demonstrates the use of Remote Temp 2 Click board by reading and displaying the temperature measurements from the local sensor and both remote channel sensors (CH1 and CH2), and monitoring the alert and critical temperature states.

Key Functions

- remotetemp2_cfg_setup This function initializes Click configuration structure to initial values.
- remotetemp2_init This function initializes all necessary pins and peripherals used for this Click board.
- remotetemp2_default_cfg This function executes a default configuration of Remote Temp 2 Click board.
- remotetemp2_read_local_temp This function reads the local sensor temperature in degrees Celsius.
- remotetemp2_read_temp_ch1 This function reads the remote channel 1 temperature in degrees Celsius.
- remotetemp2_read_temp_ch2 This function reads the remote channel 2 temperature in degrees Celsius.

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Application Init

Initializes the driver and performs the Click default configuration.

Application Task

Reads the temperature measurements in degrees Celsius from the local sensor and both remote channels, and displays the results on the USB UART approximately once per second. Also monitors and reports the alert and critical temperature states via the ALR and TCR pins.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Remote Temp 2 click example package](#)

[Remote Temp 2 click 2D and 3D files v100](#)

[TMP4719DGSR datasheet](#)

[Remote Temp 2 click schematic v100](#)

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