SIMATIC WinCC Version 6.0
Options for Individual Expansions and IT & Business Integration

With SIMATIC® WinCC®, “perfect process visualization” stands for complete operating and monitoring functionality under Windows 2000 and XP for all segments of industry – ranging from simple single-user systems through to distributed multi-user systems with redundant servers and the structure of a cross-site solution including Web clients on an Intranet or the Internet.

The WinCC basic software is the core of a large number of different applications. Based on open programming interfaces, a number of WinCC options (by Siemens A&D) have been developed as well as WinCC add-ons (by Siemens-internal and -external partners).

- **Scalable plant configurations**
  - WinCC/Server — Setting up a client/server system
  - WinCC/Web Navigator — Operation and Monitoring across the Web

- **Increasing availability**
  - WinCC/ProAgent — Reliable process diagnostics
  - WinCC/Redundancy — Increasing availability by redundancy

- **IT & Business Integration**
  - WinCC/Dat@Monitor — Visualizing processes and analyzing data
  - WinCC/Connectivity Pack — Access to archives & alarms
  - WinCC/IndustrialDataBridge — Linking to databases and IT systems
  - SIMATIC IT PPA — Evaluation of process data
  - SIMATIC IT WinBDE — Machine data management

- **SCADA expansions**
  - WinCC/User Archives — Managing data records

- **Extensions for validating according to FDA 21 CFR Part 11**
  - WinCC/Audit — Creating and managing audit trails
  - SIMATIC Logon — Central user management

- **System expansions**
  - WinCC/IndustrialX — Configuring user-defined ActiveX objects
  - WinCC/ODK — Using open programming interfaces
The application of the server option makes a WinCC single-user system a powerful client/server system. It allows multiple coordinated operator stations to be operated together with networked automation systems. A server supplies up to 32 connected clients with process data, archive data, messages, pictures and reports. This requires a network connection (TCP/IP) between the server computer and the connected clients.

**Multi-user system with up to 32 clients connected to each server**

**Distributed system**

Thus, in a complex installation, WinCC can be configured as a distributed system, in accordance with the physical structure of the plant (e.g. body works, paint shop), or on a functional basis, e.g. message server, archive server, etc. Distributing the complete application or the tasks to several servers makes possible a much higher performance profile, takes the load off the individual servers and ensures good performance. Distribution also takes into account the topology of a plant. A special example of a functional distribution is an archive server that is used in the sense of an Historian as a central cross-company information exchange.

The complete view of the plant is implemented using clients that have access to or a view of the pictures and data of different server projects at the same time. You can configure a common message and trend view of the archives of different servers for these clients.

**Key benefits**

- Setting up a client/server system – for operating and monitoring relatively large plants with up to 32 coordinated clients (also possible retroactively)
- Distributed functions or applications on several servers – with high performance profiles at high system performance levels
- Overview for the entire project - with access to all the servers in the plant from operator station
- Favorably priced configuration on the client (the lowest license is necessary)

**Servers and clients of your choice**

Depending on the plant size, up to 12 servers can be employed. Each server requires one server license. In general, the plant is controlled by WinCC (SCADA) clients that access one server or that possess a central view to multiple servers (see also “distributed system”). The clients only require the smallest runtime license (RT128) or complete license (RC128) if you also want to configure on the client. This makes it possible to configure reasonably priced operator and configuration stations in a network. You can of course carry out configuration online without affecting the function of the servers and operator stations.

Operator stations are also possible in the form of Web clients (see also page 3). In heterogeneous configurations with SCADA and Web clients, this yields, amongst other things, the following performance profile limits (variations are possible).

- 50 WinCC Web clients and one WinCC SCADA engineering client, or
- 32 WinCC SCADA clients and three WinCC Web clients.
Scalable Plant Configurations
WinCC/Web Navigator —
Operation and Monitoring via the Web

The WinCC/Web Navigator represents the arrival of process visualization via the Internet in industrial applications. Web Navigator allows you to visualize and operate your plant via the Internet or your company’s Intranet or LAN — without needing changes in the WinCC project.

This means that the Web Navigator offers the same archive display, operator input and access options as the local operator stations. This also means that the displayed process pictures can contain Visual Basic or C scripts for dynamic sequences, that you can switch over the user interface to as many languages as you like and that the operator stations on the Web are integrated into the local user management.

**Key benefits**
- Operating and monitoring over long distances with up to 50 clients at the same time
- Rapid update rates due to event-driven communications
- Clients tailored in an optimum way for Operating & Monitoring, evaluation, service & diagnostics
- Thin-client solutions on different platforms (PC, local Operator Panels, mobile PDA)
- Web and terminal clients can be added at any time
- Minimal maintenance costs due to central software administration
- Normally application of configuration data for the Web without changing it
- Increased security by separating WinCC servers and Web servers
- Individual access permissions with cross-plant user management
- High security standards

### New areas of application

Apart from typical uses of the Web Navigator in the Wide Area Network (WAN) field, you can also use the Web Navigator for applications that must be implemented with a mini-

### Operating and Monitoring of a plant using a Web browser

**Configuration with Web clients using LAN (Intranet) and Internet**
Scalable Plant Configurations
WinCC/Web Navigator — Operation and Monitoring via the Web

mum cash investment. This includes in particular applications that have a highly distributed structure (water / sewage), or in which there is only intermittent accessing of process information (building management). In addition, you can also use Web clients as normal operator stations on the LAN.

