

# SECTION 26 09 13.24 00

# ELECTRICAL POWER

# MONITORING AND

# CONTROL

## PART 1 - General

### 1.1 SCOPE

- A. This section includes the supply and installation of a complete Multi-Customer Metering System as detailed on the drawings and as described in the specifications.
- B. The Multi-Customer Metering System shall monitor all the locations as identified in the specifications and drawing and supplemental documentation. The Multi-Customer Metering System shall deliver interval energy data.
- C. The Multi-Customer Metering System shall support time-of-use function.
- D. The Multi-Customer Metering System shall be used for Revenue, LEED, M & V, M & T, Energy Monitoring, and Energy Allocation applications as identified in documentation and drawings.

### 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Refer to the following related sections for details on quantities of metered points.
  - I. ***Division 16: Electrical General and Supplementary Conditions***
  - II. ***Section 26 24 13 – Switchboards***
  - III. ***Section 26 24 16 - Panelboards***

### 1.3 SUBMITTALS

- A. The following information shall be submitted to the Engineer and Owner prior to design or installation.
  - I. System description including an overview of the system provided with detailed description of suggested communications architecture.
  - II. Bill of material including a complete listing of all hardware, software, configuration, training and start-up services being supplied under this contract by the manufacturer.

- III. Description of hardware and software.
  - IV. Stamped and signed approved submittal to be provided by the contractor prior to start-up.
- B. A final closeout submittal shall be provided and include a system operation manual that will include the following information:
- I. A system description and as built layout
  - II. System field verification, site set-up, sealing/test certificates (if applicable) commissioning report and warranty.
  - III. Descriptive bulletins and/or sales aids covering components.
  - IV. Manuals for all the products.
  - V. Software data files if software is provided.
  - VI. A complete list of device addresses and ID numbers.

### 1.3 RELATED STANDARDS

- A. Except as noted by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the Canadian Electrical Manufacturer's Association, CSA and Measurement Canada.
- B. The metering unit shall comply with UL /CSA.
- C. Listed by the Underwriters Laboratory Inc., Standard (UNL/CNL file E304286), 1 FCC class A is required for commercial installations.
- D. Listed by CSA International for US: CAN/CSA-C22.2 No. 205 – Signal Appliance, Class 4812-05-Signal Appliance, Class 4812-85-Signal Appliance-Certified to U.S. Standards (file 159143)
- E. ANSI/UL Standard No. 1638 – Visual Signal Appliance (Private-Mode Emergency and General Utility Signaling)
- F. The system shall be completed in accordance with Measurement Canada a division of Industry Canada.
- G. Meters are Measurement Canada Approved.  
AE-1406, AE-1589, AE-1872, AE-2087
- H. Data logging devices shall be Measurement Canada Approved as required  
AE-1158
- I. The metering units shall use approved type of current transformers for revenue metering as required.
- J. Manufactured by ISO9001 2001:2008 registered company.
- K. Accuracy to ANSI C12.20

#### 1.4 QUALITY ASSURANCE

##### A. Manufacturer Qualifications:

- I. The manufacturer of this equipment shall have a minimum of 5 years experience producing similar electrical equipment
- II. The manufacturer shall be a registered and accredited with Measurement Canada.
- III. Comply with requirements of the latest revisions of applicable related standards.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver material in manufacturer's original unopened protective packaging unless it is built into new distribution equipment.
- B. Materials should be securely store in its' original packaging in a manner to prevent soiling, physical damage, incursion of moisture or corrosion prior to installation.
- C. Handle in a manner to prevent damage to finished surfaces.
- D. Maintain protective coverings until installation is complete and remove such covers as part of final clean-up.
- E. Handling and storage is in strict accordance with manufacturers' instructions. It is the contractor's responsibility to obtain manufacturer's instructions.

## **PART 2 - Products**

### 2.1 Multi-Customer Metering System

- A. The preferred Multi-Customer Metering System shall be an "Embedded" design with no external enclosures required for the metering of the metered loads. The metering units shall be incorporated in to the electrical manufactures panel boards as one contained unit and include the metering display unit (MDU) (if needed), pre-wired current transformers and a fused protection.
- B. Alternatively, a single Multi-Customer Metering System unit can be installed in an external enclosure by 24" x 6" x 4"; a Multi-Customer Metering System unit (up to 3) can be installed in an external enclosure by 24" x 20" x 8". Enclosure assembly approval file must be registered with CSA.
- C. As necessary single-point metering units in the Multi-Customer Metering System shall be in approved enclosures.
- D. The Multi-Customer Metering System data collection unit (DCU) will provide a minimum logging for up to 480 days at 1 hour interval, stored in non-volatile memory.
- E. The Multi-Customer Metering System shall be supplied in the following sizes & voltages:

Metering of up to 45 elements.

Programmable up to 1-45 single element, 1-22 two-element, or 1-15 three element or a combination there of.

- I. The meter shall be self-powered and auto-ranging 120V-347V L-N.
- II. Accuracy: Meet Measurement Canada LMB-EG-07e, ANSI C12.20 Class 0.5 (USA).

