Process Expert

Installation and Configuration Guide

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

Document Scope

This document explains how to install or upgrade EcoStruxure Process Expert.

It also describes how to:

- Configure the software.
- Start the system server and engineering clients.
- Migrate databases of supported earlier versions to make them compatible with the current version.
- Repair, modify, and remove the software.

It is written for users who have a working knowledge in the design of Control systems, including supervision functions.

NOTE: Read and understand this manual and the *EcoStruxure™ Process Expert Licensing Guide* before installing and using this software.

The Licensing Guide is in the ReleaseNotesAndUGs folder of the software installation package.

Validity Note

This document is valid for EcoStruxure Process Expert 2021 or later. It supersedes any previous version.

Related Documents

Title of documentation	Reference number
EcoStruxure™ Process Expert - Security Deployment Guide	EIO0000004234 (eng)
EcoStruxure™ Process Expert Licensing Guide	EIO0000001261 (eng)
EcoStruxure™ Process Expert User Guide	EIO0000001114 (eng)
Schneider Electric Floating License Manager User Manual	EIO0000001078 (eng)
EcoStruxure™ Process Expert Infrastructure Virtualization - Application Note	EIO0000003796 (eng)

You can download these technical publications at https://www.se.com/myschneider, *Document Downloads* section.

Registration required.

mySchneider Support Portal

Visit https://www.se.com/myschneider for support, software updates, and latest information on EcoStruxure Process Expert.

Registration required.

First Steps

Overview

This chapter contains procedures describing the steps that you need to perform to install the software for the first time or upgrade a supported earlier version.

If upgrading your version of Process Expert is not supported, either uninstall it, or if you want to reuse your database, migrate it to the next version as you need to migrate databases by following the sequence of versions. For example, if Process Expert 4.2 is installed, migrate the database to Process Expert 4.3 first. Then, you can migrate it directly to EcoStruxure Process Expert 2021.

NOTE: Before installing the software on Windows Server 2019 for use with Remote Desktop Services (RDS), refer to the topic describing additional installation requirements, page 47.

First Installation or Upgrade of Process Expert 4.3/SP1

Overview

This topic outlines the steps that you need to complete to get started with EcoStruxure Process Expert in the following cases:

- You are installing the software for the first time.
- You are upgrading Process Expert 4.3 or V4.3 SP1 with or without reusing a database.

If you want to reuse one or more of your databases with the new version of the software, refer to the prerequisites, page 8 before proceeding with the upgrade. Upgrading the software without migrating a database creates a new blank one, page 30.

In case you experience difficulties, refer to the troubleshooting topic, page 138 or contact EcoStruxure Process Expert support by visiting app.schneider-electric.com/ecostruxure-hybrid-dcs.

Prerequisites to Migrate a Database

Before installing the software upgrade, you need to prepare the database, page 61 of Process Expert for migration.

This step requires using the system server of your current version.

Perform this step for each database that you want to reuse.

NOTE: For information on actions that may be required on existing systems in order to take advantage of new features after migration, refer to the topic describing the availability of new features in migrated databases, page 70.

Getting Started – System Server Installation

The tables outline the steps to follow if you are installing the software for the first time or upgrading Process Expert 4.3 or its service pack. Each step contains a reference to a topic providing more details.

Step	Action
1	Verify that the computers on which you install the software fulfill the system requirements, page 20.
2	If Citect/Plant SCADA, Control Expert, and/or Advantys are already installed on the computer, review their installation requirements, page 27 first.
3	If you are upgrading and had customized any setting in the **System Server Configuration Wizard**, page 100, write down the modifications because you need to make them again after the installation of the upgrade is completed.
4	Extract the files of the installation package, page 26 to disk or mount the image (.iso).
5	Install the software, page 39 by launching the installer. • For a first-time installation, install at least the system server. • If you are upgrading, perform this step on the computer on which the Process Expert system server is installed. You can add and/or remove clients. Select the authentication type, page 84 during installation. You need to restart the computer to complete the installation. **NOTE:** The steps to follow when you install clients are described in a separate table at the end of this topic.

Getting Started – Software Preparation and Configuration

Step	Action
1	Purchase or update licenses and activate them by using the Floating License Manager (FLM) (see EcoStruxure™ Process Expert, Licensing Guide) before the 30-day trial period expires. **NOTE:** If the FLM is installed on a remote computer, enter its IP address in the License Manager.
2	If you selected the domain authentication, the system/network administrator must create a group, page 85 for each role. (If you selected local authentication, the groups have been created automatically on the computer on which the system server has been installed.)
3	The system/network administrator must add users, page 78 who need to use the software to one or more groups either: • On the system server computer for a local authentication type. Use the Windows® **Computer Management** or **lusrmgr** (.msc) UI. • On the domain controller for a domain authentication type. Use the Windows® **Active Directory Administrative Center**. **NOTE:** At least one user must be added to the *Server Admin* group now to be able to log in to the system server and create certificates.
4	From the Windows® Start menu, click **EcoStruxure Process Expert > System Server** and log in (see EcoStruxure™ Process Expert, User Guide) by entering your Windows® username without domain or prefix and your password in the log-in window.
5	Create and/or install certificates, page 86 by using the **Security** section of the **System Server Configuration Wizard** (**Basic Settings** menu of the system server console or tray icon context menu). You can let the software create a root CA certificate or you may be able to use your own. **NOTE:** If you have installed a client on the system server computer, the certificate is valid for both server and client.
6	For a new installation or if you are not migrating a database, you can select which templates are added to the database, page 115 that is created when you start the system server.
7	If you are upgrading and had customized any setting by using the **System Server Configuration Wizard**, re-configure the system server with these modifications.
8	If you are upgrading and want to migrate, page 54 a Process Expert 4.3/SP1 database 1. Re-install the same extensions, page 114 in the Control Participant that is installed on the system server computer. 2. Restore the database backup file (.mdbk), page 67.
9	Start the system server, page 116 by using the **Start** command in the menu bar of the server console or the tray icon context menu. If you are migrating a database, the **EcoStruxure Process Expert 2021 Migration** window opens and may require user-interaction, page 68 to complete the migration of Supervision data. Wait until the system server tray icon turns green or **Server is ready** appears in the console. This may take a moment the first time. **NOTE:** If no database backup file has been restored, a blank version 2020 R2 database is created, page 126.

Getting Started – Client Installation

Step	Action
1	Verify that the computers on which you install the software fulfil the system requirements, page 20.
2	If Citect/Plant SCADA, Control Expert, and/or Advantys are already installed on the computer, review their installation requirements, page 27 first. On computers on which you install an operation client with the Control Expert option selected, only Control Expert requirements apply.
3	Extract the files of the installation package, page 26 to disk or mount the image (.iso).
4	Install the software, page 39 by launching the installer. In the **Station Role** window, clear the system server option and select the type of client that you want to install. For the operation client, you have the option to install Control Expert, page 31 for use with runtime navigation services. If you are upgrading, perform this step on each computer on which a Process Expert client is installed. You can add and/or remove types of clients. You need to restart the computer to complete the installation.
5	In the **System Server** section of the **Configuration Wizard** of the client, enter the name or IP address of the system server computer.
6	On computers on which Control Expert has been installed, enter in the License Manager (LM) the IP address of the computer on which the FLM is installed and where the EcoStruxure Process Expert licenses have been activated (if it is a remote computer). This is required for Control Expert to acquire its license rights (see EcoStruxure Process Expert, Licensing Guide) even if you are using the trial period and no license is activated yet.
7	Install certificates, page 86 by using the **Security** section of the **Engineering Client Configuration Wizard** and **Operation Client Configuration Wizard**. Open the configuration wizards from the **EcoStruxure Process Expert** folder of the Windows® Start menu. **NOTE:** Install a certificate only once per computer even if you are installing both types of clients.
8	If you are migrating and had customized any setting by using a client configuration wizard, re-configure clients with these modifications before starting them. If you have migrated a database, re-install the same extensions, page 114 in Control Expert that is installed on each client computer.
9	If you have migrated a database and want to modify existing systems or create new ones to take advantage of the new functionality of the upgrade, you need to import the templates that are supplied with the upgrade, page 57 by using the engineering client.

Upgrading EcoStruxure Hybrid DCS 2018 or Later

Overview

This topic outlines the steps that you need to complete to get started if you are upgrading either version with or without reusing a database:

- EcoStruxure Hybrid DCS 2018 or later
- EcoStruxure Process Expert 2020 or later

If you want to reuse one or more of your databases with the new version of the software, refer to the prerequisites, page 11 before proceeding with the upgrade. Upgrading the software without migrating a database creates a new blank one, page 30.

In case you experience difficulties, refer to the troubleshooting topic, page 138 or contact EcoStruxure Process Expert support by visiting app.schneider-electric.com/ecostruxure-hybrid-dcs.

Prerequisites to Migrate a Database

Before installing the software upgrade, you need to prepare the database, page 61 of version 2018 or later for migration.

This step requires using the system server of your current version.

Perform this step for each database that you want to reuse.

NOTE: For information on actions that may be required on existing systems in order to take advantage of new features after migration, refer to the topic describing the availability of new features in migrated databases, page 70.

Getting Started – System Server Installation

The tables outline the steps to follow if you are upgrading the software. Each step contains a reference to a topic providing more details.

Step	Action
1	Verify that the computers of the Process Expert system infrastructure still fulfill the system requirements, page 20.
2	If Citect/Plant SCADA, Control Expert, and/or Advantys are already installed on the computer, review their installation requirements, page 27 first.
3	If you had customized any setting the **System Server Configuration Wizard**, page 100, write down the modifications because you need to make them again after the installation of the upgrade is completed (for example, the system server IP address). **NOTE:** Starting with EcoStruxure Hybrid DCS 2018 R2, extensions that are installed in the virtual machine are automatically backed up, page 65.
4	If you want to retain the HTML help of templates that you have used with version 2018 or later, you need to copy the corresponding help files before proceeding with the upgrade. Without this step, the help of the current version is replaced by the help of the upgrade. For details, refer to *Using Help for Different Versions of Schneider Electric Templates* in the *User Guide* of version 2018 or later.

Step	Action
5	Extract the files of the installation package, page 26 to disk or mount the image (.iso).
6	Install the software, page 73 by launching the installer. Perform this step on the computer on which the system server is installed. You can remove and/or add software components during installation. **NOTE:** The following items of version 2018 or later are still valid given that they are not expired (if applicable): • The authentication type, page 84 that you had selected is retained (for system server computer). However, you can change it. • User groups and user memberships for RBAC. • Certificates, page 86. Except for the root certificate file (.pfx) created with version 2018/R2, which is deleted during the upgrade if you had created it at the default path. In such case, retrieve the file first. **NOTE:** The steps to follow when you upgrade clients are described in a separate table at the end of this topic.

Getting Started – Software Preparation and Configuration

Step	Action
1	Purchase or update licenses and activate them by using the Floating License Manager (FLM) (see EcoStruxure™ Process Expert, Licensing Guide) before the 30-day trial period expires.
2	From the Windows® Start menu, click **EcoStruxure Process Expert > System Server** and log in (see EcoStruxure™ Process Expert, User Guide) by entering your Windows® username without domain or prefix and your password in the log-in window.
3	If you are not migrating a database, you can select which templates are added to the database, page 115 that is created when you start the system server.
4	If you had customized any setting by using the **System Server Configuration Wizard**, re-configure the system server with these modifications.
5	If you want to migrate, page 54 a database of version 2018 or later: 1. Re-install extensions, page 65 in the Control Participant that is installed on the system server computer. 2. Restore the database backup file (.mdbk), page 67.
6	Start the system server, page 116 by using the **Start** command in the menu bar of the server console or the tray icon context menu. If you are migrating a database, the **EcoStruxure Process Expert 2021 Migration** window opens and may require user-interaction, page 68 to complete the migration of Supervision data. Wait until the system server tray icon turns green or **Server is ready** appears in the console. This may take a moment the first time. **NOTE:** If no database backup file has been restored, a blank version 2021 database is created, page 126.

Getting Started – Client Installation

Step	Action
1	Verify that the computers on which you perform the upgrade still fulfil the system requirements, page 20.
2	If Citect/Plant SCADA, Control Expert, and/or Advantys are already installed on the computer, review their installation requirements, page 27 first. On computers on which you install an operation client with the Control Expert option selected, only Control Expert requirements apply.
3	Extract the files of the installation package, page 26 to disk or mount the image (.iso).
4	Install the upgrade, page 39 by launching the installer. In the **Station Role** window, you can remove and/or add software components. For the operation client, you have the option to install Control Expert, page 31 for use with runtime navigation services. Perform this step on each computer on which a Process Expert client is installed. You need to restart the computer to complete the installation.
5	On computers on which Control Expert has been installed, enter in the License Manager (LM) the IP address of the computer on which the FLM is installed and where the EcoStruxure Process Expert licenses have been activated (if it is a remote computer). This is required for Control Expert to acquire its license rights (see EcoStruxure Process Expert, Licensing Guide) even if you are using the trial period and no license is activated yet.
6	If you had customized any setting by using a client configuration wizard, re-configure clients with these modifications before starting them.
7	Re-install extensions, page 65 in Control Expert that is installed on each client computer.
8	If you have migrated a database and want to modify existing systems or create new ones to take advantage of the new functionality of the upgrade, you need to import the templates that are supplied with the upgrade, page 57 by using the engineering client.

EcoStruxure Process Expert Infrastructure

Overview

This chapter provides a high-level understanding of the main software components that form the EcoStruxure Process Expert infrastructure. It also outlines how these components can be installed on various computers depending on the tasks you want to accomplish. For example, engineering only or runtime-related tasks.

Software Architecture

Overview

The EcoStruxure Process Expert infrastructure is based on a client/server architecture with integrated as well as third-party software components. It allows you to run multiple clients connecting to one server to access the tools that are required in engineering time and during operation.

By using multiple clients, several users can work simultaneously on the same system or several systems.

To use the various software components described in this topic, you need to:

- Purchase and activate the necessary licenses (see EcoStruxure™ Process Expert, Licensing Guide) before the 30-day trial period expires.
- Generate and install digital certificates, page 86.
- Create groups and/or add users to groups, page 78.

  NOTE: Starting with version 2021, Participants are not installed in a virtual machine anymore but directly on the computer.

  NOTE: EcoStruxure Process Expert and Supervision software components are available in separate installation packages, page 27.

Software Components

The EcoStruxure Process Expert installation package contains the following software components, which form the infrastructure:

- A **system server**: Manages system data, software Participant activity, and requests from clients. The user interface consists of a console that allows you to monitor server activity.
- **Engineering clients**: Provide a user interface that gives access to platform resources, such as explorers and editors. In addition, engineering clients use Control and Supervision software Participants with which you can perform in-depth configurations. Together, these resources and tools allow you to design and maintain systems. You can use several clients at the same time.
- **Operation clients**: Provide a user interface that allows you to view system components during runtime (for example, controllers, process objects, process data, and so on) for monitoring and troubleshooting purposes. These clients can use the Control Participant too. They require a Supervision client to run on the same computer, which is the entry point to runtime navigation services (RTNS) (see EcoStruxure™ Process Expert, Runtime Navigation Services , User Guide). You can use several clients at the same time.
- A **database**: Consists of several physical databases, which contain template libraries and user data related to the systems that you create by using the software. Each system has its own database. The database resides on the computer running the system server and is created during the first system server start. It is managed by third-party software, which is included.

For details on other software that is included in the installation package, refer to the topic describing installed software components, page 30.

Supervision Software Components

EcoStruxure Process Expert also uses the following software components during runtime:

- **Operation server**: I/O, alarm, trend, and report servers can be installed on one or distributed over several computers. One computer requires the configuration tools to be installed. These consist of various editors, which allow you to complete the deployment of Supervision projects on the network.
- Supervision **clients**: Provide a user interface that allows you to monitor and/or control the process during operation. A Supervision system can be made of several clients, which can be used simultaneously.

  Supervision clients can be either:

  - Control clients, which allow you to control the process during operation.
  - View-only clients, which allow you to monitor the process. They cannot interact with the process during operation.

  Each operation server also acts as a control client across the Supervision system architecture.
- OPC Factory Server or OPC UA Server Expert: Acts as an interface between the program and the I/O server and manages OPC items. While *OFSOPC* is the default communication protocol of systems that you create by using the software, *OPCUA* can be selected.

  Other protocols are also supported but require some manual configuration.

The following figure shows the Supervision client/server part of an EcoStruxure Process Expert architecture.

Background Processes

The table describes the background processes and services associated to EcoStruxure Process Expert that are started when you start a given software component.

Software component	Background process or service
System server	GuestAgent
	Runtime Access Tool Server (RAT)
	Control Expert **NOTE:** There are as many processes as the maximum number of instances, page 105 that is configured in the System Server Configuration Wizard. If the system server was started automatically, page 122, only one Control Expert service is started by the server, the others are started by the local client.
	Ctdraw32 and Citectide
Client (remote client in a distributed architecture only)	GuestAgent
	HostAgent

Software component	Background process or service
	Control Expert There are as many processes as the maximum number of instances, page 105 that is configured in the System Server Configuration Wizard.
	Ctdraw32 and Citectide

Physical Architecture

Overview

The software provides the flexibility to install software components on various physical architectures depending on the performance of the computers, the number of concurrent users, and your work method. Client stations and servers need to be connected to each other on an Ethernet network by a cable connection. A cable connection to the control network is also required.

Physical Architecture Description

Typically, the physical architecture on which an EcoStruxure Process Expert infrastructure is running consists of computers that have the following roles and connections.

Role of the computer	Number of computers	Description	Computer connected to
Servers			
System server	1	Runs the **System Server**.	Ethernet network. Ethernet control network
Operation server	1 or more	Runs Supervision server software to collect real-time data from devices and treat it according to its nature (for example, alarms or trends). Each operation server also acts as a control client.	Ethernet network. Ethernet control network.
Clients			
Engineering station	1 to n	Runs an **Engineering Client** to engineer and maintain systems.	Ethernet network. Ethernet control network
Operator station	1 to n	Runs Supervision control or view-only client software to monitor and control the automation system. Requires an **Operation Client** to do online diagnosis by using runtime navigation services (see EcoStruxure™ Process Expert, Runtime Navigation Services , User Guide). Operation clients may require Control Expert to be installed, page 31.	Ethernet network. Ethernet control network (required to use the **Operation Client**).

NOTE:

Computers can cumulate several roles in which case you need to install the software that is required for each role. Verify that each computer meets the requirements, page 26 of each role.

However, the following limitations apply:

- The system server computer cannot have a Supervision role (see EcoStruxure™ Process Expert, Supervision Participant Services User Guide), for example, operation server.
- On an engineering station, you can use the installed Supervision software only when it is not used by the engineering client.

NOTE: For more information, refer to the topic describing the installation of Supervision software, page 45.

The following figure shows an example of a physical architecture running EcoStruxure Process Expert.

NOTE: The following can exist but are not represented:

- Multiple engineering and operator stations.
- Redundant and/or multiple operation servers.
- Multiple controllers.

Performance Considerations

If you are using a client that is installed on the system server computer and perform CPU-intensive operations (for example, importing many instances), actions that you execute immediately after may trigger notifications about client/server communication interruptions.

For more information, refer to the troubleshooting topic, page 143.

Network Connections

If you experience difficulties with client/server communication, refer to the topic providing troubleshooting information, page 143.

System and Installation Requirements

Overview

This chapter describes the requirements to install the software on your computer. It also provides general information, which applies whether you install the software for the first time or upgrade an earlier version.

System Requirements

Overview

This topic describes the hardware and operating system requirements.

The hardware requirements depend on the role of the computer, page 18 in the EcoStruxure Process Expert infrastructure, the size of the application, and the operating system.

You can adjust the number of Control Participant instances, page 105 to help improve performance.

CPU Performance

To help you select a suitable CPU, the processor performance level is defined by using the PassMark® CPU mark. You can look up the CPU benchmarks by visiting passmark.com.

Verify that CPU also meets the other performance criteria that are described in this topic.

Requirements for Windows Server 2019 Remote Desktop Services

For details on the specific system requirements to use EcoStruxure Process Expert with Windows Server 2019 Remote Desktop Services (RDS), refer to the topic describing the use of RDS, page 47.

Operating System Requirements

EcoStruxure Process Expert has been tested with the following operating system versions. For a complete compatibility matrix, visit the mySchneider support portal.

It is good practice to keep your operating system up-to-date with the latest Microsoft® updates and Schneider Electric recommends that you test the compatibility of these updates in a test environment before installing them in a production environment.

Supported operating systems	Recommended for (station role)
Microsoft® Windows Server® 2019 Standard version 1809, build 17763.107	• System server • All-in-one architectures with medium and large applications **NOTE:** Using Windows Server 2019 Remote Desktop Services (RDS), page 47 is supported starting with EcoStruxure Process Expert 2021.
Microsoft® Windows® 10 Professional 64-bit version 21H1	• Clients • All-in-one architectures with small applications

NOTE: The software has been tested with operating systems configured in the following languages, page 30: English, French, Chinese, German, and Spanish.

Application Size

For simplification, applications are sized based on the number of instances. It is assumed that a Control project contains 400 sections and in each section, the facets of 5 instances are assigned.

Application size	Number of instances	Number of Supervision pages
Small	Up to 1,000	Up to 20
Medium	Less than 3,000	Less than 60
Large	More than 3,000	More than 60

Hardware Requirements - Small Applications

All-in-one architecture

The hardware requirements are valid for a maximum of 4 instances, page 105 of the Control Participant running simultaneously on the computer.

