

SILICA XYNERGY = FPGA + Cortex™-M3-MCU

SILICA's new module combines an STM32F217 Cortex™-M3 microcontroller from STMicroelectronics and a low-cost Spartan-6 FPGA from Xilinx. This combination is currently unique.



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There are countless development boards available for ARM Cortex™-M microcontrollers, and the same goes for FPGA kits. Up to now, if you wanted a development module that combines both technologies on one board, you'd be searching in vain. This seems to be odd, given that typical designs often have a microcontroller right next to the FPGA, and that this microcontroller executes tasks whose integration into the FPGA wouldn't make economic sense. The high cost of appropriate IP cores and of the additional resources

needed on the FPGA means that customers don't take long to decide on a two-chip solution. Using standard communications interfaces – such as Ethernet, USB, and CAN – is in most cases cheaper and easier to implement on a microcontroller.

A dedicated microcontroller also provides access to the analogue world, as A/D and D/A converters can be found on practically every derivative but simply don't exist in FPGAs. Conversely, access to a large

external SDRAM and to modern field buses can't be implemented using standard microcontrollers. The ideal addition here is an up-to-date FPGA with a dedicated DDR 2/3 memory controller and available IP cores for common field bus protocols. It also enables time-critical tasks in areas like video processing, high-performance motor control, encryption etc. to be executed by the FPGA, given that it is a very fast co-processor.

Another important point is that the

inclusion of an FPGA in a design provides great potential for more flexibility as well as for features that differentiate a product from its competitors. The FPGA often turns out to be the one thing that tips the scales when designers need to add innovations like higher speed and – especially – unique functions.

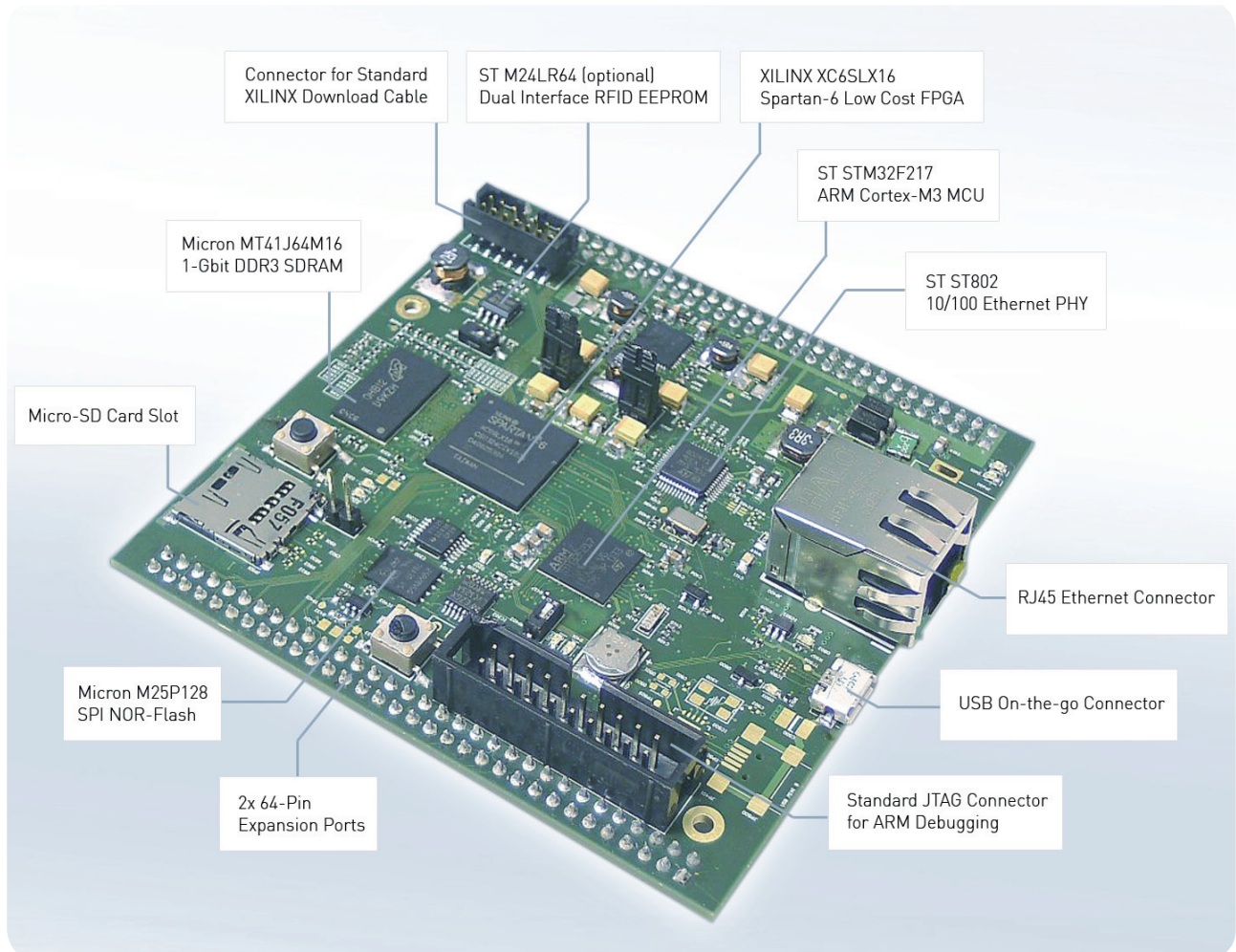
“If you wanted a development module that combined both technologies on one board, you’d be searching in vain.”

