

MU-Thermocouple1 CAN FD

Configurable System for Temperature Measurement with CAN FD Interface

User Manual



Relevant Products

Product Name	Model	Part Number
MU-Thermocouple1 CAN FD (measuring range J)	Metal-cased measuring unit with 8 measuring channels	IPEH-004005-J
MU-Thermocouple1 CAN FD (measuring range K)	Metal-cased measuring unit with 8 measuring channels	IPEH-004005-K
MU-Thermocouple1 CAN FD (measuring range T)	Metal-cased measuring unit with 8 measuring channels	IPEH-004005-T

The cover picture shows the product MU-Thermocouple1 CAN FD with the thermocouple inputs for type K (green). Versions with other thermocouple types are identical in the housing design.

PCAN® is a registered trademark of PEAK-System Technik GmbH. CiA®, CANopen®, and CANopen FD® are registered EU trademarks of CAN in Automation e.V. Other product names in this document may be the trademarks or registered trademarks of their respective companies. They are not explicitly marked by ™ or ®.

© 2021 PEAK-System Technik GmbH

Duplication (copying, printing, or other forms) and the electronic distribution of this document is only allowed with explicit permission of PEAK-System Technik GmbH. PEAK-System Technik GmbH reserves the right to change technical data without prior announcement. The general business conditions and the regulations of the license agreement apply. All rights are reserved.

PEAK-System Technik GmbH
Otto-Roehm-Strasse 69
64293 Darmstadt
Germany

Phone: +49 6151 8173-20
Fax: +49 6151 8173-29

www.peak-system.com
info@peak-system.com

Document version 1.0.0 (2021-05-05)

Contents

1	Introduction	5
1.1	Properties at a Glance	5
1.2	Prerequisites	7
1.3	Scope of Supply	7
2	Connectors and Status LEDs	8
2.1	Power Supply	9
2.2	D-Sub Connector for CAN (FD)	9
2.3	Thermocouple Inputs	10
2.4	Status LEDs	11
3	operation	12
3.1	Safety Instructions	12
3.2	Operation with Default Configuration	12
3.2.1	CAN Data	13
3.2.2	Status LEDs	14
4	Measurement Accuracy	15
4.1	Measurement Errors due to Measurement Electronics	15
4.2	Measurement Errors due to Reference Temperature Sensors	15
4.3	Measurement Error due to Thermocouples	16
4.4	Example for Determining the Total Accuracy	17
5	Configuration Software	19
5.1	Features	19
5.2	Prerequisites	20
5.3	Downloading and Starting the Software	21
5.4	Generating and Transferring a Configuration	21

6	Hardware Modifications	22
6.1	Device ID	22
6.2	Internal Termination	24
7	Firmware Transfer	26
8	Technical Specifications	29
Appendix A	CE Certificate	32
Appendix B	Dimension Drawings	33

1 Introduction

With the MU-Thermocouple1 CAN FD, measurement data of thermocouples is captured, preprocessed, and transmitted via CAN FD. The temperature is measured via 8 connectors which are specified for the temperature measuring ranges J, K or T, depending on the product version. Temperatures can be captured in Celsius, Fahrenheit, or Kelvin and processed with an individual scale and offset. The measurement data is then transmitted via CAN FD or classic CAN.

Data processing, message transmission, and LED indication are set up with the free Windows software Thermocouple FD Configuration. The configuration created on the computer is transferred via the CAN bus to the MU-Thermocouple1 CAN FD which then runs as an independent CAN node. Multiple devices can be configured independently on a CAN bus.



Attention! Heed the safety instructions in section 3.1 on page 12 that explain the meaning of the warning sign printed on the unit casing.

1.1 Properties at a Glance

- 8 Mini sockets for thermocouple types J, K, or T
- 4 galvanically isolated measuring modules, each with 2 thermocouple sockets of the same type
- Measuring ranges:
 - J: -210 to +1121 °C (-346 to +2050 °F)
 - K: -200 to +1370 °C (-328 to +2498 °F)
 - T: -200 to +400 °C (-328 to +752 °F)

- └ Measurement accuracy: 0.2 % or 1 K
- └ Accuracy of the reference temperature sensors at +25 °C ambient temperature: typically ± 0.5 K, maximum ± 1.0 K
- └ Maximum resolution of temperature data: 1/16 °C
- └ High-speed CAN connection (ISO 11898-2) for data transfer and configuring
 - Comply with CAN specifications 2.0 A/B and FD
 - CAN FD bit rates for the data field (64 bytes max.) from 25 kbit/s up to 10 Mbit/s
 - CAN bit rates from 25 kbit/s up to 1 Mbit/s
 - NXP TJA1044GT CAN transceiver
 - Galvanic isolation up to 500 V
- └ LEDs for measurement channels and power supply
- └ Configuration with the Windows software Thermocouple FD Configuration
- └ Aluminum casing with flange. DIN rail fixing option available on request
- └ Voltage supply from 8 to 30 V
- └ Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

1.2 Prerequisites

For operation:

- Power supply 12 V DC nominal (8 to 30 V possible), connection via the supplied mating connector

For configuration via CAN:

- Computer with Windows 10, 8.1 (32/64-bit)
- Configuration software Thermocouple FD Configuration for Windows
- PC-CAN interface from PEAK-System. On delivery, the CAN connection is preconfigured with 500 kbit/s.
- CAN cabling between the CAN interface and the measuring unit with proper termination (120 Ohm on each end of the CAN bus)

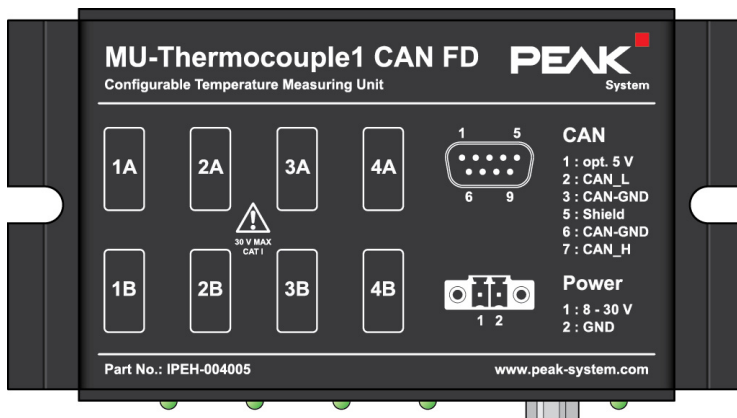
1.3 scope of supply

- MU-Thermocouple1 CAN FD in aluminum casing
- Mating connector for voltage supply
- Configuration software Thermocouple FD Configuration for Windows
- Manual in PDF format

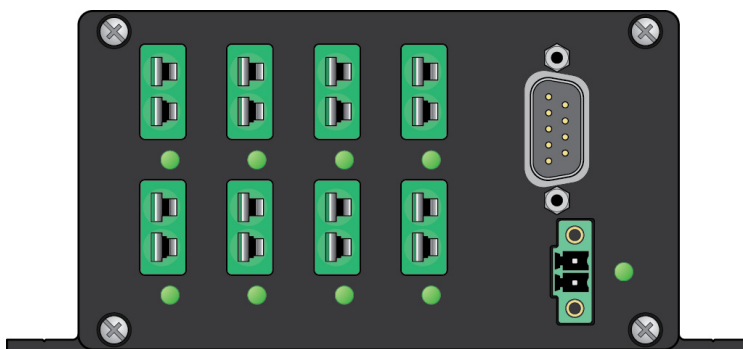


Note: Thermocouple probes are not included in the scope of supply.

2 Connectors and Status LEDs



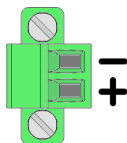
Top of the housing



Connections on the front

2.1 Power Supply

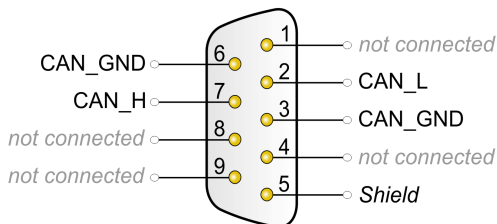
The measuring unit is operated with 12 V DC, 8 to 30 V are possible. The connection is done with the supplied mating connector (2-pole, type: Phoenix Contact MC1,5/2-STF-3,81) for fastening cable strands. The polarity is as follows:



Top view mating connector for the power supply

2.2 D-Sub Connector for CAN (FD)

A High-speed CAN bus (ISO 11898-2) can be connected to the 9-pin D-Sub connector. The pin assignment corresponds to the specification CiA® 303-1.



Pin assignment of the D-Sub connector

The measuring unit must be connected to a CAN bus which is terminated with 120 Ohm between CAN-High and CAN-Low. For special applications, the internal termination can be activated. More about this can be found in chapter 6.2 on page 24.



Tip: We recommend adding termination at the CAN cabling, for example with termination adapters (e.g. PCAN-Term). Thus, CAN nodes can be flexibly connected to the bus.