## 2.2 CURRENT TRANSFORMER

- A. Provide revenue class current transformers associated with the metering system.
- B. Loads up to 600 amps shall have 1000:1, 2000:1, 4000:1, or 6000:1 self-shorting protection precision current transformers Measurement Canada approved.
- C. Loads over 600 amps shall have instrument CTs with milliamp interface.
- D. Split-Core Current Transformers are acceptable as applicable.

## 2.3 Potential Transformers

- A. Potential Transformers (PTs) shall be revenue class and used only for the conversion of delta configurations.

## 2.4 Operations

- A. The Metering Operating Software shall operate using the Windows or Linux based operating system.
- B. The Metering Operating Software shall be capable of providing energy metering information for Utilities such as but not limited to electricity, water, natural gas, BTU, etc.
- C. The Metering Operating Software shall support "interval data" recordings in database formats with recording resolutions to a minimum of 1 minute intervals.
- D. Metering Operating Software will be database format: i-meter® Data, i-meter® Energy Analysis, i-meter® Billing
- E. The Multi-Customer Metering System shall provide with a centralized meter display unit (MDU).

## 2.5 Operating software {selectable}

- A. Multi-Customer Metering System Operating Software

.1 *Manufacturer to supply operating software with a minimum of CSV file format*

- .2 *The Metering Operating Software shall provide support for simple user interface for managing account and meter information for each load.*
- .3 *The Metering Operating Software shall support the billing and i-meter® Data, i-meter® Energy Analysis, i-meter® Billing*

B. Billing Software

- .1 *Manufacturer to supply billing software program*
- .2 *The billing software shall allow selection of the billing period (start date/time and end date/time) for billing purposes.*
- .3 *A local interface for tenant and property management to provide access to meter data (current and historical) is to be included in part of the metering system. Access is pass code protected and shall provide current reading, graphing and profiling features.*

C. Energy Information Management Software

- .1 *Manufacturer to supply i-meter® Data, i-meter® Energy Analysis or i-meter® Billing programs to support LEED, M & V, M & T, Energy Monitoring, and Energy Allocation*

- D. The current transformers will be installed at the electrical manufacturer's plant and will not require any field mounting or terminations at the job site.

## 2.6 COMMUNICATION OVERVIEW

- A. The Multi-Customer Metering System shall be able to utilize the following standard communications configuration, as a minimum:

- III. RS485 utilizing hard-wire CAT5e for cable runs for a maximum of 1000ft.
- IV. Multi-Customer Metering System i-meter® Modbus communication chain will support up to 247 meter points on one run.
- V. Multi-Customer Metering System communication chain will support up to 256 metering points on one run.
- VI. Wireless communications that will penetrate up to two floors vertical and horizontal in distance on average. The RF transmitters will communicate with each other and the main receiver. The RF network will be designed using "mesh network" technology.
- VII. Remote monitoring over an Ethernet LAN network connection.

## 2.7 MANUFACTURERS

- A. The Multi-Customer Metering System shall be manufactured and supplied by:  
Intellimeter Canada Inc.  
*Pre-approved manufacturer*

## PART 3 - Execution

### 3.1 INSTALLATION

- A. The contractor shall furnish and install the equipment specified herein. The equipment shall be as shown on the drawings and outlined below.

### 3.2 ADJUSTING AND CLEANING

- A. The meters shall be adjusted so that accurate readings appear and that the readings are within the meters accuracy range.
- B. A Trained and Certified technician should be present at commissioning to review and verify the system operation.
- C. Clean exposed surfaces using manufacturer recommended materials and methods.

### 3.3 TESTING

- A. Perform factory and installation tests in accordance with applicable NEC, NEMA, ANSI, Measurement Canada, CSA and UL requirements. Traceable to international standards.
- B. Manufacturer will provide individual test certificates for each meter supplied.
- C. SE-04 to be performed by manufacturer or Industry Canada Certified Agent.

### 3.4 WARRANTY

- A. All equipment shall be free from defect in materials and workmanship under normal use and service for the period of eighteen (18) months from the date of shipment from factory or twelve (12) months, from date of commissioning, whichever occurs first. The warranty does not apply if equipment has been improperly installed, subjected to misuse, neglect, accident, acts of God, or abnormal conditions of operation.

### 3.5 STARTUP SERVICES

- A. Project management shall be provided for the entire project through a single source of contact. The end-user shall also provide a single source of contract with authority over the project to make decisions on timely basis.

- I. On-Site start-up and training of the Owners personnel on the system shall be included in the project bid.
  - II. Start-Up shall consist of complete configuration and in-service testing of the system, to confirm proper operation of the system.
  - III. Training shall include any documentation and hands-on exercises needed by the owner's personnel at the site during the last day of the startup, as built drawings.
  - IV. Supplier shall have a remote fully functional support facility for support related questions.
- B. Calibration and Maintenance Service
- I. All meters shall be factory calibrated with precision test equipment and shall remain accurate for the seal life of the product eliminating the need for in-service calibration or adjustments.
- C. Time of Use
- I. All meters are factory configured for "Time of Use" application if or when required.