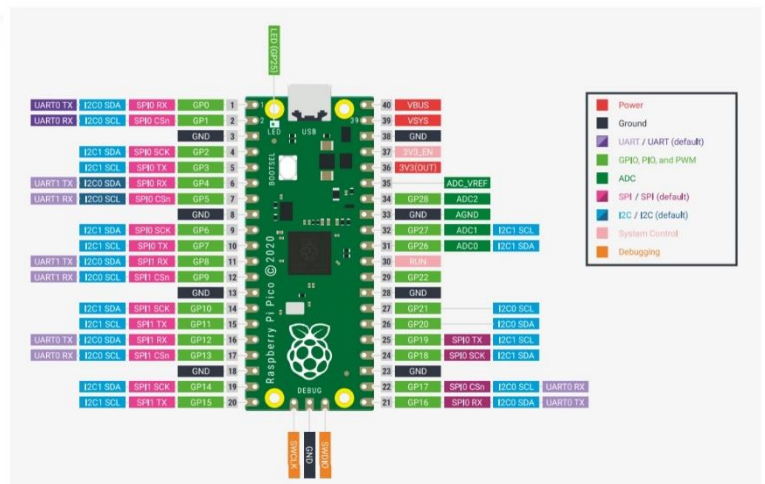


# Raspberry Pi PICO Shield



The **Raspberry Pi PICO Shield** is an adapter that allows you to install [Raspberry Pi PICO](#) System-on-Module in the mikroBUS slot or connect mikroBUS modules (such as [MikroElektronika's Click®](#)) to Raspberry Pi PICO modules.

Figure 2. The pinout of the Raspberry Pi Pico Rev2 board.



Raspberry Pi PICO pinout:

The correspondence between the Raspberry Pi PICO contacts and the **Raspberry Pi PICO Shield** contacts (connector with mikroBUS interface) is as follows:

| Raspberry Pi PICO |      |           |      | mikroBUS      |                | AUX1 | AUX2 |
|-------------------|------|-----------|------|---------------|----------------|------|------|
|                   |      | labeling  |      | mikroBUS LEFT | mikroBUS RIGHT |      |      |
| LEFT              | 1    | GP0       | 0    |               | TX             |      |      |
|                   | 2    | GP1       | 1    |               | RX             |      |      |
|                   | 3    | GND       | GND  | GND           |                |      |      |
|                   | 4    | GP2       | 2    |               |                |      |      |
|                   | 5    | GP3       | 3    |               |                |      |      |
|                   | 6    | GP4       | 4    |               | SDA            |      |      |
|                   | 7    | GP5       | 5    |               | SCL            |      |      |
|                   | 8    | GND       | GND  |               |                |      |      |
|                   | 9    | GP6       | 6    |               |                |      |      |
|                   | 10   | GP7       | 7    |               |                |      |      |
|                   | 11   | GP8       | 8    |               |                |      | 4    |
|                   | 12   | GP9       | 9    |               |                |      | 5    |
|                   | 13   | GND       | GND  |               |                |      |      |
|                   | 14   | GP10      | 10   |               |                | 1    |      |
|                   | 15   | GP11      | 11   |               |                | 2    |      |
|                   | 16   | GP12      | 12   |               |                | 3    |      |
|                   | 17   | GP13      | 13   |               |                | 4    |      |
|                   | 18   | GND       | GND  |               |                |      |      |
|                   | 19   | GP14      | 14   |               | RST            |      |      |
|                   | 20   | GP15      | 15   |               |                | 5    |      |
| RIGHT             | 40   | VBUS      | VB   |               |                |      |      |
|                   | 39   | VSYS      | VS   |               | 5V             |      |      |
|                   | 38   | GND       | GND  |               |                |      |      |
|                   | 37   | 3V3_EN    | EN   |               |                |      |      |
|                   | 36   | 3V3 (OUT) | 3V3  | 3V3           |                |      |      |
|                   | 35   | ADC_VREF  | REF  |               |                |      | 1    |
|                   | 34   | GP28      | 28   |               |                |      | 2    |
|                   | 33   | GND       | GND  |               |                |      |      |
|                   | 32   | GP27      | 27   |               |                |      | 3    |
|                   | 31   | GP26      | 26   | AN            |                |      |      |
|                   | 30   | RUN       | RUN  |               |                |      |      |
|                   | 29   | GP22      | 22   |               |                |      |      |
|                   | 28   | GND       | GND  |               |                |      |      |
|                   | 27   | GP21      | 21   |               |                | INT  |      |
|                   | 26   | GP20      | 20   |               |                | PWM  |      |
|                   | 25   | GP19      | 19   | MOSI          |                |      |      |
| 24                | GP18 | 18        | SCK  |               |                |      |      |
| 23                | GND  | GND       |      |               | GND            |      |      |
| 22                | GP17 | 17        | CS   |               |                |      |      |
| 21                | GP16 | 16        | MISO |               |                |      |      |

