![SIEMENS]

"Beginners Guide": Quick start and migration guide with WinCC Unified V17

WinCC Unified V17 Update 4

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Support

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Table of contents

1 Introduction

SIMATIC WinCC Unified is an innovative, universal tool for creating and managing configurations of PCs and SIMATIC HMI Unified Comfort Panels.[1] Its powerful feature set and cutting-edge technologies under the hood let the user quickly and easily create a wide range of visualizations with minimal troubleshooting.

Figure 1-1

The aim of this document is to simplify the initial setup or process of migration to WinCC Unified for newcomers as well as engineers who already have experience with other SIMATIC HMI software products. You will receive compact notes on the optimal deployment of WinCC Unified. You will be familiarized with concepts and techniques that facilitate the efficient migration of projects or the creation of projects from scratch. We provide links to further reading in documents and websites with which you can increase you knowledge, hone your workflow, and ultimately gain an expert understanding of WinCC Unified.

- Chapter 2, "Information sources" compiles an overview of sources where you can find further information. These sources address general concepts as well as concrete questions, including everything from FAQs over "Learning Journeys" to online and in-person training sessions.

- Chapter 3, "Basics of WinCC Unified and SIMATIC HMI provides you with an overview of the essential ideas behind the software and hardware associated with WinCC Unified. We will help you get familiar with terms and concepts that will give you an intuitive understanding of how to work with WinCC Unified.

- Chapter 4, "WinCC Unified for newcomers" lays out important information for the first meeting with WinCC Unified. This section contains the first steps with WinCC Unified, beginning with the procurement of the software and

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[1] The SIMATIC HMI products will be referred to below as "WinCC Unified" or "Unified Comfort Panels" for the sake of brevity.

proceeding until the device download of your first finished engineering configuration.

- Chapter 5 "Migration from WinCC Comfort/Advanced to WinCC Unified" is intended for engineers with prior experience with other SIMATIC HMI software products. It deals especially with the aspects that have changed since the introduction of WinCC Unified. We will draw your attention to the particularities and present steps for a seamless migration to WinCC Unified.

- Chapter 6, "More aids for working with WinCC Unified" closes out the document with references to more useful tools and articles.

2 Information sources

This chapter compiles various internet resources in which you can find further reading and detailed information on WinCC Unified as a whole – or on single aspects of HMI project engineering.

2.1 Siemens Industry Online Support ("SIOS") Portal

SIOS Portal is the central website for all information on automation with SIMATIC products. In addition to software and hardware for the engineering and visualization of plant controls, SIOS Portal also covers controllers, I/O devices and sensors. It contains articles on PROFINET as well as other bus systems and networks such as PROFIBUS, ASi and KNX. Besides current products, SIOS Portal also supports discontinued models and software versions.

Figure 2-1
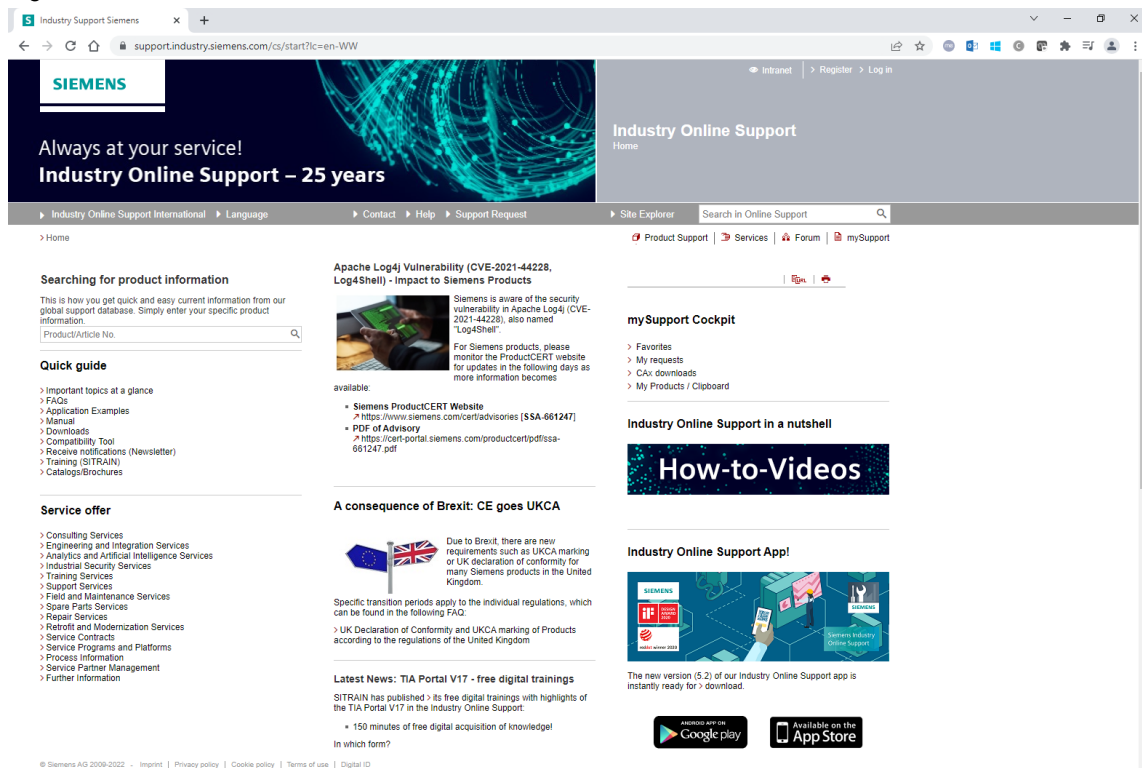
Information is provided in English and German and translations are typically also available in French, Italian, Spanish and Chinese. All documents are created by experts and approved by SIEMENS. Access to the vast majority of content is free.

The SIOS homepage is the central repository for all documents and services that we provide:

Table 2-1

| SIOS Portal Homepage |
|---|
| SIEMENS Industry Online Support Portal |

Important articles

In the following sections of the Beginner's Guide, we will refer to articles in SIOS Portal that are relevant to each of the optics being discussed. The examples we present do not represent an exhaustive list, rather, they provide an orientation. SIOS Portal is continuously being updated with new articles.

Click on the respective hyperlinks to go directly to the SIOS articles. Alternatively, go to the SIOS Portal Homepage (see above) and enter the corresponding article ID in the search bar.

There are multiple ways of finding a specific article in SIOS Portal:

- In the search bar (1), enter the terms that you want to search for, e.g. "WinCC Unified Installation". If you bracket multiple words in quotation marks, the search will locate the precise phrase rather than arbitrary combinations of the individual words.

- If you are looking for information on a specific project, enter its item number in the product information search bar (2).

Figure 2-2
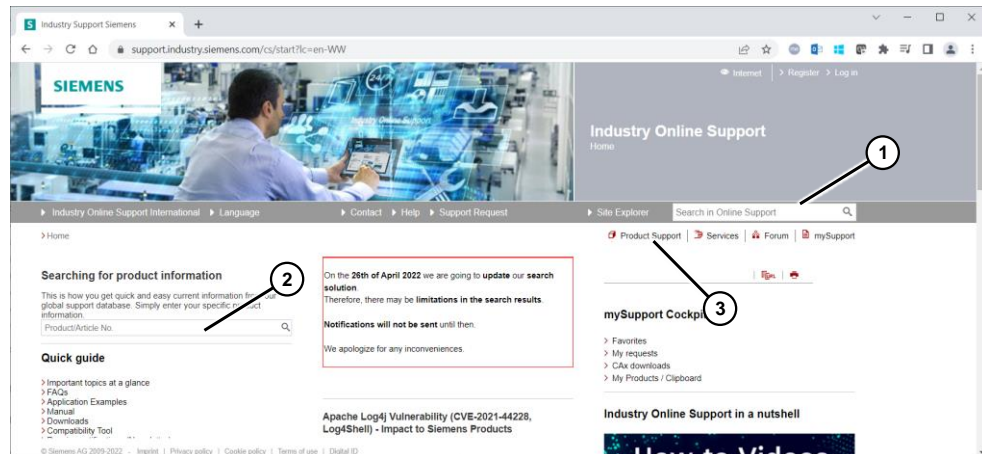
- For more complex searches, click the "Product Support" link (3). You will be taken to a search page with numerous additional filter options (see below).

Figure 2-3
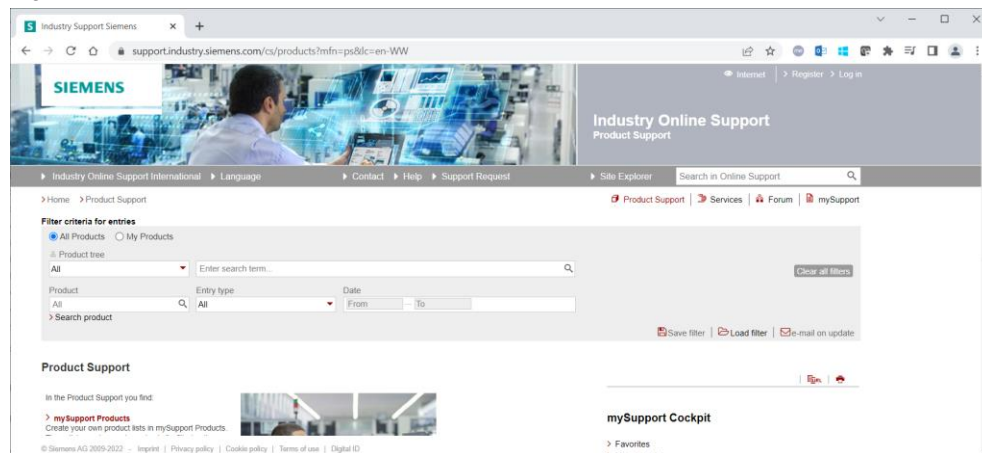
Topic pages

Topic pages are central collection points in SIOS Portal that bundle references to SIOS articles on specific topic groups. Topic pages are excellent if you are looking for an introduction or a general overview of a new field.

Figure 2-4
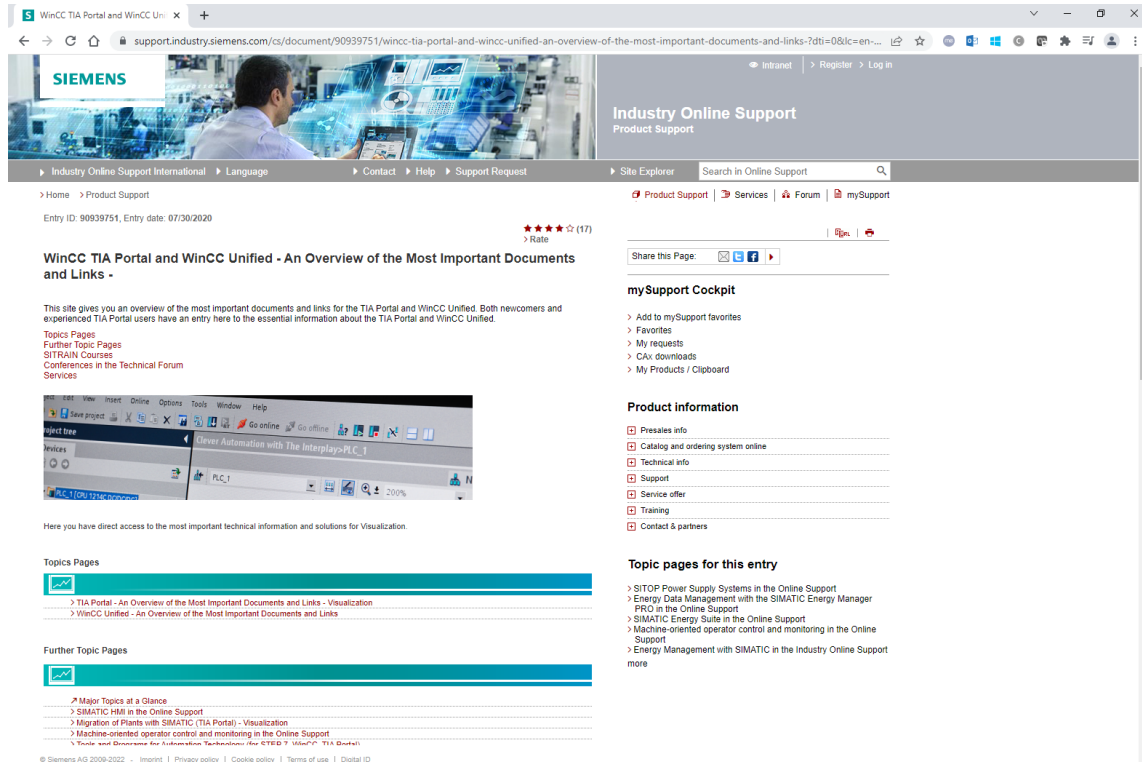
Table 2-2

Article ID	Topic page
	All topic pages in SIOS Portal
65601780	TIA Portal -- General information
109780282	TIA Portal -- Visualization
93907092	SIMATIC HMI in Online Support
90939751	WinCC TIA Portal and WinCC Unified
109777887	WinCC Unified and Unified Comfort Panels

Application examples

Application examples are SIOS articles that go into a certain aspect in more depth, for example the interfacing of an I/O module with a specific controller or the use of OPC UA for data exchange between an HMI operator device and a controller.

