technical overview

Microsoft GOLD CERTIFIED Partner

OPC FOUNDATION MEMBER

SCP SUPPORT CENTER PRACTICES CERTIFIED

CitectSCADA

Citect: Real-time Intelligence

CITECT PRODUCTS AND SOLUTIONS

- CitectSCADA
- CitectHMI
- CitectSCADA Reports
- CitectSCADA Pocket
- CitectSCADA Batch
- Switch2Citect
- Ampla
- Meta
- Nexa
- Professional Services
- Educational Services
- Support

For information on all of the above, visit www.citect.com

Our company mission is to connect people, in business and industry, to real-time intelligence to improve their business strategies, decisions and bottom line.

Established in 1973, Citect has grown to become a leading global provider of industrial and facilities automation, real-time intelligence, next generation manufacturing execution systems (MES) and on-demand benchmarking applications.

Headquartered in Sydney Australia, Citect has 21 offices and representation in Oceania, Southeast Asia, China, Japan, North and South America, Europe, Africa and the Middle East. With a large global distribution network our products are distributed in more than 80 countries worldwide.

Over the last 30 years, Citect has been the proud recipient of a number of awards with some recent accolades including:

- Microsoft Gold Certified Partner
- OPC Foundation Member
- Frost and Sullivan Product Line Strategy Award
- Support Center Practices (SCP) Certification

We strive to exceed our customers' expectations through our continued investment in technology and people, thereby ensuring we deliver world class solutions and services.

Microsoft GOLD CERTIFIED Partner

"Microsoft is pleased to be working with Citect to deliver powerful and reliable control and monitoring solutions for industrial customers worldwide."

Chris Colyer,
Worldwide Director of Plant Operations Strategy for Microsoft

CONTENTS

Citect Total Solution

Citect provides a range of solutions that meet our customers' specific needs. Our products are designed to integrate seamlessly with each other and third party products, providing you a total end-to-end solution.

Renowned for the development and application of SCADA, HMI and MES solutions, Citect is evolving into a tier one solutions provider. The ability to develop powerful and reliable industrial software capable of withstanding the rigors of large-scale operations is one of our core strengths. Leveraging open technologies, CitectSCADA, Ampla, Meta and Nexa connect to multiple plant and business systems, providing organizations with critical information to enable them to improve their overall business performance. This commitment to open connectivity helps protect our customers' IT investments by allowing them to retain existing expensive hardware systems, whilst gaining all the advantages of a state-of-the-art monitoring and control system.

Our products are complemented by professional consulting services and certified integration partner services, SCP-certified customer support and educational services, all of which enable our customers to achieve the maximum benefits from their installations. From Citect Professional Services, which can create a smooth implementation through its AdvantageOne methodology, to Citect Educational and Support Services to maximize our customers' systems, Citect is with our customers every step of the way.

We don't just sell products, we build lasting relationships with our customers.

A WIDE RANGE OF INDUSTRY SOLUTIONS

Citect is dedicated to understanding our customers' needs and providing them with the best technology available.

Citect's solutions are implemented in numerous industries, including:

- Aerospace & Defense
- Automotive
- Building Automation
- Cement & Glass
- Chemical
- Electronics
- Food & Beverage
- Machinery & Manufacturing
- Metals
- Mining & Minerals
- Oil & Gas
- Pharmaceutical
- Power / Utilities & Generation
- Pulp & Paper
- Transportation
- Water & Waste Water

CitectSCADA Offerings

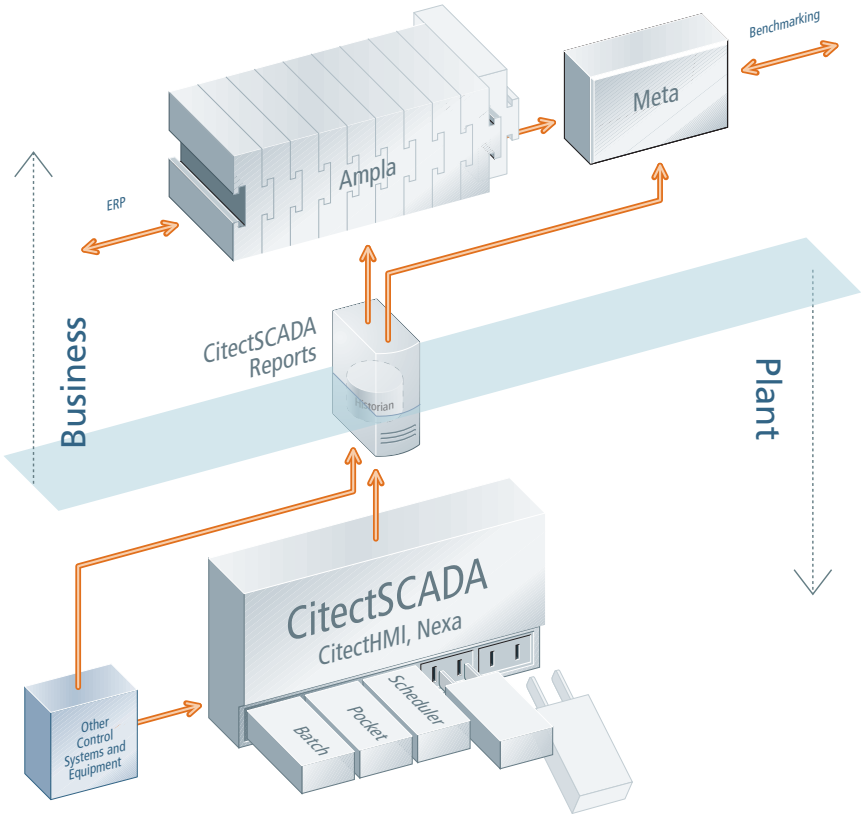
CITECTSCADA

CitectSCADA is a fully integrated industrial control solution that enables customers to increase return on assets by delivering a reliable, flexible and high performance control and monitoring system. Easy-to-use configuration tools and powerful features enable you to quickly develop and deploy solutions for any size application. Unique features like true DCS style redundancy, scalability and unrivalled flexibility differentiate CitectSCADA from its competitors.

CitectSCADA systems are sold complete and ready to go. All the features, protocols and drivers are included, and because it's sold as one comprehensive package, it is tightly integrated and built to perform.

Unlike other PC-based industrial control systems, CitectSCADA was designed from its beginning to handle all the needs of the smallest to the largest and most complex enterprises in a single, integrated system while maintaining high performance and reliability. For over 30 years Citect has been providing solutions for our customers' industrial automation needs and as a result CitectSCADA has been used in a wide range of markets and applications. From monitoring a few points on top of the Sydney Harbour Bridge in Australia to controlling some of the largest, most complex applications in the world, CitectSCADA is the choice for global manufacturers.

By leveraging Microsoft's talent, vision and market leadership, Citect continues to lower the cost of acquiring, deploying and managing large-scale industrial control systems. It enables plant managers to seamlessly link plant level information to business planning systems and, through the Internet, to remote users, devices and suppliers.



SWITCH2CITECT

Switch2Citect is a conversion tool that allows customers to simply and reliably upgrade their legacy control systems to Citect. This reduces their Total Cost of Ownership (TCO) by minimizing conversion and ongoing maintenance costs. It also provides opportunities to take advantage of the latest technologies to improve productivity at their plant.

CITECTHMI

CitectHMI is an entry level HMI (Human Machine Interface) software designed for OEMs. Based on CitectSCADA, CitectHMI is ideal for both Machine and Panel OEMs who wish to gain a competitive advantage by leveraging the strength of a world class HMI in their product offering.

CITECTSCADA REPORTS

Unique amongst historians, CitectSCADA Reports combines the openness that only an embedded MS SQL Server provides, with powerful performance to deliver an accessible, easy-to-use and secure reporting tool that lowers total cost of ownership.

CITECTSCADA POCKET

CitectSCADA Pocket enables plant managers to lower their Total Cost of Ownership (TCO) by providing a Pocket PC-based, operator interface for the remote monitoring and control of your plant anytime, anywhere. Tight integration with CitectSCADA this easy-to-use offering enables operators to change set-points and outputs as well as acknowledging alarms.

CITECTSCADA BATCH

CitectSCADA Batch enables customers to lower their TCO by delivering a highly flexible, scalable batch management solution to increase productivity and achieve consistent high quality. Providing unrivalled reliability, this easy-to-use offering integrates tightly with existing systems and facilitates compliance with international regulations.

NEXA

Nexa is a specialized facilities management system which integrates climate, lighting and other systems in single or multi-site facilities, creating enterprise-wide monitoring and control systems.

add value to your system

Add value to your system by connecting to Ampla and Meta, for enterprise-wide performance reporting and benchmarking

AMPLA

Ampla is a powerful and dynamic suite of Manufacturing Execution Systems (MES) which allows you to improve the production efficiency, performance and profitability of your business.

META

Meta is a performance benchmarking service that allows corporate executives and managers to monitor a balanced range of performance, financial and operational key performance indicators (KPI's) across a variety of levels, locations, divisions and countries. Meta enables organizations to proactively leverage best practices, initiate performance improvements and improve capital allocation through visual, on-demand, access to corporate performance analytics information anytime, anywhere.

CITECT PROFESSIONAL SERVICES

Citect Professional Services provides business consulting, engineering design, business process improvement and technology implementation services to deliver fully functional solutions from inception, through implementation to the achievement of business goals and objectives.

CITECT SUPPORT

Citect Support offers multi-level application software support services. A range of direct and self-help technical assistance options allow our clients to maintain optimum performance from their Citect software.

CITECT EDUCATIONAL SERVICES

Citect Educational Services provides multi-level Citect training courses for end users, engineers and system integrators. With highly qualified and accredited trainers, Citect offers a variety of technical training courses to meet your specific training requirements.

System Architecture Topologies : Scalable

OEM SOLUTIONS

CitectHMI has been designed for stand-alone HMI applications and includes a wide variety of driver and connectivity options.

CitectHMI is a scalable solution which can be upgraded to CitectSCADA. This is as simple as reprogramming the software key.

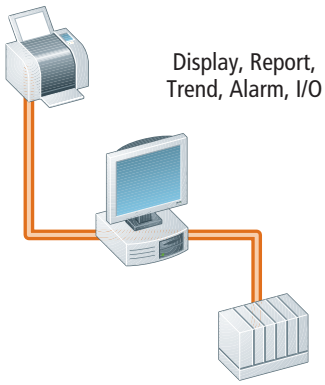
Features include:

- Historical and real time trending, advanced alarming and reporting
- Customizable installation
- Ontime runtime language switching to support global customers
- OLE Automation for automated building of graphics pages
- Two programming languages – Cicode and CitectVBA
- Statistical Process Control
- Graphical elements including Genies, Super Genies and ActiveX objects

Your SCADA system has unique requirements that change with time, so how can you choose the best architecture? CitectSCADA gives you the ultimate system architecture scalable to any application size.

SCALABLE ARCHITECTURE

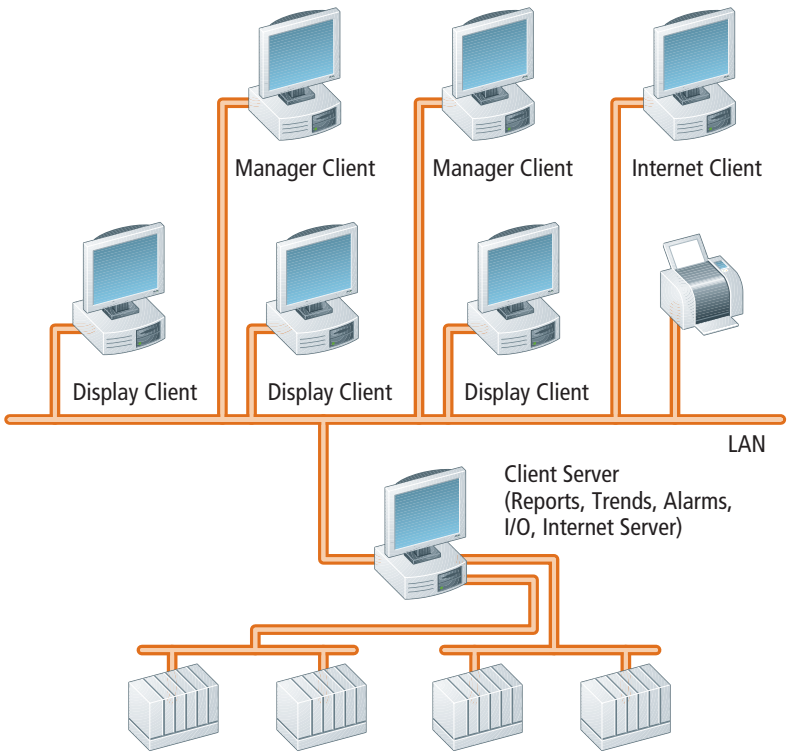
Scalability is the power to resize your system — up or down — without having to modify any of the existing system hardware or software. CitectSCADA's innovative scalable architecture allows your system's architecture to grow with your requirements, while preserving your initial investment. If you require a second operator interface, just add a LAN and a new computer, and nominate it as a Display Client. The new computer can share the same configuration, and will receive I/O from the first CitectSCADA computer.



MACHINE OR LOCAL CONTROL

Running on Windows XP-embedded, CitectSCADA provides users with a control system with the power to match the

ABOVE: Standard control.
BELOW: Large control.
OPPOSITE: Cluster control.



requirements of advanced machines. Our embedded systems provide the same level of functionality of our full SCADA package and can be run as a stand-alone system or integrated as a local control panel within an integrated control system.

STANDARD CONTROL

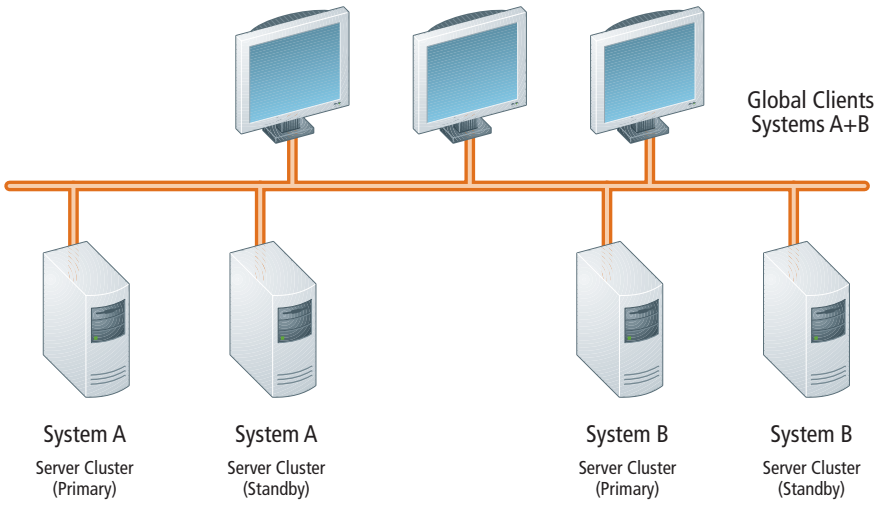
Many CitectSCADA systems have grown from a single computer to large control systems. The ability for a single system to grow without changes being made to the configuration enables CitectSCADA customers to be confident in the long term future of their control system.

LARGE CONTROL

CitectSCADA has a reputation for being the expert at large control systems. The first control system to be implemented on CitectSCADA in 1992 contained in excess of 50,000 tags. In order to complete these size of projects CitectSCADA has developed advanced communications topologies and project structures than enable the design, implementation and maintenance of a larger control system.

CLUSTERED CONTROL

With the current economic climate of looking to cut costs and centralize control, the ability of CitectSCADA to unify any number of control system into a single "clustered" system provides users the perfect topology. With each local site able to view either its own control system global control clients can be implemented that can view across the whole control system complete with unified alarm lists and the ability to compare trended data across the multiple systems.



LARGE SYSTEMS

CitectSCADA applications can scale easily on all company application sizes, small, medium and large. Coverage is available for very small applications with only a few points, through to large applications that monitor and control over half a million points. This is achieved by providing the option of using centralized or distributed processing. Centralized processing has the benefit of keeping all the data and processing in one PC which is a more economical solution. However, for very large applications, distributed processing allows you to share the processing over multiple computers.

ARGYLE DIAMONDS

In 1992, the Argyle Diamond Mine commissioned the first CitectSCADA for Windows system. Since commissioning, this fully automated 24 hour/365 day operation has never encountered production downtime due to the CitectSCADA system.

- 33 PLCs
- 33,000 digital I/O points
- 16,000 analog I/O points
- 11,500 alarms
- 4,000 historical trends
- 50 PCs on Ethernet LAN
- Common (global) database
- Configuration at any PC
- DCS style redundancy

"...there has never been any production downtime due to the CitectSCADA system."

Senior Process Control Engineer, Argyle Diamond Mines, 2000

System Architecture Topologies : Flexible

Your SCADA system, like your business, must react to changing requirements. New production lines or pressure on costs can prove difficulties. CitectSCADA uses its client server architecture to enable you to design and redesign your system as required.

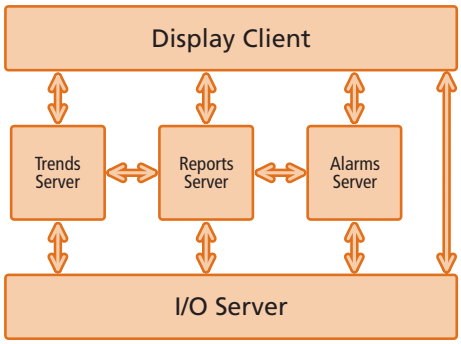
FLEXIBLE ARCHITECTURE

Designed from the start for true client-server architecture, CitectSCADA is the real-time system that ensures high performance response and integrity of data.

To take full advantage of a client-server architecture, it must be utilized at the task level. Each task works as a distinct client and/or server module, performing its own role, and interfacing with the other tasks through the client-server relationship. CitectSCADA has five fundamental tasks which handle: communications with I/O devices; monitoring of alarm conditions; report type output; trending, and user display.

Each of these tasks is independent, performing its own processing. Due to this unique architecture, you have control over which computers in your system perform which tasks. For example, you can nominate one computer to perform the display, and report tasks, while your second computer performs display, I/O, and trends.

The initial design step for your control system places I/O servers as required to access the data. The ability to support up to 255 I/O servers each with licences for the large number of protocols included with CitectSCADA, provides the control system with access to your data wherever it likes. Once the data is available with



the I/O servers, the source of the data becomes irrelevant to the control system designer. This allows the communications and the control system design to be completely separated and provides more flexibility with changing I/O server locations or system connections in the future.

Between the I/O severs and the other tasks within CitectSCADA, a publish/subscribe interfaces exists. The interface ensures that the bandwidth requirements between the clients and servers are driven by the activity or number of changes of a specific variable rather than the size of the system. By keeping a low bandwidth CitectSCADA servers can be separated from the I/O servers via shared or lower bandwidth communications, increasing the options for server locations and the flexibility of the control system.

With the tags available, CitectSCADA tasks can now be located to meet the requirements of the system. Often CitectSCADA systems are built around a central pair of servers, each acting as the primary or standby server for all the CitectSCADA tasks. This design will optimize its performance by executing each CitectSCADA task individually.

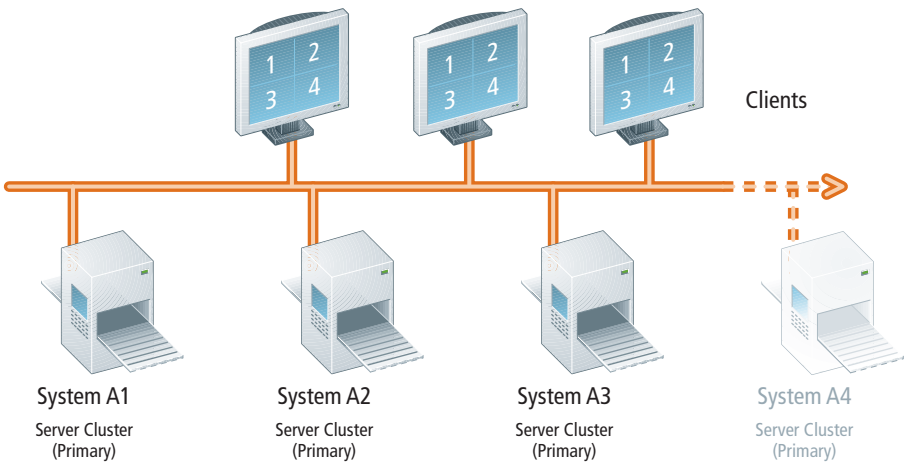
In doing so, the CitectSCADA system can create separate server and client components across all available CPUs, resulting in improved performance and stability. A system with individual task processes can either remain on the central server or have each task distributed as required to meet system needs.

As well as relocating system tasks to meet growing requirements CitectSCADA can also duplicate system tasks by adding clusters to enable system expansion. Additional clusters enable the SCADA system to expand by either using more of the existing resources or by adding new resources. For example, a system may reach a point where the number of trends being recorded needs to be enhanced. Without clusters, a larger more expensive computer must be purchased. With clusters, the system can add an additional trend task and progressively add trends on this new server without the added hardware cost.

SCENARIO

You have four identicle machines with identical projects. CitectSCADA allows you, with a single CitectSCADA project, to view all the alarms, trends, I/O and reports , and to use the same displays to display information from each of the systems. This offers a great reduction in the level of testing that is required within the project.

An example of this could be a windmill project where you have N turbines and just one CitectSCADA project, but can monitor the whole windfarm.



System Architecture Topologies : Reliable

RELIABLE ARCHITECTURE

In factory automation and other mission critical applications, hardware failure leads to production loss, and can result in potentially hazardous situations. CitectSCADA's redundancy will tolerate failure anywhere in your system, with no loss of functionality, or performance.

CitectSCADA supports full, hot standby configurations, providing complete I/O device redundancy. By nominating one device as primary, and the other as standby, CitectSCADA will automatically switch from one to the other in the event of failure. Using CitectSCADA's ability to write setpoint changes to both primary and standby I/O devices, even devices that were not designed for redundancy can be used in a redundant configuration.

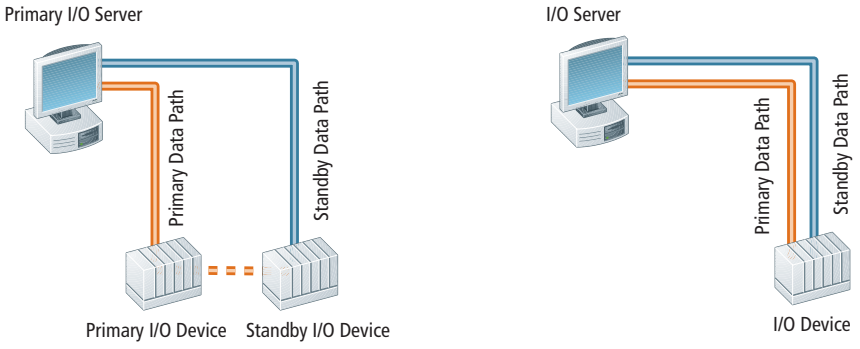
A broken communication cable and unpredictable electrical noise are common communication problems. In response, CitectSCADA allows the use of two separate communication cables, (run separately) for each I/O device. By using data path redundancy, you minimize the chance of communication loss affecting your operation

When communicating with an I/O device, many systems demand redundant I/O server configurations. To avoid conflict of data, and to maximize communication bandwidth, only the primary I/O server communicates with the I/O device.

Many SCADA systems use LANs to connect the elements, but something as simple as a faulty network card can destroy communication. CitectSCADA's built-in multiple network support provides full LAN redundancy. All you have to do is install two networks, (or more if you like). If the primary LAN fails, CitectSCADA will automatically try to connect on the other available LANs with no configuration required.

The fallibility of file servers is often forgotten. CitectSCADA supports redundant file locations, so that even if your file server fails, your SCADA system will continue unaffected. The redundancy features of CitectSCADA are integrated and easy to configure. In fact, LAN redundancy requires no setup, and task redundancy setup is configured in a few seconds using a simple wizard.

Impressively, all the redundancy features of CitectSCADA can be used together, providing you with maximum protection. Because of CitectSCADA's task based architecture, you get an unrivalled level of SCADA redundancy. Each of the tasks in CitectSCADA, (I/O, Trends, Alarms, Reports, Display), can be shared by

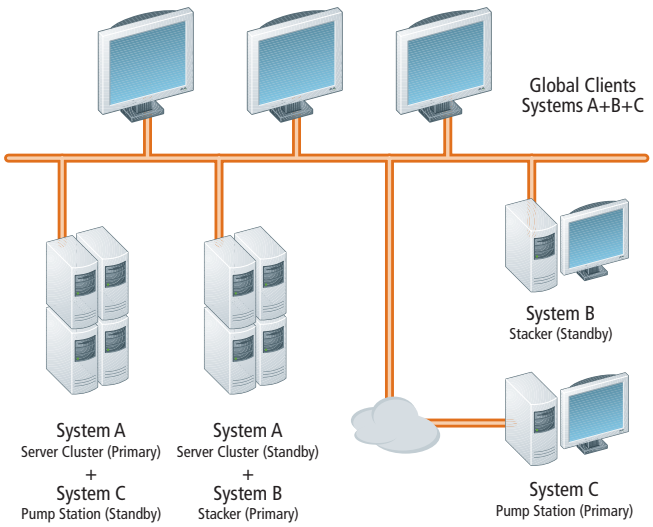


ABOVE: I/O device redundancy, data path redundancy

other computers in your system. This allows you to allocate a server task to two computers at one time; one as the primary and the other as the standby. If a primary server fails, the standby will automatically assume its role without loss of data. When the primary is absent, the clients will automatically access the standby server. When the primary server is brought back online, it will be resynchronized automatically, ensuring no gaps in your history files.

Since all tasks are different in nature, CitectSCADA offer you a separate redundancy strategy for each. If you need to upgrade or make configuration changes, you can load a new project onto the standby server. Once loaded, switch from the primary server and run the new project on the standby server. Should it not work as expected, you can switch back to the primary server without disturbing production.

BELOW: Network fault tolerance.



System Architecture: Clients

ADD FLEXIBILITY

Web Clients add flexibility and convenience to managing plant operations.

Current CitectSCADA users can now monitor the operation from any Internet/Intranet supported location.

It is economical to add access for all users (maintenance and quality assurance) because server based licensing means you only pay for concurrent users.

Applications are numerous:

- Mobile users
- Remote users
- Suppliers
- Remote plants
- Special users

Regardless of network limitations, CitectSCADA can be extended to users over the Internet.

CitectSCADA provides the flexibility to access data from anywhere via its range of client interfaces and delivery systems.

