

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 of 110 mph with a minimum setback of 3 feet on buildings ≤30 feet in height. Consult load charts/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@dpwsolar.com

WARNING

1. DPW Solar 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 DPW's scope. DPW Solar's 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. DPW Solar offers no liability/warranty on any racks not

installed to the approved layout by DPW Solar. Furthermore, DPW Solar 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.



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Before You Start

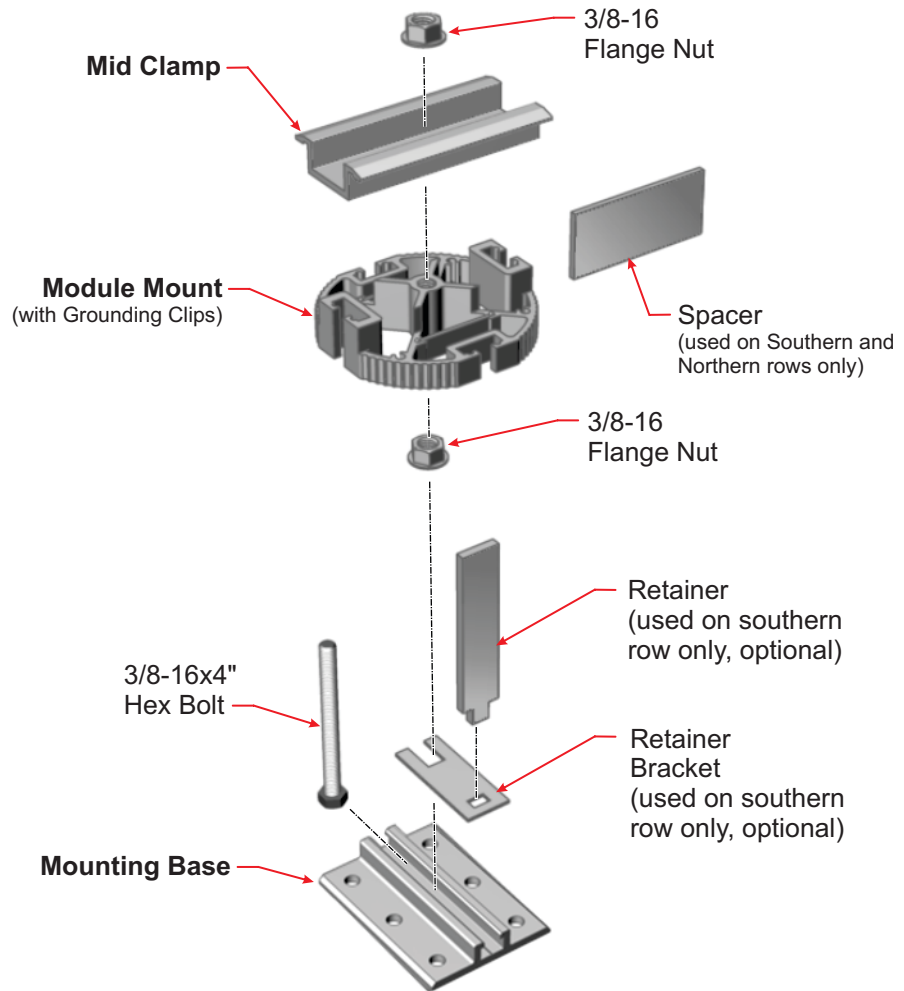
The Components

Primary components: Mid Clamp, Module Mount, and Mounting Base

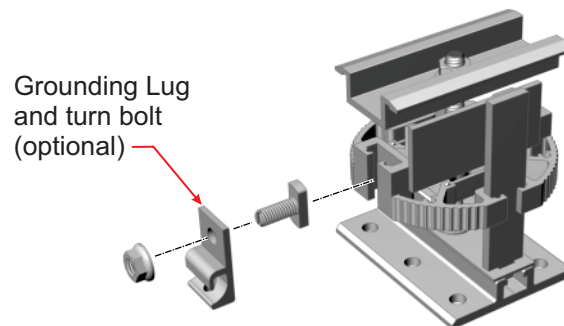
Required Tools:

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

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



Grounding Option



Before You Start

Snap Chalk Lines - Corner Mounting

Measure with care, keep the lines square and accurate.

