UNI CLICKER

USER MANUAL

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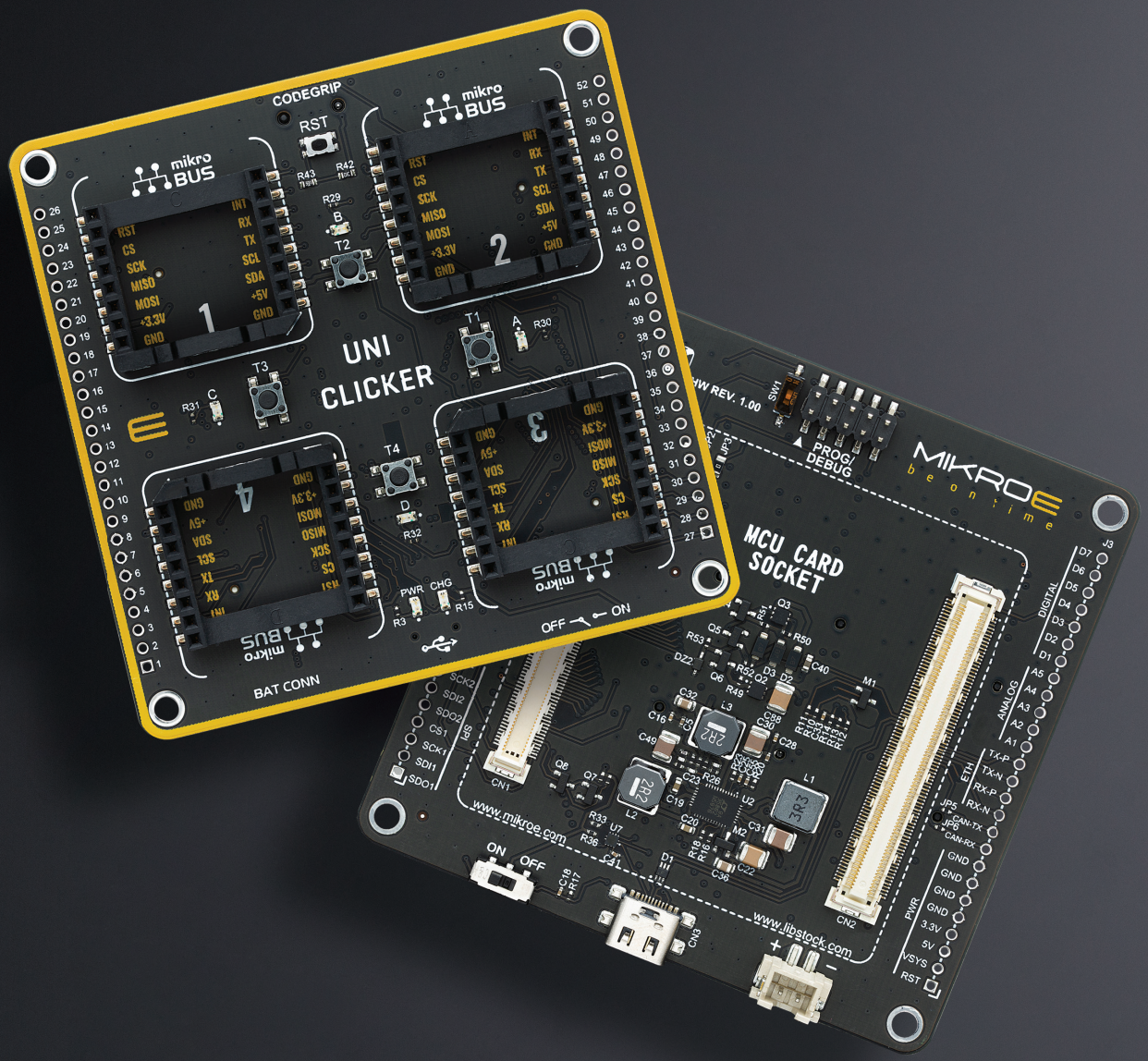
Table of contents


CODEGRIP
RST
mikro BUS
UNI CLICKER
BAT CONN
PWR
CHG
OFF
ON
HW REV. 1.00
PROG/ DEBUG
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UNI Clicker is a compact development board designed as a complete solution, you can use it to quickly build your own gadgets with unique functionalities.

Featuring a MCU Card socket, four mikroBUS™ sockets for Click boards™ connectivity, power managment, and more, it represents a perfect solution for the rapid development of many different types of applications.

At its core, there is an MCU Card socket which allows UNI Clicker to use different microcontrollers (MCUs) mounted on a standardized MCU Card, regardless of their vendor or architecture.

This provides a tremendous amount of flexibility, allowing UNI Clicker to adapt to any specific application requirements, be it a demanding task of remote weather station, or something much simpler.

Besides two 1x26 pin headers, four improved mikroBUS™ sockets represent the most distinctive connectivity feature, allowing access to a huge base of Click boards™, growing on a daily basis.

