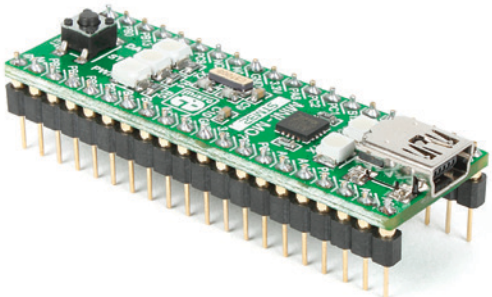

MINI-M0™

development board for STM32

The whole STM32 development board fitted in DIP40 form factor, containing high-performance STM32F051R8 ARM Cortex-M0 microcontroller.

MINI ARM

MikroElektronika
DEVELOPMENT TOOLS | COMPILERS | BOOKS

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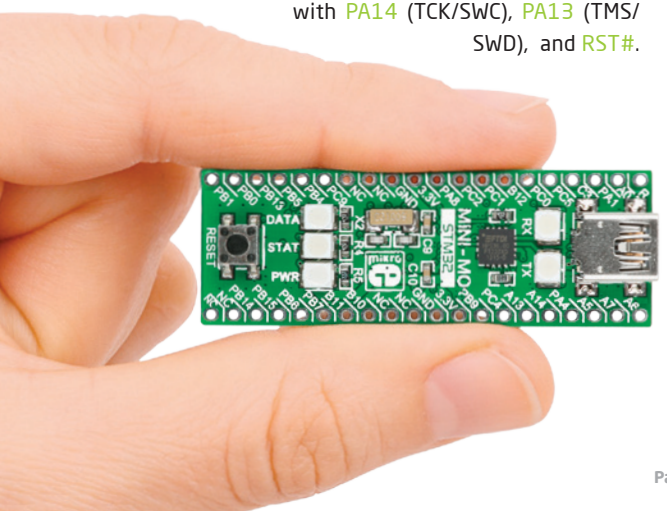
Nebojsa Matic
General Manager

Table of Contents

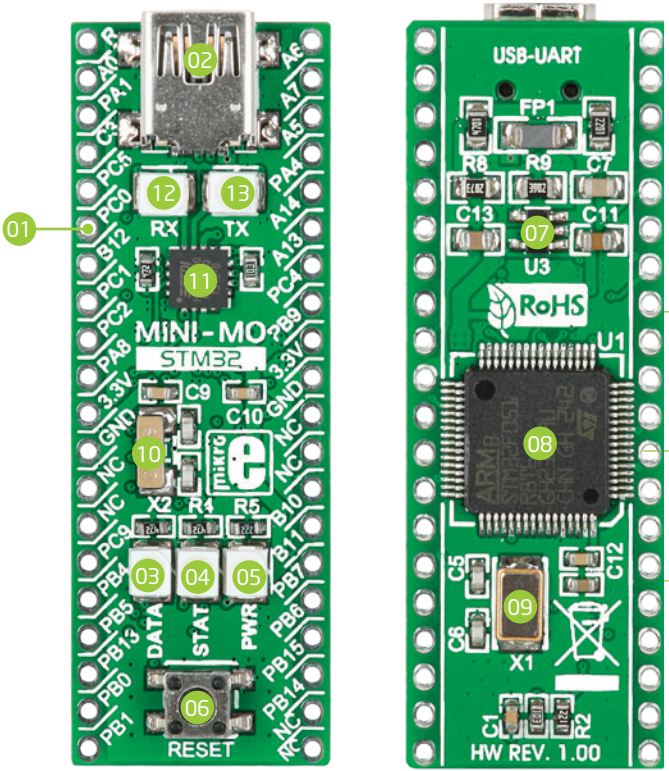
Introduction to MINI-M0 for STM32

Miniature and high-performance development tool designed to work as stand alone device or as MCU card in DIP40 socket. MINI-M0 for STM32 is preprogrammed with USB-UART bootloader so it is not necessary to have external programmer. If there is need for external programmers (mikroProg™ or ST-LINK V2) attach it to MINI-M0 for STM32 via pads marked with PA14 (TCK/SWC), PA13 (TMS/SWD), and RST#.