2.3 Thermocouple Inputs

The connection is done with 2-pin Mini connectors for thermocouples according to DIN EN 50212. The color of the socket shows the thermocouple type to be used according to the standard IEC 60584-1. Due to the different pin sizes on a thermocouple connector a reverse polarity protection is ensured.



Mini socket for a thermocouple

The following thermocouple types are supported:

Type	Color (IEC 60584-1)	Temperature Range
J	black	-210 ... 1121 °C (-346 ... 2049 °F)
K	green	-200 ... 1370 °C (-328 ... 2498 °F)
T	brown	-200 ... 400 °C (-328 ... 752 °F)



Note: Connecting the wrong type of thermocouple can lead to measurement errors.

2.4 Status LEDs

The device has status LEDs for each of the eight thermocouple inputs as well as for the power supply.

LED	LED Indication	Meaning
Thermocouple inputs (configurable)	Lights red	An intact thermocouple is connected. If the corresponding LED does not light up, despite the thermocouple being connected, the cable connection or the thermocouple may be broken.
	Flashes red quickly (4 Hz)	No thermocouple is plugged in, the thermocouple is not connected correctly, or the cable at the thermocouple is broken.
Power supply	Flashes green (1 Hz)	Normal operation
	Flashes green quickly (2 Hz)	Missing configuration. Transfer a configuration to the measuring unit via CAN.
	Flashes yellow	Firmware update in progress.

The listed LED indication of the thermocouple inputs corresponds to the pre-configuration on delivery. The software Thermocouple FD Configuration can be used to reconfigure the status LEDs of the thermocouple inputs. More about this can be found in chapter 5 on page 19.

3 operation

3.1 Safety Instructions



Attention! Danger due to electric shock! Risk of destroying the measuring unit!

You may only measure temperatures on energized parts when these are not directly connected with the mains voltage (measuring category CAT I). The measuring unit must not be used in the measuring categories CAT II, CAT III, or CAT IV.

Never apply a voltage higher than 30 V between thermocouples or between a thermocouple and earth.



Attention! Risk of burns!

At ambient temperatures of 70 °C (158 °F) and above a protection against contact must be ensured for the measuring unit, i.e. the surface may no longer be tangible.

3.2 operation with Default Configuration

The measuring unit is delivered with a standard configuration which allows you to immediately measure and record the measurement data via CAN without further adjustments. The CAN communication is set to the CAN 2.0 protocol and to a bit rate of 500 kbit/s. More information about creating your own configuration can be found in chapter 5 on page 19.

3.2.1 CAN Data

With the default configuration the measuring values of the eight measuring channels and the measuring values of the four reference temperature sensors are transmitted via CAN as follows:

Property	Value
CAN IDs	100h, 101h, 102h
Data bytes	2 per measuring channel or reference temperature sensor; 8 per CAN message
Contents per measuring channel	16-bit value: 1/16 °C
Data mode	Intel (Little Endian) signed
CAN protocol	2.0 A/B
CAN bit rate	500 kbit/s
Transmission period	300 ms

CAN ID	Data Byte	Measuring Channel
100h	1 - 2	1A
	3 - 4	1B
	5 - 6	2A
	7 - 8	2B
101h	1 - 2	3A
	3 - 4	3B
	5 - 6	4A
	7 - 8	4B

CAN ID	Data Byte	Reference Temperature Sensor
102h	1 - 2	1
	3 - 4	2
	5 - 6	3
	7 - 8	4

3.2.2 Status LEDs

With the default configuration the status LEDs for the thermocouple inputs are preconfigured according to the following table:

LED	LED Indication	Meaning
Thermocouple inputs	Lights red	An intact thermocouple is connected. If the corresponding LED does not light up, despite the thermocouple being connected, the cable connection or the thermocouple may be broken.
	Flashes red quickly (4 Hz)	No thermocouple is plugged in, the thermocouple is not connected correctly, or the cable at the thermocouple is broken.

4 Measurement Accuracy

The absolute measurement accuracy is based on the internal measurement electronics, the reference temperature sensors, and the thermocouples.



Note: If an absolute temperature value and a percentage value are specified for a measurement error, the larger measurement error or the largest error deviation regarding to the measurement result applies.

4.1 Measurement Errors due to Measurement Electronics

Due to the internal circuitry and equipment of the device, a maximum deviation of **1 K** or **0.2 %** of the measured value may occur.

4.2 Measurement Errors due to Reference Temperature Sensors

The measurement of the thermocouples results in a differential temperature between the measuring point and the temperature of the measuring socket. This differential temperature can only be converted into an absolute temperature based on the reference temperature sensors.

