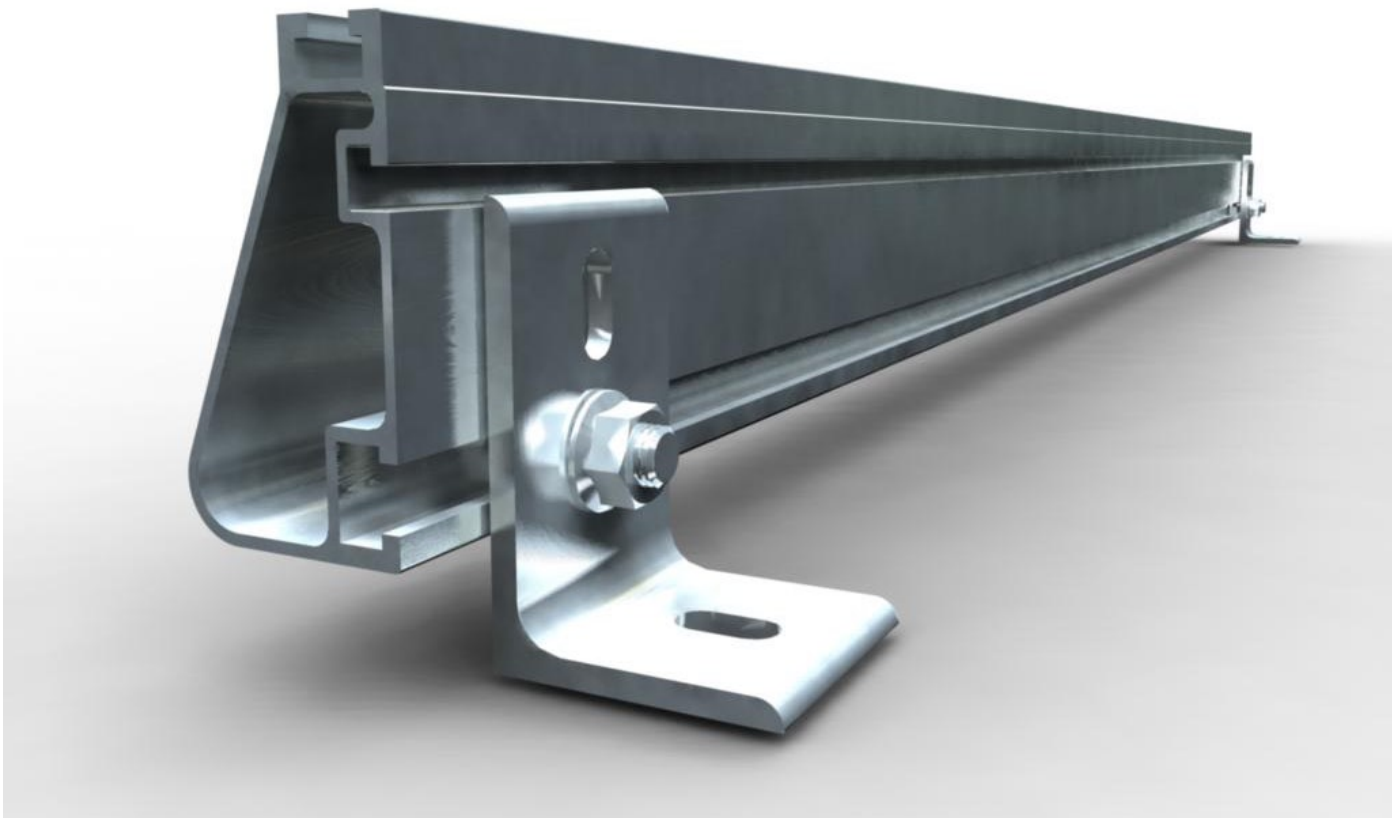




Installation Manual

XRS Solar Rail System



 **IRONRIDGE**
Solar Mounting Solutions

Introduction

The XRS Solar Rail System is a flexible and straightforward roof mounting solution for a wide variety of solar photovoltaic (PV) needs. Due to its modular design, it can easily handle a wide variety of panel sizes and quantities.

