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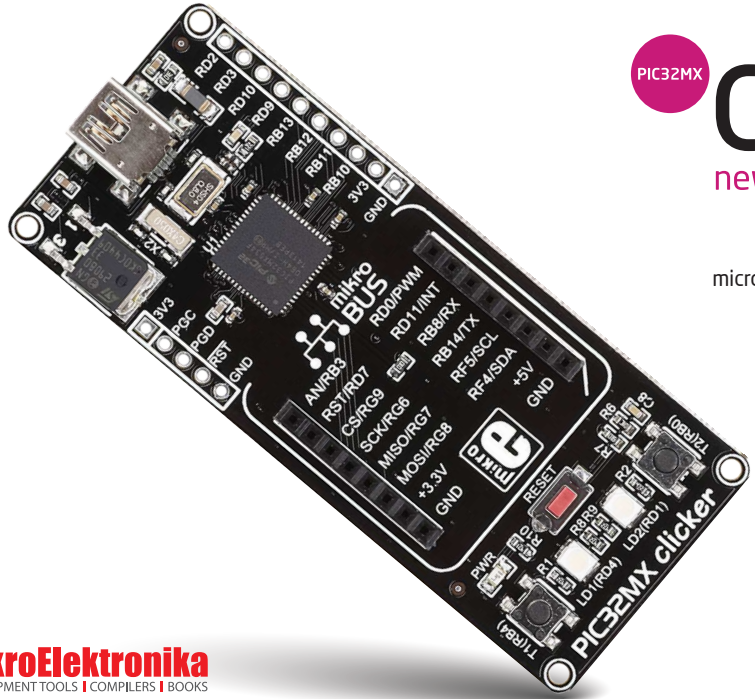
PIC32MX

# clicker

## new idea just a click away

A compact starter kit with your favorite microcontroller and a socket for click™ add-on boards. New ideas are just a click away.




USB

mikro BUS

PIC

MikroElektronika
DEVELOPMENT TOOLS | COMPILERS | BOOKS

# 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.

Nebojsa Matic
General Manager

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# 1. What is PIC32MX clicker?

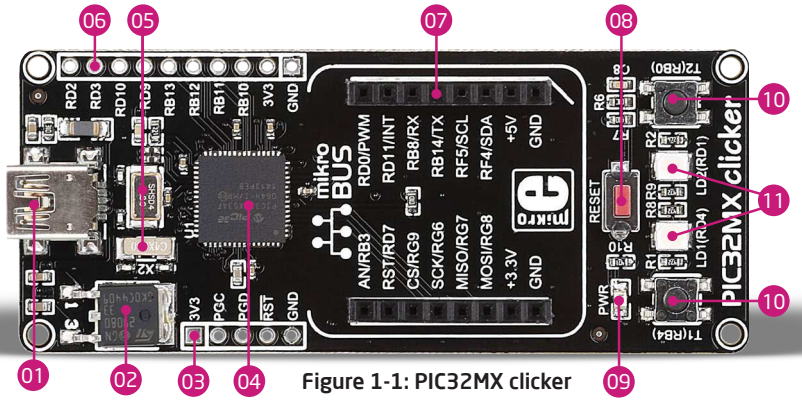



**Figure 1-1: PIC32MX clicker**

01 USB Mini-B connector
02 3.3V Voltage regulator
03 mikroProg™ Programmer connector
04 PIC32MX534F064H microcontroller
05 Crystal oscillators (8MHz and 32kHz)
06 Connection pads
07 mikroBUS™ socket
08 RESET button
09 Power indication LED
10 Additional buttons
11 Additional LEDs

**PIC32MX clicker** is an amazingly compact starter development kit which brings innovative mikroBUS™ host socket to your favorite microcontroller. It features the **PIC32MX534F064H** 32-bitmicrocontroller, two indication LEDs, two general purpose buttons, reset button, USB MINI-B connector and a single mikroBUS™ host socket. mikroProg connector and pads for interfacing with external electronics are provided as well. mikroBUS™ host connector consists of two 1x8 female headers with **SPI**, **I²C**, **UART**, **RST**, **PWM**, **Analog** and **Interrupt** lines as well as **3.3V**, **5V** and **GND** power lines. **PIC32MX clicker** board can be powered over USB cable. On-board power circuitry generates 3.3V and 5V. Power diode (GREEN) indicates the presence of power supply.

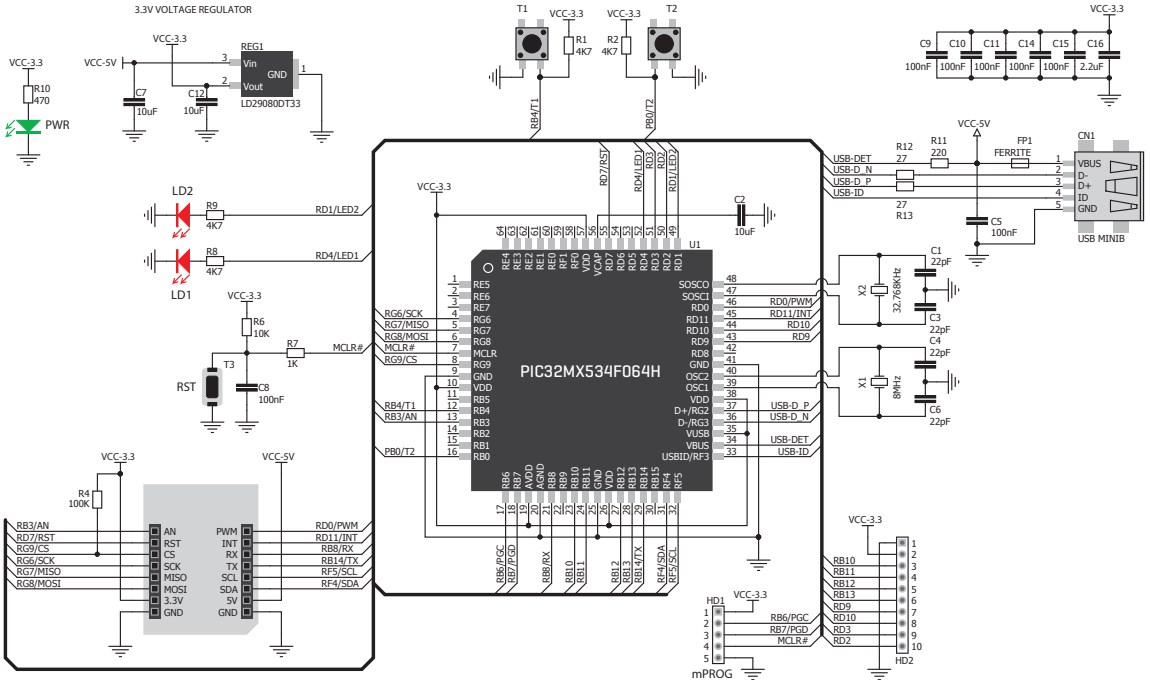



**Figure 1-2: PIC32MX clicker schematic**

# 2. Power supply

When the board is powered up the power indication LED will be automatically turned on. The USB connection can provide up to 500mA of current which is more than enough for the operation of all on-board and additional modules.

