Schneider Electric Alliance

PlantStruxure™ Certified Engineer

Exam Guide

Edition 1.1

Schneider Electric

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PlantStruxure™ Certified Engineer Exam Guide

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EDITION

Edition 1.1, December 2009

Content

Chapter 1

Introduction to the PlantStruxure™ certification

1.1 Certification for Alliance partner engineers

The PlantStruxure™ CEP (Certified Engineer Program) distinguishes and recognizes engineers skilled in the integration of Schneider Electric technology-based automation projects.

The PlantStruxure™ CEP is at the heart of the Schneider Electric Alliance Partnership Policy:
Maintaining a minimum number of PlantStruxure™ Certified Engineers is one of the prerequisites for a Schneider Electric Alliance Partner Company to reach the PlantStruxure™ Certified Alliance Partner Status.

With the certification, Schneider Electric acknowledges to the market that the PlantStruxure™ Certified Engineer masters the Schneider Electric system offer / technology. The engineer should therefore be capable, to implement a given solution/application in the best possible way using Schneider Electric technology.

1.2 Eligibility for the Schneider Electric Alliance PlantStruxure™ Certified Engineer program

Today the PlantStruxure™ Certified Engineer Program is available only to employees of active Schneider Electric ALLIANCE partners.
In case you're not sure whether your Company is an active Alliance partner, please confirm with your management or contact your local Schneider Electric Alliance program manager.

1.3 Technology and Offer in evolution

Schneider Electric's PlantStruxure™ and the collaborative control system in general is an evolving technology.
By signing up for the PlantStruxure™ Certified Engineer Program, participants commit themselves to passing annual update exams as the PlantStruxure™ offer evolves.
A PlantStruxure™ Certified Engineer will lose his certification if he does not pass the annual upgrade exam.

1.4 Your Contacts

Please contact your local **Schneider Electric Alliance Partner Manager** to sign up for a certification exam or for any question related to the PlantStruxure™ exam or the Schneider Electric Alliance Program

To bring our attention to any problems related to the **Certified Engineer Program online examination platform** or with the **Schneider Electric Alliance Extrane**t or to make any suggestion to improve the website, please write a mail to:

Mrs. Vibha Thusu email: Vibha.thusu@ae.schneider-electric.com

Chapter 2

Introduction to the examination system

2.1 The Examination Process

Examination Centers

You can take Schneider Electric Alliance PlantStruxure™ Certification exams in selected Schneider Electric offices in your country.
Please consult the PlantStruxure™ certified Engineer Program page on the Alliance Extranet or contact your local Schneider Electric Alliance Program Manager.

Exam Cost

The cost for Alliance Partner SW engineers to take a PlantStruxure™ certification exam is included in the Alliance Partner Annual Subscription Fee.

Prerequisites to take a PlantStruxure™ certification exam

1. Be a salaried employee (not subcontractor) of an active Alliance Partner Integrator
2. You have followed training delivered by Schneider Electric:

   For the sg^2/UAG module: Having followed classroom training on either sg2 or UAG.
   For the Unity Pro, Vijeo Citect SCADA and Networking & architecture exam modules, there are no formal training prerequisites although we strongly recommend sufficient formal training as organized by Schneider Electric.

Modular Exam

The exam is modular (details are described in further sections of this document). It is allowed, although not recommended, to take the complete exam in multiple sessions only taking 1 or 2 exam modules at a time. Indicate which modules you want to take on your exam registration form.

Exemptions from Exam Modules

If you have a valid Schneider Electric SCADA Certification, you are exempted from passing the SCADA module of the PlantStruxure™ exam. Please contact your local examination administrator for details.

Registering for your exam

To be able to take any exams in the Schneider Electric Alliance PlantStruxure™ Certified Engineer program, you must enroll.

This may be done by filling in the application form which can be found on the Alliance Extranet or by simple request from your local Schneider Electric Alliance Partner manager, and sending the duly completed form back to your local Schneider Electric Alliance Partner Manager.

The application form can be found at: http://www.alliance.schneider-electric.com/Certification

When you submit your request, your local Exam Coordinator will contact you regarding the details of your exam.

Why Register?

The registration process not only allows your local office to coordinate exams but is the first step in the exam process.
When you register for the first time, the Exam Coordinator in your region will arrange for your unique *Student Login* and *Student Password*. The Student Login and Password that you receive will be used in all of your Certification Exams. We will need an email address so that your exam results may be sent to you.

The Student Login follows this format

```
exam_joe_student
```

The Student Password is a computer generated random selection of characters.
The password will generally not be revealed to you; instead the examination supervisor will log in on your behalf.

Exam Enrolment

Your exam enrolment is created prior to the day of the exam. When the Exam coordinator registers you to sit for a particular exam your Username is entered into the Enrolled User Group for that exam. The enrolment is disabled until the day of your exam.

The Day of the Exam

The Exams are supervised by Exam Coordinators. When you arrive at the Examination Centre you will need to identify yourself to the Exam Coordinator. If this is your first exam the Exam Coordinator will supply you with your Exam Username and Password. You will then be escorted to the Examination Room. The location of the testing room is most likely to be a Schneider Electric Training Room.

2.2 The Examination System

Open Book Exam

All exams are open book with some limits as described below. The computers in the Examination room are loaded with appropriate versions of Unity Pro, Vijeo Citect, UAG and sg2 for the exam being taken, and all relevant user guides for those software products. You are NOT permitted to take any Training Manuals into the examination room, neither are you permitted to bring any other material, including this Study Guide, into the Examination Room.

The exams are supervised by the Exam Supervisor. Whilst you are allowed to refer to the on-line documentation and to create test projects on the installed SW system, no speaking is allowed and peeking at someone else's computer is also prohibited.

Blank paper for writing notes will be supplied; any used sheets will be destroyed by the Exam Supervisor.

Time Limit

All certification exam modules allow a certain maximum amount of time in which to complete your work.

The available time is fixed for each exam and is also subdivided into allotments for each section of the exam. You cannot "bank" time - at the end of a section, any spare time is lost, nor can you backtrack once a section is completed.

The available time for the current section is indicated on the exam by an onscreen counter/clock in the top righthand corner of the screen, so you can check the time remaining whenever you like.

2.3 Passing the Exam

Passing grade

To pass the complete PlantStruxure™ Exam, an average score of 60% or above across the 4 exam modules is required, with no module scoring below 50%.

With an average score above 60% and maximum 1 module below 50% but not below 40% you are entitled to retake that one exam module without observing the waiting time of 2 months between exams. If you then score 50% or more on that single module you will have passed the complete exam.
Note that this deliberation can only be accorded once. If you fail to score above 50% you will receive a failing grade and you will have to retake all modules that scored below 60% after having observed a waiting time of 2 months.

