SCADA Expert ClearSCADA 2015 R1
New Features

Ease of Use

Template Expressions & Simplified Property Management

Management of Templates and their Instances has been enhanced in ClearSCADA 2015 R1 to provide a dedicated interface for the configuration of all instance-controlled properties of a template, allowing for centralized management of overridden properties for template instances.

Template Property Overrides have also been expanded to include the option to define an expression that calculates the value of objects’ properties. Object properties within instances can now be configured in one of three ways:

1. Existing: controlled by the template
2. Existing: property overridden to allow for manual configuration by the user within each instance, or
3. New: tied to an expression within the template which would automatically calculate the property value for a new instance (or on modification of the expression’s parameter(s), the template or the expression)

As a result, properties within objects can now be determined from an expression centrally managed across the template and instance. Possible applications of the expression include:

1. Calculation of an ‘Address’ field from a configurable Base Address parameter plus an Offset. Adjustment of the Base Address parameter for a template instance would automatically update the Address of all its points that are derived from this calculation.
2. Configuration of common Point Scaling, Alarm State Descriptions, Units, Formatting etc across many points, allowing for central management of these attributes across an entire instance.
New WebX User Interface

A new WebX User Interface has been developed for ClearSCADA 2015 R1, delivering enhanced functionality and increased efficiency for web-based operators. The following core features of the ViewX User Interface have been incorporated into the new WebX client:

- Database Explorer navigational bar
- Alarm Banner, including direct access to Acknowledge, Disable Alarm, View Status, Locate in Database Explorer, and more
  - Alarm count summary is shown when banner is hidden
- Enhanced Logon/off experience including ability to reset password
- Direct access to object functions including ad-hoc lists & trends, point controls, notes, and context-sensitive Alarms and Events lists.

The new WebX User Interface is accessible from an HTML5 browser and provides support for viewing of Trends, Alarm Lists, Event Lists, and Queries from a variety of phones, tablets or laptops.

An enhanced experience is provided when users connect via Internet Explorer providing access to view ClearSCADA Mimics and other graphical documents including XY Plots, XYZ Plots and Dynagraphs.

Original WebX has been maintained for customers who prefer the classic ClearSCADA Web user experience, and can be reinstated via a simple configuration option. Similarly, both the new and classic WebX Interfaces can be configured to run in parallel to allow users to evaluate the new interface and migrate across as they choose.
Dictionary Translations Incorporated into Database

An important existing feature of ClearSCADA is the support for internationalization within ClearSCADA applications, which is used for user-specific translation of mimic elements, allowing individual ClearSCADA users to customize the language translation of mimics when they are displayed.

ClearSCADA 2015 R1 allows for the management of this internationalization to be transferred from an external dictionary file stored separately on each ClearSCADA server into the database root node, which provides centralized management of dictionary files across all partnered servers.

A new database table, called DBDictionary, has been created to store the translation strings for each dictionary language as required by the user. Each entry within this table specifies the Dictionary Name (or Language), a Search String, a Replacement String, and an optional Comment. When configured, users who have their Locale set to match one of the Dictionary Languages would see the Replacement String used in place of a Search String if it were to appear on a mimic.

**Note:** Enabling the dictionary functionality as described above will disable translation using any existing Dictionary Files. In this case, migration of these existing files to the new dictionary table is necessary to provide continued translation.

**Note:** Translation of strings using the string dictionary only works for whole strings. Strings on mimics cannot be built from multiple translated strings. A new “translate()” function has been created for use within server expressions, client expressions, scripting and SQL syntax to allow multiple separate strings to be translated and concatenated together. An example mimic text animation could include:

Translate('@This section of string is translated') + ' but this section is not.'
Telemetry Connectivity & Device Integration

SCADAPack Realflo Liquids (first available in ClearSCADA 2014 R1.1)

Realflo Liquids is an extension to the existing Realflo product release and adds new functionality for flow computation of Liquid Hydrocarbons such as oil, condensates, and natural gas liquids (NGLs) to the existing application. The intended application focus is upstream, on-shore applications including measurement for allocation or proration purposes and LACT (Lease Automated Custody Transfer). The new liquids functionality provides a flow computation platform on which additional upstream focused measurement applications can be built, such as Net Oil Computation (NOC), and Well Testing for allocation.

