ROCK-IT SYSTEM™

RAIL FREE SOLAR ROOF MOUNT

UTILIZES ECOFASTEN SOLAR'S PATENTED TECHNOLOGY

ETL LISTED US

Intertek

EcoFasten Solar®

4/6/2016

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ROCK-IT SYSTEM

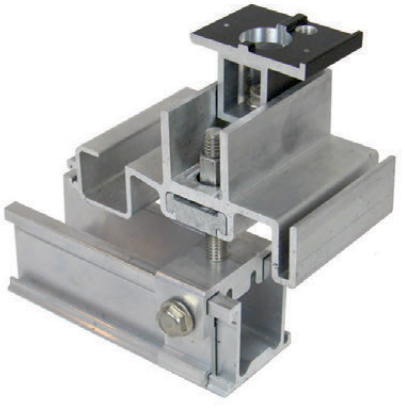
Designed with the installer in mind.

EcoFasten Solar specializes in solar roof attachments that are the easiest to install, most secure and cost-effective solutions for installers. EcoFasten offers a wide variety of standard products as well as custom solutions, for a one-stop source for all of your rooftop anchoring needs. Products are rigorously tested and approved above and beyond industry standards in-house and by third party agencies. EcoFasten's patented conical sealing system has been in service in the snow guard and solar industry for two decades.

Features

- Fastest, easiest to level system on the market
- ETL listed to UL SUB 2703
- Class A Fire rating with Type 1 modules
- Integrated electrical bonding
- SIMPLE- only 3 components
- Fixed wire management tray
- North-South adjustability of up to 4"
- Only one tool required (1/2" deep well socket)
- Vertical adjustment of 3"-4"

System Components



ROCK-IT MOUNT

ROCK-IT COUPLING

ARRAY SKIRT

EcoFasten Solar®

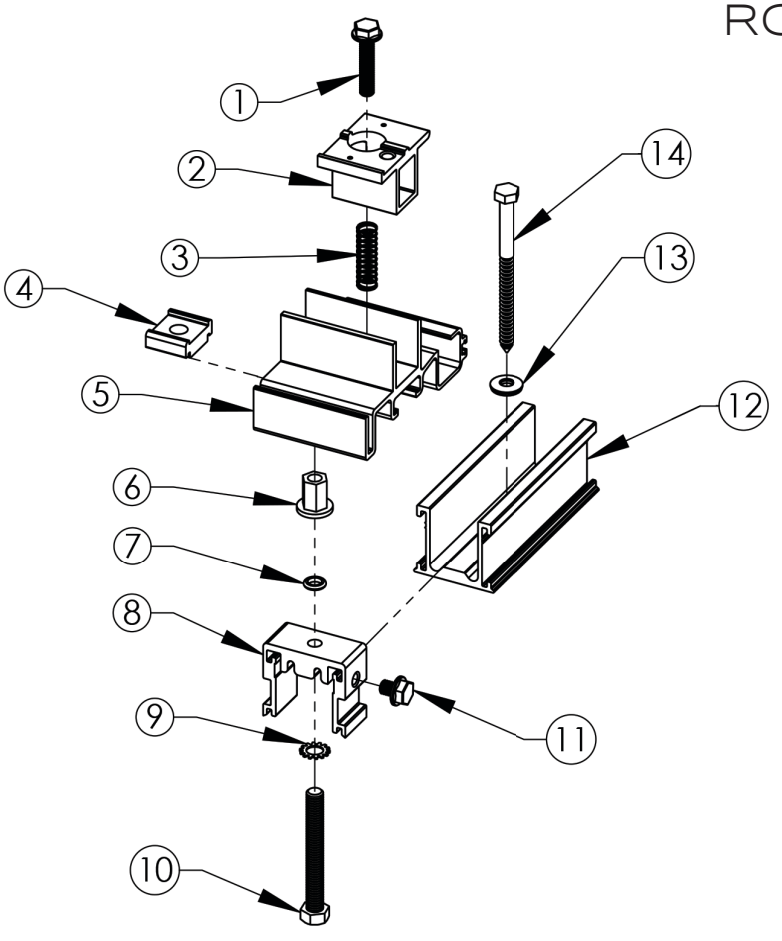
EcoFasten Solar products are protected by the following U.S. Patents:

8,151,522 B2 8,153,700 B2 8,181,398 B2
8,166,713 B2 8,146,299 B2 8,209,914 B2
8,245,454 B2 8,272,174 B2 8,225,557 B2

ROCK-IT SYSTEM Approved Modules

Module Manufacturer	Model Type (X used to indicate variable test)	Module Dimensions (mm)	Module Dimensions (in)	Surface Area (sqft)
Trina Solar	TSM-XXX-PX05.08	1640 x 992 x 40	64.57 x 39.06 x 1.57	17.64
Canadian Solar	CS6P-XXXM	1638 x 982 x40	64.50 x 38.70 x 1.57	17.33
Canadian Solar	CS6P-XXXP	1638 x 982 x 40	64.50 x 38.70 x 1.57	17.33
Jinko Solar	JKMXXXP-60	1650 x 992 x 40	65.00 x 39.05 x 1.57	17.64
Jinko Solar	JKMXXXM-60	1650 x 992 x 40	65.00 x 39.05 x 1.57	17.64
Jinko Solar	JKMXXXPP-60	1650 x 992 x 45	65.00 x 39.05 x 1.77	17.64
Jinko Solar	JKMXXXMM-60	1650 x 992 x 45	65.00 x 39.05 x 1.77	17.64
Yingli Solar	YL2XXP-29b	1650 x 990 x 40	65.00 x 38.98 x 1.57	17.49
LG Electronics	LG300N1C-B3	1640 x 1000 x 35	64.57 x 39.37 x 1.38	17.62
LG Electronics	LG300N1K-G4	1640 x 1000 x 40	64.57 x 39.37 x 1.57	17.62
Axitec Solar	AC-XXXM/156-60S	1640 x 992 x 40	64.57 x 39.06 x 1.57	17.58

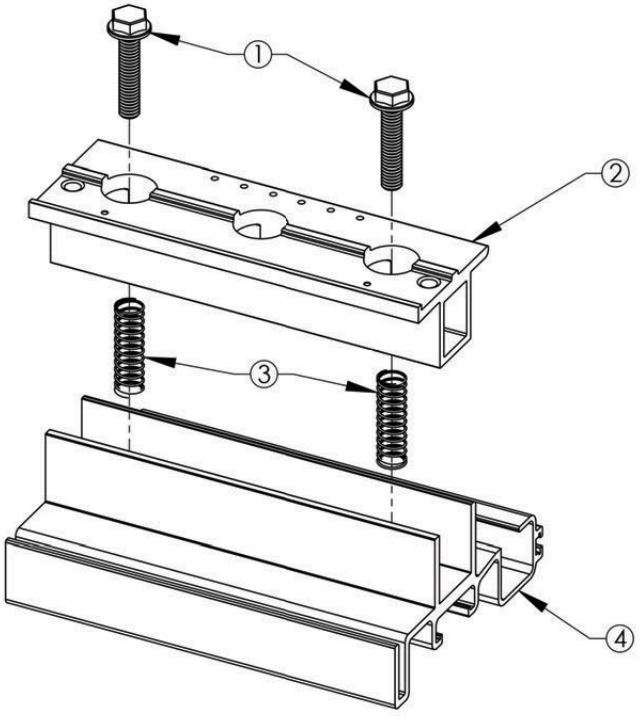
ROCK-IT MOUNT ASSEMBLY



NOTE: ITEMS 1-11 SHIP ASSEMBLED

1 5/16″-18 x 1.5″ Hex Flange Bolt 300 Series SS
2 Rock-It Mid-Clamp 6005A-T5
3 Compression Spring 300 Series SS
4 Tie Plate 6005A-T5 AL
5 Rock-It Shelf 6005A-T5 AL
6 Flange Level Nut 300 Series SS
7 Packaging O-Ring (Remove Prior to Installation)
8 Rock-It Pedestal 6005A-T5 AL
9 3/8″ ID Star Lock Washer 300 Series SS
10 3/8″-16 Hex Tap Bolt 300 Series SS
11 5/16″-18 x .375″ Hex Flange Bolt 300 Series SS
12 Rock-It-Slide 6005A-T5 AL
13 5/16″ ID EPDM Bonded Washer 300 Series SS
14 5/16″ x 4″ Hex Lag Screw or 5/16″-18 X 1.50″ Hex Bolt 300 Series SS

