

STM32 Connectivity line



STMicroelectronics

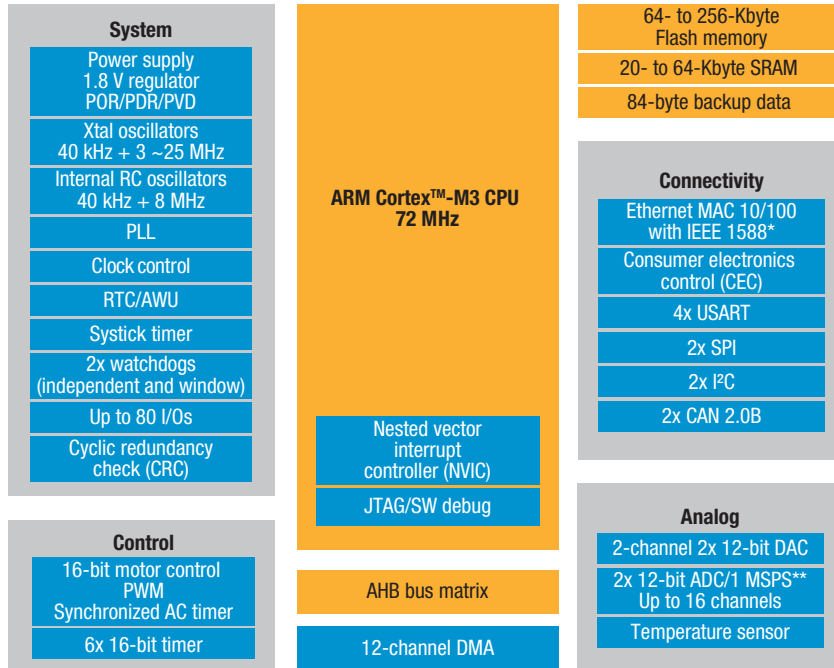
32-bit microcontroller with USB OTG,
Ethernet with IEEE 1588, dual CAN, audio class I²S

STM32 Connectivity line

The STM32 Connectivity line is intended for applications where connectivity and real-time performances are required: industrial control, control panels for security applications, UPS, home audio.

The family includes devices with 64 to 256 Kbytes of on-chip Flash memory, up to 64 Kbytes of SRAM, and 14 communication interfaces.

STM32 Connectivity line block diagram



Notes:

*STM32F107 only

** 2 MSPS in interleave mode

Abbreviations:

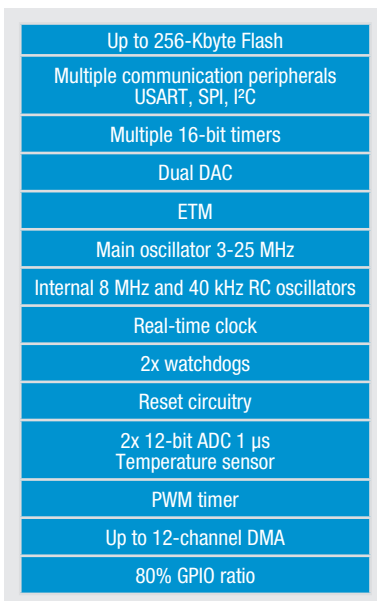
AWU: Auto wake up from halt
BOR: Brown-out reset
I²C: Inter integrated circuit

PDR: Power-down reset
POR: Power-on reset
PVD: Programmable voltage detector

RTC: Real-time clock
SPI: Serial peripheral interface
USART: Universal sync/async receiver transmitter

STM32 Connectivity line product lines

Common core peripherals and architecture:



with Ethernet (STM32F107)



+

without Ethernet (STM32F105)



