



Figure 1

# mCore<sup>®</sup> SDR

## Quick Start Guide



**mCore<sup>®</sup> SDR** is designed for industrial applications requiring protocol translation between CDL (CAT<sup>®</sup> Data Link), S.A.E. J1939, Allen Bradley Tags, Modbus RTU, and Modbus TCP. Each unit comes to you preconfigured and ready to install.

The mCore<sup>®</sup> SDR is easy to mount, with two mounting options, and environmentally sealed to protect against dust ingress and temporary immersion in up to 1 meter of water (IP66 & IP67). It was designed specifically for industrial mobile, mining, marine, and off-road applications. The device displays LED indicating lights configured to provide positive confirmation of power, connectivity, and data transmit/data receive.

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## INPUT POWER REQUIREMENTS

mCore<sup>®</sup>SDR power is supplied through Pins 7 and 8 on Key Connector A (see Table 1, Page 4). Pins 7 and 8 can be located on the Pinout Guide under “**Connecting mCore**”. The input voltage requirements are 8–48 VDC for operating temperatures between -40°C and +65°C. The input voltage requirements are limited to 8–28 VDC for operating temperatures between -40°C and +70°C. mCore<sup>®</sup>SDR has internal reverse polarity protection, but will not operate under reverse polarity conditions.

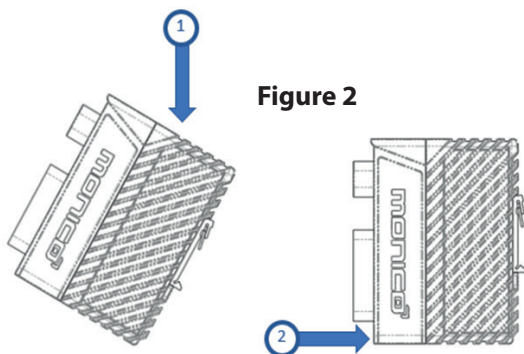
In addition to the battery positive and battery negative leads, there is a key switch wire that must be wired into the positive terminal of the power source or wired to a switch connected to the positive terminal of the power source.

**mCore<sup>®</sup>SDR will not boot if key switch is not powered.**

**The Power LED will show amber within approximately 30 seconds and then should turn to Green within 60-75 seconds which means it is fully booted and ready to run.**

## MOUNTING mCORE<sup>®</sup>SDR

**DIN Rail Mount:** The mCore<sup>®</sup> SDR unit should be mounted vertically on a horizontal DIN rail. Tilt the unit to a 45-degree angle and insert the top lip of the DIN rail bracket onto the DIN rail. Then attach the bottom lip to the DIN rail to snap the unit into place (illustrated in Figure 2). A minimum of 1" of space should be maintained on all sides of the unit to ensure proper heat regulation.



To remove the unit from the DIN rail, push down on the unit until the bottom lip is clear from the rail. Then pull out from the bottom. The unit should remove with ease.

**Surface-Mount:** The unit should be mounted securely against a flat surface, using two ¼" fasteners (not provided), to a suitable location as close to the engine as possible. **DO NOT mount directly to the engine block.** The unit should be mounted, as shown in Figure 1 on the cover of this guide, either horizontally or vertically. Horizontal is the optimal mounting orientation considering LED visibility and heat dissipation. However, other mounting orientations are acceptable.

## GROUNDING mCORE<sup>®</sup>SDR

After mounting and connecting mCore<sup>®</sup>SDR, the unit must be grounded in compliance with local and national electrical codes. It must be externally grounded using a customer-supplied ground wire before any power is applied. Contact the appropriate electrical inspection authority if you are uncertain that suitable grounding is available.

### TOOLS REQUIRED:

- QTY: 1 Grounding Lug (included)
- QTY: 1 6-Gauge Ground Wire (not included)
- QTY: 1 Nut Driver (not included)
- QTY: 1 Pliers or Crimping Tool (not included)

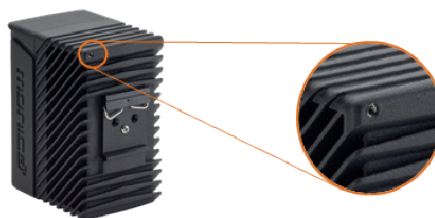
### PROCEDURE:

**Step 1:** Use the Pliers or Crimping Tool to crimp the 6-Gauge Ground Wire to the Grounding Lug.

**Step 2:** Connect the Grounding Wire to the mCore<sup>®</sup>SDR Grounding Lug connection point, shown below in Figure 3.

**Step 3:** Place the Grounding Wire over the Grounding Lug and tighten these components using a nut driver. Tighten to 9.6 in-lbs.

**Step 4:** Connect the other end of the wire to a reliable earth ground if possible. For most effective grounding, use the grounding standards listed below.



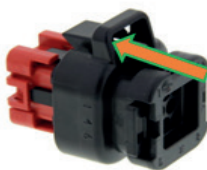
**Figure 3**

\* Safety guidelines for proper grounding are outlined in OSHA Standard 1926.962.

\* National standards for proper grounding are outlined in IEEE

## POWER DISCONNECT

To disconnect power to mCore<sup>®</sup>SDR lift the locking ear on the side of Key Connector A using a flat blade screwdriver and pull gently. The locking ear is shown below in Figure 4.



**Figure 4**

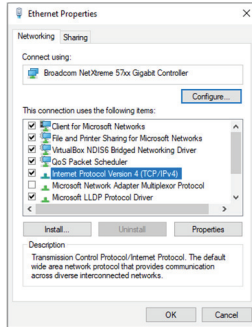
Failure to protect mCore<sup>®</sup> SDR or use in any manner not specified may result in damage.

## CONNECTING TO THE mCORE<sup>®</sup>SDR USER INTERFACE (via default configuration - Static IP)

**Special Note:** If your mCore was custom configured for Ethernet 1 to use DHCP instead of a Static IP; please consult Section 6.1 of the User Manual for instruction on how to connect via DHCP.

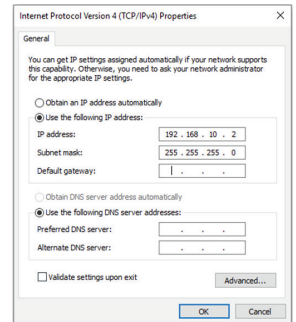
- 1) Plug the mCore's Ethernet 1 directly into your computer or network switch using an ethernet cable.
- 2) To connect to a static IP address, you will need to make sure your computer's IP address is setup properly.

**By Default:** mCore Ethernet 1 is set to static IP **192.168.10.220**



**To setup a computer IP address follow these steps:**

- 1) Select Start, then select **Settings > Network & Internet > Ethernet**.
- 2) Select **Change Adapter Options**.
- 3) Select the Ethernet adapter from the list, and Right Click, select Properties.
- 4) Select **Internet Protocol Version 4 (TCP/IPv4)**, click Properties.
- 5) Select the **"Use the following IP Address"** option.
- 6) Enter an IP Address where the last number is different from mCore's, then hit Tab. Example: use the IP depicted in graphic.
- 7) Enter a Subnet Mask. Typically, it is: 255.255.255.0. Then hit Tab.
- 8) Leave the Default Gateway blank.
- 9) Click OK to save, then Close to save.



- 3) Open an internet browser, enter the default static ip address of 192.168.10.220

- 4) You should now see the mCore Login page.

Default Username is: **admin**

Default Password is unique per mCore and will be on the label sticker on the bottom of the mCore.

**\*Note:** We recommend that the user **change the password** after the first login to a secure password. See Section 6.3: Change Password (in the User Manual) for how to do this. It is recommended to use a minimum of 8 characters in length and utilize a combination of capitalized letters, special characters, and numbers. Should the password be forgotten, you can reset mCore back to the password listed on the label sticker by performing a Factory Reset. See Section 15 of the User Manual for instructions.



