

Substation automation

Yukon Visual T&D HMI/SCADA

Designed for the power industry

EATON

Powering Business Worldwide

Proven solutions for the power industry

Eaton is aimed at implementing solutions to enhance the performance of electrical power networks. The developers of Eaton's products have a long track record in meeting customers needs with innovative and reliable solutions for all their substation integration and automation requirements.

The team behind our products has valuable experience in custom and consulting services, and an outstanding reputation for customers' support, making Eaton's energy automation solutions a leader in the field of enterprise automation solutions for the power industry.



Modernizing your substation? Put your data to work

Version 4.0 brings Visual T&D™ to the next level as a substation historian with a completely revamped datalog feature based on standard world-class database engines, allowing for:

- Increased capacity and reliability
- Improved integration with existing corporate IT infrastructure

As a standalone HMI, or as a companion product to the SMP™ Gateway, Yukon™ Visual T&D integrates seamlessly in your substation environment to provide immediate access to your data, with the following advanced features:

- Supports a large variety of devices and data sources
- Licensing model adapts to the large number of data points in modern IEDs
- Reliably and cost-effectively logs all events, alarms, operator actions and all transitions on all data points in a high-performance historian based on industry-proven PostgreSQL and Microsoft® SQL Server databases
- Automatically retrieves event files
- Millisecond time tagging
- Data point tagging for information and control inhibition
- Power industry shape libraries to simplify diagram creation

Visual T&D is designed from the ground up to be easy to set up and reduce engineering, maintenance and commissioning efforts.

Connect to all your devices—easily

Visual T&D supports a large variety of data sources.

- Connect to industry-standard OPC servers, including DNP3 and IEC 60870-5-101/104 OPC servers
- Connect to SMP Gateway
- Use the Communication Server module to provide access to a large variety of devices from ABB, AREVA, GE, SEL, Siemens and others using standard or proprietary protocols

Visual T&D can easily manage multiple data sources.

- Prefixes to support multiple sources with identically named data points
- Automatically convert device timestamps to support different time zones
- Build point lists automatically
- Use the built-in equation editor to create new logical data points based on calculations performed on physical data points

Visual T&D is designed as the companion HMI to the SMP Gateway. Connect to the SMP Gateway and get the following additional advantages:

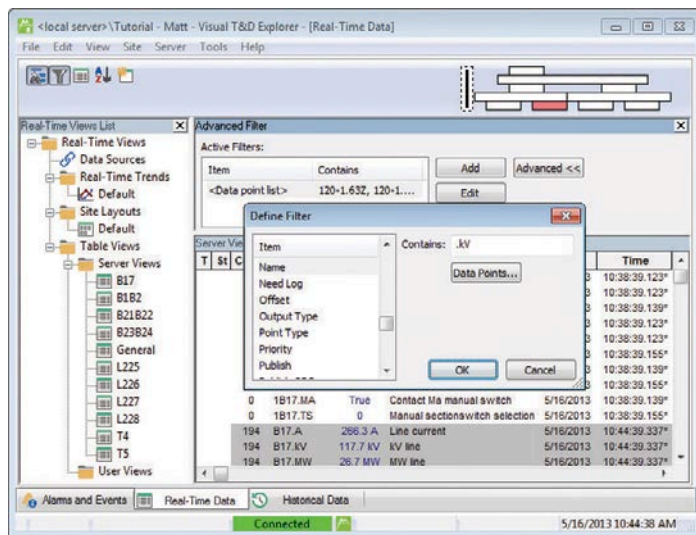
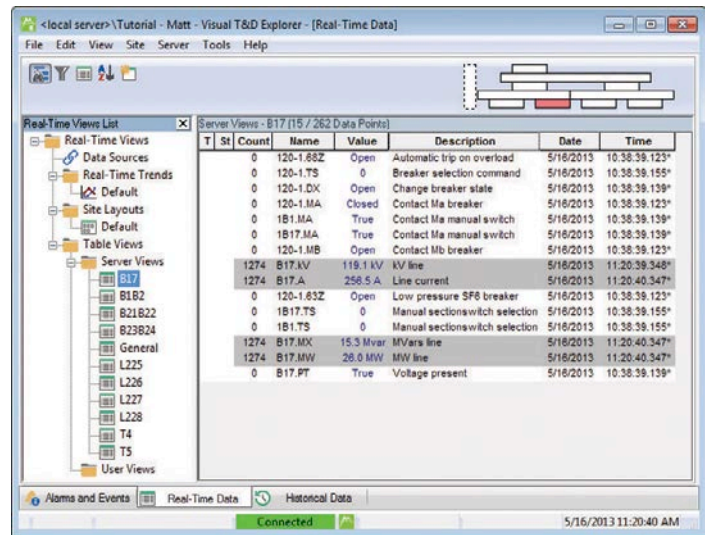
- Automatically import all data points from the SMP Gateway
- Support redundant network paths
- Use the SMP Gateway as a time source to automatically synchronize the PC clock

