SECTION 13325

SCADA SYSTEM HARDWARE

PART 1 - GENERAL

1.01. SCOPE OF WORK

A. This Specification Section covers work related to the SCADA system hardware.

B. The work specified herein shall be furnished by the same SYSTEM SUPPLIER furnishing services and equipment as defined in 13300.

1.02. RELATED WORK

A. Related work specified elsewhere includes:

1. Specification Section 13300 defines work associated with the overall SCADA.

2. The equipment will be mounted in control panels under Specification Section 13315.

3. Specification Section 13326 defines work associated with the programming the SCADA.

1.03. SUBMITTALS

A. Provide the following submittals specific to the work defined herein:

B. A SCADA hardware shop drawing package that includes the following:

1. Block Diagram: A detailed system block diagram showing all major components. Identify components by model number. Show interconnecting cables diagrammatically (by type and size).

2. Bill of Materials: A list of all components, including all software. Group components by type and include component model number and part number, component description, quantity supplied, and reference to component catalog information.

3. Descriptive Information: Catalog information, descriptive literature, performance specifications, internal wiring diagrams, power and grounding requirements, power consumption, and heat dissipation of all elements. Clearly mark all options and features proposed for this project.

4. Installation Details. Equipment installation drawings showing external dimensions, enclosure material and spacing, mounting connections, and installation requirements.

PART 2 - PRODUCTS

2.01. GENERAL REQUIREMENTS

A. All equipment, cabinets and devices furnished hereunder shall be heavy-duty type, designed for continuous industrial service. The system shall contain products of a single MANUFACTURER, insofar as possible, and shall consist of equipment models which are currently in production. All equipment provided shall be of modular construction and shall be capable of field expansion through the installation of plug-in circuit cards or additional cabinets.

B. The equipment furnished shall be designed to operate satisfactorily between 0 degrees C and 40 degrees C at up to 95 percent Relative Humidity (non-condensing).

C. All equipment furnished shall be designed and constructed so that in the event of power interruption, or temperatures outside the operational range, the equipment specified hereunder shall go through an orderly shutdown with no loss of memory, and resume normal operation without manual resetting when power is restored.

2.02. SCADA MASTER HMI

A. Tower Server/Workstation. The system server/workstation shall meet the following minimum requirements:

1. Mid-Tower.

2. Intel four core Xeon Processor at 3.5 GHz.

3. 16GB RDIMM memory.

4. 1 TB SATA hard drive.

5. 1 GB NVIDIA graphics card.

6. Dual, 24-inch Ultrasharp wide screen monitors. Dell U2415 or approved equal.

7. Equipped with the following software:

   a. Windows 10 Professional 64 bit operating system.

   b. Microsoft Office Professional.

   c. HMI application software. Provide licensed VT SCADA software with a minimum of 1,000 tags.

8. Dell PowerEdge T5810 or approved equal.

9. Provide a 500VA Uninterruptible Power Supply for the Workstation.

B. Laser Printer. Provide a color laser printer that meets the following requirements:

1. 28 ppm print speed (black)

2. 600 x 600 dpi resolution

3. 250 sheet paper tray

4. Memory: 256 MB NAND Flash, 128 MB DRAM

5. HP Color LaserJet Pro M452dn or approved equal.

C. System Interface Panel. Provide a NEMA 12, wall-mounted steel enclosure with the following:

1. Ethernet Switch. Fully managed, industrialized switch with a minimum of eight RJ45 ports. N-Tron or approved equal.

2. The MTU and related components specified below.

3. Uninterruptible Power Supply.

2.03. REMOTE TELEMETRY UNIT (RTU) LOCATED INTEGRAL TO THE PSCP

A. The RTU shall meet the following general requirements:

1. Input Voltage – 12 or 24 vdc Max. Current (840mA@12, 420mA@24).

2. 7 Year battery backup for RTC and system data.

3. Graphic Display Screen.

4. Operating Temperature – 32 to 122°F.

5. Relative Humidity – 5% to 95% non-condensing.

B. Graphic Display Screen:

1. Resistive, analog touchscreen, TFT – LCD.

2. White LED backlight.

3. 800x600 resolution.

