SECTION 25 12 19
INTEGRATION PROTOCOLS

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes Network protocols for all DDC Systems.
B. Related Sections:
   1. 25 12 23 Client-Server Information Database Integration
   2. 25 13 13 Building Level Controller

1.2 REFERENCES
A. ANSI/CEA Standard 709.C LonTalk protocol

1.3 DEFINITIONS
A. Refer to 25 06 11 Integrated Automation Definitions

1.4 SYSTEM DESCRIPTION
A. Refer to Stanford Network Architecture diagrams (MC-01) for additional details.

1.5 SUBMITTALS
A. Integration Plan
   1. Network architecture diagram. Network architecture includes but is not limited to:
      a. Nodes. Each TCP/IP node shall include:
         1) Device Description
         2) Device Name
         3) IP Address
         4) Domain Name (if applicable)
         5) Physical Location (Room Number or Location Description)
      b. Switches and Routers
      c. Integrated systems and/or sub-systems
      d. Dedicated I/O locations
   2. Coordination of vendor protocol and point list submission. Include an integration matrix detailing systems and protocols to be used.
   3. Workflow processes to integrate systems
   4. Include communication hardware, software, and protocols to implement full systems integration.
   5. Identify proposed enhancements or deviations from project documents. Include specific drawings or specifications impacted.
   6. Include latest version of LonMark Functional Profiles used for each type of controller and operator interface included in the submittal.
   7. Include latest version of protocol profiles used: BACnet Protocol Implementation Conformance Statement (PICS) for each type of controller and operator interface included in the submittal.
   8. Modbus registry list for each Modbus device. Include:
a. Name (Name should convey meaningful description of point)
b. Type i.e. Analog Input, Digital Output, etc., (Define whether Master or Slave perspective)
c. Modbus Register
d. Comment Field.
   1) For digital points indicate numeric relation to Binary State, i.e., 0=Alarm, 1=Normal.
   2) For analog points, indicate embellished description i.e., # Cooling Requests.
   3) For analog points representing Enumerated States indicate numeric relation, i.e. 0=Occ, 1=UnOcc, 3=Standby
e. Logic i.e. Summation, High Select, Modbus points stale > 5 min, etc.
f. Master Side Scaling Factor of each analog point
g. Slave Side Scaling Factor of each analog point
h. Read/Write Indicate Read or Write (Define whether Master or Slave perspective)

9. For each typical system/device that will be integrated, provide point list matrix of available points for integration that includes: Point name, descriptor device ID, object ID and point type.

1.6 QUALITY ASSURANCE
A. BACnet products shall be BTL compliant.
   1. Only Tridium-published BACnet driver may be used. Third-party BACnet driver such as BCPBacnet driver are not acceptable.
B. Lon products shall be LonMark compliant.
   1. Only Tridium-published LON driver may be used. Third-party BACnet driver such as BCPLon driver are not acceptable.
   2.
C. Modbus products shall be fully compliant with the Modbus communication protocol developed by Modicon. Any Modbus product that is not fully compliant with the Modbus communication protocol developed by Modicon, may not be acceptable. Contractor shall guarantee that all Modbus products have error-free, bi-directional read and write communication with any device, such as the Campus Emerson Delta V control system, which utilizes the Modbus communication protocol developed by Modicon. Coordinate other system requirements with owner.

Note: Section specific quality requirements should be defined here but not repeated from other sections.

1.7 WARRANTY
A. Include protocol fixes and version upgrades during warranty period.

PART 2 - PRODUCTS
2.1 – Not Used

Note: Consultant to consider adding the following language into equipment specifications (VFDs, Chillers, Boilers, CRAC units, Lighting Controls, Lab Controls, etc):

DDC Systems Integration
Comply with 25 12 19 for protocol and product certifications and listings.

Provide point list matrix of available points for integration that includes: Point name, descriptor device ID, object ID and point type

Include latest versions of protocol profiles used. Provide BACnet Protocol Implementation Conformance Statement (PICS) for each type of controller and operator interface. Include complete set of BACnet Implementation Building Blocks.
Coordinate polling rate requirements to minimize traffic of integrated equipment.
Provide support and coordination for Integration Automation System specified in division 25. Assist in system setup (addressing, naming, etc).

PART 3 - EXECUTION

3.1 CAMPUS CONTROLS TCP/IP NETWORK COMMUNICATION
   A. Niagara protocol is permitted on Campus Controls Network.
   B. FOX/FOXS protocols are permitted on Campus Controls Network.
   C. HTTP/HTTPS protocols are permitted on Campus Controls Network.
   D. BACnet IP protocol is not permitted on Campus Controls Network.
   E. Modbus TCP protocol is not permitted on Campus Controls Network.

3.2 BUILDING LEVEL CONTROLS TCP/IP NETWORK COMMUNICATION
   A. Building level controls network is a private TCP/IP network.
   B. Niagara protocol is permitted on Building Level Controls Network with no restriction.
   C. FOX/FOXS protocols are permitted on Building Level Controls Network with no restriction.
   D. HTTP/HTTPS protocols are permitted on Building Level Controls Network with no restriction.
   E. BACnet IP protocol is not permitted on Building Level Controls Network.
   F. Modbus TCP protocol is permitted on Building Level Controls Network under limited conditions.

3.3 FLOOR LEVEL NETWORK COMMUNICATION
   A. LonTalk protocol over LON TP-FT10 network is the preferred protocol of the Floor Level Network.
   B. BACnet MS/TP protocol is permitted on the Floor Level Network, under limited conditions, specifically:
      1. Only if necessary to integrate a third party controller that does not have an equivalent controller available from Distech. Equivalency shall be determined by Owner.
      2. And, only if a LON solution is not available from vendor.
      3. Only controllers/devices from one single manufacturer are permitted on any MS/TP network. Additional controllers/devices from another manufacturer require a separate MS/TP network.
   C. BACnet IP protocol is permitted on the Floor Level Network, under limited conditions, specifically:
      1. Only if necessary to integrate a third party controller that does not have an equivalent controller available from Distech. Equivalency shall be determined by Owner.
      2. And, only if a LON solution is not available from vendor.
   D. If project requires, Building Level Controllers shall communicate with Delta V Controller via MODBUS RTU.