Each section of UNI Clicker is clearly marked, offering an intuitive and clean interface. This makes working with the development board much simpler and thus, faster.

The usability of UNI Clicker doesn't end with its ability to accelerate the prototyping and application development stages: it is designed as a complete solution which can be implemented directly into any project, with no additional hardware modifications required. Four mounting holes [3.2mm/0.126"] at all four corners allow simple installation by using mounting screws. For most applications, a nice stylish casing is all that is needed to turn the UNI Clicker development board into a fully functional, custom design.

1. MCU card

UNI clicker development board offers support for various MCU architectures, mounted on a standardized MCU Card **(1)**.

MCU Card contains two 168-pin mezzanine connectors **(2)** that allow interfacing with the development board: one male and one female. Likewise, the UNI clicker development board is equipped with a pair of complementary connectors **(3)**, eliminating any possibility of the incorrect orientation, allowing MCU Card to be installed very easily.

Besides these two 168-pin mezzanine connectors, MCU Card may also contain multiplexing circuits, Ethernet PHY ICs, CAN transceivers and connectors, crystal oscillators, clock generators, and other electronic components necessary for the proper operation of the MCU. This makes each MCU Card a self-contained unit, allowing the development board to operate on a logic level, not having to facilitate specific requirements of many different MCUs. This also allows the MCU to be freely chosen, not having to worry about its pin count, compatibility, and similar issues.

Most importantly, it makes swapping between different MCUs during the development phase very simple, without any additional hardware interventions required.

NOTE *MCU Card must be installed prior to using the UNI clicker development board. More information about MCU Cards can be found at the* ***www.mikroe.com/mcu-cards***