Functionality in this release includes basic Net Oil Computation (NOC) when using a water-cut meter with analog output, Inferred Water Cut Net Oil Computation for use with Coriolis meters, and batch measurement for well-test where the start & stop of batch measurement is determined by external input from the well test application, or an external controller.

ClearSCADA 2015 R1 includes support for Realflo Liquids, supporting Flow Runs for Water and Liquid (including Density and Water Cut measurement, and two-phase flow detection) in addition to the existing Gas Flow Runs. Existing Realflo functionality for Gas within ClearSCADA has been extended to Liquids and Water, including support for remote changes to configuration from ClearSCADA, plus configuration of the Coriolis Meter connection.

O&G Driver Suite

ClearSCADA 2015 R1 delivers a new range of O&G drivers to provide native connectivity to Emerson’s ROCPlus & FloBoss, and ABB’s TotalFlow range of Flow Computers.

These dedicated O&G drivers leverage ClearSCADA’s strengths, providing:

- Native connectivity, not requiring any external software or configuration
- Native support for ClearSCADA redundancy, including all redundant partnership scenarios (Main, Hot Standby, Permanent Standby, DMZ Permanent Standby)
- Access to both current (real-time) and historical (EFM) data from the Flow Computer, including import of Alarms and Events from the Flow Computer

The following ranges of EFM devices are supported:

- Emerson’s FloBoss (FloBoss103, FloBoss104, FloBoss107) Flow Computers
- Emerson’s ROC Plus (ROC809, ROC827) Flow Computers
- ABB’s Totalflow (6400, 6700, XSeries) Flow Computers
SCADAPack E Smart RTU Modbus Master/Slave Configuration

Enhanced functionality available in SCADAPack E RTU firmware version 8.12 (or above) allows users to directly configure a Modbus Master/Slave interface and mapping of data to/from DNP3 points without the need for IEC 61131-3 logic programming in the RTU. ClearSCADA 2015 R1 includes support for these newest enhancements, as described below.

Configuration of Modbus Slave Connection

The integration of the SCADAPack E Smart RTU configuration with ClearSCADA has been extended to support direct configuration of a connection between the RTU and a Modbus Slave device. A new "Modbus Slave Device" object has been created to store the connection parameters for this interface.

DNP3 SCADAPack E Points within ClearSCADA include a new "Modbus Master Scanner" Mapping option to connect the DNP3 Point within the RTU to the Modbus Slave device. Ports of the DNP3 SCADAPack E Outstations also include a new option for configuration as a "Modbus Master (Modbus RTU)" port.

Configuration of Modbus Master Connection

ClearSCADA 2015 R1 also supports direct configuration of the link between DNP3 SCADAPack E Points and points on a Modbus Master device.

DNP3 SCADAPack E Points within ClearSCADA include new “Modbus Register” and “Modbus Data Type” fields to allow direct configuration of their Modbus connection, supporting both a 5-digit and 6-digit addressing scheme as configured in the RTU.

The DNP3 SCADAPack E Outstations include a new “Modbus Register Address Mode” option for selection between “Legacy Mapping Mode” (which is the default mode for existing configuration, enabling functionality already available in previous firmware versions using the existing “32-Bit Point Modbus Map” object), or the new “5 Digit Addressing” and “6 Digit Addressing” options depending on the required address format.
Information Management

Connection to Wonderware System Platform

Wonderware® System Platform - now part of the Schneider Electric software portfolio - offers a gateway to operational excellence applications for workflow management, performance and big data analysis, operator training and simulation, and asset optimization. It also helps drive standards and allows you to centralize and standardize the management of your operations across multiple ClearSCADA installations, leveraging various features from System Platform.

ClearSCADA 2015 R1 includes an interface for System Platform users to remotely browse the ClearSCADA database tags, allowing easy integration of ClearSCADA’s real-time data and alarm information into System Platform/InTouch screens for display and/or alarm acknowledgement.

