



Digitálne zbernice v praxi

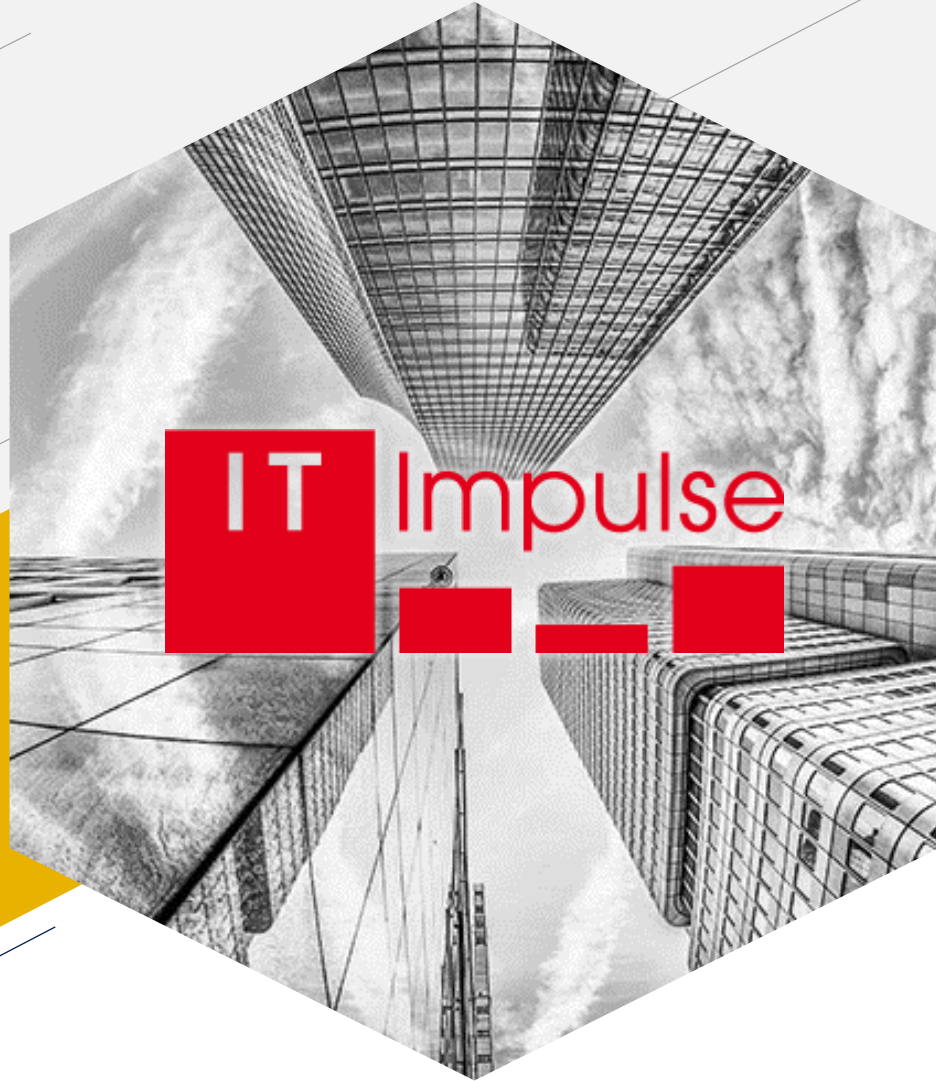
Ing. Marek Petrinec

Boldburg s.r.o. / IT Impulse s.r.o.



**Where is Arduino?
Who is Raspberry?
Why is IoT?**

BTW have you seen Gamora?



What the ... Zbernica is?

I²C,SPI,UART,I²S,Analog,CAN,R/(G)MII,USB,
Parallel,JTAG,Timer...

Kto je Master a kto Padawan?

Kto bude hore a kto dole?

Hlúpe zariadenia

- Senzory
 - Teplota
 - Prúd
 - Napätie
 - Talk
 - Poloha
 - Audio
 - ...

Inteligentné zariadenia

- Mikroprocesor
- PC
- Čokoľvek, čo môže iniciovať komunikáciu

Čiara, Kruh, Hviezda

Ako to pozapájať?

