![OLIMEX logo]

OLIMEXINO-STM32F3

User Manual

Document revision 2.0 September 2022

www.olimex.com

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What is OLIMEXINO-STM32F3

OLIMEXINO-STM32F3 is an industrial grade -40+85C operating temperature, Open Source Hardware board with STM32F303RCT6 main chip. The chip has 256 KB of flash memory and 48 KB of RAM. The board works with powered off a Li-Po battery without an external supply, and switching between USB to external to Li-Po battery power supply is seamless and automatic. If USB is connected the board gets powered by the USB, if external power is applied to the power jack – it has priority over the USB and battery and the board will be powered by the external power supply, if both external power supply and USB power supply are missing but a battery is connected the board would automatically get powered by the LiPo battery.

In STM32F3 series of microcontrollers the CAN and the USB can work at the same time.

Notice that this guide is not suitable for OLIMEXINO-GD32F3!

OLIMEXINO-STM32F3 has following features:

- STM32F303RCT6 256KB flash, 40KB RAM
- Industrial grade (-40+85)°C operating temperature
- Micro USB connector for powering and programming
- Power jack (5.5mm x 2mm) for external power supply (4.2-40)V DC
- Li-Po battery charger and connector
- Micro SD card
- RTC 32.768kHz with CR2032 battery connector
- Bootloader button
- Reset Button
- CAN driver and connector
- UEXT connector
- Arduino connectors
- Extra 16 pin GPIO connector
- 10-pin JTAG connector for programming and debugging

Product page:

https://www.olimex.com/Products/Duino/STM32/OLIMEXINO-STM32F3/open-source-hardware

Hardware schematic, revision C1

PWR1
PWR-JACK-UNI-MILLING

U1 BL9342
VIN BST
EN SW
GND FB

C4 100nF
L1
D4 SS14
R6 22R
C12 10uF_6.3V
+5V

D1 SS14
Patch
C2 100nF_50V
C1 4.7uF_50V
GND

D2 SS310
C7 10uF_6.3V
GND
PWR_FLAG

R3 20k/1%/0402
C5 47pF
R5 124K_1%
LED1
U2 KA4
BL4059B-42TPRN(SOT23-5)

R1
VBAT VCC
BATTERY
CHRG
CHARGER
PROG GND

C3 1uF_6.3V
FET1 WPM2015
D3 SS14

U4 ME6210-SOT89
Vi Vo
GND
+3.3V

C8 10uF_6.3V
C11 10uF_6.3V
C9 10uF_6.3V

R2 1.5K
GND

CON1
SJ1 closed
R4 120R
CANBUS

U3 SIT1050T
CANL VCC
CANH TXD
Vref RXD
GND S
+5V

C6 100nF
R7 330R/0402
R8 680R/0402

BAT_CON1
BAT_CON
+BATT

D24_CANTX
D14_CANRX

R35 10K
D21
SJ2
PB2

+3.3V +3.3VA +3.3VA PWR_FLAG

U5 STM32F303RCT6

C17 10uF_6.3V
BAT_HOLDER1 CR2016_32
SJ8 open
C13 100nF C14 100nF C16 100nF C18 10uF_6.3V
GND

VDDA PB0 D27 26
VSSA PB1 D28 27
VBAT PB2 28
VDD PB3 TDO_SWO 55
VDD PB4 TRST 56
VDD PB5 D4 57
VDD PB6 D5 58
VSS PB7 D9 59
VSS PB8 D14_CANRX 61
VSS PB9 D24_CANTX 62
PB10 D29_USART3TX 29
PB11 D30_USART3RX 30
PB12 D31_#SS2 33
PB13 D32_SCK2 34
PB14 D33_MISO2 35
PB15 D34_MOSI2 36

#RST PC0 D15_A0 8
BOOT0 PC1 D16_A1 9
PF4 PC2 D17_A2 10
PA0 D2 PC3 D18_A3 11
PA1 D3_LED2 PC4 D19_A4 24
PA2 D1_TXD2 PC5 D20_A5 25
PA3 D0_RXD2 PC6 D35 37
PA4 D10_#SS1 PC7 D36 38
PA5 D13_SCK1_LED1 PC8 D37 39
PA6 D12_MISO1 PC9 BOOT0 40
PA7 D11_MOSI1 PC10 D26 51
PA8 D6 PC11 USBDET 52
PA9 D7_I2C2_SCL PC12 DISC 53
PA10 D8_I2C2_SDA PC13 D21 2
PA11 USBD_N PC14 3
PA12 USBD_P PC15 4
PA13 TMS_SWDIO PF0 5
PA14 TCK_SWCLK PF1 6
PA15 TDI PD2 D25_MMCCS 54

