



Pushing Performance



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HARTING HAIC MICA Hardware Development Guide

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This hardware development guide explains how the MICA can be connected to a power supply, the assignment of the GPIO channels as well as how to customize your own circuit board and front bezel.



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1 Power Supply

1.1 PoE

The MICA can be supplied with electricity with Power over Ethernet. When using Power over Ethernet, connect the device to a PoE-capable switch with a suitable M12 X-coded cable.



Figure 1: A-coded M12 GPIO 12 pin outlet (A) and M12 X-coded Ethernet / Power over Ethernet 8 pin outlet (B)

1.2 24V Supply

Alternatively the MICA can be supplied with electricity over a Harting breakout cable (24 VDC) with a M12 plug-in connector where the input cable is grey/pink and the ground wire is red/blue. When using the M12 plug-in connector observe the assignment of the pins. Then connect the M12 connector to a power supply.

1.3 LED Status Display

The LED to the left of the M12 A-coded plug shows the status of the boot process. Red signifies the MICA is booting. Red blinking signifies a system error. Green signifies the system is completely booted. Green blinking signifies an erroneous state.

The LED to the left of the X-coded plug signifies activity of the network chip and blinks accordingly.

2 GPIO

The GPIO channels are assigned in the following way. If MICA is powered over 24V with the breakout cable, the GPIO voltage matches the input voltage. The color coding is explained in figure 3.

Caution: GPIO channels can be reconfigured from Input to Output in software. Check that all channels are in default configuration when attaching them to a new hardware device.

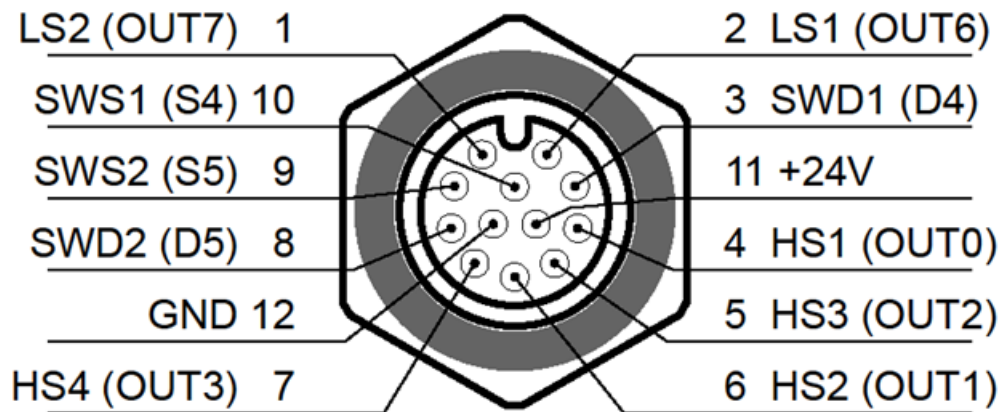
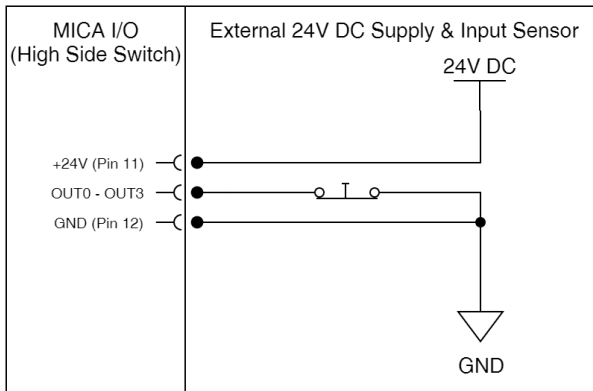
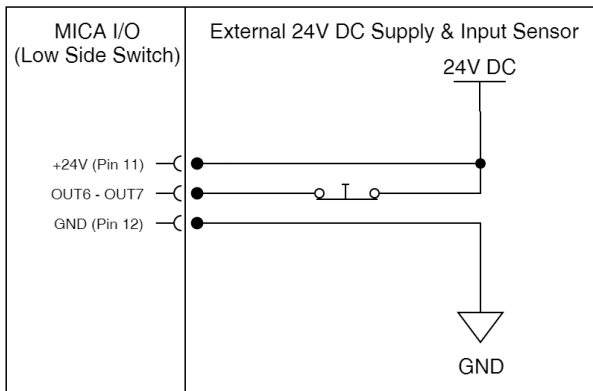