Every 2 additional instances of the Control Participant require 2 logical processors and 4 GB of RAM extra.

Component	Requirements
CPU	Workstation CPU that meets the following specifications: • Min. CPU mark: 10,000 • Min. base frequency: 2.6 GHz • Min. turbo frequency: 3.5 GHz • Cores: 4 / logical processors (threads): 8 • Min. cache size: 8 MB • Min. bus speed: 8 GT/s
RAM	16 GB
Hard drive	SSD 256 GB capacity. NTFS file system. Higher transfer speeds improve overall performance. 50 GB of free space to install and run the software.
Display	1920 x 1080 or higher
Ports	Ethernet port
Input devices	Mouse or compatible device Keyboard

Hardware Requirements - Medium and Large Applications

- **All-in-one architecture**

The hardware requirements are valid for a maximum of 4 instances, page 105 of the Control Participant running simultaneously.

Every 2 additional instances of the Control Participant require 2 logical processors and 4 GB of RAM extra.

Component	Requirements
CPU	Server CPU that meets the following specifications: • Min. CPU mark: 10,000 • Min. base frequency: 2.6 GHz • Min. turbo frequency: 3.5 GHz • Cores: ◦ Minimum: 6 cores / 12 logical processors (threads) ◦ Recommended: 8 cores / 16 logical processors (threads) • Min. cache size: 8 MB • Min. bus speed: 8 GT/s
RAM	• Minimum: 24 GB • Recommended: 32 GB
Hard drive	SSD 512 GB capacity. NTFS file system. Higher transfer speeds improve overall performance. 50 GB of free space to install and run the software.
Display	1920 x 1080 or higher
Ports	Ethernet port
Input devices	Mouse or compatible device Keyboard

- **Distributed architecture: System server computer**

The hardware requirements are valid for a maximum of 4 instances, page 105 of the Control Participant running simultaneously.

Every 2 additional instances of the Control Participant require 2 logical processors and 4 GB of RAM extra.

Component	Requirements
CPU	Server CPU that meets the following specifications: • Min. CPU mark: 10,000 • Min. base frequency: 2.6 GHz • Min. turbo frequency: 3.5 GHz • Cores: ◦ Minimum: 5 cores / 10 processors (threads) ◦ Recommended: 6 cores / 12 logical processors (threads) • Min. cache size: 8 MB • Min. bus speed: 8 GT/s
RAM	• Minimum: 16 GB • Recommended: 24 GB
Hard drive	SSD 512 GB capacity. NTFS file system. Higher transfer speeds improve overall performance. 50 GB of free space to install and run the software.
Display	1920 x 1080 or higher
Ports	Ethernet port
Input devices	Mouse or compatible device Keyboard

- **Distributed architecture: Engineering client computer**

The hardware requirements are valid for a maximum of 4 instances, page 105 of the Control Participant running simultaneously.

Every 2 additional instances of the Control Participant require 2 logical processors and 4 GB of RAM extra.

Component	Requirements
CPU	Workstation CPU that meets the following specifications: • Min. CPU mark: 10,000 • Min. base frequency: 2.6 GHz • Min. turbo frequency: 3.5 GHz • Cores: ◦ Minimum: 4 cores / 8 logical processors (threads) ◦ Recommended: 6 cores / 12 logical processors (threads) • Min. cache size: 8 MB • Min. bus speed: 8 GT/s
RAM	16 GB
Hard drive	SSD 256 GB capacity. NTFS file system. Higher transfer speeds improve overall performance. 45 GB of free space to install and run the software.
Display	1920 x 1080 or higher
Ports	Ethernet port
Input devices	Mouse or compatible device Keyboard

NOTE: The same requirements are valid if, in addition, you install an operation client on the computer.

Operation Server Hardware Requirements

The following table describes the hardware requirements for the *AVEVA Plant SCADA* Runtime Server for a large system. For detailed information and requirements for other system sizes, refer to *AVEVA Plant SCADA* help (**About Plant SCADA > Install Plant SCADA > Install a Runtime Server**).

Component	Requirements
CPU	CPU mark: 8,000
RAM	Recommended: 16 GB
Hard drive	100 GB, 7,200 RPM minimum. SSD recommended. NTFS file system.
Graphics	DirectX 11 or later with WDDM 1.0 driver. 128 MB of dedicated VRAM.
Display	1920 x 1080
Ports	Ethernet port
Input devices	Mouse or compatible device Keyboard

Operation Client Hardware Requirements

Component	Requirements
CPU	Min. CPU mark: 2,000
RAM	Minimum: 4 GB

Component	Requirements
Hard drive	SSD 256 GB capacity. NTFS file system. Higher transfer speeds improve overall performance.
Display	1920 x 1080 or higher
Ports	Ethernet port
Input devices	Mouse or compatible device Keyboard

Software Requirements

Overview

You can install EcoStruxure Process Expert 2021 on a computer in the following cases:

- EcoStruxure Process Expert for AVEVA System Platform is not installed.
- One of these supported earlier versions of the software is installed:
  - EcoStruxure Process Expert 2020 or later.
  - EcoStruxure Hybrid DCS 2018 or later.
  - StruxureWare Process Expert 4.3 or V4.3 SP1.

You must have administrator rights to install the software.

Installing the software automatically removes the earlier version of the software if installed.

Each case is described more in detail in dedicated chapters.

Only a 64-bit installation package is provided.

> **NOTE:** If you are upgrading a supported earlier version, you can migrate and reuse your database, page 30 with version 2021. In such case, you need to perform certain steps before installing the software upgrade.
>
> Upgrading the software without migrating a database creates a new blank one, page 126.

Digital Certificates

The software implements a public key infrastructure (PKI) based on the X.509 standard. It allows using a self-signed root certification authority (CA) and entity certificates to help secure client/server communication in the EcoStruxure Process Expert infrastructure.

You must generate and install certificates, page 87 before you can use the system server and clients.

Role Based Access Control

The software implements role based account control, page 79 to administer the tasks that authorized users can perform by assigning them predefined roles. Roles are associated to groups.

A person with administrator rights for the computer needs to create groups and/or add users to one or more of these groups so that they can log in to software components.

Opening the Installation Package

The installation package is supplied in the form of an ISO file. Use either method to open it:

- An ISO file management tool.

  With Windows® 10, you can use the Windows® Explorer. Right-click the file and select **Open with**.
- An archive management tool. 7-Zip is the recommended tool. It is a freeware. You can download it at www.7-zip.com.

Supervision Software Requirements

To complete the deployment of Supervision projects and use Supervision runtime, you need to install the following software, which is available in separate installation packages:

- AVEVA Plant SCADA 2020 R2
- Depending on the protocol used for communication between controllers and the I/O server:
  - OPC UA Server Expert 2.1.4903.0
  - OPC Factory Server 3.63 (LARGE (L) configuration)

The table describes the impact when Citect/AVEVA Plant SCADA is already installed on the computer on which you are installing the software.

Version installed on the computer	Impact
Same version as the one installed by the software.	The installation of Plant SCADA is skipped and the version that is installed on the computer is retained.
Earlier version	The installation is canceled and you need to remove Citect/Plant SCADA and its subcomponents before starting over the installation of EcoStruxure Process Expert.
Later version	

For more information on the installation of Plant SCADA, OPC Factory Server, and OPC UA Server Expert, refer to Installing Supervision Software, page 45.

NOTE: You can download the software from the mySchneider support portal, *Software Downloads* section. Registration required.

Control Expert Installation Requirements

The software requires a specific version, page 31 of Control Expert, which it installs on the computer.

Verify that the display language of Control Expert is set to English; otherwise, change it.

The table describes the impact on Control Expert when it is already installed on the computer on which you are installing the software.

Version of Control Expert installed on the computer	Impact on Control Expert after installation of the software
Same version as the one installed by the software.	The following functionality is modified when you open Control Expert in standalone mode: • The **PLC** menu is renamed **Controller**. • Project backup files (.BAK) and context restoration files (.ZTX) are not created anymore. In addition, settings of the **Security Editor** are modified (see EcoStruxure™ Process Expert, Control Participant Services, User Guide) once you start the system server or a client.
Earlier version	The installed version is upgraded to the one used by the software. The following functionality is modified when you open Control Expert in standalone mode: • The **PLC** menu is renamed **Controller**. • Project backup files (.BAK) and context restoration files (.ZTX) are not created anymore. In addition, settings of the **Security Editor** are modified (see EcoStruxure™ Process Expert, Control Participant Services, User Guide) once you start the system server or a client. **NOTE:** Refer to the Control Expert help for information on project file compatibility.
Later version	You cannot install the software.

If you want to create Control Expert projects and import them into the software or open Control project files coming from EcoStruxure Process Expert with Control Expert, you need to use the same version of Control Expert as used by the software and the appropriate Control Expert DTM library version. Refer to the platform release notes for version details.

If you experience difficulties with the exchange of Control project files between the software and Control Expert, contact EcoStruxure Process Expert support.

NOTE: If you upgrade the version of Control Expert that is installed by EcoStruxure Process Expert, you will not be able to open it from within the software nor use Participant services anymore (for example, to generate or build a Control project).

Advantys Installation Requirements

The software requires a specific version, page 31 of Advantys, which it installs on the computer on which the engineering client is installed.

Verify that the display language of Advantys is set to English; otherwise, change it.

If you upgrade the version of Advantys that is installed by EcoStruxure Process Expert, you will not be able to open it from within the software nor use Participant services anymore (for example, to configure an STB island).

NOTE: When you start the system server, a notification may appear in the console about Advantys not being found. If no engineering client is installed on the computer, you can disregard the message; otherwise, install the required version.

Third-Party Components Installed By the Software

The software installs third-party components that it requires to function properly, such as InterSystems Caché software, which manages the database.

Only the version that is provided in the installation package is tested and validated. Updating these third-party components independently of the EcoStruxure Process Expert installation leads to incompatibilities.

NOTICE

UNEXPECTED SOFTWARE BEHAVIOR

Use only the version of third-party software that is installed by the EcoStruxure Process Expert installer.

Failure to follow these instructions can result in unusable systems or database.

NOTE: Refer to the topic providing general installation information for details about the version of third-party software that is installed, page 31.

License Requirements

The table outlines the license-related actions that are required to use the software after the 30-day trial period is expired.

License type	Software version that is upgraded	Required action
EcoStruxure Process Expert licenses (see EcoStruxure™ Process Expert, Licensing Guide)	None (first installation)	Purchase software licenses and activate them by using the Schneider Electric **Floating License Manager**.
	EcoStruxure Process Expert 2020 or later	
	Process Expert V4.3 or its service pack	
	EcoStruxure Hybrid DCS 2018 or later	

General Installation Information

Overview of Installation Scenarios

The table outlines various software installation and database migration scenarios and describes the result in terms of available systems and templates.

Software installation scenarios	Database migration	Result
Version 2021 is installed without an earlier version of the software installed on the computer.	None	Creates a database containing templates, page 57 delivered with version 2021(2).
	The version 2021 system server is started without database migration. Later only, the user restores and migrates a database backup of an earlier version (it can come, for example, from another system infrastructure).	The migrated database replaces(1) the version 2021 database, which was created during the first server start. Only systems and templates contained in the migrated database are available. Systems created and templates delivered with version 2021 are not available anymore. However, you can import templates, page 57 delivered with version 2021.
Version 2021 is installed to upgrade a supported earlier version.	None	Creates a new database containing templates, page 57 delivered with version 2021(2). A database backup of the earlier version can be migrated at a later time to be reused.
	The user restores a database backup of an earlier version, which is migrated during the first start of the version 2021 system server.	A version 2021 database is not created. Only systems and templates contained in the migrated database are available. templates, page 57 delivered with version 2021 are not available. However, you can import them.
	The version 2021 system server is started without database migration. Later only, the user restores a database backup of an earlier version, which is migrated by restarting the system server.	The migrated database replaces(1) the version 2021 database, which was created during the first server start. Only systems and templates contained in the migrated database are available. Systems created and templates delivered with version 2021 are not available anymore. However, you can import templates, page 57 delivered with version 2021.

(1) When you restore a database, it replaces the mounted database, which remains on the computer, page 125.

(2) By default, the database may not contain all the templates that are available. You can change the setting, page 115.

NOTE: Typically, a software upgrade comes with one or more libraries, which contain only the latest version of each template. Without these latest templates, new functionality is not available (for example, support of new controller platforms or new communication modules). For more information on the latest version of templates, refer to the *Library Release Notes*.

If you intend to migrate the database of an earlier version, refer to the topic describing how to use templates supplied with the software upgrade, page 57.

User Interface Language

The user interface of EcoStruxure Process Expert and its help are available only in English.

User Rights

EcoStruxure Process Expert and Schneider Electric licensing software, page 31 are installed so that they are available to all the users of the computer.

However, only authorized users can log in, page 79 and use the system server and/or clients.

Installed Software Components

During installation of the software, you have the choice to install any combination of the following system infrastructure components on the computer.

The following two tables indicate which additional software is installed when you install a given EcoStruxure Process Expert component. They also indicate the installed version.

EcoStruxure Process Expert component	**Control Expert 15.1**(1)	**Advantys 12.0**	**ProSoft Configurator for Modicon 1.005**	**Modicon IEC 61850 Configuration Tool 2.1.4**
System server	Yes, page 28	Yes	No	No
Engineering client	You need to install some DTMs and a type library manually after the software installation, page 39 is complete.	Yes, page 28(2)	Optional(2) This application is required to configure PMEPXM0100 modules (see EcoStruxure™ Process Expert, Control Participant Services, User Guide).	Optional(2) This application is required to configure IEC 61850 communication modules (see EcoStruxure™ Process Expert, Control Participant Services, User Guide).
Operation client	Optional, page 28 Without Control Expert, you can use only the **PLC Program Viewer** Web service with runtime navigation services (see EcoStruxure™ Process Expert, Runtime Navigation Services User Guide). You need to install some DTMs and a type library manually after the software installation, page 39 is complete.	No	No	No

(1) The Topology Manager is installed but only Control Expert Classic (without the Topology Manager) is available from EcoStruxure Process Expert.

(2) If an earlier version is installed on the computer, the installer upgrades it. In case of an optional component, only if you select to install it.

EcoStruxure Process Expert component	AVEVA Plant SCADA 2020 R2	InBatch ActiveX
System server	Yes	Yes
Engineering client	Yes	Optional (installed by default) The installation is required for the InBatch ActiveX controls (see EcoStruxure™ Process Expert, Supervision Participant Services User Guide) to be available when you edit a Supervision page.
Operation client	No	Yes

Component	Database (Caché 2018.1.4.505.-1)	Schneider Electric License Manager 2.8.1.0	Schneider Electric Floating License Manager 2.8.0.0	Schneider Electric Software Update 2.5.3.0
EcoStruxure Process Expert system server	Yes	Yes(2) If an earlier version is installed on the computer, you need to allow the installer to upgrade it during installation; otherwise setup cannot complete.	Optional(2) An EcoStruxure Process Expert infrastructure requires at least one **Floating License Manager**. It corresponds to the **License Server** check box during installation. If you select it (default) and an earlier version is already installed on the computer, you need to allow the installer to upgrade it during installation; otherwise setup cannot complete. If you want to use the **Floating License Manager** on another computer on which no component is installed, verify that it is of the same version as the **License Manager** installed by the software. For more information, refer to the topic describing licensing mechanisms (see EcoStruxure™ Process Expert, Licensing Guide).	Optional. This application informs you of available updates for installed Schneider Electric software and lets you install them. An Internet connection is required to use it. If an earlier version is installed on the computer, the installer upgrades it automatically. **NOTE:** If you select not to install Software Update, you cannot install it later on without changing the role of the computer. To install it separately, use the Software Update installer located in the SESU folder of the installation package.
EcoStruxure Process Expert engineering client	No	No		
EcoStruxure Process Expert operation client	No	No		
Control Expert	n/a	Yes If the version that is installed by Control Expert is earlier, it is updated.	No	Optional (*Custom* installation type)
AVEVA Plant SCADA	n/a	No	Optional (If it is required, select it in the **Station Role** window of the EcoStruxure Process Expert installer, page 39 rather than in the AVEVA Plant SCADA installer window.)	Optional

(2) Upgrading the **License Manager** or **Floating License Manager** may change the license server port value, page 33.

NOTE: You can also install the Floating License Manager separately, page 146 by using its own installer.

License Server Port Settings

The installation of EcoStruxure Process Expert 2021 may modify the default settings of Schneider Electric licensing software, page 31 that is installed on the computer.

The table indicates which parameters are modified and the new value after the installation. The modification is performed only if the installer updates version 2.2.0.0 or later of the FLM/LM.

Software component	Parameter	Parameter value after installing Process Expert	Comment
Floating License Manager (FLM)	**License Server Port**	27011	If you had modified the default license server port value (27010), no change is made.
License Manager (LM)	**Vendor Daemon / Server Port**(1)	27011	The server port value is changed only for **Host Name / IP Address** equal to 127.0.0.1 (default value).
(1) This parameter can specify either the vendor daemon port or the license server port of the **Floating License Manager**.			

After installation, verify that the server port setting is the same in the **Floating License Manager** and **License Manager** of the EcoStruxure Process Expert 2021 infrastructure. In particular, if the two are not installed on the same computer.

For information on how to verify and/or modify the server port setting, refer to the topic describing how to configure an Enterprise License Server (see EcoStruxure™ Process Expert, Licensing Guide).

NOTE: If other software acquires license rights from a **Floating License Manager** whose license server port was changed, verify that these license rights remain available to the software.

Installation Log Files

The installer logs the activities performed during software installation in two log files.

File name	Path	Content
EcoStruxure Process Expert Installation.log	C:\ProgramData\Schneider Electric \Process Expert x(1).	• Installed, modified, repaired, and uninstalled software components. • Component version. • Applied hotfixes. • Status of the action.
EcoStruxure Process Expert x.log(1)	Folder designated by the Microsoft® Windows® *%TEMP%* environment variable.	Microsoft® installer (MSI) verbose logging information.
(1) Where *x* corresponds to the version of the software that you have installed.		

Databases

When you install the software and start the system server, a new database is created.

If you are upgrading a supported earlier version and have created a backup for migration of the database before installing the upgrade, you have the possibility to reuse the database of the earlier version after migrating it, page 61.

Default Destination Folders

The default installation paths are:

- For EcoStruxure Process Expert: C:\Program Files\Schneider Electric \EcoStruxure\Process Expert
- For the Db folder (database, for system server only): C:\ProgramData \Schneider Electric\Process Expert x (where *x* corresponds to the version of the software that you are installing, for example, 2021).

Installation Requirements

Firewall Exceptions

The installation process modifies the Windows® firewall settings of the computer to allow communication with applications that it installs.

If you are using a firewall other than the Windows® one, modify the settings of the firewall to allow incoming connections with these applications.

The following paths correspond to a default installation of the system server:

- HostAgent: C:\Program Files\Schneider Electric\EcoStruxure\Process Expert \System Server\HostAgent.exe
- SystemServer: C:\Program Files\Schneider Electric\EcoStruxure\Process Expert\System Server\SystemServer.exe

NOTE: The entries created by the installer of an earlier version of the software may remain when the program is removed.

NOTE: AVEVA Plant SCADA may make additional changes to Windows® firewall settings depending on your selection during installation.

Enabling .NET Framework 3.5 SP1 for Control Expert

Before installing the system server or an engineering client, verify that .NET Framework 3.5 SP1 is enabled by opening the Windows® Control Panel and clicking **Uninstall a program > Turn Windows features on or off**.

It must be enabled also if you install Control Expert on a computer on which only the operation client is installed.

The EcoStruxure Process Expert installer informs you if this component is missing.

NOTE: .NET Framework 3.5 SP1 corresponds to version 3.5.30729.1 and higher in the registry but may appear as .NET Framework 3.5 in the **Turn Windows features on or off** window.

Installing .NET Framework 4.6.1 for Windows® 10

Before you can install the software on a computer, .NET Framework 4.6.1 needs to be installed.

For Windows® 10 (version earlier than 1511), the installer installs it automatically after you confirm the operation.

NOTE: .NET Framework 4.6.1 is already installed on Windows® 10 versions later than 1511.

Installing .NET Framework 4.8 for Control Expert

Before you can install the system server or an engineering client on the computer, .NET Framework 4.8 needs to be installed.

The EcoStruxure Process Expert installer informs you if this component is missing.

Installing the Controller Simulator

Overview

You can use the Controller Simulator to perform deployment and execution tasks for Control Participant projects.

When you install the system server or a client, the Controller Simulator application is installed on the computer.

By default, the simulator is installed with a setting that helps secure the Ethernet ports of the computer that are used by each simulator instance. This setting applies only to the Windows® session of the user who is logged on during installation.

Modifying this setting during the installation or installing the simulator on another computer makes the computer vulnerable to cyber attack.

Securing the Ethernet Ports Used by the Controller Simulator

During installation, in the **Controller Simulator Ethernet Port Setting** dialog box a check box is shown, which impacts the way the simulator is started.

Check box	Result
Selected (default and recommended setting)	Each instance of the simulator is started with a password-protected Control project that is loaded by default. This helps secure the Ethernet port of the computer (port 502 by default) that is used by the simulator instance and helps reduce vulnerability to cyber attack. **NOTE:** If you are upgrading the software and the Ethernet port setting on the computer was already selected, the check box is unavailable.
Cleared	Simulator instances are started without a Control project being loaded. This leaves the Ethernet ports of the computer that are used by the simulator instances (port 502 by default) unsecured and may allow a cyber attacker to gain access to the computer to execute, for example, malicious code.

Default Control Project Provided

When you install the software, a password-protected Control project file is copied to the computer:

- Full path: %localappdata%\Schneider Electric\Process Expert \simulatorprofile.sta (by default, the value of the %localappdata% environment variable is C:\Users\ <username>\AppData\Local)
- Password: **31081986@v!sh**

This is the file that is loaded into each simulator instance that you start if you select the check box in the **Controller Simulator Ethernet Port Setting** dialog box during installation.

NOTE: For information on how to change the password, refer to the topic describing password management (see EcoStruxure™ Process Expert, User Guide).

Default Simulator Installation Path

- The SimulatorStarter folder is copied to the computer at the path C:\Program Files\Schneider Electric\EcoStruxure\Process Expert\Utilities and a *ProcessExpertControllerSimulator* shortcut is created on the desktop. It points to the PLCSimulatorStarter.exe file, which lets you start multiple instances of the simulator.
- The PLC_Simulator folder is copied to the computer at the path C:\Program Files (x86)\Schneider Electric.

Installing the Simulator on a Computer Without Installing the Software

Schneider Electric recommends to install and use the simulator on a computer on which EcoStruxure Process Expert is installed. This helps secure the Ethernet port that is used by the simulator on the computer by having the setting selected by default.

To install the simulator separately on a computer on which the software is not installed, proceed as follows.

Step	Action
1	Copy the *PLC_Simulator* folder to the computer. The folder is located in the installation package at the path Program Files\Schneider Electric.
2	Copy the *SimulatorStarter* folder inside the *PLC_Simulator* folder. The folder is located in the installation package at the path ProgramFiles64Folder \Utilities.
3	Create a shortcut to the PLCSimulatorStarter.exe file on the desktop. The file is located in the *SimulatorStarter* folder.
4	Copy the simulatorprofile.sta file to the computer. The file is located in the *AFS* folder in the root of the installation package.

NOTE: If you had installed the simulator that was provided with an earlier version of the software on another computer, you must replace it with the simulator provided with this version of EcoStruxure Process Expert.

Securing the Ethernet Ports for Other Windows® Sessions

The setting that helps secure the Ethernet ports of the computer applies only to the Windows® session of the user who is logged on during installation.

When another user logs on to the computer and starts a simulator instance, no password-protected Control project is loaded. The simulator needs to be configured manually (see EcoStruxure™ Process Expert, User Guide) to load the default Control project provided with EcoStruxure Process Expert or another one.

Using the Simulator

For information on how to use the simulator, load another password-protected Control project, refer to the topic describing the deployment to the controller simulator (see EcoStruxure™ Process Expert, User Guide).

Installing the Software

Overview

This chapter describes how to install the various components of EcoStruxure Process Expert and highlights specific points of the installation of Supervision software, which is required during runtime.

Installing the Software for the First Time

Overview

The installer installs necessary software depending on the components that you select during installation.

The computer may restart automatically during the installation process and requires a restart only at the very end to complete it.

NOTE: If you are upgrading a supported earlier version, refer to the topic describing how to upgrade the software, page 52.

Installing the Software

Steps to start the EcoStruxure Process Expert installation.

Step	Action
1	Verify that the hardware and software requirements, page 26 are fulfilled.
2	Quit Schneider Electric applications that are running.
3	Verify that the required .NET Framework components are enabled, page 35.
4	Temporarily disable antivirus services (such as real time, scripting) running on the computer.
5	Double-click the setup.exe file located in the root of the installation package. **Result:** The installation procedure starts.
6	Follow the instructions on screen.
7	Accept the End User License Agreement (EULA).
8	In the **Station Role** dialog box, select the components, page 30 that you want to install on the computer depending on the machine role, page 18.
9	If you selected to install the system server component, in the **Authentication Settings** dialog box, configure the settings for role-based access control, page 78.
10	The installation of EcoStruxure Process Expert continues.

Steps to install Control Expert.

NOTE:

- If you cancel the installation of Control Expert, the installation of EcoStruxure Process Expert continues. However, Control Expert is required for the software to function correctly.
- To cancel the installation of the software while the installation of Control Expert is in progress, first cancel the installation of Control Expert.

Step	Action
1	The Control Expert release notes do not open from the installer. Open the Control Expert readme and release notes from the ReleaseNotesAndUGs folder of the software installation package.
2	Accept the End User License Agreement (EULA).
3	You can select the Control Expert installation path, the setup type, and optional components. You can make changes after installation completes by restarting the installation of Control Expert by using its installer, which is located in the ESx_System_ 2021 folder of the installation package.
4	If you do not want to install SESU, page 30, choose the **Custom** Control Expert installation mode and select not to install it.
5	Click **Install** to start the installation. **NOTE:** Do not click **Yes** to restart the computer at the end of the Control Expert installation. Otherwise, the installation of EcoStruxure Process Expert is interrupted and must be restarted.
6	After Control Expert is installed or if the appropriate version, page 30 is already present on the computer, a Control Expert hotfix is installed. Click **OK** in the **Hotfix Installation Result** dialog box to resume the installation.
7	The installation of EcoStruxure Process Expert continues.

Steps to install AVEVA Plant SCADA.

Step	Action
1	Accept the End User License Agreement (EULA).
2	In the computer role window, select **Development Workstation**; otherwise, Supervision Participant services will not be available.
3	In the component selection window, keep the default selection. **NOTE:** • If you do not want to install SESU, page 30, clear its check box. • If you need to install the Floating License Manager (FLM), clear the check box if you had selected it in the **Station Role** window of the EcoStruxure Process Expert installer at the beginning of the installation procedure. Otherwise, if you install it, use the default port settings. • The AVEVA Enterprise License Manager and License Server are not required with EcoStruxure Process Expert.
4	In the **Access Restriction** window, select to add the current Windows user if required. **NOTE:** The access control for AVEVA Plant SCADA is different from the role-based access control, page 78 of EcoStruxure Process Expert.
5	You can change the default installation path.
6	Click **Install** to start the installation.
7	In the **Select Drivers** window, select the required drivers, page 45.
8	Do not select the following check boxes in the **AVEVA Plant SCADA Setup Summary** window: • Launch the AVEVA Configurator • Restart the machine for the changes to take effect Otherwise, incorrect settings may be applied and the EcoStruxure Process Expert installation is interrupted and must be restarted.
9	Click **Finish** to exit the AVEVA Plant SCADA installer. **Result**: the installation of EcoStruxure Process Expert continues.

Steps to install Advantys configuration software, licensing software, ProSoft Configurator for Modicon and IEC 61850 Configuration Tool depending on the EcoStruxure Process Expert components that you are installing and your selection in the **Station Role** dialog box, and complete the installation of EcoStruxure Process Expert.

Step	Action
1	The installer installs Advantys configuration software.
2	The installer installs Schneider Electric licensing software. **NOTE:** If an earlier version of the **License Manager** and/or **Floating License Manager** is installed on the computer, you need to accept to upgrade it so that the installation process can continue.
3	The installer installs ProSoft Configurator for Modicon.
4	If you are installing IEC 61850 Configuration Tool, you need to import the certificate, page 42.
5	Click **Finish** to exit the EcoStruxure Process Expert installer.
6	Restart the computer when prompted to complete the entire installation process.
7	Install, page 43 the following on each computer on which Control Expert is installed: • DTMs for specific devices and modules • Type libraries for the GPL and specific modules Use the installation files located in the ESx_System_2021\PXM_PRM_GSD_PsxGPL for Control Expert folder of the installation package. **NOTE:** This step is not required on a computer on which only the operation client is installed.

Importing the Certificate for IEC 61850 Configuration Tool

To import the certificate that is required by the IEC 61850 Configuration Tool, proceed as follows when you are prompted during installation.

Step	Action
1	In the **Certificates** dialog box, click **Import...**. **Result**: The **Certificate Import Wizard** dialog box opens.
2	In the **Certificate Import Wizard**, click **Browse...**. Result: The **Open** dialog box opens and automatically displays the certificate that you need to import.
3	Select the file and click **Open**.
4	In the **File to Import** screen, click **Next**.
5	In the **Certificate Store** screen, select **Automatically select the certificate store based on the type of certificate**, and click **Next**.
6	Click **Finish**. **Result**: A message is shown to confirm the successful import of the certificate.
7	Close the **Certificates** dialog box.

Installing DTMs and Type Libraries

Overview

When a DTM that you require to complete the configuration and refinement stages is not available in the **Hardware Catalog**, you need to install it manually in Control Expert.

You can also install manually in Control Expert the type libraries (Libset) that you require.

Perform the installation on each computer of the EcoStruxure Process Expert infrastructure on which Control Expert is installed.

For more information on the installation and configuration of DTMs and type libraries, refer to the Control Expert help.

Installing DTMs by Using a Setup

The table outlines the steps that you need to perform to install DTMs on a computer by using their setup.

Step	Action
1	Verify that engineering and operation clients are closed, the system server is stopped, and that the server console is closed. **NOTE:** The server console may be minimized to a tray icon. In such case, click **Exit** in the context menu of the tray icon.
2	Verify that Control Expert (standalone version) is closed.
3	Extract the installation files to disk.
4	Double-click the setup of the DTM and follow the instructions on screen.
5	Open Control Expert standalone version and update the DTM **Hardware Catalog**.
6	Close Control Expert (standalone version).

Installing DTMs by Using EDS Files

To install a DTM for an EtherNet/IP device by using EDS files, open the EtherNet/IP addition wizard of Control Expert (standalone version).

Before using the wizard, verify that engineering and operation clients as well as the system server console are closed.

After installation is completed, update the DTM **Hardware Catalog** of Control Expert (standalone version).

For details, refer to the topic that describes *adding an EDS file to the hardware catalog* in the Control Expert help.

Installing DTMs by Using GSD Files

To install a DTM for a PROFIBUS device by using GSD files, open the PROFIBUS **GSD Addition** wizard of Control Expert (standalone version).

The table describes the steps that you need to perform to install a DTM on a computer by using GSD files.

Step	Action
1	Verify that engineering and operation clients are closed, the system server is stopped, and that the server console is closed. **NOTE:** The server console may be minimized to a tray icon. In such case, click **Exit** in the context menu of the tray icon.
2	Extract the GSD files to disk if needed.
3	Open Control Expert (standalone version).
4	Open the **DTM Browser** and verify that the PRM Master and communication DTMs are installed.
5	In the **DTM Browser**, right-click **Host PC** and click **Add**.
6	In the **Add** window, select **PRM Master** and click **Add DTM**.
7	In the **DTM Browser**, right-click the PRM Master and click **Device menu > Additional Functions > Add GSD In Library**. Result: The **GSD Addition** wizard opens.
8	Follow the instructions on screen.
9	Once installation is completed, update the DTM **Hardware Catalog**.
10	Close Control Expert (standalone version).

Installing Type Libraries

To install a different version of the Libset, use the **Libset Installer** of Control Expert (standalone version).

Before using the installer, verify that engineering and operation clients as well as the system server console are closed.

For details, refer to the topic describing the *Libset* in the Control Expert help.

Installing Supervision Software

Installation Requirements

To complete the system engineering life cycle and use Supervision services during operation, you need to install Supervision software, page 27 on machines that serve as:

- Operation server: Install operation server software (configuration tools are required on at least one operation server).

  You also need to install OPC Factory Server and/or OPC UA Server Expert.
- Operator station: Install a Supervision control and/or view only client.

For more information, refer to the *AVEVA Plant SCADA Installation and Configuration Guide*.

NOTE: You cannot change the Supervision role on computers that have the role, page 18 of system server or engineering station. Also, using the installed Supervision software outside of EcoStruxure Process Expert may be limited.

NOTE: To use runtime navigation services, you need to install on the same computer, an EcoStruxure Process Expert operation client, page 18 in addition to the Supervision client.

You may need to install Control Expert, page 31 along with the operation client.

Schneider Electric Licensing Software Installed by Plant SCADA

The version of the **Schneider Electric Floating License Manager** (FLM) that is installed by Plant SCADA may be earlier than the version installed, page 31 by EcoStruxure Process Expert.

In such case, installing a EcoStruxure Process Expert component on the same computer lets you update the FLM.

Otherwise, you can also install the FLM separately, page 146 by using its own installer.

For configuration information, refer to Configuring an Enterprise License Server for Supervision Software (see EcoStruxure™ Process Expert, Licensing Guide).

NOTE: The **License Manager** is not required by Plant SCADA.

NOTE: When you install the FLM from Plant SCADA, use the default port settings.

Installing Patches for AVEVA Plant SCADA

When you manually install or remove patches or hotfixes for Plant SCADA after it has been installed by EcoStruxure Process Expert, make sure that you perform the same installation or removal on all the computers on which it has been installed. Otherwise, the functionality of the Supervision Participant may be impacted.

Installing Drivers

When you install the operation server, in the **Select Drivers** screen, select the driver that corresponds to the value of **Protocol** that is configured for tag containers (see EcoStruxure™ Process Expert, User Guide) to allow communication between controllers and the I/O server.

For details on the driver configuration, refer to the driver-specific help in the Plant SCADA *Driver Reference Help*.

Installing OPC Factory Server

If OPC Factory Server (OFS), page 27 is needed, proceed as follows to install it.

Step	Action
1	In the installation package (.iso) of EcoStruxure Process Expert, browse to <Drive>:\ESx_System_2021\AVEVACitectSCADA\Citect SCADA 2020\Extras\OFS v3.63 and double click setup.exe. **Result**: The OPC Factory Server installer opens.
2	Select a language, click **Next**, and follow the instructions on screen.
3	In the **Customer Information** screen, enter the following information: • **Part Number**: TLXCDOFS • **Serial Number**: 12345678910
4	Click **Next** and follow the instructions on screen.
5	Click **Finish** to complete and exit the installation.

For more information on how to install and configure OPC Factory Server, refer to the OFS help, which is located in the Help folder inside the OFS installation package.

Installing OPC UA Server Expert

If needed, install the required version, page 27 of OPC UA Server Expert on the operation server computer, that is, the computer on which the I/O server is installed. The order of installation does not matter.

Certain EcoStruxure Process Expert licenses (see EcoStruxure™ Process Expert, Licensing Guide) include a license for this version.

For more information on how to install and configure OPC UA Server Expert, refer to the help, which you can open from the **Help EcoStruxure Process Expert** window of the engineering client.

Using Remote Desktop Services With Windows Server 2019

Overview

This topic describes the specific requirements and limitations related to using EcoStruxure Process Expert with Remote Desktop Services (RDS) on Windows Server 2019.

It allows thin clients to connect to the Remote Desktop (RD) Session Host server and use the software by using Remote Desktop Protocol (RDP).

For information on the general software installation and configuration aspects, refer to the corresponding chapters of this manual.

Recommended RDS Deployments

The following figure shows an RDS deployment where both the engineering and operation clients can be used from thin clients. However, only one RD session can use the operation client at a time and while the Supervision Participant is not used in an engineering client RD session.

The following figure shows a deployment alternative where the operation client is installed on separate operator stations, which allows concurrent use of the operation client and Plant SCADA.

NOTE: In these deployment scenarios, among all engineering client RD sessions, only one session can use Supervision Participant services at a time (for example, to edit a page or build the Supervision project).

Server Computer System Requirements

The following hardware requirements are valid for the computer running Windows Server 2019 and the following configuration:

- 5 thin clients connecting simultaneously.
- A maximum of 4 instances, page 105 of the Control Participant running simultaneously per thin client.

  Every 2 additional instances of the Control Participant require 2 logical processors and 4 GB of RAM extra.

Component	Minimum requirements
CPU	Server CPU that meets the following specifications: • CPU mark: 10,000 • Base frequency: 2.6 GHz • Turbo frequency: 3.5 GHz • Cores: 24 cores / 48 logical processors (threads) • Cache size: 8 MB • Bus speed: 8 GT/s
RAM	128 GB
Hard drive	SSD 512 GB capacity. NTFS file system. Higher transfer speeds improve overall performance. 50 GB of free space to install and run the software.
Display	1920 x 1080 or higher
Ports	Ethernet port A bandwith of 2 to 3 mbps is recommended with each thin client. Otherwise, screen refresh issues may occur. For details on bandwith requirements when using RDP, refer to the Microsoft documentation.
Input devices	Mouse or compatible device Keyboard

NOTE: To connect more than 5 thin clients, either increase the server computer processing power or set up an additional RD Session Host server computer on which an EcoStruxure Process Expert system server and clients are installed.

Specific Configurations

- Verify that the RD Session Host server computer is registered with a domain controller.
- The following table describes the configuration to select in the Windows Server Manager.

Windows Server Manager	Selection
Installation Type	Role-based or feature-based installation
Server Roles	Remote Desktop Services
RDS Role Services	Remote Desktop Connection Broker Remote Desktop Gateway Remote Desktop Licensing Remote Desktop Session Host Remote Desktop Web Access

- In the **Session** settings of the RD Session Host server, set **End a disconnected session** to *Never*.

- To be able to use the Controller simulator from a thin client, first open the *AppData* folder of the *Administrator* user of the thin client once (*AppData* is a hidden folder). When the dialog box opens saying that you do not have permission to access this folder, click **Continue**.
- Close Participant refinement windows and client windows before signing out from your RDP session to free up resources for other sessions.

Enabling Windows Installer RDS Compatibility

To be able to install the software on Windows Server 2019, the following setting must be enabled: Computer Configuration\Administrative Templates\Windows Components\Remote Desktop Services\Remote Desktop Session Host \Application Compatibility\Turn off Windows Installer RDS Compatibility.

To access the setting, enter *gpedit.msc* in the Windows search bar.

Installing the Software

- Select all the station roles when installing EcoStruxure Process Expert on the RD Session Host server computer.

  NOTE: If you select to install the operation client on one or more operator stations, page 18, it is not required to install it on the RD Session Host server computer. Refer to the recommended deployments, page 47 for details.
- If you select the **Add the current Windows user to these groups** check box in the **Access Restriction** window of the AVEVA Plant SCADAinstaller, a dialog box may open indicating that the operation could not be completed. In this event, after the installation of EcoStruxure Process Expert completes, add the users of thin clients manually to the appropriate security roles by using the AVEVA Plant SCADA **Configurator**.
- The installation of components on thin clients is not required.

Licensing Considerations

- You need as many engineering client licenses as there are users logged in to an engineering client in concurrent RD sessions.
- All licenses must be activated by using the Floating License Manager (FLM), which can be installed on the RD Session Host server computer or a remote enterprise license server.
- The RD Session Host server computer requires an internet connection so that license rights can be validated with the Schneider Electric license server.

  NOTE: Verify that the appropriate internet connection settings are configured in all RD sessions. Otherwise, opening the FLM and the License Manager (LM) on the RD Session Host server computer may take time.
- For the first 120 days, no RDS Client Access License (CAL) is required.

The following table shows the types of RDS CALs that are available. Use the appropriate license type for each connecting user. For more information, refer to the Microsoft online documentation on remote desktop deployment licensing.

Usage scenario	Client Access License
One user connects to an RD session from several thin clients.	Per user CAL
Several users connect to an RD session from the same thin client.	Per device CAL

Limitations

Only one instance of AVEVA Plant SCADA can run at a time on the RD Session Host server computer. As a result, only one engineering client RD session can use the Supervision Participant at a time or only one operation client RD session can be opened and use Plant SCADA standalone (requires releasing the Supervision Participant (see EcoStruxure™ Process Expert, Supervision Participant Services User Guide) first).

To use additional operation client or Plant SCADA standalone instances, install them on separate operator stations, page 18. Refer to the deployment examples, page 47 for details.

Upgrading the Software

Overview

This chapter contains information on the upgrade process and describes how to upgrade a supported earlier version.

About Upgrading the Software

Overview

This section contains information about the various aspects related to upgrading a supported earlier version, page 26.

NOTE: Refer also to the topic containing general installation information, page 30.

Upgrade Process Overview

Upgrade Process Description

An upgrade consists in installing on top of an existing installation a new major version (for example, EcoStruxure Process Expert 2021) or a second release in the same year (for example, 2020 *R2*).

When you upgrade the software, you need to install the upgrade on all computers on which the system server and any clients connecting to it are installed because you cannot mix versions within the same infrastructure, page 15.

The installer:

- Searches for already installed components on the computer.
- May back up the extensions, page 65 that were installed in the virtual machines.
- Uninstalls the version that is already installed. The database that contains data of the systems that you have created is not removed.
- Installs an upgraded version of the software components that were installed on the computer.
- Gives you the option to add and/or remove machine roles, page 18.
- Upgrades the following if the version that is installed is earlier than the one included in the software upgrade:
  - Schneider Electric licensing software.
  - Associated and third-party software components, page 29.

You have the possibility to reuse databases of supported earlier version, page 61 of the software or start fresh with a blank database, page 126.

NOTE: If upgrading your version of the software is not supported, either uninstall it, or if you want to reuse your database, migrate it to the next version as you need to migrate databases by following the sequence of versions. For example, if Process Expert 4.2 is installed, migrate the database to Process Expert 4.3 first. Then, you can migrate it directly to EcoStruxure Process Expert 2021.

Upgrading a 32-Bit System Infrastructure

Starting with EcoStruxure Hybrid DCS 2018, operation clients can only be installed on 64-bit operating systems.

