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Thermo 30 Click





PID: MIKROE-5736

Thermo 30 Click is a compact add-on board that accurately measures temperature. This board features the STS32-DIS-10KS, a third-generation, high-reliability, certified digital temperature sensor from Sensirion. It is a digitally calibrated and ISO17025-certified temperature sensor with an operating temperature range of -40 to 125°C. The temperature sensor relies on industry-proven CMOSens® technology, which enables better computational power, reliability, and accuracy specifications in comparison to its predecessors. This Click board™ makes the perfect solution for the development of the thermal management of portable electronics and industrial, consumer, and environmental applications.

Thermo 30 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

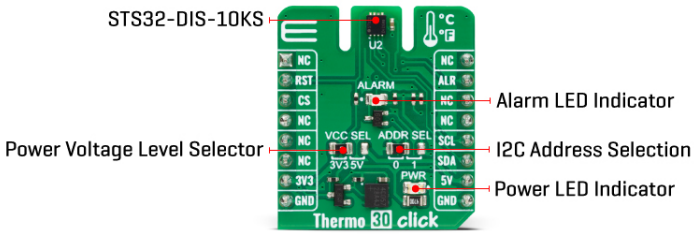
Thermo 30 Click is based on the STS32-DIS-10KS, a third-generation, high-reliability, certified digital temperature sensor from Sensirion. Every sensor has its unique serial number and is supplied with an ISO17025-accredited calibration certificate, which comprises three temperatures: −30°C, 5°C, and 70°C. The calibration is performed on each sensor and granted by the Swiss Accreditation Service. The calibration data and the serial number are stored in the onboard memory. Temperature data can be acquired both in Single Shot and Periodic Data mode as a 16-bit temperature value. The sensor is also equipped with an internal heater that can be used for plausibility checking only and can be switched on and off through software.

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ISO 27001: 2013 certification of informational security management system.
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The Thermo 30 Click uses a standard 2-Wire I2C interface to communicate with the host MCU with Fast mode support and frequencies up to 1MHz. The I2C address can be selected via the ADDR SEL jumper (0 set by default). The STS32-DIS-10KS can be reset via the RST pin of the mikroBUS™ socket, through a general call, or software as a soft reset. Resetting over the RST pin or through a general call (according to I2C specifications) achieves a full reset, while with the soft reset, the sensor resets the system controller and reloads calibration data from memory. In addition, the Thermo 30 Click comes with an alert function, a feature that can interrupt the host MCU over the ALR pin of the mikroBUS™ socket if there is an alarm condition. The red ALARM LED stands as a visual presentation of this feature.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. However, the Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used, as a reference, for further development.

Specifications

Type	Temperature & humidity
Applications	Can be used for the development of the thermal management of portable electronics and industrial, consumer, and environmental applications
On-board modules	STS32-DIS-10KS - a 3rd generation certified digital temperature sensor from Sensirion
Key Features	Low power consumption, high precision, high reliability, long-term stability, 16-bit temperature resolution, low drift digital calibration on CMOSens® technology, high accuracy, unique serial number, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

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Pinout diagram

This table shows how the pinout on Thermo 30 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset	**RST**	2	RST	INT	15	**ALR**	Alert
	NC	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

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	ALARM	-	Alarm LED Indicator
JP1	VCC SEL	Left	Power/Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Thermo 30 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Operating Temperature Range	-40	-	125	°C
Temperature Accuracy	-	±0.4	-	°C
Temperature Resolution	-	0.01	-	°C

Software Support

We provide a library for the Thermo 30 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for Thermo 30 Click driver.

Key functions

- thermo30_hw_reset Thermo 30 hw reset device function.

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- thermo30_start_measurement Thermo 30 start measurement function.
- thermo30_read_temperature Thermo 30 read temperature function.

Example Description

This example demonstrates the use of Thermo 30 Click board™ by reading and displaying the temperature measurements.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Thermo30

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

STS32-DIS datasheet

Thermo 30 click 2D and 3D files

Thermo 30 click schematic

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[Thermo 30 click example on Libstock]

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