In case of a modular approach, a score of 60% is required to pass individual exam modules. All modules with a score above 60% are acquired for a period of 2 years.

Once you pass all exams, the PlantStruxure™ Certification Administrator will be automatically advised. Your certificate will be mailed within a few days.

Failing grades and retaking an exam or part of it

In case of a failing grade, you will have to retake the exam after having observed a waiting/preparation period. Note that only the modules with a score below 60% will have to be retaken. All modules with a score above 60% are acquired for a period of 2 years.

Prerequisites to retake one or more exam modules:

- At least 2 months between 2 examination sessions
- To have participated in formal training delivered by Schneider Electric on the subject matter covered in the module.

2.4 Logging in to the Exam System

Web-based Exams

All Exams are web-based. Before you start your exam, the Exam Coordinator will have Internet Explorer loaded with the Exam web page.

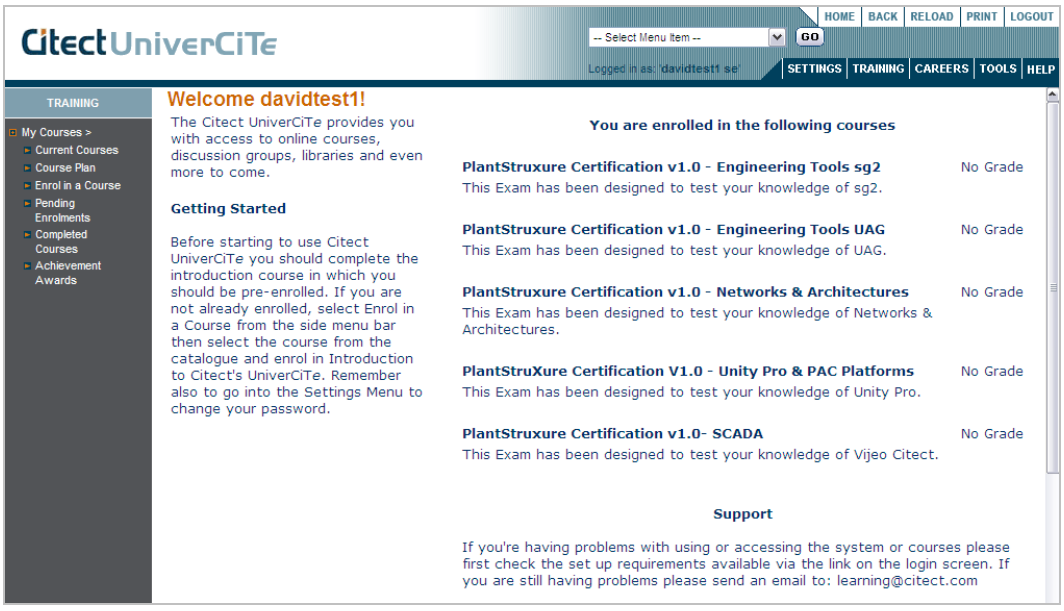
Logging In

The Examination system is hosted on the “UniverCITe” website and can be accessed from a web browser as follows:

External to the Schneider Electric WAN:

learning. citect . com

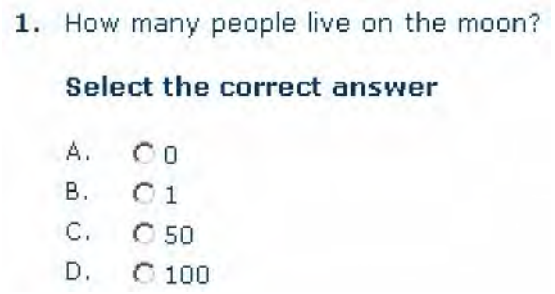
Following login, you will see a list of the exam modules in which you are currently enrolled



2.5 Exam Questions

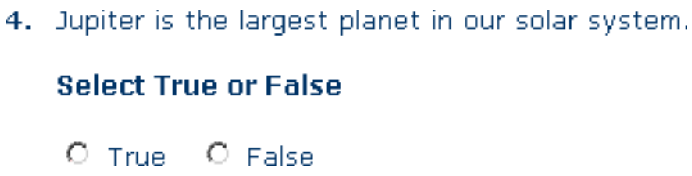
Single Answer

Read the question and select your response from the list of options. Select the radio button beside your choice.



True or False Answer

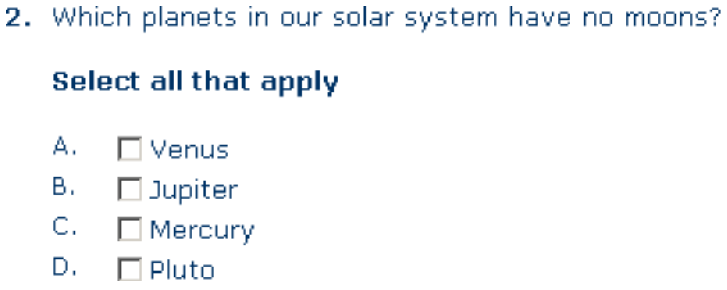
These questions offer a simple choice between two responses. Occasionally, the responses will also be expressed as a choice between two specific possibilities.



Multiple Answers

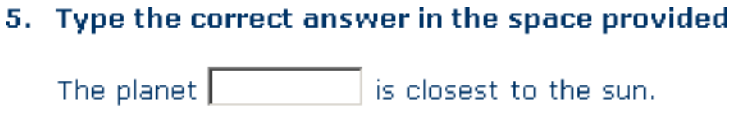
These questions are expecting at least one response, possibly as many as four. Checkboxes are provided for you to choose as many or as few responses as you think appropriate.

There will be no partial credit awarded for these questions. You must choose exactly the correct set of responses.



