

DIRIS MCM

Multi-circuit electric power meter



Full user manual:



<https://www.socomec.us/en-us/p/diris-mcm>

Meter model	Description	Reference
DIRIS MCM-16-N-N	16-channel electric power meter	4827 16NN
DIRIS MCM-16-D-N	16-channel electric power meter with display	4827 16DN
DIRIS MCM-16-D-D	16-channel electric power meter with display and disconnect switch	4827 16DD
DIRIS MCM-48-N-N	48-channel electric power meter	4827 48NN
DIRIS MCM-48-D-N	48-channel electric power meter with display	4827 48DN
DIRIS MCM-48-D-D	48-channel electric power meter with display and disconnect switch	4827 48DD

1. Safety

<p>This general safety information is to be used by both the meter operator and servicing personnel. Socomec assumes no liability for user's failure to comply with these safety guidelines.</p>		<p>Conforms to:</p> <ul style="list-style-type: none"> UL 61010-1 Edition 3 (2016), CSA C22.2 No 61010-1-12 Edition 3 Update 2 (2016),
<p>CAUTION: THIS METER MAY CONTAIN LIFE THREATENING VOLTAGES. QUALIFIED PERSONNEL MUST DISCONNECT ALL HIGH VOLTAGE WIRING BEFORE SERVICING THE METER.</p>		

Symbols on Equipment

- WARNING. Denotes caution. See manual for a description of the meanings.
- WARNING. DENOTES HIGH VOLTAGE. RISK OF ELECTRICAL SHOCK. LIFE THREATENING VOLTAGES MAY BE PRESENT. QUALIFIED PERSONNEL ONLY.
- Equipment protected throughout by double insulation (IEC 536 Class II).

Symbols in Documentation

- Contains additional information or shortcut information

2. Service types supported

MAINS System Nominal Voltages					Line to Neutral or Ground	CAT
120/208 127/220	110, 115 120, 127	100 120	100 110, 115 120, 127	110/220 115/230 120/240	150	III
220/380 230/400 240/415 260/440 277/480	200 220, 230, 240 260, 277, 347 380, 400, 415 440, 480	200 240	220 230 240	220/240 240/480	300	III
347/600	500	347 380, 400, 415 440, 480	480		600	III

3. DIRIS MCM Mounting

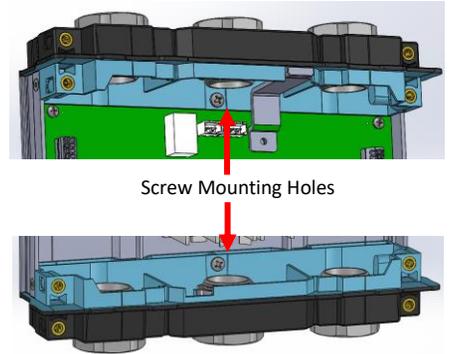
Wall mounting using customer provided #8 - #10 fasteners.

Ensure that the fasteners are appropriate for the type of surface: wood, concrete, drywall, metal etc.

Screw mounting holes are accessible with the top and / or disconnect covers removed.

Mount before installing conduit fittings for easier screw hole access.

Use the included 1:1 drill template for mounting. If lost, mark drill points using the meter, then remove it before drilling to prevent debris entry.

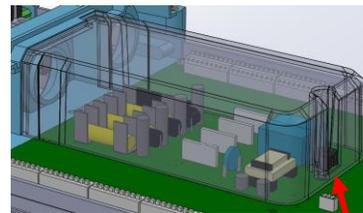


4. Voltage Wiring

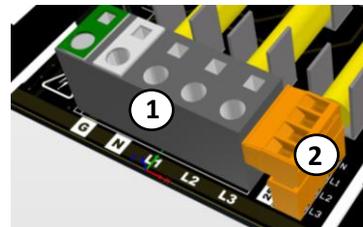
- DANGER - Failure to follow these instructions can result in serious injury or death.**
HAZARD OF ELECTRICAL SHOCK, EXPLOSION, OR ARC FLASH
- -
 - The voltage leads of DIRIS MCM meters must be connected to the building through a dedicated disconnect.
 - DO NOT EXCEED 600 VAC between L-G, L-N and L-L terminals on the primary voltage input.
 - Use a Potential Transformer (PT) to reduce voltage if ANY system voltage exceeds 600 VAC L-L
 - The DIRIS MCM meters must always be installed in compliance with local electrical codes and standards.
 - The DIRIS MCM meters shall only be energized with the internal high voltage cover installed.

Voltage connections are made accessible by removing either the metallic disconnect cover (DIRIS MCM-XX-ND or DD models) or the main metallic meter cover and then the high voltage cover. For DIRIS MCM models with a display, remove or tilt the D-70 display in order to remove the high voltage cover. Refer to section 5.

DIRIS MCM Without Disconnect

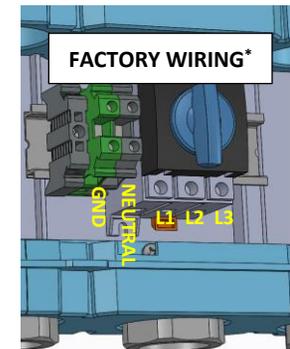


The high voltage cover is held in place by a captured fastener mounted to the PCB.



1. Primary Voltage Input (90 – 600 VAC L-L)
2. Secondary Voltage Input (90 – 250 VAC L-L)

DIRIS MCM With Disconnect



(*) The DIRIS MCM with disconnect includes factory installed wiring between the downstream side of the disconnect and the PCB. No need to remove the internal "high voltage cover".

Warning: The disconnect switch on DIRIS MCM-xx-D-D models only disconnects the primary voltage input. The secondary voltage input remains live and may present a shock hazard. Always verify power before servicing.



All DIRIS MCM CT and comm connections are made outside of the high voltage cover and can be considered safe to work on in the presence of power provided that the meter is properly grounded and that the high voltage cover remain in place.

Solid vs Stranded Wire

Either solid or stranded copper wiring is allowed at the meter or disconnect. The wiring space within these devices are tight. Best practice is to use the minimum stranded size and allow 4-6" additional length creating a small service loop. The use of crimped ferrules is recommended to eliminate the possibility of loose strands.

Meter Model	Termination Location	Wire Size	Solid or Stranded	Max Torque Rating (N-M) / lbf*in
MCM-XX-NN MCM-XX-DN	PCB Voltage Connector	#12 - #14 AWG	THHN 600 VAC, 105 C	0.5 / 4.4
MCM-XX-ND MCM-XX-DD	Disconnect and DIN Contacts	#12 - #14 AWG	THHN 600 VAC, 105 C	1.8 / 15.8

Protective Conductor Terminal

The first voltage network conductor connected to the DIRIS MCM shall be the safety ground. This terminal is internally connected to the metallic enclosure and connected to the overvoltage protection devices on the printed circuit board. The wire attached to the Safety Ground must be 14 AWG or larger and either bare copper wire or an NEC approved color (Green or Green with a yellow stripe).

Neutral vs Ground: Installers are often confused about the difference between Neutral and Ground since these wires are connected back at the service panel. The ground wire is connected to all the overvoltage protection devices within the meter, included on each CT input and voltage terminal. Leaving the Ground wire disconnected defeats the ability of the DIRIS MCM to protect itself from voltage spikes.



The DIRIS MCM uses the neutral terminal as a reference to compute power metrics. Leaving the Neutral terminal open allows the voltage at this terminal to "float" to the instantaneous center of voltage which may cause unexpected reporting.

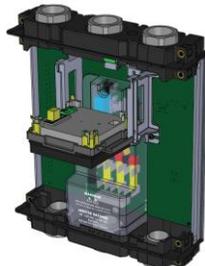
I only have 4 wires!: If the wiring installer has not included a Neutral wire and it is not possible to add one then it is advised to connect the safety ground wire and add a jumper wire between the neutral terminal and safety ground. This provides a stable voltage reference and provides protection to the meter for voltage spikes below 2 kV. Note that this is NOT a preferred solution.

