

POWER DISK™
ASSEMBLY INSTRUCTIONS

step-by-step
assembly and installation

POWER DISK™

CAUTION:

Do not install the POWER DISK system on any roof with a pitch ratio exceeding 12/12 (approximately 45 degrees) as this could lead to a catastrophic structural failure and severe personal injury or death.

The POWER DISK is the professional grade choice for mounting PV Modules on residential roofs. Featuring a rail-less design, easier height adjustment, and integrated grounding, the POWER DISK is a simple yet cost effective mounting system. What sets this mounting system apart is the roof deck mounting feature which allows for an easier array layout and faster PV module placement. The roof grip fasteners, sealing washers and pre-applied butyl mastic are all included to provide a secure and reliable roof attachment.

Important Installation Considerations

- 40 PSF maximum snow load using corner mounting.
- 70 PSF maximum snow load using edge mounting.
- Wind speed allowance: 120 MPH exposure C (ASCE 7-10) or 130 MPH exposure B (ASCE 7-10). Minimum setback of 3 feet. Maximum building height of 30 feet. Consult with PE for other mounting applications.
- Consulting with a local building department and/or professional engineer is recommended.
- Verify the allowable mounting location on module frame with module manufacturer.

CAUTION:

Be certain that the orientation of mounts and number of attachments are carefully followed in accordance to the project specific design specifications. Failure to do so could lead to catastrophic structural failure and severe personal injury or death.

Grounding Considerations

The POWER DISK requires no additional grounding devices; it has been 3rd party tested to UL2703.

About these Assembly Instructions

- These instructions are intended to be used by individuals with sufficient technical skills for the task. Knowledge and use of hand tools, measuring devices and torque values is also required.
- These instructions include various precautions in the forms of Notes, Cautions, and Warnings to assist in the assembly process and/or to draw attention to the fact that failure to follow certain assembly steps may be dangerous and could cause serious personal injury and/or damage to components. Following the step-by-step procedures and these precautions should minimize the risk of personal injury or damage to components while making the installation safe and efficient.

For questions on a specific installation please contact us at:

Phone: 800-260-3792

Email: info@plpsolar.com

WARNING

1. PLP is not liable for, and makes no warranty on, expressed or implied, the suitability of roofing, *in situ* weatherproofing materials, effect of adjacent buildings and/or equipment geometry, and other installation issues which are outside of PLP's scope. PLP sole liability is set forth in its terms and conditions of sale. Please contact the roofer or the warranty holder of the roof or building envelope system prior to the installation of a

solar structural array, to confirm acceptance and compatibility of the penetration, attachment, and roof contact methods provided and/or proposed in this manual.

2. PLP offers no liability/warranty on any racks not installed to the approved layout by PLP. Furthermore, PLP has no obligation to evaluate adjacent building or equipment geometry that may affect the wind dynamics and pressures exerted on the solar

array and disclaims any liability related thereto.

3. Stainless Steel hardware can gall when tightened too quickly. Installer should use a Silver Grade anti-seize compound prior to assembling any stainless steel hardware. Do not use an impact driver. All other driver types should be set to low speed settings.

POWER DISK™

The Power Disk conforms to ANSI/UL UL2703 (2015) Standard for Safety First Edition: Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels.

Electrical

Note: Electrical installations must be in accordance with the National Electric Code ANSI / NFPA 70. Contact your local Authorities Having Jurisdiction (AHJ) for additional details.
Max Overcurrent Protective Device (OCPD) Rating: 25A

Equipment Grounding Conductor Sizing

Module Fuse Rating	Copper Wire Size
<15 AMPS	#14 AWG 90°C
<20 AMPS	#12 AWG 90°C
20-60 AMPS	#10 AWG 90°C

Module Orientation: Portrait or Landscape
Fire Class Resistance Rating

UL 2703 Certification and the Fire Class Rating is valid only when: 1) the installation is conducted strictly in accordance with this manual and, 2) the installed system includes the Power Trim component.

Meets the requirements of Class A Steep Slope Flush-Mounting Applications when using Type 1, Listed Photovoltaic Modules.

Testing conducted with a 5" Gap (distance between roof covering and PV module frame) per UL1703 allows the system to be installed with any gap per manufacturer's instructions.

Steep Slope refers to roofs with slopes greater than or equal to 2:12.

Structural Certification

Mechanical Load Rating: The Power Disk was tested to the minimum design load criteria based on UL 2703 standard. Those are 10 psf down, 5 psf up, and 5 psf down-slope.

Marking

Product markings identified per UL2703 are to be located in a location that is readily accessible for inspection.

Periodic Inspection

Periodic re-inspection is a recommended system maintenance procedure to check for loose components or corrosion. If any loose components and/or corrosion is found, the affected components are required to be replaced immediately, with the original mounting system manufacturer's component parts.

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Before You Start

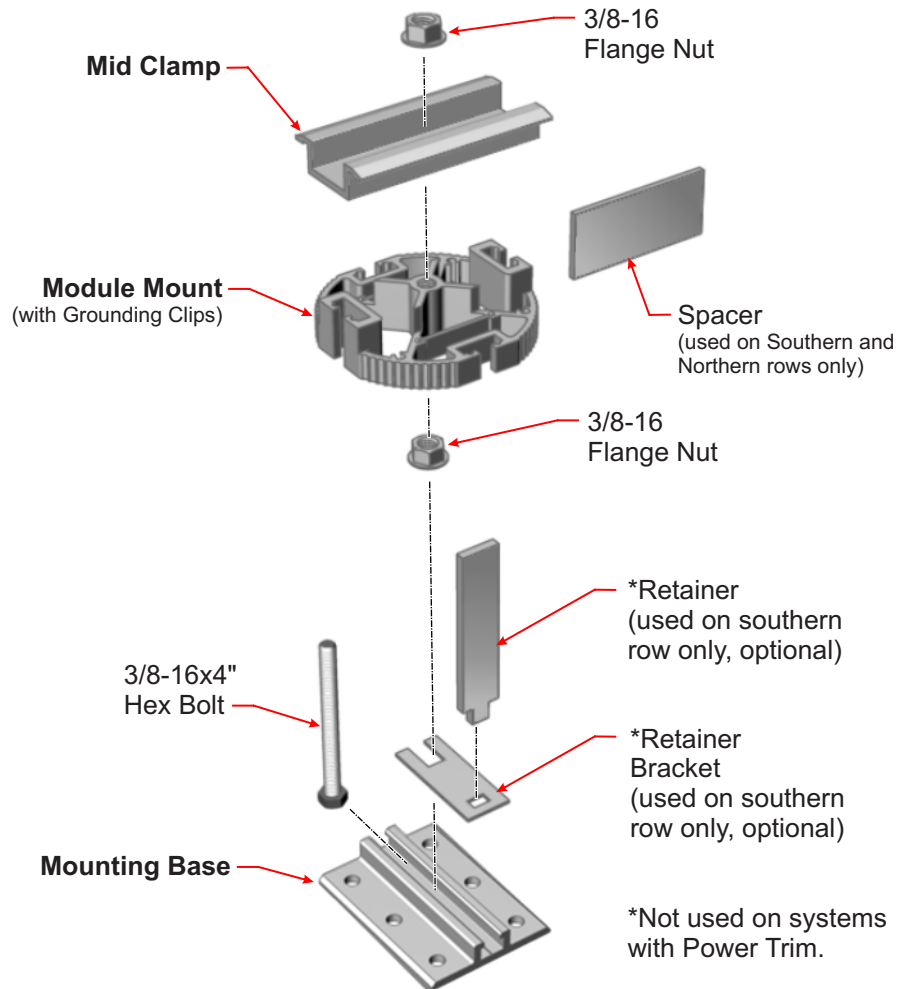
Required Tools: ☒

- ☐ 3/8" Nut driver bit
- ☐ 9/16" Deep Wall Socket
- ☐ 9/16" Wrench
- ☐ Torque Wrench
- ☐ Ratchet Wrench
- ☐ Framing Square
- ☐ Chalk Line

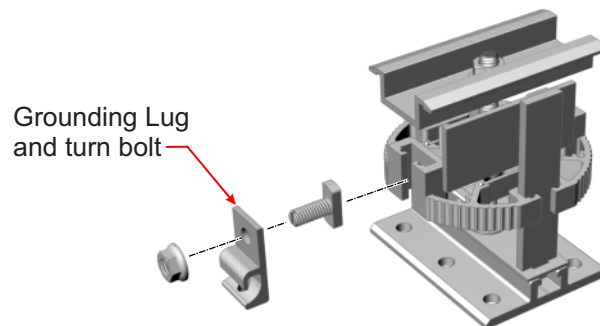
The Components

Mid Clamp, Module Mount, Mounting Base, and Deflector

Components are quickly assembled, as just one bolt is used.



Grounding Option



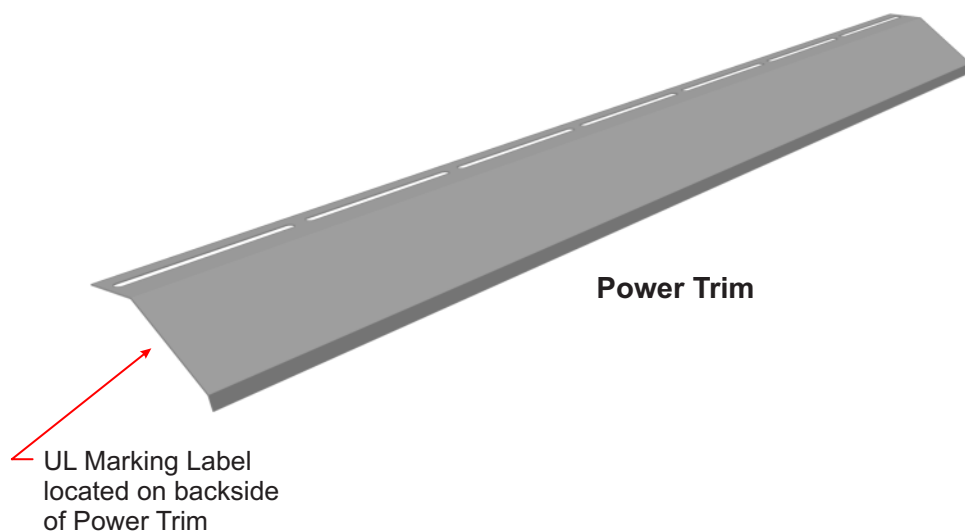
Before You Start

The Components (cont.)

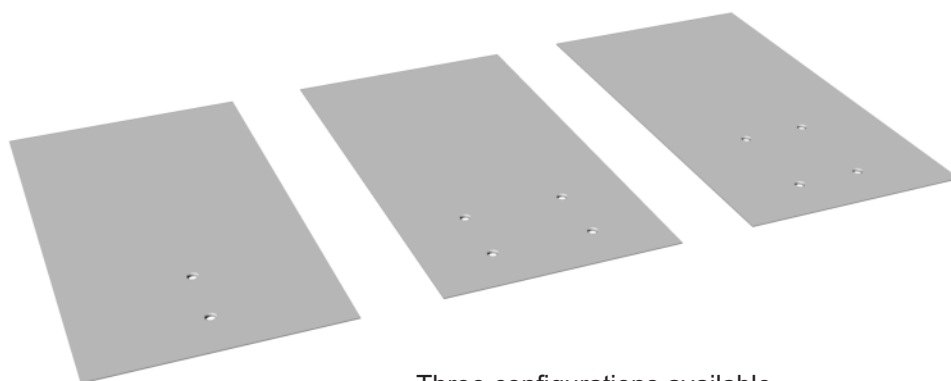
Mid Clamp, Module Mount, Mounting Base, and Power Trim

NOTE:

Power Trim provides a professional finish and acts as an installation aid for aligning the bottom row of PV modules. Power Trim is required for UL 2703 compliant systems.



Flashing (optional item not used on all systems)



Three configurations available
See Appendix B

Before You Start

There are two methods of installing the POWER DISK: Corner Mount or Edge Mount. Both methods install similarly.

Snapping chalk lines for the Corner Mounting method is shown here. The following page describes the Edge Mounting method.

Corner Mounting: with exception to the E-W outer edges, the POWER DISK's are mounted at the intersections of the Module corners, supporting two or four Modules per POWER DISK.

Chalk lines are used to accurately and squarely locate the POWER DISK mounting locations.

Inner chalk lines are marked leaving a 1/2" gap between Modules (Module length plus 1/4").

Outer chalk lines are marked at a distance equal to 20% of the Module length (0.2 x Module length).