Web server and clients
For such a configuration you need a Web Navigator Server on which the SIMATIC WinCC software is installed as a single-user or server version and a Web Navigator Client on a Windows computer. The client makes possible operating and monitoring of an ongoing WinCC project by means of an Internet browser with ActiveX support (in case of WinCC/Web Navigator V6.0 for example MS Internet Explorer V6.0 or higher) without you needing to have the WinCC basic system on your computer.

With WinCC V6.0 and above, you can set up a web server like this on any WinCC (SCADA) client. This means that a Web client that is connected to the web server can access from anywhere in the world the projects of all the maximum of 12 (redundant) WinCC servers in a system. In this connection, the Web client also switches over on a transparent basis via redundant lower-level WinCC servers. If you start several instances of the browser on the Web client, you can also view several plants, i.e. several web servers at the same time.

High performance due to event-driven communications
The communications mechanisms that WinCC/Web Navigator uses are based on event-driven transfer with high throughput, which leads to exceptional performance over the Web. With a fast communications connection, you can achieve the same update times as with a local WinCC station.

Security concept as required
Separating WinCC servers and web servers ensures more security and availability, which you can increase even further by means of standalone web servers on two independent SCADA clients. The operator stations on the Web are included in the plant's local user management. Different user permissions regulate which users have which access rights.

On accessing the Web server, each client must identify itself. In accordance with the client's configured access rights, it can either only observe the plant or only operate it. Apart from this, Web Navigator supports all common security mechanisms that can be used for applications on the Internet, e.g. routers, firewalls and proxy servers. It uses the standard HTTP protocol as the basis and therefore does not need any special firewall administration. If you need a more sophisticated security system, it is also possible to implement Secure Socket Layer (SSL) encryption or other transparent Virtual Private Network (VPN) technologies.

Thin-Client solutions
Using Thin Client solutions, you can also link simple PCs under a Windows operating system (e.g. Windows 9x, ME), robust local equipment (e.g. SIMATIC MP370 with the ThinClient MP option) and mobile clients (PDAs Personal Digital Assistants) under Windows CE. Solutions like this only make low demands on the hardware, since the application itself, i.e. the Web Navigator client, runs on the terminal server under Windows 2000, which you can connect up to 25 thin clients to.

Thin clients based on different operating systems connected to a Web Navigator Server
Scalable Plant Configurations
WinCC/Web Navigator — Operation and Monitoring via the Web

By contrast with typical Web Navigator installations, the thin clients are generally located on the same LAN as the server. However, accesses are also permissible via WAN, RAS and even the Intranet/Internet. You can integrate mobile equipment using different media, like mobile radio connections (e.g. HSCSD) or Wireless LAN. The network connection between the server and the clients is by means of the TCP/IP protocol. The RDP protocol (Remote Desktop Protocol) is used as the transport protocol to transfer the user interface and console activity between the client and the server.

Publishing instead of configuring
The Web Configurator (wizard) makes it easy and convenient to set up and configure a Web Navigator server. You create the WinCC process pictures that you want to visualize across the Internet in the usual way with the WinCC Graphics Designer. Normally, you can use the local project as the basis without changing it. The Web Publishing Wizard optimizes the pictures for transfer to and representation on the Internet.

Licenses of your choice
You can install the Web Navigator client software free of any licensing fees. To use the Web Navigator server, you need an appropriate (standard) license. There are licenses for 3, 10, 25 or 50 clients accessing the Web server at the same time. The Web Navigator clients are capable of accessing several different Web servers simultaneously.

In this connection, Web clients and Data@Monitor clients are dealt with in the same way (refer to page 9); however, both of them need separate licenses. You can use any combination you like of the individual Data@Monitor Web Edition Suite tools; as usual, the system only takes into account the number of simultaneous accesses to a Web server.

Diagnostics clients have guaranteed access to all Web servers with standard license or a cost-minimized Diagnostics Server license. Diagnostics clients are ideally suited for system integrators who are responsible for maintaining and servicing systems that are widely scattered.

Web Navigator as an integration platform
If required, you can also use the WinCC/Web Navigator as an integration platform. For this, the Web Navigator makes available user-friendly services and tools to distribute customer-specific objects (controls, files) to the linked Web clients. If desired, you can integrate these components in a cross Web server navigation system.

Thin-Client/Server Computing
The principle of thin client/server computing is based on the physical separation of data, applications and screen output. The terminal services of Windows 2000 allow to run applications – like the Web Navigator – in the main memory of a central Windows 2000 terminal server instead of their own.

In this case, client PCs become terminals that only have the purpose of entering data (via the keyboard or mouse) and of sending this data to a terminal server. The terminal server carries out the actual processing (for instance updating process pictures) and returns the resulting screen output to the client PC which then displays it on its monitor.
Increasing Availability
WinCC/ProAgent® — Powerful Process Diagnostics

A defective actuator or sensor, an incorrect movement, a missed lock or an expired monitoring time can cause massive malfunctions in the total process.

WinCC/ProAgent® enables precise process diagnostics for machines and plants. Thanks to complete integration in the world of SIMATIC process diagnostics, ProAgent offers a consistent solution on the basis of STEP 7®, S7-PDIAG and S7-GRAPH Engineering Tools as well as the SIMATIC S7-300/-400® and WinAC® control systems. The system supports all the link types of the SIMATIC S7 Protocol Suite.

If a process disturbance occurs, ProAgent determines in conjunction with the S7-PDIAG/S7-GRAPH engineering tools information about the location of the fault and its cause and supports elimination of the fault. This means that WinCC/ProAgent is an integral component of Totally Integrated Automation (TIA) for increasing productivity and reducing the lifecycle costs with a minimum engineering effort.

Standard pictures instead of configuration

The ProAgent option package is available for different equipment and software platforms from the SIMATIC HMI range: Operator Panels and Multi Panels, ProTool/Pro and WinCC. ProAgent contains standard pictures that are geared to the requirements of process diagnostics on a plant or a machine. This is based on the interaction of STEP 7 option packages and ProAgent. During configuration, the data relevant to process diagnostics, such as symbols, comments, message texts, are stored in a standardized database organization. During runtime, the standard pictures are filled with process-specific data.

SIMATIC WinCC accesses the engineering data directly and applies it in the WinCC project. The ProAgent standard pictures needed for diagnostics operations are generated automatically in WinCC. ProAgent and the S7 Engineering Tools offer a standardized diagnostics concept for SIMATIC S7. No further configuration is required for diagnostics functionality on the WinCC system.

The standard pictures (message picture, unit overview picture, diagnostic detail picture, motion picture, sequencer operating picture) are optimally geared to the requirements of the STEP 7 Engineering Tools. They are in screen resolutions of 800 x 600 and 1024 x 768 and you can switch between German, English and French.

Direct entry point to the location of the disturbance

Operators have available a direct entry point to the STEP 7 editors for comprehensive fault analysis in online operation. No additional configuration effort is needed for this: you only need a STEP 7 installation. Depending on the selected unit or message, the system automatically jumps to S7-GRAPH (the selected step) or to LAD/CSF/STL (the selected unit). In the case of a system message, the system jumps to hardware diagnostics (HW-Konfig). You can password-protect this function.

Key benefits

- Selective and fast process diagnostics in plants and machines that are controlled and monitored by SIMATIC S7 / WinAC and SIMATIC WinCC
- Reduced downtimes, increased machine and plant availability
- A universal and standardized diagnostics concept for different SIMATIC components with diagnostics by means of standard pictures
- No additional configuration effort for the diagnostics functionality due to automatic generation of diagnostics-relevant parts for the controller and HMI
- Unloading the controller with regard to memory required and program execution times
Message picture
All pending process messages are displayed in the message picture. Using a selected message in the message picture, you can make a context-sensitive jump to other diagnostics picture.

Unit overview picture
The unit overview picture sets out all technological units and their subunits (plant/machine parts) in the form of a table. This means, for example, that the operator can determine the operating mode or status of the relevant unit. Operators cannot switch over the operating mode.

Faulty units are marked with attributes. Calling up the diagnostic detail picture or motion picture depends on the unit currently selected. If technological units have been programmed with S7-GRAPH, a step can be activated or deactivated in the sequencer operating dialog for a selected sequencer. This dialog also enables the initialization or deactivation of the entire sequencer currently selected.

Diagnostic detail picture
The diagnostic detail picture displays the result of criteria analysis at the point when a process fault occurs. Current status information can also be displayed as an option. The diagnostics result is displayed either in a ladder diagram (LAD), a statement list (STL) or a symbolic list.

The operands are output for each display format with symbols and comments from the S7 symbol table. Only the criteria responsible for causing the fault are displayed and marked with a highlighting attribute. You can also switch to a display which shows the affected network.

Motion picture
The motion picture serves to support fault correction. Each motion line contains a comment line that describes the motion (e.g. x-axis), two actions for executing the motion, checkback signal for controlling the motion and information on each end position reached (max. 16).

The system can output the disturbed operand (symbol, address and comment) directly in messages, which means that users can respond directly on the basis of the information text, without needing to make any other operator inputs on the WinCC station to clarify the situation.

Sequencer operating picture
The sequencer operating picture provides support for controlling sequencers. Like Status/Control in S7-GRAPH, it makes functions available such as initializing and acknowledging sequencers, activating, deactivating and incrementing single steps and selecting control modes.

The steps are output as a list together with the number and name of each step. Active and faulty steps are marked with attributes to provide the operating personnel with a clear overview of the current status of the sequencer.

In the case of WinCC, visualization is carried out via the S7-GRAPH ActiveX control that is contained in S7-GRAPH V5.1 CD ROM. In addition, when criteria analysis is running, the system determines the missing conditions in the signal list and displays them.
Increasing Availability
WinCC/Redundancy —
Increasing System Availability by Redundancy

Increasing system availability due to redundancy in the case of applications with WinCC is possible by using
• redundant servers,
• redundant communications paths
• and highly available controllers.
The WinCC/Redundancy option gives the user the opportunity to operate two linked WinCC single-user systems or server PCs in parallel, in order to monitor each other. For both redundancy partner servers you need one of the two redundancy licenses that are supplied with the option package. On the failure of one of the servers, the second server assumes control of the entire system. When the failed server resumes operation, the contents of all message and process value archives are copied back to the restored server. All in all, this results in significantly higher levels of system availability. This means that your production stays online even if a server should fail.

Key benefits
• Increased system availability with contiguous data integrity
• Automatic switching in the case of a server failure or communications failure with the server
• Continuous operation and visualization due to automatic switching of the clients to the intact server
• Automatic matching of all the archives in the background after eliminating the disturbance

The system automatically does not just switch to the redundancy partner in the case of a failed server; it also does this in the case of disturbed process communication or applications.

Additional increase in system availability
In addition to using the WinCC/Redundancy option for running two servers in parallel, it is possible in a WinCC application to also implement redundant communication channels to the SIMATIC S7 controller. You do this by installing two communication modules and implementing duplicate communication paths (communication software S7-REDCONNECT needed). By using H-series SIMATIC S7 controllers, you can, if required, additionally increase availability at the control level.

By combining system solutions, you can create a security concept that meets even the most demanding requirements.

In a normal situation, two WinCC stations or process data servers operate completely in parallel, i.e. each station has its own process connection and its own data archives.

If either of the WinCC stations fails, the other one takes over archiving of messages, process and user data. This guarantees constant data integrity. In client-server operation, the system automatically switches clients from the failed server to the redundant machine. This guarantees continuous visualization and operation of the plant at each operator station.

When the failed server starts up again, the system automatically matches in the background all the process values, messages data from the user archive for the down period (without influencing online operation)- this means that two stations are available again that have the same data.
IT and Business Integration

WinCC/Dat@Monitor — Visualizing Processes and Analyzing Data

Key benefits

- Displaying and analyzing current process status conditions and historical data on office computers using standard tools like Microsoft’s Internet Explorer or Microsoft Excel
- No additional time and effort for configuration, since you can directly use pictures from the WinCC project
- Evaluation via centrally administered templates for detailed analyses of company processes (e.g. reports, statistics)
- You can group historical data on an individual basis, online at runtime

WinCC/Dat@Monitor Web Edition is for displaying and evaluating current process status conditions and historical data on any office PCs using Internet-capable standard tools like Microsoft’s Internet Explorer or Microsoft Excel. In this connection, a Web Navigator server supplies the Dat@Monitor client with current and historical process data.

A suite of tools

WinCC/Dat@Monitor offers you a range of Internet-capable tools for visualization and evaluation that all support common security mechanisms like Login/Password, firewalls, encryption, etc.:

- Dat@Symphony – is for monitoring and navigating via WinCC pictures using Microsoft’s Internet Explorer (view only)
- Dat@Workbook – is a logging tool that integrates archive data and current process values from WinCC in Microsoft Excel, which therefore supports online analyses

Your choice of licensing

In a similar way to the Web client, licensing is server-based, i.e. it is carried out on the Web Navigator server. Depending on the license you choose, 3, 10, 25 or 50 clients can be active at the same time. In this connection, Web clients and Data@Monitor clients are dealt with in the same way; however, both of them need separate licenses. You can use any combination you like of the individual tools; as usual, the system only takes into account the number of simultaneous accesses to a Web server.
In WinCC, non-proprietary communication in the field of automation has always been very important. On the one hand, WinCC has an integrated OPC DA 2.0 server (DA = Data Access), that gives access to all the online values in the system; on the other, it makes available open interfaces for accessing the Historian (WinCC archive data). This means that the system can transfer pre-processed process and production data to higher level systems for information conditioning (e.g. Manufacturing Execution Systems, Enterprise Resource Planning systems or office packages, e.g. Microsoft Excel, Microsoft Access, etc.)

**Access to historical data via OPC / OLE-DB**
The WinCC/Connectivity Pack includes the OPC HDA 1.0 (Historical Data Access) and OPC A&E 1.0 (Alarm & Events) servers for accessing historical data of the WinCC archive system or for transferring/acknowledging messages. OLE-DB makes it possible to directly access the archive data that WinCC stored in the Microsoft SQL Server database.

**Key benefits**
- Simple IT and business integration by means of standard interfaces (including messages)
- Access to the Historian (Microsoft SQL Server) from any computers you like via standard interfaces (OPC HDA, OPC A&E, OLE-DB)
- Further processing or analysis of data using separate tools is possible

As an HDA server WinCC makes available historical data from the WinCC archive system to other applications. The OPC client (e.g. a reporting tool) can specify the start and end times of a time interval and thus selectively request the data to be transferred. Apart from this, the client can request already conditioned data from the HDA server, i.e. actively trigger data compression before the data is transferred.

In OPC A&E, the system displays a WinCC message as an alarm and, together with all the ancillary process values, passes it on to any subscribers on the production or company management levels. Due to the filter mechanisms and subscriptions, the system only transfers selected, changed data. It is, of course, also possible to carry out acknowledgement at the MES or ERP level.

**Client Access Licenses (CAL)**
To directly access current WinCC data via OPC DA, you do not need a separate license.

In conjunction with the access options of the WinCC/Connectivity Pack, you do however need a separate CAL for each client without a WinCC license, regardless of whether you want to use OPC HDA or OPC A&E or if you want to use WinCC OLE-DB to access WinCC archive data in the Microsoft SQL server database and further process it any way you like. SIMATIC WinCC and the Web Navigator and Dat@Monitor option packages already contain appropriate Client Access Licenses. This means that you can already access the WinCC database. This license is available as a separate product for other applications.

When using the IndustrialDataBridge, you need a separate CAL for each client computer without a WinCC license.

If desired, the WinCC/CAL per Processor License even provides access for all the computers in your configuration to the interfaces of the Connectivity Pack or allows them to use the IndustrialDataBridge.
IT and Business Integration

WinCC/IndustrialDataBridge — Linking to Databases and IT Systems

WinCC/IndustrialDataBridge uses standard interfaces to link the automation level (controls) to the IT world and to ensure a flow of information in both directions. Examples of these types of interfaces include OPC in the field of automation and SQL databases in the IT world. You can integrate systems made by different manufacturers using a large number of different standard interfaces (amongst others OPC, OLE-DB, office formats). You carry out configuration (without programming) on a favorably priced basis using a standard software package. Typically, WinCC with its OPC DA server interface is the data source and an external database is the data destination. Depending on the volume of data, licenses are offered with 128, 512, 2,048 and 10K tags.

Flexible switch between applications

IndustrialDataBridge makes a connection between the source and destination interface and transfers the data as follows:

- depending on a change in value,
- after a configurable time has expired
- or if a specific event occurs.

Data is exchanged between automation systems made by different manufacturers via IndustrialDataBridge, for example via OPC. Connecting OPC servers via the IndustrialDataBridge makes possible communication between different devices, data sources and destinations.
- Linking SCADA and supervisory systems made by a wide variety of different manufacturers via the OPC interface.
- Storing process data in office formats like Excel 97/2000 or Access. You can also integrate databases for archiving larger amounts of data.
- SQL databases are available as the data destination for production data acquisition. The system can either transfer the data from the data source using the OPC module on an event-driven basis or transmit it directly from the controller using the Send/Receive module.
- With a database as the data source, you can transfer recipes or specified values directly to WinCC or to a controller. When doing this, you can use the OPC Data Access, WinAC ODK or Send/Receive modules as the interfaces to the data destination.

It is possible to implement cyclical data archiving via the OPC Data Access, WinAC ODK or Send/Receive data sources and the SQL databases data destination.

Client Access License (CAL)

When using the IndustrialDataBridge, you need a separate CAL for each client computer without a WinCC license. SIMATIC WinCC and the Web Navigator and Dat@Monitor option packages already contain appropriate Client Access Licenses (see also WinCC/Connectivity Pack).
Powerful archiving functions are a crucial element of modern SCADA systems. For this reason, SIMATIC WinCC has an integrated database based on MS SQL Server 2000 and archiving functions for messages and measured values on board. In the case of comprehensive evaluations complementary concepts are needed.

WinCC option SIMATIC IT PPA is ideally suited for this task. The **Plant Performance Analyzer** also uses Microsoft SQL Server for this. Using this tool, you easily set up a two-stage Historian concept that decouples archiving from data analysis and with this separates loading. SIMATIC IT PPA can read the data from a wide variety of different sources (e.g. from WinCC archives or any other databases) and further compress and prepare it in an appropriate form for comprehensive analyses and evaluations. You can use the **Historical Data Display**, SIMATIC IT HDD, which is in the scope of supply of SIMATIC IT PPA.

