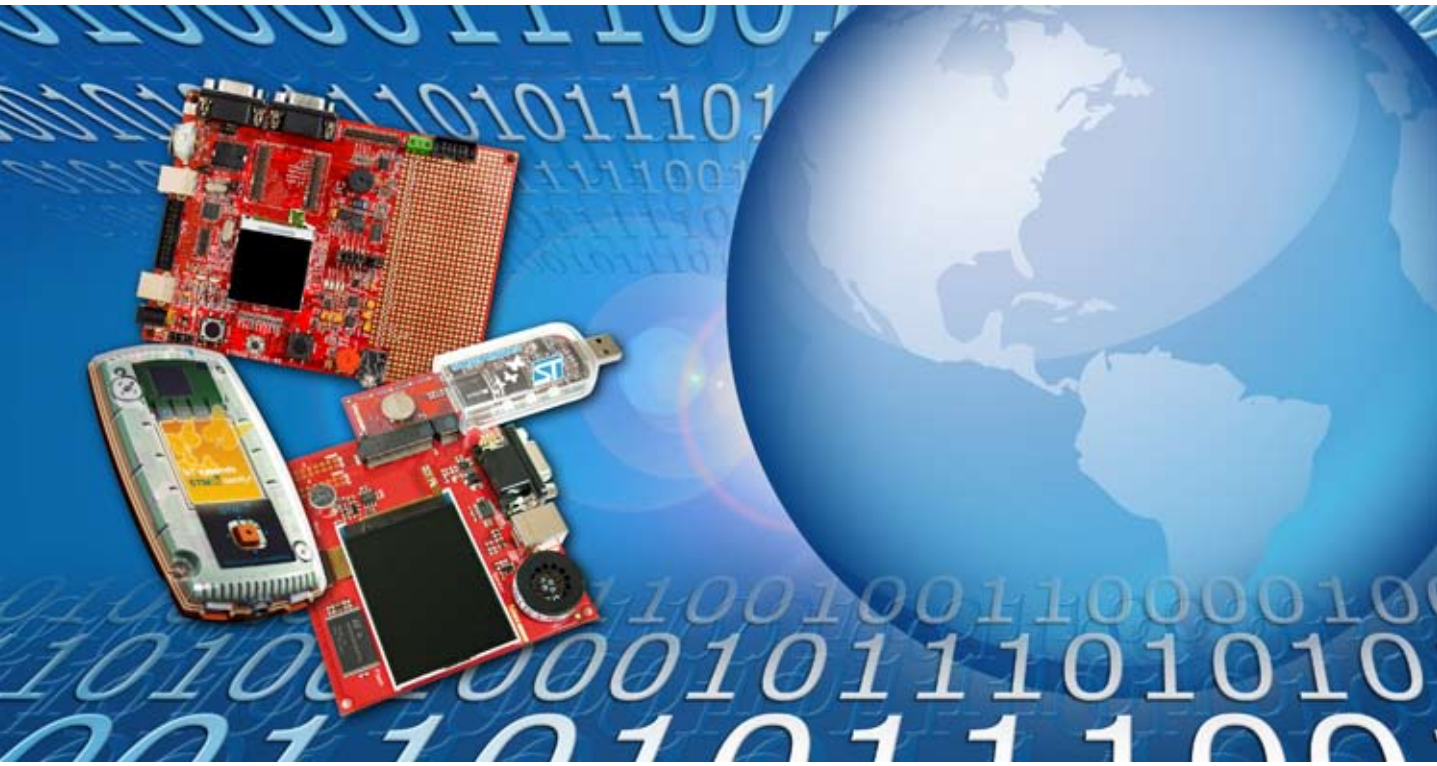
Development tools for STM32

Master the possibilities of ST ARM® Cortex™-M3 based microcontrollers



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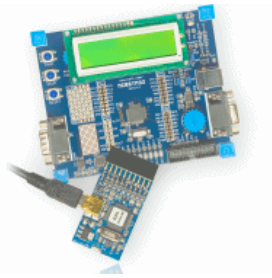
Complete tool line, tailored to STM32 microcontrollers, meets every need...

Starter kits

Starter kits are complete sets of hardware and software designed to help users discover device features and start application development quickly and easily. Kits include an evaluation board, JTAG in-circuit debugger/programmer, integrated development environment, C/C++ compiler and sample applications with source code.

