Vertiv™ Liebert® SiteScan™ Web
Critical Facilities Monitoring System
GUIDE SPECIFICATIONS

1.0 GENERAL

1.1 Overview

This document contains the specification and input/output point summaries for a Critical Facilities Monitoring System (CFMS). The system shall provide critical facility monitoring for Computer Room Air Conditioning (CRAC) systems, Uninterruptible Power Supply (UPS) systems, Power Distribution Units (PDU), Static Transfer Switches (STS), Direct Current Power Systems (DC), Branch Circuit Monitoring Systems (BCMS), Power Distribution Strips, Standby Generators, Vertiv™ Liebert® Alber™ Battery Monitoring, Rack Enclosure Monitoring, Leak Detection Systems and other critical infrastructure systems as specified.

1.2 System Requirements

1. All material and equipment used shall be standard components, regularly manufactured and available and not custom-designed especially for this project. All systems and components, except site-specific software, shall have been thoroughly tested and proven in actual use prior to installation of this project.
2. The manufacturer will furnish or supply a site-specific CFMS system based on customer requirements.
3. The CFMS architecture shall be fully modular permitting expansion of application software, system peripherals and field hardware.
4. The CFMS shall utilize a distributed processing architecture so that polling of all points is not dependent on a single processor.
5. The CFMS shall be based on open protocols and seamlessly integrate with Vertiv and Vertiv™ Liebert ® Aperture™ software suites as well as Building / Network Management Systems (BMS).
6. Open protocols supported shall include:
    - Java
    - HTTP(s)
    - BACnet PTP / IP
    - Modbus ASCII / RTU/ via serial or network interfaces IP slave only
    - SNMP v.1
7. An employee of the manufacturer shall initialize, commission and warrant the CFMS.
8. The CFMS shall have the capability of being remotely monitored and managed 24 hours a day, 7 days a week by the manufacturer.
9. The CFMS shall have the ability to be deployed worldwide.
10. The CFMS shall operate as a true Web-based system. Bolt-on Web applications shall not be permissible.

11. The Web interface shall support all standard Web browsers.
12. The CFMS shall support enterprise level databases, including SQL.
13. The CFMS shall operate on a server defined by the customer. Specific server brand or function shall not be permissible.
14. The CFMS shall support virtual server environments by default.

1.3 Approved Products

The Critical Facilities Monitoring System (CFMS) shall be Vertiv™ Liebert® SiteScan™ Web, as manufactured by Vertiv. No substitutions shall be accepted.

1.4 Scope of Work

1.4.1 Owner-Supplied Items

The owner shall furnish the following system components:

1. Network (LAN) hardware and software required to provide an Ethernet backbone to be used for transport of IP data packets from gateway modules to the CFMS Web Server, and from the CFMS Web Server to the Liebert® SiteScan™ Web workstations. These components may include hubs, routers, cabling, network operating systems, firewalls, IP addresses, Virtual Private Networks (VPN) and other components as required. The owner will supply network drops for the CFMS Web Server, CFMS Web workstations and control modules.
2. Dedicated CFMS Server meeting the following minimum requirements:

Specs:	Dual core processor, 6 GB of RAM (memory) or better, 10Mbps or higher LAN communications Supports PCs running Windows and Apple (Mac) PCs running Mac OS X	
OS:	The following operating systems in 64-bit versions: • Windows 10 Professional • Windows Server 2014 • Windows Server 2016 • Red Hat Enterprise Linux 7.4	• Windows 8.1 Professional and Enterprise Windows Server 2014 • Windows 7 Professional and Ultimate • Ubuntu Desktop 16.04 LTS
Database:	Apache Derby (default database engine-included with purchase) The SSWeb system supports the following and database engines are sold separately:	
	• SQL Server Express 2017, 2016, 2014 • Oracle 12c • PostgreSQL 9.4 and 10	• SQL Server 2017, 2016, 2014 • MySQL 5.7.2 • Apache Derby
Security:	Supports TLS (Transport Layer Security) v1.2 with 128 bit encryption between client and SSWeb server	
Supports:	• Unlimited simultaneous users • Hierarchical server configuration for very large systems • Communication to field controllers via BACnet (TCP/IP)	
Languages:	International English, Brazilian Portuguese, French, French Canadian, German, Italian, Japanese, Korean, Russian, Simplified Chinese, Swedish, Thai, Traditional Chinese, Vietnamese	
BACnet:	Advanced Operator Workstation (B-AWS) supporting BACnet Revision 12	

3. CFMS Server may be Virtual Environment compatible.
4. CFMS Workstation PCs meeting the following minimum requirements:

Dual core processor, 1.5 GB RAM, 10Mbps or higher LAN communications Supports PCs running Windows and Apple (Mac) PCs running Mac OS X and Linux	
Smart phones	Android, iOS
Tablets	Android, iOS, Surface
Operating system	Web Browsers
Windows	• Google Chrome v66.0 or later • Internet Explorer v11 • Desktop Microsoft Edge v40 or later • Mozilla Firefox v60.0 or later
Mac OS X (Apple Mac only)	• Safari v11 or later • Google Chrome v66.0 or later • Mozilla Firefox v60.0 or later
Linux	• Google Chrome v66.0 or later • Mozilla Firefox v60.0 or later

5. The owner shall supply the following information to facilitate system implementation:
    - IP addresses and subnet masks and other information to configure network devices
    - Drawing and schematics as needed to create the customized graphic pages and configuration
    - Provide a person as the nominated system owner for administrator purposes
    - Assistance in defining point descriptions, alarm messages and content for customized graphic pages and configuration
    - Secure location for hardware and server

1.4.2 Contractor's Responsibilities

In the overall scope of the project, the contractor shall provide one or more of the following CFMS components:

1. Software
    - CFMS Server software and license
    - Customized graphic pages and software configuration
2. Control Modules
    - Vertiv™ Liebert® SiteLink 12E, Liebert® SiteLink-4E or Liebert® SiteLink-2E Interface Modules for Vertiv™ Liebert® Precision Cooling, Power and UPS units.
    - Vertiv™ Liebert® SiteI/O-E Family, SSW-28IOE or SSW-IOE, Universal Input/Output Modules for space, power and cooling sensor monitoring, etc.
    - Vertiv™ Liebert® SiteTPI-E, Vertiv™ Liebert® Modbus or BACnet Third-Party Interface
    - Vertiv™ Liebert® SiteIP-E SNMP to BACnet Interface
    - 120-230VAC / 24 VAC transformers for Control Modules listed in this section

3. Control Module Mounting: Mount all control module panels (i.e., Vertiv™ Liebert® SiteLink, Vertiv™ Liebert® SiteI/O, Vertiv™ Liebert® SiteTPI and Vertiv™ Liebert® SiteIP, etc.) and furnish miscellaneous mounting hardware.
    - Provide power wiring and receptacles to power all control panels from UPS circuits. 120-230/24 VAC plug-in transformers will be furnished with the control panels.
    - All to be fed by UPS back power supplies.
    - Provide 24 VAC wiring from screw terminal on the transformer to screw terminal in each control panel.
    - Provide twisted-pair communications wiring and terminate as shown on the drawings.
    - Recommended wire is MAGNUM Cable P/N A3-ARC-156-2
    - Provide wiring for all field-mounted sensors and transducers as required and make wiring terminations. See cable specifications; wiring must meet plenum and low smoke and zero halogen standards based on local codes.
    - Label all wiring runs at both ends and provide as-built termination list to the CFMS vendor facilitate software configuration.
    - Provide warranty on contractor-furnished items as specified under General Conditions.
4. Conduit and Wiring: Conduit and wiring is provided under Division 16. The contractor is responsible for termination of all wiring used for sequence of operations and alarms.
    a. **Code and Regulations –** All electrical equipment and material and its installation shall conform to the current requirements of the following authorities:
        - Occupational Safety and Health Act (OSHA)
        - Underwriters Laboratories (UL)
        - National Electric Code (NEC)
        - National Fire Code
        - IEC 60364 Electrical Installations for Buildings
    b. **Controllers –** All distributed, stand-alone and unitary controllers supplied shall be in compliance with the following listings and standards:
        - UL916 for Open Energy Management
        - FCC Part 15, Sub-Part B, Class A
        - CE Electro Magnetic Compatibility
5. As-Built Drawings: Provide as-built drawings of system configuration per actual installation.

1.4.3 CFMS Vendor Responsibilities

Provide hardware and software as listed.

- Create site-specific software configuration and graphic screens based on information provided by the owner or customer.
- Provide system startup, commissioning, and operator orientation by factory-employed system specialist.
- Provide 24x7 system application and service support through a toll-free number.

- Provide warranty (parts and labor) per the manufacturer's warranty statement.
- The CFMS vendor shall be ISO9001 listed for design and manufacture of environmental control systems for Critical Monitoring and Control applications.

1.5 Submittals, Documentation, Acceptance and Training

1.5.1 Submittals

Shop drawings shall be approved before any equipment is installed. Therefore, shop drawings must be submitted in time for complete review so that all installations can be completed per the project's completion schedule.

- **Shop Drawings:** Copies of shop drawings shall be submitted and shall consist of a complete list of equipment, materials, manufacturer's technical literature, cut-sheets, and installation instructions. Drawings shall contain proposed layout, complete wiring, routing, schematic diagrams, tag number of devices, software descriptions, calculations, installation details, and any other details required to demonstrate that the system will function properly.
- **As Built Drawings:** All drawings shall be reviewed after the final system checkout and updated or corrected to provide 'as-built' drawings to show exact installation. All shop drawings will be acknowledged in writing before installation is started and again after the final checkout of the system. The system will not be considered complete until the 'as-built' drawings have received their final approval. The Contractor shall deliver a sets of 'as-built' drawings.

1.5.2 Documentation

User manuals for the system shall be made available electronically and include the following categories: Vertiv™ Liebert® SiteScan™ Web User-Interface Overview, Using the Geographic View, Alarms, Trends, Reports and Using the Configuration View.

1.5.3 Acceptance

- **Acceptance Testing:** Upon completion of the installation, the Contractor shall start up the system and perform all necessary calibration, testing, and debugging operations. The Contractor in the presence of the Owner's representative shall perform an acceptance test.
- **Notice of Completion:** When the system performance is deemed satisfactory, the system parts will be accepted for beneficial use and placed under warranty. At this time, <Your customer> shall issue a "notice of completion" and the warranty period shall start.

1.5.4 Training

The Contractor shall provide full instructions to designated personnel in the operation, maintenance and programming of the system. The training shall be specifically oriented to the system and interfacing equipment installed.

1.6 General Conditions

1.6.1 Warranty

The Contractor shall warrant that all systems, subsystems, component parts and software are fully free from defective design, materials and workmanship for a period of one (1) year from the date of commissioning or 18 months from shipment from the manufacturer's location, whichever comes first.