Key features

01 Connection Pads
02 USB MINI-B connector
03 DATA LED
04 STAT LED
05 POWER supply LED
06 Reset button
07 Power supply regulator
08 Microcontroller STM32F051R8
09 16 MHz Crystal oscillator
10 32.768kHz Crystal oscillator
11 FTDI FT230x chip
12 UART RX LED
13 UART TX LED



System Specification

power supply

3.3V via pads or 5V via USB

power consumption

depends on MCU state (max current into 3.3V pad is 300mA)

board dimensions

50.8 x 17.78mm (2 x 0.7")

weight

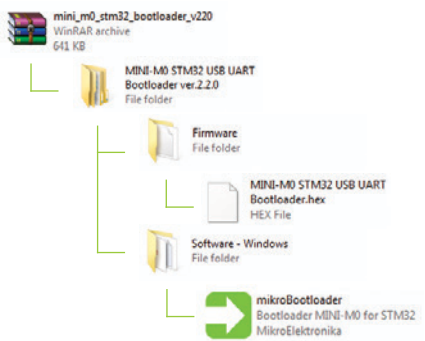
~6g (0.013 lbs)

1. Programming with mikroBootloader

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

http://www.mikroe.com/downloads/get/2055/mini_m0_bootloader_v220.zip

After software is downloaded unzip it to desired location and start mikroBootloader USB UART software.



mikroBootloader software

note *Before starting mikroBootloader software, connect MINI M0 for STM32 to a PC using a USB cable provided with the package*

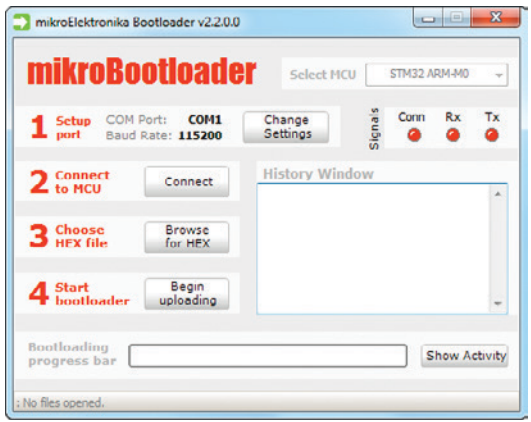


Figure 2-1: mikroBootloader window

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

Identifying device COM port

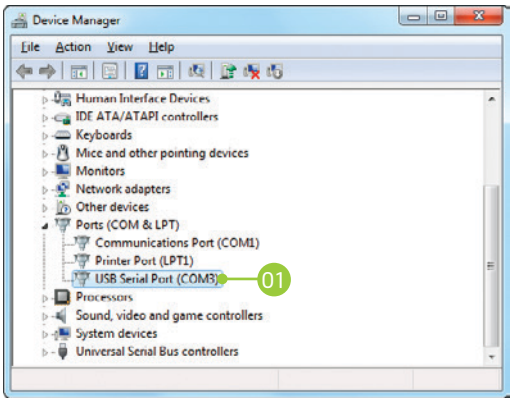


Figure 2-2: Identifying COM port

01 Open **Device Manager** window and expand **Ports section** to see which COM port is assigned to MINI M0 for STM32 (in this case it is COM3)

step 1 - Choosing COM port

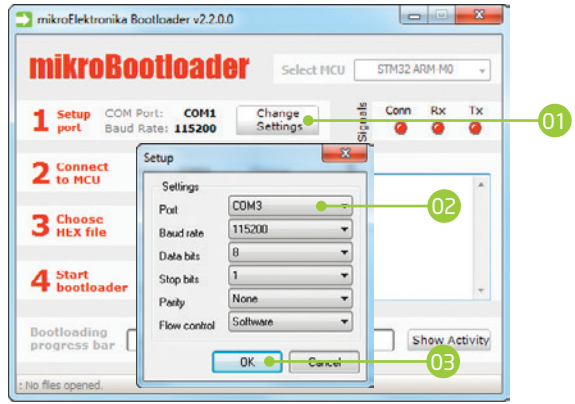


Figure 2-3: Choosing COM port

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 MINI M0 for STM32 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

