**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. Section includes:
     1. The SC1500 is a multi-parameter controller for digital analytical devices (e.g., sensors and analyzers). The controller is configured and operated with a mobile application on a customer-supplied iOS® or an Android® device with an internet browser that is connected to internet. The controller communicates on a cellular network, LAN or W-LAN. The controller comes with a hard wired “USB”-box for installing a cellular modem or W-LAN adapter. The SC1500 enables communication for Mobile Sensor Management.
     2. Scope
        1. Provide labor, material, equipment, related services, and supervision to install and operate the controller to drawings and manufacturer’s specifications.
     3. 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.
     4. 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.
  2. System Descriptions
     1. Design requirements
        1. Includes capability to actively monitor internal components and present diagnostics on the overall health of enabled connected sensors and time to next required maintenance, reducing user risk.
           1. Overall time remaining until maintenance tasks are due is displayed in days, 7 days ahead
        2. Includes capability to provide real-time alerts when issues occur on enabled sensors 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 manually enter new calibration data.
        4. The controller and laboratory spectrophotometer communicate on a cellular network, LAN or W-LAN
        5. Provides capability to view data from all connected analytical devices including: measurement data, alerts, calibration, and maintenance status in real time on any device with internet connectivity and browser
           1. 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.
     2. Performance Requirements
        1. The controller accepts digital analytical devices in any combination to measure the following water quality parameters:
           1. pH/ORP
           2. Conductivity
           3. Dissolved Oxygen
           4. Organics (SAC254)
           5. Sludge level
           6. Total suspended solids
           7. Orthophosphate
           8. Ammonium
           9. Nitrate
           10. Turbidity
     3. Environmental Requirements
        1. Operational Criteria
           1. Operating Temperature: 20 to 55 °C (-4 to 131 °F).
           2. Storage temperature: –20 to 70 °C (–4 to 158 °F)
           3. Relative humidity: 0 to 95%, non-condensing
           4. Altitude ≤2000m (6,561 ft.)

* 1. Certifications
     1. North America
        1. cTUVus compliant to UL/CSA61010-1
        2. FCC-SDOC
     2. CE approved (with all sensor types).
        1. DIN EN 61326 surge protection
        2. EMC EN 61326-1
        3. Safety: General Purpose EN 61010-1
  2. Warranty
     1. Warranted for 1 year from date of shipment from manufacturer defects.
  3. Unscheduled Maintenance
     1. Clean enclosure
     2. Calibrate mA output signals

1. PRODUCTS
   1. Manufacturer
      1. Hach Company, Loveland, Colorado and Hach Lange GmbH, Berlin, Germany
         1. SC1500 Controller
   2. Multiple channel water quality sensor transmitter with the ability to access sensor data remotely through a browser enabled device.   
      [ ] Two sensor channels  
      [ ] Four sensor channels

[ ] Six sensor channels

* 1. Manufactured Unit
     1. Microprocessor-based sensor controller.
     2. Possible to interchange digital sensors connected to the controller by unplugging and plugging in sensors as necessary.
     3. The controller is available with the following power requirements:  
        AC powered: 100 to 240 VAC ±10%, 50/60 Hz
     4. The controller uses a menu-driven operation system.
     5. The controller is equipped with a real-time clock.
     6. The controller is equipped with two security levels.
     7. The controller is equipped with a data logger with ethernet capability.
     8. The controller is able to connect to the ethernet.
     9. The controller shall have worded operation menus in 10 languages.
     10. Interface to PLC
         1. High voltage relays:
            1. Four relays (SPDT)
            2. Maximum switching voltage: 250 VAC, 125 VDC
            3. Maximum switching current: 5 A
            4. Maximum switching power: 1500 VA, 250 VAC; 625 W, 125VDC
            5. Wire gauge: 1.5 mm2 (15 AWG) maximum
         2. Analog 0/4-20 mA outputs are provided with a maximum impedance of 500 ohms.
            1. The controller can be equipped with 0, 4, 8, or 12 4-20 mA outputs.
            2. The following can be programmed:

Alarms:

1.1 High and Low alarm point

1.2 High and Low alarm point deadband

1.3 On and Off delay

Controls

2.1 Linear

2.2 PID

* + - 1. The following can be assigned:
         1. Primary, secondary, tertiary, and quaternary value measurement I
         2. Primary, secondary, tertiary, and quaternary value measurement II
      2. The controller can be equipped with the following form of digitak communication:
         1. Profibus DP
    1. All user settings of the controller are retained for 10 years in flash memory.
    2. 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
  1. Equipment
     1. Materials
        1. Housing: polycarbonate, aluminum (powder coated), and stainless steel
        2. Rating: NEMA 4X enclosure, rated IP66
     2. Conduit openings: 0.5 in. NPT
  2. Components
     1. To deliver:
        1. Controller as described in section 1.1.A
        2. Mounting hardware for wall, pipe, and panel mounting of the USB box
        3. User manual and installation documentation
     2. Dimensions: Refer to controller drawings
     3. Weight: Approximately 5 Kg (11 lb). Weight varies by model.
  3. 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)

[ ] W-LAN

[ ] LAN

* 1. Instrument Accessories

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Select as many as required

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

[ ] 4-20mA output module, 4 outputs

[ ] Profibus DP network module

[ ] Ethernet cable M12 to M12 10m

[ ] Ethernet cable M12 to RJ45, 5 m

[ ] Memory-Stick (USB)

[ ] sun roof

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PART 3 EXECUTION

* 1. Preparation
     1. Mounting
        1. Mount the controller as shown on the drawings
  2. Installation
     1. Install controller following transmittal drawings and instrument user manual.
  3. Manufacturer’s Service and Start-Up
     1. 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
     2. 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.
     3. 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.
     4. 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.
     5. Use of manufacturer’s service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION