The building blocks to develop IoT solutions

The Internet of Things (IoT) describes devices that connect and exchange data with other devices

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ST brings all the necessary blocks to easily build IoT devices
What the STM32 family offers

<table>
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<tr>
<th>Real-time performance</th>
<th>Outstanding power efficiency</th>
<th>Advanced, innovative peripherals</th>
<th>Optimized integration</th>
<th>Extensive ecosystem</th>
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<tbody>
<tr>
<td>• Powerful Cortex® cores</td>
<td>• Ultra-low dynamic power consumption</td>
<td>• Graphic acceleration</td>
<td>• Best fit for application requirements (package size, cost, performance)</td>
<td>• Comprehensive development tools</td>
</tr>
<tr>
<td>• Multicore performance</td>
<td>• Long lifetime, small battery</td>
<td>• Digital &amp; analog peripherals</td>
<td>• Safety &amp; security features</td>
<td>• Wide range of partners</td>
</tr>
<tr>
<td>• Fast interfaces</td>
<td>• Sustainable technology</td>
<td>• USB Type-C®</td>
<td></td>
<td>• Community support</td>
</tr>
<tr>
<td>• Hardware accelerators</td>
<td></td>
<td>• Peripherals for wireless and edge AI solutions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3,300+ part numbers

Rolling 10-year longevity commitment for continuous supply
STM32 high-performance MCUs

Up to 3224 CoreMark and a rich set of peripherals

STM32H7
• Dual Arm® Cortex®-M7 + Cortex®-M4 FPU at 480 MHz
• 1327 DMIPS and up to 550 MHz, 1177 DMIPS on single core
• Arm® Cortex®-M7
• From 512 Kbytes to 2 Mbytes of flash memory
• Very high performance with embedded flash & external memories

STM32F7
• Arm® Cortex®-M7 + FPU at 216 MHz – 462 DMIPS
• From 256 Kbytes to 2 Mbytes of flash memory
• Very high performance with embedded flash & external memories

STM32H5
• Most powerful Arm® Cortex®-M33 MCU yet – 375 DMIPS
• From 128 Kbytes to 2 Mbytes of flash memory
• Industry 4.0 and smart homes

STM32F4
• Arm® Cortex®-M4 + FPU up to 180 MHz – 225 DMIPS
• From 64 Kbytes to 2 Mbytes of flash memory

STM32F2
• Arm® Cortex®-M3 at 120 MHz – 150 DMIPS
• From 128 Kbytes to 1 Mbyte of flash memory
• Foundation lines for performance and connectivity
STM32 ultra-low-power MCUs

Ultra-low-power, market-proven solutions
150 DMIPS performance

STM32U5
- Arm® Cortex®-M33 + FPU at 160 MHz
- From 128 Kbytes to 4 Mbytes of flash memory
- Lowest power mode + RAM + RTC: 0.35 µA
- For IoT nodes and graphics

STM32L5
- Arm® Cortex®-M33 + FPU at 110 MHz
- From 256 to 512 Kbytes of flash memory
- Lowest power mode + RAM + RTC: 0.35 µA

STM32L4+
- Arm® Cortex®-M4 + FPU at 120 MHz
- From 512 Kbytes to 2 Mbytes of flash memory
- Lowest power mode + RAM + RTC: 0.39 µA

STM32L4
- Arm® Cortex®-M4 + FPU at 80 MHz
- From 64 Kbytes to 1 Mbyte of flash memory
- Lowest power mode + RAM + RTC: 0.34 µA

STM32L0
- Arm® Cortex®-M0 at 32 MHz
- From 8 to 192 Kbytes of flash memory
- Lowest power mode + RAM + RTC: 0.67 µA

Energy benchmark
- 464 ULPMark-CP
- 125 ULPMark-PP
- 54 ULPMark-CM
- 137000 SecureMark TLS

STM32 ultra-low-power MCUs
STM32 microprocessors making your industrial IoT applications future-proof

STM32MP25
Single or dual Arm® Cortex® - A35 up to 1.5 GHz
Arm® Cortex® - M33 at 400 GHz
NPU at 1.35 TOPS
time-sensitive networking support
3D GPU, 1080p platform

STM32MP15
Single or dual Arm® Cortex® - A7 up to 800 MHz
Arm® Cortex® - M4 at 209 MHz
3D GPU 720p

STM32MP13
Arm® Cortex® - A7 up to 1 GHz
Power- and cost-efficient with high security

STM32MP2 series
Sampling at OEMs

STM32MP1 series
Mass market availability
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ST brings all the necessary blocks to easily build IoT devices.
Pervasive wireless communications