4. 5.7” viewing area

5. Pop-up keypad.

C. Memory Size

1. Application Logic – 2MB

2. Images – 32MB

3. Fonts – 1MB

4. Memory Bits – 8192

5. Memory Integers - 4092 (16-bit)

6. Long Integers – 512 (32-bit)

7. Double Word – 256

8. Memory Floats – 64 (32-bit)

9. Timers – 384 (32-bit)

10. Data Tables – 120k dynamic RAM data

11. HMI Display – 1024

D. Inputs/Outputs

1. Base Unit: 16 Digital Inputs, 8 Digital Outputs, and 3 Analog Inputs.

2. Expansion capabilities to 1024 total I/O.

E. Special Function. Unit shall contain a built-in Triplex Pump Controller function with the following features:

1. FOFO Alternation

2. Analog Control with setpoints

3. Software HOA Switches

4. Volumetric Flow Calculations

5. Fixed or Auto Alternation Selection

6. High Level and Low Level Alarm Setpoints

F. Communications

1. Two built in serial ports (RS-232 or RS-485)

2. One Ethernet Port

G. Sanders Sci-Text, no equal

2.04. MASTER TELEMETRY UNIT (MTU)

A. The MTU shall meet the following general requirements:

1. Input Voltage – 12 or 24 vdc Max. Current (840mA@12, 420mA@24).
2. 7 Year battery backup for RTC and system data.
3. Graphic Display Screen and nine Programmable Function Keys.
4. Operating Temperature – 32 to 122°F.
5. Relative Humidity – 5% to 95% non-condensing.

B. Graphic Display Screen:

1. Resistive, analog touchscreen, TFT – LCD.
2. White LED backlight.
3. 16 Bit colors, 800x600 resolution.
4. 10.4” viewing area
5. Virtual keyboard.

C. Memory Size

1. Application Logic – 2MB
2. Images – 80MB
3. Fonts – 1MB
4. Memory Bits – 8192
5. Memory Integers - 4092 (16-bit)
6. Long Integers – 512 (32-bit)
7. Double Word – 256
8. Memory Floats – 64 (32-bit)
9. Timers – 384 (32-bit)
10. Data Tables – 120k dynamic RAM data
11. HMI Display – 1024

D. Communications

1. Two built in serial ports (RS-232 or RS-485)
2. One USB Port – mini B

3. One Ethernet Port

E. Sanders Sci-Troll, no equal

2.05. CELLULAR COMMUNICATIONS

A. GSM Modem:

1. Performance GPRS: Class 10
2. Quad Band, GSM/GPRS 800/900/1800/1900MHz
3. Up to 85.6k bps
4. SMS Capable
5. Antenna Connector 50Ohm SMA Female
6. Standard SIM Connector
7. DE9 Serial Connector RS-232
8. Power Connector 2.5mm screw on
9. 9 to 32 VDC Input Voltage
10. 4.114”Wx1.065”Hx2.35”D
11. Operating Temperature -40 to 85°C
12. Relative humidity 20 to 90% noncondensing

B. Antennae:

1. Antennae shall be specified after site signal strength testing by SYSTEM SUPPLIER.
2. Antennae to be outdoor rated.

2.06. SPARES AND EXPENDABLES

A. Provide one spare RTU.

PART 3 - EXECUTION

3.01. TRAINING

A. Hardware Maintenance: Provide a minimum of one day of hardware training for up to three of the OWNER’s personnel in the maintenance of the SCADA hardware which shall include:

1. Training in standard hardware maintenance for the equipment provided.

2. Specific training for the actual hardware configuration to provide a detailed understanding of how the equipment and components are arranged, connected, and set up.

3. Test, adjustment, and calibration procedures.

4. Troubleshooting and diagnosis.

5. Component removal and replacement.

6. Periodic maintenance.

B. Software Maintenance: Provide a minimum of one day of software training for up to four of the OWNER's personnel in the maintenance and use of the SCADA software.

END OF SECTION