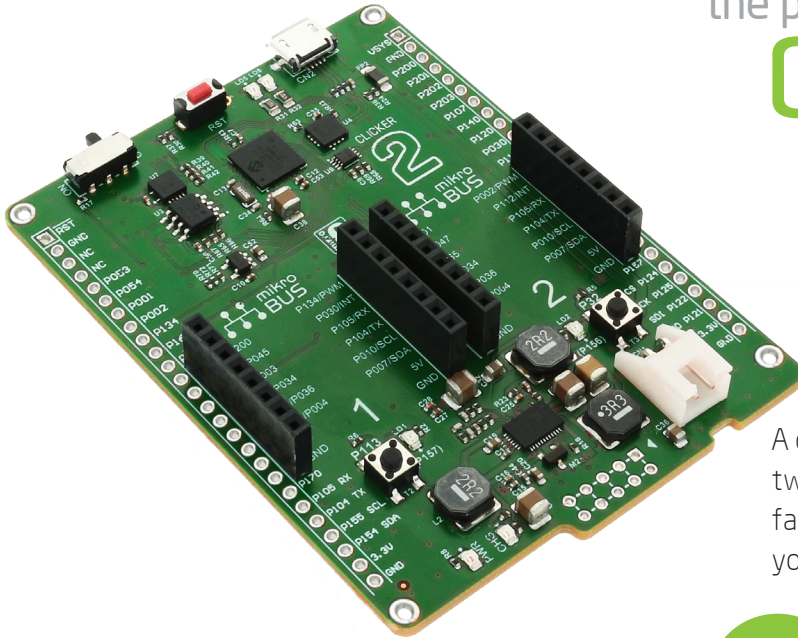


the possibilities are endless

# CLICKER 2

for CEC1702



A compact development board with two mikroBUS™ sockets and your favorite microcontroller. Unleash your imagination.



# TO OUR VALUED CUSTOMERS

I want to express my thanks to you for being interested in our products and for having confidence in MikroElektronika.

The primary aim of our company is to design and produce high quality electronic products and to constantly improve the performance thereof in order to better suit your needs.

A white, handwritten signature in cursive script, appearing to read 'N. Matic', set against a dark green background.

Nebojsa Matic  
General Manager

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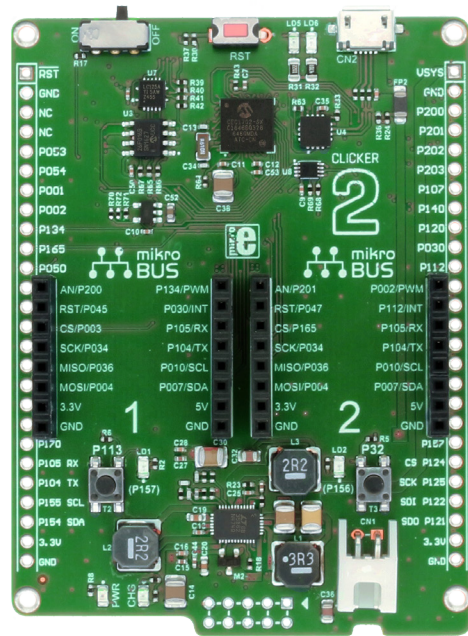
# Introduction to clicker 2 for CEC1702

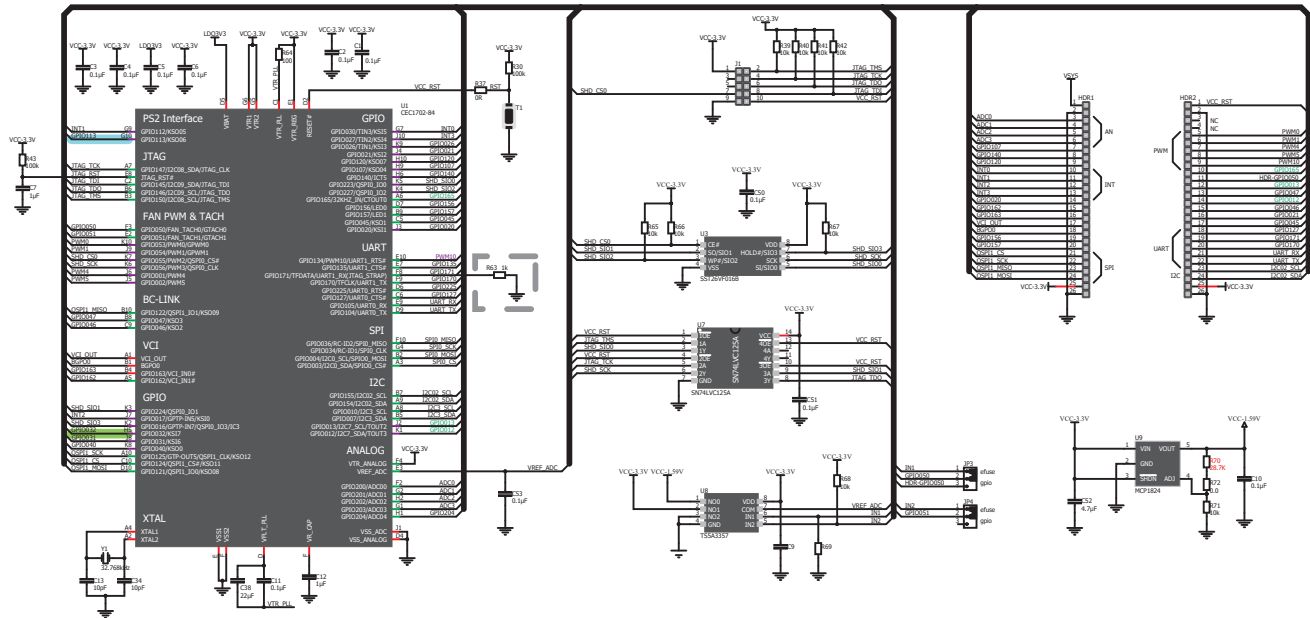
clicker for CEC1702 is a compact development board with two mikroBUS™ sockets for click board™ connectivity. With more than 270 click boards™ so far, you can combine different functionalities and create without limitations. The board carries the CEC1702, a 32-bit ARM® Cortex™-M4 Processor Core, with strong cryptographic support. It also contains two indication LEDs, two general purpose buttons, a reset button, an on/off switch, a li-polymer battery connector, a Micro USB connector.

