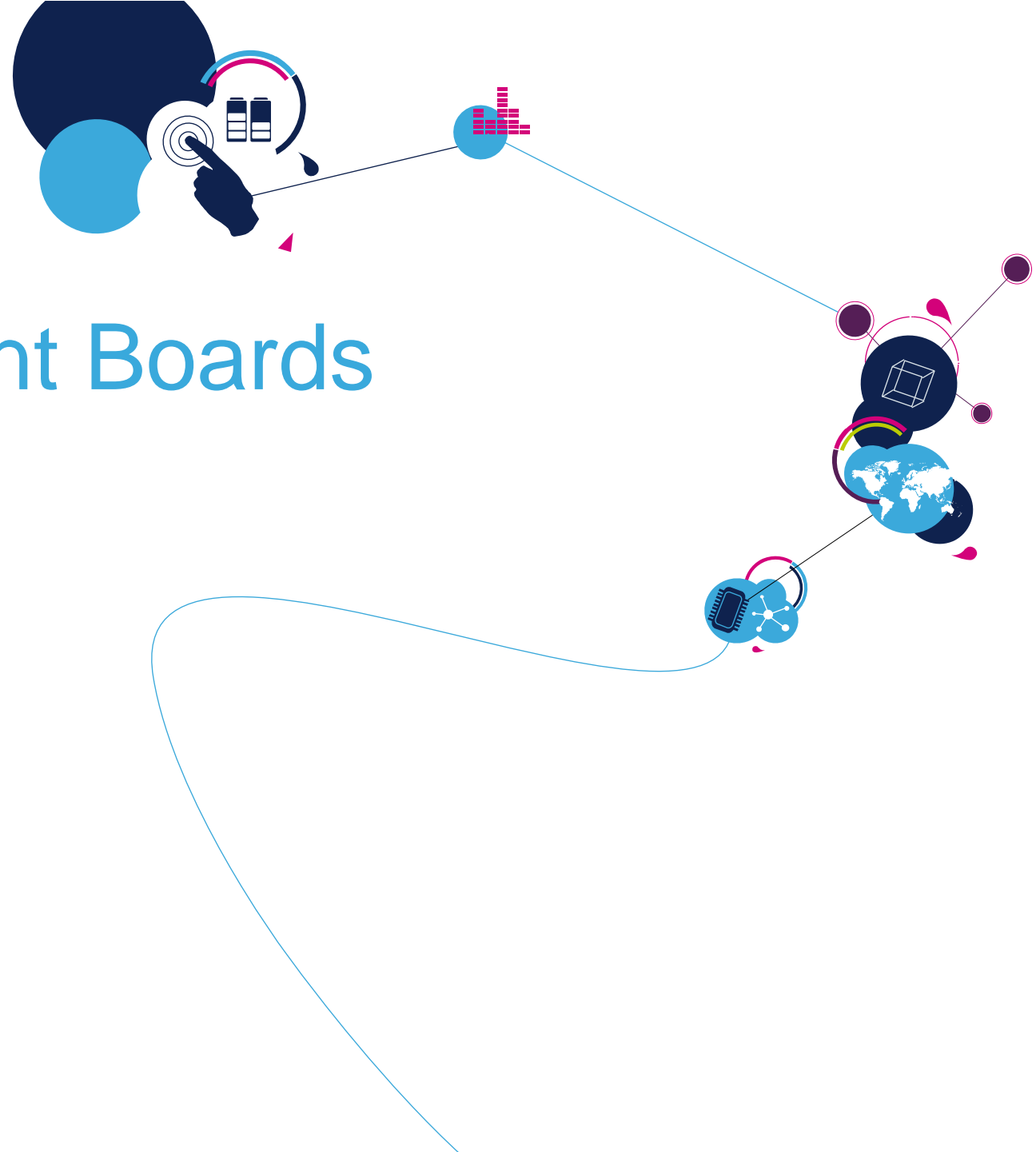


STM32 Development Boards Portfolio