1. Installer Responsibility

The installer is solely responsible for:

- ◆ Complying with all applicable local or national building codes, including any that may supersede this manual;
- ◆ Ensuring that IronRidge and other products are appropriate for the particular installation and the installation environment;
- ◆ Ensuring that all structural support members, including the roof, its rafters, and connections, can support the array under all code level loading conditions;
- ◆ Using only IronRidge parts and installer-supplied parts as specified by IronRidge. Substitution parts may void the warranty;
- ◆ Ensuring that anchoring devices including lag screws have adequate pullout strength and shear capacities as installed;
- ◆ Maintaining the waterproof integrity of the structural support or roof, including selection of appropriate flashing;
- ◆ Ensuring safe installation of all electrical aspects of the PV array; and
- ◆ Ensuring correct and appropriate design parameters are used in determining the design loading used for the specific installation. Parameters, such as snow loading, wind speed, exposure and topographic factor should be confirmed with the local building official or a licensed professional engineer.

2. Customer Support

IronRidge makes every effort to ensure your mounting kit is easy to install. If you need assistance at any point with your installation or have suggestions on how we can improve your experience, call IronRidge customer support: (707) 459-9523

3. Tools Required For Assembly

The following tools are required to assemble the XRS Solar Rail System:

| Tool | Use for |
|---|--|
| Wrenches Open-end wrench, Box-end wrench, or socket drive with sockets to support the following size hex heads: <ul style="list-style-type: none"> ◆ 3/8" ◆ 1/4" | <ul style="list-style-type: none"> ◆ 1/4 cap-end screws, 1/4 bolts ◆ 3/8 cap-end screws, 3/8 bolts |

4. Torque Values For Dry Bolts

Use the following torque values in this assembly.

| Bolt Size | Required Torque Value |
|------------------|-------------------------------------|
| ◆ 1/4-20 | 84 in-lbs (unless otherwise noted). |
| ◆ 5/16-18 | 144 in-lbs. |
| ◆ 3/8-16 | 180 in-lbs. |

5. Component List

The XRS Solar Rail System kit contains the following parts:

Note: The component list indicated here is for reference only. The actual component quantities will vary according to the quantity and make of modules that the mount is configured for. Please check the packing list that ships with every mount for a confirmation of the items that are intended to ship with the specific product on your order.

| | |
|---|---|
| <p>Foot (51-7000-001) Attaches to the roof and is the anchor point for the rest of the panel assembly</p>  | <p>Internal Splice (51-7000-010) Ties the extrusion rails together, extending their length.</p>  |
| <p>Extruded Rail (51-7000-XXX) Attaches to the foot via the foot clamp and provides support for the PV modules</p>  | <p>End Clamp (51-6000-XXX) Clamps the outside ends of the PV modules to the rails</p>  |
| <p>Center Clamp (51-6000-005) Clamps the inside edges of the PV modules to the rails</p>  | |

Component List continued...

| Part | Qty | Part Number | Comments |
|---|------------|---|--|
| Internal Splice | 1 | 29-7000-010 | Used to join XRS rails together: 1 splice is used to splice two rails. |
| 10-16 x 1/2", self-drilling, self tapping screw, SS | 8 | 48-1016-500 | |
| L-Foot Kit | 1 | 29-7000-017 | Used to attach L-foot to XRS 1 kit per 4 L-feet. |
| L-Foot | 4 | 51-7000-001 | |
| 3/8-16-1" hex cap bolt, SS | 4 | 23-3716-100 | |
| 3/8-16, flange nut, SS | 4 | 25-2501-016 | |
| Center Clamp Kit | 1 | 29-7000-XXX | Used between PV panels to secure to XRS rail 1 kit will cover 2 PV panels within a row. Part number changes depending on panel required. |
| Center Clamp | 4 | 51-6000-005 | |
| 1/4-20 x 2.00" hex cap bolt, SS, or 1/4-20 x 2.50" hex cap bolt, SS, or 1/4-20 x 2.75" hex cap bolt, SS | 4 | 23-2520-200, 23-2520-250, 23-2520-275 | Length of bolt depends on the thickness of the PV panel. |
| 1/4-20 flange nut, SS | 4 | 25-2501-014 | |
| End Clamp Kit | 1 | 29-7000-XXX | Used on the first and last PV panel in a row 1 kit will cover the first and last PV panels in a row. Part number changes depending on panel used. Example part numbers shown. |
| End Clamp | 4 | 51-6000-XXX | |
| 1/4-20 x 1" SS hex-cap bolt, SS | 4 | 23-2520-100 | |
| 1/4-20 flange nut, SS | 4 | 25-2501-014 | |
| XRS Spares Kit | 1 | 29-7000-001 | |