+BATT
R23 1M_1%_0603
R24 3M_1%_0603
C20 100nF
GND

PWR_FLAG
+5V

CON3 SWD
TMS_SWDIO
TCK_SWCLK
TDO_SWO
TDI
RESET
SJ5 open TRST

RESET
+3.3V

SJ9
GNDA GND closed
VIN

PLATFORM1
STM32 MAPPLE PLATFORM
STM32-MAPPLE_Platform(2xPN1x8+2xPN1x6)

ANALOG
D15_A0 A0
D16_A1 A1
D17_A2 A2
D18_A3 A3
D19_A4 A4
D20_A5 A5

DIGITAL
D0_RXD2 D0
D1_TXD2 D1
D2 D2
D3_LED2 D3
D4 D4
D5 D5
D7_I2C2_SCL D7

DIGITAL
D8_I2C2_SDA D8
D9 D9
D10_#SS1 D10
D11_MOSI1 D11
D12_MISO1 D12
D13_SCK1_LED1 D13
D14_CANRX D14

POWER
#RST
3.3V
5.0V
GND
GND
VIN

C21 12pF
C22 12pF
Q1 32768_1206_12.5pF
D23 2D23E
SJ3 open
R25 1M
Q2 8M_HS49S_20pF
C23 22pF
C24 22pF
FET2

D13_SCK1_LED1 SJ6 closed R33 2K LED2 green GND
D3_LED2 SJ7 closed R34 2K LED3 yellow GND

GPIO1 BH16S
D23E 1 2 D24_CANTX
D25_MMCCS 3 4 D26
D27 5 6 D28
D29_USART3TX 7 8 D30_USART3RX
D31_#SS2 9 10 D32_SCK2
D33_MISO2 11 12 D34_MOSI2
D35 13 14 D36
D37 15 16

CON4 WAKE
D21 PC13 GND

MICRO_SD(TFC-WPAPR-08)
DAT2/RES
DAT1/RES
DAT0/DO
CLK/SCLK
VSS
VDD
CMD/DI
CD/DAT3/CS
MICRO_SD1

+3.3V
R9 100K
R10 100K
R11 100K
D33_MISO2
D32_SCK2
FB1 FB0603
D34_MOSI2
D25_MMCCS
R12 10K
R13 1M
C10 10uF_6.3V
PWR_FLAG
GND

+3.3V
R14 1K
R16 10K
SW1
SW2
C19 100nF
GND
R15 10K
R17 22R
SIDE_WTCM-TR(3x4)
GND

+3.3V
Q3 WPM2015
R20 1K
PF4
GND
R21 100K
R18 4.7K
CON2 UEXT
D29_USART3TX 3 4 D30_USART3RX
D7_I2C2_SCL 5 6 D8_I2C2_SDA
D12_MISO1 7 8 D11_MOSI1
D13_SCK1_LED1 9 10 D4
R22 4.7K
SJ4
D10_#SS1
DISC

+5V D5 SS14
GND R30 20K R31 10K
USBDET
USBD_N USBC_N
USBD_P USBC_P
R28 22R
R29 22R
R32 1.5K
DISC R26 1K
R27 100K
FET3 WPM2015
+3.3V
C25 100nF
GND

USB1 uiCRO
VBUS
D-
D+
ID
GND

Olimex Ltd
Sheet: /
File: OLIMEXINO-STM32F3_Rev_C1.sch
Title: OLIMEXINO-STM32F3
Size: A4   Date: 2022-03-14   Rev: C1
KiCad E.D.A. kicad (5.1.10)-1   Id: 1/1

Programming considerations

OLIMEXINO-STM32F3 can be programmed via a number of ways. It can be programmed via JTAG or SWD tool using its 10-pin JTAG connector; it can be programmed via the built-in USB or serial bootloader. A lot of software tools can be used. For simple programming and re-programming tasks maybe consider "STM32CubeProgrammer" stand-alone programmer software. For development work again a lot of software tools can be used depending on the goals and proficiency of the user. We would provide information about how you can program the board with Arduino IDE:

Arduino IDE installation

1. In Arduino IDE navigate to Files→ Preferences and in "Additional Boards Manager URLs" field add the following link:

https://github.com/stm32duino/BoardManagerFiles/raw/main/package_stmicroelectronics_index.json

as shown below:
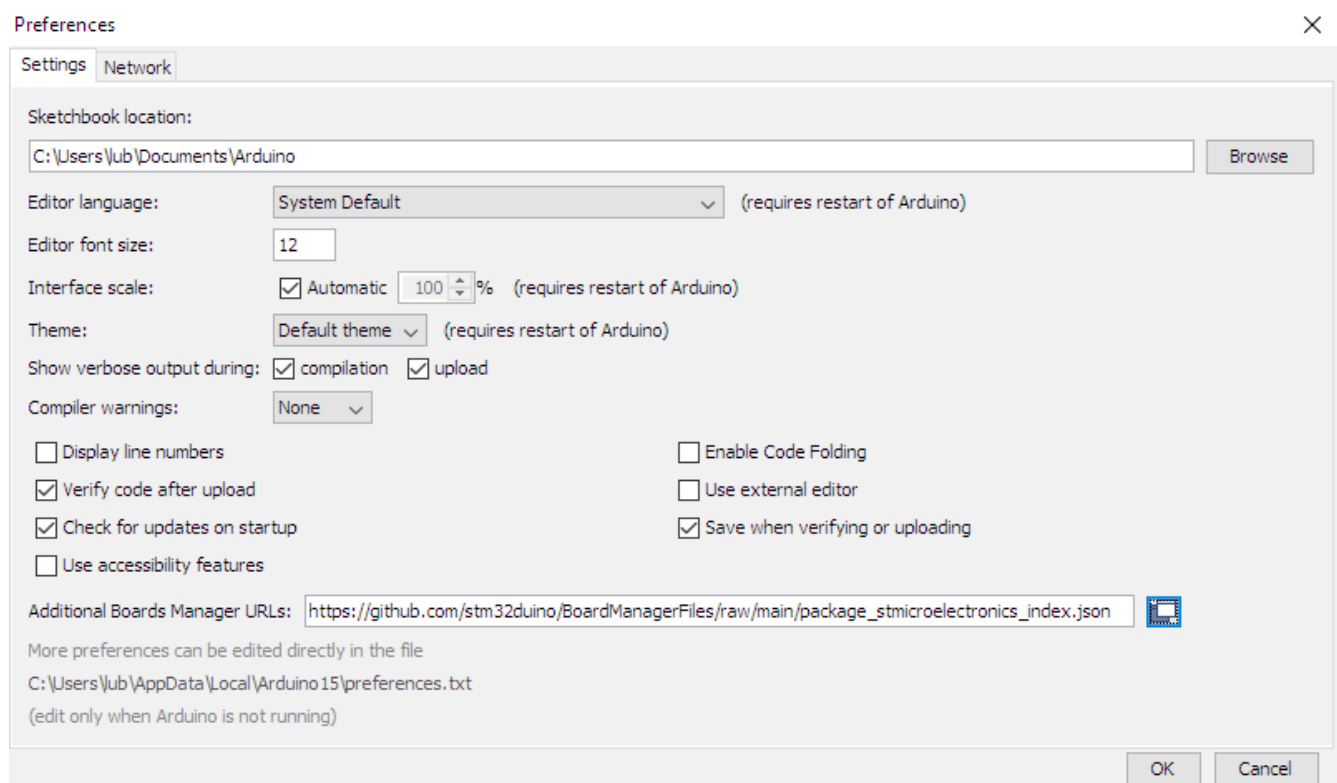
2. Then navigate to Tools→ Boards → Board Manager
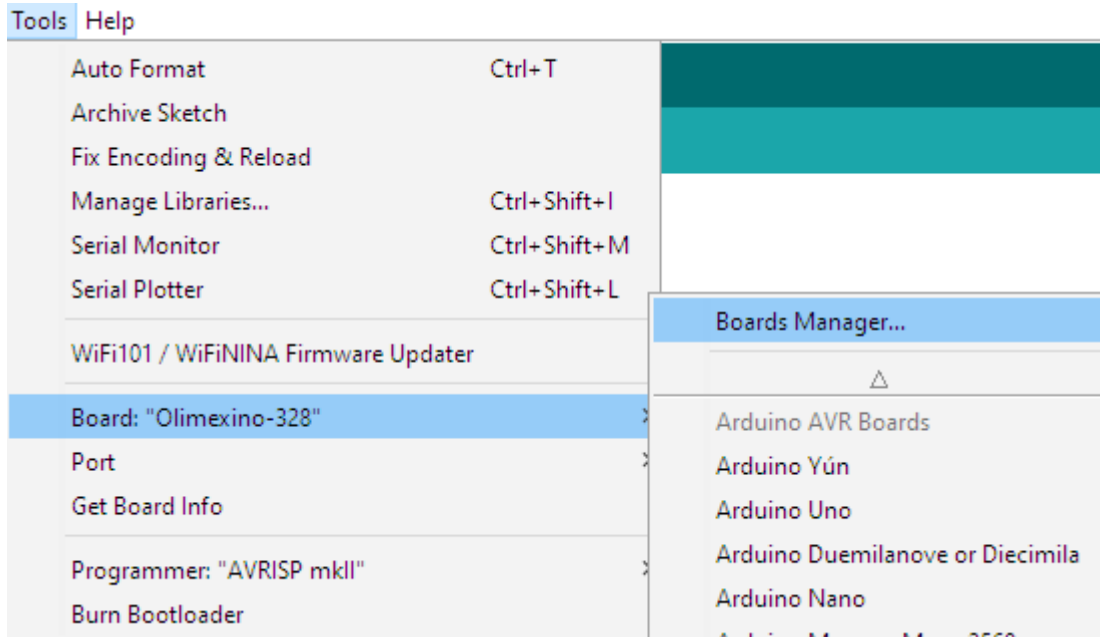