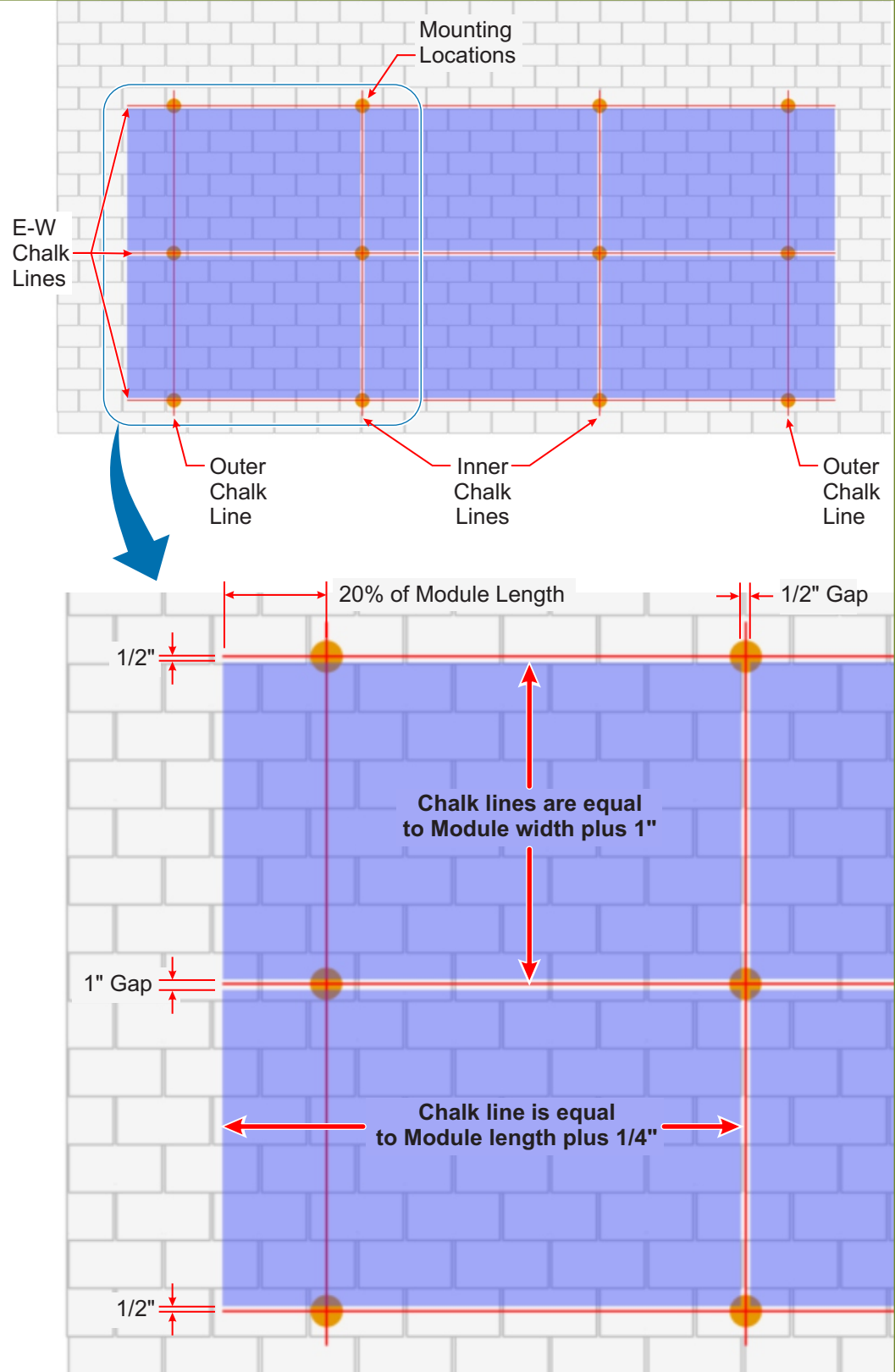
WARNING:

Improper grounding is at risk if array is not square. The POWER DISKs' grounding features rely on a carefully measured and square layout on the rooftop surface. Be certain to use a framing square while snapping chalk lines to ensure that all lines are square to one another.

See Appendix A for the grounding path diagram.

Snap Chalk Lines - Corner Mounting

Measure with care, keep the lines square and accurate.



Before You Start

Snapping chalk lines for the Edge Mounting method is shown here. The previous page describes the Corner Mounting method.

Edge Mounting: POWER DISK's are mounted on the Module edges, supporting one or two Modules per POWER DISK.

Chalk lines are used to accurately and squarely locate the POWER DISK mounting locations.

N-S chalk lines are marked at a distance equal to 20% of the Module length (0.2 x Module length). Additionally, an allowance for a 1/2" gap between Modules must be factored into the layout (Module length plus 1/2").

E-W chalk lines are calculated using the Module width plus 1/2".

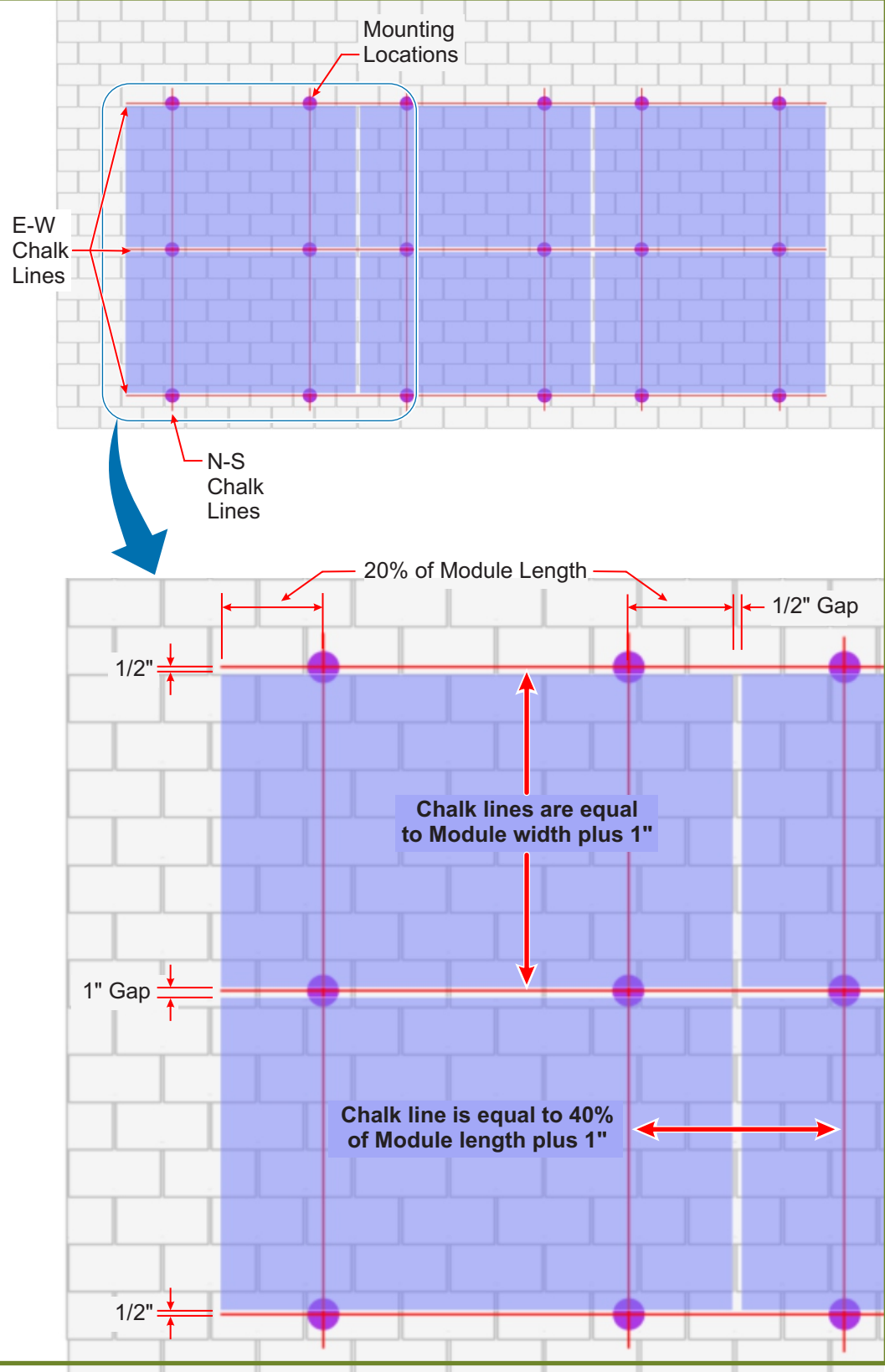
WARNING:

Improper grounding is at risk if array is not square. The POWER DISKs' grounding features rely on a carefully measured and square layout on the rooftop surface. Be certain to use a framing square while snapping chalk lines to ensure that all lines are square to one another.

See Appendix A for the grounding path diagram.

Snap Chalk Lines - Edge Mounting

Measure with care, keep the lines square and accurate.



Step 1

Attach the Mounting Bases to the Roof

Mount on top of one shingle; do not install across two shingles.

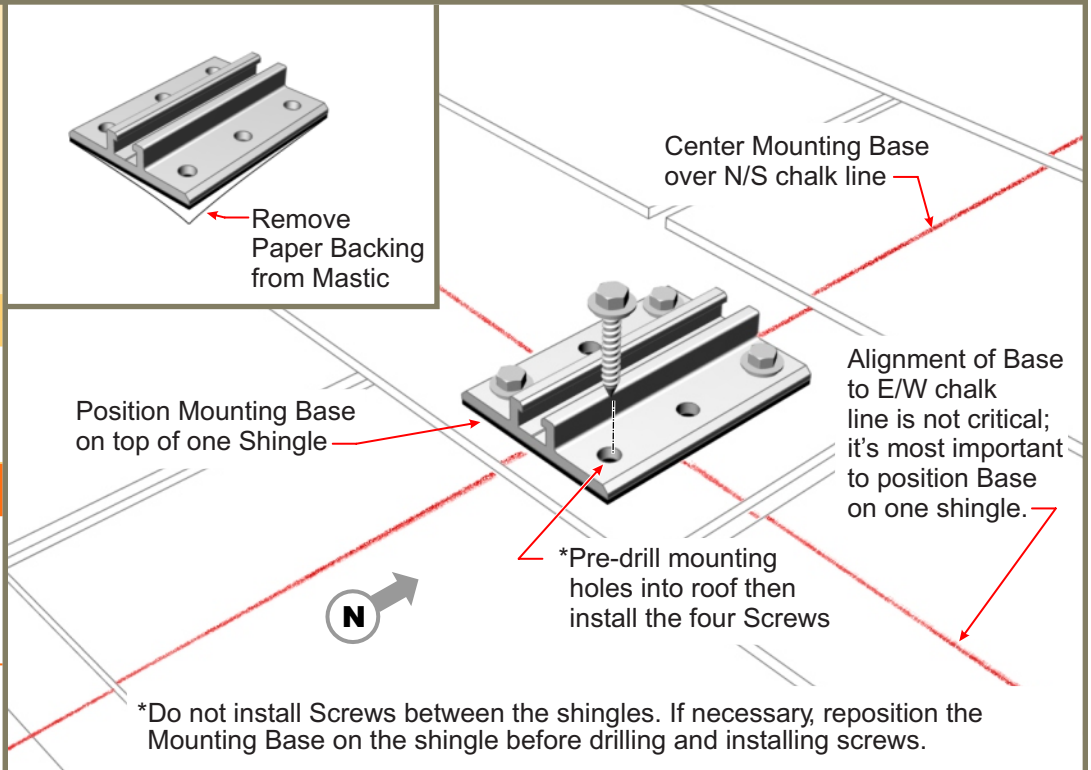
Position Mounting Base over one shingle and center over N/S chalk line. Attach with either 1-1/2" Deck Screws or 2-1/2" Lag Screws. For either, drill an appropriate sized pilot hole, prior to installing the screws.

NOTE:

E/W chalk lines are aligned with the 4" Bolt installed in the next step.

CAUTION:

Water leaks are possible if the Mounting Base is installed across two shingles. Install on one shingle to prevent leaks.



Step 2

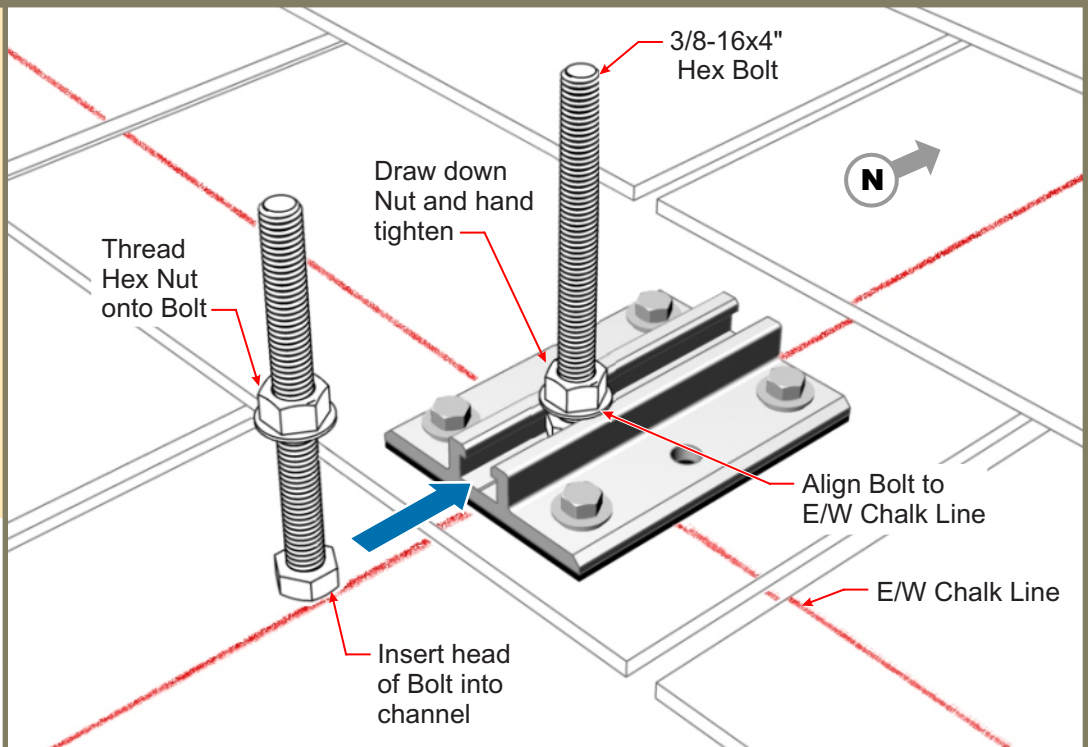
Install a 4" Hex Bolt

Slides into the channel of the Mounting Base.

Visually sight down the E/W chalk line and align the Bolt to the chalk line.

Hand tighten the Hex Nut; tool tightening will come later as:

- Adjustments to the Bolt position may be necessary.
- On the southern row, the Retainer Brackets must be inserted under the Nut as shown in the next step.



Step 3

Insert the Retainer Bracket - Southern Row Only

Bracket holds a Retainer which is optional on the Southern Row.

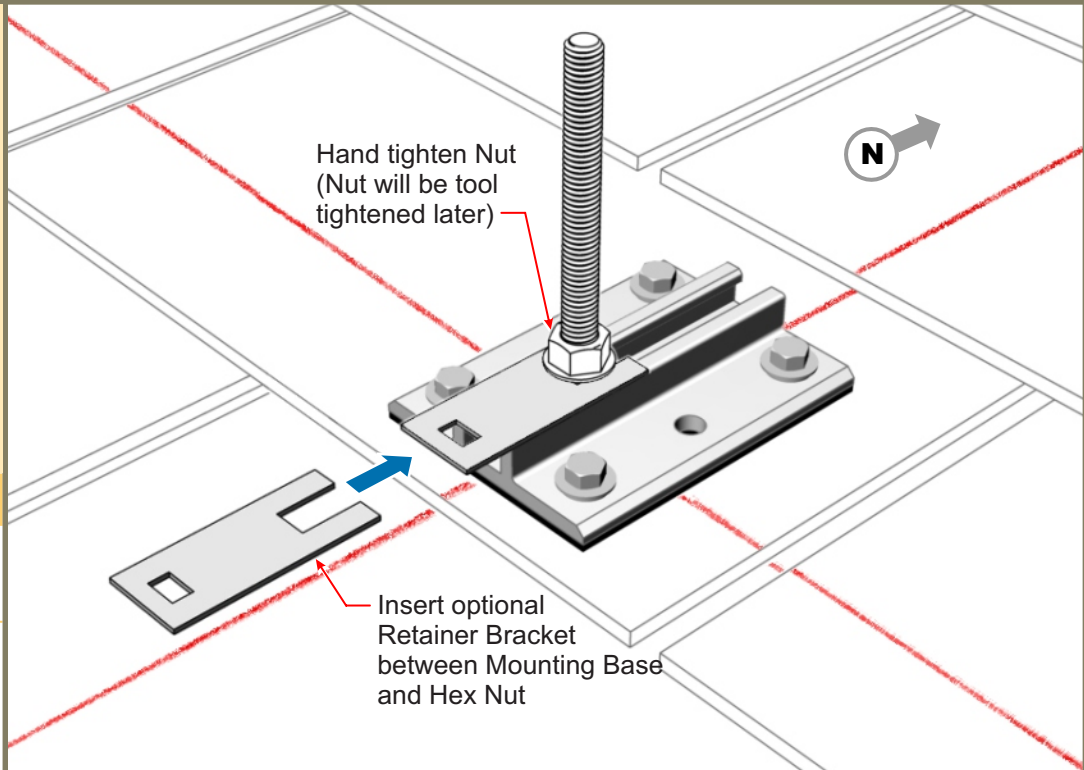
The Retainer Bracket will hold a Retainer which locks the Module Mount, preventing it from rotating during Module installation.

Hand tighten the Hex Nut; tool tightening will come later as adjustments to the Bolt position may be necessary.

Retainer bracket and retainer may be reused after final installation.

NOTE:

This Step does not apply if Power Trim is being used.



Step 4

Align the 4" Bolts on the Southern Row

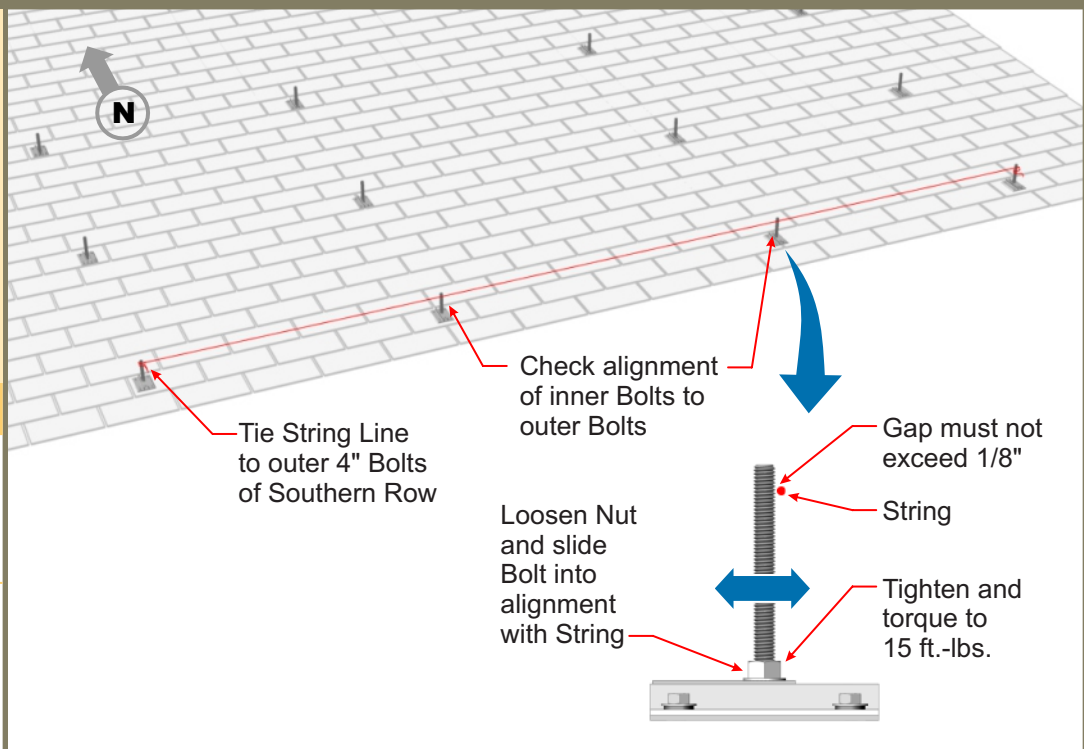
Use a string line and establish a baseline for the array alignment

It's important to establish a baseline for alignment of the array. A quick method is to pull a string line between the outer two Bolts and align the interior Bolts to the String Line.

This important step will prevent possible alignment issues as the assembly proceeds.

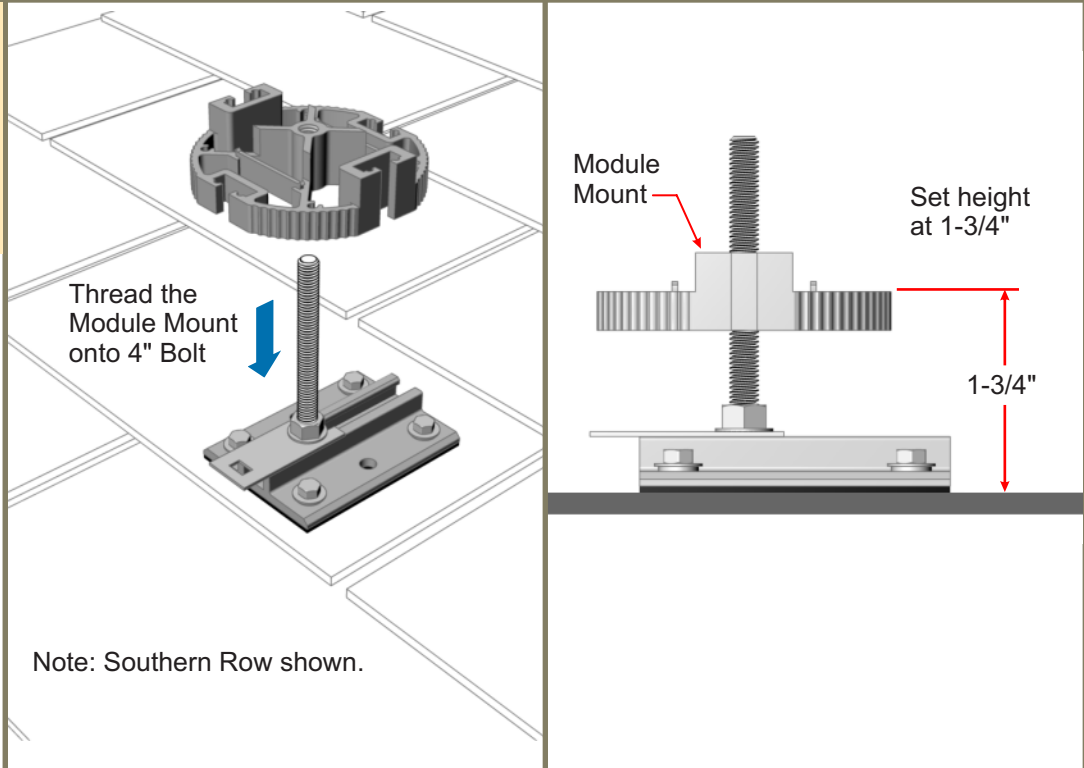
NOTE:

This step is not used on other rows. They will be adjusted row-by-row as the Modules are installed.



Step 5 Thread the Module Mount onto each of the 4" Bolts Position the Module Mount 1-3/4" above the roof top

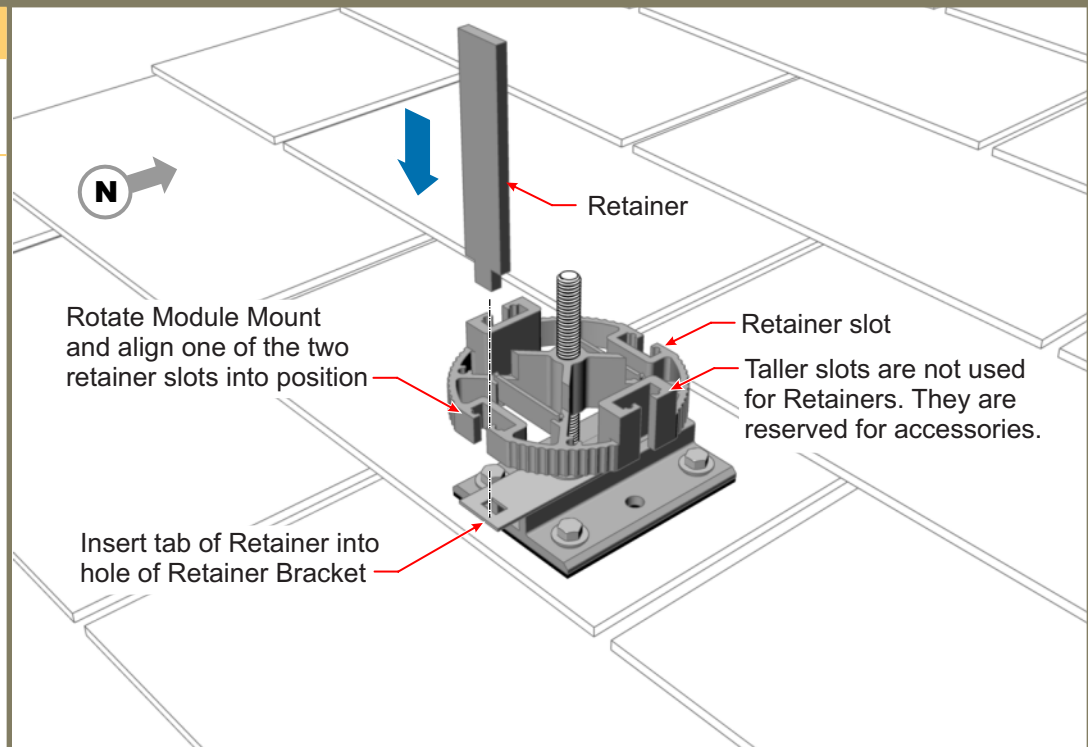
Setting the Module Mount at 1-3/4" above the roof surface leaves room for adjustments (up/down) that may be needed to level the plane of Modules due to roof undulations.



Step 6 On Southern Row only, install the optional Retainers Retainers lock and hold the Module Mounts in position

NOTE:

This Step does not apply if Power Trim is being used.



Step 7

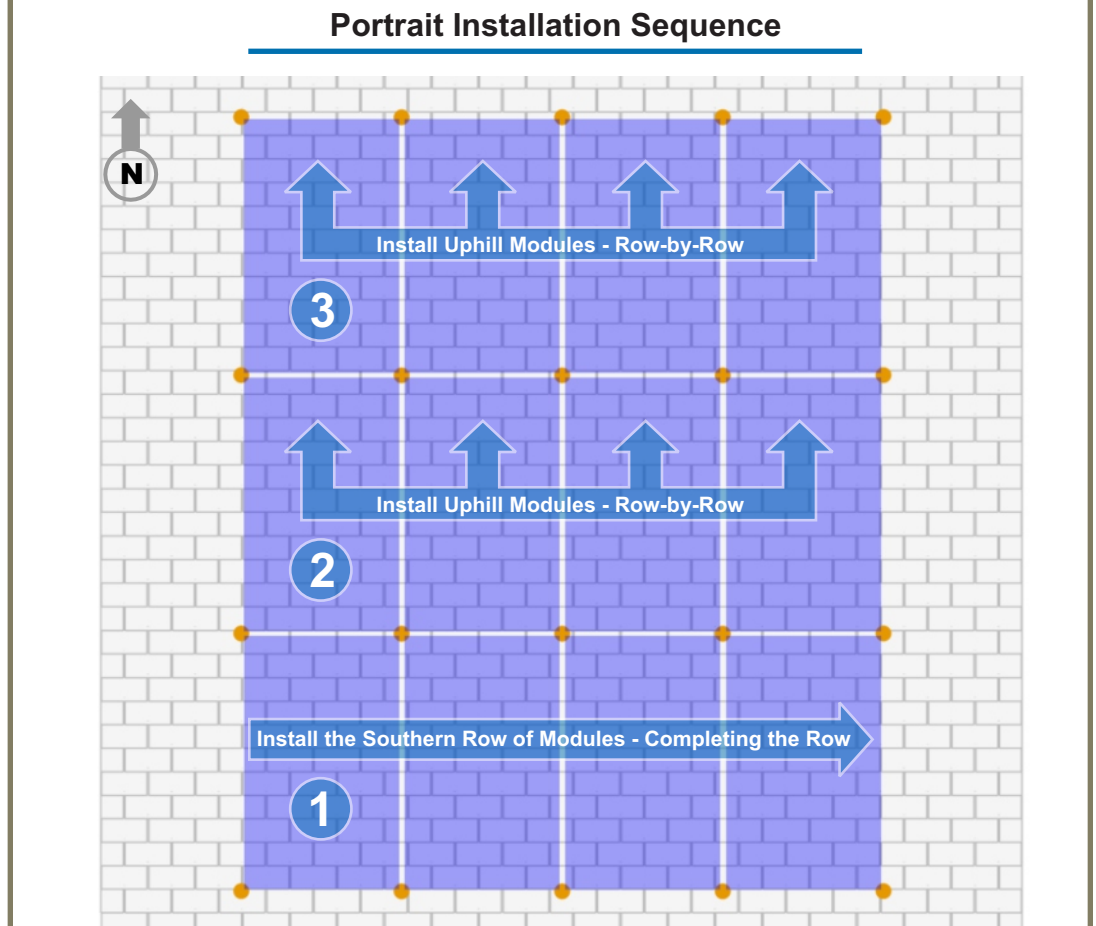
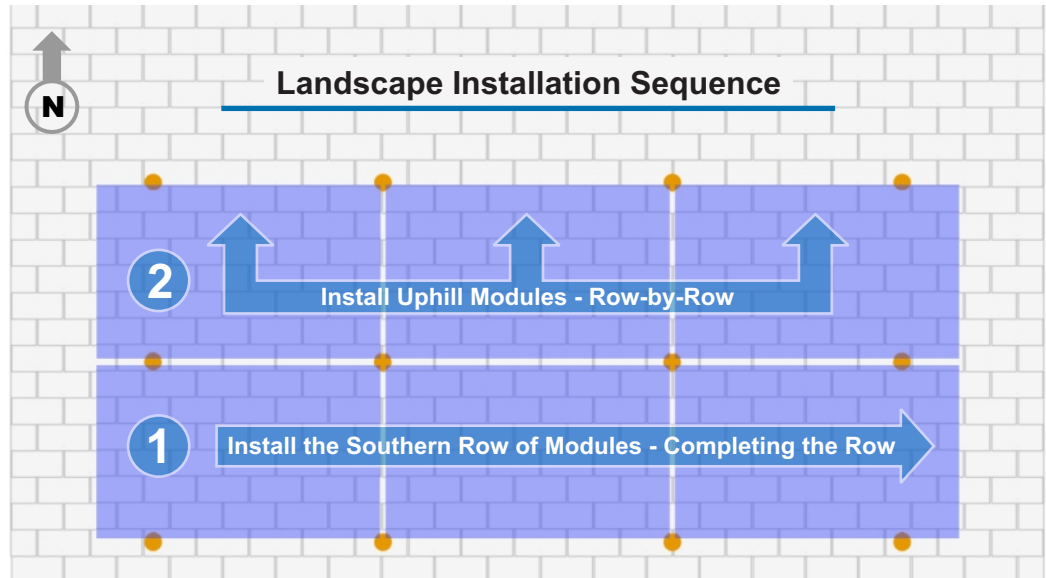
Module Installation - Sequence of Installation

For safety, install the Southern row first, then work uphill.

For safety purposes, install Modules starting from the Southern row and work uphill. This establishes and maintains a secure downhill foundation from which to build upon when installing the uphill rows of Modules. This approach also ensures a square array by working from the carefully aligned southern row of Mounts.

NOTE:

If using microinverters, they should be installed per the manufacturers installation instructions.



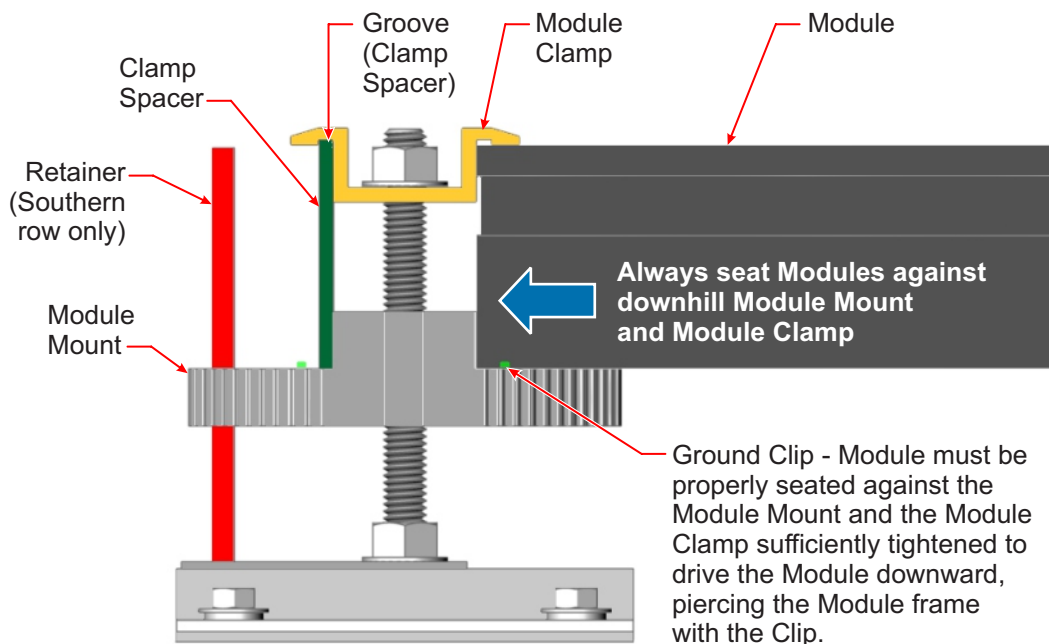
Tips!

Proper fit and alignment of the Modules Improper alignment could disable the electrical bonding of the array.

⚠ WARNING:

Do not install Modules without the Retainers of the Southern row in place. The Retainers prevent the Module Mounts from rotating. If the Mounts rotate, the Modules could fall from the roof causing severe injury or death.

View looking East to West



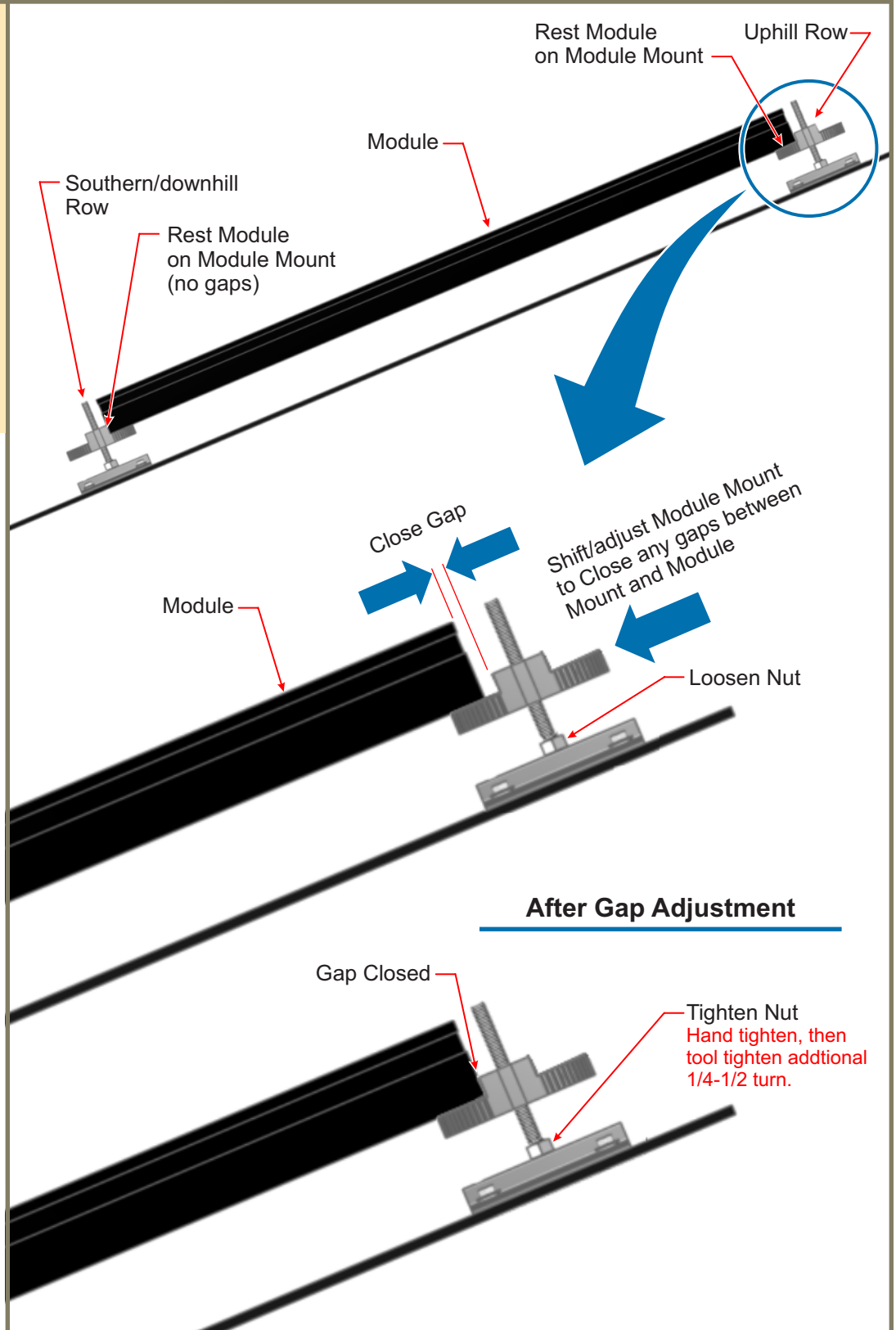
Step 8

Modules Installation - Adjustments and Seating

Place row of Modules, seating and adjusting as needed to close gaps.

