

Ready™ for PIC®

with
DIP40
socket

Best solution for fast and simple development of applications using 40-pin PIC® MCUs. Due to the special white plastic casing the Ready for PIC® board can be quickly turned into a final product.



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 handwritten signature in white ink, appearing to read 'N. Matic', is positioned on the right side of the page. The signature is fluid and cursive, with a large initial 'N' and a long horizontal stroke extending to the right.

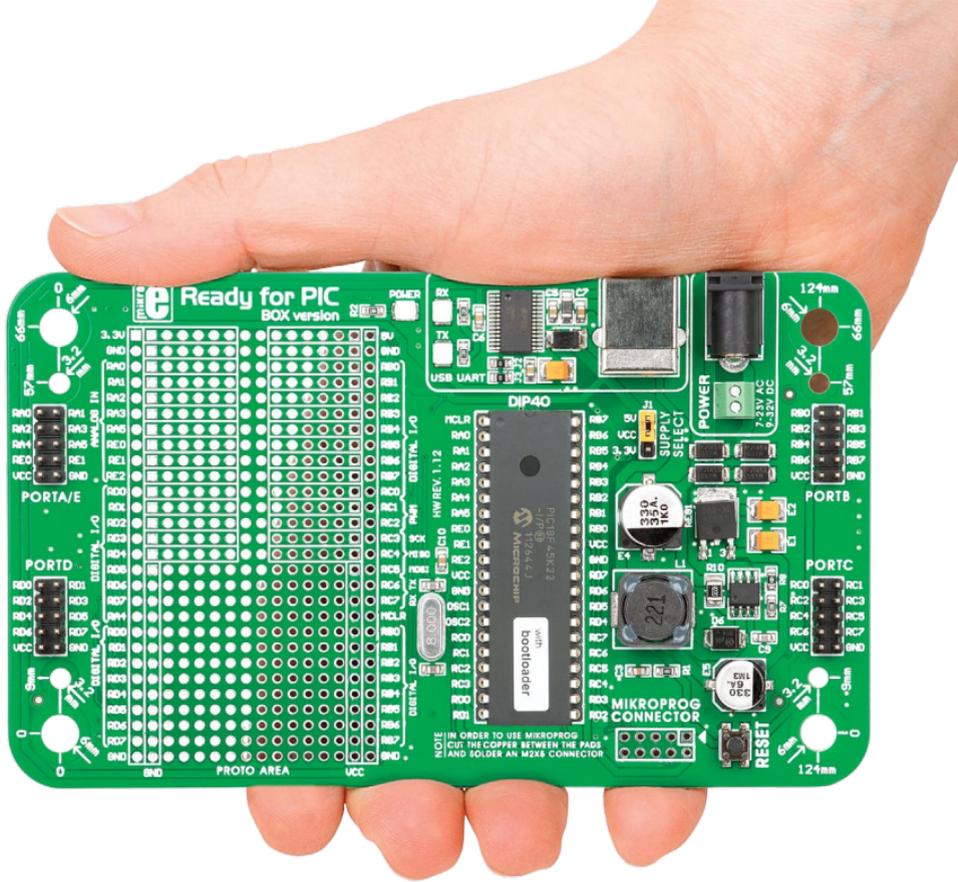
Nebojsa Matic
General Manager

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Introduction

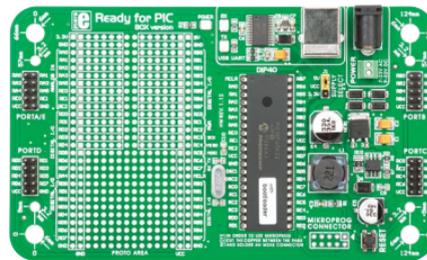
Ready for PIC[®] Board is the best solution for fast and simple development of various microcontroller applications. The board is equipped with the **PIC18F45K22** MCU that is placed in a DIP 40 socket and contains male headers and connection pads for all available microcontroller ports. The pins are grouped according to their functions, which is clearly indicated on the silkscreen. The MCU comes preprogrammed with mikroBootloader, but it can also be programmed with mikroProg[™] programmer. The board also contains USB-UART module, prototyping area and a power supply circuit. It is specially designed to fit into the special white plastic casing so that you can turn your PIC[®] project into a final product.



Package contains



01 Damage resistant protective box



02 Ready for PIC® board



03 User's guide and schematics



04 USB cable, one 2x5 header

Key features

System specification



power supply

Via AC/DC connector 7-23V AC
or 9-32V DC



power consumption

6.2mA in idle state
(when on-board modules are off)



board dimensions

141 x 84mm (5.55 x 3.3 inch)



weight

~60g (0.13 lbs)

Power LED indicator 01

UART communication LEDs (RX.TX) 02

FTDI chip 03

USB UART connector 04

Power supply select 05

Power adapter connector 06

Power screw terminals 07

Male headers 08

Reset button 09

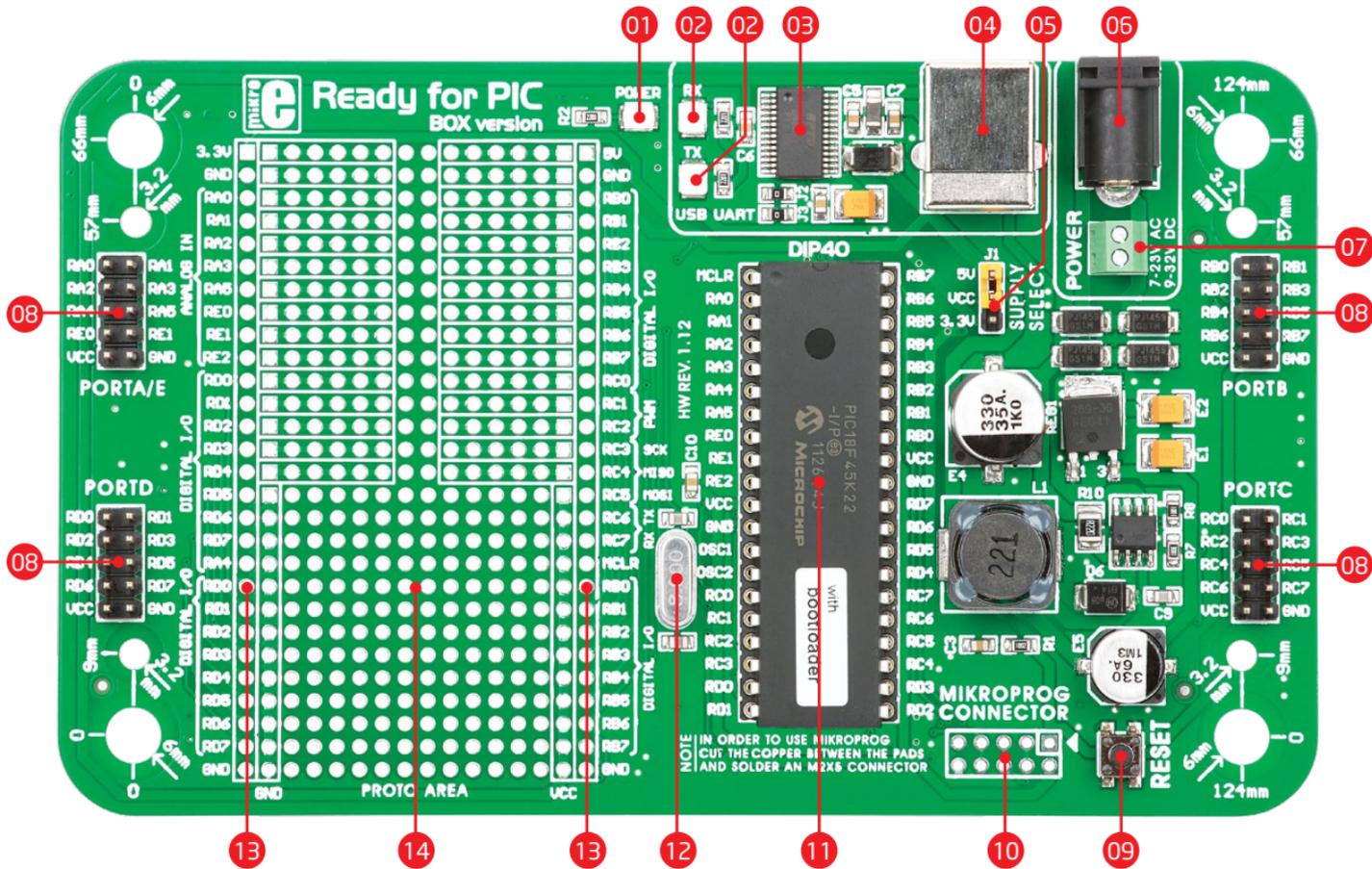
mikroProg™ connector 10

PIC18F45K22 microcontroller 11

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Connection pads 13

Prototyping area 14



1. Power supply

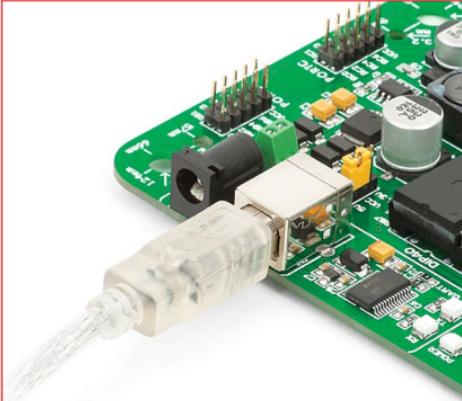


Figure 1-1:
USB power supply

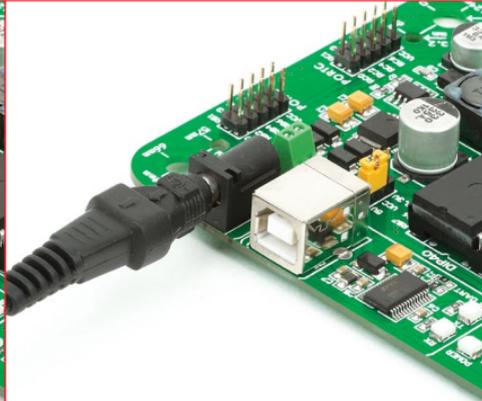


Figure 1-2:
AC/DC adapter power supply

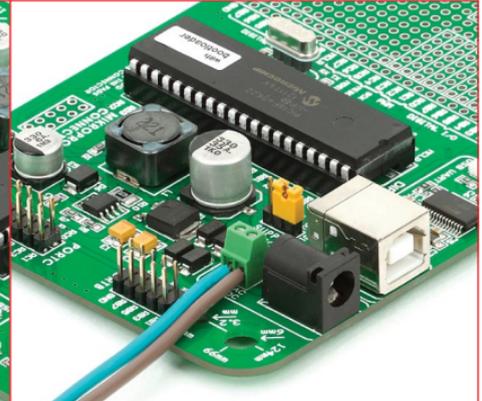


Figure 1-3:
screw terminals power supply

Ready for PIC® board can be powered in three different ways: via USB connector (**CN1**), via adapter connector using external adapters (**CN2**) or via additional screw terminals (**CN46**). The USB connection can provide up to 500mA of current which is more than enough for the operation of every on-board module and the microcontroller as well. If you decide to use external power supply, voltage values must be within **7-23V AC** or **9-32V DC** range. **Power LED ON (GREEN)** indicates the presence of a power supply. Use only one of the suggested methods for powering the board. If you use an MCU with a 5V power supply place jumper J1 in the 5V position. Otherwise, it should be placed in the 3.3V position.

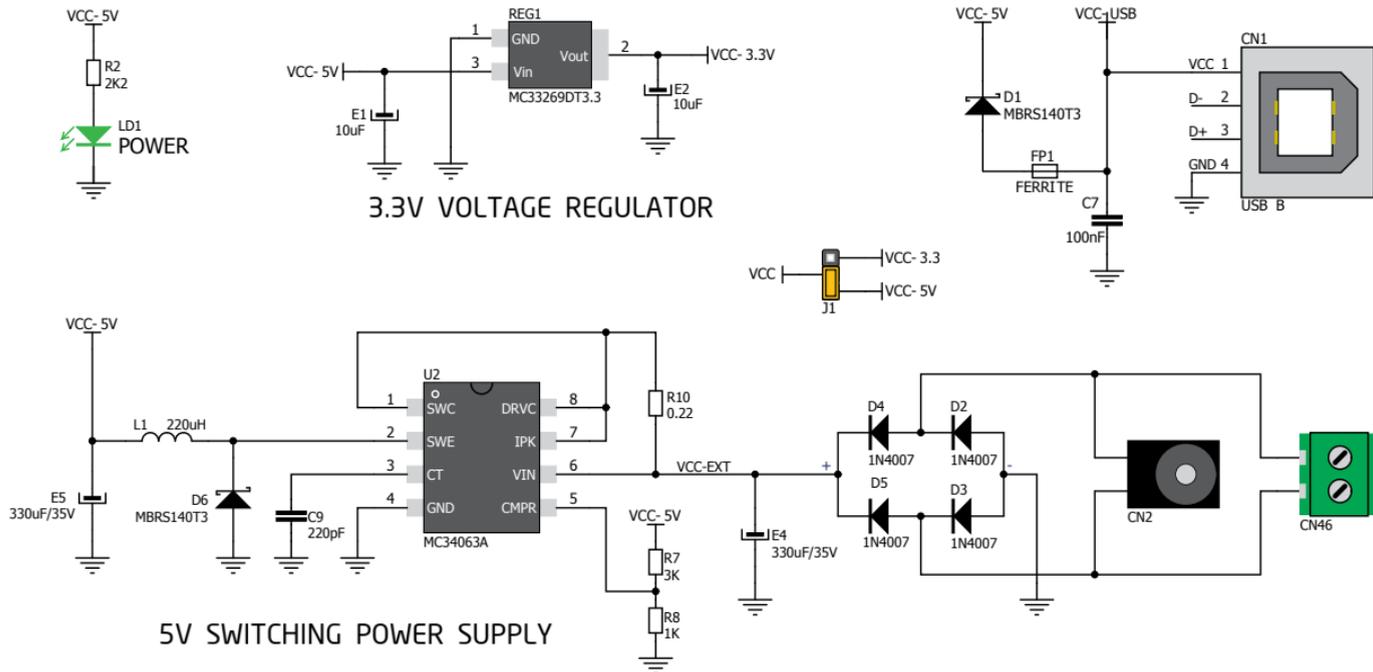


Figure 1-4: Power supply schematic

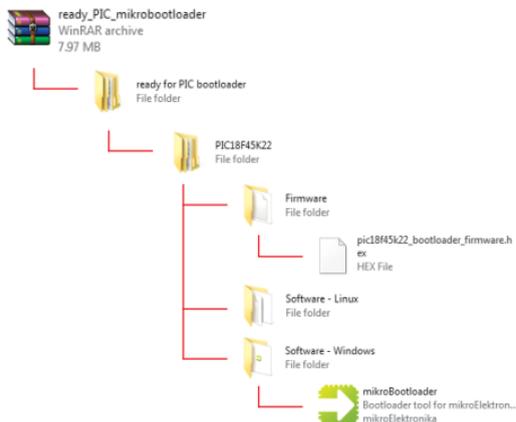
2. Programming with mikroBootloader

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



http://www.mikroe.com/eng/downloads/get/1808/ready_pic_mikrobootloader.zip

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



mikroBootloader software

note Before starting mikroBootloader, connect Ready for PIC® to a PC using the USB cable provided with the package

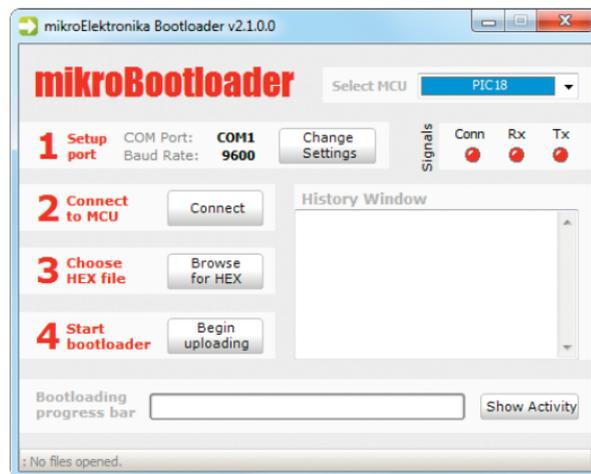


Figure 2-1: mikroBootloader window

01 When you start mikroBootloader, a window as shown in **Figure 2-1** should appear.

Identifying device COM port

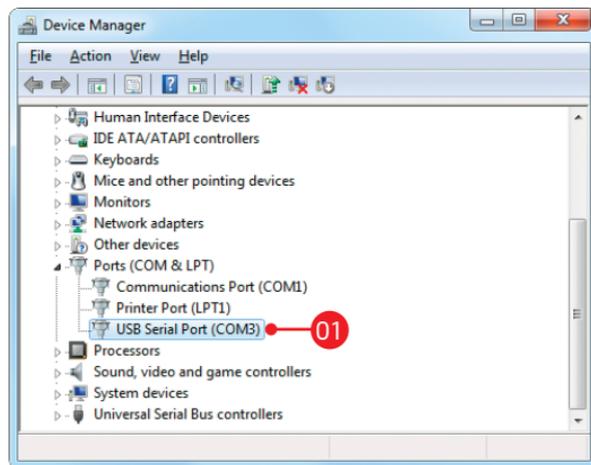


Figure 2-2: Identifying COM port

- 01 Open **Device Manager** window and expand **Ports** section to see which COM port is assigned to Ready for PIC® board (in this case it is COM3)

step 1 - Choosing COM port

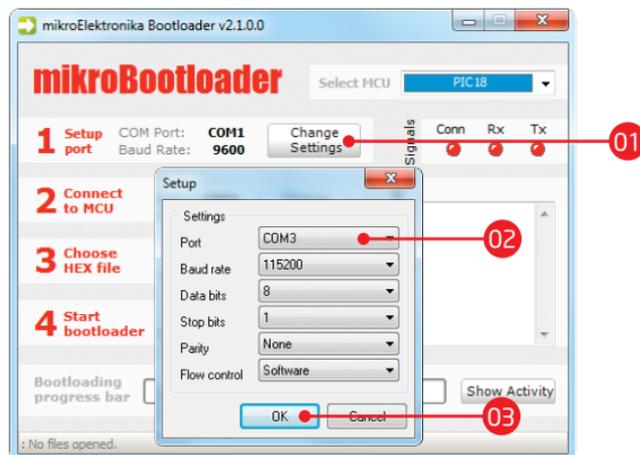


Figure 2-3: Choosing COM port

- 01 Click the **Change Settings** button
- 02 From the drop down list, select appropriate COM port (in this case it is COM3)
- 03 Click **OK**

step 2 - Establishing connection



Figure 2-4: Connecting with mikroBootloader

- 01** Press the **Reset** button on the Ready for PIC® board and click the **Connect** button within 5s, otherwise the existing microcontroller program will run. If connected, the button's caption will be changed to **Disconnect**

step 3 - Browsing for .HEX file

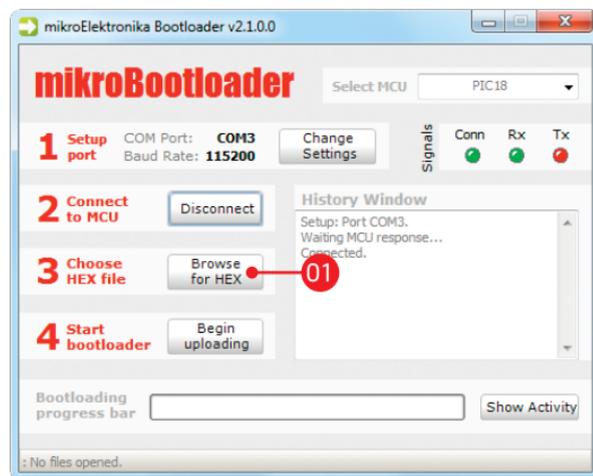


Figure 2-5: Browse for HEX

- 01** Click the **Browse for HEX** button and from a pop-up window (**Figure 2-6**) choose a .HEX file to be uploaded to MCU memory

step 4 - Selecting .HEX file

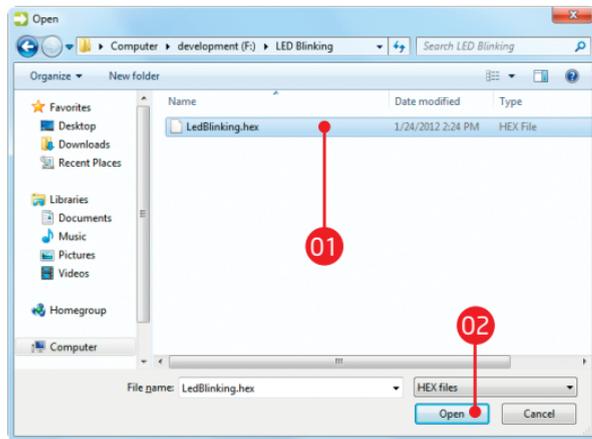


Figure 2-6: Locating and selecting .hex file

- 01 Select the .HEX file using the Open dialog window
- 02 Click **Open**

step 5 - Uploading .HEX file



Figure 2-7: Begin uploading

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

step 6 - Progress bar



Figure 2-8: Progress bar

01 You can monitor .HEX file uploading via progress bar

step 7 - Finishing upload



Figure 2-9: Restarting MCU

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

02 Press the **Reset** button on the Ready for PIC® board and wait for 5 seconds. Your program will run automatically

3. Programming with mikroProg™ programmer

The board is equipped with **mikroProg™ connector pads**, which allow you to program the microcontroller using external mikroProg™ programmer. Before attaching the programming connector, it is necessary to make a few adjustments (**Page 16**).

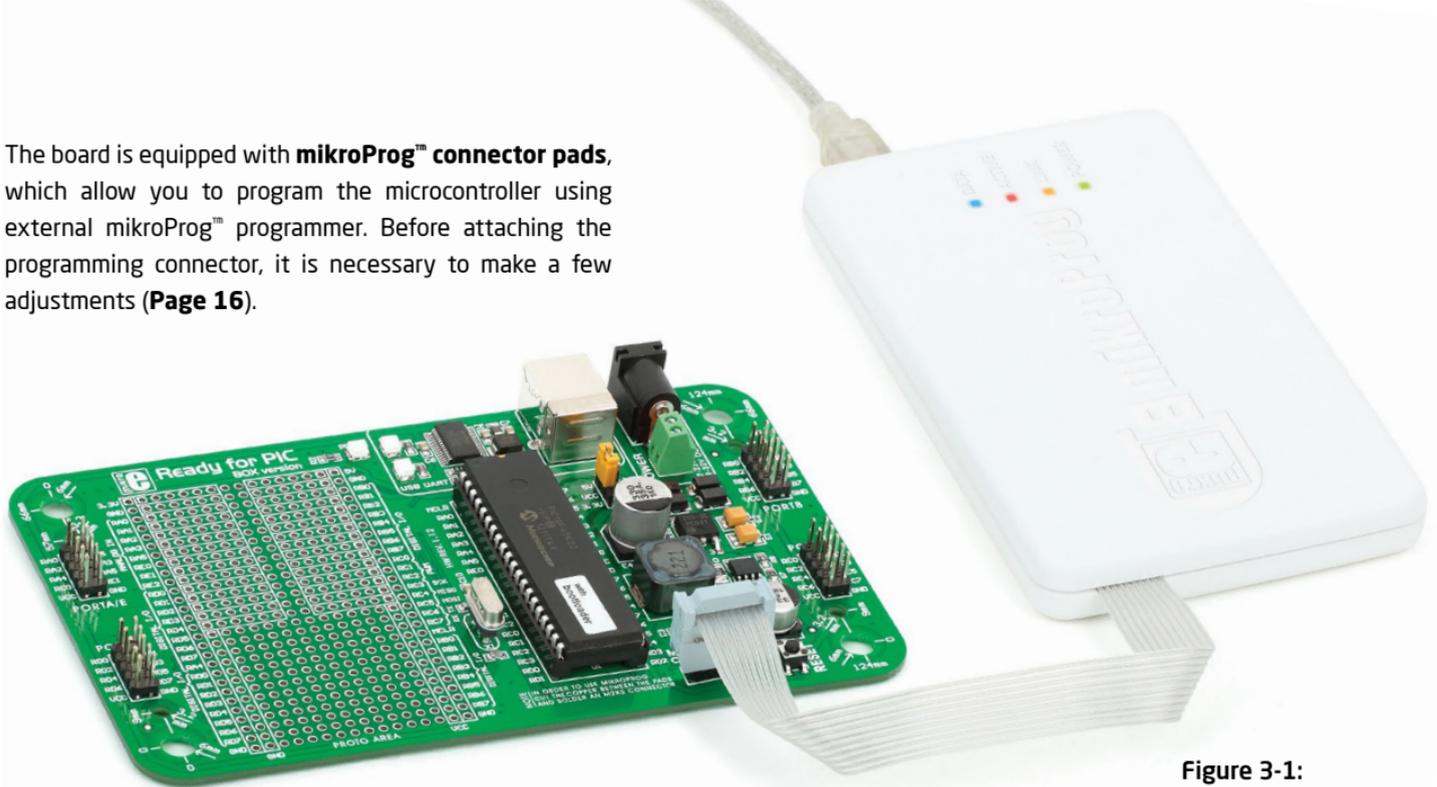


Figure 3-1:
mikroProg™
programmer



Figure 3-2: cutting copper between pads



Figure 3-3: placing 2x5 male header

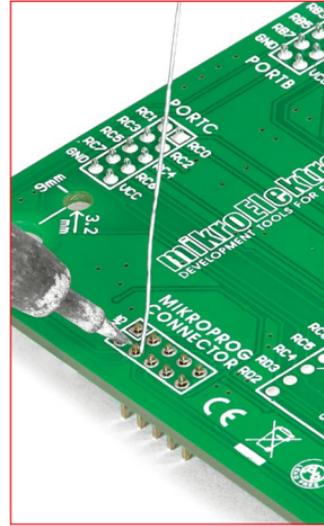


Figure 3-4: soldering 2x5 male header on the pads

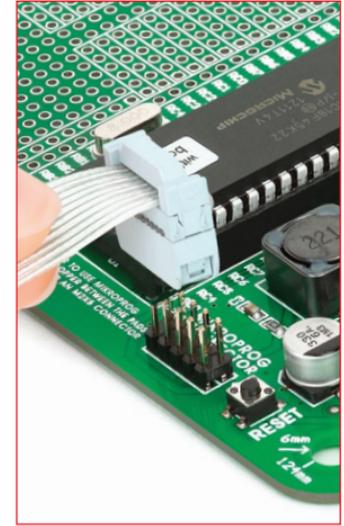


Figure 3-5: Connecting mikroProg™ programmer

First you need to cut the copper between pads for the external programmer, **Figure 3-2**. By doing so pins RB6, RB7, MCLR and VCC on the MCU will be separated from the rest of the board. After that it is time to place (**Figure 3-3**) and solder (**Figure 3-4**) a 2x5 male header on the pad (**CN5**). Now attach the external mikroProg™ programmer connector on the 2x5 header, **Figure 3-5**. After the programming process is finished you can remove the programmer connector and solder jumpers over pads in order to enable pins RB6, RB7 to be used as I/O pins and MCLR to be used as a reset pin.

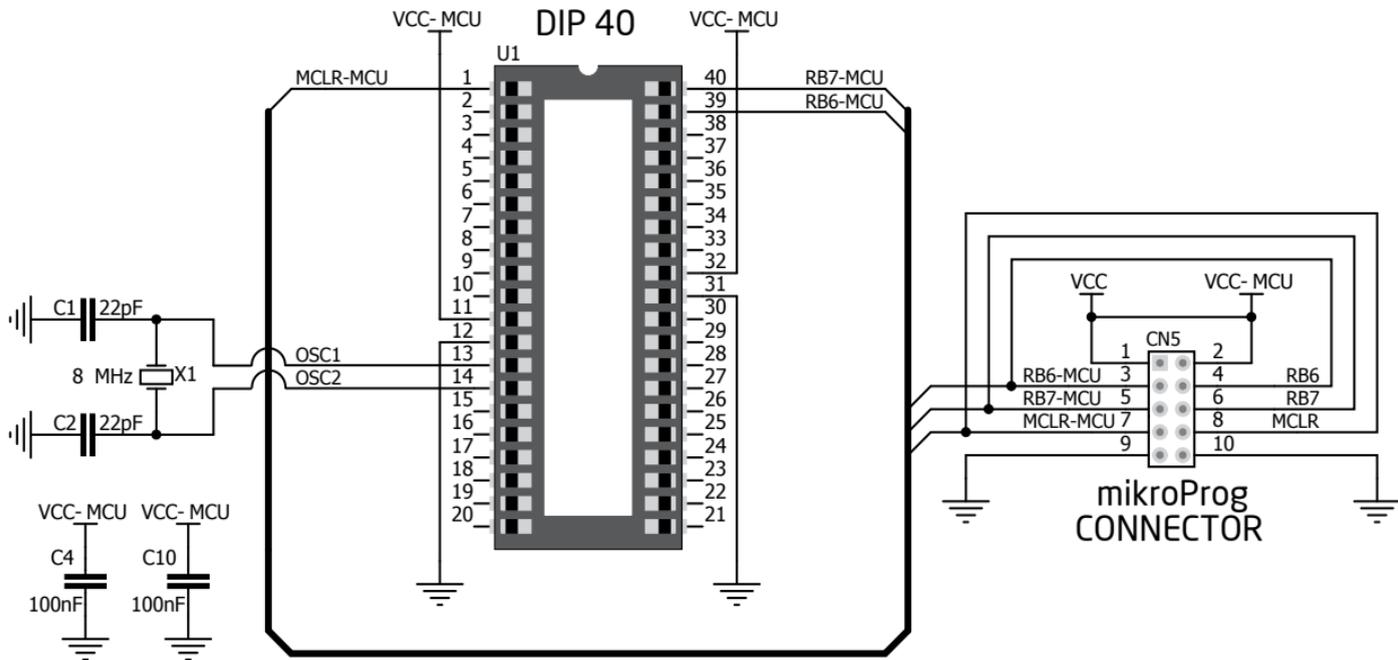


Figure 3-6: mikroProg™ programmer connection schematic

4. USB-UART

Fast on-board **FTDI® chip** allows Ready for PIC® to communicate with a PC or other UART devices using a USB-UART connection. USB-B connector (**CN1**) is used for connecting the USB cable. RX (receive) and TX (transmit) LEDs will indicate communication status. Before connecting the board to a PC, make sure that you have the appropriate **FTDI drivers** installed on your operating system. Drivers can be found at the following URL:



<http://www.ftdichip.com/Drivers/VCP.htm>

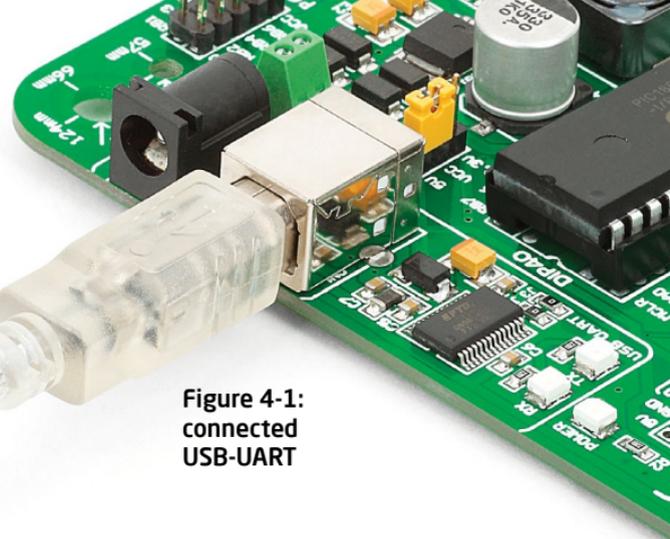


Figure 4-1:
connected
USB-UART

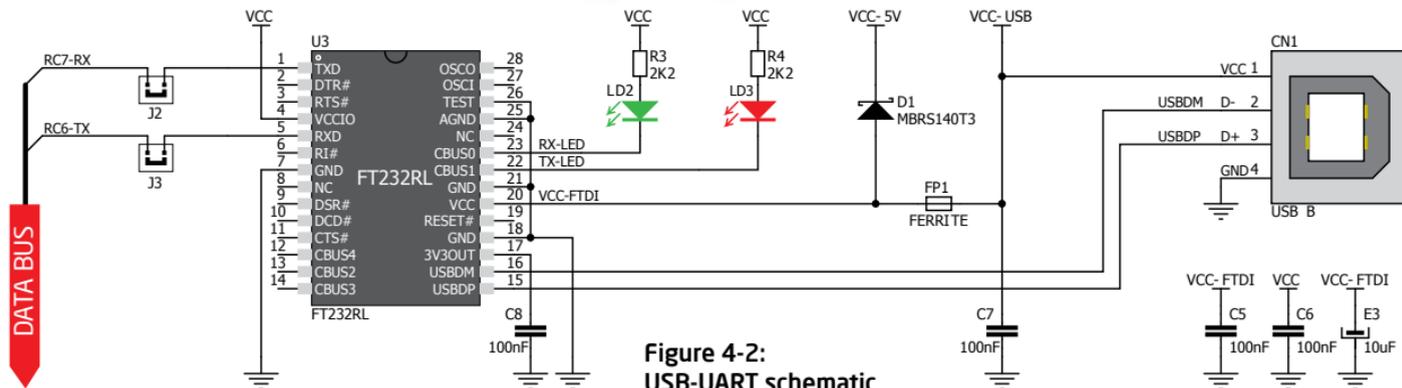


Figure 4-2:
USB-UART schematic

5. Prototyping area

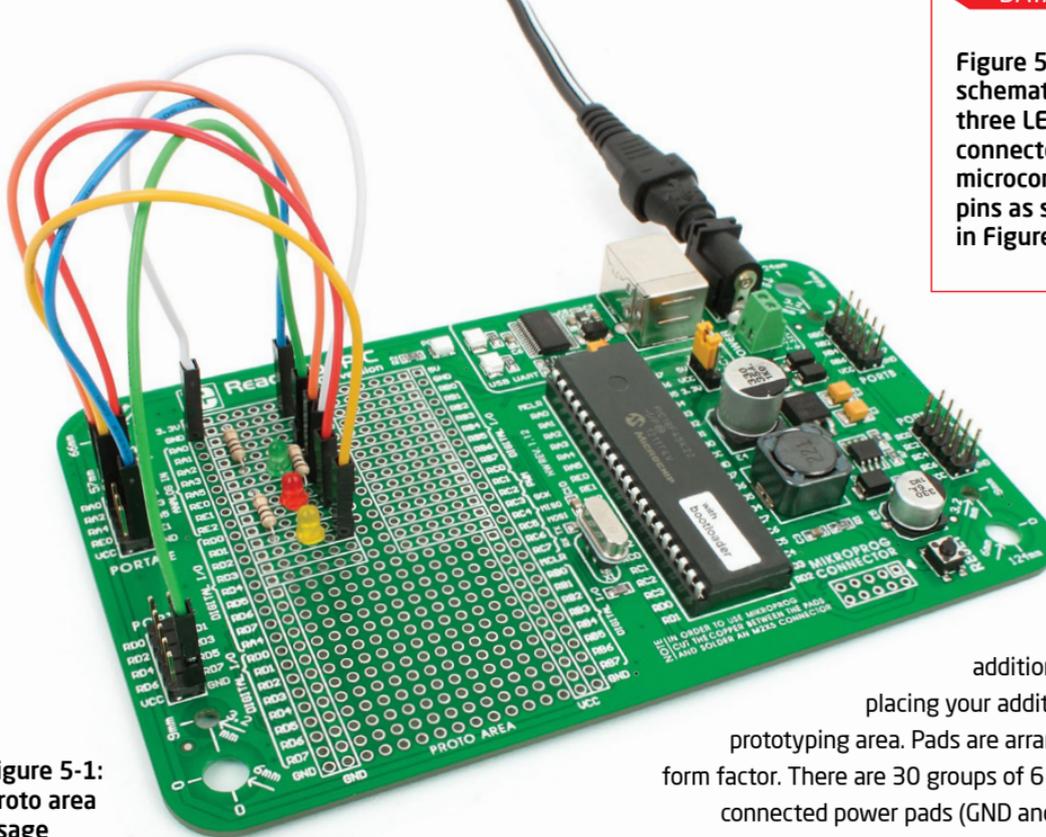


Figure 5-1:
Proto area
usage

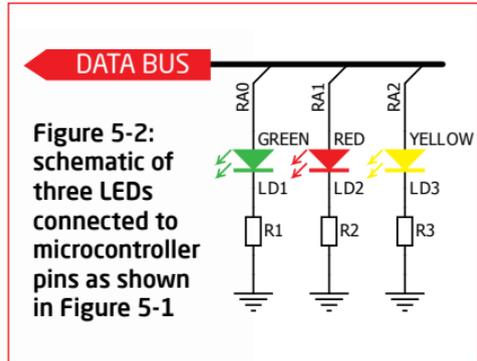
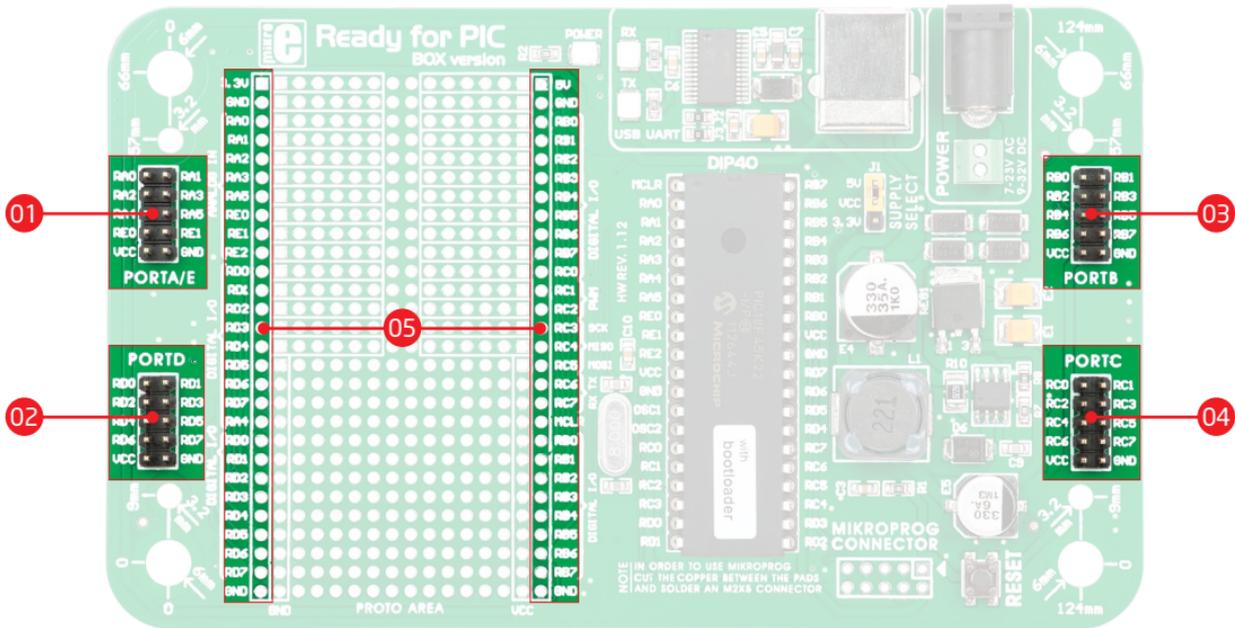


Figure 5-2:
schematic of
three LEDs
connected to
microcontroller
pins as shown
in Figure 5-1

Proto area
allows you to expand your Ready for PIC® board with additional functionality. It can be done by placing your additional components on the available prototyping area. Pads are arranged in standard 100mils distance form factor. There are 30 groups of 6 connected pads, two groups of 13 connected power pads (GND and VCC) and 186 unconnected pads.

6. Pin headers and connection pads



Each microcontroller pin is available for further connections through four on-board 2x5 connection headers and two 1x28 connection pads. Pins are grouped in four PORT groups (2x5 male headers) as well as per their functions (1x28 connection pads), which makes development and connections much easier. Everything is printed on the silkscreen, so that there will be no need of using microcontroller data sheet while developing. Before using the pins, it is necessary to solder **2x5 male headers** (1-4) on the board pads.

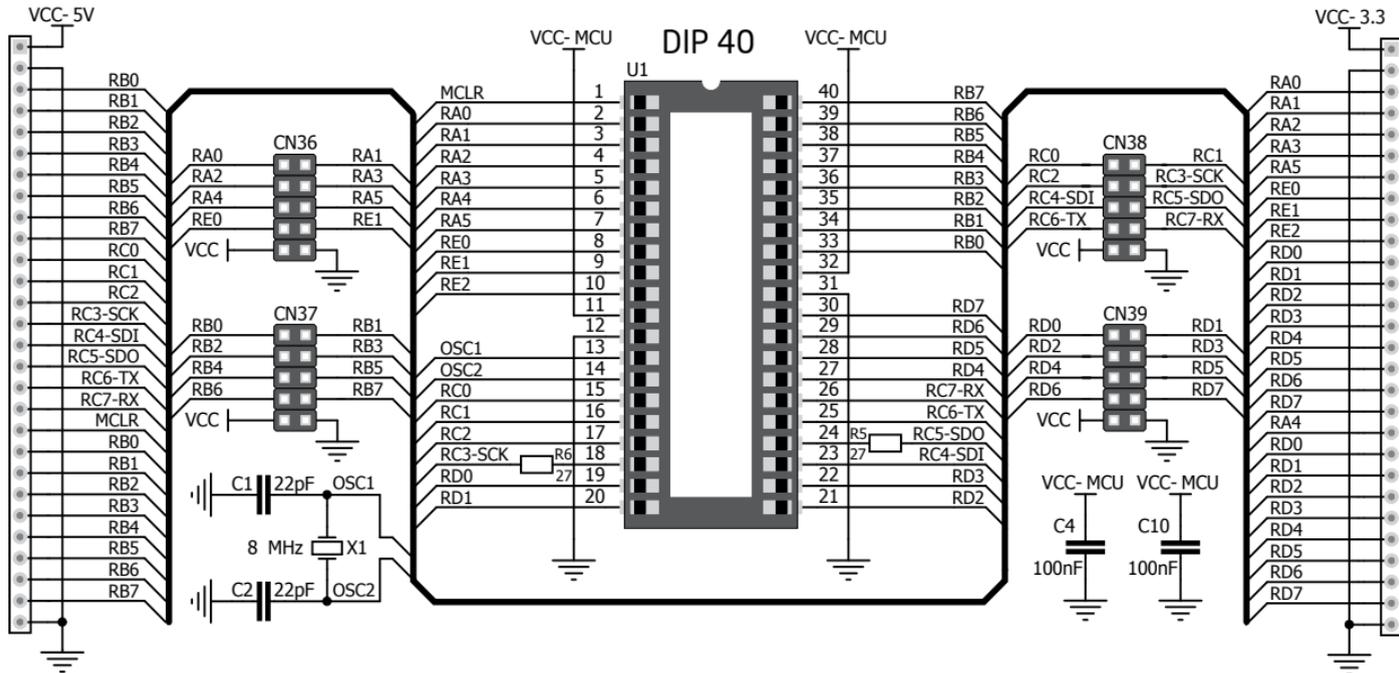


Figure 6-1: Schematic of pin headers and connection pads

7. Reset button

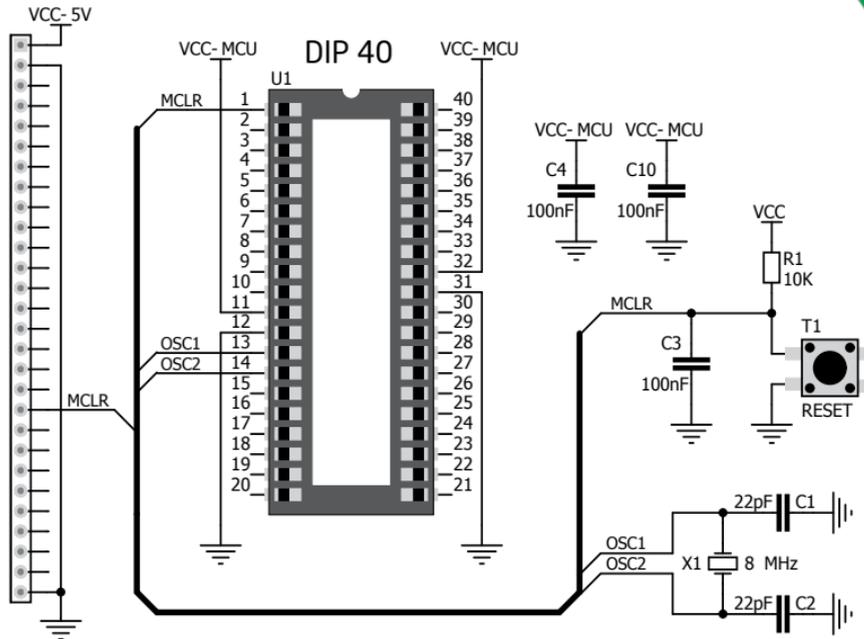


Figure 7-1:
Reset button
connection
schematic

Ready for PIC® board has a specialized reset circuit with a high-quality reset button which can be used to reset the program execution of the microcontroller. If you want to reset the circuit, press the on-board RESET button. It will generate a low voltage level on the microcontroller reset pin (input). In addition, a reset can be externally generated through **MCLR pin** on 1x28 connection pads.

8. Integrating with the casing



Figure 8-1:
Place the board into the bottom part of the casing. Make sure that the connectors are aligned with square openings



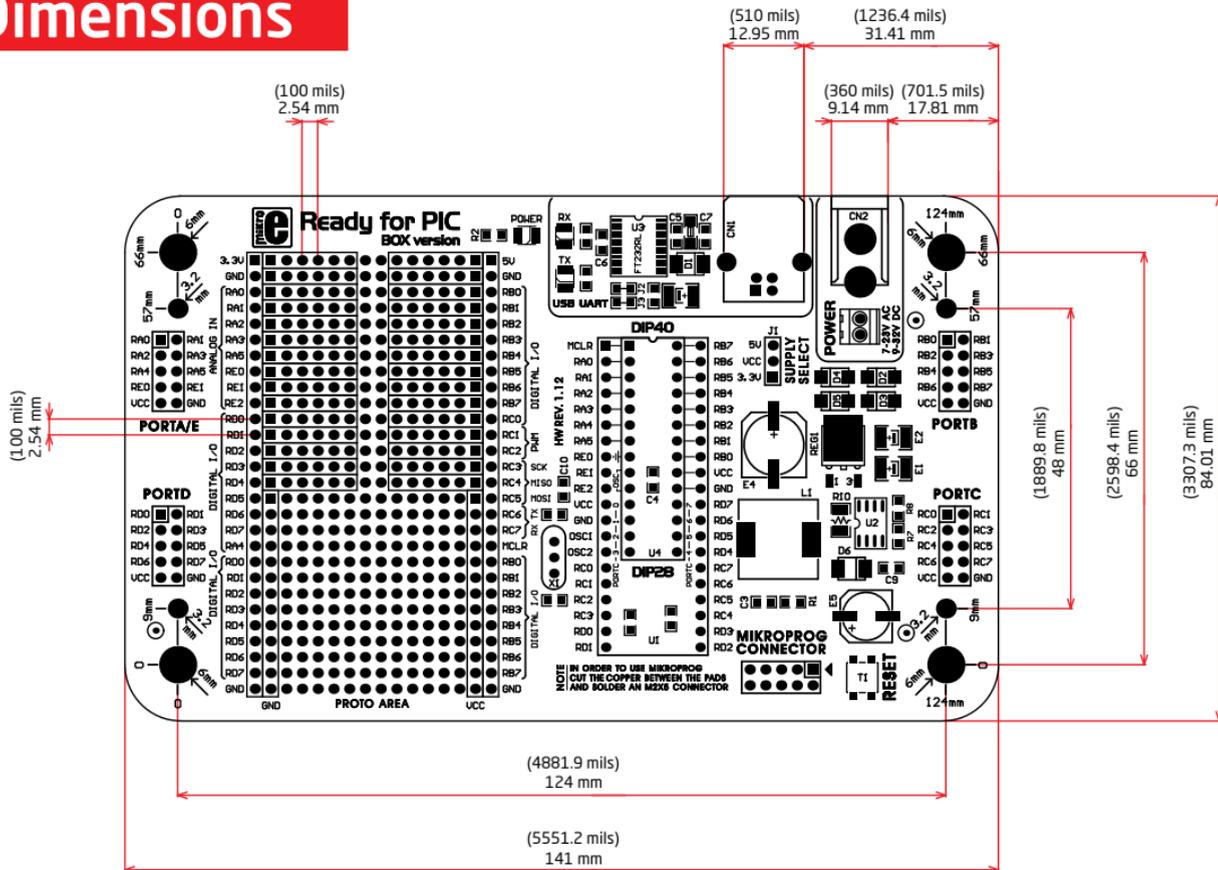
Figure 8-2:
Wind screws into inner screw holes to fix the board with the bottom plastic casing

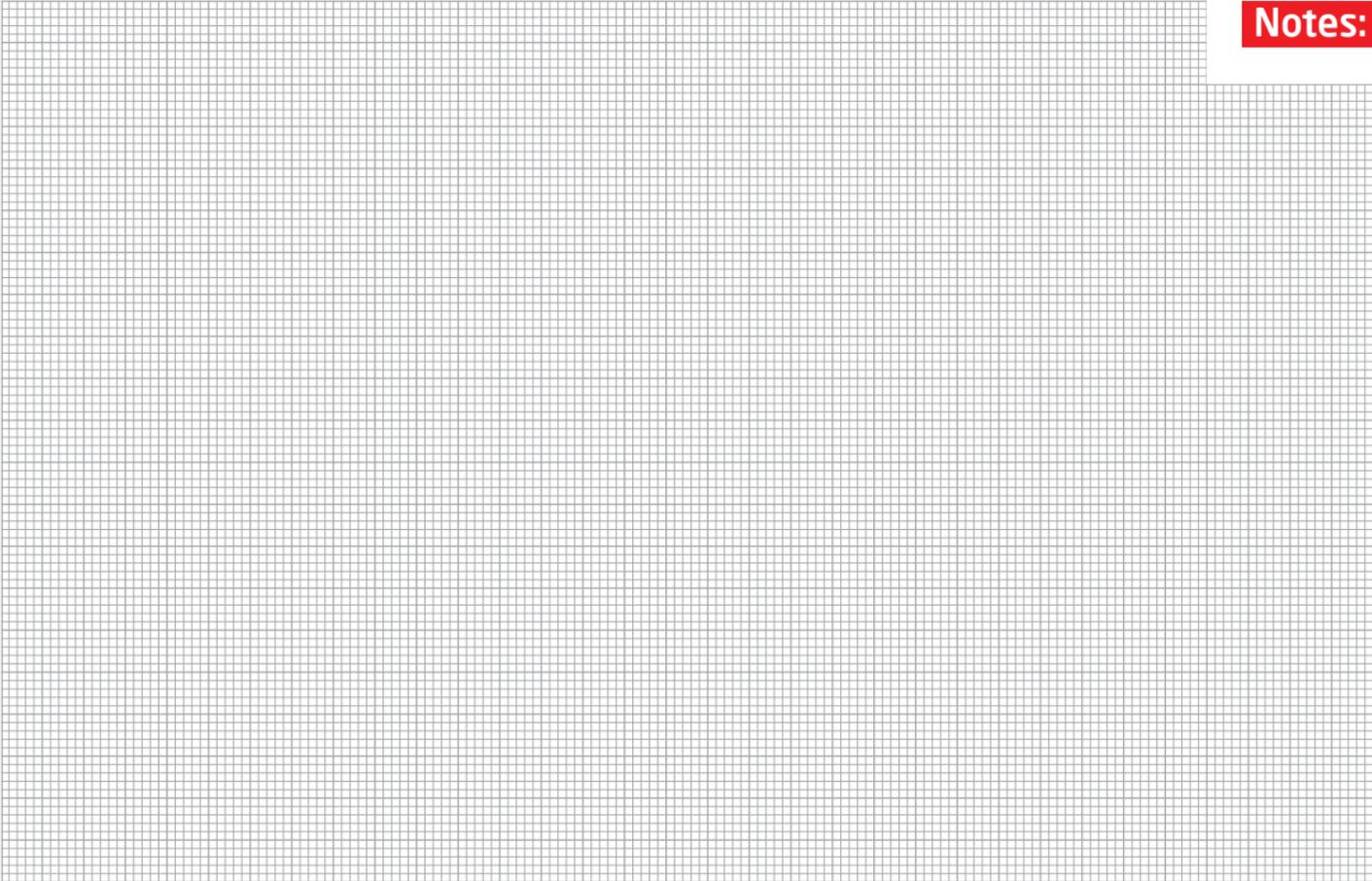


Figure 8-3:
Place cover casing plastic and wind screws into outer screw holes to fix it with bottom plastics casing

Ready for PIC® can easily be integrated into the specialized white plastic casing. This feature is very convenient for turning the board into a final product. The white plastic casing contains inner and outer screw holes. Inner are used for fixing the board to the casing and outer are used for fixing the top part of the casing. Casing comes with holes for USB and power adapter connector, but you can customize it by drilling and cutting holes in specific areas, depending on the target application.

9. Dimensions





Notes:

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