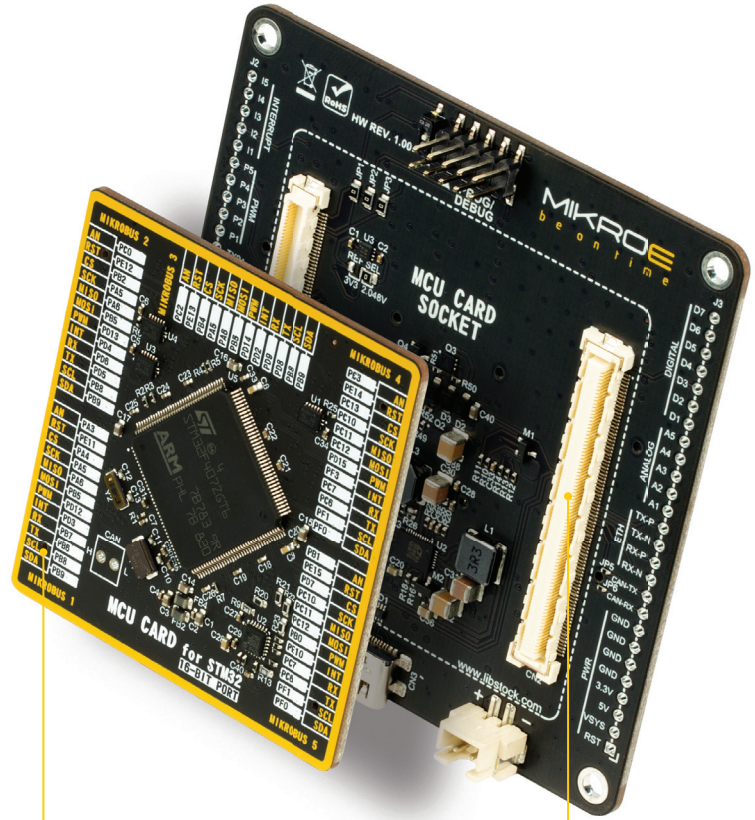


Figure 1: MCU card and UNI Clicker view

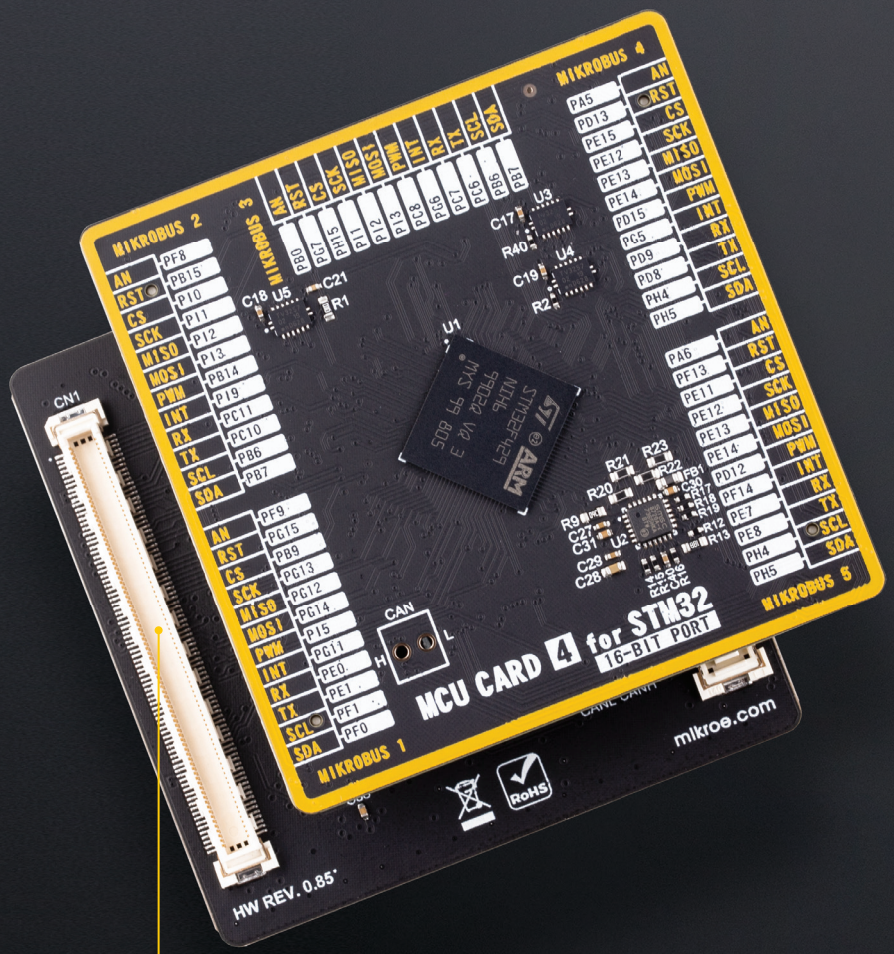


Figure 2: MCU card view

Variety of **MCUs** regardless of their vendor. One **MCU card standard** supports **multiple architectures** ARM, PIC32, dsPIC, PIC, AVR through different vendors: Microchip, ST, NXP, TI and many more yet to come!

www.mikroe.com/development-boards/mcu-cards

2. MCU prog/debug

The installed MCU (referred to as "host MCU" in the following text) can be programmed and debugged over the 2x5 pin header **(1)**, labeled as PROG/DEBUG. This header allows an external programmer (preferably CODEGRIP or mikroProg) to be used.

If your MCU card has preprogrammed bootloader, MCU can be programmed by using the mikrobootloader application. All the information about the bootloader software can be found on the following page: www.mikroe.com/mikrobootloader. A switch labeled as SW1 **(2)** is used to specify whether CODEGRIP/mikroProg or a third-party programmer is connected to the JTAG/SWD header

SW1 – ON (up) position: to use a third-party programmer
SW1 – OFF (down) position: to use CODEGRIP/mikroProg

NOTE *Before usage, please check if the programmer pinout and the 2x5 pin header pinout are compatible. Based on the used programmer/debugger tool pinout, a coresponding addapter might be needed (e.g. mikroProg for PIC).*

PROG/DEBUG

PIN#	ICSP (MCHP)	MIPS EJTAG	**JTAG**	CORTEX SWD	SPI
1	VTG	VTG	VTG	VTG	VTG
2		TMS	TMS	SWDIO	MOSI
3	GND	GND	GND	GND	GND
4	PGC	TCK	TCK	SWDCLK	SCK
5	GND	GND	GND	GND	GND
6	PGD	TDO	TDO	SWO	MISO
7					CS
8		TDI	TDI		
9	GND	GND	GND	GND	GND
10	MCLR	MCLR	RESET	MCLR	RESET

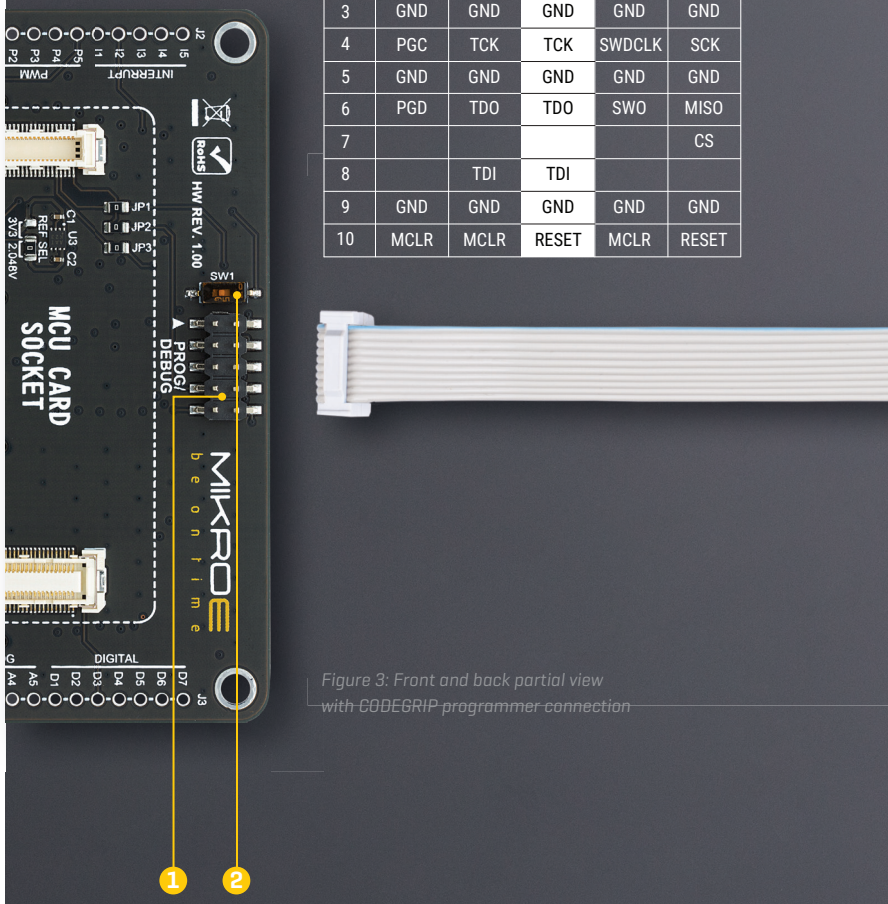
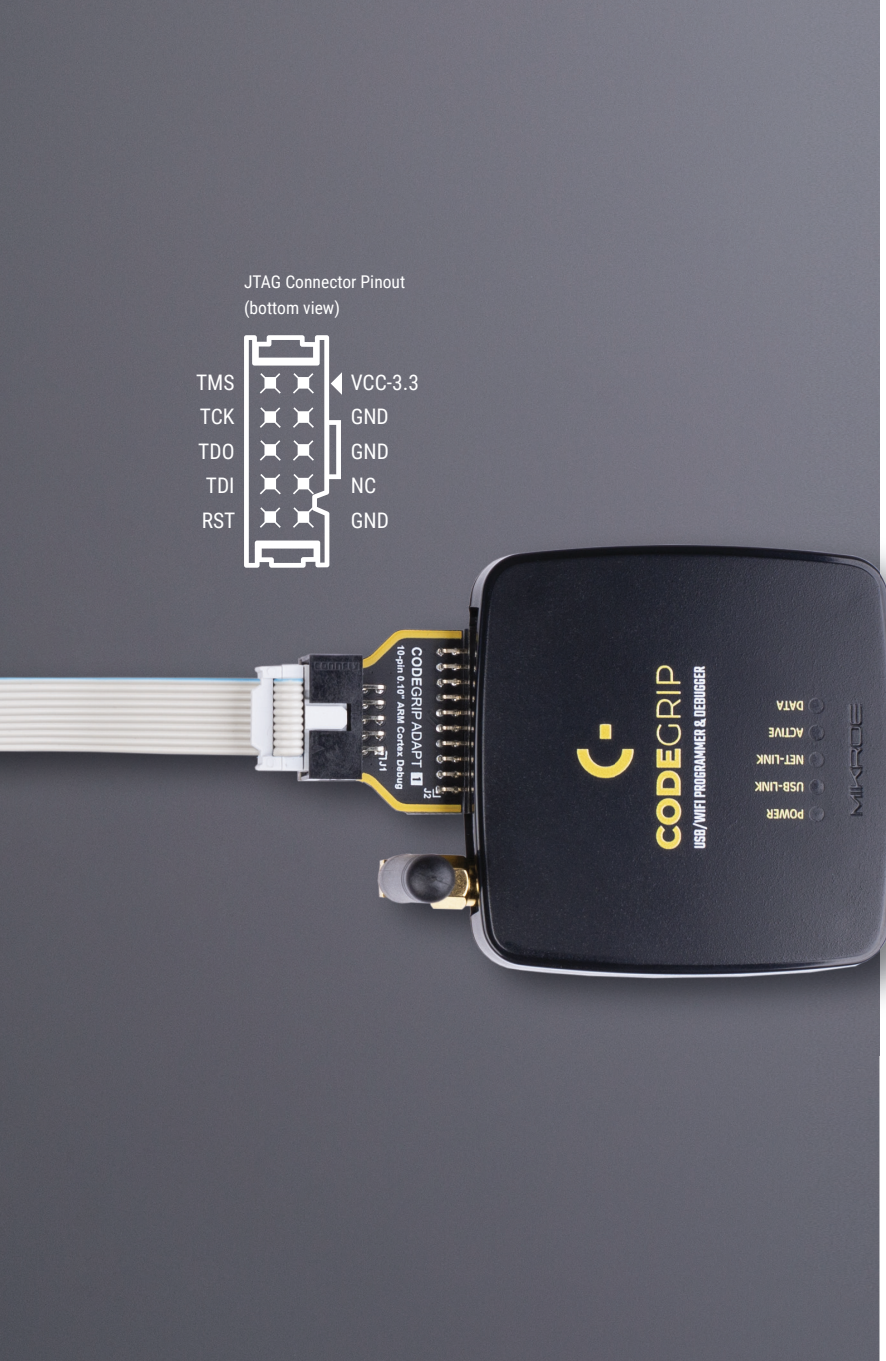
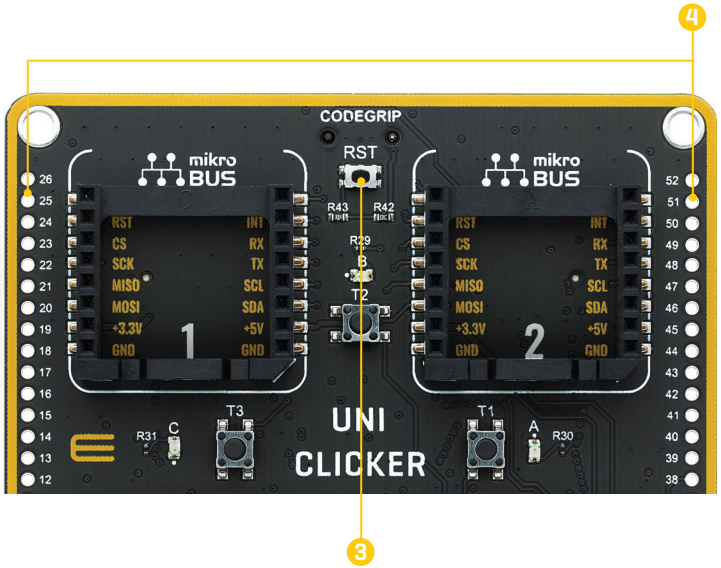