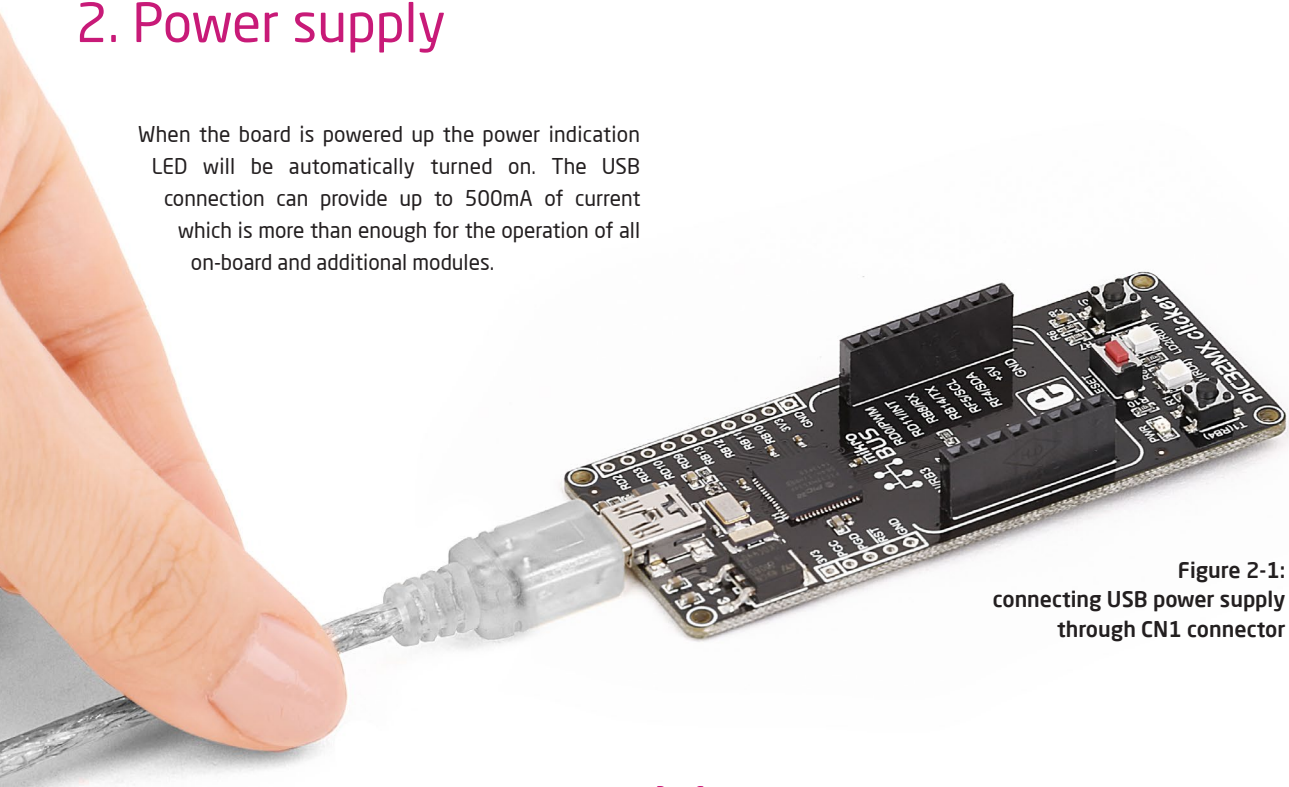



**Figure 2-1:**
**connecting USB power supply through CN1 connector**

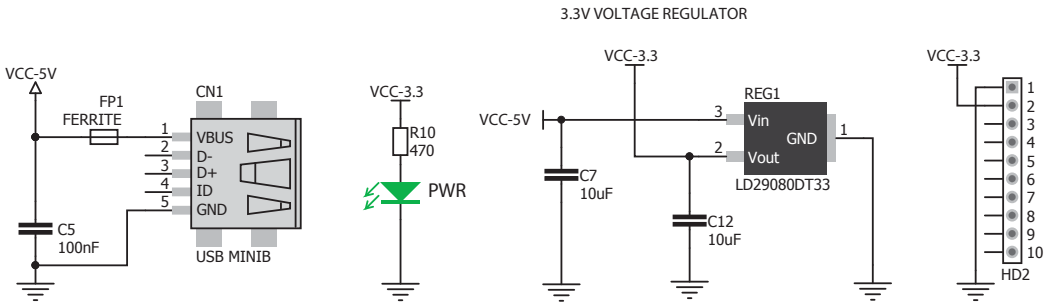
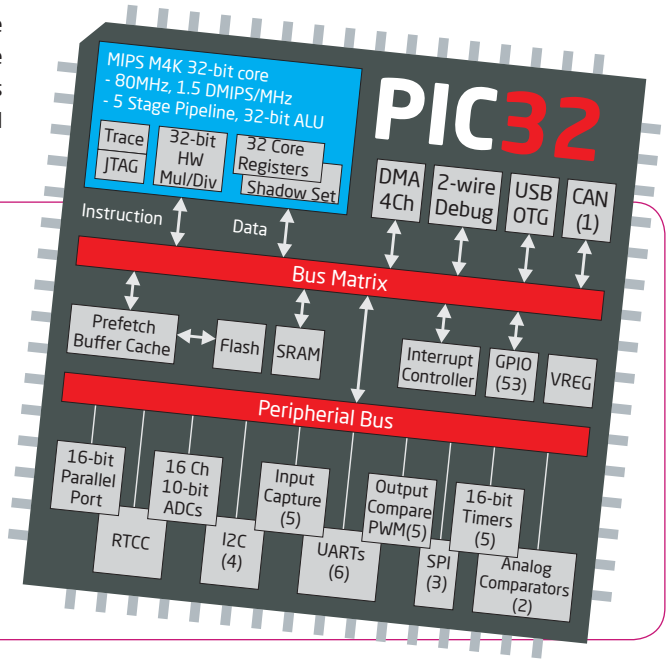



**Figure 2-2: Power supply schematic**

# 3. PIC32MX534F064H microcontroller

The PIC32MX clicker development tool comes with the **PIC32MX534F064H** microcontroller. This 32-bit MIPS M4K Core high performance microcontroller is rich with on-chip peripherals and features 64KB of Flash and 16KB RAM. It has integrated full speed USB 2.0. support.




## Key microcontroller features

- 80MHz/105DMIPS, 32-bit MIPS M4K Core;
- 64KB Flash (plus 12K boot Flash);
- 16KB RAM (can execute from RAM);
- 53 I/O pins;
- SPI, I2C, A/D, CAN
- 16-bit Digital Timers;
- Internal Oscillator 8MHz, 32kHz;
- RTCC, etc.

# 4. Programming the microcontroller

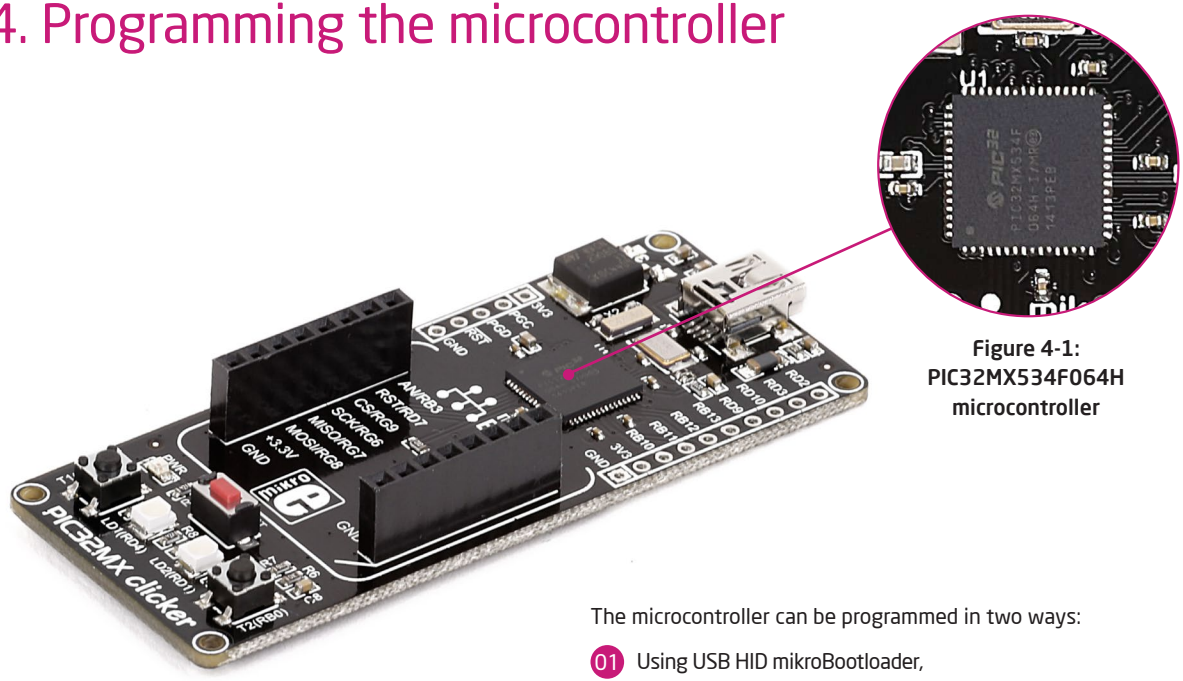



**Figure 4-1: PIC32MX534F064H microcontroller**

The microcontroller can be programmed in two ways:

01 Using USB HID mikroBootloader,

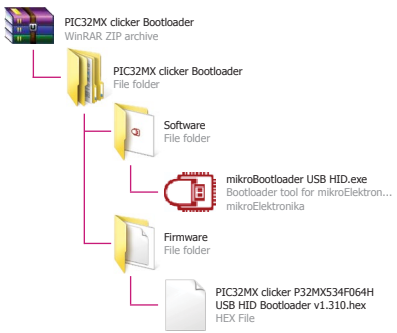
02 Using external mikroProg™ for PIC®, dsPIC®, PIC32® programmer.

# Programming with mikroBootloader

You can program the microcontroller with bootloader which is preprogrammed by default. To transfer .hex file from a PC to MCU you need bootloader software (**mikroBootloader USB HID**) which can be downloaded from:

*www.mikroe.com/downloads/get/2209/pic32mx_clicker_bootloader_v100.zip*

After the mikroBootloader software is downloaded, unzip it to desired location and start it.




## step 1 – Connecting PIC32MX clicker

**Figure 4-2: USB HID mikroBootloader window**

01 To start, connect the USB cable, or if already connected press the **Reset** button on your PIC32MX clicker. Click the **Connect** button within 5s to enter the bootloader mode, otherwise existing microcontroller program will execute.

## step 2 – Browsing for .HEX file

**Figure 4-3: Browse for HEX**

01 Click the **Browse for HEX** button and from a pop-up window (**Figure 3.4**) choose the .HEX file which will be uploaded to MCU memory.

