NETCON 3000

Resourceful SCADA system

Designed especially for energy production, transmission and distribution

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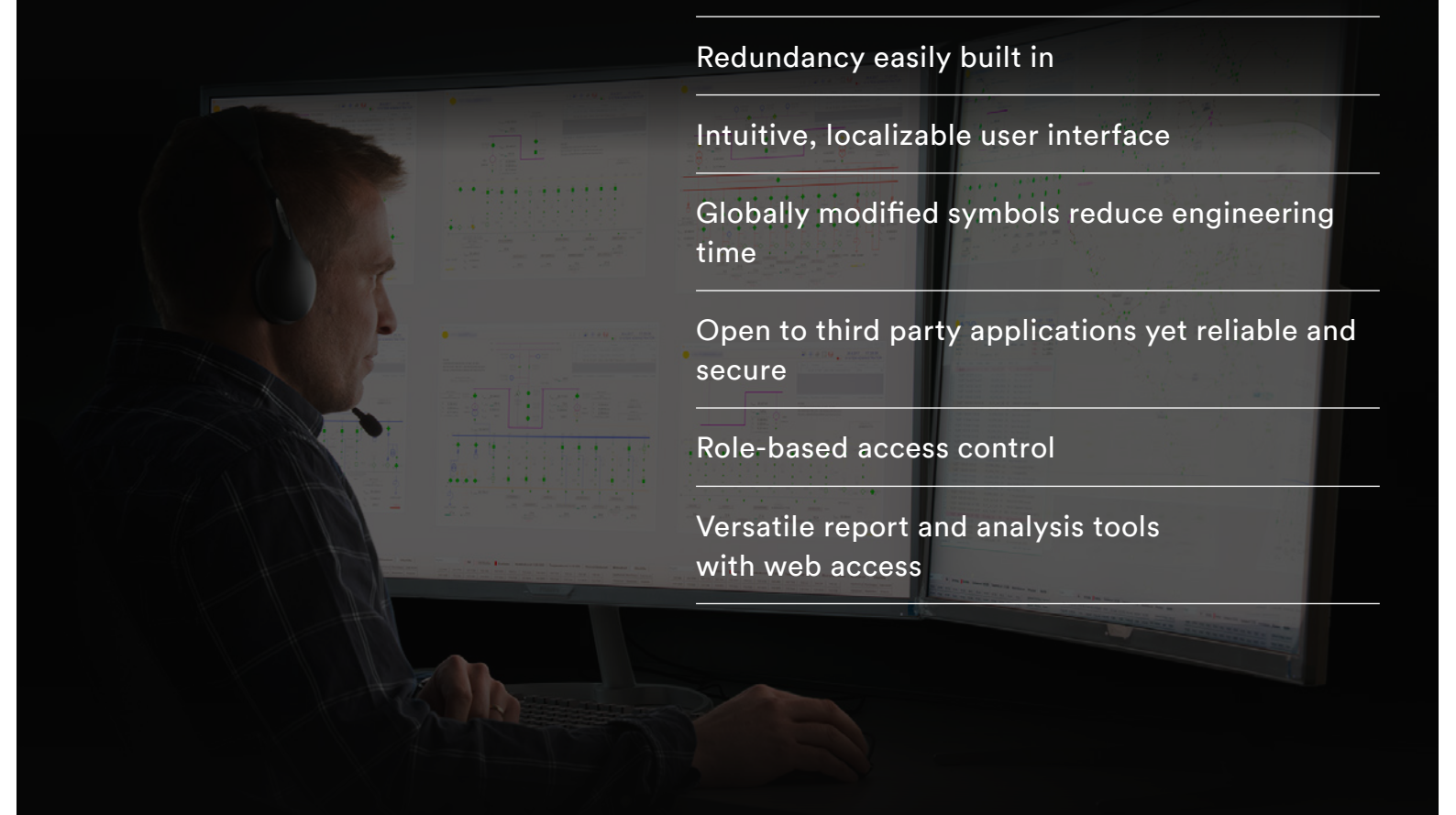
FEATURES



- Efficient handling of real-time data
- Modular, distributed system that is scalable from small to large tasks
- Redundancy easily built in
- Intuitive, localizable user interface
- Globally modified symbols reduce engineering time
- Open to third party applications yet reliable and secure
- Role-based access control
- Versatile report and analysis tools with web access

Resourceful SCADA system

Netcon 3000 is a modern, resourceful supervisory control and data acquisition system (SCADA) for energy generation and distribution. Because it is modular, distributed and open, the Netcon 3000 system enhances service delivery for operation in the deregulated electric utility business while keeping the total cost of ownership (TCO) low.