Figure 3: Front and back partial view with CODEGRIP programmer connection



3. MCU reset

UNI Clicker development board is equipped with the reset button labeled as RST **[3]**, located on the front of the board. It is used to generate a LOW logic level on the MCU reset pin.



The RST pin of the host MCU is also routed to the pin 1 of the 1x26 pin header **[4]**, allowing an external signal to reset the MCU.

4. Power supply unit

After a valid power supply source is connected **(1 – 2)**, UNI Clicker can be powered ON. This can be done by a small switch **(3)** at the edge of the board. By switching it ON, the PSU module will be enabled, and the power will be distributed throughout the board. A LED indicator labeled as PWR indicates that the board is powered ON.

The power supply unit (PSU) provides clean and regulated power, necessary for proper operation of the UNI Clicker development board. It is equipped with two different power supply inputs, offering all the flexibility that UNI Clicker needs, and a reliable and safe battery charging circuit, which allows a single-cell Li-Po/Li-Ion battery to be charged.

The PSU design is based on LTC3586, a highly integrated power management and battery charger IC that includes a current limited switching PowerPath manager. This IC transmits nearly all of the power available from the USB port to the load with minimal loss and heat. The PowerPath switching regulator and battery charger inside LTC3586 communicate to ensure that the input current never violates the USB specifications.

The MCP1501, a high-precision buffered voltage reference from Microchip is used to provide a very precise voltage reference with no voltage drift.
It can be used for various purposes: the most common uses include voltage references for A/D converters, D/A converters, and comparator peripherals on the host MCU. Depending on the specific application, either 3.3V from the power rail, or 2.048V from the MCP1501 can be selected. An onboard SMD jumper labeled as REF SEL **(4)** offers two voltage reference choices:

REF: 2.048V from the high-precision voltage reference IC
3V3: 3.3V from the main power supply rail

As explained, the advanced design of the PSU allows two types of power sources to be used, offering unprecedented flexibility: when powered by a Li-Po/Li-ION battery, it offers an ultimate degree of autonomy.
Power is not an issue even if it is powered over the USB cable. It can be powered over the USB-C connector, using power supply delivered by the USB HOST (i.e. personal computer), USB wall adapter, or a battery power bank. There are two power supply connectors available, each with its unique purpose:

CN6: USB-C connector **(1)**
CN5: Standard 2.5mm pitch XH battery connector **(2)**

