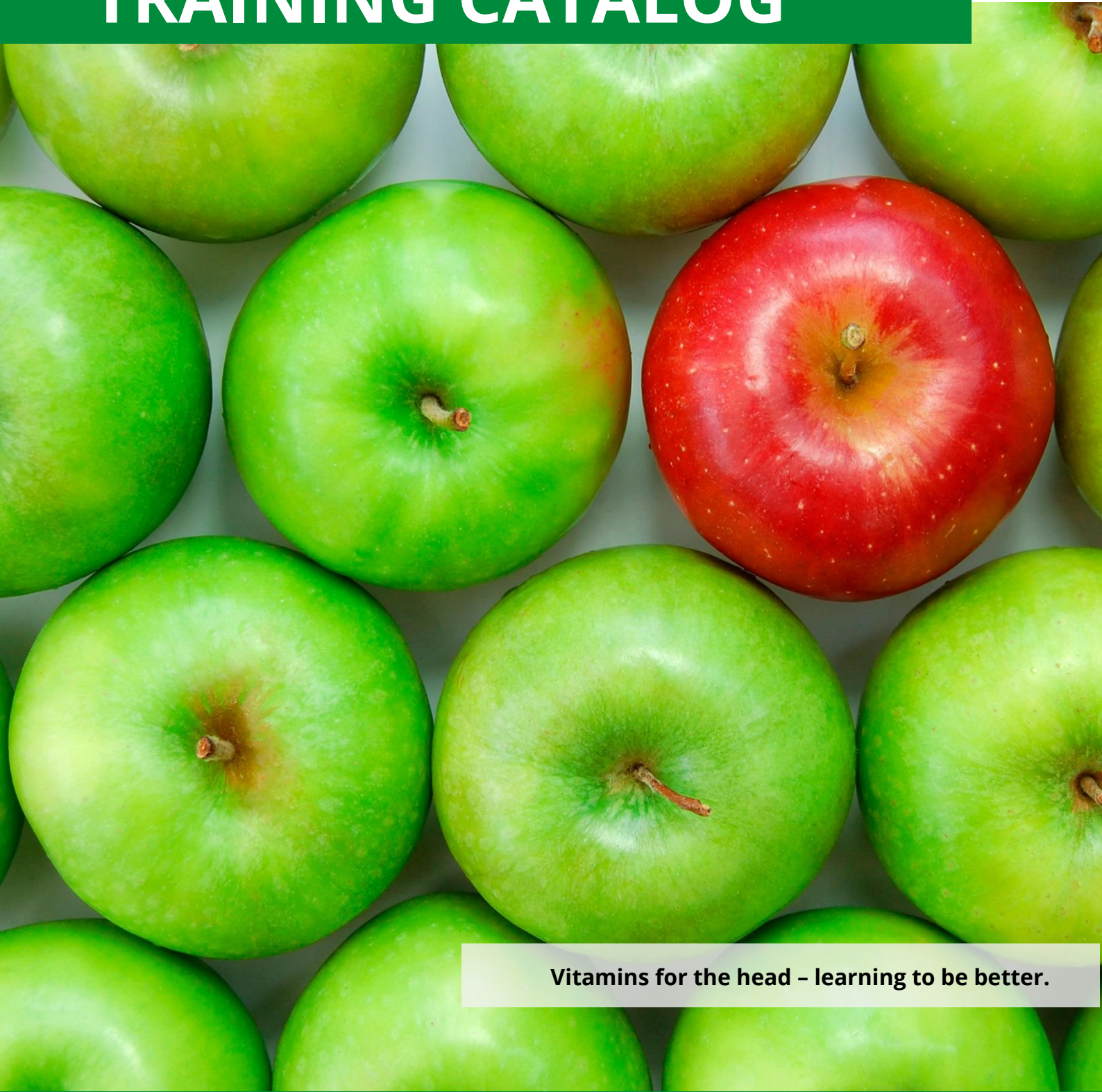




Academy

TRAINING CATALOG



Vitamins for the head - learning to be better.

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Sensor-Technik Wiedemann Academy

Training Catalog of the Sensor-Technik Wiedemann Academy

Our training offers for you

We proudly present this new training catalog of the Sensor-Technik Wiedemann Academy.

The courses have been selected with great care. We derived the course contents and objectives from our experience with the introduction of our products at our customers and from their questions at our product support organization.

Our offer extends from courses of several days duration about the whole range of STW's product portfolio to short informative meetings like webinars or workshops with selected topics about the technology of our products.

Beside the classic classroom based training, we offer self-learning material like videos.

Trainers

As all our trainers work in the departments Development & Research and Customer Support, they have acquired excellent knowledge of our products and solutions. Feel free to benefit directly from their expertise.