## step 3 – Selecting .HEX file

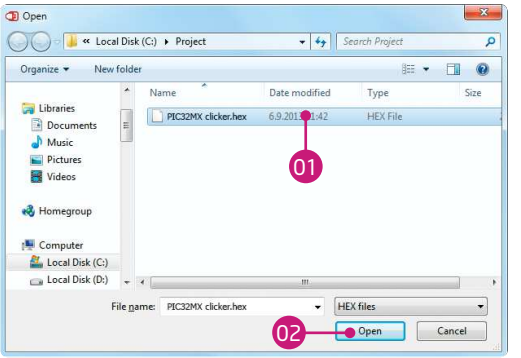



**Figure 4-4: Selecting HEX**

01 Select .HEX file using open dialog window.

02 Click the **Open** button.

# step 4 – Uploading .HEX file

**Figure 4-5: Begin uploading**

01 To start .HEX file bootloading click the **Begin uploading** button.

**Figure 4-6: Progress bar**

01 Progress bar enables you to monitor .HEX file uploading.

# step 5 – Finish upload

**Figure 4-7: Restarting MCU**

01 Click **OK** button after the uploading process is finished.

02 Press **Reset** button on PIC32MX clicker board and wait for 5 seconds. Your program will run automatically.

# Programming with mikroProg™ programmer

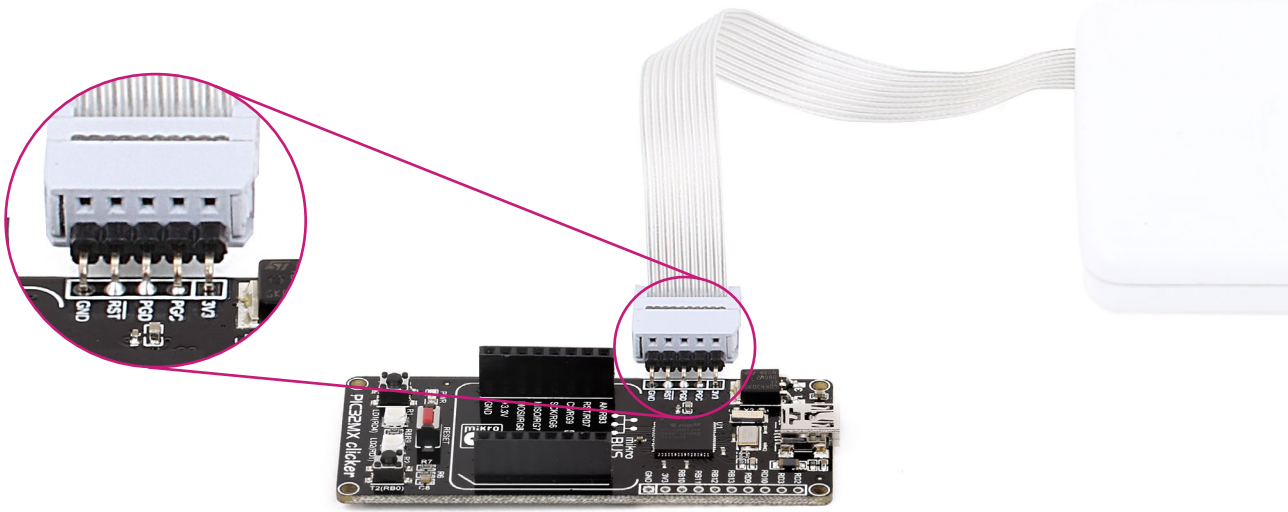



**Figure 4-9: mikroProg™ connector**

The microcontroller can be programmed with external **mikroProg™ for PIC®, dsPIC® and PIC32® programmer** and **mikroProg Suite™ for PIC® software**. The external programmer is connected to the development system via 1x5 mikroProg™ connector, **Figure 4-9. mikroProg™** is a fast USB 2.0 programmer with hardware debugger support. It supports PIC10®, PIC12®, PIC16®, PIC18®, dsPIC30/33®, PIC24® and PIC32® devices from Microchip®. Outstanding performance, easy operation and elegant design are it's key features.

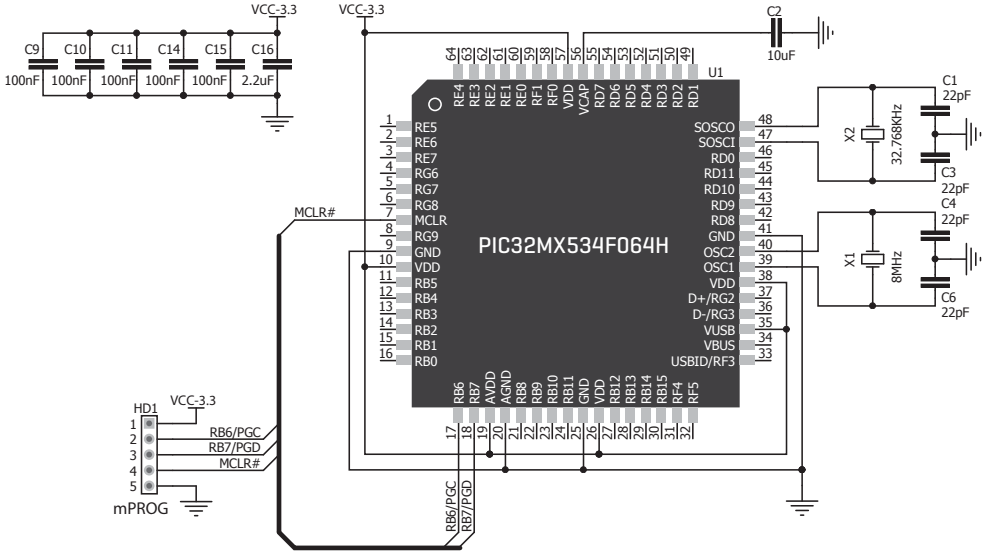



**Figure 4-10: mikroProg™ connection schematic**

NOTE | *Make sure to use only the front row of mikroProg's IDC10 connector (side with a knob and incision) when connecting it to 1x5 header on your PIC32MX clicker board.*

# 5. mikroProg Suite™ for PIC® Software

The **mikroProg™** programmer requires special programming software called **mikroProg Suite™ for PIC®**. It can be used for programming all Microchip® microcontroller families, including PIC10®, PIC12®, PIC16®, PIC18®, dsPIC30/33®, PIC24® and PIC32®. The software has intuitive interface and SingleClick™ programming technology. Just download the latest version of **mikroProg Suite™** and your programmer is ready to program new devices. **mikroProg Suite™** is updated regularly, at least four times a year, so your programmer will be more and more powerful with each new release.

