**SECTION 26 ## ##**

**MULTI-CIRCUIT SUBMETERING**

**PART 1 – GENERAL**

* 1. **SUMMARY**
1. This specification describes a revenue grade, multi-channel submeter and associated millivolt current sensors by Socomec, allowing to monitor up to 16 three-phase circuits and report measurement data to an external EMS/BMS.
2. The technical benchmark is SOCOMEC DIRIS MCM and associated mV current sensors, or equal and approved.
3. The DIRIS MCM is well-suited for datacenter multi-circuit monitoring, tenant sub metering, and for accountability metering in commercial, retail, and industrial facilities.

The following text is formatted for inclusion in an engineering consultant’s technical specifications.

**PART 2 – PRODUCTS**

* 1. **MANUFACTURERS**
	2. Subject to compliance with requirements, provide products by one of the following:
1. Revenue grade multi-channel power meter
2. SOCOMEC DIRIS MCM
3. …
	1. **MULTI-CHANNEL METER REQUIREMENTS**
	2. Meter shall monitor voltage, current, power, energy, and many other electrical parameters on an electrical system, including but not limited to:
		1. System and Phase measurements for: Amps, Volts, Frequency, kW, kWh, KVAR, kVARh, kVA, kVAh, dPF or aPF.
		2. Net System True Energy (kWh), Net System Apparent Energy (kVAh), Net System Reactive Energy (kVARh)
		3. System True Power +/- (kW)
			1. Meter shall be capable of measuring both positive and negative power to ascertain between power demand or power generation for demand response, smart grid and on-site generation applications.
		4. System True Energy +/- (kWh), Apparent Energy +/- (kVAh) & four Quadrant Reactive Energy (kVARh)
			1. Meter shall be capable of measuring both positive and negative energy to ascertain between energy consumption or energy generation for demand response, smart grid and on-site generation applications.
		5. 15 Minute Peak Demand.
	3. The meter shall be universally compatible with service voltages ranging from 90-600 VAC L-N / L-L – CAT III and shall not require the addition of a step down potential transformer. The meter shall be compatible with a secondary voltage network ranging from 90 – 250 VAC L-N / L-L – CAT III and shall not require the addition of a step down potential transformer.
	4. The meter shall support all service types (Single-Phase Two-Wire Line-to-Neutral; Single-Phase Two-Wire Line-to-Line; Single-Phase Three-Wire (Split-Phase); Three- Phase Three-Wire DELTA; Three-Phase Four-Wire WYE).
	5. Meter shall be Line-Powered from L1 Phase to L2 Phase. 90-600 VAC, CAT III, 50/60Hz, 500mA max. No external power supplies shall be required to power the meter.
	6. The meter shall monitor up to 16 three-phase circuits and allow to monitor a mix of three-phase, split-phase, and single-phase circuits, ranging from 0 – 6000 Amps.
	7. Meter shall accept 0 to 0.333VAC current sensors and therefore permit connection and disconnection of current sensors under load without shorting blocks.
	8. Current sensors shall come from the same manufacturer as the meter and shall be available in split-core configuration or Rogowski coil to simplify retrofit in existing installations
	9. For busbar and high current applications, meter shall support Rogowski coil with 131mV/1000A @ 60Hz.
	10. Current sensors shall be interchangeable on the meter.
	11. The meter shall provide a clear visible numbering of CT inputs, with color-coded terminals that match the white/black CT lead wires. This ensures easy circuit identification and minimizes the risk of wiring errors.
	12. The meter shall provide measurement data updates every 1 second.
	13. Meter shall be available with Serial RS-485, Wireless (915 MHz), and Ethernet interface.
		1. Serial RS-485 communication shall support Modbus RTU protocol using IEEE-754 single precision floating point.
		2. Ethernet communication shall support Modbus TCP protocol using IEEE-754 single precision floating point.
		3. Ethernet communication shall support BACnet IP protocol.
		4. Wireless communication shall support Modbus though the RS-485 port on the meter and shall not require a separate power supply.
	14. Meter shall provide tri-color backlight through an LCD light pipe on top front of MCM.
	15. Meter shall have a configuration for a local Socomec Display for additional live measurement feedback and programming of the system(s).
	16. Meter shall be equipped with a USB type-C port for meter powering and configuring the device, even offline.
	17. Meter shall include Interval Data Recording with a capacitor-backed real time clock. The meter shall have non-volatile memory to store up to 63 days of 15- minute interval kWh data for each CT channel.
	18. The meter shall have 2 levels of PIN protection Security (Read/Write or Read-Only)
	19. The meter shall provide a high voltage cover rated IP30 to prevent user-direct access to dangerous high voltages. This will keep instrumentation engineers safe when operating the meter while front cover is removed, even with live voltage.
	20. The meter shall be equipped with internal fuse protection on each hot leg.
	21. Meter shall comply with the following Safety Specification:
		* 1. UL Listed
			2. Conforms to UL Std 61010-1 3rd Ed
			3. Certified to CSA Std C22.2 No. 61010-1 3rd Ed
	22. Meter shall be revenue grade and accuracy with accuracy class 0.2 per ANSI C12.20 2010 or better.
	23. Meter shall be capable of operating in ambient conditions ranging from – at least 4ºF to +140ºF (-20ºC to +60ºC).
	24. Meter shall hold a storage temperature rating ranging from – at least -13ºF to +158ºF (-25ºC to +70ºC).
	25. Meter shall be capable of operating at an altitude less than or equal to 6560 feet / 2000 meters.
	26. Meter dimensions shall not exceed (L) 521 mm x (W) 277 mm x (H) 89 mm (20.5” x 10.9” x 3.1”)

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

1. Preparation shall be in accordance with reviewed product data, final shop drawing and manufacturer’s recommendations.
2. Installation shall be in accordance with manufacturer’s instructions.
3. Identify components according to Division 26 section “Identification for Electrical Systems”.

**3.02 CONNECTION**

1. Wiring connection shall be in accordance with manufacturer’s instructions.
2. Wiring connection shall be according to Division 26 section “Low-Voltage Electrical Power Conductors and cables”.

**3.03 COMMISSIONING**

The manufacturer shall propose optional remote and on-site commissioning services for the power meter and visualization software.

**3.03 MAINTENANCE & TRAINING**

1. Operation and Maintenance Instruction: Personnel shall be formally trained by the manufacturer’s authorized representative as to the proper operation and maintenance of the power meter.

**3.04 TESTING**

1. The power meter shall be declared conform to the UL standards by a testing laboratory having the NRTL (National Recognized Testing Laboratory) qualification.
2. After installing equipment, execute test reports in accordance with manufacturer’s instructions.

**END OF SECTION**