Upgrading Supervision Software

Supervision software requirements, page 27 may have changed and as a result, you may need to upgrade installed Supervision components, page 45 that are used in conjunction with the EcoStruxure Process Expert infrastructure.

Reusing Databases of a Supported Earlier Version

The following figure illustrates the typical workflow to migrate a database of Process Expert V4.3/SP1 or EcoStruxure version 2018 and later to version 2021. The migration is performed in 2 steps.

(1) If the command, page 118 does not appear, you need to install a premigration patch, page 61 first.

(2) Extensions are the necessary DTMs and the type library for the GPL and specific devices/modules.

The migration of databases is performed in two steps:

1. You need to create a backup of each database that you want to reuse by using the system server of your existing software installation.

   NOTE: The installation of the premigration patch is optional for Process Expert 4.3/SP1.

2. You need to install EcoStruxure Process Expert 2021, re-install the extensions, page 65, and restore the database backup. The migration is performed automatically when you start the system server.

If you do not want to reuse your current databases (this includes systems, segment libraries, and any template you may have created), install the software upgrade and start the system server. In this case, to save disk space, you can remove the Db database folder, page 34 of the earlier version.

NOTE: It is possible to re-use the database of 32-bit Process Expert 4.1 or earlier but you need to migrate it to V4.2 first, then to V4.3. Refer to the V4.2 *Installation Guide*, *Upgrading the Software*.

Extensions Installed in the Virtual Machine

If you had made changes to the software Participants of your supported earlier version of the software by installing extensions or adding files manually to the Extensions folder, you need to re-install them manually in case the upgrade installed a new version of Control Expert, page 31.

These changes can be, for example, the installation of device type managers (DTMs) or an upgrade of the set of libraries (Libset) of Control Expert.

To facilitate the re-installation of these extensions, page 65, EcoStruxure Hybrid DCS 2018 R2 and later automatically back up the installed extensions when you upgrade the system server.

New Name of Control Participant

The Control Participant has been renamed *Control Expert* (formerly Unity Pro). Due to this name change, the installation path of the Participant is changed to C:\Program Files (x86)\Schneider Electric\Control Expert X (where *X* is the Participant version).

If you were using any user-created patches with the earlier version of the software in which a file referred to the former Participant installation path (for example, if the execute.bat file contains the path C:\Program Files (x86)\Schneider Electric\Unity Pro), you need to update them with the new path before installing them.

Reusing Templates

If you want to reuse templates that you had created in Process Expert 4.3/SP1 or version 2018 and later and that are not part of the Global Templates library anymore (because you have, for example, exported and then deleted them), you need to Import (see EcoStruxure™ Process Expert, User Guide) the corresponding export files (.sbk) in the library of the respective version before installing the software upgrade. During migration of the database, the templates are made compatible with the upgrade.

> **NOTE:** When you import templates that were exported from a different version of the software, they may not be usable in the entire system engineering life cycle.

Reusing Application Export Files

If you want to reuse instances that you have exported from Process Expert 4.0 and later, you can import the corresponding application export files (.xml) in the **Application Explorer** after installing the upgrade. This requires that the templates that are used by these instances are available in the Global Templates library at the time of import (same template version).

For more information on the export and import of the application, refer to the topic describing how to manage application folders and instances (see EcoStruxure™ Process Expert, User Guide).

> **NOTE:** For application export files created with Process Expert earlier than version 4.0, you need to import these into the version in which they have been created (for example, Process Expert 3.1) and migrate the database to version 4.0. From then on, you can export the application and import the file into later versions.

Reusing Project or Topology Export Files

If you want to reuse Control or Supervision Participant projects, or topological entities that you have exported from Process Expert 4.3/SP1 or version 2018 and later, you need to import the corresponding export files (.sbk) into a system of the respective version before installing the software upgrade.

This is because you cannot import project or topology export files into a version of the software that is different from the one with which they were created. This restriction applies also to *R•* versions of a major release.

License Requirements

When you install a new version of the software, you may need to update your licenses (see EcoStruxure™ Process Expert, Licensing Guide).

For more information, refer to the Schneider Electric **Floating License Manager** user manual.

Before installing the software upgrade, check the instance count of existing systems to verify that your application size license is still of the appropriate size.

For more information, refer to Counting Instances (see EcoStruxure™ Process Expert, User Guide).

> **NOTE:** Unless mentioned otherwise, licenses that you have activated for a major version (for example, EcoStruxure Process Expert 2021) are valid also for subsequent releases within the same year (versions with *R*• suffix, for example EcoStruxure Process Expert 2021 R2).

Using Templates Supplied with the Software Upgrade

Overview

Typically, a software upgrade comes with one or more libraries, which contain new and/or updated templates.

To take advantage of new functionality provided by these templates, you need to import (see EcoStruxure™ Process Expert, User Guide) them if you have migrated a database of a supported earlier version. This is because the templates that are supplied with the software upgrade do not appear in the Global Templates library, page 30 after a migration.

Then, to be able to use the latest version of templates you need to update the templates that are used by the instances of your systems.

As a general rule, update a template only if it is required. That is, if the new version of the template provides a new functionality that you need or fixes an issue that you may experience. This applies in particular to systems that are already deployed.

For more information on the templates that are provided, refer to the help of the Schneider Electric libraries.

For information on the severity of the impact when updating a template and on the compatibility of templates belonging to different libraries, refer to the *Library Release Notes*.

Templates Supplied with the Software Upgrade

The new and/or updated Schneider Electric topological and application templates are provided in the form of export files (.sbk).

There is one export file per template category.

The table indicates which libraries are included with the upgrade and the path of the folder on the computer on which the system server is installed (where x is the software version). For details on each library, refer to the corresponding *Library Release Notes*.

EcoStruxure Process Expert library	Folder containing SBK files	Description
General Purpose Library 2020	C:\ProgramData \Schneider Electric \Process Expert x \Templates	GPL that supports Situational Awareness functionalities of the Supervision Participant. Template export file names have the *SA* suffix.
General Purpose Library Classic 2020	C:\ProgramData \Schneider Electric \Process Expert x \Templates Classic	Standard GPL that has been renamed General Purpose Library Classic.
Foundation Library 2021	The Foundation.sbk file is included in each folder containing SBK files of a GPL.	Contains elementary application templates that are referenced by templates of other libraries. It also contains topological templates that are required to take advantage of (if applicable): • Newly supported hardware modules. • New functionality of the new version of the Control Participant.

DTMs and Types Supplied With the Software

The EcoStruxure Process Expert General Purpose Library supplied with the upgrade may contain templates that require new or new versions of DTMs and/or types.

The necessary installation files are in ESx_System_2021\PXM_PRM_GSD_PsxGPL for Control Expert folder of the installation package.

When to Import and Update Templates

The table describes several scenarios, which are possible after you migrate a database and indicates in which case you need to use templates that are provided with the software upgrade.

Scenario	Example	Required and possible actions after migrating the database
Migrated systems are not modified or only by using templates and functionality of the earlier version of the software. Typically, the software is upgraded to benefit of performance and/or UI improvements.	User whose existing systems are deployed and working fine. No changes are planned in the application or topology in the short term, which would use new functionality (for example, adding newly supported hardware modules).	Importing templates supplied with the upgrade is not required. **NOTE:** The templates of the earlier version of the software are readily available in the Global Templates library.
Migrated systems are going to be updated to take advantage of the new features of the upgrade.	User who wants to:	
	Add to the topology a newly supported hardware module or use a new topological functionality provided by the upgrade.	Import templates of the Foundation library that is supplied with the upgrade.
	Update the module of an existing controller to the latest version.	Import templates of the Foundation library that is supplied with the upgrade then, update the template that is used by the module. Thereafter, you can configure the controller in the **Topology Explorer** and change the version of the module.
	Use the new functionality provided by the latest version of an application template of a GPL.	Import templates of a GPL that is supplied with the upgrade to create new instances. Optionally, update templates of existing instances of the application. **NOTE:** You can use templates of different GPLs in the same system as long as their facets are not assigned to a same Participant project.
Application instances and topological entities of migrated systems remain unchanged. However, new systems will be created, which contain application instances and topological entities that use new functionality of the upgrade. As a result, systems of both the earlier version and the current software version will co-exist.	System integrator who keeps supporting the installed base while creating new systems within the same database by using the upgrade.	• To create new topological entities: Import templates of the Foundation library that is supplied with the upgrade. • To create new application instances: Import templates of a GPL that is supplied with the upgrade. • Updating templates of existing instances of the application and entities of the topology is not required. **NOTE:** Because earlier and new versions of templates co-exist in the Global Templates library, verify that you are using: • The earlier version when modifying migrated systems. • The new version or templates of a different GPL when creating and modifying new systems. **NOTE:** You can use templates of different GPLs in the same system as long as their facets are not assigned to a same Participant project.

Updating Systems with the Latest Templates

After you import new templates into the Global Templates library, you can update instances of systems with these new templates.

Migrated Control Participant projects may not function properly after a migration.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Verify that any built Control Participant projects that are contained in a migrated database function properly before deploying them to controllers.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The table describes the work flow to update templates that are used by application instances and topological entities with templates supplied with the software upgrade.

Step	Description
1	Verify that the application size license that is activated for the software is of the appropriate size. If the software displays a notification about the license size, refer to Licensing Conflicts (see EcoStruxure™ Process Expert, Licensing Guide). For information on the size of systems, refer to Instance Count (see EcoStruxure™ Process Expert, User Guide).
2	Verify that you have imported Global Templates supplied with the software upgrade, page 57 and installed the necessary DTMs and/or type library.
3	If you had created your own templates, update these templates with any updated reference that may be available with the software upgrade. Refer to Updating Global Templates (see EcoStruxure™ Process Expert, User Guide).
4	Update the templates that are used by instances of the application. Refer to Updating and Replacing Templates of Instances (see EcoStruxure™ Process Expert, User Guide). **NOTE:** To maintain existing links, update instances that are linked at once.
5	Generate the Control and Supervision projects. **NOTE:** If the software detects DFB version conflicts, it opens a dialog box, which allows you to select the version you want to use. Select the version encapsulated in the new version of the template. For details, refer to the topic describing the management of versions of types in Control facets during generation (see EcoStruxure™ Process Expert, User Guide). **NOTE:** If generation detects that the controller does not support a new functionality or data type, you need to upgrade the firmware version of the CPU of the default configuration used by the Control Participant project.
6	Update the templates that are used by the topological entities of each system by using the **Update Templates** command. Refer to Updating Templates of Topological Entities (see EcoStruxure™ Process Expert, User Guide). **NOTE:** You may need to upgrade the firmware of topological entities to a version that supports new modules or data types.
7	Build the Participant projects and verify that they function properly.
8	Deploy the built Participant projects to their respective engines.

Stopping and Starting Caché

Stopping Caché

To stop Caché, you need to stop the system server first.

NOTICE
LOSS OF COMMUNICATION Stop the system server only when no client is running. **Failure to follow these instructions can result in unresponsive clients.**

To stop Caché, proceed as follows.

Step	Action
1	Quit any clients that are connected to the system server (see EcoStruxure™ Process Expert, User Guide).
2	Stop the system server (see EcoStruxure™ Process Expert, User Guide).
3	Right-click the icon representing the Caché database in the system tray. **Result:** The Caché context menu opens.
4	Select **Stop Caché**. **Result:** Caché opens the **Caché Shutdown** dialog box.
5	Select **Shut down** and click **OK**. **Result:** The Caché splash screen is shown while the database shuts down.
6	Wait until the Caché database icon turns gray, indicating that the database is shut down.

NOTE: Do not start the system server when Caché is stopped because the database needs to be running for the system server to function properly.

Starting Caché

To start Caché, proceed as follows.

Step	Action
1	Right-click the icon representing the Caché database in the system tray. **Result:** The Caché context menu opens.
2	Select **Start Caché**. **Result:** The Caché splash screen is shown while the database starts.
3	Wait until the Caché database icon turns blue, indicating that the database is running.

NOTE: By default, Caché is configured to start when you start Microsoft® Windows®.

Migrating Databases

Overview

Only the migration of databases of the following versions is supported:

- Process Expert 4.3 or V4.3 SP1
- EcoStruxure Hybrid DCS 2018 or later
- EcoStruxure Process Expert 2020 or later

Typically, migrating a database is a two-step process, page 54, which can take up to several hours depending on the size of the database. This section describes the prerequisites and how to complete the process.

NOTE: The information in this section applies only if you are upgrading and want to reuse your existing database with the upgrade.

Preparing Databases for Migration

Overview

Migrating a database of Process Expert V4.3/V4.3 SP1 or version 2018 and later is a two-step process, page 54.

In the first step, you need to prepare databases for migration before installing the software upgrade. This premigration is an automated process and is performed by using the **Migrate Database** command, page 117 of the system server of the currently installed version.

- If the command does not appear, you need to install the premigration patch first.
- For V4.3/V4.3 SP1 databases, the command is already present in the system sever console. You need to install a premigration patch only in case of forgotten passwords, page 62.

The purpose of premigration is to create a backup file of each database that you want to use with the new version of the software. Once the new version is installed, these backup files can be migrated to create a compatible database.

You cannot use clients during this step.

NOTE: If you modify, add, or delete a system or make a change to the Global Templates library or content repository after you have created the database backup file, you must create a new one in order to migrate the changes.

Activity Logs

The software creates log entries when you prepare a database for migration.

The information is added to the system server log file (see EcoStruxure™ Process Expert, User Guide).

Password Authentication

If the database contains systems with topological entities for which password protection (see EcoStruxure™ Process Expert, User Guide) is enabled and a **Controller** password has been set, the **Password Authentication** dialog box opens. You must provide the password for each controller to be able to proceed with the premigration.

The dialog box provides an option to manage forgotten passwords:

- For controllers, it lets you obtain a temporary password that you can enter directly in the **Password Authentication** dialog box.
- For station nodes, it lets you proceed with the premigration without providing the password.

  NOTE: In Process Expert 4.3/SP1, the option is only available after you install the premigration patch.

  Without installing the premigration patch, if you have forgotten the password for a controller or station node, you can cancel the premigration process, open the **Topological Explorer**, reset the password (see EcoStruxure™ Process Expert, User Guide), and then start over.

The following figure shows an example of the **Password Authentication** dialog box featuring the option to manage forgotten passwords.

Item	Description
1	When selected, shows the station nodes acting as emulated simulator for which password protection is enabled and a password has been set. Otherwise, these station nodes are not shown and you cannot enter their password. **NOTE:** Entering the password for station nodes is optional. If you do not enter it, you can proceed with the premigration after you confirm the command. However, you will need to deploy the built Control Participant project again to the station node in the new version of the software. Click **No** in the confirmation dialog box to revert to the **Password Authentication** dialog box.
2	Identifier of the system containing the topological entity.
3	Identifier of the topological entity in the **Topology Explorer**. For station nodes, indicates also the identifier of the Control Expert service.
4	The engine type can be either of the following: • **Controller**. • **Simulator**: A station node in which a Control Expert service has been created.
5	Text box to enter the **Controller** or **Simulator** password. If you enter an incorrect password for an entity, a red icon is displayed in the corresponding row.
6	Click the link if you have forgotten the password for a controller. It provides a code that you must submit to Schneider Electric support to obtain a temporary password. You can enter this temporary password directly in the **Password Authentication** dialog box and proceed with the premigration.

Installing the Premigration Patch

When necessary, install the patch on the computer on which the system server is installed before starting the premigration process.

Step	Action
1	Verify that the system server and clients are not running.
2	Copy the premigration patch installation file (.exe) that corresponds to your installed version to the computer. The file is located in the MigrationPatches folder, which is in the root of the upgrade installation package.
3	Double-click the file. **Result**: The welcome screen opens.
4	Click **Update** and follow the instructions on screen.

Creating a Database Backup File for Migration

The premigration of a database may take up to several hours depending on the size of the database.

To create a backup file of the database that is mounted, proceed as follows.

Step	Action
1	Start the system server.
2	Verify that no client is connected to the system server.
3	In the system server console menu bar or tray icon, page 117, click **Database > Migrate Database**. **Result**: A **Save As** dialog box opens. **NOTE:** The command may be impacted if the system server auto-start functionality is enabled, page 122.
4	Enter a name and location for the database backup file and click **Save**. **Result**: If the database contains a system with a topological entity for which password protection is enabled and a password has been set, the **Password Authentication** dialog box opens; proceed to step 6. Otherwise, the creation of the database backup file starts.
5	Wait until **Done** appears in the system server console after the server is stopped and database operations are completed. **Result**: The database backup file is created and premigration is complete. **NOTE:** When the creation of the database backup file starts, no activity may be shown in the system server console.
6	In the **Password Authentication** dialog box, enter the password for each topological entity or manage forgotten passwords, page 62 and click **OK**. **Result**: The creation of the database backup file starts (no activity may be shown in the system server console). **NOTE:** Click **Cancel** to close the dialog box without migrating a database.
7	Wait until **Done** appears in the system server console after the server is stopped and database operations are completed. **Result**: The database backup file is created and premigration is complete.
8	To create a backup file of another database, restore it, page 123 and repeat the procedure.

Re-Installing Extensions

Overview

When you upgrade EcoStruxure Hybrid DCS 2018 R2 and later, the software automatically backs up the extensions that were installed in the virtual machine and creates a log file.

The backup includes:

- Participant extensions that you have installed by using the **Extensions** section of the **System Server Configuration Wizard** (for example, a DTM).
- Extensions whose files you have added manually or by using an installer to the Extensions folder, which is located on the computer on which the system server is installed, at the path C:\Program Files\Schneider Electric \EcoStruxure\<software name>\Vm\Extensions (for example, a segment library extension that is added when you install such an optional library).

This facilitates the re-installation of these extensions, which are required if you are migrating a database or reusing it in another EcoStruxure Process Expert infrastructure.

NOTE: A backup of the extensions is also created when you uninstall the system server, page 136 of these versions.

Extension Backup File Name and Location

The various extension files are backed up as one compressed archive file named Extensions_*Version*.7z, where:

- *Version* is the software version that you have upgraded or removed.
- *DateTime* the date and time when the backup was performed.

Depending on the activity that you have performed, the file is located at the following path:

- After upgrading EcoStruxure Hybrid DCS: C:\Users*Username*\AppData \Local\Schneider Electric\Hybrid DCS\ExtensionBackup
- After removing EcoStruxure Process Expert: C:\Users*Username*\AppData \Local\Schneider Electric\Process Expert\ExtensionBackup

Where *Username* corresponds to the user who is currently logged on to the operating system of the computer.

Extension Backup Log Files

The software creates a log file in the ExtensionBackup folder.

The name of the log file is Log_*Version*_*DateTime*.txt where:

- *Version* is the software version that you have upgraded or removed.
- *DateTime* the date and time when the log file was created.

The log file contains:

- The names of the extensions that have been backed up. Extensions are grouped by method of installation (**Extensions** section of the configuration wizard and manual addition to the Vm\Extensions folder).
- A list of extensions that were installed in the virtual machine but that could not be backed up because the corresponding files were not present in the source location. This can be the case, for example, if the extension file has been deleted from the folder from which it was installed.

Re-Installing Extensions

Re-install the extensions before you start the system server of the software upgrade.

Once you have extracted the backup archive file to disk on the computer on which the system server is installed, you need to re-install extensions manually, page 114 in the Control Participant (Control Expert).

Migrating Databases to the Current Version

Overview

The second step of the migration process can be performed once you have upgraded the system server.

By restoring a database backup file created during the first step and starting the system server, the migration process is completed.

Once you have migrated a database, you can complete the migration process of another database at any time by repeating this step.

> **NOTE:** After upgrading to EcoStruxure Process Expert 2021, if you start the system server without restoring a database first, a blank database is created, page 30.

Prerequisites

The following are prerequisites for performing the migration process:

- You have an up-to-date backup file (.mdbk) of each database that you want to migrate, which was created before installing the upgrade, page 61.
- You have installed the version 2021 system server.
- You have re-installed, page 65 in Control Expert the DTMs and type library that are used in Control Participant projects of systems contained in the database that you want to migrate.

Migrating Supervision Data

When the software upgrade contains a new version of the Supervision Participant, a Supervision Participant migration window may open on top of the **Plant SCADA Studio** and **Graphics Builder** windows when Supervision data (for example, included projects or pages) is migrated to the new version.

The migration window opens even if systems that you are migrating as part of your database contain no Supervision project.

Depending on the Supervision data that is migrated, you may be required to interact with one or more dialog boxes to complete the migration process.

Avoid clicking **Cancel** in a dialog box related to included projects of a Schneider Electric library because you will have to upgrade these included projects to the new Supervision Participant version by retrieving them from the content repository, upgrading them externally, and adding them back to the content repository by editing a genie facet. For external included projects that you had added, you will have to upgrade them and add them to the Supervision project by using the **Include Projects** command.

Upgrading Supervision data while refining the Supervision project or after deploying it applies only to this Supervision project and does not update the included projects in the content repository.

Migrating Supervision data of databases of EcoStruxure Hybrid DCS 2018/R2 and earlier takes time.

> **NOTE:** Dialog boxes may open in the background if the **Plant SCADA Studio** window has the focus. Bringing the **Graphics Builder** window to the foreground allows showing any open dialog box and interacting with it.

The following table describes some examples in which a dialog box opens during the migration of a database, which requires some interaction.

