

carmanah E Series AI Integration Kit Installation Guide

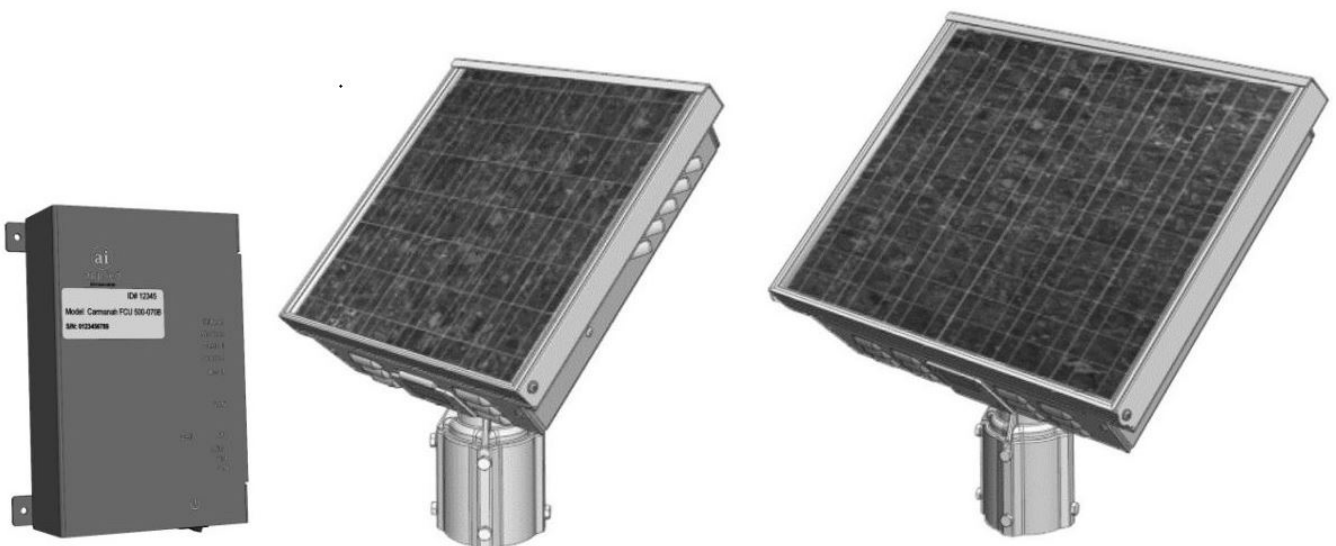
[Home](#) » [carmanah](#) » carmanah E Series AI Integration Kit Installation Guide 

Contents

- 1 carmanah E Series AI Integration Kit
- 2 Product Information
- 3 Warnings and Precautions
- 4 System Components
- 5 Tools and Materials Required
- 6 E/F Series Solar Engine Installation
- 7 Appendix A – AI-500-070C/AI-500-030 Low Power Devices
- 8 Documents / Resources
 - 8.1 References



carmanah E Series AI Integration Kit



Product Information

The E/F Series Applied Information (AI) Integration Install Guide provides instructions for the installation and operation of Carmanah's E/F Series Applied Information (AI) system. The AI system is designed to integrate with E/F Series solar engines to provide remote monitoring and control capabilities.

Warnings and Precautions

The following symbols indicate important safety warnings and precautions throughout this guide:

WARNING indicates that serious bodily harm or death may result from failure to adhere to the precautions.

CAUTION indicates that damage to equipment may result if the instructions are not followed.

NOTE suggests optimal conditions and provides additional information.

Warranty Disclaimer

This manual will familiarize you with the features, operation standards, and installation of Carmanah's E/F Series Applied Information (AI) system. Failure to comply with the use, storage, maintenance, installation or placement instructions detailed in this manual could void the warranty.

Standards

Perform all installation, wiring, grounding and maintenance in conformance with local building and electrical codes. Adherence to the National Electrical Code (NEC) is mandatory to comply with any certification markings. Non-adherence to code may void the warranty.

Safety and Usage Precautions

- **WARNING** Batteries are shipped fully charged. Use extreme caution when handling the batteries as they can generate hazardous short-circuit currents. Remove all jewelry (bracelets, metal-strap watches, etc.) before entering the cabinet.
- **WARNING** Solar panels produce DC electricity when exposed to light and can therefore produce an electrical shock or burn. To render solar panels inoperative, remove them from sunlight or fully cover their front surface with an opaque material.
- **WARNING** Before lifting any heavy or bulky equipment, ensure the load is secured so moving parts do not shift, and that it can be lifted as far as needed without back strain or loss of grip. Installation may require more than one person.
- **WARNING** Ensure the equipment is not powered during installation and wiring of the system.
- **WARNING** Recheck all completed wiring for proper polarity prior to energizing the system.
- Changes or modifications to Carmanah equipment not expressly approved by Carmanah could void both the user's authority to operate the equipment and the warranty.
- Product can have sharp edges. Accidental movement of hinged components can cause injury.