Počet zariadení v sieti

Point-to-Point

- Usart/Uart *
- USB
- R/(G)MII (Ethernet) *
- I²S

Master-Slave

- I²C
- TDM
- SPI
- 1-Wire

Multi-Master

- CAN
- I²C
- PM-Bus

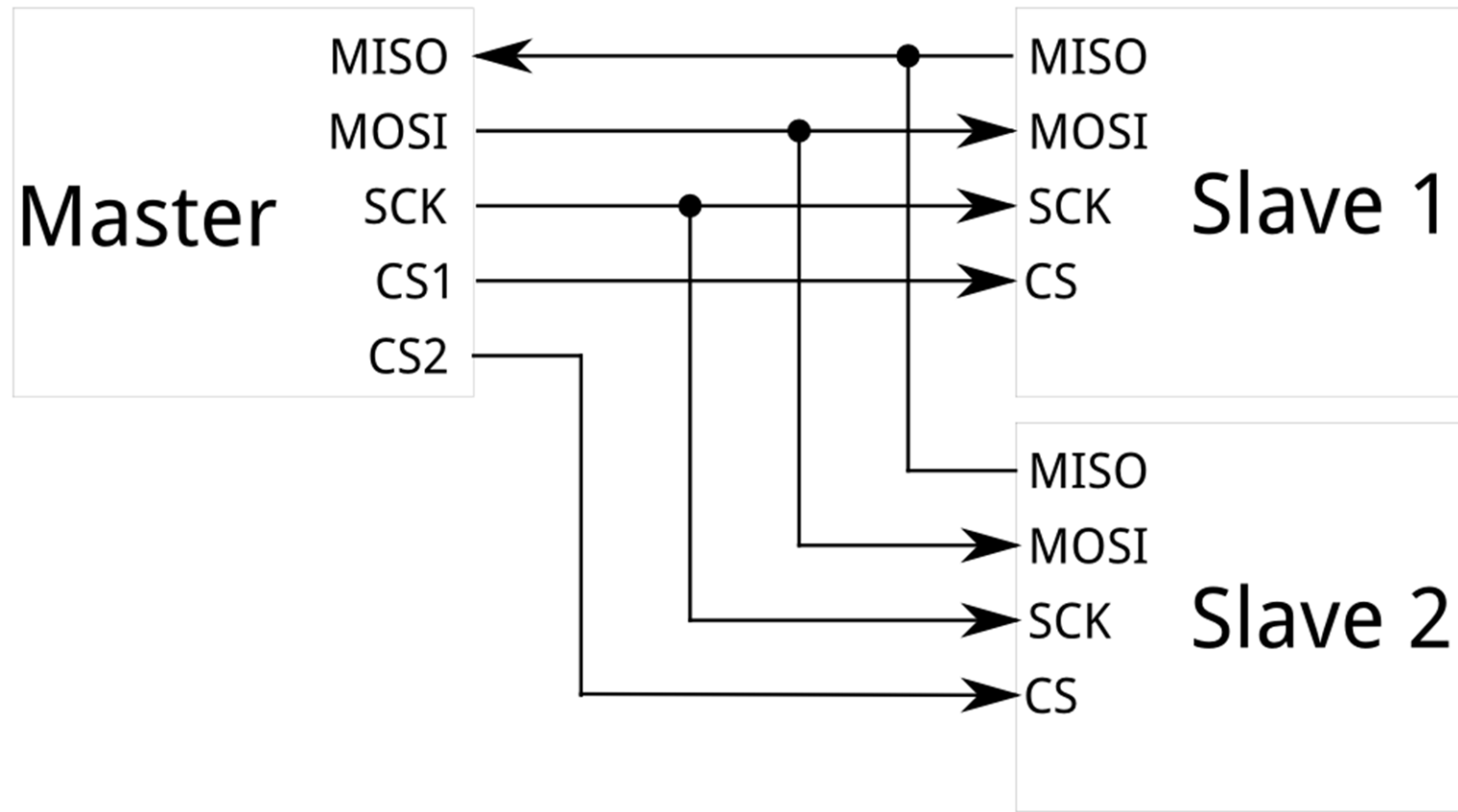
UART/USART

Universal Synchronous/Asynchronous Receiver-Transmitter



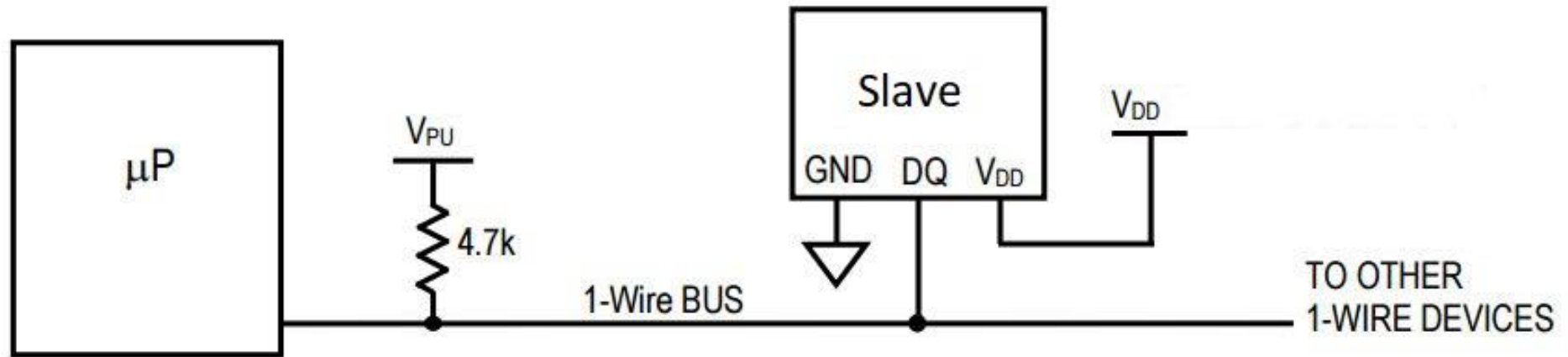
SPI