View your substation data immediately, in real-time

Visual T&D Explorer provides immediate access to all data points, in real-time, in a variety of formats, with minimum configuration effort.

Table Views provides a spreadsheet-like display of the real-time values of selected data points.

- Create any number of shared server views or local user views
- Define filters to select view contents
- Select display columns and sort order
- Map binary values to user-defined strings and icons
- Transition counters and highlighting of changed values
- Real-time printing of events



Create custom views

Use basic or advanced filters to display groups of data points that match various criteria such as type, name or location. Set up each view with its own display format and sort order.

Organize data using IEC 61850 concepts

IEC 61850 defines a complete topology of the electrical power network, with basic concepts such as regions, substations, voltage levels, bays and equipment.

Assign data points to IEC 61850 categories, and Visual T&D will automatically create all the Table Views for your network and substation.

Data timestamp and quality

Visual T&D supports time-synchronized data and IEC 61850 data quality attributes.

- Millisecond accuracy supported for synchronized data sources
- Synchronize the PC clock using a time-synchronized SMP Gateway
- Support IEC 61850 data quality attributes, when provided by the data source



Trending Views

Visual T&D Trending Views plots the value of any data point in real-time.

Trending Views provides the following capabilities:

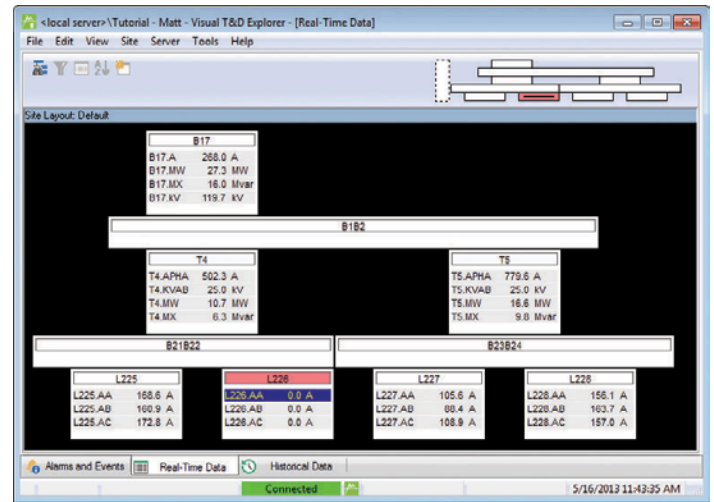
- Display multiple plots in each view
- Create any number of views
- Select automatic or manual scaling
- Select the time scale

Site Layout view

Graphically display the state of important readings and alarms, easily and rapidly, without the effort usually associated with creating a single-line diagram.

The Site Layout view is easy to set up and provides all substation information at a glance.

- Use the drag-and-drop editor to create zones representing areas, voltage levels, bays or devices
- Assign data points to zones
- Select measures and states to display in each zone
- Zone headers automatically change colors to indicate alarm states
- Scaled version of the site layout is part of the alarm annunciator



Direct control for maintenance and commissioning

Visual T&D Real-Time Views greatly simplifies maintenance and commissioning by providing you with direct access to your substation information.

But Visual T&D is not limited to viewing data. You can also perform control functions directly from the Real-Time Views.