Figure 2: Assignment of the GPIO Channels in Harting Breakout Cable

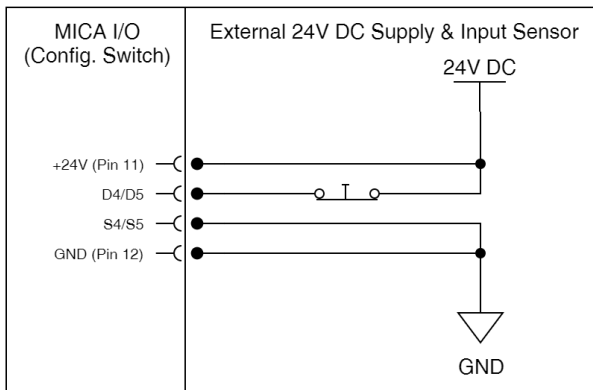
You can load a single channel with max. 50mA, a combination of channels with 250mA to avoid an overheating of the TLE chip behind the channels. You can use the GPIO channels as inputs for e.g. signals:



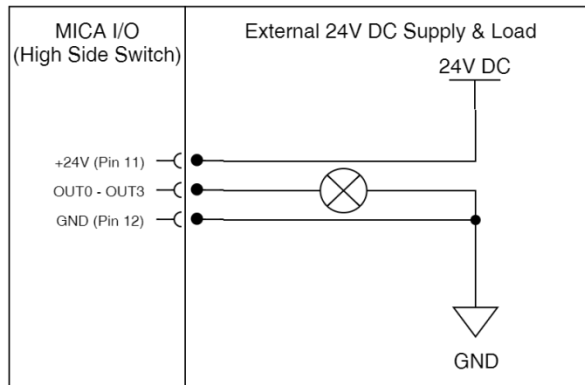
Pins HS1 (OUT0) – HS4 (OUT3) for a high side switch



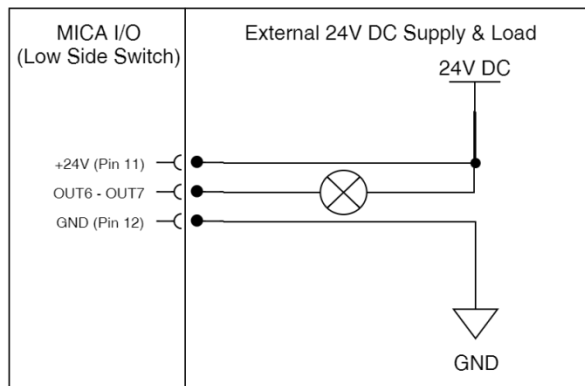
Pins LS1 (OUT6) – LS2 (OUT7) for a low side switch



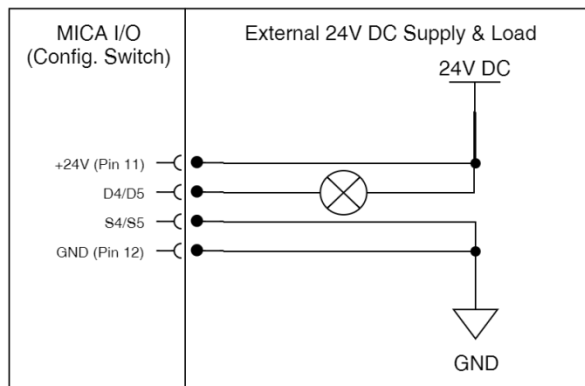
Pins SWD1(D4) / SWD2(D5) and SWS1 (S4) / SWS2 (S5) for a configurable switch



You can use the GPIO channels as outputs:
Pins HS1 (OUT0) – HS4 (OUT3) for a high side switch