▶ The temperature sensor has an error of typically **0.5 K** and, depending on the ambient temperature, a maximum of:

- └ **±1 K** at ambient temperature from 0 to 70 °C
- └ **±2 K** at ambient temperature from -20 to 85 °C

- **±3 K** at ambient temperature from -40 to 125 °C
(device is specified up to 85 °C)

Note: The ambient temperature should change slowly so that the contact point of the thermocouple in the socket actually corresponds to the measured reference temperature. The reference temperature sensor is located close to the socket.

4.3 Measurement Error due to Thermocouples

Depending on the type, thermocouples have different measurement errors. Therefore, they are assigned to classes that differ depending on the temperature range.

Thermocouple Type	Class	Measurement Error	Measuring Range
J (Fe/CuNi)	1	1.5 K or 0.4 %	-40 ... 750 °C
	2	2.5 K or 0.75 %	-40 ... 1200 °C
K (NiCr / Ni)	1	1.5 K or 0.4 %	-40 ... 1000 °C
	2	2.5 K or 0.75 %	-40 ... 1200 °C
	3	2.5 K or 1.5 %	-200 ... 40 °C
T (Cu / CuNi)	1	0.5 K or 0.4 %	-40 ... 350 °C
	2	1.0 K or 0.75 %	-40 ... 350 °C
	3	1.0 K or 1.5 %	-200 ... 40 °C

4.4 Example for Determining the Total Accuracy

The following data is assumed for the example:

- └ Thermocouple type = J, class 1
- └ Ambient temperature = 40 °C
- └ Measured temperature = 100 °C

Measurement Errors due to Measurement Electronics

The measurement error due to measurement electronics is **1 K** or **0.2 %** of the measured value.

- └ Temperature difference = 100 °C – 40 °C = 60 K
- └ Measurement error = 60 K x 0.2 % = **0.12 K**

The larger measurement error applies. In this case, the resulting measurement error is **1 K**.

Measurement Errors due to Reference Temperature Sensors

A maximum measurement error of **1 K** results from the ambient temperature of 40 °C.

Measurement Errors due to Thermocouples

The measurement error for a thermocouple type J class 1 is **1.5 K** or **0.4 %**.

- └ Measurement error = 100 °C x 0.4 % = **0.4 K**

The larger measurement error applies. In this case, the resulting measurement error is **1.5 K**.

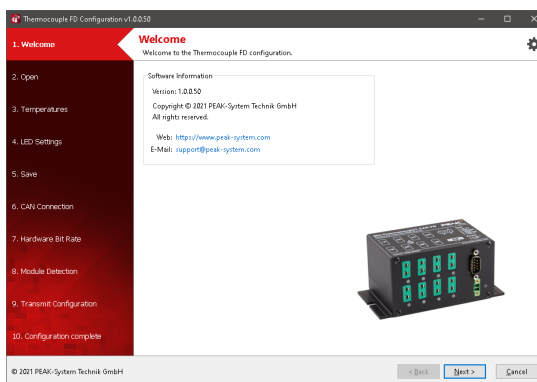
Total Accuracy

The total accuracy results from the measurement error components of the measurement electronics (1 K), reference temperature sensors (1 K), and the thermocouples (1.5 K):

$$\text{Total accuracy} = 1 \text{ K} + 1 \text{ K} + 1.5 \text{ K} = \mathbf{3.5 \text{ K}}$$

5 Configuration Software

Data processing, message transmission, and LED indication of the measuring unit MU-Thermocouple1 CAN FD are set up with the free Windows software **Thermocouple FD Configuration**. The configuration created on the computer is transferred via the CAN bus to the device which then runs as an independent CAN node. Multiple devices can be configured independently on a CAN bus. More information is available in chapter 6.1 on page 22.



Windows software Thermocouple FD Configuration

5.1 Features

- Creating and saving configurations for the measuring unit MU-Thermocouple1 CAN FD
- Configuration of measurement data transmission with CAN or CAN FD
- Configuration of the eight measuring channels and the four measuring values of the reference temperature sensors

- Assignment of the CAN IDs and cycle times for the outgoing CAN messages. The measurement data is transmitted with three messages when using CAN 2.0 and with one message when using CAN FD
 - Definition of data type and format for each measuring channel (signed or unsigned / Intel or Motorola format)
 - Defining the processing of each measuring channel with a scale and offset
- └ Configuration of the blinking behavior of the measuring channel LEDs
 - └ Export of CAN message and data configuration as a Symbol or CANdb file
 - └ Transmission of configuration data via CAN (PEAK CAN interface required)
 - └ Selective configuration of several devices in a CAN network based on the device ID

5.2 Prerequisites

- └ Computer with Windows 10, 8.1 (32/64-bit)
- └ PC-CAN interface from PEAK-System
- └ CAN cabling between the CAN interface and the measuring unit with proper termination (120 Ohm on each end of the CAN bus)

5.3 Downloading and Starting the Software

The software does not require an installation and can be started directly.