During installation, the Modules are rested on the Module Mounts.

As the Modules are placed on the Mounts, verify that the downhill edge of the Module frame has fully seated (no gaps) against the downhill Mounts. Shift/adjust the Modules to close any gaps. Be certain to adjust and seat the downhill edge of the Modules before adjusting and closing any gaps on the uphill Mounts.



Tip!

Managing & Installing the 3 Mount Configurations

Depending on their location, the Mount configurations differ in components.

The three configurations of Mounts vary given the use, or non-use, of the Clamp Spacer, the Retainer and the Retainer Bracket. The configuration is based on the location of the Mount which includes three defined areas:

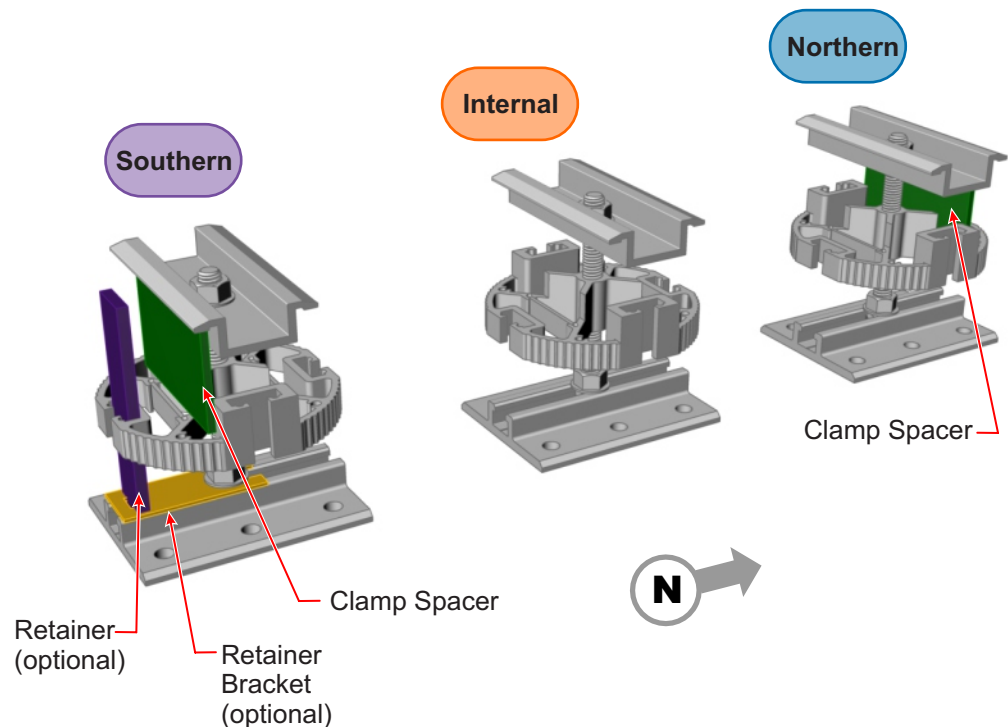
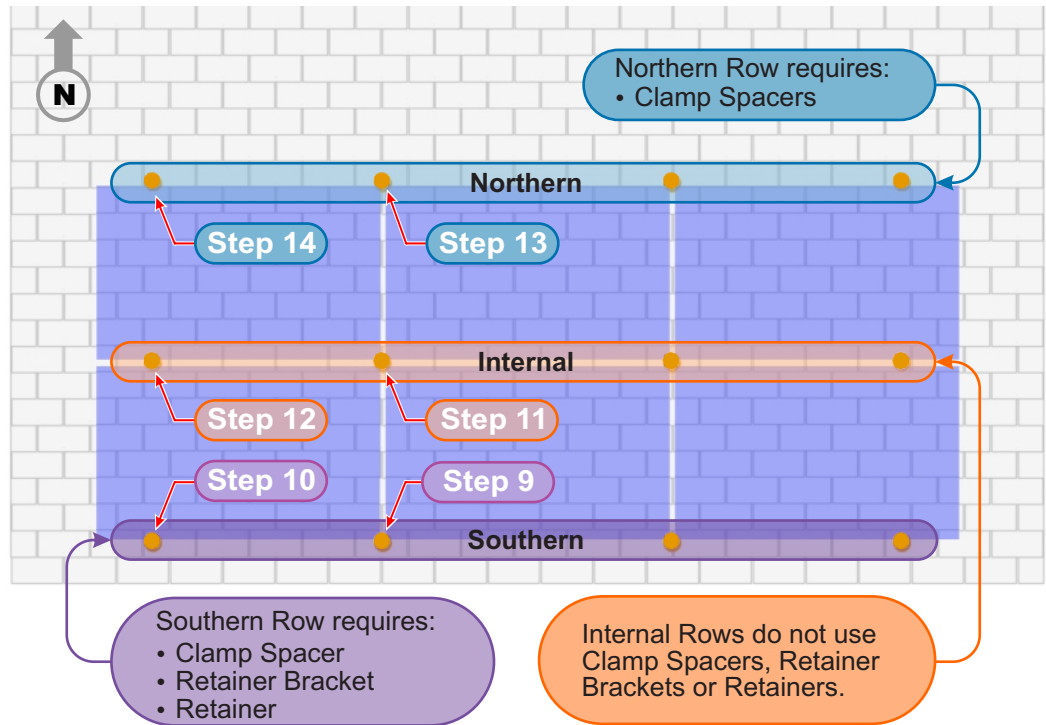
- Southern row
- Internal row(s)
- Northern row

Clamp Spacers:

These are used on the Southern and Northern rows. They are required on Mounts where there is a Module on just one side of the Mount. The Spacer fills the gap that the second Module would otherwise occupy.

Retainer Brackets and Retainers:

Used only on the Southern row to lock the Module Mount and prevent it from rotating during Module installation. Once all Modules have been clamped and secured, the Retainers are removed but not the Retainer Bracket, as it remains in place.



Step 9

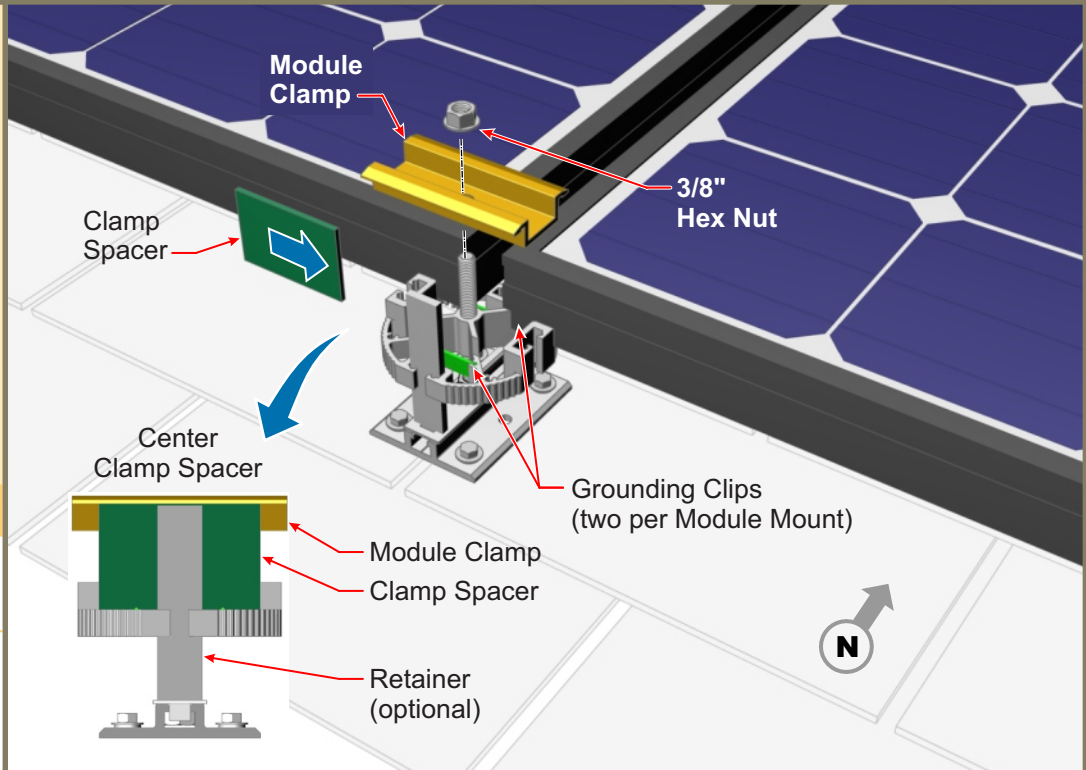
Assemble the Inner Module Mounts - Southern Row Install the Module Clamp, Clamp Spacer and Hex Nut.

Install Module Clamp and Clamp Spacer. Position the Spacer within the groove of the Module Clamp. Center the Spacer with the Module Clamp.

For now, hand tighten the 3/8" Hex Nut holding the Module Clamp in place. Do not tool tighten until after the Modules have been adjusted and aligned to the Clamps. (see next step)

NOTE:

If using Power Trim see Step 7 for its installation procedure.

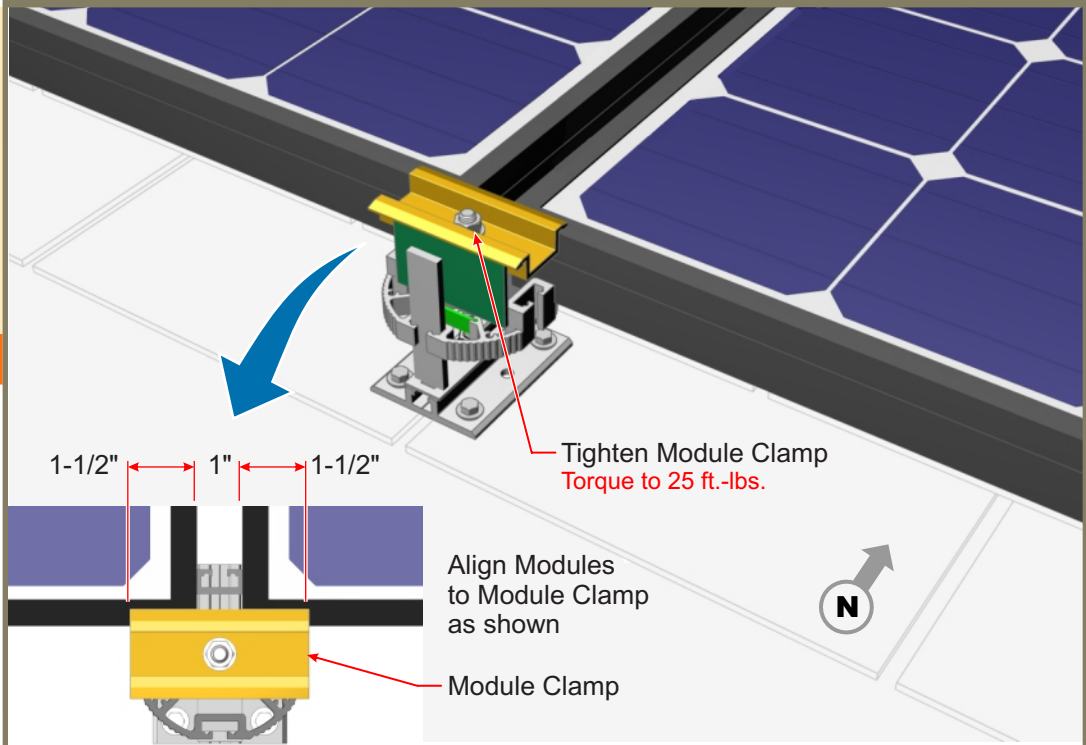


Align the Modules to the Clamp and Secure the Clamp Carefully align the Modules to the Module Clamp.

