SCIO AUTOMATION

LEADING IN AUTOMATION

COURSE CATALOGUE 2025

July 2025

Course catalogue 2025

Industrial software

TIA1:
Hardware configuration and programming basics
approx. 24 h

CVT1:
Conversion from WinCC Comfort/Adv. to WinCC Unified
approx. 24 h

TIA2:
Software architecture & development
approx. 16 h

STD1:
Getting started with the SCIO Controls Standard
approx. 4 h (Opt. +4h practice)

TIA3:
Standard development & data handling
approx. 12 h

STD2:
Create your own layouts & devices
approx. 12 h

Safety services

SAF1:
Basics of the Machinery Directive
approx. 8 h

SAF4:
In-depth SISTEMA course
approx. 8 h

SAF2:
Fundamentals of Fail-safe controllers
approx. 8 h

SAF5:
The fundamentals of ESPE and validation
approx. 4 h

SAF3:
Practical exercises on the training cell
approx. 8 h

SAF6:
Programming with PNOZmulti Configurator
approx. 8 h

Robots

ROB1:
Basic course Fanuc robots
approx. 36 h

Learning paths

Software Engineer
approx. 64 h

TIA1

Use of the Siemens TIA Portal and introduction to hardware configuration, programming and HMI configuration (theory + exercises)

HARDWARE CONFIGURATION AND PROGRAMMING BASICS

TIA1: HARDWARE CONFIGURATION AND PROGRAMMING BASICS

1.410 €

Overview

Short description:

Use of the Siemens TIA Portal and introduction to hardware configuration, programming and HMI configuration (theory + exercises)

Implementation:

- Remote
  - half days
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 18 – 24 Hours

Contents:

- The development environment
- Basic functions without a project
- A new project and project administration
- Hardware configuration
- The Siemens CPU
- Software development - Part 1
- Software development - Part 2
- HMI
- More details

Profile:

- Apprentices
- Students
- Developer

TIA1: HARDWARE CONFIGURATION AND PROGRAMMING BASICS – CONTENTS IN DETAIL

The development environment

- Portal and project view
- Organization and settings
- GSD and GSDML
- Automation License Manager
- Software updates
- External applications

Basic functions without project

- Connectivity
- Online access
- Online & Diagnostics
- Program blocks and PLC data types in the online view

A new project and project administration

- Create project
- Archiving and dearchiving
- Delete project
- The project navigation
- The inspector window

Hardware configuration

- Create new device
- Replace devices
- The device and network portal
- The network view
- The device view
- Loading the hardware configuration
- Connect online
- The topology view

The Siemens CPU

- Program structure
- Cycle, process image and cycle time
- Project navigation
- Device settings
- PLCSim

Software development - Part 1

- Focus of software development
- Program blocks
- Creating blocks
- Programming languages
- Data types

Software development - Part 2

- Help functions
- Block interfaces
- Data structures
- Structure and handling

HMI

- What is an HMI
- Siemens HMI
- Hardware configuration
- Engineering and user interface
- HMI variables
- Simulation scenarios
- Extended functions

TIA2

Introduction to the construction and structuring of software based on the architecture pattern Model-View-Controller (theory + exercises)

TIA2: SOFTWARE ARCHITECTURE & DEVELOPMENT

940 €

Overview

Short description:

Introduction to the construction and structuring of software based on the architecture pattern Model-View-Controller (theory + exercises)

Implementation:

- Remote
  - half days
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 14 – 16 Hours

Contents:

- Presentation of the training scenario
- Hardware interface
- The path to the database
- Data management
- The presentation
- Structures and basic functions
- Teamwork
- More details

Profile:

- Apprentices (with TIA1)
- Students (with TIA1)
- Developer (with TIA1)

TIA2: SOFTWARE ARCHITECTURE & DEVELOPMENT

Presentation of the training scenario

Hardware interface

- The conventional way
- How could it go better

The way to the database

- Introduction
- Properties
- Project and database

The management of data

- Software architecture
- Library conformity
- Block interface
- Further tips

The presentation

- Creating an Image
- Scalability on the HMI
- Faceplates

Structures and basic functions

- Project structuring
- Create project structure
- Basic functions of a framework
- Simple operating modes

Teamwork

- Libraries and typing
- Updating types
- Project server and joint project work

TIA3

Introduction to standard development - data handling and the resulting software architecture as well as higher programming methods (theory + exercises)

TIA3: STANDARD DEVELOPMENT & DATA HANDLING

940 €

Overview

Short description:

Introduction to standard development - data handling and the resulting software architecture as well as higher programming methods (theory + exercises)

Implementation:

- Remote
  - half days
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 10 – 14 Hours

Contents:

- Libraries and version controlling (PLC + HMI)
- Optimized and non-optimized data and function blocks
- AT declarations and slice accesses
- The Variant data type
- The Array data type*
- Dynamic software concepts with Variant and Array*
- Software units

Profile:

- Senior Developer

CVT1

Course for switching from WinCC Comfort or Advanced to WinCC Unified via differential learning. (theory + exercises)

CVT1: CONVERSION FROM WINCC COMFORT/ADVANCED TO WINCC UNIFIED

1.410 €

Overview

Short description:

Course for switching from WinCC Comfort or Advanced to WinCC Unified via differential learning. (theory + exercises)

Implementation:

- Remote
  - half days
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 18 – 24 Hours

Contents:

- Why WinCC Unified
- The new hardware
- Changes and innovations in project engineering
- Encrypted transfer
- Screen navigation with WinCC Unified
- Faceplates
- Control (user administration/parameter set types)
- Messages
- More details

Profile:

- Students (with TIA1+TIA2 or comparable)
- Developer (with TIA1+TIA2 or comparable)