Serial Peripheral Interface



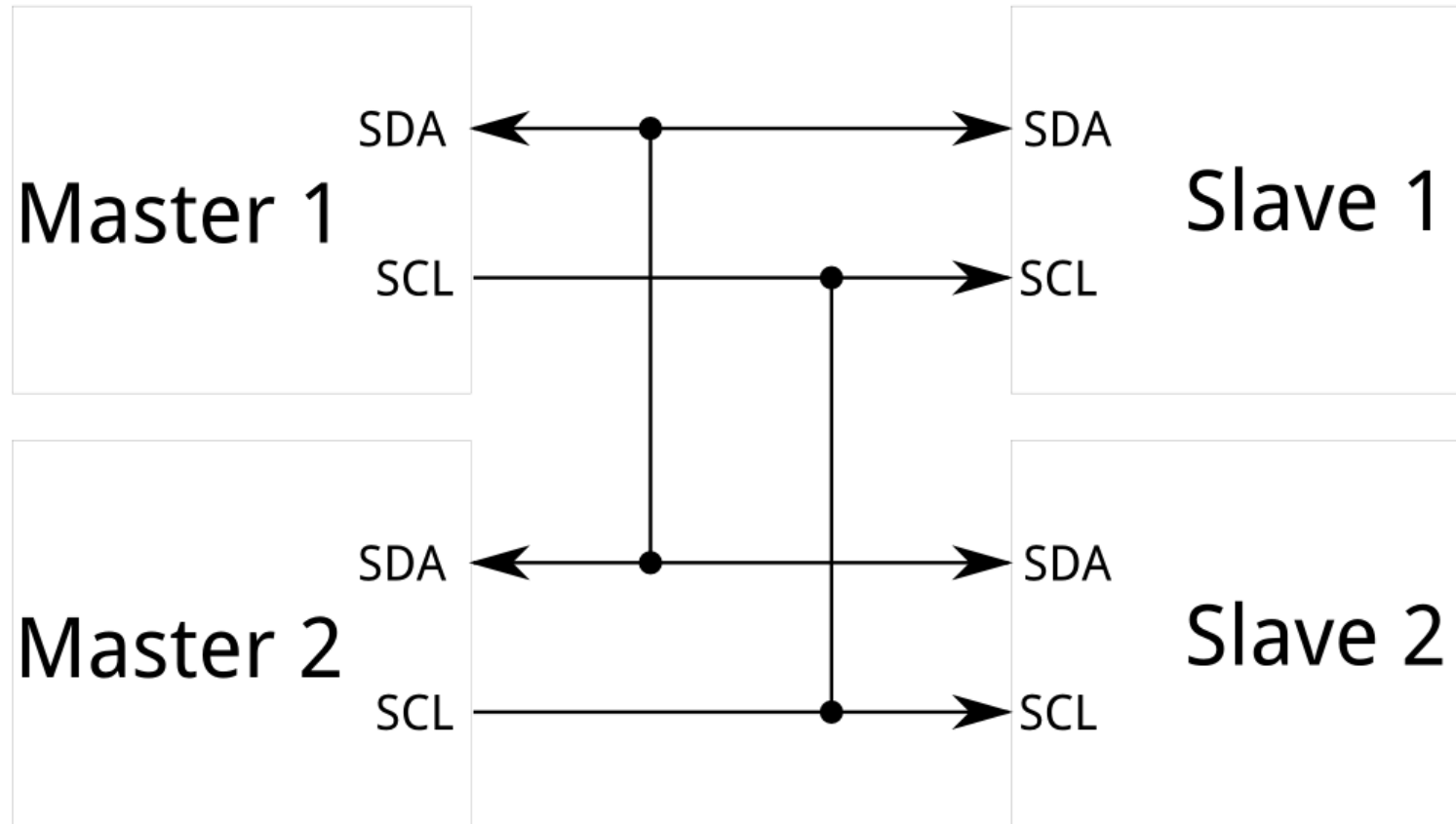
1-Wire

Serial Peripheral Interface



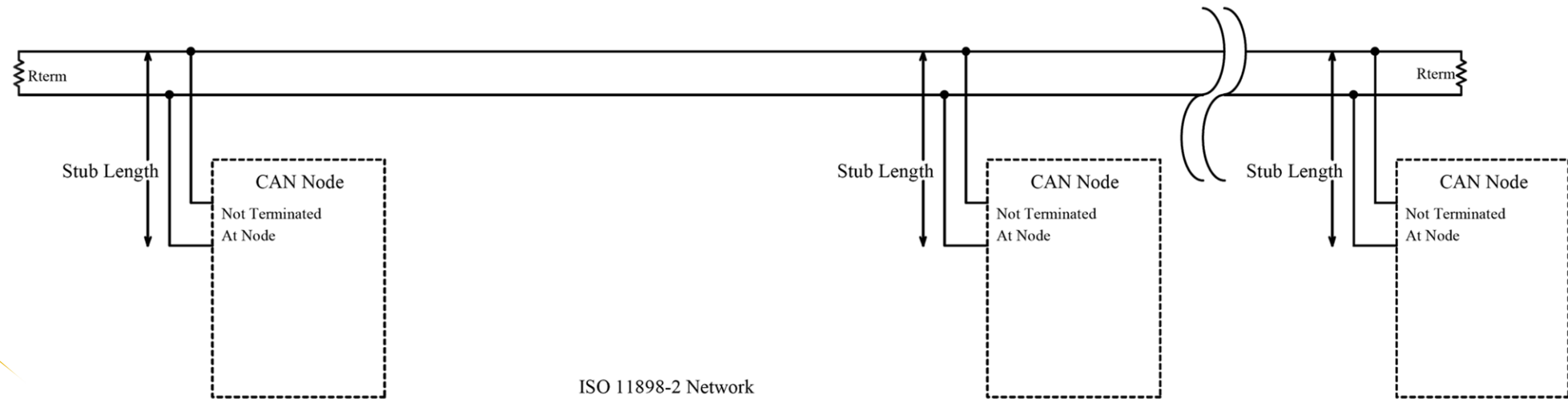
I²C

Inter-Integrated Circuit



CAN Bus

Controller Area Network



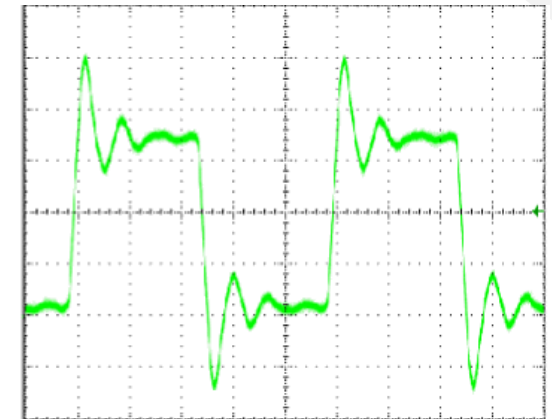
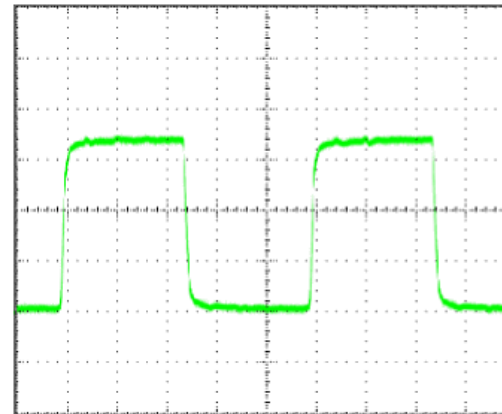
Vzdialenosť zariadení

Keď na dĺžke záleží.

Čo je fyzika?

- UART VS. RS-232 (RS-422, RS-485...)
 - Napätová úroveň CMOS / $\pm 15V$ (Pre RS-232)
 - Kapacita, Impedancia, Odpor
 - Single-Ended / Diferential
 - Data rate

Fyzika v praxi



Hodiny (minúty, sekundy)

Kde, kedy, ako a prečo

- Prečo: ???
- Kde: vnútri/vonku
- Kedy: nonstop/synchro-okno
- Ako: jednosmerne/obojsmerne



Thank You.