Scenario	User action
Missing link to graphical object. For example, a graphic or logo has been added to one or more Supervision pages.	You are prompted if you want to keep the link and in such case, you need to select the location of the graphical object.
Connection to a driver that is not part of the Supervision Participant by default. For example, a segment library that uses the ODBC driver has been installed and instances thereof are used in the Supervision project.	An information dialog box opens, which you need to acknowledge.

Completing the Migration on a Different Computer

If you have installed the system server upgrade on another computer than the one on which you have created the database backup file, confirm that the system server can access the file over the network or transfer it manually from the other computer.

> **NOTE:** Confirm that the **Read-only** attribute of the folder containing the database backup file is cleared by right-clicking the folder and selecting **Properties**.

Migrating the Database of the Earlier Version

Step	Action
1	Back up the database that is mounted by using the **Back Up Database** command, page 118 in the system server console or tray icon. A database is mounted, page 30 if you have restored one and/or already started the version 2021 system server.
2	Mount the database that you want to migrate by clicking **Database** > **Restore Database** in the system server console or tray icon. In the **Open** dialog box, select .mdbk in the file type menu. **NOTE:** The command may be impacted if the system server auto-start functionality is enabled, page 122.
3	Start the system server, page 127. **Result**: The migration of the database is performed. During this process, the **EcoStruxure Process Expert 2021 Migration** Supervision Participant window opens and may require user-interaction for migration to complete successfully.
4	Wait until **Server is ready** appears in the console. **Result**: The server is running and the database has been migrated to the current software version, which is indicated in brackets.

Migration Log Files

The software creates several log files when you migrate a database, which contain information about the migrated objects and detected errors.

The name of the log files is *migration_YYYY-MM-DD_HH-MM-SS.log* where *YYYY-MM-DD_HH-MM-SS* represents the date and time when the log file was created.

The software creates log files at the following locations:

- For the database that you have migrated, in the GLOBAL folder.
- For each system contained in the migrated database, in the System_n.

Both folders are located at the path C:\ProgramData\Schneider Electric\Process Expert X\Db where *X* corresponds to the version of the software that you are using.

NOTE: Systems that appear in the Db database folder keep their default name (*System_n*) even if you rename them in the **Systems Explorer**.

Managing Databases

Database backups that the software creates when you restore databases can use up a lot of disk space. Manage these folders regularly to recover disk space.

Impact of Migration On System Data

Overview

This topic describes the impact that database migration has on data of systems.

It describes in particular, the changes that result of new Participant features and that are available in the migrated database. These changes may require user intervention to be fully integrated in existing systems.

After Migrating Databases

Migrated Control Participant projects may not function properly after a migration.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Verify that any built Control Participant projects that are contained in a migrated database function properly before deploying them to controllers.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

After migration of the database is completed, you need to deploy the executable of a built Control Participant project to its respective engine again by using the **Deploy Built Project** command if the link status that is displayed in the status bar of the Control Participant indicates **DIFFERENT**. Deploying executables requires stopping the controller.

To view the link status, use the **Refine Online** command in the **Topology Explorer**, which opens the Control Participant window. The figure shows a partial view of the status bar.

1 Link status

The table describes the various states of Control project executables that can result of a migration and the actions you can to take in each case.

Executable status before migration	Executable status after migration	Next actions
Built	**Out Of Date**	If before migration, the built Control project was: • Deployed: You can use the **Build** or **Build All** command and deploy changes(1) or deploy it again depending on the change that you have made. • Not deployed: You can use the **Build** or **Build All** command depending on the change that you have made and deploy it.
Out Of Date		
Not Built	**Not Built**	Use the **Build** or **Build All** command and deploy it.
(1) Online refinement, deployment of changes, and redeploying the last project is not possible if the link status that is indicated in the status bar of the Control Participant is **DIFFERENT**.		

The table describes the various states of Supervision project executables that can result of a migration and the actions you need to take in each case.

Executable status before migration	Executable status after migration	Next actions
Built	**Out Of Date**	If before migration, the built Supervision project was: • Deployed: Use the **Build All** command(2). There is no need to deploy the project again to the same Supervision station nodes(1). • Not deployed: Use the **Build All** command(2) and deploy it.
Out Of Date	**Out Of Date**	Independently if the built Supervision project was deployed or not, use the **Build All** command(2) and deploy it.
Not Built	**Not Built**	Use the **Build** or **Build All** command(2) and deploy it.
(1) Supervision software installed on station nodes needs to be upgraded to meet the software requirements. Deployed Supervision projects need to be compiled locally. **(2)** Building a Supervision project will not complete successfully if the identifier of any cluster exceeds 16 characters in length. If this is the case, rename such clusters and generate any impacted Supervision project before building it.		

Locking Code of Control Projects after Migration

After you have migrated a Process Expert V4.3/SP1 database containing Control projects, it is recommended to perform a consistency check to enable the code locking feature.

This feature lets you distinguish code that is generated by the software from code that you have modified or added during refinement.

NOTE: Code may become locked without performing a consistency check depending on the status of Control facets or if you regenerate a Control project.

First Deployment or Execution Actions With a Migrated Database

The first time you use the **Deploy Changes / Undo Online Changes** or **Refine Online** command after migrating a Process Expert V4.3/SP1 database, the operation may take more time than usual because of file format conversions taking place in the background. This is part of the migration process and is indicated in the notification panel.

Availability of New Functionality in Migrated Databases

The table describes the availability of the main new features of the upgrade when you migrate a database.

Functionality	Availability in migrated database
Scheduler for system backups	The functionality (see EcoStruxure™ Process Expert, User Guide), which lets you automate the backup of systems is readily available from the context menu of the system server console or tray icon.
System and Global Template passwords	The setting in the new **Control Passwords** section, page 109 of the **System Server Configuration Wizard** is available and passwords can be set. However, the passwords (which are used as application passwords for Control Participant projects and Control constituents in Control facet templates) and file encryption are not supported by all templates in databases of versions 2020 R2 and earlier, page 111.
Simplified system engineering workflow	Several new context menu commands and a Control project generation setting (see EcoStruxure™ Process Expert, User Guide) are readily available in the **Projects Explorer**. They allow you to complete the system engineering life cycle faster. This simplified workflow (see EcoStruxure™ Process Expert, User Guide) encompasses the creation of instances as well as the assignment and generation of their Control facets. It should be used to implement small changes in an existing system.
New peer to peer communication configuration (see EcoStruxure™ Process Expert, User Guide)	The new peer to peer communication configuration functionality is available only for certain Controller platforms and requires a minimum firmware version for the CPU of the local controller. Once the controllers of the topology of your system satisfy the prerequisites, the functionality is readily available from the **Project Explorer**.
Multiple Controller simulator instances (see EcoStruxure™ Process Expert, User Guide)	To be able to use multiple Controller simulator instances, you need to import the *$UnityPro* template version 1.0.2 in the Global Templates library. This template is located in the Foundation.sbk, page 57 template archive. Once imported, it lets you assign a different communication port to each Controller simulator instance, which is represented by a Control Expert service of the station node.
Selecting Supervision page templates	The functionality is readily available from the settings (see EcoStruxure™ Process Expert, User Guide) of each Supervision project. Two default page templates are available. You can create additional page templates and add them.
Starting the supervision runtime from engineering clients	The command to launch the Supervision runtime (see EcoStruxure™ Process Expert, Supervision Participant Services, User Guide) on the local computer from an engineering client is readily available. You can use the command from the toolbar of the client or the context menu of a Supervision executable given the prerequisites are fulfilled.
Export and import of I/O devices to/from CSV file	The functionality (see EcoStruxure™ Process Expert, User Guide) is readily available from the context menu of the system root folder in the **Topology Explorer**.
Global Template wizard (see EcoStruxure™ Process Expert, Global Templates Reference Manual)	The new Global Template wizard is readily available from the **Global Templates Explorer**. It lets you create a functional application control module template with Control and/or Supervision functionality in a few steps. A detailed template creation example illustrates the description of the functionality of the wizard.
Global Templates domain enhancements	The various enhancements related to commands and context menus are readily available from the **Global Templates Explorer** and in Global Template Editors.
System documentation	The functionality to generate a report (see EcoStruxure™ Process Expert, User Guide) containing engineering information of your systems or parts of them is readily available from the **System Explorer** toolbar.

Installing the Software Upgrade

Overview

This section describes how to upgrade a system infrastructure of a supported earlier version.

Installing the Software Upgrade

Overview

Install the upgrade on computers that have the following roles, page 18 because all components of a same system infrastructure need to be of the same version:

- System server.
- Operation server (Supervision): Only if a system server, engineering client, or operation client is installed.
- Engineering station.
- Operator station (Supervision): Only if an operation and/or engineering client is installed.

You can add and/or remove roles during installation.

A restart of the computer is required to complete the installation process.

Identifying a Software Component Version

The version of an installed component is indicated in the **Installed Software** section of the **General** tab of the **About EcoStruxure Process Expert** dialog box (see EcoStruxure™ Process Expert, User Guide).

For information on how to identify the components of earlier software versions, refer to this topic in their respective installation guides.

Installation Procedure

You can upgrade a supported earlier version only when the system server is not running.

NOTICE

LOSS OF COMMUNICATION

Stop the system server only when no client is running.

Failure to follow these instructions can result in unresponsive clients.

NOTICE

LOSS OF DATA

Back up the database before installing a software upgrade.

Failure to follow these instructions can result in loss of database or unusable systems.

The following tables describe the procedure to install the software upgrade on the computer.

Steps to start the EcoStruxure Process Expert installation.

Step	Action
1	Verify that the system and installation requirements, page 20 are fulfilled.
2	If you had customized any setting in one of the configuration wizards, page 100, write down the modifications because you need to make them again after the installation of the upgrade is completed (for example, the system server IP address).
3	If you want to retain the HTML help of templates that you have used with version 2018 and later, you need to copy the corresponding help files before proceeding with the upgrade. Without this step, the help of version 2018 and later is replaced by the help of the upgrade. For details, refer to *Using Help for Different Versions of Schneider Electric Templates* in the *User Guide* of version 2018 or later.
4	Back up the mounted database, page 123 and/or prepare for migration the databases, page 61 that you want to continue using.
5	Verify that the installed components are not running.
6	Quit other Schneider Electric applications that are running.
7	Temporarily disable antivirus services (real time, scripting, and so on) running on the computer.
8	Extract the files of the installation package to disk or mount the image (.iso).
9	Double-click the setup.exe file located in the root of the installation package of the upgrade. **Result:** The installation procedure starts and looks for installed components to upgrade and/or remove.
10	Accept the End User License Agreement (EULA).
11	In the **Station Role** dialog box, the components of the earlier version that are not installed on the computer are crossed out. The other components, page 31 are upgraded by the installer. Modify the component selection as needed: **NOTE:** Deselecting the **Floating License Manager** does not remove the installed version, page 31; it remains on the computer but it is not upgraded. If an earlier version of the **Floating License Manager** is installed on the computer, you need to select the check box and accept to upgrade it so that the installation process can continue.

Step	Action
12	Click **Next** and follow the instructions on screen..
13	if you selected to upgrade the system sever component, in the **Authentication Settings** dialog box, you can modify the settings for role based access control, page 78.

Steps to install Control Expert.

NOTE:

- If you cancel the installation of Control Expert, the installation of EcoStruxure Process Expert continues. However, Control Expert is required for the software to function correctly.
- To cancel the installation of the software while the installation of Control Expert is in progress, first cancel the installation of Control Expert.

Step	Action
1	The Control Expert release notes do not open from the installer. Open the Control Expert readme and release notes from the ReleaseNotesAndUGs folder of the software installation package.
2	Accept the End User License Agreement (EULA).
3	You can select the Control Expert installation path, the setup type, and optional components. You can make changes after installation completes by restarting the installation of Control Expert by using its installer, which is located in the ESx_System_ 2021 folder of the installation package.
4	If you do not want to install SESU, page 30, choose the **Custom** Control Expert installation mode and select not to install it.
5	Click **Install** to start the installation. **NOTE:** Do not click **Yes** to restart the computer at the end of the Control Expert installation. Otherwise, the installation of EcoStruxure Process Expert is interrupted and must be restarted.
6	After Control Expert is installed or if the appropriate version, page 30 is already present on the computer, a Control Expert hotfix is installed. Click **OK** in the **Hotfix Installation Result** dialog box to resume the installation.
7	The installation of EcoStruxure Process Expert continues.

Steps to install AVEVA Plant SCADA.

Step	Action
1	Accept the End User License Agreement (EULA).
2	In the computer role window, select **Development Workstation**; otherwise, Supervision Participant services will not be available.
3	In the component selection window, keep the default selection. **NOTE:** • If you do not want to install SESU, page 30, clear its check box. • If you need to install the Floating License Manager (FLM), clear the check box if you had selected it in the **Station Role** window of the EcoStruxure Process Expert installer at the beginning of the installation procedure. Otherwise, if you install it, use the default port settings. • The AVEVA Enterprise License Manager and License Server are not required with EcoStruxure Process Expert.
4	In the **Access Restriction** window, select to add the current Windows user if required. **NOTE:** The access control for AVEVA Plant SCADA is different from the role-based access control, page 78 of EcoStruxure Process Expert.
5	You can change the default installation path.
6	Click **Install** to start the installation.
7	In the **Select Drivers** window, select the required drivers, page 45.
8	Do not restart the computer when prompted by the AVEVA Plant SCADA installer: • After the installation of the *Sentinel System Driver*. • In the **AVEVA Plant SCADA Setup Summary** window, do not select the following check boxes: ◦ Launch the AVEVA Configurator ◦ Restart the machine for the changes to take effect Otherwise, incorrect settings may be applied and the EcoStruxure Process Expert installation is interrupted and must be restarted.
9	Click **Finish** to exit the AVEVA Plant SCADA installer. **Result**: the installation of EcoStruxure Process Expert continues.

Steps to install Advantys configuration software, licensing software, ProSoft Configurator for Modicon and IEC 61850 Configuration Tool depending on the EcoStruxure Process Expert components that you are installing and your selection in the **Station Role** dialog box, and complete the installation of EcoStruxure Process Expert.

Step	Action
1	The installer installs Advantys configuration software.
2	The installer installs Schneider Electric licensing software. **NOTE:** If an earlier version of the **License Manager** is installed on the computer, you need to accept to upgrade it so that the installation process can continue.
3	The installer installs ProSoft Configurator for Modicon.
4	If you are installing IEC 61850 Configuration Tool, you need to import the certificate, page 42.
5	Click **Finish** to exit the EcoStruxure Process Expert installer.
6	Restart the computer when prompted to complete the entire installation process.
7	Repeat the entire procedure on each computer of the EcoStruxure Process Expert system infrastructure on which the upgrade is required, page 73.
8	Install, page 43 the following on each computer on which Control Expert is installed: • DTMs for specific devices and modules • Type libraries for the GPL and specific modules Use the installation files located in the ESx_System_2021\PXM_PRM_GSD_PsxGPL for Control Expert folder of the installation package. **NOTE:** This step is not required on a computer on which only the operation client is installed.

NOTE: If messages about detected errors are displayed during the upgrade, refer to the topic about troubleshooting installation, page 139.

Role-Based Access Control

Overview

This chapter describes role-based access control and how to set it up in the EcoStruxure Process Expert system infrastructure.

About Role Based Access Control

Overview

The objective of role-based access control (RBAC) is to administer the tasks that authorized users can perform by assigning them predefined roles.

Roles are associated to groups, which are created either in the operating system of the system server computer or in a domain controller. Users need to be added to these groups and must log in to the various EcoStruxure Process Expert components to be authenticated.

You must have administrator rights on the computer to set up RBAC.

NOTE: If you had set up RBAC for an earlier version of the software, your configuration remains valid when you upgrade.

Working Principle

The following figure illustrates the implementation of RBAC with local authentication. Each user has a different role and is a member of the corresponding group. The user accounts and groups are created on the system server computer.

The following figure illustrates the implementation of RBAC with domain authentication. Each user has a different role and is a member of the corresponding group. The user accounts and groups are created on the domain controller.

RBAC Setup Workflow for Local Authentication

The table outlines the steps that you need to complete if you want users to be authenticated locally on the computer running the system server.

Stage	Description
1	During installation or upgrade of the system server, select to authenticate users locally. The software automatically creates a group for each predefined role in the operating system of the local computer.
2	Complete the installation of the software.
3	If required, create a user account on the computer running the system server for each user who is authorized to use a component of the EcoStruxure Process Expert system infrastructure (system server, engineering client, operation client).
4	Add each authorized user to one or more groups depending on the tasks to be performed.

RBAC Setup Workflow for Domain Authentication

The table outlines the steps that you need to complete if you want users to be authenticated on a domain to which the computer running the system server is joined.

Stage	Description
1	During installation or upgrade of the system server, select to authenticate users on a domain.
2	Complete the installation of the software.
3	On the Active Directory® domain controller: • Create a group for each predefined role. The creation of the groups can be automated by running the supplied software tool. • If required, create a user account for each user who is authorized to use a component of the EcoStruxure Process Expert system infrastructure (system server, engineering client, operation client). • Add each authorized user to one or more groups depending on the tasks to be performed.

Roles

The following roles are defined to cover all the tasks that one can perform with EcoStruxure Process Expert.

Any logged-in user, independently of their group membership, can access the user, about, and/or help menus of a component. These menus are also accessible when no user is logged in.

Role name	Permissions
ESX HDCS Server Admin	Full access to the menu bar of the system server console and its commands. No access to client functionality.
ESX HDCS Engineer(1)	Perform tasks on the engineering client that are directly related to systems. No access to: • System server commands in the server console (the server console can be opened and locked). • Operation client functionality • **Global Templates Explorer** • **Global Root** folder, its subfolders, and the corresponding context menu commands in the **Content Repository** explorer
ESX HDCS Template Designer(1)	Perform tasks on the engineering client that are directly related to Global Templates and not a system. No access to: • System server commands in the server console (the server console can be opened and locked). • Operation client functionality • Explorers other than **Global Templates Explorer** and **Content Repository** explorer • **Systems** folder, its subfolders, and the corresponding context menu commands in the **Content Repository** explorer • **Inspect > External References** context menu command of a template in the **Global Templates Explorer**.
ESX HDCS Operator	Full access to the functionality of the operation client only. No access to: • System server commands in the server console (the server console can be opened and locked). • Engineering client functionality
(1) Both roles combined give full access to the functionality of the engineering client.	

After logging in, you can view which roles are assigned to you in the **User Information** dialog box, page 82.

Groups

For each predefined role, a corresponding group must exist either locally in the operating system of the computer running the system server or in the Active Directory® domain controller, depending on the selected authentication type. Users need to be added to these groups. A user who does not belong to one of the groups cannot log in to the software.

You can create the required groups automatically, page 85 or manually. If you had not created all the groups manually, you can add the others automatically as well.

If you create the groups manually, their name must be identical to the role name, page 81 and respect the case.

Groups can be removed manually only. Uninstalling the software does not remove the groups that were created automatically.

When adding users to a group, consider the following:

- Only individual users are allowed in each group. Users that belong to child groups cannot log in to the software.
- A user can belong to more than one group.
- If a user is added to a new group or removed from a group while the user is logged in to the software, the change takes effect only after the user logs off.

Windows® User Accounts

The computer on which users must have a Windows® account to be able to log in to EcoStruxure Process Expert depends on the authentication type that you select.

Authentication type	Computer on which the user account must exist
Domain	Domain controller
Local	Computer running the system server

Authentication Type

You can select whether the system server validates the credentials of users who log in either locally on the computer running the system server or on a domain that you specify.

The selection is made initially during the installation of the system server but can be viewed and modified by either method:

- By using the **Repair** or **Modify** functionality, page 131.
- By using the **System Server Configuration Wizard**, **Authentication** section, page 118.

User Information

The **User Information** dialog box contains the following information about the user who is logged in:

- Username and full name.
- The name of the computer running the system server of this EcoStruxure Process Expert infrastructure.
- Roles assigned to the user and their description.

You can open the dialog box from the user menu in the toolbar of each software component.

Logging In and Out and Locking the Software

The use of RBAC requires that users log in to a component before they can use it.

The software implements the single login and logout mechanism when opening several components on the same computer.

A logged-in user can lock the components that are open on the computer and only the same user can unlock them.

For details, refer to the topic describing how to log in and out (see EcoStruxure™ Process Expert, User Guide) and lock (see EcoStruxure™ Process Expert, User Guide) software components.

Setting Up Role Based Access Control

RBAC Authentication Settings

The following figure shows an example of the dialog box that appears when you install the system server or modify/repair an existing installation of the system server.

Item	Description
1	Lets you select where the system server validates the credentials of users who log in: • **Local**: On the computer running the system server. • **Domain**: On the Active Directory® domain controller.
2	You must enter the name of the domain if you have selected the domain authentication.
3	Click to verify if the domain controller of the selected domain is accessible (optional). A dialog box informs you of the result.

NOTE: You can view and change the authentication type and domain settings also in the **System Server Configuration Wizard**, **Authentication** section, page 118.

Creating Groups by Using the Software Tool

Follow this procedure to create groups if you have:

- Selected the **Domain** authentication type.
- Created only some groups (manually) and want to create the others.

Using the software tool facilitates the creation of groups with the correct name so that they are valid.

Step	Action
1	Copy the Domain folder to the domain controller computer. The folder is located at the path ProgramFiles64Folder\Utilities\Roles Manager starting from the root of the installation package (.iso).
2	Double-click Domain.bat. **Result**: A group for each role is created on the local computer. **NOTE:** Right-click the file and select **Run as administrator** if the groups were not created the first time.