Course Content and Dates

Standard courses have a defined content. They are published in this catalog and on our homepage in the internet and will be constantly updated. Via the homepage you can send us your request for a specific course with a form. We will then contact you immediately to make an appointment.

Do you have specific training needs? We would be happy to offer you a customized training to meet your requirements. Dates and duration of the training can also be arranged according to your needs. Please feel free to contact us with your specific requirements and we will send you an individual offer.

Course Booking

After determining the content, duration and date for a course, you will receive an offer from our sales department to order the course.

Contact:

Sensor Technik Wiedemann GmbH

Am Bärenwald 6

87600 Kaufbeuren

Telefon: +49-8341-9505-0

Telefax: +49-8341-9505-55

e-mail: Academy@sensor-technik.de

Location

The courses take place in the facilities of the Sensor-Technik Wiedemann Academy in Kaufbeuren. We support your learning success with up-to-date presentation technology and with equipment fitted to practical exercising in small groups.

Alternatively, we can adapt the courses to your requirements regarding content and time. As well, we can execute courses in your facilities. Please contact us and we will make you an individual offer.

Technical Equipment

STW-devices like controllers, test boxes, telematics modules or powerMELA-motors are available for practical exercises. For programming, PCs can be provided on loan if required. However, we recommend to bring your own laptops in order to use your familiar working environment.

Price

The prices mentioned in the catalog are short-prices for the course with 1 to 6 participants. If we execute the course at your facilities, we additionally charge you travel expenses for the trainer.

General Course Plan

The courses are executed in 9 teaching units of 45 minutes between 9 a.m. and 5 p.m.

Coffee, cold drinks and a lunch in the company canteen are included in the course price, if the course is executed in the facilities of the Sensor-Technik Wiedemann Academy in Kaufbeuren.

Hotel Accommodation

We are happy to support you with the arrangement of hotel accommodation close to the Sensor-Technik Wiedemann Academy in Kaufbeuren.

Controlling Mobile Machines

ESX-3CM: Programming of the controller with CODESYS V3

Brief Description:

The course explains the programming of the ESX-3CM controller with CODESYS V3 including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-3CM.

The theoretical course content will be deepened with programming examples from practice.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3CM
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with CODESYS and the STW software package
- Is able to upload software on the ESX-3CM, change parameters and monitor the controller

Prerequisites:

Basic programming knowledge, ideally with CODESYS V3, at least knowledge of programming electronic controllers.

Contents:

- Introduction to the hardware of the ESX-3CM
 - Starter Kit
 - Mainboard, supplies, GND concept, pin assignment, main relays
 - Inputs / Outputs and their grouping, NAMUR and SENT interfaces
 - Ethernet interface, CAN, other communication interfaces
 - Hints for mounting
- CODESYS V3
 - Basics, programming languages, POU's, function blocks, PLC Configuration
 - CODESYS-application, SPS-cycle, gateway server, RTS, task system
- STW adaptations of CODESYS V3
 - IDE, PLC configuration, trace, visualization, watch and recipe manager, library manager, supported libraries and devices
 - STW-libraries and documentation (API, user manual)
- STW Tools
 - WinFlash
 - KEFEX RAMView
 - ESX Testbox (TUX)
- Debugging
- Programming exercises

Course Identifier	PRG3CMCOD3
Course Number	80269
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3CM: CODESYS V3 Safety

Brief Description:

The course explains the features of CODESYS V3 Safety, how STW implemented the requirements for SIL1 und how the developers have to implement the requirements within their applications. Further contents are preparing traceability and the separation of safety and non-safety code in the application, hardware diagnosis of the ESX-3CM controller and the usage of the KEFEX tool chain. The commissioning will be practically executed using the CODESYS V3 Safety Template.

Objectives:

The participant

- Knows the different requirements for programming of safety and non-safety applications
- Knows the STW technical documentation and is able to use it for target-oriented research
- Knows the various tools and libraries of STW software packages and is able to use them for programming of safety applications
- Commissioning of an application with the safety template
- Knows the requirements to accomplish a certification for a safety application

Prerequisites:

Programming of controllers with CODESYS V3

Contents:

- Introduction to the hardware of the ESX-3CM
- Introduction to CODESYS V3 Safety, differences to the standard system
- Important features
 - Effects on the safety in CODESYS V3
 - Non interfering part of the code
- Update of the development environment to CODESYS V3 Safety with the STW-software package
- Implementation of the safety requirements by STW: Manual [H1] CODESYS Safety SIL1 - OEM Integration Manual
- Requirements for programming safety applications: Manual [H2] CODESYS Safety SIL1 - IEC Programming Guidelines
- Overview CODESYS V3 ESX-3CM SIL1 User & Safety Manual
 - Structure of the information
 - Preparing traceability
- Separation of safety relevant and non-safety relevant parts of the application's code
- Hardware diagnosis library for the STW ESX-3CM controller
- Parametrization of the ESX-3CM by using the STW-solution
- KEFEX RAMView and der KEFEX V2 driver library
- Commissioning with the included CODESYS V3 safety