▶ Do the following to start the software:

1. Download the software from this website:
<https://www.peak-system.com/quick/DL-Software-E>
2. Extract the *.zip.
3. Open the directory and execute the *.exe.

5.4 Generating and Transferring a Configuration

The software Thermocouple FD Configuration guides users step by step through the configuration. The final transfer of the configuration requires a correct connection via CAN.

▶ Do the following to establish the CAN connection:

1. Connect your PC-CAN interface from PEAK-System with your computer.
2. Establish a correct CAN cabling between the CAN interface and the measuring unit with proper termination (120 Ohm on each end of the CAN bus).
3. In the corresponding configuration step of the software, select the bit rates that are used by the connected CAN bus. A nominal bit rate of 500 kbit/s is preconfigured on delivery.

The connection is correct if the MU-Thermocouple1 CAN FD can be detected in a following configuration step.

6 Hardware Modifications

For special applications, various modifications can be done on the circuit board of the MU-Thermocouple1 CAN FD:

- Changing the device ID to enable the configuration of several measuring units connected to the same CAN bus: chapter 6.1 below.
- Activation of the internal termination: chapter 6.2 on page 24.

6.1 Device ID

If you want to configure several measuring units on the same CAN bus, you must assign each measuring unit its own ID in the range 0 to 15. This is done by means of a rotary switch on the board. This allows the measuring units to be distinguished by the configuration software.

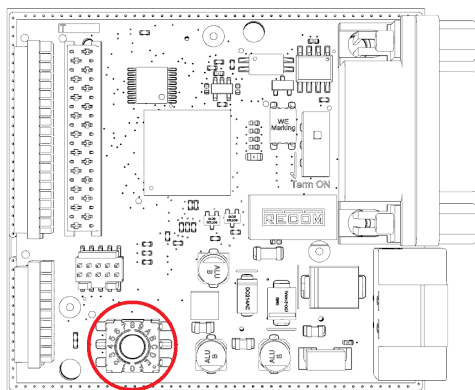
▶ Do the following to set the ID of the measuring unit:



Attention! Electrostatic discharge (ESD) can damage or destroy components on the card. Take precautions to avoid ESD.

1. Disconnect the power supply.
2. Remove all connected cables from the measuring unit.
3. Remove the two screws of the D-Sub connector and the four screws on the front panel to remove it.
4. Remove the two upper screws of the back panel and remove the housing cover.

5. Pull the board with the D-Sub connector out of the connectors of the motherboard. You can also remove the entire board from the case.
6. Locate the rotary switch on the board using the following illustration:



7. Set the desired rotary switch position. Use a flat tip screwdriver, for example.
8. Carefully plug the D-Sub board back into the connections provided on the motherboard.
9. Place the housing cover and screw it with the two upper screws of the back panel.
10. Place the front panel and fasten it with the two screws of the D-Sub connector and the four screws of the front panel.
11. Restart the device by plugging in the power supply again.

The change of the rotary switch and device ID is now active.

6.2 Internal Termination

The CAN bus termination for the CAN connection can be set with the **switch block** on the board. By default, the switch is set to **off**.



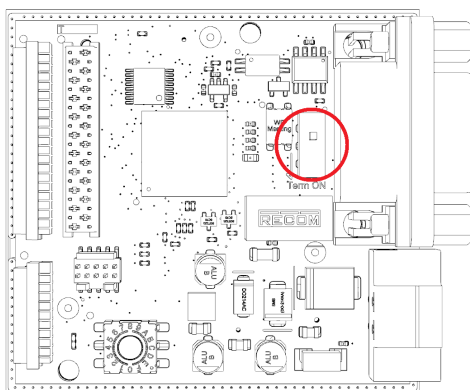
Tip: We recommend adding termination at the CAN cabling, for example with termination adapters (e.g. PCAN-Term). Thus, CAN nodes can be flexibly connected to the bus.

▶ Do the following to activate the termination:



Attention! Electrostatic discharge (ESD) can damage or destroy components on the card. Take precautions to avoid ESD.

