STM32 development boards portfolio

Ecosystem Marketing
Q2’2021
Development tools overview

STM32 Nucleo
Flexible prototyping
www.st.com/stm32nucleo

Discovery kits
Key feature prototyping
www.st.com/stm32discovery

Evaluation boards
Full feature evaluation
www.st.com/stm32evaltools

STM32 Nucleo expansion
Functionality add-on
www.st.com/x-nucleo

Third-party boards
From full evaluation to open hardware

Move Actuate
Connect
Power Drive
Sense
Translate
STM32 Nucleo key assets

Flexible prototyping

Unlimited expansion capabilities

Simply show the whole STM32 portfolio to the communities
## STM32 Nucleo form-factor choices

<table>
<thead>
<tr>
<th></th>
<th>Nucleo-32 32-pin MCU</th>
<th>Nucleo-64 64-pin MCU</th>
<th>Nucleo-144 144-pin MCU</th>
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<tbody>
<tr>
<td>Ethernet</td>
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<tr>
<td>USB</td>
<td>***</td>
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<tr>
<td>ST Zio (Uno extended)</td>
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<tr>
<td>Arduino Uno</td>
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<tr>
<td>ST morpho</td>
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<tr>
<td>Arduino Nano</td>
<td>*</td>
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</table>
STM32 Nucleo-144 structure

Flexible board power supply:
through USB or external source

Integrated STLink:
drag & drop device Flash programming

One STM32 MCU flavor with 144 pins

Arduino Uno & ST Zio connectors:
easy access to add-ons

ST morpho extension pins:
direct access to all MCU I/Os

Ethernet & USB OTG (optional)
Amazing STM32 Nucleo boards

Stretching boundaries

STM32H7 Nucleo-144
STM32L4 Nucleo-32

NUCLEO-H745ZI-Q
High performance
STM32H745 dual-core
CoreMark 3223

NUCLEO-L412KB
Lower power
STM32L412
ULPMark-CP 447
ULPMark-PP 167
STM32 Nucleo portfolio

A broad range of

- **Performance**
- **Peripherals**
- **Power**
- **Price**

www.st.com/stm32nucleo
Association with shields

Specialized functionality add-on

Smooth integration with STM32Cube software library

Multiple IDEs (STM32CubeIDE, IAR, Arm®…)

Sense
Power
Interact
Connect
Move
Nucleo expansion boards from ST

**Sensors and analog**

- X-NUCLEO-IKS02A1: MOTION AND ENVIRONMENTAL SENSORS
- X-NUCLEO-53L3A2: PROXIMITY SENSOR
- X-NUCLEO-CCA02M2: DIGITAL MICROPHONE
- X-NUCLEO-AMICAM1: ANALOG MICROPHONE
- X-NUCLEO-USBPDM1: USB TYPE-C
- X-NUCLEO-SAFEA1: SECURE ELEMENT

**Communication**

- X-NUCLEO-NFC04A1: DYNAMIC NFC TAG
- X-NUCLEO-NFC06A1: NFC CARD READER
- X-NUCLEO-PLM01A1: POWER LINE COMMUNICATION
- X-NUCLEO-GNSS1A1: ASSISTED GNSS
- X-NUCLEO-GNSS1A1: DIGITAL MICROPHONE
- X-NUCLEO-USBPDM1: USB TYPE-C
- X-NUCLEO-SAFEA1: SECURE ELEMENT

**Motor drive**

- X-NUCLEO-IHM01A1: STEPPER MOTOR DRIVER
- X-NUCLEO-IHM02A1: TWO AXIS STEPPER MOTOR DRIVER
- X-NUCLEO-IHM03A1: HIGH POWER STEPPER MOTOR DRIVER
- X-NUCLEO-IHM04A1: DUAL BRUSH DC MOTOR DRIVER
- X-NUCLEO-IHM05A1: BIPOLAR STEPPER MOTOR DRIVER
- X-NUCLEO-IHM06A1: LOW VOLTAGE STEPPER MOTOR DRIVER
- X-NUCLEO-IHM07A1: STEPPER MOTOR DRIVER
- X-NUCLEO-IHM16A1: THREE-PHASE BRUSHLESS MOTOR DRIVER

**Translate**

- X-NUCLEO-ICA01A1: MULTIFUNCTIONAL EXPANSION BASED ON OPERATIONAL AMPLIFIERS
- X-NUCLEO-CCA01M2: SOUND TERMINAL
- X-NUCLEO-LED61A1: LED DRIVER
- X-NUCLEO-GFX01M1: GRAPHICAL DISPLAY

More references at: [www.st.com/x-nucleo](http://www.st.com/x-nucleo)
STM32 power shield key assets

Accurate power profiling

- Ultra-low power consumption measurements
- Compatible with all Nucleo form factors (32 / 64 / 144)
- Graphical analysis with STM32CubeMonitor-Power tool
- Custom test sessions with scripting
- Reference tool for EEMBC ULPMark benchmark
STM32 power shield anatomy

- Power supply through USB
- STM32L496VGT6 MCU @ 80 MHz
- 3 x 12-bit ADC @ 3.2 Msamples/s
- Arduino connectors compatible with Nucleo-32, 64 & 144 boards
- 4-wire connector for any type of target board
- Local display: EEMBC ULPBench score

More information at: www.st.com/xnucleo
X-NUCLEO-LPM01A

- Ultra-low-power consumption measurements:
  - Supply target board from 1.8 to 3.3V
  - Dynamic current from 100 nA to 50 mA
  - Static current from 1 nA to 200 mA
  - Accuracy approximately 2%

- Intuitive user experience:
  - Two operating modes (stand-alone or PC-controlled)
  - Graphical PC application (reference: STM32CubeMonPwr)