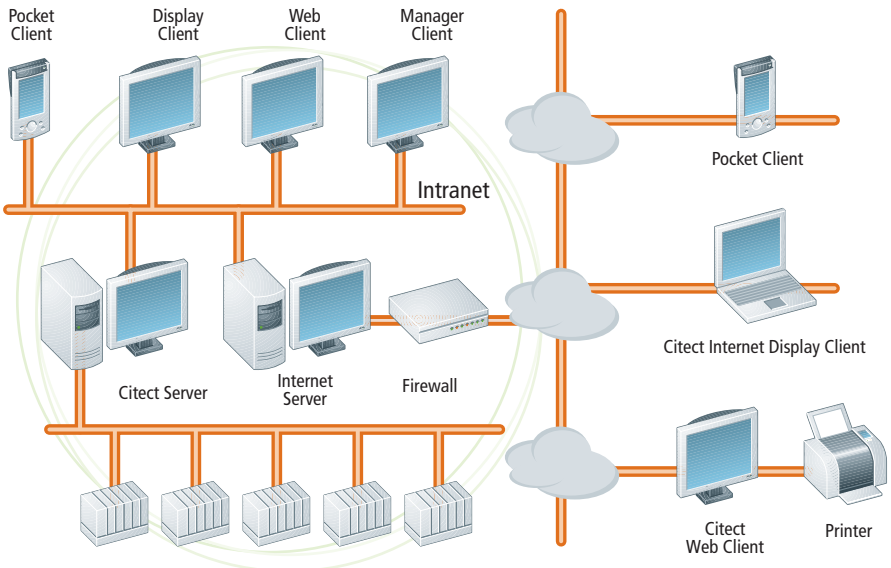
CitectSCADA provides two levels of clients. A display client has the complete functionality of the application to view any screen and read and write any variable controlled through the SCADA system. This makes the display client the perfect tool for operators. A manager client is able to view all information within the SCADA system but is unable to write to any variable or execute code to communicate with another server. This makes the manager client perfect for upper management, process optimization or causal users of the control system. Read only access is also available via a display node using project security.

CLIENTS

Both levels of CitectSCADA client can be used to display control system information. Within the control room it is typical to install the complete CitectSCADA client application onto a machine. These machines are typically dedicated to running the control system and an application interface provides the maximum viewable space for visualization and the fastest possible response. The user is able to select to have a license key located on each client or locate the license keys on the servers and have the client licenses "float" between clients.

WEB CLIENTS

CitectSCADA web clients allow the users outside the control room to access control system data in real time. The web client is a completely functional client with an identical interface to the dedicated display clients, (displayed within a web page), which requires zero maintenance. The client controls and project are downloaded from the web site and project updates will automatically be synchronized with the clients.



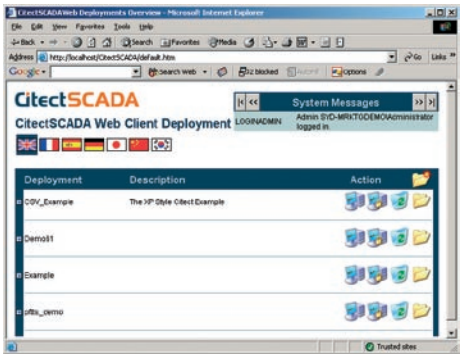
ABOVE: Typical Internet Client Architecture

SECURITY

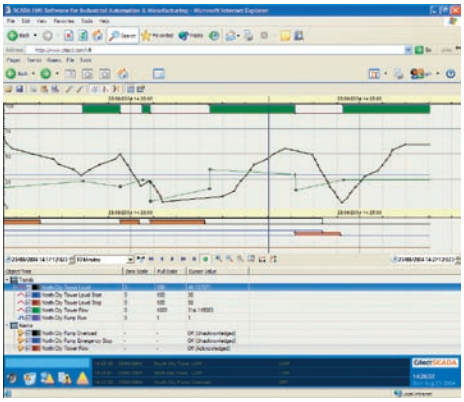
Security of web clients is controlled by the web server's advanced firewall and encrypted password protection technologies to ensure secure operation. Access to the web clients are controlled or denied based on windows user name and password, or when the number of web clients available has been exceeded. Additionally, the CitectSCADA project configuration is used requiring a local user name and password, making it secure for enterprise or remote access.

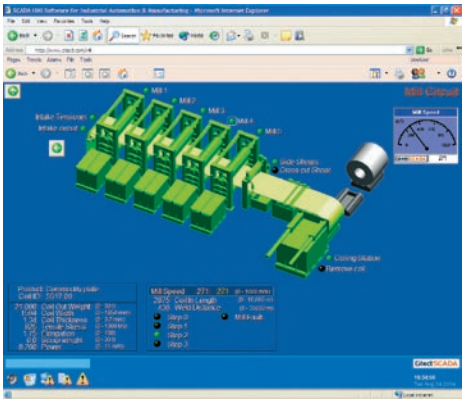
LICENSING

There is no technical restriction on the number of clients. CitectSCADA's licensing is calculated on the number of CitectSCADA clients connected to the server, not on the number of computers with CitectSCADA software installed, making it one of the most cost efficient SCADAs available.



ABOVE: Example of the Web Client Deployment page





ABOVE: Web Client in action

BENEFITS AT A GLANCE

- Full system functionality
- Impressive runtime performance
- Simple installation
- No emulation
- Zero-maintenance Web Client
- No rebuilding of graphics
- No Client Side Protection keys

For simultaneous viewing of two or three different projects, CitectSCADA supports multiple Web Clients running on the same computer.

UNLIMITED WEB MANAGER CLIENTS

Site licenses for Web Manager Clients are available making your control system visible to everyone within your organization.

Communication

CITECTSCADA DRIVER DEVELOPMENT KIT

A Driver Development Kit (DDK) is available so that you can develop your own CitectSCADA device driver. Alternatively you can modify a configurable ASCII driver, or develop a simple driver in Cicode.

See DriverWeb for more details at www.citect.com/driverweb.

Distributed Network Protocol

I/O DEVICES

CitectSCADA comes with over 140 I/O device drivers included. These allow you to connect to over 300 different models of I/O devices — PLCs, RTUs, micro controllers, loop controllers, DCS elements, weighers, bar code readers, scientific analyzers and more.

CitectSCADA gives you 100% data integrity. If the data represented on the screen isn't valid, CitectSCADA will mark it with a user definable hash or text message. Rather than display operator entered data immediately on screen, CitectSCADA can also be set to write to the I/O device first, then display the read back value.

DRIVERWEB

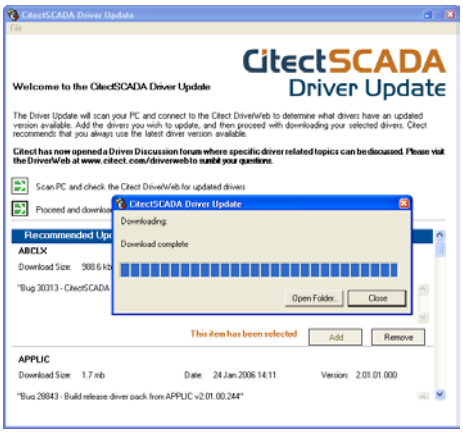
The DriverWeb is the gateway for accessing information about drivers available to CitectSCADA. For each driver you can find help documents, the latest versions of the Driver Pack and information about possible connection methods. The DriverWeb should answer most of your driver related questions, with search facilities by manufacturer, device and driver (www.citect.com/driverweb).

ABOVE: DriverWeb in action.

DRIVER UPDATE UTILITY

The Driver Update Utility is available to all users with a MyCitect account and makes it very easy to keep the CitectSCADA drivers used in specific projects up-to-date. The utility works very much like the "Windows Update" feature available in Windows XP. The Driver Update utility will scan any selected CitectSCADA installation on your PC or network and compare the installed CitectSCADA drivers with the ones available on the Citect DriverWeb, using a secure 128-bit connection. You can then select the updated drivers listed in the utility and download them to a specified directory on your PC or network. When the selected drivers are downloaded you can select which drivers and where you want to install them.

To download the latest version of the Driver Update Utility please visit www.citect.com/driverweb.



ABOVE: Keep your drivers up-to-date.

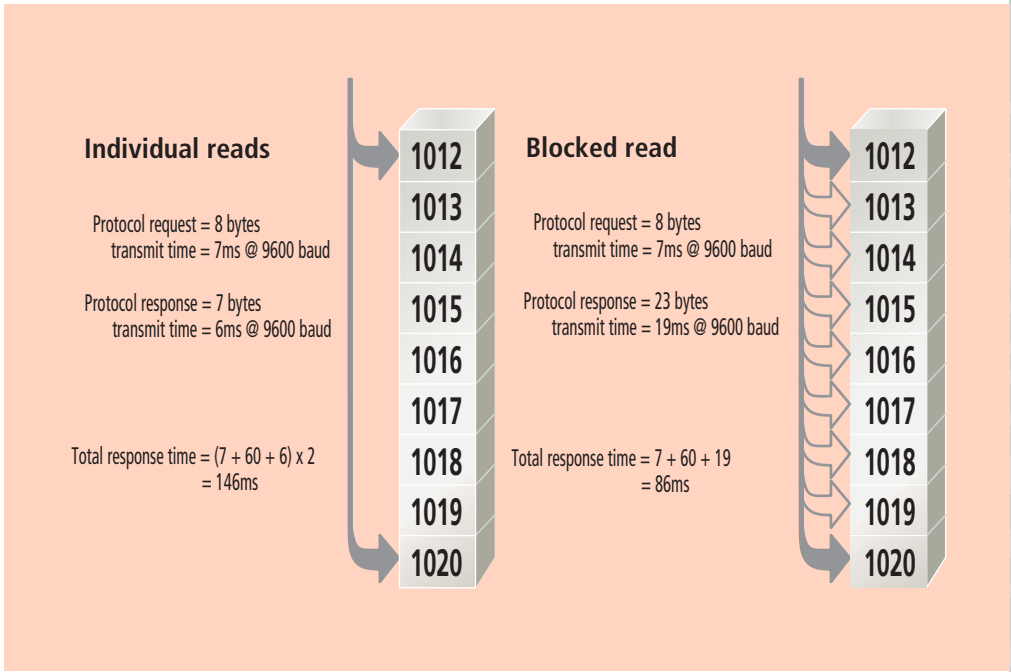
Communication: Performance

Each type of I/O device uses a unique protocol to communicate with higher level equipment such as CitectSCADA. The speed with which data can be transferred depends on, and is limited by, the I/O device and the protocol design. The limitation comes from the fact that I/O devices do not respond immediately to requests for data, and many protocols are inefficient. The following strategies allow CitectSCADA to maximize data transfer.

CitectSCADA's communication is demand based — reading only those points which are requested by the clients. More importantly, the I/O server rationalizes requests from clients, for example, combining them into one request where possible. This reduces needless communication, giving screen update times up to eight times faster (than without).

Only a restricted volume of data can be returned in one request. If all requested data is grouped together, then fewer requests are required, and the response is faster. But what happens when two required registers are separated? CitectSCADA uses a blocking constant to calculate whether it is quicker to read them separately, or in the same 'block'. By compiling a list of the registers that must be read in one scan, CitectSCADA automatically calculates the most efficient way of reading the data.

The client-server processing of CitectSCADA allows further performance increases, through the use of a cache on the I/O server. When an I/O server reads registers, their values are retained in its memory for a user defined period (typically 300ms). If a client requests data that is stored in the cache, the data is provided without the register being re-read. In a typical two client system, this will occur 30% of the time. The potential performance increase is therefore 30%. CitectSCADA also uses read ahead caching, updating the cache if it gets accessed — predicting that the same information will be requested again!



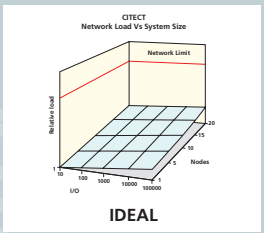
BLOCKING EXAMPLE: Citect requires registers 1012 and 1020. The I/O device has a read overhead of 60ms — which is independent of the number of registers read.

FINE TUNE YOUR PARAMETERS

The CitectSCADA developers optimize every driver that they write. Some systems, however, have varying constraints. CitectSCADA has an in-built performance monitor, allowing you to analyze your drivers. If required, each driver has a number of parameters that you can adjust, to perfectly tune your driver — under the guidance of the online help.

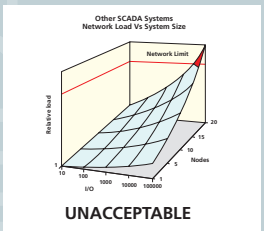
RELIABLE PERFORMANCE

CitectSCADA's distributed processing and network optimization give you excellent network performance, even when you have over 450,000 I/O and 60 CitectSCADA computer stations:



IDEAL

Without CitectSCADA's network optimization you can expect network load to increase dramatically, 'choking' as you add more I/O and computer stations:



UNACCEPTABLE

Communication: RTUs

PSTN MONITORING

CitectSCADA's Remote Device Monitoring supports scheduled Dial-Out and unsolicited Dial-In, making it easy and economical for CitectSCADA to monitor devices and sites over the Public Switched Telephone Network.

This feature has been employed in a wide range of applications:

- Cellular Networks
- Rail Systems
- Water Supply
- Power Transmission and Distribution
- Pipelines

Using standard wide area communication technologies, CitectSCADA provides an effective method to communicate with remote telemetry units (RTU) for a fraction of traditional operating costs.

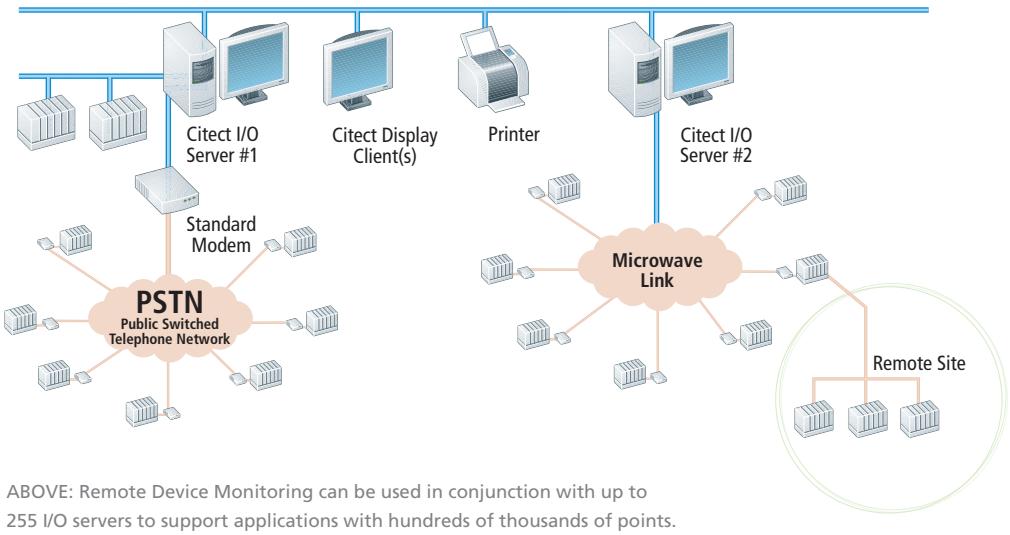
CitectSCADA can schedule connections to RTUs (for example, via modems or microwave links). To minimize data communication costs, CitectSCADA can call up the I/O device as per the user defined schedule, or when needed to exchange data, and automatically disconnect.

By working with most serial protocols provided with CitectSCADA, Remote I/O device monitoring provides the user with flexibility in selecting a wide range of PLCs or RTUs.

BUILT-IN MANAGEMENT

CitectSCADA's comprehensive features for managing remote devices are built-in:

- Easy-to-use Express Communications Wizard.
- A single modem can be used to communicate with multiple I/O devices.
- CitectSCADA can use a modem pool to simultaneously connect to multiple devices.
- Dial-In feature for remote devices. If remote alarms occur outside of scheduled dial-out times, the devices can dial-in to CitectSCADA and transfer the alarm information.
- Dial-Out I/O has full redundancy support. If the primary server fails, the standby server will dial the remote devices. The non-volatile data cache is replicated automatically between servers, so the latest data is always maintained on the standby and is available to the primary on restart. CitectSCADA keeps a local record of the last values read from each device.
- If CitectSCADA cannot connect to the remote device after user defined number of retries, that I/O device will be flagged as off-line and the values marked accordingly.
- Each modem can be configured to define its purpose Dial-Out, Dial-In, or both, and it can be dedicated for CitectSCADA only if desired.
- CitectSCADA supports connection to devices which communicate using different data frames.



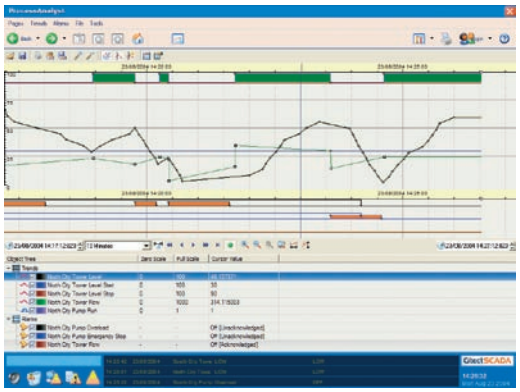
ABOVE: Remote Device Monitoring can be used in conjunction with up to 255 I/O servers to support applications with hundreds of thousands of points.

EASY TO CONFIGURE AND USE

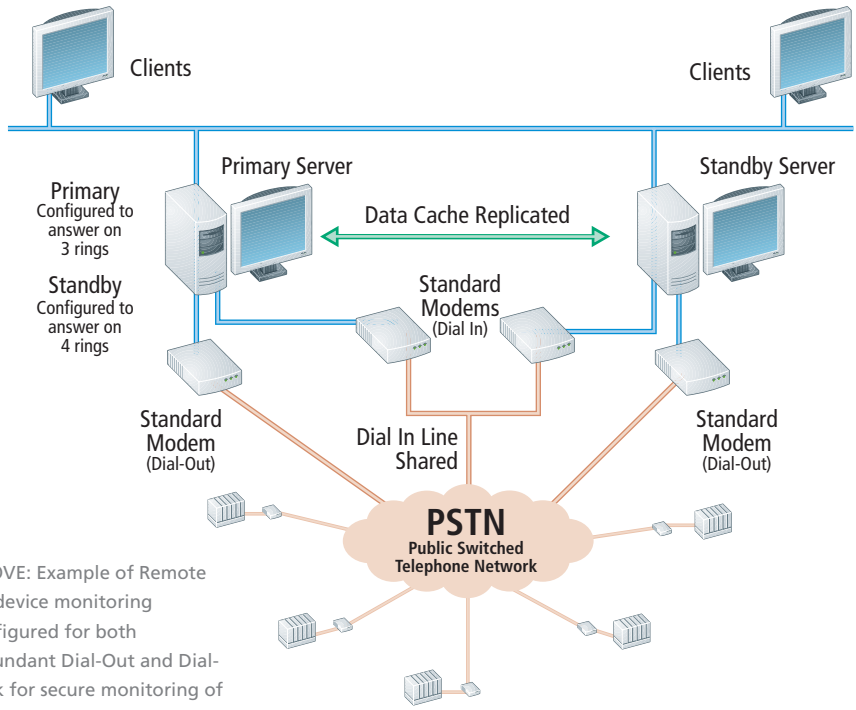
Based on a user-selected schedule, CitectSCADA's Remote I/O device monitoring feature can automatically connect to remote devices to retrieve data. Conversely it can accept unsolicited connections and data uploads from remote devices. Remote I/O device monitoring is more than a remote monitoring feature, it can also be used to implement Cicode functions on connection or disconnection.

The Express Communications Wizard includes telephone number and call schedule fields. Set it up and let CitectSCADA look after the call schedules, data transfers and disconnections. It's automatic!

Implementing the Dial-In feature requires a remote device or modem that is capable of sending an identification string (ID string). CitectSCADA uses the ID string to identify the remote caller along with the appropriate communications protocol. If the device cannot support ID string (for example, the serial port may be limited to a native protocol), industrial modems produced by Sixnet and others can provide a suitable interface.



ABOVE: CitectSCADA accurately represents time-stamped data in the Process Analyst



ABOVE: Example of Remote I/O device monitoring configured for both redundant Dial-Out and Dial-Back for secure monitoring of remote sites and devices.

BENEFITS AT A GLANCE

- Economical solution for monitoring remote trend, alarm, and tag information
- Easy to configure
- Dial-in for alarms
- Full redundancy support

TIME-STAMPED DATA

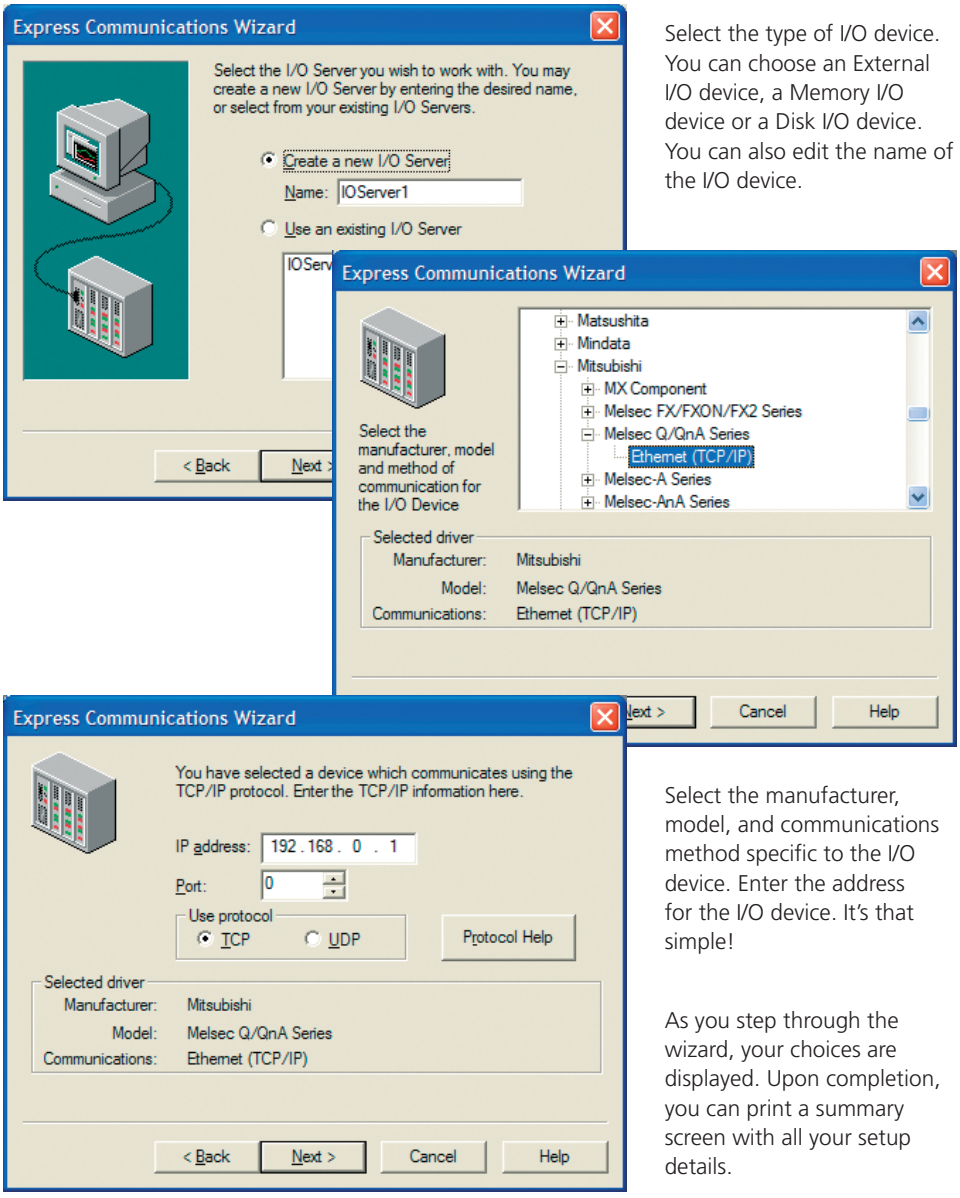
CitectSCADA enables time-stamped data from RTU event logs to be easily uploaded and back-filled into historical records. Any alarms configured for this data will trigger new alarms based on the original time-stamp.

Communication: Wizard

The Express Communications Wizard configures your I/O devices quickly and easily, getting your system up and running in less than 60 seconds.

All communication protocols are included with your CitectSCADA package.

CitectSCADA's I/O device Communication wizard will have you communicating in less than 60 seconds.



Select the type of I/O device. You can choose an External I/O device, a Memory I/O device or a Disk I/O device. You can also edit the name of the I/O device.

Select the manufacturer, model, and communications method specific to the I/O device. Enter the address for the I/O device. It's that simple!

As you step through the wizard, your choices are displayed. Upon completion, you can print a summary screen with all your setup details.

CitectSCADA allows you to develop and test your project without the need to physically connect to the I/O device. Simply define the I/O device as Memory I/O (which is volatile) or Disk I/O (which is non volatile) and CitectSCADA will behave as if it was communicating to a real I/O device. You can specify any protocol and CitectSCADA will use that device driver to communicate, ensuring a very thorough test.

Communication: Synchronization

By linking tags directly with PLC programming software, CitectSCADA makes it easier to configure and maintain your system. Drivers for several popular programming packages are included with CitectSCADA and others can be created.

CITECTSCADA FASTLINX

CitectSCADA FastLinx links your database in CitectSCADA to the PLC programming software giving you a single database solution. This reduces the development time significantly and eliminates the chance of configuration errors occurring during project maintenance and development. The bidirectional linking feature ensures that changes made in any development environment are updated automatically when projects are worked on simultaneously. When CitectSCADA and PLC projects are worked on separately, the Import and Export feature is an invaluable tool ensuring that both environments are maintained and kept up-to-date. Regardless of whether you develop your CitectSCADA and PLC project simultaneously or separately, CitectSCADA FastLinx ensures that all variable tags are maintained and updated automatically.

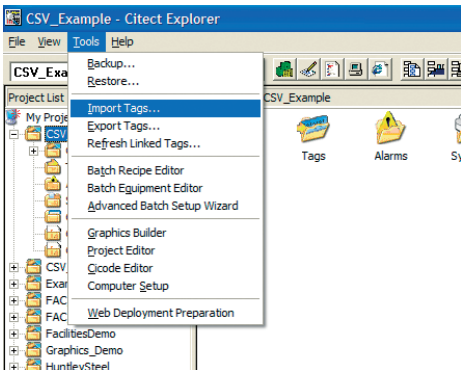
TAG IMPORT/EXPORT

The Tag Import/export feature saves valuable configuration time because a group of tag definitions can be imported in one simple operation. Equally important is the elimination of typographical errors associated with transferring tag definitions. It is quick, convenient and accurate!

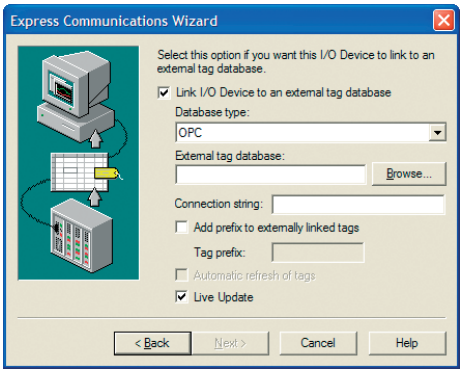
AUTOMATIC TAG SYNCHRONIZATION

The Automatic Tag Synchronization feature ensures that changes made to controller tag definitions at the PLC level are automatically updated in CitectSCADA. By permanently linking CitectSCADA tags to the PLC programming software, changes made at the controller are automatically updated in CitectSCADA.

To protect data integrity, the synchronization process is triggered on actions in CitectSCADA — such as "Insert Tag". These triggers cause CitectSCADA to check the controllers to see if changes have been made, and if needed, will update CitectSCADA's tag database.