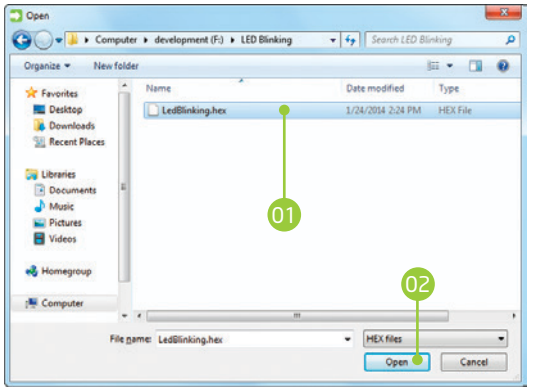


Figure 2-6: Locating and selecting .hex file

01 Select .HEX file using open dialog window.

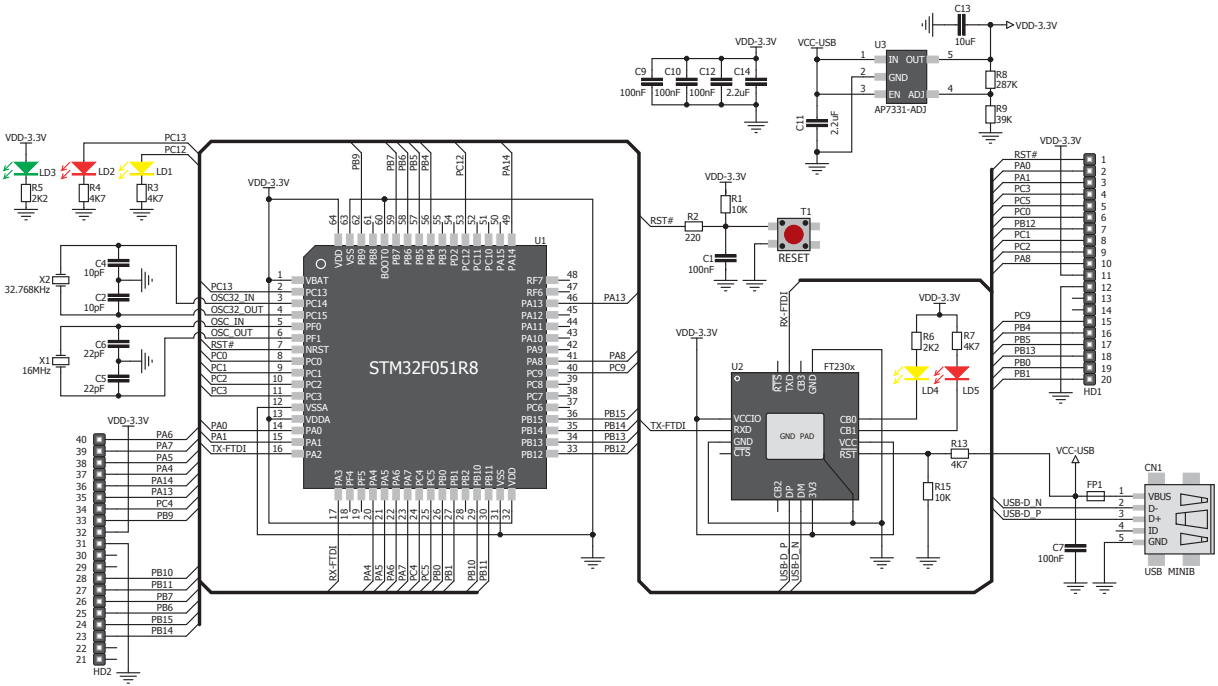
02 Click the **Open** button

step 5 - Uploading .HEX file

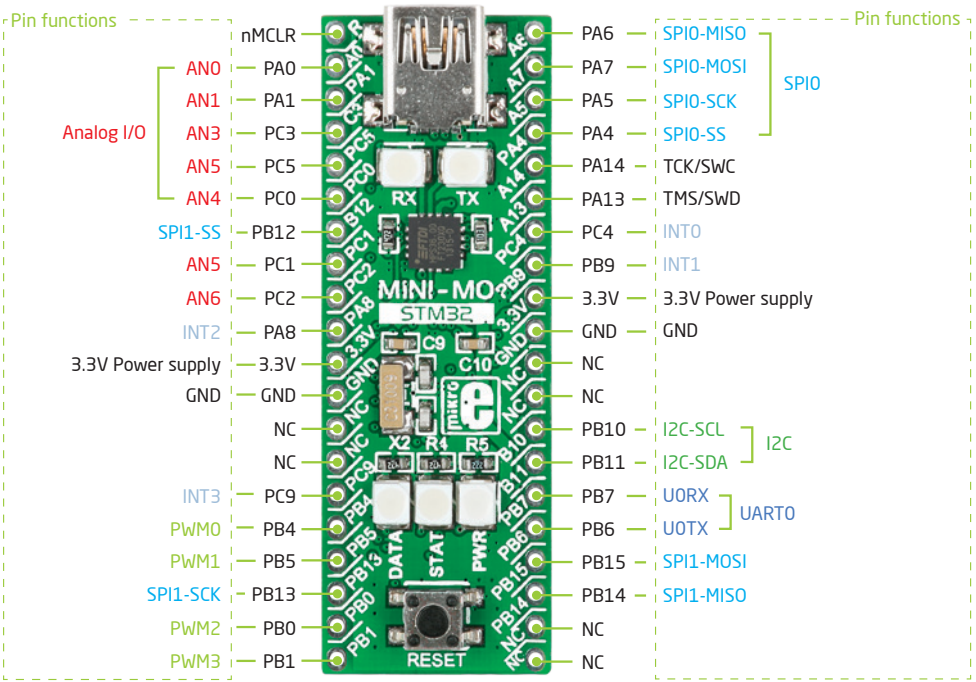
Figure 2-7: Begin uploading

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

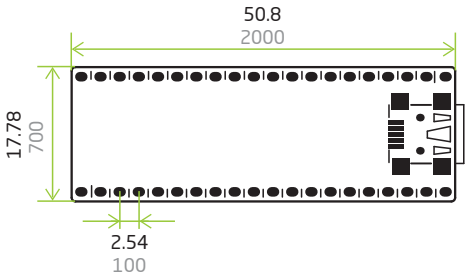
2. Schematic


STM32F051R8
U1
VDD-3.3V
PC13
PC12
LD3
LD2
LD1
R5 2K2
R4 4K7
R3 4K7
X2 32.768KHz
X1 16MHz
C4 10pF
C2 10pF
C6 22pF
C5 22pF
VBAT
PC13
PC14
PC15
PF0
PF1
NRST
PC0
PC1
PC2
PC3
VSSA
VDDA
PA0
PA1
PA2
RST#
OSC_IN
OSC_OUT
PA13
PA8
PC9
PB15
PB14
PB13
PB12
TX-FTDI
RX-FTDI
HD2
C9 100nF
C10 100nF
C12 100nF
C14 2.2uF
VCC-USB
U3
IN OUT
GND
EN ADJ
AP7331-ADJ
C11 2.2uF
C13 10uF
R8 287K
R9 39K
R1 10K
R2 220
C1 100nF
T1
RESET
U2