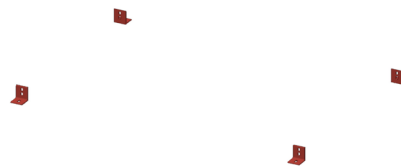
6. Assembly

Step 1 - mounting the feet and the first piece of rail

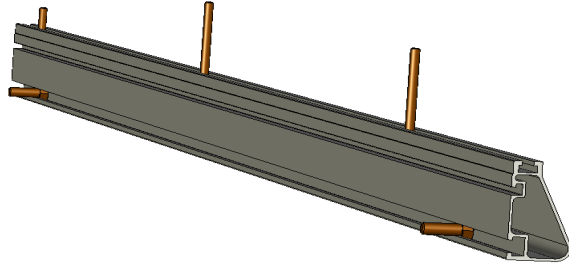
| Parts required for this step | Qty | Part Number |
|---|-----|---|
| Extruded Rail | 4 | 51-7000-XXX |
| L-Foot Assembly Kit | 1 | 29-7000-017 |
| Foot | 4 | 51-7000-001 |
| 3/8-16 x 1", hex cap bolt, SS | 4 | 23-3716-100 |
| 3/8-16, flange nut, SS | 4 | 25-2501-016 |
| Center Clamp Kit | 1 | 29-7000-XXX |
| 1/4-20 x 2.00" hex cap bolt, SS, or 1/4-20 x 2.50" hex cap bolt, SS, or 1/4-20 x 2.75" hex cap bolt, SS | 4 | 23-2520-200, 23-2520-225, 23-2520-250, 23-2520-275 |
| End Clamp Kit | 1 | 29-7000-XXX |
| 1/4-20 x 1" SS hex-cap bolt, SS | 4 | 23-2520-100 |

1. Mount all of the feet to the roof in the desired locations.

Note: Determine the maximum distance between feet according to engineering specifications.

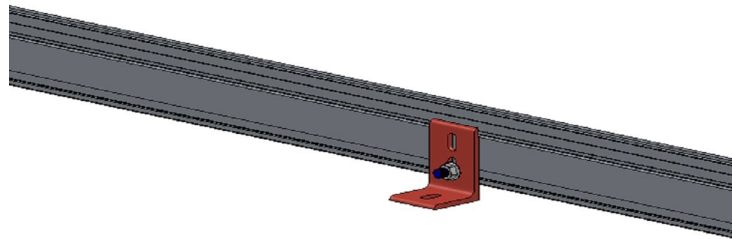


2. On the first piece of rail, slide 3/8-16" bolts into the side facing t-slot on the rail. Space the bolts out to match the foot spacing.
3. On this same piece of rail, slide 1/4-20" bolts into the top facing t-slot on the rail. Space the bolts out to match the panel spacing.



4. Attach this first piece of rail to the feet mounted on the roof. Mount the rail to each foot with a flange nut and hex bolt. Hand tighten the nuts and check the level of the rail.

Tighten 3/8-16 hardware to 180 in-lbs.

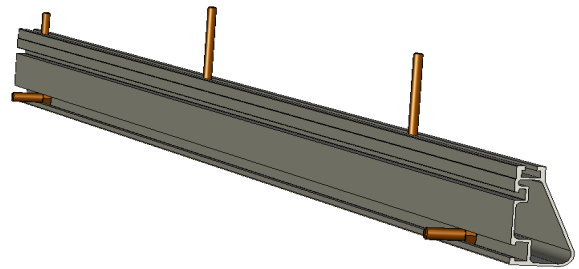


Step 2 - mounting the next pieces of rail

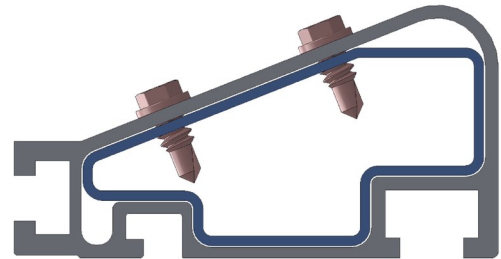
| Parts required for this step | Qty | Part Number |
|---|-----|---|
| Extruded Rail | 4 | 51-7000-XXX |
| L-Foot Assembly Kit | 1 | 29-7000-017 |
| Foot | 4 | 51-7000-001 |
| 3/8-16 x 1", hex cap bolt, SS | 4 | 23-3716-100 |
| 3/8-16, flange nut, SS | 4 | 25-2501-016 |
| Center Clamp Kit | 1 | 29-7000-XXX |
| 1/4-20 x 2.00" hex cap bolt, SS, or 1/4-20 x 2.50" hex cap bolt, SS, or 1/4-20 x 2.75" hex cap bolt, SS | 4 | 23-2520-200, 23-2520-250, 23-2520-275 |
| End Clamp Kit | 1 | 29-7000-XXX |

| Parts required for this step | Qty | Part Number |
|--|-----|-------------|
| 1/4-20 x 1" SS hex-cap bolt, SS | 4 | 23-2520-100 |
| Internal Splice | 1 | 29-7000-010 |
| 110-16 x 1/2", self-drilling, self tapping screw, SS | 8 | 48-1016-500 |

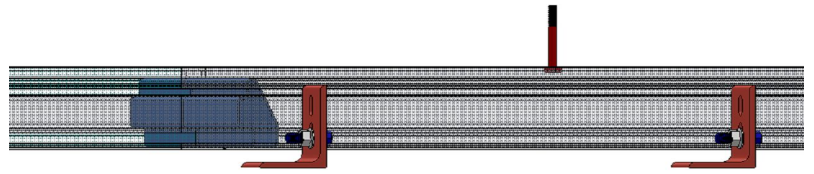
1. On the next piece of rail, slide 3/8-16" bolts into the side facing t-slot on the rail. Space the bolts out to match the foot spacing.
2. On this same piece of rail, slide 1/4-20" bolts into the top facing t-slot on the rail. Space the bolts out to match the panel spacing.



3. Lay the rail on its side, with the slotted side down as shown.
4. Slide the internal splice half way into the internal cavity in the rail. It should extend approximately 6 inches into the cavity.
5. Using two of the self-drilling, self-tapping screws, secure the internal splice into the rail utilizing the screw pattern shown at right.



6. Loosely mount this piece of rail onto its footings.
7. By moving this second rail along its footings, the internal splice should slip into the cavity on the first rail, with the rails butting tightly and evenly together.



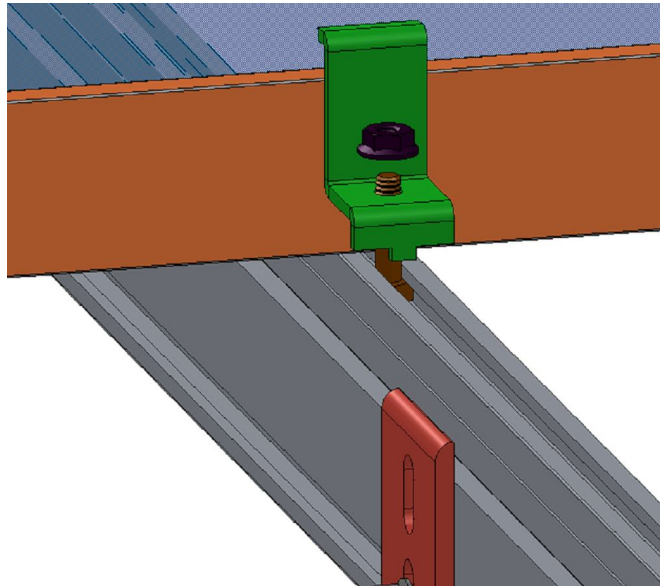
8. Maintain rail alignment while following the next steps.
9. You should mark off approximately 6 inches from the end of the first rail (where the internal splice should end). Drive two self tapping screws through the first rail in utilizing the pattern shown at right within the area you marked off.
10. Repeat this procedure for the remaining rails.