3. Type "stm32" to filter out the available packages then install the latest one made by STMicroelectronics. Wait until installations completes. It should look similar to this:
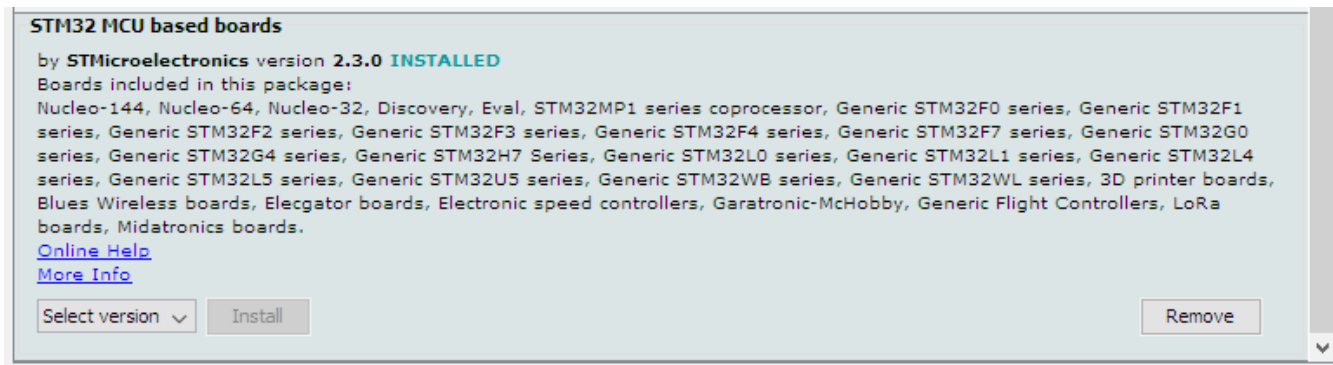
4. We want to upload the demo via USB DFU. And if you wish to upload via SWD, Serial, or DFU you need to install STM32 Cube Programmer – make sure to download and install it.