FLEXIBLE & HIGH-AVAILABILITY

The modular Netcon 3000 system scales from a single node for small applications to a networked, multi-site cluster of nodes for large ones.

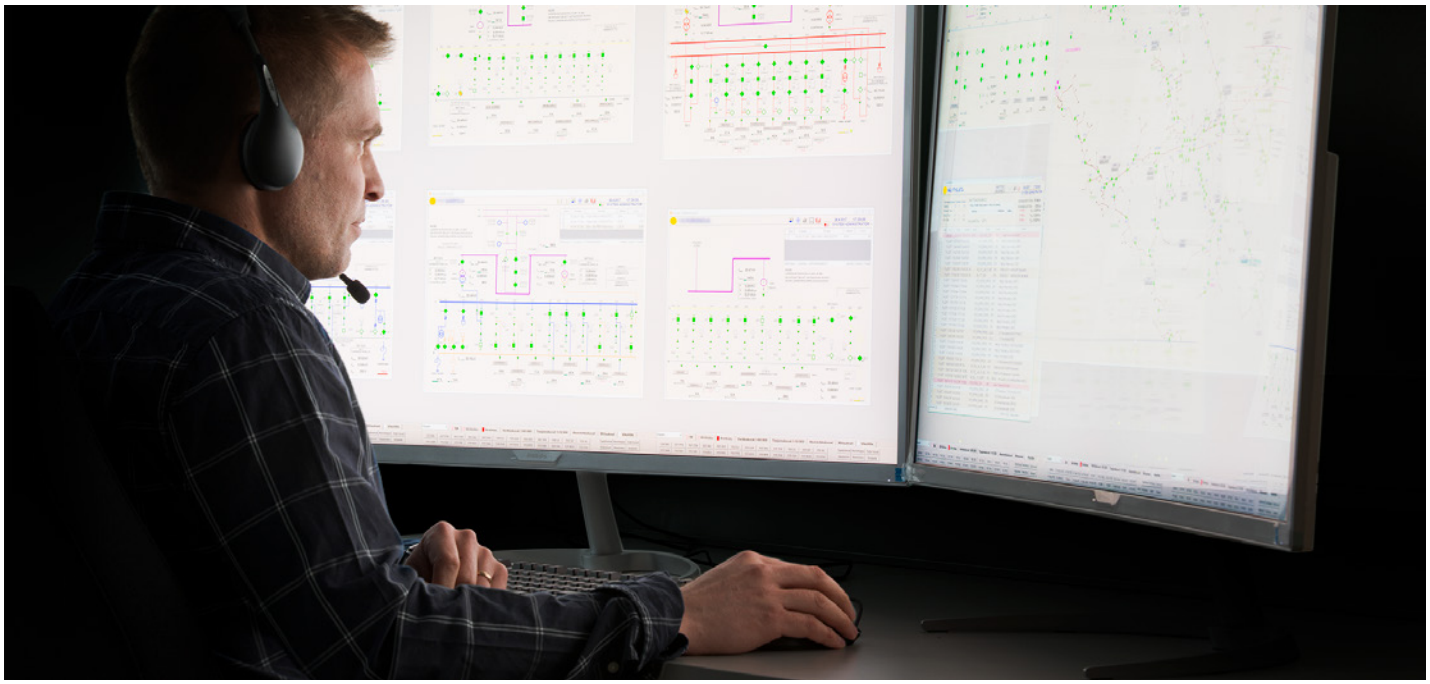
Process consolidation

In the past systems were often dedicated to single tasks. Today it may be more efficient for one system to handle several different processes and areas.

Netcon 3000 enables many parallel processes in the same system because it has user security and a process-asset hierarchy. Power generation, transmission, distribution and so forth may share the same servers using the same resources. They will remain logically separate from the operators' point of view.

Redundancy

Netcon 3000 supports high-availability systems with a redundant, hot-standby configuration. As much redundancy can be built into the system as required. The system then automatically takes of care of switchovers when necessary.



INTUITIVE USER INTERFACE

Netcon 3000 uses clear visual tools for the real-time and historical display and management of your process data. Modern graphics represent the process and its constituent objects. Component technology makes it easy to integrate information from many different sources into the same graphics. The system visualizes the past, present and future of your process along with information from other sources in a single, consistent graphical form.

The intuitive symbols have distinct colors and can have their visibility, position, size, color and rotation animated to show changes. The graphics and animations make a clear distinction between normal and out-of-band states/values, for both your process itself and your communications system.

Ease of operation

The navigation of numerous pictures is made easy by the menu component controlling the operator station workspace. The GUI has been designed to minimize the number of steps that an operator needs to take in order to master the process. Intuitive navigation options and support features help make operation convenient.