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.

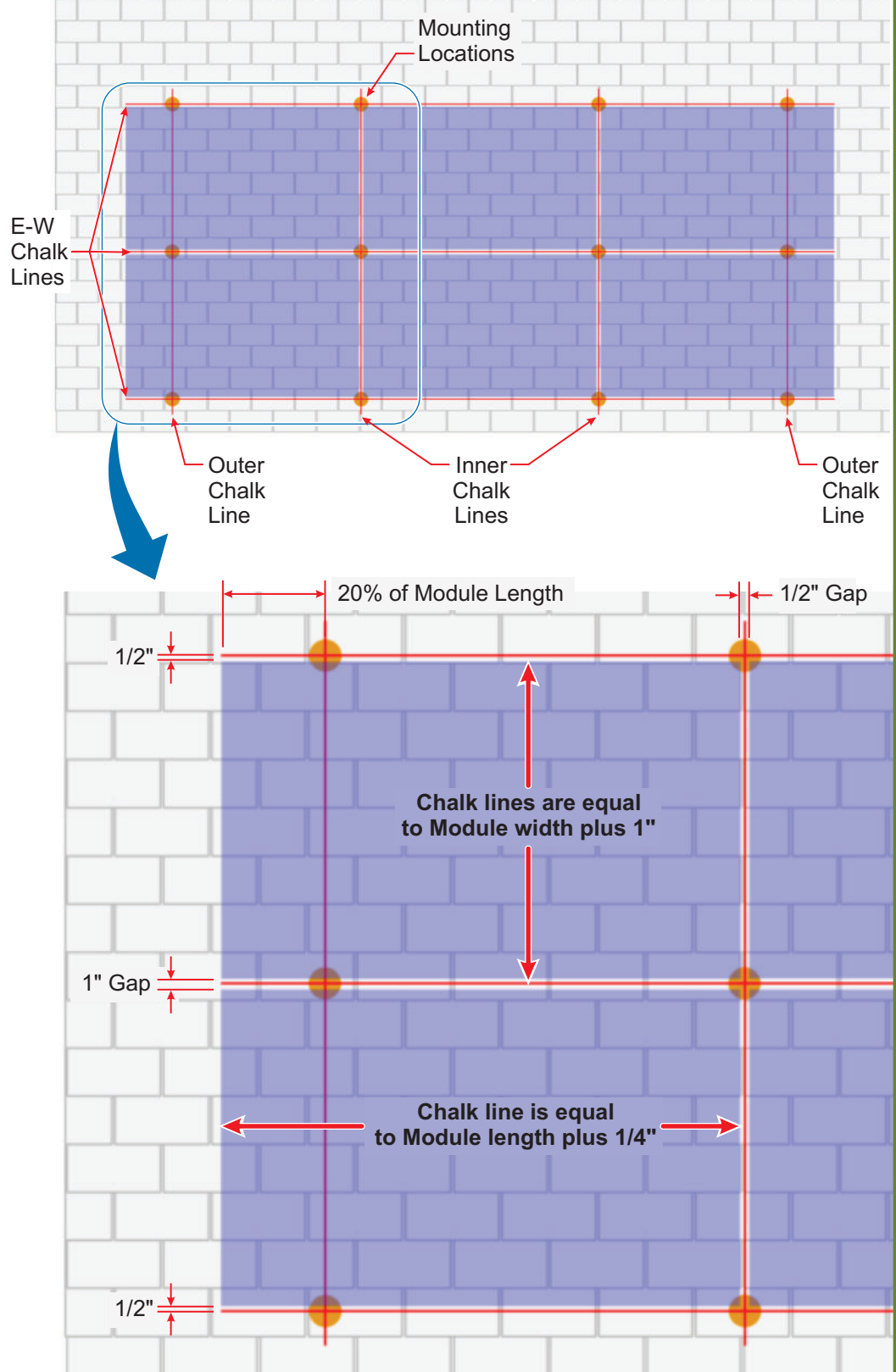
Inner chalk lines are marked leaving a 1/2" gap between Modules (Module length plus 1/4").

