

(Add No. 1, Item IV. 8)


PART 1 - GENERAL

1.1 SCOPE

- A. This section covers Supervisory Control and Data Acquisition Systems (SCADA). Furnish and install all equipment and materials as shown on the drawings and specified herein. Work shall include all necessary materials, equipment, labor, and services.
- B. Auxiliary and accessory devices necessary for system operation or performance, such as relays din connectors, or terminals to interface with other Sections of these Specifications, shall be included.

1.2 QUALITY ASSURANCE

- A. Comply with Section EL10

-  B. The following system integrators are approved for programming the RTU and associated HMI system described in Section EL13:

- 1. Neltronics – Round Rock, Texas
- 2. RLC Controls, LLC – McKinney, Texas
- 3. Prime Controls, LP – Lewisville, Texas

1.3 RELATED WORK

Section EL10, Instrumentation
Section EL11, Radio Systems

1.4 SUBMITTALS AND SHOP DRAWINGS



- A. Process catalog submittals, and equipment data for the following:

- 1. RTU's
- 2. CPU modules
- 3. Input/output modules
- 4. Input/output racks
- 5. Power supplies
- 6. Batteries

- B. Submit shop drawings for I/O connection wiring. Wiring shall comply with EL10.




PART 2 - PRODUCTS

2.1 SCADA System


- A. This section describes the general requirement of the RTU (Remote Telemetry Unit). The RTUs shall be Control Microsystems SCADA Pack 357 or approved equal. One shall act as a master at the WWTP and poll the remote lift stations.
- B. Provide an operator interface panel. The operator interface panel shall display status and alarm points from the master RTU and the remote RTUs.
-  C. Operator interface panel shall be a ~~12~~ 21" color touchscreen with 1920x1080 ~~1024x768~~ resolution powered by 24vdc with 2 Ethernet ports, 2 serial ~~RS-232~~ ports & 2 USB ports. The Operator Interface Terminal shall be Maple Systems ~~OMI5121A-CE~~ OMI6821A-CE or approved equal. The operator interface panel shall be programmed with Indusoft Web Studio programming software ~~or approved equal~~.
-  D. Provide a permanent development & runtime license for 150 tags; for the Laptop computer and a permanent 150 tag runtime license for the Touchscreen PC located in the Main Instrument Panel at the wastewater treatment plant.

PART 3 - EXECUTION


3.1 RTU PROGRAMMING

-  A. Program the Master RTU at the WWTP to poll the new remote sites. Radio is specified in section EL11. Radio is ~~single frequency, half duplex~~ a spread spectrum. Master shall poll slaves on one minute intervals. The RTUs shall report by exception for any discrete point state change and a 2% change from the previously transmitted value for any analog point.
-  B. The Master RTU will have a block of 100 contiguous registers allocated for the image table of each RTU. Reserve the first 60 registers as the image table of the values retrieved from the RTU. Reserve the remaining 40 registers for the image table of the parameters and control bits sent from the Master RTU to the Remote RTU. ~~The Remote RTUs will send Report by Exception data to the first 60 registers allocated for the associated RTU image table in the Master RTU.~~
- C. Submit an Excel spreadsheet as a control document to provide a memory map of the image table for each RTU. Configure a tab for each RTU. Columns shall include the associated Modbus address, description and EGU range. Include a table of individual bits broken out from the registers containing discrete bit values from each RTU.
-  D. The Remote RTUs will have a block of 100 contiguous registers allocated for the image table shared with the Master RTU. All values being monitored by the SCADA system from the Remote RTU will be mapped into the image table which can be read anytime by the Master RTU ~~or transmitted by the Remote RTU should any Report by Exception be triggered (any discrete value change or any analog input exceeding the 2% delta from the previously transmitted value)~~. Any downloaded parameters from the Master RTU will be read from the last 40 registers of the image table in the remote RTU for control setpoints or commands interfacing with the remote RTU's program.


- E. Program the new RTU to perform logic functions as described herein and as indicated on the drawings. Master RTU shall perform data and alarm gathering for master RTU data table.
- F. Configure software disagreement alarms if a valve open or close command is issued and the valve does not respond after a time delay, a “Failed to Open” or a “Failed to Close” alarm shall appear in the alarm window of the operator interface panel.

-  G. ~~Program the new operator interface panel to act as a stand alone control station with the ability to display all of the I/O from the other remote sites as well as the local I/O. Develop a display that graphically illustrates the overall system including the pumps, valves, valve positions and piping of the system along with line pressure, tank levels & well flows. Provide a display to show the individual inputs & outputs for each I/O module. Populate the historical trending database to collect data for 14 days. Provide a trend display graphing the flows, pressure & levels. Provide an Alarm Summary display, which lists active alarms. Configure a Historical Alarm Summary display, which chronologically lists alarms. Provide a display to access control setpoints and timer presets. Configure all displays with a row of buttons on the bottom which will provide navigation to the other displays. Program and configure acknowledge and horn silence functions. Alarms shall flash and horn shall be energized when an alarm is present. Acknowledge shall cutoff horn, and alarm point shall flash until condition returns to normal. If alarm is not acknowledged in 24 hours, re-initiate horn.~~


Program a hard I/O point to act as a watchdog timer for the RTU. Contact shall be normally closed and held open by the RTU. In the event of a RTU failure, the contact shall close a hard wired contact to the autodialer. Send all other alarms to autodialer via ModbusTCP over the Ethernet LAN.









-  H. ~~Program a hard I/O point to act as a watchdog timer for the RTU. Contact shall be normally closed and held open by the RTU. In the event of a RTU failure, the contact shall close. Send all other alarms to the autodialer via RS232 Modbus.~~

Monitor the generator status and alarms via ModbusTCP over the Ethernet LAN. Program a hard I/O point to act as a watchdog timer for the RTU. Contact shall be normally closed and held open by the RTU. In the event of a RTU failure, the contact shall close. Send all other alarms to autodialer via RS232 Modbus.


-  I. Monitor the generator status and alarms via ~~RS232~~ ModbusTCP over the Ethernet LAN.

3.2 OIT PROGRAMMING

-  A. Program the new operator interface panel to act as a stand alone control station with a screen for each lift station displaying all of the Modbus I/O from each remote site. Provide an additional screen to display all local I/O.

-  B. Provide a display that graphically illustrates the overall system including the clarifiers, pump stations, pumps, valves, valve positions, blowers, generator and piping of the system along with line pressure, tank & well levels & flows and all other monitored values not listed.
-  C. Provide a display that graphically illustrates the Influent Lift Station. Animate the wet well level with a proportional vertical fill and digital indication of the level with 0.01ft resolution. Display all of the data read from the Influent Lift Station wet well controller.
-  D. Provide a display that illustrates the generator. Display the data read over the LAN from the generator.
-  E. Provide a display to show the individual inputs & outputs for each I/O module. Populate the historical trending database to collect data for 14 days.
-  F. Provide a trend display graphing the flows, pressure, levels & pump speeds. Provide an Alarm Summary display, which lists active alarms.
-  G. Configure a Historical Alarm Summary display, which chronologically lists alarms. Provide a display to access control setpoints and timer presets.
-  H. Configure all displays with a row of buttons on the bottom which will provide navigation to the other displays.
-  I. Program and configure acknowledge and horn silence functions. Alarms shall flash and horn shall be energized when an alarm is present. Acknowledge shall cutoff horn, and alarm point shall flash until condition returns to normal. If alarm is not cleared in 24 hours, re-initiate horn.

3.3 TESTING

-  A. A field acceptance test (FAT) shall be conducted for the SCADA equipment and computer system. Testing shall verify all I/O, analog ranges and programmed control functions.
- B. The Engineer and shall be given 10 days prior notice of FAT test.

PART 4 - PAYMENT

4.01 PAYMENT

- A. The work specified in this Section shall be considered incidental and payment will be included as part of the appropriate lump sum or unit prices specified in the Proposal and Bid Schedule.