A mikroProg connector and a 2x26 pinout for interfacing with external electronics are also provided.

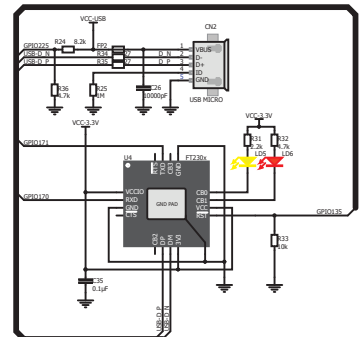
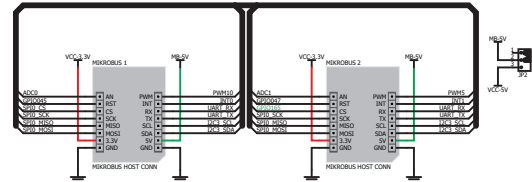
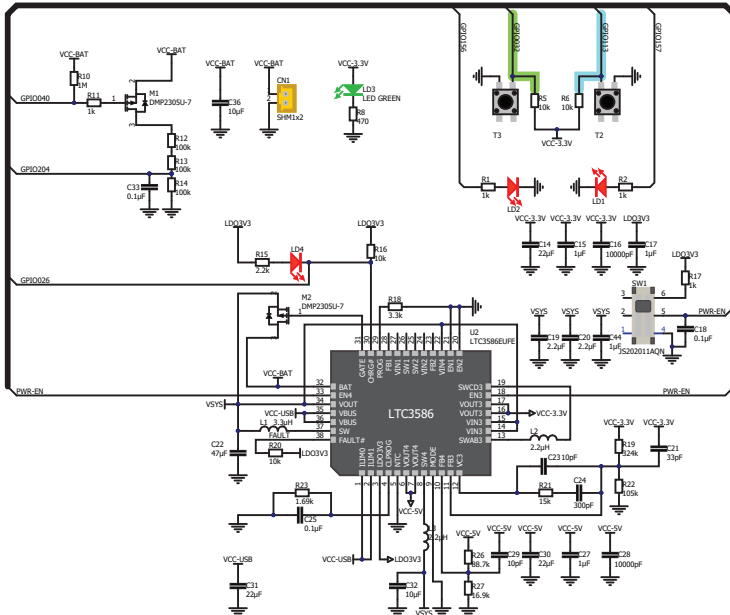
The mikroBUS™ connector consists of two 1x8 female headers with SPI, I 2C, UART, RST, PWM, Analog and Interrupt lines as well as 3.3V, 5V and GND power lines.

Clicker 2 for CEC1702 for CEC1702 board can be powered over a USB cable.



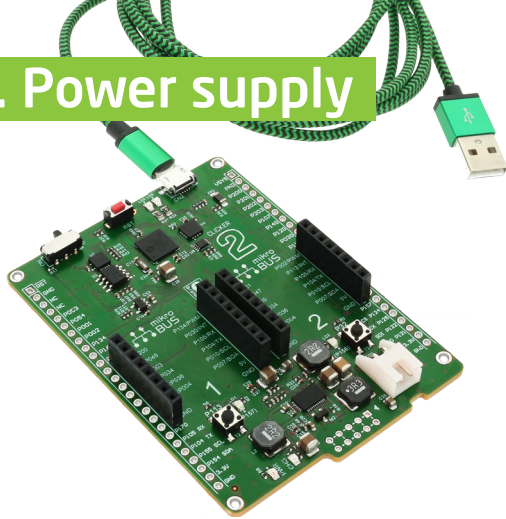


clicker 2 for CEC1702 schematic



clicker 2 for CEC1702 schematic

# 1. Power supply



## USB power supply

You can supply power to the board with a Mini USB cable provided in the package. On-board voltage regulators provide the appropriate voltage levels to each component on the board. Power LED (GREEN) will indicate the presence of power supply.

Figure 1-1:  
Connecting USB  
power supply

## Battery power supply

You can also power the board using a **Li-Polymer** battery, via on-board battery connector. On-board battery charger circuit enables you to charge the battery over USB connection. **LED diode (RED)** will indicate when battery is charging. Charging current is ~300mA