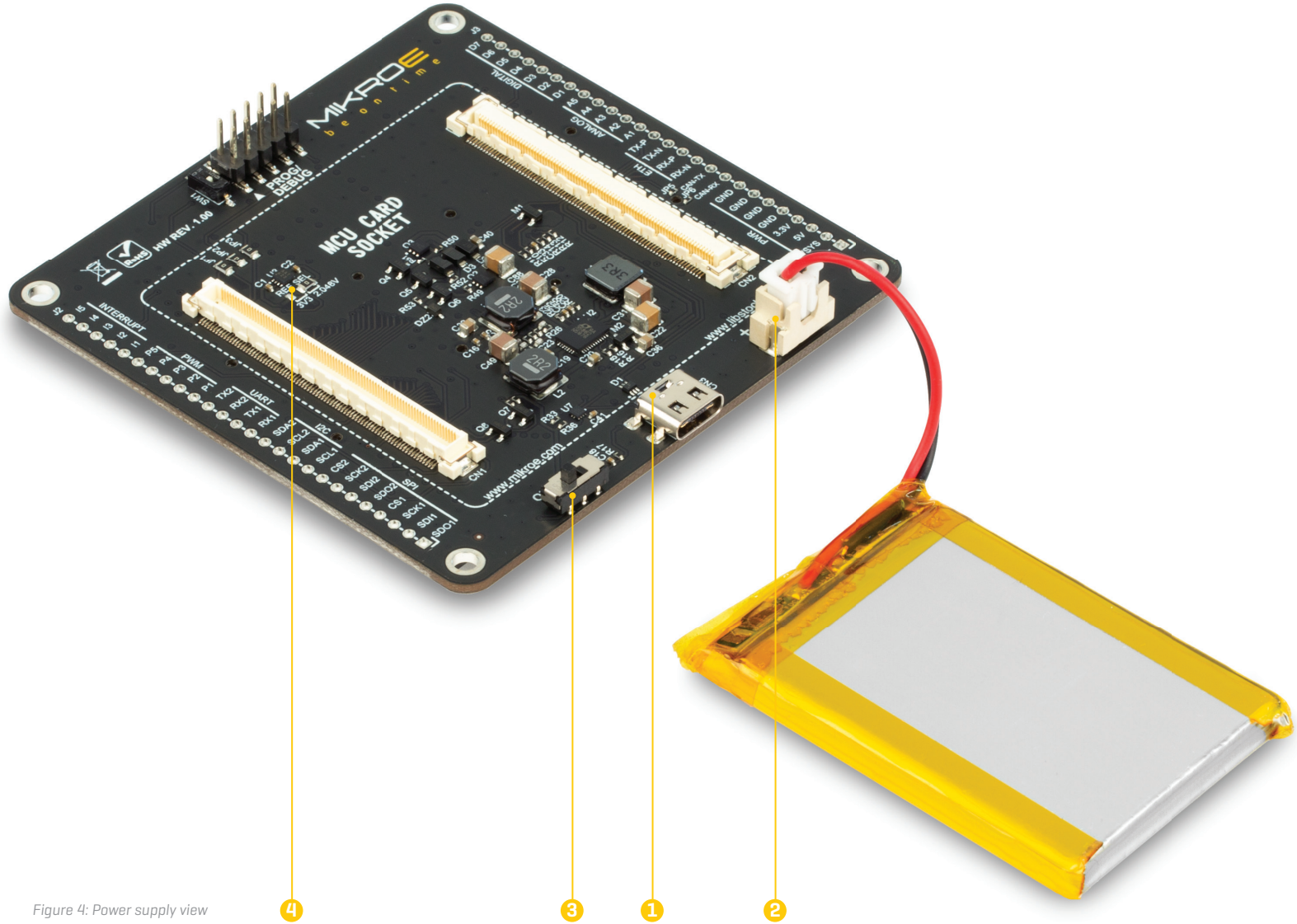


Figure 4: Power supply view

5. Connectivity

UNI Clicker offers a variety of connectivity options including USB (HOST/DEVICE), four standardized mikroBUS™ sockets, and two 1x26 pin headers which are used to directly access the host MCU pins.

NOTE

When UNI Clicker is working in USB HOST mode, it must not be mounted to another USB HOST (such as PC).

UNI Clicker supports USB as host and USB as device, allowing the development of a wide range of various USB-based applications.
The USB mode selection is done using a monolithic controller IC. This IC provides Configuration Channel (CC) detection and indication functions.
To set up UNI Clicker as a USB HOST, the USB PSW pin should be set to a LOW logic level (0) by the host MCU. If set to a HIGH logic level,

