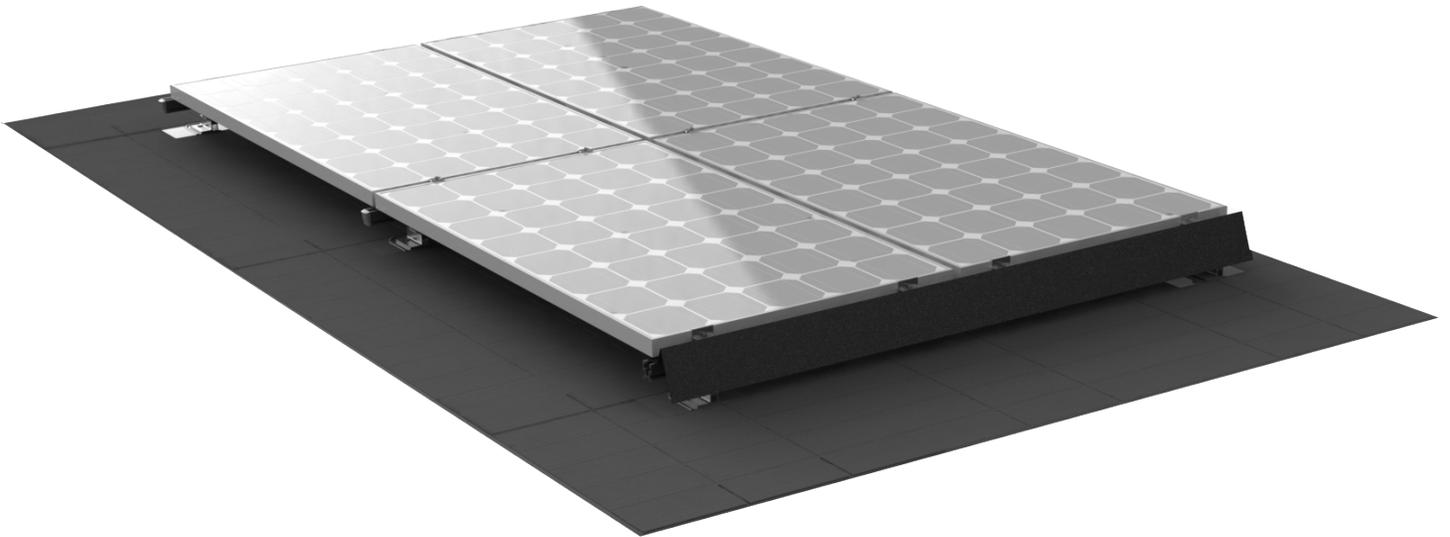


Mounting systems for solar technology



ASSEMBLY INSTRUCTIONS  
**RESIDENTIAL ROOF SOLUTIONS**  
**CROSSRAIL SHARED RAIL SYSTEM**



UL 2703 Listed System

USA

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## ENGINEERING STRENGTH IS AT OUR CORE

With sophisticated product innovations and a deep customer focus, Everest Solar is the engineering leader for all your mounting system needs. We are the US division of K2 Systems, one of Europe’s market leaders with more than 3.0 GW installed.

We offer proven product solutions and innovative designs. Wind tunnel testing along with advanced structural and electrical validation to facilitate permitting, design and installation. Our designs result in cost competitive racking systems with dedicated support that will position you to win more projects.

We partner with our customers and suppliers for the long-term. High quality materials and cutting edge designs provide a durable, yet functional system. Our product line is comprised of a few, coordinated components that lower the cost of materials, and simplify installation, saving you time and money. All backed by German engineering, a long track record of quality and a company that is here to stay.

Thank you for choosing Everest Solar Systems for your Solar PV Project.



# GENERAL SAFETY INSTRUCTIONS

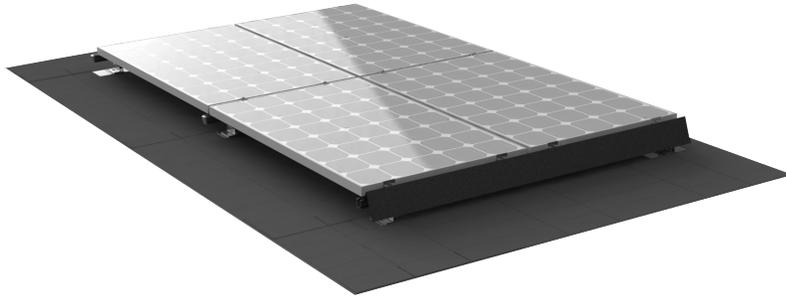
Everest Solar Systems' General Assembly Instructions must be followed to maintain the exclusive, limited product warranty. You can access these instructions at Everest's Technical Info Page:

**<http://www.everest-solarsystems.com/us/downloads/technical-information.html>** or by contacting us directly.

In general, the following applies:

- Systems should be installed by experienced contractors licensed and qualified to perform the work with professional workmanship and quality.
- Before installation, Contractor must verify that the system meets all applicable laws, regulations, ordinances, and codes. Contractor shall verify that the roof or other structures to which the system is being attached are capable of carrying the system loads. For information about the dead loads of the various system components, Contractor should review the Everest Technical information page at **<http://www.everest-solarsystems.com/us/downloads/technical-information.html>** or contact us directly.
- Contractor is solely responsible for work safety and accident prevention regulations and corresponding standards and regulations of the applicable occupational safety and health agency are followed, including:
  - Safety clothing is worn such as safety helmets, work shoes, and gloves.
  - Where required, the contractor should use fall protection, scaffolding with arrestor equipment and other approved methods for worker safety.
- Contractor shall verify that it is using the most current instructions by downloading the latest version from our website or contacting our office directly.
- Module manufacturer installation guides must be followed. Please use approved electrical bonding and grounding components that are required by the local or national codes and AHJ.
- A copy of these instructions must be on site, and read and understood by all workers during installation.
- In the event our general installation and assembly instructions are not followed, or that not all system components and assemblies are used according to these instructions, or that components are used which were not obtained from us, Everest Solar Systems is not liable for any resulting defects and damages, and the exclusive, limited warranty will be void.
- The exclusive, limited product warranty shall apply only if all instructions are strictly adhered to and the system is correctly installed. Everest Solar Systems disclaims any and all warranties, express or implied, including without limitation any warranties of merchantability and fitness for a particular purpose other than as set forth in the exclusive, limited warranty in the terms and conditions of sale, which can be viewed under on our website:  
**<http://www.everest-solarsystems.com/us/downloads/technical-information.html>**
- The dismantling of the system should be in reverse order of these assembly instructions.

# Mounting systems for solar technology



## Shared Rail for Pitched Roof:

- UL 2703 Listed for bonding and fire
- Fast, simple installation
  - No drilling, no bonding jumpers
  - Pre-assembled universal module clamps with integrated bonding
  - Robust bonding rail splices
  - Low part count
- Also compatible with tile roofs using commonly available roof hooks

## UL 2703 LISTED COMPONENTS

All components evaluated under UL 2703 and encompassed within Everest Solar System's UL 2703 Listing shown below  If you seek a UL Listed System, only the parts shown on this page are acceptable.



**CrossRail 48-S/48/80**  
 Material: aluminum  
 Finish: mill, dark anodized




**Burdny WEEB Lug 8.0 + Hardware<sup>4</sup>**  
 WEEB Lug 8.0 Material: tin plated copper  
 Hardware: stainless steel



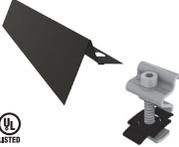

**Rail Connector Set<sup>1</sup>**  
 Material: aluminum  
 Finish: mill, dark anodized  
 Hardware: stainless steel




**L-Foot with Hardware<sup>2</sup>**  
 Material: aluminum  
 Finish: mill, dark anodized  
 Hardware: stainless steel




**Universal Bonding Mid Clamp Set<sup>1</sup>**  
 Material: stainless steel  
 Finish: silver, dark

**Optional: Array Skirt with Hardware**  
 Material: aluminum  
 Finish: dark anodized  
 Hardware: stainless steel




**Universal Bonding End Clamp Set<sup>1</sup>**  
 Material: stainless steel  
 Finish: silver, dark




**Optional: Micro Inverter and Optimizer Mounting Kit<sup>1,3</sup>**  
 Material: stainless steel



<sup>1</sup> Dark anodized rail must use Bonding T-Bolt and Bonding MK3 hardware.  
<sup>2</sup> Use standard L-foot with third-party roof attachments and EverFlash L-foot with EverFlash Comp Flashing.  
<sup>3</sup> The inverter hardware kit is not intended to replace the micro inverter ground and has only been evaluated to attach to the rail.  
<sup>4</sup> For certain jurisdictions, this item is regarded as a single-use item for a UL 2703 Listed System.

