

ST MCU's Trainings Catalogue

The right information on the right products



T.O.M.A.S.

*Technically Oriented
Microcontroller Application Services*

H1/2013

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Dear Customers,

We are pleased to present you our offer of ST Microcontroller's trainings for H1 2013. The complete ST trainer's team is looking forward to share with you our expertise and enthusiasm on the ST Microcontroller's products and application development techniques.

In addition, it is our great pleasure to extend the offer of ST MCU trainings thanks to our **Training Partners**. For more details about our Training Partners please see the next page.

All sessions are thorough technical trainings made for:

- *SW and HW Engineers of embedded systems*
- *Distributor Field Application Engineers (ST sessions only)*

Additional Trainings on customer's or other STMicroelectronics' sites are possible upon request. Please contact us or our Partners to know the availability and conditions.

A few tips to make your journey and ST training a success:

- Any ST training may be canceled if there is not a minimum of 8 attendees. Therefore, please, do not book tickets or rooms unless you have received a confirmation e-mail from us, which is sent about 4 weeks before the start of the training.
- For the resident outside of Europe who need an entry visa, please contact us at least 4 weeks before the training.
- ST Trainings are free of charge and include free lunch and collations at ST premise. Accommodation and other expenses are at your charge. For Partners Training, the conditions have to be negotiated with them directly.
- Distributor FAE MCU Certification Test is open and available after every microcontroller training from ST.

Logistics for ST sessions:

To book hotel rooms for the training, please provide your ST contact person with Check IN and Check OUT dates, or make the reservation by yourself. For more informations about the logistics and ST offices locations please see the [last page](#) of this catalog.

Roman Ludin
Microcontroller Training Center Manager
Microcontroller Application and Support Team Manager
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ST MCU Trainings Partners

In order to extend the offer of ST MCU trainings (STM32 family mainly) we would like to present our Training Partners:



Sessions provided by our Training Partners offers you several services and extended flexibility in terms of:

- *Coverage and available sessions*
- *Language options*
- *Combined sessions with RTOS, tools, communication protocols, etc.*

All Training Partners are using up-to-date training materials and product information provided by ST.

The Training Partners are professional training companies and most of them are known as leader and top quality service providers on their market. In addition, to ensure the quality of the ST Microcontrollers training, ST has put in place a certification program. The certified partners have been asset on their technical Knowledge on the ST microcontrollers, their facilitation skills, logistic and registration.

For more details about each partner please see next page.

Prescheduled sessions provided by our Training Partners are present in the Trainings Calendar overview inside this catalog. For more details about Training Partners sessions please go to their page or contact them directly.

