ABB UNIVERSITY & ONLINE ACADEMY FOR EXCITATION AND SYNCHRONIZATION

J820 - UNITROL® 6000 Medium Control Builder Programming 5 days, in person training

Course goals

At the end of the course the student will be able to solve most of the main problems occurred on-site or during engineering phase.

Main learning objectives

Upon completion of this course, the students are able to:

- Use the Compact Control Builder and PEC Tool for UNITROL®
- Use the “Interaction Windows” for commissioning and configuration of the software
- Add and implement functions to the existing standard software using the programming languages “structured text” and “Sequence Flow Charts”
- Link signals and parameters to the Excitation Control Terminal
- Use the On-line editor and Test Mode for debugging and testing

Participant profile(s)

- The Control Builder course J820 is developed especially for commissioning engineers and/or control engineers, who want to gain deep knowledge in Control Builder programming for UNITROL® 6000 Medium, Power, X-Power and Nuclear system application

Prerequisites

- Completion of J810 UNITROL® Light Service and Commissioning training
- English Level: B1

Delivery and learning methods

- Lectures with experienced trainer
- Focus on Hands-On

Duration

- 5 days, Max. 14 participants

Registration

For registration or enquiries please visit: ABB University & Online Academy for Excitation - Enquiries
ABB MyLearning page (requires log in): J820 UNITROL® 6000 Medium

Notes

Participants are kindly requested to apply online for public courses

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Topics

Functionalities

- How to define the correct Compact Control Builder (CCB) version needed
- The complete process of download/upload to/from Flash with PEC tool (scan, flash utility, OPC files)
- How to create environment variable
- How to test the software in «test» and «online» mode
- How to use the search function and find a signal inside the software in order to program and troubleshoot («rebuild» mode)
- How to follow a signal in the software structure
- How to use the function help

Interaction windows

- How to use the interaction windows and its meanings
- How to set parameters in interaction windows and save to flash
- How to use the boot parameters
- Understand structure of Excitation interaction windows

Programming basic

- What are the programming rules for Excitation Systems
- UNITROL®
- How to use the Control Builder attributes (difference between retain/cold retain/hidden/...)
- What is difference between private and global variable and how to use it
- How to use the type and data type
- How and why to program in structured text (ST) and in sequential function chart (SFC)
- How to troubleshoot using Compact Control Builder
- I/O's
- How to create digital/analog input/output and is able to
- Detect which in/output is already affected to a signal (new SW version: 5.1.0/1)
- How to scale the analog signal

Function Blocks and Libraries

- How to use the function blocks (TON, TOFF, TP, flip-flop S/R, analog scaling and linearization)

Operator Select/State Machine

- What is Operator Select (OS) used for
- When to use OS instead of State Machine (SM) and understanding the reasons
- How to program in OS and in State Machine

Variable Mapping/Routing

- How to map a variable from the OS to SM and SM to OS (by using the PS_mapping) for 5.1.0/1 and by using the standard rooting way)
- How to root a variable from OS and display it in ECT respective interaction windows

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Link to ECT
– How to link an Event from CB to the ECT and send an ECT input to CCB – How to overwrite the event/alarm in the ECT coming from CCB

Fieldbus
– How to program in Fieldbus I/O's (control/status word) and to map into SM – How to connect and test the fieldbus with a fieldbus Master – How to force/read a bit and/or analog signals

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Virtual Course map

Typical course layout (time or sequence may change)

DAY 1 | 8:30 AM – 4:30 PM

- What means Control Builder
- How to install Control Builder
- How to get started
- Compact Control Builder:
  - Interaction windows
  - Programming language
  - Help function of Control Builder and search function
- Exercises
  - Data types
  - Trace a signal
  - Force a signal retain/cold retain
- UNITROL® 6000 Control IT Template (CIT), Structure
- Interaction Windows
- Programming basics

DAY 2 | 8:30 AM – 4:30 PM

- Exercises
  - Programming of an input/output
  - Programming if then els
  - Create status in signal on the interaction windows
- Exercises-CIO
  - Programming: boot mode
- Exercises
  - Mapping/Routing variables from SM to OS and OS to SM
- Exercises
  - Mapping/Routing variables from SM to OS and OS to SM buy using the CCB version 5.1.0/1
- Exercises
  - -I/O's mapping programming: boot mode

DAY 3 | 8:30 AM – 4:30 PM

- Exercises
  - How to add IO's and events in CIT
- How to add analog signals
- Factory visit
- Engineering case: Load sharing activation (I/O, mapping, fieldbus)
- Online Test and troubleshooting

DAY 4 | 8:30 AM – 4:30 PM

- Fieldbus communication test with Master fieldbus (configuration Status/Control Word)
- Function block exercise
- Flip-flop and logic programming

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DAY 5 | 8:30 AM – 4:30 PM

- The UNITROL® 6000 Programming Guidelines
- How to add analog signals
- Exercises scaling of I/O's
- Programming of Toggle button e.g., Auto/Man change over
  - Exercise
- Programming of Interlock for Ready to Start
  - Exercise
- Creating project documentation according to the programming guide lines

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Contact us

ABB University & Online Academy for excitation and synchronization

Austrasse, CH-5300 Turgi / Switzerland

Web: https://new.abb.com/power-electronics/excitation-and-synchronization/service/training

E-mail: ch-learningcenter-powerelectronics@abb.com