

SECTION 230906 – (BAS) LOCAL OPERATOR INTERFACE

Note to the Design AE: The AE and project manager should discuss the project with Applicable UNC Facilities personnel. There is a 'Preface' document describing how to employ this and other UNC controls-related Guide Specifications. The AE is instructed to consult the Preface document for guidance on the nature of this specification, methods for deleting non-applicable text, and the use and deletion of Editor's Note's before proceeding to customize this specification.

PART I. GENERAL**I.1 SECTION INCLUDES**

- A. Local System Architecture

I.2 RELATED DOCUMENTS

- A. Section 230900 –Building Automation System (BAS) General
- B. Section 230901 - Building Automation System (BAS) Basic Materials, Interface Devices, and Sensors
- C. Section 230904 - BAS Communication Devices
- D. Section 230905 - BAS Software and Programming
- E. Section 230801 - BAS Commissioning

I.3 DESCRIPTION OF WORK

- A. Refer to Section 230900 for general requirements.

The scope of this section is to provide BAS graphics alarming, scheduling and trending.

PART II. PRODUCTS

II.1 OPERATOR INTERFACE (OI)

- A. UNC provides the LCS that will host the OI. Refer to 230900/I.13 SYSTEM ARCHITECTURE/D/3 for details on LCS configuration.
- B. Contractor shall install a local operator's interface on the University provided LCS. All necessary bindings and IP addressing necessary to accomplish items listed in this section shall be provided. The contractor shall also provide bindings under section "230900/I.4/A Enterprise Building Management System Integration.
- C. The new OI shall allow all levels of user access to the local system.
{Coordinate with UNC regarding Graphic Interface requirement}
- D. Operator Interface Graphic Software:
 - 1. Graphic software shall facilitate user-friendly interface to all aspects of the System Software specified above. The intent of this specification is to require a graphic package that provides for intuitive operation of the systems without extensive training and experience. It shall facilitate logical and simple system interrogation, modification, configuration, and diagnosis.
 - 2. Graphic software shall provide for multitasking such that third-party programs can be used while the OI software is on line. Software shall provide the ability to alarm graphically even when operator is in another software package.
 - 3. Dynamic Data Displays: Dynamic physical point values shall automatically updated at a minimum frequency of 6 updates per minute without operator intervention. Point value fields shall be displayed with a color code depicting normal, abnormal, override and alarm conditions.
 - 4. Point Override Feature: Each displayed point shall be individually enabled/disabled to allow mouse-driven override of digital points or changing of analog points. Such overrides or changes shall occur in the control unit, not just in the workstation software. The graphic point override feature shall be subject to password level protection. Points that are overridden shall be reported as an alarm, and shall be displayed in a coded color. The alarm message shall include the operator's user name. A list of points that are currently in an override state shall be available through menu selection.
- E. Operator Interface Alarm and Event Reporting
{Coordinate with UNC regarding Alarm Interface requirement}
 - 1. Alarm management shall be provided to monitor, buffer, and direct alarms and messages to the LCS operator interface. At no time shall the ability to report alarms be affected by either operator activity at the LCS, or by communications with other panels on the network.
 - a) **Alarm Descriptor:** Each alarm or point change shall include that point's English language description, and the time and date of occurrence. In

addition to the alarm's descriptor and the time and date, the user shall be able to print, display and store an alarm message to more fully describe the alarm condition or direct operator response.

- b) **Alarm Prioritization:** The software shall allow users to define the handling and routing of each alarm by their assignment to discrete priority levels. For each priority level, users shall have the ability to enable or disable an audible tone whenever an alarm is reported and whenever an alarm returns to normal condition. Users shall have the ability to manually inhibit alarm reporting for each individual alarm and for each priority level. Contractor shall coordinate with UNC on establishing alarm priority definitions.
 - c) **Alarm Acknowledgment:** For alarm priority levels directed to the LCS, an indication of alarm receipt shall be displayed immediately regardless of the application in use at the workstation, and shall remain on the screen until acknowledged by a user having a password that allows alarm acknowledgment. Upon acknowledgment, the complete alarm message string (including date, time, and user name of acknowledging operator) shall be stored in a selected file on the LCS hard disk.
- 2. It shall be possible for any operator to receive a summary of all alarms regardless of acknowledgement status; for which a particular recipient is enrolled for notification; based on current event state; alarm priority; and notification class.

F. Operator Interface Trending

{Coordinate with UNC regarding Trending requirement}

- 1. The LCS shall be able to display historical data in both a tabular and graphical format. The requirements of this trending shall include the following:
 - a) Provide trends for all physical points, virtual points and calculated variables. A minimum of 80% of the systems trends may be active without impacting remote data access performance defined in 230900/I.13/F.
 - b) In the graphical format, the trend shall plot at least 4 different values for a given time period superimposed on the same graph. The 4 values shall be distinguishable by using unique colors. Displayed trend graphs shall indicate the engineering units for each trended value.
 - c) The sample rate (up to 5 second interval) and data selection shall be selectable by the operator.
 - d) The trended value range shall be selectable by the operator.
 - e) Where trended values on one table/graph are COV, software shall automatically fill the trend samples between COV entries.
- 2. **Data Buffering and Archiving:** Trend data shall be buffered at the BPOC, and uploaded to remote storage when archival is desired. Archive shall be capable of storing 14 days of trend data accessible at the operator's interface. Storage and retrieval of the archive shall not impact remote data access performance defined in 230900/I.13/F. All archived trends shall be transmitted to the LCS as applicable. Uploads shall occur based upon a user-defined interval, manual command, or automatically when the trend buffers become full.

G. Operator Interface Equipment Scheduling

{Coordinate with UNC regarding Scheduling requirement}

1. Provide a graphic utility for user-friendly operator interface to adjust equipment-operating schedules.
2. Scheduling feature shall include multiple seven-day master schedules, plus holiday schedule, each with start time and stop time. Master schedules shall be individually editable for each day and holiday.
3. Scheduling feature shall allow for each individual equipment unit to be assigned to one of the master schedules.
4. A yearly calendar feature shall allow assignment of holidays, and automatic reset of system real time clocks for transitions between daylight savings time and standard time.

II.2 LON ROUTER/BPOC

- A. Furnish and install all LON routers and Building Point of Connection (BPOC) gateways as required for the BAS to function locally.
- B. All LON routers and BPOCs shall be capable of providing all system services normally provided through the EBLG connection. See “Standard Control Drawing C-4.05” for details.
- C. One VLAN connection will be provided to the LCS for connectivity of the OI.

II.3 SUBMITTALS

- A. **Electronic Submittals:** While all requirements for hard copy submittal apply, these control submittals shall also be provided in electronic format as follows:
 1. **Graphic Files:** Graphic drawings shall be provided on electronic media as an Acrobat PDF. Each unique graphic shall be represented one time. This submittal must be approved by the *Owner* 60 days prior to the operator interface installation.
- B. Submit BAS User’s Guides (Operating Manuals) and BAS Advanced Programming Manuals for all workstation software not installed by UNC.

PART III. EXECUTION**III.1 INSTALLATION**

- A. Set up the workstation (OI) as indicated on the drawings. Install all software and verify that the systems are fully operational. Ensure licensing is provided for all software.

- B. No license, software component, key, etc or any piece of information required to install, configure, operate, diagnose and maintain the system shall be withheld.
- C. Set up portable operator terminal and configure it as the remote workstation. Install all software and verify that the system is fully operational.
- D. Install systems and materials in accordance with manufacturer's instructions.

END OF SECTION 2309xx