SILICA was motivated to develop its Xynergy Board by its experience with customers who kept confirming the scenario described above. The kit combines a brand new STMicroelectronics STM32F217 controller, which is based on an ARM® Cortex™-M3 core, with a XILINX Spartan-6 low-cost FPGA (XC6SLX16) in a single design. The controller’s new FSMC interface enables a parallel, 16-bit connection for the FPGA. This ensures high-speed data transfer between the two components. The Cortex™-M3 core can be clocked at up to 120 MHz. Also, 1 MB Flash memory as well as 128 KB SRAM are integrated on the device. In addition, the 128 Mb DDR-3 memory, which is connected to the FPGA, can be made transparent via the FSMC bus, enabling the controller to use it too.

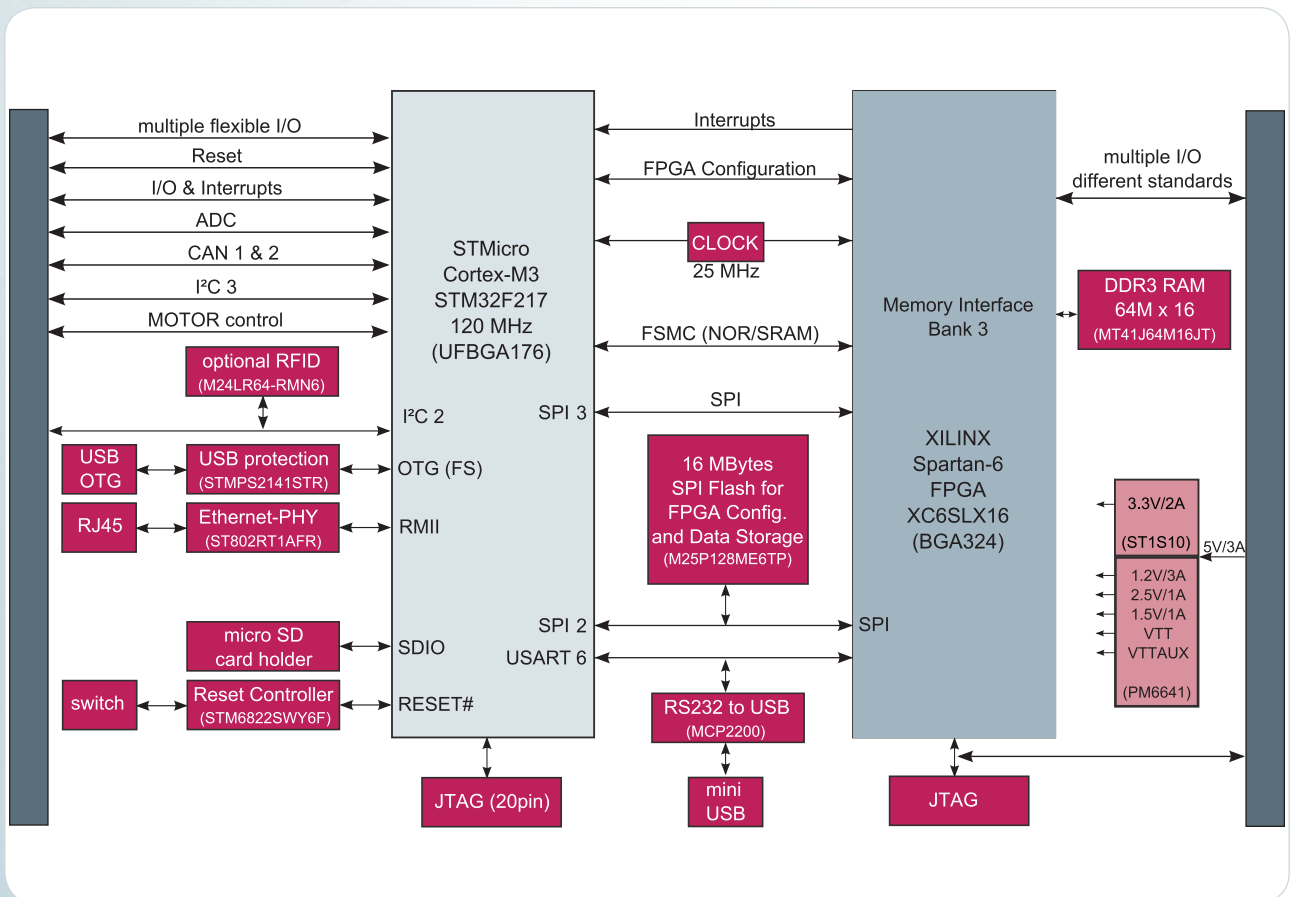


Xynergy Board Features:

- ST STM32F217 ARM® Cortex™-M3 MCU
- Xilinx XC6SLX16 Spartan-6 low cost FPGA
- ST ST802 10/100 Ethernet PHY
- RJ45 Ethernet connector
- Micron MT41J64M16 1-Gbit DDR3 SDRAM
- Micron M25P128 SPI NOR-Flash
- Micro-SD Card Slot
- ST M24LR64 dual interface RFID EEPROM (optional)
- USB on-the-go connector
- Standard JTAG connector for ARM debugging
- Connector for standard Xilinx Platform Cable USB II
- 2 x 64-pin expansion ports



Silica's Xynergy Board combines a Cortex™-M3 controller from STMicroelectronics (STM32F217) with a low-cost FPGA from the Xilinx Spartan-6 family (XC6SLX16)



A variety of communications interfaces are provided, including Ethernet, USB On-the-Go and CAN as well as SPI, Virtual COM-Port (with a RS232 to USB bridge) and a Micro-SD card slot. Two 64-pin extension sockets in a standard 2.54 mm grid are provided so that the kit can be plugged into an optional motherboard with FPGA Mezzanine connectors (FMC).

This facilitates the connection of an increasingly wide choice of FMC plug-in boards from different manufacturers for the provision of Industrial Ethernet capabilities, for example. The kit can also be connected to one of the motor control interfaces developed by STMicroelectronics, which uses them on several of its own kits. It could even be integrated into companies' own designs as a ready-to-use, plug-in module.

Turning to the software side, companies can choose from a selection of development systems for the STM32F217. Along with their

full versions, most tool suppliers offer evaluation versions that have limited functionality to a greater or lesser extent but are free of charge.

The kit also includes an ST-Link debug adapter that can be connected to the 20-pin standard JTAG socket that is provided on the Xynergy Board.

"The board can be used as soon as it has been unpacked, as it comes with USB and Ethernet cables as well as a 5 V power adaptor."

The FPGA can be configured directly using a XILINX standard download cable (not supplied in the

kit) or indirectly via the STM32F217. The mounted Micron M25P128 SPI Flash memory can be used as a non-volatile configuration module for the FPGA and can also be used via the microcontroller.

For the FPGA, XILINX provides its free-of-charge ISE Web-PACK development environment. It provides full support for the Spartan-6 and can be downloaded free of charge from the XILINX website. Further information is available from SILICA staff in the company's sales offices and at www.silica.com/Xynergy.