ST MCU Trainings Catalogue



T.O.M.A.S.

Technically Oriented Microcontroller Application Services

Version: 1.4

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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 <u>last page</u> of this catalogue.

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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!



H2/2015 ST MCU Trainings Calendar Overview

	July	August	September	October	November	December	January
STM32F0 & F3						<u>Paris 8-10</u>	
STM32F334			Munich 8-10		<u>Paris 10-12</u>		
STM32F7			<u>Paris 29-1</u>		Milan 24-26		<u>Prague 12-14</u>
STM32L4					Milan 3-5		
STM32L0			<u>Prague 29-1</u>				
Motor Control with ST solutions					Prague 3-5		<u>Munich 19-21</u>
Advanced C						Prague 2-2	
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
50	December 8 th 9:00	December 10 th 17:00	Intermediate	ST Paris

Prerequisites: technical English, MCU programming in C language, 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. This training explains ultra-low-power approach and setup, recommended for experts!



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
40	September 29 th 09:00	October 1 st 17:00	Expert (3 days)	ST Prague

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

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





STM32L4 Standard Training – 3 days

This training introduces the ultra-low-power STM32 microcontroller family series. It starts with the presentation of CORTEX M4 core and architecture, which this 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 M4 core, STM32L4 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
- **STM32L4 system architecture** (Embedded Flash, DMA, Power control, Backup domain, Reset block, Clock)
- STM32L4 peripherals

 (IO, Timers, RTC, ADC, SPI, UART, I2C, DAC, LPTIM, firewall)
- Hardware tools (SWD, eval boards, kits)
- Hands-on exercises (Practical examples)

Agenda:

- STM32 family overview

Available Sessions:

Week	Start	End	Level	Location
45	November 3 rd 09:00	November 5 th 17:00	Intermediate (3 days)	ST Milan

Please consider attending our and partner 1-day seminars! Their list is available here.

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

More about this STM32 family: www.st.com/stm32l4





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.

STM32 Releasing your creativity

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
37	September 8 th 09:00	September 10 th 17:00	Expert	ST Munich
46	November 10 th 09:00	November 12 th 17:00	Expert	ST Paris

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

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





STM32F7 Technical Training – 3 days

This training is dedicated to the top class member of the wide STM32 microcontroller family, the STM32F7. The training starts with the ARM Cortex-M7 core and introduction to the new bus architecture. 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 or TouchGFX library with practical hands-on, too.

What are the benefits for you?

- You will learn the features of Cortex-M7 core and architecture
- You will discover the new peripherals and system blocks of the STM32F7 line
- You will practice the device functionality and performance in several hands-on examples
- You will be able to present the STM32F7 line (for FAE's mainly)

Agenda:

- STM32F7 overview
- Cortex-M7 presentation
- STM32F7 system architecture, system IP's and performance
- STM32F7 flash, DMA, DCMI
- Standard peripherals (GPIO, RTC, watchdogs)
- Connectivity peripherals
 (USB FS/HS, Ethernet, SPI, I2C, USART)
- Dedicated peripherals
 (Camera interface, QuadSPI, TFT)
- Hands-on exercises
 (Practical examples selected peripherals, device performance, STemWin, TouchGFX)

Available Sessions:

Week	Start	End	Level	Location
40	September 29 th 09:00	October 1 st 17:00	Intermediate	ST Paris
48	November 24 th 09:00	November 26 th 17:00	Intermediate	ST Milan
2	January 12 th 09:00	January 14 th 17:00	Intermediate	ST Prague

Please consider attending our and partner 1-day seminars! Their list is available here.

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

More about this STM32 family: www.st.com/stm32f7



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 handson 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

Agenda:

- BLDC/PMSM motors basics
- FOC drive theory

Available Sessions:

Week	Start	End	Level	Location
45	November 3 rd 09:00	November 5 th 17:00	Basic	ST Prague
3	January 19 th 09:00	January 21 st 17:00	Basic	ST Munich

Prerequisites: technical English, MCU programming in C language, 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.

