

SECTION 260913 - ELECTRICAL POWER MONITORING AND CONTROL

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(Engineer shall edit specifications and blue text in header to meet project requirements. This includes but is not limited to updating Equipment and/or Material Model Numbers indicated in the specifications and adding any additional specifications that may be required by the project. Also turn off all "Underlines".)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section and all other sections of Division 26.

1.2 SUMMARY

- A. Section includes the following for monitoring and control of electrical power system:
 - 1. Communication network and interface modules for ethernet TCP/IP data transmission protocols.
 - 2. Power monitoring equipment (Power Monitors).
 - 3. Programming and Software.

1.3 DEFINITIONS

- A. Ethernet: Local area network based on IEEE 802.3 standards.
- B. Firmware: Software (programs or data) that has been written onto read-only memory (ROM). Firmware is a combination of software and hardware. Storage media with ROMs that have data or programs recorded on them are firmware.
- C. HTML: Hypertext markup language.
- D. I/O: Input/output.
- E. KY Pulse: A term used by the metering industry to describe a method of measuring consumption of electricity that is based on a relay changing status in response to the rotation of the disk in the meter.
- F. LAN: Local area network; sometimes plural as "LANs."
- G. LCD: Liquid crystal display.
- H. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or remote-control, signaling and power-limited circuits.
- I. Modbus TCP/IP: An open protocol for exchange of process data.

- J. Monitoring: Acquisition, processing, communication, and display of equipment status data, metered electrical parameter values, power quality evaluation data, event and alarm signals, tabulated reports, and event logs.
- K. PC: Personal computer; sometimes plural as "PCs."
- L. rms: Root-mean-square value of alternating voltage, which is the square root of the mean value of the square of the voltage values during a complete cycle.
- M. RS-232: A TIA standard for asynchronous serial data communications between terminal devices.
- N. RS-485: A TIA standard for multipoint communications using two twisted-pairs.
- O. TCP/IP: Transport control protocol/Internet protocol incorporated into Microsoft Windows.
- P. THD: Total harmonic distortion.
- Q. UPS: Uninterruptible power supply; used both in singular and plural context.
- R. WAN: Wide area network.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Attach copies of approved Product Data submittals for products (such as switchboards and switchgear) that describe power monitoring and control features to illustrate coordination among related equipment and power monitoring and control.
- B. Shop Drawings: For power monitoring and control equipment. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Outline Drawings: Indicate arrangement of components and clearance and access requirements.
 - 2. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices to be used. Describe characteristics of network and other data communication lines.
 - 3. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

4. Wiring Diagrams: For power, signal, and control wiring. Coordinate nomenclature and presentation with a block diagram.
5. UPS sizing calculations for workstation.
6. Surge suppressors: Data for each device used and where applied.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified manufacturer.
- B. Field quality-control reports.
- C. Other Informational Submittals:
 1. Manufacturer's system installation and setup guides, with data forms to plan and record options and setup decisions.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For power monitoring and control units, to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
 1. Operating and applications software documentation.
 2. Software licenses.
 3. Software service agreement.
 4. PC installation and operating documentation, manuals, and software for the PC and all installed peripherals. Software shall include system restore, emergency boot diskettes, and drivers for all installed hardware. Provide separately for each PC.
 5. Hard copies of manufacturer's specification sheets, operating specifications, design guides, user's guides for software and hardware, and PDF files on CD- ROM of the hard-copy submittal.
- B. Software and Firmware Operational Documentation:
- C. Software licenses and upgrades required by and installed for operating and programming digital and analog devices.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Addressable Relays: One for every 10 installed. Furnish at least one of each type.
2. Data Line Surge Suppressors: One for every 10 of each type installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Manufacturer Qualifications: A firm experienced in manufacturing power monitoring and control equipment similar to that indicated for this Project and with a record of successful in-service performance.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.9 COORDINATION

- A. Coordinate features of distribution equipment and power monitoring and control components to form an integrated interconnection of compatible components.
 1. Match components and interconnections for optimum performance of specified functions.
- B. Coordinate Work of this Section with those in Sections specifying distribution components that are monitored or controlled by power monitoring and control equipment.

1.10 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include the operating systems. Upgrade shall include new or revised licenses for use of software.
 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.11 WARRANTY/GUARANTEE

- A. See Division 26 Specification Section “Basic Electrical Requirements’ for warranty and guarantee requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - 1. Schneider Electric - Power Management Operation, PM5563RD.