These interfaces are enabled as optional components that can be selected during the ClearSCADA installation.

Connection to Wonderware Historian

Wonderware Historian - now part of the Schneider Electric software portfolio - is a high-performance process historian, capable of storing large volumes of data generated from today's industrial facilities. Historian easily retrieves and securely delivers information to desktop or mobile devices, enabling organizations to analyze processes anywhere at any time.

A native interface between ClearSCADA 2015 R1 and Wonderware Historian has been created to facilitate the expansion of an existing ClearSCADA system to easily include a centralized enterprise Historian while continuing to capitalize on your existing software investment, enabling greater insight into your process with rich historical data capture and analysis tools.

The Wonderware Historian can be used to unify data from multiple ClearSCADA systems into a central enterprise repository, leveraging the redundancy features existing in both ClearSCADA and Wonderware Historian to provide high availability. The interface includes buffering of historical data locally at ClearSCADA to provide resilience against temporary communications failures without loss of data.

The interface is configured within a new “Wonderware Historian” object within ClearSCADA, supporting connections to both On Premise and Online variants, including options for data enabling compression and limiting bandwidth utilization. Individual ClearSCADA points can either opt-in or opt-out to export their historic data via this interface, so only the important data is published across a remote connection.
**Detailed Alarm Summary Information**

The alarming capabilities have been extended in ClearSCADA 2015 R1 to provide detailed Alarm Summary information to users. This summary integrates key information together including alarm transitions, responsible user(s) and any acknowledgement comments for simplified analysis.

The Alarm Summary is available via a context-sensitive Pick Menu option, meaning that it’s accessible from everywhere you need it including the Alarm Banner and Database Explorer. Like all other tabulated information within ClearSCADA, this can be easily exported via the clipboard or ODBC interfaces for integration into other applications.

**Integrated Calculation of Alarm Statistics**

Five new properties have been added to database Groups (including Instances) within ClearSCADA 2015 R1, to provide alarm roll-up calculations. These new properties are as follows:

- AlmSeverityActiveUnack (Active Unacknowledged Alarm)
- AlmSeverityActiveAck (Active Acknowledged Alarm)
- AlmSeverityClearedUnack (Cleared Unacknowledged Alarm)
- AlmSeverityDisabled (Disabled Alarm)
- AlmSeveritySuppressed (Suppressed Alarm)

These properties are dynamically updated when accessed and provide the highest severity (using a value of 1 – 1000) of alarm for each of the five scenarios shown above. These new properties can be referenced from mimics to facilitate creation of ASM (Abnormal Situation Management)-like displays according to user requirements.

For example, if the AlmSeverityActiveUnack property for a group is non-zero, this indicates there is an Unacknowledged Alarm on that group, and the value of the property can be used to animate a suitable alarm indicator. Furthermore, if there are no unacknowledged alarms a different indicator can be used to show that there are still active acknowledged alarms.

This new functionality can remove the need for custom logic when working with alarms, and then reduces the impact this logic typically had on the scalability of solutions due to continuous CPU requirements associated with these calculations.
Increased Security, Performance, and Reliability

Historian Monitoring & Protection

ClearSCADA can now be configured to generate an alarm when it detects behaviour within each of the historic modules (Historian, Event Journal, Configuration Changes Log, and the new Alarm Summary) that is considered abnormal, including:

- Over Activity
  - Alarms on more records per hour/week than the configured thresholds
  - Storage is limited at configurable levels if excess would impact performance
- Write Errors
- Corrupt Records

System Alarms will be generated when any of the above thresholds have been exceeded, providing details of the specific cause within the Message field.

Note: Default “Warning” and “Maximum” thresholds have been configured for Over Activity which will be applied automatically after upgrading to ClearSCADA 2015 R1. These thresholds should be reviewed by your System Administrator to ensure they are suitable for your system.

Client Access Control List

There is a common need within a SCADA networked environment to limit access to a range of users within the organisation, or more specifically, restrict clients’ access to specific ClearSCADA servers or to only specific interfaces thereof.