ST MCU Trainings Partners details

Training Partner	Contact info	Coverage	Languages	Certified	Trainings Options and Expertise
	info@ac6-training.com +33 (0) 141 168 010 www.ac6-training.com	Worldwide	French English	Yes	<ul style="list-style-type: none"> - STM processors - USB, PCI, PCIExpress , RapidIO, Ethernet - VHDL – FPGA - C, C++, Real time and industrial grade JAVA - Real Time OS: Linux, Android, Windows
	dev@antycip.com +33 1 49 92 68 10 www.antycip.com	France	French English	Yes	<ul style="list-style-type: none"> - STM32 - RTOS, TCP/IP - ARM7TDMI and CORTEX M3 - Development tools: ARM, IAR, Keil
	info.de@doulos.com +49 511 277 1340 www.doulos.com www.doulos.com/ARM	Worldwide	German English	Not yet	<ul style="list-style-type: none"> - STM32 - ARM intro, ARM Embedded Software - ARM Cortex-Mx Processor - C/C++, SystemC, Perl, VHDL, Verilog
	education@exelen.ch +41 26 422 48 42 www.exelen.ch/education	Central Europe France, Italy	English French Italian	Yes	<ul style="list-style-type: none"> - STM32 - RTOS (SafeRtos, FreeRTOS, uc/os-III), - Development tool chains, hardware design tools - VHDL, FPGA design
	kurt.boehringer@hitex.de +49 721 9628 195 www.hitex.de	Central & East Europe Benelux	German English	Yes	<ul style="list-style-type: none"> - STM32, STR7xx, STR9xx - USB, Ethernet (TCP/IP), CAN, FlexRay - Software Quality, Development Tools - RTOS, GNU Compiler
	p.siwon@microconsult.de +49 (0) 89 45061744 www.microconsult.com www.microconsult.de	Worldwide	German English	Yes	<ul style="list-style-type: none"> - STM32, Cortex Mx, ARM7/9/11, VHDL - C, C#, C++, Java, Perl, UML, TCL/TK, Python C - Embedded C++ Software Engineering RTOS - TCP/IP, VOIP-SIP, CAN - Project management, testing
	training@mvd-fpga.com +33 (0) 5 62 13 52 32 www.mvd-fpga.com	France Worldwide	French English	Yes	<ul style="list-style-type: none"> - STM32, STR7xx, STR9xx - ARM7/9/11, Cortex-M1/M3/R4/A8 - USB2.0, PCI Express 2.0, Ethernet, TCP/IP, IEEE1588, CAN - Embedded and real-time software development - FPGA Design, VHDL language
	bruno.richard@raisonance.com +33 (4) 76 61 02 31 http://www.raisonance.com/	France	French English	Not yet	<ul style="list-style-type: none"> - STM8, STM32 - Real-Time Operating Systems (RTOS) - Embedded development methodologies in C/C++
	bruno.coppi@tecnologix.it +39 02 48954230 http://www.tecnologix.it	Italy	Italian English	Yes	<ul style="list-style-type: none"> - STM32 - Keil Development Tools (Advanced, Keil Realtime Library) - CANopen, J1939, DeviceNet, LIN protocols - Ethernet, EtherCAT. Modbus/TCP, Profibus