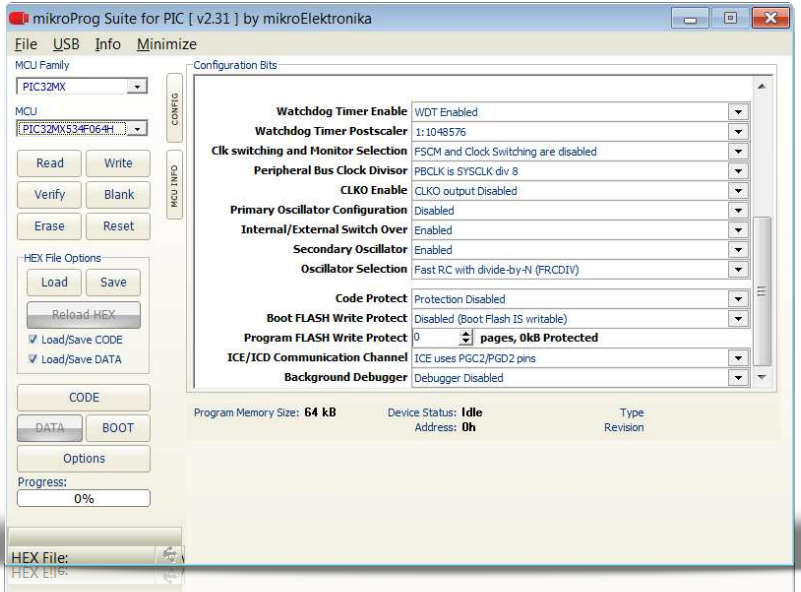
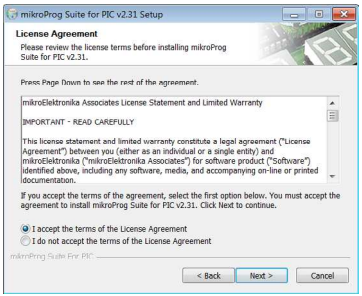