ROCK-IT COUPLING ASSEMBLY

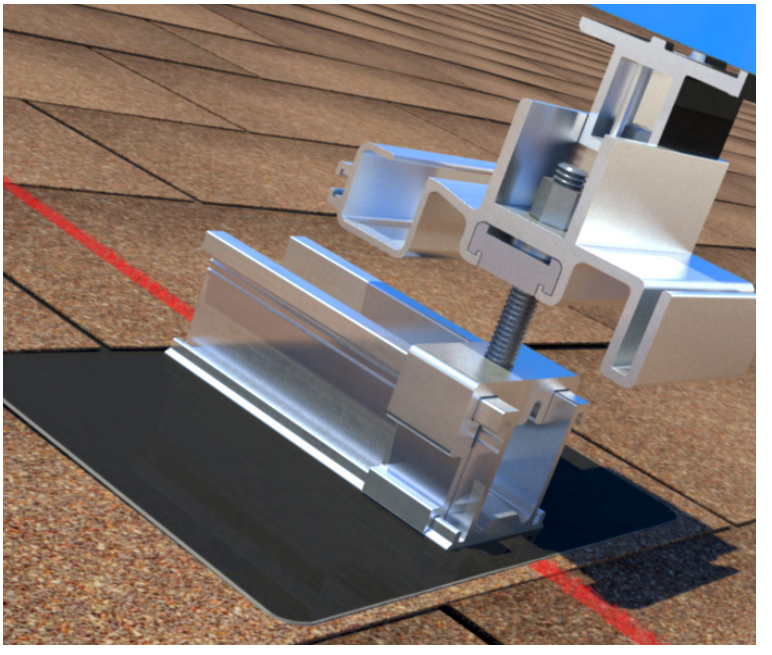


NOTE: ITEMS 1-4 SHIP ASSEMBLED

1 5/16″-18 x 1.5″ Hex Flange Bolt 300 Series SS
2 Rock-It Coupling Mid Clamp 6005A-T5 AL
3 Compression Spring 300 Series SS
4 Rock-It Coupling Shelf 6005A-T5 AL

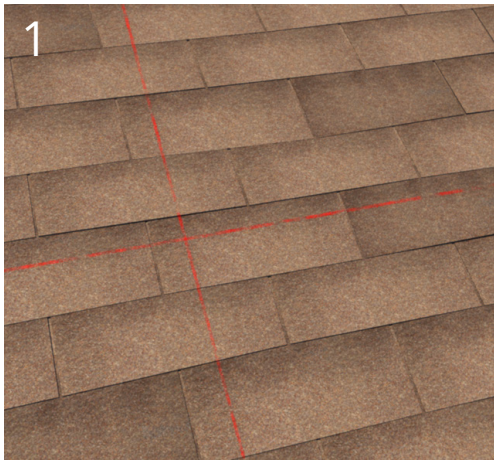
Array Layout

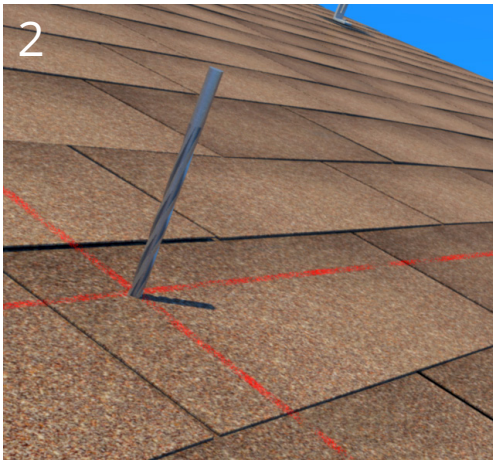
- Find the required structural attachment points. Mark these using a vertical (N-S) chalk line on the center of the rafters.
- Spacing may vary depending upon project specific structural requirements; i.e. high snow and wind load areas may require lesser bracket spacing in the E-W axis vs. the maximum spacing. Max spacing is 48″ for portrait orientation and 72″ for landscape orientation. Consult project layout diagram for project specific bracket spacing on the roof.
- Install Rock-It Mounts to predetermined mount spacing.
- The array skirt sections are the width of a typical 60 cell module – use the array skirt as a guide to lay out module placement.