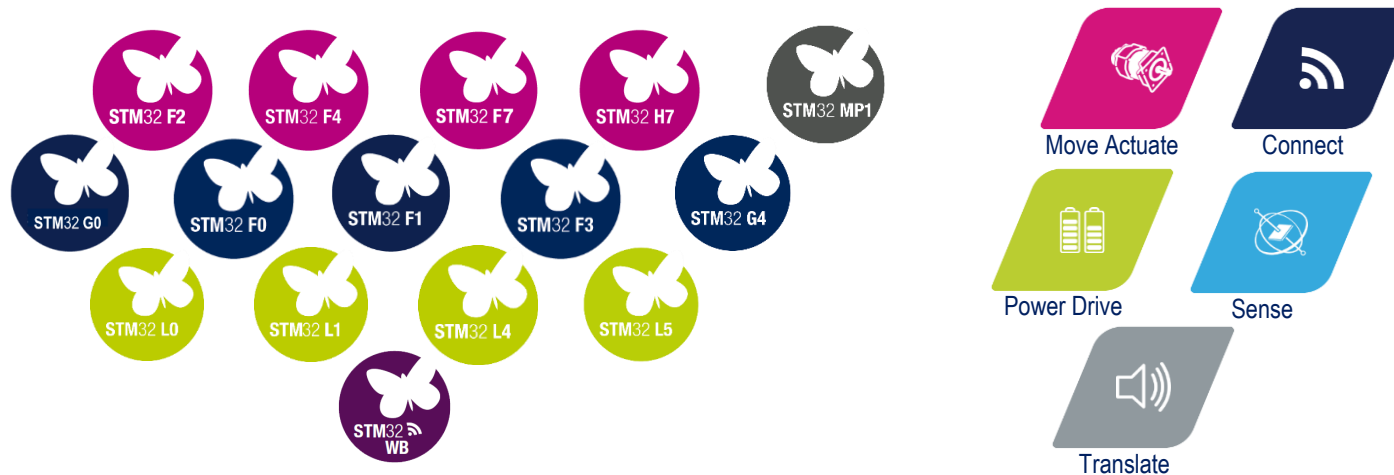
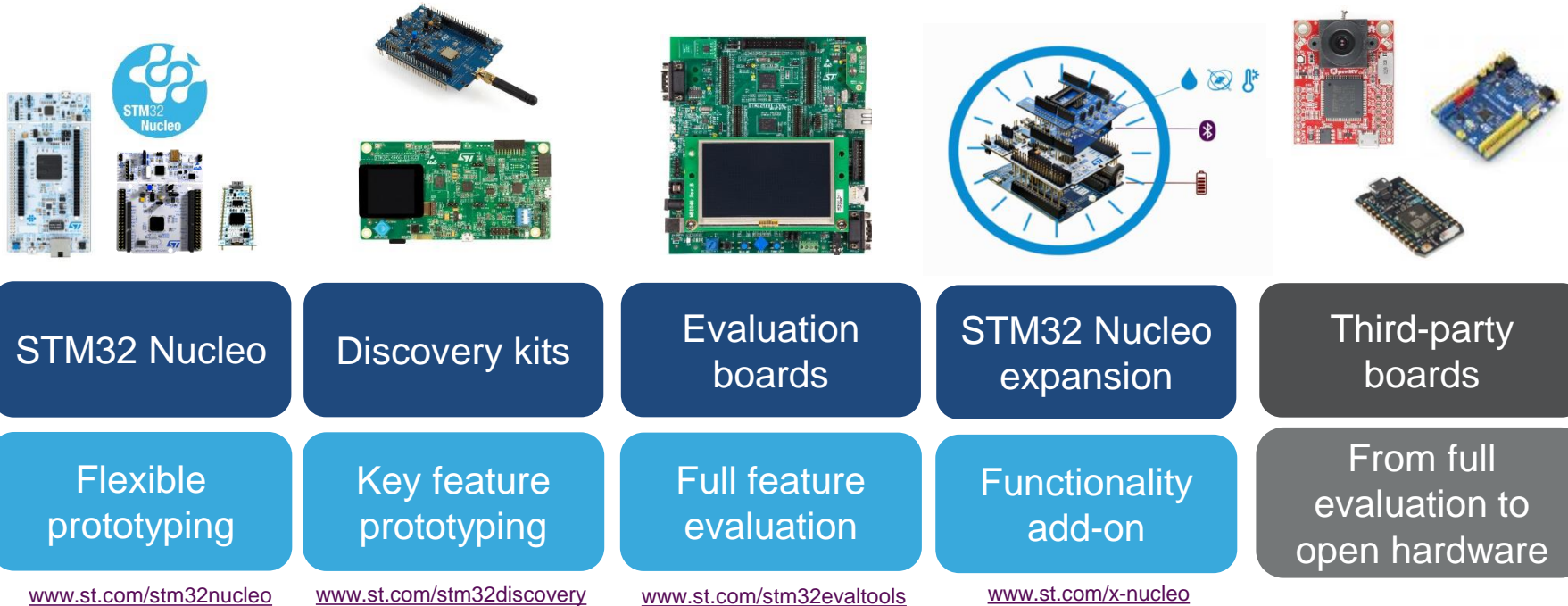
Ecosystem Marketing

Q4'2019



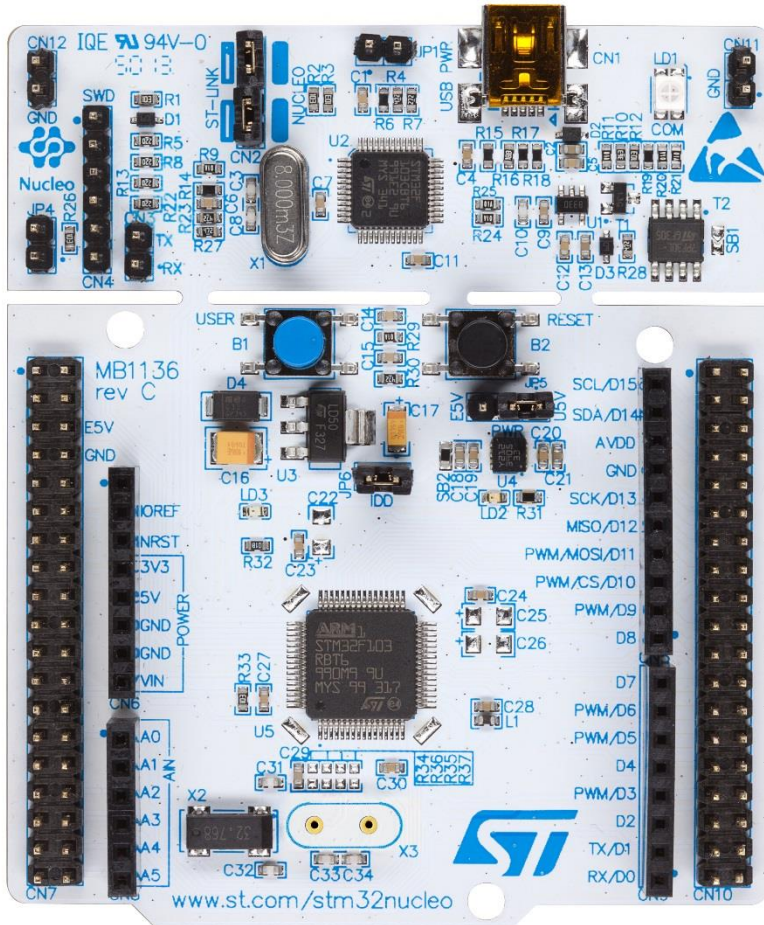
Development tools overview

2



STM32 Nucleo key assets

3



Flexible prototyping

Unlimited expansion capabilities

Simply show the whole STM32 portfolio to the communities





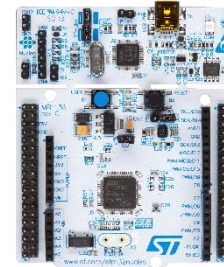
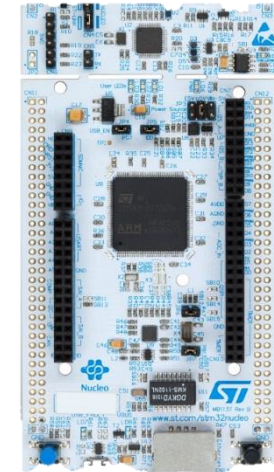
STM32 Nucleo form choices

4

Ethernet	***	
USB	***	
ST Zio (Uno extended)	***	
Arduino Uno ST morpho	**	**
Arduino Nano	*	
Nucleo-32 32-pin MCU		Nucleo-64 64-pin MCU
		Nucleo-144 144-pin MCU

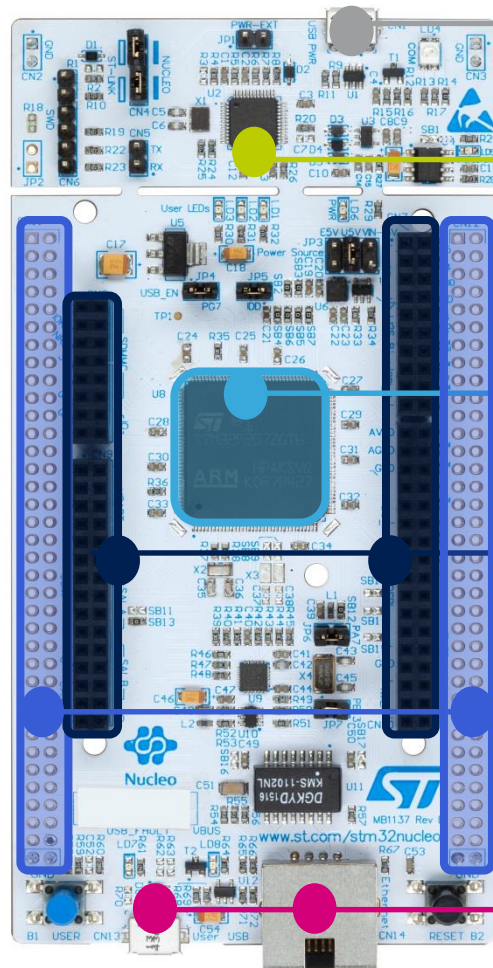


(on selected MCU configurations)



STM32 Nucleo-144 structure

5



Flexible board power supply:
through USB or external source

Integrated STLink v2-1:
drag & drop device Flash programming

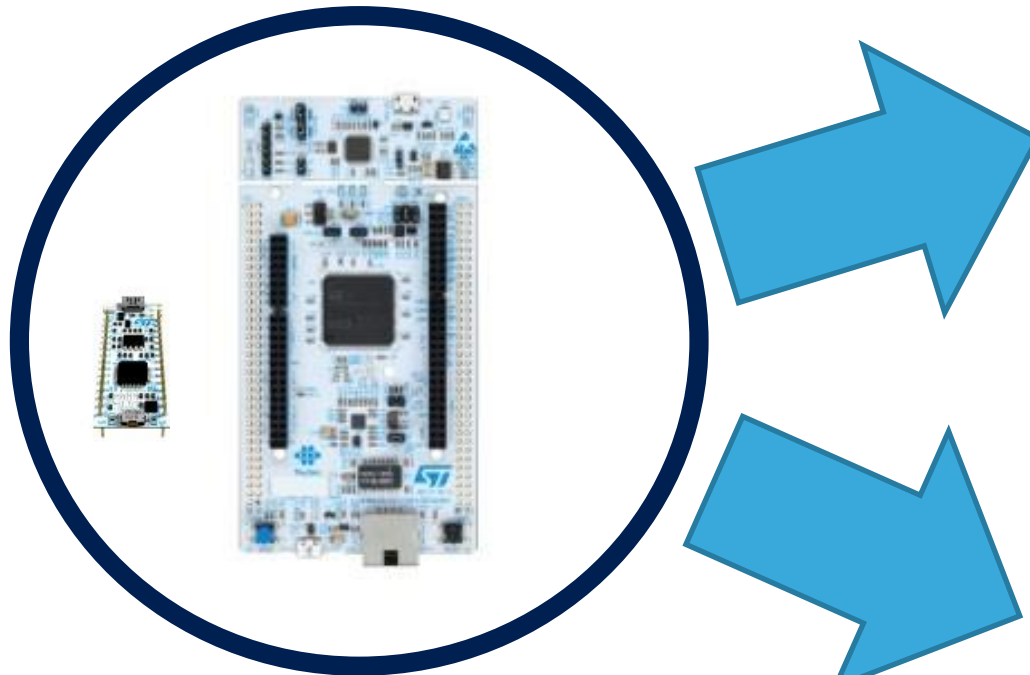
One STM32 MCU flavor with 144 pins

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)

