PLEASE NOTE: The following specification contains areas, highlighted in yellow and with the [ ] symbol. In these areas, the engineer must make a selection, add specific, project related information and should delete what is not applicable for the specific project.

PART 1 GENERAL

1.1 Section includes:

A. A modular single or dual channel water quality sensor transmitter with the ability to access sensor data remotely through a browser enabled device.
   [ ] Single channel
   [ ] Dual channel

B. Scope
   1. Provide labor, material, equipment, related services, and supervision to install and operate the controller to drawings and manufacturer's specifications.

C. Related sections: Related sections include, but shall not be limited to,
   1. Specifications for all other instruments listed in section 40 75 00, Process Liquid Analytical Measurement
   2. Schematics related to this instrument.

D. Alternates
   1. Parameter-specific controllers that do not allow changing parameter configurations in the field are unacceptable.
   2. Controllers or transmitters without the capability to access data through an internet browser enabled device and cannot present real-time instrument diagnostics are not acceptable.

1.2 System Descriptions

A. Design requirements
   1. Includes capability to actively monitor all internal components and present diagnostics on the overall health of all connected sensors and time to next required maintenance, reducing user risk.
      a. Ability to see and be notified of upcoming and past due maintenance.
   2. Includes capability to provide real-time alerts when sensor issues occur with built in workflows with step-by-step guidance to perform calibration and maintenance tasks, reducing user risk.
   3. Includes connection to laboratory spectrophotometers for adjustment of nitrate and ammonia online sensor values without the need to remove sensor from the system.
   4. Includes cellular network coverage or a LAN connection
   5. Provides capability to view all connected plant measurements, alerts, calibration, and maintenance status in real time on any internet browser capable device.
      a. Connects with overall data system for real time graphic of both online and laboratory data for a full picture of functional plant operational capability.
   6. Controller designed to be used in indoor or outdoor locations.

B. Performance Requirements
   1. The controller accepts digital sensors in any combination to measure the following water quality parameters:
      a. pH/ORP
      b. Conductivity
      c. Dissolved Oxygen

d. Organic load
e. Sludge level
f. Ammonium
g. Nitrate
h. Combination Ammonium and Nitrate
i. Total suspended solids
j. Orthophosphate
k. Ammonium
l. Nitrate
m. Turbidity

C. Environmental Requirements
1. Operational Criteria
a. Operating Temperature:
1) Ethernet version: -20 to 60 °C (-4 - 140 °F).
2) Cellular version: -20 to 55 °C (-4 - 131 °F)
b. Storage temperature: –20 to 70 °C (–4 to 158 °F)
c. Relative humidity: 0 to 95%, non-condensing
d. Altitude ≤2000m (6,562 ft.)

1.3 Certifications
A. EMC: CE approved (with all sensor types). Listed for use in general locations to UL and CSA safety standards by ETL (with all sensor types).
B. Safety: General Purpose UL/CSA 61010-1 with cETLus safety mark

1.4 Warranty
A. Warranted for 1 year from date of shipment from manufacturer defects.

1.5 Unscheduled Maintenance
A. Clean controller face
B. Calibrate mA output signals

PART 2 PRODUCTS

2.1 Manufacturer
A. Hach Company, Loveland, Colorado and Hach Lange GmbH, Berlin, Germany
1. SC4200 Controller

2.2 Manufactured Unit
A. Microprocessor-based sensor controller.
B. Change digital sensors connected to the controller by unplugging and plugging in sensors as necessary.
C. The controller is available with the following power requirements:
AC powered: 100 to 240 VAC ±10%, 50/60 Hz
D. The controller uses a menu-driven operation system.
E. The controller is equipped with a real-time clock.
F. The controller is equipped with two security levels.
G. The controller is equipped with a data logger with ethernet capability. The controller shall have worded operation menus in 8 languages.
H. The controller is equipped with an USB reader for data download and controller software

upload.

I. High voltage:
   1. Two relays (SPDT)
   2. Maximum switching voltage: 250 VAC
   3. Maximum switching current: 5 A (resistive only load)
   4. Maximum switching power: 1250 VA, 125 W (resistive only load)
   5. Wire gauge: 0.75 to 2.5 mm2 (18 to 12 AWG)

J. Five analogs 0/4-20 mA outputs are provided with a maximum impedance of 500 ohms.
   1. The controller can be equipped with five additional 4-20 mA outputs with a maximum impedance of 500 ohms.
   2. The following can be programmed:
      a. Alarms:
         1) High and Low alarm point
         2) High and Low alarm point deadband
         3) On and Off delay
      b. Controls
         1) Linear
         2) PID
   3. The following can be assigned:
      a. Primary, secondary, tertiary, and quaternary value measurement I
      b. Primary, secondary, tertiary, and quaternary value measurement II
      c. Calculated values

K. The controller can be equipped with the following forms of communication:
   1. Profibus DP

L. All user settings of the controller are retained for 10 years in flash memory.

M. The controller is equipped with a system check for:
   1. Power up test (monitoring and shutdown)
   2. Total power draw
   3. Memory devices
   4. Motherboard temperature

2.3 Equipment

A. Materials
   1. Housing: polycarbonate, aluminum (powder coated), and stainless steel
   2. Rating: NEMA 4X enclosure, rated IP66

B. Conduit openings: 0.5 in. NPT

2.4 Components

A. To deliver:
   1. Controller as described in section 1.1.A
   2. Mounting hardware for wall, pipe, and panel mounting
   3. User manual and installation documentation

B. Dimensions: Refer to controller drawings

C. Weight: 1.7 kg (3.7 lbs.)

2.5 Instrument Options,

****

Must be added to instrument at time of order. Choose none, one, or both

****

[ ] North American Cellular Modem (GSM)
[ ] North American Cellular Modem (CDMA)

[ ] LAN

2.6 Instrument Accessories

****

Select as many as required

****

[ ] 4-20mA output module, 5 outputs
[ ] Profibus DP network module
[ ] M12/RJ45 connector kit (Ethernet cable)
[ ] M12/M12 connector kit (Ethernet cable)
[ ] LZY472-01 USB adapter
[ ] Ethernet cable M12 to M12, 10 m
[ ] Ethernet cable M12 to RJ45, 5 m
[ ] Mobile holder
[ ] Ethernet-Adapter for SC Service Port
[ ] Memory-Stick (USB)
[ ] UV protection screen
[ ] UV protection screen with sun roof

****

PART 3 EXECUTION

3.1 Preparation

A. Mounting
   1. Mount the controller as shown on the drawings

3.2 Installation

A. Install controller following transmittal drawings and instrument user manual.

3.3 Manufacturer's Service and Start-Up

A. Contractor will include manufacturer's services to perform commissioning of the system to include device provisioning to communicate via local protocols and initiate initial product configuration
B. Contractor will include the manufacturer's services to perform start-up on instrument to include basic operational training and certification of performance of the instrument.
C. Contractor will include a manufacturer's Service Agreement that covers all the manufacturer's recommended preventative maintenance, regularly scheduled calibration and any necessary repairs beginning from the time of equipment startup through to end user acceptance / plant turnover and the first 12 months of end-user operation post turnover.
D. Items A and B are to be performed by manufacturer's factory-trained service personnel. Field service and factory repair by personnel not employed by the manufacturer is not allowed.
E. Use of manufacturer's service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION