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.

MikroElektronika
DEVELOPMENT TOOLS | COMPILERS | BOOKS

PIC

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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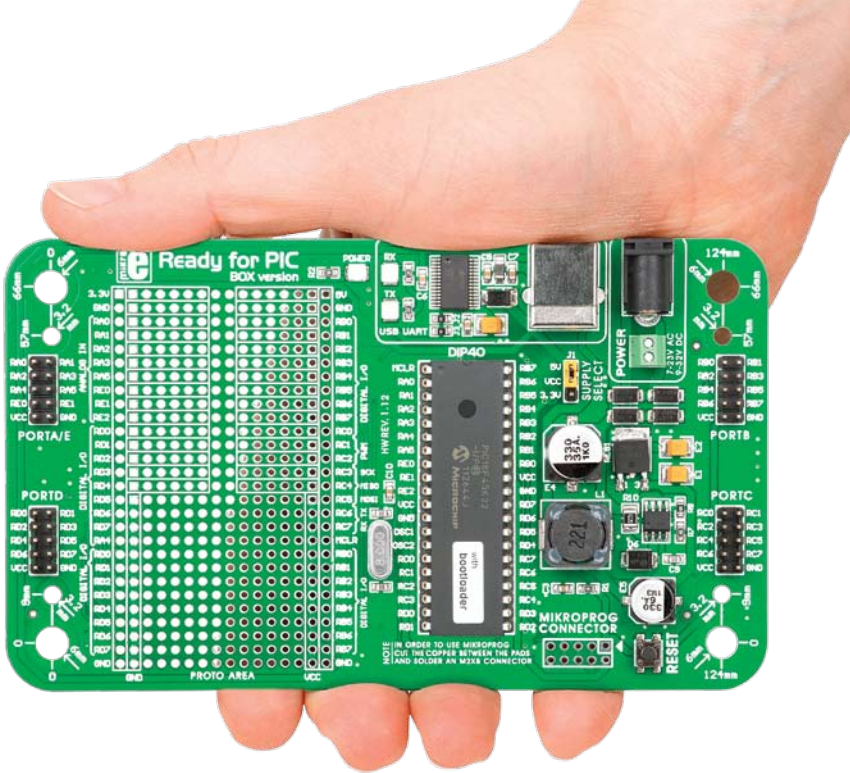
Introduction

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 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 pre programmed 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 with male pin headers

03 DVD with documentation and examples

04 Ready for PIC® user's guide

05 Ready for PIC® schematic

06 USB cable

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)

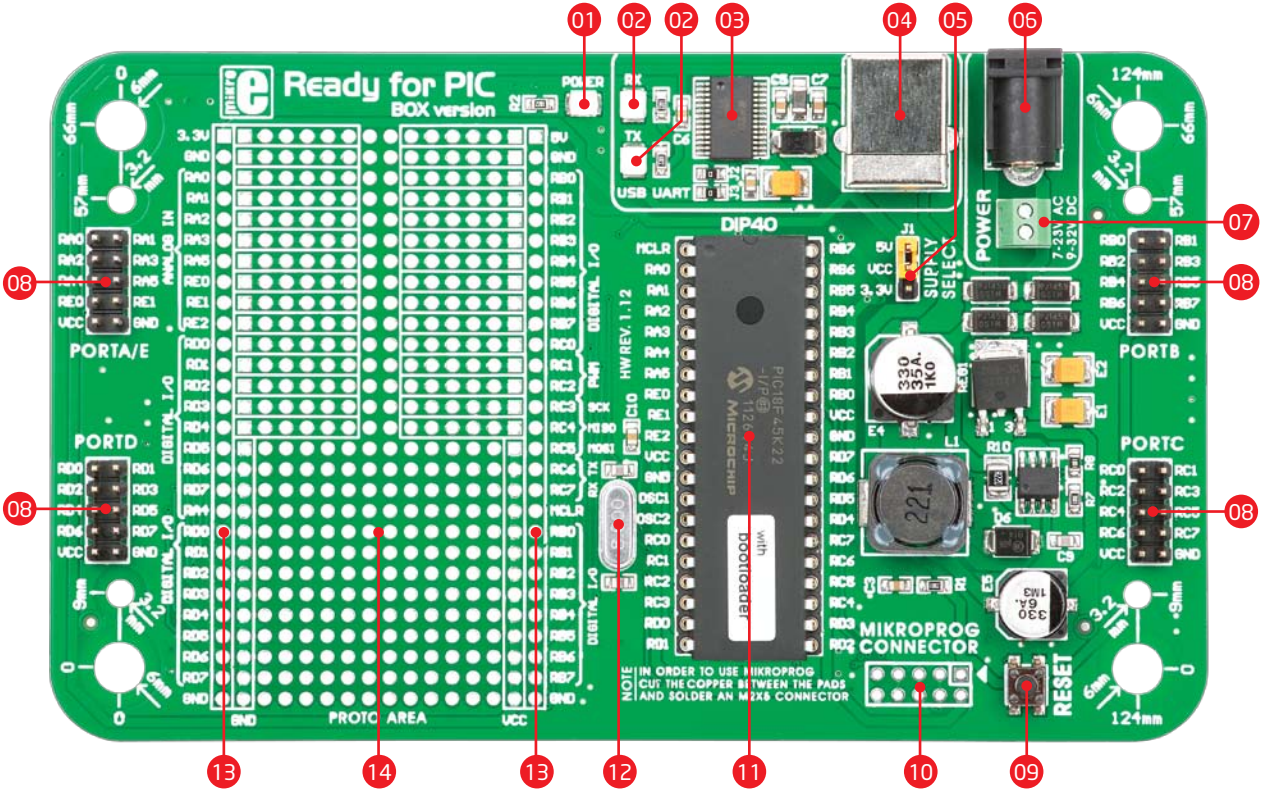
board dimensions

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
Crystal oscillator 12
Connection pads 13
Prototyping area 14


01
02
02
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08
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12
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13
14
Ready for PIC
BOX version
POWER
RX
TX
USB UART
DIP40
SUPPLY SELECT
POWER
7-23V AC
9-32V DC
PORTA/E
PORTB
PORTC
PORTD
MIKROPROG CONNECTOR
RESET
PROTO AREA
HWREV. 1.12
IN ORDER TO USE MIKROPROG CUT THE COPPER BETWEEN THE PADS AND SOLDER AN M2X5 CONNECTOR
124mm
66mm
57mm
9mm

1. Power supply

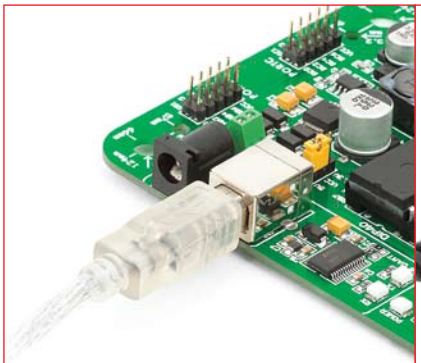


Figure 1-1:
USB power supply

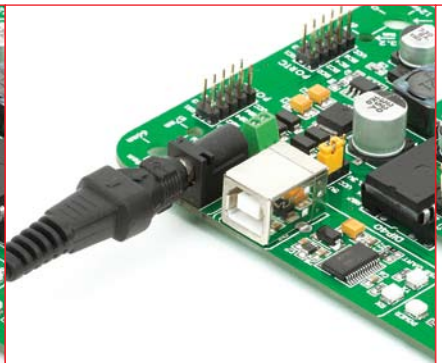


Figure 1-2:
AC/DC adapter power supply

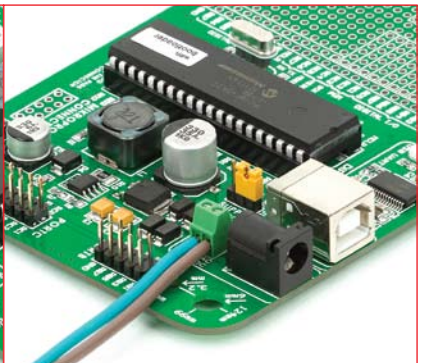


Figure 1-3:
screw terminals power supply

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 power supply. Use only one of suggested methods for powering the board. If you use MCU with a 5V power supply place jumper J1 in the 5V position. Otherwise, it should be placed in the 3.3V position.

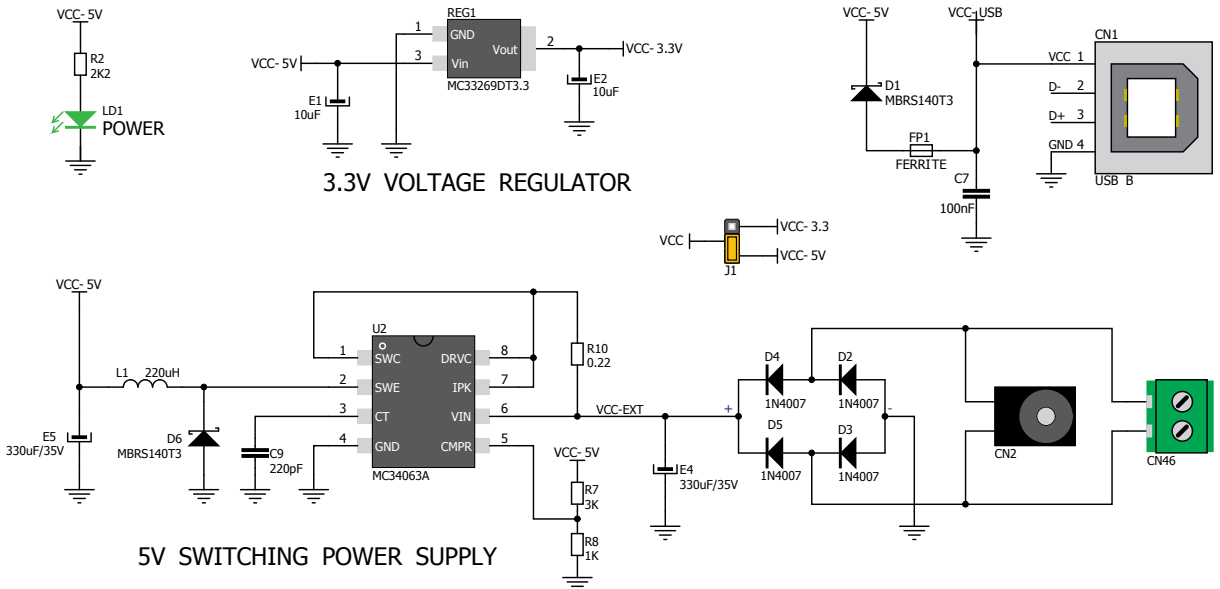


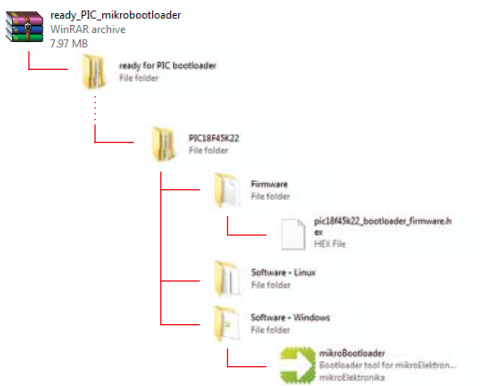
Figure 1-4: Power supply schematic

2. Programming with mikroBootloader

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

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

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



mikroBootloader software

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

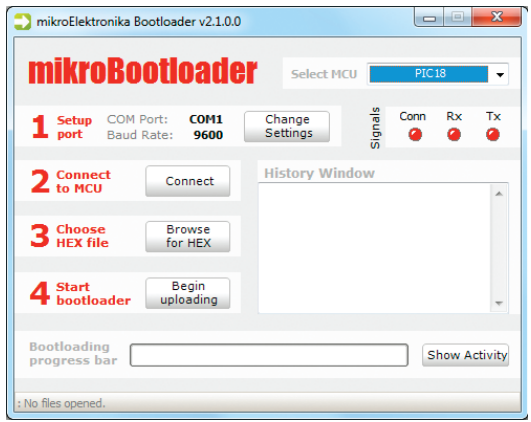


Figure 2-1: mikroBootloader window

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

Identifying device COM port

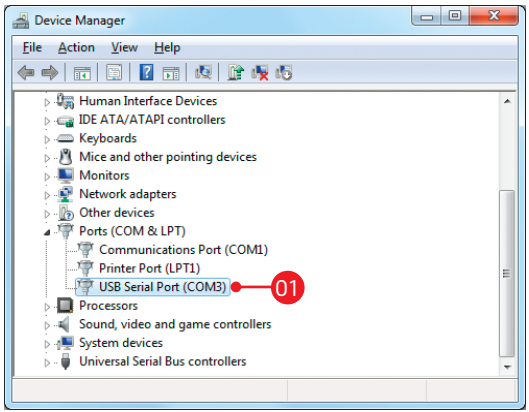


Figure 2-2: Identifying COM port

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

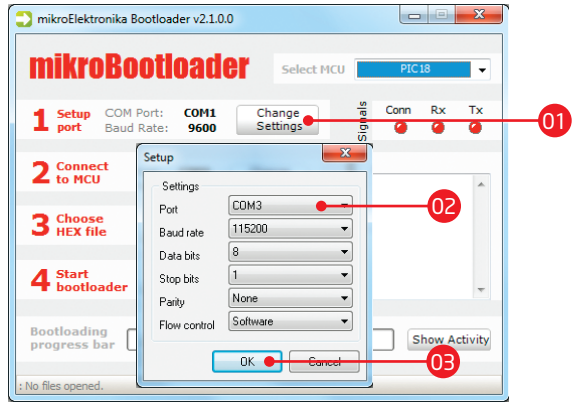


Figure 2-3: Choosing COM port

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

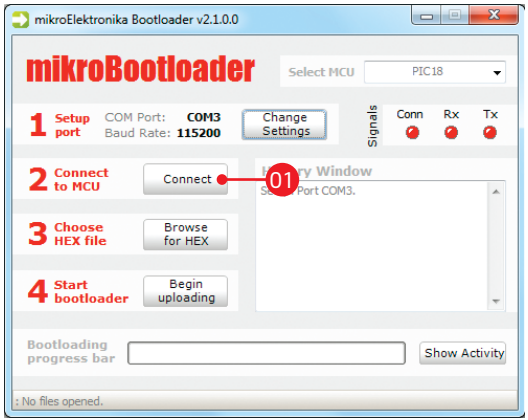


Figure 2-4: Connecting with mikroBootloader

01 Press the **Reset** button on 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

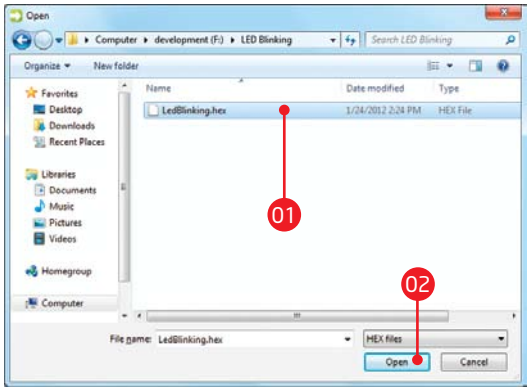


Figure 2-6: Locating and selecting .hex file

01 Select .HEX file using open dialog window

02 Click the **Open** button

step 5 - Uploading .HEX file

Figure 2-7: Begin uploading

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

step 6 - Progress bar

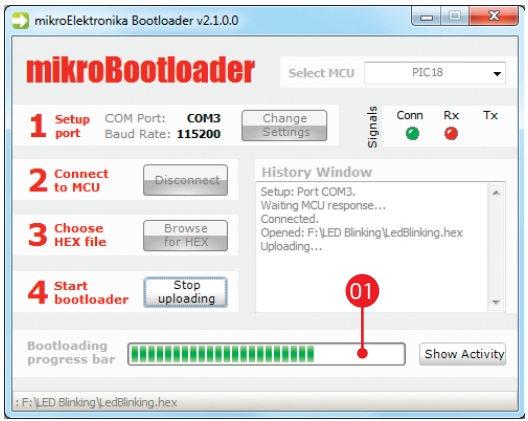


Figure 2-8: Progress bar

01 Progress bar enables you to monitor .HEX file uploading

step 7 - Finishing upload

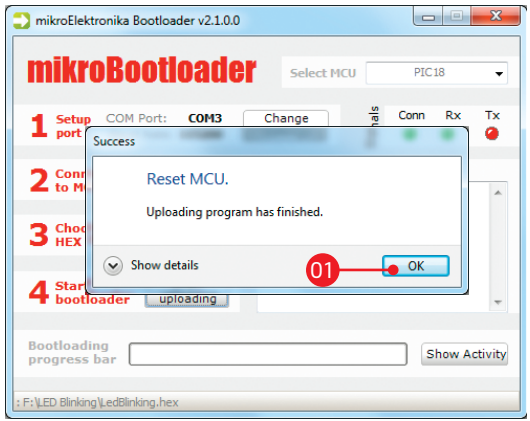


Figure 2-9: Restarting MCU

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

02 Press **Reset** button on 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**).

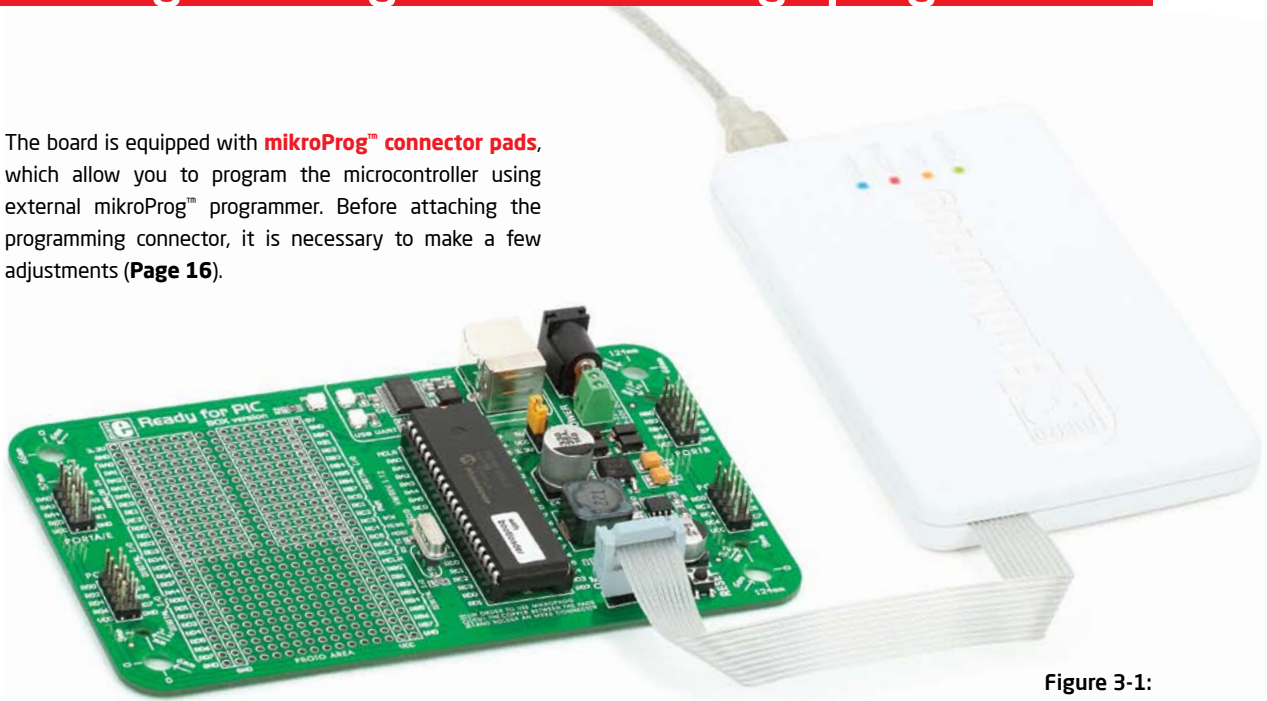


Figure 3-1: mikroProg™ programmer

Figure 3-2: cutting copper between pads

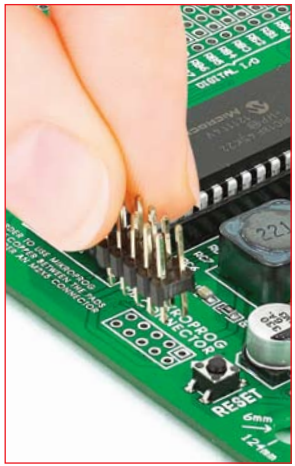


Figure 3-3: placing 2x5 male header

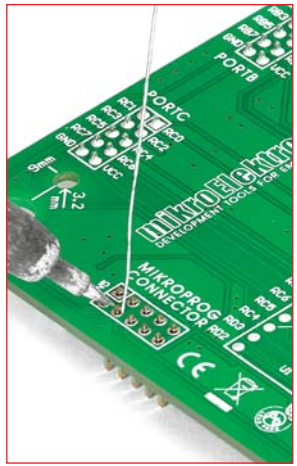


Figure 3-4: soldering 2x5 male header on the pads

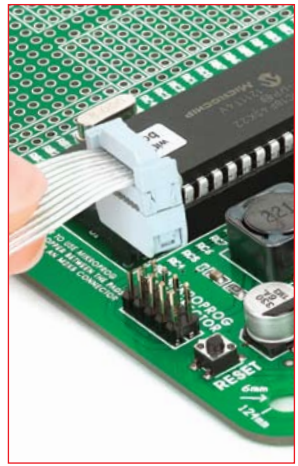


Figure 3-5: Connecting mikroProg™ programmer

First you need to cut copper between pads for the external programmer, **Figure 3-2**. By doing so pins RB6, RB7, MCLR and VCC on 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 ti is time to place the external mikroProg™ programmer connector on the 2x5 male header, **Figure 3-5**. After the programming process is finished you can remove 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 reset pin.

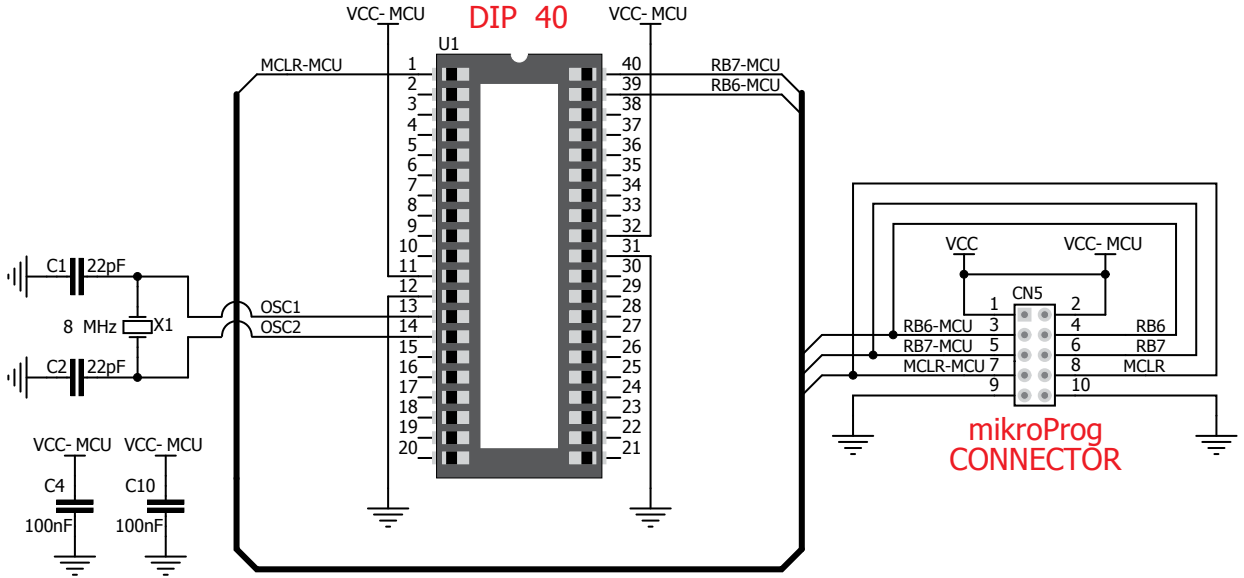


Figure 3-6: mikroProg™ programmer connection schematic

4. USB-UART

Fast on-board **FTDI® chip** allows you to communicate with a PC or other UART devices using 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

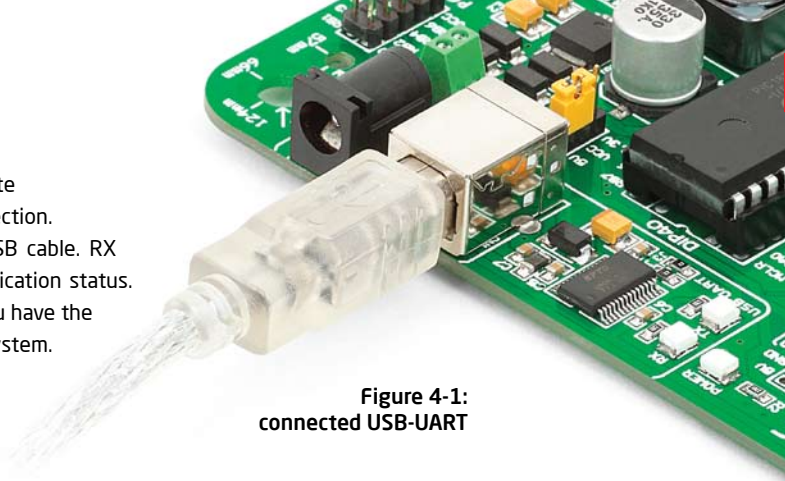


Figure 4-1: connected USB-UART

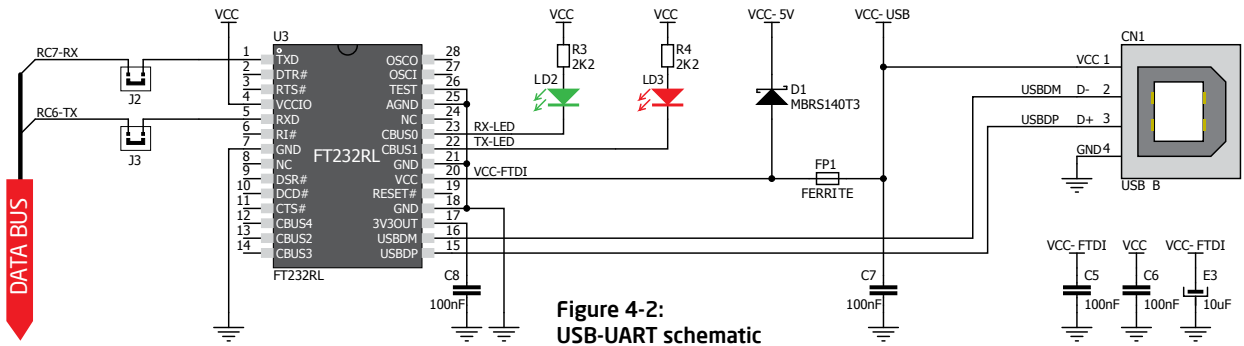


Figure 4-2: USB-UART schematic

5. Prototyping area

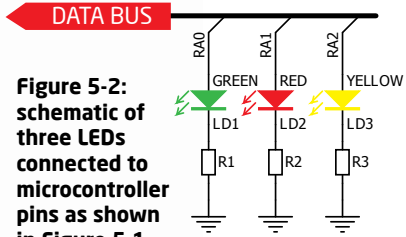


Figure 5-2: schematic of three LEDs connected to microcontroller pins as shown in Figure 5-1

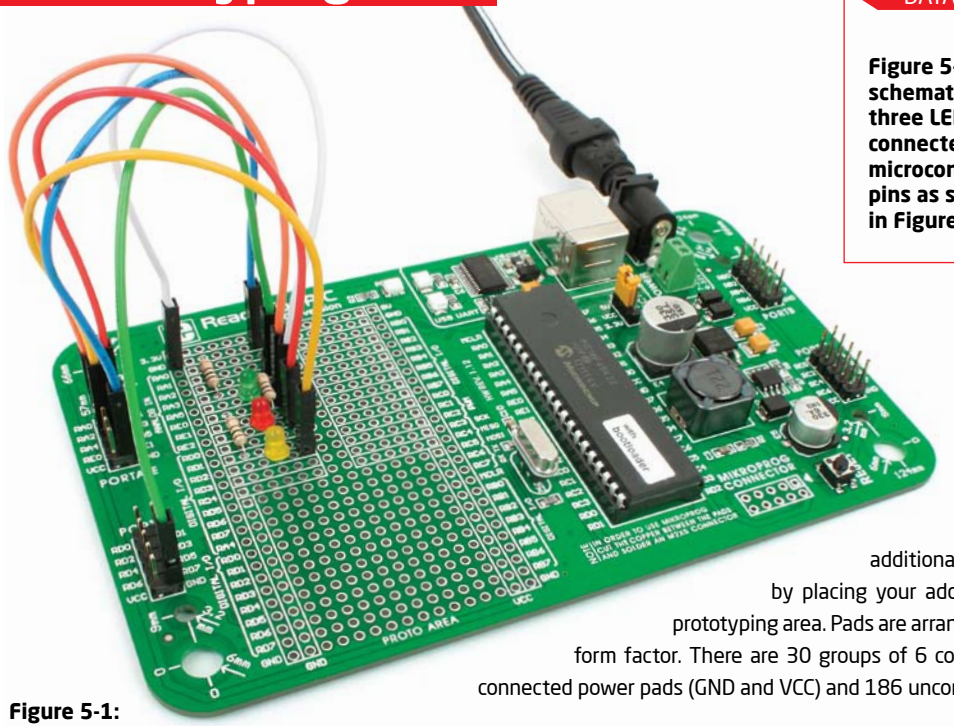
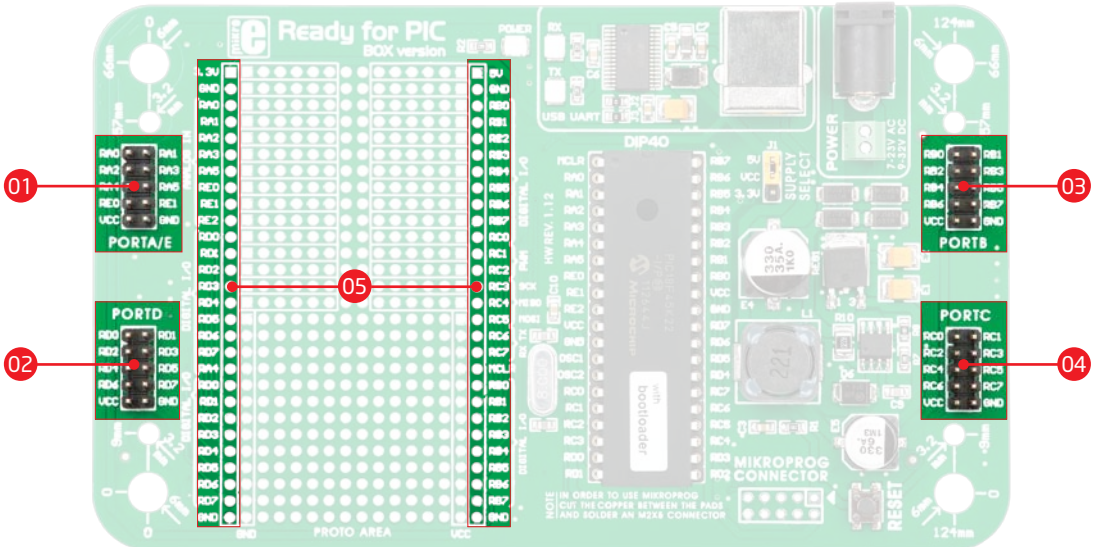