Stretching boundaries



STM32H7 Nucleo-144
STM32L4 Nucleo-32

NUCLEO-H745ZI-Q

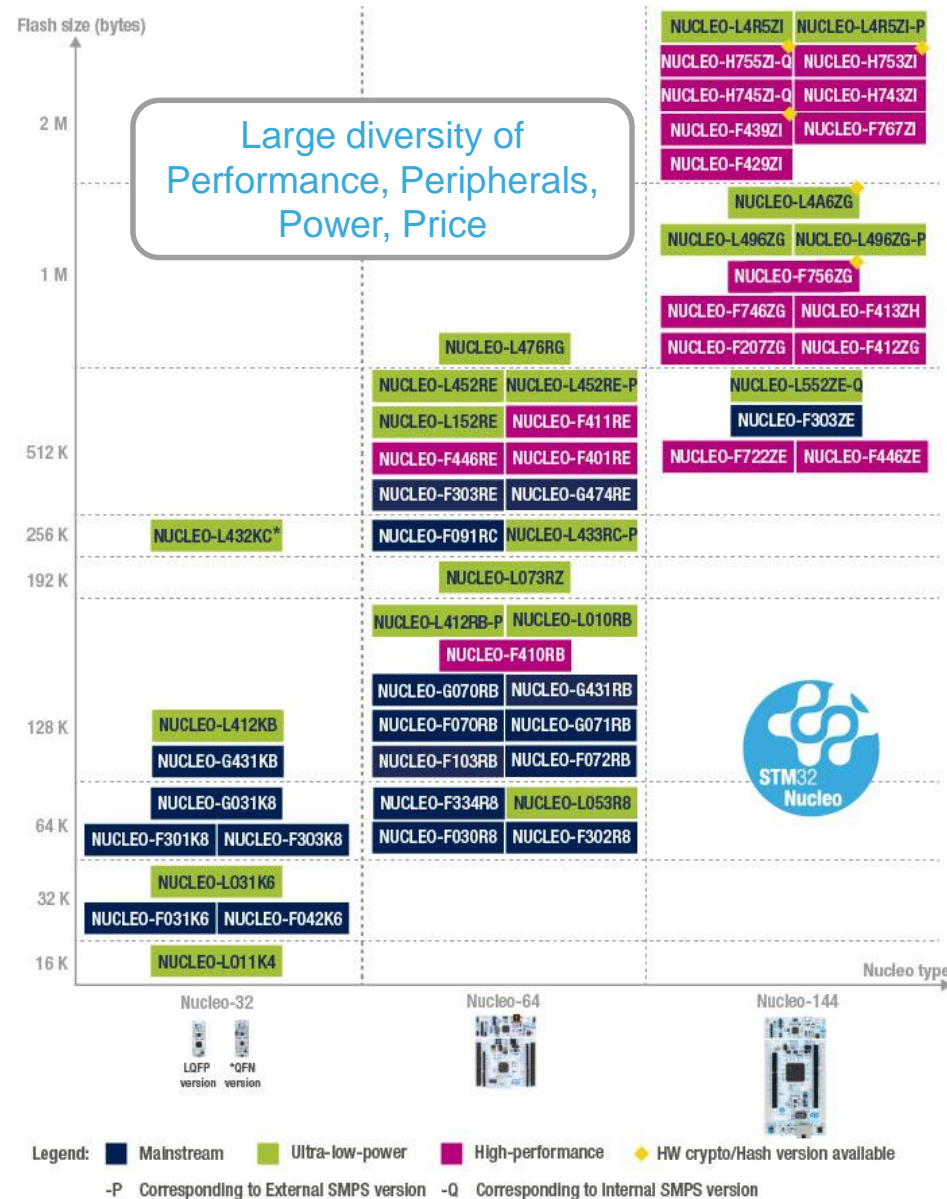
Higher performance
STM32H745 dual-core
CoreMark 3220
Price 29\$