1. Disconnect the power supply.
2. Remove all connected cables from the measuring unit.
3. Remove the two screws of the D-Sub connector and the four screws on the front panel to remove it.
4. Remove the two upper screws of the back panel and remove the housing cover.
5. Pull the right board with the D-Sub connector out of the connectors of the motherboard. You can also remove the entire board from the case.
6. Locate the switch on the board using the following figure:



7. Set the desired switch position.

Switch Position	Internal Termination
OFF (default)	none
ON	120 Ω between CAN_L and CAN_H

8. Carefully plug the D-Sub board back into the connections provided for it on the motherboard.
9. Place the housing cover and screw it with the two upper screws of the back panel.
10. Place the front panel and fasten it with the two screws of the D-Sub connector and the four screws of the front panel.
11. Restart the device by plugging in the power supply again.

The internal termination is now active.

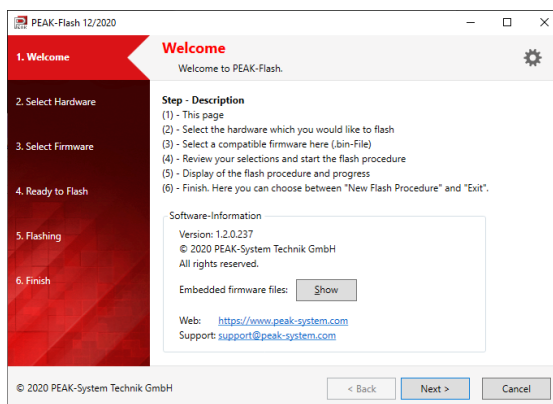
7 Firmware Transfer

A new version of the firmware can be transferred to the MU Thermocouple CAN FD. The firmware upload is done via a CAN bus with the Windows program PEAK-Flash.

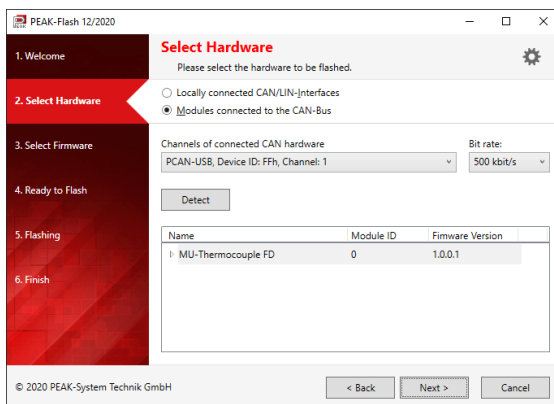
▶ Do the following to transfer a new firmware with PEAK-Flash:

1. Connect the device to the power supply.
The power LED lights green.
2. Connect the CAN interface of your computer to the CAN connector on the measuring unit. Make sure that the CAN cabling is terminated correctly (2 x 120 Ω).
3. Download the PEAK-Flash software from the following page: www.peak-system.com/quick/DL-Software-E
4. Open the zip file and extract it to your local storage medium.
5. Run the `PEAK-Flash.exe`.

The program opens.



6. Click the **Next** button.
7. Click on the **Modules connected to the CAN bus** radio button.
8. In the **Channels of connected CAN hardware** drop-down menu, select a CAN interface connected to the computer (e.g. PCAN-USB FD).
9. In the **Bit rate** drop-down menu, select the bit rate that is used by the connected CAN bus. A nominal bit rate of 500 kbit/s is preconfigured on delivery.



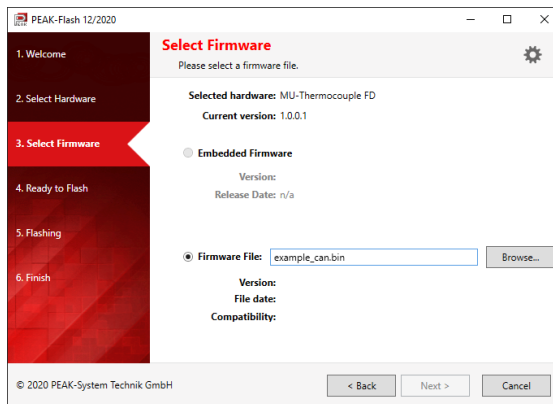
10. Click on **Detect**.

In the list, the **MU-Thermocouple1 CAN FD** appears together with the **Module ID** and **Firmware Version**. If not, check whether a proper connection to the CAN bus with the appropriate bit rate exists.

11. Click **Next**.
12. Select the **Embedded Firmware** or the **Firmware File** radio button.

Embedded Firmware uses the firmware embedded in PEAK-Flash to update the device.