## NON-UL LISTED COMPONENTS

Components in this section were not evaluated by UL for bonding



### Universal Mid Clamp Set with AddOn

Material: stainless steel  
Finish: mill, black oxide



### Optional: End Cap for CrossRail 48-S/48/80

CrossRail 48 End Cap shown  
Material: glass fiber reinforced polyamide



### Universal End Clamp Set with AddOn

Material: stainless steel  
Finish: mill, black oxide



### Optional: External Omega Cable Clip

Material: polyamide, black



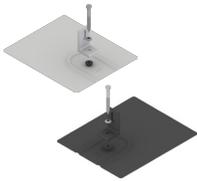
### Slide Bracket

Material: aluminum



### Optional: HEYClip SunRunner Cable Clip SS, S6404

Material: stainless steel



### EverFlash Comp Kit

Material: aluminum  
Finish: mill, dark anodized  
Hardware: stainless steel

## TOOLS AND TORQUE SPECIFICATIONS REQUIRED

Everest Solar Systems are designed to make installation easy and fast. The basic tools required to assemble the parts are listed below as a guide.

### TOOLS REQUIRED

- Torque wrench (0 – 50 ft-lb)
- Cordless Drill (non-impact)
- 13mm Deep Socket
- 15mm Deep Socket
- 6mm Allen Drive (for M8 Allen Bolt)
- 1/2" Socket (for lag bolt)
- Measuring Tape
- String Line

### TORQUE SPECIFICATIONS

- M10 T-Bolts: 25.8 ft-lb (35 Nm)
- M8 T-Bolts: 10 ft-lb (13.5 Nm)
- M8 Allen Bolts: 10.3 ft-lb (14 Nm)

Tools and materials for the installation of third party items such as roof attachment products, roof covering and sealing products or items used for bonding and grounding are not listed here. Please refer to the instructions of those third party products.

## BONDING AND GROUNDING:

Appropriate means of bonding and grounding are required by regulation. The information provided in this manual shall always be verified with local and national building codes.

Everest Solar Systems has obtained a UL 2703 system listing from Underwriter's Laboratories (UL).

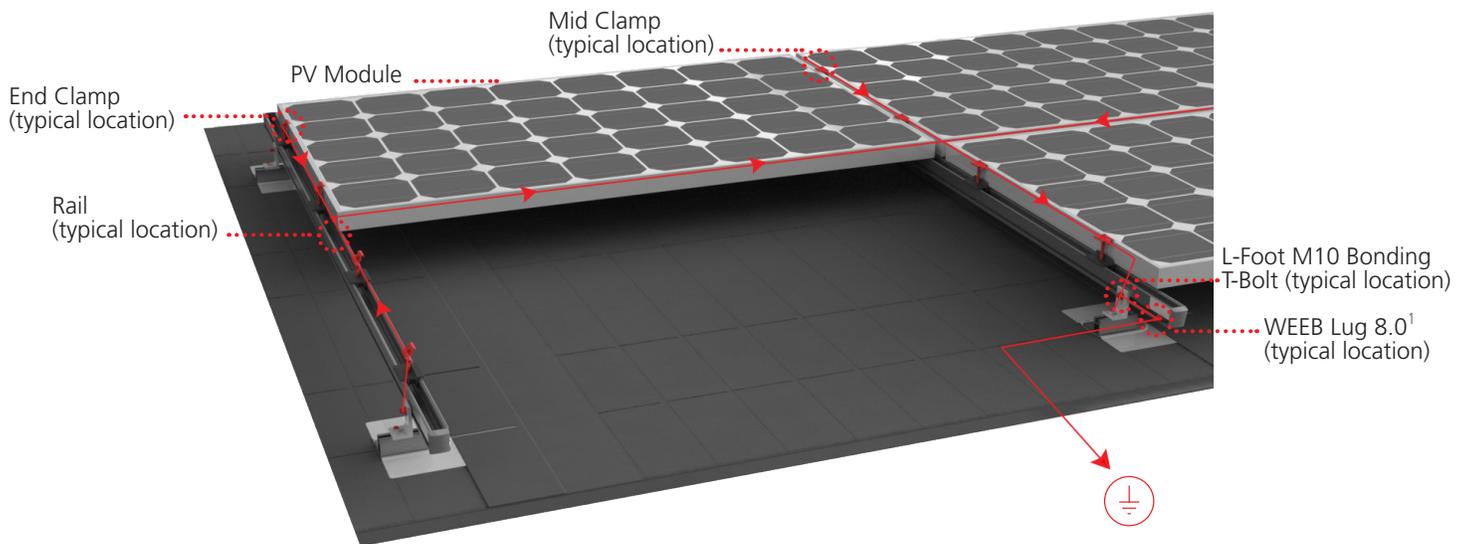
A sample bonding path diagram is shown in Figure 1 below. Your specific installation may vary, based upon site conditions and your AHJ's requirements.