Pins LS1 (OUT6) – LS2 (OUT7) for a low side switch



Pins SWD1 (D4) / SWD2 (D5) and SWS1 (S4) / SWS2 (S5) for a configurable switch

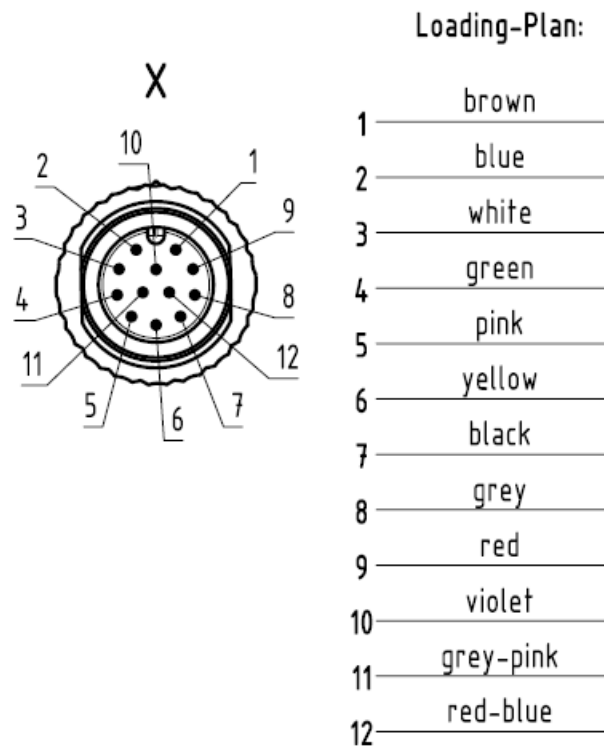


Figure 3: Color Coding of Channels in Harting Breakout Cable (see attachment 1)

3 MICA Customizable Circuit Board

3.1 Technical Description

In the technical drawing fig. 1 the dimensions and measurements of the printed circuit board [PCB] of the MICA functional module are depicted. On the left you see the top view, in the middle the side view and on the right the bottom view. The eight metallized areas in the middle of the top view depict module connector pins. The GND is the signal ground. The VDD (supply voltage) supplies the device with 5V +/- 10% and 1A. The pins VBUS, D-, D+, GND, GND define the USB 2.0 connection. A functional module should perform like a self-powered USB 2.0 compatible device.

All metallized mounting holes and mounting pads should be connected to GND.

| Connector Pins | Function |
|----------------|--|
| GND | signal ground |
| VDD | Supply voltage, supplies the device with 5V +/- 10% and 1A |
| VBUS | defines the USB 2.0 connection |
| D- | defines the USB 2.0 connection |
| D+ | defines the USB 2.0 connection |
| GND | defines the USB 2.0 connection |
| GPIO | GPIO Reserved for future use |
| GND | GPIO Ground |

3.2 Thermal Behavior

At the bottom of the functional module a thermal interface material (for example Bergquist GF 1500) should be applied.