5. Removing the Display

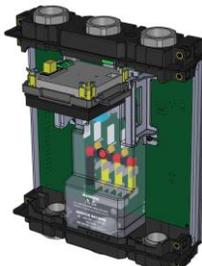
Step 1: Apply upward pressure to disengage the locking mechanism, then slide the display up on its guide rails.



Step 2: Tilt the display forward slightly to disengage the top mounting tabs from the slots in the rail.

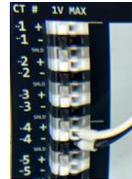


Step 3: Slide the bottom of the display upward along the guide rails until the bottom tabs align with the guide rail slots.



6. Current sensor (CT) connections

CTs (333.3 mV type) and Rogowski Coil Sensors are connected along the edges of the Power Meter.



The CT terminals are color coded to match the polarity of the signal wires (+ White), (- Black) and (shield Grey).

If the wire leads are shortened it is best practice to crimp a #22 ferrule onto the wire to prevent stranding.

Please observe the following recommendations when installing current sensors:

- The CT's rated current should normally be greater than or equal to the maximum current of the measured circuit.
- It is preferable to install the CT and DIRIS MCM meter close to each other. However, you may extend the CT wires by 100 feet (30 m) or more by using shielded twisted-pair cable and by running the CT wires away from high current and line voltage conductors.
- When extending CT leads, we recommend using lead extensions with the same or larger gauge wire.
- For highest accuracy, try to separate the CTs on different phases by 1.0 inch (25 mm) to minimize magnetic interference.



7. DIRIS MCM technical characteristics

Electrical	
Service Types	Single Phase, Split Phase, Three Phase-Four Wire (WYE), Three Phase-Three Wire (Delta), Open Delta, Corner Grounded Delta, Center Grounded Delta
Voltage Inputs	2 voltage inputs: - Main voltage input: 90-600 VAC L-N / L-L - CAT III - Secondary voltage input: 90-250 VAC L-N / L-L CAT III
Current Inputs	333 mV output CT's or Rogowski Coil Sensors (131 mV/kA @ 60 Hz)
Maximum Current Input	- 150% of current sensor rating. - 4000 A for ROG Rogowski coil sensors
Measurement Type	True RMS using continuous sampling
Line Frequency	50/60 Hz
Input Power	- Internal three phase power supply (90 – 600 VAC), L1, L2 or L3; 500 mA max. - DC powered from 5V USB port (500 mA)
AC Protection	500 mA Slow Blow CC Class Fuse 200 kA on each hot leg (L1, L2, and L3)
Power Out	24 VDC output, 50 mA steady state, 100 mA peak at Duty Cycle 10%, self-resetting fuse
Accuracy	0.2% ANSI C12.20-2010 Class 0.2
Communication	
Hardware	RS-485, Ethernet, & USB (for configuration only)
Supported Protocols	Modbus RTU, Modbus TCP & BACnet IP
Wiring Length	1200 meters with Data Range of 100K bits/second or less
RS-485 Loading	1/8 unit
Communication Rate	9600, 19200 (Default), 38400, 57600, 76800, 115200
Serial Protocol	8N1
Termination / Bias	None provided
Mechanical	
Wire Connections	Voltage Connection to PCB or Disconnect: 12-14 #AWG, 600 VAC 105 °C CT Connection: 12-22 AWG, 600 VAC 105 °C
IP rating	IP30
Operating Temperature	-20 °C to + 60 °C (-4 °F to 140 °F)
Humidity	5% to 95% non-condensing
Enclosure	Extruded anodized aluminum body End caps 94-V0 flammability rating, connections sized for 1–inch EMT conduit
Software	
Operating System	Windows® 8, Windows® 10, Windows® 11
Communications Port	One USB Port required on PC, Type A or Type C
Standards	
FCC	FCC Part 15, Class B (Radiated and Conducted Emissions)
Safety	Conforms to UL Std 61010-1, 3rd Edition, UL 61010-2-30:2010 Certified to CSA Std C22.2 No. 61010-1, 3rd Edition