Kit	Evaluation board	Target device	In-circuit emulator	IDE	C/C++ compiler
Hitex kits					
STM3210E-SK/HIT	STM32 PerformanceStick2 plus I/O board (LCD, NAND, speaker, etc.)	STM32F103ZE (512 Kbytes)	Embedded via USB interface	HiTOP5 (unlimited)	Tasking C/C++
STM3210B-SK/HIT	STM32 PerformanceStick plus I/O board (USB, CAN, ADC, I/O, etc.)	STM32F103RB (128 Kbytes)			
IAR KickStart					
STM3210E-SK/IAR	General-purpose board (UART, SPI, I^2C, LEDs, I/Os, etc.) with target MCU and device specific features	STM32F103ZE (512 Kbytes)	Embedded J-Link via USB interface	EWARM (For code up to 32 Kbytes)	IAR C/C++
STM3210B-SK/IAR		STM32F103RB (128 Kbytes)			
Keil kits					
STM3210E-SK/KEIL	General-purpose board (UART, SPI, I^2C, LEDs, I/Os, etc.) with target MCU and device specific features	STM32F103ZE (512 Kbytes)	ULINK-ME (USB/JTAG)	µVision3 (For code up to 16 Kbytes)	ARM RVCT
STM3210B-SK/KEIL		STM32F103RB (128 Kbytes)			
Raisonance REva					
STM3210B-SK/RAIS	REva motherboard with UART, SPI, I^2C, LEDs, I/Os, etc. and daughter-board mounted MCU(s)	STM32F103RB (128 Kbytes)	Embedded RLink (USB/JTAG)	RIDE (For code up to 32 Kbytes)	GNU C/C++



ST motor control starter kit

Complete development platform with ready-to-run motor control demo for quick, easy motor control feature evaluation with STM32 (dedicated peripherals, dual ADC, sensorless mode, Cortex™-M3 core). The kit allows rapid implementation of sensor and sensorless vector-based control for three-phase PMSM and AC induction motors. It includes a PMSM motor, motor control board, device-specific evaluation board, opto-isolation board, J-Link (USB/JTAG), motor control GUI, application and C sources.

ST order code: STM3210B-MCKIT

Evaluation boards

ST evaluation boards implement all device features and come with sample code (C sources) based on ST firmware libraries, which users are free to adapt and use in their own applications. ST order codes:

- STM3210E-EVAL – ST evaluation board for the STM32F10xxE (512 Kbytes) devices
- STM3210B-EVAL – ST evaluation board for the STM32F10xxB (128 Kbytes) devices

Evaluation boards are also available from numerous third-party providers including:

- Olimex – Low-cost evaluation boards for STM32 devices covering a wide range of features and peripherals
- Softbaugh – Evaluation board for low-power STM32 designs
- Anby, Embest, Greenchips, Manley, and Propox - Standard evaluation boards for local markets.

Integrated development environments (IDE)

Choose from a full range of development solutions offering start-to-finish control of application development from a single environment. Solutions are available for a range of compilers and in-circuit emulators, and offer project management, source editing, application building and debugging from a single, easy-to-use graphical interface.

Supplier	IDE	Supported compilers	In-circuit debuggers, emulators
Aiji System	OPENice-EDS	Supports a variety of images Dwarf1/2, ELF, AxF, Keil, GCC, ARM (ADS, RVDS)	OPENice-A1000
Altium / TASKING	EDE	TASKING C/C++	Tantino, Tanto, J-Link
Green Hills Software	MULTI	Green Hills	Green Hills Probe
Hitex	HITOP5	GNU C/C++, Tasking, ARM, and IAR	Tantino for Cortex
IAR[1]	EWARM	IAR's ISO C/C++ and Extended Embedded C++	AnbyICE, ARM RealView ICE, J-Link, Macraigor Wiggler and other RDI-based JTAG interfaces
iSYSTEM	WinIdea	ARM, GHS, GNU, IAR, Keil, Tasking	iONE
Keil	uVision3	Keil, GNU C/C++, ARM (ADS and RVDS)	Keil ULink, Hitex Tanto, iSYSTEM iC3000, Nohau EMUL-ARM
Lauterbach	TRACE32 PowerView	IAR, MetaWare, High C/C++, ARM (ADS and RVDS), Windriver, GNU C/C++	TRACE32 – Power Tool, TRACE32 – ICD
Raisonance [2]	RIDE	GNU C/C++	RLink
Rowley	CrossWorks	GNU C/C++	CrossConnect, Macraigor Wiggler, IAR, J-Link
Signum	Chameleon	Compatible with all major C/C++ ARM compilers	JTAGjet, JTAGjet-Trace (ETM)

1. IAR Embedded Workbench for ARM with IAR C/C++ compiler is available from STMicroelectronics, order code STR-EW/IAR
2. Raisonance RIDE with GNU C/C++ compiler and RLink is available from STMicroelectronics, order code STX-PRO/RAIS

STM32 development flexibility with trace capability

The STM32 SWV (single wire viewer, available on all STM32) provides a low-bandwidth data and instruction tracing over one single output pin. This feature is made available with the latest release of the development tools/ in-circuit emulator without any additional cost.
In addition, the STM32 Embedded Trace Macrocell™ delivers full real-time instruction trace. Trace tools connect to the STM32 via a low cost 20-pin high-density connector.