Each electrical connection has been evaluated to a maximum fuse rating of 30A. At least one ground lug must be used to ground all strings within each sub-array, although additional may be used for redundancy. When installed per these installation instructions, all connections meet the requirements of NEC 690.43.

Everest CrossRail system was tested with the SolarWorld, Sunmodule family of modules.

- PlusSW200-300Mono (including black)
- PlusSW200-280Poly (including black)

This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.



**Figure 1:** Bonding connections shown in red. For certain jurisdictions, bonding and grounding connections are identified at typical locations.

<sup>1</sup>Only required at one location per connected array.

**Note:** Bonding and grounding has only been evaluated using clamp sets without AddOn.

## CROSSRAIL FIRE RATING:

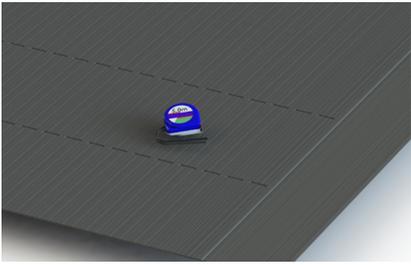
The CrossRail 48-S/48 system has undergone fire performance testing in accordance with UL 2703, Fire Performance.

A System Class A fire rating is achieved when using CrossRail 48-S/48 under the following conditions:

- Roof slope of 2/12 inch rise per linear foot or greater.
- Used in combination with a UL 1703 Listed module with a fire performance rating of Type 1, Type 2, or Type 3. Consult the module manufacturer for specific fire performance rating information.
- CrossRail may be mounted using any stand-off height to maintain the Class A fire rating. Always consult the module manufacturer's installation instructions to ensure your installation is in compliance with their UL 1703 Listing.
- The results of the racking system do not improve a roof covering Class rating.

All documentation can be found on UL's Online Database as well as Everest Solar Systems' website.

## ASSEMBLY: STEP BY STEP



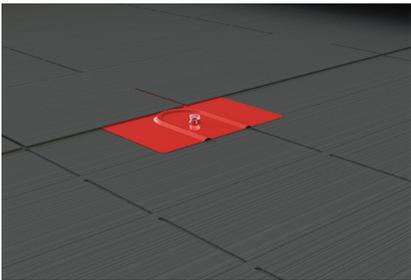
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### PREPARE ROOF FOR EVERFLASH COMP SHINGLE FLASHING INSERT

Locate the rafters and snap horizontal and vertical lines to mark the installation position for each EverFlash flashing. Drill a pilot hole (1/4" diameter) for the lag bolt. Backfill with appropriate sealant. Always consult a professional roofer to ensure integrity is maintained.

**Important:** The roof must be measured accurately for installation. If the front mounts are not aligned the system may not install properly.

Materials required: Tape measure, string line, drill



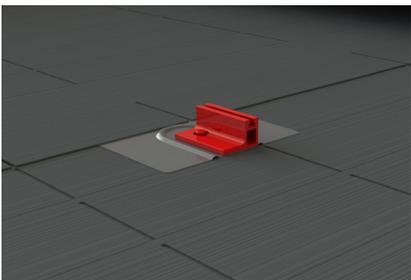
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### INSERT FLASHING

Use a water repellent flashing to protect against water infiltration. Consult a qualified roofing professional and the manufacturer's flashing installation instructions.

**Important:** The flashing must not overhang the butt end of the shingle.

**Note:** Various roof coverings, such as curved tile roofs, may require alternative flashings or mounting hardware.



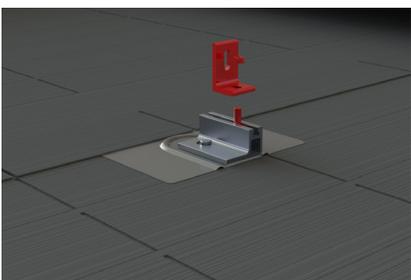
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### RECOMMENDED: INSTALL SLIDE ADJUSTER BRACKET

We recommend the use of a slide-adjustable roof mount to allow for easy alignment of the rail during installation of the modules.

Line slide adjuster bracket mount pilot hole with flashing hole. Insert lag bolt through slide adjuster bracket, flashing hole and into a rafter. Refer to slide adjuster bracket manufacturer for installation instructions and specifications.

Materials required: Bolt, flashing, slide adjuster bracket and hardware, torque wrench with socket



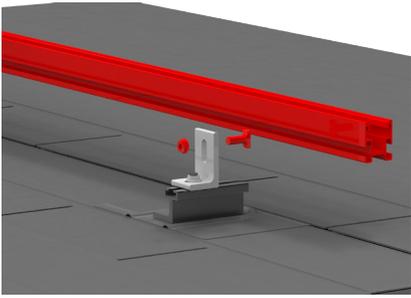
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### PLACE L-FOOT

Insert the T-bolt through the L-foot slot and into the top channel of the slide adjuster bracket. Turn the T-bolt clockwise ensuring that the mark at the end of the shaft is vertical, indicating proper alignment.

Attach the M10 serrated hex nut and tighten enough that the L-foot is snug, but can still slide along the bracket.

Materials required: L-foot, M10 T-Bolt (use bonding T-bolt with dark rail), M10 serrated hex nut



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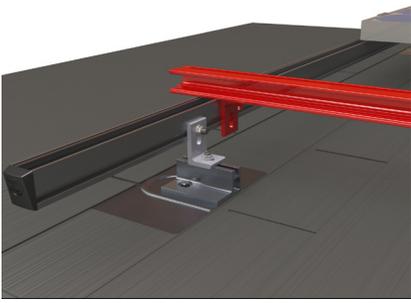
## INSTALL CROSSRAIL

Make sure that the top of the CrossRail is located above the top of the L-foot. Double check that the alignment marking on the end of the T-bolt shaft is vertical, to ensure it is properly engaged.

Due to thermal expansion, we recommend placing a gap of 1.25" - 2.00" (3 - 5 cm) every 65 ft (20 m) between rails. Maximum allowable spacing between thermal expansion gaps shall not exceed 80 ft (24.4 m).

**Note:** Typically, rail cantilevers may not exceed 1/3 of the maximum allowable span. Refer to the engineering letters on Everest's website ([www.everest-solarsystems.com](http://www.everest-solarsystems.com)) for more detail on maximum spans and cantilevers.

Materials required: CrossRail, M10 T-bolt (use bonding T-bolt with dark rail), M10 serrated hex nut



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## USE A JIG TO PROPERLY ALIGN CROSSRAIL

**Step 1.** To create a jig use a piece of a CrossRail and securely attach two L-feet facing apart so that the flat section of the L-foot will butt against the CrossRail rail being aligned. Measure your module in the direction it will be laying (portrait/ landscape). Use this measurement to space L-feet, however reduce size by 1/4 inch from each L-foot to account for rail width and to achieve proper module contact on AddOn.

**Step 2.** Run jig along CrossRail to ensure all rail is set at proper distance.

**Step 3.** At each mount location, ensure proper rail spacing with the jig. Tighten the L-foot T-bolt at the mount to 25.8 ft.-lbs. (35 Nm) and move on to the next mount.

## RAIL CONNECTOR INSTALLATION

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### ALIGN RAILS

Align the two rail ends next to each other.



8

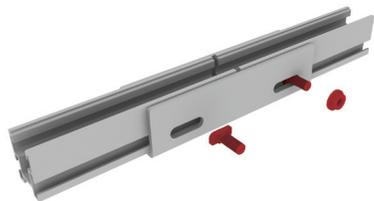
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### SLIDE RAIL CONNECTOR

Slide the rail connector from below the rails, centering the connector between the two rail ends. Ensure the rail connector does not interfere with an L-foot or roof attachment.

**Note:** The rail connector for CrossRail 48-S contains mating features, thus must be inserted prior to aligning rails together (step 7 above).





