

Control System Integration Requirements for connection to the Siemens Building Automation System at Florida State University

PART 1 – GENERAL

- 1.01 All non Siemens Building Systems that communicate with the Campus BAS shall conform to the standard for communication for the University as stated herein. Proof of compliance will be required prior to listing in project specifications as an approved vendor. Listing as an approved vendor shall not reduce the requirements of this specification to be met.
- 1.02 Communication protocols to the BAS shall be fully described in the project specifications. The required communication method for all devices shall be via the *Secondary Network (FLN)* (See PART 2 – PROTOCOLS).
- 1.03 If there is no solution available utilizing a device that is native to the *Secondary Network*, devices that utilize a *Gateway* to translate to the *Secondary Network (FLN)* protocol may be considered. Vendors requiring the use of *Gateway* devices require pre-approval by the University and Siemens prior to being listed in project specifications as an approved vendor.
- 1.04 Vendor shall certify, via the *Systems Integration Certification form*, that their system fully integrates with the Siemens BAS for all agreed upon points. The form shall be signed off by both the vendor and Siemens.
- 1.05 Submittals including PICS statements shall be required prior to design development of projects for review and approval by the University. Equipment samples may be required for consideration and testing by the University and Siemens prior to review and approval.
- 1.06 Non Siemens Building Systems (Devices) is defined as equipment utilized at Florida State University within facilities for HVAC, Lighting, Power, etc to operate the facilities that this University intends to connect to the Campus Building Automation System of Siemens Field Panels and Servers. The connection shall allow the communication (bi-directionally) for building control, monitoring, alarming, scheduling, occupancy status, etc.
- 1.07 The Control Systems Integration Requirements document has attempted to minimize all potential integration issues. There shall be no variances to this standard granted without written approval of the Florida State University Central Utilities Department and Siemens.

PART 2 – PROTOCOLS

- 2.01 Accepted Protocols for Direct Connection to the BAS *Secondary Network (FLN)*

The project specifications will determine the protocol(s) available for connection to the BAS *Secondary Network (FLN)*. Since each project has specific requirements, the vendor should not assume that all of the protocols listed below are available for each project. Each Siemens field panel has a limited number of *Secondary Networks (FLN)* available and the protocols selected for each project are based on the systems architecture required to meet the overall design goals.

Accepted Protocols

- A. Siemens P1
 - B. BACNet MS/TP
 - C. MODBUS RTU
- 2.02 Communication:
 - A. The required communication method for all devices shall be via the *Secondary Network (FLN)*
 - B. Primary Network – Campus APOGEE VPN Ethernet Communication:

**Control System Integration Requirements
for connection to the Siemens Building Automation System at
Florida State University**

1. All Siemens Building Controllers and Servers shall directly reside on the *Primary Ethernet Network (ALN)* such that communications may be executed directly between Building Controllers, or directly between server and Building Controllers on a peer-to-peer basis.
2. Non Siemens Building Controllers shall not connect to the Siemens Campus VPN Network except through the *Secondary Network (FLN)* as described below.
 - A. *Secondary Network (FLN): P1*
 1. Devices shall communicate directly via EIA-485 Twisted cabling to a Siemens Field Panel.
 2. Devices covered under this section shall be currently listed in the Siemens “*APOGEE Integration Compatible Products Guide*” .
 3. A maximum of (99) Devices may be configured on individual secondary networks to ensure adequate global data and alarm response times.
 - B. *Secondary Network (FLN) : BACNet MS/TP*
 1. Devices shall communicate directly via EIA-485 Twisted cabling to a Siemens Field Panel.
 2. Communication over the secondary network shall be BACnet MS/TP data layer protocol and MS/TP physical layer as is defined in ASHRAE 135-2004.
 3. Devices covered under this section must meet BTL (BACnet Testing Laboratories) standards and shall be listed by BTL.
 4. A maximum of (50) Devices may be configured on individual *Secondary Networks (FLN)* to ensure adequate global data and alarm response times.
 - C. *Secondary Network (FLN): MODBUS RTU*
 1. Siemens Field Panel shall operate as Modbus Master.
 2. Slave Devices shall communicate directly via EIA-485 Twisted cabling to a Siemens Field Panel.
 3. Communication over the secondary network shall be Modbus RTU data layer protocol via RS-485.
 4. A maximum of (31) Slave Devices may be configured on individual secondary networks without repeaters to ensure adequate global data and alarm response times. Additional addressing up to a total of (247) may be allowed subject to prior approval by FSU and Siemens.