- Configure any binary or analog output to support control functions
- Assign control privileges to users
- Select Direct Execute or Select Before Operate control modes
- Select Open or Close, Analog Setpoint or Pulse operations

Tag data points for information or operation inhibition

Select any point in a Visual T&D display, and tag it for information or to inhibit its operation.

Attribute	Value
Type	All control inhibited
Owner	Matt
Timestamp	5/17/2013 13:29:45

Comment:
Reserved for maintenance.

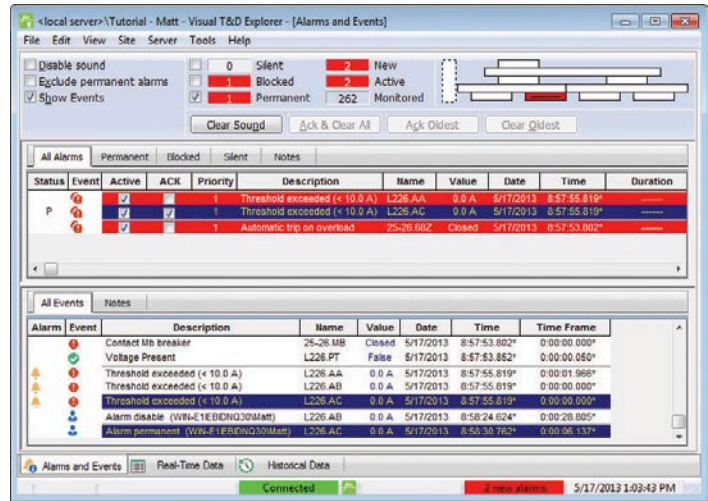
Alarm and event management

Visual T&D provides comprehensive alarm and event processing.

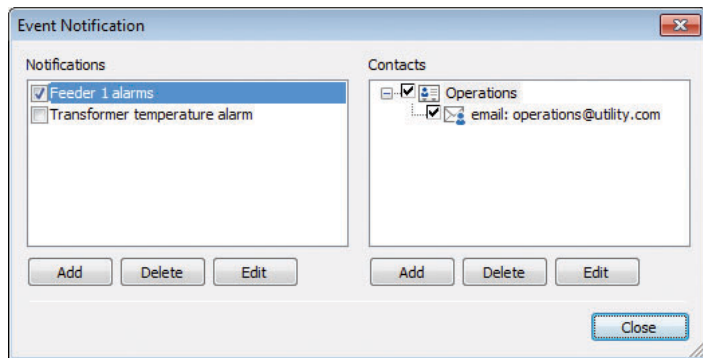
- Use binary state changes to trigger alarms or events
- Trigger alarms or events when analog values move out of their operational range
- Use logical data points to configure multiple ranges or low-low/high-high limits
- Built-in system alarms on loss of data source or time synchronization
- Built-in alarms on loss of data quality

Alarms and Events view features

- Events tab displays a chronological list of recent events and alarms
- Alarms tab displays a separate color-coded list of all current alarms
- Configurable Alarm Management Process
- Scaled Site layout view quickly determines position, state and acknowledgment status of any alarm
- Additional tabs provide filtered views of Blocked, Silent and Permanent alarms



- Notes tab is used to share information among operators
- Create additional tabs with filtered views of events or alarms
- Attach detail files to alarm sources in order to provide additional information or special operator procedures when an alarm is triggered



Notify users of significant alarms and events

Visual T&D can automatically notify selected users by email, SMS or pager, when alarms and events occur.

The Event Notification function offers the following capabilities:

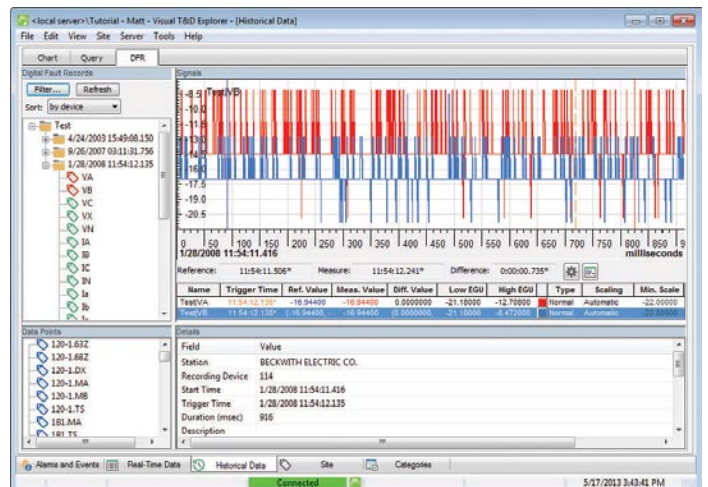
- Select event categories—user or system events, alarms, device failures, etc.
- Select sources—internal or external data points
- Trigger notification by appearance, disappearance or acknowledgement of a condition
- Set up filters to limit the number of notifications in avalanche conditions
- Add sequence of events to notification, directly in the message or as an attached file
- Assign notifications to individual contacts, by email, SMS or pager

Automatically retrieve event files

When used with SMP Gateway, Visual T&D can automatically retrieve and process event files from digital fault recorders and relays.

Visual T&D supports the following event processing capabilities:

- Automatically retrieve events from a growing number of devices, including DFRs and relays
- Convert event files to industry-standard COMTRADE format
- Use the search filter to simplify file browsing
- Display multiple channels simultaneously
- Extract channel data for processing and analysis
- Automatically notify selected users by email, SMS or pager, when event files are available



Data logging

Reliable data logging capability is an essential aspect of an HMI or SCADA.

The Visual T&D data log is a true historian and is designed to provide you with a complete record of all substation data, alarms and events. Using professional third-party professional database engines PostgreSQL or Microsoft SQL Server, Visual T&D allows:

- Safe backup of all logged data at all times, following your corporate IT guidelines
- Datalog size is only limited by your hardware infrastructure
- Reports can be done with Visual T&D native tools, as well as any third-party reporting tools
- Datalog can be deployed on a dedicated database (PostgreSQL database engine provided at installation time) or on a corporate database already in place

Visual T&D logs all events and alarms

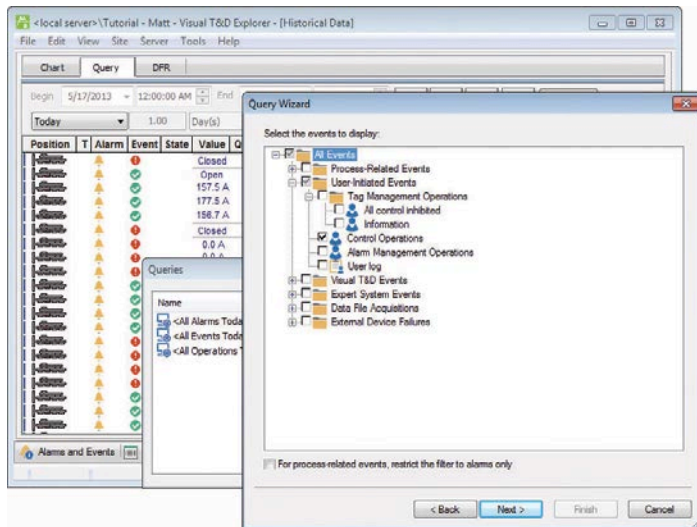
- Log all transitions, on all data points, analog and binary
- Log all tag operations
- Disable logging of selected data points
- Use individually configurable deadbands to limit the amount of recorded data
- Field-proven performance with up to 100K data points and up to 10K sustained transitions per second of recorded data
- Supports millisecond timestamping and data quality
- Supports out-of-sequence data



Historical trends

Use the Historical Chart View to display the historical trend for any data point.

- Select standard time frames such as “Yesterday” or “This week” or specify your own
- Use the Zoom function and measurement cursors to analyze the selected time range
- Export selected data to a text file for analysis



Alarm and Event history

Use the Query View to display historical lists of alarms and events.