CVT1: CONVERSION FROM WINCC COMFORT/ADVANCED TO WINCC UNIFIED

What's new about WinCC Unified

- Why WinCC Unified?
- Presentation of the Unified Hardware Panels
- Changes and innovations in project engineering
- Helpful tools

Working with WinCC Unified

- Hardware and connection
- Load with "Encrypted transfer"
- Screen windows
- Navigation with screen windows
- Complex navigation with more than one navigation level (burger menu)
- Faceplates
- Nested faceplates
- User administration
- Parameter set types (recipes)
- messages

STD1

How to navigate in the SCIO Controls Standard, the use of standard modules, the implementation of process sequences and strategies for diagnosis (theory)

GETTING STARTED WITH THE SCIO CONTROLS STANDARD

STD1: GETTING STARTED WITH THE SCIO CONTROLS STANDARD

260 €

Overview

Short description:

How to navigate in the SCIO Controls Standard, the use of standard modules, the implementation of process sequences and strategies for diagnosis (theory)

Implementation:

- Remote
  - half day
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 4 Hours

Contents:

- Why is standardization important?
- Structure (line, automatic function, process module)
- Codiquette
- Beginners Guide
- The HMI
- Basics of process sequences
- Basics of devices/components
- More details

Profile:

- Apprentices (with TIA1+TIA2)
- Students (with TIA1+TIA2)
- Developers (with TIA1+TIA2)

STD1: GETTING STARTED WITH THE SCIO CONTROLS STANDARD

Introduction

- Why is standardization important?
- Structure (line, automatic function, process module)
- Codiquette
- Operating modes and states

Beginners Guide

- Software units (depending on STD version)
- Costants in STD
- Specification Devices & Componets
- Text lists in the STD
- Messages and diagnostics

The HMI

- Demonstration of the structure
- Demonstration of the menus
- Demonstration of the functions

Basics of process step chains

- Create new process sequences
- Calling up new process sequences
- Faceplates
- Messages
- Wait steps

Basics Devices/Components

- General structure and properties
- Standard handshake and data model
- The controller (function module)
- HMI representation (Faceplate)
- Use of the elements

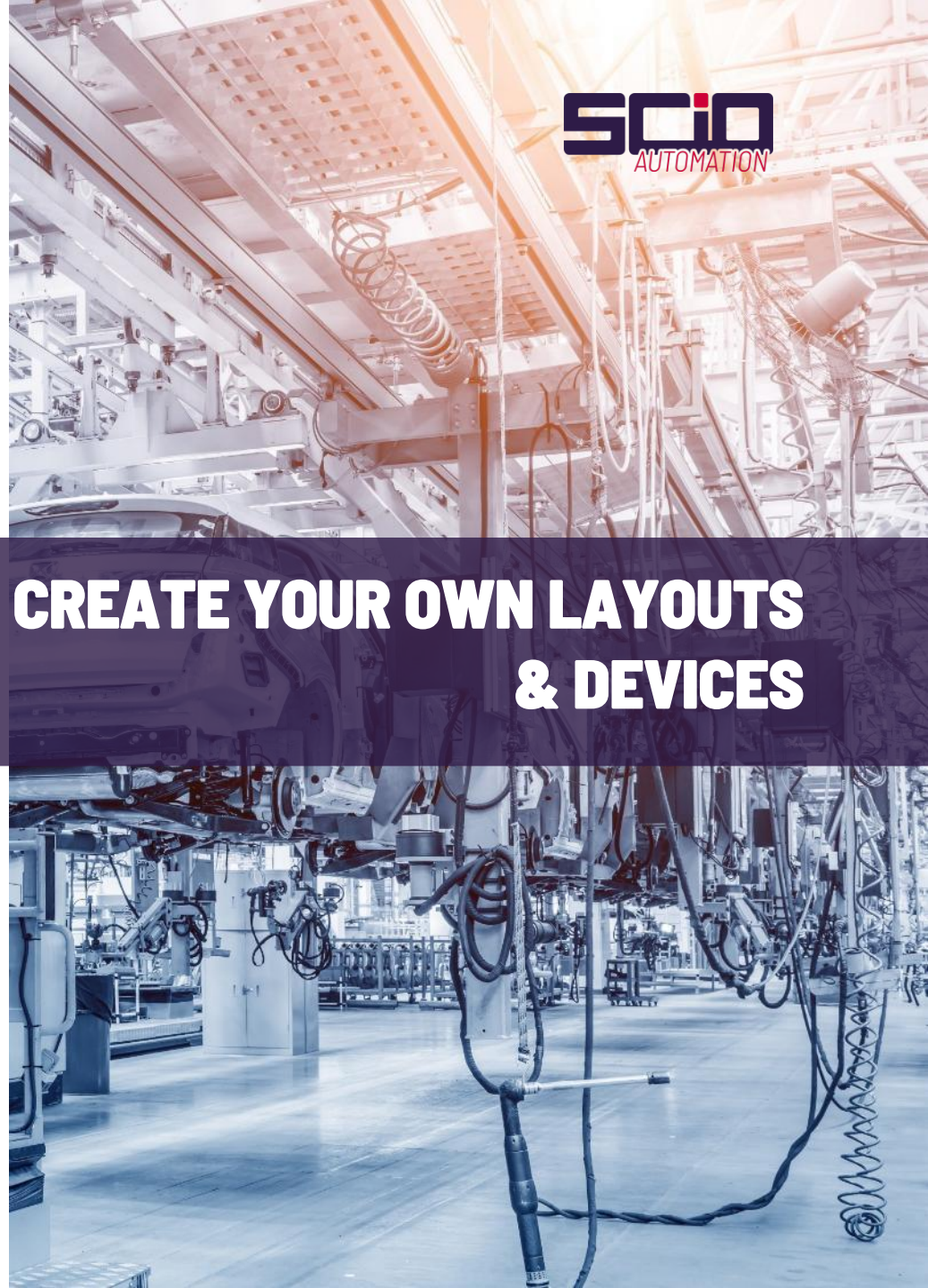
Option

An additional introduction to a specific machine or system can be booked if required. Participants will be introduced to the specific structure and where necessary special implementations.

