IM500/SM500 – Industrial IoT Module

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Solar Kit Quick Install Guide

support@SystemsWithIntelligence.com
www.SystemsWithIntelligence.com

Note: Please read this manual thoroughly before operating this unit and retain it for future reference.

⚠ Important Safety Instructions ⚠

Please save these instructions.

This manual contains important safety, installation, and operating instructions for the IM500/SM500, Junction Box, Wall or Pole Mount System, Solar Panel. The following symbols are used throughout the manual to indicate potentially dangerous conditions or important safety information.

⚠ **WARNING: Indicates a potentially dangerous condition. Use extreme caution when performing this task.**

CAUTION: Indicates a critical procedure for safe and proper operation of the system.

NOTE: Indicates a procedure or function that is important to the safe and proper operation of the system.

General Safety Information

- Read all of the instructions and cautions in the manual before beginning the installation.
- Do **NOT** attach solar panel to pole mount until mount is securely fit, and pole base has been secured.
- Chance to strip nuts and bolts exists.
- Multiple people for installation is suggested.
- Do **NOT** substitute parts from other manufacture ring sources, doing so may void the warranty and/or result in an unstable system

- This system is **NOT** possessing any compliance with residential structural codes and should not be used in place of a system that is, if so required by local regulations

Installer Responsibilities

- Installation compliance with any applicable codes which are in force at the installation site
- Installation compliance and compatibility with all system components and the environment including but not limited to roofing, system components, etc.
- Verification that all project information is accurate

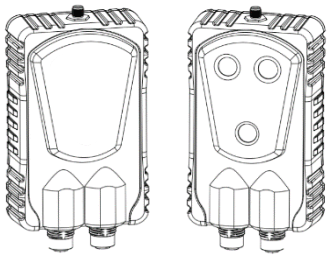
WARNING: This equipment should be installed, adjusted, and serviced by qualified electrical maintenance personnel familiar with the construction and operation of the equipment and the hazards involved. Failure to observe this precaution may result in bodily injury. Protective gloves and safety glasses should be worn during installation.

1. Content

Please note that the number of components depends on the parts ordered.

A. Solar Panel
B. Wiring Kit for Solar Panel
C. Wall or Pole Mount System for Solar Panel
D. Junction Box
E. IM500/SM500
F. Wall or Pole Mount for IM500/SM500
G. Wiring Kit for IM500/SM500

Image	Component
	**A. Solar Panel**
	**B. Wiring Kit for Solar Panel**
	**C. Wall or Pole Mount System for Solar Panel**
	**D. Junction Box**

	**E. IM500/SM500**
	**F. Wall or Pole Mount for IM500/SM500**
	**G. Wiring Kit for IM500/SM500**

2. Solar Panel Installation

Installing solar photovoltaic systems may require specialized skills and knowledge. Installation should be performed only by qualified personnel. All modules come with a permanently attached junction box and #12 AWG wire terminated in connectors. The installer should assume the risk of all injury that might occur during installation, including, without limitation, the risk of electric shock.

One individual module may generate DC voltages greater than 30 volts when exposed to direct sunlight. Contact with a DC voltage of 30V or more is potentially hazardous. When disconnecting wires connected to a photovoltaic module that is exposed to sunlight, an electric arc may result. Such arcs may cause burns, may start fires and may otherwise create problems. Therefore, be extremely careful!

Solar modules change light energy to direct-current electrical energy. They are designed for outdoor use. Modules may be ground mounted, mounted on roof, vehicles or boats. Proper design of support structures is the responsibility of the system designer and installer.

- Do not attempt to disassemble the module, and do not remove any attached nameplates or components.
- Do not apply paint or adhesive to module top surface.
- Do not use artificially concentrated sunlight directly on the module.

When installing the system, abide with all local, regional and national statutory regulations. Obtain a building permit where necessary. Abide with any local and national regulations when mounting on vehicles or boats. Safety precaution for installing a solar photovoltaic system

2.1. Safety Precaution Measures

Solar modules produce electrical energy when light shines on their front surface. The DC voltage may exceed 30V. If modules are connected in series, the total voltage is equal to the sum of the individual module voltages. If modules are connected in parallel, the total current is equal to the sum of individual module currents.

- Keep children well away from the system while transporting and installing mechanical and electrical components.
- Completely cover the module with an opaque material during installation to keep electricity from being generated.