Typed Responses

A small number of questions expect a typed response



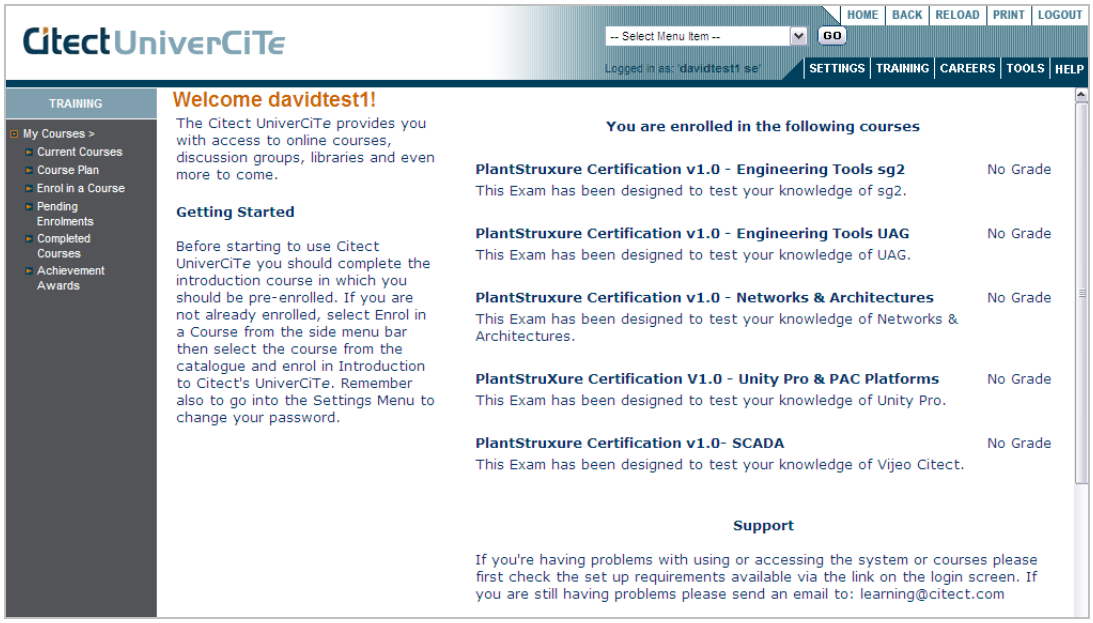
2.6 Exam Question difficulty and marks

Exam modules contain a mix of easier and more difficult questions.
More credit is allotted to the more difficult questions.
At the beginning of each exam module section, the total possible number of points is indicated

2.7 Commencing an Exam

Select Your Exam

From the list of enrolled exam modules (typically, you will be enrolled in all modules when you register), choose the exam module you wish to attempt.



Personal Details

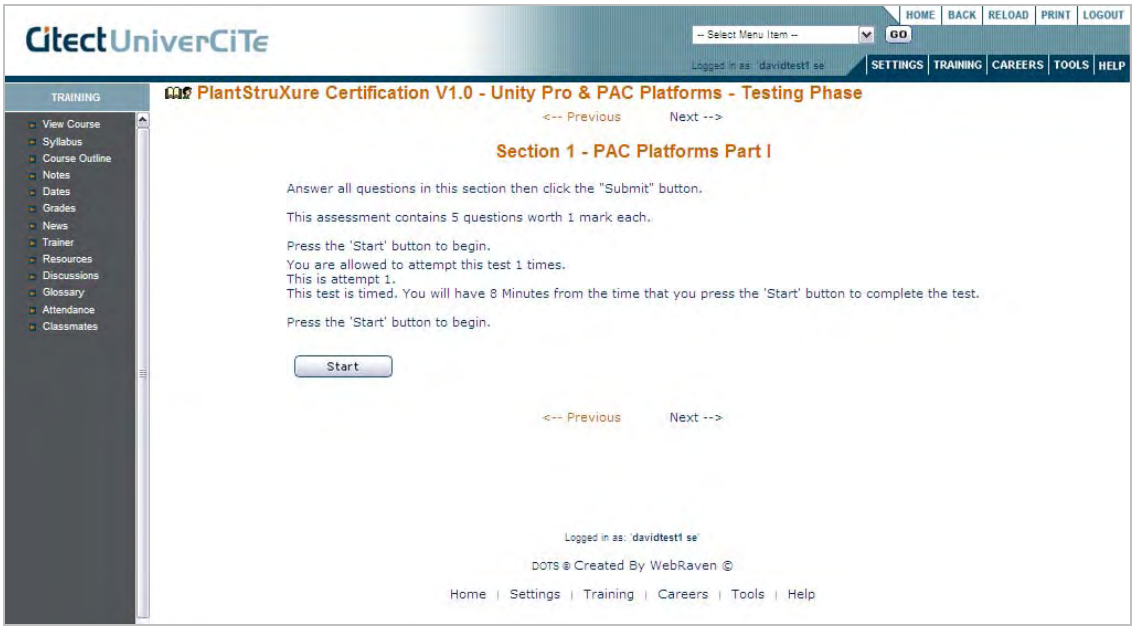
Once you open your exam, you will be requested to confirm all contact details. This includes the name of your supervisor. This person may be contacted at some later time to confirm the exam took place correctly.
Pressing Submit will open the actual exam.

2.8 Working through the Exam

Exam Sections

Having confirmed your details, you will then be presented with the exam sections you will encounter. Each of these sections is separately timed.

Typically, there are easy questions worth few points and hard questions worth more points. This is your last opportunity to make sure you're not attempting the wrong exam!

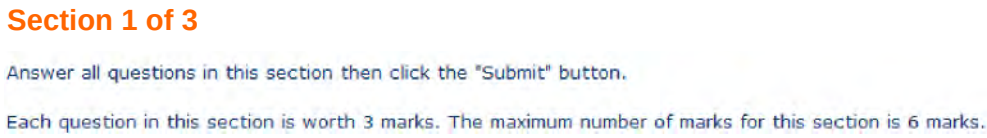


Once you click the Start button, timing commences for the first section.

Inside a section

You will be given the name of the section and advised the value of each section and the total number of points available in the section. The timer in the top right corner of the screen will start counting down.

Click on “submit” at the bottom of the screen to complete the section. You will be warned if there are uncompleted questions and the section will not close.



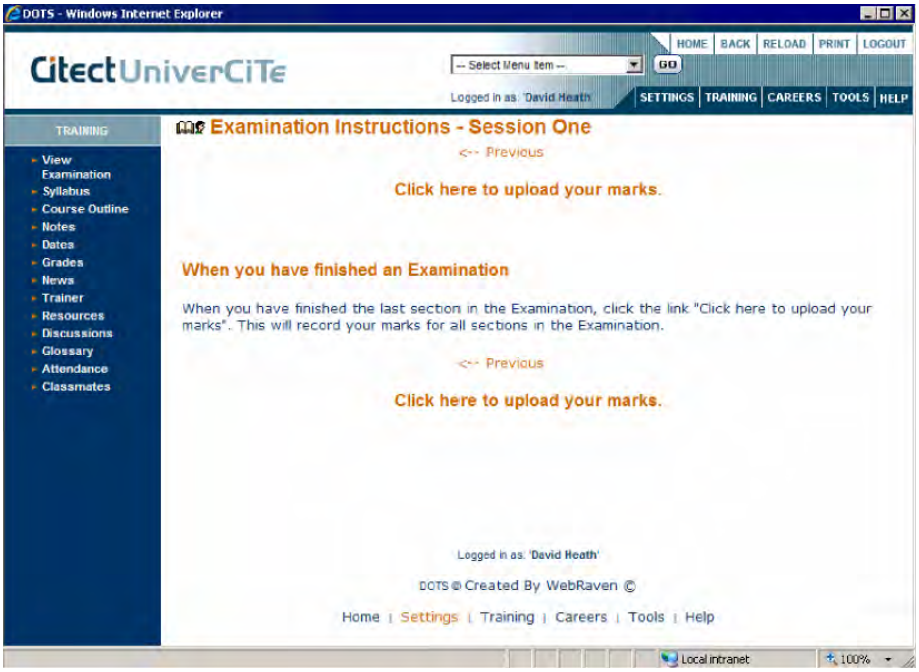
Completing a section

When you click on “Submit”, the section is graded and results given to you. Clearly this is the reason that you cannot return to a section.

2.9 Completing the exam

Uploading your marks

After submitting the final exam section, a screen will be presented inviting you to upload your grades.



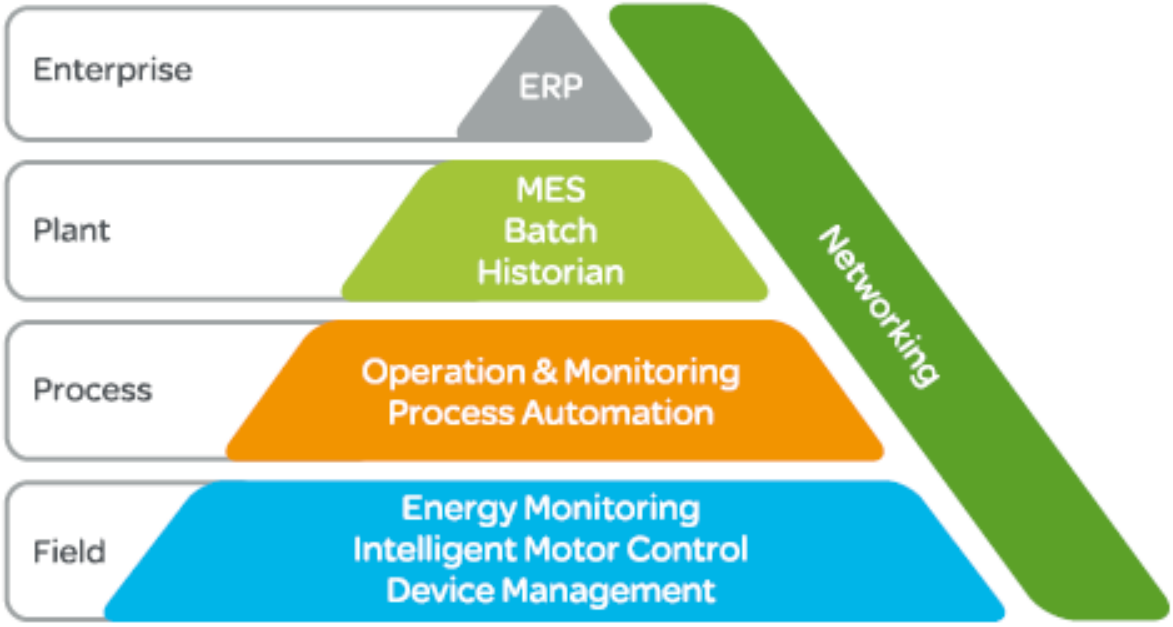
You will not be able to see your detailed grade at this time. Your examination results are automatically forwarded to the PlantStruxure™ Certification Administrator who will mail you your examination result for each exam module you took. In case you passed all 4 modules you will receive your Certificate.
Please refer also to section 2.3 of this manual.

Chapter 3

The PlantStruxure™ Certified Engineer Exam Structure

3.1 Introduction to PlantStruxure™

PlantStruxure™ is a collaborative system that allows industrial and infrastructure companies to meet their automation needs and at the same time deliver on growing energy management requirements. In a single environment, measured energy and process data can be analyzed and used to yield a holistically optimised plant.



PlantStruxure™ covers a both very broad and very deep scope of functionalities, technologies and components:

Energy Management

- iPMCC to optimise energy consumption
- Smart power and energy meters
- Variable speed drives for better energy efficiency
- Energy management software to measure and analyse

Manufacturing Execution System

- Real-time access to plant and business information allowing key personnel to identify and act on opportunities to maximize plant and process efficiency and to correct problems before they impact on supply chain, regulatory compliance and production.

Transparent Ready Networking

- Transparent communication between all system components
- Standard Ethernet technology and industrial protocols
- Dedicated device network support including Modbus TCP, EtherNet/IP, Profibus, CANopen,, AS-Interface
- Support for dedicated instrumentation buses such as Profibus PA, Foundation Fieldbus & HART.

Operation

- The link between the operator and the process
- Easy system navigation
- Powerful alarm management
- Advanced trending and process visualisation
- A range of client options including web clients, PDAs, smart phones.

Control

- Scaleable family of programmable automation controllers to meet all control requirements
- Integrated SIL2 safety
- Hot-swappable processors, I/O and communications modules and power supplies
- Advanced process control functionality
- Configuration based on IEC61131-3 standard.

Engineering

- Engineer and modify your entire system from a single location
- Flexible engineering tools in order to support your efforts to be more efficient
- Reusable and extensible object libraries for standardisation
- Off-line simulation to reduce testing and commissioning.

3.2 The PlantStruxure™ Certification Exam Structure

The PlantStruxure™ certification aims to certify professional broad technical experts, covering an important part of the breath of PlantStruxure™.
Important to note is that he PlantStruxure™ certification is not covering the entire scope (breadth and width) of PlantStruxure™.
We believe that in the industrial automation business, design and engineering is a team effort, and the engineering team s likely to contain a mix of both deep and broad technical experts. The broad technical experts have the important role of bringing all the pieces together to ensure a consistent and coherent architecture and application, thereby relying on deep technical expert colleagues for specific technical details when required.
The PlantStruxure™ certification aims to certify those broad technical experts.