Applications

For Carmanah R829-E/F and R247-E/F systems, the E/F Series AI Integration Kit allows for remote system monitoring, scheduling and control. With Carmanah R820-E/F and R920-E/F Rectangular Rapid Flashing Beacon (RRFB) systems, the E/F Series AI Integration Kit allows remote system monitoring.

The E/F Series AI Integration Kit is available in two different states of assembly described below:

- If ordered with a Carmanah E/F system: the harnessing is assembled to the Carmanah EMS in the factory,

creating an “AI-ready” Carmanah E/F system. Skip to Section 4.4 for configuration.

- If ordered separately: the E/F Series Integration Kits are provided as a kit of parts to be installed by the user following all the installation steps provided.

NOTE The Applied Information AI-500-070B/071B Field Control Unit (FCU) does not fit in the Carmanah E Series solar engine.

NOTE Installing the AI Integration Kit in the field voids the warranty on the Carmanah E/F system.

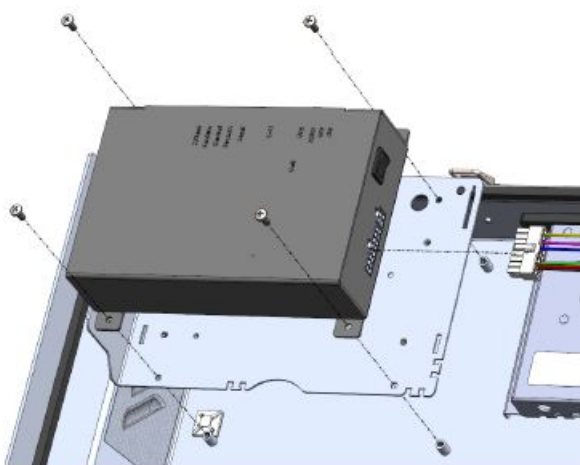
NOTE This install guide describes installing the AI Integration Kit into a Carmanah F Series system. The same steps can be followed to install the kit into a Carmanah E Series system.

System Components

The E/F Series Applied Information (AI) Integration Kits consists of the following items:

1. Bracket, mount, F Series (1)
 - **a.** F Series systems only
2. Harness, AI 16-pin to terminal block (1)
3. Adapter, 90°, SMA male to SMA female (2)
4. Screw, machine, #8-32 x 3/8", Phillips (4)
 - **a.** F Series systems only
5. Wago 211-413, 3-position splice terminal (2)
6. Wago 221-415, 5-position splice terminal (2)
7. Cable tie, 4" (2)
8. Wire, hookup, 16AWG red (6")
9. Wire, hookup, 16AWG black (3")
10. Heat-shrink, tubing, 3/8" ID, black (1")
11. Install guide, AI Integration Kit, E/F Series (1)
12. Adapter, harness, AI 070B to 030/070C (1)

NOTE The Applied Information AI-500-070B, AI-500-070C, and AI-500-030 (monitoring only) are supported with E/F Series systems. Modem supplied separately.



Tools and Materials Required

The following tools and materials may be required to install the AI Integration Kit into your E/F Series system:

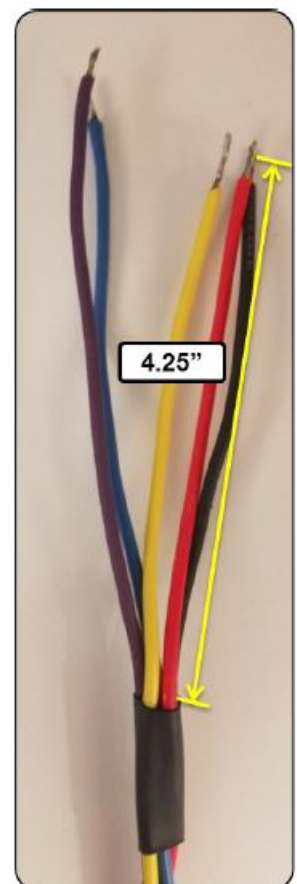
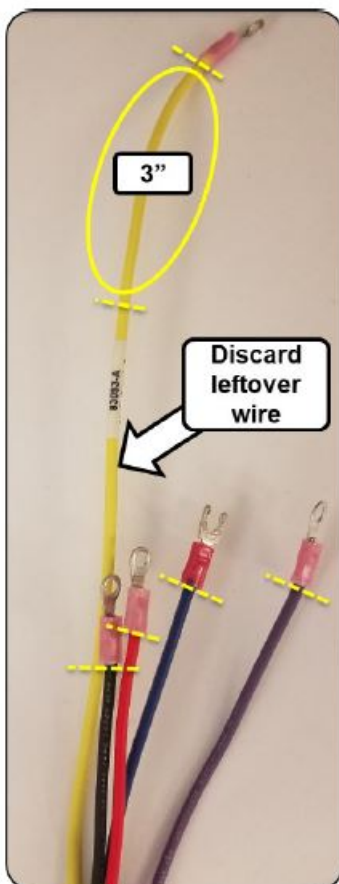
1. Drill and ½" drill bit
2. Deburring tool or similar
3. Crescent wrench
4. Side cutters
5. Heat gun
6. 3/32" flat blade screwdriver
7. Multi-bit screwdriver
8. Electrical multimeter
9. Digital calipers