### The mCore<sup>®</sup>SDR User Interface provides a way to interact with the device

Setup  
Protocols  
Firewall  
Define Data Tags

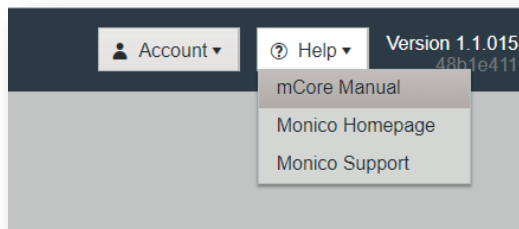
Configure Web Server  
Customer Logs  
View live data  
Manage Password Access

Extract customer logs  
Access System Functions  
Factory Reset

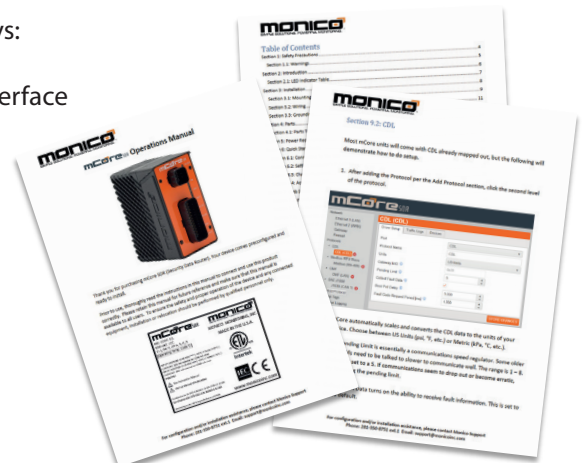
## mCORE<sup>®</sup>SDR USER MANUAL (Accessing)

The **mCore<sup>®</sup>SDR User Manual** can be accessed two ways:

- 1) Gain access to the User Interface through the User Interface  
Click **Help | mCore Manual**

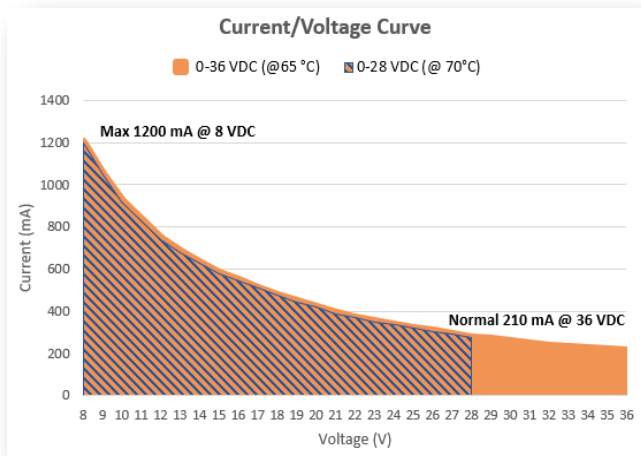


- 2) Downloaded from the Monico Website at:  
**www.monicoinc.com/support/product-support**








## CURRENT/VOLTAGE REQUIREMENTS

The input voltage requirements are 9 – 36 VDC for operating temperatures between -40°C and +65°C.  
The input voltage requirements are limited to 8 – 28 VDC for operating temperatures between -40°C and +70°C. The mCore has internal reverse polarity protection, but will not operate under reverse polarity conditions



**\*\* User is required to install a 2 Amp fast blow fuse rated for at least 50VDC (or the maximum voltage of the supplied power) to protect against short circuit. \*\***

**Table 2 - Connection Parts & Accessories**

mCore Connection Parts (AMPSEAL*)		
Item	Description	AMPSEAL Part Number
	Plug, 8 Pin, Key Connector A	776286-1
	Plug, 35 Pin, Key Connector B	776164-1
	Sealing Plug**	770678-1
	Backshell, 8 Pin	2138529-1
	Backshell, 35 Pin	776463-1
	Connector	770854-1

\* Connectors are AMPSEAL brand; available through LADD Industries

\*\* Only needed if Connector Seal was punctured due to mis-wiring or pins no longer being used. This will re-seal the connector against water ingress.