Course Identifier	CODSAFE3CM
Course Number	87512
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.400 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3CM: Programming of the controller with C

Brief Description:

The course explains the hardware functions and the programming of the ESX-3CM controller with C including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-3CM.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3CM
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with C and the STW software package
- Knows the debugger solutions
- Is able to upload software on the ESX-3CM, change parameters and monitor the controller

Prerequisites:

Basic knowledge of programming electronic controllers.

Programming skills in the programming language „C“.

Contents:

- Introduction to the hardware of the ESX-3CM
 - Starter Kit
 - Mainboard, supplies, GND concept, pin assignment, main relays
 - Inputs / Outputs and their grouping, NAMUR and SENT interfaces
 - Ethernet interface, CAN, other communication interfaces
 - Hints for mounting
- Software development environment
 - Installation of the software
 - Setup of the software ESX-3CM compiler
 - KEFEX RAM-View, data organization on the laptop and on the controller
 - Functions of the STW-API
- CAN Bus
 - Introduction
 - Initialize, read and process data of CAN-objects
 - Application layer: SAE J1939 and CANopen
- Debugger
 - Introduction of the hardware and software solution
 - Demonstration of the Lauterbach hardware debugger

Course Identifier	PRG3CMC
Course Number	80268
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3CM: Programming of the controller with C for safety projects

Brief Description:

The course explains the hardware functions and the programming of the standard systems of the ESX-3CM controller in C. Further contents are the introduction to the safety layer and the SIL2 diagnosis and the difference between standard API and safety API.

The course is intended for developers, who will program own safety applications for the ESX-3CM.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3CM
- Knows the STW technical documentation and is able to use it for target-oriented research
- Knows the requirements for programming of safety applications
- Is able to program own safety applications with C and the STW software package
- Knows the debugger solutions
- Is able to upload software on the ESX-3CM, change parameters and monitor the controller

Prerequisites:

Basic knowledge of programming electronic controllers.

Programming skills in the programming language „C“.

Contents:

- Introduction to the hardware of the ESX-3CM
 - Mainboard, pin assignment, EEPROM
 - Inputs / Outputs
 - Hardware functions, configuration options
- Software (standard system)
- Programming of the standard system
- Requirements for the programming in SIL-2/PL d projects (safety manual)
- Introduction to the safety layer
 - ESX-3CM safety BIOS with memory protection
 - Software safety API for the creation of SIL-2/PLd applications
 - Difference to the standard API / additional functions
- Introduction to the SIL2 diagnosis
- Diagnosis library for safety projects
- Debugger
 - Introduction of the hardware and software solution
 - Demonstration of the Lauterbach hardware debugger

Course Identifier	PRG3CMCSAF
Course Number	85613
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.400 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XM: Programming of the controller with CODESYS V3

Brief Description:

The course explains the programming of the ESX-3XM controller with CODESYS V3 including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-3XM.

The theoretical course content will be deepened with programming examples from practice.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3XM
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with CODESYS and the STW software package
- Is able to upload software on the ESX-3XM, change parameters and monitor the controller

Prerequisites:

Basic programming knowledge, ideally with CODESYS V3, at least knowledge of programming electronic controllers.

Contents:

- Introduction to the hardware of the ESX-3XM
 - Mainboard, supplies, GND concept, pin assignment
 - EEPROM
 - Inputs / Outputs
 - Extension boards
 - Hardware functions, approval tests
- CODESYS V3
 - Basics, programming languages, POU's, data types, operators, syntax
 - Architecture of CODESYS-applications, SPS-cycle, gateway server, RTS
- STW adaption of CODESYS V3
 - IDE, PLC configuration, trace, visualization, watch and recipe manager, library manager, supported libraries and devices
 - STW-libraries and documentation (API, user manual)
- STW Tools
 - Winflash
 - KEFEX RAMView
 - ESX Testbox (TUX)
- Debugging
- Programming exercises

Course Identifier	PRG3XMCOD3
Course Number	76104
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XM: CODESYS V3 Safety

Brief Description:

The course explains the features of CODESYS V3 Safety, how STW implemented the requirements for SIL2 und how the developers have to implement the requirements within their applications. Further contents are preparing traceability and the separation of safety and non-safety code in the application, hardware diagnosis of the ESX-3XM controller and the usage of the KEFEX tool chain. The commissioning will be practically executed using the CODESYS V3 Safety Template.