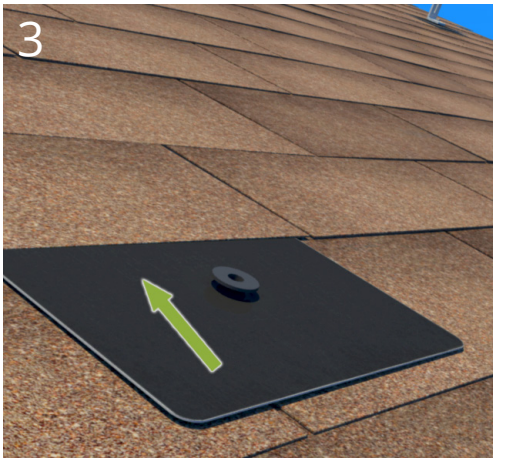


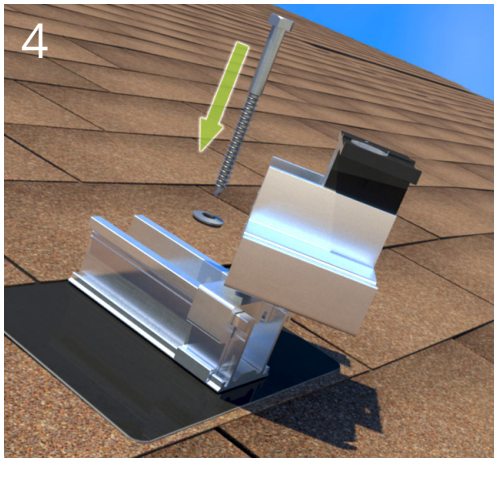
Note: The distance between the rows of mounts is calculated by the module dimension N-S plus 1 3/8″ (35mm). Lag screw should be installed as close to center of exposed shingle as possible. The minimum distance between the lag screw and the edge of the shingle is 1/2″.

GreenFasten Flashing Install









1 Locate the rafters and snap horizontal and vertical lines to mark the installation position for each GreenFasten flashing.

2 Drill a pilot hole (1/4″ diameter) for the lag bolt. Backfill with sealant. EcoFasten Solar recommends an EPDM mastic.

3 Insert the flashing so the top part is under the next row of shingles and pushed far enough up slope to prevent water infiltration through vertical joint in shingles. The leading edge of flashing must butt against upper row of nails to prevent turning when torqued.

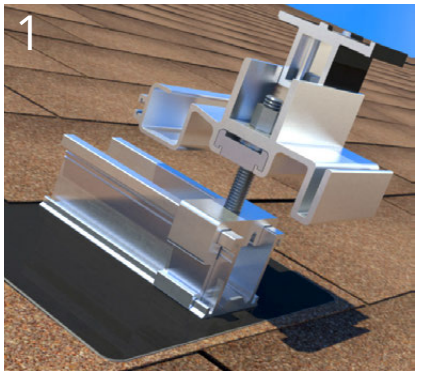
4 Line up pilot hole with GreenFasten flashing hole.

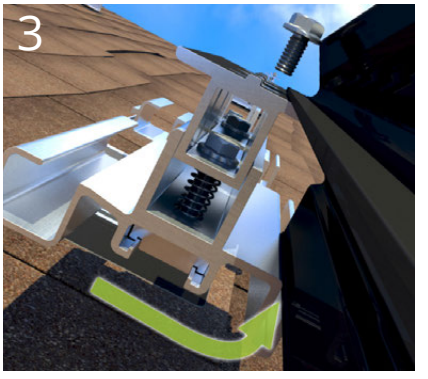
Insert the lag bolt through the EPDM bonded washer, the Rock-It slide, the gasketed hole in the flashing and into the rafter.

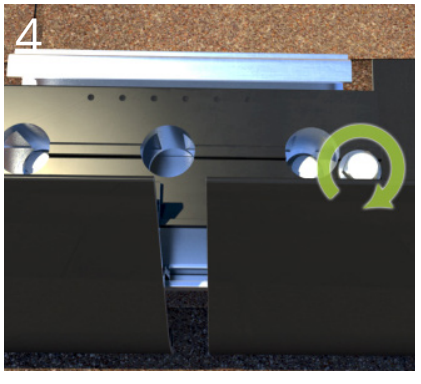
Torque: The range is between 100-140 torque inch-pounds depending on the type of wood and time of year. The visual indicator for proper torque is when the EPDM on the underside of the bonded washer begins to push out the sides as the washer compresses. If using an impact wrench to install the fasteners be careful not to over torque the fastener. You may need to stop and use a ratchet to finish the install.

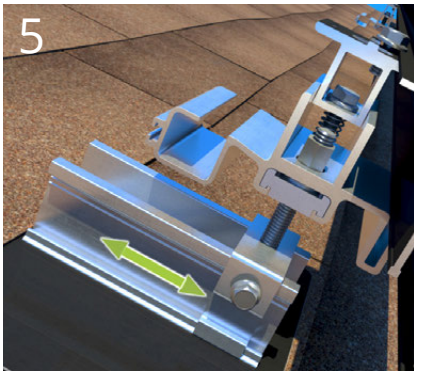
*The Engineer of Record shall check capacity of rafter to support lag screw loading.

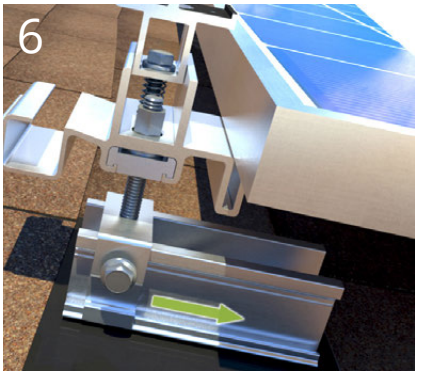
ROCK-IT SYSTEM INSTALL

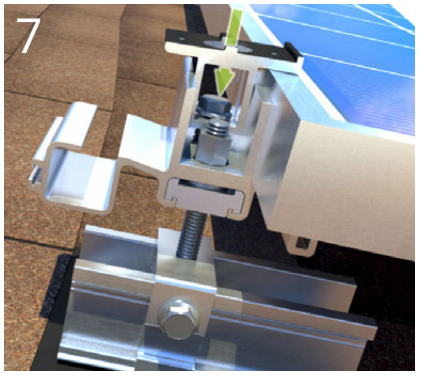


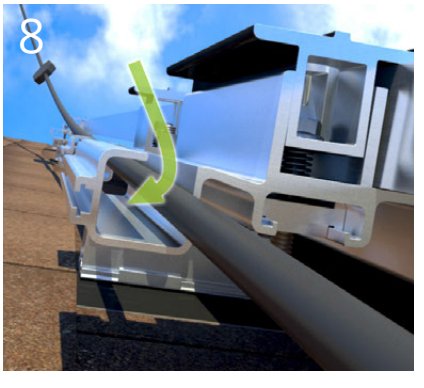


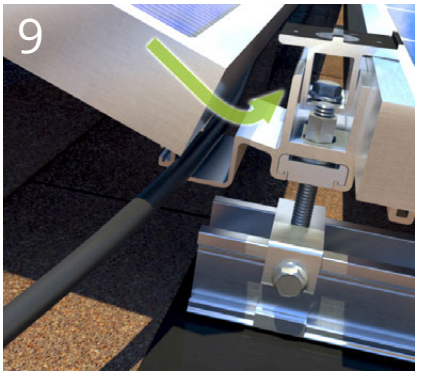


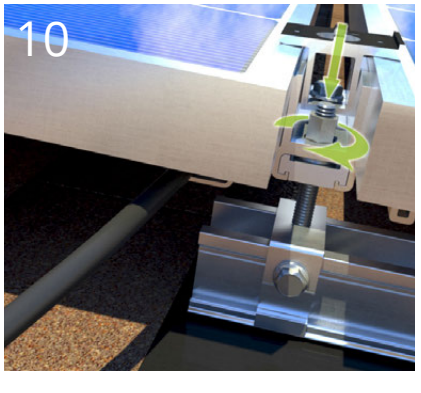












1 Install EcoFasten Solar Flashing with Rock-It Mounts
- Follow GreenFasten Install instructions for flashing and bracket install on composition shingle roofs.
- Optimum vertical distance between lag bolts is 1 3/8" plus module dimension.
- Set mounts on eave most row so that the Rock-It Pedestal is on the South end of Rock-It Slide. (ex. image 1)
- Set mounts on all upper rows so that the Rock-It Pedestal is on the North end of Rock-It Slide. (ex. image 6)

2 Install Array Skirt to Eave Mounts
- Install array skirt starting on west side of array and move east.

3-4 Attach Couplings to Array Skirt
- *Torque* the west most array skirt bolt on coupling first *to 150 in-lbs.*
- When tightening the east bolt the array skirt sections will be drawn together.

5 Align and Straighten First Row of the Rock-It System with Array Skirt
- Use North-South adjustment of the Rock-It pedestal to straighten array skirt.
- *Torque* screw on side of Rock-It Pedestal to *150 in-lbs to* secure it to the Rock-It Slide.
- Adjust Flange Level Nut to level the system (optional – can be leveled during or after installation)

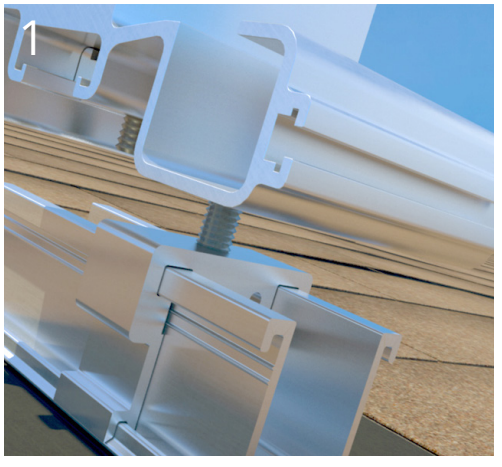
6-7 Install 1st Row of PV Modules
- Slide Rock-It Mounts that are upslope down to engage top of first module.
  Note: Make sure cable tray is facing upslope.
- Torque 1st and 2nd row of mid-clamps on Rock-It Mounts and Rock-It Couplings to 150 in-lbs.

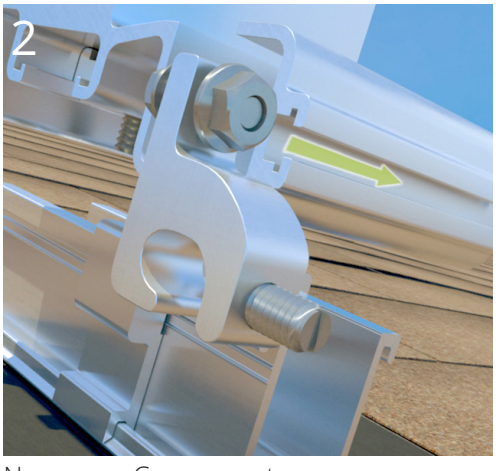
8-9 Install Balance of PV Modules
- Secure wire and electrical components in built in wire tray on Rock-It Mounts and Couplings.
- Install next row of panels and torque mid-clamps to secure modules.
- Repeat install for all remaining rows of modules.

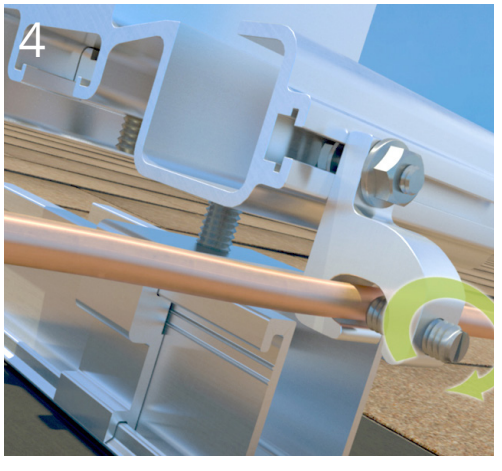
10 Level the Rock-It System
- When assembly is complete, level the entire system by adjusting Flange Level Nuts. *Level nut has no torque value.*

ROCK-IT SYSTEM

Grounding Lug Install







Necessary Components:

- Burndy CL50-1TN Ground Lug (UL Listing #KDER.E9999)
- 14 AWG - 4 AWG Copper Ground Wire*
- 8-32 x 0.5" Serrated Flange Head Bolt (300 Series SS) 8-32 Serrated
- Flange Nut (300 Series SS)
- 11/32" and 1/4" wrenches or ratchets/sockets

1 The Ground Lug is installed into the T slot on the Rock-It Mount.

2 Slide the Flange Head Bolt on the Ground Lug into T slot on Rock-It Mount.

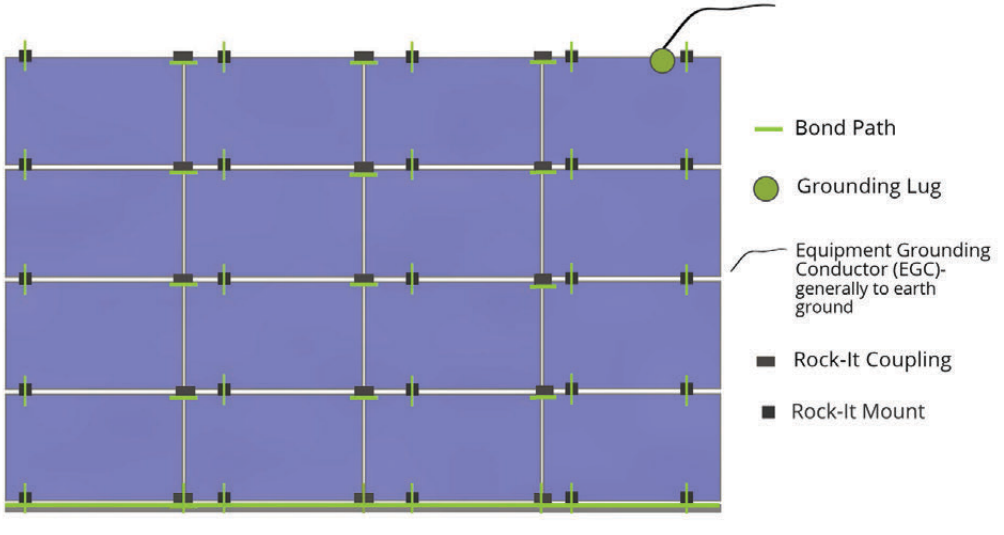
3 *Torque* Flange Nut/Bolt *to a minimum of 35 in-lbs.*

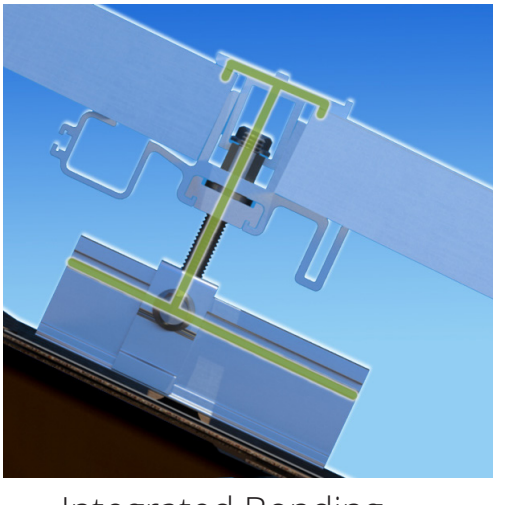
4 Place wire in Ground Lug channel and tighten set screw to complete assembly *(see torque values below)*.

14-10 AWG = 20 in-lbs.
8 AWG = 25 in-lbs.
6-4 AWG = 35 in-lbs.

**Minimum of 1/4" clearance required between bare copper wire and aluminum*

Bonding Assembly and Bonding Path





Integrated Bonding

Grounding Information

The rail-free Rock-It System may be used to mount and ground PV modules that comply with UL 1703, only when that specific module has been evaluated for mounting and grounding, in compliance with the included installation instructions.

Grounding lug must be visible to inspectors from the perimeter of the PV array.

Multiple use grounding pins

Grounding pins within the mid-clamp are multiple use bonding/grounding devices. Modules will need to be adjusted if the mid-clamps are loosened to ensure there is “new” metal for the grounding pins to pierce into upon retightening.

Grounding Method

Rock-It Mount: Bonds N-S rows of modules
Rock-It Coupling: Bonds E-W rows of modules
Array Skirt: Bonds E-W along entire array when installed

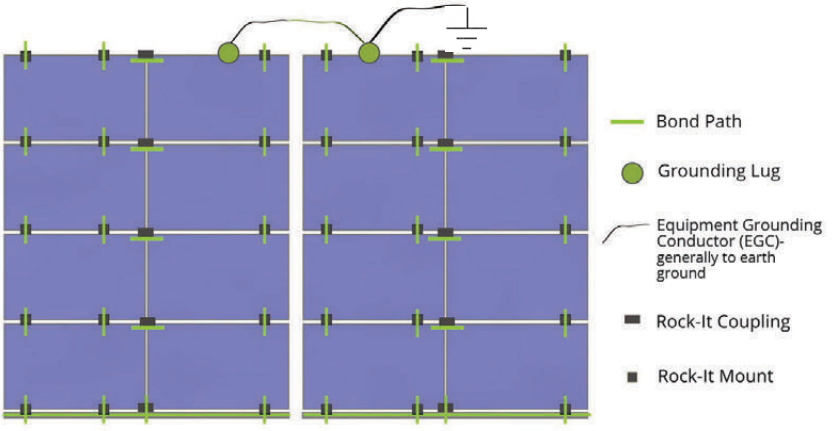
One Burndy CL50-1TN ground lug is required per PV array, limited to 300 modules, placed in either portrait or landscape orientation.

See page 6 for grounding path diagram, and page 9 for system specifications and ratings.

Thermal Expansion and Bonding

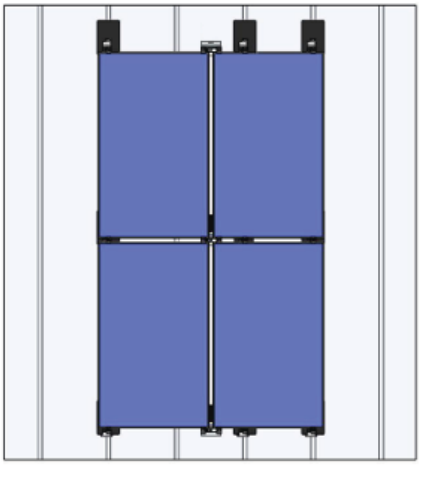
A thermal expansion gap is required per each continuous 40' length of modules.

Omit a coupling and leave a 2" gap in the array skirt and also between the modules at that point.



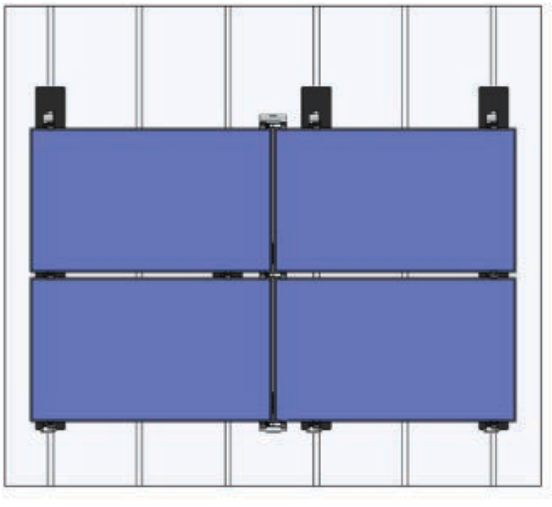
Bracket Spacing

Portrait Orientation



Maximum east/west bracket spacing in portrait orientation is 48" OC.

