

Manuals.plus /

› NOYITO /

› NOYITO MAX6675 K-Type Thermocouple Module Instruction Manual

## NOYITO MAX6675

# NOYITO MAX6675 K-Type Thermocouple Module Instruction Manual

Model: MAX6675 | Brand: NOYITO

## 1. PRODUCT OVERVIEW

---

The NOYITO MAX6675 is a monolithic thermocouple digitizer designed for use with K-type thermocouples. It integrates a signal conditioning amplifier, a 12-bit analog-to-digital converter, cold junction compensation, and a digital controller with an SPI-compatible interface. This module provides a simple and accurate solution for temperature measurement in various applications.

### Key Features:

- Simple SPI serial port for temperature value output.
- Temperature detection range: 0°C to 1023.75°C.
- Converter temperature resolution: 0.25°C.
- Integrated on-chip cold-junction compensation.
- High impedance differential input.
- Thermocouple disconnection detection.
- Working voltage range: 3.0V to 5.5V.
- Working current: 50mA.
- Operating temperature range: -20°C to 85°C.

## 2. PRODUCT COMPONENTS

---

The NOYITO MAX6675 Thermocouple Module typically includes the following components:

- MAX6675 Thermocouple Module board.
- K-Type Thermocouple (often included, but may vary by package).
- Header pins for connection.
- Terminal block for thermocouple connection.



Figure 2.1: The NOYITO MAX6675 Thermocouple Module, showing the main board, green terminal block for thermocouple connection, and header pins for interfacing with a microcontroller.



Figure 2.2: Rear view of the MAX6675 module, illustrating the solder points and board layout.

### 3. SETUP AND CONNECTION

---

This section details the steps for connecting the MAX6675 module to a microcontroller (e.g., Arduino, Raspberry Pi) and a K-type thermocouple.

#### 3.1 Pinout Description:

Pin	Description
GND	Ground connection.
VCC	Power supply input (3.0V to 5.5V).
DO	Data Output (SPI MISO).
CS	Chip Select (SPI SS).
CLK	Clock Input (SPI SCK).
+	Positive terminal for K-type thermocouple.
-	Negative terminal for K-type thermocouple.

#### 3.2 Wiring Diagram (Example):

Connect the module to your microcontroller using the SPI interface. Ensure correct polarity when connecting the K-type thermocouple to the terminal block.



Figure 3.1: Detailed view of the MAX6675 module's pinout for digital and thermocouple connections.



Video 3.2: This video demonstrates the connection and basic operation of a DC 3-5V MAX6675 Module with a K-Type Thermocouple, showing how to interface it and read temperature values.

### 4. OPERATING INSTRUCTIONS

---

After successful connection, the MAX6675 module can be operated by sending commands via the SPI interface to read temperature data. Libraries are available for popular microcontrollers to simplify this process.

#### 4.1 Temperature Reading Process:

1. Initialize the SPI communication on your microcontroller.
2. Set the Chip Select (CS) pin low to select the MAX6675 module.
3. Read 16 bits of data from the Data Output (DO) pin.
4. Set the Chip Select (CS) pin high to deselect the module.
5. Process the 16-bit data:

- Bits D14 to D3 represent the 12-bit temperature value.
- Bit D2 indicates thermocouple input open (1 = open, 0 = connected).
- Bits D1 and D0 are device ID bits (always 0).

6. Convert the 12-bit temperature value to Celsius by multiplying by 0.25°C.

The module automatically performs cold junction compensation, ensuring accurate temperature readings even with varying ambient temperatures around the module.

## 5. SPECIFICATIONS

Specification	Value
Brand	NOYITO
Model Number	MAX6675
Temperature Range	0°C to 1023.75°C
Temperature Resolution	0.25°C
Measurement Accuracy	±0.25°C
Working Voltage Range	3.0V ~ 5.5V (DC)
Working Current	50mA
Operating Temperature Range	-20°C ~ 85°C
Output Type	Digital (SPI)
Material	Copper (for certain components)
Item Dimensions (L x W x H)	0.81 x 8.07 x 0.12 inches
Item Weight	0.176 ounces

## 6. MAINTENANCE

The MAX6675 module is designed for durability and requires minimal maintenance. Follow these guidelines to ensure optimal performance and longevity:

- **Storage:** Store the module in a dry, anti-static environment when not in use.
- **Cleaning:** If necessary, gently clean the module with a soft, dry cloth. Avoid using liquids or abrasive cleaners.
- **Connections:** Periodically check all connections (power, SPI, thermocouple) to ensure they are secure and free from corrosion.
- **Environmental Conditions:** Operate the module within its specified operating temperature and humidity ranges to prevent damage.

## 7. TROUBLESHOOTING

If you encounter issues with your MAX6675 module, consider the following troubleshooting steps:

- **No Temperature Reading:**
  - Verify power supply (VCC and GND) is correctly connected and within the 3.0V-5.5V range.

- Check SPI connections (DO, CS, CLK) for proper wiring and continuity.
  - Ensure the K-type thermocouple is correctly connected to the + and - terminals with correct polarity.
  - Check for thermocouple disconnection (Bit D2 in the read data should be 0).
  - Confirm your microcontroller's SPI code is correctly implemented and communicating with the MAX6675.
- **Inaccurate Readings:**
    - Ensure the thermocouple is properly seated and making good contact.
    - Verify that the thermocouple type is K-type. Other types will yield incorrect readings.
    - Check for external electrical noise that might interfere with the readings.
    - Confirm the cold junction compensation is functioning (this is internal to MAX6675).
  - **Module Not Responding:**
    - Power cycle the module and microcontroller.
    - Inspect the module for any visible damage or loose components.

## 8. WARRANTY AND SUPPORT

---

NOYITO products are designed for reliability. For specific warranty information, please refer to the product packaging or the retailer's terms of sale. For technical support or further assistance, please contact your vendor or visit the official NOYITO website.