Objectives:

The participant

- Knows the different requirements for programming of safety and non-safety applications
- Knows the STW technical documentation and is able to use it for target-oriented research
- Knows the various tools and libraries of STW software packages and is able to use them for programming of safety applications
- Commissioning of an application with the safety template
- Knows the requirements to accomplish a certification for a safety application

Prerequisites:

Programming of controllers with CODESYS V3.

Contents:

- Introduction to the hardware of the ESX-3XM
- Introduction to CODESYS V3 Safety, differences to the standard system
- Important features
 - Effects on the safety in CODESYS V3
 - Non interfering part of the code
- Update of the development environment to CODESYS V3 Safety with the STW-software package
- Implementation of safety requirements by STW:
- Manual [H1] CODESYS Safety SIL2 - OEM Integration Manual
- Requirements for programming safety applications: Manual [H2] CODESYS Safety SIL2 - IEC Programming Guidelines
- Overview CODESYS V3 ESX-3XM SIL2 User & Safety Manual
 - Structure of the information
 - Preparing traceability
- Separation of safety relevant and non-safety relevant parts of the application's code
- Hardware diagnosis library for the STW ESX-3XM
- Parametrization of the ESX-3XM by using the STW-solution
- KEFEX RAMView and der KEFEX V2 driver library
- Commissioning with the included CODESYS V3 safety template

Course Identifier	CODSAFE3XM
Course Number	76105
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.400 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XM: Programming of the controller with C

Brief Description:

The course explains the hardware functions and the programming of the ESX-3XM controller with C including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-3XM.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3XM
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with C and the STW software package
- Knows the debugger solutions
- Is able to upload software on the ESX-3XM, change parameters and monitor the controller

Prerequisites:

Basic knowledge of programming electronic controllers.

Programming skills in the programming language „C“.

Contents:

- Introduction to the hardware of the ESX-3XM
 - Mainboard, supplies, GND concept, pin assignment
 - EEPROM
 - Inputs / Outputs
 - Extension boards
 - Hardware functions, approval tests
- Software development environment
 - Installation of the software
 - Setup of the software ESX-3XM compiler
 - KEFEX RAM-View, data organization on the laptop and on the controller
- Functions of the STW-API
- CAN Bus
 - Introduction
 - Initialize, read and process data of CAN-objects
 - Application layer: SAE J1939 and CANopen
- Debugger
 - Introduction of the hardware and software solution
 - Demonstration of the Lauterbach hardware debugger

Course Identifier	PRG3XMC
Course Number	76106
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XM: Programming of the controller with C for safety projects

Brief Description:

The course explains the hardware functions and the programming of the standard systems of the ESX-3XM controller in C. Further contents are the introduction to the safety layer and the SIL2 diagnosis and the difference between standard API and safety API. The course is intended for developers, who will program own safety applications for the ESX-3XM.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3XM
- Knows the STW technical documentation and is able to use it for target-oriented research
- Knows the requirements for programming of safety applications
- Is able to program own safety applications with C and the STW software package
- Knows the debugger solutions
- Is able to upload software on the ESX-3XM, change parameters and monitor the controller

Prerequisites:

Basic knowledge of programming electronic controllers.
Programming skills in the programming language „C“.

Contents:

- Introduction to the hardware of the ESX-3XM
 - Mainboard, pin assignment, EEPROM
 - Inputs / Outputs, extension boards
 - Hardware functions, configuration options
- Software (standard system)
- Programming of the standard system
- Requirements for the programming in SIL-2 / PLd projects (safety manual)
- Introduction to the safety layer
 - ESX-3XM safety BIOS with memory protection
 - Software safety API for the creation of SIL-2 / PLd applications
 - Difference to the standard API / additional functions
- Introduction to the SIL2 diagnosis
- Diagnosis library for safety projects
- Debugger
 - Introduction to the hardware and software solution
 - Demonstration of the Lauterbach hardware debugger

Course Identifier	PRG3XMCSAF
Course Number	76108
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.400 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XL: Programming the controller with CODESYS V3

Brief Description:

The course explains the programming of the ESX-3XL controller with CODESYS V3 including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-3XL.

The theoretical course content will be deepened with programming examples from practice.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3XL
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with CODESYS and the STW software package
- Is able to upload software on the ESX-3XL, change parameters and monitor the controller

Prerequisites:

Basic programming knowledge, ideally with CODESYS V3, at least knowledge of programming electronic controllers.