ABOVE: The import tags utility is accessed from the Tools menu in the CitectSCADA Explorer



To prevent changes being made in CitectSCADA and then overwritten on the next update, tags that are automatically refreshed have several fields set to read-only. For example, data fields are set to read-only while other fields, such as engineering units and display formats, are defined in CitectSCADA. By modifying the ASCII format file for each tag import driver, users can define which fields are read-only.

SUPPORTED PLC PROGRAMMING SOFTWARE

Variable Tag linking is currently available for OPC Servers, CSV files, Mitsubishi MXChange, Schneider Unity Pro and Concept, Beckhoff Twincat, Omron PMF and Rockwell RS Logix.

Configuration: Security

Citect recommends addressing security at all levels within your control system. While the components themselves need to be sucured, your control system infranstucture, and in particular your network, needs to be secured from attack. In the past, SCADA networks were separate from other networks and physical penetration of the system was needed to perpetuate an attack. As corporate networks became electronically linked via the Internet or wireless technology, physical access was no longer necessary for a cyber attack. One solution is to isolate the SCADA network; however, this is not a practical solution in a world where control systems are being controlled more directly by the business system or where the data required for that control and monitoring is coming form increasingly remote data sources such as remote terminal units (RTU).

To aid in the development of strict control system security, Citect has produced a white paper available at www.citect.com/security. In this document we detail the design considerations that you require in order to keep your control system secure as a whole rather than focusing on each specific part. The core elements covered within this document are.

- Keep your network design simple (reducing contact points)
- Use firewalls to protect each part of your system and in particular wherever your system passes outside your control (wireless or radio communications)
- Utilize the power available of VPNs to enable users anywhere within the world to access your control system securely
- Use IPsec to ensure that only the right devices are connected to the network

While there are core elements of security that are required for every network additional security is required for wireless networks. The two most common ways of gaining unauthorized access to a wireless network are by using an unauthorized wireless client, such as a laptop or PDA, or by creating a clone of a wireless access point. If no measures have been taken to secure the wireless network then either of these methods can provide full access to the wireless network.

When implementing a wireless network a couple of standard security measures can be taken to minimize the chance of an attacker gaining access to the wireless network:

- Utilize the ability to restrict MAC addresses
- Require WEP protols to be available
- VPNs for the wireless clients

Within a secure network, CitectSCADA configuration can be undertaken by any user from within the business. For these users Windows integrated security provides a simple and secure method of control over project configuration. Each project is able to be secured to be only accessible to a subset of users. For larger projects, this enables access for different users to different parts of the process or security. For an OEM style customer, this enables them to secure a sub component within a project to ensure included projects can not be changed while the OEM is not present. Utilizing Windows security also ensures that regardless of the editor used for configuring your projects, they are always secure.

Most applications have special operations that only qualified people should perform. Your system must provide some form of security to prevent accidental or deliberate tampering to protect personnel and your investment. CitectSCADA's comprehensive security features are integrated into all interface elements, ensuring a secure runtime system.

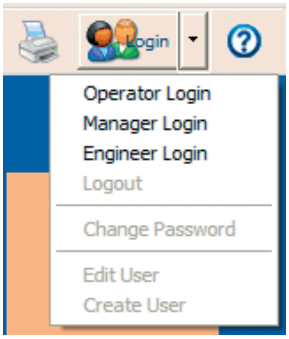
CitectSCADA's security system is user based, allowing you to define individual or group security details for the runtime system. Any user can be assigned a security login, forcing them to enter their user name and password to gain access to parts of the runtime system.

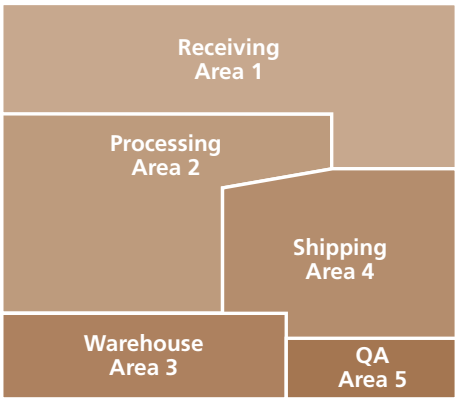
There is no limit to the number of users (or groups) that you can have configured in your system — you can even add and delete new ones during runtime.

Access is controlled by granting users the ability to view different areas of your system. If able to view an area, the user may also need to have the correct privilege level to perform actions, or view objects. For each graphical object, page, trend, and report, you can define the area to which it belongs, and what privilege levels are required to make it visible or usable. Since users can use any CitectSCADA computer, access is granted/denied by the server, not by the client — giving added security for WAN applications.

In most applications, the operator should not be allowed to exit CitectSCADA. You can secure the CitectSCADA runtime environment itself, by stopping users from swapping to the Windows operating system or other Windows programs.

CitectSCADA manager clients are a cost effective way to provide view only access, with the additional protection of a hardware security lock that can reside on the CitectSCADA server. Manager clients can be shared amongst many users anywhere on the network. Simply allow enough manager client licenses to satisfy the maximum number of users logged in at any one time.





Operator 1:
Viewable Areas: 1, 3, 5
Global Privileges: 3, 5
Additional Privileges in Areas: 1, 2, 4

Operator 2:
Viewable Areas: 1, 3
Global Privileges: 3, 5
Additional Privileges in Areas: 1, 4

Supervisor:
Viewable Areas: Plantwide
Global Privileges: 1, 2, 3, 4, 5
Additional Privileges in Area: 1

To stop unknown people tampering with your plant when the operator station is unmanned, you can have CitectSCADA automatically log people out of the system (for example, if the mouse is idle for 5 minutes). Without an appropriate password, no unauthorized users can access the system.

Support for read only projects allows you to secure your CitectSCADA configuration from unauthorized changes. CIPs and OEMs can deploy a project safe in the knowledge it can't be changed.

Cicode commands are protected in the Kernel, preventing unauthorized access. A user is required to log into the Kernel before Cicode commands will execute in the Kernel window, regardless of whether they are logged into CitectSCADA.

CitectSCADA Graphics

SHOW DIFFERENT STATES

Graphics allow you to create a realistic, intuitive operator interface. For example, you could configure a tank that can be…

filled,

heated,

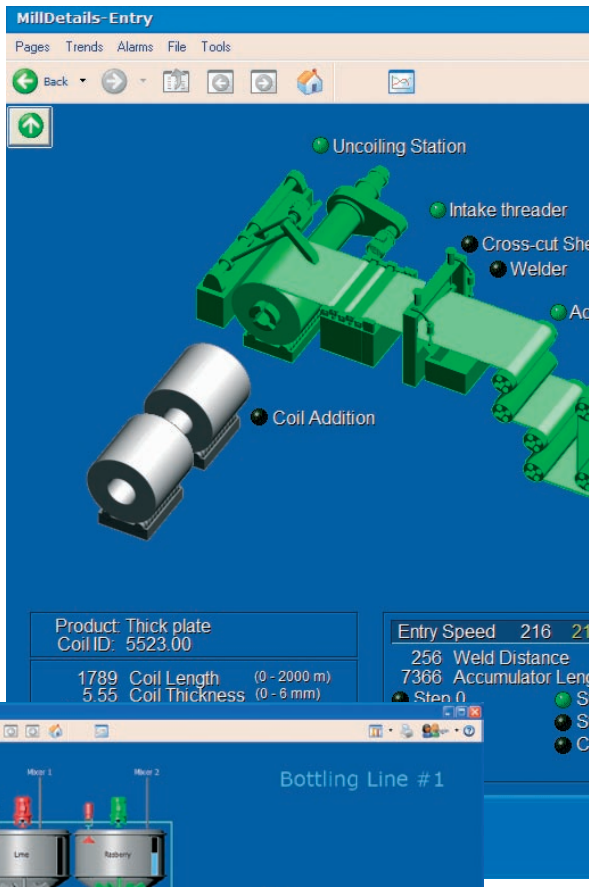
or rotated.

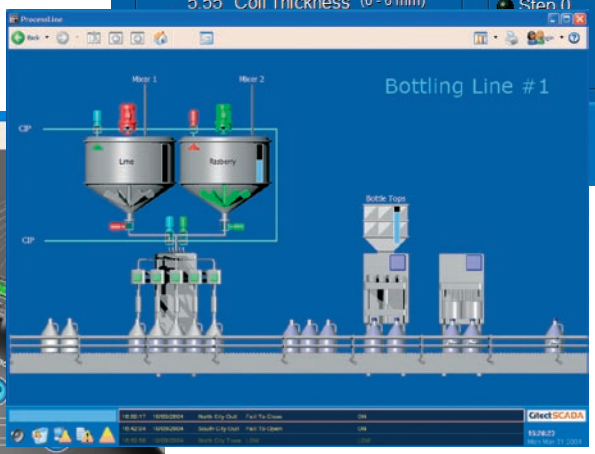
Just by using graphics, you will find yourself developing new ideas for your interface.

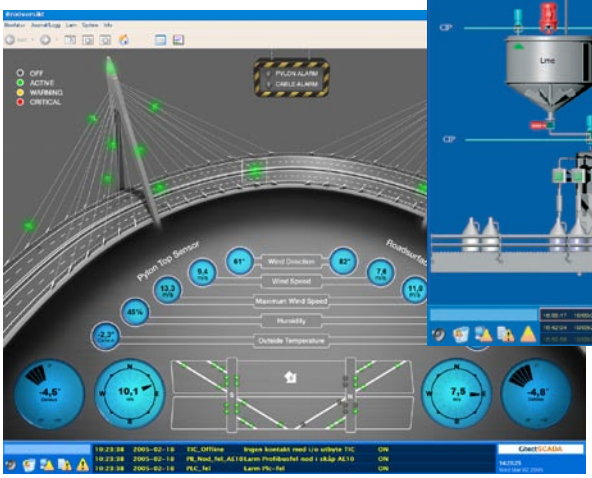
The graphics capabilities of your SCADA system are a critical factor in the overall usability. The graphics of CitectSCADA allow you to quickly develop true color, easy-to-use graphics that provide the operator with an intuitive, consistent user interface.

CitectSCADA's graphics are based on a simple set of objects, namely rectangles, ellipses, bitmaps, straight lines, freelines, polylines, text, symbols, and pipes. Associated with all these objects is a common set of object properties. These properties allow an object's behavior to be directly linked to your plant variables. The movement, rotation, size, color, fill and visibility of any object can be used to realistically mimic plant floor conditions, and commands and touch properties can be assigned so that the object can accept a variety of operator inputs.

This approach quickly delivers impressive results — for even the most demanding applications. All objects are interactive, so your operator interface will be simple, intuitive, and flexible, and because graphics were developed with optimization in mind, you can expect excellent runtime performance.



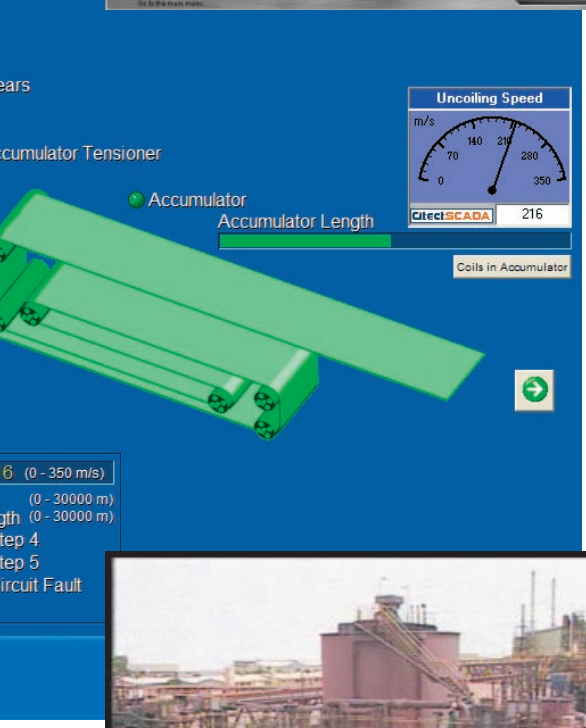




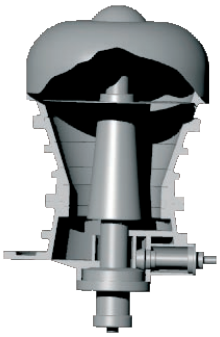
CitectSCADA utilizes screen resolutions up to 4096x4096, which you can choose to suit the application. With these resolution capabilities, you can even use high quality images (scanned photos, etc.) to provide instant recognition of plant equipment.

BENEFITS AT A GLANCE

- Complete flexibility
- Intuitive graphics reduce operator error
- Minimum operator keystrokes
- Increase learnability through clarity
- Blend control and display functionality into one object
- Efficient use of screen space



CitectSCADA comes with rich Symbol Libraries, loaded with commonly used graphics — like pumps, tanks, valves, and motors. These graphics will instantly add consistency and functionality to your screens.



ActiveX objects can be used to add custom features onto your CitectSCADA graphic.

Graphics Builder

GRAPHICS IMPORT

CitectSCADA can import a wide variety of different file types including:

- Windows Bitmap (BMP, RLE, DIB)
- AutoCAD (DXF) — both 2D and binary
- Windows Meta File (WMF)
- Tagged Image Format (TIF)
- JPEG (JPG, JIF, JFF, JGE)
- Encapsulated Postscript (EPS)
- Fax Image (FAX)
- Ventura (IMG)
- Photo CD (PCD)
- Paintbrush (PCX)
- Portable Network Graphic (PNG)
- Targa (TGA)
- WordPerfect (WPG)
- ActiveX objects

So if the picture you want is already drawn, just import it!

The import process is simple. If the source application supports click and drag, then do just that: click on the file, and drag and drop it onto a page in the Graphics Builder. Once the object has been imported, CitectSCADA sees it as a Graphics object, with all of the associated configuration features and flexibility.

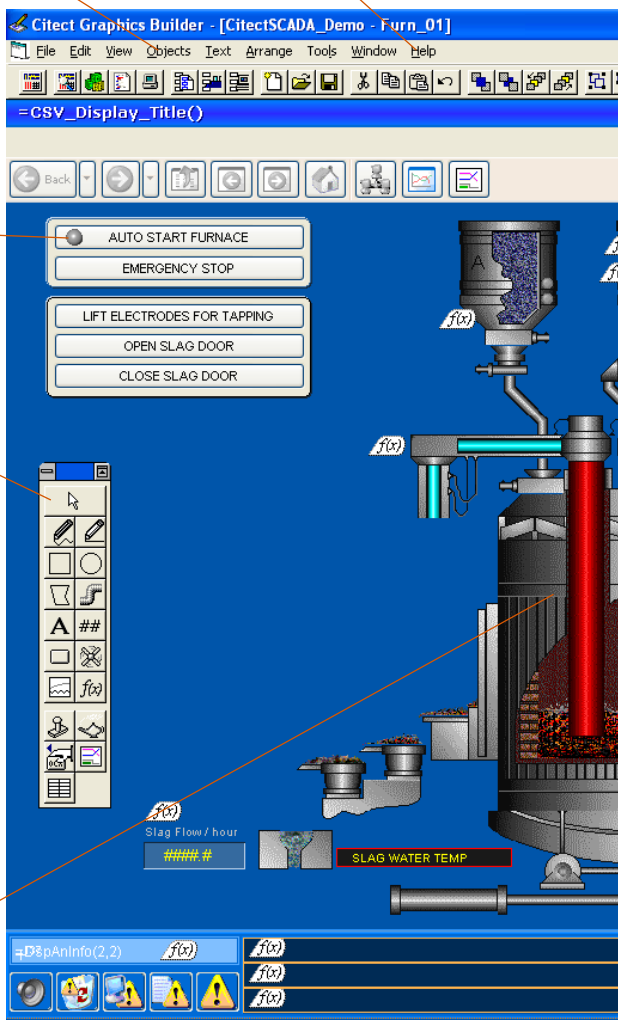
The Graphics Builder allows you to quickly and easily design an intuitive operator interface for your CitectSCADA system. Drawing the graphical elements of your graphics pages couldn't be simpler — just select a tool, then click and drag. Once drawn, objects can be moved, reshaped, copied, pasted, aligned, grouped, rotated…

Because objects can be placed precisely using guidelines or the grid, your graphics pages will look professional and precise.

Objects can be locked onto a page so they cannot be accidentally moved or deleted.

Objects can also be rotated, mirrored, grouped, ungrouped, aligned, etc.

Select the Graphics Builder Help to learn more about the Graphics Builder, using the interactive click-and-learn facility.



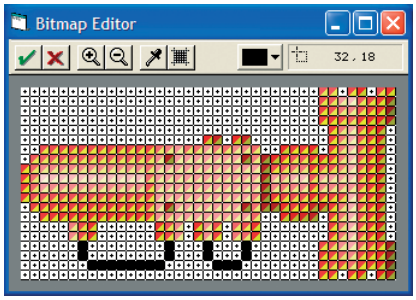
Windows XP-style buttons are available for those users who are familiar with Windows XP environment.

The Toolbox has the drawing tools that you use to draw your graphics objects.

All the graphics tools have their own tool tips and each is fully explained in the Online Help.

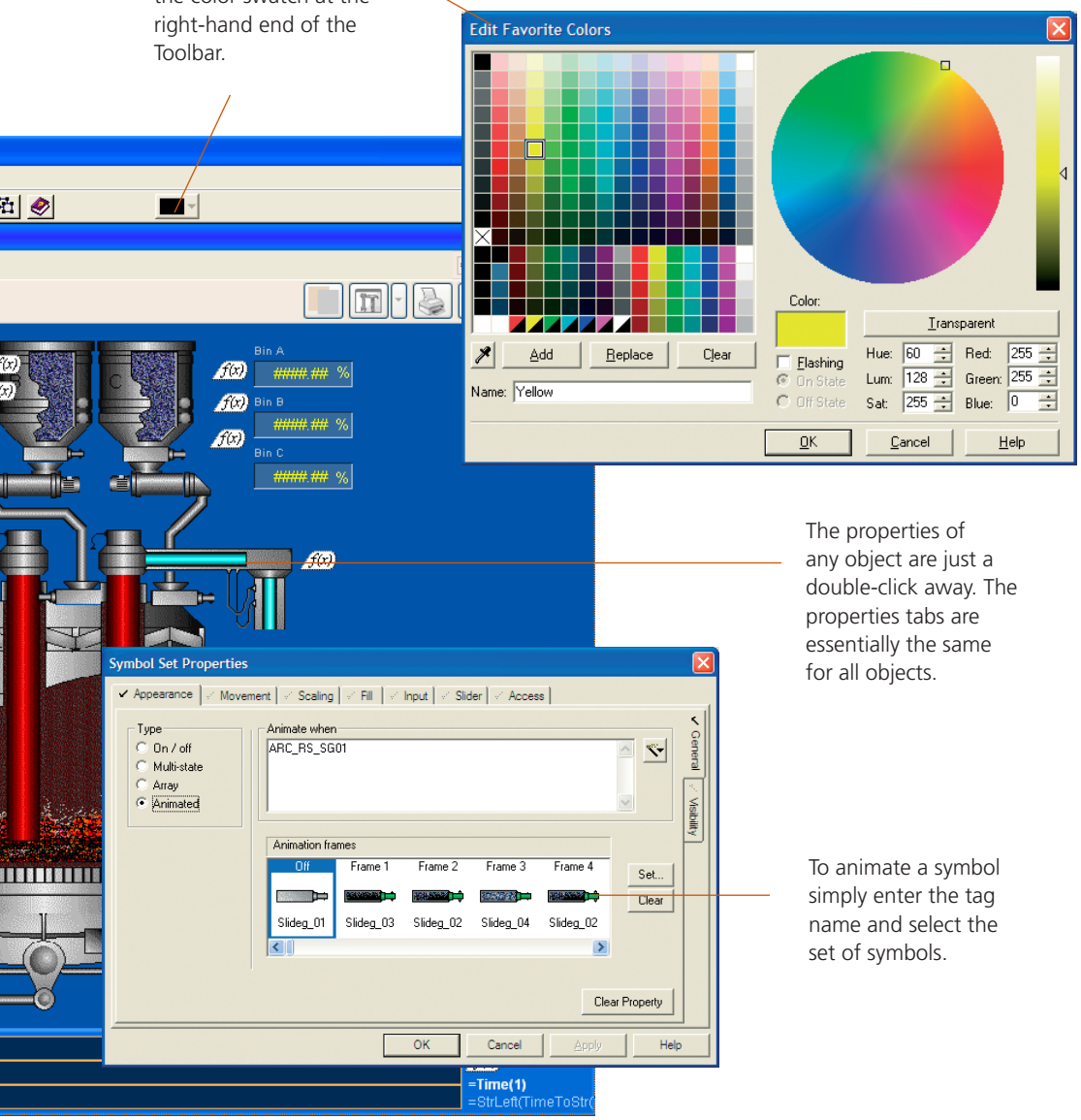
The Toolbox can be moved to any part of your screen, allowing you to take full advantage of the entire drawing area. If the Toolbox is to go unused for a short period of time, you can "roll" it up (so that only its title bar displays), or hide it altogether.

Nodes of lines, polylines and pipes can be moved, added or deleted.



CitectSCADA enables any number of flashing colors on a single page allowing users to display flashing 3D symbols.

To display the true color palette, click on the color swatch at the right-hand end of the Toolbar.



The properties of any object are just a double-click away. The properties tabs are essentially the same for all objects.

To animate a symbol simply enter the tag name and select the set of symbols.

COLOR SWAPPING

The colors in a graphics object can be changed automatically. This is particularly useful for 3D object manipulation. For example, a 3D green ball can be made blue at the press of a button, and the quality and illusion of depth remain the same.

BITMAP EDITOR

Any graphics object (or group of objects) can be converted into a bitmap in one simple step.

Bitmaps are edited using the Bitmap Editor. The Bitmap Editor is a tool that allows you to edit your bitmap pixel by pixel. Because you can zoom in and out, even the smallest details can be edited precisely. You can even change the size of the bitmap.

OLE AUTOMATION

Graphics can be automatically generated from a database using the OLE Automation interface for the Graphics Editor.

GRADIENT FILL

Gradient color and direction for objects including ellipses, rectangles and polygons can be defined with the gradient fill feature.

Page Templates

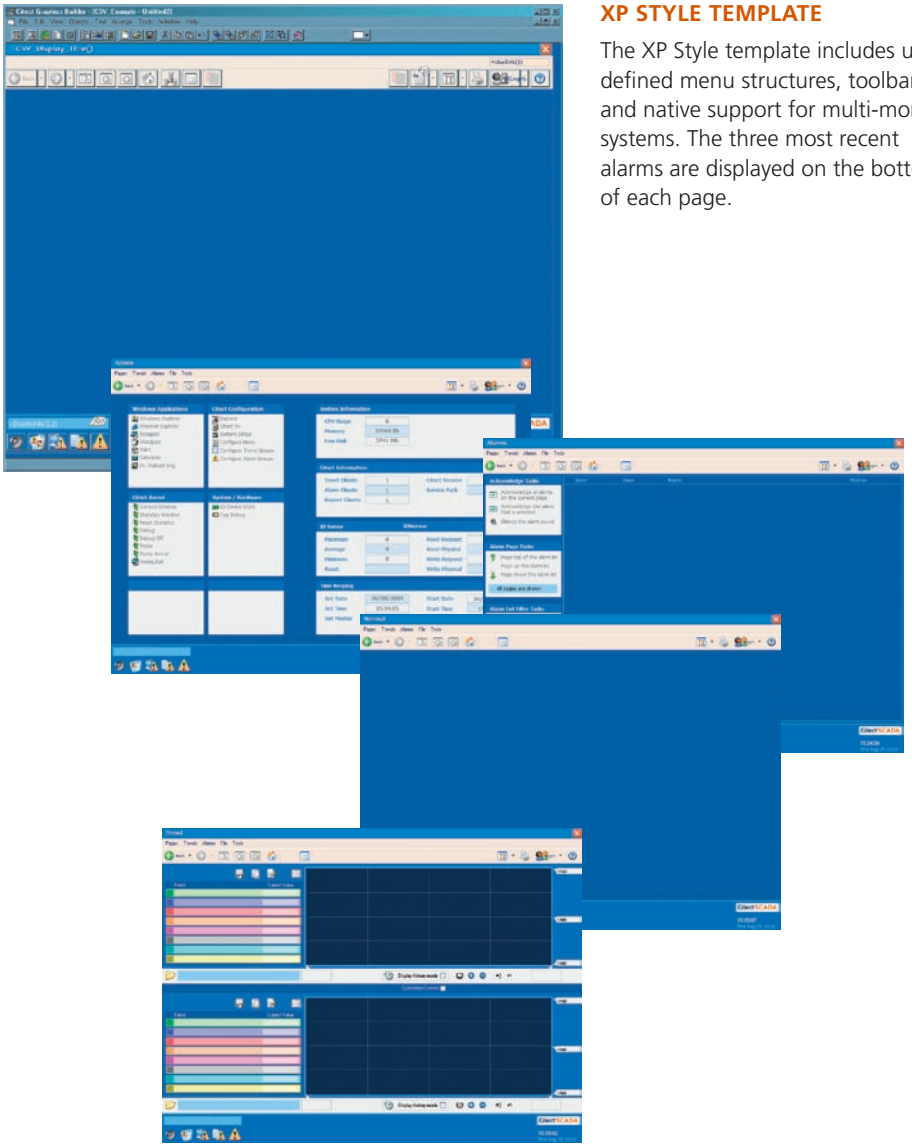
Page templates save you time and effort because you don't have to draw each page from scratch. When you base a new page on a template, the page design is already complete. All you have to do is enter the information that is unique to the new page.

Templates are also useful when you need to make the same modification to a group of pages. If all the pages are based on the same template, you can just change the template. The pages will be updated automatically.

If you take advantage of CitectSCADA's page templates, you will notice your project developing a consistent look and feel. Consistency reduces both operator learning times and operator error.

CitectSCADA provides templates for all common page types, so graphics pages are easy to create. Templates are tried and tested page designs that you can adapt to your own environment.

CitectSCADA provides a comprehensive selection of templates. Specialty pages, such as Alarm, Trend, and SPC displays, come pre-built — all you have to do is add the relevant tag names, etc. More unique pages can be based on generic templates, such as the Normal template. No matter what template you use, the basic elements including borders, status bars and navigation tools, are already configured.



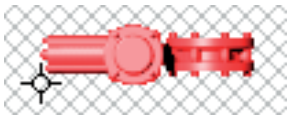
XP STYLE TEMPLATE

The XP Style template includes user defined menu structures, toolbars and native support for multi-monitor systems. The three most recent alarms are displayed on the bottom of each page.

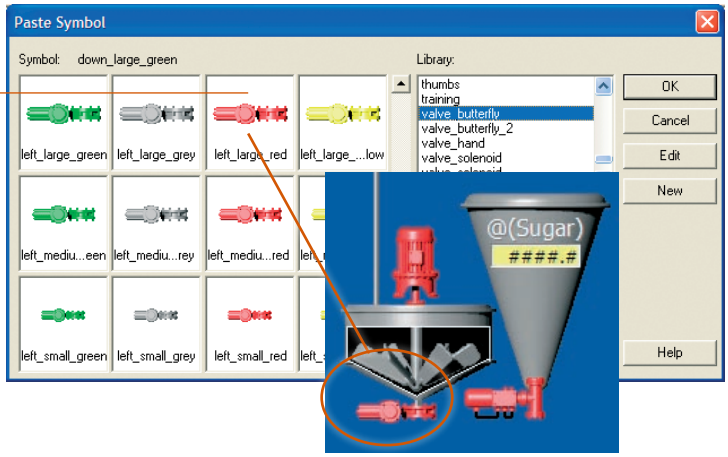
Symbols

If you use a particular graphic regularly, you can store it in a library as a symbol. Rather than constantly redrawing the graphic, you can then just paste the symbol from the library.