Time zones

When processes span several time zones, operators' work hours are best scheduled in local time. Netcon 3000 supports dynamic selection of the client time zone.

Language layer

For large processes, operators from different geographical areas may be working in the same dispatch center. There may be many nationalities speaking different languages. In Netcon 3000, each operator can select their preferred language.

EASE OF DEVELOPMENT

Application availability

Utilities need efficient real-time communication between their network and various information systems both inside and outside their own enterprises. They should expect their control systems to provide a wide variety of applications. It matters less if these are available from the same supplier or from top-notch third party suppliers.

Thanks to its open architecture and large installation base, Netcon 3000 can bring you an ever-expanding range of applications. It uses ActiveX, the best available container for third party applications:

- Drop-in “controls” bring the applications to life without programming.
- Secure Containment technology ensures the reliable and secure execution of third party controls.

The Netcon 3000 also integrates with your MES (manufacturing execution system) and ERP (enterprise resource planning) system.

Reusable, globally modified symbols

Since each process object in SCADA applications has many attributes, the basically simple task of presentation can become quite complex. Netcon 3000 streamlines the engineering by providing proven, pre-developed symbol sets for objects.

The system uses object-oriented component technology and provides reusable symbols for the most common process objects such as switches, disconnectors, generators, valves, pumps and measurements. Changes made to a Netcon 3000 symbol are automatically propagated throughout the application. As a result, your engineers will spend less time creating, modifying, validating and re-validating GUI applications. This means considerable savings for your company.

ENHANCED PRODUCTIVITY

- Point-and-click simplicity in the building of applications
- Easy-to-use, powerful wizards accelerate the development process
- Faster system development and deployment
- Simplified application integration

System distribution, scalability & redundancy

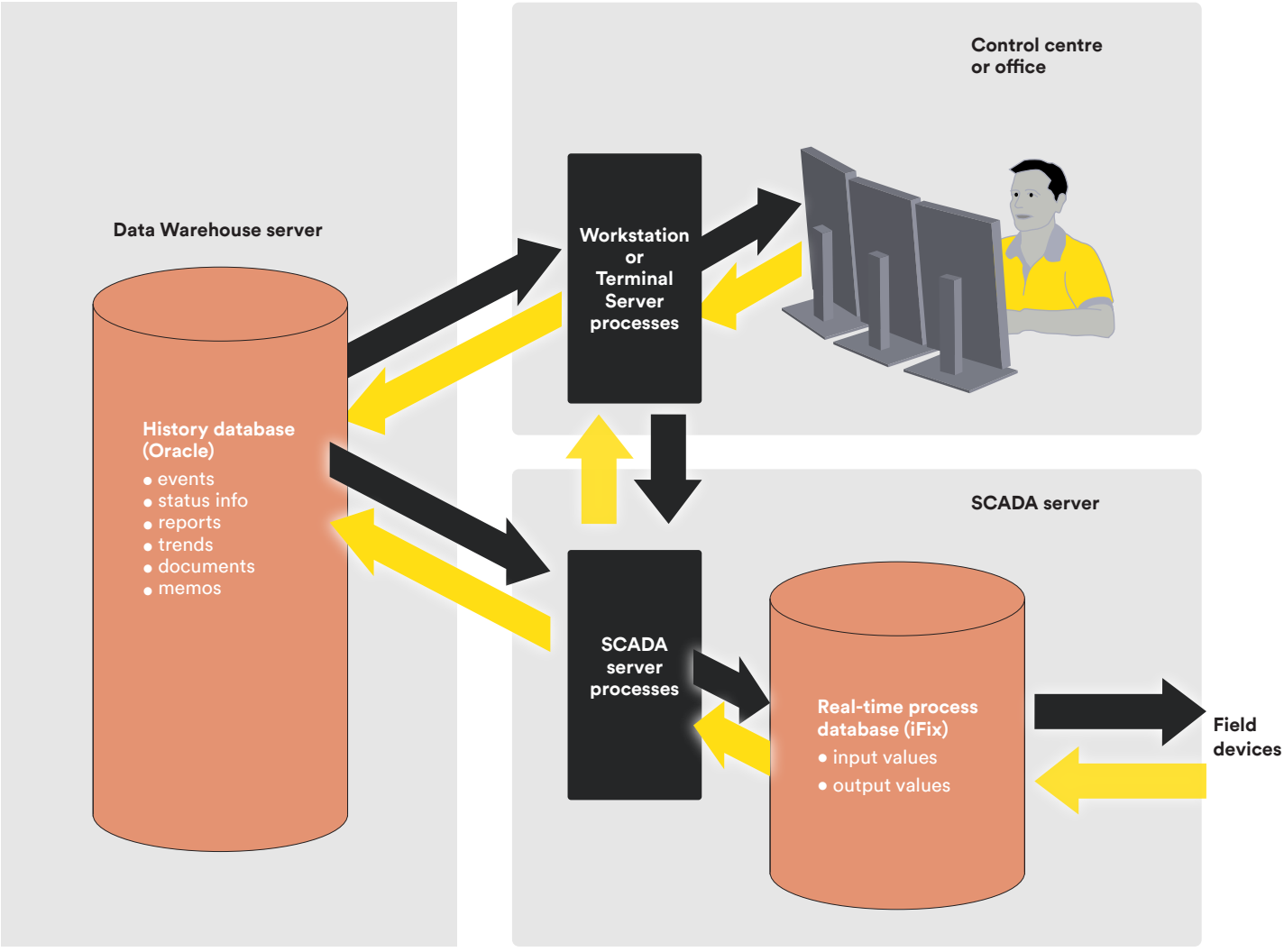
CLIENT/SERVER ARCHITECTURE

ICT infrastructure is gaining a more important role as utilities strive continuously to adapt to short and long term changes in their business processes. The system tools and open interfaces of Netcon 3000 provide agile solutions for energy process management as a critical part of today's ICT infrastructure.

Netcon 3000 is a distributed, highly scalable SCADA system that can handle from a few hundred data points to a million. In addition, it can flexibly deal with various utility requirements, from the basic to the most demanding ones.

System distribution options

In a truly distributed architecture, your process information is not replicated all over the system. Instead, it is stored in one place but shared so that it can be accessed by users throughout the network.



The Netcon 3000 system collects, processes and distributes real-time data with unparalleled flexibility and scalability. The architecture of the system enables you to take advantage of multiple clients, along with the Microsoft Terminal Server technology, to seamlessly extend the reach of the HMI/SCADA applications. Your data is accessible across national borders and time zone boundaries. Thanks to the use of unique identification, no complex cross-references or other tedious work are needed.

SCADA servers

The multi-tasking system is based upon a real-time SCADA database, which either runs on one server or is distributed over several. The SCADA server(s) acquire and process data, performing e.g. alarm checking, calculations, logging and archiving according to the set parameters. Communication and protocol conversions are handled by networked instances of the Netcon NFE application with the associated real time databases.

The SCADA servers maintain the central process database. A wide variety of object types are available in the database, including analog and digital inputs and outputs, calculations, alarms, timers and more.

The data is available in real time, upon request, to the system client applications, to third parties and to the users. Data processing applications include real-time graphics, trending, reporting and many others. These applications can run on the same computer as the SCADA server or on a number of networked server or client computers.

Operator stations

The user interface at the operator stations runs on, and is connected to the central system via, networked thick or thin clients. Such clients may be used wherever IP connections are available.

A Netcon 3000 operator station may be based on a thin client running on any terminal client -enabled platform. The Terminal Server technology manages system servers and clients in a secure and convenient way. Where necessary, Citrix Metaframe may be used to extend access to the terminal client across platform boundaries.

The Netcon 3000 client supports multiple displays with one or several process diagrams containing combinations of process diagrams and text.

Data access control

Netcon 3000 users are allocated to groups which have well-defined read and write privileges to the process parameters and to specific functions. The access control prevents non-authorized users from controlling the process.

Each user group is assigned access to specific application features and security areas. An operator can use the features available to the group to which she/he belongs. Every object in the process database contains a reference to a security area. A user, when logged in, is authorized to operate those objects whose security area matches one of her/his security areas.

