SIMATIC WINCC UNIFIED DATA HUB

# **Central long-term archive** for SIMATIC WinCC Unified

Turning data into value:
With SIMATIC WinCC Unified Data Hub, users enjoy the benefits of a fully integrated solution for central and long-term storage of shopfloor data for SIMATIC WinCC Unified systems.

SIEMENS

**SIMATIC WINCC UNIFIED DATA HUB**

# Turning data into value

SIMATIC WinCC Unified Data Hub is an efficient solution for the long-term archiving of shopfloor data in the SIMATIC WinCC Unified environment. Users benefit from a scalable central data archive that is perfectly integrated into the SIMATIC WinCC Unified system.

**Long-term archive for shopfloor data**

SIMATIC WinCC Unified Data Hub (UDH) stores and manages long-term-relevant data from various WinCC Unified Runtime stations by transferring entire data logs (tag logging, alarm logging, audit trail) to the UDH server via integrated WinCC Unified mechanisms. The UDH server is designed to support UDH clients that use current or previous versions of SIMATIC WinCC Unified PC Runtime. The transmission of complete data logs simplifies configuration by eliminating the need to select individual tags, and long-term-relevant data are bundled in long-term-relevant logs with uniform consolidation and compression. Built-in buffering on the UDH client ensures that no data are lost during transmission, even if the connection to the UDH server is temporarily interrupted. Flexible dashboards for the evaluation of historical data can be created online via the standardized GraphQL interface of the UDH server.

**Based on the proven SIMATIC WinCC Unified PC Runtime architecture**

The SIMATIC WinCC UDH server is based on the proven WinCC Unified PC system architecture and uses a database for the logging backend. This managed database offers powerful, almost unlimited storage capacity and supports backup and recovery measures. As a result, large amounts of data can be logged and made accessible for long periods of time. For maximum data availability, the underlying storage system must be configured appropriately, for example, with RAID technology. A powerful and reliable industrial PC platform is essential to run WinCC Unified PC Runtime on all supported operating systems.
The entire solution is developed and configured using WinCC Unified ES (in TIA Portal) without any additional tools, which makes UDH implementation and configuration very efficient.

**Unlimited storage and central access**

The system can be scaled as needed in terms of the amount of data and number of UDH clients, provided that the UDH server hardware has been selected in accordance with the requirements. Industrial PCs with sufficient resources and RAID options ensure reliability and availability. The central UDH server complements the user's existing automation solution and is independent of the WinCC Unified stations that monitor the process (segregation of duties) and archive data locally. As a plant-specific long-term archive, the UDH server enables central access to shopfloor data. All data remain on premises, so users retain full ownership and control over their data, and the solution can be implemented even if company policies prohibit the use of cloud solutions.

**Selection of long-term-relevant data and secure transmission with loss-free buffering**

WinCC Unified Runtime stations (UDH clients) are used on the shopfloor to control and operate machines and production lines (SCADA). There, all process data and alarms are recorded and archived locally, with long-term-relevant data being summarized in separate logs. During engineering, the transfer to a central archive server (UDH server) is activated for long-term-relevant logs, to enable later tracking or analysis of the process data. For specific use cases with the audit option, audit trail logs can also be selected for central archiving. This transfer of the logs is automatic, and buffer mechanisms ensure loss-free data transmission even if the connection fails.

The operator uses the trend or alarm controls locally on the UDH client to display and analyze current or historical process data. Depending on the selected time range, the controls display data from the local archives or data automatically retrieved from the UDH server. For the user, the data archive location is irrelevant, even for remote access via web clients.

**Detailed system diagnostics to ensure system transparency and reduce downtime**

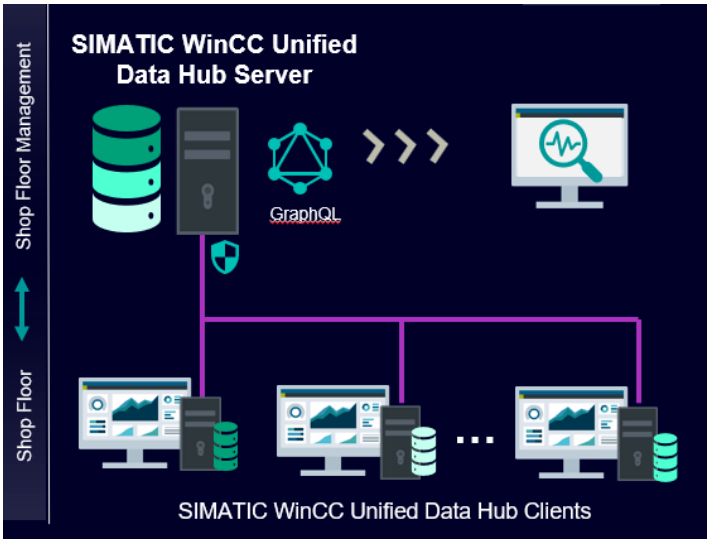
The Diagnostics Viewer shows details about the status of the UDH server (running, stopped, error) as well as the time stamp of the last update and a list of all registered and connected UDH clients (nodes). In addition to the status information (communication, performance, and data integrity) of the UDH server, the Diagnostics Viewer also displays diagnostic information for UDH clients, including registration details, manager status, health status, and memory usage, as well as information about the SQL connection, buffer status, and synchronization status.