Duration: approx. 4 h

STD2

Introduction to creating your own system layouts and creating your own devices in the SCIO Controls Standard (theory)



CREATE YOUR OWN LAYOUTS & DEVICES

STD2: CREATE YOUR OWN LAYOUTS & DEVICES

710 €

Overview

Short description:

Introduction to creating your own system layouts and creating your own devices in the SCIO Controls Standard (theory)

Implementation:

- Remote
  - half days
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 10 – 12 Hours

Contents:

- Structure (line, automatic function, process module)
- Codiquette in detail
- Definition & structure of device
- Creation of the device components
- Layouting a machine/plant
- Creating new process modules
- Creating new automatic functions
- More details

Profile:

- Students (with TIA1+TIA2+STD1)
- Developers (with TIA1+TIA2+STD1)

STD2: CREATE YOUR OWN LAYOUTS & DEVICES

Structure (line, automatic function, process module)

Codiquette in detail

- Program elements and structure
- Creator Language
- Programming languages
- Digital inputs and outputs
- Siemens system functions
- Instance data blocks
- Symbols, comments and general rules
- Data storage in the process module

Definition & Structure Device

- Model-View-Controller
- Structure of the database
- Structure of the faceplate
- Structure of the driver block
- Handshake

Creation of the device elements

- Creation of the database
- Creation of the driver block
- Creation of the faceplate

Layouting a machine/plant

- Examples from existing projects
- Layouting on a specific new system (optional)

Creating new process modules

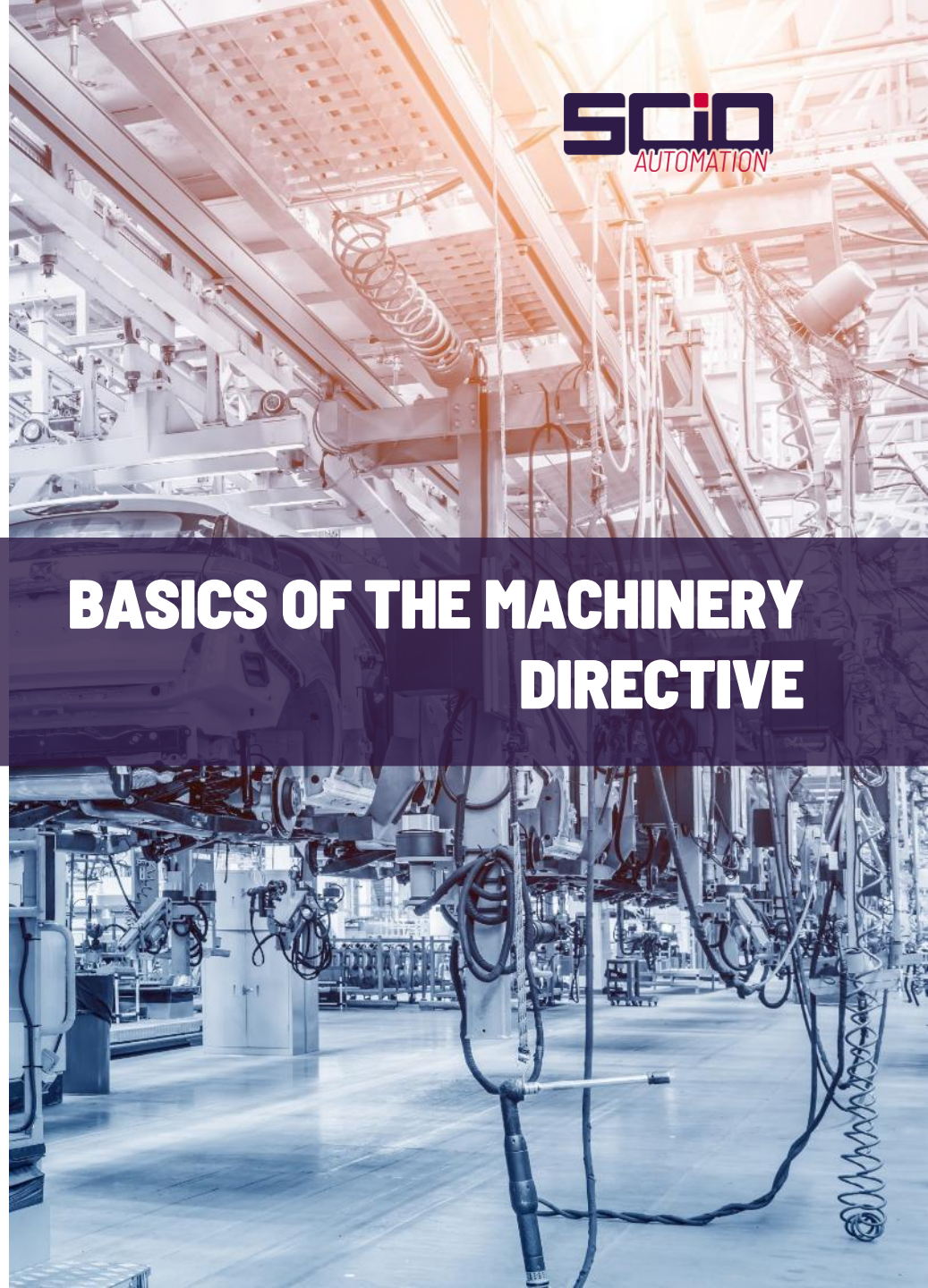
- Configuration
- Source code upgrade
- Upgrade HMI project engineering

Creating new automatic functions

- Configuration
- Source code upgrade
- Upgrade HMI project engineering

SAF1

Basic knowledge and requirements of machine directives and standards.



