

ST MCU Trainings Catalogue

The right information on the right products



T.O.M.A.S.

*Technically Oriented
Microcontroller Application Services*

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Foreword to the ST Europe technical trainings

Dear customers,

We are pleased to present you our actual offer of ST microcontroller trainings. The complete ST trainer's team is looking forward to share with you our expertise and enthusiasm on the ST Microcontroller 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 [this 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 locations or other STMicroelectronics sites are possible upon request. Please contact us or our Training Partners to learn the availability and conditions.

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

- Any ST training may be canceled if there is less than a minimum of 8 attendees. Therefore, please, do not book your tickets or rooms unless you have received an official confirmation e-mail from us, which is sent about 4 weeks before the start of the training.
- For the residents outside of Europe who need entry visa, please contact us at least 6 weeks before the training.
- ST Trainings are free of charge and include free lunch and collations at ST premises. 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.

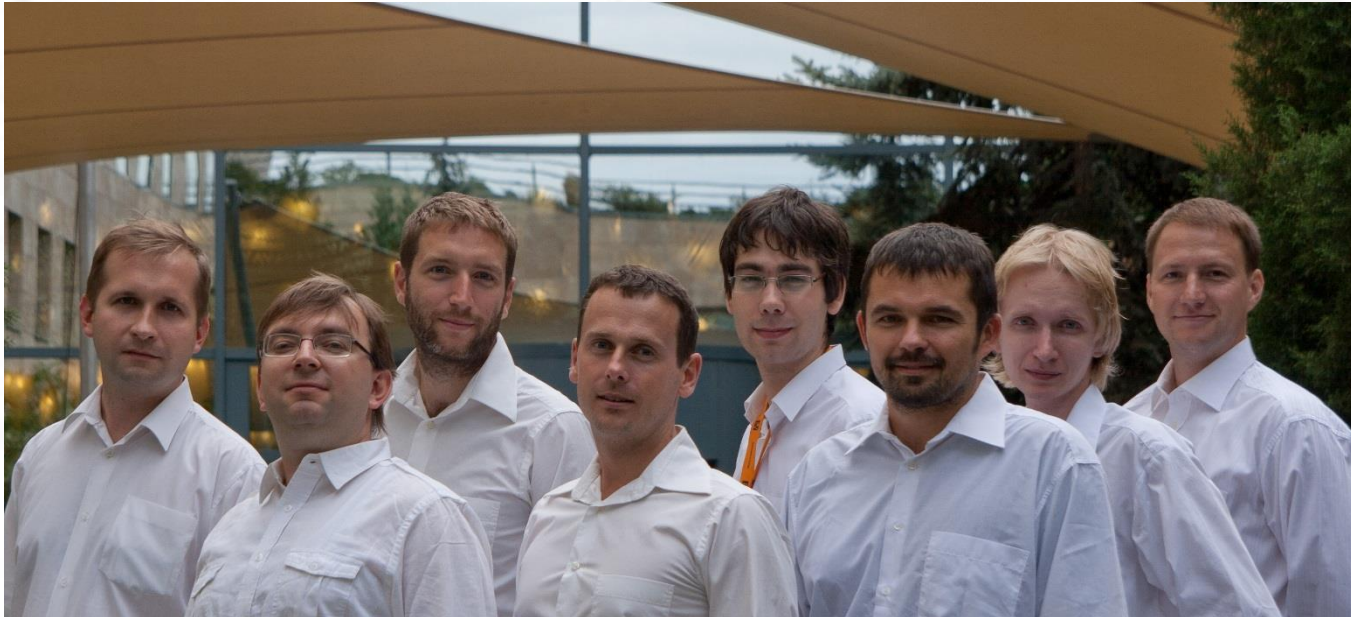
Logistics for ST sessions:

To reserve the hotel rooms for the training, please provide us the check-in and check-out dates, or make the reservation yourself. For more information about the logistics and ST office locations please see the [last page](#) of this catalogue.

Tomas Dresler
Microcontroller Training Center Manager
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ST Trainers team

The T.O.M.A.S. team consists of fully skilled and professional facilitators. Every trainer has conducted more than 200 training days. Our everyday working activity is answering microcontroller technical questions (hotline) and designing and validating microcontroller-based applications. This ensures high level of our technical expertise and allows us to understand your application requirements, providing you with optimized solutions and added value.



More than 7000 trained participants in our technical trainings since 2004!

H1/2015 ST MCU Trainings Calendar Overview

	January	February	March	April	May	June
STM32F0 & F3					W20 Prague	
STM32F334				W18 Milan		
STM32F4+emWin				W14 Prague (special guest I2ST w. Java +1 day)		W27 Prague
STM32L0		W6 Prague				
Motor Control with ST solutions			W12 Stockholm	W18 Munich		W24 Paris
Advanced C				W15 Munich		
RTOS, USB, Ethernet, SSL						W26 Prague
1 day technical workshops	Actual offer of day-long technical workshops organized by ST is available here .					

Note: For more details about the ST trainings please click on the chosen session.



STM32F0+F3 Standard Training – 3 days

This combined training introduces the STM32 microcontroller family entry level series and successor of STM32F1. It starts with the Cortex M0 and M4 cores and Cube HAL and CubeMx tool. It is followed by the bus architecture, memory organization, reset block, interrupts, low power modes and 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 and –M4 cores, STM32F0 and STM32F30x peripherals
- You'll get familiar with Cube HAL and CubeMx
- 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 Mx 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)
- **STM32F3 peripherals**
(OpAmps, comparators, SD-ADC, Timers)
- **Hardware tools**
(SWD, eval boards, kits)
- **Hands-on exercises**
(Practical examples on Discovery kits)

Available Sessions:

Week	Start	End	Level	Location
20	May 12 th 9:00	May 14 th 17:00	Intermediate	ST Prague

Prerequisites: technical English, basics of MCU programming in C, own PC (notebook) with Windows, USB and administrator rights

More about these STM32 families: www.st.com/stm32f0, www.st.com/stm32f3



STM32L0 Standard Training – 3 days

This training introduces the low power STM32 microcontroller family series. It starts with the presentation of CORTEX M0+ core and architecture, which the STM32 is based on. It follows with the memory organization, reset block, interrupts, low power modes and all peripherals, such as IO ports, ADC, timers, RTC, SPI, USART, I2C, DAC and all low-power peripherals. 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, STM32L0 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**
- **STM32L0 system architecture**
(Embedded Flash, DMA, Power control, Backup domain, Reset block, Clock)
- **STM32L0 peripherals**
(IO, Timers, RTC, ADC, SPI, UART, I2C, DAC, LPTIM, firewall)
- **Hardware tools**
(SWD, eval boards, kits)
- **Hands-on exercises**
(Practical examples)

Available Sessions:

Week	Start	End	Level	Location
6	February 3 rd 09:00	February 5 th 17:00	Intermediate (3 days)	ST Prague

Prerequisites: technical English, basics of MCU programming in C, own PC (notebook) with Windows, USB and administrator rights

More about this STM32 family: www.st.com/stm32l0



STM32F334 Technical Training – 3 days

This training introduces the STM32F334 microcontroller series. It starts with the presentation of Cortex-M4 core and architecture on which the STM32 is based. It follows with the memory organization, reset block, interrupts, low power modes and selected peripherals, such as IO ports, ADC, timers, DAC, embedded comparators and Op-Amps. Biggest impact is on High Resolution timer features. 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, development tools and HR timer of STM32F334
- You will be able to start-up a new project and use the development tools

Agenda:

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

Available Sessions:

Week	Start	End	Level	Location
18	April 28 th 09:00	April 30 th 17:00	Expert	ST Milan (Cornaredo, Italy)

Prerequisites: technical English, basics of MCU programming in C, own PC (notebook) with Windows, USB and administrator rights

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



STM32F2+F4 Technical Training – 3 days

This training is dedicated to the high performance members of the wide STM32 microcontroller family, the STM32F2 and F4 lines. The training starts with the refresh of the ARM Cortex-M3 core and introduction to Cortex-M4 core main capabilities. The advanced STM32F2 and F4 system architecture including dedicated system IPs is deeply covered. Main part of the training focuses on the rich set of peripherals, such as GPIOs, RTC, ADC, DAC, FMC, SPI/I2S, USB FS and HS, Crypto, Camera interface, Ethernet and new peripherals such as TFT/LCD controller and SDRAM interface. Numerous hands-on examples are designed to practice most of the peripherals and device features. The graphics will be demonstrated on STemWin library with practical hands-on, too.



What are the benefits for you?

- You will refresh the Cortex-M3 core details and learn the features of Cortex-M4 core
- You will discover the new peripherals and system blocks of the STM32F2 and F4 lines
- You will practice the device functionality and performance in several hands-on examples
- You will be able to present the STM32F2 and F4 lines (for FAE's mainly)

Agenda:

- **STM32F2, F4 overview**
- **Cortex-M3 and Cortex-M4 presentation**
- **STM32F2, F4 system architecture, system IP's and performance**
- **STM32F2, F4 flash, DMA, DCMI**
- **Standard peripherals**
(GPIO, RTC, watchdogs)
- **Connectivity peripherals**
(USB FS/HS, Ethernet, SPI, I2C, USART)
- **Dedicated peripherals**
(Camera interface, Crypto module, TFT)
- **Hands-on exercises**
(Practical examples – selected peripherals, device performance, STemWin)

Available Sessions:

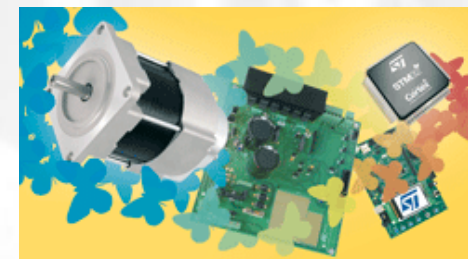
Week	Start	End	Level	Location
3	January 13 th 9:00	January 15 th 17:00	Intermediate	ST Prague (Czech Republic)
14	March 31 st 9:00	April 3 th 17:00	Intermediate Special guest: I2ST and embedded Java	ST Prague (Czech Republic)
27	June 30 th 9:00	July 2 nd 17:00	Intermediate	ST Prague (Czech Republic)

Prerequisites: technical English, basics of MCU programming in C, own PC (notebook) with Windows, USB and administrator rights

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

STM32 Motor Control Solutions – 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
12	March 17 th 9:00	March 19 th 17:00	Basic	Stockholm (Sweden)
18	April 28 th 9:00	April 30 th 17:00	Basic	ST Munich (Germany)
24	June 9 th 9:00	June 11 th 17:00	Basic	ST Paris (France)

Prerequisites: technical English, basics of MCU programming in C, own PC (notebook) with Windows, USB and administrator rights

More about STM32 Motor Control SDK:

<http://www.st.com/web/en/catalog/tools/FM147/CL1794/SC961/SS1743/LN1734/PF257936>

Advanced C Training – 1 day

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.

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.

```
/* 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;
```

Agenda:

- C language tips & tricks
- Writing robust C programs

Available Sessions:

Week	Start	End	Level	Location
15	April 8 th 09:00	April 8 th 18:00	Basic	ST Munich (Germany)

Prerequisites: Technical English, Basics of C programming, own PC (notebook) with Windows, USB and administrator rights

Training 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 offer 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 visit their webpages or contact them directly.