Contents:

- Introduction to the hardware of the ESX-3XL
 - Mainboard, supplies, GND concept, pin assignment
 - EEPROM
 - Inputs / Outputs
 - Extension boards
 - Hardware functions, approval tests
- CODESYS V3
 - Basics, programming languages, POU's, data types, operators, syntax
 - Architecture of CODESYS-applications, SPS-cycle, gateway server, RTS
- STW adaption of CODESYS V3
 - IDE, PLC configuration, trace, visualization, watch and recipe manager, library manager, supported libraries and devices
 - STW-libraries and documentation (API, user manual)
- STW Tools
 - Winflash
 - KEFEX RAMView
 - ESX Testbox (TUX)
- Debugging
- Programming exercises

Course Identifier	PRG3XLCOD3
Course Number	76109
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XL: CODESYS V3 Safety

Brief Description:

The course explains the features of CODESYS V3 Safety, how STW implemented the requirements for SIL2 und how the developers have to implement the requirements within their applications. Further contents are preparing traceability and the separation of safety and non-safety code in the application, hardware diagnosis of the ESX-3XL controller and the usage of the KEFEX tool chain. The commissioning will be practically executed using the CODESYS V3 Safety Template.

Objectives:

The participant

- Knows the different requirements for programming of safety and non-safety applications
- Knows the STW technical documentation and is able to use it for target-oriented research
- Knows the various tools and libraries of STW software packages and is able to use them for programming of safety applications
- Commissioning of an application with the safety template
- Knows the requirements to accomplish a certification for a safety application

Prerequisites:

Programming of controllers with CODESYS V3

Contents:

- Introduction to the hardware of the ESX-3XL
- Introduction to CODESYS V3 Safety, differences to the standard system
- Important features
 - Effects on the safety in CODESYS V3
 - Non interfering part of the code
- Update of the development environment to CODESYS V3 Safety with the STW-software package
- Implementation of safety requirements by STW:
 - Manual [H1] CODESYS Safety SIL2 - OEM Integration Manual
 - Requirements for programming safety applications:
 - Manual [H2] CODESYS Safety SIL2 - IEC Programming Guidelines
- Overview CODESYS V3 ESX-3XL SIL2 User & Safety Manual
 - Structure of the information
 - Preparing traceability
- Separation of safety relevant and non-safety relevant parts of the application's code
- Hardware diagnosis library for the STW ESX-3XL
- Parametrization of the ESX-3XL by using the STW-solution
- KEFEX RAMView and der KEFEX V2 driver library
- Commissioning with the included CODESYS V3 safety templates

Course Identifier	CODSAFE3XL
Course Number	76110
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.400 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XL: Programming of the controller with C

Brief Description:

The course explains the hardware functions and the programming of the ESX-3XL controller with C including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-3XL.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3XL
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with C and the STW software package
- Knows the debugger solutions
- Is able to upload software on the ESX-3XL, change parameters and monitor the controller

Prerequisites:

Basic knowledge of programming electronic controllers.

Programming skills in the programming language „C“.

Contents:

- Introduction to the hardware of the ESX-3XL
 - Mainboard, supplies, GND concept, pin assignment
 - EEPROM
 - Inputs / Outputs
 - Extension boards
 - Hardware functions, approval tests
- Software development environment
 - Installation of the software
 - Setup of the software ESX-3XL compiler
 - KEFEX RAM-View, data organization on the laptop and on the controller
- Functions of the STW-API
- CAN Bus
 - Introduction
 - Initialize, read and process data of CAN-objects
 - Application layer: SAE J1939 and CANopen
- Debugger
 - Introduction to the hardware and software solution
 - Demonstration of the Lauterbach hardware debugger

Course Identifier	PRG3XLC
Course Number	76111
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-3XL: Programming of the controller with C for safety projects

Brief Description:

The training explains the hardware functions and the programming of the standard systems of the ESX-3XL controller in C. Further contents are the introduction to the safety layer and the SIL2 diagnosis and the difference between standard API and safety API.

The training is intended for developers, who will program own safety applications for the ESX-3XL.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-3XL
- Knows the STW technical documentation and is able to use it for target-oriented research
- Knows the requirements for programming of safety applications
- Is able to program own safety applications with "C" and the STW software package
- Knows the debugger solutions
- Is able to upload software on the ESX-3XL, change parameters and monitor the controller

Prerequisites:

Basic knowledge of programming electronic controllers.

Programming skills in the programming language „C“.