Firmware File uses a custom firmware file (*.bin) to update the device.



13. Click **Next**.

The **Ready to Flash** dialog appears.

14. Click **Start** to transfer the new firmware to the MU-Thermocouple1 CAN FD.

The **Flashing** dialog appears.

15. After the process is complete, click the button **Reset Module** to restart the device.

16. You can exit the program.

You can now use the MU-Thermocouple1 CAN FD with the new firmware.

8 Technical specifications

Connectors

Power	Phoenix mating connector ¹ , 2-pole, pitch 3.81 mm
CAN (FD)	D-Sub (m), 9 pins Pin assignment according to specification CiA [®] 303-1
Thermocouple Inputs	8 x Mini sockets (DIN EN 50212)

Power Supply

Operating voltage	8 -30 V DC
Current consumption	Idle: 75 mA at 12 V Maximum: 110 mA at 8 V 75 mA at 12 V 35 mA at 30 V
Protection	±36 V (static) overvoltage protection -36 V reverse polarity protection ±4 kV ESD protection
Maximum voltage at pins CAN_H/CAN_L	± 42 V

CAN (FD)

Protocols on OSI layer 2	CAN FD ISO 11898-1:2015, CAN FD non-ISO, CAN 2.0 A/B
Physical transmission	ISO 11898-2 (High-speed CAN)
Transceiver	TJA1044GT
CAN bit rates	Nominal: 25 kbit/s ... 1 Mbit/s
CAN FD bit rates	Nominal: 25 kbit/s ... 1 Mbit/s Data: 25 kbit/s ... 10 Mbit/s
Controller	Integrated in LPC54618
Supported Clock frequencies	80 MHz, 40 MHz, 20 MHz

¹ Mating connector Phoenix Contact MC1,5/2-STF-3,81 - 1827703

CAN (FD)

Supported bit timing values	Prescaler (BRP)	Nominal 1 ... 512	Data 1 ... 32
	Time Segment 1 (TSEG1)	1 ... 256	1 ... 32
	Time Segment 2 (TSEG2)	1 ... 128	1 ... 16
	Synch. Jump Width (SJW)	1 ... 128	1 ... 16
Galvanic isolation	Pins CAN_H, CAN_L, and CAN_GND are decoupled galvanically against the supply with 500 V		
Internal termination	Switchable, not activated on delivery		
CAN ID reserved for configuration transfer	7E7h		

Thermocouple Inputs

Count	8
Connectors	Mini sockets for thermocouples (DIN EN 50212)
Supported thermocouple types (IEC 60584-1) with measuring range	J = -210 ... +1121 °C (-346 ... +2050 °F) K = -200 ... +1370 °C (-328 ... +2498 °F) T = -200 ... +400 °C (-328 ... +752 °F)
Sampling rate	3 Hz
Measurement accuracy of the measurement unit ²	0.2 % or 1 K
Influence of ambient temperature	10.5 ppm/K
Reference temperature sensors	4 (1 per measuring module)
Measuring accuracy of the reference temperature sensors	Typically: 0.5 K Maximum values: ±1 K at 0 ... 70 °C (32 ... 158 °F) ±2 K at -20 ... 85 °C (-4 ... 185 °F) ±3 K at -40 ... 125 °C (-40 ... 257 °F)
Max. resolution for CAN data	1/16 °C
Measuring category	CAT I (only electric circuits that are not connected to the mains)

² The values refer only to the accuracy of the measuring electronics and do not consider the temperature sensors.

Thermocouple Inputs

Galvanic isolation	Inputs 1A/1B, 2A/2B, 3A/3B, 4A/4B are galvanically decoupled from each other with 500 V; Inputs 1A/1B, 2A/2B, 3A/3B, 4A/4B are galvanically decoupled from the supply with 500 V
--------------------	---

Microcontroller

CPU	LPC54618 (based on Arm® Cortex® M4)
Clock frequency	160 MHz
RAM	200 kByte on-chip SRAM
Firmware upload	via CAN with PEAK-Flash (PCAN interface required)

Measures

Dimensions	130.5 x 59.5 x 73 mm (W x H x D) See also dimensional drawing in Appendix B
Weight	420 g

Environment

Operating temperature	-40 °C ... 85 °C (-40 ... 185 °F)
Temperature for storage and transport	-40°C ... 100°C (-40 ... 212 °F)
Relative humidity	15 ... 90 %, not condensing
Ingress protection (IEC 60529)	IP20