FT230x
VCCIO
RXD
GND
CTS
RTS
TXD
CB3
GND
CB0
CB1
VCC
RST
CB2
DP
DM
3V3
GND PAD
R6 2K2
R7 4K7
LD4
LD5
R13 4K7
R15 10K
USB-D_N
USB-D_P
FP1
C7 100nF
CN1
VBUS
D-
D+
ID
GND
USB MINIB
HD1

3. Pinout


Pin functions
Analog I/O
AN0
AN1
AN3
AN5
AN4
SPI1-SS
AN5
AN6
INT2
3.3V Power supply
GND
INT3
PWM0
PWM1
SPI1-SCK
PWM2
PWM3
nMCLR
PA0
PA1
PC3
PC5
PC0
PB12
PC1
PC2
PA8
3.3V
GND
NC
NC
PC9
PB4
PB5
PB13
PB0
PB1
MiNI-MO
STM32
RESET
PA6
PA7
PA5
PA4
PA14
PA13
PC4
PB9
3.3V
GND
NC
NC
PB10
PB11
PB7
PB6
PB15
PB14
NC
NC
Pin functions
SPI0-MISO
SPI0-MOSI
SPI0-SCK
SPI0-SS
SPI0
TCK/SWC
TMS/SWD
INT0
INT1
3.3V Power supply
GND
I2C-SCL
I2C-SDA
I2C
U0RX
U0TX
UART0
SPI1-MOSI
SPI1-MISO
Analog Lines
Interrupt Lines
SPI Lines
I2C Lines
UART lines
PWM lines

4. Dimensions



Legend

mm

mils

Notes:

Notes:

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