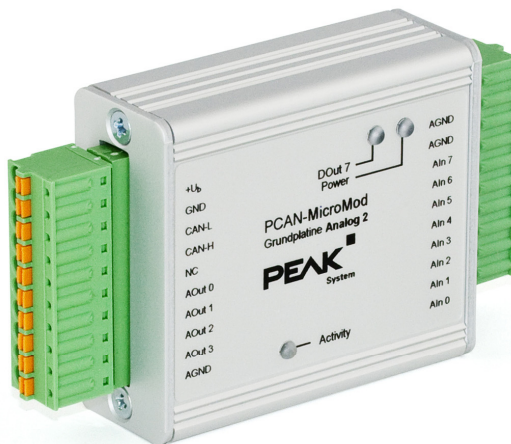


# PCAN-MicroMod Analog 2

Motherboard for the PCAN-MicroMod

## User Manual



## Products taken into account

Product Name	Model	Item Number
PCAN-MicroMod Analog 2	Including casing and PCAN-MicroMod	IPEH-002207

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# 1 Introduction

The motherboards by PEAK-System provide an application-specific environment for the I/O module PCAN-MicroMod (short: MicroMod). This includes input and output circuits, a casing, and connectors. This way you can use the MicroMod e.g. at instrument manufacture, plant construction, or in the automotive industry.

The motherboard Analog 2 is intended for common analog requirements.



**Note:** This manual only refers to the motherboard as base for a PCAN-MicroMod and to the standard firmware. For the MicroMod and the configuration program PCAN-MicroMod Configuration exists separate documentation.

## 1.1 Properties at a Glance

- └ 8 analog inputs with following properties:
  - Measuring range bipolar, -10 to +10 V, resolution 16 bit (other measuring ranges possible on request, also unipolar)
  - Protection against undervoltage and overvoltage
  - Hardware low-pass with  $\tau = 1$  ms
  - Software low-pass optionally set by configuration ( $\tau = 1 - 1000$  ms)

- └ 4 analog outputs with following properties:
  - Voltage range 0 to 10 V based on 12-bit DAC
  - Output current 20 mA per channel
  - Short circuit protection
- └ Spring-cage connectors (optionally with screw connection)

## 1.2 Scope of Supply

- └ Module with following components: motherboard, PCAN-MicroMod, metal casing
- └ 2 terminal block connectors for the motherboard
- └ CD with software and documentation

## 1.3 Prerequisites for Operation

- └ Voltage supply within a range of 11 to 30 V DC (8 to 30 V when not using analog outputs)
- └ For creating and transferring configurations: computer with Windows 7/Vista/XP and a CAN interface from the PCAN series

## 2 operation

### 2.1 Pin Assignment

The motherboard has two connectors, J1/2 on the left and J3 on the right. The pin assignment is as follows:

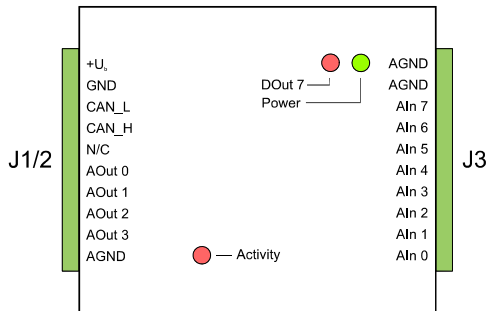


Figure 1: Pin assignment of the motherboard Analog 2

J1/2 Pin	Port name	Function
1	+U <sub>b</sub>	Operating voltage (11 - 30 V DC, w/o AOut 8 - 30 V DC)
2	GND	Digital ground
3	CAN_L	Differential CAN signal
4	CAN_H	
5	N/C	Not connected
6	AOut 0	Analog output (0 - 10 V, 12 bit)
7	AOut 1	
8	AOut 2	
9	AOut 3	
10	AGND	Analog ground

J3 Pin	Port name	Function
1	Aln 0	Analog input (-10 - +10 V, 16 bit)
2	Aln 1	
3	Aln 2	
4	Aln 3	
5	Aln 4	
6	Aln 5	
7	Aln 6	
8	Aln 7	
9	AGND	Analog ground
10	AGND	

## 2.2 Configuration Program

In order to create and transfer MicroMod configurations the Windows software PCAN-MicroMod Configuration is used. This section covers basic points about installation and use of the program with the motherboard Analog 2.


You'll find detailed information about the use of PCAN-MicroMod Configuration in the related documentation which is invoked via the program (e.g. with **F1**).

### 2.2.1 System Requirements

- Windows 7/Vista/XP
- Computer with CAN interface of the PCAN series (for sending a configuration to the PCAN-MicroMod via CAN)

## 2.2.2 Installing the Program

Under Windows install the program from the supplied CD. Start the corresponding installation routine by using the CD navigation going to **Tools > PCAN-MicroMod Configuration 2.x.x**.