- Do not wear metallic rings, watchbands, ear, nose, lip rings or other metallic devices while installing or troubleshooting photovoltaic systems.
- Use only insulated tools that are approved for working on electrical installations.
- Abide with the safety regulations for all other components used in the system, including wiring and cables, connectors, charging regulators, inverters, storage batteries and rechargeable batteries, etc.
- Use only equipment, connectors, wiring and support frames suitable for use in solar electric systems. Always use the same type of module within a particular photovoltaic system.

Under normal outdoor conditions the module will produce current and voltages that are different than those listed in the data sheet. Data sheet values are values expected at standard test conditions.

2.2. Installation Considerations

Before installing, obtain information about any requirements and pre- approvals for the site, installation, and inspection from the relevant authorities.

- Check applicable building codes and ensure that the structure can bear the module system load

2.3. Pre-Installation Requirements

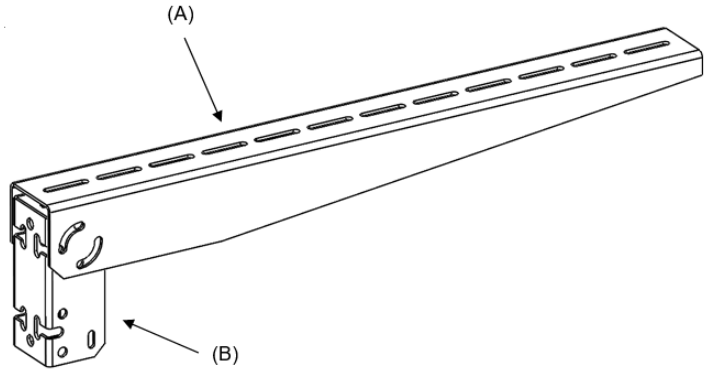
- Ensure that the modules meet the general technical system requirements.
- Ensure other system components do not damage the modules mechanically or electrically
- Modules must not be connected together to create a voltage that is higher than the maximum system voltage.
- The small drainage holes on the undersize of the module must not be blocked.
- Avoid shading—even minor partial shading reduces yields. Sunlight should be able to reach the module even on the shortest day of the year. Shading can affect module service life.

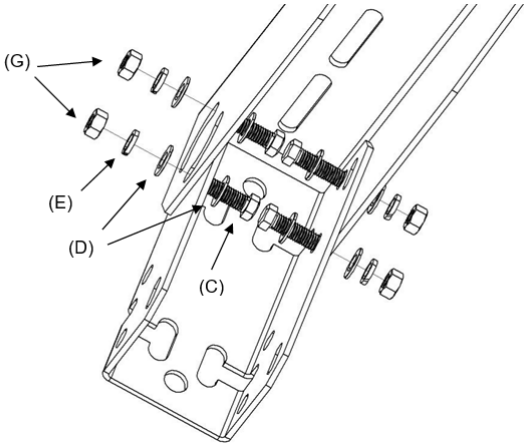
2.4. Wall Mount Assembly and Solar Panel Mounting

- All installation methods herein are only for reference. The system installer is responsible for making sure installation is abided by all codes.
- Recommended tools to have before installation (Not provided):
  - Socket wrench
  - Torque extension
  - Box-Leveler
  - Tape Measure
  - 18mm wrench or socket for larger hex nut
  - 13mm wrench or socket for smaller hex nut

The above tools and equipment are highly recommended to have available to assist with installation but are in no way a comprehensive list of tools that can ease installation. Installers feel free to substitute comparable equipment where appropriate.

- Attach the Fixed Bracket (B) and Tilt Arm (A)