Features and benefits

Features	Benefits
10/100 Ethernet MAC with embedded DMA and IEEE 1588 hardware support	Economical networking and accurate clock synchronization
Ethernet PHY connectable using MII and RMII interfaces	Full flexibility in the PHY selection
USB 2.0 On-The-Go (OTG) full speed with embedded OTG PHY	USB host capability, no need for an external USB OTG controller or PHY
Dual CAN 2.0B active	Gateway capability with connectivity to 2 independent CAN buses and twice more filtering capability in single CAN mode
Dedicated buffers for USB OTG and dual CAN peripherals	Simultaneous usage of USB and CAN, allowing gateway implementation
PLL block offering advanced clock schemes to core and peripherals	Flexibility and optimal cost for clocking simultaneously USB, CAN, Ethernet MAC, Ethernet PHY and audio class I ² S
Support for Ethernet, USB, CAN, SPI, I ² C, UART/IrDA, 10 timers, and up to 80 5 V-tolerant GPIOs; analog capability with 2x 12-bit ADCs, 2x 12-bit DACs and full supervisor functions	Because all these peripherals can work simultaneously, the STM32 Connectivity line is a great communication gateway
Flexible bootloader supporting USART, CAN and USB device firmware upgrade (DFU) class	Flexibility of communication interface Security as the bootloader cannot be erased, so guaranteeing that a new code can always be reprogrammed
Flexible power and clock management with multiple low-power modes, and a low-power real-time clock (1.4 µA typ at 3.3 V) with programmable wake-up features, 84 bytes for data backup	Tailor your system on-the-fly to balance performance and power consumption as needed - even in standby mode, the RTC can be kept running on battery while saving key application data in the 84-byte backup

Superior connectivity: Ethernet with IEEE 1588, USB OTG and dual CAN

The STM32 Connectivity line makes networking economical with a central system or other devices for a wide range of products, as a result of an embedded Ethernet MAC peripheral with dedicated DMA controller. The IEEE 1588 precision time protocol hardware support provides accurate clock synchronization over the network and retains ample CPU bandwidth to implement the embedded application.

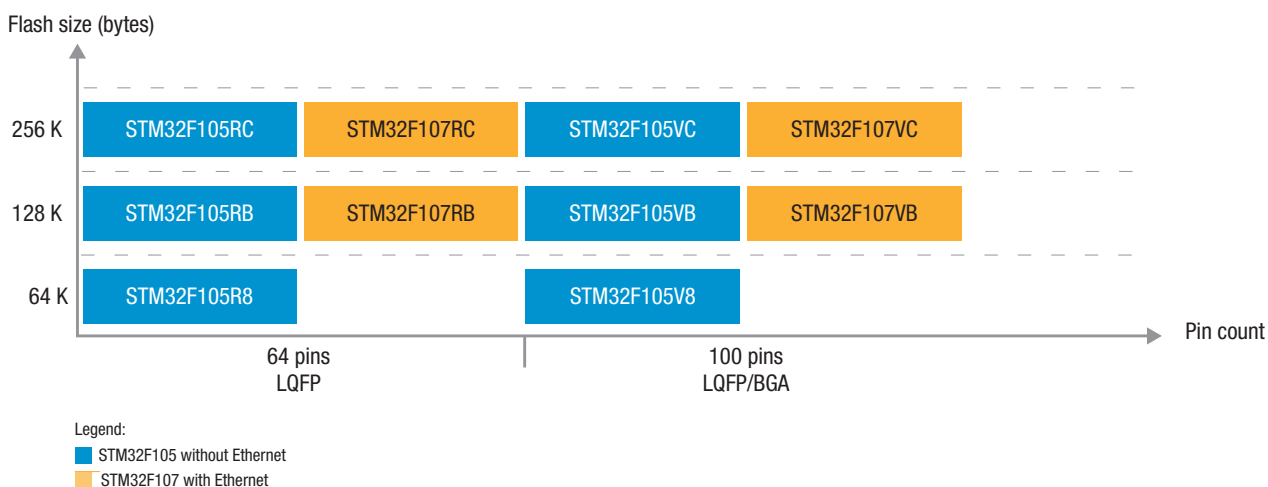
The USB 2.0 OTG makes the STM32 Connectivity line a turnkey solution to add a USB device, host or OTG function to a product. Firmware upgrade in the field, data logging or data storage are now as easy as connecting a standard USB mass storage device to the STM32. Adding a USB keyboard, mouse or any other device is just as easy.