Depth of the examination

The exam modules will not go in an extremely deep technical detail at any moment: be it on product,

technology or system level.
For that level of expertise, we propose other, more specialized certifications, which are much narrower in scope, but which will go much deeper in detail, e.g.: SCADA certification

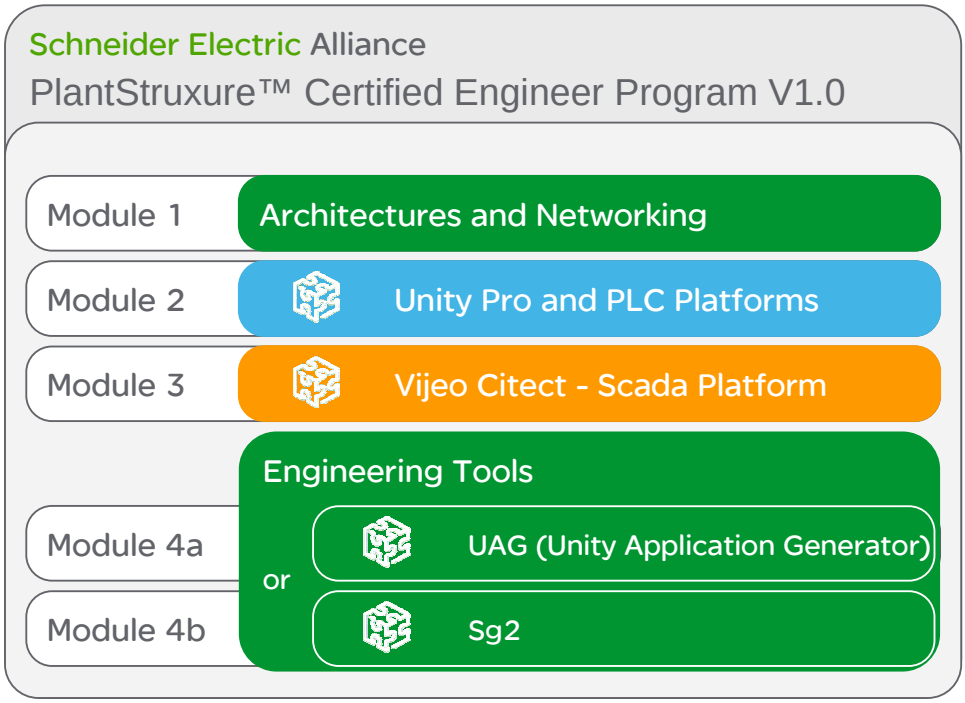
Scope of the exam

The certification focuses more on advanced architectural and connectivity aspects of PlantStruxure™ and less on the system and related functionality aspects, such as information, instrumentation, motor and energy management.
Some important system aspects are excluded from the PlantStruxure™ certification, as they will be subject for specific, separate, certifications at a later time: MES (Manufacturing Execution System), Asset Management, Batch Management, Historian.

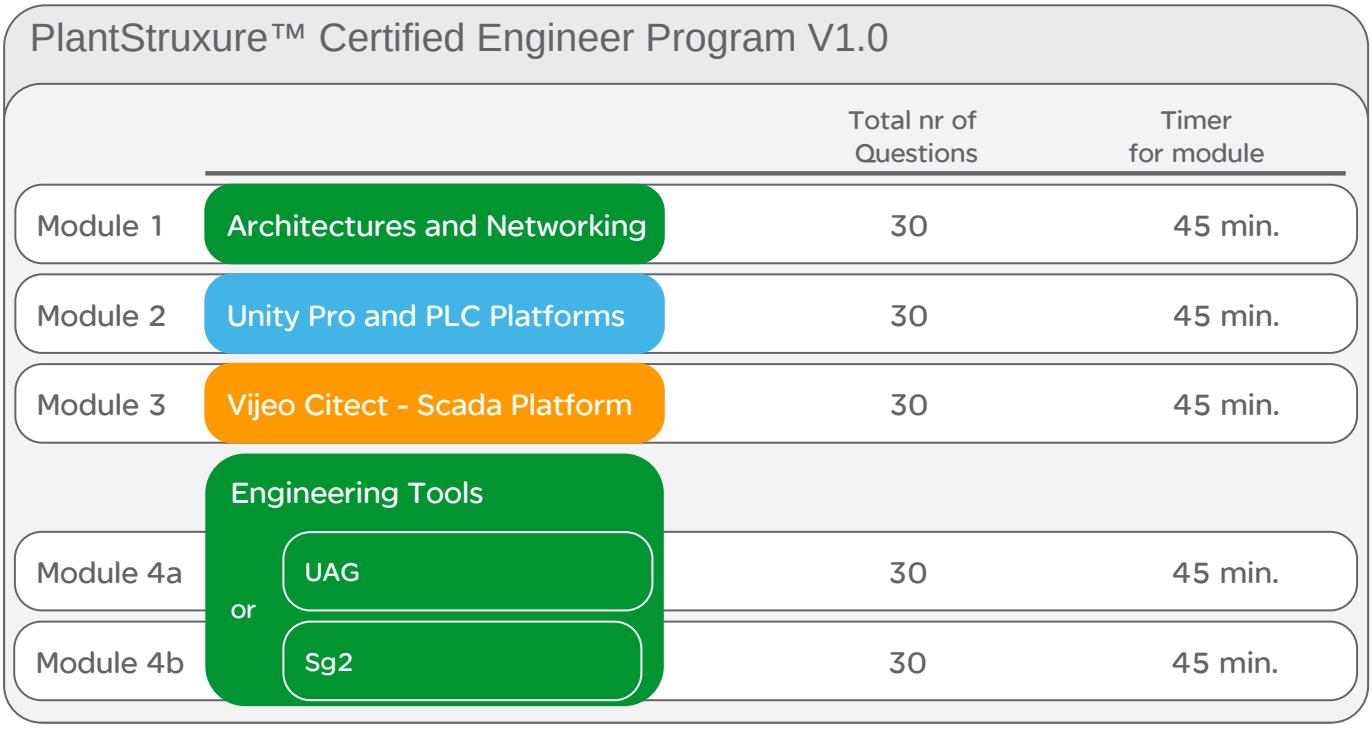
Today the Schneider Electric Alliance PlantStruxure™ Certified Engineer Exam is structured around 4 main axes:

- Module 1: Schneider Electric Architectures and Networking
- Module 2: Unity pro and PAC Platforms
- Module 3: SCADA : Vijeo Citect
- Module 4: Engineering Tools.

Modules 1 through 3 are mandatory, and passing grades on each module are required to be eligible for certification.
Module 4 contains two submodules - one for UAG and one for sg^2. A passing grade on only one of these two modules is sufficient to be eligible for certification. A candidate can choose to take either one or both of these. No additional credit is given to candidates passing both submodules.



3.3 Exam Module Overview



3.4 Exam module details

In the next chapter, more details are given on the topics covered in the exam and how to prepare for them.

