SCADA system

Modern, efficient and flexible

SIMATIC WinCC Open Architecture
V3.15

siemens.com/wincc-open-architecture
SIMATIC WinCC Open Architecture forms part of the SIMATIC HMI range and is designed for use in applications requiring a high degree of client-specific adaptability, large and/or complex applications and projects that impose specific system requirements and functions. SIMATIC WinCC Open Architecture enables handling with bigger amounts of data with even smaller hardware solutions.

**Highlights SIMATIC WinCC Open Architecture:**
- Object orientation facilitates efficiency in engineering and flexible system expansions
- Up to 2,048 systems on distributed systems
- Scalable up to networked redundant high-end systems with more than 10 million tags
- Platform-independent and available for Windows, Linux, iOS and Android
- Hot Standby Redundancy and Disaster Recovery System guarantee highest reliability and availability
- SIL 3 certified according IEC 61508
- Platform for customized solutions
- Comprehensive range of drivers and connectivity: SIMATIC S7 Plus, SIMATIC S7, XML, OPC, OPC UA, TCPIIP, Modbus, IEC 60870-5-101/104, DNP3, IEC 61850, IEC 61400, Ethernet/IP, S-Bus ...

**Supported operating systems**
- Microsoft
  - Windows 10
  - Windows 7 SP1
  - Windows Server 2012 R2
  - Windows Server 2008 R2
- Linux
  - RedHat Enterprise Linux 7.2
  - CentOS 7.2
  - OpenSUSE Leap 42
  - SLES 12.1
- VMware
  - ESXi 5.5 and 6
  - vSphere HA Cluster
- Supported operating systems for mobile devices
  - iOS 9 or higher
  - Android 5.1 or higher

New in SIMATIC WinCC Open Architecture V3.15

**SmartSCADA**
The SmartSCADA option allows the valuation of assets by key figures (key performance indicators, KPI) and the subsequent optimization using statistical methods. Data mining is used to select relevant data from a large amount of data. Here, connections and dependencies between different process values are recognized and used for further classification. When classifying the selected data, results are linked, states are automatically recognized and named by the user. Statistical models are generated from these assessed data. These models can then be used for optimization in the plant, for example for an efficient root cause analysis. This can be done both with historical data and with real-time data.

**SmartSCADA Classification**
In addition to the existing KPI, data mining and classification functions, SmartSCADA also provides a generic interface to „R“, which allows data from the SCADA system to be processed directly using statistical methods. „R“ is a free programming language for statistical data analysis. SmartSCADA is industry-independent and can be used for any application. Examples include wind power plants, power supply systems or large production plants. The SmartSCADA option allows WinCC OA to be used for root cause analysis, predictive maintenance, condition monitoring and more.
User Interface – Enhancements and new features
The user interfaces within WinCC OA have been reworked. The previous Standard UI is now called Desktop UI. It is handled like an app, the installation package is distributed via webpage and there is no need to install the UI from DVD or to install a browser plugin. All panels are synchronized via the WinCC OA server. WinCC OA provides an overview of all projects and a common device management for Mobile and Desktop UIs. With these improvements the administration of all UIs is simpler and more efficient. The WinCC OA UI family consists of Desktop UI, Mobile UI and ULC UX. The Desktop UI is available for Windows and Linux, the Mobile UI for mobile devices with iOS and Android and the ULC UX for browsers (EDGE, IE, Chrome, Firefox) on desktops. The Web Client is replaced by the Desktop UI.

Layout enhancements
With the new layout enhancements, 100% responsive applications can be realized. The new grid layout allows a simple arrangement of objects in layouts. Dynamic dashboards can be designed easily with the layout inheritance and the possibility to add symbols to the layout during runtime.

Use JavaScript graphics libraries*
Within WinCC OA V3.15 you can use JavaScript graphics libraries. This means you can use existing JavaScript graphic objects and combine JavaScript with WinCC OA. You can write your own JavaScript code and use it in WinCC OA. WinCC OA widget selection can easily extended with fancy JavaScript graphic objects. Furthermore, you can use WinCC OA functions (i.e. dpConnect, dpGet, dpSet, ...) within JavaScript code. Benefit from a large number of JavaScript libraries and a big JavaScript developer group. Due to that enhancement the WebView EWO is available on Mobile UI.

Object oriented screen references*
Users can create their own widgets with user-defined properties and events and use them multiple. The widgets are encapsulated, so the testability, changeability and stability of references is increased. Users can save engineering time due to this new function.

Object oriented scripting
Enlarge WinCC OA programming language with object oriented aspects like classes, structures, enumeration, and inheritance.