- Resale price (RRP) $70

- Official EEMBC Energy Monitor v2.0:
  - Direct computation of ULPMark scores
Nucleo expansion boards from 3rd parties

**LoRaWAN communication**
- Frequency range from 868 to 930 MHz
- LoRaWAN-compliant protocol stack

**Industrial Ethernet protocols**
- PROFINET®, Ethernet/IP™, EtherCAT,
- POWERLINK, Sercos®, and Modbus®

More information at:
www.st.com/stm32evaltools
Nucleo boards for wireless communication

**LoRaWAN node & gateway**
LRWAN2 frequency > 800 MHz, LRWAN3 frequency < 500 MHz, LoRaWAN-compliant protocol stack

**Multiprotocol RF transceiver**
Bluetooth™ 5.2 and IEEE 802.15.4-2011 compliant

**Long Range wireless node**
Frequency range 150-960 MHz
LoRa, (G)FSK, (G)MSK, BPSK modulations
LoRaWAN, Sigfox-compliant protocol stack
Latest discovery kits

STM32WB5MM-DK
B-U585IOT02A
B-L462E-CELL1
B-L072Z-LRWAN1
STM32G0316-DISCO
B-G474E-DPOW1
STM32H735G-DK
STM32MP157F-DK2
<table>
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<tr>
<th>Part number</th>
<th>MCU</th>
<th>USB</th>
<th>Audio</th>
<th>Display</th>
<th>Connectivity</th>
<th>Expansion</th>
<th>STLink</th>
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<td>Expansion</td>
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## Discovery kit portfolio 4/5

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<th>Part number</th>
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<th>Connectivity</th>
<th>Expansion</th>
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<td>OTG</td>
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<td>Color LCD 480x272</td>
<td>Ethernet</td>
<td>Arduino Uno, STMod+, Mikrobus, Grove</td>
<td>V3</td>
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<td>STM32WB5MM</td>
<td>OTG</td>
<td>x</td>
<td>OLED 128x64</td>
<td>BLE v5.2, Zigbee, Thread</td>
<td>Arduino Uno, STMod+, Mikrobus, Grove</td>
<td>V2-1</td>
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</table>

More information at: [www.st.com/stm32discovery](http://www.st.com/stm32discovery)
## Discovery kit portfolio 5/5

<table>
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<tr>
<th>Part number</th>
<th>MCU</th>
<th>Description</th>
<th>Key features</th>
<th>Expansion</th>
<th>STLink</th>
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<tbody>
<tr>
<td>B-L072Z-LRWAN1</td>
<td>STM32L072</td>
<td>All-in-one low-power wireless node</td>
<td>LoRa, Sigfox, WMbus AAA-battery operation</td>
<td>Arduino Uno, ST morpho</td>
<td>V2-1</td>
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<tr>
<td>B-L4S5I-IOT01A</td>
<td>STM32L4S5</td>
<td>All-in-one IoT node with low-power connectivity &amp; multiway sensing</td>
<td>BLE, NFC, Wi-Fi, Sensors (digital microphone, 9-axis navigation, pressure, humidity, temperature, proximity / gesture detection)</td>
<td>Arduino Uno, Pmod</td>
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<td>B-U585I-IOT02A</td>
<td>STM32U585</td>
<td>All-in-one IoT node with low-power connectivity &amp; multiway sensing</td>
<td>BLE, Wi-Fi, Sensors (digital microphone, 9-axis navigation, pressure, humidity, temperature, proximity / gesture detection)</td>
<td>Arduino Uno, Pmod, STM++, MikroBus, Grove</td>
<td>V3</td>
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<tr>
<td>B-L462E-CELL1</td>
<td>STM32L462</td>
<td>Worldwide Cellular IoT node LTE catM / NB-IoT</td>
<td>eSIM and MicroSIM, 3-month dataplan included</td>
<td>STmod+, MikroBus, Grove</td>
<td>V2-1</td>
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</table>

**LoRa**

**sigfox**

**X-CUBE-LRWAN**

LoRaWAN-compliant software expansion for STM32Cube

**X-CUBE-SFOX**

Sigfox-compliant software expansion for STM32Cube

**X-CUBE-CLOUD**

Cloud connectors as expansion for STM32Cube (Amazon Web Services, Microsoft Azure, IBM Watson)

**X-CUBE-CELLULAR**

Cellular software framework as expansion for STM32Cube.

More information at: [www.st.com/stm32app-discovery](http://www.st.com/stm32app-discovery)
STM32L5 discovery IoT node…

Multi-link communication, multiway sensing

- PMOD extension connector
- Gyro/Accelerometer/Magnetometer, Proximity, Pressure, Humidity, Temperature sensors
- STMOD+ extension connector
- Audio mics
- BLE module (WB5MM)
- Integrated STLink: drag & drop Flash programming
- Wi-Fi module
- STM32L475 MCU
- Arduino Uno extension connectors
- USB Type-C connector

B-U585I-IOT02A
...Delivers user-friendly cloud access

- Direct connection to cloud services
- Low-power communication
- Environmental awareness: humidity, pressure, temp
- Detection hub: motion, proximity, audio
- Direct support of communities
Latest evaluation boards

STM32G081B-EVAL
STM32G474E-EVAL
STM32H757I-EVAL
STM32L552E-EV
# Evaluation board portfolio

The table below lists the evaluation boards for different MCU families, categorized by performance:

## Mainstream

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<td>STM3210E-EVAL</td>
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<td>STM32G0C1</td>
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<td>STM3240G-EVAL</td>
<td>STM32H7B3</td>
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<td>STM32474E-EVAL</td>
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## Ultra-low-power

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## High-performance

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More information at: [www.st.com/stm32evaltools](http://www.st.com/stm32evaltools)
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