Securing Client/Server Communication

Overview

This chapter describes how to generate and install digital certificates that are required to use EcoStruxure Process Expert.

About Using Digital Certificates

Overview

The software implements a public key infrastructure (PKI) based on the X.509 standard. It uses a Schneider Electric self-signed certification authority (CA) to create root and entity certificates to help secure client/server communication in the EcoStruxure Process Expert system infrastructure, page 14.

You may be able to use your own CA and root certificate.

Certificates are verified and must be validated successfully at these times:

- For the system server: During server start.
- For clients: During the attempt to connect to the system server.

In a distributed infrastructure, a client can connect to the system server only if their respective certificates are issued and signed by the same root CA.

The use of digital certificates is mandatory.

> **NOTE:** If you had generated and/or installed certificates for an earlier version of the software, they remain valid when you upgrade it given that they are not expired.
>
> If you have modified the role of a station, page 90 during the upgrade, you may need to install new certificates.

The following figure illustrates the working principle of the PKI in a distributed system infrastructure.

Certificate Installation Workflow - Distributed System Infrastructure

The table outlines the steps that you need to complete to install certificates in order to use the software when the various components are installed on different computers.

Stage	Description
1	On the system server computer, generation of a password-protected root CA certificate, page 91 by a user with administrator rights. This step is performed by using the **System Server Configuration Wizard**. This also installs a set of entity certificates on this computer, which is required for the system server to run. **NOTE:** If you want to use your own root certificate file (.pfx), you need to select to install only certificates, page 92 in the **System Server Configuration Wizard**.
2	On each computer of the EcoStruxure Process Expert system infrastructure, installation of a set of entity certificates, page 94 by a user with administrator rights, who knows the root CA certificate file location and password. This step is performed by using any client configuration wizard. This also installs the root CA certificate on each computer.

Certificate Installation Workflow - All in One Architecture

The table outlines the steps that you need to complete to install certificates in order to use the software when all the components are installed on the same computer.

Stage	Description
1	Generation of a password-protected root CA certificate, page 91 by a user with administrator rights. This step is performed by using the **System Server Configuration Wizard**. This also installs a set of entity certificates on this computer. **NOTE:** If you want to use your own root certificate file (.pfx), you can select to install only certificates in the **System Server Configuration Wizard**.

Recommendations

The following are recommendations related to the expiration of certificates.

Certificate	Recommendations
Root CA certificate	Stop using the software as soon as you receive a notification about the upcoming expiration of a certificate and install new certificates. If you keep using the software after certificates have expired, software Participant services (for example, refinement) or runtime navigation services may not function properly.
Entity certificates	

The following are recommendations for sharing the root CA certificate file (.pfx) to make it accessible to computers of a distributed EcoStruxure Process Expert infrastructure when you install entity certificates.

Sharing method	Recommendations
A shared folder	Restrict access permissions so that only the user who needs to install entity certificates on the computer can access the folder.
	Once entity certificates are installed, disable folder sharing.
A removable drive	Once entity certificates are installed, remove the drive.
	Do not use the drive for another purpose and keep it in a safe place.

The following are recommendations for the validity period of entity certificates.

Process Expert component usage	Recommendations
Normal use	Use the default validity period or shorter.
Temporary or occasional use	Limit the validity to one day.

NOTE: Once you have generated a certificate, you cannot modify its validity period. To change it, you need to generate a new certificate.

Certificate Properties

Certificates are installed on a machine basis and are valid for all users who can use EcoStruxure Process Expert.

You can check whether root CA and entity certificates are installed on the local computer and view information about these certificates in the **Microsoft® Management Console** (in a Windows® 10 operating system, use the *certlm.msc* service of the local computer).

The following set of entity certificates is generated on each machine and can be found under **Personal\Certificates**:

- System server: *EcoStruxure Hybrid DCS Server*
- Engineering client: *EcoStruxure Hybrid DCS Engineering Client*
- Operation client: *EcoStruxure Hybrid DCS Operation Client*

They are issued by *EcoStruxure Hybrid DCS Root*, which is the root CA certificate generated by EcoStruxure Process Expert and located in **Trusted Root Certification Authorities\Certificates**.

Modifying the Software Installation

After you have installed entity certificates on a computer, if you install a new client on this computer, you do not need to install an additional entity certificate.

However, if only clients are installed and you add the system server, you need to install new certificates by using the **System Server Configuration Wizard**. You can reuse the same root CA (.pfx) that you had used to install entity certificates for the clients.

Generating and Installing Root CA Certificates

Overview

The **Security** section of the **System Server Configuration Wizard** lets you generate a root certificate and private key on the computer on which the system server is installed. Both are stored in a single file (.pfx) that is created in a location that you select.

The default name of the root CA is *EcoStruxure Hybrid DCS Root*.

This operation also generates a set of entity certificates and installs the root CA certificate along with the set of entity certificates on the computer so that you can start the system server.

NOTE: Only root certificate files with the .pfx extension are supported,

Prerequisites

- You must have installed the system server.
- Any EcoStruxure Process Expert component installed on the computer must not be running.

Accessing the System Server Configuration Wizard

To open the **System Server Configuration Wizard**, click:

- In the system server console menu bar, **Settings > Basic**.
- In the system server tray icon context menu, **Basic Settings**.

Security Section Description

The following figure shows the **Security section** of the **System Server Configuration Wizard** when you select to generate and install the root CA and entity certificates.

Item	Description
1	• **Generate and Install Certificates** generates and installs both the root CA and a set of entity certificates on the computer. • **Install Certificates** installs only a set of entity certificates on the computer by using an existing root CA certificate, which must be accessible from the computer, page 89. The fields that are displayed depend on the selection.
2	• When you select **Generate and Install Certificates** for the first time or after uninstalling certificates, contains the full path to the default root CA certificate file that you are creating. The path is C:\Users\<username>\AppData\Local\Schneider Electric\Process Expert\Certificates. You can edit the full path but the path must exist and you must use the .pfx extension for the file name. You can create the file at a different location on the local computer, a network location shared, page 89 with all computers running a EcoStruxure Process Expert component (for example, the system server, the engineering client), or on a removable drive (for example, a USB drive). • When you select **Install Certificates**, the field is empty. You must enter the full path or browse to an existing root CA certificate file (.pfx).
3	• When you select **Generate and Install Certificates**, you must create and confirm a password. Hovering with the pointer over the text field shows a tooltip containing the applicable password rules. It is possible to generate different root certificate files by using the same password. **NOTE:** You will need this password to generate entity certificates on other computers of a distributed EcoStruxure Process Expert system infrastructure. • When you select **Install Certificates**, you must enter the password that was used to generate the root CA certificate. If you have forgotten the password, you need to generate a new root CA certificate.

Item	Description
4	• When you select **Generate and Install Certificates**, expiration date of the root CA and entity certificates. You can edit the field. • When you select **Install Certificates**, enter the expiration date of the entity certificates. 15 days before the expiration date (see EcoStruxure™ Process Expert, User Guide) and at 24-hour intervals thereafter, a notification about the upcoming certificate expiration is shown: • For the system server certificate: In the server console (only when the server is starting) and in clients that are connected to the server. • For client certificates: In the client when it is starting or running. After this date, a new root CA certificate and/or new entity certificates need to be installed.
5	Depending on your selection, button to proceed with: • The generation and installation of the CA root and the set of entity certificates on the computer. • The installation of the CA root and the set of entity certificates on the computer.
6	Button to uninstall root and entity certificates, page 98 from the computer.
7	Once you have successfully installed certificates on the computer, the fields display the corresponding information. If no certificates are installed on the computer or if the operation did not succeed, the fields are empty.

Generating and Installing Root CA and Entity Certificates on the System Server Computer

To install only entity certificates on the computer, refer to the corresponding procedure, page 94.

Step	Action
1	Open the **System Server Configuration Wizard**. **Result**: The **Security** section is displayed.
2	Select **Generate and Install Certificates**.
3	Modify the path and/or file name if required. You can create only files with the .pfx extension. **NOTE:** You need to have read/write permissions for the folder containing the certificate file.
4	Enter and confirm a password.
5	Modify the expiration date, page 89 if needed. **NOTE:** Schneider Electric recommends that you do not extend the validity period.
6	Click **Generate and Install**. **Result**: • The root CA certificate file is created at the selected location. • A set of entity certificates is installed on the computer. If you are using an all-in-one architecture, the certificate installation process is complete. • The fields of the **Installed System Server Certificates** section are populated. **NOTE:** If the **Certificate Import Wizard** dialog box opens, you can click **No** to preserve your current Certificate Revocation List (CRL). Clicking either button has no impact on the PKI functionality for EcoStruxure Process Expert. Certificate revocation is currently not supported.
7	If you are using the **System Server Configuration Wizard** only to generate and/or install certificates, you can close the window by clicking the close button or **Cancel**.

Installing Entity Certificates

Overview

You must install a set of entity certificates, page 89 on each computer of a distributed EcoStruxure Process Expert system infrastructure so that clients can connect to the system server. This applies also when using an all-in-one architecture.

All entity certificates of a same system infrastructure must be issued and signed by the same root CA.

You can test the client/server connection to verify certificate validity.

Prerequisites

- You must have installed the system server and clients. The component on which you want to install entity certificates must not be running.
- You must have generated a root CA certificate, page 91 by using the **System Server Configuration Wizard** or posses your own root certificate file with . pfx extension.
- The folder containing the root certificate file must be accessible from the computer on which the component is installed.

Connecting Clients to Several System Servers Having Different Certificates Installed

If you need to connect a client to several system servers each possessing entity certificates issued by a different root CA, you need to install in the client as many sets of entity certificates as there are system servers. Each set of client entity certificate is generated by using the same root CA as the one used to generate the entity certificates on the system server computer.

Opening Client Configuration Wizards

Step	Action
1	Verify that clients are closed.
2	In the Windows® Start menu, click **EcoStruxure Process Expert**.
3	Click the **Configuration Wizard** entry of any component.
4	Go to the **Security** section.

Security Section Description

The following figure shows the **Security** section of the **Engineering Client Configuration Wizard**. The section is available also in the configuration wizards of the operation client and system server, page 92.

Item	Description
1	Full path of the root CA certificate file. Once you have successfully generated entity certificates, the last full path that you have entered is retained when you open the same configuration wizard again.
2	Enter the password that was used to generate the root CA certificate. **NOTE:** If you have forgotten the password, you need to generate a new root CA certificate.
3	Expiration date of the set of entity certificates that are installed on the computer. 15 days before the expiration date (see EcoStruxure™ Process Expert, User Guide), a notification about the upcoming certificate expiration is shown. From then on, you are notified at 24-hour intervals. The expiration notification is displayed in clients that are starting or running. In a distributed EcoStruxure Process Expert system infrastructure, the upcoming expiration of the system server certificate is shown in clients that are connected to this server. After this date, the next time a client attempts to connect to the system server, the entity certificates are considered invalid. A new set of certificates needs to be installed. **NOTE:** The expiration date cannot exceed the expiration date of the root certificate.
4	Button to proceed with the installation of the root CA and the set of entity certificates on the computer.
5	Button to uninstall root and entity certificates, page 98 from the local computer.
6	Once you have successfully installed certificates on the computer, the fields display the corresponding information. If no certificates are installed on the computer or if the operation did not succeed, the fields are empty.

Installing Entity Certificates

Step	Action
1	Verify that the EcoStruxure Process Expert components installed on the computer are not running. If you are installing entity certificates for a system server, verify that clients that connect to it are not running.
2	Open the **Security** section of the configuration wizard of the component installed on the computer. **NOTE:** If you have installed several components (for example, an engineering client and an operation client) on the same computer, you need to install certificates once by using the configuration wizard of either of the installed components. If one of the installed components is the system server, you must use the **System Server Configuration Wizard**. It installs certificates for the clients as well.
3	Enter the full path of the root CA certificate file, page 92 with the .pfx extension.
4	Enter the password for the root CA certificate.
5	Modify the expiration date, page 89 if needed. **NOTE:** Schneider Electric recommends that you do not extend the validity period.
6	Click **Install**. **Result**: The set of entity certificates and the root CA certificates are installed in the local certificate store. **NOTE:** If the **Certificate Import Wizard** dialog box opens, you can click **No** to preserve your current Certificate Revocation List (CRL). Clicking either button has no impact on the PKI functionality for EcoStruxure Process Expert. Certificate revocation is currently not supported.
7	For clients that need to connect also to another system server, page 94, repeat the procedure and enter the full path and the password that corresponds to the root CA certificate used on the other system server computer.
8	If you are using the configuration wizard only to install certificates, you can close the window by clicking the close button or **Cancel**.

Verifying Certificate Validity

The **Test Certificates** button lets you verify if the certificate that is installed on the computer is valid for the system server to which the client is configured to connect, page 106. To perform the test, the computer running the system server must be reachable and the server running. If a connection can be established, the certificate is valid.

The button is located in the **System Server** section of the configuration wizard of the engineering and operation clients.

A notification informs you of the outcome of the test.

Uninstalling Certificates from the Computer

Overview

Uninstalling certificates deletes the EcoStruxure Process Expert root CA and entity certificates from the certificate store of the computer.

The root CA certificate file (.pfx) remains on the computer and can be reused to install new entity certificates.

Prerequisites

You can uninstall certificates from a computer only when the components installed on this computer are not running.

Uninstalling Certificates When Removing the Software

By default, when you remove, page 131 the software from the computer by using the installer or the **Change** command of the Windows® **Control Panel**, EcoStruxure Process Expert certificates remain in the certificate store of the computer.

If you reinstall the software or install a later version, these certificates are reused as long as they are still valid. You do not need to install new certificates.

Clear the **Preserve EcoStruxure Process Expert Security Certificates** check box to delete EcoStruxure Process Expert root CA and entity certificates from the certificate store.

The following figure shows a sample dialog box featuring this check box.

NOTE: When the root CA certificate file (.pfx) is no longer present, you can reinstall or modify the software on the same computers but you cannot renew entity certificates or install the software on different computers by using this root CA certificate.

Uninstalling Certificates from the Computer

Step	Action
1	Verify that the EcoStruxure Process Expert components installed on the computer are not running.
2	Open the configuration wizard of a component that is installed on the computer.
3	In the **Security** section, page 96, click **Uninstall**. **Result**: The EcoStruxure Process Expert certificates that were installed on the computer are deleted from the local certificate store.

Configuring the Software

Overview

This chapter describes how to configure the system server, clients, as well as Participants before starting the software for the first time and thereafter, when changes are required.

The configuration is performed by using the various sections of the configuration wizards.

Using Configuration Wizards

Overview

The following configuration wizards are available to facilitate the configuration of software components:

- **System Server Configuration Wizard**
- **Engineering Client Configuration Wizard**
- **Operation Client Configuration Wizard**

Each configuration wizard consists of several sections.

Configuration wizards are used for the initial configuration of the client/server architecture and later to adjust your settings if required. Starting a component without using its configuration wizard applies the default settings that are described in this chapter.

You can open the client configuration wizards through the start menu of Microsoft® Windows®. The system server configuration wizard is accessible only from the server console, page 117 or its tray icon. You must have the necessary permissions.

NOTE: Configure the system server first because the software provides means to take over server settings when configuring clients to speed up the configuration process.

Client/Server Configuration and User Accounts

The configuration of the system server and clients that is performed by using the corresponding configuration wizard is tied to the user account that is used to log on to the operating system of the computer. Configuration settings are stored in the local user folder.

When another user logs on to the computer for the first time, the person has to perform the necessary configuration.

If the configuration of the system server changes (for example, because another user has logged on to the computer running the system server, which has loaded the account-specific system server configuration), then the configuration of clients connecting to the server may change as well.

Configuration Wizard Sections

The **System Server Configuration Wizard** features the following sections.

Section	Description
Control Passwords	Used to enable password protection, page 109 at the system level and for Control facet templates of the Global Templates library.
Security	Used to generate the root CA certificate, install entity certificates, and uninstall certificates, page 86.
Authentication	Used to set up the authentication type, page 84 for role based access control (RBAC) for the EcoStruxure Process Expert system infrastructure.
Audit Trail	Used to enable and configure audit trail, page 112 for system engineering activities performed by users.
Hosting	Used to view and configure communication port, page 104 settings for connections with clients. Lets you also: • Configure the number of Control Participant sessions. • Set the system server startup mode, page 122.
Data Folders	Used to configure which templates and content containers, page 115 a blank database contains.

The **Engineering Client Configuration Wizard** and **Operation Client Configuration Wizard** feature the following sections.

Section	Description
System Server	Used to view and configure communication, page 104 settings for the connection with the system server.
Security	Used to install entity certificates and uninstall certificates, page 86.

Using Configuration Wizards

When the software is running and you make changes by using a configuration wizard, the changes are applied only when you restart it.

NOTICE
LOSS OF COMMUNICATION Stop the system server only when no client is running. **Failure to follow these instructions can result in unresponsive clients.**

NOTE: Quit a software component before making changes by using its configuration wizard.

To use a configuration wizard, proceed as follows. You must have the necessary permissions.

Step	Action
1	From the Microsoft® Windows® Start menu, click **EcoStruxure Process Expert** and one of the configuration wizards: • **Engineering Client Configuration Wizard** • **Operation Client Configuration Wizard** For the **System Server Configuration Wizard**, in the menu bar of system server console, click **Settings** > **Basic** (or **Basic Settings** in the tray icon context menu). The system server needs to be stopped. **Result:** The selected configuration wizard opens.
2	Verify the settings and/or make necessary changes in the various sections, page 102 of the configuration wizard as described further in this chapter. Clicking **Back** does not discard your changes.
3	Click **Save & Close**. **NOTE:** Click **Cancel** to discard changes and close the configuration wizard. You cannot cancel the creation of certificates, page 86.

Configuring the System Server and Clients

Overview

This topic describes the parameters that you can configure by using:

- The **Hosting** section for the system server:
  - The client/server communication port.
  - The file transfer port.
  - The number of Control Participant sessions.
  - The system server startup mode
- The **System Server** section for clients:
  - The client/server communication port.
  - The IP address of the system server.

This topic also describes the communication ports that are used by third-party software installed along with EcoStruxure Process Expert.

Communication Port Availability

Before using the system server and its clients, you need to verify that the ports configured by default are not already used on the computer on which the system server is installed.

In case one of these ports is used, you need to configure another port that is available.

To verify port usage on the computer, execute `netstat -a -b` at a command prompt. The command returns a list of ports that are being used and the corresponding application.

Hosting Section

The table describes the parameters that you can configure in the **Hosting** section of the **System Server Configuration Wizard** window.

Parameter	Description	Default value
Port	Main TCP port that is used by engineering and operation clients to communicate with the system server to load data and execute user commands. **NOTE:** If you modify this value, you need to modify it also for each engineering and operation client that connects to the server.	9950 **NOTE:** The same value is configured by default for engineering and operation clients.
File transfer port	TCP port that is used to transfer files between clients, the system server, and software Participants. The port is automatically transferred to clients.	9951
CriticalMes-saging port	Port that is used to maintain a continuous communication link between the system server and clients. The port is used by the SystemServer.exe and HostAgent.exe processes. **NOTE:** If you modify this value, you need to modify it also for engineering and operation clients that connect to the server.	9949
Caché installation path	Installation path of the third-party software that manages the EcoStruxure Process Expert database.	C:\Program Files \InterSystems \STRUXURE-WAREPEv47
Control Participant Max Instances	Indicates the maximum number of Control Participant sessions that you can open simultaneously on each computer on which Control Expert is installed. Range: 4 to 20 **NOTE:** • The settings applies also for runtime navigation services when you install Control Expert on the computer running the operation client. • The number of sessions for Advantys is not configurable and limited to 1.	4
Server Startup Mode	Sets the *Startup Type* of the *SE-ServerManager-EcoStruxureProcessExpert* service on the computer on which the system server is installed. Possible values: • *Manual*: Requires that you use the **Start** command of the server console or system tray icon to start the system server once you are logged in. • *Auto*: Starts the system server automatically, page 122 when you restart the computer even if you are not logged in. A restart of the computer is required for the setting to take effect.	*Manual*

NOTE: Both ports accept connections from any IP address.

The table describes additional ports used by the system server.

Protocol	Port	Description
UDP	18080	Logging/display
UDP	18081	Logging

Server Parameters for Clients

The table describes the parameters that you can configure in the **System Server** section of the **Engineering Client Configuration Wizard** and **Operation Client Configuration Wizard** windows.

Parameter	Description	Default value
Host Name / IP Address	Name or IP address of the computer on which the system server is installed. For example, *Server_1* or *168.190.0.100*.	*Localhost*
Port	TCP port that is used for the client/server connection. **NOTE:** If you modify this value, you need to modify it also for the system server and any other engineering and operation client that connects to the same server.	9950 **NOTE:** The same value is configured by default for the system server.

NOTE: You can test the client/server connection by using the **Test Certificates** button. The system server must be running. A dialog box informs you of the outcome of the test. If you experience difficulties, refer to the troubleshooting topic, page 138.

System and Control Facet Template Password Overview

System Passwords

The following diagram shows how enabling the **Control application and facet template password protection** setting at the system server level enforces password management at the system level.

Settings and properties in bold are introduced in EcoStruxure Process Expert 2021.

Arrows indicate a user action.

(1) The property is enabled and read-only.