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## CONNECT RAILS

Attach the rail connector using two M10 T-bolts (use bonding T-bolts with dark rail) and hex nuts per side (4 total). Ensure that the slot on the bottom of the T-bolt is vertical, indicating that the T-bolt head is properly engaged in the rail channel.

Torque M10 serrated hex nuts to 25.8 ft-lb (35 Nm).



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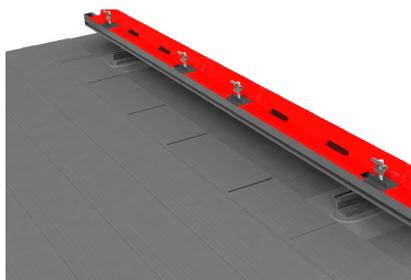
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## OPTIONAL: ATTACH MICRO INVERTERS OR POWER OPTIMIZERS

Using the Micro Inverter Mounting Kit Hardware from Everest Solar Systems, attach your chosen device to the top channel of CrossRail. Torque M8 Allen Bolt to 10.3 ft-lb (14 Nm).

**Note:** For certain jurisdictions, if clamp tension is released, the clamps need to be relocated on panel to ensure bonding path.

Materials required: Micro Inverter Mounting Kit includes: M8x20mm Allen Bolt, M8 lock washer, M8 flat washer, MK3



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## OPTIONAL: INSTALL ARRAY SKIRT

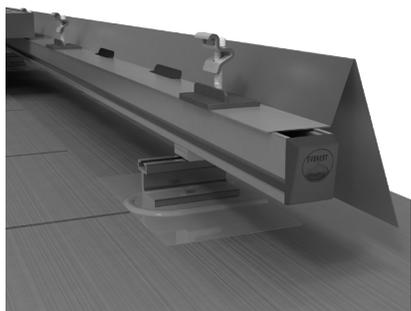
Using the Array Hardware Kit from Everest Solar Systems, attach the Array Skirt to the top channel of CrossRail. Torque M8 Allen bolt to 10.3 ft-lb (14Nm).

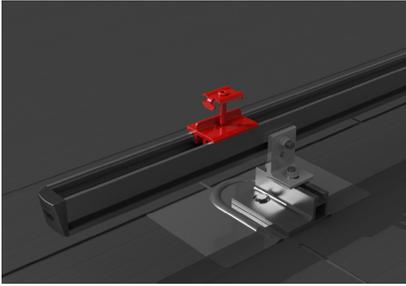
**Step 1:** Place array skirt into channel insuring tabs lock into the channel.

**Step 2:** Place clamps and orient the AddOn ridge to face the module. This will give the module a firm resting location.

**Recommendation:** Use chalk to mark where modules ends will lay on roof to ensure proper placement and module alignment.

Materials required: Array Hardware kit, Array Skirt, End Clamp Set with AddOn





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### INSERT ADDONS AND CLAMPS INTO CROSSRAIL

Insert AddOns and Clamps (Mid and End) into rail at approximate module mounting locations. To place Clamps, insert the MK3 slot nut of the pre-assembled end clamps into the top channel on CrossRail. While slightly lifting the plastic tabs, rotate 90 degrees clockwise to engage the MK3 into the channel.

**Recommendation:** Use chalk to mark roof at approximate module resting locations.

Materials required: Mid Clamp Set with AddOn, End Clamp Set with AddOn



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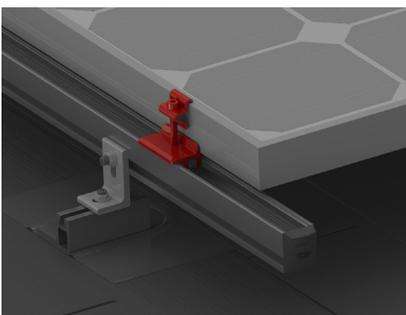
### SET MODULES INTO PLACE

For modules with frame thickness greater than 35mm, use lip on the AddOn to rest modules prior to clamping.

**Recommendation:** Start at bottom module row and work up.

Lay the modules in a row down one at a time. Safely connect properly managed wired to the modules before setting them down.