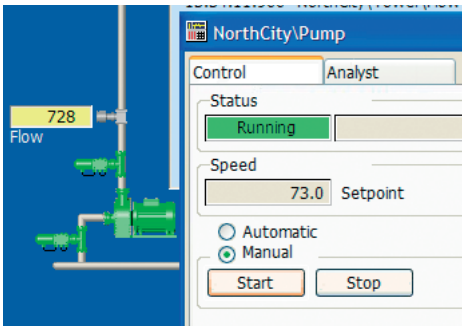
For example, if you need the same valve graphic on multiple pages as a static background picture, draw the valve, and copy it to the symbol library — it is now a symbol.

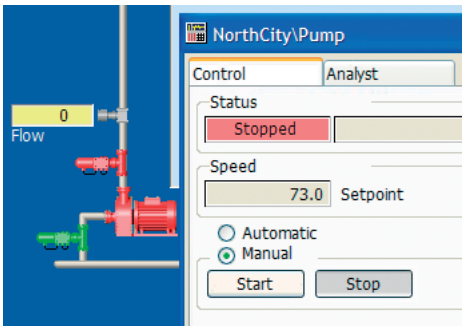


First check the standard symbol library shipped with CitectSCADA. If the symbol exists then simply paste it onto the page. If not, draw the required symbol directly into the symbol library.



Symbols can change dynamically based on the state of a device. For example, you could assign two pump symbols to a device, a green one for running and a red for stopped.





CitectSCADA comes with several pre-defined symbol libraries, and more libraries are available from the CitectSCADA toolbox and website. Also supplied standard with CitectSCADA are a range of pre-defined symbol sets which can be used as real animations. When the individual symbols in the set are displayed in quick succession, a simple animation is formed. Animations can be used at runtime to indicate moving equipment, active processes, etc.

AT A GLANCE...

- Pre-defined and Custom libraries
- Ongoing library development
- Changes to library updated automatically on all pages
- Over 500 symbols included

SYMBOLS HAVE MANY BENEFITS

You only need to draw an object once. You can then save it to a library (as a symbol), and use the symbol many times on any of your graphics pages.

When you change a symbol, all occurrences of the symbol are updated automatically on all pages. A symbol remains linked to its library unless you deliberately cut the link.

By storing common objects in a library, you reduce the amount of disk space required to store your project, and reduce the amount of memory required by the runtime system.

Object-based Configuration

TYPICAL EXAMPLES OF GENIES INCLUDE:

- Pumps
- Valves
- Values (with input)
- Tanks
- Conveyors
- Faceplates (on graphics screens)
- Any repeated configuration

TYPICAL EXAMPLES OF SUPER GENIES INCLUDE:

- Device Popups
- Loop Control
- Sequence Control
- Duty/Standby
- PLC/RTW Status
- Identical Machine Control
- Any repeated popup or page

SCADA systems comprise objects or devices which range from simple pushbuttons through pumps and valves to complex loop controllers, sequencers or motor control centers. When building your control system you should use a common standard for the operator interface.

CitectSCADA enables you to quickly and easily develop your control system by providing object-based configuration tools for development. In addition, the use of object-based configuration reduces maintenance and ensures a consistent operator interaction. CitectSCADA provides existing libraries that can be extended and customized or enhanced to suit the requirements for your project, or you can simply build your own.

These tools are optimized by the use of a tagging standard within the device tags. A good tag naming convention reduces the amount of configuration entry and hence lowers the risk of errors.

Both internal and user defined libraries are able to be easily transferred between projects to leverage development or maintain a consistent corporate standard. In all cases modifications made to enhance these libraries can be seamlessly retrofitted within the previous CitectSCADA systems.

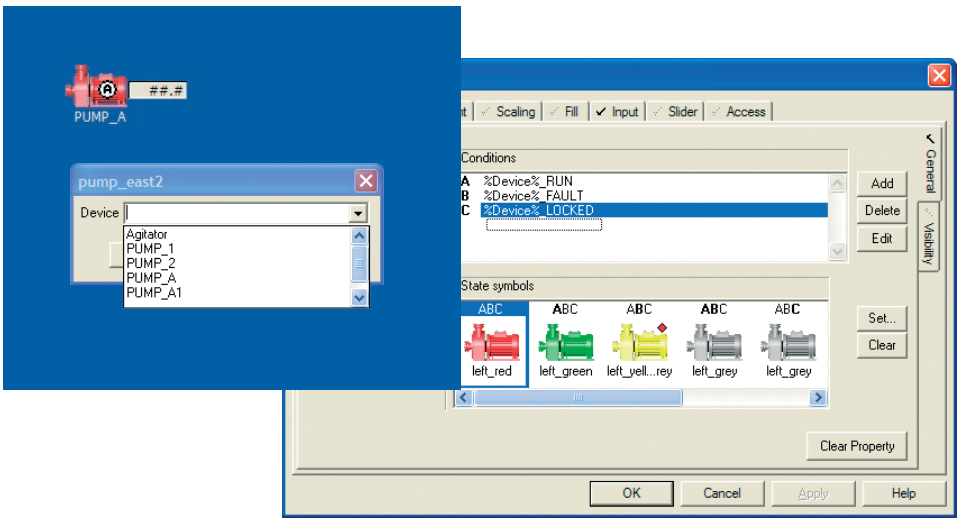
GENIES

CitectSCADA Genies act as a macro within project development. The Genie is built to combine any number of individual graphics objects together. A pump may consist of the pump display plus an auto/manual indication and an alarm indication. All of these configurations are grouped together in a Genie.

The configuration is made by combining fixed text with parameters. The parameters can represent a whole field alone or be combined with other parameters or fixed text to represent the contents of a field.

Optional parameters can be provided to enable a reduction in the number of Genies resulting in reduced maintenance and testing costs. The optional parameters enable pumps without auto/manual control to hide this indication based on the fact that the auto/manual tag has not been defined.

Each parameter is exposed when the Genie is added to the graphics page. The form used to display the parameters can be tailored to include additional help information for the user or to provide a drop down list from the devices within the database.



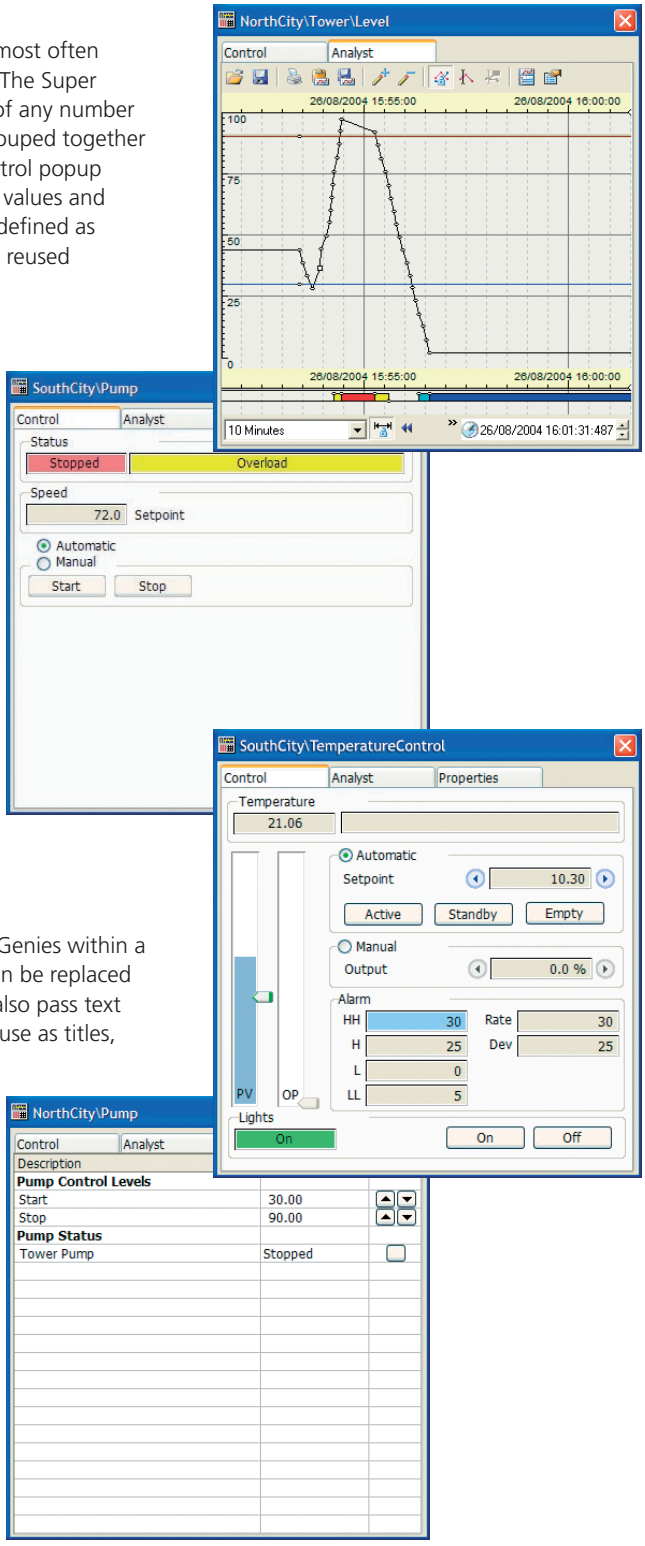
SUPER GENIES

CitectSCADA Super Genies are most often used for device control popups. The Super Genie is built as a combination of any number of individual graphics objects grouped together on a page or popup. A loop control popup may have trend sliders, buttons, values and other configurations. These are defined as a single Super Genie and can be reused throughout the project.

To enable reuse, the configuration is made in terms of assignments (or parameters) passed to the Super Genie when it is displayed. Each parameter represents a tag, value or string. The configuration can access both the values and the attributes of the tags passed to the Super Genies.

A Super Genie can be provided a fixed set of assignments from a Genie or use a tagging convention to turn a single device name into a set of assignments. Code can also enable these parameters to be read from other sources (databases, files).

To reduce the number of Super Genies within a project, tags that do not exist can be replaced by default values. The user can also pass text strings into the Super Genie for use as titles, display information or within logging.



GENIES AND SUPER GENIES HAVE MANY BENEFITS

You only need to draw and configure an object once. You can then save it to a library and use it over and over again.

When you change a Genie or Super Genie from the library, it will be automatically changed wherever you have used it throughout your project. (A Genie remains linked to its library unless you deliberately cut the link).

As with Symbols, Genies and Super Genies save you disk space, because you only save one copy of the actual configured object. They also reduce the amount of memory required by the runtime system.

CitectSCADA has a library of pre-configured Genies and Super Genies that you can use in your CitectSCADA System.

Operator Actions

AT A GLANCE...

- Tool tips
- Sliders
- Keyboard commands
- Mouse touch commands
- Screen target regions
- Popup menus
- XP-style buttons

CitectSCADA provides users with a range of pre-defined system pages and templates to get you up and running fast. System pages are included for trends, alarms, administration tools and the Process Analyst, which are available in a variety of templates. Both system pages and custom graphics utilize a variety of user-friendly commands and controls for operators to interact with the CitectSCADA runtime. You can assign privileges to the different commands and controls as well as send a message to the command log each time an operator issues a command.

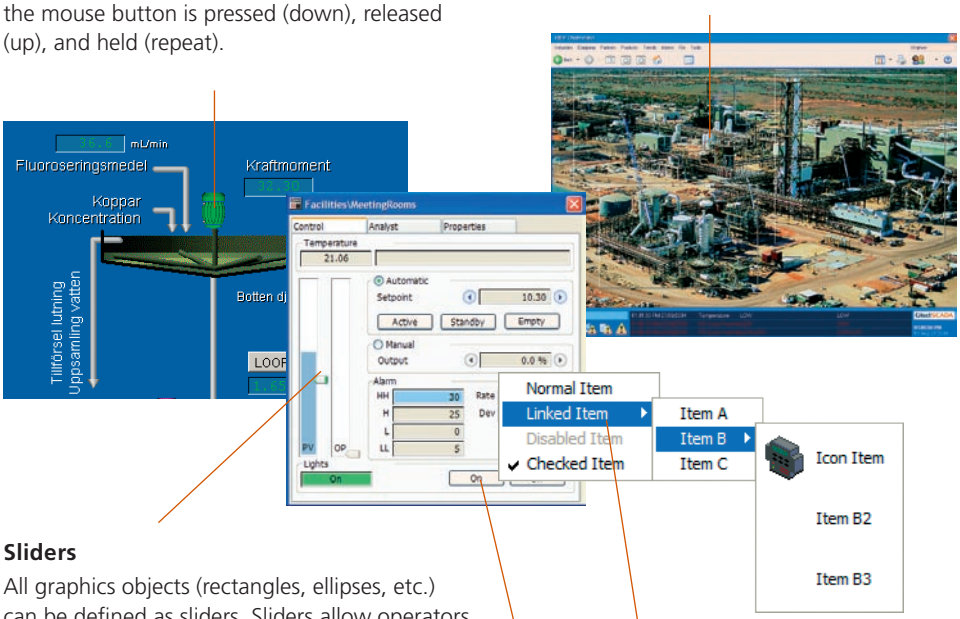
Touch Commands

Touch Commands can be assigned to any graphics object, including button objects. They are activated when the operator clicks on the object.

Separate commands can be activated when the mouse button is pressed (down), released (up), and held (repeat).

Screen Targets

Screen targets are a hot-spot region on the background screen which the operator can click on (like a button). These invisible buttons allow for greater flexibility in operator interface design.



Sliders

All graphics objects (rectangles, ellipses, etc.) can be defined as sliders. Sliders allow operators to change the value of analog variables by changing the position of the slider object. For instance, a setpoint value might increase as you move a slider up, and decrease as you move it down. Sliders can move left to right, up and down, and they can even rotate. If runtime conditions change the value of the variable, the slider will automatically move to reflect the new value.

Popup Menus

Popup menus simplify navigation and can also be used to trigger Cicode or CitectVBA functions.

Popup menus can be disabled, checked or linked to other menu items.

Keyboard Commands

Global (or system) keyboard commands can be issued from anywhere in the runtime system. Page keyboard commands can be issued only from the page for which they are configured. Object keyboard commands can only be issued when the mouse pointer is positioned over the object.

XP-style Buttons

There is an option to create buttons in XP-style with dynamic property support, which further saves time in training for operators who are already familiar with XP environment.

Improve Operations with Process Analyst

Process Analyst is the next generation in historical visualization tools.

Process Analyst allows operators and process engineers to analyze the cause of process disturbances by bringing together trend and alarm data, which are traditionally stored separately. With the Process Analyst, users can simply view them all on a single integrated display.

Complete flexibility is provided to the user on how the pens can be displayed, for example they can be overlaid or stacked and any pen can be placed in different panes to reduce clutter and make the display easier to read.

The Process Analyst includes many unique features including true Daylight Savings Time support, accuracy to millisecond resolution, individual time axis per pen, customizable toolbars, rich printing and saving of all display settings for easy recall.

EXAMPLES OF USE

Root Cause Analysis

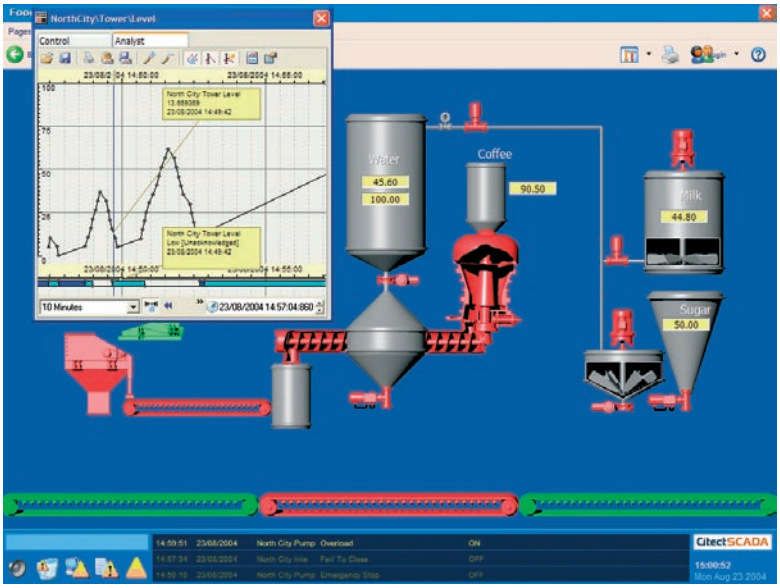
When a process upset or disturbance occurs it is always time consuming finding the root cause. In the past the process engineer had to compare trend data from the screen with alarm logs. With Process Analyst, all the engineer has to do is simply add any pen (analog, digital, alarm) that could have contributed to the process upset to the display. Each process change can then be easily compared as alarms occur, enabling sophisticated analysis of the process upset.

Compare Different Batches

With Process Analyst it is easy to compare different batches in a single integrated view. Simply place all the variable tags, alarms and state changes for a batch unit on one pane, and the same set on a separate pane. Then the operator simply has to scroll one of the panes through time. Any differences in the batch execution will immediately be visible.

Sequence of Events

With SCADA systems, the data is distributed around a wide area and typically the RTUs collect the data at millisecond resolution and send it to CitectSCADA every time it is polled. The Process Analyst displays historical alarms and trends to millisecond accuracy, making it easy to determine the sequence of events.



"The Process Analyst is a vast improvement from existing SCADA systems and enables processes to be optimized by making it easier for operators to analyze disturbances."

Paul Donald, Telemetry Officer, Central Highlands Water

Improve Operations with Process Analyst

EASY TO USE

The Process Analyst's capability to display such rich information requires it to have an easy-to-use, yet powerful navigation system. Every pen added to the Process Analyst has a number of properties including:

- Pen Color and Name
- Tag properties such as Engineering Units, Scales, etc.
- Cursor Values (multiple cursors are available)
- Data average / minimum / maximum

The information available is customizable, allowing you to add or remove any of the standard column types (e.g. Engineering Units), and also add custom columns.

CUSTOMIZABLE

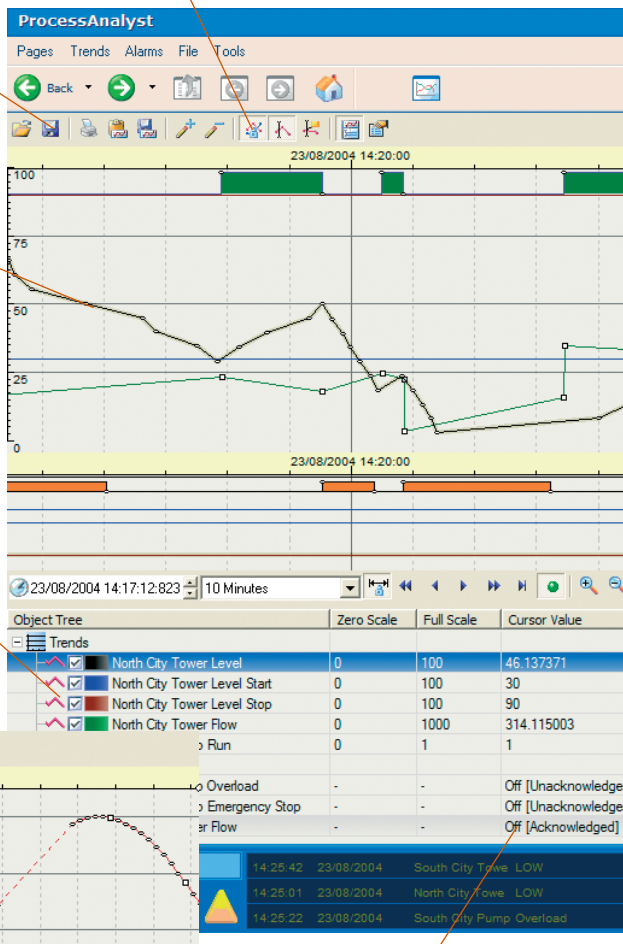
Users can select which buttons to appear on each instance of the Process Analyst. The security access required can also be defined and users can add custom buttons for additional functionality.

Individual pens can be unlocked allowing its values to be compared in different time frames.

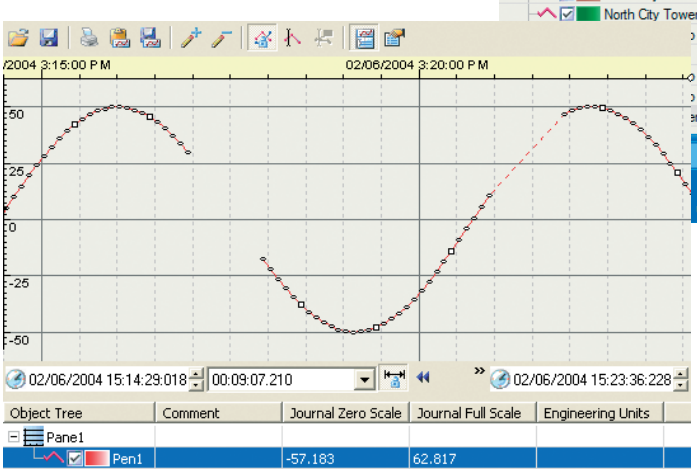
Save the current view as either a template or process snapshot.

Overlaid analog and stacked digital pens on the same pane.

Operators can easily declutter the display.

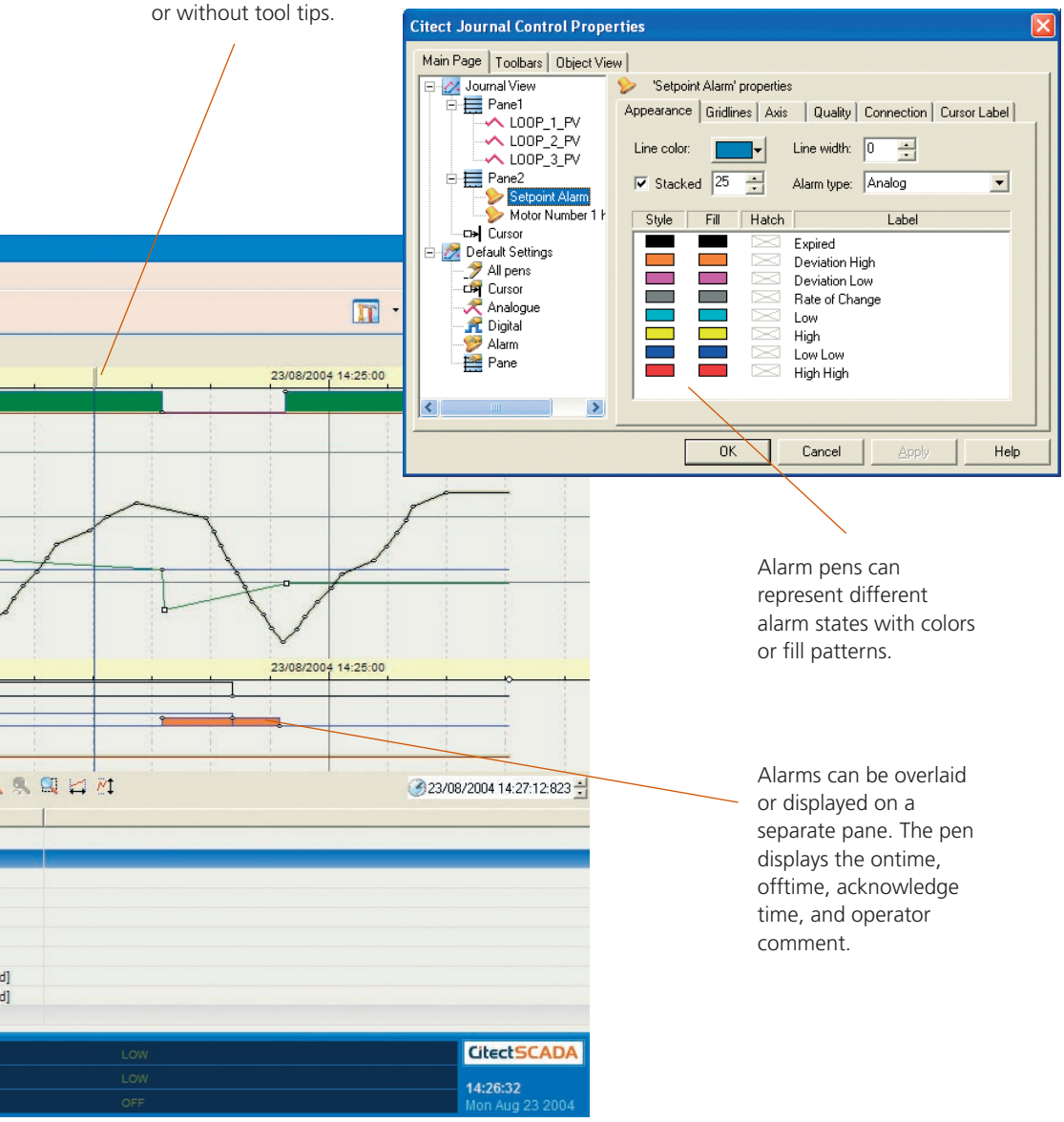


BELOW: Trend Example Showing Different Quality Attributes.



The value of any pen is displayed at the current cursor location.

Multiple trend cursors can be displayed with or without tool tips.



Alarm pens can represent different alarm states with colors or fill patterns.

Alarms can be overlaid or displayed on a separate pane. The pen displays the ontime, offtime, acknowledge time, and operator comment.

AT A GLANCE...

- Analyzes the cause of process upsets quickly and simply
- Allows operators to recognize patterns that may lead to process disturbances
- Provides total flexibility on how you view and analyze your process
- High quality output to printers
- True daylight saving support

Customizable Trend Pages

CitectSCADA trends are a seamless combination of real-time and historical data. When you display a CitectSCADA trend page, you can monitor the current activity as it happens, and simply scroll back through time to view the trend history.

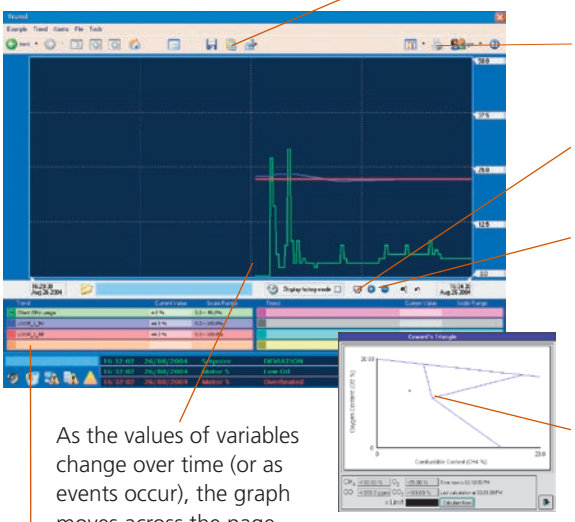
CitectSCADA's trend task is client-server based. The Primary Trend Server collects and records the trend data, sending updates to a Standby Trend Server (if one exists) as requested. When a trend is displayed on a client computer, the client has only to request the necessary trend data from the Primary Trend Server.

