

## DEMONSTRATION OF SCADA IN CLEAN WATER SUPPLY

### Core Components of SCADA

This document provides detailed technical specifications for the core components required for the SCADA system integration in the water production facility. The specifications ensure that bidders have a clear understanding of the quality, performance, and compatibility requirements for each component. These technical guidelines are designed to maintain consistent performance, reliability, and operational efficiency across different installations while allowing bidders the flexibility to propose suitable solutions.

Depending on the nature of components, technical specifications may focus on different parameters and performance. If not explicitly stated, bidders are free to select components as long as they align with the overall project goals and contribute to the successful implementation.

The core components are listed below:

- PLC (If not used, no need to follow):
  - Power Input: 12-24 VDC
  - Digital Input: Isolated, 0-24 VDC input range
  - Digital Output: Isolated, 0-24 VDC output range, Dry Switch or Open Collector
  - Analog Input (Voltage): 0-10 VDC input range, 10-bit resolution or higher
  - Analog Input (Current): 4-20 mA input range, 10-bit resolution or higher
  - Analog Output (Voltage): 0-10 VDC output range, 10-bit resolution or higher
  - Analog Output (Current): 4-20 mA output range, 10-bit resolution or higher
  - Support I/O Extension: At least 64 I/O points or 8 Extension Modules
  - Support Network: RS485, LAN (10/100/1000 Mbps)
  - Network Protocol: Modbus RTU, Modbus TCP, MQTT
  - Warranty: 2 Years.
- Input/Output Extension (If not used, no need to follow):
  - Power Input: 12-24 VDC
  - Digital Input: Isolated, 0-24 VDC input range
  - Digital Output: Isolated, 0-24 VDC output range, Dry Switch or Open Collector
  - Analog Input Voltage: 0-10 VDC input range, 10-bit resolution or higher
  - Analog Input Current: 4-20 mA input range, 10-bit resolution or higher
  - Analog Output Voltage: 0-10 VDC output range, 10-bit resolution or higher
  - Analog Output Current: 4-20 mA output range, 10-bit resolution or higher
  - Support Network: RS485 or LAN
  - Network Protocol: Modbus RTU or Modbus TCP or MQTT
  - Warranty: 2 Years.
- Digital Flow Meter:
  - Liquid Type: Water, Sewage
  - Fluid Velocity: 0-7 m/s
  - Turbidity: 0-1000 NTU with little bubble
  - Fluid Temperature: 0-100 °C
  - Pipe Material: Steel, Stainless, Cast iron, Copper, Cement, PVC, HDPE
  - Pipe Diameter: 100-1000 mm



- Transducer Type: Clamp-on or Insertion Ultrasonic Transducers
- Communication: RS485, Modbus-RTU
- Baud Rate: 1200-38400 bps
- Accuracy: 1% (Standard)
- Working Temperature: 0-60 °C (Controller), 0-100 °C (Transducer)
- Working Under Water: 2 m (After completely sealing) for both Controller and Transducer
- Warranty: 2 Years.
- Digital Power Meter:
  - Phase: 3 Phase
  - Rating Voltage: 220/380 VAC
  - Rating Current: Depending on the Load
  - Frequency: 45-65 Hz
  - Withstand Voltage: > 2 kV/1 min
  - Insulation between Terminal and Chassis: > 100 MΩ
  - Accuracy: 1% (Standard)
  - Display Type: Digital Display
  - Communication: RS485, Modbus-RTU
  - Baud Rate: 1200-38400 bps
  - Warranty: 2 Years.
- Water Pressure Sensor for Booster Pump System:
  - Power Supply: 24 VDC
  - Measurement Range: 0-10 Bar
  - Measuring Media: Gaseous, Liquid, Water
  - Medium Temperature: -40 to 80 °C
  - Environment Temperature: -40 to 85 °C
  - Compensation Temperature: At least -10 to 70 °C (Standard)
  - Pressure Type: Gauge Pressure, Absolute Pressure
  - Accuracy: 1% Full Scale (FS)
  - Overload: 200%
  - Temperature Drift: ≤ 0.03 % FS/°C
  - Long-term Stability: ≤ 0.2 % FS/Year
  - Display Type: Digital
  - Communication: RS485, Modbus-RTU
  - Baud Rate: 1200-38400 bps
  - Protection Grade: IP65
  - Warranty: 2 Years.
- Water Pressure Switch for Booster Pump System:
  - Rating Power: 250 W
  - Rating Current: 0.5 A
  - Rating Voltage: 220 VAC, 24 VDC
  - Measurement Range: 0.1-7 Bar (Adjustable)
  - Maximum Endurance: 10 Bar
  - Measuring Media: Compressed Air, Water
  - Medium Temperature: -5 to 60 °C
  - Environment Temperature: -5 to 60 °C
  - Switch Type: Normally Close (NC)
  - Protection Grade: IP54



- Warranty: 2 Years
- Water Pressure Sensor for Water Tank (Water Level Sensor):
  - Power Supply: 24 VDC
  - Measurement Range: 0-10 m
  - Measuring Media: Liquid, Water
  - Medium Temperature: -20 to 85 °C
  - Working Temperature: -40 to 80 °C
  - Accuracy: 1% Full Scale (FS)
  - Overload: 200%
  - Sensitivity Drift:  $\leq 2\%$  FS
  - Zero Drift:  $\leq 2\%$  FS
  - Long-term Stability:  $\leq 2\%$  FS/Year
  - Communication: RS485, Modbus-RTU
  - Baud Rate: 1200-38400 bps
  - Protection Grade: At least IP68
  - Warranty: 2 Years.
- Float Switch (Water Level Sensor) for Intake:
  - Use Media: Water, Oil
  - Max Contact Rating: 10 W
  - Max Switching Voltage: 220 VDC
  - Max Switching Current: 1.5 A
  - Max Breakdown Voltage: 300 VDC
  - Max Carry Current: 3.0 A
  - Max Contact Resistance: 100 M $\Omega$
  - Temperature Rating: -30 to 125 °C
  - Material: Stainless Steel
  - Length: 150 mm (Recommended)
  - Type: Double Balls Float Switch, Straight
  - Warranty: 2 Years.
- Float Switch (Water Level Sensor) for Water Tank:
  - Use Media: Water, Oil
  - Max Contact Rating: 10 W
  - Max Switching Voltage: 220 VDC
  - Max Switching Current: 1.5 A
  - Max Breakdown Voltage: 300 VDC
  - Max Carry Current: 3.0 A
  - Max Contact Resistance: 100 M $\Omega$
  - Temperature Rating: -30 to 125 °C
  - Material: Stainless Steel
  - Length: 100 mm (Recommended)
  - Type: Single Balls Float Switch, L Type
  - Warranty: 2 Years.
- Non-Contact Level Switch (Liquid Level Sensor) for PAC or CL Container:
  - Voltage Range: 5-24 VDC
  - Use Media: Water (cold, hot, boiling), Liquid
  - Use Container/Tube/Pipe: Mon-Metallic (Plastic, Glass, Ceramic)
  - Sensing Distance: Max 20 mm
  - Sensing Type: Capacitance Sensor







- 4G Band: Band 5 (850 MHz), Band 8 (900 MHz), Band 3 (1800 MHz), Band 1 (2100 MHz), Band 7 (2600 MHz)
- Communication: RS232, RS485
- Baud Rate: At least 1200-38400 bps
- Warranty: 2 Years.
- IoT Gateway:
  - Power Supply: 12-24 VDC
  - Rating Current: Max 3A
  - Network Technology: GSM/CDMA/HSPA/LTE
  - 2G Band: Band 8 (900 MHz), Band 3 (1800 MHz)
  - 3G Band: Band 1 (2100 MHz)
  - 4G Band: Band 5 (850 MHz), Band 8 (900 MHz), Band 3 (1800 MHz), Band 1 (2100 MHz), Band 7 (2600 MHz)
  - Communication: LAN, Wi-Fi (Optional)
  - Network Protocol: MQTT
  - Warranty: 2 Years.

