

**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 System requirements for Local Area Network (LAN)-for Building Energy Monitoring and Control System (EMCS).

**1.2 RELATED SECTIONS**

- .1 Section 25 05 01 – EMCS: General Requirements.

**1.3 SYSTEM DESCRIPTION**

- .1 Data communication network to link Operator Workstations and EMCS Control Panels:
  - .1 Provide reliable and secure connectivity of adequate performance between different sections (segments) of network.
  - .2 Allow for future expansion of network, with selection of networking technology and communication protocols.
- .2 Data communication network to include, but not limited to:
  - .1 EMCS-LAN.
  - .2 Modems.
  - .3 Network interface cards.
  - .4 Network management hardware and software.
  - .5 Network components necessary for complete network.

**1.4 DESIGN REQUIREMENTS**

- .1 All control products provided for this project shall comprise a BACnet internetwork. Communication involving control components (i.e., all types of controllers and Operator Workstations) shall conform to ANSI/ASHRAE Standard 135-2012, BACnet.
- .2 Each BACnet device shall operate on the BACnet Data Link/Physical layer protocol specified for that device class.
- .3 The Contractor shall provide all communication media, connectors, repeaters, bridges, hubs, switches, and routers necessary for the internetwork.
- .4 All controllers shall have a communication port for connections with the Operator Workstations using the BACnet Data Link/ Physical layer protocol.
- .5 A device on the internetwork shall be provided with a 56k-baud modem that will allow for remote Operator Workstation using the BACnet PTP Data Link/ Physical layer protocol. Remote Operator Workstation via this modem shall allow for communication with any and all controllers on this network as described in this section.
- .6 Connection of an Operator Workstation device to any one controller on the internetwork will allow the operator to interface with all other controllers as if that interface were directly connected to the other controllers. Data, status information, reports, system software, custom programs, etc., for all controllers shall be available for viewing and editing from any one controller on the internetwork.

- .7 All database values (e.g., objects, software variables, custom program variables) of any one controller shall be readable by any other controller on the internetwork. This value passing shall be automatically performed by a controller when a reference to an object name not located in that controller is entered into the controller's database. An operator/installer shall not be required to set up any communication services to perform internetwork value passing.
- .8 The time clocks in all controllers shall be automatically synchronized daily. An operator change to the time clock in any controller shall be automatically broadcast to all controllers on the network.
- .9 Network Medium: CAT6 minimum, #22-24 shielded twisted cable, or fibre optic cable compatible with network protocol to be used within buildings.
- .10 Provide minimum FTV rated cable where run in conduit; use FT6 rated cable otherwise.

## **Part 2 Products**

### **2.1 ETHERNET SWITCHES**

- .1 Refer to Section 25 30 02 – EMCS: Field Control Devices.
- .2 Contractor to connect to existing owner supplied LAN switch. Supply and install communication wiring from Boiler Room panels to LAN switch location. Coordinate set-up and termination with Departmental Representative.

## **Part 3 Execution**

### **3.1 COMMUNICATION WIRING**

- .1 The Contractor shall adhere to the items listed in the “Wiring Installation” Article in the specification.
- .2 All cabling shall be installed in a neat and workmanlike manner. Follow manufacturer's installation recommendations for all communication cabling.
- .3 Do not install communication wiring in raceway and enclosures containing Class 1 or other Class 2 wiring.
- .4 Maximum pulling tension and bend radius for cable installation as specified by the cable manufacturer shall not be exceeded during installation.
- .5 Contractor shall verify the integrity of the entire network following the cable installation. Use appropriate test measures for each particular cable.
- .6 When a cable enters or exists a building, a lightning arrestor must be installed between the lines and ground. The lightning arrestor shall be installed according to the manufacturer's instructions.
- .7 All runs of communication wiring shall be un-spliced length when that length is commercially available.

END OF SECTION