CONNECTING mCore®SDR

Pinout is depicting the female header connectors and respective key orientations on your mCore®SDR that will mate to the male connectors shown in Table 1. Be sure to follow the AMPSEAL “How-to Instructions” located the below web addresses.

These instructions include steps for proper inserting, crimping, and removing of wires into the pin connectors. For proper hand crimping, an AMPSEAL 2119118-1 hand crimping tool (not included) must be used.

<https://laddinc.com/resources/how-to-instructions/ampseal-connectors/>  
<https://laddinc.com/resources/how-to-instructions/ampseal-16-contact-crimping/>

Pinout for Key Connector A

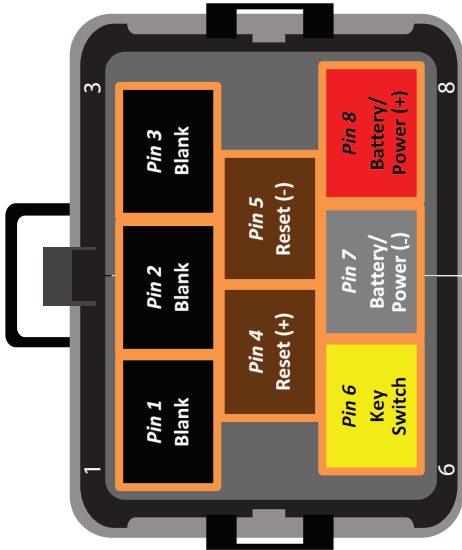


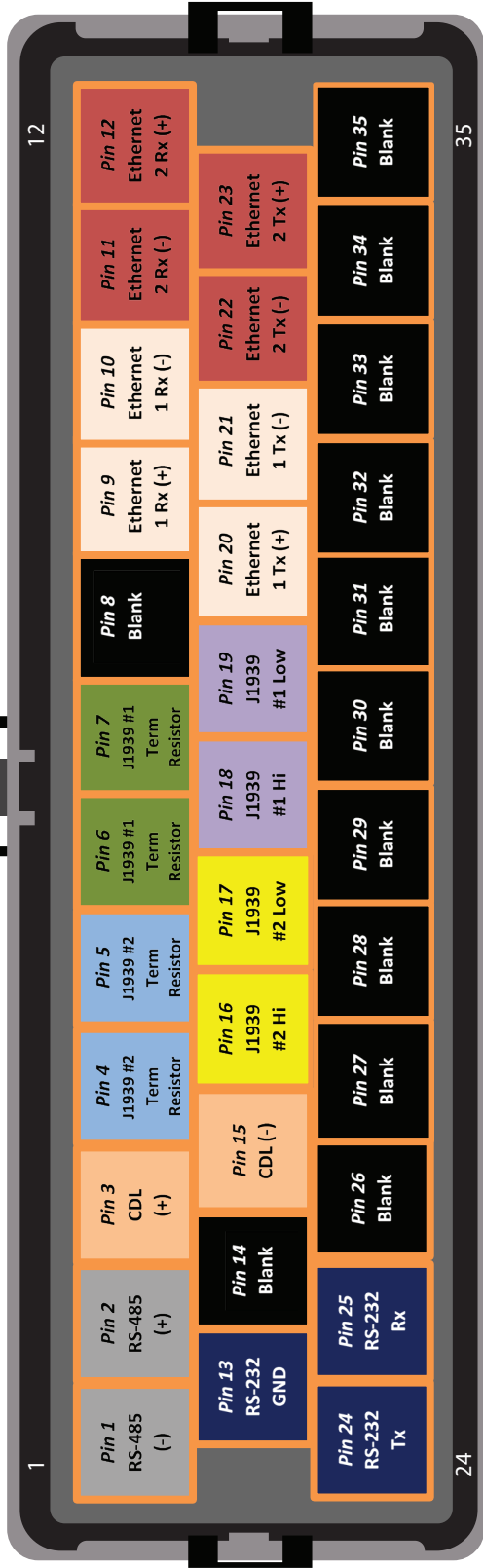
Table 1 - mCore Pinouts

\*\* Please carefully review the Input Power Requirements on page 3 of this guide. \*\*

mCore® SDR is approved for Class I Div 2 Group A, B, C and D. In order to maintain this rating the unit must be installed in a separate tool secured enclosure and comply with the one of the following NEC wiring methods:

1. Extra-hard usage cord – Section 501.140 of the NEC and Rule J18-160 of the CE Code Part I;
2. Instrumentation tray cable (Type ITC or CIC) – Section 501.10(B) and 501.105(B)(6) of the NEC and Rule J18-152 of the CE Code Part I;
3. Power-limited tray cable (Type PLTC) – Article 725 of the NEC; and
4. Tray cable (Type TC) installed per Article 336 of the NEC and Rule 12-2202 of the CE Code Part I.

Pinout for Key Connector B



The unit should be connected to the desired ports according to the pinout diagram using the recommended connectors shown in Table 2, Page 3 of this guide as well as in the User Manual. The pin numbers are labeled on each AMPSEAL key connector to ensure proper connection.

mCore LED Indicators						
	Solid Green	Blinking Green	Solid Amber	Blinking Amber	Solid Red	Blinking Red
<b>Power</b>	Powered On, Booted Up, and Ready To Use		Powered On and Booting Up	Key-switch Has Initiated Shutdown or Software Upgrade In Progress	Final Shutdown Sequence and Initial Reboot	Unit Does Not Have Power
<b>CDL</b>		Good Communications	Actively Scanning CDL Bus for Responding Parameters	Indicates Responding Parameters During Scanning	Cable Not Connected, Wired Incorrectly, or CDL Device Is Powered Off	Protocol Not Configured
<b>CAN1</b>		Good Communications			Cable Disconnected or J1939 Device Is Powered Off	Protocol Not Configured
<b>CAN2</b>		Good Communications			Cable Disconnected or J1939 Device Is Powered Off	Protocol Not Configured
<b>Modbus Master (RS-485/232)</b>	Actively Polling But Receiving No Replies	Good Communications			Upon Bootup Only: No Activity On Bus, Cable Not Connected, or Incorrect Mapping For Slave Device	Protocol Not Configured
<b>Modbus Slave (RS-485/232)</b>	Will Be Temporarily Solid When Other Devices On The Network Are Being Polled	Good Communications	No Polls Being Received, Cable Not Connected, Master Device Powered Off, or Incorrect Registers Being Requested			Protocol Not Configured
<b>Ethernet 1</b>	Link Established But Not Actively Communicating	Good Communications			No Link Established or Cable Disconnected	
<b>Ethernet 2</b>	Link Established But Not Actively Communicating	Good Communications			No Link Established or Cable Disconnected	
<b>Factory Reset</b>		Factory Reset Is Complete (All Protocol LEDs)				Factory Reset Initiated (All Protocol LEDs)

## Notes Page:

For telephone support please contact Monico Support at  
**281-350-8751 and select Option 1**

## mCore<sup>®</sup> SECURE DATA ROUTER



Thank you for purchasing mCore<sup>®</sup> SDR (Secure Data Router). Your device comes preconfigured and ready to install.

Prior to use, thoroughly read the instructions in this Quick Start Guide and/or the User Manual to connect and use this product correctly. Please retain for future reference and make sure that this Quick Start Guide and the User Manual is available to all users. To ensure the safety and proper operation of the device and any connected equipment, installation or relocation should be performed by qualified personnel only.