2.2 FUNCTIONAL DESCRIPTION

- A. Instrumentation and Recording Devices: Monitor and record load profiles and chart energy consumption patterns.
 - 1. Calculate and Record the Following:
 - a. Load factor.
 - b. Peak demand periods.
 - 2. Measure and Record Metering Data for the Following:
 - a. Electricity.
- B. Software: Calculate allocation of utility costs.
 - 1. Automatically Import Energy Usage Records to Allocate Energy Costs for the Following:
 - a. At least fifteen (15) departments.
 - b. At least thirty (30) tenants.
 - c. At least five (5) buildings.
- C. Power Quality Monitoring: Identify power system anomalies and measure, display, and record trends and alarms of the following power quality parameters:
 - 1. Voltage regulation and unbalance.
 - 2. Continuous three-phase rms voltage.
 - 3. Periodic max./min./avg. voltage samples.
 - 4. Harmonics.

5. Voltage excursions.
- D. Emergency Load Shedding. Preserve critical loads or avoid total shutdown due to unforeseen loss of power sources according to the following logic:
 1. Determine system topology.
 2. Evaluate remaining loads and sources.
 3. Shed loads in less than 100 ms.
- E. Demand Management:
 1. Peaking or co-generator control.
 2. Load interlocking.
 3. Load shedding.
 4. Load trimming.
- F. System: Report equipment status and power system control.

2.3 SYSTEM REQUIREMENTS

A. Power Meters

1. General Provisions
 - a. All setup parameters required by the Power Meter shall be stored in nonvolatile memory and retained in the event of a control power interruption.
 - b. Also, Accumulated Energy, Peak Demand, Minimum and Maximum, and Usage Time quantities should be stored in nonvolatile memory and retained in the event of a control power interruption.
 - c. The Power Meter may be applied in three-phase, three- or four-wire systems as well as single phase
 - d. The Power Meter shall be capable of being applied without modification at nominal frequencies of 45 to 65 Hz.
 - e. Power meter must be Square-D PM5563RD.
2. Measured values
 - a. The Power Meter shall provide the following, true RMS metered quantities:
 - 1) Real-Time Readings
 - 2) Current (Per-Phase, N (calculated), 3-Phase Avg)
 - 3) Voltage (L-L Per-Phase, L-L 3-Phase Avg, L-N Per-Phase, L-N 3-Phase Avg.)

- 4) Real Power (Per-Phase, 3-Phase Total)*
 - 5) Reactive Power (Per-Phase, 3-Phase Total)*
 - 6) Apparent Power (Per-Phase, 3-Phase Total)
 - 7) Power Factor Signed (3-Phase Total)
 - 8) Frequency
 - 9) THD (Per-Phase, Current and Voltage)
- b. Energy Readings
- 1) Accumulated Energy (Real kWh*, Reactive kVarh*, Apparent KVAh) (Absolute)
- c. Demand Readings
- 1) Demand Current Calculations (Per-Phase):
 - a) Present
 - b) Peak
 - 2) Demand Real Power Calculations (3-Phase Total):
 - a) Present
 - b) Peak
 - 3) Demand Reactive Power Calculations (3-Phase Total):
 - a) Present
 - b) Peak
 - 4) Demand Apparent Power Calculations (3-Phase Total):
 - a) Present
 - b) Peak
- d. Power Analysis Values
- 1) THD - Voltage (Per-Phase, Line to Line, Line to Neutral)
 - 2) THD - Current (Per-Phase, Neutral)
 - 3) Signed Power Factor (3-Phase)
- e. Usage Time: The Power Meter should display the time that the device has been in service, displaying hours and minutes.

* kW, kVAR, kWh, and kVARh are signed net consumption values. The PM5563RD keeps a single registers with the net consumption values per each type of Energy and Power.

3. Demand: All power demand calculations shall use any one (1) of the following calculation methods, selectable by the user:
 - a. Block Interval Demand. The three following demand calculation modes shall be possible under Block Interval Demand: Sliding Block, Fixed Block, and Rolling Block.
 - b. Synchronized Demand
 - c. Thermal Demand
4. Sampling
 - a. The current and voltage signals shall be digitally sampled at a rate high enough to provide true rms accuracy to the 15th harmonic.
 - b. The Power Meter shall provide continuous sampling at a minimum of up to thirty-two (32) samples/cycle, simultaneously on all voltage and current channels of the meter.
5. Minimum and Maximum Values
 - a. The Power Meter shall provide minimum and maximum values for the following parameters:
 - 1) Voltage L-L
 - 2) Voltage L-N
 - 3) Current
 - 4) Power Factor
 - 5) Real Power Total
 - 6) Reactive Power Total
 - 7) Apparent Power Total
 - 8) THD Voltage L-L
 - 9) THD Voltage L-N
 - 10) THD Current
 - 11) Frequency
 - b. For each min/max value listed above, the Power Meter shall record the following attributes:
 - 1) Min/Max. Value
 - 2) Phase of recorded Min/Max (for multi-phase quantities)
 - c. Minimum and maximum values shall be available via communications and display.
6. Current Inputs

- a. The Power Meter shall accept current inputs from standard instrument current transformers with 5 amp secondary output and shall have a metering range of 5mA-6 amps with the following withstand currents: 10 amp continuous, 50 amp 10 sec per hour, 120 amp 1 sec per hour.
 - b. Current transformer primaries adjustable from 5 - 32,767 A shall be supported.
7. Voltage Inputs
- a. The circuit monitor shall allow connection to circuits up to 480 volts AC without the use of potential transformers. The Power Meter shall also accept voltage inputs from standard instrument potential transformers. The Power Meter shall support PT primaries through 1.6 MV.
 - b. The nominal full scale input of the Power Meter shall be 277 Volts AC L-N, 480 Volts AC L-L. The meter shall accept a metering over-range of 20 percent. The input impedance shall be greater than 2 Mohm (L-L) or 1 Mohm(L-N).
8. Accuracy
- a. The Power Meter shall comply with IEC62053-22 Class 0.2S for Real Energy and IEC62053-23 Class 2 for Reactive Energy
 - b. Voltage shall be accurate to 0.1 percent from 50 to 227 V. Current shall be accurate to 0.15 percent from 1 to 6A. Power Factor shall be accurate from 1 to 6A. Power shall be accurate to 0.2 percent. Frequency metering shall be accurate to plus 0.05 percent from 45-65 Hz.
 - c. No annual calibration shall be required to maintain this accuracy.
9. Input/Output
- a. The Power Meter shall include on-board two (2) Digital Inputs and One Digital Pulse Output. The Power Meter shall be capable of operating a solid-state KY output relay to provide output pulses for a user definable increment of reported real energy. The standard KY output shall operate from 8–36 V DC max range, 24 V DC nominal. @ 25 degrees C, 3.0 kV rms isolation, 28 delta on-resistance @ 100 mA. It shall allow for the following operation modes:
 - 1) External-This is the default setting. The output can be controlled by a command sent over the communications link.
 - 2) Alarm-The output is controlled by the power meter in response to a Setpoint controlled alarm condition. When the alarm is active, the output will be ON. Multiple alarms can be associated with the same output simultaneously.

- 3) kWh Pulse-In this mode, the meter generates a fixed-duration pulse output that can be associated with the kWh consumption.
 - b. The Power Meter shall be capable of operating the two (2) Digital Inputs to provide all the following modes:
 - 1) Normal-Use the normal mode for simple ON/OFF digital inputs.
 - 2) Demand Interval Synch Pulse-Use this mode to configure a digital input to accept a demand synch pulse from a utility demand meter.
 - 3) Digital Alarm-Use this mode to associate the input operation with any of the alarms. These alarms shall have a fixed pickup and dropout magnitude:
 - 4) The two digital inputs shall operate from 12-36 V DC, 24 VDC nominal, impedance 12k Ohm, maximum frequency 25 Hz, response time 10 msec, and isolation 2.5kV rms.
10. Upgrades
 - a. It shall be possible to field upgrade the firmware in the Power Meter to enhance functionality. These firmware upgrades shall be done through the communication connection and shall allow upgrades of individual meters or groups. No disassembly, changing of integrated circuit chips or kits shall be required and it will not be necessary to de-energize the circuit or the equipment to perform the upgrade.
11. Control Power
 - a. The Power Meter shall operate properly over a wide range of control power including 100-415 VAC, plus or minus 10 percent, 5VA; 50 to 60Hz. Or 125-250 VDC, plus or minus 20 percent, 3W.
12. Communications
 - a. The Power Meter shall communicate via using Ethernet connection.
13. Alarms: The Power Meter shall detect 15 predetermined alarms. All alarms shall be configured with the following values when using the display:
 - a. Enable-disable (default) or enable.
 - b. Pickup Magnitude
 - c. Pickup Time Delay
 - d. Dropout Magnitude
 - e. Dropout Time Delay
 - f. Values that can also be configured over communications are:
 - g. Alarm Type