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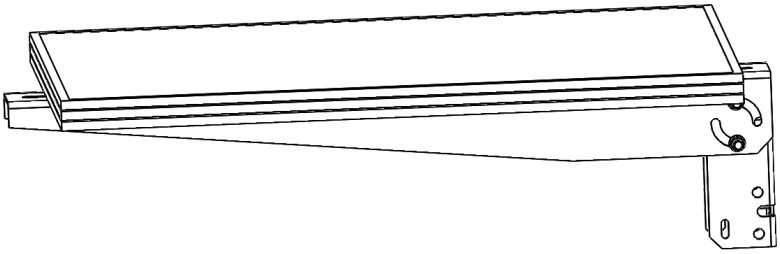
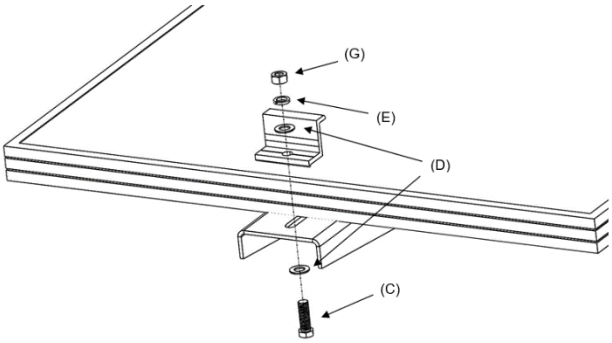
NOTE: M8 Washer (D) and M8 Spring Washer (E) are essential parts when tightening M8 Nut (G), over tightening may damage parts

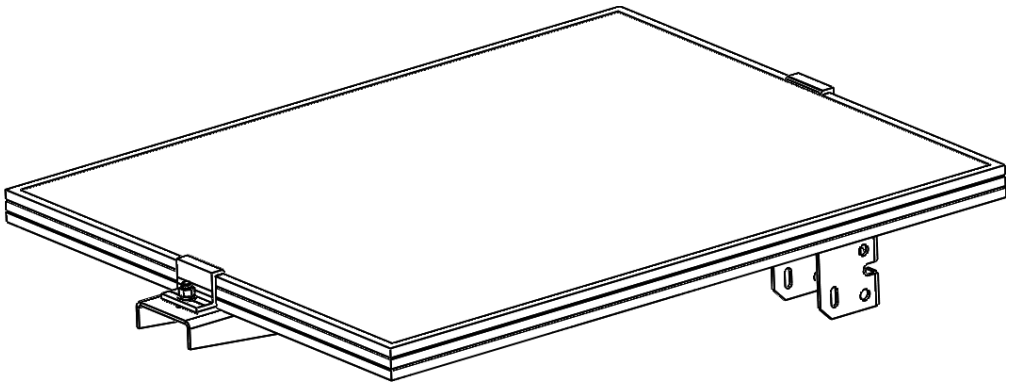
NOTE: Adjust tilt arm (A) and fixed bracket (B) to desired angle prior to tightening M8 Nut (G)

- Attach the Panel to the Wall Mount



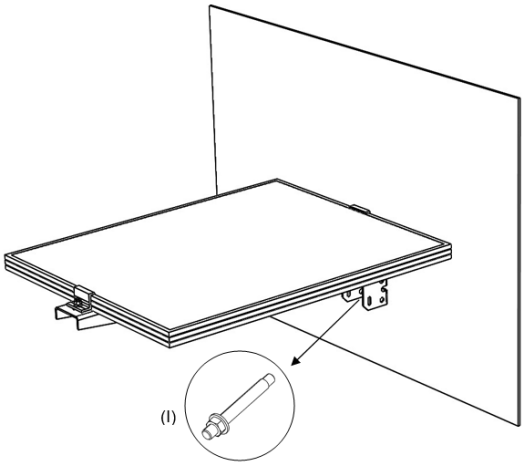


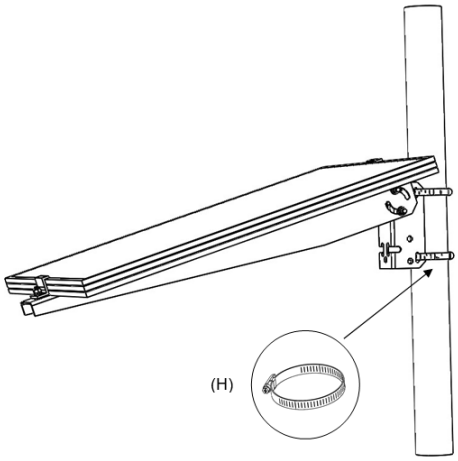
⚠ WARNING! Keep hands clear of pinch points!



NOTE: This is what the clamp should look like when it is fastened to the panel.

