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Topic 1 Intro to IDE

- About CODESYS
 - Company Overview
 - CODESYS Product Ecosystem
 - Support Options
 - The Development System
 - Benefits of the IEC 61131-3
 - Version Handling
 - Caveat
 - Device Tree
- Starting a new project
- Starting the simulator
- Scanning for devices
- Logging in and running
- Breakpoints and single step
- Lab Notes

Topic 2 Help, Settings and layout

- Tour of Online Help
- Options
- Customize the CODESYS Dev. System
- Project Settings
- Miscellaneous settings
- Page Layout
- Other Sources of Help

Topic 3 CODESYS Projects

- Multiple Devices in a single Project
- Programmable vs Parameterizable
- Managing CODESYS IDE Objects
- Active Application
- Online Status
- Updating Devices and Project Archive

Topic 4 Variables and data types

- Basic Data Types
- Declaring Variables and Auto Declare
- Upper and Lower Limit of Basic Types
- Arrays and Array Initialization
- Global vs Local Scope
- Input and Output Variables
- Strings
- Display Radix
- Declaring instances of Function Blocks

Topic 5 Ladder logic and FBD Editor

- Ladder Logic Basics
- Function Block Diagram Basics
- Adding an LD or FBD POU
- Using the Tool Box and Tool Bar
- Adding comments
- Box Vs Box w/ EN/ENO

Topic 6 Sequential Function Chart

- Overview
- SFC Elements
 - Steps, Transitions, and Actions
- Branches
 - Linear, Alternative, Simultaneous
- Toolbar Options and Properties Window
- Copy Reference vs Implantation
- Macros, Implicit Variables
- Asynchronous Jumps

Topic 7 Structured Text

- Introduction to ST
- Assignments
- Operators
- Conditionals, CASE
- Loops: For, While, Repeat
- Enumerations
- Accessing Function Block I/O Variables
- State Machines in Structure Text

Topic 8 Advanced Debugging

- Simulation Vs Control Win
- Breakpoints, Single Step, Watch List
- Flow Control, Force and Write
- Browse, Definition, Call Tree,
- Cross Reference
- Online Change, Trace and Trend
- Operating Mode, Core Dump and Load
- Reset and Clean
- Device Log and Messages

Topic 9 Functions and Function Blocks

- Program Organization Units - POUs
- Programs vs Functions vs Function Blocks
 - Features, Limitations
 - Inputs, Outputs
- Standard Functions and FBs
- Function Block declaration and Instantiation
- FB I/O variable access with dot convention
- Input Assistant

Topic 10 Continuous Function Chart

- CFC vs LD
- Editing Basics
- Using Methods
- Editing Pins and Blocks
- Parameters
- Recommended usages for each language
- Multi-Language CFC

Topic 11 The Power of Object Oriented Industrial Programming (OOIP)

- OOIP vs OOP
- Traditional Task-Based vs OOIP
- Plant View
- Control and Equipment View
- I/O Mapping for object re-use
- Simulation
- Examples of Discrete, Batch, and continuous process plants

Topic 13 I/O Devices and Fieldbus

- Adding Local I/O to device
- Configure local I/O
- Adding an Ethernet Fieldbus Device
- Installing a Device with EDS file
- Configuring an Ethernet IP Device
- Online Config Mode

Topic 12 User Defined Types

- Multi-Dimensional Arrays
- Structures and Enumerations
- Unions and Alias
- Composite Pins, Structure Mapping
- FBs as Data Structures

Topic 14 Visualization Overview

- Visualization Manager
- Displaying Values
- Getting Inputs
- Animation
- Reusing Visualization/Object Oriented Visualization
- Dialogs

Topic 15 Libraries

- Types of Libraries
- Library Manager
- Library Repository
- Available Libraries
 - Standard, CAA, OSCAT, etc.
- Codesys Store
- Creating a Custom Library
- Implement your Custom Library

Topic 16 Task Configuration

- Introduction
- Task Types
- Task Priorities
- Task Monitoring
- Watchdog Timer

Topic 17 OPC UA and Peer to Peer

- Symbol Configuration Object
- Exposing variables via GUI
- Exposing variable via Attribute
- OPC-UA Enumerated Types
- Network Variables, Data Server

Topic 18 CODESYS Security

- Configure an Owner
- Project Permissions
- Project File Encryption
- Encrypted Connection
- Device (PLC) Security

Topic 19 Recipes

- Comparison to a spreadsheet
- IDE vs Programmatic
- Recipe Manager
- Recipe Definitions
- IDE Load, Save, Write, Read
- Programmatic Operations

Topic 20 Using a Trace

- Ring Buffer Theory and Operation
- Configuring the buffer, and Trigger
- Adding variables, configuring Axes
- Cursors, pan, zoom, save, load, etc.

Topic 21 CODESYS Store & Professional Developers Edition (PDE)

- SL Runtimes
- CODESYS UML
- CODESYS Profiler
- CODESYS Static Analysis
- Demos & Misc
- Packages

Topic 22 Subversion and Collaborative Design

- SVN Integration in CODESYS
- Device Tree, Check-in/out
- Compare, revision control

Topic 23 Miscellaneous Topics

- Controller Handling
- Source Code Management
 - Upload/Download
 - Import/Export, Compare
 - Refactoring
- External File, Conditional Pragmas
- Localization, Unit Conversion,
- Python Scripting, Alarm Object

Topic 24 OOP and Inheritance

- OOP vs OOIP?
- Inheritance vs Instantiation
- Precedence of methods and variables
- Interfaces and Properties
- References, Pointers, and caveats

Final Project

Bottled Happiness