Netcon 3000 Flexible Manning

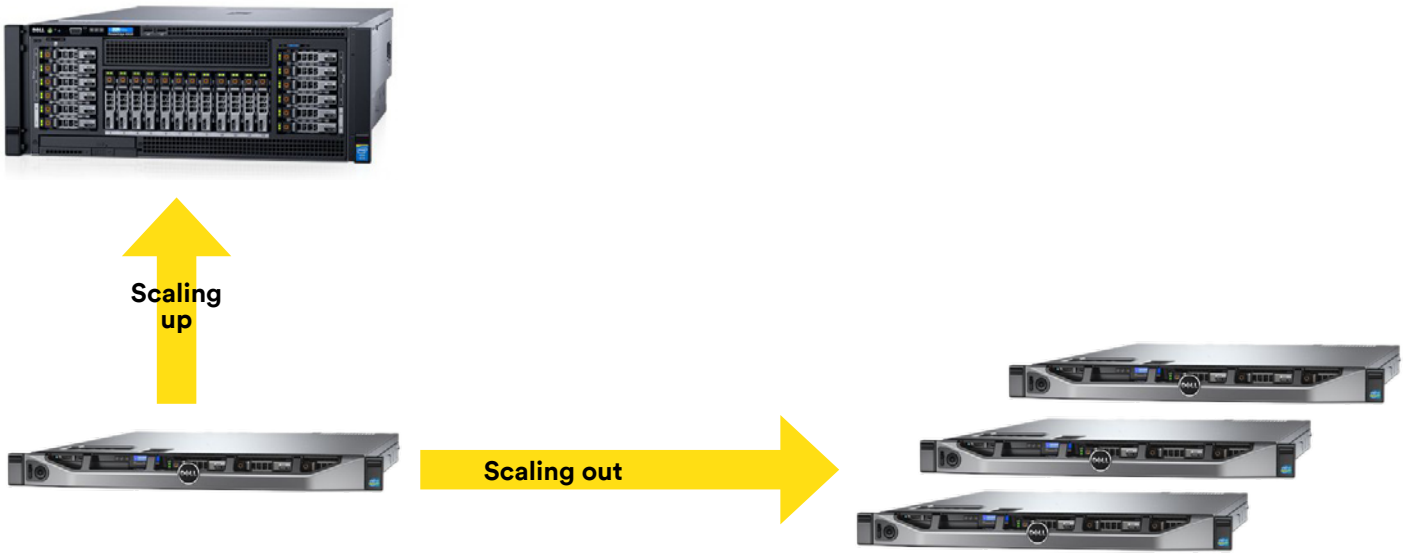
While process information is available to users throughout the network, the access is restricted. Netcon 3000 Flexible Manning supervises the users and makes sure that every process data point has an operator responsible for it at any given moment.

SCALABILITY

As utilities grow or start using more process information, the increasing amount of data that need to be made available requires more and more computing resources. Two concepts for staying on top of the resource requirements have evolved: scaling up and scaling out.

Scaling out

As a distributed system, Netcon 3000 is inherently modular. It consists of a cluster of computers, independent or interconnected. You can easily add more computers, bringing along parallel processing capability and other resources. This translates to better availability.



Such scaling out sets no limits to the expansion of the system. It also means easy maintenance.

When you expand your Netcon 3000 system beyond two or three nodes, which is a very common scenario, the power of the system's distributed, client/server architecture really shines through.

Scaling up

The other alternative is scaling up, which means upgrading existing pieces of hardware, such as a server. It too is easy in the Netcon 3000 system. You simply transfer the application software, operating system and database onto new and more powerful hardware. Once the new system is ready, it is brought online. The impact on existing application code and on the organization of your system is minimal.

REDUNDANCY

While the distribution of resources limits the impact of computer failure in itself, the Netcon 3000 system can also be made to contain as much actual redundancy as required for the sake of availability.

The classic scheme of duplicated server computers is still valid in principle. However, strides in computing power have made it feasible, and often far more cost-effective, to have a couple of server computers functioning as platforms, each running several virtual servers. Each of the functionally separate servers (SCADA, Data Warehouse, Terminal, etc.) can thus be duplicated without the cost and hassle of maintaining numerous physically separate servers. Systems with redundant Netcon 3000 DWH servers are licensed as Netcon 3000 Enterprise, while those with a single Netcon 3000 DWH server are Netcon 3000 Standard.

The physical, platform servers may then be put in different locations as a guard against various natural and human-related hazards, such as flood, fire and theft.

FLEXIBLE AND SECURE

- Real-time client/server architecture allows unparalleled scalability
- Choice of clients, including client for operator station and client terminal server
- Enhanced security and accountability
- Resources are easily duplicated whether servers are physical or virtual

Data Warehouse

ROBUST DATA STORAGE

Data Warehouse (DW) is a robust data store for the Netcon 3000 system. It collects and organizes data into databases that you can search and mine for information via the various Netcon 3000 DW applications. The databases are the foundation for your critical operations and business decisions.

The Netcon 3000 DW server is usually common to all the nodes in the system, even when the system as a whole is distributed. It handles the data using store-and-forward technology.

Fault tolerance

Given the importance of data protection today, the Oracle database underlying Data Warehouse uses powerful solutions that enable businesses to protect their data and recover it in a timely manner when needed. This entails

- protection from server failure,
- a guard against data loss,
- recovery from human error, and
- minimization of planned downtime.

RAW AND REFINED DATA

Time series

The Netcon 3000 DW time series database stores process values as time series, calculates aggregates from these, manages the aggregates and makes them available for trend charts, reports and statistics. Hundreds of thousands of aggregates may be stored for several years.

Measured values as well as indication and status information are stored in the DW time series database at high sample rates. The sampled values are aggregated into fixed-period time series containing averages, minimums and maximums. Indication states and status changes are stored so that the operating hours and switch counts of process units can be viewed and reported.

With the Time Series Editor application, an operator can correct values judged to be faulty while preserving the original ones.

Events

The SCADA process database generates events such as change-of-state events, alarms, operator commands and acknowledgements. Events and alarms generated by the system can also be stored.

Process, operator and system events are all stored in the Netcon 3000 DW Events database. They are accurately time stamped with UTC time. The generous capacity accommodates different requirements and configurations: hundreds of thousands to tens of millions of events can be stored.

Status database

The Netcon 3000 DW status information database contains the status of objects from the real time process database of the SCADA nodes for viewing and reporting.

Memos and reminders

Calendar-dependent information and timed alerts are stored in the Netcon 3000 DW memo database. Memo is a tool with which operators can create and manage notes and reminders. A reminder is a timed alert that triggers an ordinary process alarm in the SCADA.

WEB SERVER ACCESS

The Netcon 3000 Web Server provides users with realtime and historical reports, event and alarm analysis charts, general or incident specific instructions, plant documents and pictures, system information, etc.

Reports

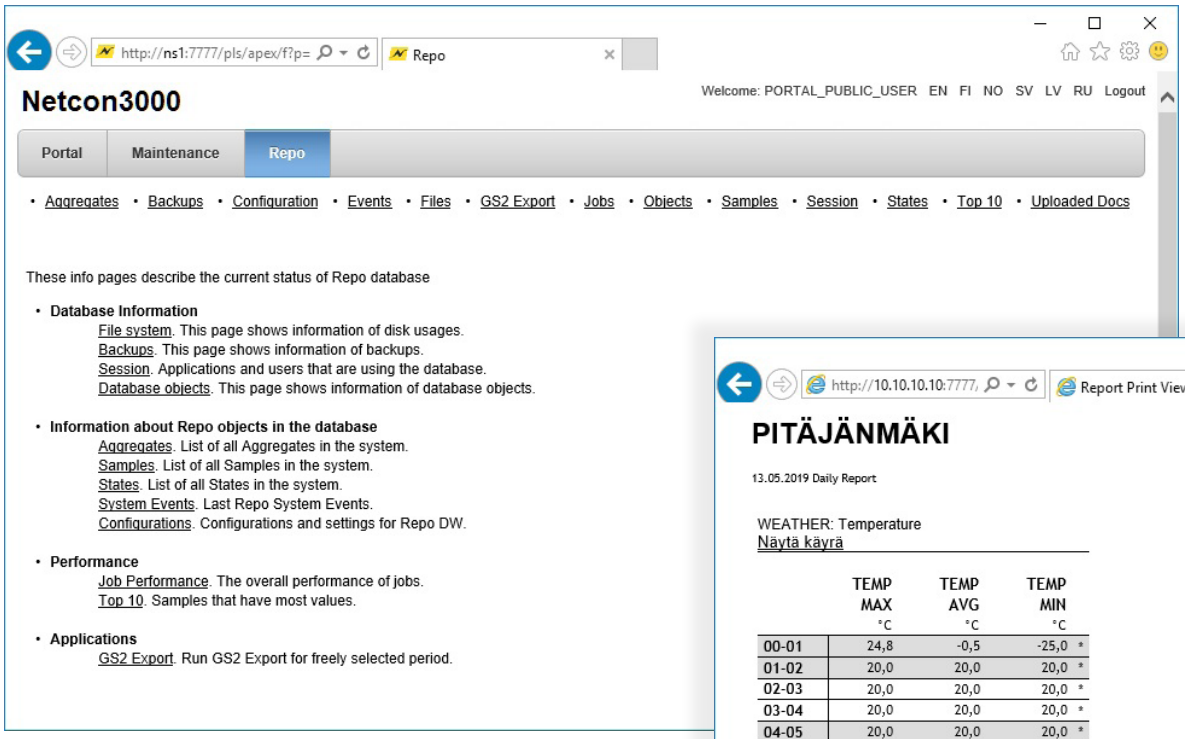
Netcon 3000 Repo utilizes the data from the DW time series database along with the web server to generate reports in the HTML, CSV or text format and to show them in a browser window. From there the report may be copied and pasted into Excel, downloaded as a CSV file or sent through FTP or email.