2.03 Gateways

Some systems do not have a native communications protocol suitable for connection to the Siemens *Secondary Network (FLN)*. If no other equipment is available that will fulfill the requirements of the design, upon special approval, equipment may be connected to the *Secondary Network (FLN)* via a *Gateway Device* that has been approved by FSU and Siemens.

Control System Integration Requirements for connection to the Siemens Building Automation System at Florida State University

Approved Devices

- A. ICC ETH-1000
- B. ICC XLTR-1000

Gateway Devices shall not be used without approval by the University and Siemens. In addition, the devices must conform to the requirements described in the Database section of this document.

2.04 Database

BACNet

- A. All database and system network layouts including items described below shall be submitted for review and shall be approved by Siemens prior to allowance of equipment release.
 - 1. BTL Listing and Product Datasheets
 - 2. BACnet Instance Numbers conforming to University allocations
 - 3. Object Naming conforming to University standards
 - 4. System Riser and Layout shop drawings (project specific)
 - 5. Database settings for data communications variables
 - 6. Ability of all requested points to be polled without additional front end programming to allow intermittent switching between monitoring of points on the system connected to the *Secondary Network (FLN)*.
 - 7. Signed *Systems Integration Certification Form*
- B. Verification that all approved requirements have been met shall be required prior to connection to the Campus BAS and acceptance of the device.

MODBUS

- A. All database and system network layouts including items described below shall be submitted for review and shall be approved by Siemens prior to allowance of equipment release.
 - 1. MODBUS Listing and Product Datasheets
 - 2. MODBUS Metadrops conforming to University allocations
 - 3. MODBUS Integrated Systems Binary (ISB) files conforming to University allocations
 - 4. Object Naming conforming to University standards
 - 5. System Riser and Layout shop drawings (project specific)
 - 6. Database settings for data communications variables
 - 7. Ability of all requested points to be polled without additional front end programming to allow intermittent switching between monitoring of points on the system connected to the *Secondary Network (FLN)*.
 - 8. Signed *Systems Integration Certification Form*
- B. Verification that all approved requirements have been met shall be required prior to connection to the Campus BAS and acceptance of the device.

PART 3 – PRODUCTS

3.01 Products

- A. Devices defined include but are not limited to:
 - 1. Variable Frequency Drives, Motor Controllers
 - 2. Generators, ATS, Switchgear, Power Meters, Lighting Control.

**Control System Integration Requirements
for connection to the Siemens Building Automation System at
Florida State University**

3. Unitary HVAC Equipment (Chillers, Boilers, Roof top Units, DX Split Systems, DX Variable Refrigerant Flow Systems, PTAC, Computer Room AC Units, Process Coolers, Ductless Split Systems.
4. Individual classroom or small group of rooms lighting controls.

All Devices require prior written approval before being added to design documents for inclusion on a project or the campus

- B. Devices that are native to the *Secondary Network (FLN)* AND are listed in the “*APOGEE Integration Compatible Products Guide*” for the *Secondary Network (FLN)* chosen in project design documents will be given preference over products requiring a 3rd party *gateway* device.
- C. The Siemens APOGEE system functions as the primary building control system. In addition to providing the HMI function, the system also allows remote programming, program restoration functions, and a common PPCL language. The central server also integrates with other BI software systems via OPC and XML and is not addressed in this document. The intent of control systems integration is to provide a means to integrate major pieces of equipment with complex on board controls and field level devices to operate as a extension of the APOGEE system. Listed below are some system types that are excluded for use via a gateway device for connection to the *Secondary Network (FLN)*:
 1. Building controllers with non-PPCL programming used to manage other sub controllers utilizing DALI or other forms of distributed I/O.
 2. Visualization clients or other forms of hardware designed to export information from the APOGEE system.

PART 4 – EXECUTION

- 4.01 In addition to the project specifications the following shall apply
- A. Coordination with Siemens for all requirements is the responsibility of the device vendor and University assigned project/construction manager prior to project pricing and award.
 - B. All runs of communication wiring shall be un-spliced.
 - C. All communication wiring shall be labeled to indicate origination and destination data.
 - D. Communications and Systems wiring unless otherwise approved by the University shall be installed by Siemens or the University directly in accordance with all applicable Florida Codes and standards.
 - E. The contractor shall be responsible to install all required raceway(s), including pull string, for all involved components of the control system(s).

*****END OF SECTION*****