Conformity

RoHS	EU directive 2011/65/EU (RoHS 2) EU directive 2015/863/EU (amended list of restricted substances) DIN EN IEC 63000:2019-05;VDE 0042-12:2019-05
EMC	EU Directive 2014/30/EU DIN EN 61326-1:2013-07;VDE 0843-20-1:2013-07

Appendix A CE Certificate

EU Declaration of Conformity



This declaration applies to the following product:

Product name: **MU-Thermocouple1 CAN FD**

Item number(s): **IPEH-004005-J/-K/-T**

Manufacturer: **PEAK-System Technik GmbH**
Otto-Roehm-Strasse 69
64293 Darmstadt
Germany

CE We declare under our sole responsibility that the mentioned product is in conformity with the following directives and the affiliated harmonized standards:

EU Directive 2011/65/EU (RoHS 2) + 2015/863/EU (amended list of restricted substances)

DIN EN IEC 63000:2019-05; VDE 0042-12:2019-05

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016); German version EN IEC 63000:2018

EU Directive 2014/30/EU (Electromagnetic Compatibility)

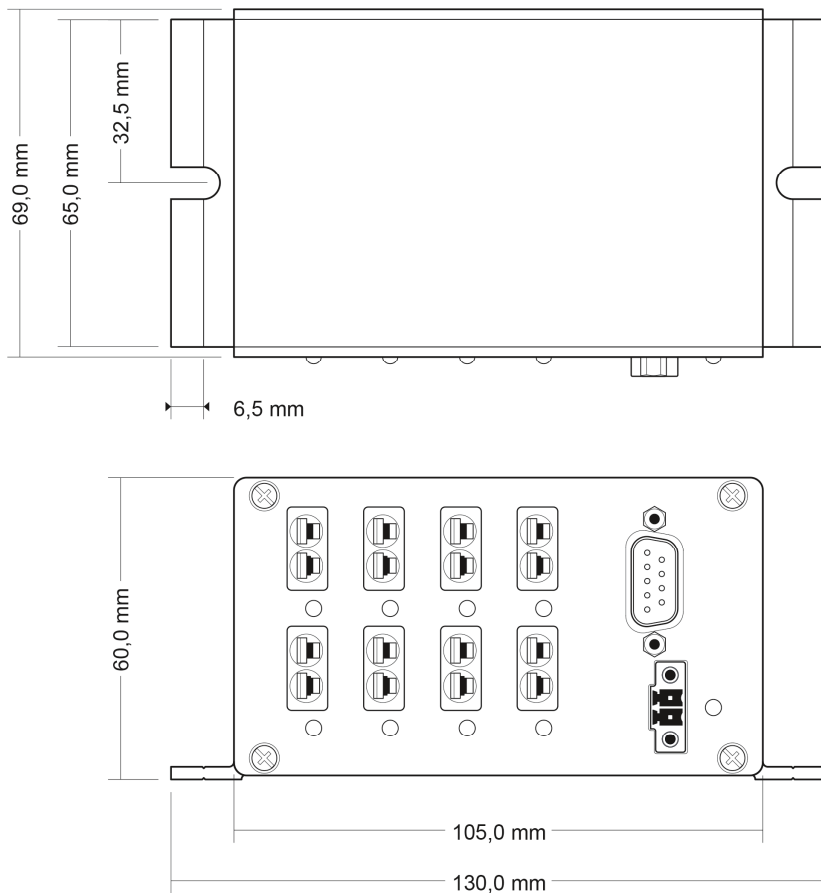
DIN EN 61326-1:2013-07; VDE 0843-20-1:2013-07

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements (IEC 61326-1:2012); German version EN 61326-1:2013

Darmstadt, 9 April 2021

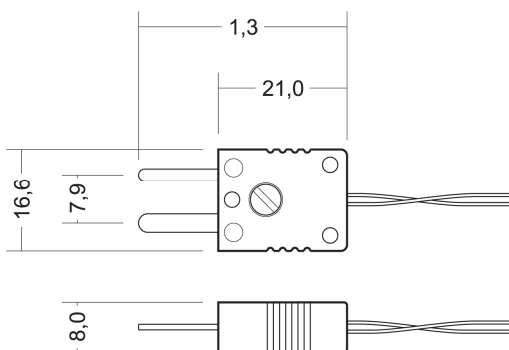
Uwe Wilhelm, Managing Director

Appendix B Dimension Drawings



Dimension drawing MU-Thermocouple1 CAN FD

The figures do not correspond to the original size.



Dimension drawing Mini thermocouple plug
(dimensions in mm)

The figures do not correspond to the original size.