C# API
To support newest programming technologies and reuse existing C# business logic a C# API was integrated in WinCC OA. C# is a general-purpose, object-oriented programming language. C# offers a large number of .net libraries and a big developer group with C# know-how is available. With the new C# API you can read and query process values, alerts and historical data. You can also write process values and acknowledge alerts. Furthermore, you can manage data points, read configs and more. With the C# façade you can use multiple threads within one C# application and native C# data types.

Further enhancements
With the SIL 3 certification for the WinCC OA option Disaster Recovery System, an application with highest availability and safety can be realized. The new version supports VMware HA (high availability) cluster, so a multi redundant system can be created. The WinCC OA user authentication can be extended with a custom one. Use custom authentication like LDAP or any other within your application.

New drivers and enhancements
• SIMATIC S7 Plus
• TIA Portal export tool
• Modbus server
• TLS Gateway
• LOGO 8
• Multi tenancy for OPC UA - / OPC DA - / Modbus server

* Will be available later in a patch
Object orientation
- Referencing of symbols and objects
- Inheritance of structured data point types
- Object hierarchy
- Direct mapping of data point types to objects
- Flexible plant model - different views on the data model realizable

Redundancy
- Hot Standby
- Disaster Recovery System (2x2 Redundancy)
  The aim of this feature is to extend the WinCC OA redundancy concept through a second Hot Standby System. The operability of the system nevertheless remains maintained on another system even in the event of a complete failure on the first Hot Standby System. Thus, the data loss and the idle time are kept as low as possible.
- Automatic client switch over
- Automatic recovery
- Automatic process image and history synchronization
- Automatic synchronization of project data
- Redundant networks (LAN)
- Redundant peripheral component support (SIMATIC S7)
- Split mode operation for updates and testing

Parallel archiving
The parallel HDB and RDB archiving enables the storage of data into the local historical database and into the central Oracle database. Local systems do not need an Oracle server installation. This archiving method is compatible with the Disaster Recovery System, historical queries and archive compressions.

Security
- Blocking via IP-Blacklist
- System stability due to intrinsic safety
- Autonomic systems
- Communication (Standard: SSL encryption, Option: Secure)
- Encryption of panels, scripts and libraries

SSL encrypted communication
SSL encryption for communication of managers to each other and to all clients is used consistently. It is implemented by default in the system.

Safety
WinCC OA is SIL3 certified according to IEC 61508. TUEV SUED (technical inspection agency, South Germany) approved that WinCC OA functions, development processes and supporting documents are conform to IEC standard. A guideline is provided, which describes basic and operational conditions within which WinCC OA can be used for safety critical projects as a process visualization and control system.
GIS Viewer
Full integration of standardized maps of cartographic information (GIS) with SCADA objects in WinCC OA.

Video
Offers the easy possibility to integrate IP-cams, IP-components which fulfill the ONVIF 2.0 standard and complete video management systems into WinCC OA. Due to the integration of SCADA and video management into one system, the interfaces can be reduced and the costs for training, maintenance and operation are also reduced to a minimum.

BACnet
BACnet provides an integrated BACnet conform online-/ offline-engineering solution and a specific object library.

Recipes
Recipe management for parameter sets and set point lists. Unlimited recipe types, unlimited recipe quantities, access control, creation of recipes from real-time process data. Easy-to-use user interface. Import / export of recipes as CSV.

Scheduler
Timer and event programs with simple graphic configuration. Cyclic and acyclic-periodic call-ups, individual events and time lists, special day rules (holidays). Arbitrary actions: value changes, recipe starts, reminders, scripts

Reporting
- Web-based Reporting Interface (SOAP)
  - Eclipse BIRT
  - Crystal Reports
  - SIMATIC Information Server
  - Microsoft Excel
  - Several templates for Eclipse BIRT and examples for SIMATIC Information Server
- Online values, history
- Compressed data, SQL, alarms
- Diagnostics tools
- Audit trail

Trending
Trend widgets for integration into customized screens and a trend application (Var-Trend) as a ready-to-use trend application. Supports:
- Online and historical values
- Value trend over time or value
- Time comparison trends
- Bar trends 2D and 3D
- Color and filling pattern for trend curves
- Display of invalid values, alarm range and/or value range
- Multiple or shared scales, ruler, automatic legend
- Time resolution in ms, switch during runtime between local and UTC-time
- Zoom / Unzoom of trend areas

SmartSCADA
Allows the assessment of plants by Key Performance Indicators (KPI). The subsequent optimization is carried out using statistical methods based on „R“.
Technical product description
SIMATIC WinCC Open Architecture V3.15