5. Restart Arduino IDE.

6. Now select the board. Under "Board" select "Generic STM32F3 series" and under "Board part number:" go for "OLIMEXINO-STM32F3". Under upload method remember to select DFU, which is the microUSB method (alternatively you can also serial method but that requires Serial-USB adapter attached to the GND, RX, TX pins at the UEXT connector). Follow the image below:
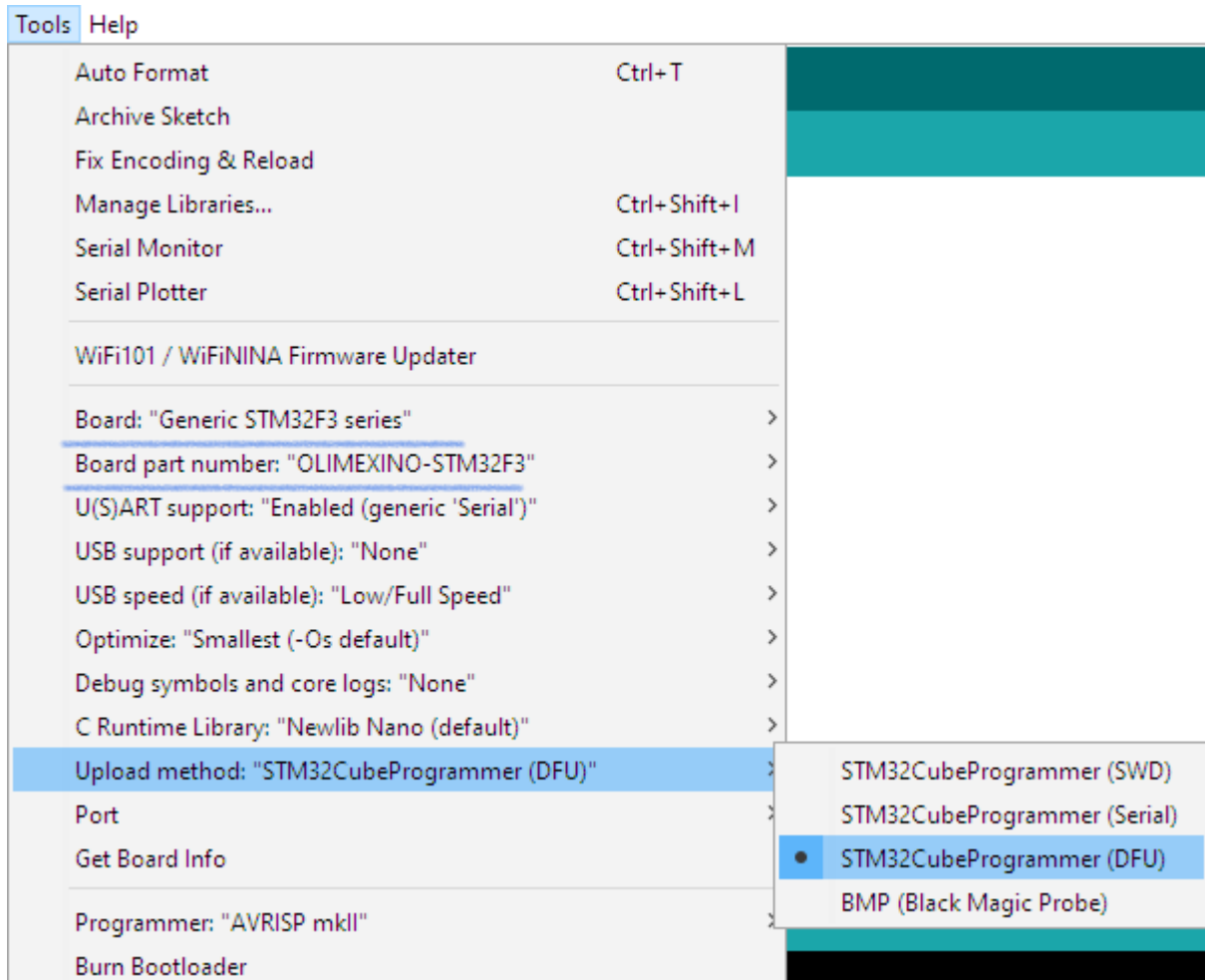
7. Put the board in USB DFU mode – this is done by button manipulation – press and hold down button SW1 then press and release button SW2, then release button SW1. The board should now be recognized as "STM32 bootloader".

8. Load one of the examples from File → Examples. Maybe Examples → 01.Basics → Blink. Click the upload button and wait until success.

If you encounter issues with the installation make sure to also check the official installation instructions:

https://github.com/stm32duino/wiki/wiki/Getting-Started

Software examples and libraries

You can find our work here:

https://github.com/OLIMEX/OLIMEXINO-STM32F3/tree/master/SOFTWARE

In GitHub software folder there are examples on how to use the GPIOs (LEDs and button), I2C, SPI (we provide new library for this as otherwise you couldn't use the micro SD card as original Arduino library support just one SPI), CAN, UART, SD-card, LCD3310.

There is also an example with MOD-LCD2.8RTP.

Document revision history

Revision 2.0 September 2022

- Updated installation instructions

- Updated schematic to latest one

- Minor spelling and design improvements

Revision 1.0 July 2020

- Initial release of the document