BASICS OF THE MACHINERY DIRECTIVE

SAF1: BASICS OF THE MACHINERY DIRECTIVE

Overview

Short description:

Basic knowledge and requirements of machine directives and standards.

Implementation:

- Remote
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 6 – 8 Hours

Contents:

- European directives, national laws, standards
- Risk assessment
- Risk reduction in the 3-step method
- Testing, validation and placing the machine/plant on the market
- Responsibility of the operator
- Dealing with old machines
- Machine/plant as a whole

Profile:

- Apprentices
- students
- Developers
- Responsible person (e.g. management)

SAF2

Implementing and configuring required safety measures for safety control systems.

FUNDAMENTALS OF FAIL-SAFE CONTROLLERS

SAF2: FUNDAMENTALS OF FAIL-SAFE CONTROLLERS

470 €

Overview

Short description:

Implementing and configuring required safety measures for safety control systems.

Implementation:

- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 6 – 8 Hours

Contents:

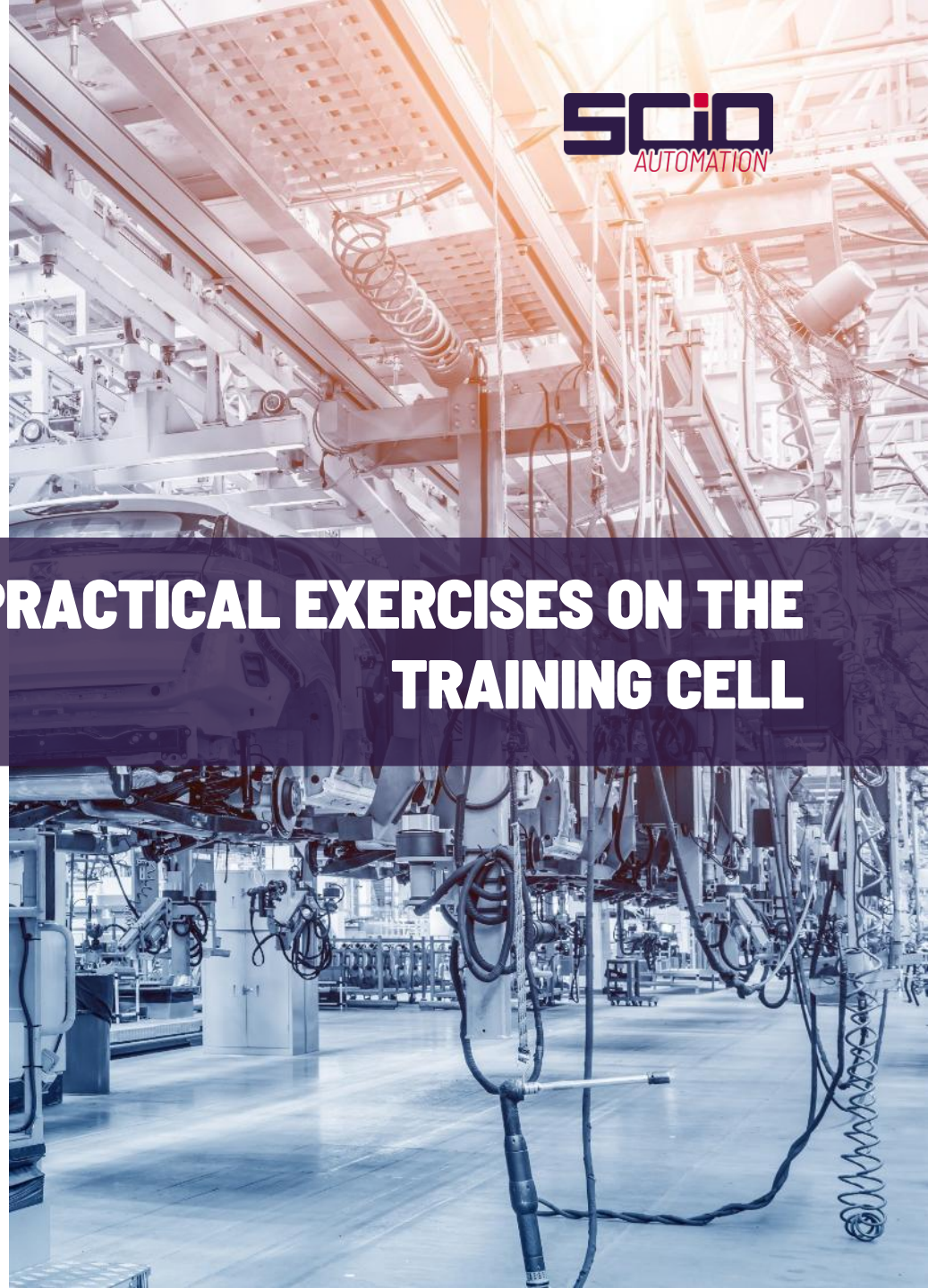
- Configuring fail-safe control systems
- I/O module configuration
- Safety administration
- Methods for SAFETY programming
- Testing and validation

Profile:

- Apprentices (with TIA1+TIA2+SAF1)
- Students (With TIA1+TIA2+SAF1)
- Developers (With TIA1+TIA2+SAF1)

SAF3

Commissioning and testing an Fail-safe control system.



PRACTICAL EXERCISES ON THE TRAINING CELL

SAF3: PRACTICAL EXERCISES ON THE TRAINING CELL

Overview

Short description:

Commissioning and testing an Fail-safe control system.