The dual CAN 2.0B makes the STM32 Connectivity line a turnkey solution to implement a CAN gateway. Also since dual CAN and USB peripherals can be used simultaneously, the STM32 is the perfect fit to connect a computer or USB device to CAN networks.

Fully compatible with the STM32 platform

The pin-to-pin and function compatibility with the current STM32 family allows easy migration.

STM32 Connectivity line portfolio



Applications

■ Point of sales

- Portable terminals
- Vending machines
- Thermal printers
- Scanners/readers



■ Building automation

- Security/surveillance/fire
- HVAC
- Biometric identification
- Time and attendance



■ Portable

- Medical monitors
- Data acquisition
- Test and measurement
- Automotive diagnostics and accessories gateway



■ Consumer

- Home audio



■ Industrial automation

- PLC
- Industrial networking
- Robotics



■ Communication

- Serial protocol gateways
- Office phones



STM32 audio software

This professional audio engine from the leading technology company Spirit is a high-quality and fully-supported solution. It removes the hurdles associated with open source solutions, and insures a fast development with professional results for audio applications. The solution supports the popular MP3 and WMA key formats, supported by a set of must-have add-ons such as a channel mixer, standalone 3-band parametric equalizer and loudness control.

The STM32 audio software is available for the STM32F105 Connectivity line products, which feature several dedicated enhancements for high-quality audio processing.

Contact your local ST sales and marketing office for more information on this solution.



Superior audio: audio class I²S

The two audio class I²S of the STM32 Connectivity line, combined with the embedded Ethernet and USB OTG peripherals, address the connectivity and features required of many home-audio applications.

The new PLL block clocking the two I²S peripherals provides less than 0.5% error on the master clock connected to the external audio DAC.

The USB 2.0 OTG controller can connect any USB device, including USB mass storage devices and portable audio players. The powerful Cortex-M3 core running at 72 MHz is able to handle not only the audio decoding of music files stored on an SD card or USB mass storage device connected to the STM32, but also the user interface.

Device summary

Part number	Program memory		RAM (Kbytes)	A/D inputs	Timer functions		Serial interface	I/Os (high current)	Packages	Supply voltage (V)	Special features
	Type	Size			12 or 16-bit (IC/OC/PWM)	Others					
	Flash	(Kbytes)									
STM32F105/107 Connectivity line - 72 MHz CPU											
64 pins	STM32F105R8	●	64	20	16x12-bit	7x16-bit (20/20/22)	3xSPI, 2xI ² S, 2xI ² C, 3xUSART (IrDA, ISO 7816), 2xUART, USB OTG FS, 2xCAN	51(51)	LQFP64	2.0 to 3.6	72 MHz CPU speed, 2-channel DAC, V _{bat} pin, low-power features, embedded POR, PDR and PVD, 8 MHz and 40 kHz internal RC oscillator, 3-25 MHz main oscillator, dedicated 32 kHz oscillator, 1x high-speed USART 4.5 Mbit/s, motor control oriented PWM, 2x ADC (double sample and hold capability), advanced PLL schemes for audio class I ² S communication, -40 to 85 °C or -40 to 105 °C
	STM32F105RB	●	128	32	16x12-bit	7x16-bit (20/20/22)		51(51)	LQFP64		
	STM32F105RC	●	256	64	16x12-bit	7x16-bit (20/20/22)		51(51)	LQFP64		
	STM32F107RB	●	128	48	16x12-bit	7x16-bit (20/20/22)		51(51)	LQFP64		
	STM32F107RC	●	256	64	16x12-bit	7x16-bit (20/20/22)		51(51)	LQFP64		
100 pins	STM32F105V8	●	64	20	16x12-bit	7x16-bit (20/20/22)	3xSPI, 2xI ² S, 2xI ² C, 3xUSART (IrDA, ISO 7816), 2xUART, USB OTG FS, 2xCAN	80(80)	LQFP100, LFBGA100		
	STM32F105VB	●	128	32	16x12-bit	7x16-bit (20/20/22)		80(80)	LQFP100, LFBGA100		
	STM32F105VC	●	256	64	16x12-bit	7x16-bit (20/20/22)		80(80)	LQFP100, LFBGA100		
	STM32F107VB	●	128	48	16x12-bit	7x16-bit (20/20/22)		80(80)	LQFP100, LFBGA100		
	STM32F107VC	●	256	64	16x12-bit	7x16-bit (20/20/22)		80(80)	LQFP100, LFBGA100		