Align the Modules to the Module Clamps as shown. Careful alignment and spacing is critical as it not only maintains symmetry of the array during the installation but more importantly, it assures proper conductivity for bonding the array.

WARNING:

The gap between Modules must be centered on the Module Clamps. If not, there's a risk of cutting the electrical bonding of the array as the Grounding Clips may not be engaging the Module frame(s) as intended.

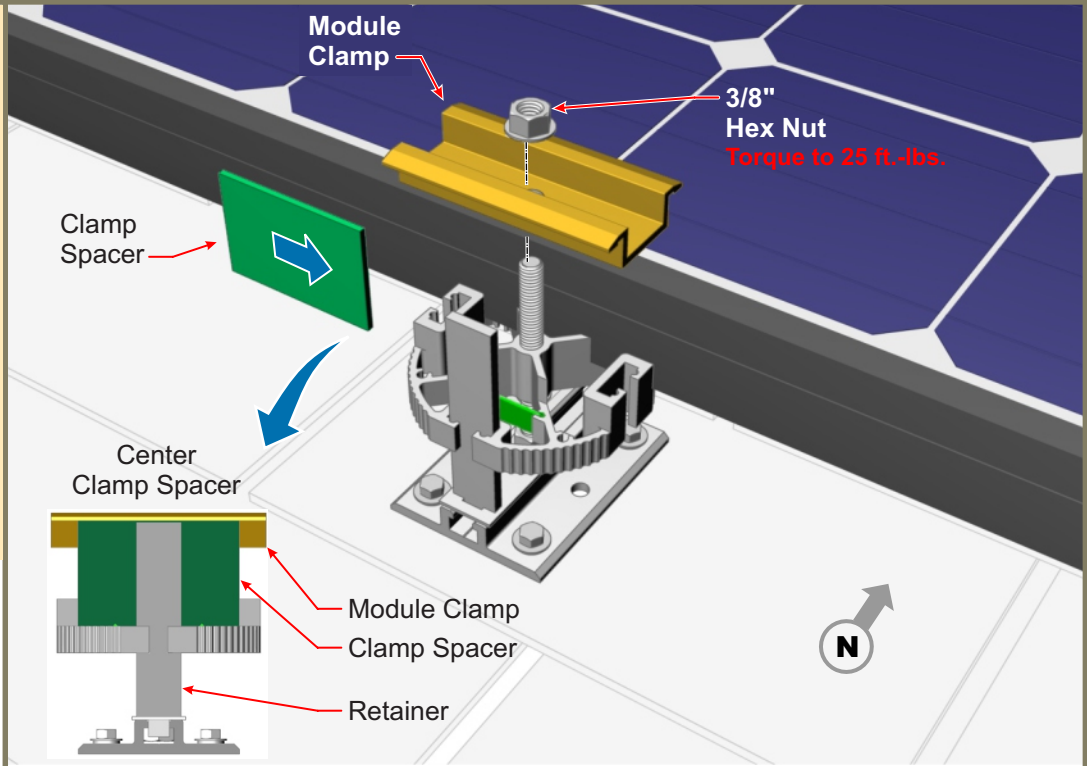


Step 10 Assemble the Outer Module Mounts - Southern Row

Install the Module Clamp, Clamp Spacer and Hex Nut on outer Mounts.

Similarly to the inner Mounts, install the Module Clamp and the Clamp Spacer on the outer Mounts. Position the Spacer within the Module Clamp. Center the Spacer with the Module Clamp.

Before tightening, ensure that the Modules have been aligned and the Clamps tightened on the inner Mounts of the Southern row (see previous step) before securing the Clamps on the outer Mounts of the Southern row.



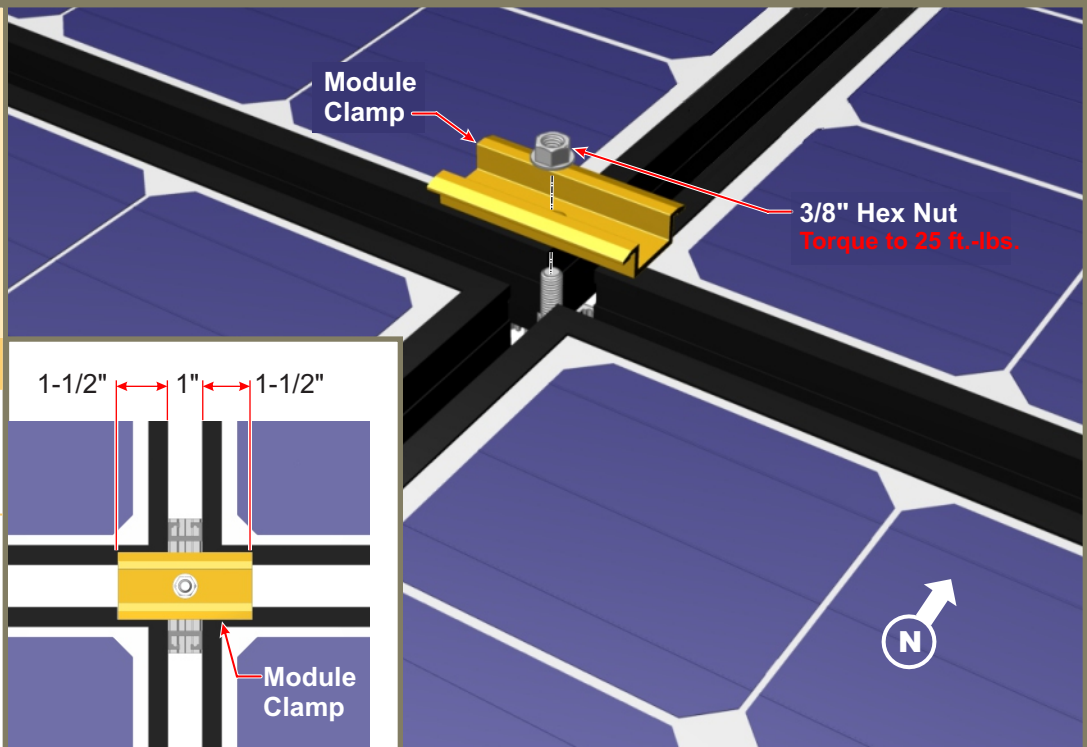
Step 11 Assemble the Inner Module Mounts - Internal Rows

Install the Module Clamp and Hex Nut on the internal Mounts.

Install the next row of the uphill Modules. Ensure that the Modules have been seated against the Mount and there are no gaps between the Modules and the Mounts. Secure with the Clamp and Hex Nut as shown.

NOTE:

The internal Mounts do not use Clamp Spacers, Retainer Brackets or Retainers.



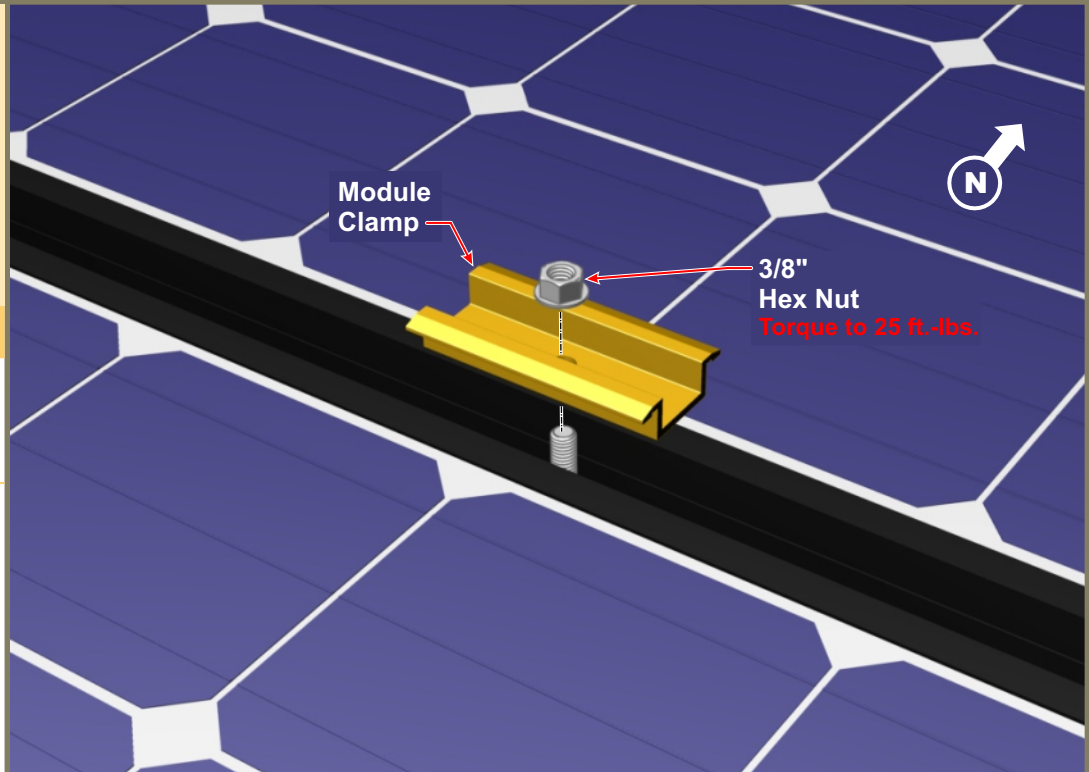
Step 12 Assemble the Outer Module Mounts - Internal Rows

Install the Module Clamp and Hex Nut on outer Mounts.

After securing the inner Clamps, install the outer Mounts. Ensure that the Modules are seated against the Mount and there are no gaps between the Modules and Mounts. Secure with the Clamp and Hex Nut as shown.

NOTE:

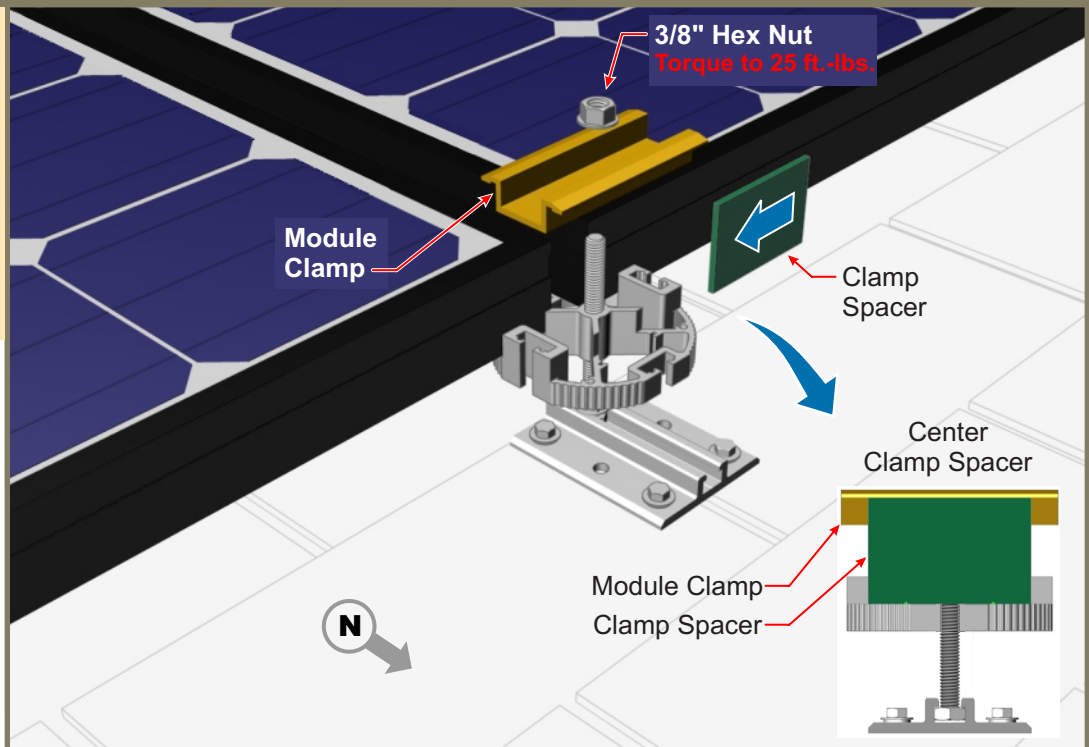
The internal Mounts do not use Clamp Spacers, Retainer Brackets or Retainers.