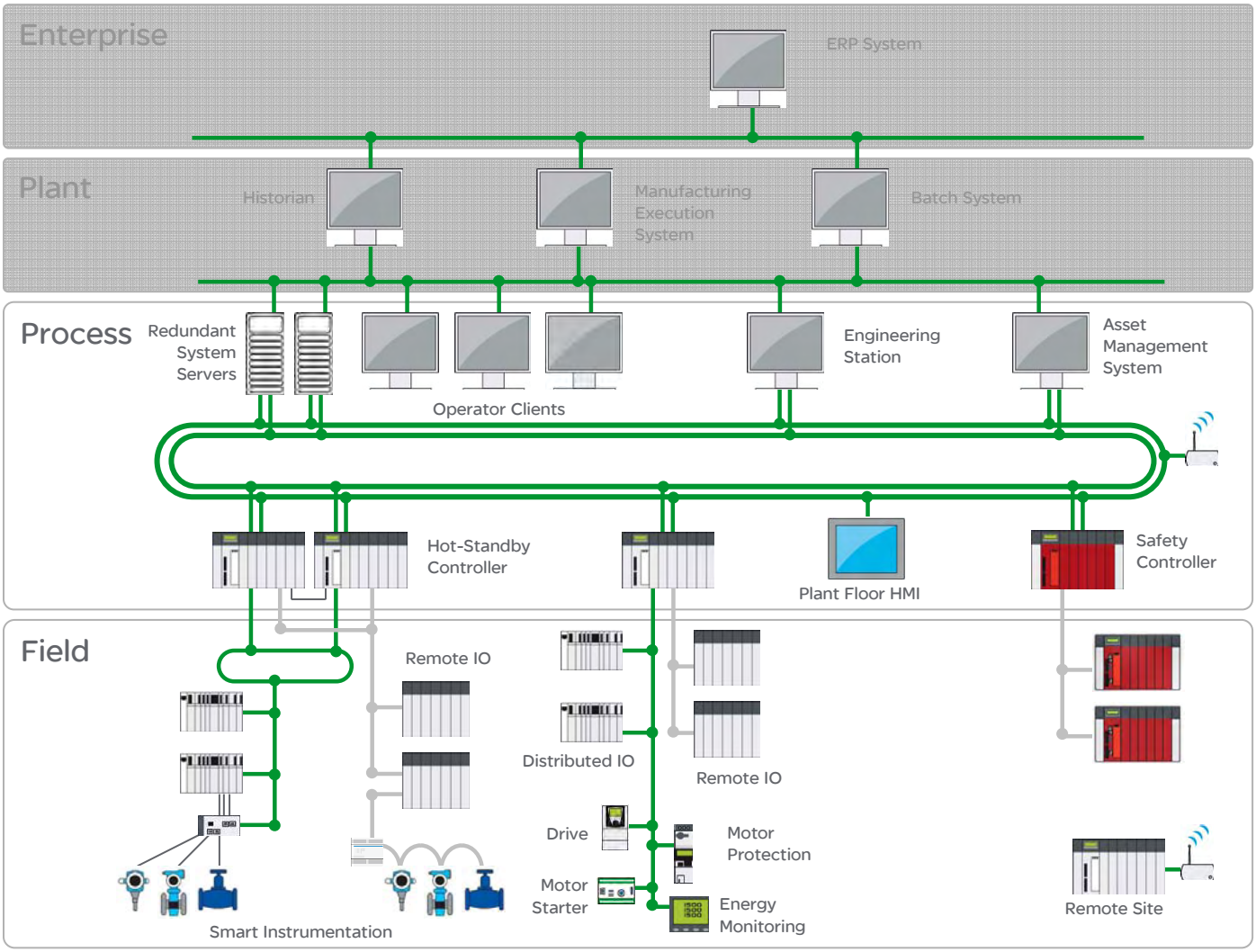
Chapter 4

Preparation and Training Guide – Architectures and Networking

4.1 Introduction

Building effective and cost efficient architectures is a challenging task and requires knowledge of a broad range of components and technologies.

This exam module covers exactly that: without delving into deep technical details of individual components or networking standards, Schneider Electric expects PlantStruxure™ Certified Engineers to master this broad portfolio of knowledge in order to be able to build the best possible architecture which meets the customer and application requirements.



4.2 Topics covered in the exam

Configuring networks and networking principles based on following networks:

- Modbus TCP
- CanOpen
- S908 bus
- Profibus DP / PA
- AS-i bus

Building architectures based on Schneider Electric technology

- Transparent Ready
- PAC Platforms M340, Quantum, Premium and remote I/O
- Networks mentioned above
- Network equipment: Connexium switches

Questions in the exam may cover features, possibilities and constraints directly related to interconnecting and integrating these components into effective architectures

Note: Questions on Variable Speed Drives (Altivar), Softstarters, Intelligent Motor Starters (TeSys), HMI, W@de RTU and other components typically part of architectures built on Schneider Electric technology are not included in this exam.

4.3 Preparation: Recommended Training

Section	Training name	Level	Delivery	Duration
Transparent Ready	Transparent Ready System View Elearning modules (4+8 modules)	Expert & Intermediary	online	
Modbus TCP	Modbus TCP training (**)	Intermediary	classroom	
CANopen	CANopen training (**)	Intermediary	classroom	
AS-Interface	AS-Interface Fieldbus (**)	Intermediary	classroom	
Profibus DP/PA	Profibus DP/PA (**)	Intermediary	classroom	
Connexium switches	ConneXium switches (**)	Intermediary	classroom	

(**) Please refer to your country local Schneider Electric office for the local training catalogue and local name of the trainings.

4.4 Preparation: Additional Recommended Reading

- Automation Solution Guide (*), section 1 Automation Selection Guide
- Automation Solution Guide (*), section 9 Industrial Networks
- “Transparent Ready, User Manuel”, Aug 2008, Ref: 31006929

- “Transparent Factory Network Design and Cabling Guide”, Mar 2005, Ref: 35002987.01
- “Modicon M340, Premium, Atrium and Quantum Using Unity Pro Communication Services and Architectures Reference Manual”, Apr 2009, Ref 35010500.06
- “TCSESM Managed Switch Redundancy, Manual”, Aug 2008, Ref: 31007126
- “ConneXium Ethernet Cabling System TCSESM Managed Switch Configuration Manual”, Aug 2008, Ref 31007122
- System User Guide (*) “CANopen Characteristics”, Feb 2006, Ref 33003798.00
- System User Guide (*) “Premium or Micro on CANopen, Master - Master Communication”, Jun 2005, Ref 33003569
- System User Guide (*) “Premium, Magelis, Altivar, Advantys STB on Ethernet”, Mar 2006, Ref 33003800
- System User Guide (*) “Premium and Advantys STB on Profibus DP”, Mar 2006, Ref 33003548

(*) Accessible and downloadable from the Alliance Extranet through the technical Library