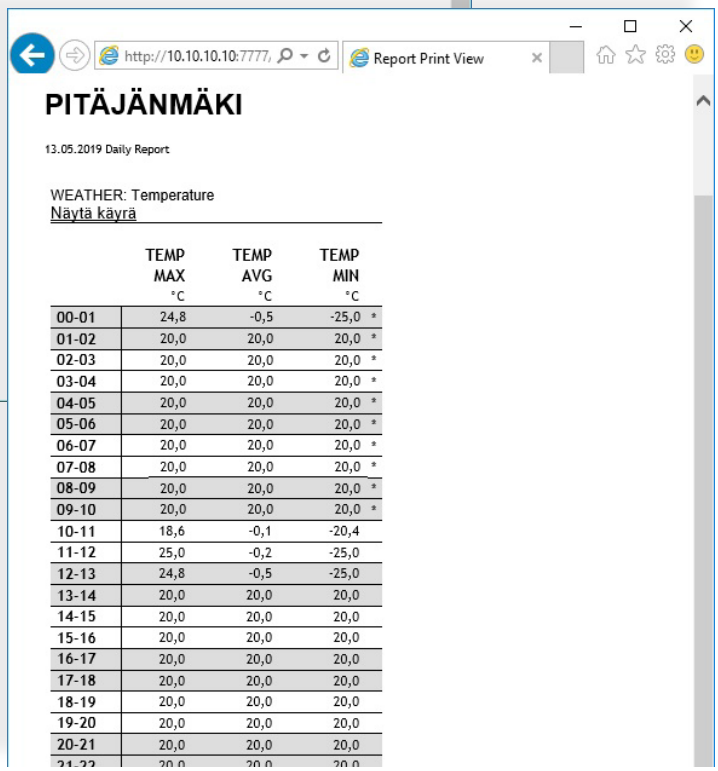
Alarms and Events Analysis (AEA)

Alarm management is crucial for effective process supervision. The vast number of alarms and events registered by a SCADA system is hard to comprehend without analysis tools. AEA is an efficient tool that generates analyses of alarms and events using the data in the DW events database.

Plant and process documents

The Netcon 3000 system can store and manage all the various plant and process documents. In a web browser the user can select the desired document from a tree representing the plant asset hierarchy. At the operator station the documents are accessed through objects in the process graphics, which similarly reflect positions and locations in the plant asset hierarchy.





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01-02	20,0	20,0	20,0	*
02-03	20,0	20,0	20,0	*
03-04	20,0	20,0	20,0	*
04-05	20,0	20,0	20,0	*
05-06	20,0	20,0	20,0	*
06-07	20,0	20,0	20,0	*
07-08	20,0	20,0	20,0	*
08-09	20,0	20,0	20,0	*
09-10	20,0	20,0	20,0	*
10-11	18,6	-0,1	-20,4	
11-12	25,0	-0,2	-25,0	
12-13	24,8	-0,5	-25,0	
13-14	20,0	20,0	20,0	
14-15	20,0	20,0	20,0	
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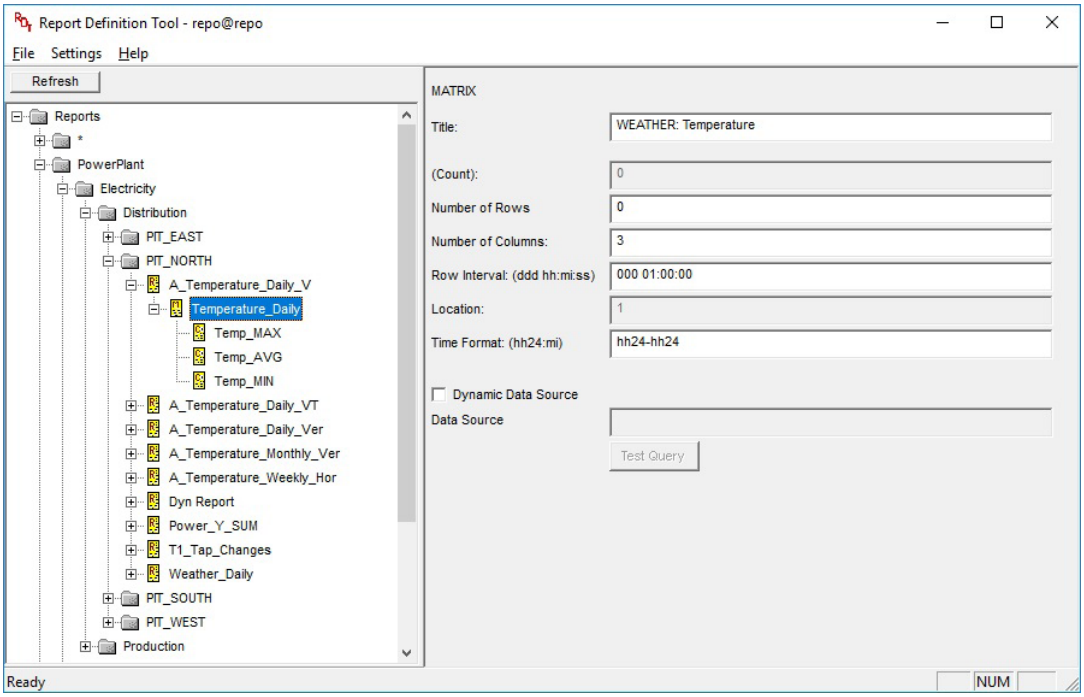
20-21	20,0	20,0	20,0	