NUCLEO-L412KB

Lower power
STM32L412
ULPMark-CP 447
Price 10.32\$

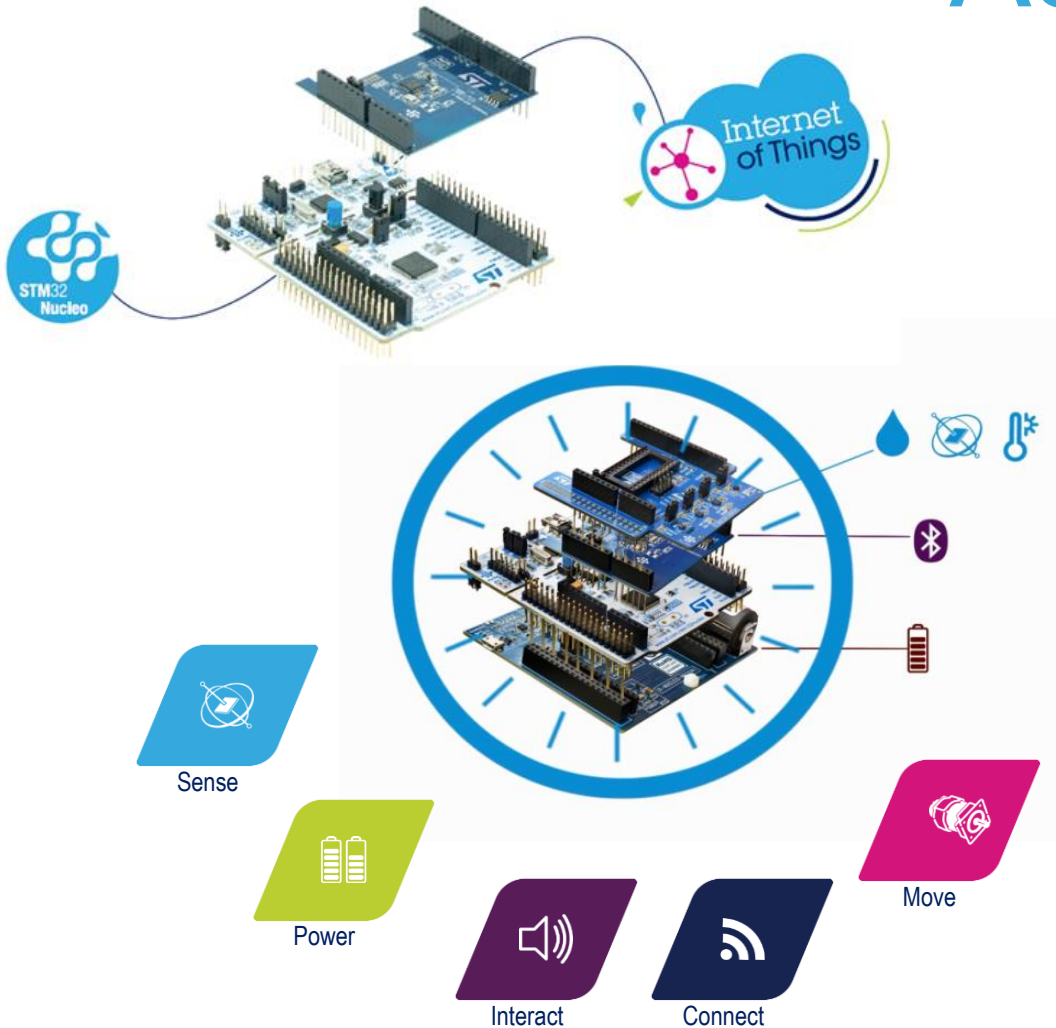
STM32 Nucleo portfolio

7



Association with shields

8



Specialized functionality add-on

Smooth integration with
STM32Cube software library

Multiple IDEs
(Mbed™, IAR, Arm®...)

Nucleo expansion boards from ST

9

Sensors and analog



X-NUCLEO-IKS01A2
MOTION AND ENVIRONMENTAL SENSORS



X-NUCLEO-6180XA1
PROXIMITY AND AMBIENT LIGHT SENSOR



X-NUCLEO-53L0A1
PROXIMITY SENSOR



X-NUCLEO-CCA02M1
DIGITAL MICROPHONES

Translate



X-NUCLEO-IKA01A1
MULTIFUNCTIONAL EXPANSION BASED ON OPERATIONAL AMPLIFIERS

Communication



X-NUCLEO-IDB05A1
BLUETOOTH LOW ENERGY



X-NUCLEO-NFC04A1
DYNAMIC NFC TAG

X-NUCLEO-NFC05A1
NFC CARD READER



X-NUCLEO-PLM01A1
POWER LINE COMMUNICATION



X-NUCLEO-GNSS1A1
ASSISTED GNSS



X-NUCLEO-CCA01M1
SOUND TERMINAL

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-IHM07M1
STEPPER MOTOR DRIVER



X-NUCLEO-IHM06A1
LOW VOLTAGE STEPPER MOTOR DRIVER



X-NUCLEO-IHM05A1
BIPOLAR STEPPER MOTOR DRIVER



X-NUCLEO-IHM12A1
LOW VOLTAGE DUAL BRUSH DC MOTOR DRIVER



X-NUCLEO-LED61A1
LED DRIVER



X-NUCLEO-IPS02A1
INTELLIGENT POWER SWITCH

STM32 Power Shield key assets

10

Accurate power profiling



Ultra-low power consumption measurements

Compatible with all Nucleo form factors (32 / 64 / 144)

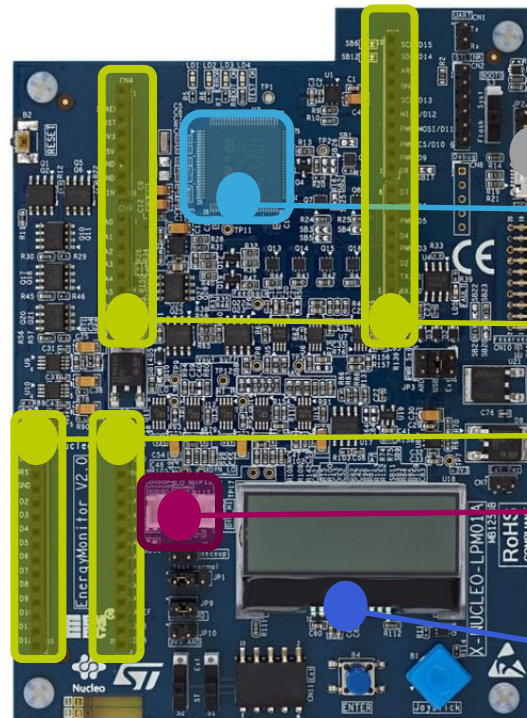
Graphical analysis with STM32CubeMonitor-Power tool