4.5 Preparation: Practical Experience

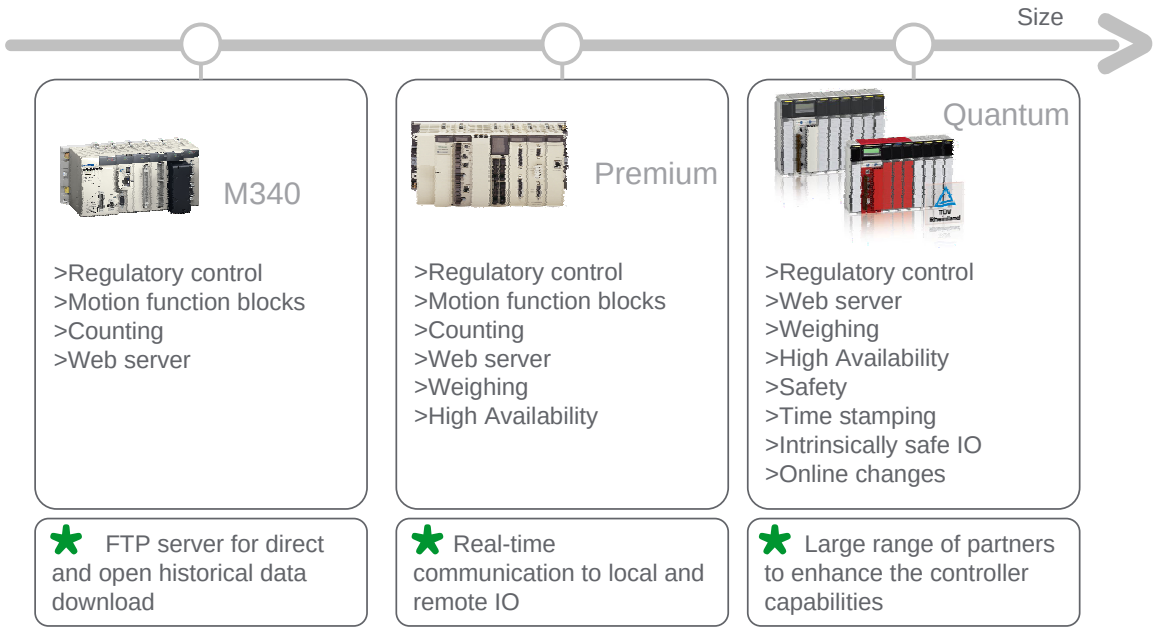
We strongly recommend a relevant amount of practical experience working hands-on designing and implementing above mentioned architectures and networks before attempting the certification exam, as experience during designing, programming, debugging and commissioning is key to truly mastering those topics.

Chapter 5

Preparation and Training Guide – Unity Pro and PAC Platforms

5.1 Introduction

>> PAC Platforms



>> Unity Pro

Unity Pro is designed for IEC61131-3 programming, debugging and operation of Modicon M340, Premium and Quantum programmable automation controllers.

Easy to use

Unity Pro makes best use of the graphic and context-sensitive interfaces of Windows XP® and Windows Vista®.

- Direct access to tools and data
- 100% graphic configuration
- Customizable toolbar and icons
- Extended drag-and-drop and zoom functions
- Integrated diagnostics window
- FDT/DTM container.

Five IEC61131-3 languages to mix as you wish

Each section of code can be programmed in the language of your choice, best adapted to each processing operation. All edit, debug and operation tools are accessible no matter which language is used.

All the advantages of standardization

Benefit from a complete set of functions and tools enabling modeling of application structure on your machine or process structure. The program is split into organized function blocks grouping: program sections, animation tables, operator screens and hyperlinks. Basic functions used repetitively are encapsulated in user function blocks (DFB) in IEC61131-3 language.

Time saving by reuse

Tested and qualified, your standards reduce on-site development and installation times. Quality and deadlines are optimized.

- Function modules reusable in the application or between products by means of XML import/export
- Function blocks instanced by drag-and-drop from the library
- Instances can automatically inherit library modifications
- Specific libraries can be reused in Vijeo Citect.

Off-line simulation

The simulation function built into the system enables engineers to replicate the functionality of the application in a PC environment. This helps to identify any errors in the application programming and decreases testing and commissioning time.

5.2 Topics covered in the exam

Unity Pro

- Security
- Project environment & settings
- Configuration editor
- Variables
- Application Structure
- Libraries management
- Languages: FBD, LD, ST, IL, SFC
- DFB
- Application testing & debugging (analyze, simulate, rebuild)

PAC HW Platforms

- Modicon M340 PACs
- Modicon Premium PACs
- Modicon Quantum PACs
- Advantys Remote I/O

5.3 Preparation: Recommended Training

Section	Training name	Level	Delivery	Duration
Unity Pro	Unity Pro expert training (**)	expert	Classroom	
	Unity Pro advanced training (**)	advanced	Classroom	
	Unity Pro training (**)	intermediary	Classroom	
PAC platforms	M340, Quantum and Premium technical training (**)	Intermediary	Classroom	
Remote IO	Advantys technical training	Intermediary	Classroom	
	STB - Basic Island Configuration Tutorial	Intermediary	Online	
	Advantys-Quan/Prem-Ethernet Config	Intermediary	Online	
	STB-Advantys-Quantum/Modbus Plus Co	Intermediary	online	

(**) Please refer to your country local Schneider Electric office for the local training catalogue and local name of the trainings.

5.4 Preparation: Additional Recommended Reading (*)

- Automation Solution Guide, section 10 – “Data Processing and Software”
- Unity Pro
  - “Program Languages and Structure, Unity Pro”, Apr 2009, Ref 35006144
  - “Communication Services and Architectures, Unity Pro Reference Manual”, Apr 2009, Ref 35010500.06
  - System User Guide (*): “Application Diagnostics with Unity”, Mar 2006, Ref 33003586
- Premium PAC Platform:
  - “TSX57/PCX57, Hardware PAC Implementation, Communication, Network and Bus Interfaces”, May 2007, Ref 35009581
- Quantum PAC Platform:
  - “Quantum - Hardware Reference Manual, Unity Pro”, Apr 2009, Ref 35010529
- Modicon M340 PAC Platform:
  - “Modicon M340 - Processors, Racks and Power Supply Modules, Unity Pro”, Apr 2009, Ref 35012676
  - “Modicon M340 for Ethernet Communications Modules and Processors User Manual”, Apr 2009, Ref 31007131.04
- Advantys Remote I/O:
  - “Advantys STB, System Planning and Installation Guide”, Feb 2009, Ref: 31002947
  - “STBNIP2212 Standard Ethernet Modbus TCP/IP Network Interface Module”, Feb 2009, Ref: 31003688
  - “STBNCO2212 Standard CANopen Network Interface Module”, Feb 2009, Ref: 31003684
  - “STBNDP2212 Standard Profibus DP Network Interface Module”, Feb 2009, Ref: 31002957

(*): All System User Guides, reference manuals and other indicated documents are accessible and downloadable from the Alliance Extranet through the technical Library

5.5 Preparation: Practical Experience

We strongly recommend a relevant amount of practical experience working hands-on with Unity Pro and the mentioned PAC platforms before attempting the certification exam, as experience during designing, programming, debugging and commissioning is key to truly mastering the topic.