Figure 2-5
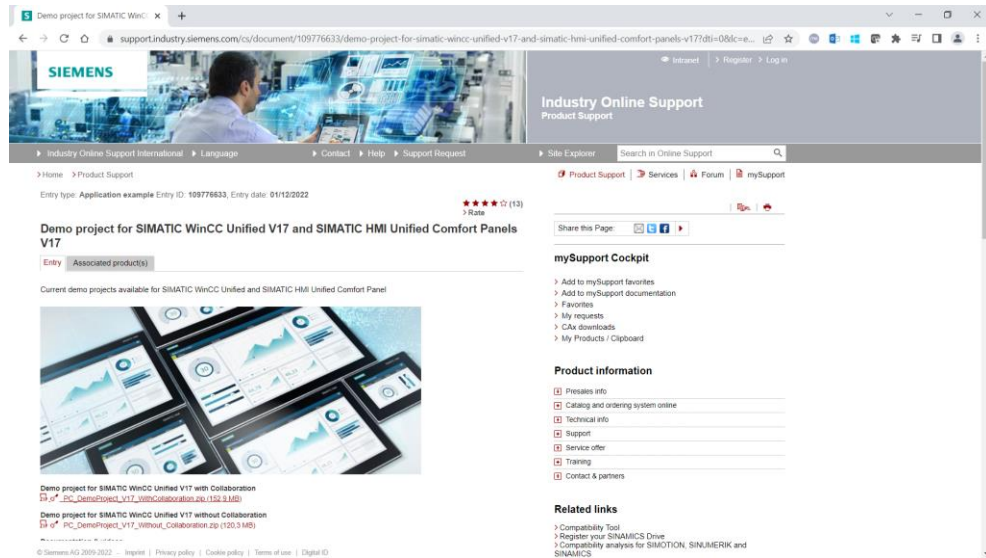
The application examples are typically composed of a document that both examines the technical background as well as provides step-by-step instructions on how to create a working engineering configuration, complemented by a TIA Portal project or a library. The project or library contains the functionalities described in the application example and can be deployed on a system right away.

The Table below shows a selection of application examples related to an introduction/migration to WinCC Unified:

Table 2-3

Article ID	Application example
109776633	Demo project for SIMATIC WinCC Unified V17 and SIMATIC HMI Unified Comfort Panels V17
109768002	Guide for switching from Comfort Panels to Unified Comfort Panels and from WinCC Runtime Advanced to WinCC Unified PC Runtime
109781803	Creation of ODK applications for WinCC Unified Runtime
109782859	Configuring Logging for SIMATIC WinCC Unified Systems
109758536	SIMATIC WinCC Unified - Tips and Tricks for Scripting (JavaScript)
109760056	Filtering of messages and alarms in SIMATIC WinCC Unified
109770480	SIMATIC WinCC Unified – Toolbox

FAQs

FAQs ("Frequently Asked Questions") supplement application examples with shorter articles that give concrete answers to single problems. These are mainly questions that come up often or which concern topical issues.

Figure 2-6
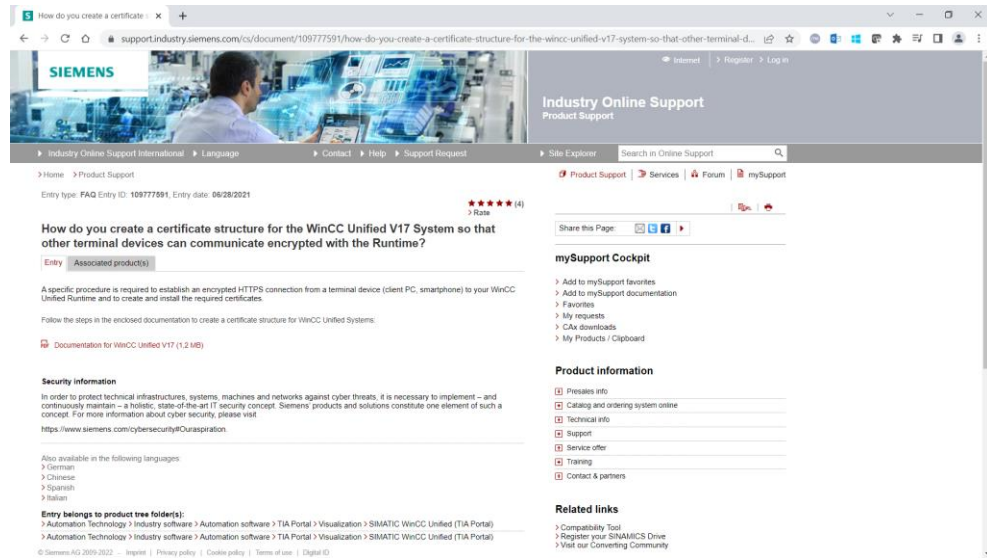
Depending on the topic, the FAQs only consist of short statements, references to more detailed information, or more in-depth explanations. TIA configurations are also part of an FAQ where necessary.

The Table below shows a selection of FAQs related to an introduction/migration to WinCC Unified:

Table 2-4

Article ID	FAQ
109799540	Questions and answers about the new security features in TIA Portal V17
109777591	How do you create a certificate structure for the WinCC Unified V17 System so that other terminal devices can communicate encrypted with the Runtime?
109773589	Which Windows functions must be activated in order to be able to install SIMATIC WinCC Unified?
109781234	Why does loading HMI images with TIA Portal V16/V17 fail with the error message "Components with a different version are installed on the target device. An older incompatible firmware image exists on the target device."?
109251656	Tips for TIA Portal Openness
109757952	Which browser can you use for SIMATIC WinCC Unified?
109775493	Why do you get the message "Load process will not be performed because preconditions are not met." when loading a WinCC Unified project?
109780176	Why does the project transfer of the Unified Comfort Panel fail? (Loading the operator panel)

Tutorial Center and YouTube videos

The Tutorial Center represents collections multimedia systems that provide information in the form of short instructional videos.

Figure 2-7
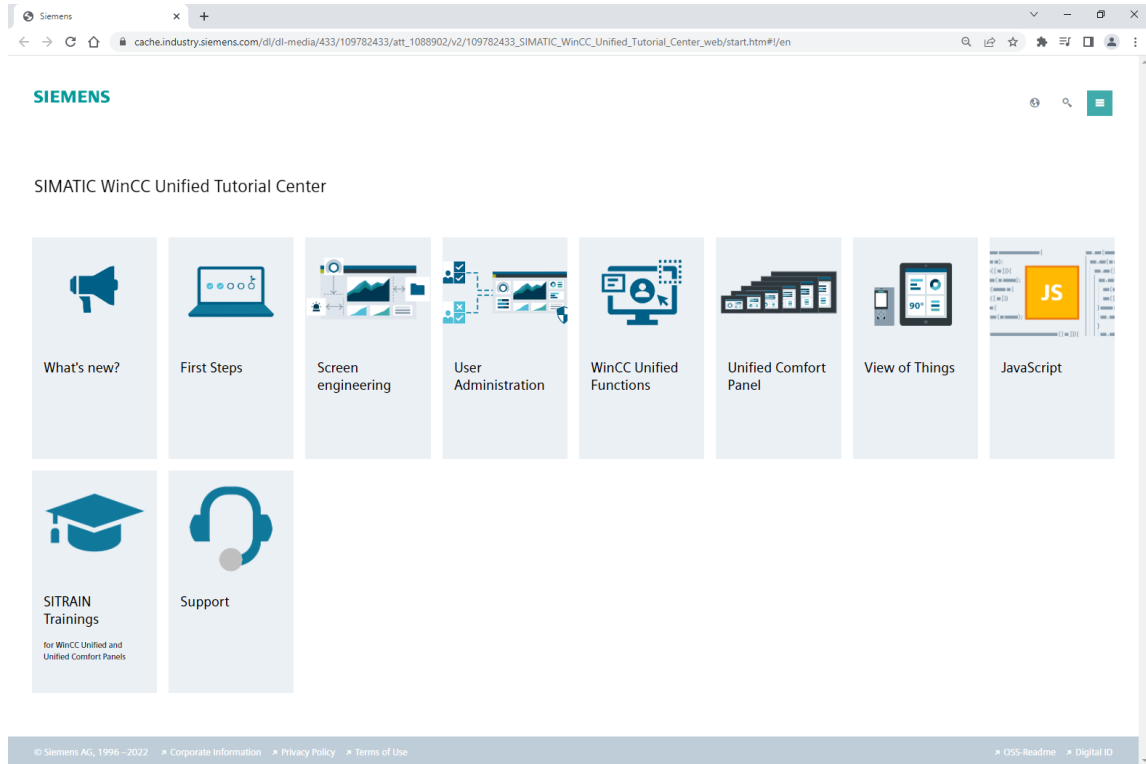
Each Tutorial Center is dedicated to one topic area, within which the videos are grouped into modules on individual technical aspects. The videos are excellent for self-study in fundamental topics.

Table 2-5

Article ID	Tutorial Center
106656707	TIA Portal Tutorial Center
109782433	SIMATIC WinCC Unified Tutorial Center
109764401	"Mister Automation" videos on TIA Portal
109767570	Automation Tasks - Get automated in less than 10 minutes (videos)

2.2   SITRAIN Digital Industry Academy

SITRAIN is the SIEMENS academy for continuing education in all things automation. Here you can find a comprehensive offering of in-person and online events as well as personal coaching and materials for self-study with which you can deepen and reinforce your knowledge in automation topics.

Figure 2-8
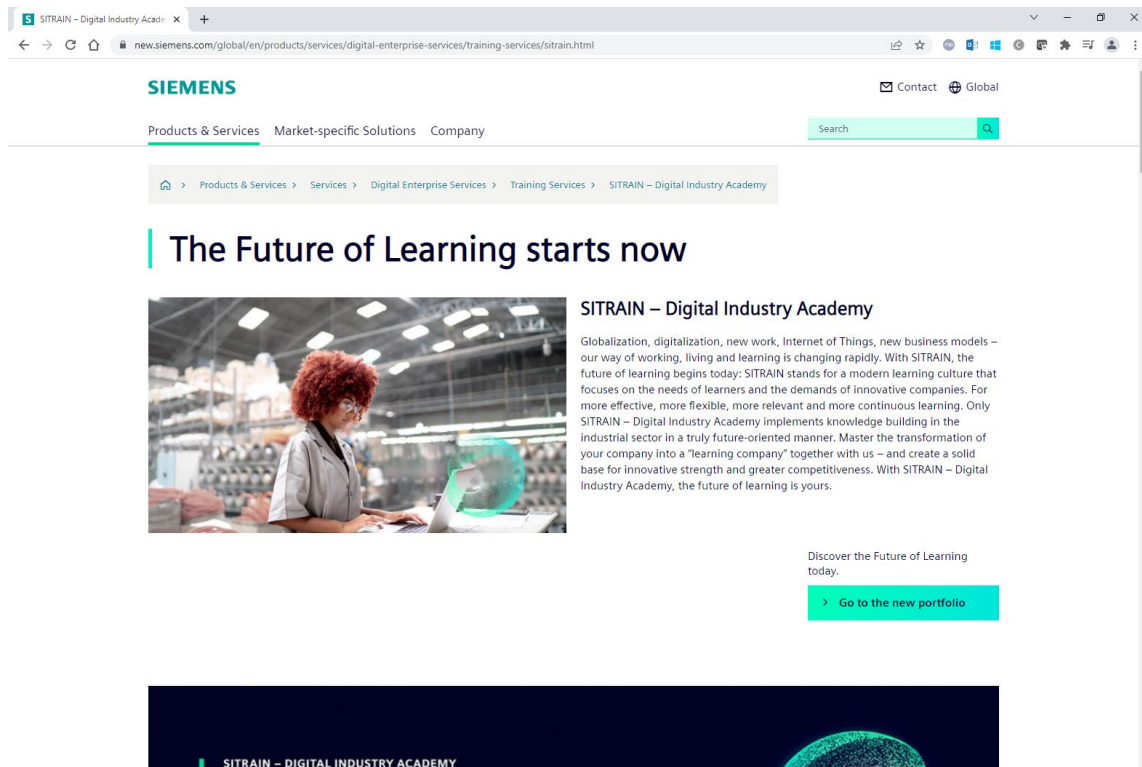
Table 2-6

SITRAIN
SITRAIN Homepage

Three knowledge formats make up the backbone of our philosophy: "Learning Journeys", "Learning Events" and "Learning Memberships".