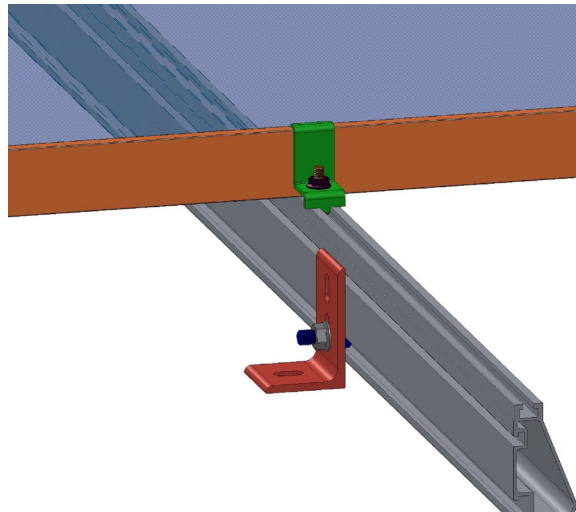
Step 3 - clamping the panels to the rails

| Parts required for this step | Qty | Part Number |
|------------------------------|-----|-------------|
| Center Clamp Kit | 1 | 29-7000-XXX |
| 1/4-20 flange nut, SS | 4 | 25-2501-014 |
| End Clamp Kit | 1 | 29-7000-XXX |
| 1/4 flange nut, SS | 4 | 25-2501-014 |

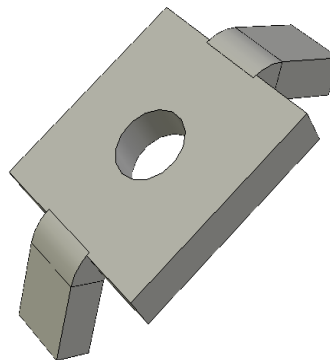
1. Lay the first PV module in position on the rails.
2. Then slip the end clamp over the bolt, making sure it is firmly hooked over the side of the module.



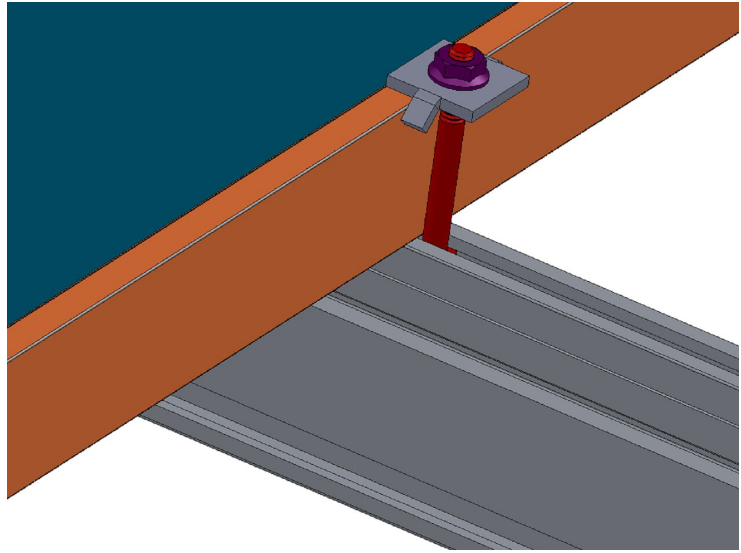
3. Complete the clamp assembly with a flange nut as shown.
Tighten to 60-65 in-lbs.
4. Repeat with the other clamp.



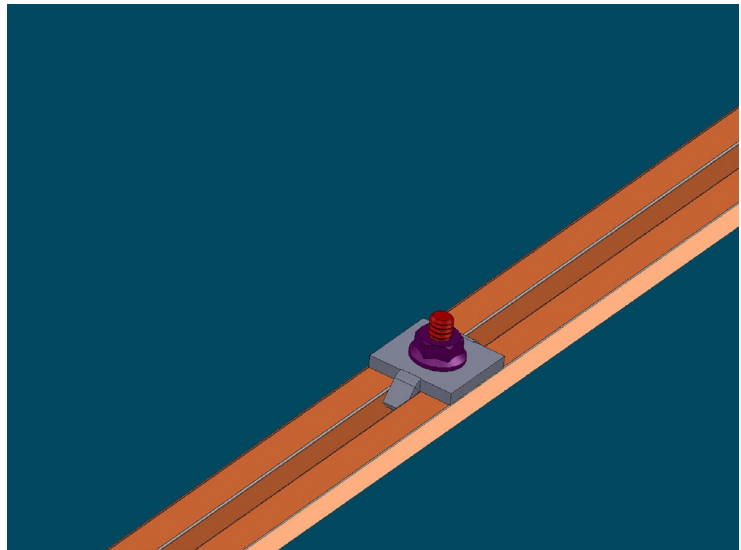
5. Working from the opposite side of the PV module. Assemble the center clamps by putting a clamp on the bolt, followed by the flange nut.



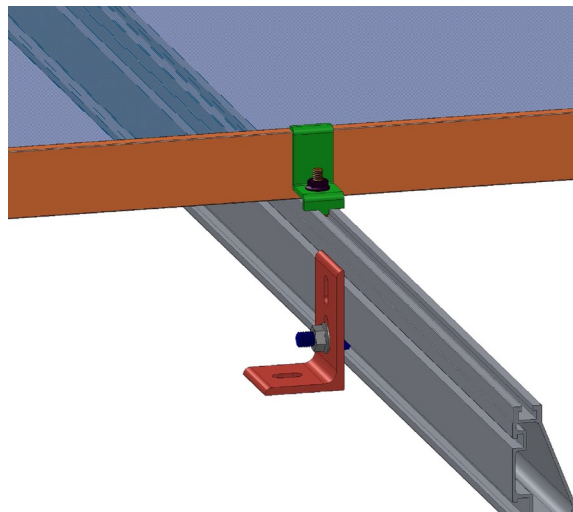
6. Place the second PV Module into position on the rails, sliding it against the first so the center clamps are in contact with the edges of both panels.



7. Tighten to 84 in-lbs.



8. Repeat the procedure using center clamps to secure each successive module.
9. Secure the last module at the end of the rails using the other set of end clamps.



IronRidge 10-Year Warranty

Terms and Conditions

IronRidge warrants each Mounting Structure to be free from defects in materials and workmanship for ten (10) years from the date of first purchase (“Warranty Period”), when installed properly and used for the purpose for which it is designed, except for the finish, which shall be free from visible peeling, or cracking or chalking under normal atmospheric conditions for a period of three (3) years, from the earlier of 1) the date the installation of the Product is completed, or 2) 30 days after the purchase of the Product by the original Purchaser (“Finish Warranty”). The Finish Warranty does not apply to any foreign residue deposited on the finish. All installations in corrosive atmospheric conditions are excluded. The Finish Warranty is VOID if the practices specified by AAMA 609 & 610-02 – “Cleaning and Maintenance for Architecturally Finished Aluminum” (www.aamanet.org) are not followed by Purchaser for IronRidge’s aluminum based products.

The warranty covers the replacement cost of parts to repair the product to proper working condition. Transportation and incidental costs associated with warranty items are not reimbursable. The warranty does not cover normal wear, or damage resulting from misuse, abuse, improper installation, negligence, or accident. The warranty does not cover any defect that has not been reported in writing to IronRidge within ten (10) days after discovery of such defect. Furthermore, it does not cover units that have been altered, modified or repaired without written authorization from the manufacturer or its authorized representative, or units used in a manner or for a purpose other than that specified by the manufacturer. IronRidge’s entire liability and Purchaser exclusive remedy, whether in contract, tort or otherwise, for any claim related to or arising out of breach of the warranty covering the Mounting Structures shall be correction of defects by repair, replacement, or credit, at IronRidge’s discretion. Refurbished Mounting Structures may be used to repair or replace the Mounting Structures.

IronRidge shall have no liability for any injuries or damages to persons or property resulting from any cause, whatsoever, or any claims or demands brought against IronRidge by Purchaser, any employee of Purchaser, client of Purchaser, end-user of the Product or other party, even if IronRidge has been advised of the possibility of such claims or demands (collectively, “Third Party Claims”). This limitation applies to all materials provided by IronRidge during and after the Warranty Period.