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Xynergy – Makes the Difference!

STM32F417 meets XILINX Spartan-6



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Why Xynergy?

- Very easy: There is a clear **S**ynergy achieved by combining the latest generation of the most popular ARM Cortex-M3 / Cortex-M4 implementation (STM32) and state-of-the art low cost FPGA technology (Spartan-6) from XILINX
- **S**ynergy ist too „general“ for a name ... so just take the „**X**“ from XILINX and substitute it for the „**S**“ and you are done!
- Xynergy is the only board available on the market combining an ARM Cortex-M MCU with a low cost FPGA



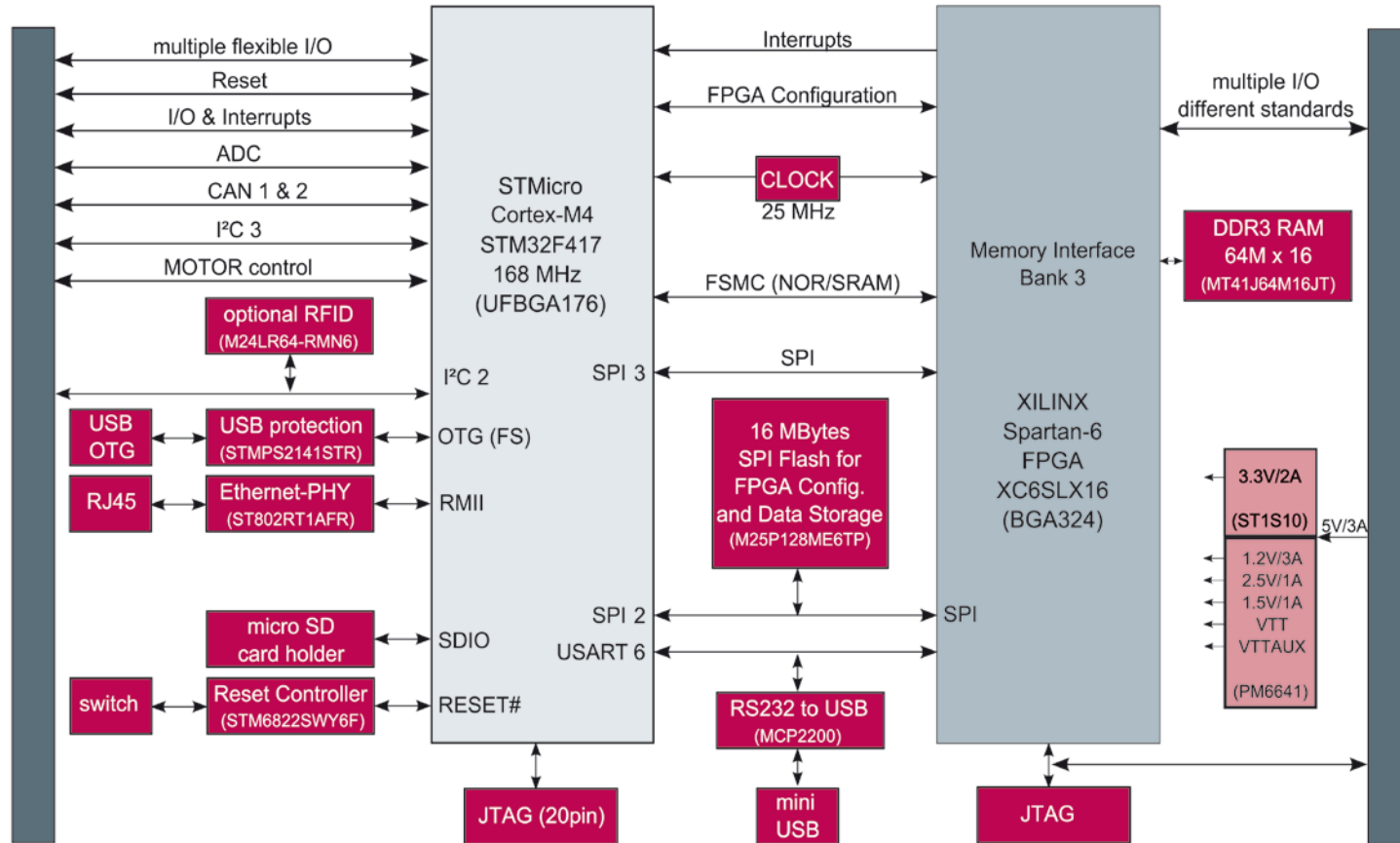
- **„Cortex-M4 Edition“ with pin compatible STM32F417IGH6**
That is extensive re-use of the well known „Cortex-M3 Edition“ for STM32F4x with Cortex-M4
- ➔ **Excellent option for designers who need additional performance in terms of f_{\max} (168 MHz vs 120 MHz), FPU and DSP instruction set!**