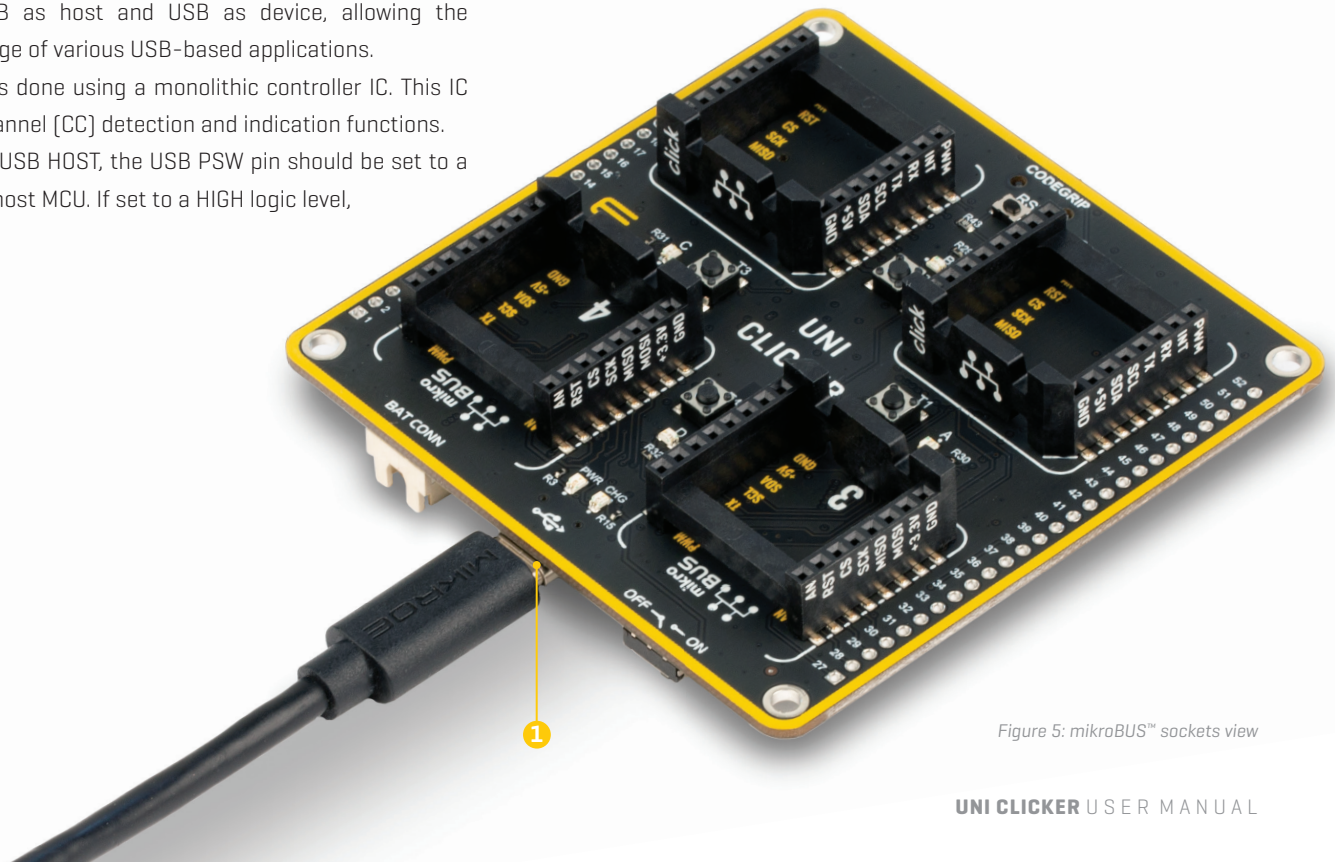


Figure 5: mikroBUS™ sockets view

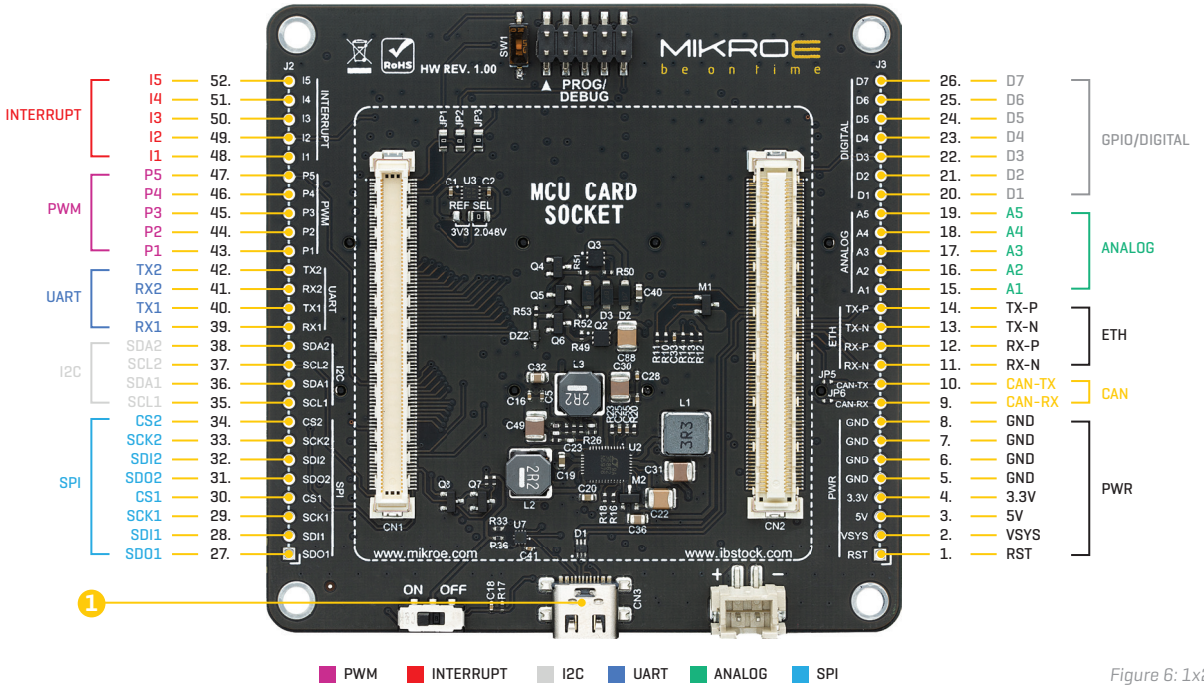


Figure 6: 1x26 pin header view

UNI Clicker acts as a DEVICE. While in HOST mode, UNI Clicker provides power over the USB-C connector **[1]**. The USB PSW pin is driven by the host MCU, allowing the software to control the USB mode.