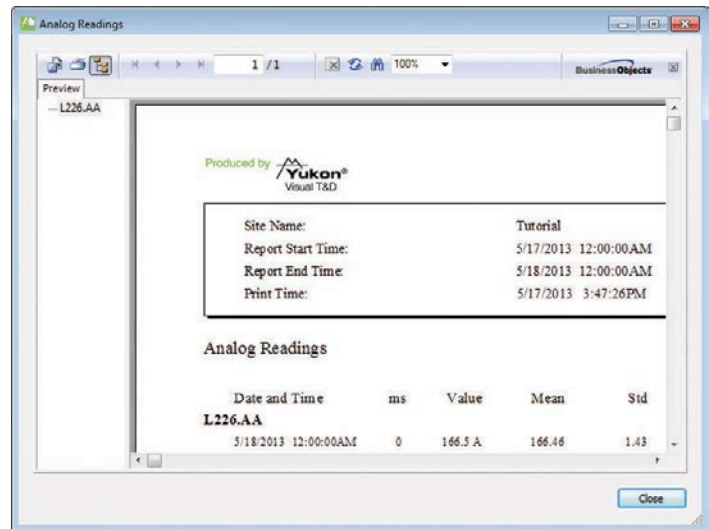
- Select standard time frames such as “Yesterday,” “This week” or specify your own
- Select standard queries such as “All events today,” “All alarms today” or build your own query using the Historical Query Wizard

Reports

Use the built-in report generator to create historical reports for selected data points.

Use the report generator to:

- Select among analog readings or transitions on binary data points
- Select the sampling period—seconds, minutes or hours
- Select the time frame
- Print a report or export data in a variety of formats
- Use the built-in templates, or create your own with industry-standard Crystal Reports
- Excel® add-in to access real-time or historical data
- Automatic report generation, event triggered or scheduled



Visual T&D Diagram Editor

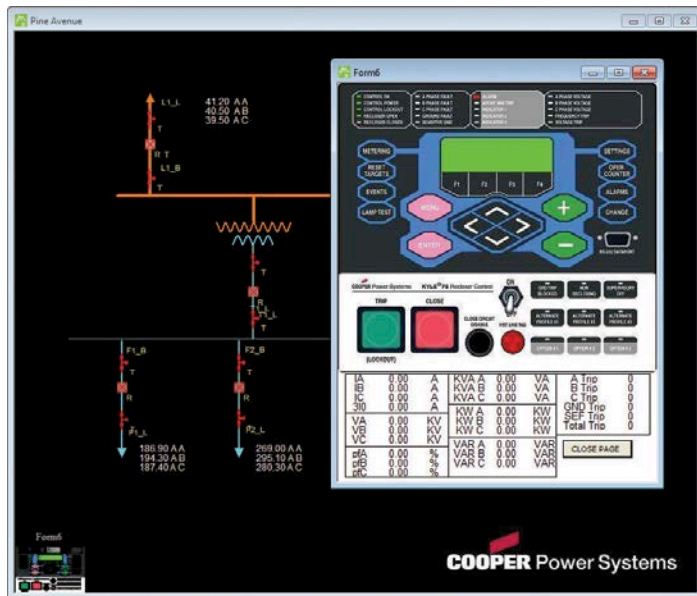
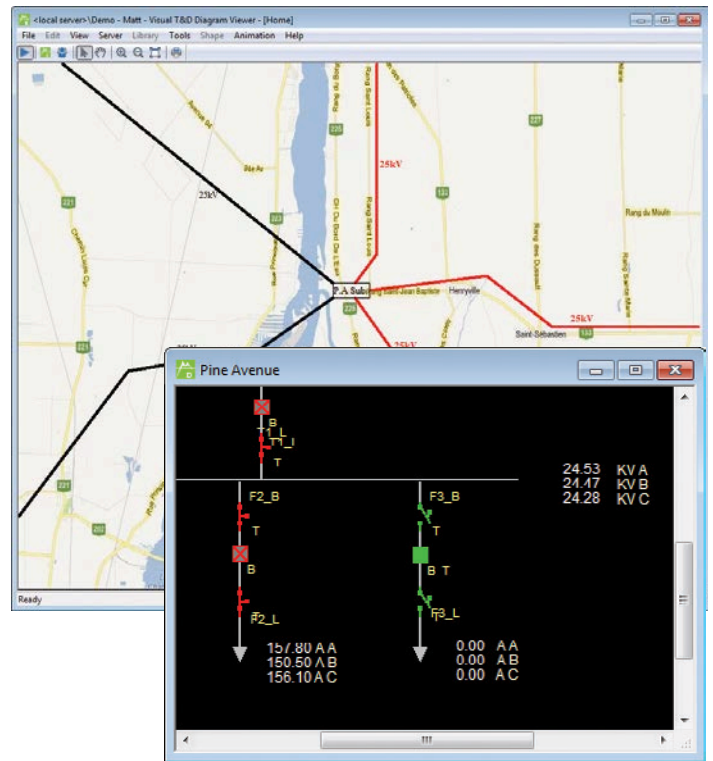
Create interactive diagrams to monitor and operate your substation, and even your network. Visual T&D Diagram Editor is a complete drawing program.

