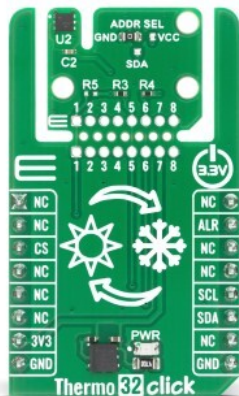


Thermo 32 Click



PID: MIKROE-6941

Thermo 32 Click is a compact add-on board designed for digital temperature measurement, thermal monitoring, and temperature-based alert management. It is based on the [N34TS108](#), a low-voltage digital temperature sensor from [onsemi](#). This sensor features 12-bit temperature resolution with 0.0625°C granularity, high measurement accuracy, a dynamically programmable limit window, and built-in under- and over-temperature alert functions for thermal supervision without constant MCU polling. It also supports high-speed I2C communication, configurable I2C addressing, and MIKROE's Click Snap feature for flexible standalone implementation. Thermo 32 Click is well suited for smartphone and tablet thermal management, battery management systems, thermostat control, HVAC equipment, and under- and over-temperature protection in environmental monitoring applications.

For more information about **Thermo 32 Click** visit the official [product page](#).

How does it work?

Thermo 32 Click is based on the N34TS108, a low-voltage digital temperature sensor from onsemi, offering reliable temperature monitoring with a dynamically programmable limit window and integrated under- and over-temperature alert functions. These features allow the system to react to temperature changes without requiring constant polling from the host controller or application processor, making it suitable for thermal control in power-sensitive and performance-oriented designs. The sensor delivers 12-bit temperature resolution with 0.0625°C granularity, while maintaining high accuracy of up to $\pm 0.75^{\circ}\text{C}$ in the temperature range from -20°C to $+85^{\circ}\text{C}$ and up to $\pm 1^{\circ}\text{C}$ from -40°C to $+125^{\circ}\text{C}$. Thermo 32 Click is well suited for applications such as smartphone and tablet thermal management, battery management systems, thermostat control, HVAC equipment, and under- and over-temperature protection in

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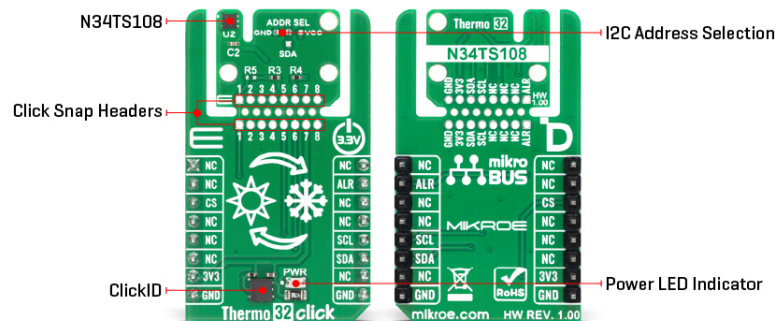


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environmental monitoring solutions.



This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the N34TS108 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Communication with the host MCU is established through a high-speed I2C two-wire serial interface, supporting frequencies up to 3.4MHz. In addition, the I2C address can be easily configured using onboard jumpers marked ADDR SEL in the Click Snap area, allowing multiple devices to operate on the same communication bus. Besides the communication pins, the board also uses the ALR pin as an alert interrupt output, which is triggered whenever the measured temperature goes beyond the defined upper or lower threshold limits.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

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 smartphone and tablet thermal management, battery management systems, thermostat control, HVAC equipment, and

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	under- and over-temperature protection in environmental monitoring applications
On-board modules	N34TS108 - low-voltage digital temperature sensor from onsemi
Key Features	Low-voltage digital temperature sensing, dynamically programmable limit window, under- and over-temperature alert functions, high measurement accuracy, high-speed I2C interface, configurable I2C address selection, alert interrupt output, Click Snap feature, and more
Interface	I2C
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Thermo 32 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	NC	
	NC	2	RST	INT	15	ALR	Alert Interrupt
ID COMM	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	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	ADDR SEL	Left	I2C Address Selection GND/SDA/VCC: Left position GND, Lower position SDA, Right position VCC

Thermo 32 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Range	-40	-	+125	°C
Accuracy (-20°C to +85°C)	-	±0.15	±0.75	°C
Accuracy (-40°C to +125°C)	-	±0.3	±1	°C

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Resolution	-	0.0625	-	°C
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Software Support

[Thermo 32 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 how to read temperature data and detect ALERT events using the Thermo 32 Click board.

Key Functions

- `thermo32_cfg_setup` This function initializes Click configuration structure to initial values.
- `thermo32_init` This function initializes all necessary pins and peripherals used for this Click board.
- `thermo32_default_cfg` This function executes a default configuration of Thermo 32 Click board.
- `thermo32_get_alert_pin` This function reads the digital state of the ALERT pin.
- `thermo32_clear_alert` This function clears the alert interrupt by reading the configuration register.
- `thermo32_get_temp` This function reads the temperature and converts it to degrees Celsius.

Application Init

Initializes the driver and configures the Thermo 32 Click for temperature measurement.

Application Task

Reads the temperature value periodically and logs an ALERT message when the alert pin becomes active.

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

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[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Thermo 32 click example package](#)

[Thermo 32 click 2D and 3D files v100](#)

[Thermo 32 click schematic v100](#)

[N34TS108 datasheet](#)

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