Development tools

As for all STM32 products, a complete range of high-end and low-cost development tools is available to provide software and hardware solutions. In addition to a free SW library supporting all standard peripherals, advanced libraries are available from 3rd parties to offer turnkey solutions for Ethernet TCP/IP stacks and USB OTG stacks.

TCP/IP Networking Software and USB Device, Host and OTG stacks

Company	TCP/IP solutions	USB solutions			Website
		Device	Host	OTG	
HCC-Embedded	-	USB	USB	USB	www.hcc-embedded.com , www.hcc-embedded.com/en/solution/st_micro
CMX	CMX-TCP/IP	CMX-USB	CMX-USB	CMX-USB	www.cmx.com
Express Logic	NetX	-	-	-	www.rtos.com
IAR	PowerPac TCP/IP	PowerPac USB	PowerPac USB	PowerPac USB	www.iar.com , www.iar.com/st
Interniche	NicheLite	-	-	-	www.iniche.com , www.st.com/mcu
Keil	RL-TCPnet	RL-USB	-	-	www.keil.com
Micrium	μC/TCP-IP	μC/USB	μC/USB	μC/USB	www.micrium.com , www.micrium.com/st/index.html
Micro Digital	smxNS	smxUSBD	smxUSBH	smxUSB0	www.smxrtos.com , www.smxrtos.com/stmicro.htm
Quadros Systems	RTXC Quadnet RTXC Quark	RTXCusb	RTXCusb	RTXCusb	www.quadros.com
Segger	embOS/IP	emUSB	emUSB	emUSB	www.segger.com

Evaluation board STM3210C-EVAL

Complete hardware evaluation platform with the STM32 Connectivity line (STM32F107VCT6), implementing the full range of device peripherals and features.



STM3210C-EVAL

Starter kits

Product	Order code
ComStick (Hitex)	STM32-COMSTICK
Starter kit (IAR)	STM3210C-SK/IAR
Starter kit (KEIL)	STM3210C-SK/KEIL
Starter kit (Raisonance)	STM3210C-SK/RAIS
REva daughter board (Raisonance)	STM32107C-D/RAIS
EvoPrimer*	STM3210CPRIMER

Note:
* Contact ST sales office for availability



STM32-COMSTICK



STM3210CPRIMER

Micrium book and board package

Micrium book

Micrium's newest real-time kernel μ C-OS/III designed to save time on embedded system projects. A two-part book dedicated to μ C-OS/III is accompanied by an STM32 Connectivity line evaluation board.

Order code: STM32CMICOS-EVAL



STM32CMICOS-EVAL

Micrium TCP/IP book

Understand how a TCP/IP stack works using Micrium's μ C/TCP-IP as a reference with the book *μ C/TCP-IP: The Embedded Protocol Stack for the STM32F107, Connectivity line*. Examples run on the STM32F107 evaluation board available with the book *μ C/OS-III*.

Order code: STM32CMICTCP-BK



STM32CMICTCP-BK