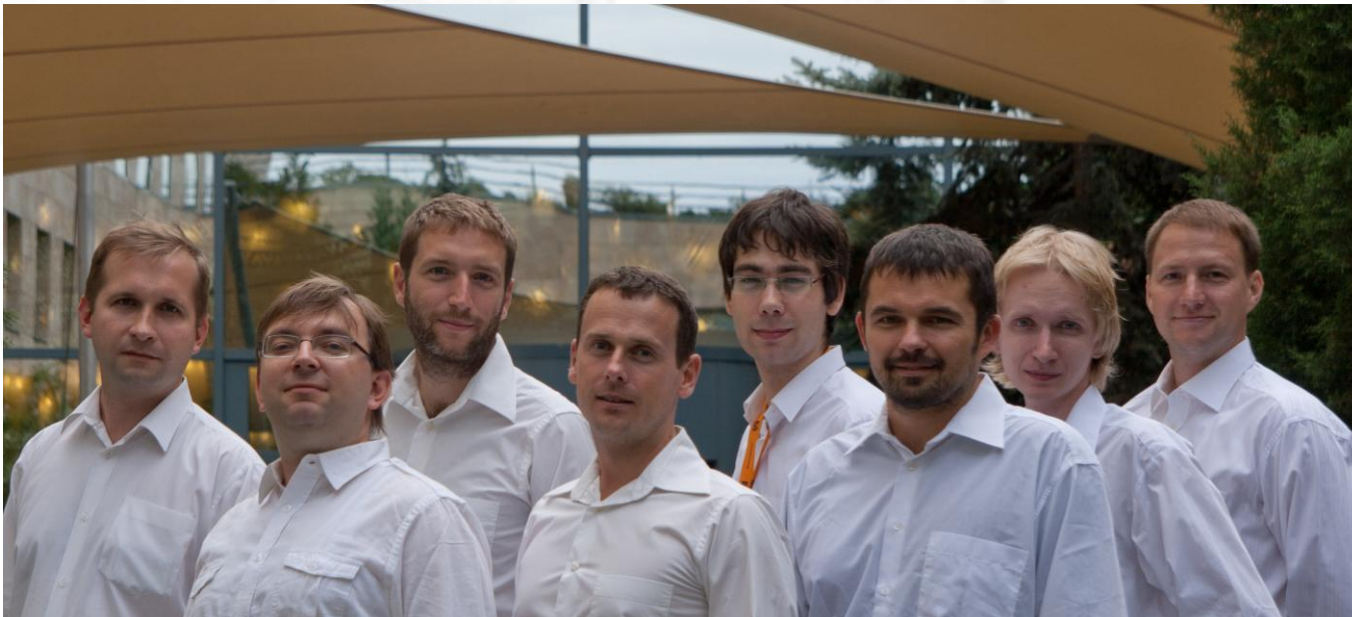
H1/2013 MCU Trainings Calendar Overview

H1/2013	January	February	March	April	May	June
STM32F0xx		5.-6. (W6) ST - Munich (Germany)		9.-10. (W15) ST - Prague (Czech Rep.)		
STM32F1xx		7.2. (W6) ST - Munich (Germany)				
STM32F3xx	15.-17. (W3) ST - Castelleto (Italy)		12.-14. (W11) ST - Prague (Czech Rep.)			
STM32F2xx STM32F4xx						11.-13. (W24) ST - Castelleto (Italy) 18.-20. (W25) ST - Nordic 25.-27. (W26) ST - Stuttgart (Germany)
STM8A/S/L			19.-21. (W12) ST - Prague (Czech Rep.)			
Low Power Workshop				18.4. (W16) ST - Prague (Czech Rep.) 25.4. (W17) ST - Munich (Germany)	7.5. (W19) ST - Castelleto (Italy)	4.6. (W23) ST - Hamburg (Germany)
Motor Control with ST MCU's					21.-23. (W21) ST - Prague (Czech Rep.)	
STM32Fxxx trainings done by Training Partners	15.-18. (W4)* MVD - Paris (France)		14.-15. (W11)* Exelen – Fribourg (Switzerland) 19.-22. (W12)* MVD – Paris (France)		13.-16. (W20)* MVD - Paris (France)	13.-14. (W24)* Exelen – Fribourg (Switzerland) 25.-28. (W26)* MVD - Paris (France)

Note: For more details about the ST trainings please click on the chosen session. In case of sessions provided by our Training Partners (*) you will be redirected to their web page getting the full info about the given session.

ST Trainers Team

The ST Trainers Team consists of fully skilled and professional facilitators. Every trainer has conducted more than 200 training days. Their everyday working activity is answering microcontroller hotline technical questions and designing of various microcontroller based embedded applications. This ensures their high level of technical expertise and allowing them to understand your application requirements providing you with optimized solutions.



More than 5000 trained participants in our Technical Trainings since 2004!



STM32F0xx Standard Training – 2 days

This training is introducing the STM32 microcontroller family entry level series. It starts with the presentation of CORTEX M0 core and architecture on which the STM32 is based. It is followed by the memory organization, reset block, interrupts, low power modes and all peripherals, such as IO ports, ADC, timers, RTC, SPI, USART, I2C and DAC. Most of the theoretical presentations are combined with practical hands-on examples. Part of the training focuses on the software and hardware development tools.



What are the benefits for you?

- You will familiarize yourself with CORTEX M0 core, STM32F0 peripherals and development tools.
- You will be able to start-up a new project and use the development tools.
- You will be able to present the STM32 family with all its technical features (for FAE's mainly).

Agenda:

- **STM32 family overview**
- **CORTEX M0 core architecture**
- **STM32F0 system architecture**
(Embedded Flash, DMA, Power control, Backup domain, Reset block, Clock)
- **STM32F0 peripherals**
(IO, Timers, RTC, ADC, SPI, UART, I2C, DAC)
- **Hardware tools**
(JTAG, SWD, eval boards, kits)
- **Hands-on exercises**
(Practical examples)

Available Sessions:

Week	Start	End	Level	Location
6	February 5 th 09:00	February 6 th 17:00	Basic	ST Munich (Germany)
15	April 9 th 09:00	April 10 th 17:00	Basic	ST Prague (Czech Republic)

Prerequisites: Technical English, Basics of MCU programming, PC with USB and Admin rights

More about STM32 family: www.st.com/stm32f0



STM32F10x Standard Training – 1-3 days

This training is introducing the STM32 microcontroller family. It starts with the presentation of CORTEX M3 core and architecture on which the STM32 is based. It is followed by the memory organization, reset block, interrupts, low power modes and all peripherals, such as IO ports, ADC, timers, RTC, SPI, USART, I2C, CAN, USB, FSMC, I2S, SDIO and DAC. Most of the theoretical presentations are combined with practical hands-on examples. Part of the training focuses on the software and hardware development tools.