"Learning Journey"

Learning Journeys are a combination of various learning modules which take a holistic approach to guide participants through a study program on a specific topic area. They are characterized by a mix of different learning methods:

- Live events ("Learning Events"), in which an experienced coach guides you through the topics and familiarizes you with the material – in person or online.

- Self-study modules that make up a "Learning Membership", in which you practice your knowledge with exercises and absorb advanced knowledge of the details on your own time. Online study materials form the basis of this type.

- Personal coaching, where a coach helps you tackle remaining hurdles in a personal meeting.

Figure 2-9
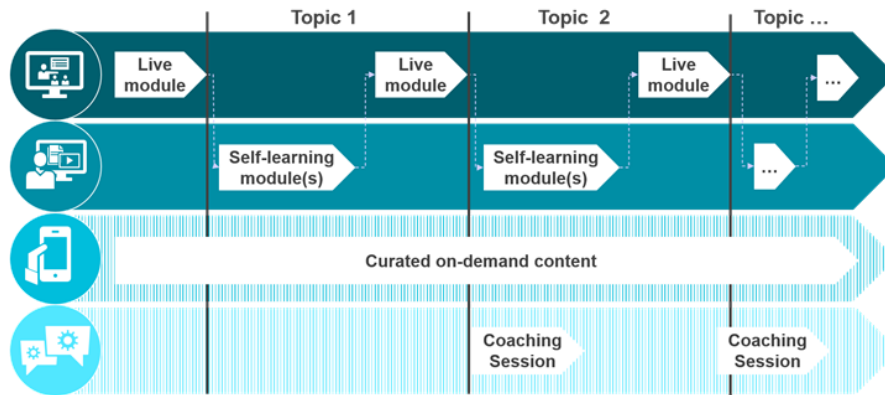
"Learning Events"

Learning Events are training sessions for small groups on a certain set of topics either in person or online. The scope of these events depends on the material being covered. A learning guide explains the topics, gives you hands-on exercises – using on-site hardware or in virtual form – and is available for questions and further inquiries at any time.

Figure 2-10

Table 2-7

Article ID	Learning Events
	Overview: SIMATIC WinCC Unified in the TIA Portal
109773211	SITRAIN Training: WinCC Unified & Unified Comfort Panels
109781323	SITRAIN advanced course: SIMATIC WinCC Unified for PC systems

"Learning Membership"

A Learning Membership is a paid subscription for special content from SIOS Portal that enables you to advance your studies on your own time or look up specialized knowledge as needed. It provides access to a comprehensive portfolio of courses, curated by SIEMENS, that contain rich multimedia content on practically any automation topic.

A Learning Membership is included when you book a Learning Journey.

Table 2-8

Article ID	Learning Membership courses
109780015	Helpful hints: Tips and tricks about SITRAIN access
109799758	SITRAIN: Digital Training with Highlights of TIA Portal V17
	WinCC - Introduction to TIA Portal and HMI
	WinCC Unified – Installation
	WinCC Unified - System overview V2
	WinCC Unified - Configuring communication
	WinCC Unified - First Steps
	WinCC Unified – Creating screens – Introduction
109782872	TIA Portal - WinCC Unified Scripting (JavaScript)
	WinCC Unified - View of Things in TIA Portal

3 Basics of WinCC Unified and SIMATIC HMI

Overview

In the following SITRAIN online course, you will find an overview of the WinCC Unified system within TIA Portal:

Table 3-1

Learning Membership courses
WinCC Unified - System overview V2

3.1 WinCC Unified and other SIMATIC HMI software

WinCC Unified is the latest addition to the portfolio of SIMATIC visualization software. Underneath numerous innovations and new features, many operator concepts and working methods have been carried over from previous products.

Figure 3-1
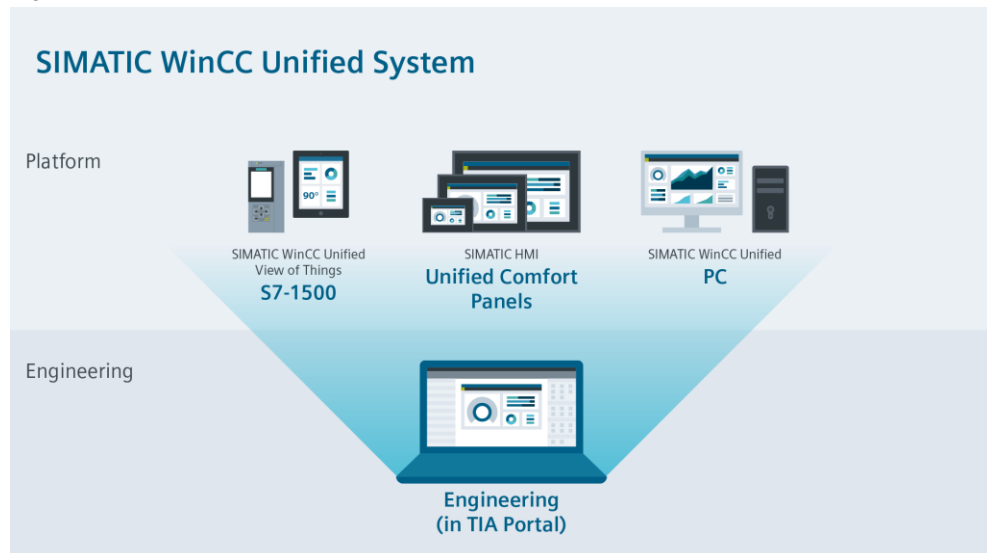
3.1.1 Overview of SIMATIC visualization software solutions

WinCC ("Windows Control Center")

WinCC is a SCADA ("Supervisory Control and Data Acquisition") software program sold by SIEMENS since 1996. To avoid confusion with other software products, its name is also complemented with the current major version number: "WinCC V7".

WinCC is a scalable and open SCADA system for maximum plant transparency and productivity. It can be expanded with a variety of options and addons.

WinCC flexible

WinCC flexible is a software suite for the light-duty performance class and extends WinCC V7. With various editions, WinCC flexible is adapted to different operator device platforms (PC or Panel) and supports various quantity structures.

TIA Portal ("Totally Integrated Automation Portal")

TIA Portal is the cutting-edge framework for project engineering of controllers and HMI operator devices with a uniform user interface and a unified database ("Totally Integrated Automation"). Engineering of all devices can be performed in a single shared software system, enabling you to quickly and efficiently implement your engineering tasks.

WinCC Comfort/Advanced and WinCC Professional

WinCC Comfort/Advanced and WinCC Professional are the visualization components within TIA Portal.

WinCC Comfort/Advanced essentially evolved WinCC flexible. Here, the Comfort and Advanced editions differ mainly in the range of supported HMI operator devices.

WinCC Professional expands the feature set with many features and capabilities that used to be reserved for WinCC V7.

WinCC Unified

WinCC Unified is part of the latest TIA Portal editions. WinCC Unified represents the next step in integrating SCADA-based and operator panel-based visualization engineering. In particular, WinCC Unified supports configuration of the new generation of Unified Comfort Panels (see chapter 3.2).

WinCC Unified furthermore uses modern, high-performance software technologies such as an HTML-based runtime on operator devices.

It is possible to use licenses for WinCC Comfort/Advanced and WinCC Unified at the same time with one TIA Portal installation. This makes it possible to configure older operator devices as well as Unified Comfort Panels in a uniform development environment in TIA Portal.

WinCC View Of Things ("VoT")

SIMATIC WinCC Unified "View of Things", known as "VoT" for short, is a web application in the memory of the SIMATIC S7-1500.

The webpages are configured with WinCC Unified (TIA Portal).

WinCC Unified View of Things uses a limited number of screen objects in comparison to the screen objects of the Unified Comfort Panels or the WinCC Unified runtime.

Table 3-2

Article ID	Application example
109803395	WinCC Unified: View Of Things - VoT, Getting started

Industrial Edge

Industrial Edge is a system integrated into the industrial automation environment. It facilitates rapid, secure and reliable deployment of apps for analyzing process data in your plant.

Industrial Edge offers tried-and-true Edge infrastructure with a central management system, integrated runtime environment and diverse applications and microservices that greatly streamline the deployment of innovative services.

The cloud and edge computing solutions from Siemens include turnkey software solutions for using machine data either locally on the machine and in realtime or globally and cross-machine.

Table 3-3

Product website
Industrial Edge for production machines and plants

3.1.2 Core components: Engineering system and runtime

WinCC Unified consists of two core components:

Engineering system ("ES")

The engineering system is the software used to configure the visualization. In the case of WinCC Unified, this software is fully integrated into the TIA Portal user interface. This means that the user does not perceive any difference in the "look and feel" when switching between visualization engineering (WinCC Unified or Comfort/Advanced, resp.) on the one hand and controller engineering (STEP 7) on the other.

Runtime ("RT")

The runtime is the software that underlies the engineering configuration. It runs on operator devices and is what actually "interprets" the configuration. It creates the connection between the operating system on the operator device and the engineering configuration. Different runtime versions must be used depending on your hardware:

- On SIMATIC HMI **Unified Comfort Panels**, the runtime is based on Linux and HTML 5. Previous Comfort Panels use Windows CE as the underlying operating system.

- PCs use a special **PC runtime** (running on Windows).

- For rapid prototyping, a **simulation** of the Panel runtime with a configuration can also be started. The simulation emulates more or less the functionality of the configuration, allowing you to check your work in advance before making any major hardware expenditures.

Note	For differences in the behavior between the simulation and the actual Panel runtime, refer to chapter 2 of the Readme for the TIA Portal V17 image download (Article ID: 109746530)

Figure 3-2
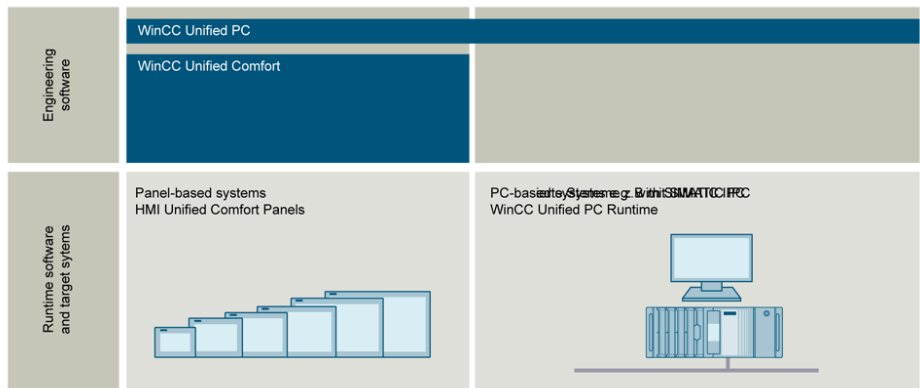
Additional tools

The engineering system and runtime are supplemented by a series of additional tools for working with the WinCC Unified system.

Chapter 4.2, "Tools for WinCC Unified" explains the most important components.

3.2 SIMATIC HMI Unified Comfort Panels and Unified Runtime (PC)

Unified Comfort Panels were specially developed for use with WinCC Unified. Compared to the devices of the previous generation, the hardware and software that underlie the new generation have been fundamentally reworked, resulting in numerous improvements in performance, interoperability and user-friendliness.

Figure 3-3
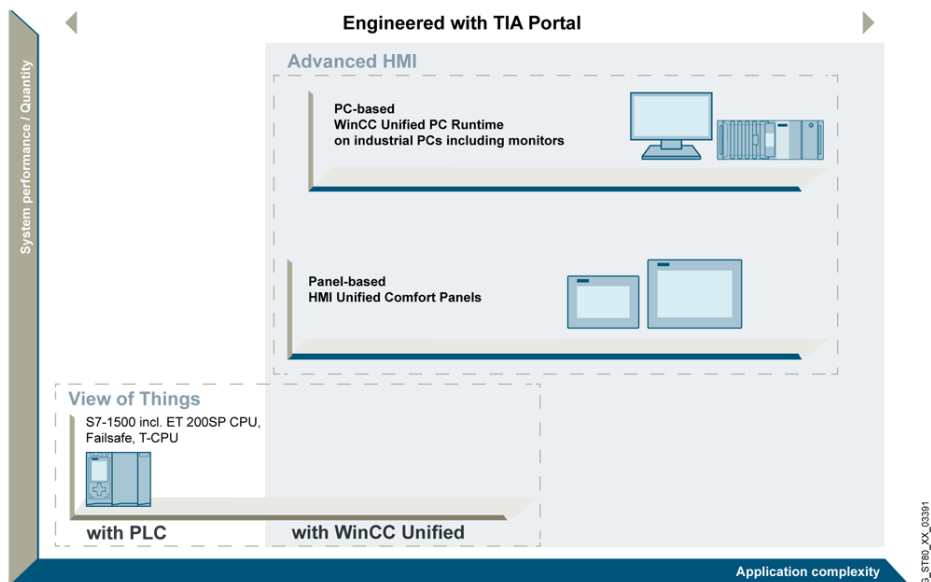
The "SIMATIC Unified Runtime (PC)", or "PC Runtime" for short, can run on practically any appropriately equipped PC. However, it is recommended to use the PC Runtime together with the SIEMENS industrial PCs that have been developed especially for this purpose.