Implementation:

- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site **(on request)**

Duration: 6 – 8 Hours

Contents:

- Presentation of the tmp training cell
- Presentation of the required technical documentation
- Practical exercise 1-10
- More details

Profile:

- Apprentice (With TIA1+TIA2+SAF1+SAF2)
- Students (With TIA1+TIA2+SAF1+SAF2)
- Developers (With TIA1+TIA2+SAF1+SAF2)

SAF3: PRACTICAL EXERCISES ON THE TRAINING CELL

Presentation of the SCIO training cell

Presentation of the required technical documentation

Practical exercise 1
- Project engineering/configuration of the Fail-Safe-PLC

Practical exercise 2
- Assigning the Profisafe address

Practical exercise 3
- Configure I/O modules

Practical exercise 4
- Configure Safety Administration

Practical exercise 5
- Create variables according to Eplan, comments

Practical exercise 6
- Programming safety functions

Practical exercise 7
- Commissioning enabling switch

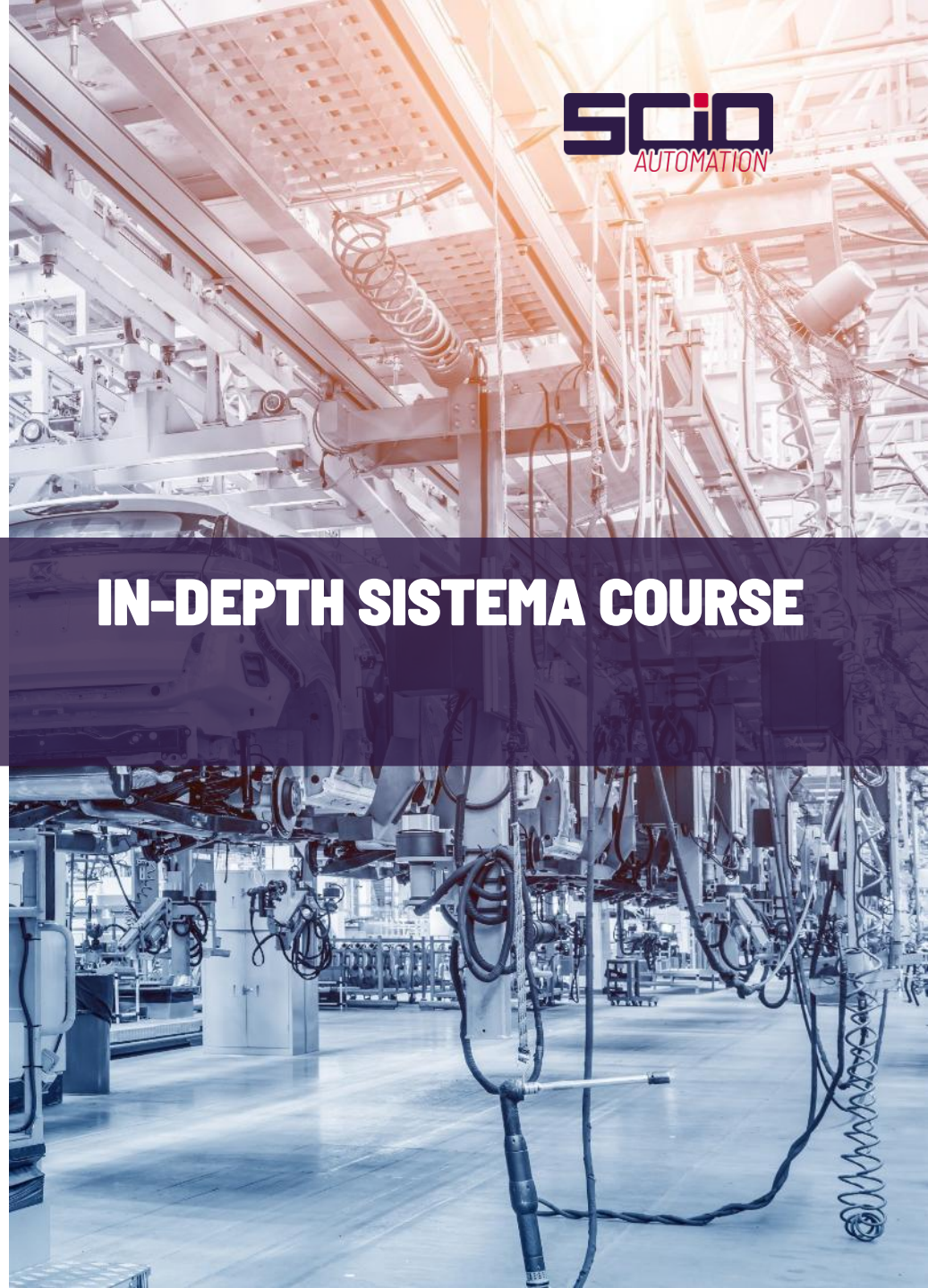
Practical exercise 8
- Troubleshooting

Practical exercise 9
- Check using the shutdown matrix

Practical exercise 10
- Open points, practical examples

SAF4

How to use SISTEMA software effectively to reduce risk in a systematic way.



SAF4: IN-DEPTH SISTEMA COURSE

Overview

Short description:

How to use SISTEMA software effectively to reduce risk in a systematic way.

Implementation:

- Remote
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 6 – 8 Hours

Contents:

- Introduction and exercise
- SISTEMA, supporting all the following examples
- SISTEMA examples and exercises
- Special features, tips, effective working
- Project process and documentation
- More details

Profile:

- Electrical planner

SAF4: IN-DEPTH SISTEMA COURSE

Introduction and exercise

- Two-channel example circuit, determination of the safety-related block diagram
- Determination of Kat, MTTFD, DC, CCF, PFHD, performance level (PL)

SISTEMA, supporting all of the following examples

- Structure, functions, possibilities
- Definition of projects and security functions, risk assessment
- Structure formation, data input
- Determination of PFHD and PL
- Use of manufacturer libraries
- Creating your own libraries
- Documentation printout
- Background knowledge, expert settings
- Q&A session, discussion

SISTEMA examples and exercises

- single-channel structure
- two-channel structure
- SISTEMA examples: various structures and variants, safety PLC, safe bus systems