E/F Series Solar Engine Installation

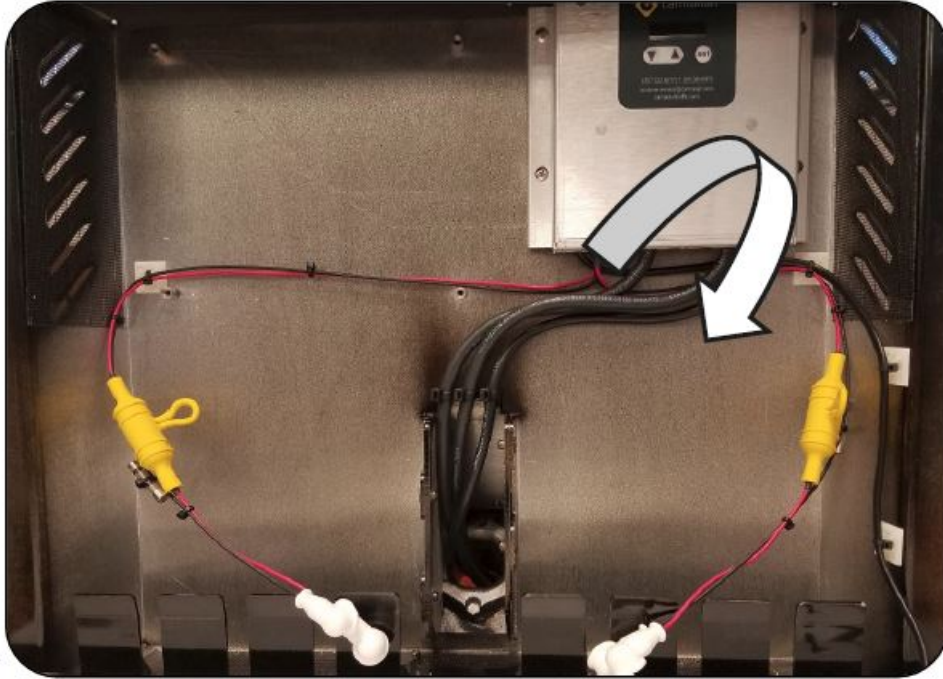
NOTE If the AI Integration Kit was order with a Carmanah E/F Series system, skip to Section 4.4. Instructions for installation reflect the F Series engine but are suitable for E Series as well.

Wiring

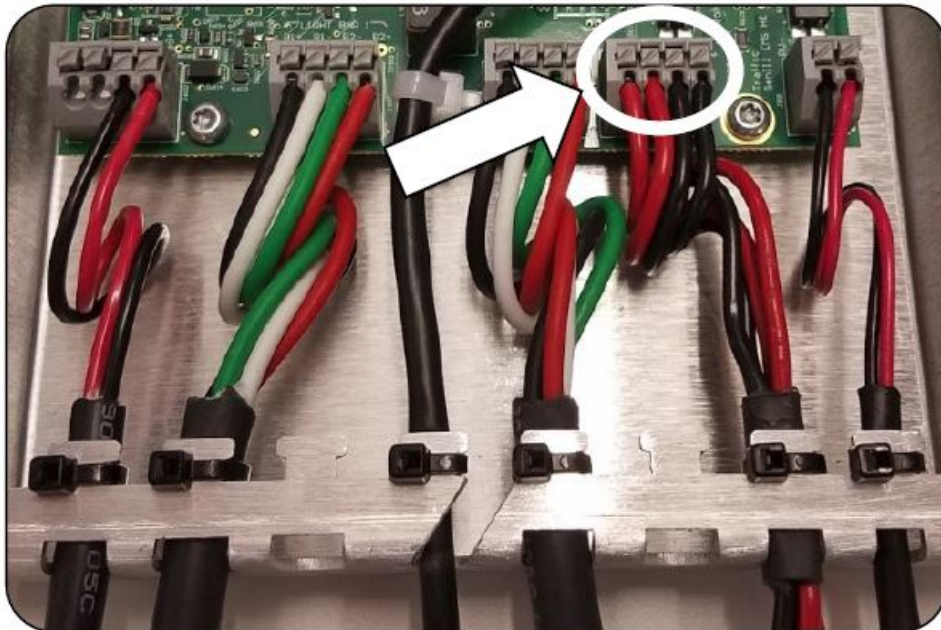
1. Remove power to the system by disconnecting both battery fuse holders.
2. Obtain the AI 16-pin harness. Cut and remove terminal of the five wires shown (violet, blue, black, red, and yellow). Leave the green wire ring terminal intact (not shown).
3. Cut yellow wire to same length as black wire. Cut a three-inch section of yellow wire and strip each end 0.35" for later use.
4. Install provided heat-shrink tubing around the five wires 4.25" from the end of black wire. Other wires will end up being longer. Use heat gun to affix the heat-shrink tubing.
5. Strip insulation of the five wires 0.35".



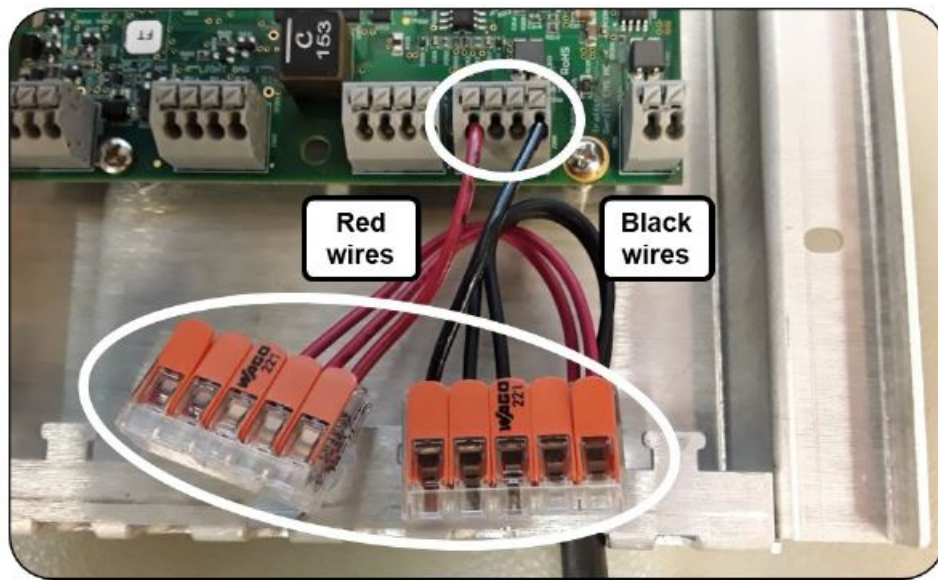
6. Unlatch and swing solar panel open. Remove the four Energy Management System (EMS) cover screws. Swing EMS down to access the internal wiring.



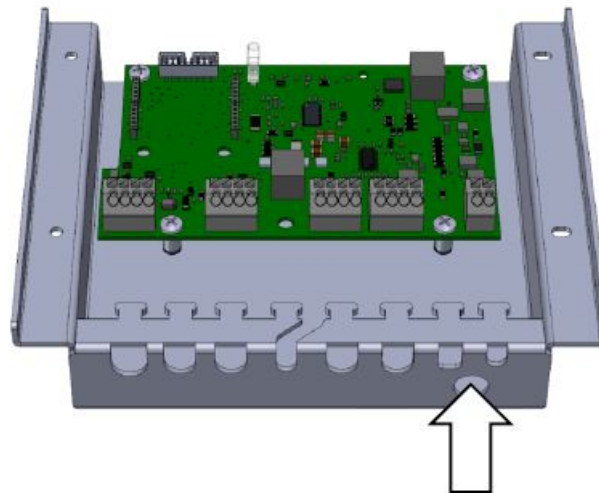
7. Remove battery harness wires from battery circuit board terminal by pushing down on each terminal button with a small flat bladed screwdriver and pulling out each wire.



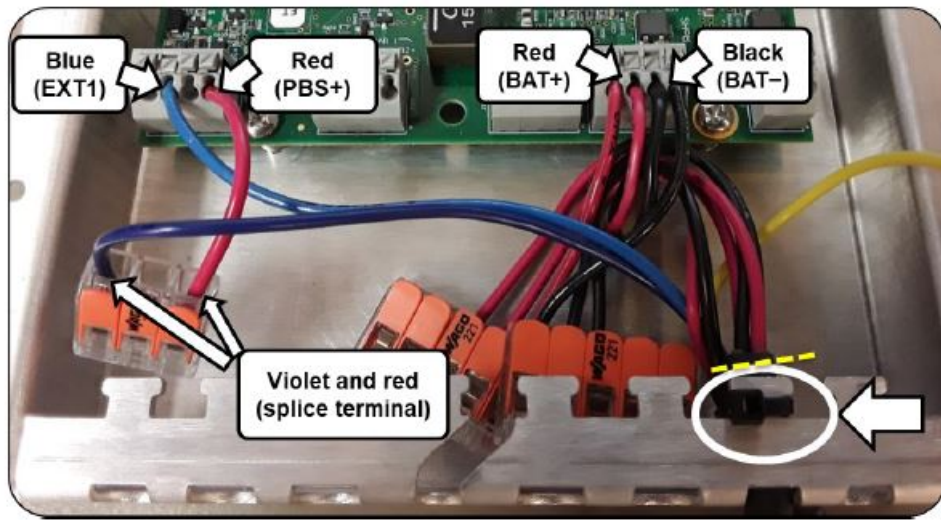
8. Obtain 3" of red and 3" of black wire supplied with the kit.
- Strip ends of both wires 0.35".
 - Use small flat bladed screwdriver to depress each terminal button and insert the wire into the terminal.
 - Install one end of the red wire into the left BAT+ terminal.
 - Install one end of the black wire into the right BAT- terminal.
 - Insert the other end of each wire into two of the 5-position splice terminals.
9. Route the two red battery harness wires into the splice terminal with the red wire from BAT+.
10. Route the two black battery harness wires into the splice terminal with the black wire BAT-.



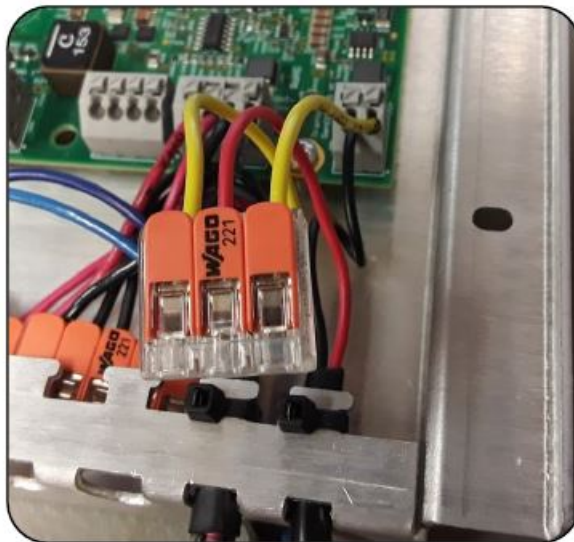
11. Obtain 3" of red wire supplied with the kit and strip both ends to 0.35".
12. Insert one end of 3" red wire into PBS+ terminal.
13. Route modified AI harness wires (from steps 1-4, violet/blue/black/red/yellow) into the hole shown.



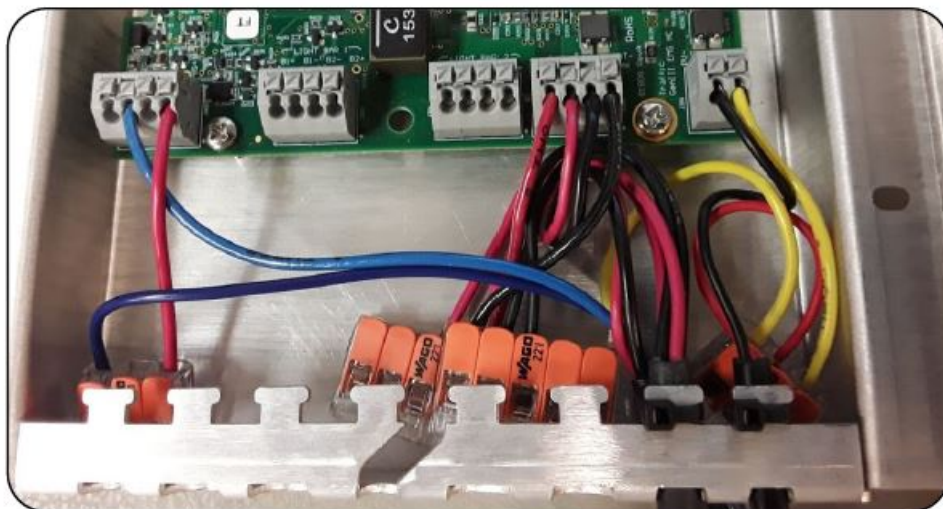
14. Install the wires into the terminals as follows:
 - **Violet** → 3-position splice terminal with red wire going to PBS+
 - **Blue** → EXT1
 - **Red** → Middle BAT+
 - **Black** → Middle BAT-
15. Align ends of heat-shrink on both harnesses near end of sheet metal tab. Install a cable tie around both harness and sheet metal as shown below.



16. Remove red solar panel wire from the PV+ terminal. Insert red wire into 3-position splice terminal.
17. Insert one end of 3" yellow wire from step 2 into PV+ terminal. Insert other end of 3" yellow wire into 3-position splice terminal.
18. Insert yellow wire from AI 16-pin harness into third splice terminal position.



19. Tuck 3-position splice terminal under PV and battery harnesses as shown below. Route wires as neatly as possible.

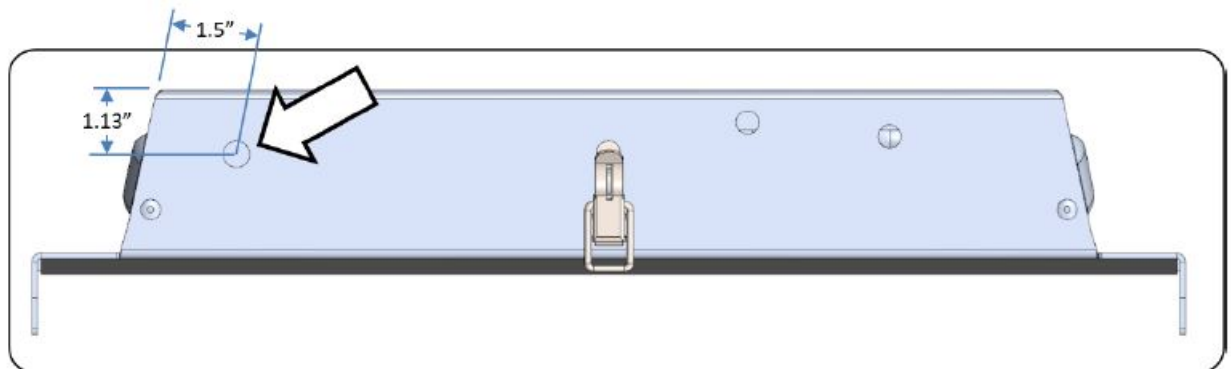


20. Turn EMS over and replace four screws. Install ring terminal from green ground wire under bottom right EMS screw.



Antenna

1. Drill a ½" hole on the top of the solar engine enclosure. Deburr hole and remove all aluminum chips.
 - **a.** E Series – on the top of the solar engine enclosure, mark a point 1.13" from the back and 1.50" from the side as shown.
 - **b.** F Series – use the half shear indentation to locate the tip of the drill bit.

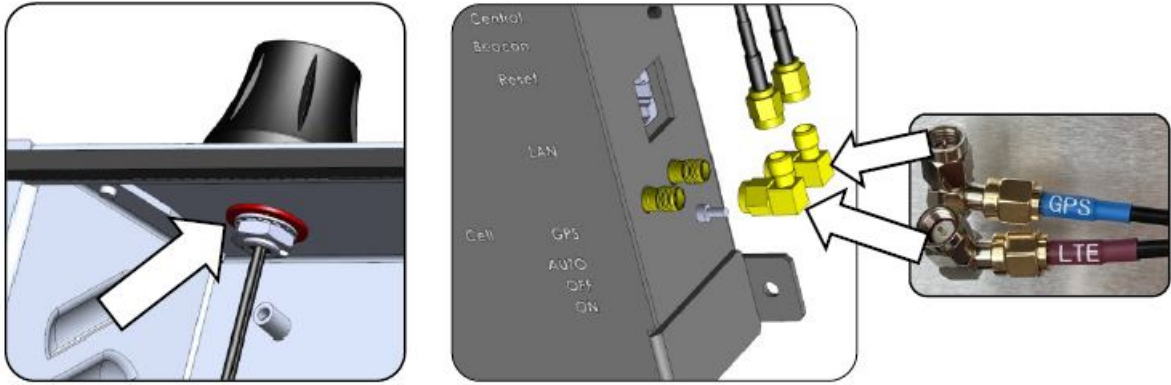


WARNING Ensure the equipment is not powered during installation. Recheck all wiring prior to energizing the system.

CAUTION Ensure all metal chips are removed to prevent system damage caused by short circuits.

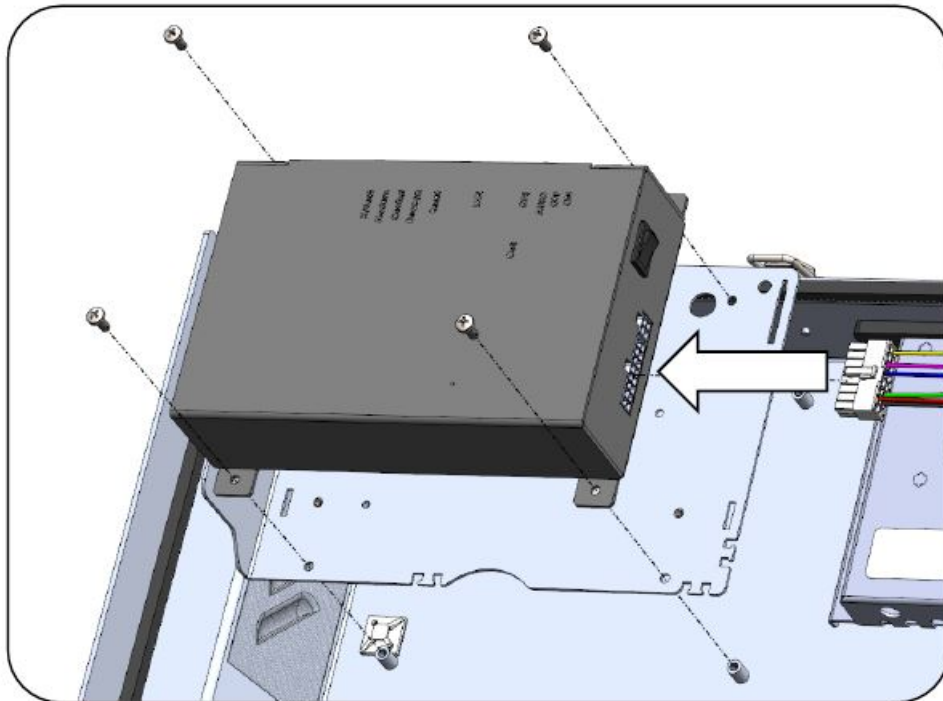
CAUTION Ensure that no burrs are present that would interfere with the antenna seal.