IND. CONT. EQ.  
FOR HAZ. LOC.  
CL I, DIV 2, GP A, B, C, D  
Operating Temp. Code T4

Conforms to UL STD 61010-1 & ISA STD 12.12.01  
Certified to CSA STD C22.2 #s 61010-1 & 213



## SAFETY PRECAUTIONS

## WARNINGS

**Thoroughly read and follow the safety precautions and operating instructions listed in this manual before using the product. After reading, retain this manual for future reference.**

- Do not use or mount the product in any manner or location not intended.
- This manual should be available for anyone operating, repairing or relocating the product.
- The product should be installed, repaired or removed by qualified personnel only.
- Do not disassemble or modify the product. Improper installation or repair may cause injury, damage, electric shock or fire.
- To ensure proper operation and avoid damage to the product, use appropriate tools along with recommended connectors and recommended wire gauge.
- Do not open or break the seal between the housing and the connector header.
- Do not operate a unit that has been damaged.
- Extended environmental conditions: wet location, outdoor use, ambient temperature - 40°C and 70°C, and altitude up to 2000m.

**WARNING** – EXPLOSION HAZARD. DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED. **AVERTISSEMENT** – RISQUE D'EXPLOSION. NE PAS BRANCER OU DÉBRANCHER LORSQUE LE CIRCUIT EST SOUS TENSION.

**WARNING** – EXPLOSION HAZARD. DO NOT DISCONNECT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.

**AVERTISSEMENT** – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER SI LE CIRCUIT EST SOUS TENSION, À MOINS QUE LE MILIEU SOIT LIBRE DE SUBSTANCES INFLAMMABLES CONCENTRÉES.

**WARNING** – EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE BATTERIES OR PLUG-IN MODULES (AS APPLICABLE) UNLESS POWER HAS BEEN DISCONNECTED OR THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.

**AVERTISSEMENT** – RISQUE D'EXPLOSION. NE PAS RETIRER OU REMPLACER DES BATTERIES OU DES MODULES DE PLUG-IN (COMME APPLICABLES) À MOINS QUE LA PUISSANCE A ÉTÉ DÉCONNECTÉE OU LA ZONE EST LIBRE DE CONCENTRATIONS IGNITIVE.

**WARNING** – DO NOT REMOVE THE AMPSEAL CONNECTORS UNLESS THE EQUIPMENT NEEDS TO UNDERGO REPAIR OR MAINTENANCE. AFTER REPAIR OR MAINTENANCE HAS BEEN DONE, PLEASE CHECK THE BARE PINS ON THE EQUIPMENT TO ENSURE THERE IS NO DUST OR WATER PRESENT. IP RATING OF THE EQUIPMENT IS ONLY MAINTAINED WITH THE AMPSEAL CONNECTORS ATTACHED TO THE EQUIPMENT.

**AVERTISSEMENT** – NE RETIREZ PAS LES CONNECTEURS AMPSEAL À MOINS QUE L'ÉQUIPEMENT NE SOIT RÉPARÉ OU ENTRETENU. UNE FOIS LA RÉPARATION OU L'ENTRETIEN EFFECTUÉE, VÉRIFIEZ LES BROCHES NUES SUR L'ÉQUIPEMENT POUR VOUS ASSURER QU'IL N'Y A PAS DE POUSSIÈRE OU D'EAU PRÉSENTE. LA CLASSIFICATION IP DE L'ÉQUIPEMENT EST UNIQUEMENT ENTRETENU AVEC LES CONNECTEURS AMPSEAL ATTACHÉS À L'ÉQUIPEMENT.

**WARNING** – TO MAINTAIN CLASS 1, DIVISION 2 RATING, THE UNIT MUST BE INSTALLED IN A TOOL-SECURED ENCLOSURE USING ONE OF THE NEC WIRING METHODS THAT IS OUTLINED IN THIS MANUAL.

**AVERTISSEMENT** – POUR MAINTENIR L'INDICE DE CLASSE 1, DIVISION 2, L'UNITÉ DOIT ÊTRE INSTALLÉE DANS UN BOÎTIER SÉCURISÉ EN UTILISANT L'UNE DES MÉTHODES DE CÂBLAGE NEC DÉCRITES DANS CE MANUEL.