Chapter 6

Preparation and Training Guide – Vijeo Citect

6.1 Introduction

Vijeo Citect is the system of choice when you require a reliable, flexible and high performance system for any industrial automation monitoring and control application.

Whether you need an easy-to-use operator interface with networked reporting capability, or an entire client/server HMI/SCADA system spanning multiple plants on different continents, you can do it all with Vijeo Citect.

Vijeo Citect comes with powerful features including:

- Graphical process visualization
- Superior alarm management.
- Advanced clustering options for control when and where you want.
- Historical and real-time trending.
- Built-in reporting.
- Statistical Process Control.
- Multi-threaded CitectVBA and Cicode programming languages.
- Powerful analysis tools.

Vijeo Citect is designed to provide industrial companies of all sizes with agile control over both engineering and runtime operations to significantly improve performance and achieve a lower cost of ownership. The advanced clustering technology help companies safeguard plant reliability. The rapid-change deployment helps increase security and maximizes engineering productivity

Vijeo Citect is a part of the fully integrated Schneider Electric Auomation System Platform that will help you increase your return on assets by delivering a reliable, flexible and high performance supervisory control and data acquisition system. Easy-to-use configuration tools and powerful features enable you to quickly develop and deploy solutions for any size application.

6.2 Topics covered in the exam

- Vijeo Citect Configuration
  - The CitectSCADA Environment
  - Managing Projects
  - Setting Up Communications
  - Graphics
  - Commands and Controls
  - Genies and Super Genies
  - Devices

- Events, Alarms
- Trends, Process Analyst
- Navigation
- Reports
- Security

- Vijeo Citect Networking and Architecture
  - Configuring networks
  - Setting up and configuring Vijeo Citect networks , client/server configuration, clustering
  - Redundancy with Vijeo Citect
  - Internet Display Client
  - Web Client
  - Vijeo CItect Pocket
  - Object ID's

Note: Topics covered in the Vijeo Citect Customization & Design, and in the Vijeo Citect Cicode trainings, are not covered in the Plantstruxure™ exam.

6.3 Preparation: Recommended Training

Training name	Delivery	Duration
Vijeo Citect Configuration Training	Classroom	3d
Vijeo Citect Networking and Architecture Training	Classroom	2d
Vijeo Citect Customization Training (**)	Classroom	3d
Vijeo Citect Cicode Training (**)	Classroom	2d

(**) Not required to pass the PlantStruxure™ Certified Engineer exam.

6.4 Preparation: Additional Recommended Reading

- Relevant topics in the Vijeo Citect Help
- Relevant articles in the Vijeo Citect Knowledge Base

6.5 Preparation: Practical Experience

We strongly recommend a relevant amount of practical experience working hands-on with Unity Pro and the mentioned PAC platforms before attempting the certification exam, as experience during designing, programming, debugging and commissioning is key to really master the topic.

Chapter 7

Preparation and Training Guide – Engineering tools - UAG

7.1 Introduction

Unity Application Generator is an advanced design and generation software tool that integrates multiple PACs and HMI/SCADA systems to provide an automation solution similar to a Distributed Control System.

Structured Project Design - bridge from the process engineer to the control/automation designer (from the P&ID to the automation system). Capture and re-use of the Customer's best practices within application specific libraries that reduce the dependency on experts, enable standardization and increase software robustness.
Single Database entry avoids duplication of efforts and the resulting errors. Automatic Application Generation including the automatic configuration of networks in multi-device systems increases efficiency, improves software quality, speeds commissioning while simultaneously reducing project risk. Integrated change tracking and automatic documentation generation reduces engineering effort and enables system validation.

UAG integrates best in class products from Schneider Electric and leading partners into an advanced automation platform based on International Standards ISA-88, GAMP, IEC61131-3:

- Unity PACs (Premium / Quantum)
- Leading HMI/SCADA systems
- Modbus TCP/IP communication
- OFS/OPC

7.2 Topics covered in the exam

- The UAG project development process
- Designing the physical model
- Designing the topological model
  - Networks
  - Data Servers
  - HMIs
  - PACs
- Generating the PAC/SCADA application(s)
- Applying customer standardization elements to UAG
- Definition and creation of user defined control modules (SCoDs) within UAG

7.3 Preparation: Recommended Training

Training name	Delivery	Duration
UAG Training	Classroom	3 days

7.4 Preparation: Additional Recommended Reading

- "Unity Application Generator 3.1, Basic User Manual", Sep 2008, Ref 33002830
- "Unity Application Generator 3.1, Extended User Manual", Sep 2008, Ref 33003669
- "SCoD Editor 3.1, User Manual", Sep 2008, Ref 33002608

(*): All System User Guides, reference manuals and other indicated documents are accessible and downloadable from the Alliance Extranet through the technical Library

7.5 Preparation: Practical Experience

We strongly recommend a relevant amount of practical experience working hands-on with the Unity Application Generator before attempting the certification exam, as experience during designing, programming, debugging and commissioning is key to really master the topic.

Chapter 8

Preparation and Training Guide – Engineering tool sg^2

8.1 Introduction

sg^2 is a tool that quickly configures projects with Unity Pro and Vijeo Citect using pre-built objects for Schneider Electric device integration and process control functionality.
sg^2 is an essential tool for anyone developing automation projects using Schneider Electric equipment

sg^2 provides the following benefits for System Integrators:

- Reduced costs through decreased engineering time
- Decreased project risk by providing preconfigured and tested object libraries
- Flexibility to develop specific objects to meet their own standards, or end user specific standards
- Ability to deliver increased system functionality to the End User in the form of better diagnostics, easier maintenance and greater system aesthetics (graphics)

sg^2 contains the following components:

- SGS Workbench – the user environment with which to build the sg^2 configuration
- SGS Guardian – the link (database exchange) between Vijeo Citect and Unity Pro
- sg^2 Object Libraries – objects that provide the alibility to easily connect Schneider Electric devices and process control functionality to the automation system
- SG Builder – a tool that can be used to create user defined objects to work with sg^2

8.2 Topics covered in the exam

- The sg^2 Project Development Process
- The sg^2 Framework
- Working with the SGS Workbench Working with SGS Guardian
- Working with the SG Builder
- Working with the SGCU Editor

8.3 Preparation: Recommended Training

Training name	Delivery	Duration
Sg2 Training	Classroom	xxxxx

8.4 Preparation: Additional recommended reading

- Sg2 User Manual

8.5 Preparation: Practical Experience

We strongly recommend a relevant amount of practical experience working hands-on with sg2 before attempting the certification exam, as experience during designing, programming, debugging and commissioning is key to really master the topic.

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