You can choose to have redundancy by allocating a Standby Trend Server (using a wizard). If the Primary Trend Server fails, the Standby will instantly assume its role, obtaining data directly through the I/O server and responding to all client requests. Because the Standby Trend Server tracks all trend data, even when the Primary is operating, no data is lost if the Primary fails. When restarted, the failed computer receives updates from the new Primary Server, and becomes the Standby Trend Server.

CitectSCADA's distributed trending system handles large numbers of variables without compromising performance or data integrity. Choose from a selection of pre-configured trend pages that provide clear data representation with customizable views.

Any plant floor variable can be logged and trended. A trend builds a picture over time of how the variable (product output, level, temperature, etc.) is changing or how a device or process is performing. CitectSCADA trends are created from a selection of sample values. The sample values are plotted against time, and the resultant graph gives you an indication of process behavior. Trend samples can be taken periodically, or when specific events occur in your system. Sampling rates can be as frequent as 10 milliseconds and as moderate as 24 hours.

CitectSCADA comes with a host of ready-made trend templates, allowing you to quickly create trend graphs complete with navigation tools and dynamic readouts from the plant floor. You can display trends in single, double, or popup windows, but if you feel that you want something specific to your system, you can easily configure it yourself, with your own functions and trend pens.



Copy trend data to the clipboard, ready for pasting into third party applications (in table format), such as Excel, Word, etc.

Print the trend data in intuitive color or black and white plots. You can also integrate trend plots into reports.

Change the resolution and span time of the graph while it is running.

Select an area of the graph, and press the Zoom button to magnify it.

The X,Y plot feature is very flexible, allowing you a high level of customization. You can display your plots on screen or as a printout — using the full color palette.

Example: a CitectSCADA plot used in underground mining (Coward's Triangle), shows whether the air is explosive, potentially explosive, or safe. A plot point inside the dynamically calculated triangle indicates an explosive condition and the mine is evacuated.

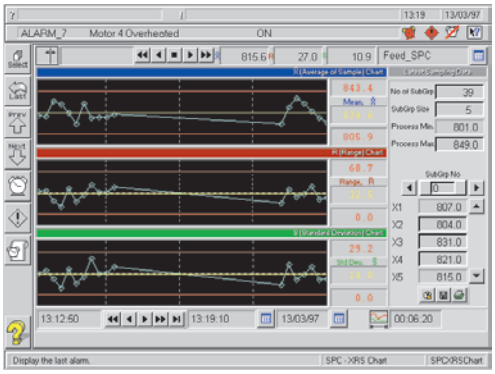
As the values of variables change over time (or as events occur), the graph moves across the page — the latest values are always displayed.

CitectSCADA trends give you the flexibility to define your trend pens while the project is running.

Statistical Process Control (SPC)

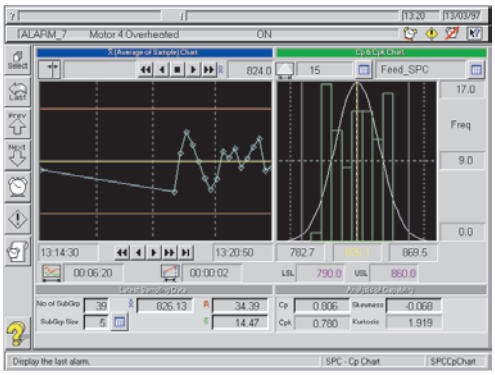
For an easy-to-understand graphical indication on product quality, you can use SPC charts. Prevent out of limit deviations before they happen, with CitectSCADA's easy-to-understand SPC charts.

CitectSCADA provides the three types of charts most commonly used for statistical analysis.



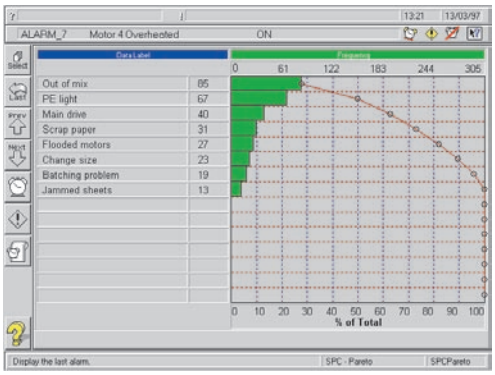
Control (XRS) Charts

Control (XRS) Charts allow you to analyze the variations in plant data. You can configure charts to individually display the mean, range, or standard deviation, or all of the above.



Capability Charts

You can use capability charts to determine whether your process is meeting your specifications. CitectSCADA is pre-configured to arrange the data and make all necessary calculations.



Pareto Charts

If you would like to analyze the frequency of faults and problems, use a Pareto chart. After you specify which values to watch, CitectSCADA will arrange the data and draw the graphs in runtime.

AT A GLANCE...

- Mean, Range, and Standard Deviation (XRS)
- Pre-configured calculation routines
- Template based pages (easy configuration)
- Capability charts
- Pareto charts
- SPC Alarms are integrated into the alarming system

Fast and Reliable Alarms

There are often many alarms that trigger simultaneously. CitectSCADA has been designed and tested to make sure that it will capture and log every single alarm — even in very large systems.

You can specify the action to be taken when the alarms are triggered (e.g. activate an audible alarm such as a .WAV file).

To assist operators in dealing with alarms, you can create graphic help pages that contain information about the alarms, such as the action an operator must perform to correct the situation. You can display these pages automatically when the alarm occurs, or only when an operator specifically requests help.

An efficient alarm system allows you to quickly isolate and identify faults, reducing the amount of downtime. The CitectSCADA alarm system is fast and reliable, providing you with detailed alarm information in formats that are clear and legible.

All alarms are processed and managed by a CitectSCADA Alarm Server. Any CitectSCADA Display Client can display alarms and acknowledge alarms. This eliminates duplicated processing, ensures that alarms are acknowledged system wide, and provides for server based security checking.

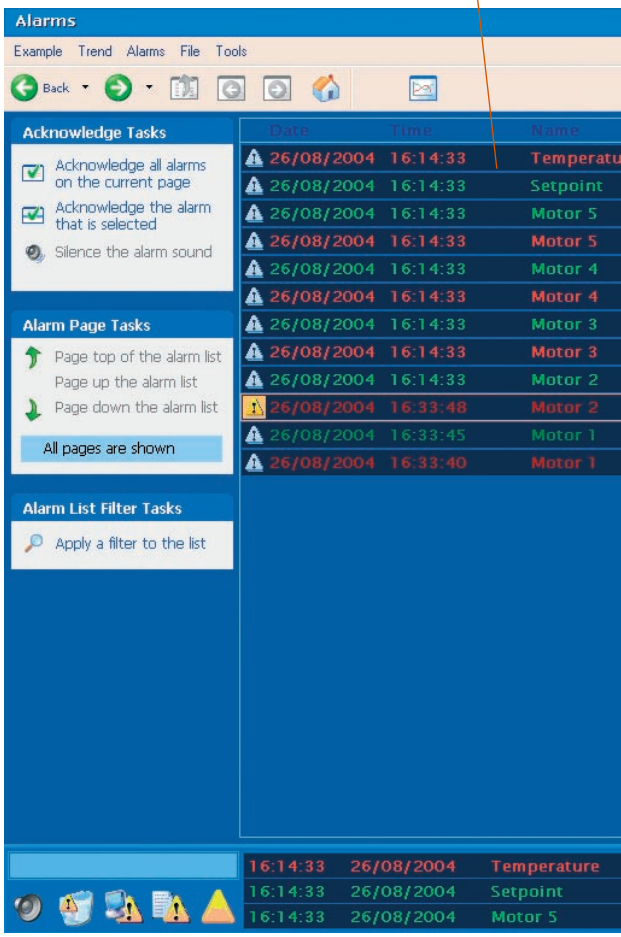
Configurable Alarms report fault conditions in your plant. Variables, groups of variables, expressions, calculation results, etc. can all be monitored by the CitectSCADA alarm system.

Working in conjunction with the I/O device, CitectSCADA's alarms are time-stamped, with precision to 1 millisecond. This can be essential when differentiating between alarms that occur in rapid succession. Millisecond precision allows you to determine cause-effect relationships between alarms.

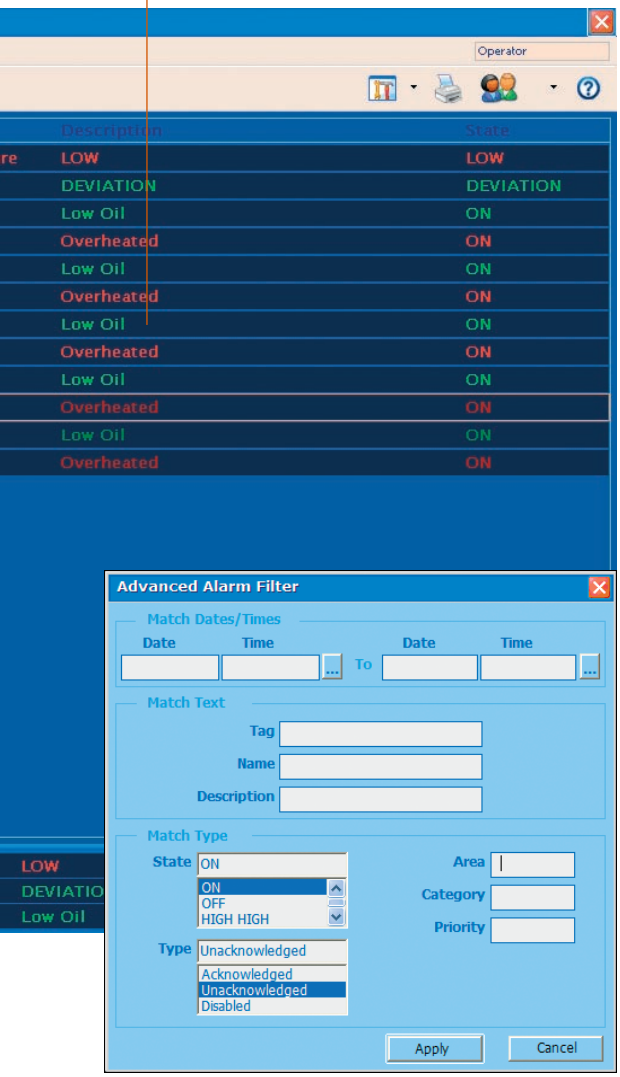
Quick recognition and identification of alarms is important. CitectSCADA displays alarms on dedicated alarm pages, but the most recent alarms are always visible on every page. Alarms can be organized by color, font, and order, according to priority, category, or time of occurrence. For an account of all alarms that have occurred on your system, the alarm summary page provides a complete history.

CitectSCADA also continually runs diagnostic routines to check both its own operation and all peripheral equipment, such as I/O devices. This facility is fully integrated within CitectSCADA, and no configuration is necessary.

The alarm summary page, shows the details for each alarm occurrence on a single line so that users do not need to scroll through history to determine the on time, off time and duration.



Flexible alarm formatting permits display of any related variable when the alarm is triggered.



ALARM PROPERTIES

Alarm properties can be used to change the appearance of your graphics objects — when a specific alarm occurs, you might change the color of a symbol from green to red, or display a 'danger' icon.

- Alarm Tag, Alarm Name, Alarm Description
- Alarm Category, Help Page, Area, Privilege
- Disabled, Acknowledged, Unacknowledged
- On Time, Off Time, On Date, Off Date, Alarm Duration, Acknowledged Time/Date
- Operator Definable Comment
- Alarm State for High High, High, Low, Low Low, Rate, Deviation
- Value of the variable and the alarm deadband (hysteresis)
- Custom Filters

ALARM FILTERS

A good alarm system should not overwhelm operators with excessive alarm information.

CitectSCADA allows the operator to filter alarms based on any alarm property. Filters can be saved and automatically loaded based on the current user.

AT A GLANCE...

- Analog, digital, SPC, and custom alarms
- Integrated Hardware/ Diagnostic alarms
- No limit on configurable alarms
- Millisecond resolution
- Configurable display formats
- Summary/History logging
- Filter is customizable by any alarm property
- Acknowledge from any network computer
- ODBC, DBF, CSV and ASCII data formats
- Support for RTU based alarms

Accessing Database Systems: DatabaseExchange

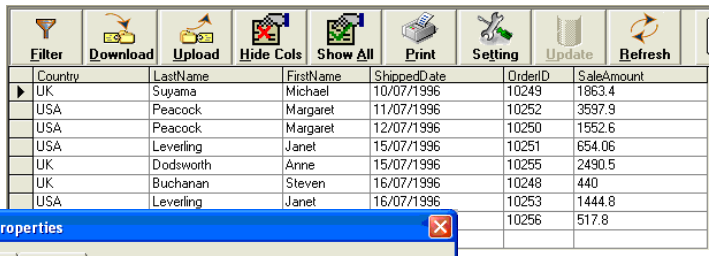
AT A GLANCE...

- Menus can be positioned at the top or bottom of the control.
- The control supports parameterized queries of a Microsoft Access database.

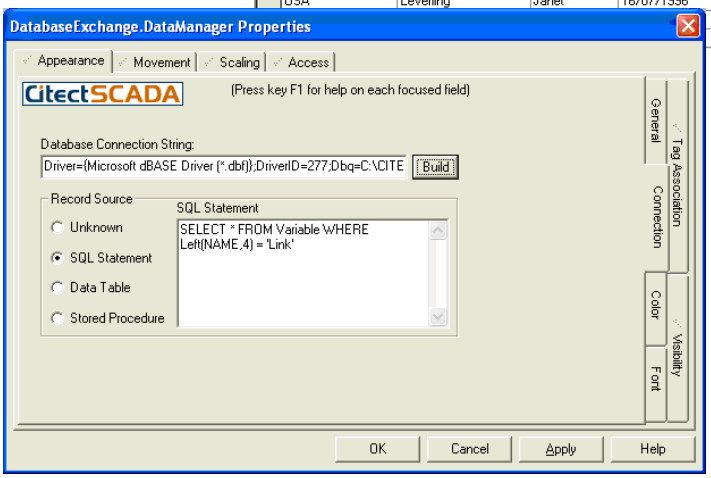
The DatabaseExchange is an ActiveX control that enhances the ability of CitectSCADA to utilize database information.

DatabaseExchange will display data from any configured database (via ODBC) within an operators screen. The data displayed can be controlled by a query that is able to be configured within the project. The database exchange is able to react to settings within the control system as operators can edit data within the control. The data can also be altered via code at runtime. These changes will automatically persist to the database.

RIGHT: The returned data ready to display or exchange



Country	LastName	FirstName	ShippedDate	OrderID	SaleAmount
UK	Suyama	Michael	10/07/1996	10249	1863.4
USA	Peacock	Margaret	11/07/1996	10252	3597.9
USA	Peacock	Margaret	12/07/1996	10250	1552.6
USA	Leverling	Janet	15/07/1996	10251	654.06
UK	Dodsworth	Anne	15/07/1996	10255	2490.5
UK	Buchanan	Steven	16/07/1996	10248	440
USA	Leverling	Janet	16/07/1996	10253	1444.8
				10256	517.8



LEFT: Use the power of SQL directly from CitectSCADA

As well as displaying information from the database the control enables the user to define tags for each column within the data returned. The user is then able to select to upload or download information between these tags and the database. In this way machine setup parameters or set points can be loaded from a database or persisted to database after an optimal performance. The uploading of data will replace the existing data if a row is selected or add an additional row to the database.

The database exchange is integrated into the Graphics Builder toolbar.

Integrated Reports

CitectSCADA's Reports System is a fully integrated part of the product. When you invest in CitectSCADA, you automatically receive the tools needed to create and run attractive, informative reports.

Shift Report

24 May 2006

Total milk in:	336150	L
Total starter in:	3080	L
Total Milk and Starter in:	339230	L
Production Time Forward:	656	mins
Production Time in Divert:	10	mins
Total Production Time:	666	mins
Number of Diverts:	8	diverts
Number of Vats:	22	vats
Total Cheese Weight:	23441.92	Kg
Total Number of Blocks:	1272	blocks
Yield:	***0.069***	***Kg/L***

Grower Status

24 May 2006

Run No.	Batch No.	Merchant	Processed Modules	AV Turnout
66	13	ADF	8	36.52%
66	13	ADF	2	39.77%
67	14	ADF	6	37.28%
67	14	ADF	2	38.41%
68	15	BBF	10	39.60%
68	15	BBF	4	36.88%

A CitectSCADA report is a statement or account of plant floor conditions that you can run periodically, on request, or only when an event occurs (such as a change of state in a bit address, when CitectSCADA starts up, or at a specified time of day).

Reports can be generated in any format you want. They can include formatted text, current and historical data, and even the results of calculations. They can also contain operating instructions — to change operations or variables within your plant, download instructions, perform diagnostics, or change recipes.

Reports can be displayed on a page at runtime, printed when the report runs, or saved on disk for printing or display at a later date. You can use a text editor or word processor to view, edit, or print these reports. Your reports can be saved in HTML format, so that they can be viewed over the Internet, using a standard web browser.

For more sophisticated reports, or reports that integrate data from multiple SCADA systems, CitectSCADA Reports should be used. It is a powerful reporting and analysis tool that seamlessly collects, historizes and reports data from multiple SCADA systems. Users can utilize the integrated database containing trend, alarm and event data to get a complete understanding of plant operations.

ACCUMULATORS

Accumulators are an easy way to keep track of incremental runtime data such as motor run hours, power consumption, and downtime.

You set a trigger (e.g. motor on) to increment three counters:

- The number of times the accumulator is triggered (e.g. start times for the motor)
- The run time in steps of 1 second
- The totalized value, by a value you define (e.g. the current)

INTEGRATED XML WEB SERVICE

With the industry's acceptance of XML web services as an interface between business applications, a read-only web service interface is integrated into CitectSCADA providing access to all tags, alarms and trend information.

CitectSCADA Project Development

CitectSCADA is conceptually divided into two distinct parts: The Runtime Environment, and the Configuration Environment. The Configuration Environment consists of a set of tools (applications) that are used to build the runtime system. It is centered around the CitectSCADA Explorer, which is used to create and manage projects.

CitectSCADA Explorer can be customized to suit special use and OEM applications. Menus, toolbar buttons and features can be altered or removed.

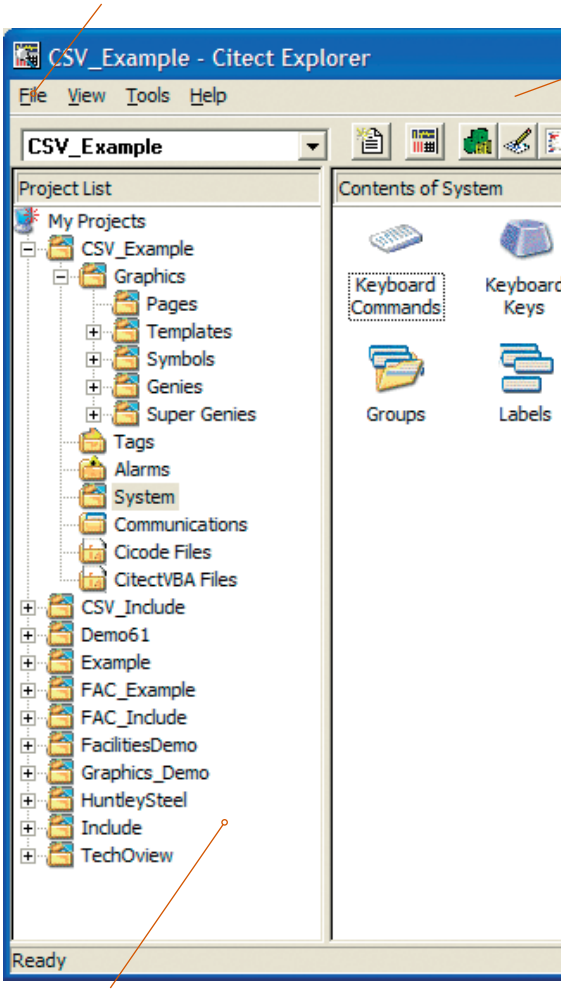
Disorganized projects lead to maintenance problems. The CitectSCADA Explorer is the hub of the configuration process. It simplifies project management, allowing you to access and modify any part of any project.

CitectSCADA provides tools to enable rapid development of large projects. Each project can be divided into up to 240 included projects. Each of these projects can be worked on by different developers in a variety of locations. In these cases it is difficult to maintain control of project standards and merge changes from different teams together. CitectSCADA included projects enable this to occur without placing additional effort on the development teams.

CitectSCADA manages standards within a project by placing all the standard symbols, objects and user interfaces within a single project. Each development team can include this object within their own sub projects and have access to all the project standards. When standards are changed or updated, the new project can be sent to development teams to update their projects and see the changes within their project.

CitectSCADA enables remote development of projects by enabling any combination of CitectSCADA projects to be combined together. A remote developer can include the project standards as well as their own section of development. This can be used during development of the existing project or during maintenance — a single project can be updated by an Integrator at the same time small changes can be made by the local maintenance team.

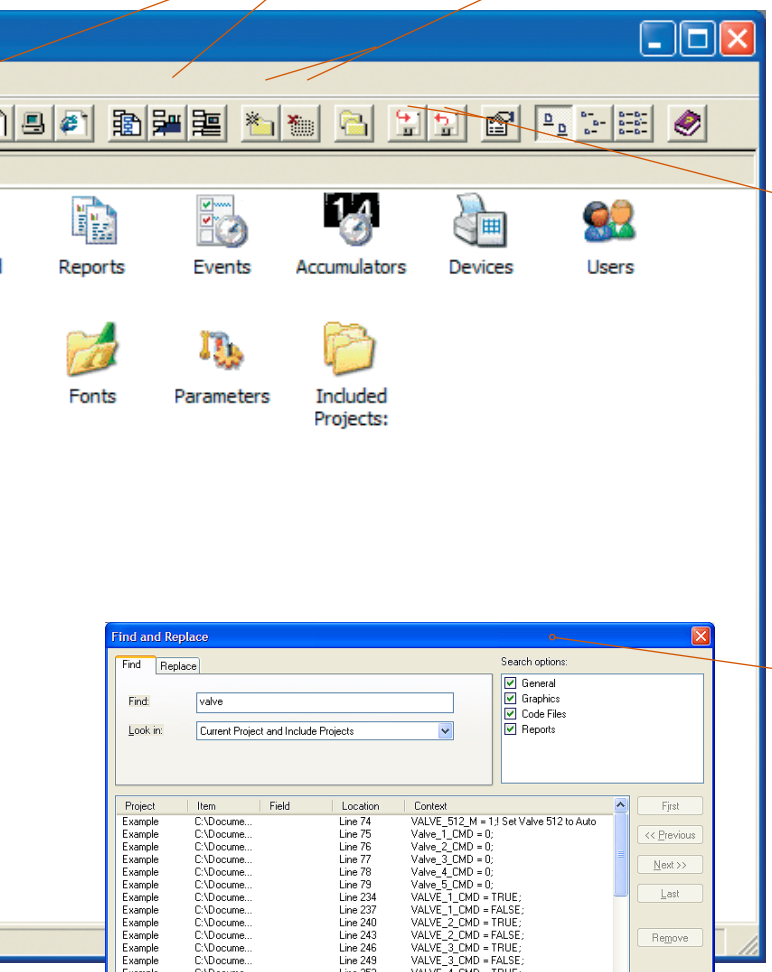
The File menu contains commands for creating, removing, organizing, and running your projects. The global properties of a project are accessed through this menu.



The CitectSCADA development environment can open any number of projects. This enables CIPs to be editing projects from different customers at the same time. The projects are displayed in the tree. Their file structure is displayed as you navigate with the + and – symbols.

Use the tool bar to switch to the other applications in the CitectSCADA Environment (Project Editor, Graphics Builder, CitectSCADA Batch, Cicode Editor, Online Help).

CitectSCADA can work on projects located on fileservers. Simply use link and unlink to bring projects from the file server into the development environment.



CitectSCADA provides one-step backup and restore of all parts of a project. A project can be backed up to floppy disk (with automatic multiple disk span), your local drive, or a network drive.

Configuration is made easy with the Find and Replace feature.

All CitectSCADA forms and dialogs have a Help button which invokes context sensitive help.

AT A GLANCE...

- Quick, easy access
- Familiar interface
- Simple, convenient management of projects
- Single step backup and restore of entire project

FIND AND REPLACE FEATURE

The Find and Replace feature enables you to find and replace text strings within a single graphics page, template, Graphics Builder and across multiple projects when accessed in the Project Editor. There is also a new option, warning you about unused tags on full compile, which identifies unused tags. All these contribute to a significant reduction in the time spent in configuration.

Monitor and Control with Cicode/CitectVBA

Cicode is easy to use and offers the flexibility, reliability and performance required by plant monitoring systems. Cicode is a programming language written for the control environment, it is also compiled and offers full multi-tasking. These important features provide CitectSCADA users with unmatched flexibility for extending the functionality of their SCADA/HMI systems without compromising system performance.

EVENTS

Events can be set up so that they trigger actions when they occur. For instance, when a process is complete, an operator could be notified and a series of instructions could be executed.