(2) The Control project that opens when you configure a controller also has the application password (with *<Password A> set)* and file encryption enabled.

(3) Setting a password is mandatory to perform deployment and execution operations.

(4) Formerly *Optional Security Services By Default* property of the system.

(5) The **Controller**/**Simulator** application password is not replaced by the system access password when you deploy the Control project. File encryption, however, is enabled in the deployed Control project.

NOTE: The properties to manage the application password and file encryption are disabled in the Control Participant (offline and online refinement).

NOTE: When the **Control application and facet template password protection** setting at the system server level is disabled, password management at the system level becomes optional.

For more information, refer to the topics describing how to:

- Enable the **Control application and facet template password protection** setting, page 109.
- Manage the **System Access Password** (see EcoStruxure™ Process Expert, User Guide).
- Manage the **Controller Access Password at Creation** property (see EcoStruxure™ Process Expert, User Guide).

Global Templates Password

The following diagram shows how enabling the **Control application and facet template password protection** setting at the system server level enforces password management at the template level.

The setting in bold is introduced in EcoStruxure Process Expert 2021.

The arrow indicates a user action.

NOTE: The properties to manage the application password and file encryption are disabled in the Control Participant.

NOTE: When the **Control application and facet template password protection** setting at the system server level is disabled, password management at the Global Template level becomes optional.

For more information, refer to the topic describing how to manage the **Control constituent application password** (see EcoStruxure™ Process Expert, User Guide) of Control facet templates.

Enabling Passwords of Systems and Control Facet Templates

Control Passwords Section

The **Control application and facet template password protection** setting lets you set a password for each system and for the Control facet templates of the Global Templates library.

These passwords are used respectively as:

- Application password of the Control Participant projects of the system.
- Application password of Control Participant STU files, which encapsulate Control logic in Control facet templates.

In addition, it enables file encryption of the Control Participant project files.

The setting configures the following properties:

- The **System Access Password** property (see EcoStruxure™ Process Expert, User Guide) of each system.
- The **Control constituent application password protection** setting (see EcoStruxure™ Process Expert, User Guide) of the Global Templates library.

Possible values:

- **Enabled**: Enables both properties and requires setting a password for each system and one for the Global Templates library.

  It also enables the **Controller Access Password at Creation** property of each system.

  The properties cannot be disabled independently anymore.
- **Disabled** (default): Disables the properties and clears passwords. File encryption is disabled. You can enable each property independently if you want to use it.

  NOTE: Disabling the setting may take time, page 110.

Changing the value of the setting requires restarting the system server to apply the change and takes about an additional 45 min. to complete with the Schneider Electric Global Templates library. More time is required for the restart if you have installed additional libraries and/or templates.

Enabling the Control application and facet template password protection Setting

If the **Control application and facet template password protection** setting is enabled, you must set the **Control constituent application password** password when you start the system server in either situation:

- You start it for the first time after enabling the setting.
- You start it with a blank database.
- You start it after having restored a database for the first time (.dbk or .mdk, page 111 database file).

This password (see EcoStruxure™ Process Expert, User Guide) is used as application password of Control Participant STU files, which encapsulate Control logic in Control facet templates.

In addition, you must set a **System Access Password** (see EcoStruxure™ Process Expert, User Guide) when you open a system for the first time.

NOTE: After you have entered password once, you are not required to enter it again until you close the engineering client or restart the system server.

Disabling the Control application and facet template password protection Setting

If you disable the **Control application and facet template password protection** setting (system server level), when you restart the system server, you must enter the following in the **Password Authentication** window:

- The **System Access Password** for each system.
- The **Control constituent application password** for the Global Templates library.

Otherwise, you cannot disable the setting. In such case (for example, if you have forgotten one of the passwords), you need to stop the system server, enable the setting, restart the server, manage the passwords from the engineering client, and start over.

Disabling the setting clears the system access password of each system and the Control constituent password of the Global Templates library.

NOTE: Disabling the **Control application and facet template password protection** setting (system server level) has also the following impact:

- Clears the application password of Control Participant projects of the system.
- Clears the application password of Control Participant STU files, which encapsulate Control logic in Control facet templates.
- Disables file encryption.

System Access Password and Control constituent application password protection When Restoring Databases

The following table describes the impact on system access and Control constituent application password protection when you restore a database.

Restored database	**Server on which database is restored**		
System Access Password and/or Control constituent application password protection settings	**Control application and facet template password protection setting (server level)**	**System Access Password and/or Control constituent application password protection settings after restoration**	**Comment**
Disabled	Disabled	Remain disabled	Password protection can be enabled after restoration.
	Enabled	Both are enabled	The Control facet template password must be entered during server start, page 109.
Enabled	Enabled	Remain enabled	The same passwords remain in effect.
	Disabled (has never been enabled)	Remain enabled	The same passwords remain in effect.
	Disabled (was disabled after being enabled)	Both are disabled	The system access and Control facet template passwords must be entered during server start., page 110

NOTE: When you restore a database, the state of the **Control application and facet template password protection** setting (server level) that was in effect at the time the backup was created is irrelevant.

Using the System and Global Templates Passwords With Migrated Databases

The system and Control facet template passwords are supported by templates of Schneider Electric General Purpose libraries 2021 and Segment libraries (available on the mySchneider Support Portal, page 6) released for EcoStruxure Process Expert 2021.

Schneider Electric and user-created templates of earlier versions may not support these passwords. Information about Control facet templates to which the application password could not be applied is shown in the system server console after you start the system server with the **Control application and facet template password protection** setting enabled and set the password. The information is also shown in the notification panel of engineering clients.

Contact Schneider Electric support, page 6 if you want to use the system and Control facet template passwords with a migrated database.

Configuring Audit Trail

This topic describes how to enable audit trail for user activities in EcoStruxure Process Expert and the parameters that you can configure when the system server is stopped.

Audit Trail Section

The following figure shows an example of the **Audit Trail** section.

Item	Description
1	When selected (true), the system server sends audit trail messages (see EcoStruxure™ Process Expert, User Guide) to the configured syslog server when the connection is established. Default value: Cleared (false)

The table describes the parameters of the **Syslog Server Settings** section.

Item	Description
Host Name/IP Address	Name or IP address of the computer on which the syslog server is installed.
Port	Port that is used for communication with the syslog server. Default value: 514 **NOTE:** The communication protocol that is used is TCP.
Retry Interval	Period (minutes) after which the system server tries to reconnect to the syslog server in case the connection was interrupted and could not be reestablished right away. The system server attempts to reconnect at these intervals until the connection is reestablished. Default value: 2
Test Connection	Click the button to verify if the system server is able to connect to the configured syslog server. A dialog box opens to inform you of the result.

NOTE: Click **Save & Close** in the last section to save your changes.

The table describes the parameters of the **Install Syslog Server Certificate** section.

Item	Description
Enable Security	When selected, the X.509 certificate that is installed is verified and must be validated when the system server connects to the syslog server. In addition the CN must match; otherwise, the connection is not allowed. When cleared, the connection with the syslog server is established as anonymous user without using the certificate. **NOTE:** When security is enabled, verify that secure communication is enabled for the syslog server before starting the EcoStruxure Process Expert system server; otherwise, the messages that the software sends are not legible in the syslog server application.
Certificate File	Click the browse button to select the X.509 certificate file (.pfx) that is generated by the syslog server.
Password	Password for the selected certificate file.
Syslog Server Certificate CN	Common name of the server. Required.
Install	Installs the selected certificate. If a certificate is already installed, it is removed. A dialog box opens after the operation completes and the information in the lower section is updated. **NOTE:** Once the installation is completed, closing the window or canceling does not remove the certificate.

The table describes the parameters of the **Installed Syslog Server Certificate** section.

Item	Description
Certificate File	Path to the file (.pfx) that was selected to install the certificate.
Valid Till	Validity of the installed certificate.

NOTE: To view information about the *EcoStruxure Hybrid DCS AuditTrail* certificate, open the **Microsoft® Management Console** (in a Windows® 10 operating system, use the *certlm.msc* service of the system server computer).

Managing Participant Extensions

Overview

Starting with version 2021, Participants are not installed in a virtual machine anymore but directly on the computer.

As a result, extensions, such as device type managers (DTMs), generic station description (GSD) files, and electronic data sheet (EDS) files, which are used to update the **Hardware Catalog** need to be installed, page 43 and removed by using the Control Participant on each computer of the EcoStruxure Process Expert infrastructure.

Configuring the Content of Blank Databases

Overview

The **Data Folders** section lets you configure which templates and content containers a blank database contains.

You need to configure the parameters before starting the system server, page 126 or using the **Create Blank Database** command, page 118.

> **NOTE:** After the blank database has been created, you can import additional templates (see EcoStruxure™ Process Expert, User Guide) and content containers (see EcoStruxure™ Process Expert, Runtime Navigation Services , User Guide).

Customizing Templates and Content Containers of Blank Databases

The folder whose path is configured by using the configurable database parameters must be reachable from the system server computer. The folder can contain one or more archive files, which can be located in subfolders.

To create a database that contains no templates and/or content containers, edit the path to point to an empty folder.

To add other templates and/or content containers in addition to those that are located at the default path, copy the corresponding archive files to this folder.

Configurable Database Parameters

The following figure shows a sample **Data Folders** section of the system server configuration wizard. In the path, *software name* includes the major version.

Item	Description
1	By default, path to the folder containing the template archive files, page 57 (.sbk) of a Schneider Electric library. Verify that the templates (.sbk) that you are adding are compatible, page 55 with this version of the software; otherwise, the system server may not start.
2	By default, path to the folder containing the content container archive files (.cbk) (see EcoStruxure™ Process Expert, Runtime Navigation Services , User Guide) that are extracted to disk during installation of the software. **NOTE:** Verify that the selected content containers match the templates that are installed in the database.

Starting the Software

Overview

This chapter describes the system server console and the various actions that you can perform by using its commands. It also describes how to start the system server and engineering clients for the first time.

For information on how to start the operation client, refer to the topic describing how to set up runtime navigation services (see EcoStruxure™ Process Expert, Runtime Navigation Services , User Guide).

For additional information on how to start and quit the software, including logging in to clients and client/server connection, refer to the topic that describes starting and quitting the software (see EcoStruxure™ Process Expert, User Guide).

System Server Console and Tray Icon

Overview

Starting with EcoStruxure Process Expert 2021, when you double-click the system server desktop icon, the system server console is minimized to a system tray icon. If the server startup mode, page 105 is set to *Manual* and you are not logged in, the log-in window opens first.

To open the console, double-click its icon in the system tray.

By using the console or the tray icon, you can perform the following actions:

- Start, stop, and configure the system server.
- Back up, restore, and delete databases of the current version of the software.
- Restore databases of a supported earlier version, page 26.
- Back up databases of the current version to migrate them to a later version.
- Create an empty database.

To use commands of the system server console menu bar or system tray icon context menu, you must be logged in with a user account that is a member of a group that is created for an EcoStruxure Process Expert role, page 81, which has the necessary permission.

NOTE: To back up individual systems, use the corresponding command from the system context menu in the **Systems Explorer** of the engineering client (see EcoStruxure™ Process Expert, User Guide).

System Server Console Description

Item	Description
1	Activity and notification area of the console. The information that is shown is cleared when the console is closed.
2	Full name of the logged-in user and name of computer. If the full name is not defined, the username appears instead.
3	Opens the user menu.
4	Minimizes the console to a system tray icon. **NOTE:** When the system server is running, the tray icon appears green; otherwise, gray.
5	The behavior depends on the server startup mode, page 105: • In *Manual* mode, closes the console and stops the system server. • In *Auto* mode (once the system server computer has been restarted): ◦ Closes the console but does not stop the system server. ◦ The user that is logged in to the system server is logged out. ◦ Removes the server icon from the system tray. **NOTE:** Corresponds to the **Exit** command of the server tray icon context menu.

System Server Commands

The table describes the commands of the **Action** menu.

Command	Description
Start	Starts the system server. **NOTE:** If you had restored a database of a supported earlier version, it migrates the database, page 67. **NOTE:** The command is disabled if you have set the **Server Startup Mode**, page 105 to *Auto* and the server is already started.
Stop	Stops the system server after you confirm the command (see EcoStruxure™ Process Expert, User Guide).

The table describes the commands of the **Database** menu. The commands are disabled(1) when the system server is running.

Command	Description
Back Up Database	Opens a **Save as** dialog box, which lets you save, page 123 the mounted database to disk as one file (.dbk).
Restore Database	Opens an **Open** dialog box, which lets you mount a database by using a backup file of either format: • .dbk: Backup files created by using the **Back Up Database** command of the current version of the software. • .mdbk: Backup files created by using the **Migrate Database** command of a supported earlier version of the software. This mounts the database so that it is migrated, page 67 when you start the system server. Restoring this type of backup file requires that **Server Startup Mode**, page 105 is set to *Manual* or that the server service is stopped, page 122. **NOTE:** The software creates a copy of the database folder, page 123 before restoring the one that you have selected.
Delete Database	Allows you to remove the Caché database entries pertaining to the installed EcoStruxure Process Expert databases. The command is available only in either of the following cases: • The Db folder on the computer on which the system server is installed is either empty or missing. • The CACHE.DAT file is missing in the GLOBAL and SCHEMA subfolders and no *System_n* system exists in the Db folder. For more information, refer to the troubleshooting section, page 138.
Create Blank Database	Lets you back up the mounted database to a location that you select and starts the system server with a blank database, page 126 after you confirm the command. You can configure, page 115 which templates and content are added to the blank database.
Migrate Database (1)	Opens a **Save as** dialog box, which lets you save the mounted database to disk as one file (.mdbk). It lets you create a backup file, page 61 of a database that you can migrate to make it compatible with a later version of the software once you have installed it. The command is available only if **Server Startup Mode**, page 105 is set to *Manual* or the server service is stopped, page 122. **NOTE:** You cannot restore this backup file (.mdbk) in the same version of the software. To do so, create a backup file by using the **Back Up Database** command. **NOTE:** If the command does not appear in the menu, you need to install a premigration patch, which is made available when the later version of the software is released.
(1) The **Migrate Database** command is available only when the system server is running.	

The table describes the commands of the **Settings** menu.

Command	Description
Basic (Settings)	Opens the **Server Configuration Wizard** window, page 102, which lets you configure settings of the system server and Participants. The command is disabled when the system server is running.
Advanced (Settings)	Gives access to advanced parameters of the system server, Participants, client/server communication, and the database, which you can adjust if you experience difficulties running the software. The command is available only after you enable the console command prompt, page 120. **NOTE:** Modifying default settings may have a negative impact on software functionality. Contact EcoStruxure Process Expert support before modifying settings. The command is disabled when the system server is running.
System Backup Scheduler	Lets you schedule the automatic backup of systems (see EcoStruxure™ Process Expert, User Guide). The command is available only when the system server is running.

The table describes the commands of the **Help** menu.

Command	Description
View Help	Opens the global HTML software help.
About	Opens the *About* dialog box (see EcoStruxure™ Process Expert, User Guide).

The table describes the commands of the **User** menu.

Command	Description
Lock(1)	Locks (see EcoStruxure™ Process Expert, User Guide) the components where you logged in on the local computer.
User Information (1)	Opens the **User Information** dialog box, page 82.
Log In/Log Out	Lets you log in or out (see EcoStruxure™ Process Expert, User Guide) of the software.
(1) The command is not available in the context menu of the server tray icon.	

Enabling the Console Command Prompt

Enabling the console command prompt gives you access to advanced functionality and settings.

NOTE: Modifying advanced settings may have a negative impact on software functionality. Contact EcoStruxure Process Expert support before modifying settings.

To enable the console command prompt, proceed as follows.

Step	Action
1	Open the system server console.
2	Press **Ctrl**+**M** and enter *support@Pes2016* (case sensitive).
3	Press **Enter**. **Result**: **Entering maintenance mode** is displayed in the console and the command prompt is enabled.

NOTE:

- If you enter a wrong password, repeat step 2.
- To disable the command prompt, press **Ctrl**+**M** again.

Using the System Server Auto-Start Functionality

Overview

By using the **Server Startup Mode** setting, page 105 of the **System Server Configuration Wizard**, you can configure the system server to start automatically when you restart the computer.

System Server Service

The auto-start functionality relies on the *SE-ServerManager-EcoStruxureProcessExpert* service on the computer on which the system server is installed. It uses the *Local System* account.

By default, the service is set to *Manual* and is stopped. It can only be started by configuring the **Server Startup Mode** setting to *Auto* and restarting the computer.

You can stop the service by opening Windows **Services**.

NOTE: Stopping the service when the system server is started stops the system server.

NOTE: You can start the system server manually, page 118 when the service *Startup Type* is set to *Automatic* in Windows **Services** given you are logged in (see EcoStruxure™ Process Expert, User Guide).

System Server Functionality Without Logged-In User

When the *SE-ServerManager-EcoStruxureProcessExpert* service is running and no user is logged in to the system server, clients can connect to the server.

However, you cannot use system server commands, page 118. To use them, a user with the necessary rights must log in.

If you start an engineering or operation client on the system server computer, you must log in (see EcoStruxure™ Process Expert, User Guide) to use the client.

Restoring and Migrating Databases With the Auto-Start Feature Enabled

You cannot use the **Migrate Database** command, page 118 and restore database backup files with file extension .mdbk when the *SE-ServerManager-EcoStruxureProcessExpert* service is running. Before performing a migration and/or restoration, proceed as follows.

Step	Action
1	Log in to the system server.
2	Stop the system server by using the **Stop** command from the menu bar of the server console or the system tray icon.
3	If the system server console is open, close it. Otherwise, click **Exit** in the context menu of the server tray icon.
4	Open Windows **Services**, right-click the *SE-ServerManager-EcoStruxureProcessExpert* service, and click **Stop**.
5	Open the server console by double-clicking the system server desktop icon and log in to the server. **Result**: You can now restore database backup files with file extension .mdbk by using the **Migrate Database** command from the server system tray icon.
6	Start the system server by using the **Start** command. **Result**: You can now use the **Migrate Database** command.

Backing Up and Restoring Databases

Overview

Data of systems that you create is stored in the database. It also contains the templates of the Global Templates library.

You can back up a database as a file (.dbk) and restore a database from such a backup file by using the corresponding commands in the system server console menu bar, page 117.

Database backup files can only be used with the version of the software that was used to create them.

Exceptions apply for certain supported versions of databases that you can restore to migrate them to the current version. This may be the case, for example, for additional releases within the same year (versions with *R*• suffix) or when Participants are compatible from one version to the other.

> **NOTE:** You can also back up and restore individual systems by using the corresponding commands from the context menu in the **Systems Explorer** of the engineering client (see EcoStruxure™ Process Expert, User Guide). A system backup contains less data than a database backup (for example, it does not contain templates) and is version dependent.

Backing Up and Restoring Databases for Migration

To create a database backup file of the current version of the software in order to migrate and reuse it in a later version, you may need to use the **Migrate Database** command, page 118.

Controller/Simulator Password Management After Restoring a Database

After you restore a database that contains a controller and/or a station node for which **Controller** or **Simulator** password protection (see EcoStruxure™ Process Expert, User Guide) has been enabled, you need to do the following to be able to deploy a Control Participant project:

- If no password was set, you need to set one.
- If a password was set, you need to enter the password when prompted.

For more information, refer to the topic describing how to manage passwords for deployed Control Participant projects (see EcoStruxure™ Process Expert, User Guide).

Managing Database Backup Files

Database backup files that the software creates when you restore databases can use up a lot of disk space. Manage these folders regularly to recover disk space.

Backing Up a Database

You can back up databases only when the system server is stopped.

NOTICE
LOSS OF COMMUNICATION Stop the system server only when no client is running. **Failure to follow these instructions can result in unresponsive clients.**

To back up the EcoStruxure Process Expert database, proceed as follows.

Step	Action
1	Quit any clients that connect to the system server whose database you want to back up (see EcoStruxure™ Process Expert, User Guide).
2	Stop the system server (see EcoStruxure™ Process Expert, User Guide).
3	Close and reopen the system server console if required.
4	From the system server console menu bar or tray icon context menu, click **Database > Back Up Database**. **Result:** A **Save as** dialog box opens.
5	Select a file name and location for the database backup and click **Save**. **Result:** The software starts the back-up process and displays **Done** in the system server console when the operation is completed.

Restoring a Database

When you restore a database, the software creates a copy of the existing database folder before mounting the new database.

The name of the database folder copy is created by adding the suffix _*YYYYMMDDHHMMSS* to the name of the database folder, where *YYYYMMDD* represents the date and *HHMMSS* the time when the copy was created.

The copy of the database folder is stored at the path: C:\ProgramData\Schneider Electric\Process Expert X, where *X* corresponds to the version that you are using.

You can restore databases only when the system server is stopped.

NOTICE
LOSS OF COMMUNICATION Stop the system server only when no client is running. **Failure to follow these instructions can result in unresponsive clients.**

To restore a EcoStruxure Process Expert database, proceed as follows.

Step	Action
1	Quit any clients that connect to the system server (see EcoStruxure™ Process Expert, User Guide).
2	Stop the system server (see EcoStruxure™ Process Expert, User Guide).
3	Close and reopen the system server console if required.
4	From the system server console menu bar or tray icon context menu, click **Database > Restore Database**. **Result:** An **Open** dialog box opens.
5	Select a database backup file (.dbk) and click **Open**. **Result:** The software: • Creates a copy the existing database. • Starts the restore process of the selected file. • Displays **Done** in the system server console when the database is mounted. **NOTE:** If the restore operation does not complete successfully, the software restores the previously mounted database.

Starting With a Blank Database

Starting With a Blank Database

At any point in time, you can start fresh with a blank database, which can contain the latest templates provided with the software version, and/or your templates, or no templates at all.

Configuring the Content of the Database

When you start the system server and a blank database is created, the templates and content containers that are specified in the **Data Folders** section, page 115 of the system server configuration wizard are added to this database.

Methods to Create a Blank Database

The table describes the method that you need to use to create a blank database for various scenarios.

Scenario	Method
Software is installed for the first time and system server has not yet been started.	Starting the system server creates a blank database, page 30.
Software has been upgraded to a next major or intermediate (Rx) version and no database has been restored.	
Any scenario where a database is already mounted. The database may have been migrated and/or contains systems that you have created.	Use the **Create Blank Database** command, page 118 and start the system server.

Starting the System Server

Overview

Before starting the system server for the first time, verify server settings, page 101 from the **System Server** console, page 117 or tray icon.

Start the system server before starting clients.

A first system server start may take several minutes because it imports templates into the Global Templates library and creates the database (this step is not performed if you are migrating a database).

If starting the system server migrates a database, page 67, the start-up time is significantly longer because of the additional steps that the software carries out to migrate it. Depending on the size of the database, the process may take hours.

Once you start the system server, you cannot stop it until startup is completed.

Refer to Starting and Quitting the Software (see EcoStruxure™ Process Expert, User Guide) for more information on working with the system server and clients.

NOTE: Before you can start the system server, you must:

- Add users to groups, page 79.
- Generate and install digital certificates, page 86.

Server Activity Log

The **System Server** console lets you monitor and keep track of the server activity until you stop it. The history of activity data is logged in a log file (see EcoStruxure™ Process Expert, User Guide).

Considerations When Using Several System Servers

If a system server and a client are installed on the same computer, the system server cannot start if the client is already running and connected to different system server. In such case, a message appears in the server console.

Starting the System Server for the First Time Manually

To start the system server for the first time, proceed as follows.

Step	Action
1	Configure, page 100 the system server as needed.
2	Verify that Caché, page 60 is running by checking the presence and the color of the Caché notification area icon. When Caché is running, its notification area icon is blue.
3	From the Windows® start menu, click **EcoStruxure Process Expert > System Server**. **Result:** The log-in window opens.
4	Enter your username without domain or prefix, your password, and click **Log In**. **Result:** The system server console is minimized to a tray icon.
5	If you want to migrate a database, refer to the topic describing database migration, page 67. Otherwise, proceed to step 6.
6	Open the server console from its tray icon and click **Action > Start**. **Result:** The system server starts up and creates a new, blank database, page 115. If you are upgrading an earlier version and/or have restored a database backup file in the previous step, the system server migrates this database instead. **NOTE:** During the system server start, several Participant windows may open briefly. Do not close them manually; otherwise, the functionality of the software may be impacted. **NOTE:** If you have enabled the **Control application and facet template password protection** setting, you may be prompted to set a password, page 109.
7	Wait until the server tray icon turns green or the system server console displays the following message at the bottom of the window to start the engineering client, page 129: **Server is ready**.

Troubleshooting System Server Startup

If you experience difficulties during system server startup, refer to the troubleshooting topic, page 138.

Starting the Engineering Client

Overview

Start the system server, page 127 before starting any client.

Before you start the engineering client for the first time, you need to configure, page 73 the server settings.

Refer to Starting and Quitting the Software (see EcoStruxure™ Process Expert, User Guide) for more information on working with the system server and clients.

NOTE: Before you can start the engineering client, you must generate and install digital certificates, page 86.

Client Activity Log

The notification panel lets you monitor and keep track of the engineering client activity until you stop the system server. To keep the history of data that is displayed in the notification panel, you need to export the data (see EcoStruxure™ Process Expert, User Guide).

Other client activity is logged in log files (see EcoStruxure™ Process Expert, User Guide).

Starting the Engineering Client

After an unexpected interruption of the client/server connection, the states of both the engineering client and the system server may have become inconsistent. This can be the case, for example, if at the time of the interruption an operation was in progress such as an import of several Participant projects or pasting of many instances.

NOTICE
LOSS OF COMMUNICATION After an interruption of the client/server connection, verify that the last operation executed by the software was completed successfully, and if necessary, repeat the last operation. **Failure to follow these instructions can result in unresponsive clients.**

NOTE: It is recommended to use the notification panel of the engineering client to verify the status of each task executed through a task menu command. The history of other client-related activity data is logged in log files (see EcoStruxure™ Process Expert, User Guide).

To start the engineering client for the first time, proceed as follows.

Step	Action
1	Configure the server settings as needed by using the Engineering Client Configuration Wizard.
2	With the system server running, from the Windows® start menu, click **EcoStruxure Process Expert > Engineering Client**. **Result:** A splash screen appears to indicate that the engineering client is starting. After a few moments, the log-in window opens. **NOTE:** If you are already logged in (see EcoStruxure™ Process Expert, User Guide) to another EcoStruxure Process Expert on this computer (for example, the system server) the engineering client window opens without displaying the log-in window.
3	Log in by entering your username without domain or prefix and your password. **NOTE:** Close the log-in window to quit the engineering client.
4	Click **Log In**. **Result:** The engineering client window opens.

NOTE: If you start the engineering client:

- Before the system server, the client displays a notification that it cannot locate the server.
- While the system server is still starting up, the splash screen of the client is displayed until the server is up and running.

Modifying, Repairing, and Removing the Software

Overview

This chapter describes how to modify, repair, and remove EcoStruxure Process Expert.

Modifying the Software Installation

Overview

By using the **Modify** functionality of the installer, you can perform the following actions after you have installed at least one EcoStruxure Process Expert component on the computer:

- Install one or more additional components (for example, an engineering client).

  However, you cannot reinstall a subcomponent that you have removed by using the Microsoft® Windows® **Control Panel** (for example, Modicon IEC 61850 Configuration Tool). In this case, use the repair functionality, page 134).
- Uninstall one or more installed components.
- Change the authentication type and create role groups, page 79 (only if the system server is installed or if you select to install it).

You can access the functionality from either:

- The installation package.
- The **Uninstall or change a program** window of the Microsoft® Windows® **Control Panel**. Select the **Change** command for **EcoStruxure Process Expert**.

When you remove an installed component, the installer checks the integrity of the files of remaining components.

NOTE: To remove the software from the computer use the remove functionality, page 136.

Associated and Third-Party Software Components

When you modify the installation, do not select to restart the computer if prompted by the installer of the Control or Supervision Participant. Only restart the computer at the end once the installation of EcoStruxure Process Expert is complete.

If you select to install a new software component on the computer, required associated and third-party components are installed as well. However, if you uninstall a software component, associated and third-party components, page 31 are not uninstalled.

Software Licenses

When you add and/or remove software components from the computer, verify that you:

- Return licenses that have become unnecessary through the **Floating License Manager**.
- Activate licenses for newly installed components as needed.

For information on the return process, refer to the Schneider Electric **Floating License Manager** user manual.

Modifying the Software Installation

You can modify the software installation only when the system server is stopped.

NOTICE

LOSS OF COMMUNICATION

Stop the system server only when no client is running.

Failure to follow these instructions can result in unresponsive clients.

NOTICE

LOSS OF DATA

Back up the database before modifying the installation.

Failure to follow these instructions can result in loss of database or unusable systems.

NOTE: For more information, refer to the topic describing how to back up the database, page 123.

To modify the software installation of a computer by using the installation package, proceed as follows.

Step	Action
1	Quit any clients connected to the system server (see EcoStruxure™ Process Expert, User Guide).
2	Stop the system server (see EcoStruxure™ Process Expert, User Guide).
3	Close Control Expert and AVEVA Plant SCADA running outside EcoStruxure Process Expert.
4	Back up the database, page 123 of the software infrastructure.
5	On the computer whose installation you want to modify, double-click the **setup.exe** file that is located in the root of the installation package. **Result:** The installer dialog box opens.
6	Select **Modify** and click **Next**.
7	The dialog box shows the various software components. Those that are crossed out are not installed on the computer: • Select the other components that you want to install. • Select to remove the components that you want to uninstall. • Do not modify the selection of installed components that you want to keep.
8	Click **Next**. **Result:** The software proceeds with the removal and/or installation of components according to your selection.
9	Click **Finish** to exit the installer.
10	Restart the computer when prompted to complete the installation process.

Repairing the Software

Overview

If a software component is not working properly, you may be able to repair it by using the **Repair** functionality of the installer.

The installer attempts to install missing programs and files, and fix corrupt files and registry entries.

On a computer on which the system server is installed, you can also change the authentication type and create role groups, page 79.

You can access the functionality from either:

- The installation package.
- The **Uninstall or change a program** window of the Microsoft® Windows® **Control Panel**. Select the **Change** command for **EcoStruxure Process Expert**.

  NOTE: Associated and third-party components are not repaired. However, if an associated or third-party component that is required has been removed, it is installed. In such case, do not select to restart the computer if prompted by the installer of the Control or Supervision Participant. Only restart the computer at the end once the repair of EcoStruxure Process Expert is complete.

Repairing the Installation

You can repair an installation only when the system server is stopped.

NOTICE
LOSS OF COMMUNICATION Stop the system server only when no client is running. **Failure to follow these instructions can result in unresponsive clients.**

NOTICE
LOSS OF DATA Back up the database before repairing the installation. **Failure to follow these instructions can result in loss of database or unusable systems.**

NOTE: For more information, refer to the topic describing how to back up the database, page 123.

To repair the software on a computer by using the installation package, proceed as follows.

Step	Action
1	Quit any clients connected to the system server (see EcoStruxure™ Process Expert, User Guide).
2	Stop the system server (see EcoStruxure™ Process Expert, User Guide).
3	Close Control Expert and AVEVA Plant SCADA running outside EcoStruxure Process Expert.
4	Back up the database, page 123 of the software system infrastructure.
5	On the computer on which the component that you want to repair is installed, double-click the **setup.exe** file that is located in the root of the installation package. **Result:** The installer dialog box opens.
6	Select **Repair** and click **Next**. **Result:** The software attempts to repair the installed software components. **NOTE:** If you repair an installation that includes Control Expert, the installer of its hotfix may run independently of your selection.
7	Click **Finish** to exit the installer.
8	Restart the computer when prompted to complete the repair process.

Removing the Software

Overview

This operation removes the software from the computer. The database that contains the data of existing systems is not removed.

Nevertheless, consider backing up existing databases, page 123.

You can access the functionality from either:

- The installation package.
- The **Uninstall or change a program** window of the Microsoft® Windows® **Control Panel**. Select **EcoStruxure Process Expert**.

To remove software components individually, use the modify functionality, page 132.

A restart is required to complete the process of uninstalling the software from the computer.

> **NOTE:** The process does not remove the Schneider Electric **License Manager** and **Floating License Manager**.

Removing Digital Certificates

Removing the software may delete digital certificates, page 98.

Removing Associated and Third-Party Components

By default, when you remove the software by using the installer or the **Change** command of the Microsoft® Windows® **Control Panel**, the process also removes the following software (if installed):

- InterSystems Caché, the application managing the database.

  > **NOTE:** The InterSystems folder is not removed. You need to remove it manually. The folder is located at the path: C:\Program Files.

- Control Expert
- Advantys
- Modicon IEC 61850 Configuration Tool
- ProSoft Configurator for Modicon
- AVEVA Plant SCADA

  > **NOTE:** The following components are not removed and need to be removed manually if you want to reinstall the software:
  >
  > - **AVEVA Plant SCADA Deployment**
  > - **AVEVA Plant SCADA Connectivity Server**
  > - **AVEVA Plant SCADA Graphics Server**
  > - **AVEVA Plant SCADA Security Configuration**

Clear the check box to keep these applications on the computer.

When you remove the software by using the **Uninstall** command for **EcoStruxure Process Expert** in the Microsoft® Windows® **Control Panel**, these applications are not removed.

Removing Hotfixes

You can remove hotfixes that have been applied to the software by using the **Uninstall** command from the Microsoft® Windows® **Control Panel**. Navigate to the **View installed updates** window under **Programs and Features**.

Removing to Install an Earlier Version of the Software

If you are removing the software to install an earlier version, you need to also remove these third-party components, page 136:

- Remove the InterSystems Caché application.
- Delete the InterSystems folder, which is located at the path: C:\Program Files.

Returning Licenses

When you remove the software from the computer, consider returning your licenses through the **Floating License Manager** so that you may activate them again on a different computer.

For information on the return process, refer to the Schneider Electric **Floating License Manager** user manual.

Removing EcoStruxure Process Expert

You can remove the software only when the system server is stopped.

NOTICE
LOSS OF COMMUNICATION Stop the system server only when no client is running. **Failure to follow these instructions can result in unresponsive clients.**

NOTICE
LOSS OF DATA Back up the database before removing the software. **Failure to follow these instructions can result in loss of database or unusable systems.**

NOTE: For more information, refer to the topic describing how to back up the database, page 123.

The table describes the procedure to remove the software from the computer by using the installation package.

Step	Action
1	Quit Schneider Electric applications that are running, clients, and stop the system server (see EcoStruxure™ Process Expert, User Guide).
2	Close Control Expert and AVEVA Plant SCADA running outside EcoStruxure Process Expert.
3	Back up the database, page 123.
4	On the computer on which the component that you want to remove is installed, double-click the *Setup.exe* file located in the root of the installation package. **Result:** The installer dialog box opens.
5	Click **Next**.
6	Select **Remove**.
7	Follow the instructions on screen.
8	Click **Finish** to exit the installer.
9	Restart the computer when prompted to complete the removal process. **NOTE:** You can click **No** to restart the computer yourself later. However, a restart of the computer is required before you start a new installation of EcoStruxure Process Expert.

Troubleshooting

Overview

This chapter contains various troubleshooting information.

Troubleshooting Installation

Invalid Drive Notification During Installation

When you copy the installation package (ISO file) from the external hard drive to the computer and start the installation from the computer when the copy is complete, you may receive a notification about an invalid drive (1327) if you disconnect the external hard drive before the installation is finished.

Restart the installation and leave the external hard drive connected to the computer until the installation of the software is finished.

Installation Does Not Complete

Verify that the path to any file of the installation package does not exceed 260 characters, whether you are accessing it on the local computer or from a network location.

Unable to Uninstall the Software by Using the Control Panel

If you are trying to remove the software by using the **Uninstall** command in the Microsoft® Windows® **Control Panel** and you receive a notification that the software cannot be uninstalled because the installation log file cannot be opened, proceed as follows.

Step	Action
1	Open **Task Manager**.
2	Stop the **explorer.exe** process.
3	Restart the **explorer.exe** process by clicking from the menu of the **Task Manager**, **File > New Task (Run...)**.
4	Enter `explorer.exe` and click **OK**.
5	Uninstall the software again by using the **Uninstall** command.

Notification During Reinstallation Of the Software

During the reinstallation of the software, a dialog box about InterSystems Caché opens containing the message *Error. CctrlInstallStartCP(STRUXUREWAREPE) failed. Return value: 1*.

Reason: The temporary files in the *%TEMP%* folder of the computer exceed the limit of 65,535 files. When the installation tries to create new temporary files, it cannot do so because the file limit has been reached. Therefore, the installation does not complete successfully and an unrelated message is reported.

Solution: Delete no longer required files in the *%TEMP%* folder of the computer before installing the software.

Troubleshooting the System Server

Delay Starting the System Server

If you experience delays of several minutes when starting the system server and you have configured several Enterprise license servers in the License Manager, confirm that each IP address can be reached from the computer on which the system server is installed.

For more information, refer to the topic describing the configuration of Enterprise license servers (see EcoStruxure™ Process Expert, Licensing Guide).

System Server Not Starting

The following describes various issues that can prevent the system server from starting.

Cannot load Counter Name data because an invalid index “ ” was read from the registry: If the system server console displays this message shortly after starting the server, proceed as follows.

Step	Action
1	Open a command prompt as administrator.
2	Change to C:\Windows\SysWOW64
3	Execute `lodctr /r`
4	Press **Enter**. **NOTE:** You may see a message about a detected error: **Unable to rebuild performance counter setting from system backup restore, error code is 2**
5	Restart the system server.

Troubleshooting System Server Startup Difficulties Related to Database

If the software displays notifications about the system server not starting, you may have deleted the Db folder or all or part of its contents on the computer on which the system server is installed.

Notifications appear in:

- The system server console with text in red.
- The notification panel.

The Db folder contains the files of databases where the software stores data of the Global Templates library and of existing systems. The default path to the Db folder is C:\ProgramData\Schneider Electric\Process Expert X, where *X* corresponds to the version that you are using.

The figure shows an example of the contents of the Db folder for a healthy database with two systems created. The right-hand section of the window shows the CACHE.DAT file that exists in the GLOBAL and SCHEMA subfolders.

NOTE: Systems that appear in the Db folder keep their default name (*System_n*) even if you rename them in the **Systems Explorer**.

Deleting the Db folder or some of its contents creates an inconsistency with the database entries that exist in the Caché database.

In such case, you need to remove the Caché database entries pertaining to the installed databases to make them consistent with the file structure on the computer.

To remove Caché database entries, proceed as follows.

Step	Action
1	In the system server console menu bar, page 118 or tray icon context menu, click **Database > Delete database**. **Result**: The **Delete Database** dialog box opens.
2	Click **Yes**. **Result**: The Caché database entries are removed. **NOTE:** Click **No** to close the **Delete Database** dialog box without removing Caché database entries.
3	Wait until the console displays **Done** to start the system server.

System Server Startup Difficulties Related to Missing Directory

The system server displays a notification about a missing directory during startup if the following conditions apply:

- You are using an operating system configured in a language other than English.
- The username of the logged-in user contains characters that are not part of the US-ASCII character table.

Use only a username that contains characters of the US-ASCII character table to log in to the operating system of computers on which the system server and engineering clients are installed.

Troubleshooting Client/Server Communication

CPU-Intensive Operations

Performing CPU-intensive operations (for example, importing many instances or mapping many interfaces) by using a client on a computer on which the system server is installed may lead to CPU starvation.

As a result, actions that you execute immediately after such CPU-intensive tasks may trigger notifications about client/server communication interruptions.

Increase the priority of the **EngineeringClient.exe** or **OperationClient.exe** process to *Above Normal* by using the **Details** tab of the Windows® **Task Manager**.

Network Connections

The system server and its engineering stations need to be connected to the same Ethernet network by a cable connection so that the system server, engineering, and operation clients are able to communicate. This can be a network that is dedicated to client/server communication.

In case the computer on which the system server is installed is connected also to another network (for example, an enterprise network providing access to the Internet), verify that an interruption of this network connection does not block communication on the client/server network. This may happen, for example, if a domain firewall is configured to disable all communication ports of the computer in case the connection to the enterprise network is interrupted.

Negative Connection Test Result

A button to test the client/server connection is located in the **System Server** section of the client configuration wizards, page 101.

If the result of the connection test is negative, verify the following:

- The validity of the digital certificates, page 86.
- The port configuration, page 104.

Communication Port Usage

The software uses communication ports for client/server communication. If you experience communication difficulties, verify if any of them are already used.

Refer to the topic describing how to configure the system server and clients, page 104.

Troubleshooting the Caché Database

Problem Description

The Caché database does not start if you have changed the name of the computer while Caché was running and have restarted the computer. The Caché icon in the notification area of Microsoft® Windows® remains gray.

Attempting to start the Caché database manually opens a dialog box **Cache Terminal could not start (112)**.

Caché software stores the name of the computer in temporary files. When it starts, it compares the name of the computer with the name stored in the files. If they do not match, the Caché database does not start.

Recommendation

To change the name of the computer on which the Caché application is installed, first stop the Caché application, page 60.

Starting Caché

To get the Caché database to start again, proceed as follows.

Step	Action
1	Browse to C:\Program Files\InterSystems\STRUXUREWAREPEv47\mgr.
2	Delete the following files: • cache.ids • cache.lck
3	Start the Caché, page 60 database.

Appendices

What's in This Part

Installing the **Floating License Manager** 146

Installing the Floating License Manager

What's in This Chapter

Installing the **Floating License Manager** 146

Installing the Floating License Manager

Overview

This topic describes how to install the **Floating License Manager** (FLM) on a computer that is to become an enterprise license server and on which no EcoStruxure Process Expert nor Supervision components are going to be installed.

For more information on how to use the FLM, refer to the topic describing licensing mechanisms (see EcoStruxure™ Process Expert, Licensing Guide).

Installation Procedure

Step	Action
1	Double-click the FloatingLicenseManagerSetup_PE.exe file to extract the installation files. The file is located inside the LicenseManagers folder of the EcoStruxure Process Expert installation package.
2	Select a destination folder on the computer on which you want to install the FLM.
3	In this destination folder, double-click the setup.exe file to start the installation.
4	Follow the instructions on screen. **NOTE:** Use the following values to configure parameters of the FLM (see EcoStruxure™ Process Expert, Licensing Guide): • **Web Port**: 8090 • **License Server Port**: 27011 • **Vendor Daemon Port**: 27010
5	Accept the End User License Agreement (EULA).

NOTE: To obtain the server port value that is used by an FLM after installation, refer to the topic describing how to verify the license server, vendor daemon, and Web port settings of the FLM (see EcoStruxure™ Process Expert, Licensing Guide).

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