A range of trace tools are available from third-party tool suppliers including:

Supplier	Trace tools
Keil - RVMDK	JTAGjet-Trace
IAR - EWARM	J-Trace
Lauterbach - PowerView	TRACE32 CombiProbe TRACE32 PowerTool
Signum - Chameleon	JTAGjet-Trace

Promotion kits

STM32 Primers

Ultra low-cost, complete development kits for a fun, easy introduction to STM32 and the ARM Cortex™-M3 core. The STM32 drives ergonomic, MEMS-based controls for graphical user interface and game demos. It includes an evaluation board (USB, LCD), integrated debugging/programming via USB (RLink), software toolset (RIDE - debug code up to 32 Kbytes, GNU C /C++ compiler) and application sources.

ST order codes: STM3210B-PRIMER
STM3210E-PRIMER

Try the STM32, share creative ideas, join www.stm32circle.com

STM32 Performance Sticks

Very low-cost evaluation and development kits to explore the performance features of the ARM Cortex™-M3 core based STM32. These kits include a DashBoard graphical interface for real-time display of processor performance (power consumption, speed of execution, etc.), an evaluation board with integrated debugging/programming via USB and unlimited software toolset (HiTOP5, Tasking C compiler), sample applications (USB, CAN, ADC, etc.), and a connector for peripheral specific extension boards.

ST order codes: STM3210B-PFSTICK
STM3210E-SK/HIT (including I/O board)

Programmers

Programmers for STM32 devices, including single position, gang and automated programming solutions that are ready to integrate into a production environment, are available from BP Microsystems, Data I/O, Dataman, Elnec, System General and Xeltec. In-circuit programming solutions that can be adapted to an engineering or production environment include the complete list of JTAG in-circuit debugging/programming tools, as well as dedicated programming tools such as those from PLS, Segger and SofTec Microsystems.

For current status of STM32 support by production programming solutions, please check on www.st.com/mcu

Embedded firmware

Software productivity is the cornerstone of embedded developments. With the STM32, developers have now access to more performance and more resources that enable them using off-the-shelf proven software solutions. This helps them implement standard features in no time, and allow them to focus on the part where they can make the difference. The STM32 provides a full range of software components, from ST or partners.

STM32 libraries

- **STM32 firmware library:** Complete packages consisting of device drivers for all the standard device peripherals. Each device driver includes a set of functions covering full peripheral functionality.
- **STM32 USB developer kit**: Complete firmware package that makes implementation of the USB slave interface in STM32 applications quick and painless.
- **STM32 self-test routines Class B norm certification**: A full set of ready to use self-test routines for home appliance certification under EN/IEC 60335-1 Class B norm (functional safety).
- **STM32 motor control software**: Complete 3-phase motor control library supporting PMSM motors in sensored and sensorless mode and AC induction motors in sensored mode, and a patented single shunt algorithm. This software is included in the STM32 motor control starter kit.

STM32 speech codec software

The **STM32 speech-codec software** library enables you to transmit longer messages and store more speech data. The Speex codec high-compression format and small embedded-memory footprint allows you to design cost-effective solutions for narrowband bitrates.

Function	Program (Kbytes)	RAM (Kbytes)	CPU load 72 MHz (%)
Encoder	32	6.5	52
Decoder	32	3.7	8
Encoder + decoder	32	7.3	60 %

STM32 DSP software library

The STM32 DSP library provides a solution to developers seeking a ready-to-use, easy-to-integrate and well-documented software library to perform digital signal processing algorithms. It is written in C and assembly language to achieve the best optimization and is supported by IAR, Keil and Raisonance toolchains.

The STM32 DSP software library function-execution speed takes advantage of the Cortex-M3 core instruction set including hardware divide executed in 2 cycles and multiply and accumulate instruction executed in 2 cycles.