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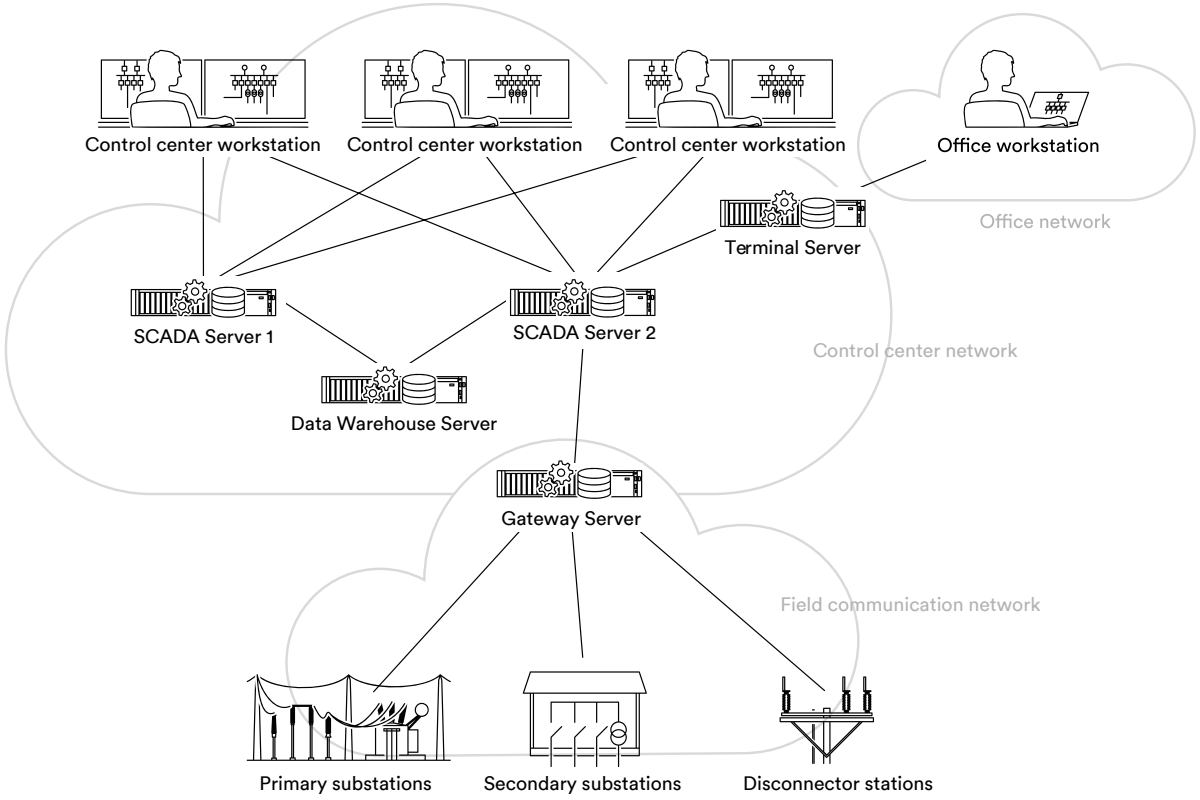
EXAMPLE OF HARDWARE ARCHITECTURE



KEY BENEFITS

Open system

Netcon 3000 uses standard, high volume hardware, firmware and application packages. The general advancement of these packages contributes to the Netcon 3000 system now and in the future. Netcon 3000 is built upon iFIX, the award-winning industrial technology platform.

Low TCO

The total cost of ownership is kept low thanks to the use of mainstream technology. Netcon 3000 is an investment compatible with a wide range of established and emerging technologies.

Large installed base

The installed base of the system platform exceeds 200,000 nodes, covering applications such as power generation, power distribution, oil, gas, water, wastewater and many manufacturing industries.

System evolution

Netcontrol has a long-standing commitment to give you the solution that best enables you to master your process. Our goal is to make your ongoing investments as profitable as possible and to minimize partial risks by delivering to you a highly flexible, scalable and adaptable system.