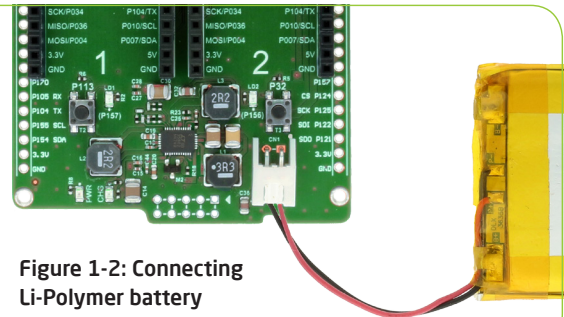


Figure 1-2: Connecting  
Li-Polymer battery

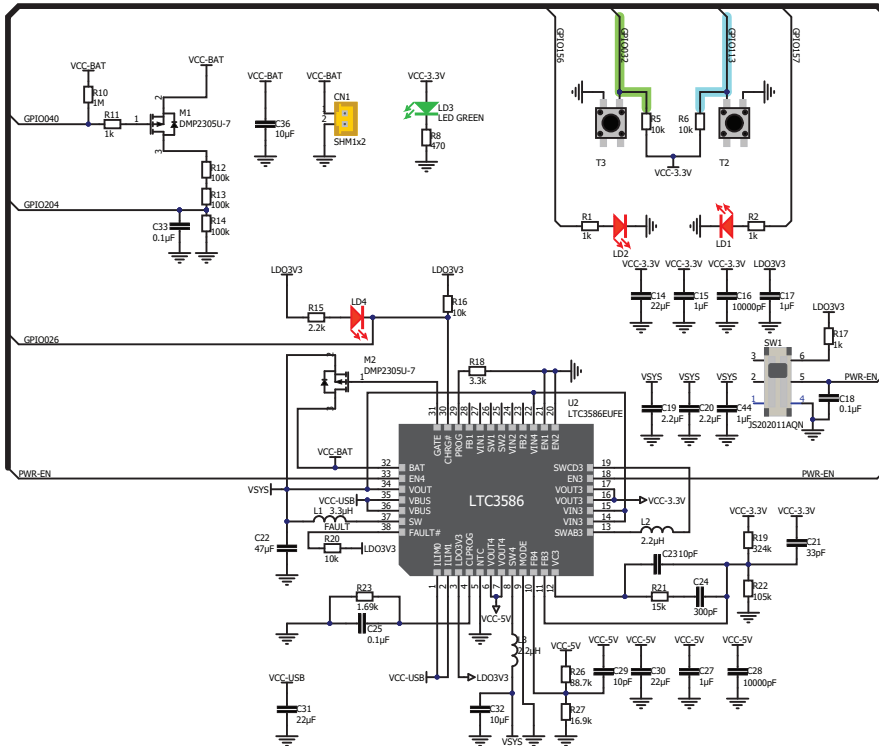


Figure 1-3: Power supply schematic

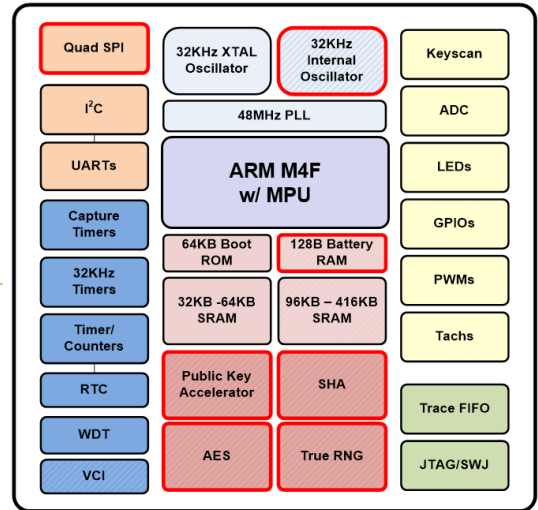


## 2. CEC1702 microcontroller

The clicker 2 for CEC1702 development board comes with the CEC1702 microcontroller from Microchip. The CEC1702 is a full-featured ARM® Cortex®-M4-based microcontroller with a complete hardware cryptography-enabled solution in a single package. This low-power but powerful, programmable 32-bit microcontroller offers easy-to-use encryption, authentication, private and public key capabilities and allows customer programming flexibility to minimize customer risk.

### Key microcontroller features

- 480KB SRAM: Code + Data
- Robust HW Crypto Cypher Suite
- 2.5K bits User Programmable OTP
- Secure boot provides a HW-based root of trust
- Security Supervisor
- Can replace or supplement existing



# 3. Programming the microcontroller

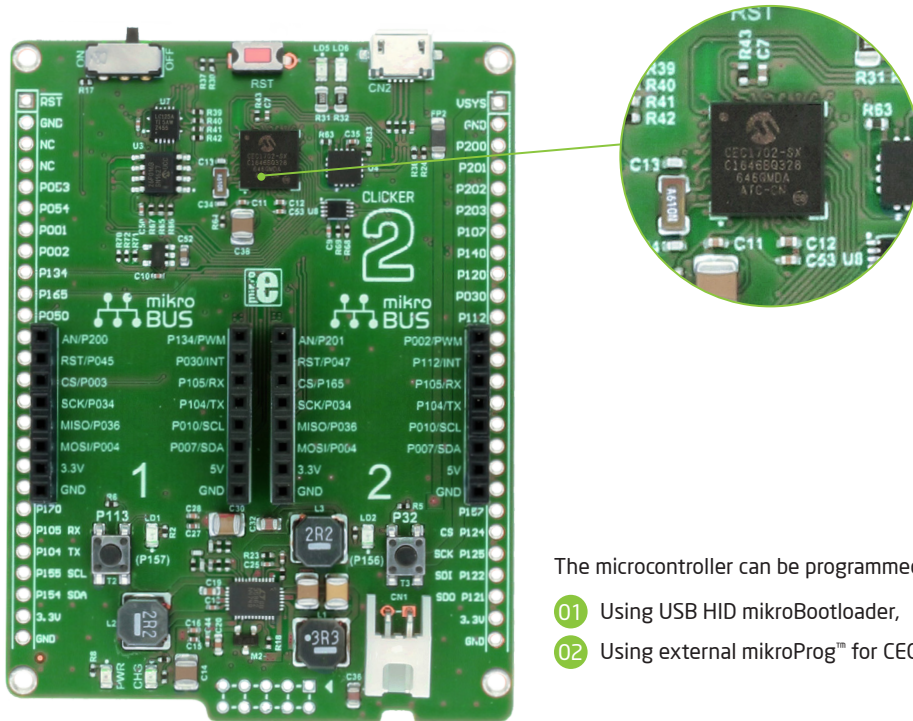


Figure 3-1:  
CEC1702  
microcontroller

The microcontroller can be programmed in three ways:

- 01 Using USB HID mikroBootloader,
- 02 Using external mikroProg™ for CEC1702 programmer

## 3.1 Programming with mikroProg™ programmer

On-board mikroProg™ programmer requires special programming software called mikroProg Suite™ for ARM®. This software is used for programming of all supported microcontroller families with ARM® Cortex™-M3 and Cortex™-M4 cores. The software has an intuitive interface and SingleClick™ programming technology. To begin, first locate the installation archive on the link below:

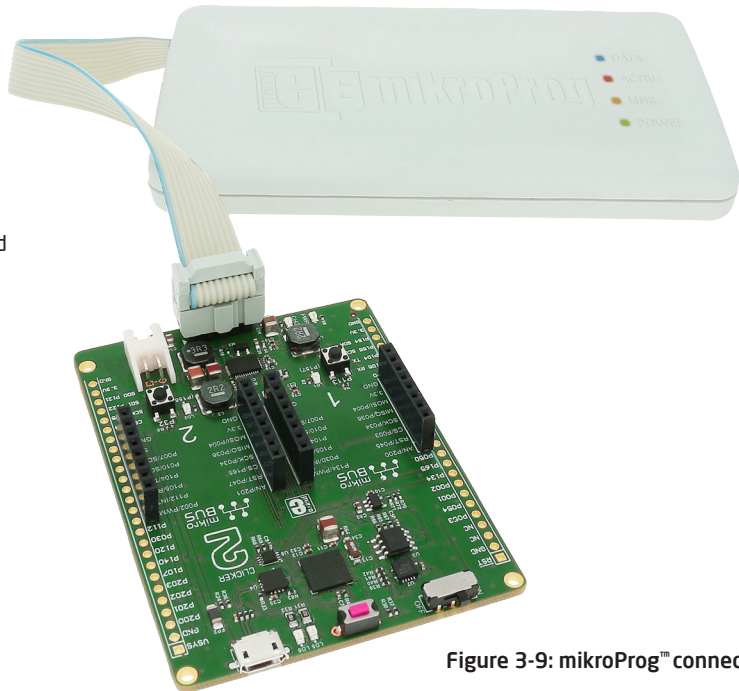


Figure 3-9: mikroProg™ connector

# mikroProg Suite™ for ARM® software

On-board mikroProg™ programmer requires special programming software called mikroProg Suite™ for ARM®. This software is used for programming of all supported microcontroller families with ARM® Cortex™-M3 and Cortex™-M4 cores. The software has an intuitive interface and SingleClick™ programming technology. To begin, first locate the installation archive on the link below:



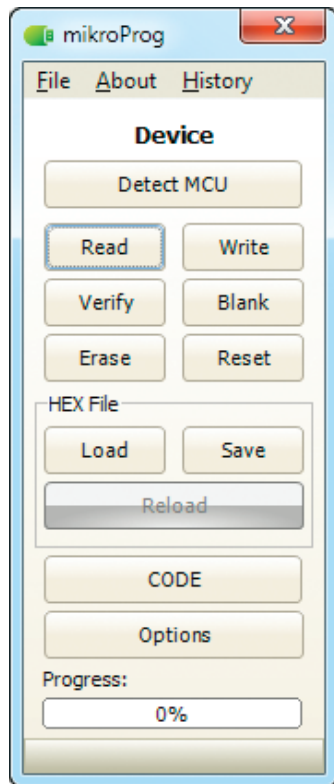
[http://www.mikroe.com/downloads/get/1809/mikroprog\\_suite\\_for\\_arm.zip](http://www.mikroe.com/downloads/get/1809/mikroprog_suite_for_arm.zip)

After downloading, extract the package and double click the executable setup file, to start installation.

## Quick guide

- 01 Click the **Detect MCU** button in order to recognize the device ID.
- 02 Click the **Read** button to read the entire microcontroller memory. You can click the **Save** button to save it to the target HEX file.
- 03 If you want to write the HEX file into the microcontroller, first make sure to load the target HEX file using the **Load** button. Then click the **Write** button to begin programming.
- 04 Click the **Erase** button to clear the microcontroller memory.

Figure 3-10:  
mikroProg Suite™  
for ARM® window



**NOTE** Before attaching the programming connector, you have to solder the provided 2x5 male header to the JTAG (CN3) pads.

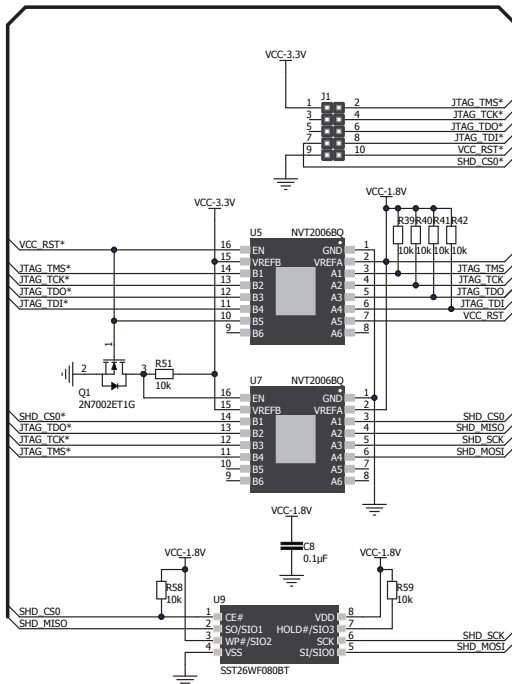
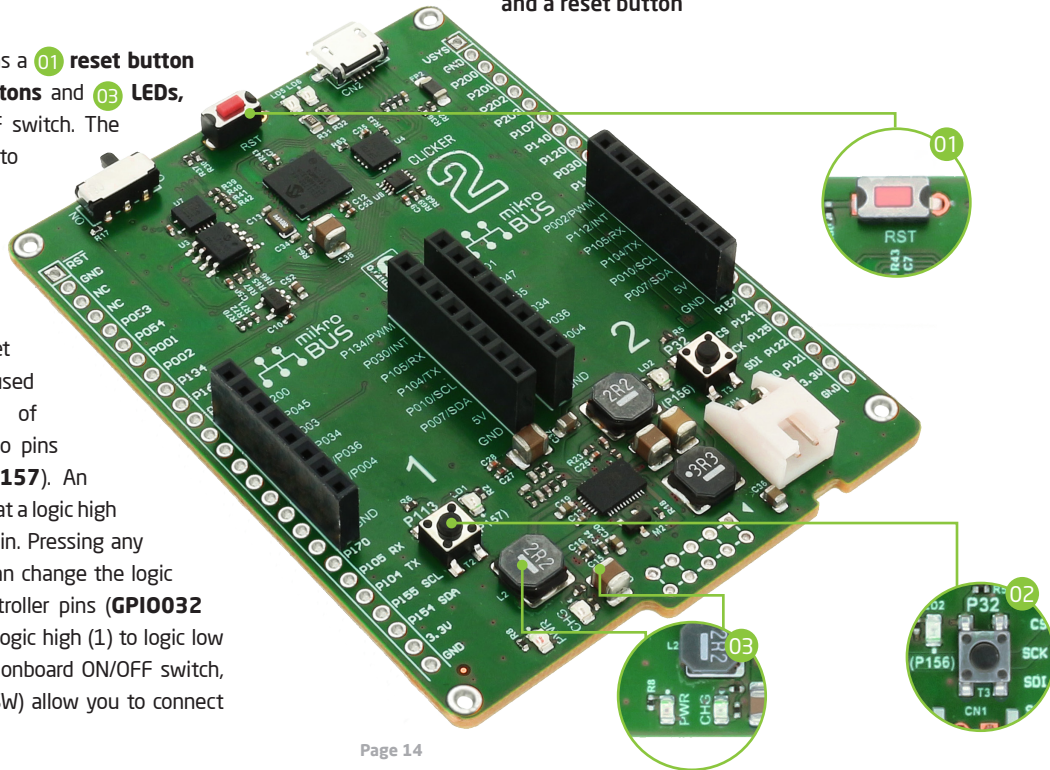