2. Route antenna coax connector cables into enclosure hole and through plastic washer, lock washer, and nut. Tighten nut securely using crescent wrench.
3. Thread 90° coax adapters onto antenna connectors. Orient as shown (facing upward when installed into solar engine).
4. Thread coax adapters onto AI FCU connectors. Match GPS & LTE labels on antenna harness & AI FCU (Cell closer to front, GPS closer to back).



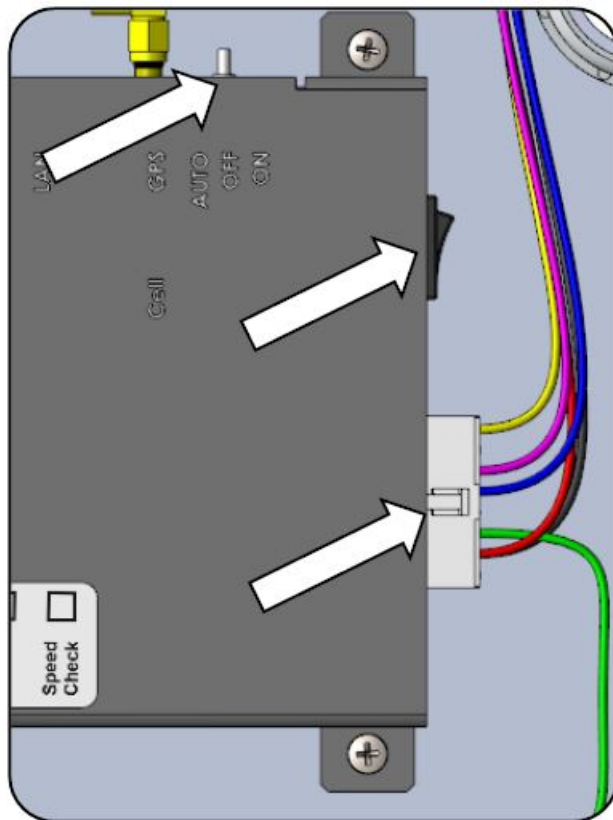
AI-500-070B Field Control Unit (FCU)

1. Use four supplied screws to install AI-500-070B into enclosure with bracket.
2. Install the 16-pin connector from the EMS to the AI-500-070B.
3. Route coax cables between AI-500-070B and antenna neatly and cable tie as needed.



Testing AI-500-070B

1. Ensure AI serial number has been activated.
2. For R920 or R820 systems set toggle switch to "OFF". In all other cases set to "AUTO".
3. Ensure connector is properly mated on the bottom of the AI-500-070B.
4. Confirm correct wiring and power-up system by connecting the battery fuse holders and turning on the AI power switch.
5. On your PC, open a browser and navigate to the Glance website:
 - a. glance.appinfoinc.com
6. Log in using the credentials provided by AI or the distributor you purchased the equipment from.
7. On the upper left side of the browser, select the device name that matches the Device ID (the ID number labelled on the AI-500-070B).



CAUTION Ensure the equipment is not powering during installation. Recheck all wiring prior to energizing the system.

8. Ensure that the “Current Status” indicates “Online”.
9. Ensure “Current Device Status” is “OK”.
10. Contact Applied Information to arrange the firmware in the AI unit to be programmed correctly, if this hasn't already been done.
 - **a. Phone:** 678.830.2170
 - **b. Email:** support@appinfoinc.com
 - **c. Web:** appinfoinc.com

Current Status : Online
 Current Alarms :
 Current Schedule: Schedule 1
 Power Status : No AC
 Current Device Status : OK
 Timezone : -7 Hours
 Time Since Last Contact : 24 Minutes 6 Seconds
 7/8/2019 9:47:54 AM

	Now
System Voltage (V DC)	13.3
Solar Array Voltage (V DC)	23.4

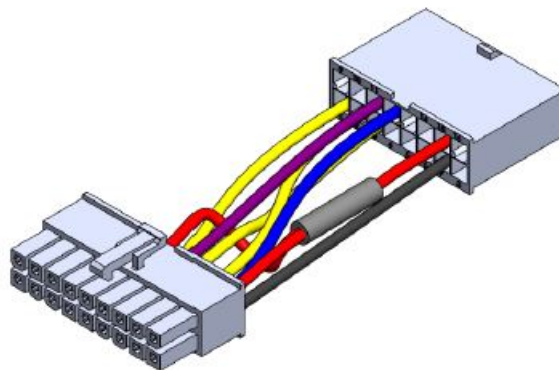
	Status
Cabinet Door	Closed
Lamp Fault	OK
Beacon Status	Central Override - ON

	Inputs
	■ Status - Override is Active
Beacon Control	<input checked="" type="radio"/> On <input type="radio"/> Off <input type="radio"/> Schedule