Step 13 Assemble the Inner Module Mounts - Northern Row

Install the Module Clamp, Clamp Spacer and Hex Nut.

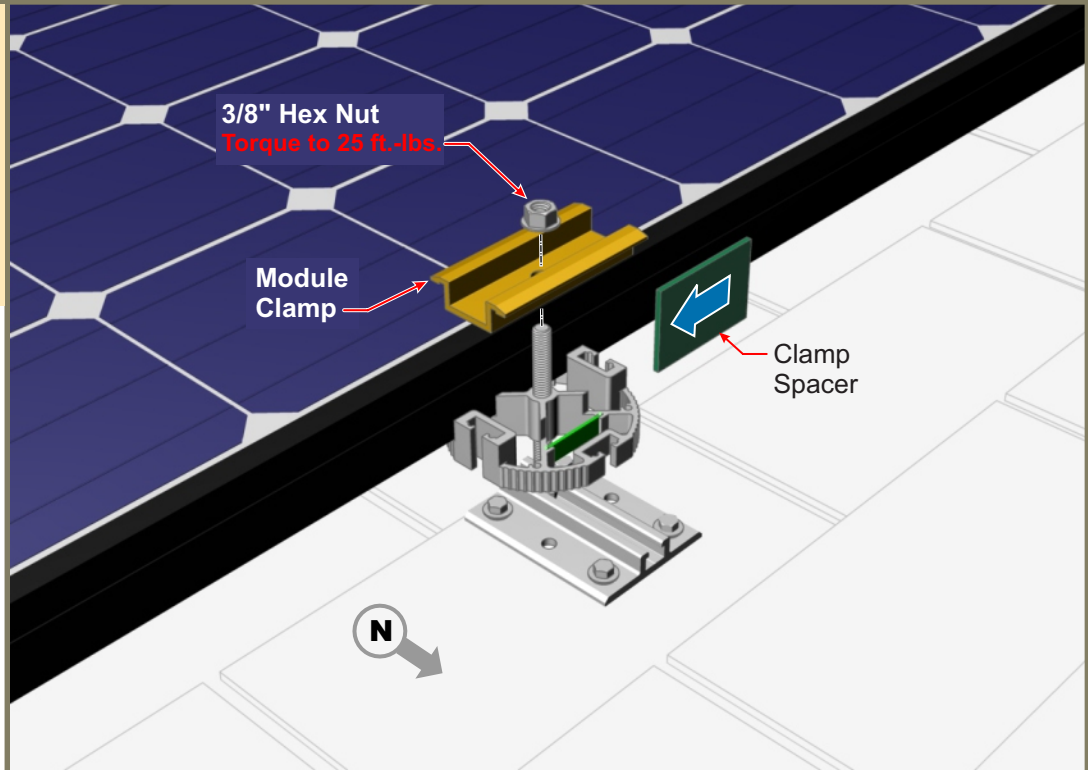
Install the final row of the uphill Modules. Ensure that the Modules have been seated against the Mount and there are no gaps between the Modules and the Mounts. Secure with Clamp and Hex Nut as shown.



Step 14 Assemble the Outer Module Mounts - Northern Row

Install the Module Clamp, Clamp Spacer and Hex Nut.

After securing the inner Clamps, install the outer Mounts. Ensure that the Mounts are seated against the Module and there are no gaps between the Mounts and the Modules. Secure with the Clamp and Hex Nut as shown.

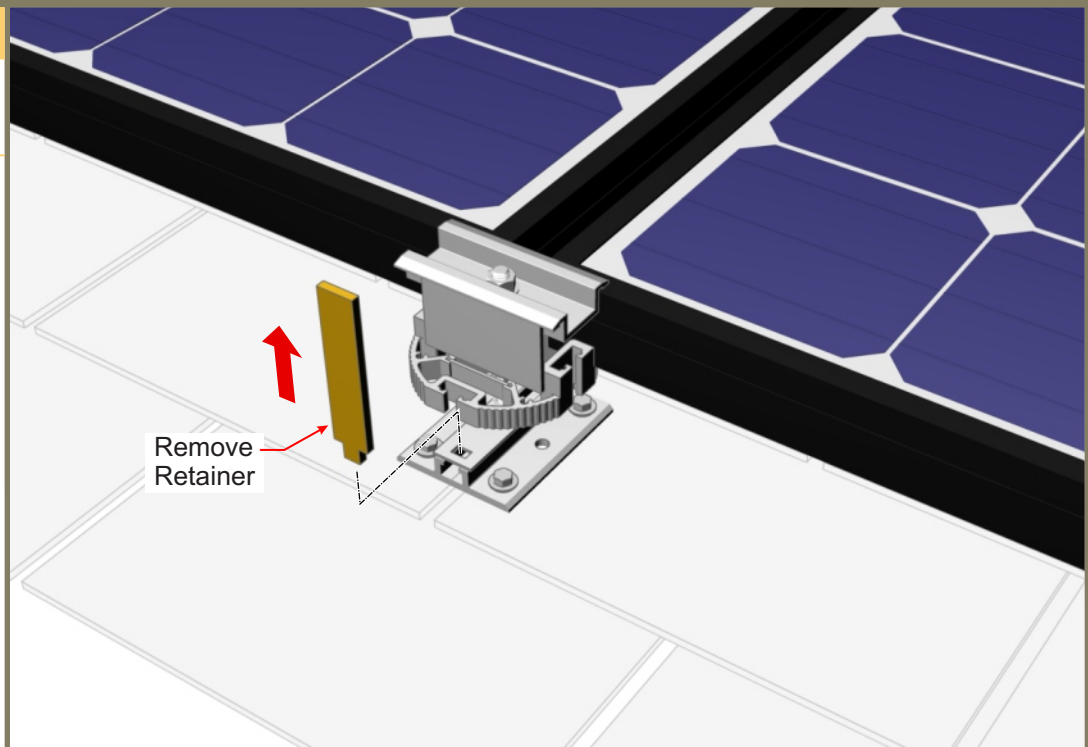


Step 15 Remove the Retainers from the Southern Row

No longer required, the Retainers can be safely removed.

NOTE:

This Step does not apply if Power Trim is being used.



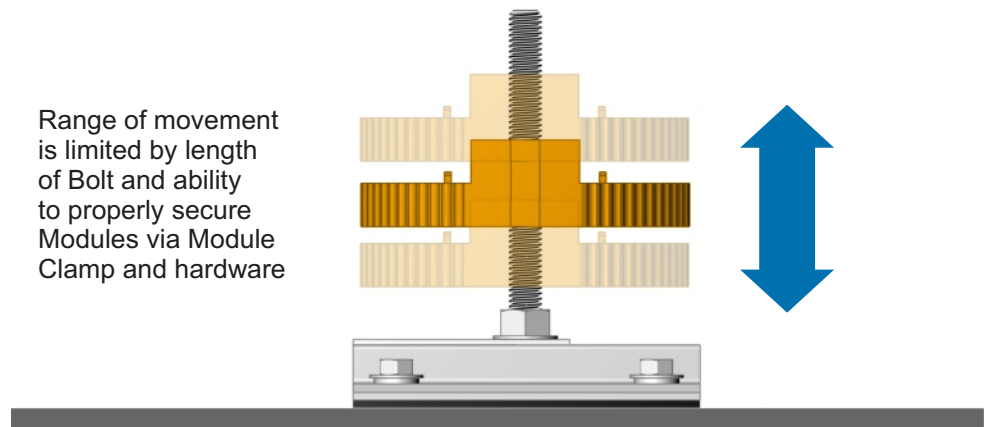
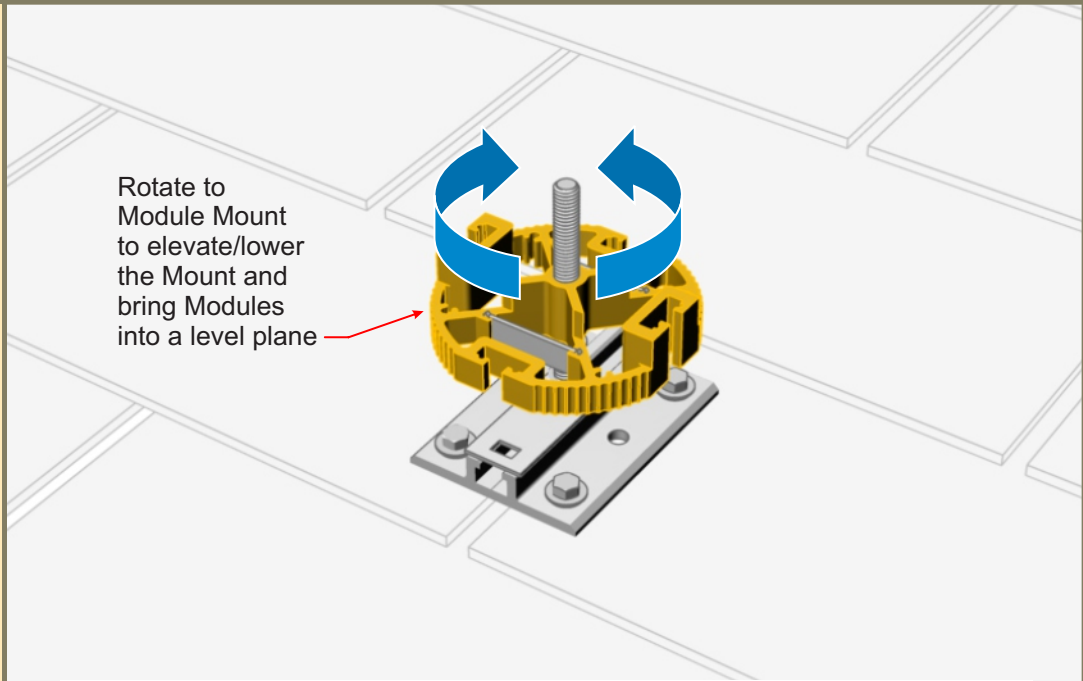
Step 16 Leveling the Array

Roof undulations can be handled with elevation adjustments.

Visually sight over the array looking for any highs/lows. If necessary, adjust the Module Mounts to raise/lower the Modules and level the plane of the Modules.

The Module Mounts can be threaded up/down on the 4" Bolt to modify elevations as needed.

1. Remove the Nuts and the Module Clamps securing the affected Module to allow movement of the Module and to gain access to the Module Mount.
2. Remove or temporarily raise the affected Module.
3. Grasp the outer grooved ring of the Mount and rotate the Mount in the appropriate direction to raise or lower the Module.
4. Reposition the Module(s) and secure with the Module Clamp and hardware; torque to specifications. Refer to previous steps as needed to re-install components.