Together with SIMATIC WinCC V6, SIMATIC IT PPA is the heart of the SIMATIC IT Historian. Here, SIMATIC IT PPA also offers direct integration into the SIMATIC IT Framework, which for its part allows a direct link to other IT applications like SAP/R3, for example.

**Acquiring data, evaluating it and compressing it**

Using option SIMATIC IT PPA, you can read the process and production data from different sources, group it, evaluate it and (in compressed form) store it for long-term data archiving in a Microsoft SQL Server database.

WinCC can fetch current online data directly via the OPC DA server (Data Access); it fetches historical data either via OPC HDA (Historical Data Access), or via OLE-DB. By means of OLE-DB/ODBC, it is also possible to read data from other external databases. After acquisition, the system checks the validity of this data on an as-required basis and stores it on the Microsoft SQL Server after giving it a time stamp and a quality marker that completely complies with the OPC HDA standard.

**Key benefits**

- Powerful and flexible calculation and evaluation of the most important performance indicators
- Data compression and compressed storage of measured values
- Integrated evaluation rules for the relevance of measured values
- Display of the archive data possible in curves and tables via a standardized ActiveX control in a WinCC process picture
- Wizard-supported ActiveX control configuration, online too
- Connection of external databases via ODBC

**Plant Performance Analyzer – Functionality**

- Cyclical or event-driven reading of measured values,
- Implemented evaluation rules,
- Implemented compression functions (mean value, integral, total, etc.)
- Integrating databases via the OLE DB / ODBC interface,
- Direct link to WinCC via OPC HDA and OPC DA,
- OPC HDA Quality Flag Management,
- ActiveX control for displaying curves and tables - HDDx (Historical Data Display).

**User-friendly display and evaluation of archived data**

Display and visual analysis of the archived measured values are carried out via SIMATIC IT HDD. This Historical Data Display (HDD) runs as a **fat client application** on the SIMATIC IT PPA server and is used at the same time for configuring the archives and the compression functions. The fat client is supplied with the respective option.

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**Measured value evaluation by means of an ActiveX control (Historical Data Display)**
On the WinCC client, the HDD runs as a **lean client application** and you can integrate it into the WinCC process pictures in the form of an **ActiveX control**. A package containing five lean client licenses is available as an option. In this connection, you can install as many lean clients as you want of which a maximum of five have access to the PPA server at the same time. This means that you can run the HDD either on the SIMATIC IT PPA server or on a WinCC client and display data from any PDA archive you like on the network.

On the one hand, Historical Data Display supports **display in table form** and on the other it can represent as a fat client up to eight diagrams at the same time with each one containing **a maximum of 64 curves**. The zoom function and dynamic representation of mean, minimum and maximum values are further features. As an ActiveX control (lean client), you can also integrate it directly into a WinCC process picture; in this case, however, it only supports a curve diagram. You can, however, integrate as **many HDDx controls as you like** into a WinCC project.

*Measured value evaluation by means of an ActiveX control (Historical Data Display)*
Using SIMATIC WinBDE, the machine data management software, transforms a local WinCC operator station into the central acquisition and evaluation station for machine and production data. WinBDE is scalable and of hierarchical structure. This makes possible efficient machine data management for anything between one machine and up to an entire production facility.

**Key benefits**
- Complete transparency about the plant and machinery as the basis of optimizing plant productivity, this means
  - Avoiding disturbances and bottlenecks
  - Increasing availability
- Can be used for individual machines up to complete production facilities
- Export of production data for more detailed evaluations

**Evaluations: On a machine-specific or cross-plant basis**
Individually generated graphic evaluations make possible detailed analysis directly at the machine. The generated data serves as proof of availability of individual production facilities or entire production lines. Furthermore, this transparency at the machine enables operators to quickly respond to any disturbances, which extends machine utilization rates.

**WinBDE Workstation** supports local direct machine data acquisition and evaluation with several units per machine with a maximum of 32 machines/units.

**WinBDE Supervisor** is designed for central evaluations and comparing individual machines (with regard to availability and productivity. Evaluations are carried out about the works calendar, day types, shifts and working time models. You can manage up to 64 machines/units of lower-level WinBDE workstations.

Data is acquired automatically and you can add dialogs for manual input of changes of status.

**Evaluation options**
SIMATIC WinBDE makes possible extensive evaluation of the operating states – on a machine- and unit-related basis. A comparison of single units in relation to event and status progressions is also possible. By means of different filter functions, users can automatically define the progressions and events to be displayed and how they are to be sorted. You can store these definitions and retrieve them whenever you need them. Hardcopy and export functions make documentation and evaluation easier.