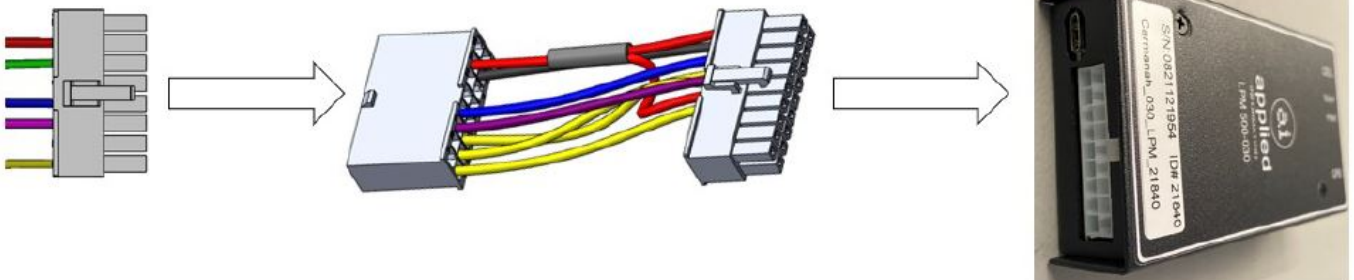
NOTE If testing indoors where there is no GPS signal, this may result in a device status of “No GPS Lock”.
NOTE R829 school zone application shown above.

Appendix A – AI-500-070C/AI-500-030 Low Power Devices

For systems that will contain the AI-500-070C/AI-500-030, Carmanah includes an adapter harness to go from the AI-500-070B harness to the AI-500-070C/AI-500-030 low-power device.



The supplied AI-500-070B (16-pin) harness will connect to the adapter harness (16-pin to 18-pin). The 18-pin end of the adapter harness then connects to the AI-500-070C/AI-500-030.

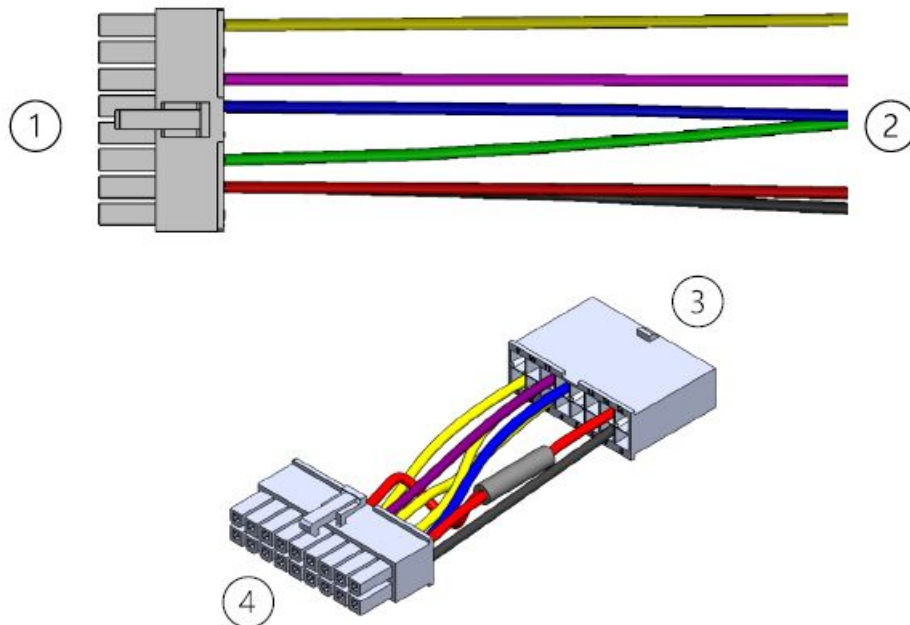


The following monitoring/control parameters will be available with this harness and adapter configuration in an E/F Series system:

- Solar panel voltage monitoring
- Battery voltage monitoring
- Beacon monitoring
- Beacon control and scheduling (AI-500-070C only)
- Knockdown monitoring

NOTE The beacon control wire (violet; PBS+ Wago connector) should be disconnected and capped off for systems using the AI-500-030.

Follow the instructions provided by Applied Information for installing the AI-500-070C/AI-500-030 or contact their email support at support@appinfoinc.com.



1. To adapter harness; #3
2. To E/F Series Energy Management System (EMS; see Section 4.1)
3. To AI-500-070B harness; #1
4. To AI-500-070C/AI-500-030 device


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Documents / Resources

 <p>carmanah® E/F Series AI Integration Kit For all E Series and F Series systems</p>	<p>carmanah E Series AI Integration Kit [pdf] Installation Guide AI-500-070B, AI-500-070C, AI-500-030, E Series, F Series, E Series AI Integration Kit, E Series, AI Integration Kit, Integration Kit</p>
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References

- [Applied Information | Smart City and Connected Infrastructure Expertise](#)
- [Systems for Traffic Beacons and Signs | Solar LED Beacons | Carmanah](#)
- [glance.appinfoinc.com](#)
- [Applied Information | Smart City and Connected Infrastructure Expertise](#)
- [glance.appinfoinc.com/](#)
- [Systems for Traffic Beacons and Signs | Solar LED Beacons | Carmanah](#)

Manuals+