Figure 3-13: mikroProg™ connection schematic

## 4. Buttons and LEDs

The board also contains a **01 reset button** and a pair of **02 buttons** and **03 LEDs**, as well as an ON/OFF switch. The **Reset button** is used to manually reset the microcontroller—it generates a low voltage level on the microcontroller's reset pin. **LEDs** can be used for visual indication of the logic state on two pins (**GPIO156** and **GPIO157**). An active LED indicates that a logic high (1) is present on the pin. Pressing any of the two **buttons** can change the logic state of the microcontroller pins (**GPIO032** and **GPIO113**) from logic high (1) to logic low (0). In addition to the onboard ON/OFF switch, two pads (EXT and PSW) allow you to connect

Figure 4-1:  
Two LEDs, two buttons  
and a reset button





# 5. Power management and battery charger

clicker 2 for CEC1702 features **LTC®3586-2**, a highly integrated power management and battery charger IC that includes a current limited switching PowerPath manager. LTC®3586 also **enables battery charging over a USB connection**.

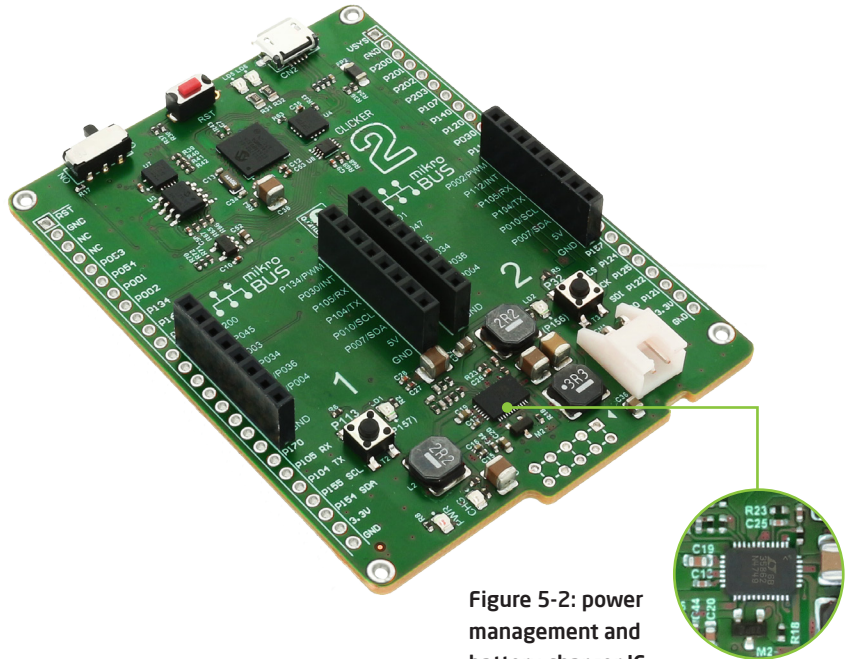
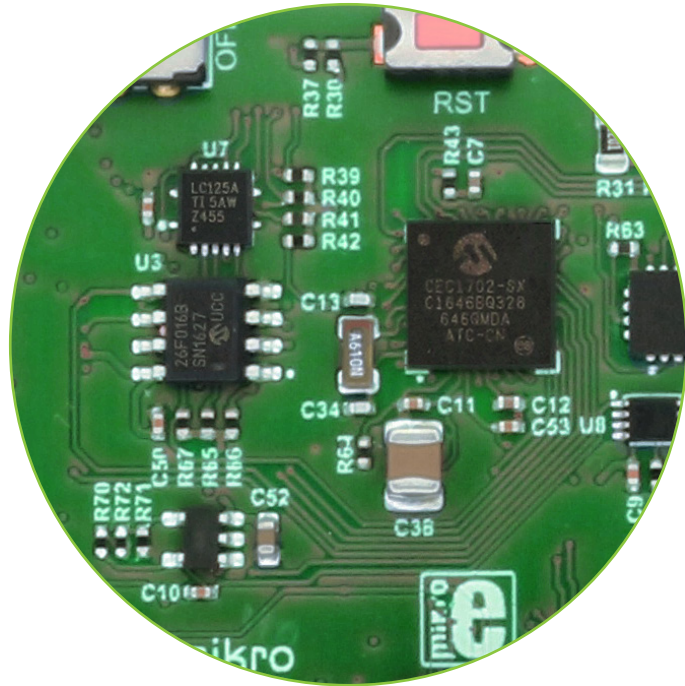


Figure 5-2: power management and battery charger IC



# 6. Oscillator

The CEC1702 microcontroller is equipped with an internal 32kHz oscillator that provides a stable clock signal. The board also contains a 32kHz crystal oscillator.



**NOTE** | The use of crystal in all other schematics is implied even if it is purposely left out, because of the schematics clarity.