Signals not used in mikroBUS from the installed Raspberry Pi PICO are routed to the AUX1 and AUX2 connectors, which makes it possible to use almost all the functions of the Raspberry Pi PICO without changing the software.

There is a place for installing a button, the signal from which is sent to reset the RUN pin of the Raspberry Pi PICO.

The bottom-side shield has a Qwiic connector for I<sup>2</sup>C. The bottom-side also houses pull-up resistors for I<sup>2</sup>C. They are switchable (using JP jumpers on bottom-side), resistors are connected by default.

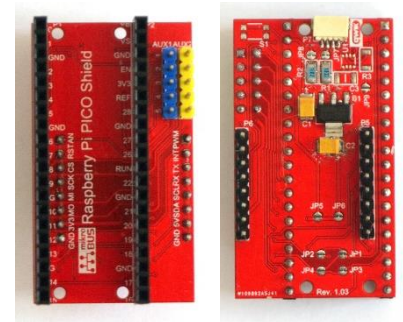
On the bottom-side there are also jumpers to select direct and cross-connect RX and TX to the corresponding mikroBUS signals.

List of jumpers on the bottom-side and their default states:

| Image | Function                                    | Default state |
|-------|---|---------------|
| JP1   | direct or cross connection for TX0 (default | CLOSE         |
| JP2   | is direct)                                  | OPEN          |
| JP3   | direct or cross connection for RX0 (default | CLOSE         |
| JP4   | is direct)                                  | OPEN          |
| JP5   | 3V3 source for mikroBUS (JP1 - Feather,     | OPEN          |
| JP6   | JP2 - Shield), default Shield               | CLOSE         |
| JP7   |   | CLOSE         |
| JP8   | pull-up for i2c                             | CLOSE         |
| JP9   | BME280 address on i2c                       | OPEN          |

The **Raspberry Pi PICO Shield** contains (on the bottom-side) the voltage regulator [AMS1117-3.3](#) and the necessary capacitors. On the bottom-side there is a jumper defining the 3V3 source on the mikroBUS (from the installed to Raspberry Pi PICO slot module or from AMS1117-3.3). By default - from the installed module.

Optionally, a [BME280](#) is installed on the bottom-side of the module (7-bit address on I<sup>2</sup>C = 111011x). The address for BME280 is selected with jumpers on the bottom-side. The default address should be 1110111.





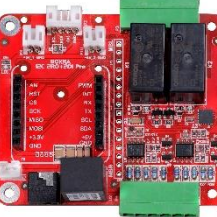
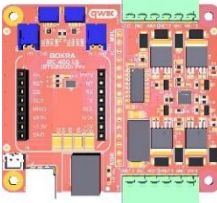
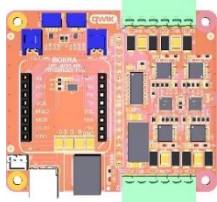
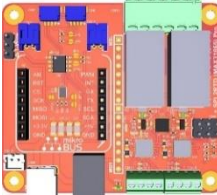
**Raspberry Pi PICO Shield** size - 51 x 29.21 mm.