Contents:

- Introduction to the hardware of the ESX-3XL
 - Mainboard, supplies, GND concept, pin assignment,
 - EEPROM
 - Inputs / Outputs, Extension boards
 - Hardware functions, configuration options
- Software (standard system)
 - Programming of the standard system
 - Requirements for the programming in SIL-2 / PLd projects (safety manual)
- Introduction to the safety layer
 - ESX-3XL safety BIOS with memory protection
 - Software safety API for the creation of SIL-2 / PLd applications
 - Difference to the standard API / additional functions
- Introduction to the SIL2 diagnosis
- Diagnosis library for safety projects
- Debugger
 - Introduction to the hardware and software solution
 - Demonstration of the Lauterbach hardware debugger

Course Identifier	PRG3XLCSAF
Course Number	76112
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.400 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-2-4: Programming of the controller with CODESYS V2.3

Brief Description:

The course explains the programming of the ESX-2-4 controller with CODESYS V2.3 including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-2-4.

The theoretical course content will be deepened with programming examples from practice.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-2-4
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to program own applications with CODESYS and the STW software package
- Is able to upload software on the ESX-2-4, change parameters and monitor the controller

Prerequisites:

Basic programming knowledge, ideally with CODESYS V2.3, at least knowledge of programming electronic controllers.

Contents:

- Introduction to the hardware of the ESX-2-4
 - Mainboard, supplies, GND concept, pin assignment,
 - EEPROM, Inputs / Outputs
 - Hardware functions, approval tests
- CODESYS V2.3
 - Basics, programming languages, POU's, data types, operators, syntax
 - Architecture of CODESYS-applications, SPS-cycle, gateway server, RTS
- STW adaptations of CODESYS V2.3
 - IDE, PLC configuration, trace, visualization, watch and recipe manager, library manager, supported libraries and devices
 - STW-libraries and documentation (API, user manual)
- STW Tools
 - Winflash
 - KEFEX RAMView
 - ESX Testbox (TUX)
- Debugging
- Programming exercises

Course Identifier	PRGESX2COD2
Course Number	75825
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

ESX-IOXp: Programming of the controller with CODESYS V2.3

Brief Description:

The course explains the programming of the ESX-IOXp controller with CODESYS V2.3 including the STW-specific software, plugins, libraries and tools.

The course is intended for developers, who will program own applications for the ESX-IOXp. The theoretical course content will be deepened with programming examples from practice.

Objectives:

The participant

- Knows hard- and software requirements for programming the ESX-IOXp
- Knows the configuration options for Inputs and Outputs of the ESX-IOXp
- Knows the STW technical documentation and is able to use it for target-oriented research
- Is able to install the STW-specific software
- Is able to program own applications with CODESYS and the STW software package
- Is able to upload software on the ESX-IOXp, change parameters and monitor the controller

Prerequisites:

Basic programming knowledge, ideally with CODESYS V2.3, at least knowledge of programming electronic controllers.

Contents:

- PLC configuration IOXp
 - Hardware variants and configuration options
 - Properties of Inputs and outputs
- Installation of the STW-CD on a laptop and commissioning of the software
- Usage of API specific libraries
- STW tools
 - Programming environment with CODESYS
 - Winflash
- Programming exercises
 - Reading signals from the inputs
 - Processing data
 - Stimulate signals on outputs
 - Debugging

Course Identifier	PRGIOXPCOD2
Course Number	76087
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Controlling Mobile Machines

Features of the VSX-Display-Family

Brief Description:

This Webinar shows the most exciting features of the STW-Displays from the VSX- -family. The programming of a user interface with the VSX devKit will be demonstrated.

Das Webinar is intended for people, who want to use the displays of the interACT-family.

Objectives:

The participant

- Knows the platform based concept of the VSX product family
- Knows the displays of the VSX-series and their most important features
- Knows the VSX devKit

Prerequisites:

None

Contents:

- Introduction
 - Platform based concept of the VSX product family
 - Functions of the platform eiCab
 - Speed Booting
 - Safety features
 - Multimedia interfaces
 - Expandability
 - Diagnostic Capability
- Displays of the InterACT V-series
- Demonstration of the VSX devKit
 - Widgets
 - Wizard for applications programming

Course Identifier	LMI AV
Course Number	76119
Course Type	Webinar
Target Group	System Planers, Technical Sales Representatives
Duration	2 Hours
Price	Free of charge
Location	Online



Controlling Mobile Machines

Programming of the VSX-Display-Family

Brief Description:

The course gives an overview of the displays of the VSX-series and the platform concept. Furthermore, the course introduces to the programming of the displays with the VSX DevKit.

The course is intended for developers, who want to program user interfaces on the VSX displays. The theoretical course content will be deepened with programming examples from practice.