- Complete set of standard drawing tools—lines, rectangles, ellipses and text labels
- Create complex shapes by grouping simple shapes
- Import pictures and bitmaps

Use the Visual T&D animation function to create shapes that change according to the value of data points.

- Display real-time values
- Evaluate expressions and display the results
- Flash or change colors to indicate status or alarm conditions
- Select and display text messages
- Move and resize shapes

Process operator actions using predefined library shapes, or create your own scripts with Visual T&D's integrated Microsoft Visual Basic for Applications™.



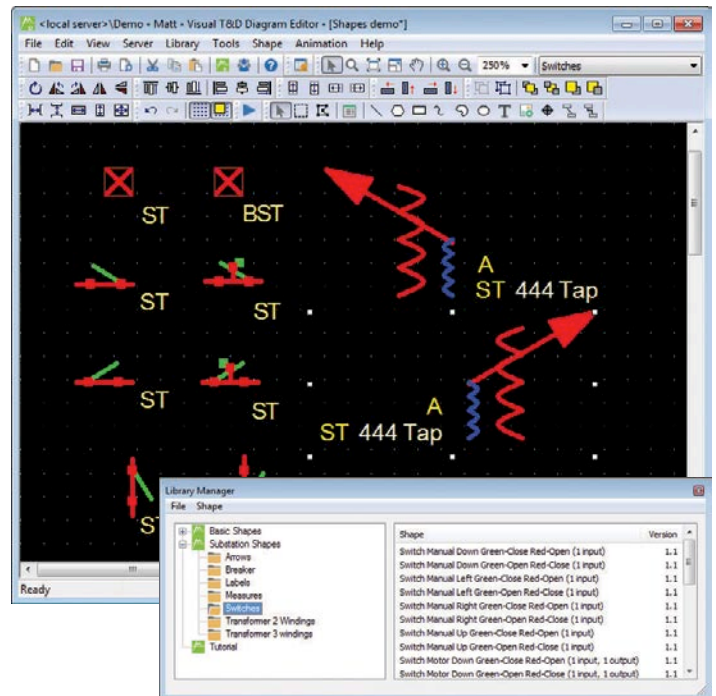
Reduce errors and engineering time with Visual T&D

Visual T&D's advanced Automatic Alias Resolution function significantly reduces the time required to create and test your substation diagrams.

Aliases are place markers used instead of data points in shape libraries. The Automatic Alias Resolution function automatically assigns data points to shapes, based on your own naming convention.

Symbols for the power industry

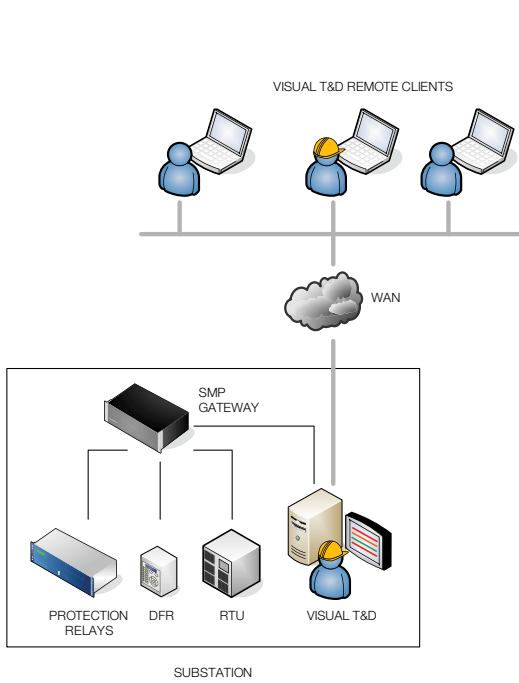
Visual T&D Diagram Editor libraries contain symbols and shapes specially designed to create diagrams for substations. Instead of pumps and conveyors, Visual T&D libraries provide circuit breakers, line switches and transformers.