Table 3-4

Expert Talk
SITRAIN Expert Talk: New Unified Comfort Panels and established Comfort Panels

Note	Comprehensive information on the Unified Comfort Panels can be found on the SIEMENS website: https://new.siemens.com/global/en/products/automation/simatic-hmi/wincc-unified/hardware.html

Feature set

- Unified Comfort Panels are characterized by a significant performance improvement and expansion of quantity structures compared to Comfort Panels. Do however observe the note on page 28.

- Unified Comfort Panels offer the completely new ability to expand the functionality of devices by the addition of apps. Thanks to the integration of Siemens Industrial Edge, users can now run other programs simultaneously alongside this standard device functionality. Project-specific requirements can thus be implemented quickly and easily.

- Unlike earlier generations of operator devices, Unified Comfort Panels use an HTML 5-based runtime that has been developed specifically for the needs of automation. Engineering configurations are displayed through the pre-installed web browser.

- Wide variety of display sizes ranging from a 7" to 21.5" screen diagonal in either a classic or neutral design.

Figure 3-4: The model names roughly correspond to the usable screen diagonals.

Note	Detailed technical information can be found in the SIEMENS Industry Mall (https://mall.industry.siemens.com/) under Automation technology -> SIMATIC HMI operator control and monitoring systems -> HMI devices -> Advanced HMI Panel-based -> SIMATIC HMI Unified Comfort Panels.

Unified Comfort Panel image management

Operator device images contain the operating system that mediates the functions between the firmware of the operator device and the downloaded configuration and/or its runtime environment.

Due to storage limitations, not all image versions are delivered with TIA Portal. Image versions must be downloaded separately from SIOS Portal.

The operator device images must be compatible with both the TIA Portal version you are using as well as the device version that has been configured in TIA Portal. Otherwise, errors may occur when attempting to download the configuration (see Table below). This means that, after updating TIA Portal, you may also need to download and install updates to the operator device images.

Table 3-5

Article ID	FAQ
109781234	Why does loading HMI images with TIA Portal V16/V17 fail with the error message "Components with a different version are installed on the target device. An older incompatible firmware image exists on the target device."?
109784440	Download SIMATIC STEP 7 incl. Safety, S7-PLCSIM and WinCC V17 TRIAL Download with images under "DVD 3 / 4"
109746530	Image Downloads for HMI Operator Panels (also contains updates)

4 WinCC Unified for newcomers

This chapter will guide you through the steps ending with your first configuration download in WinCC Unified.

4.1 Support for newcomers

WinCC Unified beginner's course

The following SITRAIN online course contains brief instructions for getting started in your work with WinCC Unified.

Figure 4-1

Table 4-1

Learning Membership courses
WinCC Unified - First Steps

"Getting Started" product website

SIEMENS' product website provides a wealth of information on getting started with WinCC Unified.

Figure 4-2
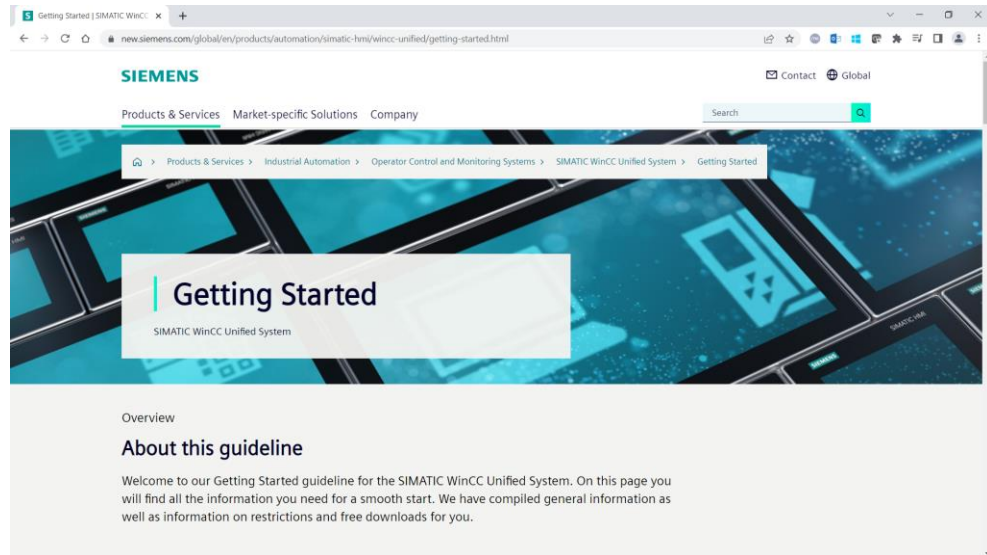
Table 4-2

Product website
Getting Started WinCC Unified System

Use the links and documents compiled in the Getting Started pages to familiarize yourself with the WinCC Unified system. They provide you with pointers on the suitability of WinCC Unified for your automation tasks, on compatibility with existing installations, and on the migration to WinCC Unified.

"WinCC Unified Getting Started"

The "Beginner's Guide" only contains an overview of the features and system architecture of WinCC Unified.

For details and step-by-step instructions on the installation and operation of WinCC Unified, please refer to the respective "Getting Started" in SIOS Portal:

Table 4-3

Article ID	FAQ
109801175	SIMATIC HMI WinCC Unified Getting Started V17

A Getting Started can be used as a conventional PDF or a multimedia display system.

Figure 4-3
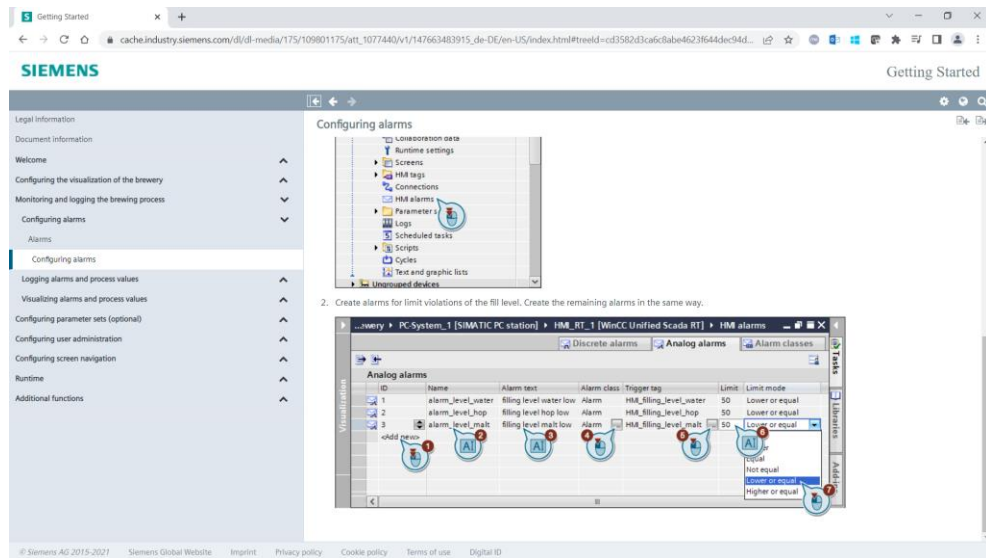
4.2 Tools for WinCC Unified

The WinCC Unified installation package includes not only the TIA Portal engineering system and the runtime, it also contains a number of additional tools and auxiliary programs that will support you with the installation and administration of the WinCC Unified system.

This chapter briefly explains the most important of these tools.

After the installation is complete, you can find these tools in the "Siemens Automation" folder in your Windows Start Menu. You can copy them to the Windows desktop taskbar for your convenience.

Figure 4-4
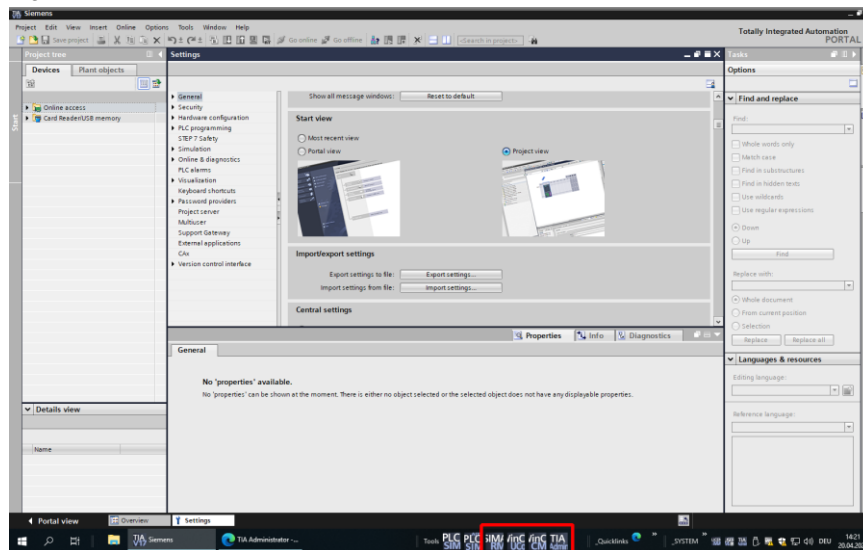
"TIA Administrator"

TIA Administrator is the core tool for management of your WinCC Unified installation.

Figure 4-5
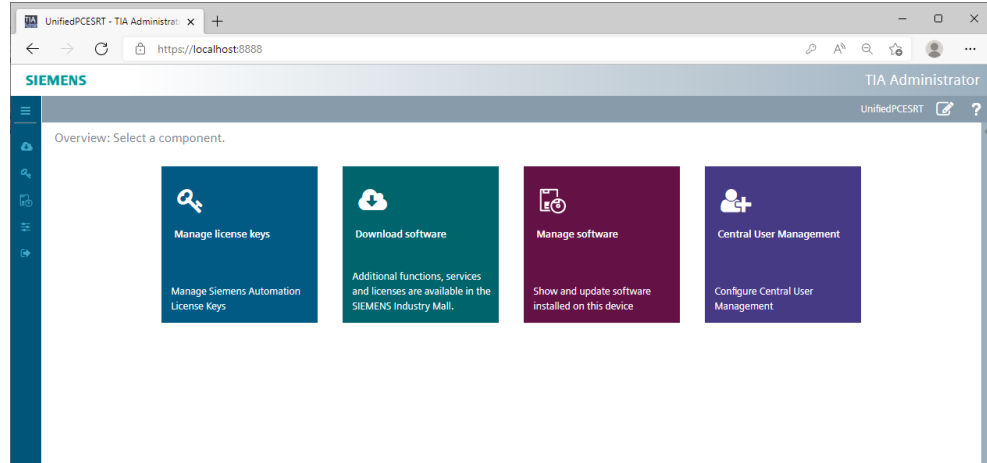
TIA Administrator comprises four essential components:

- "Manage License Keys": Facilitates installation and uninstallation of the license keys for licensed SIMATIC products and the transfer of license keys between different data storage devices (e.g. USB drives).

- "Download Software": Establishes a connection to the Siemens "Online Software Delivery" ("OSD") where you can obtain add-ons, additional components, and licenses for your TIA Portal system.

- "Manage Software": Gives you an overview of the TIA Portal components installed on your PC, checks the Siemens update servers for new software versions and suggests updates so that you can keep your system up-to-date.

- "Central User Management" aka "User Management Component": The user management function of the User Management Component (UMC) enables system-wide central maintenance of users. Person-specific assignment of roles and permissions minimizes maintenance effort while achieving a high level of transparency.This feature helps collaborative creation of large projects with multiple engineers working at the same time.

Table 4-4

Article ID	Application example
109780337	Central User Management with "User Management Component (UMC)"

Launch TIA Administrator with the taskbar or Windows Start Menu.

Because the tool is browser-based, you can also launch it by entering the following URL in the address bar:

```
https://localhost:8888
```

"WinCC Unified Configuration"

WinCC Unified Configuration lets you change various settings for the WinCC Unified engineering system and WinCC Unified runtime. In particular, here you can configure certificate exchange (see chapter 4.5) and runtime user management (see chapter 4.8.3).