The main areas of application of the shield:

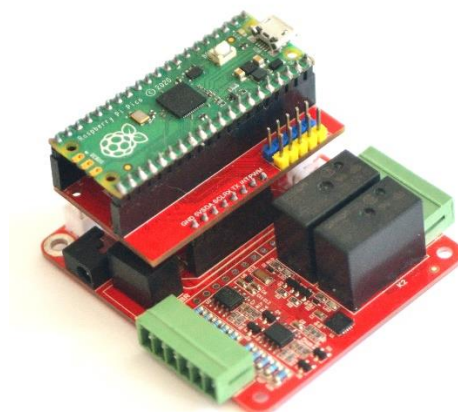
- Data acquisition systems (DAS)
- Scientific and medical devices
- Smart home and building automation
- HVAC and air monitoring
- Consumer electronic
- Toys

With **Raspberry Pi PICO Shield**, it is easy to use Raspberry Pi PICO to control the following Pro Series I/O modules:

| Image   | Name                | Characteristics  |
|---|---------------------|--|
|  | I2C 4AI ADS1x15 Pro | 4 channels differential analog input based on 16-bit ADS1115 and 12-bit ADS1015 ADC. The two Texas Instruments ΔΣ (delta-sigma) ADCs installed on the module. Voltage measurement ranges: 0-0.5V, 0-5V, 0-10V, ± 0.5V, ± 5V, ± 10V. Current measurement ranges: 0-20mA, 4-20mA, ± 20mA, 0-40mA. Measurement speed: up to 860 measurements per second for ADS1115 and up to 3300 measurements per second for ADS1015. |

|   |                                  |   |
|---|----------------------------------|---|
|    | <p>I2C 2RO+2AI Pro</p>           | <p>2 Omron G5Q-14 relays and 2 analog input channels based on an ADC from Texas Instruments (either ADS1115-Q1 or ADS1015). Voltage measurement ranges: 0-0.5V, 0-5V, 0-10V, <math>\pm 0.5V</math>, <math>\pm 5V</math>, <math>\pm 10V</math>. Current measurement ranges: 0-20mA, 4-20mA, <math>\pm 20mA</math>, 0-40mA. Measurement speed: up to 860 measurements per second for ADS1115 and up to 3300 measurements per second for ADS1015.</p>  |
|    | <p>I2C 2RO+2DI Pro</p>           | <p>2 Omron G5Q-14 relays and 2 digital input channels (based on Texas Instruments ISO1211). The modules allow you to enter the values of 2 digital signals, both DC and AC. Supports 9-V to 300-V DC and AC digital input. Compliant to IEC 61131-2; Type 1, 2, 3 characteristics for 24-V isolated digital inputs. Accurate Current Limit for Low-Power Dissipation: <math>-2.2\text{ mA}</math> to <math>2.47\text{ mA}</math> for Type 3. Maximum transient isolation voltage (up to 60s) <math>-3600V</math>.</p> |
|    | <p>I2C 4DO LS (BTS3160D) Pro</p> | <p>4 channels low-side digital output, based on BTS3160D.</p>   |
|   | <p>I2C 4DO HS (TPS1H100) Pro</p> | <p>4 channels high-side digital output, based on TPS1H100.</p>  |
|  | <p>I2C 2RO + SPI 2RTD Pro</p>    | <p>2 Omron G5Q-14 relays and 2 digital input channels (based on Texas Instruments ISO1211).</p>   |

This is what the Raspberry Pi PICO looks like, installed with the **Raspberry Pi PICO Shield** in the module **IoTing Digital** (aka **I2C 2RO + 2DI Pro**)



You can also learn more about the **I2C 2RO + 2DI Pro** module on the [IoTing Digital](#) page at Crowd Supply.

[MikroElektronika](https://www.mikroe.com) manufactures numerous modules with mikroBUS interface - Click® modules.



All these modules can be easily connected directly to the XIAO and QT using the **Raspberry Pi PICO Shield** schematic:

