



Specification

SCADA including Outpost2, MTU, historian

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1 Purpose

The aim of this document is to provide users, consultants and distributors with a detailed specification to include in proposals and tender bids.

The specification here should be included with the latest Iconics specification to produce a complete document. The reason for keeping it separate is to allow Iconics to update their specification and MultiTrode to update ours when various changes are made.

2 System Overview

The SCADA system for the water and wastewater reticulation network shall consist of:

- Field hardware for local control and data acquisition
- Communications network
- MTU (master telemetry unit)
- Historian
- HMI software

3 Field hardware

The field hardware shall be of a modular design and incorporate the following essential features:

- “Out of the box” control of a typical pump station
- Operator interface (preferably graphical LCD with softkeys) with view of level, pump mode, fault status and intuitive control of pumps, fault reset, etc
- Pre-built configurable functions including:
 - Setpoint adjustment
 - Grouping and alternation
 - Level device selection and redundancy
 - Station optimization including
 - Max run time (efficiency function)
 - Max off time (odour reduction)
 - Max starts/hr (pump protection)
 - Inter-pump start/stop delays
 - Well washer controls
 - Fault handling (delays, critical/non-critical selection)
- In-built functionality for advanced pump control of up to 6 pumps including grouping and alternation
- Multiple profiles of setpoints for spill management, energy management, etc
- Dedicated I/O for pump seal, thermal, PT100, conductive level probe
- 3-phase voltage and DC supply monitoring
- Expandable I/O
- 10Mbit/s Ethernet and 115kBit/s RS232 serial ports
- Native DNP3 (level 2) protocol
- Datalogger
- Option of IEC61131-3 PLC programming language to interact with (or replace) pump control module
- Optional motor protection module including insulation resistance testing for motor windings

4 Communications network

The system shall support a variety of communications networks including:

- Private radio
- PSTN
- Wireless LAN
- Cellular

The communications protocol will be an open protocol such as DNP3 which includes:

- Change of state reporting
- Native date/time and quality stamps for each data point
- Event buffering for non-critical data

5 MTU

The MTU will communicate with all of the field devices using DNP3 (or MultiTrodE protocol for legacy hardware) and supply this data to the historian. The MTU will also supply the data to the HMI using OPC-XML-DA.

The MTU can be implemented in a redundant configuration.

6 Historian

The historian collects data from the MTU and stores the data into any of the following databases:

- Microsoft SQL server
- Oracle
- MySQL

The historian will store values on change, and will use the date/time stamp from when the event took place, not when the historian acquired the data from the MTU.

The historian will be able to support 10 tags/sec change with bursts up to 1000 tags/sec.

6.1 Access

The historian will make the data available to the HMI and to other trending and reporting clients, using an OPC-HDA interface.

The data will also be accessible using an ODBC/JDBC interface.

6.2 Archiving

Data will be stored for up to 10 years. Data older than 6 months will be archived, such that it is still completely accessible, but data retrieval will be slower. This will ensure high speed access for more recent data.

7 HMI

The HMI will be based on a well-supported global SCADA platform.

7.1 Pre-built for pump stations

The supplied HMI will have the following features already setup

7.1.1 Screens

- station overview, including
 - summary alarms including level alarm, level device fault, WAN comms fault, supply fault
 - numbers of pumps and pump summary alarm
 - comms statistics
 - 3-phase voltage
 - level
 - station name and id
- pump status, including
 - auto / off/ manual (hand)
 - detailed pump fault status
 - thermal
 - seal
 - delay fail input
 - critical fault
 - non-critical fault
 - under-current
 - over-current
 - phase fail
 - earth fault
 - control for
 - pump mode – auto / off/ manual (hand)
 - pump fault reset
 - detailed pump data
 - 3-phase currents (where available at site)
 - power and kWh (where current monitoring module installed at site)
 - accumulators
- Flow data
 - Derived flow data (if module installed in field hardware), or
 - From flow meter if installed
- I/O
 - Other I/O as installed at site

7.1.2 Configuration

Configuration screens for:

- Changing setpoints of all pumps and alarms
- Changing between profiles in the field hardware

7.1.3 Pre-configured reports

The system will include standard reports relevant to pump station networks, including

- Daily hours run & starts report
- Daily exception reports (stations with accumulators outside user set parameters will be reported along with the exception data)
- Daily site report
- Daily fault report

7.2 “Add site” functionality

The system will include an “Add site” screen, allowing new sites to be added to the system without any programming or tag I/O knowledge required.

The “Add Site” function will:

- Generate the station summary page along with all of the drill down pages
- Automatically add the new site to the reports
- Automatically add the new site to the pre-configured trends
- Automatically add the new site to the alarm server and alarm dial out system