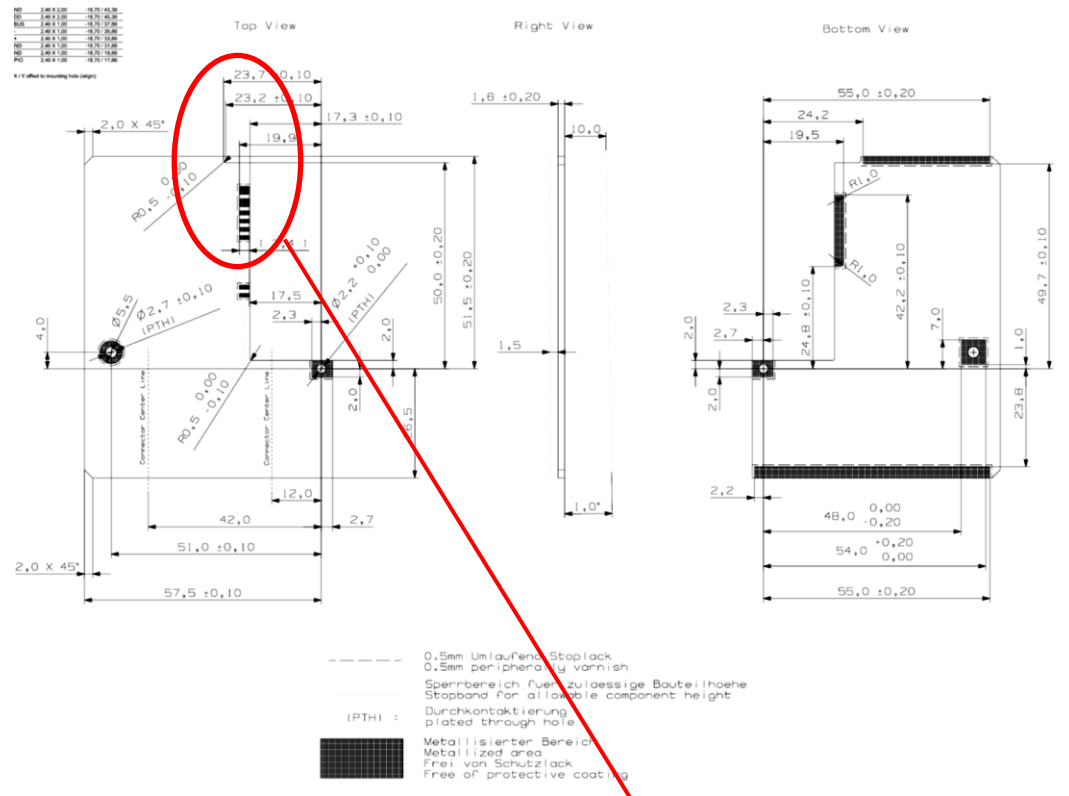


Figure 4: Printed Circuit Board (PCB)

Module Connector Pin Table

| Signal | Pad Size | Pad Location * |
|--------|-------------|----------------|
| GND | 2,40 X 2,00 | -18,70 / 43,30 |
| VDD | 2,40 X 2,00 | -18,70 / 40,30 |
| VBUS | 2,40 X 1,00 | -18,70 / 37,80 |
| D- | 2,40 X 1,00 | -18,70 / 35,80 |
| D+ | 2,40 X 1,00 | -18,70 / 33,80 |
| GND | 2,40 X 1,00 | -18,70 / 31,80 |
| GND | 2,40 X 1,00 | -18,70 / 19,80 |
| GPIO | 2,40 X 1,00 | -18,70 / 17,80 |

* X / Y offset to mounting hole (origin)

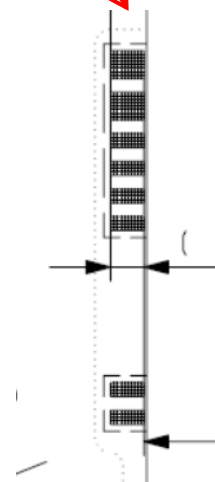


Figure 5 Allocation of Connector Pins (top to bottom)