 **Note:** In order to create a configuration for the module PCAN-MicroMod Analog 2 you need the **program version 2.5.1.54** or higher.

## 2.2.3 Creating a Configuration

When you start creating a new configuration in PCAN-MicroMod Configuration, the dialog box Board Type appears in order to select the type of the used motherboard. The necessary settings are explained in the following.

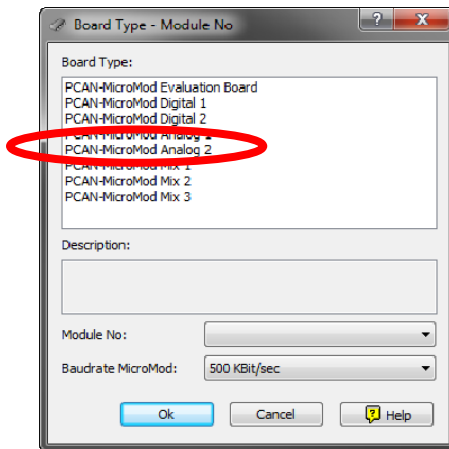


Figure 2: PCAN-MicroMod Configuration: selection of the motherboard Analog 2

**Board Type:** PCAN-MicroMod Analog 2

**Module No:** 0

The module number of the MicroMod on the motherboard Analog 2 is set to 0 at delivery and is relevant, if you want to configure more than one MicroMod on the same CAN bus. See also section 2.5 *Several MicroMods on the CAN Bus* on page 11.

### Baudrate MicroMod: 500 kbit/sec





At delivery the MicroMod module is set to a transfer rate of 500 kbit/s. A change of this setting will take effect after sending the completed configuration to the MicroMod.



**Note:** For the first transfer of a configuration to the module it must be integrated in a CAN network with a transfer rate of 500 kbit/s.

## 2.2.4 Applicable MicroMod Services

The motherboard's inputs and outputs are controlled by the services of the MicroMod. The following table shows the assignment of the motherboard functions to the MicroMod services.

Function on motherboard	Port name	Access with MicroMod service(s)
Analog inputs	AIn 0 ... AIn 7	 Analog Input  Curve
Analog outputs	AOut 0 ... AOut 3	 Analog Output
LED DOut 7	Dout 7	 Digital Output

## 2.3 Correction Factor for Analog Inputs

The impedance of the voltage source being connected to an analog input affects the measurement with 0.2 % per k $\Omega$ . Because the resulting error of measurement is linear, it can be compensated in the MicroMod configuration by a matching correction factor (Scale value).

If you know the source impedance  $R_s$  and want to gain an accuracy of measurement, use the following formula for the Scale value:

$$\text{Scale} = 1 + \left( R_s [\text{k}\Omega] \cdot \frac{0.002}{1\text{k}\Omega} \right)$$

Example for a source impedance of 4 k $\Omega$ :

$$\text{Scale}(4\text{k}\Omega) = 1 + \left( 4\text{k}\Omega \cdot \frac{0.002}{1\text{k}\Omega} \right) = 1.008$$

## 2.4 Status LEDs

The motherboard incl. MicroMod has three LEDs with the following status indications:

LED	Indication
Power (green)	Power is applied.
DOut 7 (red)	Is linked to the digital output DO 7 of the MicroMod and can be configured freely.
Activity (red)	Status of the MicroMod. During normal operation it blinks at a frequency of 1 Hz.

You'll find further information about other states of the status LED "Activity" in the user manual for the PCAN-MicroMod.

## 2.5 Several MicroMods on the CAN Bus

If you want to use several MicroMods on the same CAN bus and want to configure them, each one needs its own module number. That way the MicroMods are distinguishable for the program PCAN-MicroMod Configuration.

The module number is set on the MicroMod by solder jumpers and lies in the range of 0 to 31. At **delivery** each MicroMod has the **module number 0**.

**Note:** During normal operation at the CAN bus the module number has not effect.

For setting the solder bridges on the MicroMod unscrew the top of the casing and remove the MicroMod from the motherboard. Please find further information about the assignment of module numbers in the separate manual for the PCAN-MicroMod.

### Remounting the MicroMod

When you remount the MicroMod, take notice of the white triangular marks on each the motherboard and the MicroMod (upper left corner). These marks must align.