Figure 4-6
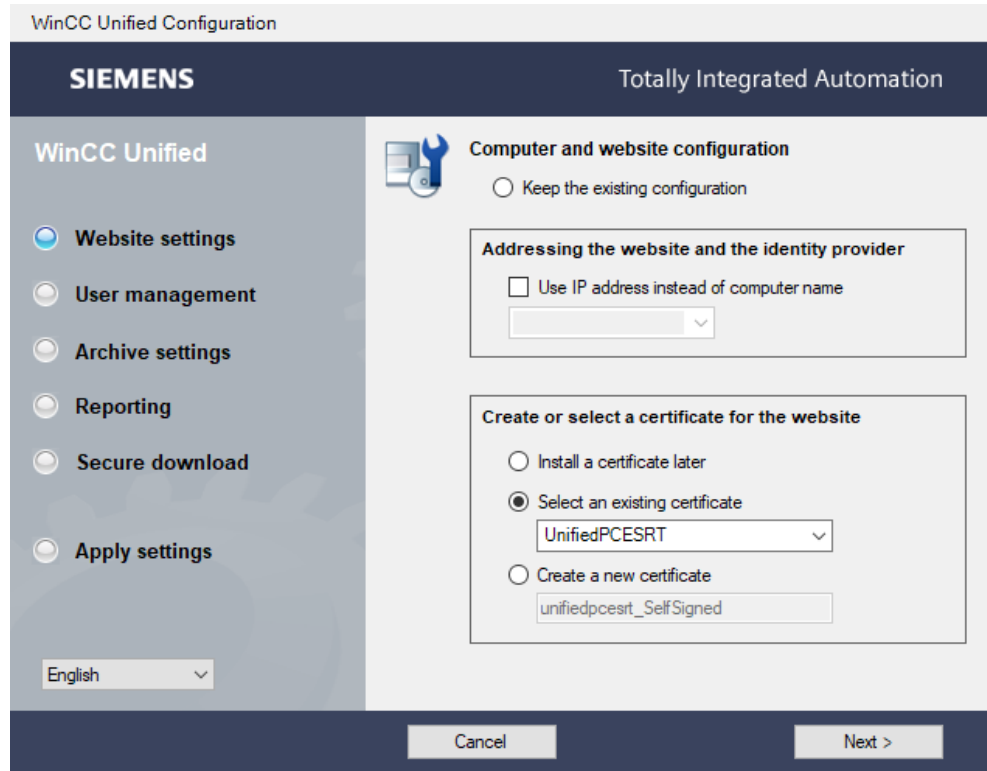
"WinCC Unified Certificate Manager"

WinCC Unified Certificate Manager defines a "certificate authority", necessary for the communication between WinCC Unified runtimes (see chapter 4.5) as well as for data exchange via OPC UA.

Figure 4-7
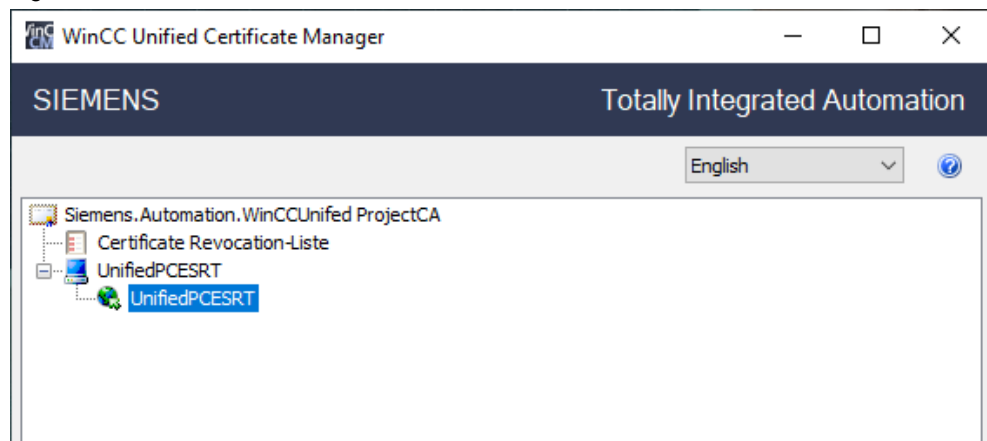
"SIMATIC Runtime Manager"

SIMATIC Runtime Manager must also be installed on the same device as the runtime installation in order to manage compiled projects on a PC.

Figure 4-8
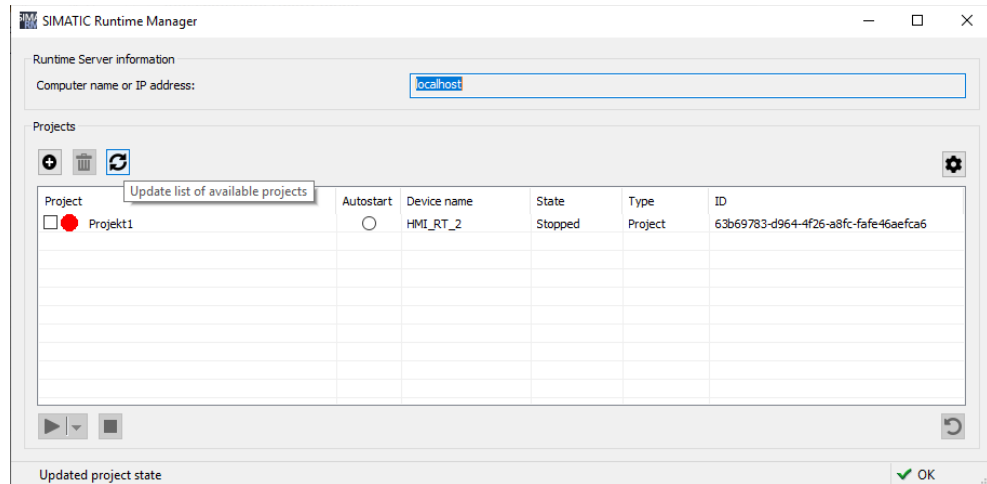
Runtime Manager primarily serves to start, stop and delete compiled configurations on the PC (see chapter 4.8.1). Unlike with Panels, multiple configurations can be stored here simultaneously.

Finally, Runtime Manager provides the following functions:

- Autostart a configuration when device starts up
- Launch configuration with certain user accounts
- Display user management settings
- Check connection to the UMC server
- Manage certificates
- Restore and delete archive segments

The use of Runtime Manager is explained in the WinCC Unified runtime manual:

Table 4-5

Article ID	Manual
109803796	SIMATIC HMI WinCC Unified, WinCC Unified Runtime "SIMATIC Runtime Manager" chapter

Note	With WinCC Comfort/Advanced, simulated Panel configurations were displayed immediately after download. Configurations simulated in WinCC Unified, on the other hand, are only displayed after the download once a browser window is opened with the appropriate address (see chapter 4.8.2).

4.3 Download and updates

4.3.1 Sources and required components

The delivery releases for TIA Portal and WinCC Unified can be found in SIOS Portal.

Table 4-6

Article ID	Download/delivery release
109784438	Delivery release for TIA Portal V17
109792165	Delivery release for SIMATIC WinCC Unified V17 Engineering System & Runtime

The delivery releases contain important information about

- New and revised features
- System requirements (hardware, host operating system, etc.)
- Order data / item numbers
- Training options and further information
- Compatibility

Detailed information about the compatibility of various products with each other is available by means of the free compatibility tool as well:

Tabelle 4-7

Article-ID	FAQ
64847781	Compatibility Tool for Automation and Drive Technology

Trial versions

Free trial versions of WinCC Unified and the other TIA Portal components are be downloaded at any time from SIOS Portal and are valid for 21 days:

Use the installation package "STEP 7 Basic/Professional incl. Safety and WinCC Basic/Comfort/Advanced and WinCC Unified".

Table 4-8

Article ID	Download/delivery release
109784440	Download SIMATIC STEP 7 incl. Safety, S7-PLCSIM and WinCC V17 TRIAL

Licensed versions

Licensed versions of WinCC Unified can be obtained from SIEMENS Industry Mall or from your local SIEMENS sales representative. Note that the engineering system and runtimes are licensed independently of one another.

Table 4-9

Article ID	Ordering options
	WinCC Unified in SIEMENS Industry Mall
	Regional SIEMENS Industry sales representatives

The various licensed WinCC Unified versions differ mainly with respect to the HMI operator devices supported and the quantity structures of the configurable external tags ("PowerTags"). If the licensed number of tags no longer meets your requirements, you can expand the quantity structures with "PowerPacks".

<table>
<tr><td>Note</td><td>Note that method of counting used tags has also changed between WinCC Comfort/Advanced and WinCC Unified.

In WinCC Comfort/Advanced, for example, an array always counts as one tag for licensing purposes, independently of the number of array elements. In WinCC Unified, each array element counts as a tag.</td></tr>
</table>

4.3.2 Software updates

You can obtain updates to your TIA Portal installation in two ways:

- Semi-automatically with TIA Administrator (recommended), or
- Manually via SIOS Portal

Updates through TIA Administrator

Besides numerous other administrative functions, TIA Administrator can also connect with the Siemens update server and then download and install new software products and updates or extensions (see chapter 4.2).

You must consent to downloading and installing each of the updates.

Figure 4-9
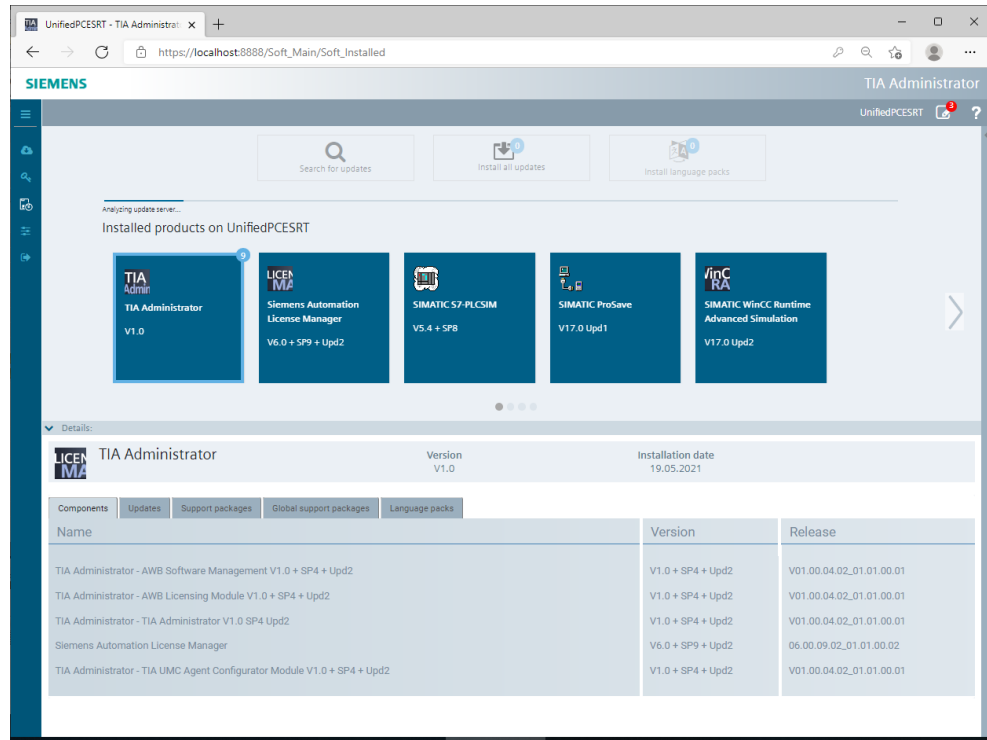
Updates via SIOS Portal

SIOS Portal offers continuously updates articles with information about updating TIA Portal components. You can obtain the corresponding downloads here free of charge.

Table 4-10

Article ID	Download
109792171	Information on updates for WinCC Unified V17
109792166	Updates for SIMATIC WinCC Unified PC V17
109746530	Image Downloads for HMI Operator Panels (as well as Unified Comfort Panel Updates)
109784441	Updates for STEP 7 V17, S7-PLCSIM V17 and WinCC V17

4.4   Installation

Overview

The following SITRAIN course provides an overview of the necessary steps for a successful WinCC Unified installation:

Table 4-11

Learning Membership courses
WinCC Unified – Installation

Figure 4-10
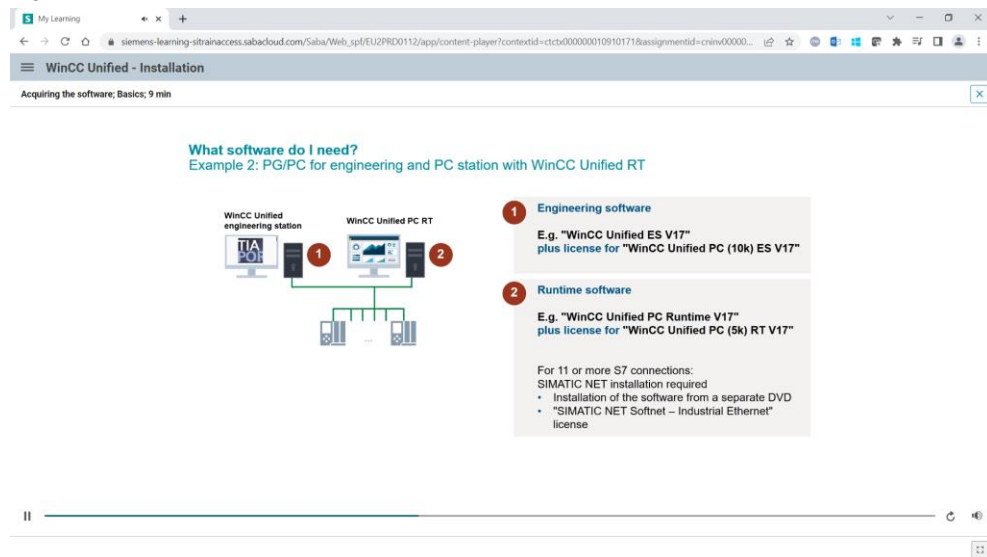
Requirements

Before installing the WinCC Unified engineering system as part of TIA Portal, certain Windows functions on the target computer first need to be enabled. Depending on the Windows installation, they might not be enabled by default. Make the required settings, if applicable, as described in the following FAQ.

Table 4-12

Article ID	FAQ
109773589	Which Windows functions must be activated in order to be able to install SIMATIC WinCC Unified?

If installing TIA Portal from a data storage medium, the WinCC Unified software will already be on the DVD. In the Installation Wizard, select WinCC Unified again in order to install it.

Figure 4-11
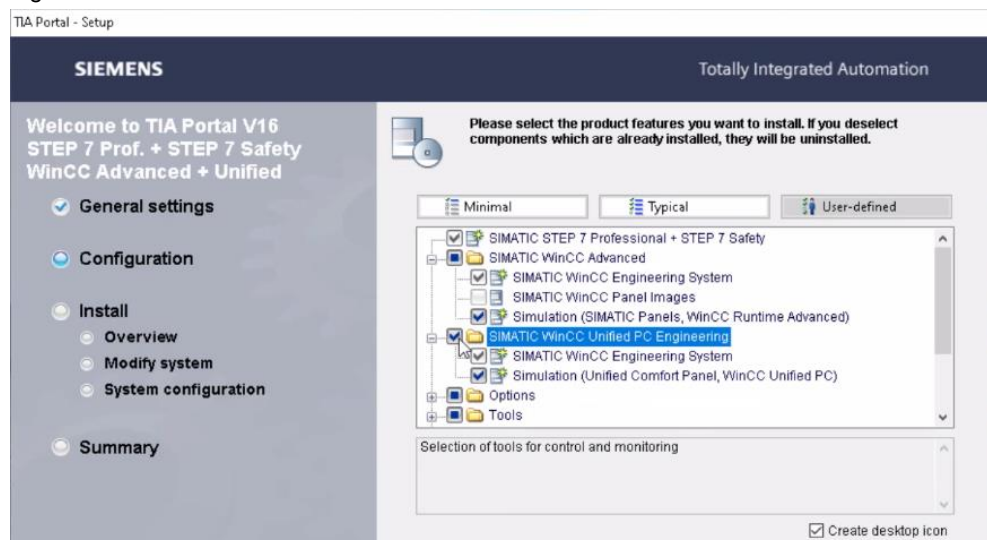
Note	It is not possible to install WinCC Unified in parallel with WinCC V7.5 or WinCC Professional.

Windows User Management

To install and, to some extent, operate WinCC Unified, the user must have administrator privileges. If the user loses these privileges after completing the installation (for example due to internal IT policies), then WinCC Unified will only be usable with some restrictions as a result, and error message like "Project status 'partly running'" might occur..

More Information regarding possible problems and their solutions can be found in chapter 2 of the "Readme WinCC Unified Runtime" for Update 4 of WinCC Unified Runtime:

Tabelle 4-13

Beitrags-ID	Download
109792166	Updates for SIMATIC WinCC Unified PC V17

Note	Refer also to chapter 5.3.1, User administration.

4.5 Required certificate structure

WinCC Unified runtime communication is secured with certificates. To create an appropriate certificate structure, use the "WinCC Unified Configuration" and "WinCC Unified Certificate Manager" tools (see chapter 4.2).

4.5.1 WinCC Unified runtime on the engineering computer

To use a local WinCC Unified runtime and log on a user, you must make the settings listed in the following FAQ.

Carry out the steps before starting a simulation of a Unified Comfort Panel.

Table 4-14

Article ID	FAQ
109806850	Which settings do you have to make to use a WinCC Unified Runtime on the engineering computer using certificates?

4.5.2 Communication with other devices

For secure encrypted communication between the WinCC Unified runtime and other devices, a certificate exchange between the communication partners must have been performed beforehand.

Certificates are required for the following functions of WinCC Unified devices:

- OPC UA server
- OPC UA client
- OPC UA Exporter

- Web server
- RT collaboration
- Audit Trail System

Certificates are managed and created with "WinCC Unified Certificate Manager".

The following FAQ describes the steps necessary to create a certificate structure:

Table 4-15

Article ID	FAQ
109777591	How do you create a certificate structure for the WinCC Unified V17 System so that other terminal devices can communicate encrypted with the Runtime?

4.6 Preparing the operator device (Unified Comfort Panel)

Basic information

For basic information to familiarize yourself with the operation of Unified Comfort Panels, refer to the "Getting Started" website:

Table 4-16

Product website
https://new.siemens.com/global/en/products/automation/simatic-hmi/wincc-unified/getting-started.html

Operating system updates

Note	For more on this, also see the section entitled "Unified Comfort Panel image management", page 20.

Follow the instructions in the following FAQ to download and/or update the image of an operator device:

Table 4-17

Article ID	FAQ
19701610	How do you do a SIMATIC HMI operating system update (firmware update, OS update) on operator panels or perform a "Reset to factory settings"?
	Observe the section "Procedures for 'classic' (Basic/Mobile/Comfort) operator panels -> 'Operating system update' or 'Reset to factory settings' with WinCC Comfort/Advanced".

Restore factory settings

If it becomes necessary to reset a Unified Comfort Panel to factory settings, use the free tool "ProSave".

For detailed instructions on the procedure, see the corresponding chapter in the manual:

Table 4-18

Article ID	Manual
109795870	Unified Comfort Panel manual
	Chapter "Transferring data -> Updating the operating system -> Resetting an HMI device to factory settings via ProSave"

Note	Further information is available in the FAQ entitled How do you do a SIMATIC HMI operating system update (firmware update, OS update) on operator panels or perform a "Reset to factory settings"? (Article ID: 19701610)

4.7 Configuration download

After finishing work on the engineering configuration, the configuration still needs to be downloaded to the operator device – whether Panel or PC. Once again, you will need to observe specific steps, described in the following course:

Table 4-19

Learning Membership courses
WinCC Unified - Download configuration to HMI device

4.8 Starting the simulation

4.8.1 Management of runtimes

Multiple runtime configurations can be loaded on a PC simultaneously. They are managed, especially when it comes to starting and stopping the runtime, by SIMATIC Runtime Manager (see chapter 4.2).

4.8.2 Starting the configuration on a PC

The WinCC Unified PC runtime is **always** displayed in a browser. In this case, the Windows 10 Kiosk Mode can be employed to prevent the user from switching to other applications.

To obtain access to the visualization, enter either the full name of the target computer or its IP address as a URL in the browser. If the browser and the configuration are on the same computer, the URL can simply be "localhost".

Communication always runs over the "https" protocol, which is encrypted with TLS or SSL and thus protected against manipulation by third parties. This prevents eavesdropping or manipulation of the data traffic by unauthorized parties.

First start and "unsecure connection" error message

When you try to reach localhost, a notice may appear when starting the browser that the connection is not private:

Figure 4-12
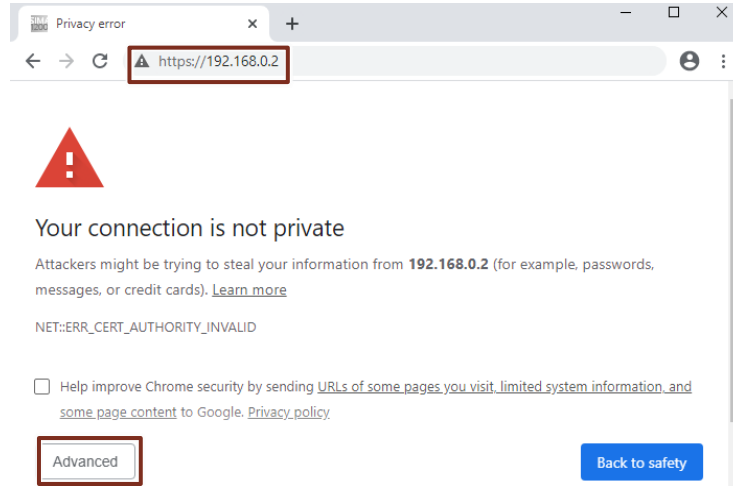
The wording of the error message varies by browser: "Your connection is not private", "Your connection is not secure" or the like.

This is caused by an incorrect certificate structure on the localhost. Correct this issue by following the instructions in chapter 4.5.

As a workaround in this case, you can click the "Advanced" button and then click "Proceed to..." in the next dialog:

Figure 4-13
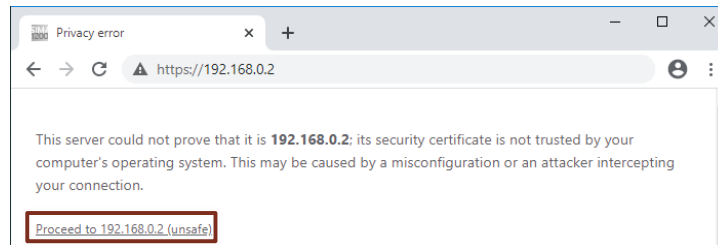
By doing this, you override the interdiction from the browser and establish a connection to the runtime.

The following FAQ describes the procedure and the remedy in detail:

Table 4-20

Article ID	FAQ
109810490	How do I avoid the message "This site is not secure" in the browser with WINCC Unified PC RT (TIA Portal)?

Start screen in the browser

After the login is successful, the runtime start screen appears:

Figure 4-14
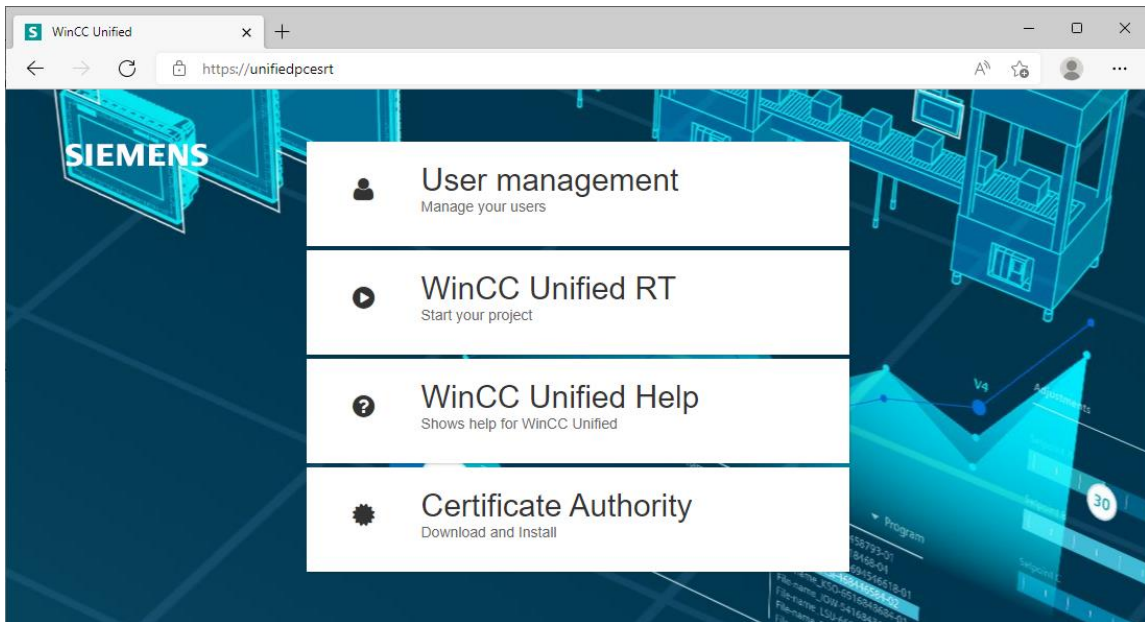
The fourth tile, "Certificate Authority", only appears if the certificate exchange has not yet been completed.

From here you can go to the visualization by logging in with the name and password of a user whom you have previously created in the user management of the configuration.

Table 4-21

Article ID	Manual
109794204	"SIMATIC HMI WinCC Unified Engineering V17", chapter "Unified Comfort Panel"
109794204	"SIMATIC HMI WinCC Unified Engineering V17", chapter "Displaying runtime"

Note	For remote access from one device to another, the Required certificate structure (chapter 4.5) needs to have been installed beforehand.

4.8.3   User management

Requirements for browser access

Observe the following points if you use one of these configurations:

- Use of the Unified runtime on PCs,
- Remote access to other Panels,
- Simulation of Panels on a PC

Then the following conditions must be met so that the browser can access a project that has been started in Runtime Manager:

- The project's user management configuration is active.
- When using the local user management feature:
  - At least one user has been created before downloading in TIA Portal.
  - At least one role has been assigned to the user. The roles give the user function rights to either monitor or monitor and control the runtime project.
  - At least one role has the "HMI Administrator" role.
- If using central user management:
  - At least one user has been created in the UMC ("User Management Component") system.
  - The user created in the UMC system was imported to the TIA Portal project before the download.
  - The user's roles give the user function rights to either monitor or monitor and control the runtime project.

Users are managed with the help of the "WinCC Unified Configuration" tool. Observe the information in chapter 5.3.1 as well as in the following application example:

Table 4-22

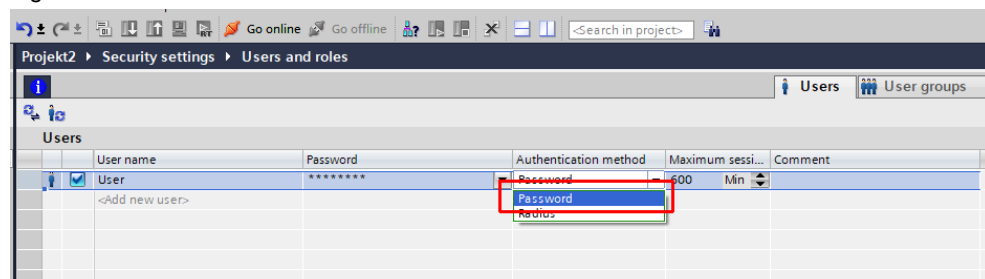| Article ID	Application example
109780337	Central User Management with "User Management Component (UMC)"

RADIUS authentication methods

Always select "Password" as the authentication method for user management.

Figure 4-15

Using the RADIUS method ("Remote Authentication Dial-In User Service") can cause permanent issues with the user management on your operator device.

5 Migration from WinCC Comfort/Advanced to WinCC Unified

5.1 Migration guide from WinCC (TIA Portal) to WinCC Unified

The "Beginner's Guide" contains only a general overview of the features of WinCC Unified and will get you familiarized with the system architecture.

Details and step-by-step instructions on the shift to WinCC Unified can be found in two "Migration guides". It is highly recommended to read these if you wish to migrate from WinCC Comfort/Advanced to WinCC Unified:

Figure 5-1

Table 5-1

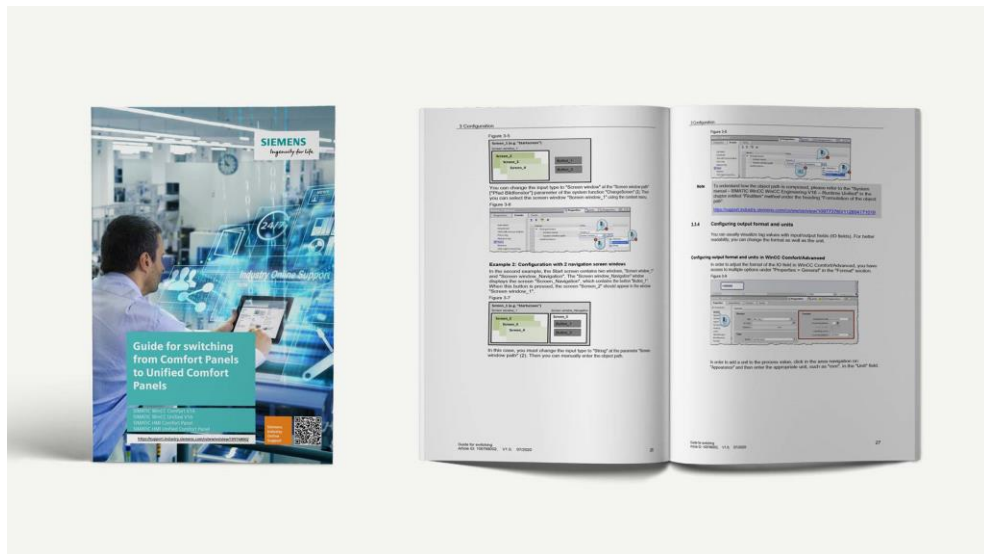| Article ID	FAQ
109768002	Guide for switching from Comfort Panels to Unified Comfort Panels and from WinCC Runtime Advanced to WinCC Unified PC Runtime

These guides address the transition from SIMATIC HMI Comfort Panels to SIMATIC HMI Unified Comfort Panels as well as the transition from WinCC Runtime Advanced to WinCC Unified PC Runtime.

5.2 Missing features

Below you will find a selection of product characteristics that are not yet available in WinCC Unified. It is not a complete list.

Conversion and the "Data2Unified" tool

As a consequence of fundamental technical changes (system architecture, scripting language, use of screen windows instead of templates, etc.), it is not possible to convert complete projects from WinCC Comfort/Advanced to WinCC Unified. The free TIA Portal add-in "Data2Unified" will nonetheless help you with the conversion of selected configuration content to WinCC Unified.

Figure 5-2
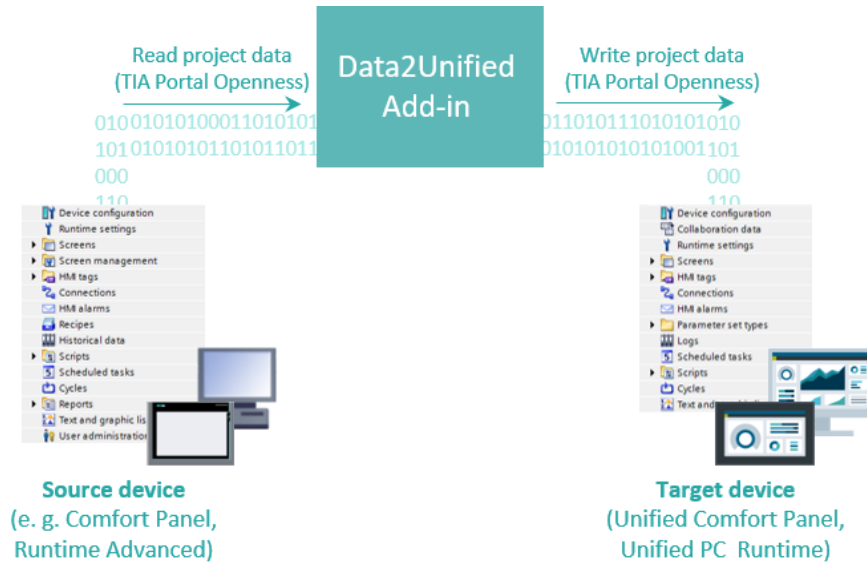
The following article will take you to the download of "Data2Unified". There you will find comprehensive instructions and an explanation of the configuration features that the conversion will capture:

Table 5-2

Article ID	Download
109770510	Data2Unified Add-in

Figure 5-3
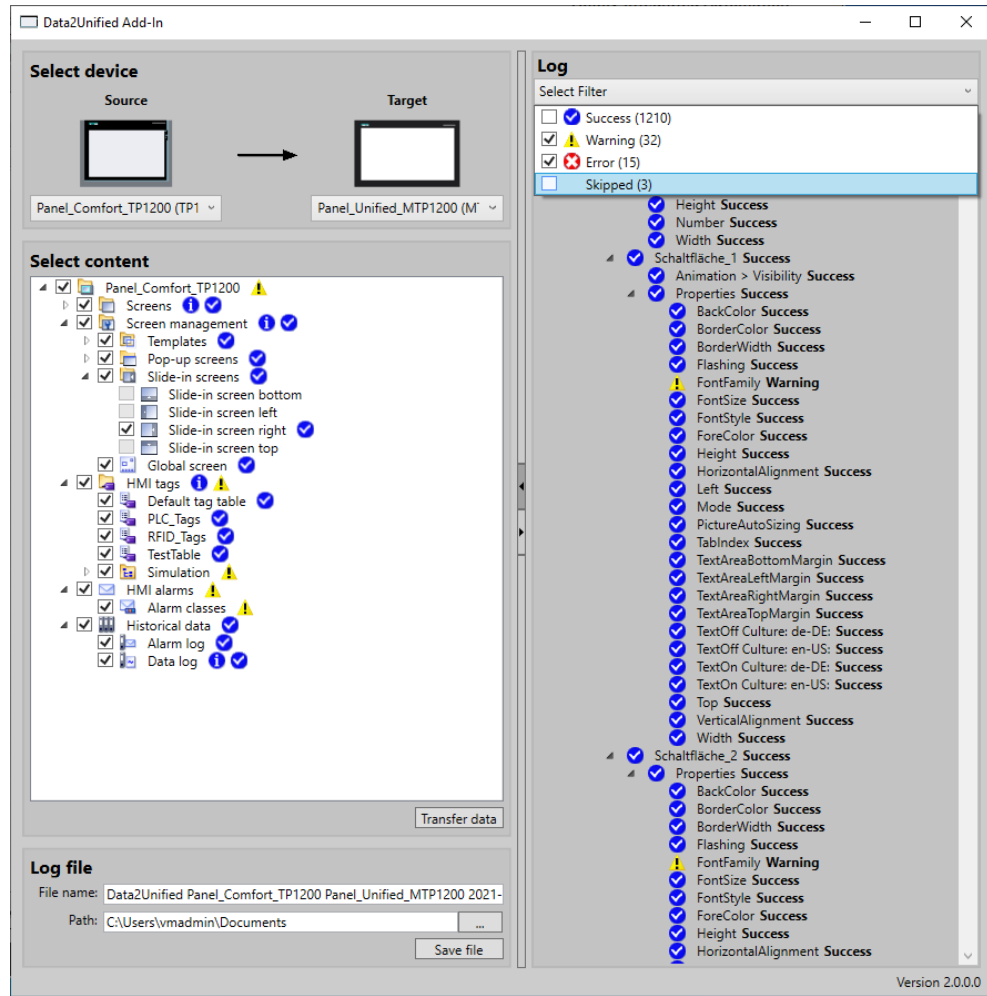
Network drives for saving logs

With Unified Comfort Panels, it is not possible to store logs on network drives.

Range pointers

Range pointers are data ranges that are exchanged between the PLC and the HMI operator device not in the form of single tags but rather as "complete units". They are typically used to transmit system data such as the current screen number, date/time, user logoff, etc.

Range pointers are not implemented in WinCC Unified. The function of some range pointers can, however, be emulated with scripts (see chapter 5.3.5). The following FAQ describes the options one by one:

Table 5-3

Article ID	FAQ
109794243	How do you configure area pointers for WinCC Unified HMI operator panels?

Grouping of screen objects

Objects in screens cannot currently be joined into groups.

5.3 Revised features

5.3.1 User administration on the operator device

Editor

The user management editor has been revised for WinCC Unified.

In WinCC Comfort/Advanced, it was located in the project tree under "User administration". In WinCC Unified, users are now managed in the "Security settings > Users and roles" editor.

Users

User management in WinCC Unified V17 has changed when compared to WinCC Comfort/Advanced versions.

As a result, you will create a user in the TIA Portal project and assign that user a user role so that the user can log on to the WinCC Unified runtime.

When downloading the project to the runtime device, make sure that the existing user management on the device is overwritten. To do this, in the "Load preview" dialog, disable "Keep current user management data in runtime".

For a precise description of the error that occurs if the user management is not correctly configured, and for instructions on troubleshooting, see the following FAQ:

Table 5-4

Article ID	FAQ
109805541	How do you clear an error message during user login to "WinCC Unified RT"?

Note	A user account is not necessary in order to merely operate an HMI device. However, a user account is necessary to simulate the HMI device and to establish remote access to the Panel as a web client.

Role concept and function rights

In WinCC Comfort/Advanced, users were assigned to user groups with various user rights.

WinCC Unified replaces this concept with "function rights" for the users. When migrating, this requires a modification of the user management in the configuration.