Objectives:

The participant

- Knows the displays and the platform concept of the VSX display family and it's benefits for software development.
- Knows the development kit and the provided widgets
- Is able to program user interfaces using a variety of widgets

Prerequisites:

Programming skills in Qt helpful, but not mandatory

Contents:

- Introduction
 - Hardware of the VSX-product family
 - Interfaces
- Development environment VSX DevKit
 - DevKit concept and tools
 - Datapoints, Lookup-Tables, Widget-configuration
 - Widget classes and examples for widgets
 - Language- and color management
 - Video-processing
 - Protocols, like CAN-protocols, KEFEX
- HMI API for extension of the graphical programming environment with C++
- Simulation and debugging
- Programming exercises

Course Identifier	PRGIAV
Course Number	76120
Course Type	Classroom Based Training
Target Group	Developers
Duration	1 Day
Price	690 € plus statutory VAT.
Location	STW Academy



Functional Safety

Introduction to Functional Safety

Brief Description:

The workshop explains what functional safety is and which requirements for it are defined in the standard EN ISO 13849. Furthermore, safety functions and their characteristic values as well as requirements for standard oriented development processes and a roadmap for systematic work-off are presented.

The workshop is intended for Project Managers and Developers of safety applications.

Objectives:

The participant

- Knows the relevant european directives and national laws as source of requirements for the development of safety applications.
- Knows the most important requirements of EN ISO 13849
- Knows the definition of safety functions and their characteristic values.
- Knows possible measures to avoid systematic failures and random faults

Prerequisites:

None

Contents:

- Regulatory framework
 - European directives and national laws
 - Harmonized standards
- Realization of a project
 - Clarification of the requirements and search for suitable product standards
 - Risk analysis and transition to functional safety
 - EN ISO 13849 and a roadmap for systematic work-off of the requirements
 - How to avoid systematic failures and random faults
- Performance Level
 - Required Performance Level PLr
 - Risk graph
- Safety functions and their characteristic values
 - Architectures conforming to the standard
 - Categories, MTTFd, DC, CCF
 - Methods for calculation of the accomplished PL and SISTEMA
 - Basic and well-tried safety principles, well-tried components

Course Identifier	WSEINFUSI
Course Number	76121
Course Type	Workshop
Target Group	Project Managers, Developers
Duration	1 Day
Price	1.000 € plus statutory VAT.
Location	STW Academy

Note: This training is conducted by our partner SoDoQ

Data Management and Connectivity

machines.cloud: Getting Started

Brief Description:

The course includes an overview of the features and characteristics of the TCG family as well as the commissioning and basic configuration of a telematics module. Here, the CAN bus and the connection to the machines.cloud are configured by means of the graphical configuration interface machines.insight. Selected features of machines.cloud for the interaction with the telematics module are explained. The course is intended for technicians, developers and project managers who use telematics modules and machines.cloud for data management or want to evaluate the solution.

Objectives:

The participant

- Knows the hardware and software components required to operate the machines.cloud solution
- Can commission a telematics module of the TCG family for use with machines.cloud
- Can configure a telematics module of the TCG family with the corresponding tools to provide the required data
- Can administrate the telematics module in machines.cloud and manage the sent data

Prerequisites:

None

Contents:

- Overview of hardware and software components
 - Telematics modules of the TCG family
 - Graphical on-board user interface machines.insight
 - IoT platform machines.cloud
- Commission the telematics module
 - Minimum requirements for operation
 - Setting up and configuring machines.insight
 - Diagnosis and monitoring
- Introduction to machines.cloud
 - Administration of the platform
 - Register modules in Device Management
 - Visualize transmitted data in the cockpit

Course Identifier	TELEGS
Course Number	82267
Course Type	Workshop
Target Group	Technicians, Developers, Project Managers
Duration	1 Day
Price	1.500 € plus statutory VAT.
Location	STW Academy / Customer

Data Management and Connectivity

TCG series: Commissioning and programming of the modules

Brief Description:

The course explains the hardware- and software features of the telematics modules of the TCG series and introduces to the programming. Necessary basic knowledge of Linux as well as the Teleservice Application Framework are explained. Practical exercises for installation, commissioning and programming are executed throughout the course.

Objectives:

The participant

- Knows the configuration options of the TCG series
- Is able to install the development environment under Linux and Windows
- Knows the features of the Teleservice Application Framework (TAF)
- Is able to program telematics applications with the Teleservice Application Framework (TAF)

Prerequisites:

Pr Programming skills in the programming language „C“.