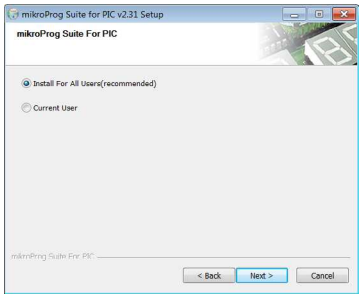

**Figure 5-1: Main window of mikroProg Suite™ for PIC® programming software**

# Software Installation Wizard

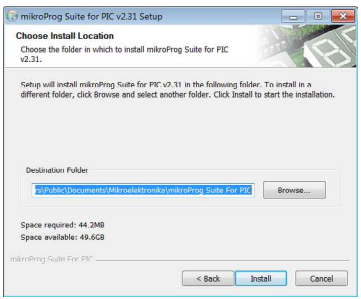
01 Start Installation



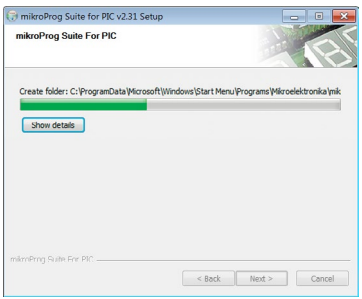

02 Accept EULA and continue



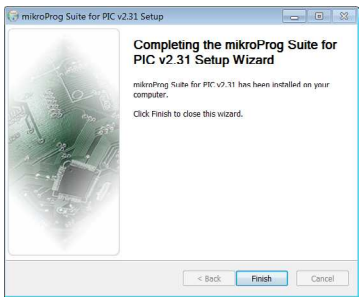

03 Install for all users




04 Choose destination folder




05 Installation in progress




06 Finish installation

# 6. Buttons and LEDs

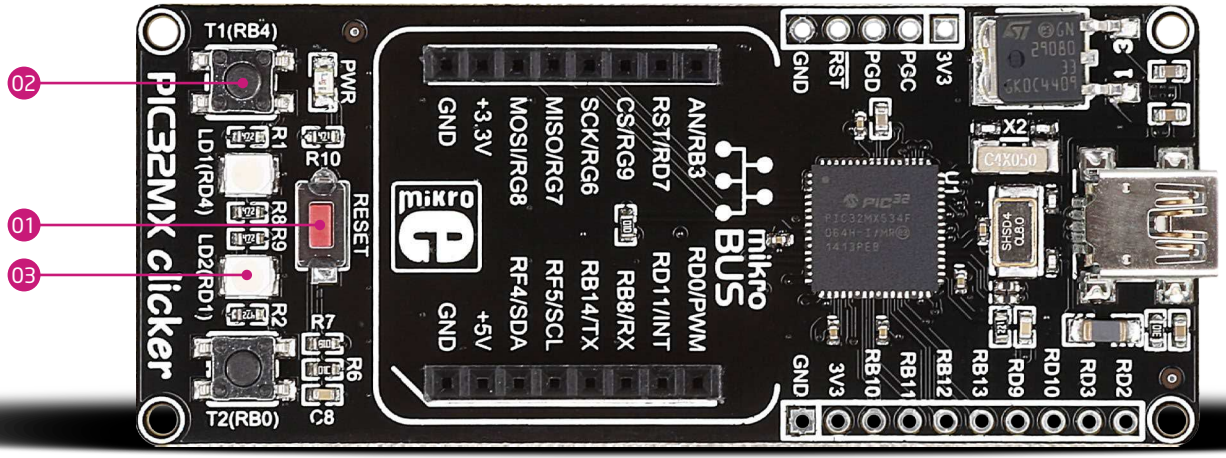



**Figure 6-1: Two buttons, two LEDs and a reset button**

The board also contains 01 **reset button** and a pair of 02 **buttons** and 03 **LEDs**. Each of these additional peripheral are located in the bottom area of the board. **Reset button** is used to manually reset the microcontroller. Pressing the reset button will generate low voltage level on microcontroller reset pin. **LEDs** can be used for visual indication of the logic state on two pins (**RD4** and **RD1**). An active LED indicates that a logic high (1) is present on the pin. Pressing any of these **buttons** can change the logic state of the microcontroller pins (**RB4** and **RB0**) from logic high (1) to logic low (0).

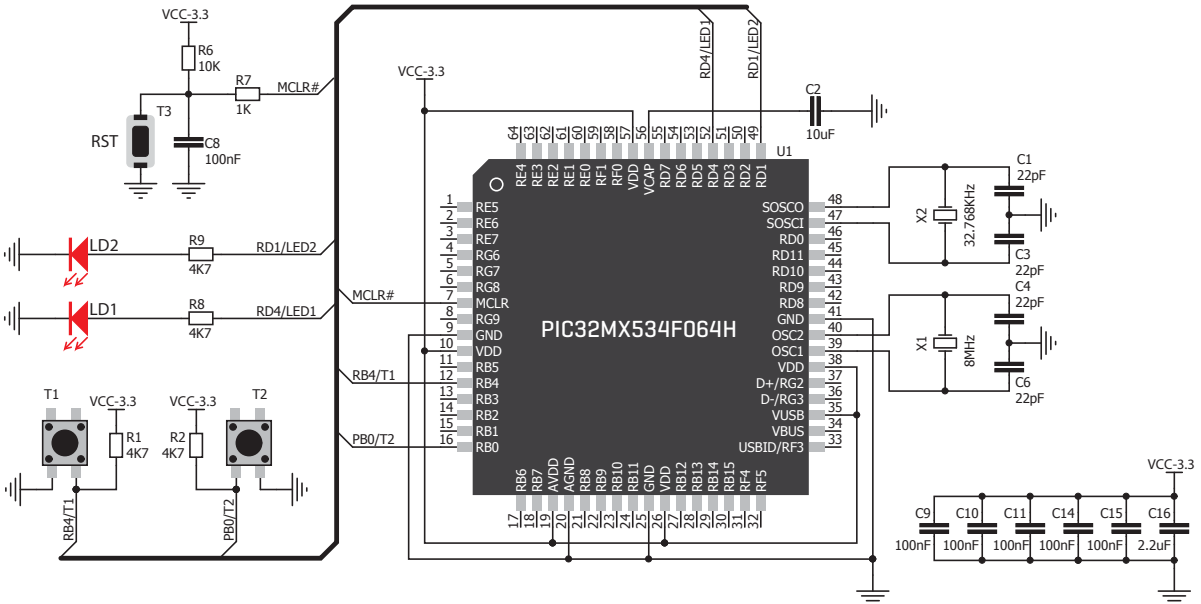


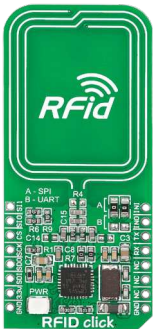

**Figure 6-2: Other modules connection schematic**

# 7. click™ boards are plug and play!

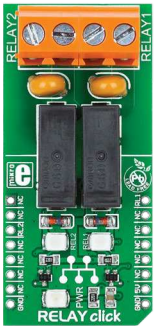
Up to now, MikroElektronika has released more than 100 mikroBUS™ compatible **click™ boards**. On the average, one click™ board is released per week. It is our intention to provide you with as many add-on boards as possible, so you will be able to expand your development board with additional functionality. Each board comes with a set of working example codes. Please visit the click™ boards webpage for the complete list of currently available boards:

*www.mikroe.com/click*

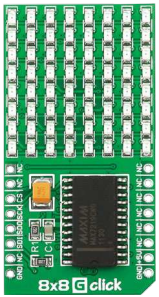
**Figure 7-1:**
**PIC32MX clicker driving GSM click™ board**