- h. Test Register
- i. Alarm Label

14. Display

- a. The Power Meter display shall be back lit LCD for easy viewing, display shall also be anti-glare and scratch resistant.
- b. The Display shall be capable of allowing the user to view four values on one screen at the same time. A summary screen shall also be available to allow the user to view a snapshot of the system.
- c. The Power Meter display shall provide local access to the following metered quantities:
 - 1) All quantities in Section B
 - 2) Minimum and Maximum readings in Section E
 - 3) Any of the Active Alarms from Section P
 - 4) I/O Status
- d. Reset of the following electrical parameters shall also be allowed from the Power Meter display:
 - 1) Peak demand current
 - 2) Peak demand real power (kW) and peak reactive demand (kVAR).
 - 3) Energy (MWh) and reactive energy (MVARh)
- e. Setup for system requirements shall be allowed from the Power Meter display. Setup provisions shall include:
 - 1) CT rating
 - 2) PT rating (Single Phase, 2-Wire)
 - 3) System type [three-phase, 3-wire] [three-phase, 4-wire]
 - 4) Watt-hours per pulse
 - 5) Communication parameters such as address and baud rate
 - 6) Alarms
 - 7) Digital I/O
 - 8) Demand calculation mode settings
 - 9) Bar graphs
 - 10) And Passwords for Setup and Reset

2.4 ETHERNET GATEWAY COMMUNICATIONS

- A. The Ethernet Gateway shall feature one 10/100 Mbit UTP port.
- B. The Ethernet Gateway shall provide a web based interface for device configuration and diagnostics.

- C. The Ethernet Gateway shall feature one serial port that is configurable for RS232 or RS485 with support for individual dedicated CAT 6 cable.
- D. A single Ethernet Gateway, assigned a single IP address, shall provide high speed Ethernet support for up to two hundred forty- seven (247) Modbus devices or one hundred ninety nine (199) Power Logic (SY/MAX) devices.
- E. The Ethernet Gateway shall feature the following protocols: Ethernet – ModbusTCP/IP, HTTP, FTP, SNMP (MIB2), TCP, UDP, IP, ICMP, and ARP. Serial - MODBUS, JBUS, and POWERLOGIC (SY/MAX).
- F. The Ethernet Gateway shall provide the ability to control the access of ModbusTCP/IP master devices attempting to communicate with attached serial devices. The gateway shall be able to not allow access and shall have the ability to limit access to read-only or provide full access to the attached serial devices.
- G. The Ethernet Gateway shall have an input voltage of 24 Vdc and a maximum burden of 4 Watts.
- H. The Ethernet Gateway shall allow control power to be received through the Ethernet cable utilizing Power over Ethernet (PoE) according to IEEE 802.3af.
- I. The Ethernet Gateway shall operate in ambient temperature of -25⁰C to 70⁰C, an ambient storage temperature of – 40⁰C to 85⁰C and will operate in relative humidity of 5 to 95%.
- J. The Ethernet Gateway shall be a stand-alone product in an IP30 enclosure that is DIN- rail mountable.
- K. The Ethernet Gateway shall be compliant with electromagnetic interference emissions according to EN 55022, EN 55011, FCC Class A, and for immunity according to EN 61000-6-2.
- L. The Ethernet Gateway shall be compliant with regulatory and safety standards for the USA, Canada, Europe, Australia, and New Zealand according to IEC 60950 and UL 508.
- M. The Ethernet Gateway shall be compatible with Ethernet TCP/IP.
- N. The gateway shall provide a twisted pair connection to connect to the Ethernet backbone. The Ethernet twisted-pair port shall have: An RJ45 connector, support for 10/100BaseTx connection with auto-negotiate and user specified parameters of 10Mb or 100Mb, full-duplex or half duplex. LEDs shall be provided to indicate Ethernet link, speed, and activity. At a minimum, there shall be the following LED's:
 - 1. One for Physical Ethernet Link (LK),
 - 2. One for Transmit (TX),
 - 3. One for Receive (RX),
 - 4. One for the speed(10/100).