**Machine data evaluation**
- Disturbance analysis with duration and frequencies
- Status/availability analysis as a function of time
- Machine performance by objective determination of availability
- Evaluations on the basis of working shifts, days, weeks etc.
- Exact logbook/log about machine status conditions and disturbances
- Export and printing of evaluation data

**Production data evaluation**
- Part-type-specific production quantity evaluation
- Machine-specific quantity evaluation
- Calculation of OEE figures (availability, performance, quality, rate of utilization; OEE = Overall Equipment Effectiveness)
- Calculation of the mean time between failures (MTBF) and of the mean time to repair (MTTR)

**WinBDE adds machine data management to WinCC**
Key benefits

- Storage and management of any user data in data records
- Flexible representation by means of ActiveX controls optionally with a table and form view
- Simple linking of data record fields to the process via direct tag linking
- Import/export functions for further-processing using other tools (e.g. Microsoft Excel)

The WinCC/User Archives option allows the application of user archives, in which related data is stored in data records. WinCC and its automation partners (e.g. a SIMATIC S7 PLC) can write to these data records and exchange them among one another if required.

An operator can, for example, input parameter records in WinCC, store them in the user archive and forward them to the automation level if required. In the other direction, a PLC can continuously acquire production parameters during a shift and transmit them to WinCC at the end of the shift. Other applications include the acquisition of batch data, the specification of production parameters and the control of inventory data.

Easy to configure...

WinCC user archives are conveniently created and preset with data using a separate editor. Special ActiveX controls from the Graphics Designer’s object palette are used to display data from user archives at runtime.

You make the link between data records and fields from user archives to the process simply using a direct tag link.

... versatile application

Import and export functions support the reading in/out of data via external applications (e.g. Excel). Freely selectable filter criteria enable clear display of data records. The view can be switched between a spreadsheet and a form view.

WinCC provides functions for the free organization of data storage in the user archives which influence archives, data records and fields. They can create, open, close or reset archives and for example read, write or overwrite data records or field contents.

Sequential archives can for example record batch data, shift production data or data on product quality and fulfill the statutory documentation requirements by recording on a continuous basis.

Only servers and single-user stations need individual licences.

WinCC/User Archives editor:
Free definition of archives, views and archive data

Display of the archive data in table form or as an individual record based on the User Archive Control used.
Extensions for validating according to FDA 21 CFR Part 11
WinCC/Audit — Creating and Managing Audit Trails

Using “FDA options” WinCC/Audit and SIMATIC Logon and with good engineering practices – which are documented in a white paper – SIMATIC WinCC complies with the requirements of FDA 21 CFR Part 11 in the pharmaceutical and food industries (FDA = Food and Drug Administration). These options make it considerably easier to validate plants and this provides the most convincing and comprehensive response to the requirements in these industry segments.

WinCC/Audit is a software option package for generating Audit Trails in engineering (version tracking) and at runtime (operator inputs and changes in the project)

Configuration/management of Audit Trails ...

WinCC/Audit allows you to easily configure an Audit Trail of operator inputs. In this connection, you can use any user interface elements you like and, if desired, also require operators to enter a comment.

By contrast with conventional configuration of operator messages, it is also possible to make the necessary settings for the Audit Trail at a later date: even after the WinCC project has been concluded.

You can use Audit Trail both for revision tracking in engineering („What changes have been made to the project?”) as well as at runtime of the WinCC application (Who made what changes and when?) In the case of changes, the system records the user, the date/clock time, the object, the old and new values as well as the comments.

The Audit Trail is stored on a forgery-proof basis in the archive (Historian). Using an Audit Viewer, you can search, display, export and print Audit Trails in any database on the network.

... and document management

Revision tracking completely complies with the FDA requirements. Apart from this, Audit in engineering supports project versioning with document management. The function corresponds to Microsoft Visual SourceSafe®. Users can log on and then edit project documents, delete them, recover them or set them back to an older version. In the context of WinCC, this affects pictures (*.PDL), project functions (*.FCT), Global Scripts (*.PAS), log layouts (*.RPL) and all types of project documentation.
The use of IT technology in process automation together with the number of users with different authorizations that result from this places high demands on user administration to guarantee security in the entire plant.

User management with SIMATIC Logon integrates itself in the safety system and user management of Windows and in this way meets the FDA requirements.

SIMATIC Logon offers a **number of security mechanisms** on both the administrator and user sides. Users are uniquely identified in the usual way by means of a user ID, a user name and a password. Functions like password aging, automatic log-off after a predefined time and blocking the password after entering it wrongly several times guarantee the highest levels of operating security. In addition administrators can set up new users online on a cross-plant and cross-application basis as well as lock these users.

### Key benefits
- Central, cross-plant user management, integrated in Windows User Management
- High levels of security due to measures on both the administrator and user sides
- Can be used in different configurations (single-user, client/server systems up to highly available solutions)

In the SIMATIC WinCC environment, you can use Logon on a wide variety of different structures such as single-user stations or client/server configurations. With SIMATIC Logon, the **high availability** is provided by primary/secondary domain controllers and the local Windows User Management system.