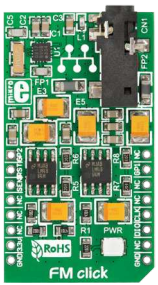

RFid click™




Relay click™

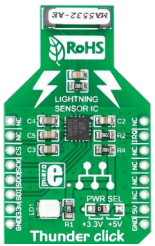



8x8 click™

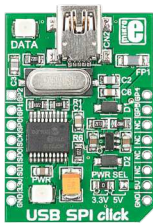



FM click™

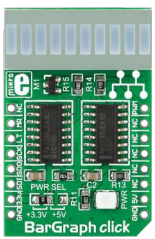
Bluetooth2 click™



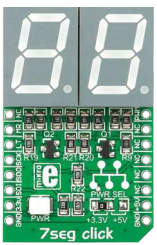

Thunder click™




USB SPI click™

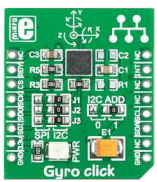



BarGraph click™

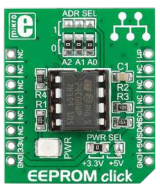



7seg click™

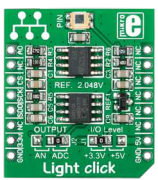
THERMO click™



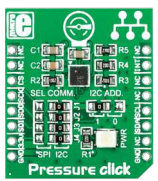

Gyro click™




EEPROM click™



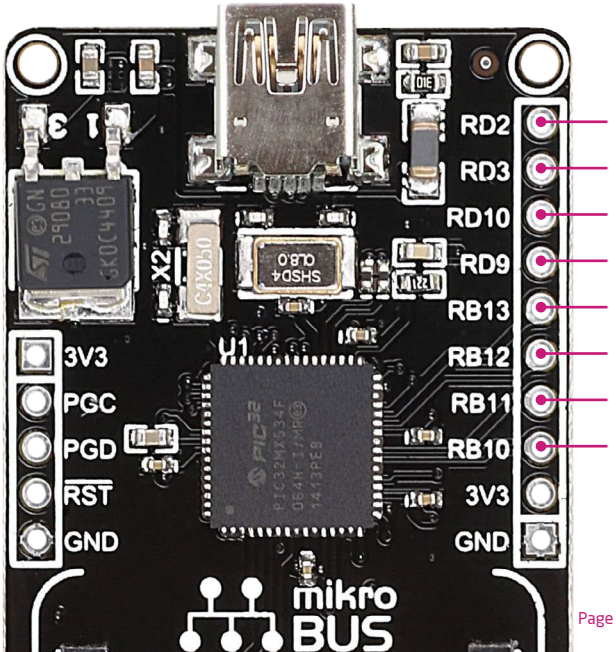

LightHz click™




Pressure click™

# 8. Pinout

In addition to the mikroBUS™ socket, the PIC32MX clicker has a row of 9 pins with Analog, Interrupt, I2C, UART and PWM lines (+ GND) for connecting external electronics.




| | | | |
|---|---|---|---|
| RD2 | SDA3 | U1RX | PWM3 |
| RD3 | SCL3 | U1TX | PWM4 |
| RD10 | INT3 | SCL1 | |
| RD9 | INT2 | SDA1 | |
| RB13 | AN13 | | |
| RB12 | AN12 | | |
| RB11 | AN11 | | |
| RB10 | AN10 | | |

- Analog Lines
- Interrupt Lines
- I2C Lines
- UART lines
- PWM lines

# 9. Dimensions

Legend

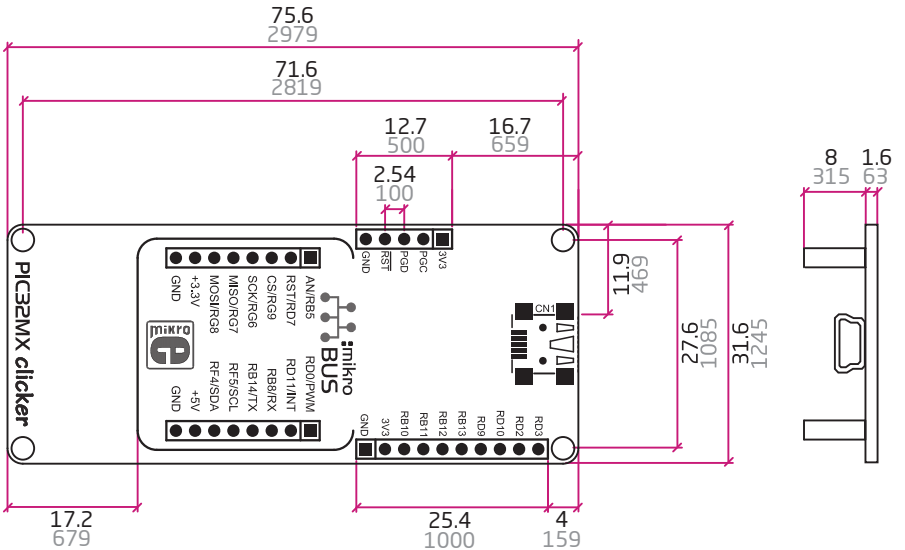
mm

mils

Mounting hole size

ø2 mm

ø79 mils



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