Figure 5-1: Proto area usage

Proto area allows you to expand your Ready for PIC® board with additional functionality. It can be done by placing your additional components on 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.

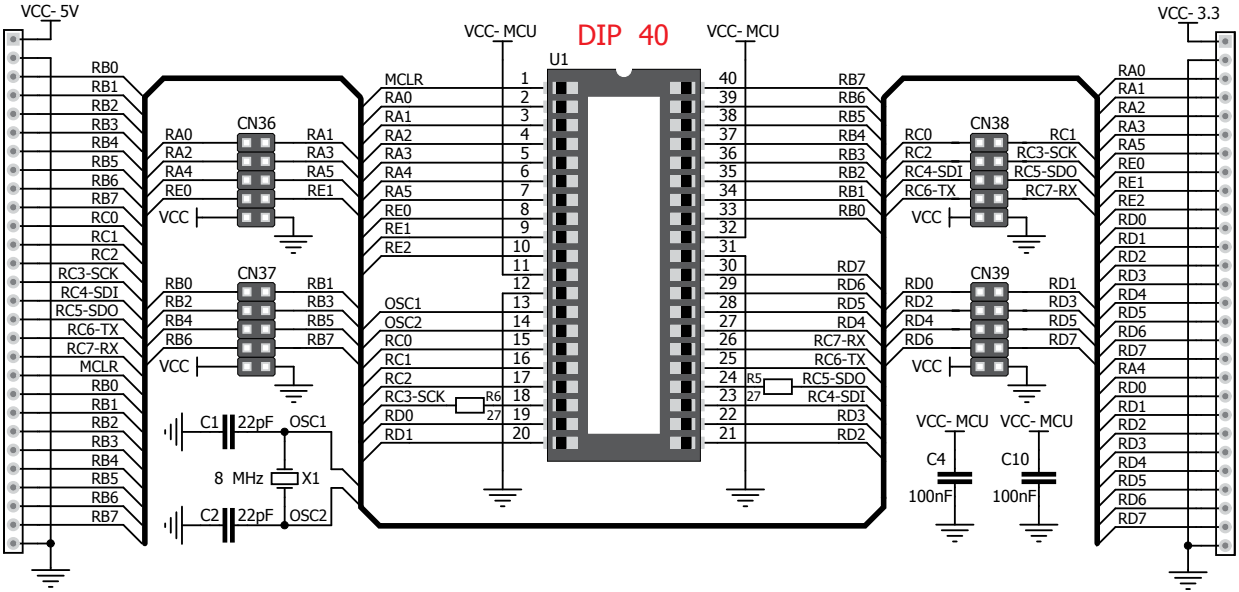
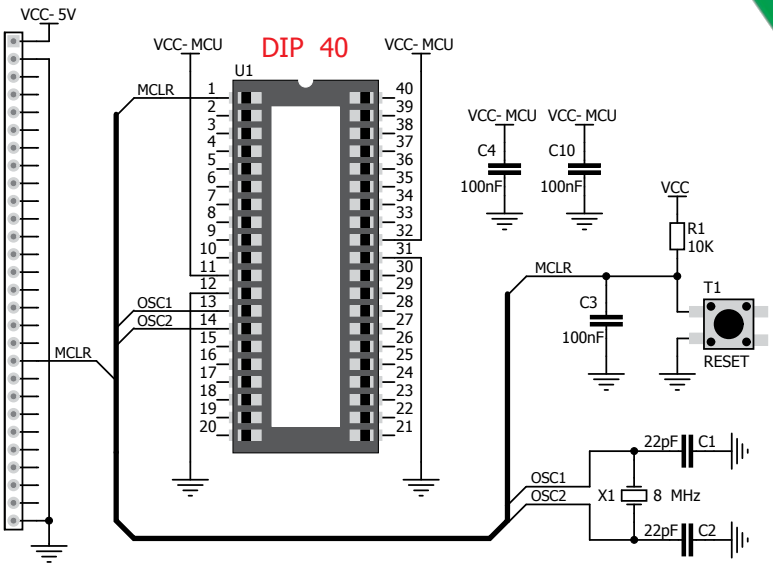