**Note:** For modules under 35 mm module thickness, reserve AddOn retaining ledge orientation.



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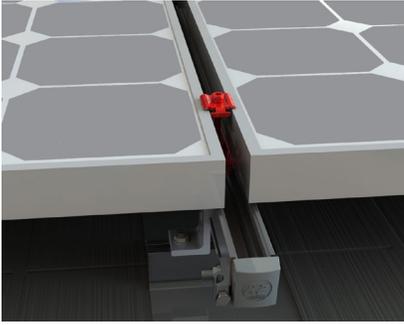
### TIGHTEN END CLAMPS

Tighten the end clamps and AddOns to the module at the specified locations per the PV module manufacturer's installation instructions. Torque the M8 bolt to 10.3 ft-lb. Ensure the clamp sits flush against the frame of the PV module, the M8. Never mount end clamps directly over a rail connector or at the end of the rail. Ensure a minimum gap of 1 inch (25 mm) exists from the end of the rail to the clamp.

**Important:** Verify module manufacturers recommended torque specification to ensure clamps are compatible.

**Note:** For certain jurisdictions, if clamp tension is released, the clamps need to be relocated on panel to ensure bonding path.

Materials required: End Clamp Set with AddOn



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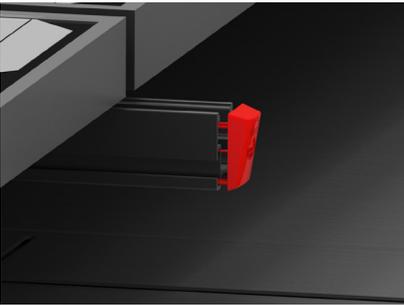
## TIGHTEN MID CLAMPS

Tighten the mid clamps and AddOns to the module at the specified locations per the PV module manufacturer's installation instructions. Torque the M8 bolt to 10.3 ft-lb. Ensure the modules are flush against the clamp and torque.

**Important:** Verify module manufacturers recommended torque specification to ensure clamps are compatible.

**Note:** For certain jurisdictions, if clamp tension is released, the clamps need to be relocated on panel to ensure bonding path.

Materials required: Mid Clamp Set with AddOn



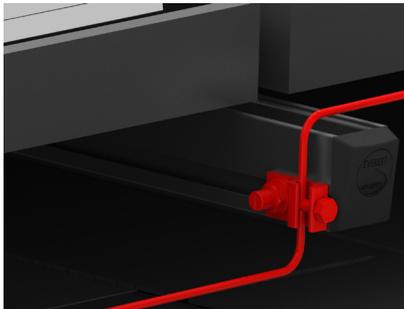
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## OPTIONAL: ATTACH END CAPS

Push the pins of the appropriate end cap into end of the rail.

CrossRail 48 End Cap shown.

Materials required: End Cap



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## SYSTEM GROUNDING

CrossRail components are required to be electrically bonded and grounded via Burndy's WEEB Lug 8.0 Assembly (Burndy P/N 781810537572) and the use of either #6 or #8 AWG solid copper wire. A minimum of one WEEB Lug 8.0 is needed to ground each sub array. The lug must be attached to the side channel of CrossRail, as shown. To attach the WEEB Lug 8.0, insert the M8 T-Bolt into the side slot on CrossRail and rotate clockwise 90 degrees. Attach the remaining components, as shown, tightening the M8 serrated hex nut to 10 ft-lb (13.5 N-m).

Once the lug has been installed, a #6 or #8 AWG solid copper wire from a DC ground location external to the array must be inserted in the equipment ground conductor location on the lug. Torque the bolt to 5 ft-lb (6.7 N-m).

Materials required: WEEB Lug 8.0 Assembly.

**Note:** Verify with your local jurisdiction that the WEEB Lug 8.0 is considered a single-use item in a UL 2703 Listed System.

**Warning:** Employ best industry practices to ensure that copper does not contact aluminum and galvanized steel.

# Mounting systems for solar technology



Ready!

## THANK YOU FOR CHOOSING AN EVEREST SOLAR SYSTEMS MOUNTING SYSTEM.

Systems from Everest Solar Systems are fast and simple to install. Please contact us if you have any questions or suggestions for improvements. We are looking forward to receive your call on our

**Service-Hotline +1 760.301.5300**

## TERMS AND CONDITIONS

Product images are for illustrative purposes only. Specifications are subject to change without notice. All sales of our products shall be subject to Everest Solar Systems terms and conditions, including the exclusive limited warranty set forth therein. The terms and conditions can be found at <http://www.everest-solarsystems.com/us/downloads/technical-information.html>

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K2 Systems SRL, Italy  
K2 Solar Mounting Solutions Ltd., UK

**CrossRail Shared Rail Assembly Instructions US7-0616**  
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