Agenda:

- C language tips & tricks
- Writing robust C programs

Agenda:

- C language tips & tricks
- Writing robust C programs

Available Sessions:

Week	Start	End	Level	Location
49	December 2 nd 09:00	December 2 nd 18:00	Basic	ST Prague

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
ac6 training	info@ac6-training.com +33 (0) 141 168 010 www.ac6-training.com	Worldwide	French English	Yes	- STM processors - USB, PCI, PCIExpress , RapidIO, Ethernet - VHDL – FPGA - C, C++, Real time and industrial grade JAVA - Real Time OS: Linux, Android, Windows
cynetis embedded	info@cynetis-embedded.com +33 1 85 08 70 69 http://www.cynetis- embedded.com/formations/	France	French English	Yes	- STM32 / ARM Cortex-M4 - RTOS (FreeRTOS, Keil RTX, CMSIS-RTOS) - TCP/IPv4 & IPv6, SSL/TLS, Crypto - Development Tools: KEIL, ARM, GCC
A DOULOS	info.de@doulos.com +49 511 277 1340 http://www.doulos.com/	Worldwide	German English	Yes	- STM32 - ARM Architecture Fundamentals, ARM embedded software - ARM Cortex-Mx processors - C/C++, SystemC, Perl, VHDL, Verilog, SystemVerilog
EXELEN EmbH	education@exelen.ch +41 26 422 48 42 www.exelen.ch/	Central Europe France, Italy	English French Italian	Yes	- STM32 - RTOS (SafeRtos, FreeRTOS, uc/os-III), - Development tool chains, hardware design tools - VHDL, FPGA design
Hands On Training	ContactUs@HandsOnTraining.co.il +972-52-5816791 www.handsontraining.co.il	Israel, Europe, U.S.	English Hebrew	Not yet	- STM32 - ARM cores as ARM certified training center in Israel - Keil MDK, DS5 - FreeRTOS, Android, Linux
hitex DEVELOPMENT TOOLS	kurt.boehringer@hitex.de +49 721 9628 195 www.hitex.de	Central & East Europe Benelux	German English	Yes	- STM32, STR7xx, STR9xx - USB, Ethernet (TCP/IP), CAN, FlexRay - Software Quality, Development Tools - RTOS, GNU Compiler
MASTERS	masters@masters.com.pl +48 58 69 10 691 http://www.masters.com.pl	Poland	Polish	Yes	- STM32F0 - STM32F4xx - STM32F4x9 + TFT/LCD controller
MICRO CONSULT	p.siwon@microconsult.de +49 (0) 89 45061744 www.microconsult.com www.microconsult.de	Worldwide	German English	Yes	- 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
MVD Training	training@mvd-fpga.com +33 (0) 5 62 13 52 32 www.mvd-fpga.com	France Worldwide	French English	Yes	- 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
LOGIX	bruno.coppi@tecnologix.it +39 02 48954230 http://www.tecnologix.it	Italy	Italian English	Yes	- STM32 - Keil Development Tools (Advanced, Keil Realtime Library) - CANopen, J1939, DeviceNet, LIN protocols



H2/2015 Training Partners Calendar Overview

	July	August	September	October	November	December
Cynetis http://www.cynetis-embedded.com/	30 th June-3 rd July STM32+FreeRTOS		15 th - 18 th STM32+FreeRTOS	20 th - 23 rd STM32+FreeRTOS	17 th - 20 th STM32+FreeRTOS	15 th - 18 th STM32+FreeRTOS
Exelen http://www.exelen.ch/		27 th - 28 th	24 th - 25 th		26 th - 27 th	17 th - 18 th
HandsOn http://www.handsontraining.co.il			1 st – 3 rd F4 SW optimization 7 th Migrating smoothly from F4 to F7 8 th – 10 th F7 SW development	7 th -8 th F4 Advanced debugging 20 th -22 nd F7 SW optimization	10 th -12 th F7 SW development 17 th -19 th F7 SW optimization 23 rd Migrating smoothly from F4 to F7	1st-3rd F4 SW optimization 15 th -17 th F7 SW development 28 th Migrating smoothly from F4 to F7
Masters http://www.masters.com.pl/	21 st STM32 Cube (Gdańsk, Kraków) 22 nd STM32 Cube (Poznań, Rzeszów)		9 th STM32F0+GSM (Katowice) 10 th STM32F0+GSM (Warszawa)	7 th STM32F7 (Łódź) 8 th STM32F7 (Białystok) 14 th STM32F4+Butterfly (Poznań) 21 st STM32 Cube (Katowice) 22 nd STM32 Cube (Warszawa)	5 th Advanced C (Gdańsk or Katowice) 18 th STM32F4+TouchGFX (Katowice) 19 th STM32F4+TouchGFX (Warszawa)	
Microconsult www.microconsult.de	13 th -15 th STM32				2 nd -4 th STM32	
MVD www.mvd-training.com	27 th -30 th STM32F3+F4	4 th -7 th STM32F1+F2	28 th -1 st October STM32F3+F4	19 th -22 nd STM32F1+F2 20 th -23 rd STM32F3+F4	23 rd -26 th STM32F1+F2	7 th -10 th STM32F3+F4

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



STMicroelectronics Kista Kista Science Tower, Färögatan, 33 164 51 Kista



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