Function	RAM (bytes)	Code (bytes)
PID controller	12	52
Complex radix-4 16-bit FFT optimized for 64 points	512	718
Complex radix-4 16-bit FFT optimized for 256 points	2048	1486
Complex radix-4 16-bit FFT optimized for 1024 points	8192	4560
16-bit FIR filter	2N-1+2C (1)	162
16-bit auto-regressive moving-average IIR (ARMA) filter	2 (N+4) + 10 + N (2)	156
16-bit biquad IIR filter	20 x 2 + 2*N (2)	294

1. N output samples, C coefficients
2. N output samples

Operating systems, solution stacks and more

Supplier	Software	Description	Typical Footprint
CMX	CMX-RTX	Multi-tasking, royalty-free, real-time OS also available in a scaled down version	ROM: <10 K RAM: <1 K
eCosCentric	eCosPro	Reliable, out-of-the-box solution based on the eCos open-source RTOS combining high-performance (deterministic response times, minimum interrupt latency, low overhead context switches) with the flexibility to minimize footprint while tailoring functionality to application needs.	ROM: 2 K RAM: <1 K
Express Logic	ThreadX	Deteministic real-time OS for embedded applications with advanced features, including picokernel™ architecture, preemption-threshold™, event-chaining™, and a rich set of system services.	ROM: 2 K RAM: –
FreeRTOS.org	freeRTOS	Open-source, portable, preemptive, reliable, real-time kernel that can be used in commercial applications. Royalty-free commercial licensing. Support and development services available. SafeRTOS, IEC 61508 certified sister product also available.	ROM: 4.2 K RAM: 1K
IAR	PowerPac	3-task evaluation edition available. A full-featured real-time operating system combined with a high-performance, versatile file system. It will include sample projects and board support packages for most devices, and boasts a priority controlled and extremely dense real-time operating system with fully interruptible kernel that can be used in time critical situations. Optional USB device stack for Bulk, HID, MSD and CDC communication classes.	ROM: 2-4 K RAM: 51 bytes
Keil	ARTX-ARM	Preemptive, multi-tasking RTOS that supports mailbox and memory pools, and includes Flash file system and TCP/IP networking support	ROM: 6 K RAM: 0.5 K
Micrium	µC/OS-II	A highly portable, ROMable, scalable, preemptive real-time, multi-tasking kernel (RTOS) for microcontrollers, µC/OS-II can manage up to 250 application tasks and is suitable for safety critical applications and is certified for use in avionics (DO-178B Level A) and medical (FDA 510(k)) applications.	ROM: 16 K RAM: 2 K
	µC/GUI	An efficient, processor and LCD controller-independent graphical user interface (GUI) for any application that operates with a graphical LCD. It is compatible with single-task and multitask environments, with a proprietary operating system or with any commercial RTOS. µC/GUI is shipped as C source code.	ROM: 10-60 K RAM: 0.6-7.2 K
Quadros Systems	RTXC Quadros	Flexible, scalable RTOS with a full suite of integrated stacks and middleware (TCP/IP, USB, file systems, GUI tools, CAN and more). Supported by VisualRTXC Design Tool - a powerful, easy-to-learn development environment ideal for developers moving to 32-bit platforms.	ROM: <20 K RAM: <4 K
Segger	embOS	Small, real-time kernel, for deeply embedded systems supporting common 8/16/32-bit CPUs, provides all the benefits of a full-featured, multi-tasking system (mailboxes, event semaphores, full priority control, etc.) via a 100% identical API (e.g. small footprint, fast context switches, low interrupt latency) for hard real-time applications with minimal resources. The kernel features a start project and embOSView for task viewing and profiling.	ROM: 2 K RAM: 52 bytes
	emWIN	Graphical user interface (GUI) for applications operating with a graphical LCD. EmWIN is compatible with single-task and multitask environments, and proprietary operating systems or any commercial RTOS. Features include complete windows management, configurable display size, switches for compile-time optimizations, LCD caching for improved speed, virtual display support, plus a board support package for the STM3210F evaluation board.	ROM: 2 K RAM: 20 bytes/ window

Internet support

Up-to-date information can be found at www.st.com/mcu. For further information about a specific third-party tool, please visit the relevant web site:

Aiji System (아이지시스템):www.aijisystem.com
Altium Tasking: www.tasking.com
BP Microsystems: www.bpmicro.com
CMX Systems: www.cmx.com
Data I/O: www.data-io.com
Dataman: www.dataman.com
eCosCentric: www.ecoscentric.com
Elnec: www.elnec.sk
Embest (英蓓特): www.embedinfo.com
freeRTOS.org: www.freertos.org
Greenchips (그린칩스): www.greenchips.co.kr
Green Hills Software: www.ghs.com
Hitex: www.hitex.com
IAR: www.iar.com
iSYSTEM: www.isystem.com
Keil: www.keil.com
Lauterbach: www.lauterbach.com
Manley (力利): www.manley.com.cn
Micrium: www.micrium.com
Olimex: www.olimex.com
PLS: www.pls-mc.com
Propox: www.propox.com
Quadros Systems: www.quadros.com
Raisonance: www.raisonance.com
Rowley: www.rowley.co.uk
Segger: www.segger.com
Signum: www.signum.com
SofTec Microsystems: www.softecmicro.com
Softbaugh: www.softbaugh.com
System General: www.sg.com.tw
Xeltec: www.xeltec.com

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