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.



Before You Start

Snap Chalk Lines - Edge Mounting

Measure with care, keep the lines square and accurate.

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.

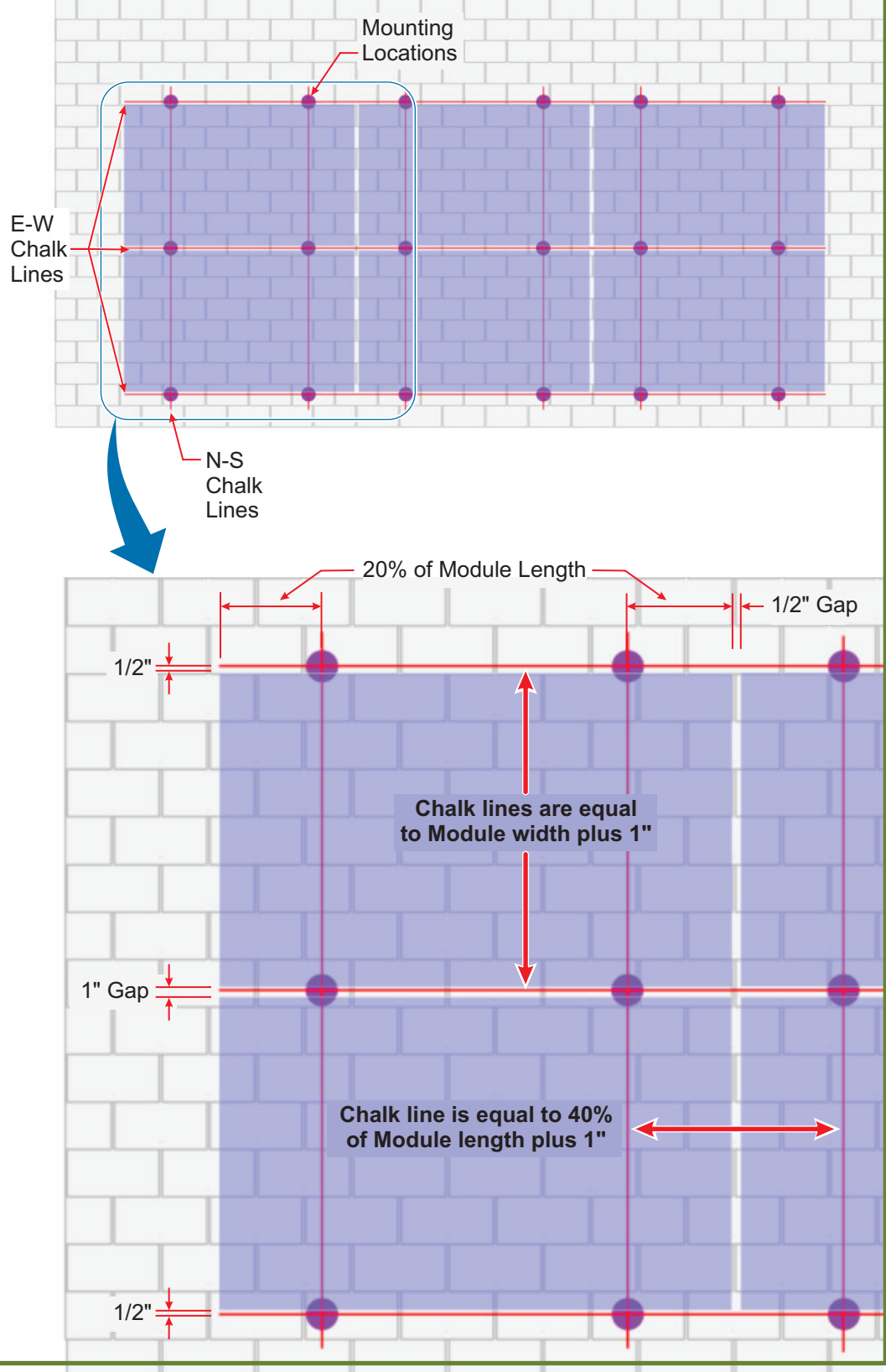
N-S chalk lines are marked at a distance equal to 20% of the Module length (0.2 x Module length). Additionally an allowance for a 1/2" gap between Modules must be factored into the layout (Module length plus 1/2").