Wireless market

Source: ABI
### STM32 wireless MCUs

**The ideal fit for RF designers looking for more than just a radio device**

<table>
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<th>Model</th>
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<tr>
<td>STM32WBA</td>
<td>- <strong>Arm® Cortex®-M33</strong> w/ TrustZone® @ 100 MHz&lt;br&gt;- 1 Mbyte of flash memory / 128 Kbytes RAM&lt;br&gt;- Bluetooth® Low Energy 5.3 (long-range, 2 Mbps, advertising extension)&lt;br&gt;- Up to +10 dBm output power&lt;br&gt;- Enhanced security</td>
</tr>
<tr>
<td>STM32WB</td>
<td>- Dual core &amp; security (Arm® Cortex®-M4 /-M0+) &lt;br&gt;- Up to 1 Mbyte flash memory / 256 Kbytes RAM&lt;br&gt;- Bluetooth® Low Energy 5.4, Zigbee R22 &amp; Thread, proprietary, Matter Q4’23</td>
</tr>
<tr>
<td>STM32WB0</td>
<td>- Arm® Cortex®--M0+ at 64 MHz &lt;br&gt;- Up to 512 Kbytes of flash memory / 64 Kbytes RAM&lt;br&gt;- Transceiver frequency: 2.4 GHz&lt;br&gt;- Power outputs: up to 8 dBm&lt;br&gt;- Bluetooth® Low Energy 5.3</td>
</tr>
<tr>
<td>STM32WL</td>
<td>- World 1st MCU enabling LoRa® (G)FSK, (G)MSK, BPSK&lt;br&gt;- Arm® Cortex®-M4 and -M0+ at 48 MHz supporting RF – 60 DMIPS&lt;br&gt;- Up to 256 Kbytes of flash memory / 64 Kbytes RAM&lt;br&gt;- Transceiver frequency: 150 to 960 MHz&lt;br&gt;- Dual-power outputs: up to 22 dBm and up to 15 dBm (Embedded PAs)</td>
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AI is everywhere, however the AI that matters to your products is enabled by a different category of software and hardware.
STM32N6: a general-purpose MCU optimized for demanding applications

- Machine vision pipeline & Neural Processing Unit
- Advanced Graphics & Multimedia accelerators
- Advanced security features
Benefits of edge AI

- Ultra-low latency
  Real-time applications

- Reduced data transmission
  Generate meaningful information

- Enhanced privacy and security
  No data sharing in the cloud

- Sustainable on energy
  Low data, Low power

- Lower cost of inference
  to enable a new class of operations

Benefits for the end application

- Energy savings
- Higher reliability and longer equipment lifetime
- Safer
- More privacy
- Innovation in functionality
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Addressing the security challenges & gaps

Security challenges for our customers

- Complex
- Evolving fast
- Time to market

Missing link

Scalability, certification, maintenance
core security hardware and services

IoT security certifications & regulations

Security across multiple devices

Robust hardware

Developers
STM32Trust: A scalable approach to security

IoT security certifications & regulations

Secure Hardware + Open-Source Software

STM32 Trust TEE
Secure Hardware + SoC Security Software

Secure Manager

STSAFE Secure element

Protect code

Protect IP & IoT / Cloud

Crypto

Secure Hardware

Brand + Trust + Resilience

VALUE

Security across multiple devices

Robust hardware
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The STM32 Developer Zone
Everything for STM32 developers in one place
All this technology contributes to a more sustainable environment

Residential & commercial lighting, HVAC and appliances use >50% of total electricity consumption

- Washing machine
  - From Class D to Class A++
  - >40% Energy Saving

- Air conditioning/Climate control
  - From analog to digital
  - From AC to BLDC control
  - >30% Energy Saving

- Digital consumer power supply
  - Efficiency > 98% in run mode
  - Stand-by power < 1mW
  - >70% Energy Saving

- Electronic lighting
  - From incandescent bulbs to LED lighting
  - >80% Energy Saving

Source: IEA, EPA

Adding more intelligence to bring the next step in energy savings
Combination of Edge AI clothes and advanced Motor control algorithms to load weight measurement reduces the amount of water and detergent used and significantly lowers start-up current.

Energy savings per wash cycle
~ 15-40%

Adding intelligence to save energy & resources

Standard (open loop) sensorless startup
- High peak current

Zero Speed Full Torque (ZeST) sensorless start-up
- No high peak current
  - Shorter start-up

Load current when drum spinning
Our technology starts with You

Find out more at www.st.com