

Salient Characteristics:

Servers:

- a. Server must be capable of providing 24 x 7 x 365 continuous system monitoring and data collection.
 - System Component
 - Software
 - Radio Frequency
 - FCC Certificate
 - Protocols
 - Network/System
 - Security Policy
- b. Secondary server must be provided as a backup.
 - Must be a duplicate version of the primary server

Gateways:

Hubs

- a. Connectivity:
 - IEEE 802.15.4 protocol (slower)
 - Wireless or Wi-Fi 2.4 to 5Ghz, 900-915Mhz
 - IEEE 802.11 b/g/n/ac is preferred for quicker/faster operation
 - RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- b. Distance: 200 ft to 300 ft (60 – 90m) is adequate for distance between devices; further distance (max. 1500 ft (450 m) would be beneficial and preferred as long as current infrastructure supports it.
- c. Cabling may be required to be installed for network connections
 - CAT 5e is acceptable
 - CAT 6 is preferred
- d. Check for operation and function.

Routers

- a. Connectivity:
 - IEEE 802.15.4 protocol (slower)
 - Wireless or Wi-Fi 2.4 to 5Ghz, 900-915Mhz
 - IEEE 802.11 b/g/n/ac is preferred for quicker/faster operation
 - RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
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- b. Distance: 200 ft to 300 ft (60 – 90m) is adequate for distance between devices; further distance (max. 1500 ft (450 m) would be beneficial and preferred as long as current infrastructure supports it.
Wi-fi mapping/signal strength testing will be required if VA owned existing Wi-fi will be used and/or stand alone Wi-fi system will be provided in the contract
- c. Cabling may be required to be installed for network connections
 - CAT 5e is acceptable

- CAT 6 is preferred
- d. Check for operation and function. **Cable testing and certifications will be required**

Signal Repeaters

- a. Connectivity:
 - IEEE 802.15.4 protocol (slower)
 - Wireless or Wi-Fi 2.4 to 5GHz, 900-915Mhz
 - IEEE 802.11 b/g/n/ac is preferred for quicker/faster operation **RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW**
- b. Distance: 200 ft to 300 ft (60 – 90m) is adequate for distance between devices; further distance (max. 1500 ft (450 m) would be beneficial and preferred as long as current infrastructure supports it.
- c. Cabling may be required to be installed for network connections
 - CAT 5e is acceptable
 - CAT 6 is preferred
- d. Check for operation and function.

Transmitters:

Temperature Sensors (should read- TEMP & HUMIDITY TRANSMITTER

- a. Connectivity:
 - Wi-Fi: 802.11 b/g/n/ac
 - **RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW**
- b. Onboard Memory
- c. Room Temperature and Humidity
 - Range: 10°C to 50°C (Temperature)
 - Accuracy: +/- 0.5°C
 - Range: 10 to 95% (Humidity)
 - Accuracy: +/- 3%
- d. **Local Display and alarm**
- e. **Configurable for external probes**

AIRFLOW EXCHANGE RATE TRANSMITTER

– BACnet Compatible

- Wi-Fi: 802.11 b/g/n/ac
- **RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW**

-Analog output: 0-10v/ 4-20mA (selectable)

-Measuring range: 0-15 m/s

-Measuring accuracy: +/- 0.65 m/s

-local Display and local alarm

LINE POWER MONITOR TRANSMITTER

– Display and Local Alarm

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @50mW
- No delay for alarm setting

Differential Pressure Monitors

- BACnet/IP Compatible with CAT 5e or CAT 6 network cable
- Display – Color Preferred
- Local Audible and Visual Alarm
- Wi-Fi or CCX Connectivity – 2.4 GHz 802.11 b/g/n or 5 GHz 802.11 ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
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- Measurement Range: -125 Pa to +125 Pa (+/- 0.5 in H²O)
- Accuracy: +/-0.1” WC (+/- 0.25% FS)
- Report Rate – settable at 5, 15, 30, 60 minutes
- USP 797 Requirement
- Overpressure: +/- 1 PSI (15” WC for < 0.10” WC FS)
- Analog Input – 4-20mA, 0-5 vdc, or 0-10 vdc configurable for either Analog or Digital
- Analog Output – 4-20mA, 0-5 vdc, or 0-10 vdc
- **External & Internal Probe**
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- Connectivity: Range: -17°C to 60°C (Temperature)
- Accuracy: +/- 0.5°C **internal**
- **External: see probe data**
- **Min. requirement for external: -34c to 82c (Temperature)**
- **Accuracy; +/- 0.5c**
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- **Fridge & Freezer Transmitter/Probe**
- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW

-local Display and local alarm

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- Range: -45°C to 15°C
- Accuracy: +/- 0.5°C

- **Ultra-Low Freezer Transmitter/Probe**

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- local Display and local alarm

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- Range: -90°C to -45°C
- Accuracy: +/- 0.5°C

- **Incubator Transmitter/Probe**

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- local Display and local alarm

- Range: 10°C to 50°C (Temperature)
- Accuracy: +/- 0.5°C
- Range: 10 to 95% (Humidity)
- Accuracy: +/- 3%

Centrifuge Probe

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Food Trays/Salad Bars Probe

-probe range: -34c to 82c

-probe accuracy; +/-0.5c

Hemo Temp/Air – Blood Bank Refer/Freezer Probe

-probe range: -34c to 82c

-probe accuracy; +/-0.1c

Vaccine & Reagent Probe

-probe range: -34c to 82c

-probe accuracy; +/-0.1c

BAC T Probe

-probe range: -34c to 82c

-probe accuracy; +/-0.1c

Blood/Plasma Probe

-probe range: -34c to 82c

-probe accuracy; +/-0.1c

Pipe/Dish Machine Probe kit, tank attachment kit

Probe range: -34c to 149c

Probe accuracy range: +/-5c

External Transmitters: not needed, covered under : Temp/Humidity transmitter, item e. (above)

Ambient Temperature & Humidity Sensors**a. Connectivity:**

- Wi-Fi: 802.11 b/g/n/ac
- Wireless: 901-928 MHz

b. Moisture:**c. Humidity: 0 to 95% RH (non-condensing)****d. Range: -45°C to 15°C****e. Accuracy: +/- 0.5°C (Temp) +/- 2% (Humidity)****Oxygen (O2) Sensor/Tranmitter****f. Connectivity:**

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- Range: 0% to 25%
- Accuracy: +/- 3%
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Door Ajar Alarm Sensor/Transmitter

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- magnetic switch or external contacts
- Senses door open/closed state
- No delay alarm trigger
- Local display and alarm

Domestic Hot Water Sensor/Transmitter

- External pipe mount
- Probe range; -40c to 120c
- Probe accuracy; +/- 2c

- **Variable sampling rate**
- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
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Steam Trap Sensor/Transmitter

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- External probe mount
- Probe range: -20c to 200c
- Probe accuracy: +/-0.5c
- Variable sampling rate

Carbon Dioxide (CO₂) Sensor/Transmitter

- Wi-Fi: 802.11 b/g/n/ac
- RF specifications U.S. : ISM 900 MHz, FHSS (902-928 MHz) @250mW
- Range: 0% to 20%
- Accuracy: +/- 2%
- Real time sampling

Analog Input – 4-20mA, 0-5 vdc, or 0-10 vdc configurable:

- either Analog or Digital

Analog Output – 4-20mA, 0-5 vdc, or 0-10 vdc

All devices must be RoHS Compliant.

Software:

- Must be Approved or Authorized on VA TRM website
 - <https://trm.oit.va.gov/TRMHomePage.aspx>
- Customer Support
- SAML 2.0 SSO Capable – Preferred
- LDAP – Acceptable (if SAML 2.0 SSO is not available)
- Alert Communications
 - Email (SMTP)
 - SMS/MMS
 - Alarm, Lights, Strobes
 - Phone Call
- Escalatory Alarm Settings **per individual device (Servers, Gateways, Routers, Repeaters, Transmitters, etc)**
- Access to NIST Certifications and/or Calibrations
- NIST Certification
 - Must adhere to ISO-17025 protocols
 - NIST Traceable

- i. Scheduled Reports: **scheduling set up and configurable by end users**
- j. Restrictable Access for End Users
- k. Web Based Access for End Users
- l. Integrated Third Party Hardware – Analog or Digital
- m. Export Data to Third Party Systems
- n. Must be able to access NIST certifications for inspection reports.