For detailed information, see the WinCC Unified manual:

Table 5-5

Article ID	Manual
109794204	SIMATIC HMI WinCC Unified Engineering V17 – WinCC Unified, Configuring users and roles

Note	See also chapter 4.8.3.

5.3.2 Screen management

Fundamentals

Pop-up screens and slide-in screens are screens that are not displayed permanently but which are instead shown or hidden as needed.

Global screens and permanent areas are screens or screen segments that appear in every screen in a configuration. For example, they can be used to ensure that a message window can be opened at any time.

Screen management in WinCC Unified

Screen management has changed in the shift from WinCC Comfort/Advanced to WinCC Unified. Screen templates, permanent areas, slide-ins and other elements are no longer realized with specialized objects, but rather with screen windows. In addition, they are no longer saved automatically in separate folders in the project tree, instead they are saved like regular screens.

Note	For the sake of simplicity, we recommend creating individual folders in the project tree for each of the special forms and storing the corresponding screens there.

Further differences are:

- The system functions for pulling up or closing pop-up screens have changed.
- The dynamization options for pop-up screens have been extended.

For detailed instructions on the function and configuration of the screen management, refer to the two migration guides:

Table 5-6

Article ID	Application example
109768002	Guide for switching from Comfort Panels to Unified Comfort Panels and from WinCC Runtime Advanced to WinCC Unified PC Runtime (chapter 3.4 in each)

5.3.3 Faceplates

Fundamentals

Faceplates are composite groups of screen objects that serve as reusable modules. They can be reused as complete units. In this way, in a facility with multiple identical plant components, the visualization only needs to be configured for one plant component and then copied for the other components.

Changes in the editor

The faceplate editor has been redesigned from the ground up in the move from WinCC Advanced to WinCC Unified. Instructions for using the new editor can be found in the relevant chapter of the manual:

Table 5-7

Article ID	Manual
109794204	"SIMATIC HMI WinCC Unified Engineering V17", chapter "Configuring faceplates"

Once again, also note the two migration guides:

Table 5-8

Article ID	Application example
109768002	Guide for switching from Comfort Panels to Unified Comfort Panels and from WinCC Runtime Advanced to WinCC Unified PC Runtime (chapter 3.3.1 in each)

5.3.4 System functions

Fundamentals

System functions are functions provided by the runtime for a configuration. They are particularly well suited for linking to system events, for example button presses. System functions allow common tasks to be easily and simply carried out, for example a screen change or parameter assignment of a trend display.

Not all system functions available in WinCC Comfort/Advanced are still available in WinCC Unified. The use or naming of some system functions has changed.

Refer to the following manual sections for a comparison of the system functions in WinCC Comfort/Advanced and WinCC Unified:

Table 5-9

Article ID	Manual
109798671	SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17, System functions for Comfort Panels
109798671	SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17, System functions for Runtime Advanced
109794204	SIMATIC HMI WinCC Unified WinCC Engineering V17 - WinCC Unified, System functions

Note	The system function "SetBitWhileButtonPressed", often coupled with the "Press" event of, say, a button, is no longer available in WinCC Unified.
	To achieve an equivalent behavior, two events must be linked with two system functions:

- "Press" event → System function "SetBitInTag"
- "Release" event → System function "ResetBitInTag"

Requirements for use

Certain system functions require the presence of a valid tag value, otherwise they cannot be executed.

For more on this topic, refer to the following FAQ:

Table 5-10

Article ID	FAQ
109795137	How do you use the system functions "SetBitInTag", "ResetBitInTag", "DecreaseTag", "IncreaseTag" and "InvertBitInTag" correctly with WinCC Unified?

5.3.5 Scripting as an aid during configuration

Fundamentals

The following SITRAIN online course provides an overview on scripting with JavaScript in WinCC Unified:

Table 5-11

Article ID	Learning Membership courses
109782872	TIA Portal - WinCC Unified Scripting (JavaScript)

The Tutorial Center offers an interactive video on the topic:

Table 5-12

Tutorial Center course
JavaScript in WinCC Unified

The application example below contains numerous configuration aids and explainers on the use of scripts with WinCC Unified:

Table 5-13

Article ID	Application example
109758536	SIMATIC WinCC Unified - Tips and Tricks for Scripting (JavaScript)

Properties of scripts

Not all configuration tasks can be conveniently accomplished with a user interface. For complex tasks, it is simpler to program procedures in the form of "scripts". At the same time, scripts take up resources on an operator device and can cause some processes to slow down. For this reason, the reasons for and against using scripts must be weighed against each other.

Note	Cyclically calling scripts is especially resource-intensive, most of all when the call interval is short. Always check whether a script must be run cyclically or whether this can be avoided with alternative techniques.

Programming languages used

The SIMATIC HMI software supports various programming languages for scripting:

Table 5-14

Product	**Supported scripting languages**		
	Visual Basic Script	**C script**	**JavaScript**
WinCC V7	×	×	-
WinCC flexible	×	-	-
WinCC Comfort/Advanced	×	-	-
WinCC Unified	-	-	×

Thanks to its performance, potential for reuse, and security, scripting plays a greater role in WinCC Unified project engineering than in earlier software products.

Visual Basic Script and JavaScript

Virtual Basic Script ("VBS") is a scripting language published by Microsoft. It is supported by all modern Windows operating system versions. VBS has developed a high level of acceptance, but Microsoft has long since ceased development on it. Microsoft prefers the use of other scripting languages instead.

This is why WinCC Unified moved to JavaScript as a scripting language. JavaScript offers some advantages. Specifically, it is:

- Open-source
- Vendor-independent
- Ubiquitous
- Stable
- Available cross-platform

| **Notes**	• Despite the similarity in their names, JavaScript and the programming language "Java" are significantly different from one another. • The official language standard of JavaScript has been specified as "ECMA-262", also known as "ECMAScript". The three terms are thus sometimes used interchangeably.

WinCC Unified utilizes a JavaScript interpreter that is integrated into practically every modern internet browser; this interpreter provides a suitable runtime environment.

TIA Portal editor for scripting

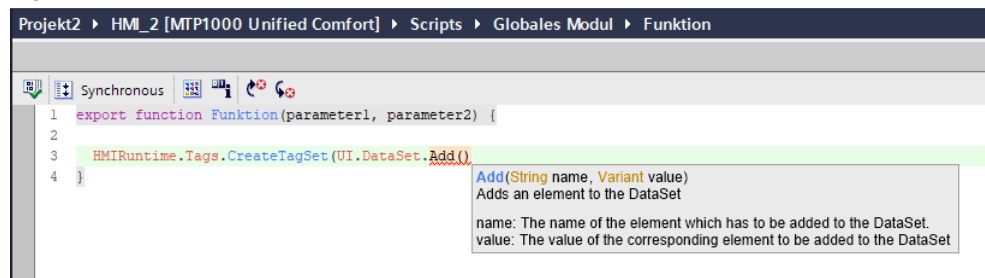The TIA Portal editor will help you develop scripts in numerous ways:

- Syntax highlighting
- Syntax checking
- Autocomplete that provides suggestions to complete instructions in the script based on the VB object model.

Figure 5-4
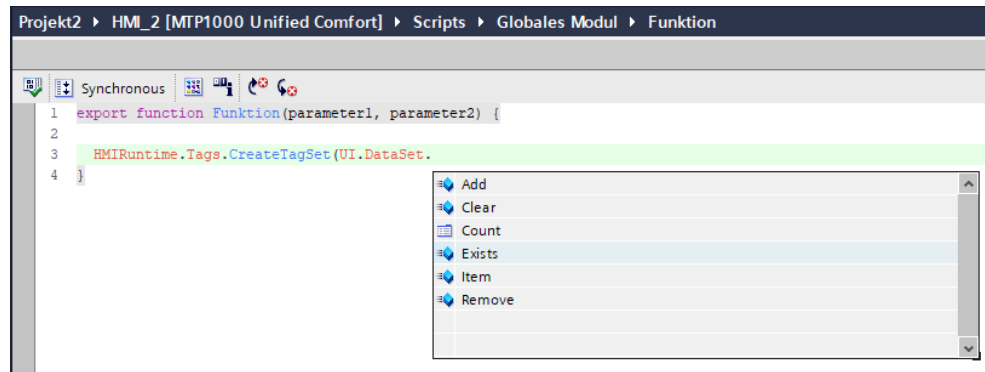
- Tooltips that give you hints on the correct use of each of the functions.

Figure 5-5

Global modules and local scripts

WinCC Unified distinguishes between two classes of scripts:

- **Global modules** representing a sort of library of general and reusable scripts. These can be used to convert between different units of measure, for example.
- **Local scripts**, which are always linked to concrete events, such as the value change of a tag or the click of a button.

Functions from global modules can be called from within local scripts.

Scripting instead of system functions, "snippets"

Scripting can also be employed to implement functions that wouldn't otherwise be available. (More information is available in the application example "Tips and Tricks for Scripting", see Table 5-13))

WinCC Unified supports you in this arena with "snippets". Snippets are short, reusable code blocks that you can paste into your scripts. Simply assign them parameters to adapt them to your engineering task.

Simply right-click in the scripting editor to view a selection of available snippets.

Figure 5-6
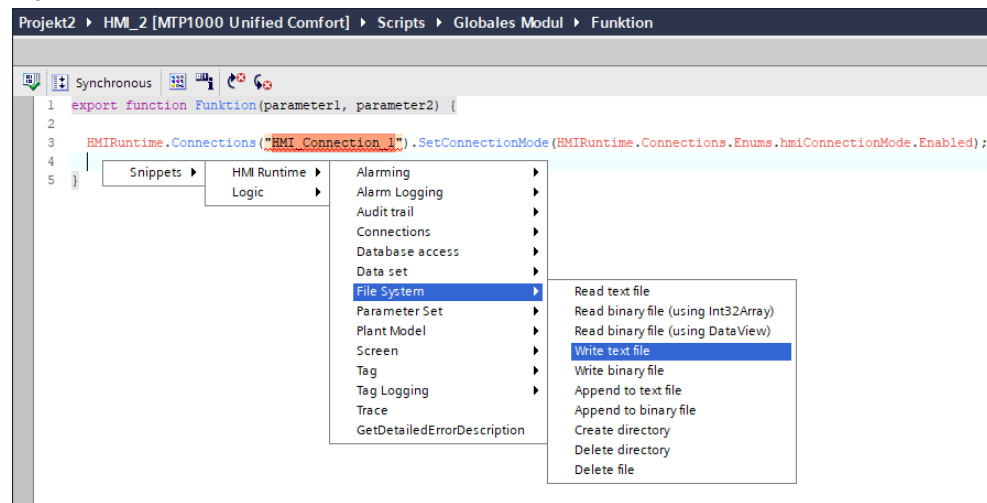
6 More aids for working with WinCC Unified

"WinCC Unified Toolbox"

The toolbox for SIMATIC WinCC Unified from Siemens Industry Online Support provides you with many useful tools that make everyday work much easier.

The various tools are available in the global library in WinCC Unified, making them easy to integrate into your visualization. These tools are suitable for both WinCC Unified PC Runtime as well as for Unified Comfort Panels.

Table 6-1

Article ID	Application example
109770480	SIMATIC WinCC Unified – Toolbox

"HMI Template Suite"

The HMI Template Suite is a free application example for WinCC (TIA Portal) and WinCC Unified. It offers you design templates for HMI objects that you can then modify before using in your own projects.

It can help you achieve an attractive, cohesive and ergonomic layout when configuring your operator devices.

Table 6-2

Article ID	Application example
91174767	HMI design with the HMI Template Suite

"HMI Security Guidelines"

The HMI Security Guidelines offer valuable tips and rules that you can apply to your workflow when configuring a secure HMI system.

Following the guide will help you realize in particular the following advantages:

- Minimization/prevention of manipulation during configuration
- Reduction of risks, for example with device settings and access restrictions
- Risk mitigation through exterior construction approaches, as well as through device-specific settings
- Prevent unwanted remote access with suitable safeguards; customize apps and services

Table 6-3

Article ID	Application example
109481300	Security guidelines for SIMATIC HMI operator devices and SIMATIC WinCC Unified

"Custom Web Controls"

Custom Web Controls are powerful control/display elements for web-based HMIs. This application example shows you how to integrate Custom Web Controls, created in Visual Studio Code, into WinCC Unified.

Table 6-4

Article ID	Application example
109779176	Integrating user-defined controls into WinCC Unified (Custom Web Controls)

7 Appendix

7.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts.

Please send queries to Technical Support via Web form:

support.industry.siemens.com/cs/my/src

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

support.industry.siemens.com/cs/ww/en/sc/2067

7.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

7.3 Links and literature

Table 7-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the article page of the application example https://support.industry.siemens.com/cs/ww/en/view/1
\3\	

7.4 Change documentation

Table 7-2

Version	Date	Change
V1.0	06/2022	First version