3.3 Front Bezel

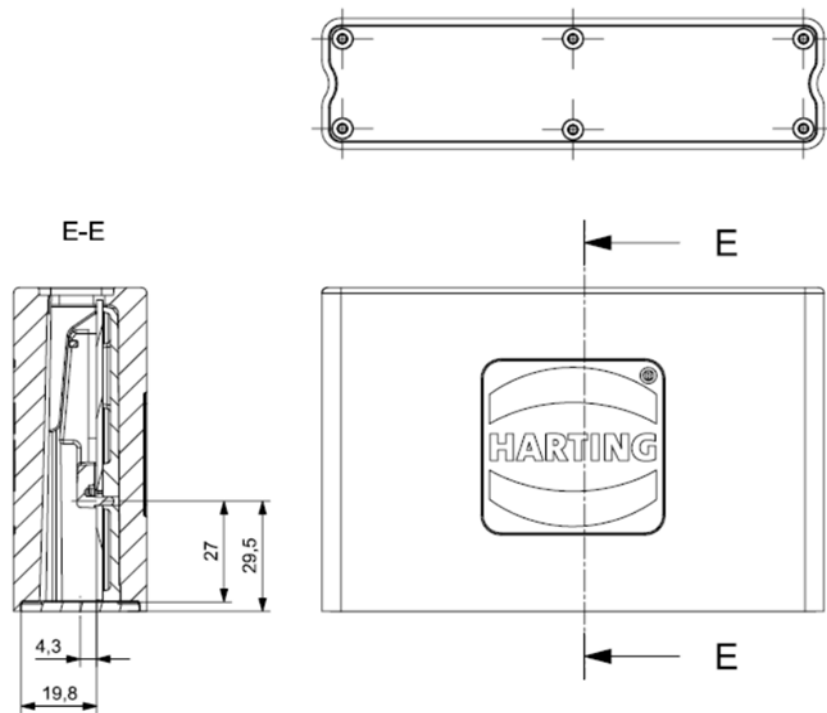


Figure 6 Position of the Customizable Circuit Board in Relationship to Front Bezel

The front bezel can be customized with the proper connectors to fit your application. The position of the customizable circuit board in relationship to the front bezel is shown in figure 6.

4 Attachments

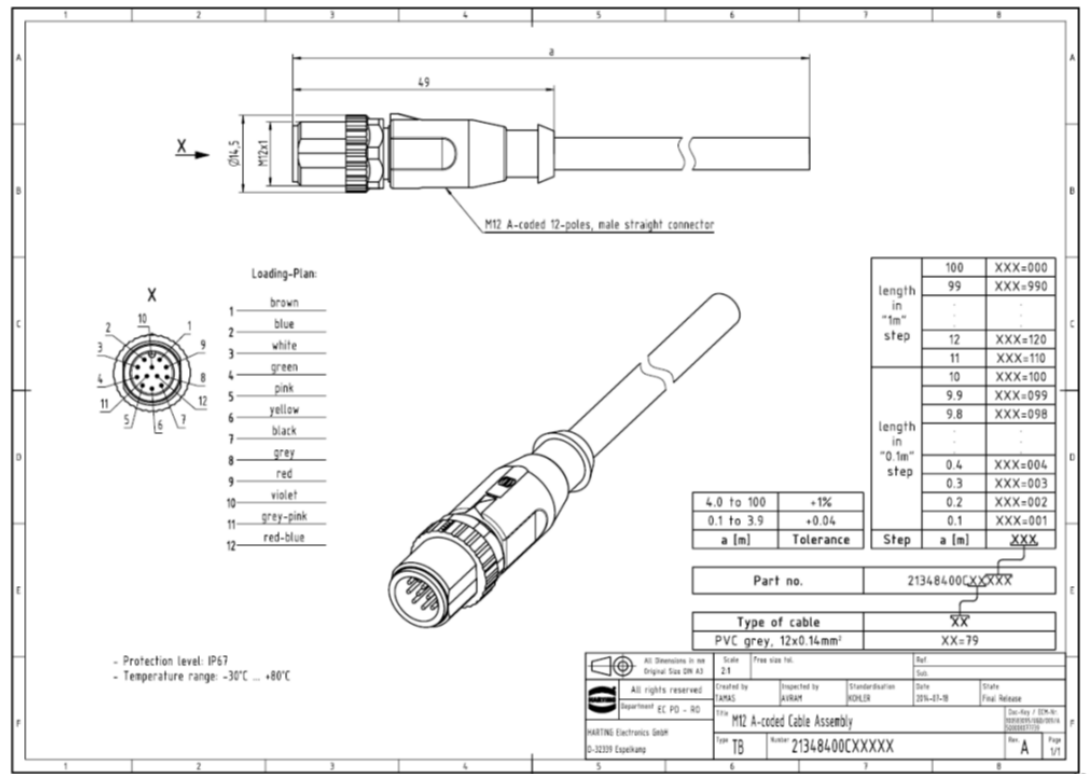


Figure 7: M12 A-coded Cable Assembly of Harting Breakout Cable

Document Version

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|-------|-------------------------------------|
| 1.3.0 | Chapter LED Display has been added. |
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