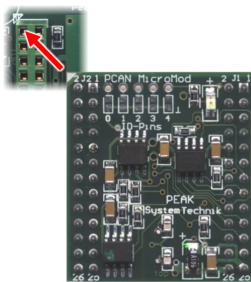


Figure 3: Positioning of the MicroMod

## 3 Technical specifications

### Power supply

Operating voltage +U <sub>b</sub>	11 - 30 V DC ( $\pm 5\%$ ), w/o AOut: 8 - 30 V DC
Power consumption	max. 200 mA
Reverse-polarity protection	Yes, $\pm 30$ V
Overvoltage protection	$\pm 30$ V static, $\pm 500$ V surge
Ripple (5 V)	< 50 mV (V <sub>b</sub> = 12 V, 200 mA load)
Ripple (analog)	< 20 mV

### Analog inputs

Measuring range	-10 - +10 V Other measuring ranges on request
Resolution	16 bit 0.3125 mV/digit
Input impedance	< 500 k $\Omega$
Overvoltage protection	$\pm 30$ V
Low-pass time constant $\tau$	Hardware: 1 ms Software: 1 - 1000 ms (optional by configuration)

### Analog outputs

Type	12-bit DAC-based
Voltage range	0 - 10 V
Resolution	12 bit
Output current	20 mA
Short circuit protection	Yes

### CAN

Transmission standard	High-speed CAN ISO 11898-2, 33 kbit/s - 1 Mbit/s (typically 500 kbit/s), set by PCAN-MicroMod Configuration (Windows software)
Termination	none
CAN ID reserved for configuration transfer	0x7E7
Module number at delivery	0

(for configuration transfer)

### Peculiarity Interference resistance

Surge	$\pm 500$ V (specification industrial sector: $\pm 1$ kV) <sup>1</sup>
Line-conducted HF compatibility	10 V <sub>eff</sub> (specification: 3 V <sub>eff</sub> )

### Environment

Operating temperature	-40 - +85 °C (-40 - +185 °F)
Temperature for storage and transport	-40 - +125 °C (-40 - +257 °F)
Relative humidity	15% - 90%, not condensing
Ingress protection (IEC 60529)	IP20
EMC	EN 61326-1: 2006-10 EC directive 2004/108/EG

### Measures

Casing size (incl. connectors)	55 x 68 x 24 mm (3 1/16 x 1 5/8 x 13/16 Inches) See also dimension drawing in Appendix B on page 15
Weight	108 g (3.81 oz.)

<sup>1</sup> This specification could only be fulfilled with  $\pm 500$  V due to the available space. Therefore the motherboard should be used with a local power supply.

# Appendix A CE Certificate

PCAN-MicroMod Analog 2 IPEH-002207 – EC Declaration of Conformity  
PEAK-System Technik GmbH



## Notes on the CE Symbol

The following applies to the PCAN-MicroMod Analog 2 product IPEH-002207

### EC Directive

This product fulfills the requirements of EC directive 2004/108/EG on "Electromagnetic Compatibility" and is designed for the following fields of application as per the CE marking:

### Electromagnetic Immunity/Emission

DIN EN 61326-1; publication date: 2006-10  
Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements (IEC 61326-1:2005);

German version EN 61326-1:2006

### Declarations of Conformity

In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities at the address below:

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info@peak-system.com

A handwritten signature in black ink, appearing to read "Uwe W. Sch.".

Signed this 5<sup>th</sup> day of February 2010

## Appendix B Dimension Drawing

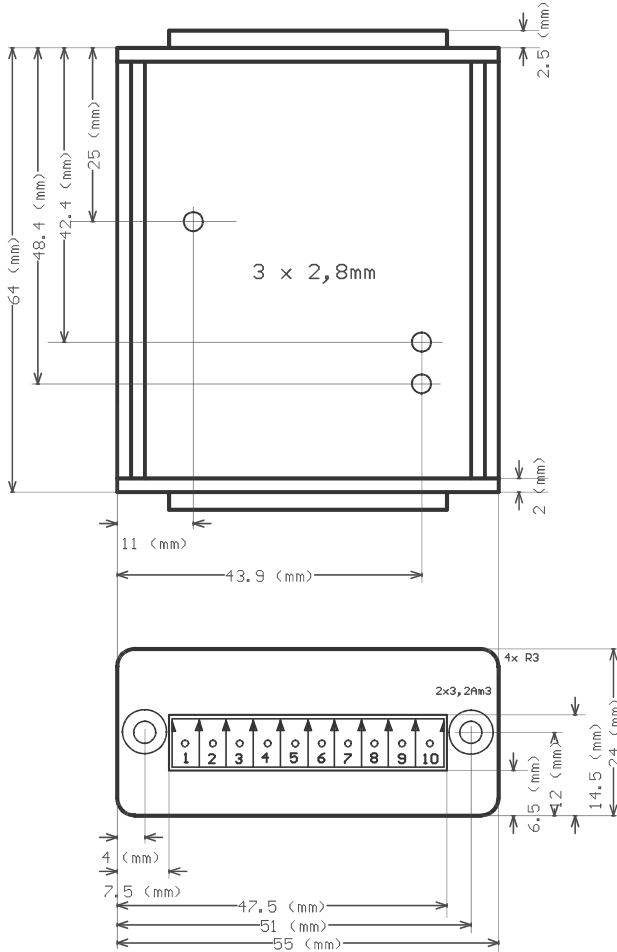


Figure 4: Top view and view of front side with connector

The figure doesn't show the actual size of the product.