What are the benefits for you?

- You will familiarize yourself with CORTEX M3 core, STM32F1 peripherals and development tools.
- You will be able to start-up a new project and use the development tools.
- You will be able to present the STM32 family with all its technical features (for FAE's mainly).



Agenda:

- **STM32 family overview**
- **CORTEX M3 core architecture**
- **STM32F1 system architecture**
(Embedded Flash, DMA, Power control, Backup domain, Reset block, Clock)
- **STM32F1 peripherals**
(IO, Timers, RTC, ADC, SPI, UART, I2C, CAN, USB, FSMC, I2S, SDIO, DAC)
- **Hardware tools**
(JTAG, SWD, eval boards, kits)
- **Hands-on exercises**
(Practical examples)

Available Sessions:

Week	Start	End	Level	Location
6	February 7 th 09:00	February 7 th 17:00	Basic	ST Munich (Germany)

Prerequisites: Technical English, Basics of MCU programming, PC with USB and Admin rights

More about STM32 family: www.st.com/stm32f1



STM32F3xx Standard Training – 3 days

This training is introducing the STM32F3 microcontroller series. It starts with the presentation of CORTEX M4 core and architecture on which the STM32 is based. It is followed by the memory organization, reset block, interrupts, low power modes and all peripherals, such as IO ports, ADC, timers, RTC, SPI, USART, I2C, CAN, USB, DAC, embedded comparators and Op-Amps. Most of the theoretical presentations are combined with practical hands-on examples. Part of the training focuses on the software and hardware development tools.



What are the benefits for you?

- You will familiarize yourself with CORTEX M4 core, STM32F3 peripherals and development tools.
- You will be able to start-up a new project and use the development tools.
- You will be able to present the STM32 family with all its technical features (for FAE's mainly).

Agenda:

- **STM32 family overview**
- **CORTEX M4 core architecture**
- **STM32F3 system architecture**
(Embedded Flash, DMA, Power control, Backup domain, Reset block, Clock)
- **STM32F3 peripherals**
(IO, Timers, RTC, SPI, UART, I2C, CAN, USB, ADC, DAC, Comparator, Op-Amp)
- **Hardware tools**
(JTAG, SWD, eval boards, kits)
- **Hands-on exercises**
(Practical examples)

Available Sessions:

Week	Start	End	Level	Location
3	January 15 th 09:00	January 17 th 17:00	Basic	ST Castelletto (Italy)
11	March 12 th 09:00	March 14 th 17:00	Basic	ST Prague (Czech Republic)

Prerequisites: Technical English, Basics of MCU programming, PC with USB and Admin rights

More about STM32 family: www.st.com/stm32f3



STM32F2xx & STM32F4xx Training – 3 days

This training is dedicated to the new members of the wide STM32 microcontroller family, the High Performance STM32 F2 and F4 lines. The training starts with the refresh of the ARM CM-3 core and introduction of CM-4 core main capabilities. The advanced STM32 F2 and F4 system architecture including dedicated system IP's is deeply covered. Main part of the training is focusing on the rich set of peripherals, such as GPIO's, RTC, ADC, DAC, FSMC, SPI/I2S, USB FS and HS, Crypto, Camera interface, Ethernet and new peripherals to be introduced. Numerous hands-on examples are designed to practice most of the peripherals and device features.



What are the benefits for you?

- You will refresh the CM-3 core details and learn the features of CM-4 core.
- You will discover the new peripherals and system blocks of the STM32 F2 and F4 lines.
- You will practice the device functionality and performance in several hands-on examples.
- You will be able to present the STM32 F2 and F4 lines (for FAE's mainly).

Agenda:

- **STM32 F2,F4 overview**
- **CM-3 and CM-4 presentation**
- **STM32 F2,F4 system architecture, system IP's and performance**
- **STM32 F2,F4 flash, DMA, DCMCI**
- **Standard peripherals**
(GPIO, RTC, watchdogs)
- **Connectivity peripherals**
(USB FS/HS, Ethernet, SPI, I2C, USART)
- **Dedicated peripherals**
(Camera interface, Crypto module)
- **Hands-on exercises**
(Practical examples – selected peripherals, device performance)

Available Sessions:

Week	Start	End	Level	Location
24	June 11 th 09:00	June 13 th 17:00	Basic	ST Castelleto (Italy)
25	June 18 th 09:00	June 20 th 17:00	Basic	Nordic
26	June 25 th 09:00	June 27 th 17:00	Basic	Stuttgart (Germany)

Prerequisites: Technical English, Basics of MCU programming, PC with USB and Admin rights

More about STM32 family: www.st.com/stm32f4



Low Power Workshop – 1 day



One can think of the total energy consumed by the application as a function of the expected or designed lifetime of a product and its average power consumption. However, the relation and balance between the performance and execution time needs to be discussed in detail to get a complete overview of the application power requirements. Using practical examples, we will present the main conventions, general software design principles and tips & tricks that can be applied to optimize and control the power consumption of an Ultra-Low-Power embedded-microcontroller application.

What are the benefits for you?

- You will learn several tips and tricks enabling you to achieve desired low power consumption of embedded applications.
- You will practice some of these techniques with STM32L device.

Agenda:

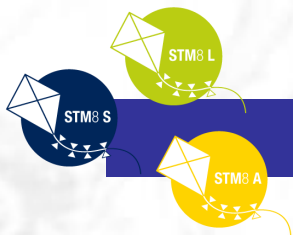
- **Low Power introduction**
- **Power versus Energy**
- **Low power profile selection**
- **Software tips/tricks**
- **Hardware related aspects**
- **MCU support for Low Power**
- **Hands-on exercises**
(Practical examples – selected peripherals, low power modes, SW tricks)

Available Sessions:

Week	Start	End	Level	Location
16	April 18 th 09:00	April 18 th 17:30	Basic	ST Prague (Czech Republic)
17	April 25 th 09:00	April 25 th 17:30	Basic	ST Munich (Germany)
19	May 7 th 09:00	May 7 th 17:30	Basic	ST Castelleto (Italy)
23	June 4 th 09:00	June 4 th 17:30	Basic	Hamburg (Germany)

Prerequisites: Technical English, Basics of MCU (C,ASM) programming, PC with USB and Admin rights

More about STM32L family: www.st.com/stm32l



STM8A/S/L Training – 3 days

This training is introducing the STM8 microcontroller family from bottom to top including the STM8S and STM8L devices. It starts with a detailed description of the STM8 core, memory organization, reset block, interrupts, low power modes, watchdog and low level programming protocol - SWIM. It continues with detailed description of the STM8S and STM8L peripherals: IO ports, ADC, timers, SPI, SCI, I2C, CAN, LCD, RTC and DAC. All theoretical presentations are combined with the practical hands-on examples. Part of the training also focuses on the software and hardware development tools.



What are the benefits for you?

- You will familiarize yourself with the STM8 core, peripherals and development tools.
- You will be able to start-up a new project and use the development tools.
- You will be able to present the STM8 MCU with all its technical features (for FAE's mainly).

Agenda:

- **STM8 architecture**
(Core, memory, reset, SWIM)
- **STM8 peripherals**
(IO, Timers, ADC, SPI, SCI, I2C, CAN, LCD, RTC, DAC)
- **SW toolchain**
(STVD, Cosmic, Raisonance)
- **HW toolchain**
(In-Circuit Debuggers, Emulators)
- **Hands-on session**
(Practical examples)

Available Sessions:

Week	Start	End	Level	Location
12	March 19 th 09:00	March 21 st 17:00	Basic	ST Prague (Czech Republic)

Prerequisites: Technical English, Basics of MCU programming, PC with USB and Admin rights

More about STM8 family: www.st.com/stm8

ST Motor Control MCU's Training – 3 days

The training first covers the general basics of BLDC/PMSM motors and their drive using Field Oriented Control (FOC). The training is covering the FOC control method and its implementation on STM32, including the different current sensing methods, sensors and sensorless topologies and other dedicated functions which are part of the STM32 motor control library. All theoretical presentations are combined with practical hands-on examples using the Motor Control Starter Kits, GUI, motor control libraries and real motors.



What are the benefits for you?

- You will learn about the common BLDC/PMSM motor types.
- You will first familiarize yourself with the Field Oriented Control basics and its implementation on STM32.
- You will practice the tools and motor control libraries of ST solutions.
- You will be able to present the STM32 main technical features and demonstrate it using the Starter Kit (for FAE's mainly).

Agenda:

- **BLDC/PMSM motors basics**
- **FOC drive theory**
- **STM32 general overview**
- **STM32 FOC implementation**
- **STM32 FOC library**
- **Tools, Starter kit, GUI**
- **Hands-on sessions**

Available Sessions:

Week	Start	End	Level	Location
21	May 21 st 09:00	May 23 rd 17:00	Basic	ST Prague (Czech Republic)

Prerequisites: Technical English, Basics of MCU programming, PC with USB and Admin rights

More about STM32 MC: http://www.st.com/internet/com/end_application/901.jsp

More about STM8 MC: http://www.st.com/internet/com/end_application/28.jsp

Advanced C Training – 2 days

Intention of this training is to improve your knowledge of C language and to focus on embedded applications for microcontrollers. We will show you advanced programming techniques, give you an overview of common programming mistakes and show you some tips & tricks. Main theme is to improve robustness of embedded software.

```
/* Private functions -----*/
void RCC_Configuration(void);
TestStatus Buffercmp(uint8_t* pBuffer1, uint8_t* pBuffer2, uint16_t BufferLength);

SPI_InitTypeDef SPI_InitStructure;
GPIO_InitTypeDef GPIO_InitStructure;

/**
 * @brief Main program
 * @param None
 * @retval None
 */
int main(void)
{
    /* System clocks configuration -----*/
    RCC_Configuration();

    /* Initialize the I2C EEPROM driver -----*/

    GPIO_PinRemapConfig(GPIO_Remap_SPI1, ENABLE);
    RCC_APB2PeriphClockCmd(RCC_APB2Periph_SPI1, ENABLE);

    GPIO_InitStructure.GPIO_Pin = GPIO_Pin_3 | GPIO_Pin_4 | GPIO_Pin_5;
    GPIO_InitStructure.GPIO_Mode = GPIO_Mode_AF_PP;
}
```

What are the benefits for you?

- You will improve your C language programming skills.
- You will learn several ways to avoid common mistakes and problems in embedded software.
- You will improve your skills to write robust application.

Agenda:

- **C language tips & tricks**
- **Writing robust C**

Session organized upon request.

Prerequisites: Technical English, Basics of C programming

Logistics and ST office location details

Hotel Room Booking

We can recommend one of the five hotels near the ST Office in Prague:

1. **Hilton Hotel** (next to the ST office - IBC building) - 128EUR/night, breakfast and internet included (ST price)
<http://www.hilton.com/en/hi/hotels/index.jhtml?ctyhocn=PRGHITW>
2. **Jurys Inn** (3 minutes walk) – 92EUR/night, breakfast and internet included (ST Price)
<http://praguehotels.jurysinns.com/>
3. **Ibis Hotel Old Town** (10 minutes walk or 2 tram stops or 1 metro stop) – individual price in the time of booking
http://www.ibishotel.com/ibis/fichehotel/gb/ibi/5477/fiche_hotel.shtml
4. **Mercure Hotel** (10 minutes walk or 2 tram stops or 1 metro stop) – individual price in the time of booking
http://www.mercure.com/mercure/fichehotel/gb/mer/3440/fiche_hotel.shtml
5. **Pension Alice** (3 minutes walk) - individual price in the time of booking
<http://www.penzion-alice.cz/>

Note: Final price may vary on the season and actual currency conversion ratio.

Hotels information in other ST locations will be provided to you in the training confirmation email.

ST Offices Location Details

STMicroelectronics Prague
IBC Building, Pobrezni 3
186 00 Prague 8
Czech Republic



STMicroelectronics Munich
Bahnhofstrasse 18
85609 Aschheim-Dornach
Germany



STMicroelectronics Marlow
Atlas House, Third Avenue
Globe Business Park
SL7 1EY Marlow, UK



STMicroelectronics Castelletto
Via Tolomeo, 1
20010 Cornaredo, Italy



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Sweden



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