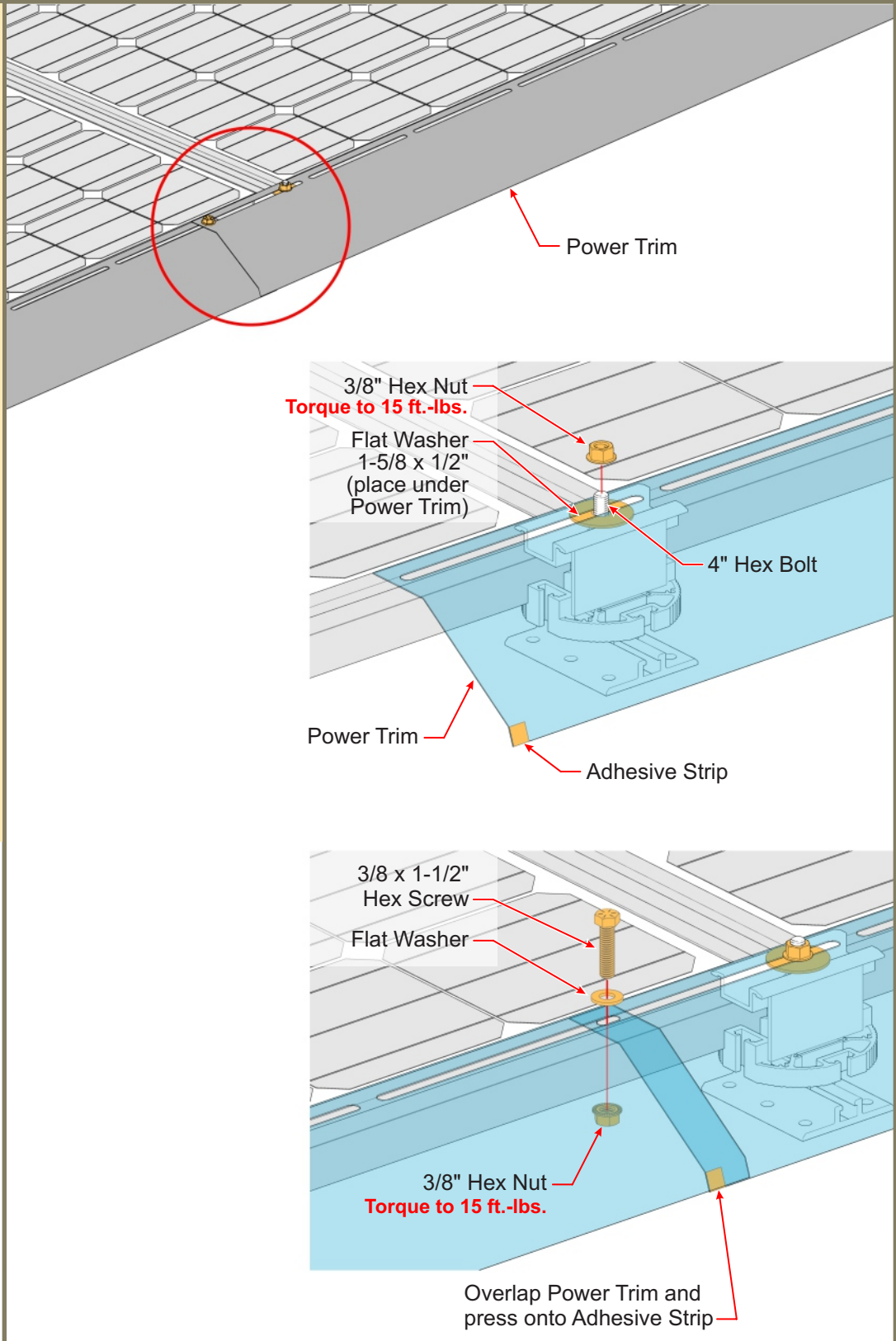


Step 17

Installing Power Trim - Southern edge of Array

Power Trim is secured to Mid Clamps and Adjacent Power Trim

1. Place Flat Washer over exposed 4" Hex Bolts of the Power Disk and rest on the Mid Clamp.
2. Install the Power Trim as shown and secure with Hex Nut.
3. On overlapping sections, peel away backing and affix Adhesive Strip flush to the corner-bottom edge of the Power Trim.
4. Peel away paper on exposed Adhesive Strip.
5. Position the next Power Trim section by overlapping adjacent section. Secure to adjacent section using Hex Screw, Flat Washer and Hex Nut.
6. Join the bottom edges of the two sections of Power Trim by pressing them together at the location of the Adhesive Strip.



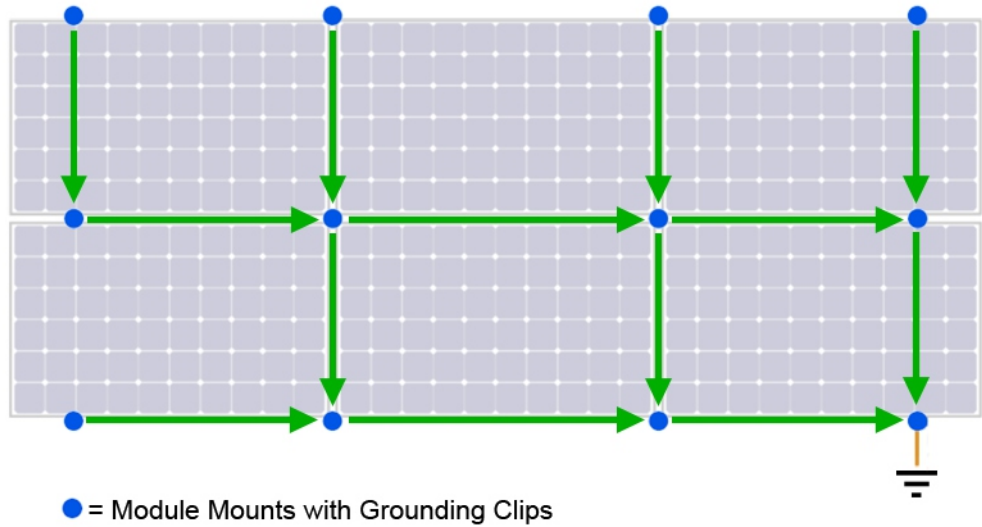
APPENDIX A

System Grounding

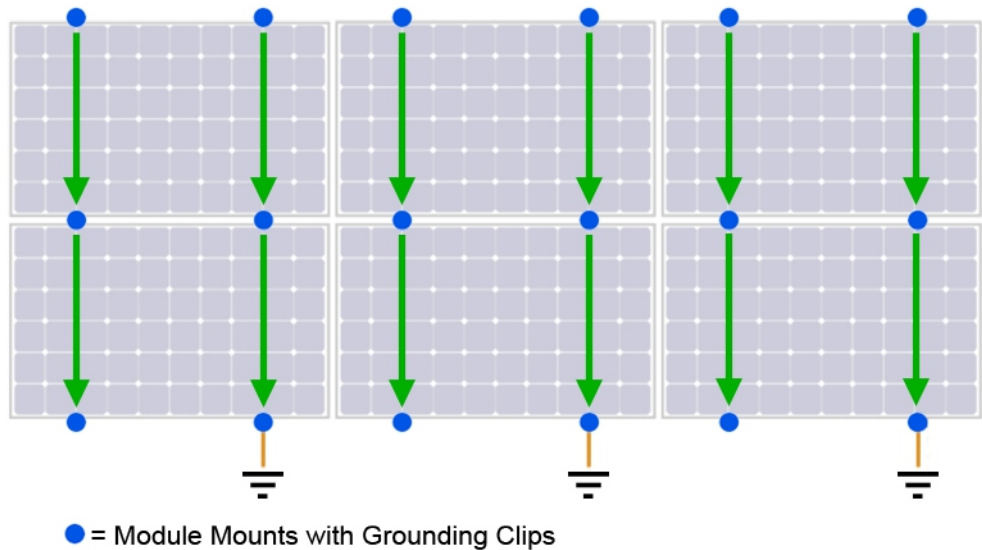
Bonding via Module Mounts and Module Frames

Each structure or group of bonded structures is to be connected to an equipment ground or earth ground via an NEC approved wire conductor. The copper wire conductor may be connected to the structure at any one of the PV Module Mounts (see below right) using an approved grounding lug.

Grounding Path - Corner Mount



Grounding Path - Edge Mount

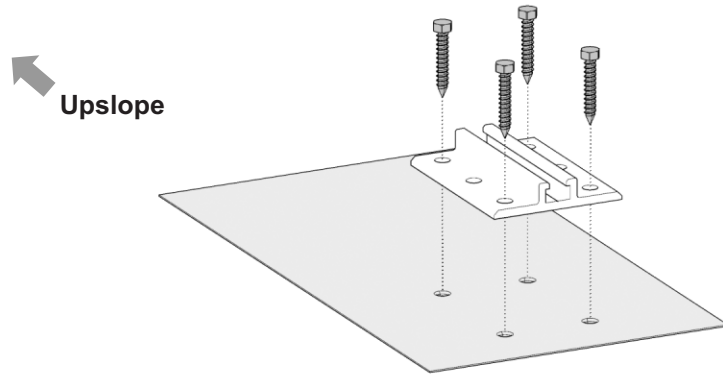


APPENDIX B

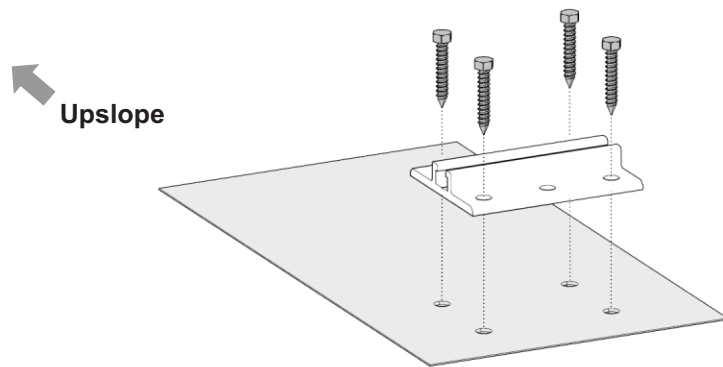
Using Flashing - Three Configurations Available

Optional item, not used on all systems.

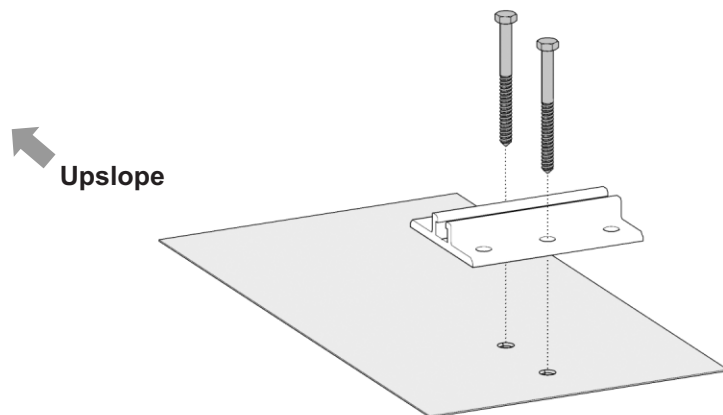
To install Flashing, lift upper shingle and insert a minimum of seven vertical inches of the upper edge of the Flashing under the shingle.



Part No. 5801342 Base mounts in vertical orientation with four roof screws



Part No. 5801346 Base mounts in horizontal orientation with four roof screws



Part No. 5801344 Base mounts in horizontal orientation with two lag screws directly into roof joists

APPENDIX C

Compatible Modules

These Modules meet the UL2703 Standard

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.

Manufacturer	Frame Thickness	Model
Boviet	40 mm	BVM6610P-xxxW, BVM6610P-xxxBW, BVM6610P-xxxBB
Canadian Solar	40 mm	CS6P-250P, CS6P-255P, CS6P-260P, CS6P-260P-SD, CS6P-265P, CS6P-265P-SD, CS6P-270P
Hanwha	32 mm	Q-Cells: HSL60, HSL72
Heliene	40 mm	60P-MIM
Kyocera	46 mm	KU250-6BCA, KU255-6BCA, KU260-6BCA, KU265-6BCA
LG	35 mm	LG300N1C-G3, LG305N1C-G3, LG310N1C-G3
	36 mm	LG365N2W-B3, LG375N2W-B3
	40 mm	LG320N1C-G4, LG325N1C-G4, LG 335N1C-G4, LG340N1C-G4
	46 mm	LG375N2W-G4
REC Solar	35 mm	REC265TP, REC270TP, REC275TP, REC280TP, REC285
	38 mm	REC240PE, REC245PE, REC250PE, REC255PE, REC260PE, REC265PE, REC270PE
Silfab	38 mm	SLA260M, SLA265M, SLA270M, SLA275M, SLA280M, SLA285M, SLA290M, SLA295M, SLA300M
Solar World	31 mm	SW280 31mm
	33 mm	SW280, 285, 290, 295, 300 33 mm, SW 320 XL 33mm FR, SW 325 XL 33mm FR, SW 330 XL 33mm FR, SW 335 XL 33mm FR, SW 340 XL 33mm FR, SW 345 XL 33mm FR, SW 350 XL 33mm FR
Suniva	38 mm	OPT-275-60-4-100, OPT-280-60-4-100, OPT-285-60-4-100, OPT-290-60-4-100, OPT-295-60-4-100, OPT-300-60-4-100
Sunpower	46 mm	SPR-327NE-WHT-D, SPR-333NE-WHT-D, X21-335-BLK, X21-345-BLK
Suntech	50 mm	STP270-24/Vd, STP275-24/Vd, STP280-24/Vd, STP285-24/Vd, STP290-24/Vd, STP295-24/Vd, STP300-24/Vd, STP305-24/Vd
Topoint Solar	35 mm	JTM185-72M, JTM190-72M, JTM195-72M, JTM200-72M
Trina	40 mm	TSM-290PD14, TSM-295PD14, TSM-300PD14, TSM-305PD14, TSM-310PD14, TSM-315PD14, TSM-320PD14, TSM-325PD14



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