Ing. Marek Petríneč



+421 940 600 384



marek@boldburg.com



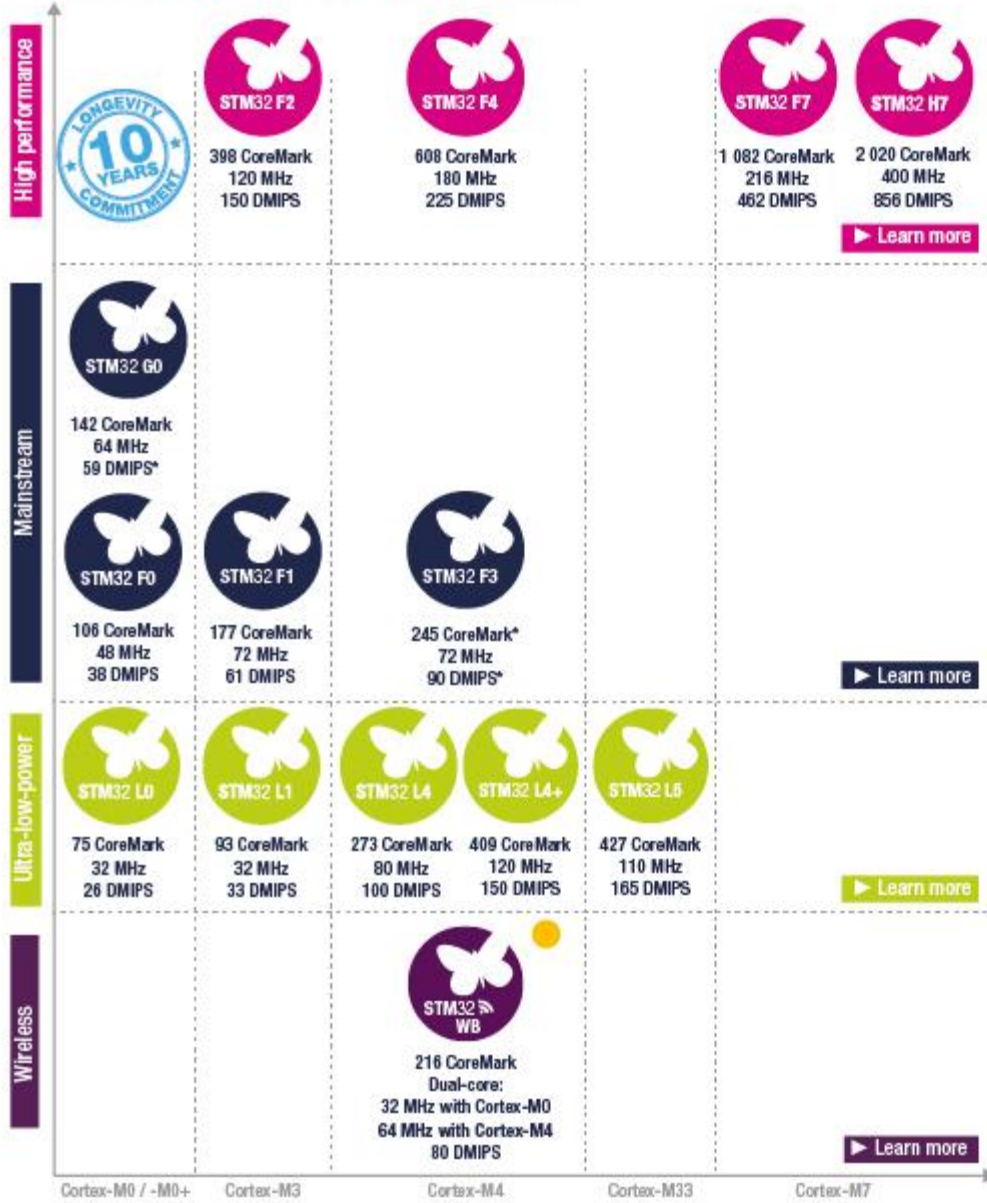
www.boldburg.com



STM32

ST-Microelectronics

STM32 32-bit ARM Cortex MCUs



Legend: *from CCM-SRAM Cortex-M0+ Radio Co-processor

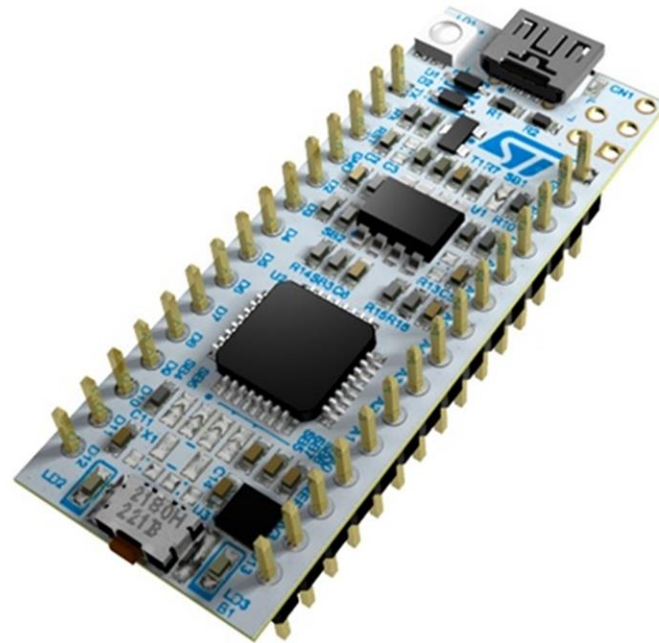
STM32 Ecosystem

- Software tools**
 - STM32CubeMX Configuration and initialization tool
 - Integrated Development Environments (IDE)
 - STM Studio Monitoring tool
 - [▶ More software tools](#)
- Embedded software**
 - STM32Cube MCU Packages
 - STM32Cube Expansion Packages
 - [▶ More embedded software](#)
- Hardware tools**
 - STM32 Nucleo development boards, Discovery kits, Evaluation boards
 - STM32 Nucleo expansion boards
 - ST-LINK in-circuit debugger/programmer
- Join the STM32 Community!**
community.st.com/stm32

STM32L-series

Ultra-low-power 32-bit MCUs

- DMA
- CORTEX-M3/M4
- Analógové periférie
 - ADC
 - DAC
 - OPAMP+PGA
 - COMP



STM32F-series

STM32F4 series of high-performance MCUs with DSP and FPU instructions

- DMA
- CORTEX-M3/M4
- 180Mhz
- Ethernet
- SDRAM Interface

