

SECTION 17140 PROGRAMMABLE LOGIC CONTROLLER

PART 1 - GENERAL

1.01 SUMMARY.

- A. Provide Programmable Logic Controllers as specified herein and as shown on the schedules and drawings. Installing contractor shall receive, place, connect, and mount all equipment specified in this Section per the manufacturer's instructions. Installing contractor shall furnish all hardware, wire, connectors, and other necessary items as required for a complete and functional control system.
- B. Related Sections:
 - 1. Section 17000 Security Electronics, General
 - 2. Section 17120 Touch Screen System
 - 3. Section 17150 Electronic Relay System
 - 4. Section 17200 Intercommunications System

1.02 REFERENCES.

- A. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. Underwriter's Laboratories (UL)
 - 1. UL 508 Industrial Control Equipment
 - 2. NEC National Electrical Code (latest edition)

1.03 WORK INCLUDED

- A. Provide materials, equipment, programming and services as required to install programmable logic controllers as specified herein.
- B. Major Sub-systems include:
 - 1. Programmable Logic Controllers (PLC's).
 - a. PLC located in main security electronics room.
 - 2. Electronic relay system.

1.04 COORDINATION WITH OTHER TRADES

- A. Coordinate the work of this Section with that of other sections as required to ensure that the entire work of this Project will be carried out in an orderly, complete and coordinated fashion.

1.05 SUBMITTALS

- A. See division 17000.

1.06 APPROVALS

- A. General
 - 1. Submittals shall be made in accordance with the General Provisions (Section 17000) of these specifications.

- B. Specific Requirements:
 - 1. Submit catalog cuts for all equipment and devices being furnished under this Section.

1.07 DESCRIPTION

- A. ***The PLC rack located in the security electronics room shall have a minimum of one (1) open slot for use with a future fiber optic controller link card to tie in a new PLC for a future housing unit addition.***
- B. Programmable Logic Controllers (PLC) shall provide control and monitoring functions for systems as described on the drawings and in these specifications.
- C. The controllers shall provide all necessary logic functions, timing functions, memory, software, input/output points and communication capabilities for the operating features required to meet all of the requirements for the specifications.
- D. Logic functions shall include but limited to AND, OR and INVERT functions with sufficient levels to provide operating features required to perform all of the functions required by the specifications.
- E. Timing functions shall include, but not be limited to, on-delay, off-delay, stepping and pulsing. Sufficient variations of programmable timing shall be available to provide all the operating features as required by the specifications.
- F. The controller shall be standard off the shelf, commercially available industrial grade programmable logic controller equipment. Proprietary or custom cage mounted, discrete logic cards or PLC units and associated software such as those manufactured by MTI, OSS, Simplex, ICOTECH and Comtec are not acceptable.
- G. Each PLC CPU location shall be provided with UPS backup power sufficient to maintain system power in the event of main power failure for a minimum of 15 minutes.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The PLC shall be the product of a manufacturer engaged in the production of controllers for industrial application for a minimum of five years. Only manufactures with national distribution and local parts outlets will be considered.
- B. The program shall be developed for each controller on an individual basis and shall be stored in a non-volatile memory.
- C. The programming format shall be traditional relay ladder logic utilizing basic and advanced instruction sets for function generation. Controllers that utilize spreadsheets and other means of programming shall not be acceptable.
- D. The I/O modules shall be standard backplane type mounting and shall contain status LED's for I/O point on the module.
- E. There shall be a minimum of 10% spare capacity in the amount of installed PLC I/O.
- F. I/O modules shall be installed in any available slot in the CPU or expansion baseplates, and shall require no tools for insertion and extraction.
- G. The system design shall accommodate the replacement of assemblies without having to disconnect field wiring. Wherever possible, removable connectors shall be used to connect field wiring to the individual circuit board assemblies
- H. The controller shall operate on 105 to 130 VAC, 60 Hz and contain an Integral circuit breaker for overload protection. The controller shall Operate in temperatures of 0 to 60C and up to 95 percent humidity(non-condensing). The controller shall conform to electrical noise standards of IEEE-472.

- I. The PLC shall be Modicon Quantrum Series, Allen-Bradley PLC5 Series, GE Fanuc Series 90-70, Omron CS1 Series, or pre-approved equal

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data; including product technical bulletins, product catalog, installation instructions, submittal sketches or drawings, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL, cUL, or CSA label and comply with all applicable National Electrical Code (NEC) standards.

3.03 PREPARATION

- A. All equipment related to the system shall be factory tested before shipment.

3.04 INSTALLATION

- A. Contractor shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- B. Install in accordance with manufacturer's handling and installation instructions.
- C. Install in accordance with all local and pertaining codes and regulations.
- D. All equipment and systems shall be installed by the ESC. Subcontracting of equipment installation shall not be permitted.
- E. Equipment shall be ready to use condition at end of installation.
- F. Energize equipment in accordance with manufacturer's instructions.

3.05 PROTECTION AND CLEANING

- A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- B. Touch up, repair, or replace damaged components before Substantial Completion.
- C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of equipment. Remove construction debris from equipment area and dispose of debris.
- D. Clean integral air filters, heatsinks, grills, and fans before Substantial Completion and Commissioning Services.

3.06 WARRANTY

- A. The ESC shall provide a single source warranty for all supplied equipment specified in this section to be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

END OF SECTION 17140