Training Partner 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 / ARM Cortex-M4 - RTOS (FreeRTOS, Keil RTX, CMSIS-RTOS) - TCP/IPV4 & IPV6, SSL/TLS, Crypto - Development Tools: KEIL, ARM, GCC
	info.de@doulos.com +49 511 277 1340 http://www.doulos.com/	Worldwide	German English	Yes	<ul style="list-style-type: none"> - STM32 - ARM Architecture Fundamentals, ARM embedded software - ARM Cortex-Mx processors - C/C++, SystemC, Perl, VHDL, Verilog, SystemVerilog
	education@exelen.ch +41 26 422 48 42 www.exelen.ch/	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
	ContactUs@HandsOnTraining.co.il +972-52-5816791 www.handsontesting.co.il	Israel, Europe, U.S.	English Hebrew	Not yet	<ul style="list-style-type: none"> - STM32 - ARM cores as ARM certified training center in Israel - Keil MDK, DS5 - FreeRTOS, Android, Linux
	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
	masters@masters.com.pl +48 58 69 10 691 http://www.masters.com.pl	Poland	Polish	Yes	<ul style="list-style-type: none"> - STM32F0 - STM32F4xx - STM32F4x9 + TFT/LCD controller
	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.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

H1/2015 Training Partners Calendar Overview

	January	February	March	April	May	June
AC6 info@ac6-training.com	13-16 th C language	10-13 th C language 17-20 th FreeRTOS w. STM32	10-13 th C language	14-17 th C language 21-24 th FreeRTOS w. STM32	12-15 th C language	16-20 th C language 23-26 th FreeRTOS w. STM32
Antycip http://www.cynetis-embedded.com/	20-23 rd STM32 & FreeRTOS	17-20 th STM32 & FreeRTOS	17-20 th STM32 & FreeRTOS	14-17 th STM32 & FreeRTOS	19-22 nd STM32 & FreeRTOS	16-19 th STM32 & FreeRTOS
Doulos www.doulos.com		Feb 24 th SW design w. Cortex-M				Jun 16 th SW design w. Cortex-M
Exelen http://www.exelen.ch/						Jun 23-24 th Givisiez
Masters http://www.masters.com.pl/	19 th STM32L0 20 th STM32L0	23 rd STM32L0 24 th STM32L0		1 st STM32L0+GSM 2 nd STM32L0+GSM 13-17 th IoT 20-24 th IoT	7 th STM32L0+GSM 19 th STM32L0+GSM	
Microconsult www.microconsult.de			Mar 23-25 th Munich STM32			
MVD www.mvd-training.com	Jan 5-8 th	Feb 16-19 th		Apr 13-16 th		Jun 8-11 th

Note: Sessions provided by our **Training Partners** are redirected to their web page, where you will get the full info about the session. Changes may apply without prior notice!

Logistics and ST office location details

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

- **Hilton Hotel** (next to the ST office - IBC building)
<http://www.hilton.com/en/hi/hotels/index.jhtml?ctyhocn=PRGHITW>
- **Jurys Inn** (3 minute walk) – 92EUR/night, breakfast and internet included
<http://praguehotels.jurysinns.com/>
- **B&B Hotel** (next to the ST office) - 49EUR/night, breakfast – 7,5EUR, internet included
<http://www.hotelbb.cz/en/portal/index.html>
- **Ibis Hotel Old Town** (10 minute walk or 2 tram stops or 1 metro stop)
http://www.ibishotel.com/ibis/fichehotel/gb/ibi/5477/fiche_hotel.shtml
- **Grandior Hotel Prague** (5-10 minute walk across main street)
<http://www.hotel-grandior.cz/en/>
- **Design Hotel Elephant** (5-10 minute walk across main street)
<http://www.hotel-elephant.cz/?lang=EN>

*Prices may vary, ST doesn't guarantee them!

**Hotels information in other ST locations will be provided to you in the training confirmation email.
Only few parking lots are available after prior reservation! Use hotel parking where available!**

ST Office 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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