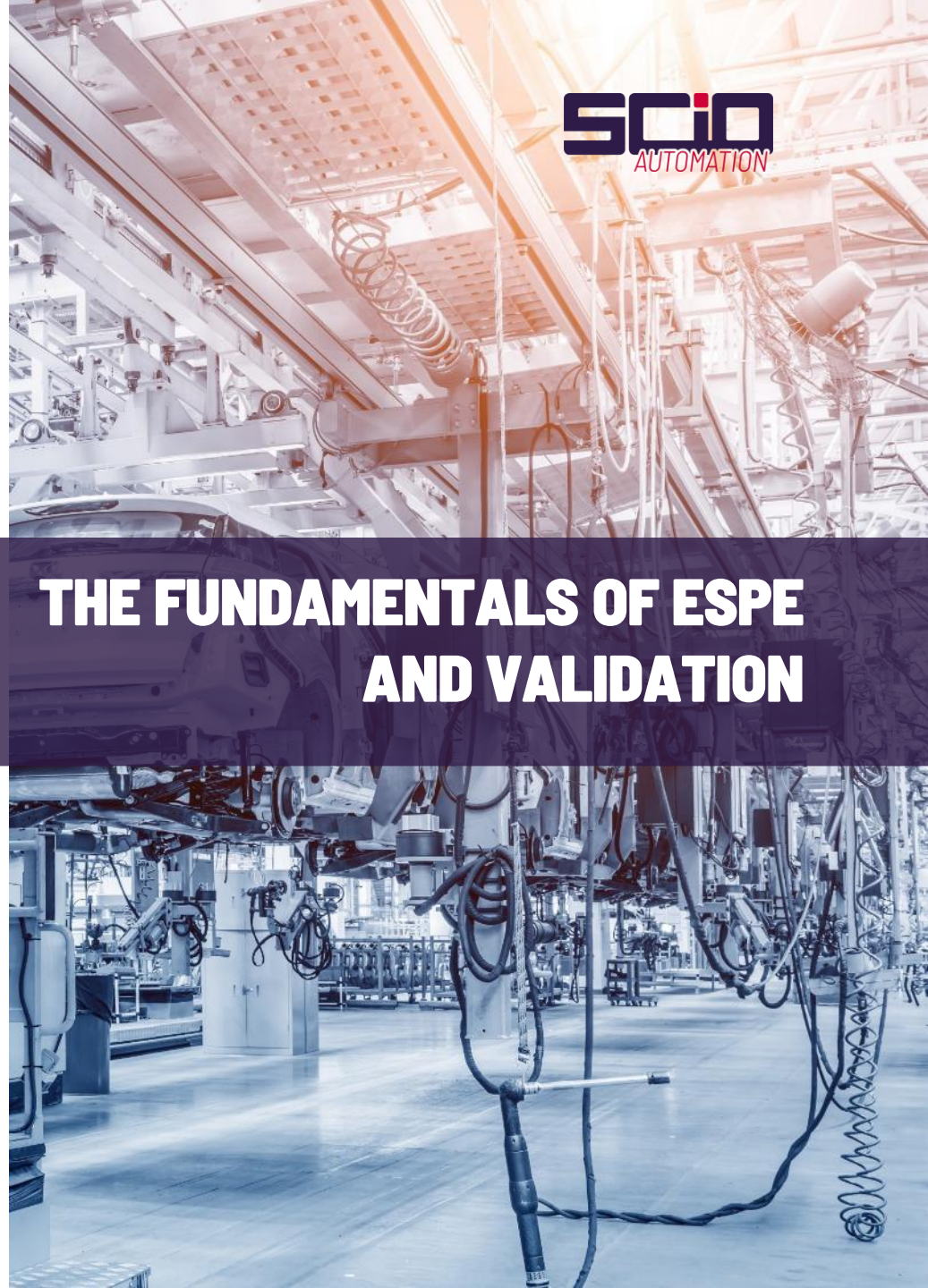
Special features, tips, effective working

- Series connection of door switches
- Working with many actuators
- Single-channel wiring in a two-channel structure
- Tips: Performance level not reached... What next?

Project process and documentation

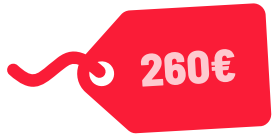
SAF5

Plan and integrate electro-sensitive protective equipment.



THE FUNDAMENTALS OF ESPE AND VALIDATION

SAF5: THE FUNDAMENTALS OF ESPE AND VALIDATION



Overview

Short description:

Plan and integrate electro-sensitive protective equipment.

Implementation:

- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 4 Hours

Contents:

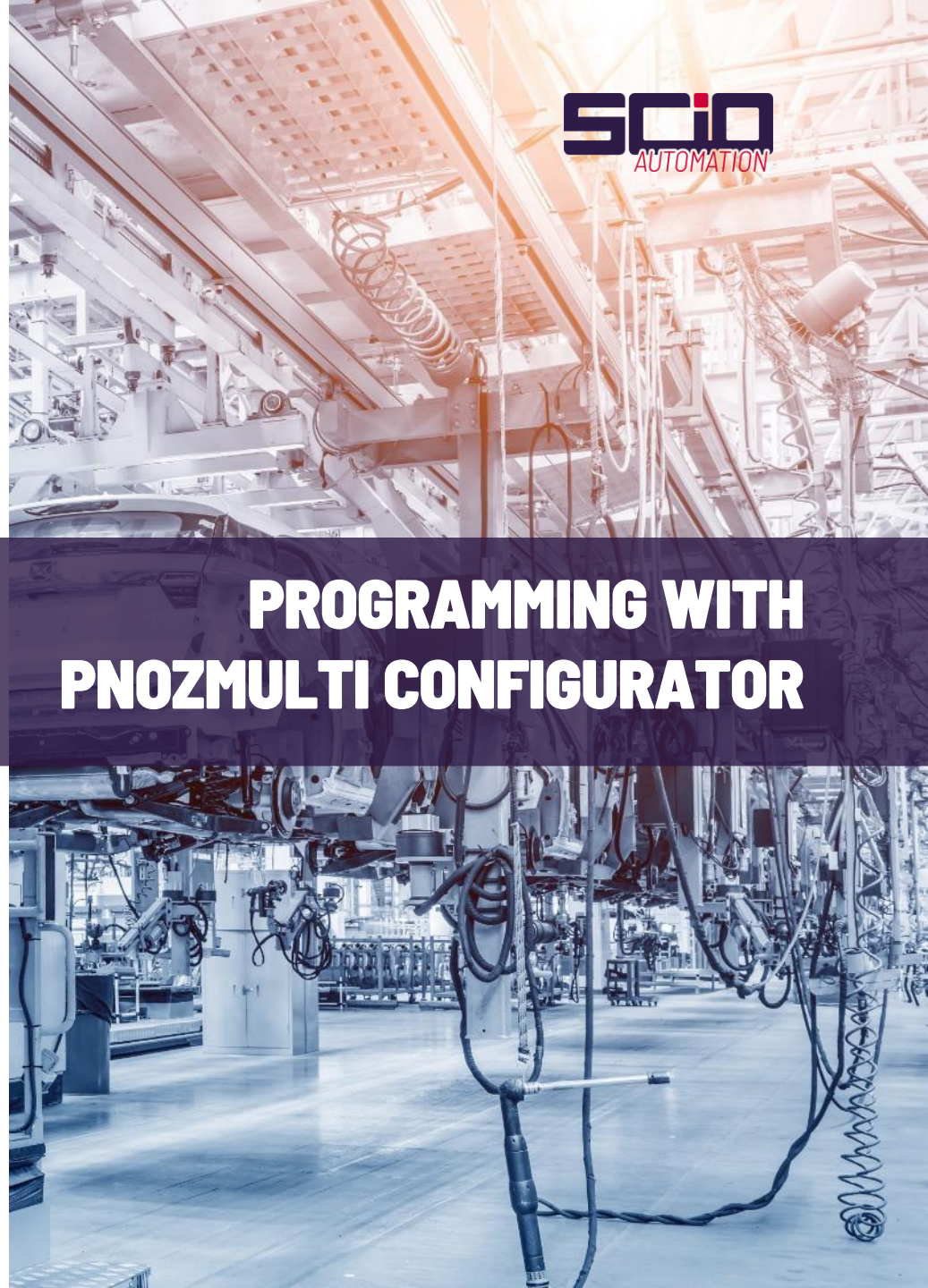
- Overview / Summary Basics of the MRL 2006/42/EC
- Presentation of "safety standards" with regard to the ESPE
- Testing, who is qualified? How does the implementation work?
- Risk assessment, BetrSichV
- Testing of safety light grids
- Overrun measurement (NLM)

Profile:

- Commissioning engineer
- Electrician (assembler)

SAF6

Configurator Design and integrate a PILZ safety control system.



PROGRAMMING WITH PNOZMULTI CONFIGURATOR

SAF6: PROGRAMMING WITH PNOZMULTI CONFIGURATOR

470 €

Overview

Short description:

Configurator Design and integrate a PILZ safety control system.

Implementation:

- Remote
  - full days
- Presence
  - At SCIO Automation Duisburg GmbH
  - At the customers site

Duration: 6 – 8 Hours

Contents:

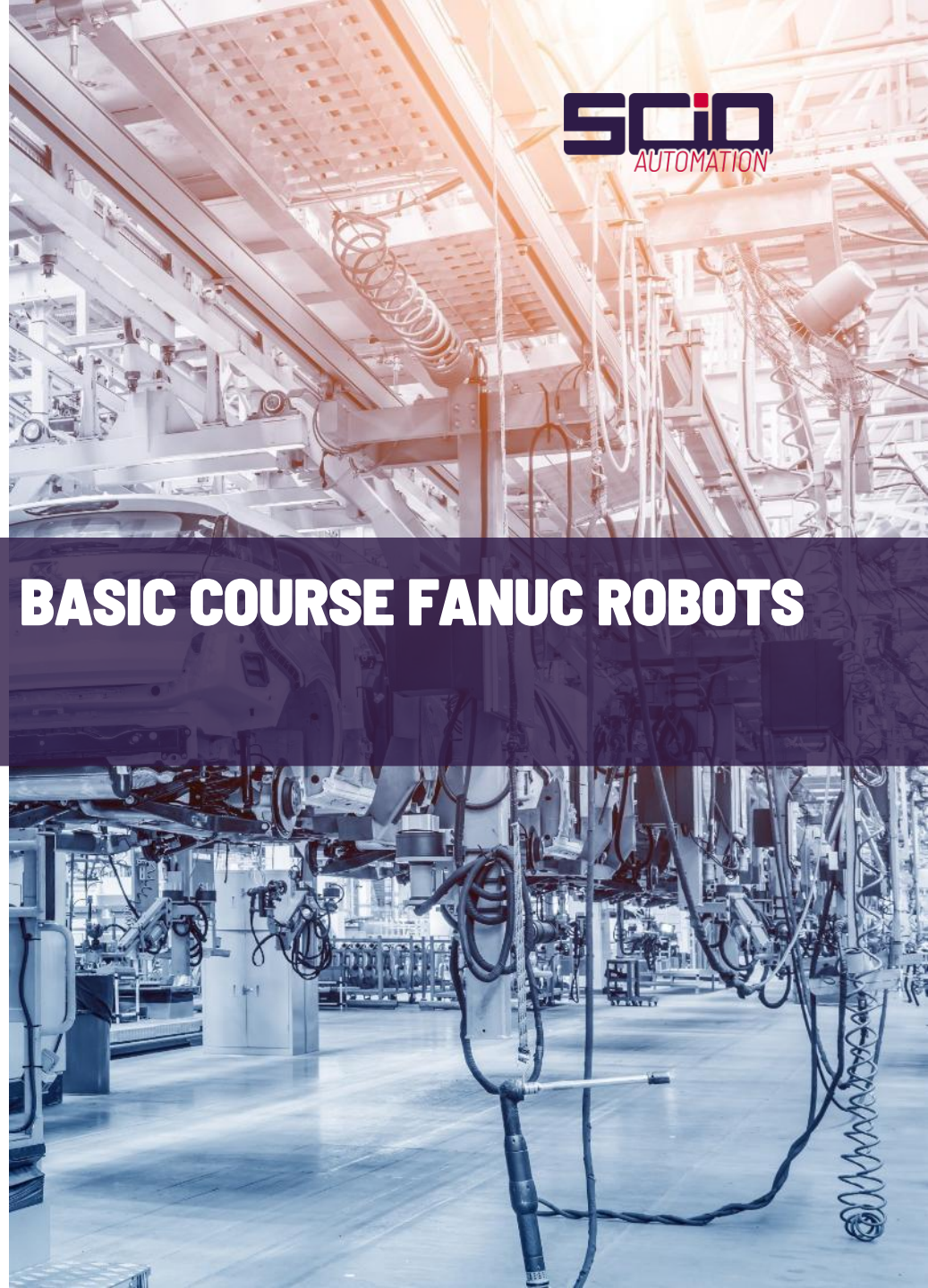
- Overview / Summary Basics of the MRL 2006/42/EC
- Introduction: The PILZ safety controller
- Introduction to the PNOZmulti Configurator
- Example tasks
- Troubleshooting and fault rectification
- Transferring the safety program
- Checking the safety program

Profile:

- Apprentices
- students
- Developers

ROB1

The basic course provides basic knowledge in the operation, programming and safety of Fanuc robots.



BASIC COURSE FANUC ROBOTS

ROB1: BASIC COURSE FANUC ROBOTS

2.115 €

Overview

Short description :

The basic course provides basic knowledge in the operation, programming and safety of Fanuc robots.

Implementation:

- Presence
  - At SCIO Automation Duisburg GmbH

Duration: 34-36 Hours

Contents:

- Basics and components
- Operate the robot safely
- System setup and calibration
- Practice-oriented programming
- System maintenance and security
- More details

Profile:

- Operator
- Maintainer
- Software developer
- Students

ROB1: BASIC COURSE FANUC ROBOTS

Basics and components

- Layout and function of the individual system components of an industrial robot

Operate the robot safely

- Collision-free manual movement of the robot (referencing)
- Moving to, saving and correcting positions
- Working in different coordinate systems (e.g. world, user, tool)

System setup and calibration

- Precise calibration of a tool (TCP - Tool Center Point)
- Setting up a user coordinate system

Practice-oriented programming

- Creation, testing and correction of simple automatic programs
- Use of counters for program sequence control
- Conditional branches and jumps in the program
- Use of inputs and outputs for communication with the periphery

System maintenance and security

- Analysis and handling of error messages
- Carrying out a data backup of programs and configurations

LEARNING PATH – SOFTWARE ENGINEER

TIA1:
Hardware configuration and programming basics

Approx. 24 h

→

TIA2:
Software architecture & development

Approx. 16 h

→

SAF1:
Basics of the Machinery Directive

Approx. 8 h

SAF2:
Fundamentals of Fail-safe controllers

Approx. 8 h

→

SAF3:
Practical exercises on the training cell

Approx. 8 h

Package price:

In case you book the entire learning path, the package is discounted by 10%!

~~3760 €~~

3384 €

We train all our new software developers according to a learning path!

But why do we do this?

At SCIO's Duisburg site, all new employees in the field of software development are consistently trained according to the "Software Engineer" learning path - no matter if they already have decades of professional experience.

But why do we invest all this effort?

- Standardized foundation of knowledge
  - It makes sure that a consistent foundation of knowledge is available
  - Closing hidden knowledge gaps
- Standardized language
  - It is made sure that everyone knows and uses the same terms
- Standardized style & rules
  - It is made sure that everyone is aware of the preferred programming style and that this is used
  - Reduces friction losses during the rotation of development teams
- Standardized strategies & best practices
  - Ensuring that everyone knows and can apply the most important proven strategies and best practices

Standardize training in your own company - with our proven learning path!

APPOINTMENTS 2025

	May	June	July	August	September	October	November	December
TIA1 Hardware configuration and programming basics	---	06/02 – 06/04 06/30 – 07/02	---	08/25 - 08/27	---	10/20 – 10/22	---	12/08 – 12/10
TIA2 Software architecture & development	---	06/05 – 06/06	07/03 – 07/04	08/28 – 08/29	---	10/23 – 10/24	---	12/13 – 12/14
CVT1 Conversion from WinCC Comfort/Advanced to WinCC Unified	---	---	07/28 – 07/30	---	09/22 – 09/24	---	11/17 – 11/19	---
SAF1 Basics of the Machinery Directive	05/19	06/23	07/14	08/11	09/15	10/13	11/10	12/15
SAF2 Fundamentals of Fail-safe controllers	05/21	06/24	07/15	08/12	09/16	10/14	11/11	12/16
SAF3 Practical exercises on the training cell	05/22	06/25	07/16	08/13	09/17	10/15	11/12	12/17
SAF4 In-depth SISTEMA course	05/23	06/26	07/17	08/14	09/18	10/16	11/13	12/18

- Individual appointments are possible on request

Notes on the prices quoted

- All prices are ...
  - ... plus VAT.
  - ... excluding travel expenses
  - ... per participant

PRICES