**Reliable backup and restore with time-based segmentation of archived data**

Integrated segment archiving enables the reliable and high-performance archiving and retrieval of historical WinCC data. The system automatically configures the archive segmentation, with each archive segment storing data for a default period of time.
The combination of full backups and differential backups ensures data availability. Restoration is thus possible for individual segments or full database backups.

**Secure access and IT/OT Integration with GraphQL**

All data remain on the users' own premises.
WinCC Unified PC Runtime's GraphQL interface enables seamless integration with IT systems and applications. Users with IT know-how benefit from up-to-date online documentation. GraphQL, which provides direct access to historical data or alarms from the UDH server, is used to exchange data with other applications, to create tailored dashboards in a secured environment to support higher-level analyses and decision making, and to evaluate data via "IT-friendly" queries and tools such as Apollo Studio. To ensure that archived data cannot be manipulated, the system prevents write access to the database.




GraphQL enables secure data exchange with IT systems.

**USE CASES**

# How users benefit from long-term data archives

Insights from archived data open the door to efficiency improvements. From complete traceability of processes, to streamlining servicing through statistical analyses, to increasing efficiency by monitoring resource consumption, applications in many different industries can benefit from faster, more reliable, and better-informed decisions based on archived shopfloor data.

**Complete process traceability**

By providing access to historical shopfloor data, SIMATIC WinCC Unified Data Hub enables users to track historical production parameters and conditions, for example, to trace user logins and parameter changes, or to check that temperature-sensitive products were handled, stored, and processed within predefined temperature limits. Users can easily provide documentation for external and in-house audits and demonstrate compliance with production requirements or regulations.

**Data-based predictive maintenance**

Archived data prove extremely valuable for detecting trends in machine performance. This capability can be used to improve machine service. For example, changes in motor parameters (such as temperature or power consumption) or vibration data from sensors can serve as early indicators of wear, enabling preventive maintenance and the avoidance of unplanned machine downtime. Through the analysis of archived data, users can not only identify gradual deterioration in machine performance but also analyze historical data using advanced methods (including AI) to detect correlations and causes. These insights can then be used to identify optimization potential and prevent future downtime by determining the optimum point for performing maintenance that offers the best ROI.

**Resource transparency**

In addition to production data, data on the consumption of resources, such as electrical power, but also compressed air and heating or cooling media, can be archived as well. Through analysis of long-term data, users can compare consumption per production period or per product and calculate energy KPIs, identify unnecessary consumption, and develop strategies for optimizing resource utilization. They can also create reports to demonstrate compliance with efficiency measures or sustainability goals.

Users benefit from the resource transparency provided by dashboards created with the standardized GraphQL interface.

# Additional resources

**The complete introduction to SIMATIC WinCC Unified Data Hub**

The TIA Documentation Portal provides an in-depth guide on how to install, configure, and work with SIMATIC WinCC Unified and SIMATIC WinCC Unified Data Hub. You can view, share, and print all information free of charge.
TIA Documentation Portal | SIMATIC WinCC Unified
TIA Documentation Portal | WinCC Unified Data Hub

**SIMATIC WinCC Unified PC Runtime**

The SIMATIC WinCC Unified Data Hub server is based on SIMATIC WinCC Unified PC Runtime, the Windows-based solution for state-of-the-art process and machine visualization. Learn more about what makes this high-performance, flexible, and versatile HMI and SCADA system the right choice for operation and integration: SIMATIC WinCC Unified PC

**Configuration of WinCC Unified logging**

The SIMATIC WinCC Unified system offers users the possibility to log tags and alarms in a file-based or server-based manner. The application example linked below demonstrates how logging works and how to use it efficiently. You will also learn how to create central archives for WinCC Unified PC Runtime using the WinCC Unified Data Hub server.
Application Example | Configuring Logging for WinCC Unified System

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