END OF SECTION

(Add No. 1, Item IV. 9)

PART 1 - GENERAL

1.01 SCOPE

- A. This section covers computer systems and software. Work shall include all necessary materials, equipment, labor, and services.
- B. Auxiliary and accessory devices necessary for system operation or performance, such as relays din connectors, or terminals to interface with other Sections of these Specifications shall be included.

1.02 QUALITY ASSURANCE

Comply with Section EL10, Paragraph B.

1.03 RELATED WORK

Section EL10, Instrumentation
Section EL12, SCADA Systems

PART 2 - PRODUCTS

2.01 HARDWARE

- A. Furnish and install one desktop PC in the Lab/Office building with the following minimum specification:

PERSONAL COMPUTER (PC)

Dell OptiPlex™ 7040 Tower, with 5-Year ProSupport
Processor: Intel® Core™ i5-3770 Quad core 3.2GHz
Memory: 8GB DDR4, 2133MHz
Monitor: Dell UltraSharp™ 21.5 inch Widescreen
Video Card: Dual channel (2) SVGA ports
Boot Hard Drive: 500GB SATA, 16MB DataBurst Cache™
Second Hard Drive: RAID-1 Identical to boot hard drive
Removable Media: 16X DVD+/-RW, with Roxio Creator & CyberlinkPowerDVD
Keyboard: USB Quiet Keyboard
Mouse: USB Optical mouse with scroll wheel
NIC: 10/100/1000 Ethernet
UPS: APC BR1500G 1500va

PC OPERATING SYSTEM & PRODUCTIVITY SOFTWARE

Operating System: Window® 7 Professional, 64 bit
Productivity Software: Microsoft® Office Home and Business 2016

HDD Backup/Recovery: Symantec Norton Ghost
Antivirus/spam/firewall: MacAfee® Total Protection

- 1 B. Furnish one laptop PC with the following minimum specification:

LAPTOP COMPUTER (PC)

Dell Latitude™ 14 3000 Laptop with 5-Year ProSupport
Processor: Intel® Celeron™ 3215U
Memory: 8GB DDR4, 2133MHz

LAPTOP OPERATING SYSTEM

Operating System: Window® 10 Professional, 64 bit
Productivity Software: Microsoft® Office Home and Business 2016
HDD Backup/Recovery: Symantec Norton Ghost
Antivirus/spam/firewall: MacAfee® Total Protection

PART 3 - EXECUTION

3.01 GENERAL

- A. In the Lab/Office building, install the desktop computer and the UPS.
- B. Connect the desktop to the Ethernet switch in the instrument panel and install the Telog recording software on the desktop system.
- 1 C. Provide the Laptop PC with Indusoft Web Studio software with a 150 tag runtime license.
- 1 D. Load the same application as the Touchscreen PC in the Main Instrument Panel into the laptop. The ModbusTCP driver allows access to the SCADAPack PLC over the spread spectrum radio system from any site. To insure system wide bandwidth availability, the automatic laptop polling frequency will be configured to be a minimum 30 second interval between polling cycles.
- 1 E. The SCADA application loaded on the laptop will access the SCADAPack PLC in the Main Instrument Panel at the treatment plant via spread spectrum radios. The laptop SCADA application will contain all of the displays and functions that are programmed into the Maple Systems touchscreen OIT located in the Main Instrument Panel at the treatment plant.

~~3.02 SCADA SOFTWARE~~

- ~~1 A. The install OIT software and configure to view the OIT screens. Program and configure alarm and acknowledge functions for alarms.~~

3.02 TRAINING

- A. Coordinate with the Owner to schedule a training session for the maintenance of the new equipment being installed under this contract.

PART 4 - PAYMENT

4.01 PAYMENT

- A. The work specified in this Section shall be considered incidental and payment will be included as part of the appropriate lump sum or unit prices specified in the Proposal and Bid Schedule.

END OF SECTION