ClearSCADA 2015 R1 delivers enhanced functionality to allow the user to specify from which IP address ranges connections to the server will be accepted. Separate management of users based on client access methods will be included, catering for:

- ViewX
- Original WebX
- Data Access
- OPC
- ClearSCADA Utilities

ClearSCADA Client Access Control Lists are configurable per server, and can be used for operational purposes as well as to enhance system security. Possible operational uses include:

- Enforcing client load balancing between servers, or
- Ensuring that floating licenses on a server dedicated for essential operational use are not consumed by corporate users.
Simplified Driver Installation Changes

The adding and/or removing of ClearSCADA Server modules (e.g. drivers) has been simplified within ClearSCADA 2015 R1, as Standby Servers are now able to synchronize with a Main Server that has additional modules installed.

This means that unused driver modules can be uninstalled across a redundant ClearSCADA installation without having to take the Main ClearSCADA server offline, as a Standby server(s) can successfully synchronize with the active Main even though the Main Server has fewer driver modules installed.

Improved Auditing of Security Related Events

While the standard ClearSCADA Event List does include security related events, it requires configuration of suitable queries to restrict the full Event List to just the security related events for review/auditing.

To simplify the security auditing process, a new logging class has been created in ClearSCADA 2015 R1 specifically for security-related events, such as login/out/fail, and password change. These security events can be easily filtered using the new Category called “Security” within the Event Journal.

As described further below, security events from a DMZ Permanent Standby server will be integrated into this centralized audit trail, providing a comprehensive audit trail of security events from all servers in a redundant partnership.

Security Logging Events Transferred from DMZ Standby to Main Server

Login events from a DMZ Permanent Standby server do not currently find their way back to the Main Server because of enforced one-way communications to a DMZ Standby server.

ClearSCADA 2015 R1 enables security events, including logon or logon failures performed on a DMZ Standby server to be routed to the Main server for centralized logging. User accounts on a DMZ Standby server can automatically become disabled after repeated logon failures (according to the system security configuration); accounts locked in this manner on a DMZ Standby server can be re-enabled by System Administrators using ViewX on the Main server via a new option “Sync Users On DMZ Standbys” accessible via the pick menu of the User Account object.
**Enhanced User Account Security**

ClearSCADA 2015 R1 delivers a number of improvements to User Account security:

- Administrators are able to force all passwords to auto-expire if they tighten the system password policy via the Server Configuration tool, thereby requiring all users to update their passwords at time of next logon
- Users are forcibly logged off if their User Account is disabled
- Users are provided with warning prior to the timed expiration of their password
- Users are notified of any failed logon attempts since their last successful logon via the ViewX Messages interface
- The default System Security level on a new ClearSCADA installation is set to ‘Strong’
- User Accounts will have their passwords randomized during an export to ensure database security is not compromised

**Changes to ClearSCADA Sample Database & Super User**

**Sample Database Installation**

The ClearSCADA Sample Database now appears as two “Configuration Samples” options within a custom ClearSCADA installation to allow users the choice of whether or not this is installed. When the Configuration Samples are selected for installation (included within a “Full” installation) the Sample Database will automatically be loaded when the ClearSCADA server is started if an existing database is not found.

**Changes to ClearSCADA Super User**

Creation of a ClearSCADA Super User account is now mandatory during installation in order to provide administration access to configure the Sample User Accounts (see section below). It is strongly recommended that this is disabled via the System Configuration utility once a replacement Administrator user account has been created within the database.

**Note:** The built-in Super User account, if enabled, is only valid on the local ClearSCADA server machine, and will be denied access to ClearSCADA if logon is attempted from a remote client machine.

**Changes to Sample User Accounts**

To increase security, the previous “Eng” and “Sales” User Accounts within the ClearSCADA Sample Database have been removed, and replaced with the following new example user accounts:

- AdminExample – an example Administrator user account
- EngExample – an example Engineer user account
- OperExample – an example Operator user account

These above new user accounts are disabled by default and have no password, and therefore need to be enabled and have a new password set before they are operational.