Custom test sessions with scripting

Reference tool for EEMBC ULPMark benchmark

STM32 Power Shield anatomy

STM32 Power Shield anatomy



Power supply through USB

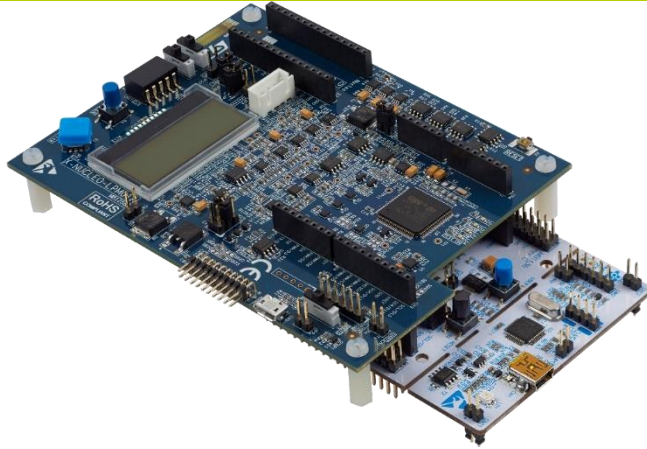
STM32L496VGT6 MCU @ 80 MHz
3 x 12-bit ADC @ 3.2 Msamples/s

Arduino connectors compatible
with Nucleo-32, 64 & 144 boards

4-wire connector
for any type of target board

Local display:
EEMBC ULPBench score

X-NUCLEO-LPM01A



STM32
CubeMonitor-Power

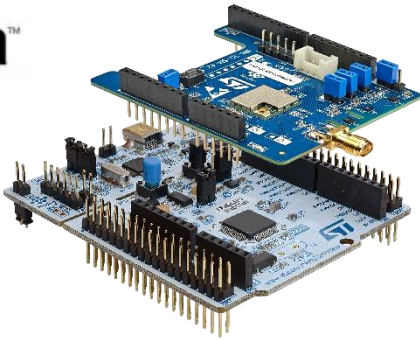


- Ultra-low-power consumption measurements:
 - Supply target board from 1.8 to 3.3V
 - Dynamic current from **100 nA to 50 mA**
 - Static current from **1 nA to 200 mA**
 - Accuracy approximately **2%**
- Intuitive user experience:
 - Two operating modes (stand-alone or PC-controlled)
 - Graphical PC application (reference: [STM32CubeMonPwr](https://www.st.com/en/development-tools/stm32cubemonpwr.html))
- Resale price (RRP) \$70
- Official EEMBC Energy Monitor v2.0 :
 - Direct computation of ULPMark scores



Nucleo expansion boards from 3rd parties

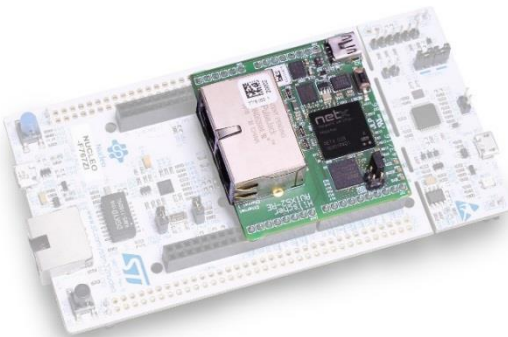
13



I-NUCLEO-LRWAN1
By USI®

LoRaWAN communication

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



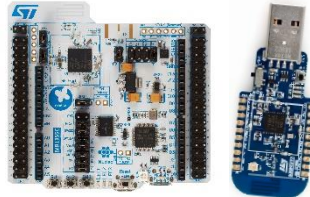
I-NUCLEO-NETX
By Hilscher

Industrial Ethernet protocols

PROFINET®, Ethernet/IP™, EtherCAT,
POWERLINK, Sercos®, and Modbus®

Nucleo packs for wireless communication

14



P-NUCLEO-WB55
By ST



OPENTHREAD
released by NXP

Multiprotocol RF transceiver

Bluetooth™ 5.0 and IEEE 802.15.4-2011 compliant



P-NUCLEO-LRWAN2
By ST and USI



LoRaWAN HF band node & gateway

Frequency range above 800 MHz
LoRaWAN-compliant protocol stack



P-NUCLEO-LRWAN3
By ST and RisingHF



LoRaWAN LF band node & gateway

Frequency range below 500 MHz
LoRaWAN-compliant protocol stack

Latest Discovery kits

15



STM32L4R9I-DISCO



STM32F413H-DISCO



STM32F769I-DISCO



P-L496G-CELL01 &
P-L496G-CELL02



B-L475E-IOT01A



B-L072Z-LRWAN1



Discovery kit portfolio 1/3

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Part number	MCU	USB	Audio	Display	Connectivity	Expansion	arm MBED
<u>32F0308DISCOVERY</u>	STM32F030					Proprietary	Mbed
<u>STM32F0DISCOVERY</u>	STM32F051					Proprietary	
<u>32F072BDISCOVERY</u>	STM32F072	x				Proprietary	
<u>STM32VLDISCOVERY</u>	STM32F100					Proprietary	
<u>STM32F3DISCOVERY</u>	STM32F303	x				Proprietary	
<u>32F3348DISCOVERY</u>	STM32F334					Proprietary	Mbed
<u>32L0538DISCOVERY</u>	STM32L053	x		E-paper		Proprietary	
<u>32L100CDISCOVERY</u>	STM32L100					Proprietary	
<u>32L152CDISCOVERY</u>	STM32L152			LCD		Proprietary	
<u>32L476GDISCOVERY</u>	STM32L476	OTG	x	LCD		Proprietary	Mbed OS
<u>32L496GDISCOVERY</u>	STM32L496	OTG	x	Color LCD 240x240	Add-on (optional)	Arduino Uno, Pmod, STmod+, MikroBus, Grove	
<u>32L4R9IDISCOVERY</u>	STM32L4R9	OTG	x	Color AMOLED 360x360	Add-on (optional)	Arduino Uno, Pmod, STmod+, MikroBus, Grove	

Discovery kit portfolio 2/3

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Part number	MCU	USB	Audio	Display	Connectivity	Expansion	arm MBED
<u>STM32F4DISCOVERY</u>	STM32F407	OTG	x			Proprietary	
<u>32F411EDISCOVERY</u>	STM32F411	OTG	x			Proprietary	
<u>32F412GDISCOVERY</u>	STM32F412	OTG	x	Color LCD 240x240	Add-on (optional)	Arduino Uno	
<u>32F413HDISCOVERY</u>	STM32F413	OTG	x	Color LCD 240x240	Wi-Fi	Arduino Uno	Mbed OS
<u>32F429IDISCOVERY</u>	STM32F429	OTG		Color LCD QVGA	Add-on (optional)	Arduino Uno	Mbed OS
<u>32F469IDISCOVERY</u>	STM32F469	OTG	x	Color LCD 800x480	Add-on (optional)	Arduino Uno	Mbed OS
<u>32F723EDISCOVERY</u>	STM32F723	OTG HS	x	Color LCD 240x240	Add-on (optional)	Arduino Uno, Pmod, STMod+, MikroBus, Grove	
<u>32F746GDISCOVERY</u>	STM32F746	OTG HS	x	Color LCD 480x272	Ethernet	Arduino Uno	Mbed OS
<u>32F769IDISCOVERY</u>	STM32F769	OTG HS	x	Color LCD 800x480	Ethernet	Arduino Uno	Mbed OS

Discovery kit portfolio 3/3

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Part number	MCU	Description	Key features	Expansion	arm MBED
B-L072Z-LRWAN1	STM32L072	All-in-one low-power wireless node	LoRa, Sigfox, WMBus AAA-battery operation	Arduino Uno, ST morpho	Mbed OS
B-L475E-IOT01A	STM32L475	All-in-one IoT node with low-power connectivity & multiway sensing	BLE, SubGHz, NFC, Wi-Fi, Sensors (digital microphone, 9-axis navigation, pressure, humidity, temperature, proximity/gesture detection)	Arduino Uno, Pmod	Mbed OS
P-L496G-CELL01	STM32L496	Worldwide Cellular IoT node 2G/3G pentaband	7.2 Mbps downlink, 5.76 Mbps uplink, eSIM and MicroSIM, 3-month dataplan included	Arduino Uno, Pmod, STmod+, MikroBus, Grove	
P-L496G-CELL02	STM32L496	Worldwide Cellular IoT node LTE cat M1 / cat NB1 / EGPRS pentaband	300 Kbps downlink, 375 Kbps uplink, eSIM and MicroSIM, 3-month dataplan included	Arduino Uno, Pmod, STmod+, MikroBus, Grove	



[I-CUBE-LRWAN](#)

LoRaWAN-compliant software expansion for STM32Cube



[X-CUBE-SFOX](#)

Sigfox-compliant software expansion for STM32Cube



[X-CUBE-CLOUD](#)

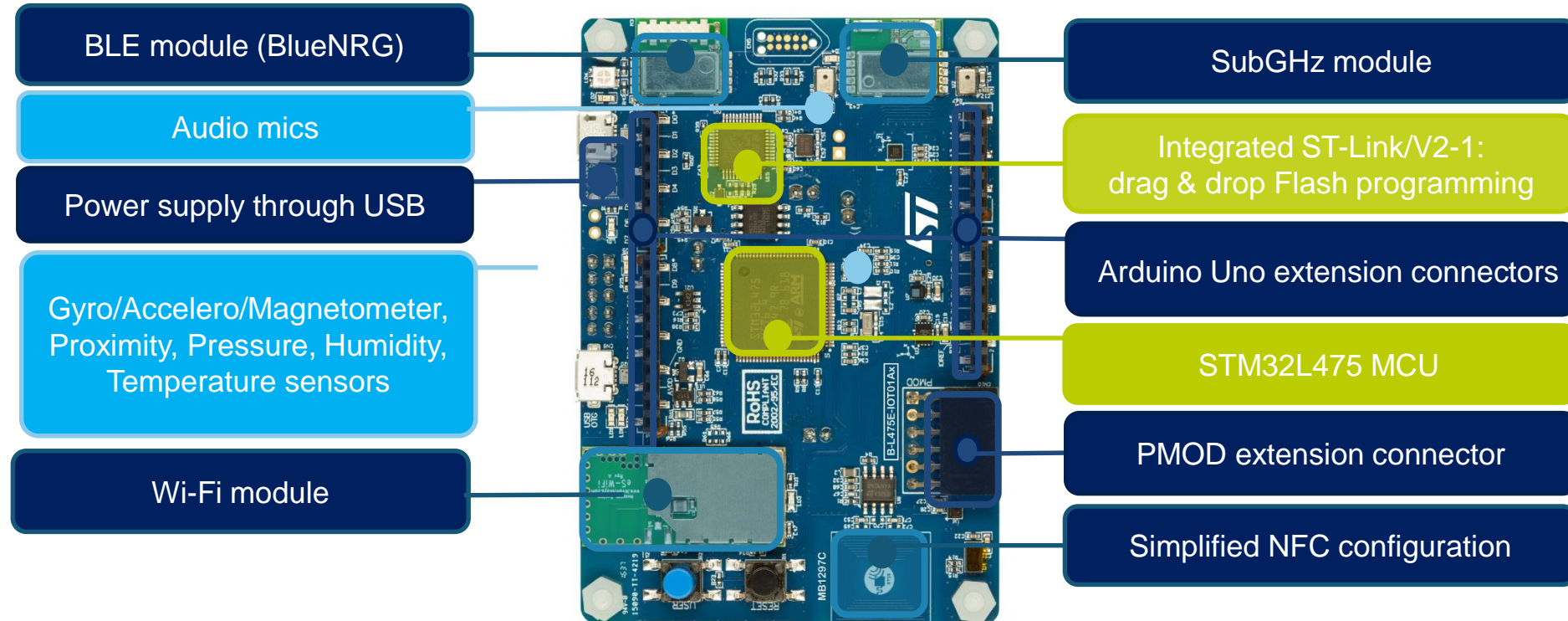
Cloud connectors as expansion for STM32Cube (Amazon Web Services, Microsoft Azure, IBM Watson)

www.st.com/stm32app-discovery

STM32L4 Discovery IoT node...