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Xynergy Block Diagram





Outstanding Performance and Power



Cortex-M4 maximum processing performance with 0-wait state execution from Flash up to 168 MHz

- **FPU**
- **210 DMips at 168 MHz**
- **Adaptive Real Time (ART memory accelerator™)**
 - ✦ 128-bits wide Flash with Prefetch
 - ✦ Intelligent Branch management
- **32-bit 7 layers AHB bus matrix interconnects**



230µA/MHz, 22.5 mA at 120 MHz

- ✦ ST's 90 nm process, 1.2 V core
- ✦ ST ART Accelerator™ reducing accesses to Flash
- **Advanced low-power modes and features**
 - ✦ Backup SRAM and RTC
 - ✦ < 1µA with RTC on
 - ✦ < 1uA with 4Kbyte backed up SRAM
 - ✦ < 2uA with both on
- **VDD min down to 1.7 V**



Peripherals and integration



- **High Speed USB OTG**
- **Audio PLL, I²S and USB synchronization**
- **Camera interface, 8- to 14-bit parallel, up to 54 Mbyte/s**
- **Flexible static memory interface up to 60 MHz synchronous**
- **Cryptographic acceleration: AES 128, 192, 256, Triple DES, HASH (MD5, SHA-1), and HMAC**
- **3 SPIs running at up to 37.5 Mbit/s,**
- **6 USARTs running at up to 10.5 Mbit/s**
- **3x 12-bit ADC, 2.4 MSPS, up to 7.2 MSPS in interleaved mode**
- **True random-number generator**
- **Fast GPIO (84 MHz toggling)**



- **1 MByte Flash**
- **192 KByte SRAM incl. 64KBbyte CCM SRAM**
- **80 Byte + 4 KByte back up SRAM: used as EEPROM to save application state, calibration data,**
- **528 byte of OTP memory to store critical user data such as Ethernet MAC addresses or cryptographic keys.**



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Features Spartan-6 XC6SLX16

- **14.579** Logic Cells (6 Bit LUT, 2 Flip-Flops)
- **576 Kb** Block RAM organized in **32** 18 Kb Blocks
- **2** Clock Management Tiles (CMTs), each containing 2 DCMs and 1 PLL
- **Maximum 232** Single-Ended or **116** Differential User I/Os
- **32** DSP48A1 Slices: Multiply Accumulate (MAC) and many more arithmetic functions
- **2** DDR2 / DDR3 SDRAM Memory Controller Blocks

XILINX.
SPARTAN⁶



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Target Applications

- Evaluation of mixed Microcontroller / FPGA designs
- General purpose industrial applications using Ethernet / USB / CAN / SPI / I²C
- General purpose pre-, post- and co-processing with FPGA, i.e. digital filtering , advanced crypto, video etc.
- Implementation of industrial Ethernet IP in FPGA
- Motor control with FPGA acceleration of closed loop algorithms
- Access to DDR3-Memory for the Microcontroller
- Custom interfaces