- Install the Wall Mount on Wall or Pole





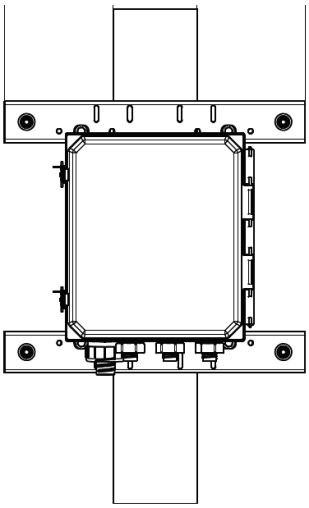
NOTE: Please check the direction of Fixed Bracket (B) prior to installation. Choose appropriate Hose Clamp (H) size for installation.

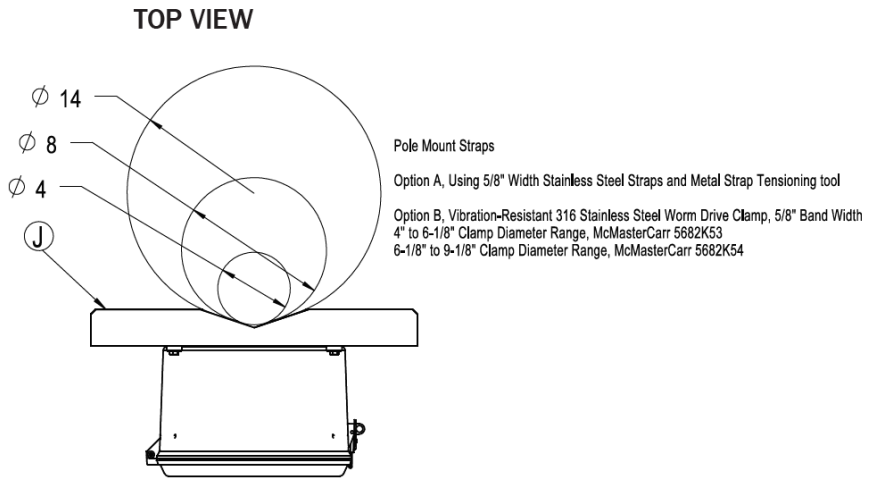
NOTE: Please use proper tool for this installation. Installation process may require assistance.

For more details see https://www.renogy.com/content/files/Manuals/MTS-WM.pdf

2.5. Junction Box Mount

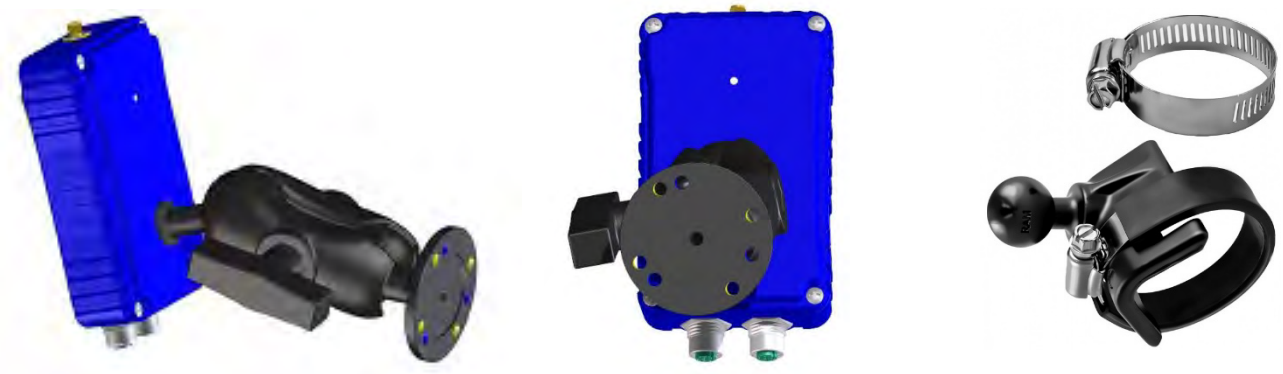
- All installation methods herein are only for reference. The system installer is responsible for making sure installation is abided by all codes.
- Junction Box can be mounted on a round or square pole with an optional adapter





2.6. IM500/SM500 Mount

- All installation methods herein are only for reference. The system installer is responsible for making sure installation is abided by all codes.
- The IM500/SM500 can be mounted using the included arm on a flat surface. Optional, you can order a round pole mount and replace the flat part of the mount.