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Multi-link communication, multiway sensing



B-L475E-IOT01A

...delivers user-friendly cloud access

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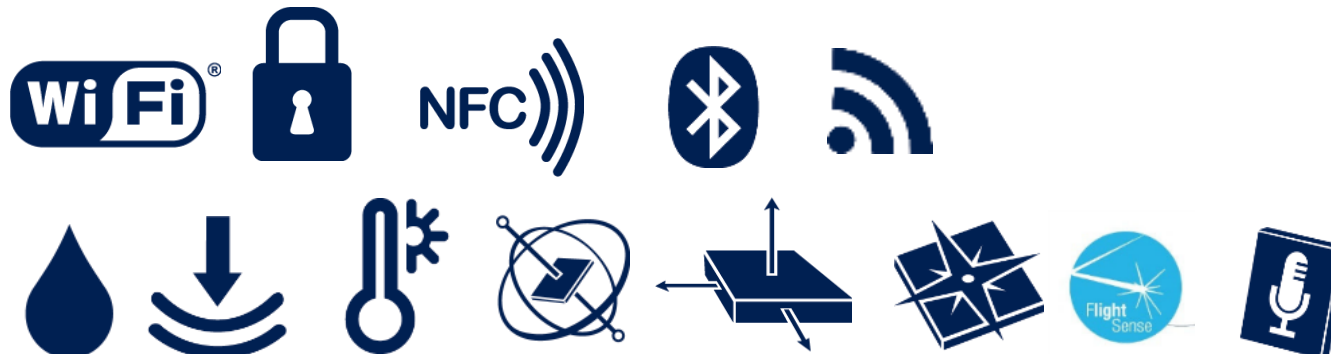
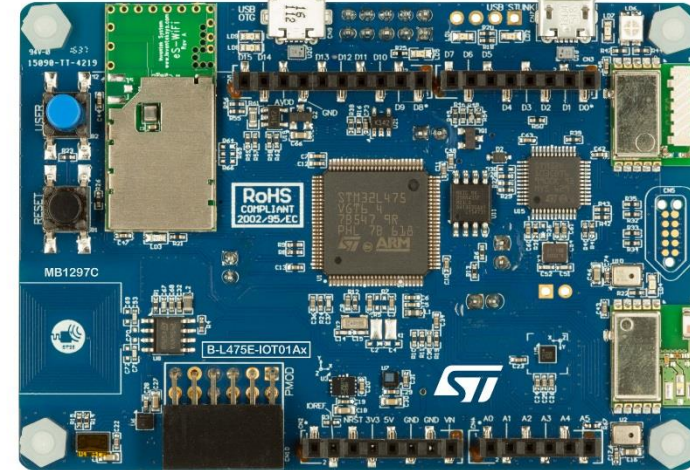
Direct connection to cloud services

Low-power long-range communication

Environmental awareness: humidity, pressure, temp

Detection hub: motion, proximity, audio

Direct support of communities



Cloud STM32Cube
Expansion Packages

Latest Evaluation boards

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STM32L4R9I-EVAL



STM32F769I-EVAL



STM32H743I-EVAL

Evaluation board portfolio

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Mainstream



Ultra-low-power



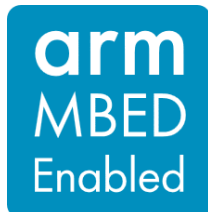
High-performance



Part number	MCU	Part number	MCU	Part number	MCU	Part number	MCU
STM32072B-EVAL	STM32F072	STM32L073Z-EVAL	STM32L073	STM3220G-EVAL	STM32F207	STM32746G-EVAL	STM32F746
STM32091C-EVAL	STM32F091	STM32L152D-EVAL	STM32L152	STM3221G-EVAL	STM32F217	STM32756G-EVAL	STM32F756
STM32100E-EVAL	STM32F100	STM32L476G-EVAL	STM32L476	STM3240G-EVAL	STM32F407	STM32F769I-EVAL	STM32F769
STM3210E-EVAL	STM32F103	STM32L4R9I-EVAL	STM32L4R9	STM3241G-EVAL	STM32F417	STM32F779I-EVAL	STM32F779
STM3210C-EVAL	STM32F107			STM32429I-EVAL	STM32F429	STM32H743I-EVAL	STM32H743
STM32303E-EVAL	STM32F303			STM32439I-EVAL	STM32F439	STM32H753I-EVAL	STM32H753
STM32373C-EVAL	STM32F373			STM32446E-EVAL	STM32F446		
				STM32479I-EVAL	STM32F479		

STM32 Boards contribute to Communities

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41
Boards
([full list here](#))

25
Expansion
Boards
([full list here](#))



21
Boards
([full list here](#))
([libraries](#))

10
Expansion
Boards
([full list here](#))

Releasing your creativity

16



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 community.st.com



www.st.com/stm32hardwaretools