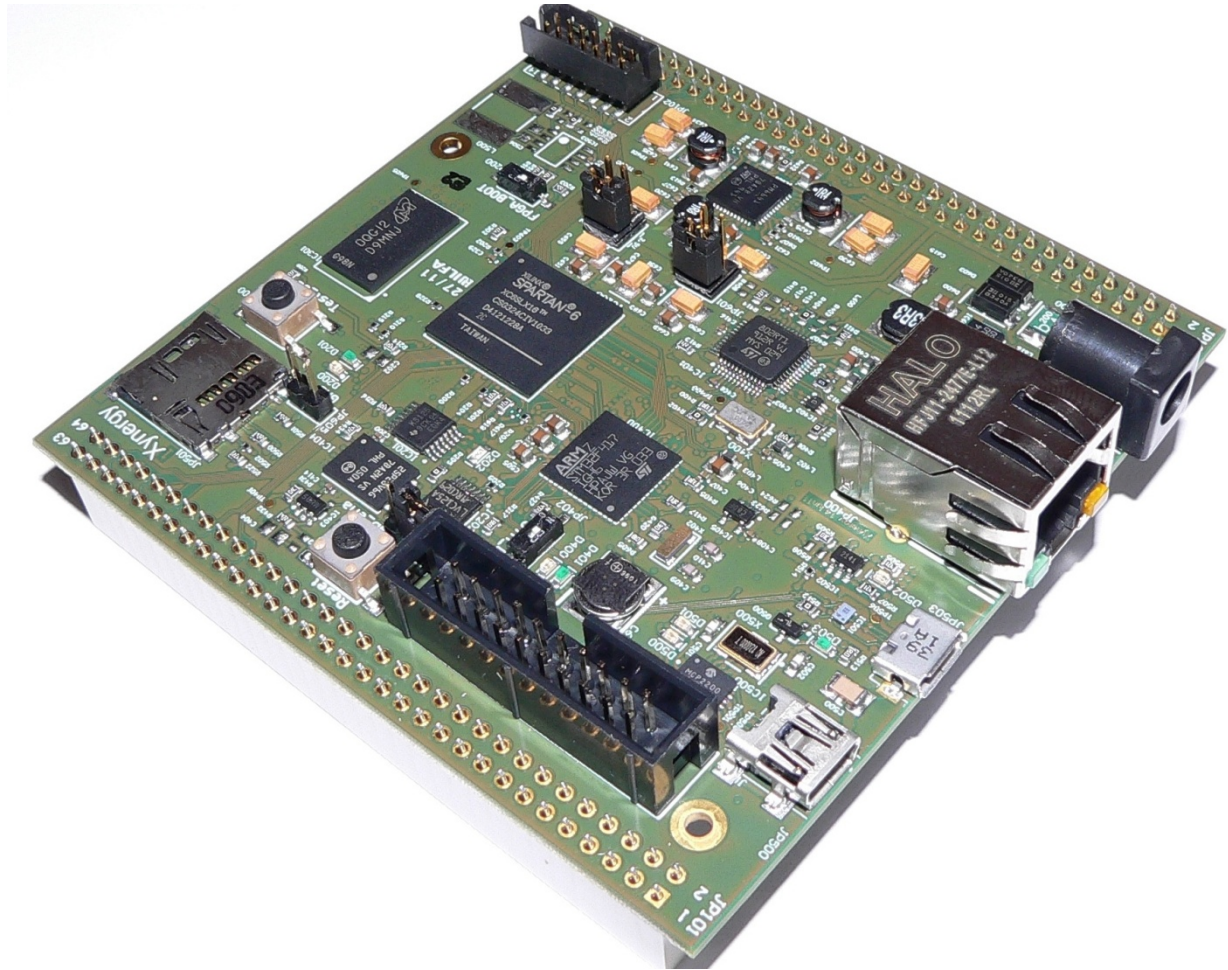


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Packing List

The Board...





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Packing List cont.

... 5V / 3A wall power supply with all potentially needed adapters for all relevant countries ...



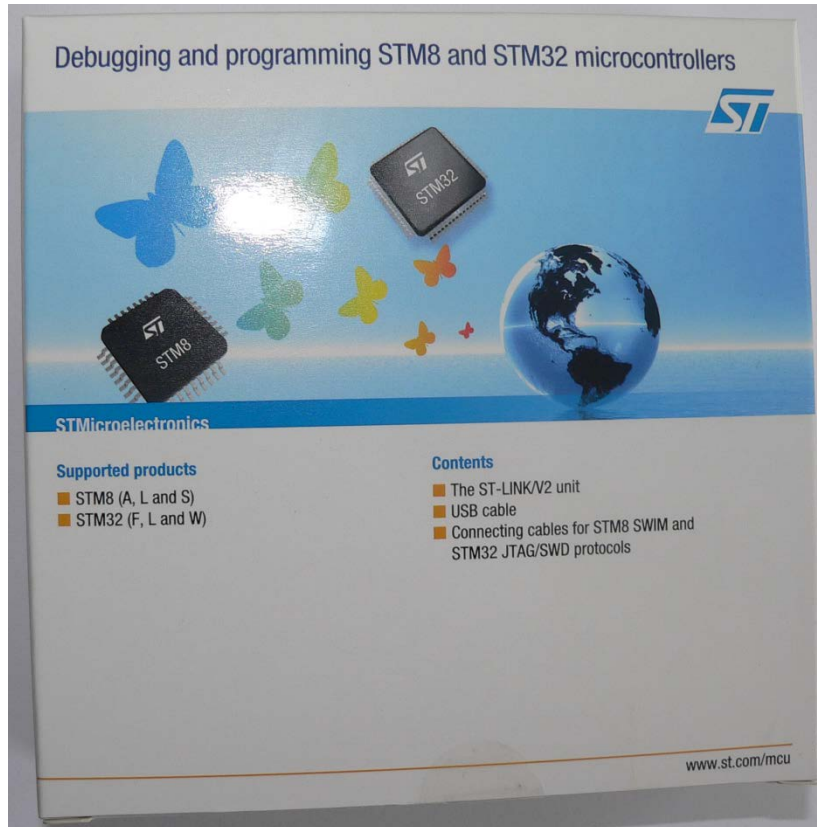


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Packing List cont.

... **ST-Link/V2 low cost in-circuit debugger for STM32 ...**





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Packing List cont.

... USB A / Micro USB A for USB-OTG...