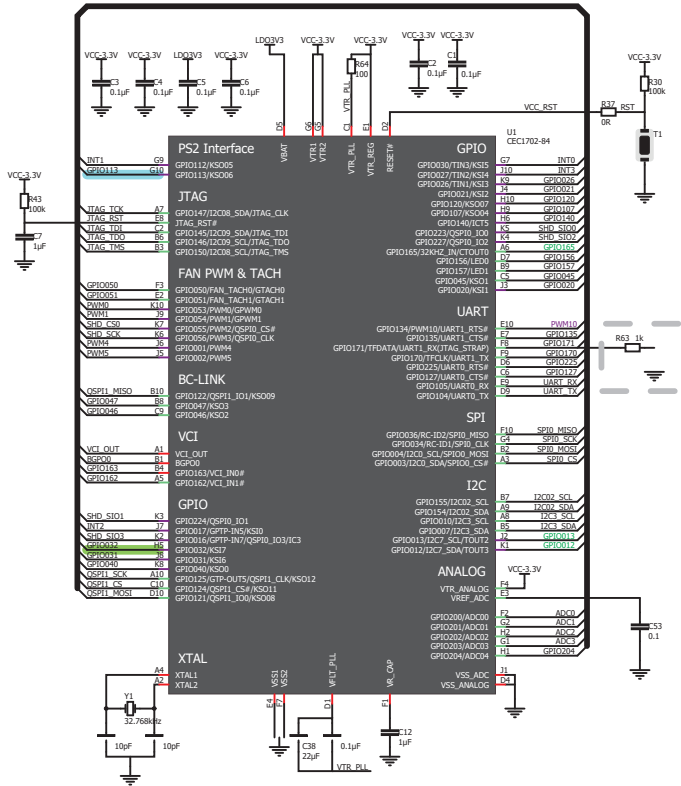
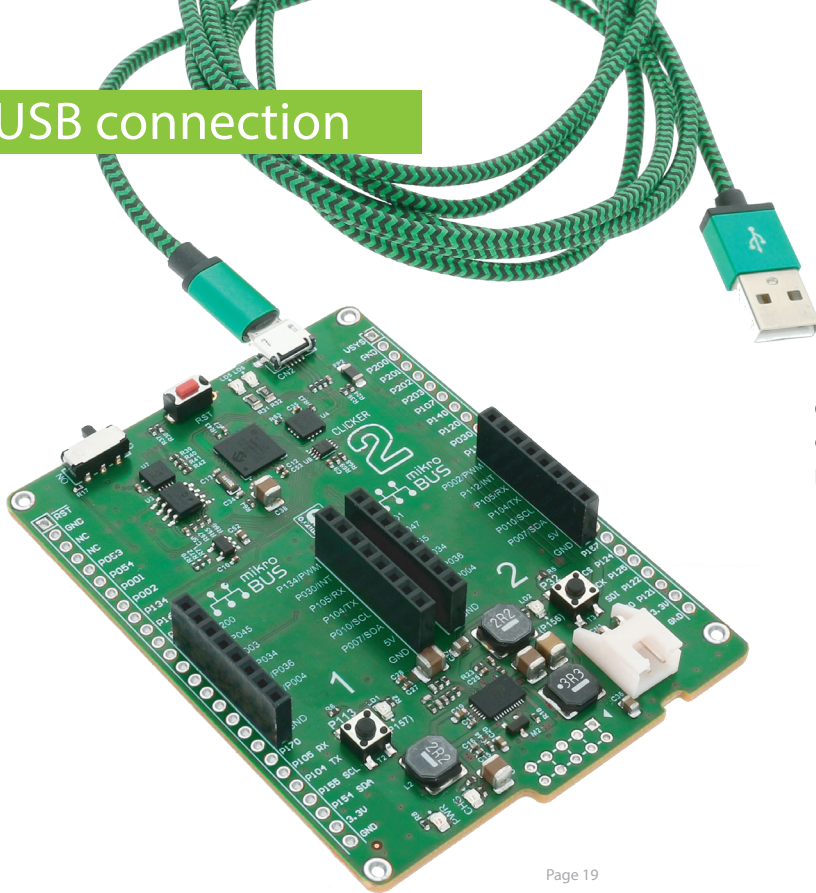


Figure 6-3: Crystal oscillator schematic

## 7. USB connection



Connection with target USB host is done over a mikro USB connector which is positioned next to the battery connector.