Figure 6-1: schematic of pin headers and connection pads

7. Reset button



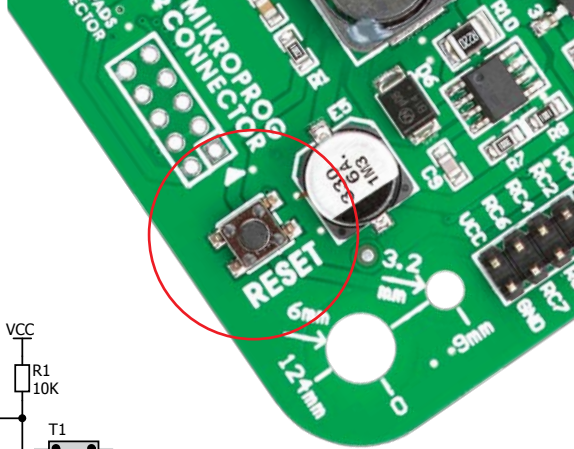


Figure 7-1: Reset button connection schematic

Ready for PIC® board has a specialized reset circuit with high-quality reset button which can be used to reset the program execution of the microcontroller. If you want to reset the circuit, press on-board RESET button. It will generate 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

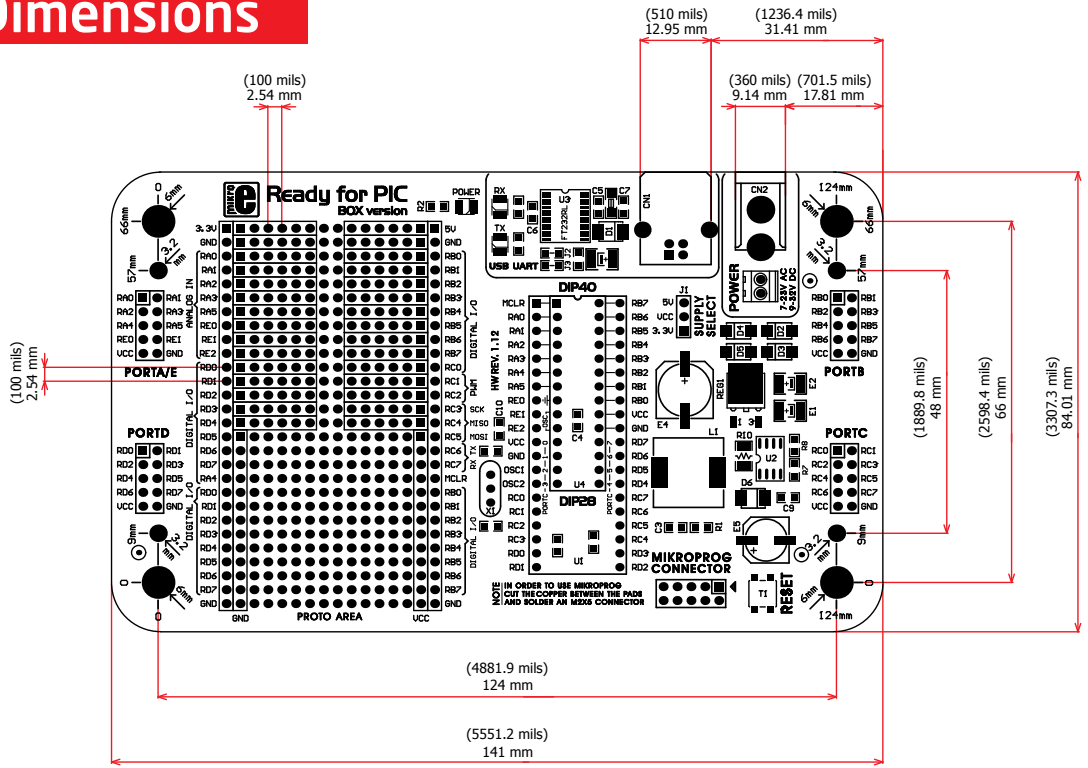
Figure 8-1:
Place the board into the bottom part of the casing. Make sure that connectors are aligned with square openings

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:

Notes:

If you want to learn more about our products, please visit our website at www.mikroe.com
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If you have any questions, comments or business proposals, do not hesitate to contact us at office@mikroe.com

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