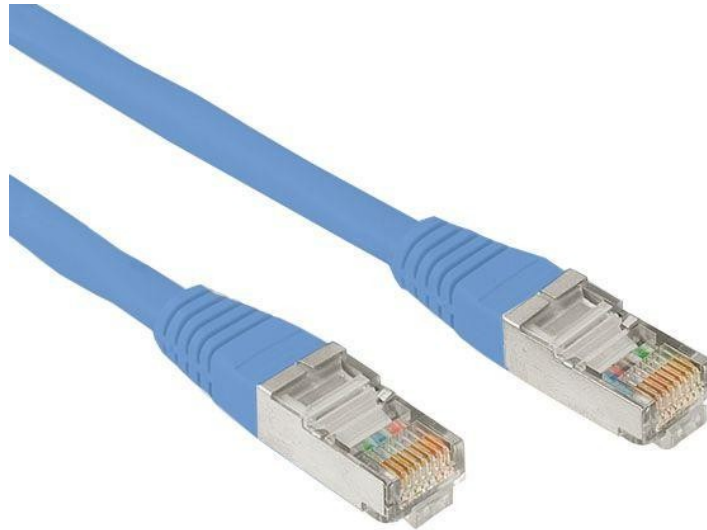


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Packing List cont.

... CAT-5(e) cable for Ethernet connection ...





Packing List cont.

... Flyer with short introduction, referencing to the Xynergy webpage for download of further documentation, software etc. : <http://www.silica.com/xynergy>

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Silica Xynergy Board
STM32 Meets Spartan-6

ST M321R4 (ARMv7-M) Dual-Channel USB-Ethernet Controller
BLANK XE6SLX16 Spartan-6 Low-Cost FPGA
ST STM32F205 ARM Cortex-M3 MCU
ST STM32F103T8C8 Ethernet PHY
Stack Ethernet Connector
USB On-The-Go Connector
USB Micro-B Connector for Virtual COM-Port
Simplified JTAG Connector for ARM Debugging
Micro-SD Card Slot
Micro-USB (AM9610) 1.5m Cable (2015) USB-A
Micro-USB (M05F128) SPI NAND Flash
2x 40 Pin Expansion Ports
Micro-USB (M05F128) USB to Micro-USB Connector

Ordering Information:
XYZBAYXNERGY € 199.-

For further details, please visit: www.silica.com/xynergy

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The Silica Xynergy Board combines an ARM Cortex-M3 based STMicroelectronics STM32F217 controller with a Xilinx Spartan-6 low-cost FPGA (XC6SLX16) in one design.

There are numerous development tools for either ARM Cortex-M microcontrollers or FPGA kits, but this is the first module in the market that merges both technologies on one board.

Target Applications

- Evaluation of mixed microcontroller/ FPGA designs
- General purpose industrial applications using Ethernet/ USB/ CAN/ SPI/ I2C
- General purpose pre-, post- and co-processing with FPGA, i.e. digital filtering, advanced crypto, video etc.
- Implementation of industrial Ethernet IP in FPGA
- Motor control with FPGA acceleration of closed loop algorithms
- Access to DDR3 memory for the STM32
- Custom interfaces

Kit Content

- Silica Xynergy Board
- ST-LINK/V2 In-circuit debugger/ programmer for STM32
- 5 W/3 A Power adapter
- Cat-5 Patch Cable
- USB 2.0 Cable A/ mini B for Virtual COM-port connection

Getting Started

The Getting Started documentation, including links to compatible development tools with free options, the user manual, software examples and any additional documentation is available for download from: www.silica.com/xynergy

No guarantee as to the accuracy, completeness or reliability of any information. Subject to modifications and amendments.

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Download Page



Silica.com » Xynergy Software Download



Silica Xynergy Board Documentation

Find below the necessary material to get started with your Silica Xynergy Board:

- [Xynergy User Guide](#) (pdf, 1.6 MB)
- [Schematic & Silkscreen](#) (zip, 1.8 MB)

Software Examples

- [Getting_Started](#) (pdf, 0.3 MB)
- [Preloaded_Software_on_Xynergy](#) (pdf, 0.6 MB)
- [Microchip MCP2200 Virtual COM-Port Driver and Utilities](#)

STM32:

- [Xynergy-Networking \(WEB-Server\)](#) (zip, 16.4 MB)
- [Xynergy-Resource-Examples](#) (zip, 49.1 MB)

Xilinx:

- [FSMC-Interface for Spartan-6](#) (zip, 2.4 MB)
- [DDR3-Memorytest with MicroBlaze](#) (zip, 20.3 MB)

Xynergy Testing:

- [Xynergy_Board_Test](#) (pdf, 0.7 MB)
- [Xynergy_Testing](#) (zip, 0.6 MB)

Gerber Data

To receive the Gerber Data, please, send an email to knut.sennwald@silica.com with a brief description of your application.



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How to order, Price, Availability

- **Cortex-M4 Version**
 - Part number is **XYZBAYXYNERGYM4**
 - Price: **€209,-**
 - Available from SILICA **stock**