THERMO K click

PID: MIKROE-2501

RS Product Code: 136-0862

THERMO K click carries the MCP9600 IC from Microchip. Depending on the type of probe it uses the click can measure temperatures from −200 °C to +1372 °C.

The click is designed to run either on 3.3V or 5V power supply. It communicates with the target MCU through I2C interface.

Temperature range

With the type-K probe, available in our store, this click can measure temperature up to +480 °C. With a different probe it can theoretically measure temperature up to +1372 °C.

THERMO K click has a PCC-SMP thermocouple connector on board, suitable for all K-type probes.

MCP9600 IC from Microchip

The MCP9600 IC converts thermocouple EMF to degree Celsius with integrated Cold-Junction compensation. It corrects the thermocouple nonlinear error characteristics of eight thermocouple types and outputs ±1.5°C accurate temperature data.

4 alert outputs

THERMO K click has 4 alert outputs on board that can be used to detect multiple temperature zones. You can define on which specific temperature the THERMO K click will send an alarm.

Low power modes

Low-Power modes are available for battery-powered applications. In shut-down mode the module uses only 2 µA.

Thermocouple probe

In order to use THERMO K click you need to connect the appropriate K-type thermocouple probe (not included in the package) into the PCC-SMP connector.

Application

Hand-held measurement equipment, industrial equipment thermal management, petrochemical thermal management, etc.

Key features

- MCP9600 IC from Microchip
- Four Programmable Temperature Alert Outputs
- Operating Current: 300 µA (typical)
- Shutdown Current: 2 µA (typical)
- Interface: I2C
- 3.3V or 5V power supply

Specification

Product Type	Temperature / Humidity
Applications	Hand-held measurement equipment, industrial equipment thermal management, petrochemical thermal management, etc.
On-board modules	MCP9600 IC from Microchip
Key Features	Operating Current: 300 µA, Shutdown Current: 2 µA
Key Benefits	Four Programmable Temperature Alert Outputs
Interface	I2C
Power Supply	3.3V or 5V
Compatibility	mikroBUS
Click board size	M (42.9 x 25.4 mm)
Weight	28g

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Jumpers and settings

Designator	Name	Default Position	Default Option	Description: describe the use + list all options with respective descriptions
JP1	PWR.SEL.	Left	3V3	Power Supply Voltage Selection 3V3/5V, left position 3v3, right position 5V
JP2	ADDR. SEL.	Right	GND	I2C address Selection. Left position (VDD) is 1100111x and right position (GND) is 1100000x .

Additional information

Our store offers Thermocouple Type-K Glass Braid Insulated probes.

Pinout diagram

This table shows how the pinout on THERMO K click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS™				Pin	Notes
Alert 4 output	**Alert 4**	**1**	AN	PWM	**16**	**ALERT2**	Alert 2 output
Alert 3 output	**ALERT3**	**2**	RST	INT	**15**	**ALERT1**	Alert 1 output
Not connected	NC	**3**	CS	TX	**14**	NC	Not connected
Not connected	NC	**4**	SCK	RX	**13**	NC	Not connected
Not connected	NC	**5**	MISO	SCL	**12**	**SCL**	I2C Clock
Not connected	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

Programming

The demo shows the temperature on the TFT or LCD display. It measures every half a second. We have examples for PIC, dsPIC, PIC32, ARM, AVR and FT90x compilers. The code snippet is from the Example folder of the PIC compiler and P18F87K22 MCU.

This example is a temperature reading routine. First, we are reading the “Thermocouple Temperature Register” and then we are converting the value to a temperature in the Celsius scale.

```
float Read_Temperature()
{
    float Temperature;

    tmp_data[0] = MCP9600_TH;

    I2C1_Start();
    I2C1_Wr( MCP9600_I2C_ADDR );
    I2C1_Wr( tmp_data[ 0 ] );
    I2C1_Stop();
    Delay_us( 50 );
    I2C1_Start();
    I2C1_Wr( MCP9600_I2C_ADDR | 1 );
    tmp_data[ 0 ] = I2C1_Rd( 1 );
    tmp_data[ 1 ] = I2C1_Rd( 0 );
    I2C1_Stop();

    if((tmp_data[0] & 0x80) == 0x80)
    {
        tmp_data[0] = tmp_data[0] & 0x7F;
        Temperature = 1024 - (tmp_data[0]*16 + tmp_data[1] / 16);
    }
    else
    {
        Temperature = (tmp_data[0] * 16 + (float)tmp_data[1] / 16);
    }

    return Temperature;
}
```

Downloads

Thermo K click Examples

Thermo K click Schematic