Architecture
• Client-server-system
• Functional separation into several processes (managers)
• Load distribution on several computers
• Redundancy (Hot Standby)
• Disaster Recovery System
• Multi-server - distributed systems up to 2048 systems
• Heterogeneous operating systems and version distribution
• Multi-monitor operation
• Multi-login on one workstation
• Multi-user system
• Event orientated process
• Internal message compression
• Safety functions to increase reliability (overload detection and regulation, query restrictions)
• VMware (+Cluster) support

Alarm system
• VDI 3699 / DIN 19235
• Freely definable alarm classes with 255 different priorities and definition of alarm colors (blinking)
• Standard, discrete and multiinstance alarms
• Up to 255 analog alarm ranges
• Summary alarms
• Automatic filtering of alarms (Handling of alarm floods)
• Panel hierarchy summary alarms
• Combined alarm- and event screen, alarm row with definable column set and colors and advanced sorting and filtering
• Storable configurations
• Direct access to the associated process window
• Comments and attended values on alarms
• Online change of alarm classes

Process interfaces / drivers
• Event driven or cyclic polling
• Several different drivers at the same time on one server
• Periphery time stamps
• TCP/IP: SIMATIC S7, SIMATIC S7 Plus, TLS Gateway, Modbus, Ethernet/IP, SNMP Manager & Agent, BACnet
• OPC UA: DA, AC (Client & Server), HA (Client)
• OPC: DA, AE, HDA (Client & Server)
• Tele control / RTU: SSI, IEC 60870-5-101, -104, DNP3, SINAUT, IEC 61850/61400
• SIMATIC Logo 8
• Additional drivers on request or with a C++ API

Data model
• Object oriented data model with freely definable and easy configurable structure
• Many standard objects included
• Modeling of technological objects in any hierarchy
• User definable tree structure
• Several different properties definable on elements
• Type-in-type (referencing)
• Inheritance
• Groups
• Generate different views on the data model

Engineering environment
• Graphical editor
• Project hierarchy editor (Panel topology)
• Project editor
• Database editor
• Control programming editor, Script Wizard
• Mass data engineering and ASCII in / out manager
• Integration of external version management tools (CVS, SVN, ...)
• Simple symbols, EWOs, style sheets, color schemes
• Framework for engineering & application user interfaces
Graphical user interface
- Drag & Drop
- JavaScript
- Flexible window technique
- Platform neutral application
- Picture in picture
- Zooming / Panning
- Cluttering / Decluttering
- Root-, child- and embedded panel
- Multi-monitor operation
- Multi-selection
- True color / synchronous blinking
- Up to 8 picture layers
- Online tool tips (multi lingual)
- Configurable panel topology
- GUI navigation objects
- Online switchable multi language support
- UTF-8 for multi language support
- Supports the widely used graphical objects and widgets also with comprehensive animation capabilities
- Support of external widgets (e.g. ActiveX)
- Layout management “Responsive design”
- Multitouch support: zooming, panning, decluttering, safe two-hand operation and custom gestures
- Animations: panel transition, object animations, animation groups

User access
- Full user access security optional with integration into Windows Active Directory (Single Sign On)
- Various permission levels
- Command protocol (Audit trail)
- Conform to FDA 21 CFR Part 11
- Plugin mechanism for external authentication systems like LDAP

Internet/Intranet
- Desktop UI
- Mobile UI for iOS and Android
- Ultralight Client ULX UX (HTML5)
- mobile App WinCC OA Operator (iOS)
- Webserver, web alarm screen, diagnostics and reporting
- Supports main security functions (HTTPS, SSL, Kerberos encryption, etc.)

Archiving
Comprehensive archiving options
- Value archives as flat-file structure (HDB)
- ORACLE archiving
- Parallel archiving (Oracle, HDB)
- DB Logger (MSSQL, MySQL, ORACLE)
- Data compression
- Correction values
- Laboratory values
- Web-based reporting interface (SOAP)
- Reporting templates based on Eclipse BIRT and SIMATIC Information Server

Object libraries
- WinCC OA standard object library
- SIMATIC S7 object libraries (Basic/Advanced)
- BACnet object library

Application programming / Scripting
- Interpreter with C-syntax (“Control” language) and multithreading support
- Object oriented aspects like classes
- Libraries and DLL’s for customized extensions of the scripting language
- Debugger / diagnostic tools
- Supports a lot of external interfaces, like: database access, ADO, COM and XML, XML Parser, XML-RPC-Interface, UART- and TCP-access, WebSockets
- Complete access to attributes of graphical objects
- Know-how protection (Panels/scripts encryption)
- Additional Businesslogic via C++ or C# API

UTF-8 for multi language support
All Unicode characters can be represented in four bytes.
Security information
Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens’ products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens’ guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit http://www.siemens.com/industrialsecurity.

Siemens’ products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer’s exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under http://www.siemens.com/industrialsecurity.