- O. The Ethernet Gateway shall have a serial RS-485 port that is used to connect serial field devices to the LAN. The RS-485 serial port shall have the following specification:
 - 1. Support up to 32 serial devices without a repeater. Support for Modbus, Jbus, Power Logic and mixed mode daisy chains. Support for both 2-wire or 4-wire daisy chains. Support for baud rates of 2400 to 38400. Support for parity values of Even and None. Provide pluggable screw terminal type connectors with a minimum of 5-positions. Provide LEDs to indicate serial communication activity. At a minimum, there shall be the following LED's: One for Transmit (Tx), and one for Receive (Rx) per port.
- P. The Ethernet Gateway shall have a minimum of one port that can be configured for either RS-485 or RS-232. An LED indicator shall be provided to indicate which port is active (RS485 / RS232).
- Q. The serial port shall have configurable biasing and termination to support 2-wire and 4-wire communicating devices.
- R. The Ethernet Gateway shall provide internal jumpers to support 2-wire daisy-chains that can be applied or removed from the communication lines.
- S. The Ethernet Gateway shall allow a Modbus serial master on its serial port to request data from devices on a TCP/IP network. A minimum of 16 remote IP addresses shall be supported across the entire Modbus address range of 1 to 247. A minimum of 128 remote devices shall be supported.
- T. The Ethernet Gateway shall be configurable by either RS-232 connection via Hyper Terminal® interface or Ethernet connection via standard web browser.
- U. The Ethernet Gateway shall provide a user interface that includes English, French, German, and Spanish languages.
- V. Setup of the Ethernet Gateway shall be accomplished via the on-board Ethernet port and a web browser. No software shall be required for configuration of the gateway that is not a standard component in Microsoft's off-the-shelf operating systems.
- W. The Ethernet Gateway shall support field upgradeable firmware without need of any special software not; present in Microsoft's standard operating systems to accommodate new system features.

2.5 LAN CABLES

- A. Unshielded Twisted Pair Cables: Category [6] as specified for horizontal cable for data service.

2.6 LOW-VOLTAGE WIRING

- A. Low-Voltage Control Cable: Multiple conductor, color-coded, No. 20 AWG copper,

minimum.

1. Sheath: PVC; except in plenum-type spaces, use sheath listed for plenums.
2. Ordinary Switching Circuits: Three conductors unless otherwise indicated.
3. Switching Circuits with Pilot Lights or Locator Feature: Five conductors unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CABLING

- A. Comply with NECA 1.
- B. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.
- C. Install LAN cables using techniques, practices, and methods that are consistent with specified category rating of components and that ensure specified category performance of completed and linked signal paths, end to end.
- D. Install cables without damaging conductors, shield, or jacket.

3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."
- B. Label each power monitoring and control module with a unique designation.

3.4 GROUNDING

- A. Comply with IEEE 1100, "Recommended Practice for Powering and Grounding Electronic Equipment."

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage Square D "Intelligent Product Support Services" to perform all programming, startup, commissioning and integration of all new meters in the

University's existing PME Electrical Metering System.

- B. Perform tests and inspections.
1. Manufacturer's Field Service: Engage Square D "Intelligent Product Support Services" to inspect components, assemblies, and equipment installations, including connections.
- C. Tests and Inspections:
1. Electrical Tests: Use caution when testing devices containing solid-state components.
 2. Continuity tests of circuits.
 3. Operational Tests: Set and operate controls at workstation and at monitored and controlled devices to demonstrate their functions and capabilities. Use a methodical sequence that cues and reproduces actual operating functions as recommended by manufacturer. Submit sequences for approval. Note response to each test command and operation. Note time intervals between initiation of alarm conditions and registration of alarms at central-processing workstation.
 - a. Coordinate testing required by this Section with that required by Sections specifying equipment being monitored and controlled.
 - b. System components with battery backup shall be operated on battery power for a period of not less than 10% of calculated battery operating time.
 - c. Verify accuracy of graphic screens and icons.
 - d. Metering Test: Load feeders, measure loads on feeder conductor with an rms reading clamp-on ammeter, and simultaneously read indicated current on the same phase at central-processing workstation. Record and compare values measured at the two locations. Resolve discrepancies greater than 5 percent and record resolution method and results.
 - e. Record metered values, control settings, operations, cues, time intervals, and functional observations and submit test reports printed by workstation printer.
- D. Power monitoring and control equipment will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.
- F. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.
- G. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.
- H. Reports: Submit written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.
- I. Remove and replace malfunctioning devices and circuits and retest as specified above and

note corrective action in report.

3.6 DEMONSTRATION

- A. Engage Square D “Intelligent Product Support Services” to train owner's maintenance personnel to adjust, operate, and maintain systems. See Division 01 Section "Demonstration and Training."
 - 1. Train owner's management and maintenance personnel in interpreting and using monitoring displays and in configuring and using software and reports. Include troubleshooting, servicing, adjusting, and maintaining equipment. Provide a minimum of two (2) hours training.
 - 2. Training Aid: Use approved final versions of software and maintenance manuals as training aids.

3.7 ON-SITE ASSISTANCE

- A. Occupancy Adjustments: When requested within twenty-four (24) months of date of Substantial Completion, provide Square D “Intelligent Product Support Services” on-site assistance in adjusting system to suit actual occupied conditions. Provide up to three (3) visits to Project during other-than-normal occupancy hours for this purpose.

END OF SECTION 260913