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**User management in the food industry**

In the SIMATIC WinCC environment, you can use Logon on a wide variety of different structures such as single-user stations or client/server configurations. With SIMATIC Logon, the **high availability** is provided by primary/secondary domain controllers and the local Windows User Management system.
System Expansions
WinCC/IndustrialX® — Configuring User-defined ActiveX Objects

Using only the basic functions, you can configure SIMATIC WinCC in a user-friendly way. WinCC/IndustrialX is an option that further simplifies the solving of a visualization task by standardization of user-specific objects.

No separate display object is required any more for each motor, pump, valve, etc., instead objects of the same type are standardized. Engineering become more cost-efficient, if functions and displays can be used repeatedly.

IndustrialX employs the ActiveX technology for the process visualization. Configuration wizards make the creation of your own standard displays easy. IndustrialX controls are flexible and can be tailored to meet the requirements of the most varied applications, for example specific for applications in the chemical, glass or paper manufacturing industries.

IndustrialX offers code templates for easy linking customer-specific ActiveX controls to WinCC data sources that are themselves suitable for use on Web Navigator clients.

**Key benefits**
- Easy creation using configuration wizards
- Fast-track starting due to the use of standards: ActiveX technology, creation using Visual Basic
- Central creation and modification of object representations of the same type (type-coding) saves you time and money
- Configuration of intelligent, vertical market and technology-specific objects (graphic representation and logical processing) with expertise protection
- Can be used on a diverse basis: in WinCC pictures and other Windows applications (e.g. Internet Explorer, Excel)

**Quick and easy to configure**
Using the IndustrialX Control Designer, you create one IndustrialX control for process objects of the same type, e.g. for several motors. Linking is carried out of the individual data of a data record e.g. the target value, actual value, temperature and operating mode. Once you have created the IndustrialX control, you can integrate it into pictures as often as you like.

At integration, you only need to specify the name of the data record. At runtime, each integration of the IndustrialX Control then automatically works with the data of the assigned data record. Each time the IndustrialX Control is used, you do not need to spend time and effort on linking the individual data.

**Carry out modifications on a central basis**
If you have a lot of IndustrialX Controls, which are already integrated in process pictures, you can easily change them later. Such changes are made once at a central location and can affect the graphic representation as well as the processing logic. All
the changes affect all the IndustrialX controls in all the process pictures that have already been configured. If, for example, there are 47 motors of the same type in a plant that are visualized in 13 different process pictures using IndustrialX controls, you only need to make the changes once at a central location. These changes are then effective everywhere. This obviates the need to carry out time-consuming, error-prone changes at 47 different locations!

**Rapid processing, know-how protected**
IndustrialX controls are composed of compiled Visual Basic code that guarantees fast, effective processing. The technological know-how that you invested in creating your controls can - if necessary - be protected from copying if the source code is not supplied.

Wouldn’t you like to significantly expand the functionality of your WinCC system for an industry-specific application? Do you want to integrate your own data in WinCC tools, e.g. the reporting and logging system? The **Open Development Kit (ODK)** option package describes the open programming interfaces, with which data and functions of the WinCC configuration and the WinCC runtime system can be accessed. The interfaces are designed as C-Application Programming Interfaces (C-APIs).

**API functions** can be used as follows:
- Within WinCC, for example, in Global Scripts or within C actions in Graphics Designer,
- In Windows applications in C development environments (the current version of Microsoft Visual C++ is required as the development environment for WinCC).

**Key benefits**
- Individual system expansions by means of an open, standard programming language
- Access to data and functions of the WinCC configuration and runtime systems
- Development of separate applications and add-ons to the basic WinCC systems

API functions are **configuration and runtime functions**, e.g.:
- MSRTCMsg: generates a message
- DMValue: determines the value of a tag
- PDLRTSetProp: sets the object properties in a picture

The scope of delivery of WinCC/ODK comprises a CD-ROM with lots of examples and a voucher for a one-day introductory seminar.

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**Innovation & Continuity**
WinCC Add-ons

WinCC add-ons are developed and marketed by other Siemens departments and by third-party vendors. WinCC add-ons are supported by the respective product supplier who is also the contact person for integrating the product into the automation and IT solution. WinCC add-ons can solve a wide range of tasks, such as transmission of radio calls in the event of certain production alarms, toolkits and simulation software, MES applications (e.g. batch processing, maintenance, process and document management, management information system), industry solutions for water treatment, fuzzy logic and communication channels to control systems from Siemens and other vendors. WinCC add-ons are available in various forms:

- ActiveX control
- Channel DLL to WinCC
- Function DLL
- Autonomous software package

The Add-on Directory provides you with an overview of the currently available WinCC add-ons. The add-ons are arranged by category to make the desired WinCC expansion easier to find.

http://www.siemens.com/addons

Add-on categories

- SCADA expansion
- Configuration tools
- Software for MES, ERP and IT integration
- Industry and technological solutions
- Communication channels
  — Connection to Siemens PLCs
  — Connection to PLCs of other manufacturers

For further information about SIMATIC HMI customized products see:

www.siemens.com/wincc

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