The USB ID pin is used to detect the type of the device attached to the USB port, according to the USB OTG specifications: the USB ID pin connected to GND indicates a HOST device, while the USB ID pin set to a high impedance state (HI-Z) indicates that the connected peripheral is a DEVICE.
The superior connectivity features of the UNI clicker development board is provided with four standardized mikroBUS™ host connectors, allowing interfacing with the vast amount of Click boards™.

Each MCU card has different pins routed to the mikroBUS™ sockets, depending on the particular MCU. Therefore, each mikroBUS™ socket is labeled on the development board with its ordinal number, by which the connector is referenced to in the Mikroe development environment, software applications, tutorials, etc. mikroBUS™ is the add-on board standard that offers maximum expandability with the smallest number of pins. More information at ***www.mikroe.com/mikrobus***

A lot of the host MCU pins are routed to two 1x26 pin headers, making them available for further connectivity. In addition to MCU pins, some additional peripheral pins are also routed to this header.

6. Buttons and LEDs

The board also contains four buttons and LEDs, located on the back side. Buttons **(1)** can be used to apply the desired logic state to pins of the MCU they are routed to. Pressing any of the two buttons can change the logic state of the microcontroller pins from logic high (1) to logic low (0).

LEDs **(2)** can be used to visually indicate a logic state of the specific pin. The maximum current through a single LED is limited with the 1k resistor. Each LED is connected to a MCU pin, and an active LED indicates that a logic high (1) is present.

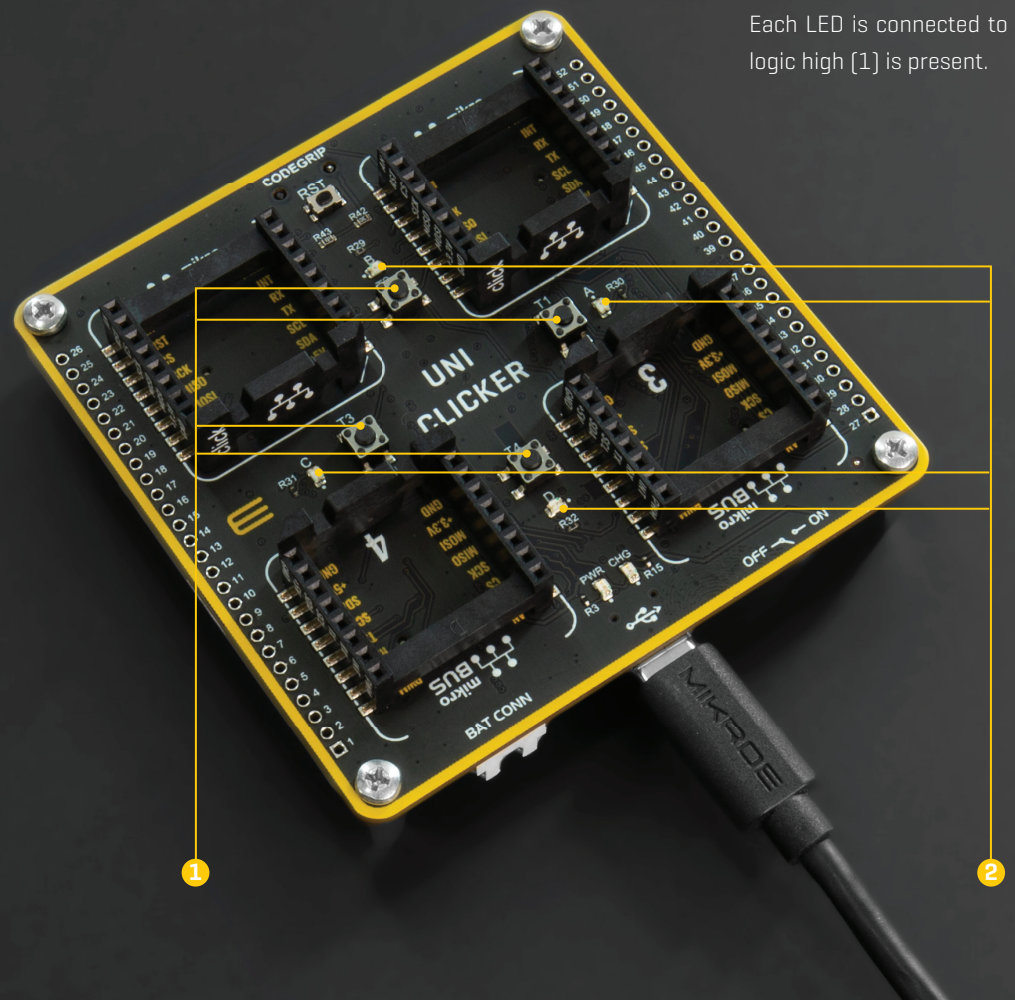


Figure 7: Buttons and LEDs view

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