

# Digital 1 / Digital 2

Motherboard for the PCAN-MicroMod

## User Manual



## Products taken into account

Product Name	Model	Item Number
PCAN-MicroMod Digital 1	Including casing and PCAN-MicroMod	IPEH-002200
PCAN-MicroMod Digital 2	Including casing and PCAN-MicroMod	IPEH-002201

The picture on the front page shows the PCAN-MicroMod Digital 1. The PCAN-MicroMod Digital 2 has the same design.

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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 motherboards Digital 1 and Digital 2 (short: Digital 1/2) serve common digital 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 digital inputs with following properties:
  - Pull-up or pull-down circuit selectable (in 3 groups)
  - High state at 5 to 18 V input voltage
  - Schmitt trigger behavior, inverting
  - Low-pass behavior
  - Parallel connection of a frequency input (for each digital input 0 to 3) for alternative use (e.g. at fast changes of state, or at countings)

- └ 5 digital outputs with following properties:
  - Digital 1: 4 low-side switches, max. 45 V, 0.35 A
  - Digital 2: 4 high-side switches, max. 34 V, 1.1 A
  - 1 fast low-side switch, max. 55 V, 0.75 A (“Frequency output”)
  - Short circuit protection
- └ Status LEDs for power supply and digital output
- └ Spring-cage connectors (optionally with screw connection)

## 1.2 Prerequisites for Operation

- └ Voltage supply with a range of 8 to 26 V DC
- └ For creating and transferring configurations: computer with Windows 7/Vista/XP and a CAN interface from the PCAN series

## 1.3 Scope of Supply

- └ Module with following components: Motherboard Digital 1 or Motherboard Digital 2, PCAN-MicroMod, metal casing
- └ Terminal block connectors for the motherboard
- └ CD With software and documentation

## 2 Configuring the Module

You can customize the motherboard by modifying the hardware. The following subsections contain descriptions about possible modifications.

### Accessing the Motherboard

In order to carry out the modifications described in the following you must unscrew the top of the casing and remove the MicroMod from the motherboard.

### 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.

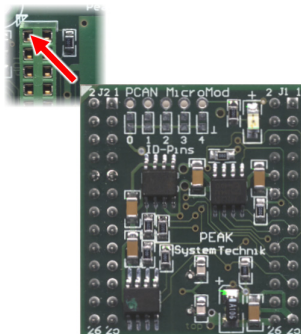


Figure 1: Positioning of the MicroMod

## 2.1 Pull-up/Pull-down Circuits of the Inputs

You can setup the digital inputs in groups so that they either have pull-up or pull-down circuits. This is done with 0-Ohm resistors or solder bridges respectively.



**Note:** At delivery all digital inputs are set to pull-up circuits with 0-Ohm resistors (as substitute for a solder bridge).

The assignment is as follows:

Solder bridge	Digital inputs
JP2	DIn 0 to DIn 2
JP3	DIn 3 to DIn 5
JP4	DIn 6 and DIn 7

Circuit	Solder bridge to ... (label on PCB)
Pull-up (+U <sub>b</sub> )	H
Pull-down (GND)	L

The solder bridge JP1 on the motherboard Digital 1/2 is reserved for service purposes.



**Attention!** Double-check for inadvertently made short circuits after altering the setup of an input group.

## 3 operation

### 3.1 Pin Assignment

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

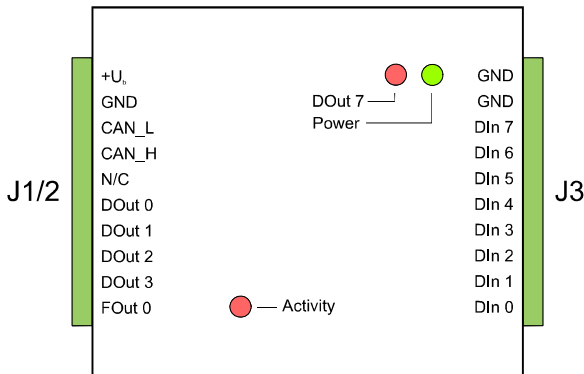


Figure 2: Connectors of the motherboards Digital 1 and Digital 2

Port name J1/2	Function
+U <sub>b</sub>	Operating voltage 8 - 26 V DC
GND	Digital ground
CAN_L	Differential CAN signal
CAN_H	
N/C	Not connected
DOut 0	Digital output
DOut 1	
DOut 2	
DOut 3	
FOut 0	Frequency output

Port name J3	Function
GND	Digital ground
GND	
DIn 7	Digital input
DIn 6	
DIn 5	
DIn 4	
DIn 3	Digital input, frequency input parallel
DIn 2	
DIn 1	
DIn 0	

## 3.2 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 Digital 1/2.

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**).

### 3.2.1 System Requirements

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

### 3.2.2 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**.

### 3.2.3 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.

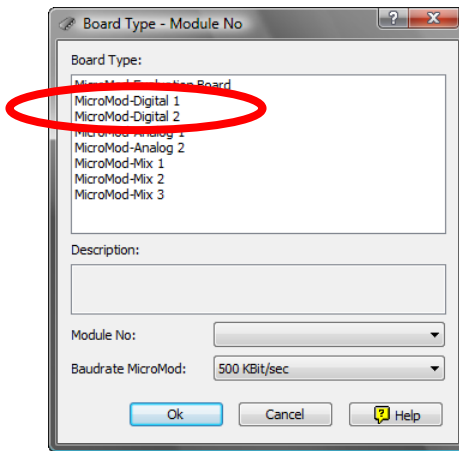


Figure 3: PCAN-MicroMod Configuration: selection of the motherboard Digital 1/2

#### **Board Type:** PCAN-MicroMod Digital 1/2

#### **Module No:** 0

The module number of the MicroMod on the motherboard Digital 1/2 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 3.4 *Several MicroMods on the CAN Bus* on page 12.

### Baudrate MicroMod: 500 kbit/s








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.

### 3.2.4 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	Function label	MicroMod service(s)
Digital input,	DIn 0 ... DIn 7	 Digital Input  Digital Function  Rotary Encoder
Frequency input (Parallel to channels DIn 0 ... DIn 3)		 Frequency Input
Digital output	DOut 0 ... DOut 3	 Digital Output
Frequency output (For higher- frequency status changes)	FOut 0	 PWM and Frequency Output
LED DOut 7	DOut 7	 Digital Output

### 3.3 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.

### 3.4 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.

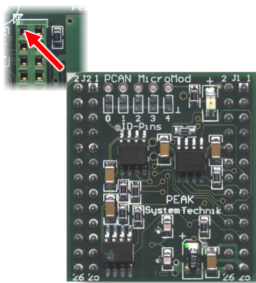


Figure 4: Positioning of the MicroMod

## 4 Technical specifications

	Digital 1	Digital 2
<b>Power supply</b>		
Operating voltage +U <sub>b</sub>	8 - 26 V DC (±5 %)	
Current consumption	Max. 200 mA Typ. 35 mA at 12 V w/o load	Max. 200 mA (w/o output driver)
Reverse polarity protection	Yes, ±30 V	
Ripple (5 V)	< 50 mV (+U <sub>b</sub> = 12 V, 200 mA load)	
<b>Inputs</b>		
Switching thresholds	UIH = 4 V; UIL = 3 V, contact or logic level	
Input impedance	2.7 kΩ	
Open input	Pull-up, optional pull-down (in groups)	
Overvoltage protection	Yes	
Low-pass	f <sub>g</sub> = 7 kHz	
Special feature	Frequency inputs of the PCAN-MicroMod parallel (only DI 0 to DI 3)	
<b>Outputs</b>		
Type	Low-side	DOut: High-side FOut: Low-side
Voltage proof	DOut: < 45 V FOut: < 55 V	DOut: < 43 V FOut: < 55 V
Output current	DOut x: 0.35 A FOut: 0.75 A (constant current, all outputs active)	DOut x: 1.1 A FOut: 0.75 A
Short circuit protection	Yes, short circuit currents: DOut x: 0.5 A FOut: 1.2 A	DOut: 4 A FOut: 1.2 A

### CAN

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

### Peculiarity Interference resistance

Tests	According to IEC 61000 and DIN EN 61 326
Surge	$\pm 500$ V (specification industrial sector: $\pm 1$ kV) <sup>1</sup>
Line-conducted HF compatibility	$10 V_{\text{eff}}$ (specification: $3 V_{\text{eff}}$ )

### Environment

Operating temperature	-40 - +85 °C (-40 - +185 °F)
Temperature for storage and transport	-40 - +100 °C (-40 - +212 °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, Appendix B on page 17)
Weight	107 g (3.77 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 Motherboard Digital 1/2 IPEH-002200/01 – EC Declaration of Conformity  
PEAK-System Technik GmbH



## Notes on the CE Symbol **CE**

The following applies to the PCAN-MicroMod Motherboard Digital 1/2 product IPEH-002200/01

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

Signed this 5<sup>th</sup> day of February 2009

# Appendix B Dimension Drawing

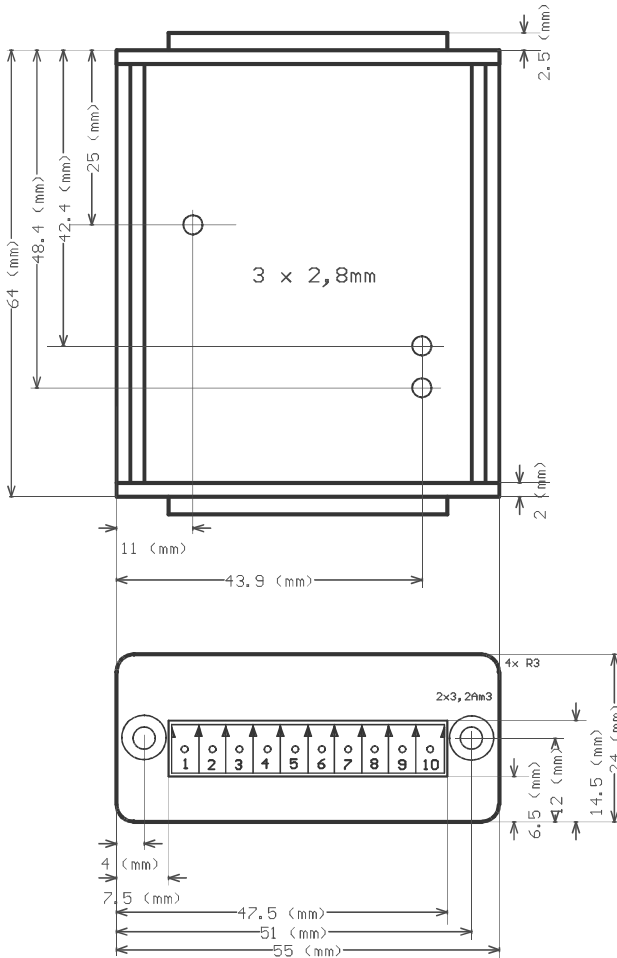


Figure 5: Top view and view of front side with connector

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