From the substation to the control room

Visual T&D's client/server architecture provides you with a completely flexible and scalable solution.

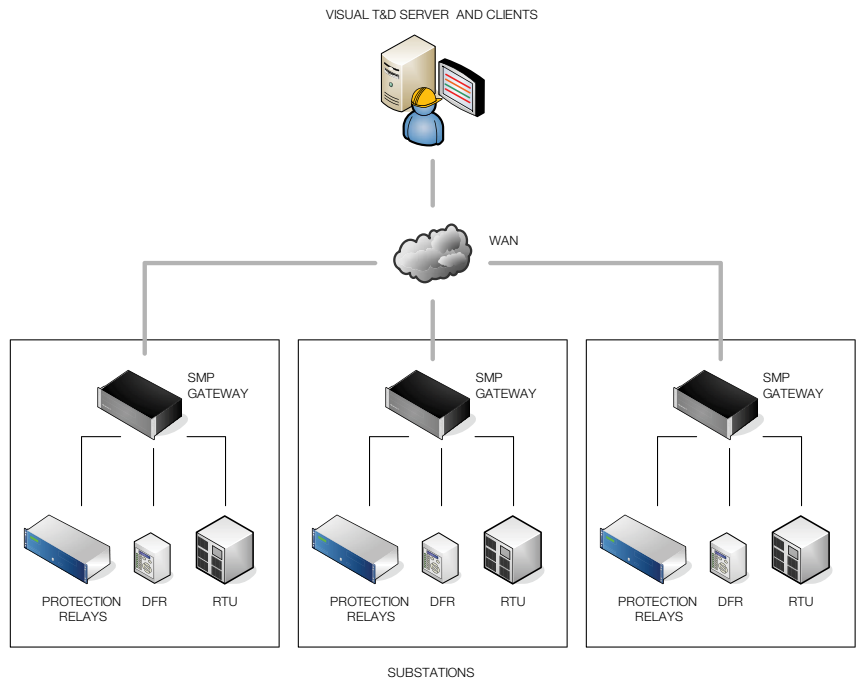
Use it as a substation HMI . . .



