

## Visual T&D

Functional Specification Guide

Visual T&D

**PS914001EN**

### 1.0 Scope

This specification describes the features and specifications of Eaton's Cooper Power series Yukon Visual T&D.

Visual T&D is a Data Acquisition and Control Client-Server system that provides the following functionalities which are essential in Substation Automation:

- Substation HMI (Human Machine Interface)
- Centralized SCADA

Visual T&D is an integral part of Eaton's substation automation solution. It is designed to work as a standalone product or as a complement to Eaton's Cooper Power series SMP Gateway family.

### 2.0 Applicable Standards

2.1. The Quality Management System shall be ISO 9001 Certified.

### 3.0 Features

3.1. Real-time view

3.1.1. The HMI shall allow all data point visualization based on table views. The views shall be user-configurable at the server or client level. The HMI shall also allow the users to display the real-time data.

3.2. Data timestamp and quality

3.2.1. The HMI shall support time-synchronized data.

3.2.2. The HMI shall synchronize the PC clock using a time-synchronized SMP Gateway data concentrator.

3.3. Trending

3.3.1. The HMI shall allow real-time data plot trending with the following capabilities:

- multiple plots per view
- unlimited number of views
- automatic or manual scaling
- selectable time scale

3.4. Site Layout

3.4.1. The HMI shall allow for simple graphical display for the state of important readings and alarms, without the effort usually associated with creating a single-line diagram.

3.5. Control

3.5.1. The HMI shall allow control via binary or analog output points. Real-time views greatly simplify maintenance and commissioning by providing the user with direct access to his substation information. The control privileges shall be assignable per user.

3.5.2. The supported control modes shall be:

- Direct Execute
- Select Before Operate

3.5.3. The supported control operations shall be:

- Open or Close
- Analog Setpoint

- Pulse
- 3.6. Tagging**
- 3.6.1.** The HMI shall allow the user to tag any point in the system, for information purposes or to inhibit its operation.
- 3.7. Alarm and event management**
- 3.7.1.** The HMI shall provide complete alarm and event management capabilities.
- 3.7.2.** Alarms shall be triggered based on binary state changes and analog thresholds crossings. The system shall also permit the configuration of multiple ranges, or low-low/high-high limits, to be associated to alarms.
- 3.7.3.** The HMI shall have built-in system alarms on loss of:
- Data source
  - Time synchronization
  - Data quality
- 3.7.4.** The HMI shall also provide:
- Events tab display of chronological list of recent events and alarms
  - Alarms tab display with separate color-coded alarms
  - Configurable alarm notification to individual contacts, by email, SMS or pager.
- 3.7.5.** The HMI shall allow the user to use a query view to display historical lists of alarms and events including the selection of standard:
- Time frames, such as "Yesterday", "This week", or as configured by the user
  - Queries, such as "All events today", "All alarms today", or as configured by the user
- 3.8. Event File Retrieval**
- 3.8.1.** The HMI shall allow automatic event file retrieval and processing from digital fault recorders and relays.
- 3.8.2.** The HMI shall be capable of converting the event files to industry-standard COMTRADE format.
- 3.8.3.** The HMI shall offer the following event processing capabilities:
- Search filters
  - Multiple simultaneous display channels
  - Channel data extraction for processing and analysis
- 3.8.4.** The HMI shall automatically notify selected users by email, SMS or pager, when event files are available.
- 3.9. Data Logging**
- 3.9.1.** The HMI shall be capable of logging all substation data, alarms and events. All transitions shall be logged.
- 3.9.2.** The Datalog shall be based on a third party professional database, such as PostgreSQL or MS SQL Server. The HMI shall allow the connection to an already-in-place corporate database.
- 3.9.3.** The datalog size shall be limited by your hardware infrastructure.
- 3.9.4.** The HMI shall provide datalog reporting with its native tool and using third party tools. The HMI shall provide historical Chart View to display the historical trend for any data point on any time frames. The HMI historical viewer shall also provide a Zoom function and measurement cursors to analyze a selected time range.
- 3.9.5.** Data shall be exportable to a text file for analysis.

**3.10. Single Line Diagram**

**3.10.1.** The HMI shall provide a complete Single Line Diagram to monitor and operate a substation or the complete electrical system when used as a centralized SCADA.

**3.10.2.** The HMI Single Line Diagram shall be totally configurable with:

- A complete set of standard drawing tools—lines, rectangles, ellipses and text labels
- An industry-specific shape library, including circuit breakers, line switches, transformers, etc.
- The creation of complex shapes by grouping simple shapes
- The capability to import pictures and bitmaps

**3.10.3.** The HMI shall provide animation functions to create shapes that change according to the value of data points including:

- Real-time values display
- Expression evaluation results display
- Status or alarm conditions change
- Text messages
- Shape move or resize

**3.11. Licensing**

**3.11.1.** The HMI shall feature a client-server architecture. The client and server shall be able to run on different or the same computer.

**3.11.2.** The client application shall be usable remotely to access all substation data, even with low bandwidth links.

**3.12. Operating System**

**3.12.1.** The HMI shall support the following operating systems:

- Supported OS: Windows® 7 (All SP), Windows® 10, Windows® Server 2008 R2 (All SP), Windows® Server 2012 R2 (All SP).