Figure 7-1:  
Connecting USB  
cable to clicker 2

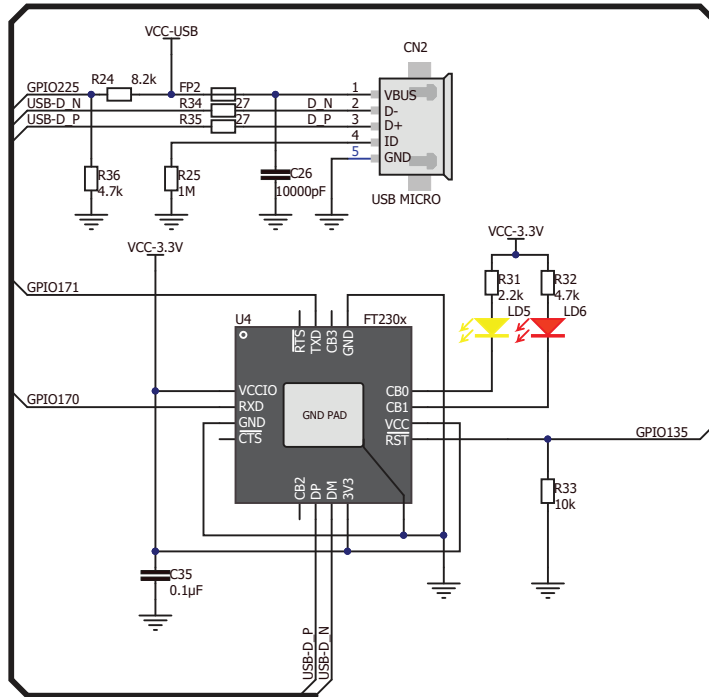


Figure 7-2: USB module connection schematic

# 8. Pads



Pads HDR2

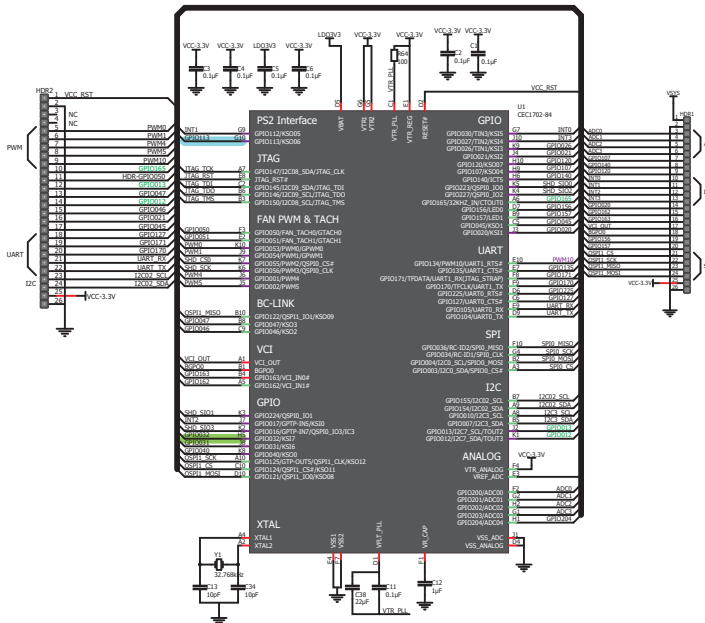
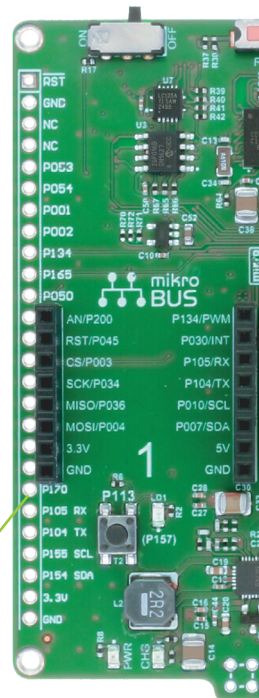


Figure 8-1: Connecting pads schematic

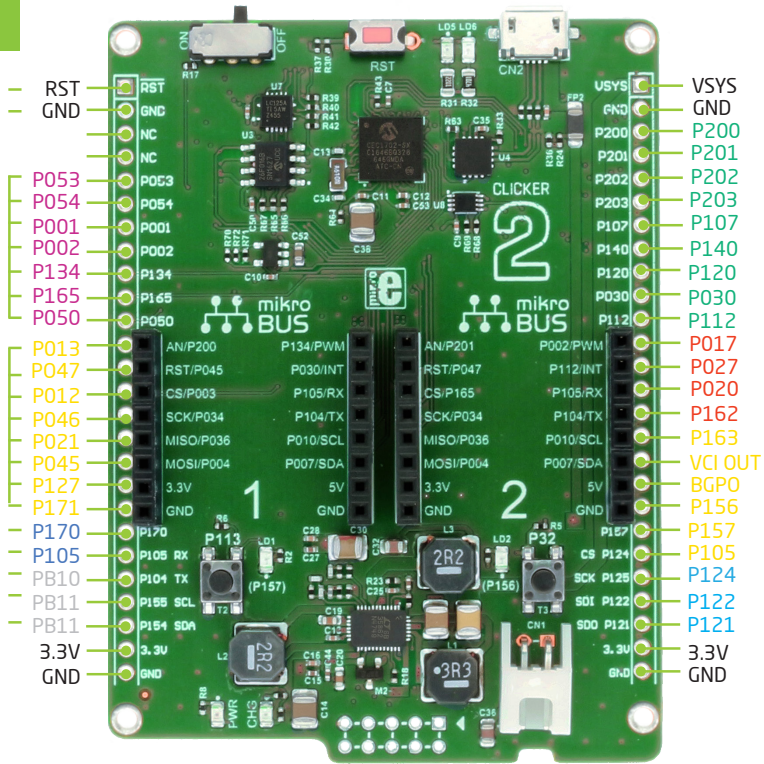


Pads HDR1

Most microcontroller pins are available for further connectivity via two 1x26 rows of connection pads on both sides of the clicker 2 for CEC1702 board. They are designed to match additional

# 9. Pinout

- Reset pin
  - Reference Ground
  - PWM lines
  - Digital I/O lines
  - UART Lines
  - IC2 Lines
  - 3.3V power supply
  - Reference Ground
- Pin functions - - - - -



- System power supply
  - Reference Ground
  - Analog Lines
  - Interrupt Lines
  - Digital I/O lines
  - SPI Lines
  - 3.3V power supply
  - Reference Ground
- - - - - Pin functions

■ Digital lines  
 ■ Analog Lines  
 ■ Interrupt Lines  
 ■ SPI Lines  
 ■ I2C Lines  
 ■ UART lines  
 ■ PWM lines

# 9.1 mikroBUS™ pinouts

Having two mikroBUS™ sockets and an additional connection pad, clicker 2 for CEC1702 utilizes all of the CEC1702's I/Os. Each of the **two UART outputs** has its own separate connection pin (either on mikroBUS™ 1 or 2, or on the 2x26 connection pad). Of the **two SPI lines**, one is routed to mikroBUS™ 1; the other is shared between mikroBUS™ 2 and the pins on the connection pad. Same goes for the **two available IC lines**.

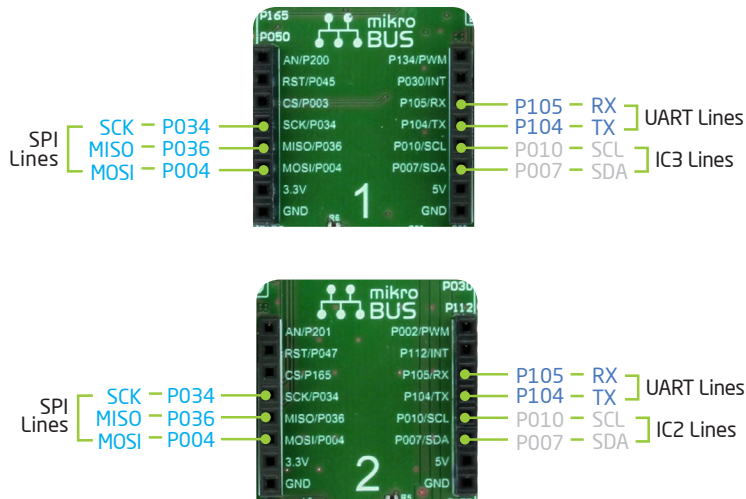


Figure 9-1:  
mikroBUS™  
individual and  
shared lines

## 10. click™ boards are plug and play!

Up to now, MikroElektronika has released more than 270 mikroBUS™ compatible **click™ boards**. On the average, two click boards is released per week. It is our intention to provide you with as many add-on boards as possible, so you will be able to expand your development board with additional functionality. Each board comes with a set of working example code. Please visit the click™ boards webpage for the complete list of currently available boards:



<https://shop.mikroe.com/click>

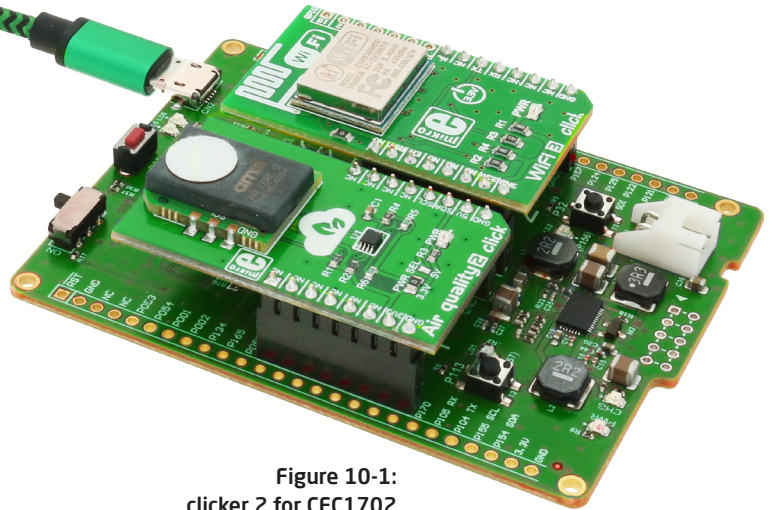
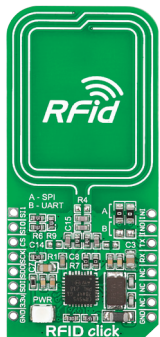
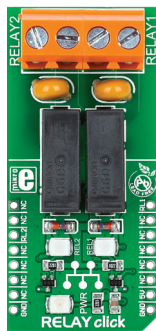


Figure 10-1:  
clicker 2 for CEC1702  
driving click™ boards

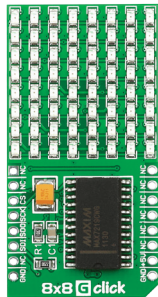




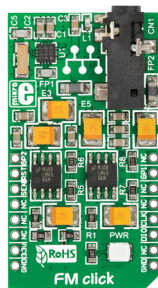
RFid click™



Relay click™



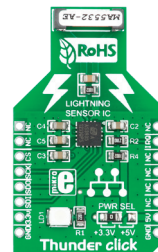
8x8 click™



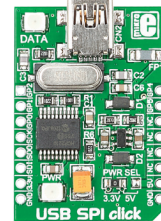
FM click™



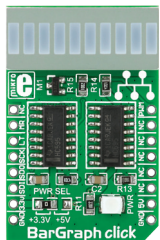
Bluetooth2 click™



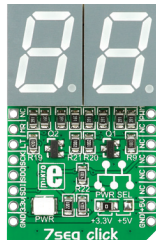
Thunder click™



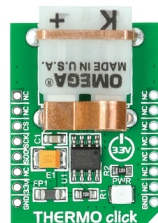
USB SPI click™



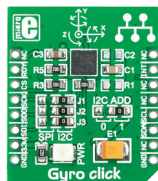
BarGraph click™



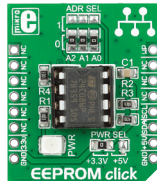
7seg click™



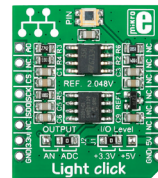
THERMO click™



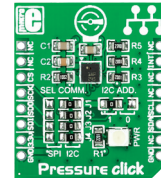
Gyro click™



EEPROM click™

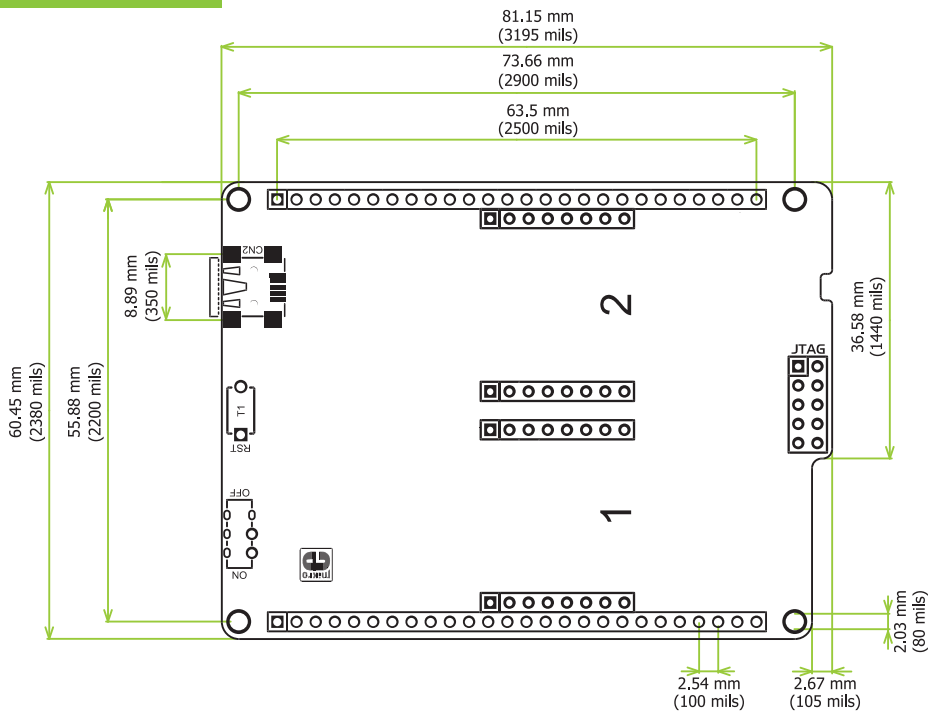


Light click™



Pressure click™

# 11. Dimensions



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