HMI features

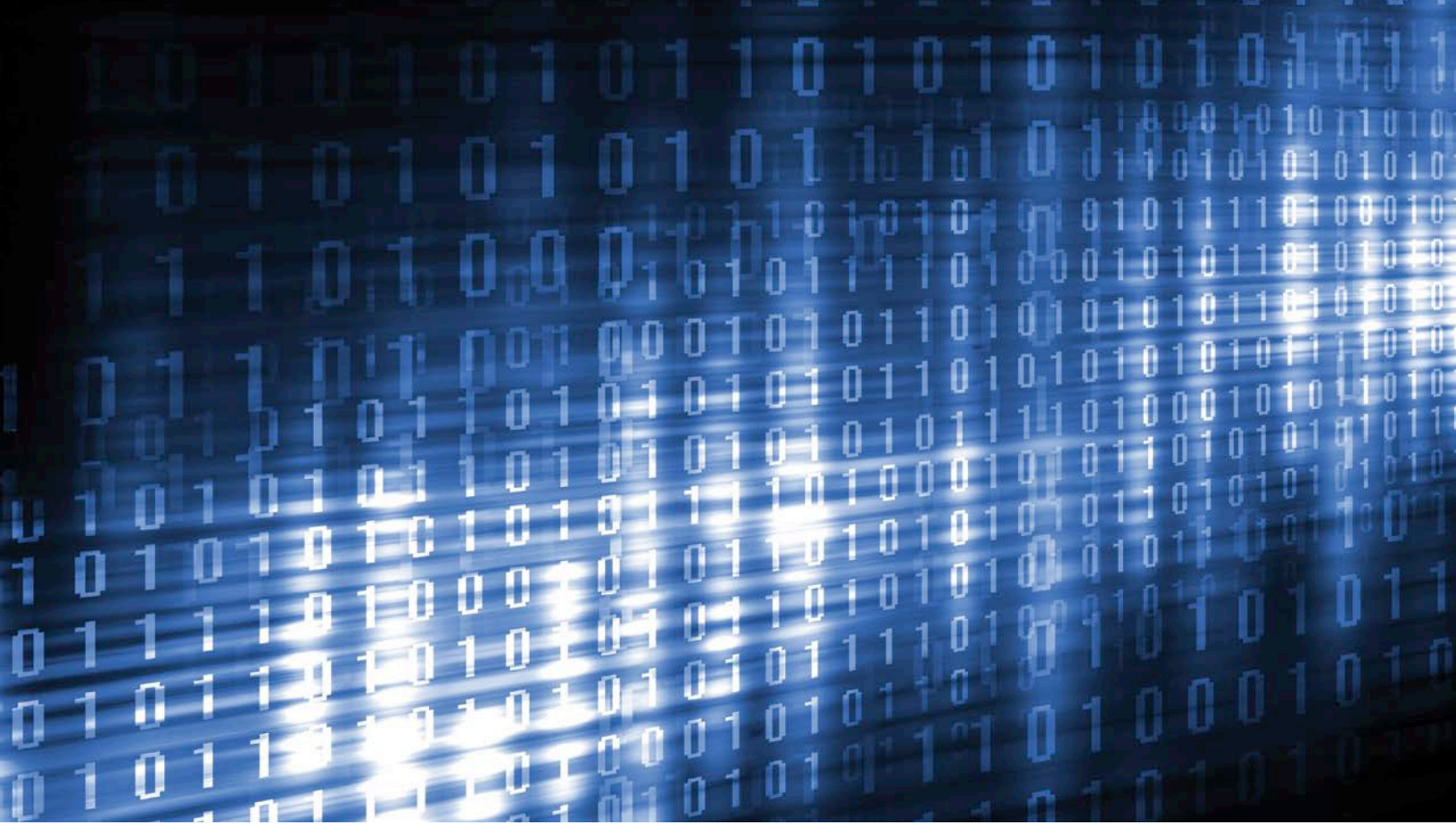
- No separate runtime license required
- Client and server applications can be installed on the same computer
- Client applications can be configured to launch automatically, without requiring a Windows® login
- Client applications can be used remotely to access all substation data, even with low bandwidth links

Or. as a SCADA for a small network



SCADA features

- Field-tested with up to 100,000 data points
- Field-tested at up to 10,000 transitions per second
- Supports redundancy with Microsoft Windows Server 2003 clusters
- Supports multiple data sources



A key element of your substation automation solution

Create interactive diagrams to monitor and operate your Visual T&D and the SMP Gateway are the perfect combination for small networks, or distribution automation applications.

Use the SMP Gateway to integrate devices and manage communications.

- Integrate RTUs and protection relays
- Perform protocol conversion
- Support network or modem connections
- Provide remote access to IEDs for configuration and maintenance

Use Visual T&D to manage all SMP Gateways, display and log real-time data, manage alarms and perform control operations.

Visual T&D integrates seamlessly with the SMP Gateway, with minimum configuration efforts.

Eaton can help you put together a cost-effective out-of-the-box solution, including all hardware and software components, engineering support and training. Please contact us for more information.

A licensing model for the power industry

Modern substations contain an ever-increasing number of IEDs with hundreds of data points.

Visual T&D's licensing model is designed to provide economical access to all the data in your substation.

Only physical I/O and calculated data points, derived from physical I/O, count as licensed data points.

Visual T&D is available in the following standard configurations:

- 1,500 data points
- 5,000 data points
- 10,000 data points
- 15,000 data points
- 20,000 data points

Larger configurations are also supported. Please inquire.

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For more information about how Eaton's products can benefit substation integration, security and communications, contact **PSMO-sales@eaton.com** and request a demonstration.

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