Landscape Orientation

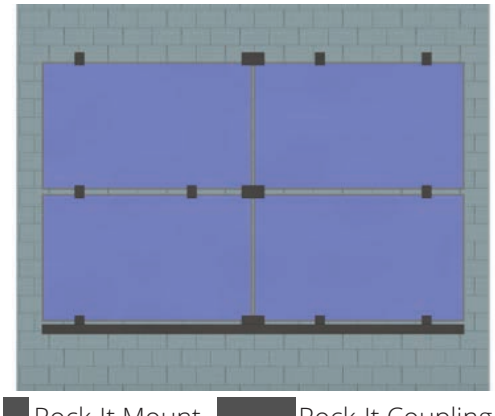


Maximum east/west bracket spacing in landscape orientation is 72" OC.

Spacing may vary depending upon project specific structural requirements; i.e. high snow and wind load areas may require lesser spacing E-W than the maximum.

Staggered Layout

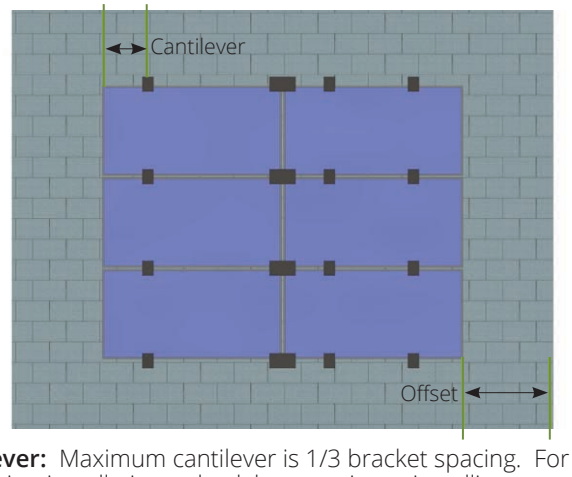
Staggered Mounting Points



Rock-It Mount Rock-It Coupling

The array layout instructions in this installation manual offer a general overview of layout. Periodically, due to a variety of factors (roof obstacles, shading, etc.) other layouts are required.

Cantilever and Offset



Cantilever: Maximum cantilever is 1/3 bracket spacing. For portrait orientation installations, check layout prior to installing.

Offset: Offset from all roof edges depends on wind speed, snow loads, local fire and building codes per location

ROCK-IT SYSTEM

- Fastest, easiest to level system on the market
- ETL listed to UL SUB 2703
- Class A Fire rating with Type 1 modules
- Integrated electrical bonding
- SIMPLE- only 3 components
- Fixed wire management tray
- North-South adjustability of up to 4″
- Only one tool required (1/2″ deep well socket)

Max No. of Panels	300 Modules per ground lug	**Materials**	300 Series Stainless, 6000 Series Aluminum
Max System Voltage	1000VDC	**Coating**	Black Andodization/Mill Finish
Class A Fire Rating	With UL1703 Type 1 Rated Modules	**Lug Specifications**	Burndy CL50-1TN Ground Lug (UL Listing #KDER E9999)
Leveling Range	3-4″	**Ground Wire Per above Lug spec.**	14 AWG- 4 AWG Copper Ground Wire
Rock-It Slide Range	4″	**Max Module Size**	64.96″(1650mm) x 39.05″(992mm) x 2″(50mm)
Min/Max Roof Slope	1/2:12/12:12	**Max Downforce/Uplift Rating**	45 PSF
Max Anchor Spacing	72″	**Rock-It Mount Load Rating**	547lbs with Single 5/16″ Lag 3.0 Safety Factor
Skirt Box QTY	6 units	**Slide Fastening Hole**	5/16″ diameter
Mount Box QTY	12 units	**Module Cantilever**	*Max. cantilever is 1/3 bracket spacing*
Rock-It Slide Box QTY	50 units		
Coupling Box QTY	12 units	**Warranty**	10 Year Material and Workmanship

Codes: National Electric Code, ANSI/NFPA 70, NEC 250, NEC 690, IRC, IBC

System marking (placed on side or underside of Rock-It Mount and Coupling): Standards: UL 2703, UL 1703

Intertek
5002110
CONFORMS TO
UL SUBJECT 2703

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