Contents:

- Hardware of the TCG series
 - Hardware variants TC1 Mobile, TC1 WiFi, TC1 WiFi+
 - Hardware variants TC3 and ESX-TC3G
 - Hardware features
- Development environment for programming of the TCG series
 - Commissioning of the TCG telematics modules
 - Installation and configuration of the development environment (Linux and Windows)
- Linux basics
 - Directory structure (standard Linux and STW-specific directories)
 - Basic Commands
- Teleservice Application Framework (TAF)
 - Create a new project
 - Inter-process communication via D-Bus
 - Create data pool, log and process data
 - Collect GPS data
 - Configure a data logger
 - Concepts for data transmission
- Connector to the STW solution machines.cloud
- Practical programming exercises

Course Identifier	IBNPRGTC
Course Number	80297
Course Type	Classroom Based Training
Target Group	Developers
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy



Principles of power electrification

Brief Description:

The course includes possible use cases for changing from conventional to electrical drive trains. The main components for the implementation of electrical drive trains are presented.

Objectives:

The participant

- Knows about the opportunities to change from conventional to electrical drive trains
- Knows the most important components to implement electrical drive trains
- Is able to call the advantages of electrical drive trains against conventional drive trains

Prerequisites:

None

Contents:

- System solutions for mobile machines
 - Energy generating components
 - Energy consuming components
 - Power Management
 - High voltage network
 - Safety concept
- Use cases
- Advantages of electrical drive trains in mobile machines
- Technical concepts of the drive train
- Energy supply
 - Diesel electric
 - Pure electric

Course Identifier	MELAPRINZ
Course Number	76130
Course Type	Classroom Based Training
Target Group	Deciders, Developers
Duration	1 Day
Price	690 € plus statutory VAT.
Location	STW Academy

Power Electrification

Commissioning and operation of powerMELA drives

Brief Description:

The course explains the hardware (mechanical and electronical) and the software of the powerMELA-drive train. Further contents are the functions to control the drive train as part of a complete system. The course is intended for system integrators and developers of power electrification. The theoretical course content will be deepened with demonstrated examples from practice.

Objectives:

The participant

- Knows the advantages of the powerMELA drive train
- Knows the hardware structure of the powerMELA drive trains, and maintenance concepts
- Is able to bring the powerMELA drive train into service regarding hard- and software
- Is able to control the powerMELA drive train through the communication interface

Prerequisites:

Basic knowledge as conveyed in the course „ principles of power electrification“.

Contents:

- Hardware structure of the powerMELA drive train
 - Technical Data, system interfaces, power electronics, control electronics
 - Cooling circuit, thermic conditions
 - Operating conditions
- Installation and commissioning
 - Mechanics, assembly
 - Cooling
 - Electrical connection (power- and control electronic)
- Firmware commissioning
 - Setup the CAN-hardware and establish a communication connection
 - Usage of KEFEX WinFlash
 - Parametrizing the inverter with the powerMELA Service Tool
 - Control settings, limitations and turn-off limits
 - Error reaction
- Communication with powerMELA CAN protocol, overview, message types
- powerMELA Operating
 - Operation with the powerMELA Control Tool
 - Operation as motor or generator
 - Control of speed, torque and voltage
 - Error-handling
 - Communications driver for STW controllers (C or CODESYS)
- Power management in the vehicle
- Practical examples for operation of the powerMELA drives

Course Identifier	MELAAANINT
Course Number	76132
Course Type	Classroom Based Training
Target Group	Developers, System Integrators
Duration	3 Days
Price	2.070 € plus statutory VAT.
Location	STW Academy

System design in electrification projects

Brief Description:

The course contains an introduction to the system design in electrification projects. The interaction of components for generation of energy, power management, drive and absorption of excessive energy is explained.

The course is intended for developers and system integrators to deepen their overall system knowledge and about solutions with STW's powerMELA components.

The theoretical course content will be deepened with demonstrated examples from practice.

Objectives:

The participant

- Knows typical system topologies for electrification projects
- Knows the main steps how to change from hydraulic to electric systems
- Knows the most important properties and dependencies of/between the main components in an electrical system

Prerequisites:

Basic knowledge as conveyed in the course „ principles of power electrification

Contents:

- Basic Electrification Systems
 - Topologies of electrified power trains
 - Converting a hydraulic system to an electric system
 - Voltage ranges
- Electric drives
 - Motor design and motor types
 - Cooling concepts
 - Generator systems
- Energy Converters
 - Properties of Converters
 - Brake Choppers
 - DC-DC Converters
- Battery and charger systems
 - Chemical basics
 - Battery management
 - Standards, types and plugs for charging systems
- Energy distribution and safety
 - Power distribution unit
 - Protection measures against electric shock
 - Selfdischarge and discharge current
 - Insulation measurement
- Power Management
- Application examples

Course Identifier	MELASYS
Course Number	86227
Course Type	Classroom Based Training
Target Group	Developers, System Integrators
Duration	2 Days
Price	1.400 € plus statutory VAT.
Location	STW Academy



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