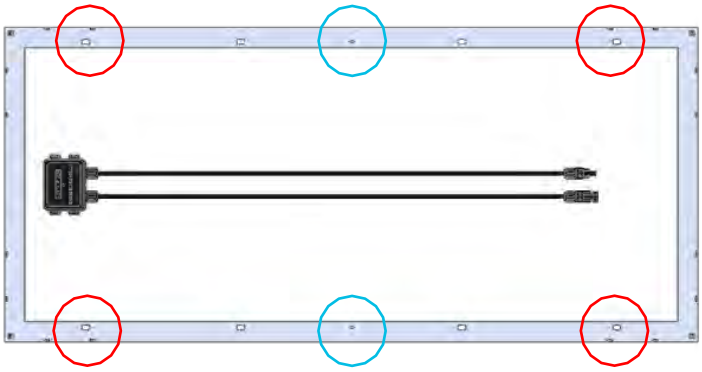


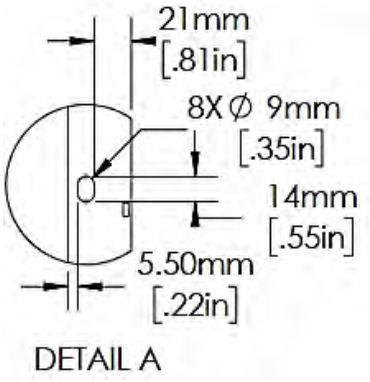
NOTE: Ensure the IM500/SM500 is properly mounted before powering up the system.

3. Electrical Installation

3.1. Cables and Wiring

- Wiring kit for solar panel contains two (2) stranded, PV-rated, output MC4 cables. The positive connector is a male connector and the negative connector is a female connector.
- Wiring kit for IM500/SM500 consist of two (2) cables; a 10m cable with male-female connectors for power and an 1m cable with a male connector for Digital I/O.
- MC4 cables are intended for use on the output wiring of a module or panel and comply with the Standard for Connectors for use in Photovoltaic Systems, UL 6703, see module literature for appropriate mating connectors.
- Keep connectors dry and clean and ensure that caps are tightly sealed before connecting modules.
- Faulty connections can result in electrical shock so make sure to fasten all connections securely.
- Solar panel needs to be grounded using the intermediary holes (blue) in the frame. Grounding cable is not included.





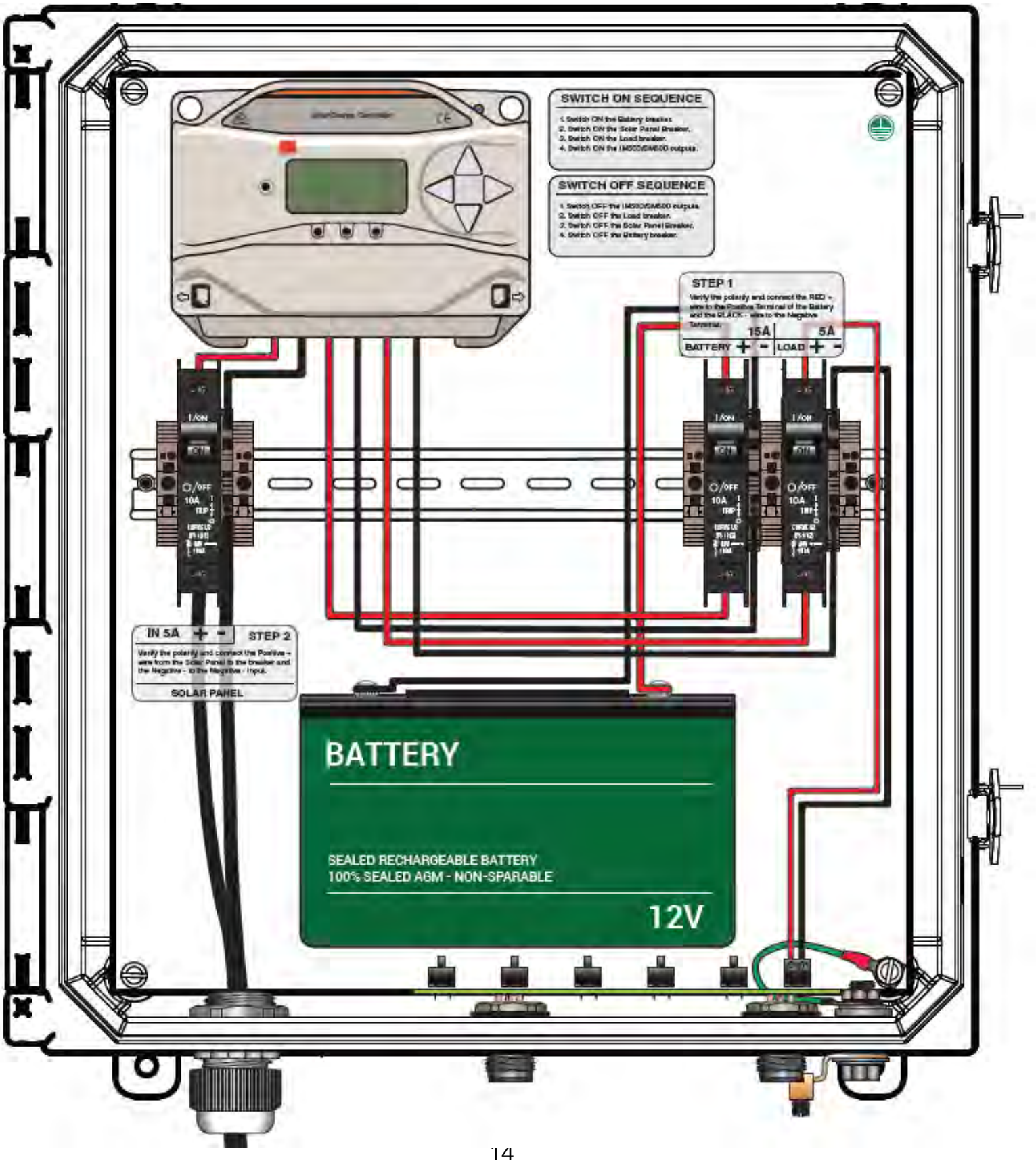
3.2. Junction Box Wiring

CAUTION: Ensure ALL the breakers are in the OFF position before starting to make all the connections.

- Place the battery (12V, 20Ah Deep Cycle Lead Acid Batteries) inside the junction box and connect the RED wire to the battery terminal + and the BLACK wire to the – terminal.

NOTE: Measure the voltage at the terminals to ensure it has proper polarity and voltage (~12VDC).

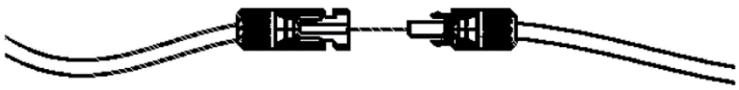
- Insert the two MC4 cables with the free ends from the outside of the junction box through the liquid tight connector. Connect the wire labeled + to the breaker and the wire labeled – to the negative input and secure them by tightening the liquid tight connector.
- Connect the 10m power cable from the junction box to the IM500/SM500



3.3. Solar Panel wiring

CAUTION: Ensure ALL the breakers are in the OFF position before starting to make all the connections.

- Connect the MC4 cables to the solar panel terminals. The terminals are matting connector to ensure the proper polarity is applied to the junction box.



3.4. Power ON sequence

CAUTION: Ensure ALL the breakers are in the OFF position

CAUTION: Measure the voltage at the input breaker to ensure the proper voltage and polarity is applied.

CAUTION: Verify the battery is a 12V model and the polarity of the battery is matching the cable color.

- Switch ON the BATTERY breaker.
- Switch ON the SOLAR PANEL breaker.
- Switch ON the LOAD breaker.
- Switch ON the individual ports for IM500/SM500.

3.5. Power OFF sequence

NOTE: This step is necessary for troubleshooting the system and battery replacement.

- Switch OFF the individual ports for IM500/SM500.
- Switch OFF the LOAD breaker.
- Switch OFF the SOLAR PANEL breaker.
- Switch OFF the BATTERY breaker.

Systems With Intelligence Inc.
6889 Rexwood Road, Unit #9
Mississauga, Ontario, CANADA
L4V 1R2

Tel: +1-289-562-0126
Fax: +1-289-562-0152

General Inquiries:
info@SystemsWithIntelligence.com

Sales Inquiries:
sales@SystemsWithIntelligence.com

Product Support:
support@SystemsWithIntelligence.com