0.1 Hardware description

0.1.1 Board Nucleo STM32

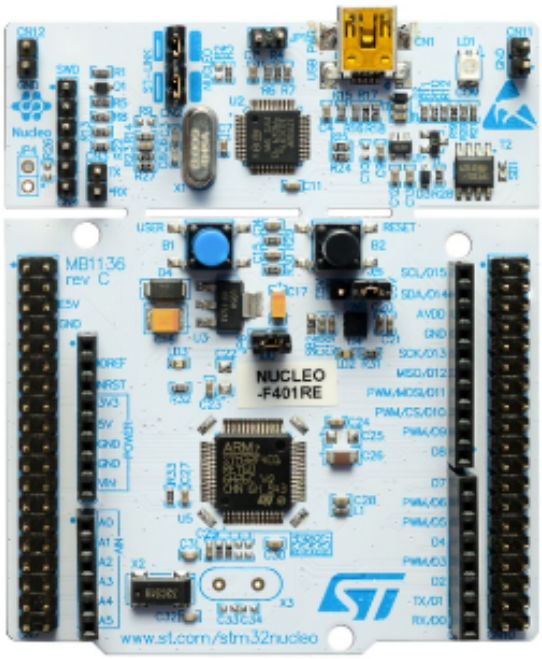

Figure 1: Board NUCLEO STM32F4 F466RE

- Specifications:
  - STM32 microcontroller with LQFP64 package.
  - Two types of extension resources
    - Arduino Uno Revision 3 connectivity
    - STMicroelectronics Morpho extension pin headers for full access to all STM32 I/Os
  - On-board ST-LINK/V2-1 debugger/programmer with SWD connector
    - selection-mode switch to use the kit as a standalone ST-LINK/V2-1
  - Flexible board power supply
    - USB VBUS or external source (3.3V, 5V, 7-12V)
    - Power management access point
  - Three LEDs
    - USB communication (LD1), user LED (LD2), power LED (LD3)
  - Two push buttons: USER and RESET
  - USB re-enumeration capability: three different interfaces supported on USB
    - Virtual Com port
    - Mass storage
    - Debug port

  - Supported by wide choice of Integrated Development Environments (IDEs) including IAR^{TM}, $Keil$®, GCC-based IDEs

- Purpose:

0.1.2 Camera OV7670

Figure 2: Camera OV7670 no FIFO

- Specifications:
  - Photosensitive Array: 640x480
  - IO Voltage: 2.5V to 3.0V
  - Operating Power: 60mW/15fps
  - Sleeping Mode: $<20\mu$A
  - Operating Temperature: -30 to 70 deg C
  - Output Format: YUV/YCbCr4:2:2 RGB565/555/444 GRB4:2:2 Raw RGB Data (8 digit)
  - Lens Size: 1/6"
  - Vision Angle: 25 degree
  - Max Frame Rate: 30fps VGA
  - Sensitivity: 1.3V / (lux-sec)
  - Signal to Noise Ratio: 46dB
  - DynamicRange: 52dB
  - Browse Mode: By row
  - Electronic Exposure: 1 to 510 row

- Pixel Coverage: 3.6μm x 3.6μm
- Duck Current: 12mV/s at 60 deg C
- PCB Size (L x W): Approx. 1.4x1.4inch / 3.5x3.5cm

0.1.3 Uart to MicroUSB CP2102

Figure 3: UART to MicroUSB CP2102

- Features:
  - Embedded USB transceiver, no external circuit device
  - Containing clock circuit, no external circuit device
  - Contains power-on reset circuit
  - The on-chip voltage regulator within the 3.3V output
  - Meet the USB2.0 specification requirements
  - SUSPEND pins support USB suspend state
  - Asynchronous serial data bus compatible with all handshakes and modulation controller interface signals
  - Support data format is 8 data bits, 1 stop bit and the parity bit
  - Connotation 512 byte receive buffer and 512 byte transmit buffer
  - Supports hardware or X-ON / X-OFF Handshake
  - Size: 21x16mm