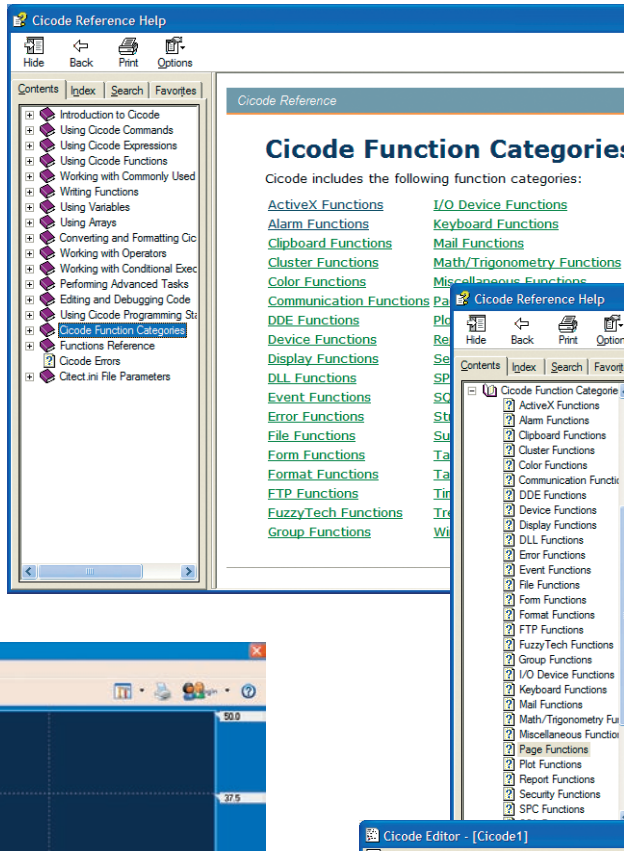
You can run an event

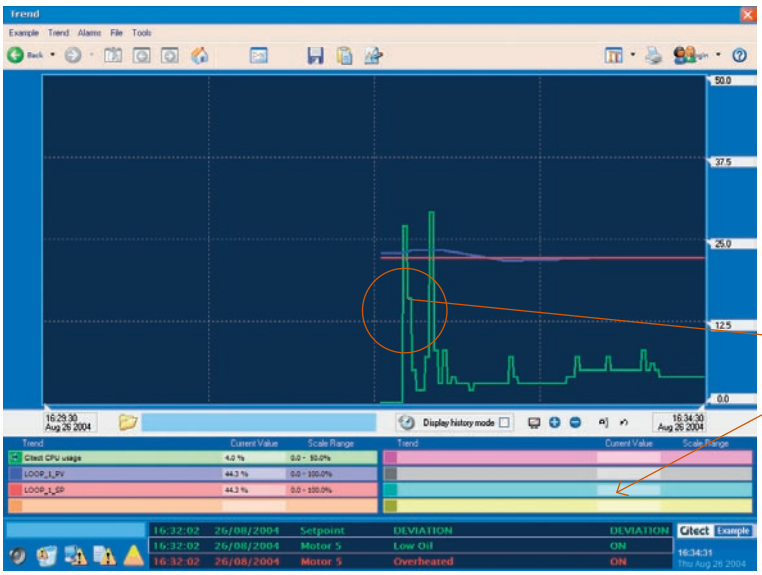
- Automatically at a specified time and period
- Automatically when a trigger condition becomes TRUE
- Automatically when a trigger condition is TRUE at a specified time and period

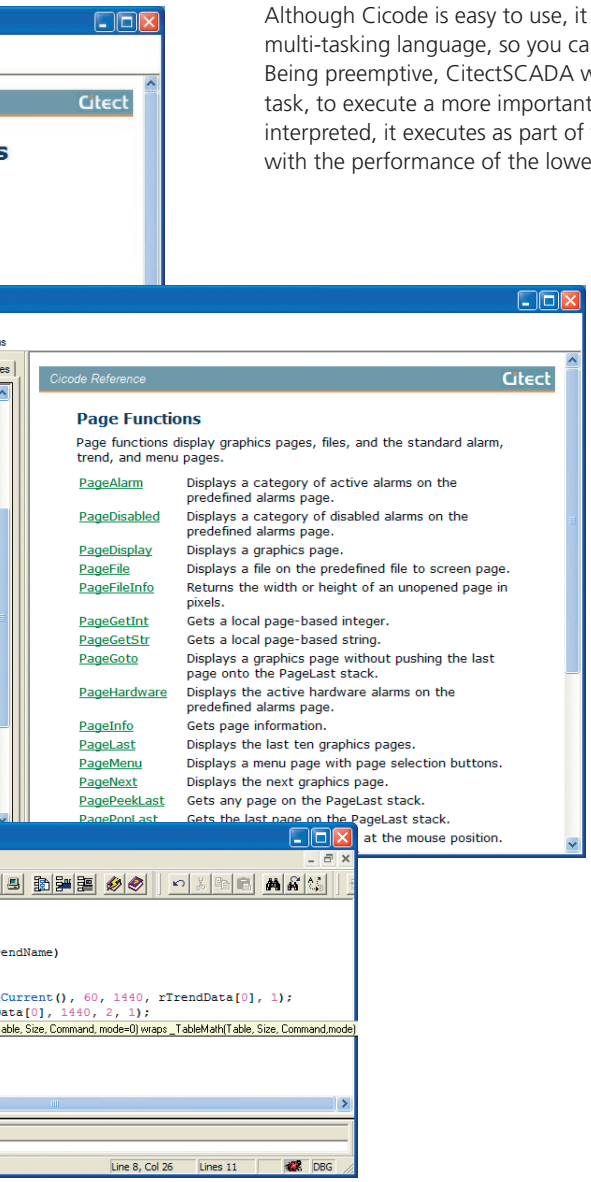
Many applications have special requirements. To provide you with maximum flexibility and power, CitectSCADA comes with two programming languages — Cicode and CitectVBA. Cicode is designed specifically for plant monitoring and control applications, while CitectVBA is better suited to interacting with third party objects and applications.

With Cicode and CitectVBA you have access to, and control of, all the elements in your runtime system: real time data, historical data, operator displays, alarms, reports, trends, security, etc. These programming languages also give you access to your computer system, including the operating system and communication ports. The applications for Cicode and CitectVBA are wide, from simple numerical calculations to advanced calculations representing complex data.

Cicode is an advanced language that is similar to other high level languages like 'C'. CitectVBA is compatible with Microsoft Visual Basic for Applications (VBA). CitectVBA has over 650 SCADA/HMI specific functions included, reducing the need for complex or extensive code.







Although Cicode is easy to use, it is not just a macro or script language. Cicode is a multi-tasking language, so you can run multiple instances of Cicode simultaneously. Being preemptive, CitectSCADA will temporarily suspend a less important Cicode task, to execute a more important one. Because Cicode is compiled, and not interpreted, it executes as part of the CitectSCADA system, but without interfering with the performance of the lower level CitectSCADA tasks.

Because Cicode has high level functions for all common operations such as acknowledging an alarm or changing a page, there is no need for low level programming. All memory management is handled by CitectSCADA, so you do not need to use 'pointers', or 'poke' things into memory.

AT A GLANCE...

- Easy to use
- Industry standard
- Preemptive
- Multi-tasking
- Compiled for optimal performance — not interpreted or scripted
- Extends the functionality of CitectSCADA
- Integrates seamlessly as part of CitectSCADA
- Proven, robust language
- Over 650 SCADA functions included

CITECTVBA

CitectVBA is a Visual Basic compatible scripting language and is perfect for integrating CitectSCADA with ActiveX Objects and third party applications. CitectVBA utilizes the Cicode engine to ensure the running code is multi-threaded.

Cicode/CitectVBA Editor

DEBUGGING CICODE

The Cicode Editor is a fully functional debugger, able to analyze running Cicode/CitectVBA and find errors. Debugging can also be performed from a remote computer.

BREAKPOINTS

To debug a function, you must first stop the code at a desirable point. The DebugBreak function, a manually inserted breakpoint, or a hardware error will halt a Cicode thread.

STEPPING THROUGH CODE

The position of a halted thread is marked with an arrow. You can step through the function, line by line, and watch what happens in the debug windows as the code executes.

The following tools are provided in the Cicode Editor to control stepping through functions:

- Step Into
- Step Over
- Step Out
- Continue

The Cicode Editor is a programming environment specifically designed for writing and debugging Cicode and CitectVBA.

Included in CitectSCADA's collection of debug controls are tools for starting and stopping debug mode, inserting and removing breakpoints, and stepping controls.

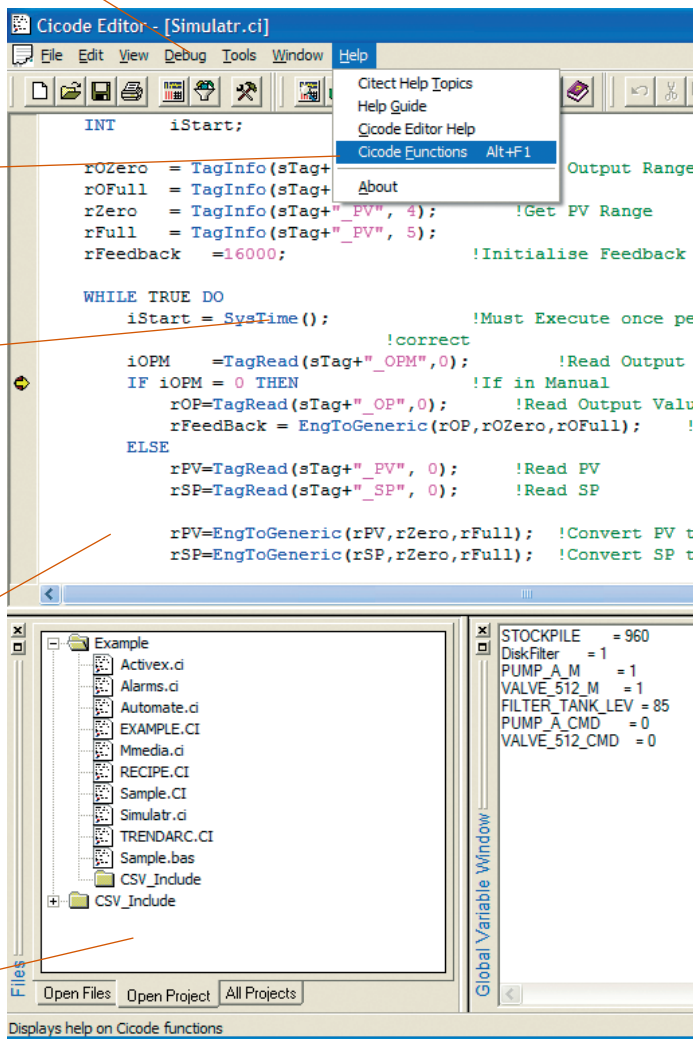
CitectSCADA provides help on all Cicode/CitectVBA functions.

As well as the normal Help menu options, you can display information on a function in the work area by pressing F1 while it is selected.

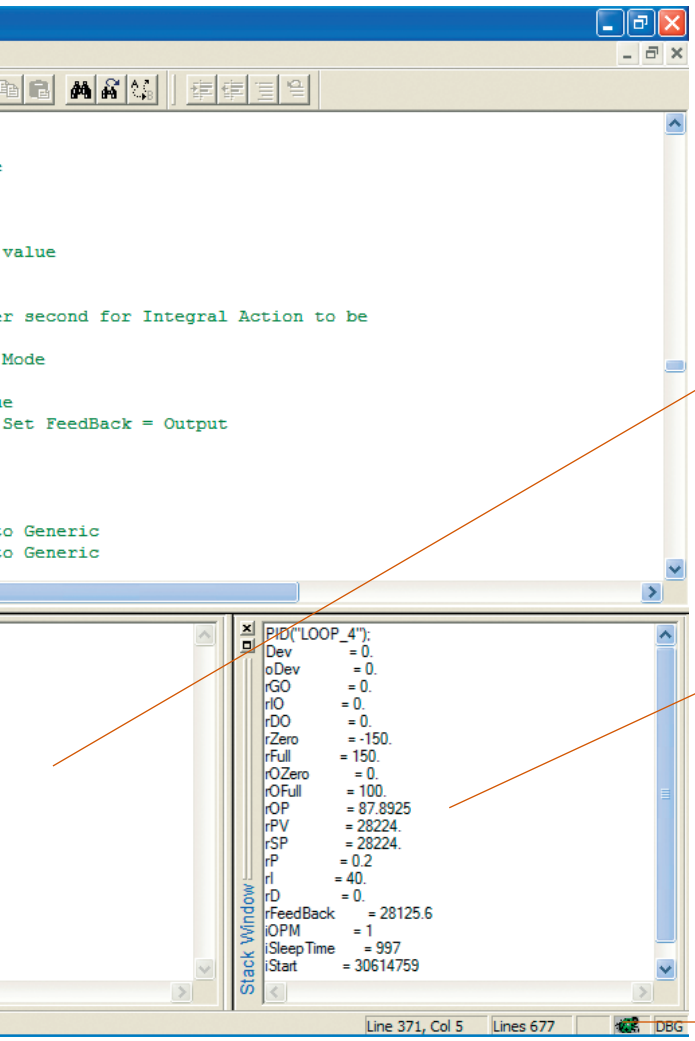
The work area is where Cicode file windows are presented. You can have multiple Cicode files opened — from a number of different projects.

Each Cicode or CitectVBA file is a text document that you can type into directly.

The Files window displays all Cicode and CitectVBA files for each project linked to the development environment.



If the project is not running when you switch the Editor to Debug mode, CitectSCADA will automatically compile and run it.



The Global Variable Window displays the current value of each global variable.

The Stack Window displays the functions called, their parameters, and the value of local variables within each function.

The Cicode Editor Bug is red when editing and green when debugging.

DEBUG WINDOWS

The Cicode Editor has a number of debug windows that you can use to display information about running Cicode:

The Stack Window shows the stack values of the current thread. The stack consists of the functions called (including the arguments), any variables used in the functions, and return values.

The Threads Window lists all Cicode threads currently executing.

The Breakpoint Window shows the location of the breakpoints in all of the Cicode files you have opened.

The Output Window shows the information messages sent by CitectSCADA during debugging.

The Global Variable Window shows you the current values of all global variables used so far in debugging.

Online Help

AT A GLANCE...

- Comprehensive coverage (over 4000 pages)
- Context sensitive
- Effective search facility

CitectSCADA's Online Help is a comprehensive package, logically structured, easy to find, and easy to understand. It is accessible in a number of different ways, from any part of CitectSCADA.

All CitectSCADA dialogs have a Help button that invokes context sensitive help.

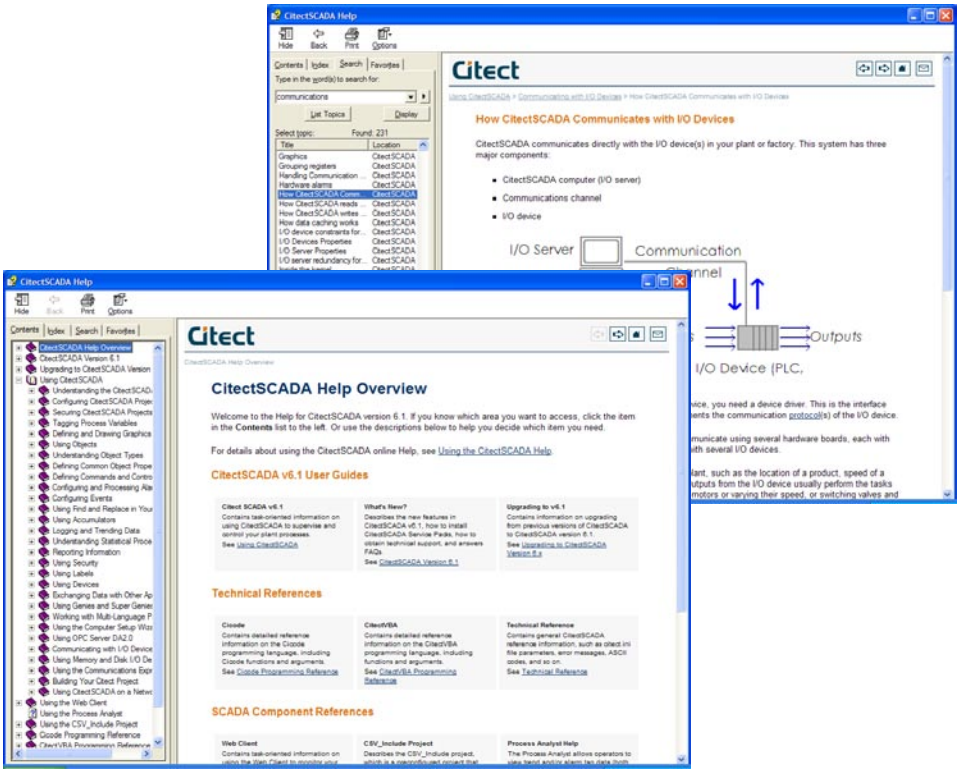
For more general information, you can use the Help menu. It gives you direct access to the Help Contents and the Help Guide, as well as application specific information, such as the click-and-learn facilities.

Of course, you can always just press the Help Topics button to the right of the toolbar, and display the Contents.

Once the Help is open, you can perform index or keyword searches or browse the 'Help Direct' topics. No matter what kind of information you require, the CitectSCADA Online Help provides the tools to find it.

CitectSCADA's Online Help Index operates using standard Windows functionality. To find the information you need, just type part of a key word — the keyword list scrolls automatically to the closest match. You can also do a full text search using the Find facility.

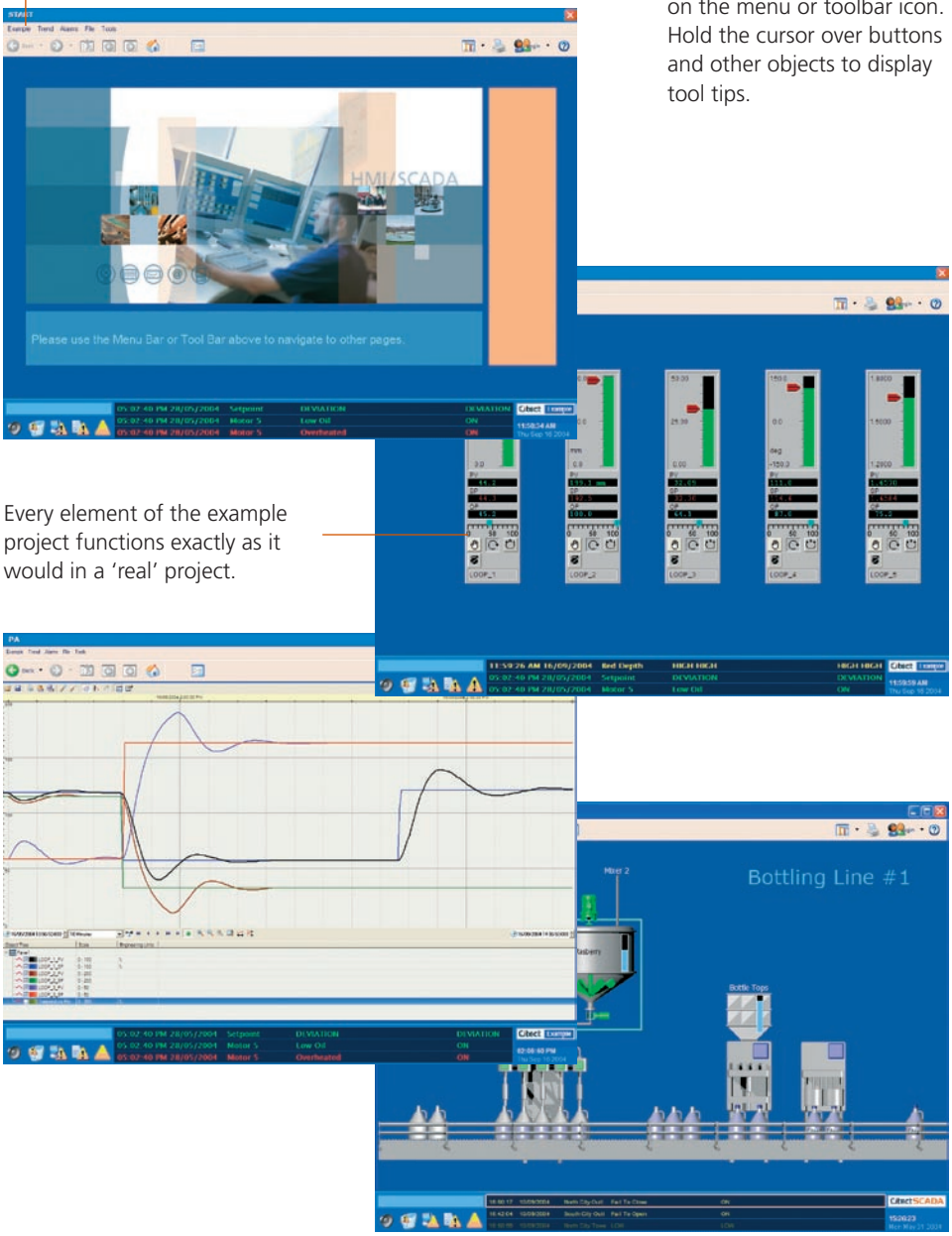
CitectSCADA's Online Help provides easy access to the information you need. It includes a logical grouping of Help items on the CitectSCADA Help Overview page, easy access to driver Help, and the use of "breadcrumbs" to facilitate navigation.



Example Project

Two Example Projects are supplied with CitectSCADA based on different templates. These are fully configured projects that are ready to run and can be used for ideas on how to configure your own project.

To display any graphics page in the example project, click on the menu or toolbar icon. Hold the cursor over buttons and other objects to display tool tips.



Every element of the example project functions exactly as it would in a 'real' project.

The Example Project is automatically installed when you install CitectSCADA.

You can use the Example project when you want to experiment with something before including it in your own project. The test page is already set up to display directly from the menu page.

The Example Project is provided complete with the ability to switch online between the following languages:

- Afrikaans
- English
- German
- French
- Norwegian
- Polish
- Spanish
- Swedish
- Russian
- Chinese
- Hungarian
- Japanese
- Korean
- Dutch

CitectSCADA Reports: Server

AT A GLANCE

- Easy-to-use configuration tools
- Long-term data storage repository for plant floor information
- Controlled access to plant and business from different control systems anytime, anywhere
- Based on latest open industry standard technologies and applications, such as Microsoft .NET
- Provides information to users with industry standard desktop applications such as Microsoft Excel, Microsoft Reporting Services and Internet Explorer
- Data exchange with business systems

CitectSCADA Reports is a powerful plant-wide reporting analysis tool. It seamlessly collects, historizes and reports data from CitectSCADA systems integrating industry standard technology. CitectSCADA Reports reduces systems training and increases accessibility to plant floor data within the enterprise.

Most businesses improve their plant floor reporting to enable the organization to monitor and enhance their business units. While the control system is the most automated department in a business, it is often the least well represented as the information is locked within the control system environment.

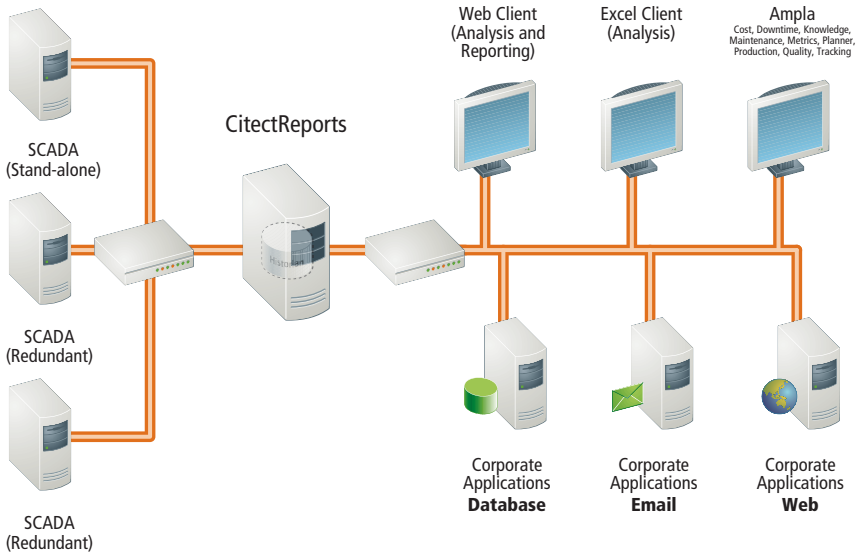
There are typical reasons why this information is unavailable. The business and plant networks are disconnected (the process system cannot agree on acceptable technologies or control system cannot be subjected to IT network downtime). The plant information that is available is structured with control system tag names and is unintelligible to business users. The information was not available within the applications that the users wanted to use.

Empowering the organization to make the right decisions, CitectSCADA Reports is focused on resolving issues and making all control system information available to users and applications throughout the enterprise.

DATA ACCESS

CitectSCADA Reports provides access to tag, alarm and trend information directly from within the SCADA systems. This data can be transferred to business applications or visualized within the web and Excel clients of CitectSCADA Reports, enabling data from multiple CitectSCADA systems to be compared and analyzed or historized to the historian for long term storage and greater analysis options.

The data made available by CitectSCADA Reports clients is customizable to suit individual process needs. Each data item can be named appropriately for business users and located (independent of its data source) anywhere within a free-format tree structure to represent your plant or process. The areas of this tree available to each business user can be filtered to provide users exactly the information they require.



RIGHT: CitectSCADA Reports bridges process and corporate networks.

This tree structure is utilized throughout CitectSCADA Reports clients. In Excel and web clients the tree enables users to easily find the data they require. The location of a device or tag within the structure can be used a parameter to allow dynamic reporting.

HISTORIAN

The next generation historian in CitectSCADA Reports represents a significant milestone in making this data readily available within the enterprise. It contains a high performance environment with a data store based on relational database technology. The data store is an embedded Microsoft SQL Server 2005 and can persist 100,000 changes per second to the database (dual processor) ensuring that it meet your performance needs.

Utilizing an industry standard database such as MS SQL Server as a platform for the historian data allows easy transition of data across the divide between the control systems and business systems. A relational database is easily understood by both IT and production staff. It can be easily secured to control access to the historian data based on user access and is likely to be similar to existing systems on site. It reduces the friction between groups and the amount of maintenance or in house knowledge that needs to be maintained.

The historian collects all changes in the values of process tag values as well alarm activity from within each control system. Each change is saved with a time stamp (with resolution of 100 nanoseconds) and an OPC quality stamp. Data can be acquired at user definable rates, including sub-second data acquisition rates.

The historian supports redundant control system links. In the event that one link fails the historian will request the data from the other link to the control system. In the event that the network link to the historian fails the historian will backfill from control system trend and alarm systems to acquire data that it could not acquire in real-time. Quality flags are stored using the OPC status and sub-status definitions in conjunction with customized high-byte sub-statuses to accurately reflect the status of the SCADA system data at any time.

The historian compresses data by saving only changes in values. For each tag a dead band is available that will enable small ripples or insignificant changes to be filtered from the data that is stored. This data is stored directly into tables in the SQL server. In doing this there is an increase in the amount of data storage required but also in the availability of the data to external applications and users. To calculate the exact disk requirements, CitectSCADA Reports provides a disk space calculator and performance counters to show the number of changes that occur per second.

The data is stored securely within the historian. The historian leverages the security of SQL Server to enable to the user to secure each table, view and function within the SQL server. This enables users to be forced to access functions to use identity logging functions for modifying the historian data. Standard SQL audit tools can also be used to see if any unauthorized editing of databases has occurred.

The advantages of storing data directly in an SQL server are evident when accessing the data from external applications. The large number of applications that have SQL connectors ensures that your data will be available in most applications that you require.

ACTIVE DATA EXCHANGE

CitectSCADA Reports complements its direct access to SCADA system data and historization capabilities with the ability to actively extract, transform and load (ETL) data between the control system and other business databases. This enables CitectSCADA Reports to work as a scheduled interface between most business applications and the control system.

Data transfers are able to be scheduled based on time, conditions within the SCADA process or the success or failure of other ETL tasks. CitectSCADA Reports can also act as an interface to call standard ActiveX script and send emails or data transfer tasks from within the SQL Server.

HISTORIAN PERFORMANCE

Historian Poll

- 100ms (or greater)
- Deadbands (per tag)

Historian Data Accuracy

- 100ns (for external time-stamped data)
- OPC Quality Flags

Historian Read Performance

- 100,000 Change per second (dual cpu)
- 40,000 change per second (single cpu)

HISTORIAN SECURITY

- Windows Integrated or SQL user based
- Secure each table, item, procedure

HISTORIAN INTERFACES

- SQL Native Client
- OLE-DB
- ODBC
- Web Service

EXTRACT/TRANSFORM/LOAD

- Extract tag values and store them in a database
- Extract tag trend values and store them in a database
- Extract alarm summary information and store them in a database
- Extract historian trend values and store them in a database
- Extract tag values from a database application and transfer them to any SCADA system

SUPPORTED DATABASE SYSTEMS

- MS SQL (7.0, 2000, 2005)
- MSDE (1.0, 2000)
- Oracle (7, 8, 9)

CitectSCADA Reports: Clients

AT A GLANCE

Reporting Data Sources

- Citect Historian
- SQL Server
- OLE-DB
- ODBC
- Oracle
- Web Service

Reporting Output Formats

- HTML
- PDF
- MS Excel

Reporting Delivery

- Email
- File share
- web portal

with MS Reporting Services and Office integration providing additional tools.

REPORTING

Creating professional reports and delivering them to the correct people is simplified with CitectSCADA Reports. Citect utilizes the graphical query builder and report generation capabilities of Microsoft Reporting Services to deliver drag, drop and click reporting of any data from the historian.

The reports can be built using stored procedures and parameterized views (table value functions) that are defined within the historian database or can be directly driven by the data in the historized tables.

The stored procedure interfaces enables the data, which is stored only when the data changes, to be returned as a set of time-series data (i.e. 30 seconds averages). The data can be based on raw value or by interpolating between recorded values.

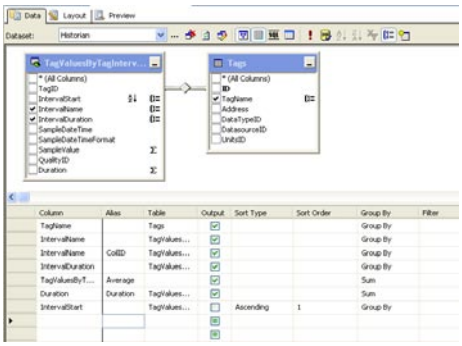
The parameterized views (table value functions) also process the raw data with a focus on enabling the data to be grouped. Reporting often requires maximum of a variable during the production of a product or the total for a set of production runs or even just the runtime for a device (or all devices) within the system.

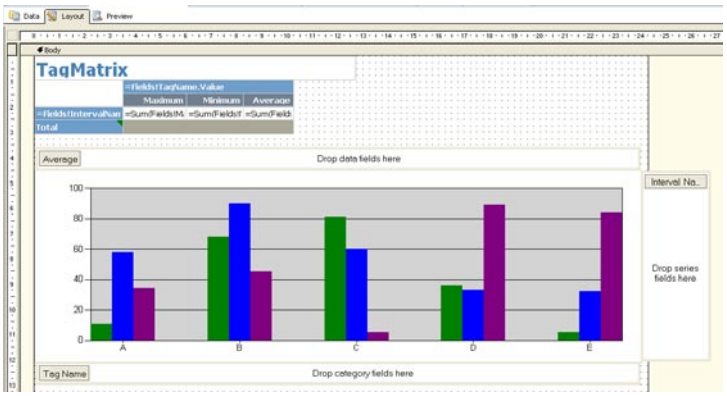
These views easily allow the user to ask for various statistical information including maximum, minimum, average, total, count or on-time of any variables or condition. These values are able to be grouped by time, the value of a tag (such as a batch id), an event (such as a pump running) or by an alarm (allowing reports for the data preceding each occurrence of an alarm). Views are also available to provide an alarm summary and alarm event lists.

Reports are generated using Microsoft Reporting Services. By utilizing an industry standard report generation tool, CitectSCADA Reports reduces the cost of report development training. Reporting Services provide templates for report design, a drag and drop environment to extend the base reports and a full featured reporting system compatible with every other major business.

Once generated reports are deployed to the CitectSCADA Reports server and are scheduled to run based on an advanced scheduler. Scheduled reports can be sent to managers by email or recorded in a file share. In either case the user is able to select to receive the report as HTML, PDF or an Excel spread sheet. In this way reporting data can act as a secure record or as a starting point for more plant analysis.

Reports are accessed via URL. This enables them to be integrated into the CitectSCADA Reports web client, CitectSCADA or any corporate reporting system.





TOP RIGHT: Using a historian query in CitectSCADA Reports.

RIGHT: Building the report you need becomes easy with CitectSCADA Reports.

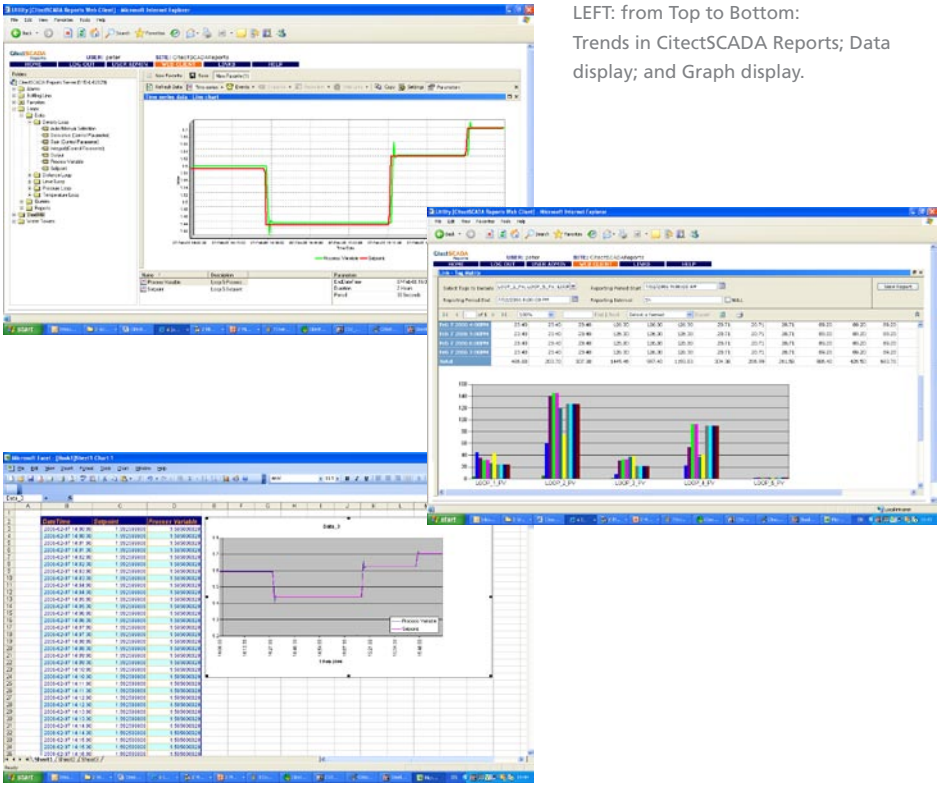
WEB AND EXCEL CLIENT

Using CitectSCADA Reports Web Client you can visualize plant information from your control systems and historian over the intranet/internet simply using a browser such as Internet Explorer. Built-in views include time-series line and XY graphs for analyzing analog values over time, Gantt charts for analyzing state changes over time, Pareto charts for analyzing frequency and duration of states as well as data lists which allow raw plant data to be pasted directly from the web browser into analysis applications such as Excel. The web client analytical tools can also be used on real-time tags taking snapshots of current values and displaying this as a real-time trend.

The CitectSCADA Reports web client also acts as a portal to the reports generated by the reporting system. Reports are able to be accessed using fixed or operator adjustable parameters to provide both fixed and adhoc reporting. Excel reports are created as PDF documents or web pages can also be integrated and viewed within the CitectSCADA Reports Hierarchy. The hosting of web pages enables CitectSCADA access to also be hosted in the web client providing a single portal for users.

The Excel client can also access information link from the SCADA system or historian directly into Microsoft Excel. The user is able to select from the same plant hierarchy as the web client and request the values of any item within the tree. Each request has parameters allowing the user to control the time period and the format of the data returned.

Parameterized queries to the historian are also able to be hosted as items within the plant hierarchy. These queries can then be requested in Microsoft Excel to provide grouped and prepared data directly onto the spreadsheet for further analysis. The data returned is then able to be used within the pivot tables and other Excel features to rapidly massage the data into whatever form is required.



LEFT: from Top to Bottom: Trends in CitectSCADA Reports; Data display; and Graph display.

FAVORITES

CitectSCADA Reports Web Client allows you to organize the information you wish to view through your Favorites links. A new Favorite is automatically created when the user selects published data to be viewed. This is achieved simply by double clicking on the published item or dragging it into the Summary Window. Favorites can be made available to other users on the system.

CitectSCADA Pocket

BENEFITS AT A GLANCE

- Maximize mobility using wireless technology, to monitor and control your plant anytime, anywhere
- Improved operator utilization
- Be alerted to Alarms immediately and take prioritized action
- Resolve issues in one area whilst working in other parts of your plant
- Improve maintenance, commissioning and equipment testing
- Eliminate need to travel between different sites to get desired data
- Manage both your plant operations and business schedule at the same time

READ-ONLY LICENSES

Read-only CitectSCADA Pocket licenses are available to provide access to all tags, alarms and trend information.

"Putting control of your plant into the palm of your hand"

CitectSCADA Pocket provides an easy-to-use operator interface which gives operators, maintenance and plant managers maximum mobility to remotely monitor and control your plant.

NO ENGINEERING REQUIRED

CitectSCADA Pocket has been designed for ease of use and configuration, and contains pre-defined displays for Trends, Variable Tags and Alarms.

Once CitectSCADA Pocket is installed, simply connect to CitectSCADA, download the Tags and it is ready to use. No changes to your CitectSCADA configuration are required.

TECHNOLOGY

CitectSCADA Pocket takes advantage of Microsoft's latest technologies including the Pocket PC and Windows Mobile Operating System, XML Web Service and .NET Framework.

Connection to the XML Web Service is provided through HTTP, allowing you to use any available wireless media that your Pocket PC supports, such as WLAN, Bluetooth, GPRS or 3G.

BENEFITS FOR ALL

Plant Operators

Be alerted to Alarms immediately and take prioritized action, wherever you are in the plant.

Plant Managers

Optimize staff utilization as your operators respond to issues more quickly through instant access to plant information anytime, anywhere.

Maintenance Managers

Remotely monitor an area of the plant where changes have been made to ensure they are effective.

System Integrators

Remote visualization during testing and commissioning means the work can be completed much faster.

ALARM NOTIFICATION

To simplify operations, the Alarm display lists the unacknowledged Alarms from CitectSCADA and you can easily filter out the Alarms you do not want to see. When a new Alarm is activated in your plant, the Pocket PC will annunciate it through the in-built speaker. Once the Alarm is acknowledged in CitectSCADA Pocket, it is silenced and the Alarm list is updated both on the Pocket PC and in CitectSCADA.

ABOVE: CitectSCADA Pocket Trend display

CitectScheduler

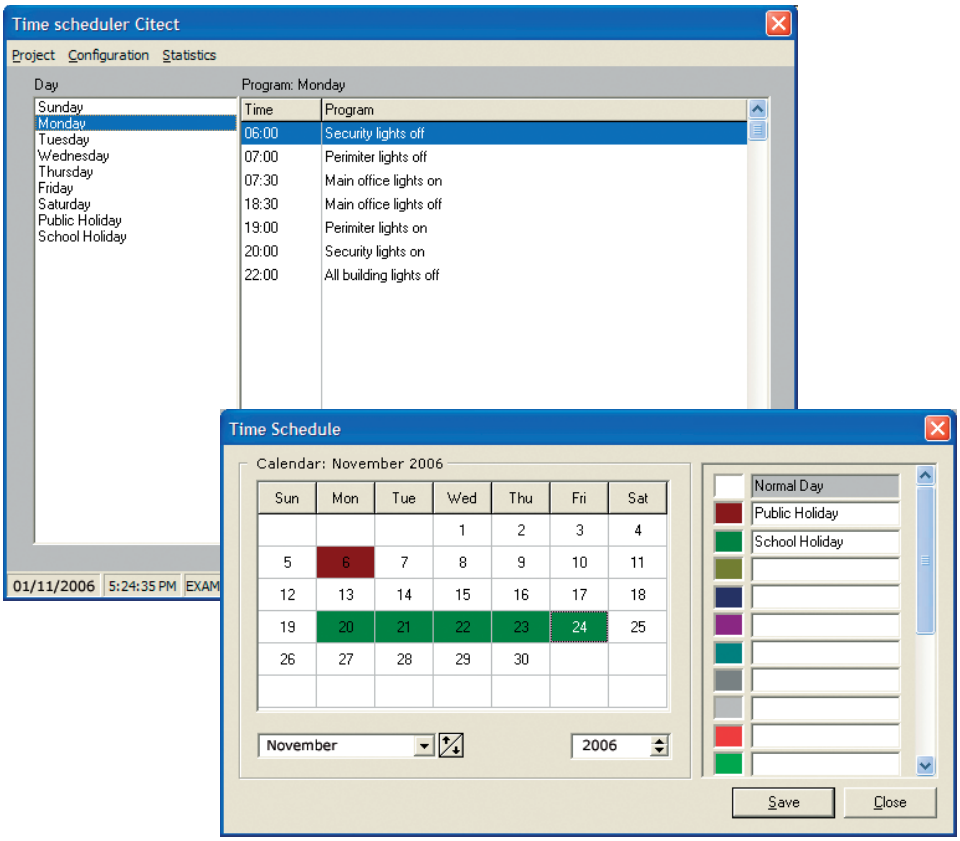
The Scheduler is an integrated tool that will provide functionality to automatically control equipment, based on calendar events.

Scheduling is an important feature in both the building and industrial automation industries, where cost savings through optimized energy usage is a key factor.

For example, the Scheduler ensures that after working hours, heating and lighting are automatically switched off, room temperatures are lowered, and plant equipment is not left running longer than required. Also, with configured "special days", the Scheduler can automatically control certain parts of your plant or building during holidays or other irregular events.

The Scheduler is extremely easy to configure due to its calendar based user interface. A preset control schedule can be configured during project development, and if required, this schedule can be changed by managers or operators during runtime.

CitectSCADA's ability to connect with a large number of different device manufacturers (Johnson Controls, Landis & Staefa, Honeywell and TAC), used in both the building and industrial automation industries, enables the Scheduler to act as a single point of configuration for all your equipment.



AT A GLANCE...

- Easy to use configuration interface
- Calendar control for simple overview of control events
- Tight integration with CitectSCADA and Nexa
- Up to 20 special days to account for irregular events
- Up to 200 programs that can be configured to control certain parts of your plant or building
- Expressions can be used in calendar events, i.e. Tag = Tag + Value
- Fully redundant scheduler functionality
- Automatic update of programs over redundant schedulers
- Simple access to programs for manual override
- Ability to schedule control of equipment connected to a large number of different devices

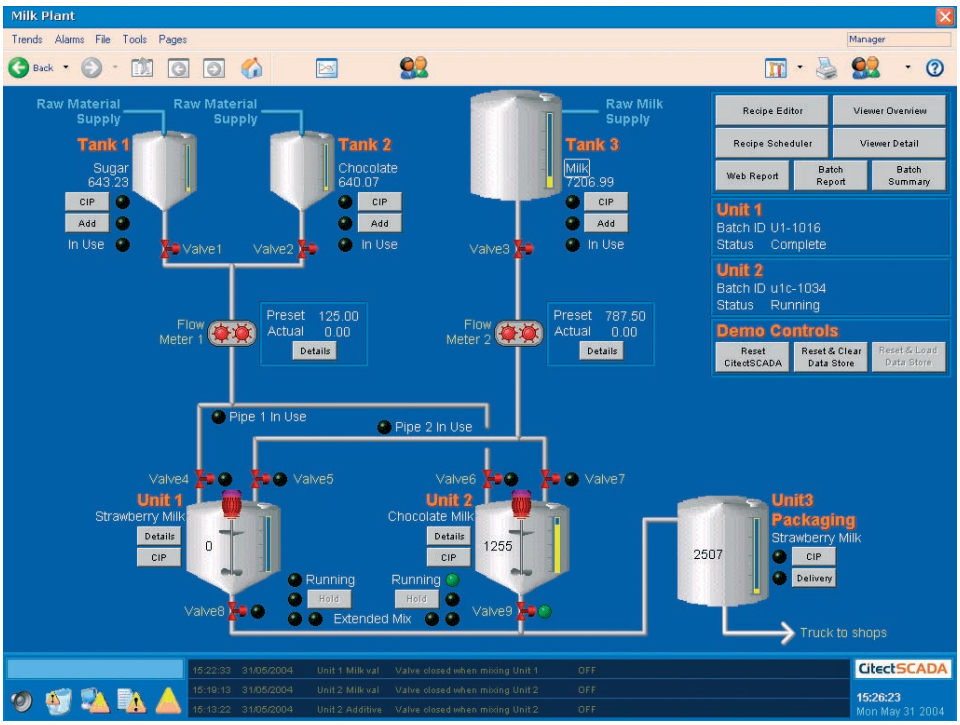
NOTE: For Event Scheduling you can use CitectSCADA Events (see page 42).

CitectSCADA Batch

"CitectSCADA Batch increases the efficiency of our plants and ensures a continuously high quality of manufacturing. [It] offers the required flexibility in order to meet all demands concerning a user-friendly operation as well as GMP-compliant documentation"

Klaus Maiwald,
Production Management,
Beiersdorf AG – CPG, Berlin

CitectSCADA Batch enables customers to lower their Total Cost of Ownership (TCO) by delivering a highly flexible, scalable batch management solution to increase productivity and achieve consistent high quality. Providing unrivalled reliability, this easy-to-use offering integrates tightly with existing systems and facilitates compliance with international regulations.



TOP: Example of a typical batch system for the food and beverage industry.

With customers demanding you keep costs down and quality high, CitectSCADA Batch is the all-in-one solution of choice to optimize your production process efficiencies whilst increasing your competitive advantage.

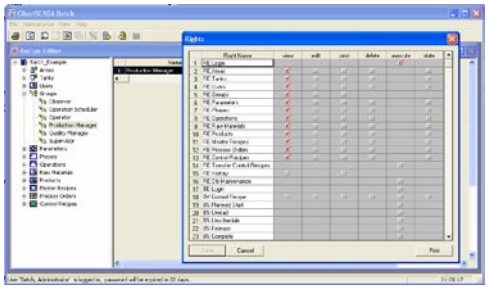
A fully integrated module, CitectSCADA Batch's design is centered on reliability with multi-level, hardware independent redundancy to ensure continuous production. With exceptional reporting, control and visualization capabilities specific to the needs of the food and beverage, pharmaceuticals and chemicals industries, CitectSCADA Batch controls and documents all automatic actions and manual operations prescribed by the Batch Recipe Editor in accordance with international regulations.

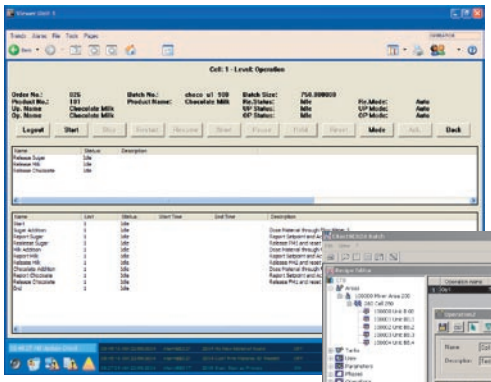
RANGE OF FUNCTIONS

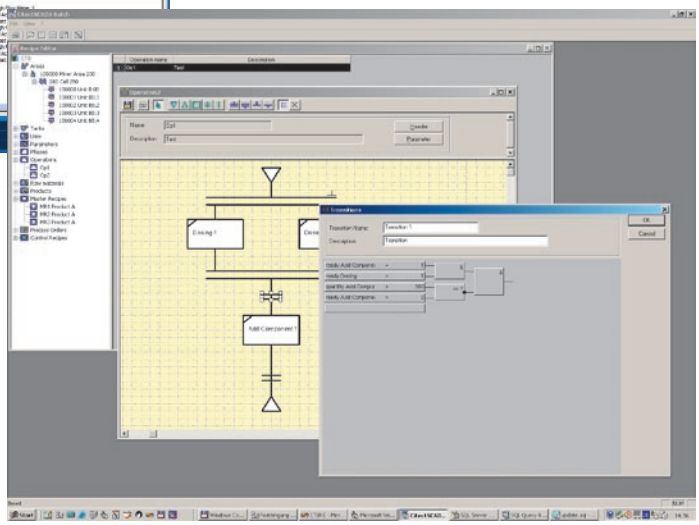
CitectSCADA Batch supports a full range of functions for compliance: configuration, documentation, batch execution and batch reporting:

- Define and manage plant equipment
- Define and organize Master Recipes
- Organize production orders
- Schedule and control batch recipe execution
- Processing of the batch order in accordance with manufacturing instructions
- Control of process parameters related to the plant
- Tracking of lot numbers and quantities in accordance with GMP
- Automatic documentation of the manufacturing in accordance with the GMP
- Electronic record, electronic signatures and audit trailing in accordance with FDA
- Management of up to 99 simultaneous batches
- Unlimited number of process phases per recipe
- Parallel processing of operations in similar process phases with no limitations
- Multi-language capability

RIGHT: CitectSCADA Batch facilitates compliance with FDA 21 CFR Part 11.







TOP: The Batch viewer will help you manage production schedules and ensure they are on time from any CitectSCADA PC on your network.

RIGHT: The Batch Recipe Editor makes it easy to configure your master recipes.

INCREASE PRODUCTIVITY AND QUALITY WHILST ACHIEVING SIGNIFICANT COST SAVING

With the market demanding faster deliveries, lower prices and higher quality, you need a flexible and reliable batch management system that is consistent with ISA S88 and facilitates compliance with regulations such as the US Food and Drug Administration (FDA) 21 CFR Part 11.

ISA S88

The S88 standard defines an "industry best practice," which outlines terminology, data structures and models for the Batch industries.

GMP

GMP aims to assist companies such as those in the food and beverage and healthcare industries, to improve process efficiencies leading to improved quality. As part of GAMP 4, it assists companies to achieve validated and compliant computer automated systems.

FDA 21 CFR PART 11

The set of regulations known as FDA 21 CFR Part 11 defines the guidelines for recording and managing electronic data. It also describes the criteria under which an electronic signature can be regarded as reliable and the equivalent of a hand-written signature.

The intent of the FDA regulations is to protect consumers from fluctuating quality, or manufacturing mishaps. This is achieved by ensuring no changes are introduced to a production process without appropriate authorization.

Switch2Citect

DO YOU HAVE ANY OF THE FOLLOWING PAINS?

"The cost of maintaining our system is becoming more expensive every year"

"Our legacy system doesn't meet the needs of our business anymore. It doesn't add value!"

"Our original system provider has abandoned us and left us with a system which is unsupported and outdated"

"We have multiple control systems, some of which are unsupported."

CITECT CAN HELP YOU!

If you can relate to any of the above, Citect can help. Contact your local Citect representative today and ask them about Switch2Citect.

www.citect.com/switch2citect

Switch2Citect is an automated conversion tool that allows customers to simply and reliably upgrade their legacy control systems to CitectSCADA. This reduces their Total Cost of Ownership (TCO) by minimizing conversion and ongoing maintenance costs. It also provides opportunities to take advantage of the latest technologies to improve productivity at their plant.

At present Switch2Citect can transform around 50% of the world's installed HMI/SCADA systems including:

- Fix32 and iFix (Intellution)
- InTouch (Wonderware)
- FactoryLink (USData)

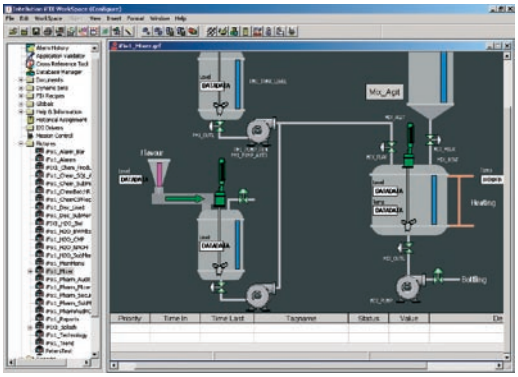
Switch2Citect automates about 75% of the manual tasks required to develop a display by hand. This results in approximately 25% of the cost, 15% of the manpower and 50% of elapsed time of a traditional manual conversion.

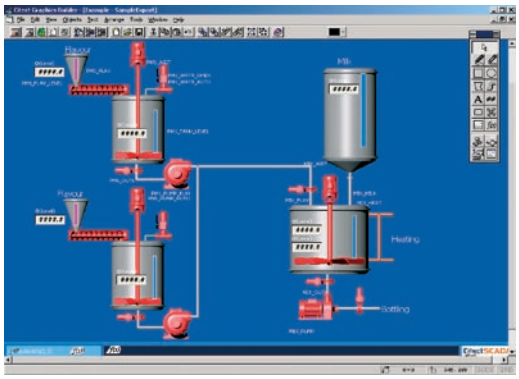
HOW DOES IT WORK?

Switch2Citect reads the configuration of the legacy control system into an intermediate format that allows the user to define what elements of the system are converted and how they are converted. Switch2Citect also upgrades the configuration or tag database directly into CitectSCADA.

Graphics pages from the legacy system are converted into the individual elements (text, line, bar graph, trend, etc) by Switch2Citect so they can be directly exported to CitectSCADA, where they will look and operate the same as the original graphic.

Switch2Citect is able to link any graphical element or group of elements with a single CitectSCADA genie. The mapping process allows the original attributes to be combined or modified before being used as a CitectSCADA genie parameter. This provides the operator with an enhanced user interface.





Switch2Citect is able to link any graphical element or group of elements with a single CitectSCADA genie. The mapping process allows the original attributes to be combined or modified before being used as a CitectSCADA genie parameter.

Software Licensing

Every CitectSCADA package you buy has all the features and protocols/device drivers included. CitectSCADA's no-nonsense licensing scheme allows you to choose an appropriate package to match your system, providing you with maximum value for money.

CitectSCADA's licensing is based on the number of computers that will be running CitectSCADA at once, not the number of computers with CitectSCADA installed. So, if CitectSCADA is installed on 100 computers, but no more than 15 run it at any one time, you only need 15 licenses.

The price of each license is determined by a number of factors:

POINT COUNT AND LIMIT

A point is an individual digital or integer variable, read from an I/O device. CitectSCADA only counts points from the I/O device once, no matter how many times they are used in your project. You get memory, disk, and Cicode variables free of charge.

The point limit is the maximum number of I/O device addresses that can be read. CitectSCADA caters for any point limit — 75, 150, 500, 1500, 5000 …unlimited.

COMPUTER ROLE

In networked applications, not all CitectSCADA tasks are used on each computer. Since you should not have to pay for what you do not use, you have the option to purchase Display and Manager Client licenses instead of a full license. A computer with a Display Client license is able to perform all operator interface functions and exchange data with servers, but it cannot be a CitectSCADA server. A computer with a Manager Client license provides read only displays — perfect for just monitoring a process.

SINGLE VS MULTI-USER

CitectSCADA licenses can be supplied as single user or multi-user. Multi-user licenses allow anyone on the LAN or WAN to run a session of CitectSCADA. This means you can use any PC to run CitectSCADA without having to install a software or hardware protection key on every PC. It also means you can access any information from any computer.

CITECTSCADA REPORTS LICENSING

CitectSCADA Reports is licensed by the following core components:

- CitectSCADA Reports Server
- CitectSCADA Historian by number of historized points (optional)
- CitectSCADA Historian Client (optional)

You can extend the CitectSCADA Reports Server at any time by purchasing add-ons, including:

- CitectSCADA Reports Web Server / Client
- Oracle database connectors
- Microsoft SQL Server connectors
- Wonderware InTouch connectors
- Intellution FIX32/iFIX connectors

AT A GLANCE...

- Concurrent licensing
- Manager Clients
- Hardware or Software protection keys
- Internal Variable Tags – free

If you want to try CitectSCADA for yourself, you can obtain a fully functional evaluation pack from your distributor for a small fee, (to handle printing and shipping costs), or download it from our website at www.citect.com.

The evaluation pack is exactly the same as a licensed pack, (including the software and manuals), but projects will run for a limited time only.

The configuration environment, on the other hand, can be utilized for as long as you want. Feel free to use the evaluation pack to build a trial project — to test the runtime and communication capabilities of CitectSCADA as introduced in this document.

Ampla: Manufacturing Execution Systems

BENEFITS AT A GLANCE

Optimize production process efficiencies

Ampla allows you to 'drill down' into the detail of your plant's Key Performance Indicators so you can take considered and prioritized action.

Maximize Return On Assets (ROA)

A clearer picture on your plant's operations allow you to eliminate equipment downtime, unscheduled maintenance and process bottlenecks whilst improving overall equipment effectiveness, speeding up time-to-market and streamlining schedules.

Increase Return On Investment (ROI)

Each tightly-integrated analysis module provides fast, incremental and measurable information so you can make continuous improvements when you need them. Since modules can be deployed incrementally across a single common platform, associated costs are shared across all modules, decreasing capital expenditure and increasing Return on Investment (ROI). Significant ROI can be expected in six to 12 months.

Low Total Cost on Ownership (TCO)

Each module resides on the same tree hierarchy and runs on a single real-time platform, saving you the time and costs of rework in the configuration and deployment of multiple modules. Based on the Microsoft Windows format, the system requires minimum training to use effectively and enables customers to continuously extend and refine their system.

Ampla is a highly scalable MES solution that drives the effective planning, operation and improvement of production operations. Supporting continuous improvement methodologies like Lean and Six Sigma, and integrating with plant and business systems, Ampla delivers fast ROI and sustainable plant performance improvements.

This is achieved by processing, analyzing and presenting important real-time intelligence from across the business. This allows corporate, IT, plant and production managers to make faster and better decisions based on accurate and current information.

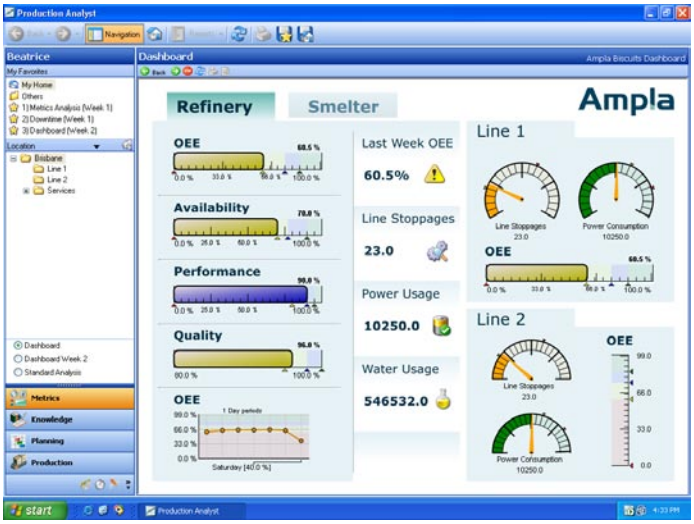
Citect's non-invasive, low-risk modular approach leverages open technologies and complements existing automation and IT systems, delivering fast and high return on investment (ROI), with a low total cost of ownership (TCO).

The result of close collaboration with customers across a wide range of industries worldwide, Ampla is a unique suite of customizable analysis modules which target specific areas for business improvement.

Ampla connects to multiple plant and business systems, collects the relevant data and presents it as easy-to-understand, real-time intelligence for productivity analysis, data mining, querying and reporting.

Managers can dynamically select the information they need to take prioritized action and make continuous production efficiency improvements. For example, decision-makers can 'drill-down' through the production hierarchy to identify bottlenecks to production, inhibitors to quality and root causes of delays.

Furthermore Ampla connects seamlessly to CitectSCADA to transform plant-level technical data to information for planning, operating and informing at the operations management level.



LEFT: Dashboard delivery of data allows extremely fast overviews of various production aspects, customized for each individual user's needs, throughout the enterprise.

Meta: Performance Benchmarking, On-demand

Meta, developed by Citect, is an innovative benchmarking service that allows you and your managers to benchmark a balanced range of performance, financial and operational Key Performance Indicators (KPI's) across a variety of levels, locations, divisions and/or countries.

Through the service you are able to identify best practices, initiate performance improvements and improve capital allocation by providing graphical on-demand access to operational performance.

Meta provides you real-time intelligence by sharing KPI information between corporate offices and those personnel responsible for reporting growth, performance and other business critical parameters.

Most importantly, everyone in the decision making process will have a single consistent version of the information to enable informed action.

By regularly monitoring performance you can drive growth, profitability and sustainability. On-demand access to this information allows you to effectively leverage your teams' knowledge and empowers you to make the best decision for your organization.

Sharing capabilities and information across departments, divisions, branches, regions or countries is a challenge for any organization. Meta allows effective knowledge sharing by bringing together the accurate information from different locations.

Enterprise benchmarking is essential to corporate profitability and the efficient allocation of capital. Meta harnesses the power of the internet to enable you and your team to have fast, secure access to the KPI's and reliable data required.

A business' performance is only as good as its people and their ability to make informative decisions. Providing your people with the best tools to make these decisions is essential when dealing with the bottom line. Meta works by providing essential information towards performance and continuous improvement through such features as:

Dashboards	Analytics	Initiatives
Reporting	Role-Based & Asset-Based Security	
Favourites	Custom Time Periods	Forecasting
Custom Timing	Enhanced Charting Functionality	

Meta facilitates benchmarking through a suite of tools specifically designed to increase performance and overall competitiveness.

EMPOWER YOUR STAKEHOLDERS

Corporate Executives: Meta provides accurate and comparable information designed to identify business critical best practices and investment opportunities.

Managers: Visibility into the performance and improvement initiatives across the organization is essential to be an effective manager. Meta uncovers problems that slow progress and show you where attention is required.

All Users: Meta facilitates responsive decision making at all levels, presents answers to critical business questions without sifting through reams of data and allows for immediate comparison of past and present performance measures.

Services, like Meta, that fit the SaaS model, eliminate the risks of obsolescence that lends itself to traditional software and provides access to immediate functionality. Meta strives to deliver the highest level of service at the lowest cost to provide a superior SaaS offering to our customers.

Citect offers you the opportunity to test Meta and experience the advantages that your organization can benefit through a variety of ways. For further information on an unsurpassed opportunity to empower your organization contact Citect directly or visit www.citect.com/meta.

Meta – Better Performance through Benchmarking!

Citect Support

MULTI-LEVEL SUPPORT SERVICES

Gold, GoldPlus and Platinum Maintenance and Support Agreements are available to purchase with your Citect software. These are all annual contracts and you can choose which offering best suits the needs of your organization.

Citect Support provides a formal structure of application software support services designed to optimize your investment in Citect technology.

SUPPORT CENTER PRACTICES (SCP) CERTIFICATION

The Citect Global Support Centre, Sydney, Australia is SCP certified so you can be assured of the quality service you will receive. SCP Certification quantifies the effectiveness of customer support based upon a stringent set of performance standards and represents best practices in the industry.

CITECT SUPPORT SERVICES

A range of direct and self-help technical assistance options allow you to maintain optimum performance from your Citect software, whilst automatic product updates keep you at the forefront of technological advancements.

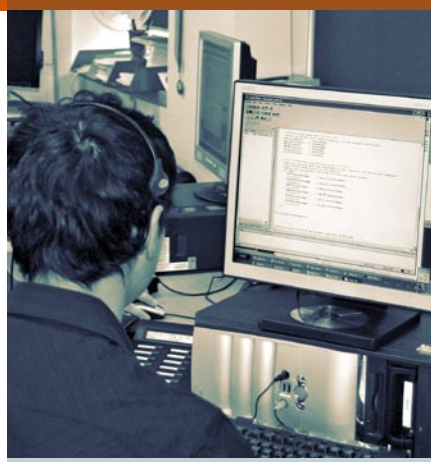
Citect Maintenance and Support Agreements cover all Citect software as well as Standard Drivers. Specialty Driver Support is required for the following licensed drivers: Bailey, DNPr, IEC870-5-104, Moscad, SemAPI and Teleperm. Specialty Driver Support is an add-on support service to Citect's Gold, GoldPlus and Platinum Support Agreements.

Features	Gold	GoldPlus	Platinum
Direct Access Support	•	•	•
Additional Support	•	•	•
Online Support Tools	•	•	•
Product Upgrades, Driver Upgrades, Service Packs	•	•	•
Emergency Support Fixes and Patches	•	•	•
Customer Service Request (CSR) Escalation	•	•	•
Priority Telephone Support	**Event Cover Option** Subject to an additional fee	•	•
Priority Response Commitment		•	•
Priority Customer Service Request (CSR) Escalation		•	•
Pre-Service Telephone Audit		•	•
Site Champion		•	•
Platinum Support Specialist (PSS)			•
Quarterly Review Meetings			•
Emergency Hardware Key			•
Upgrade Planning Assistance			•
Annual System Performance Review			•
Security Advisory Service			•
Platinum Support Webinars			•
Quarterly Support Services Usage Report			•
Customized Support Services			Subject to an additional fee
Specialty Driver Support	Subject to an additional fee	Subject to an additional fee	Subject to an additional fee
Fee – Annual Contract for Single Site	**15% of License** Min fee applies	**20% of License** Min fee applies	**24% of License** Min fee applies

Enterprise Support

Global Enterprise Support Agreements can be set up to include any of Citect's Support services. An Enterprise Support Agreement ensures a single point of management; common commercial terms and annual purchasing price reviews; multiple global sites are covered and additional sites can be covered at any time during the Support Agreement subject to a fee.

CSR Resolution



CUSTOMER SERVICE REQUESTS (CSRs)

Citect's centralized Support ensures all logged Customer Service Requests (CSRs) follow the CSR Escalation Model. A fully documented procedure, this model ensures all calls have a clear path to resolution, giving you updates at every stage. CSRs can be logged by telephone, web portal, fax and email. The recent addition of a web portal service allows you to manage, update and monitor the progress of your CSRs via the Internet.

VIRTUAL ENGINEER

Virtual Engineer allows a Citect Support Engineer to securely connect to a Citect system anywhere in the world and cost effectively locate the cause of your issue. Improved response and resolution times have been documented since the implementation of this industry-standard authentication technology. This means your issues are dealt with quickly, minimizing any disruption to your business.

Priority escalation for GoldPlus and Platinum customers	STAGE 1 0 to 15 mins	STAGE 2 15 mins to 2 hours	STAGE 3	STAGE 4	STAGE 5
Global S-Business General Manager (GM)					
Global S-Business Technical Services Manager (TSM) / Ampla (Level 3-4) / Support Programmers					
Global S-Business Customer Support Manager (CSM)					
Global S-Business Senior Support Engineer (SSE)					
Global Support Engineer (SE)					

Citect Educational Services

Custom Training

WHEN AND WHERE YOU NEED IT!

Run a Citect training course onsite at your premises or at your chosen location, allowing your organization to train more employees and save travel time and expenses.

Citect Educational Services offers a suite of programs and courses designed for end users, engineers, system integrators, technical colleges, universities and educational establishments. Our courses provide you with hands-on experience, leaving you feeling confident to design and configure your own systems whilst our programs are designed to facilitate the latest education and application of Citect software.

Courses include instructor led, online and onsite offerings for the suite of Citect software and related complementary software products. Courses include configuration and programming courses, update courses, and introductory courses for CitectHMI/SCADA, CitectSCADA Reports, Nexa and Ampla solutions.

Programs include the **Citect Educational Center Program** which regulates the standard of Citect courses. The **Citect Academic Program** provides tertiary institutions with access to world class courseware to use in conjunction with their degree and diploma courses in related fields. The **Citect Certified Engineer (CCE) Program** recognizes engineers skilled in the integration of Citect-based automation projects. To become a Citect Certified SCADA Engineer (CCSE), there are four exam elements that must be achieved: Configuration, Cicode, Networking and Design.

Our educational methodology has been proven effective through thousands of hours of instruction. Feedback received from customers confirms our success and drives continuous development in services offerings. We have implemented a guided stream of learning that facilitates progression from basic through to advanced knowledge of all Citect products.

For more information, visit www.citect.com/education

BOOK A TRAINING COURSE

All Citect courses can be booked at www.citect.com/education

AVAILABLE COURSES

CitectHMI/SCADA Configuration

Gain insight into CitectSCADA project design and become familiar with configuration techniques. This interactive course includes practise with plant control, data collection, trending and reporting.

Cicode Programming

Learn about basic programming techniques using the Cicode programming language in this interactive course. This course is aimed at the user who has had no programming experience. It is also useful for the experienced user who wishes to become familiar with Cicode.

CitectHMI/SCADA Upgrade

Receive an upgrade to CitectSCADA project design and configuration techniques, and view the newest product features.

CitectSCADA Reports

CitectSCADA Reports is a tool that takes information gathered from your SCADA system and makes it available for display in industry standard applications. This course is designed for engineers who wish to configure and maintain a CitectSCADA Reports project and managers who wish to analyze the data in the client tools.

Ampla Performance

Gain insight into Ampla project design and become familiar with configuration techniques. This "hands-on" course includes practise with the modules Production, Downtime and Metrics.

Ampla Performance Client

Users will learn the basics of Improvement Methodologies, why Ampla is being implemented and how Ampla will help them. Operators will be able to enter data into records. Mangers will be able to practise using the client analysis tools. This "hands-on" course includes practise with the modules Production, Downtime and Metrics.

CitectSCADA Networking and Architecture

Gain advanced skills including knowledge of the principles behind networking in CitectSCADA, such as how CitectSCADA uses a network, redundancy and distributed servers. Learn more about the Citect Kernel and connecting to CitectSCADA remotely through the Web Client and CitectSCADA Pocket.

CitectSCADA Customization and Design

This interactive course will give you insight into the principles behind customizing CitectSCADA. You will be using different programming techniques including Cicode and VBA. In addition, you will learn about the Citect Kernel and exchanging data between CitectSCADA and other applications such as Microsoft Access and Excel.

Citect Professional Services

Citect Professional Services provide engineering design, technology implementation, consulting and process improvement services to deliver fully functional solutions. From inception through implementation Citect Professional Services is committed to delivering solutions that provide customers with results aligned to their business requirements.

Citect prides itself on being able to provide our customers with industry specific skills and tools. By capitalizing on our deep vertical domain experience, Citect Professional Services is able to offer higher value solutions that minimize risk and lower delivery costs.

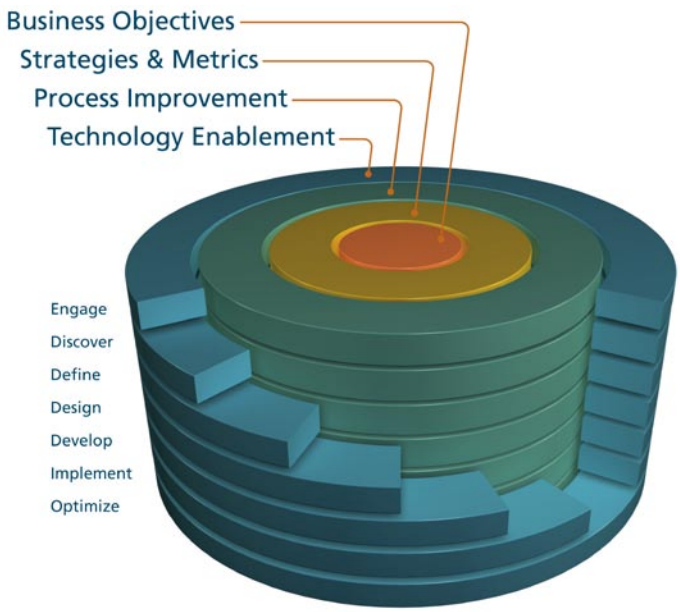
Our proven AdvantageOne methodology, global skills and vertical expertise allow Citect Professional Services to focus on achieving sustainable business outcomes and a rapid, measurable return on investment for your business.

In addition to the scale and breadth of our services and capabilities within the organization, Citect has a global network of closely aligned partners that enables a diverse team of professionals to be mobilized for both long and short term engagements, for existing or new client projects, from small projects right through to turn-key solutions.

ADVANTAGEONE

AdvantageOne is Citect's proven delivery methodology that takes a strategic and comprehensive approach to implementing solutions. AdvantageOne is focused on maximizing solution acceptance and business return.

AdvantageOne is the culmination of standards and tools from Citect's 30 years experience in delivering Industrial Automation and MES solutions. It draws on numerous industry standard frameworks such as PMBOK, Lean, SixSigma and ISA-95. AdvantageOne delivers Citect customers with a "best-of-breed" approach that aligns with each customer's specific standards and methodology of choice.



Businesses today know that implementing technology alone will not deliver substantial positive results. For this reason, Citect Professional Services takes a balanced approach by considering the business, cultural and technical aspects of an implementation.

From small projects through to turn-key solutions, AdvantageOne is applied to all aspects, including:

- Electrical & Control Systems Design
- Electrical and P&ID Drafting
- Component Supply and Development
- Factory & Site Acceptance Testing
- Commissioning & Handover
- Management and Maintenance

AdvantageOne focuses on aligning the implementation with the overall objectives of the organization. This is done by clarifying and defining:

- Business objectives
- Strategies and metrics
- Process improvement
- Technology enablement.

Features

ARCHITECTURE

Scalable

- Configuration free system growth
- Unlimited project size
- 255 simultaneous connected clients
- LAN / WAN Support
- Web ready without configuration
- Support for low bandwidth operation
- Support for multiple active cluster systems

Flexible

- True Exception reporting
- Client/Server Architecture
- Alarm, Trend and Report Servers scalable across any machine configurations
- Project files centralized for maintenance, distributed for remote sites or a mix of both
- Changes in a single location

Reliable

- Built-in Primary/Standby level
  - File Server Redundancy
  - LAN Redundancy
  - Alarms Server Redundancy
  - Trend Server Redundancy
  - Report Server Redundancy
- Multi-level I/O server Redundancy
- Support for full reliability at local control panels
- Automatic server swap
- Automatic trend history synchronization
- Automatic alarm table synchronization
- Automatic time synchronization
- Secure
- Automatic restart upon system failure

Performance

- Maintain performance regardless of size
- Low CPU and Memory requirements
- Low network utilization
- Multi-CPU Support

Security

- Based on individual users as well as groups of users
- 250 simultaneous logged in users
- Unlimited number of user names definable
- Definable area and privilege profile per user name

I/O COMMUNICATIONS

Connectivity

- Support for open standards
- Multiple protocols per I/O server
- Drivers work on RS232, 422, 485, TCP/IP
- Driver setup in 60s
- 255 simultaneous connected clients
- 4096 I/O devices per system
- Dial-In/Out support for remote devices
- Driver Development Kit for custom protocols
- OPC Server DA2.0 support
- Integrated XML web service

Access

- Drivers at no additional cost
- Driver Web contains latest version
- Driver update to maintain up-to-date drivers

Performance

- Dynamic optimization of all drivers
- Data read on-demand
- 100,000 integers per second update from an I/O device

TAGS

- Unlimited number of tags
- 80 Character Tag Name
- Support for quality and time-stamped on relevant drivers

FastLinx

- Single database solution for PLC and SCADA
- Bi-direction synchronization with PLC development environment
- Static synchronization for offline development

Import

- Automatic importation and synchronization
- Import from multiple PLC types
- Add user defined importation schema

GRAPHICS

Development

- Unlimited screens
- True Color screens
- Easy pick color selector with names colors
- Transparent color support
- Advanced animations without coding
- Animation of symbols sets based on tag data
- 32,000 animations per page
- Unlimited Flashing Colors
- Support for multiple languages
- 3D pipe tool
- 3D effects (raise, lower, emboss)
- Import graphics
  - Windows Bitmap (BMP, RLE, DIB)
  - AutoCad (DXF)
  - Encapsulated Postscript (EPS)
  - Fax Image (FAX)
  - Ventura (IMG)
  - JPEG (JPG, JIF, JFF, JFE)
  - Photo CD (PCD)
  - PaintBrush (PCX)
  - Portable Network Graphics (PNG)
  - Targa (TGA)
  - Tagged Image Format (TIFF)
  - Windows Meta File (WMF)
  - Word Perfect (WPG)
- Unlimited undo
- Windows XP-style buttons with dynamic movement properties

Templates

- Over 70 templates in multiple styles and at multiple resolutions are provided
- Templates are extensible in the graphics builder
- Templates can contain animations
- Changes in templates are replicated to all pages
- Templates are transportable between projects

Symbols

- Over 800 symbols provided
- User defined symbols can be developed in the graphics builder
- Symbols can contain animations
- Changes in symbols are updated to all instances
- Symbols are transportable between projects

Object-based Configuration

- Unlimited number of objects defined as Genies and Super Genies
- User defined Genies enable user defined plant equipment to be placed on the screen
- User defined Super Genies enable a single user interface for multiple devices
- Genies and Super Genies can accommodate variations in the device tags without needing further development

Runtime

- 4096 x 4096 resolution
- Resizable screens (Isotropic and Anisotropic)
- Multi-monitor support
- Page selectable update times (min 10ms)
- Communication loss display
- Runtime language swapping
- Support for single and double byte character sets

Security

Security level can control:

- Visibility of objects
- Access to graphic displays
- Acknowledge of alarms
- Running of reports
- System utilities

OPERATIONS

Controls

- Touch commands
- Mouse over detection
- Keyboard commands of system, page or animation level
- Sliders in one or two dimensions
- DatabaseExchange

Process Analyst

- Combine alarm and trend data
- 32+ pens
- 4+ panes
- 2+ cursors
- Stacked or Overlaid pens
- Display of data quality
- Analogue and Digital Pens
- Alarm Acknowledge displayed
- Alarm Description (analog and multi-digital)
- Alarm Comment display
- True Daylight Savings support
- Save views at runtime
- Views stored in redundant locations
- Display different time periods on the same display
- Customizable and Extensible controls

Alarms

- Unlimited number of alarms
- Centralized processing of alarms. Alarms can be defined as:
  - Digital
  - Analog
  - Time-stamped
  - High level expression
  - Multi-Digital
  - Time-stamped digital
  - Time-stamped analog
- On-line change of language for all alarms
- Network acknowledge without configuration
- Network disable without configuration
- Category, area and priority of alarms
- Alarm Delay
- 1ms precision of time stamped alarms
- Variable data in alarm messages
- Acknowledge individually or in group
- Acknowledge based on category or priority
- Acknowledge graphically, in alarm list or through Cicode
- Alarm sorting
- Alarm filtering
- Custom alarm fields

Trending

- Unlimited number of trends
- 16,000 trends per page
- Display any historical trend in less than 1 sec
- Control of trend file sizes
- View archived trends transparently in the running trend system
- Resolution user selectable from 1ms 2
- Compare trends
- Instant trends on any tag
- Event or periodic storage

SPC

- Cp and CpK Charts
- X, R and S Charts
- Pareto Charts
- Adjustable subgroup size and limits
- Alarms on the following Above UCL, Below LCL, Outside CL, Down Trend, Up Trend, Erratic, Gradual Down, Gradual Up, Mixture, Outside WL, Freak, Stratification and High Level expression

Reports

- Native report editor, WYSIWYN reports, Rich Text reports

Triggered by: Time Schedule, External Event, High Level Expression, Operator Input

Output to: Printer, File, Email, Screen, HTML

CONFIGURATION

Project Development

- Any size project
- Divisible into include projects
- Easy standards definition
- Easy project maintenance
- Computer Setup Editor to configure each PC in network

Code

- True preemptive and multitasking
- Up to 512 concurrent threads
- More than 600 SCADA functions provided
- Libraries for user-written functions
- Capable of more than 4,500 user functions
- Local, module and global variables
- No additional software required to write own functions
- Direct access to trend data, report values and alarm details
- Syntax coloring
- Online Help functionality
- Quick help as 'tool tip'
- Editor with:
  - Runtime breakpoints
  - Variable watch
  - Thread monitoring
  - Colorcoding
  - Breakpoints window
  - Single stepping
  - Current line indication
  - Remote debugging (NT only)
  - Automatic debug on error

SECURITY

- Project level Windows integrated security

DATA EXCHANGE

- OPC Server and Client
- ODBC
- OLE-DB
- CTAPI
- DLL
- MAPI (MAIL)
- TCP/IP
- SERIAL

SUPPORTED MANUFACTURERS

ABB
ABB Instrumentation
Action Controls
Advantech
Air Liquide*
Allen Bradley
Ampcontrol
Anybus*
April
Aromat Corporation
Aspen Technology*
B&R Industrial
Baker Hughes
Barber Coleman*
Beckhoff
Bosch
Bristol Babcock*
Busware*
Campbell Scientific Inc
Cegelec
Cimetrics
Clipsal
Colby Demag
Contemporary Control Systems
Contrec Systems
Control Microsystems Inc.
Cutler Hammer*
Danfoss
Data Electronics
Detroit Diesel Corporation
Eberle
Echelon*
Elpro Technologies
Elsag Bailey
Emerson
Engage Networks
Enron
Eurotherm International
Facon
Fischer & Porter
Fisher
Fisher and Paykel
Fisher Rosemount Systems*
Fluke
Foxboro*
Fuji Electric
Gantner
GE
GE Fanuc
GEC
GEC Alsthom
Generic devices
Harris Controls
Hewlett Packard
Hima Gmbh
Hitachi
Honeywell
Idec Izumi
Intech (NZ)
Intuitive Technologies (@aGlance)*
Johnson Controls
Kaye Instruments Inc
Keyence
LG Industrial Systems
Matsushita
Mauell
Mettler Toledo*
Mitsubishi
Moeller
Moore Industries
Moore Products
Motorola
MOX Products
MTL Instruments
National Instruments
Nematron
NJ International
Omnitronics
Omron
Optimation Optilogic*
Opto 22
Philips*
Phoenix Contact
PLC Direct (Koyo)
Preferred Instrumens
Reliance Electric
Rockwell Automation
Rosemount
RTP
SAAB
SAIA
Samsung
Satt Control
Schlage Electronics
Schlaps & Partner
Schneider Electric
Serck
Siemens
Sisco
SIXNET
Softing AG
Sprecher & Schuh
Square D
Steeplechase
Telefrang
Telemecanique
Thermo Westronics*
Tibco*
Toshiba
Transmitton
Triconex Corporation
Unidata
Universal Instruments Corporation
Valmet*
Vikingegaarden
VIPA
Wago*
Weidmuller
West Instruments*
Westinghouse
Willowglen
Woojin
Yaskawa*
Yokogawa
ZWorld

BACNET

Ascii
BacNet*
DNP 3.0
EIB
IEC870-5
Modbus
OPC
Profibus
SNMP

NOTE: *Supported by using OPC.
The list is valid at the time of printing, for up-to-date list of all supported manufacturers and devices, visit the DriverWeb – the gateway for accessing information about drivers available to CitectSCADA (www.citect.com/driverweb).

For more information visit **www.citect.com**

OCEANIA +61 2 9496 7300, AFRICA +27 11 699 6600, FRANCE +33 47 215 8450, GERMANY +49 81 61 872916, GREATER CHINA +86 21 6886 3799, INDIA +22 4017 0053, JAPAN +81 3 5821 1124, LATIN AMERICA +1 770 521 7511, MIDDLE EAST +31 71 576 1550, NETHERLANDS +31 71 576 1550, NORTH AMERICA +1 770 521 7511, NORTH ASIA +65 6482 2212, SOUTH EAST ASIA +65 6482 2212, UK +44 1675 466658

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Real-time Intelligence