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 DISK's 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.



Step 1

Attach the Mounting Bases to the Roof

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

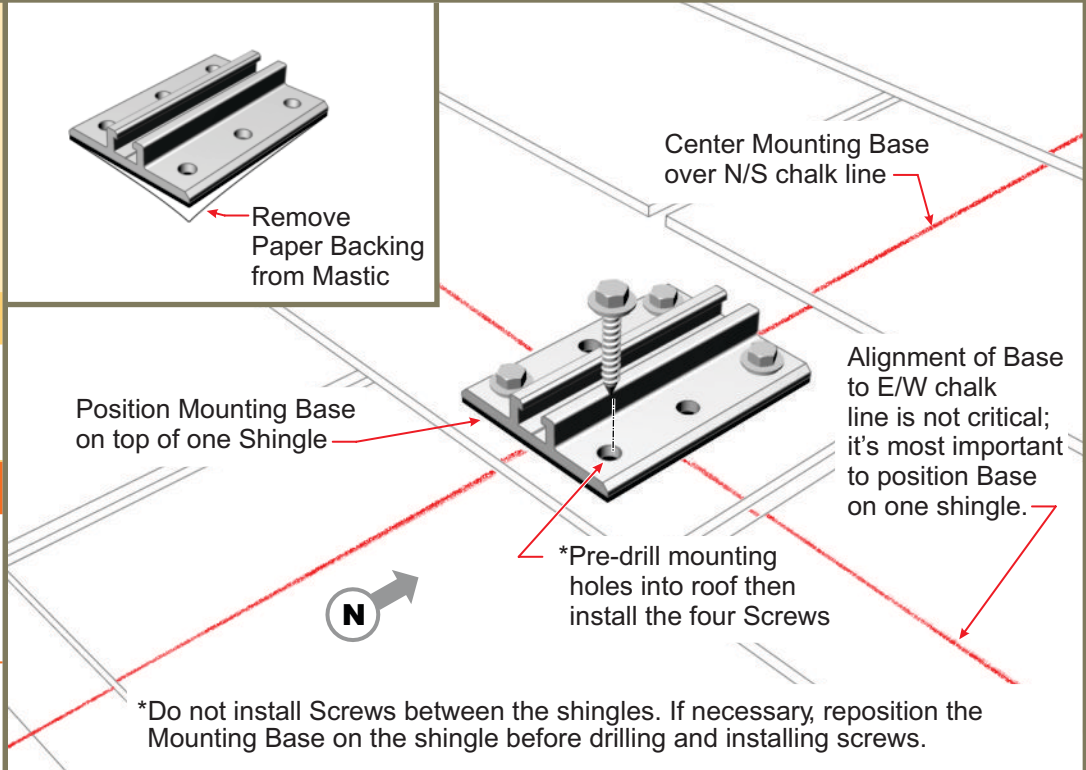
Position Mounting Base over one shingle and center over N/S chalk line. Attach with either 1-1/2" Deck Screws or 2-1/2" Lag Screws. For either, drill an appropriate sized pilot hole, prior to installing the screws.

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

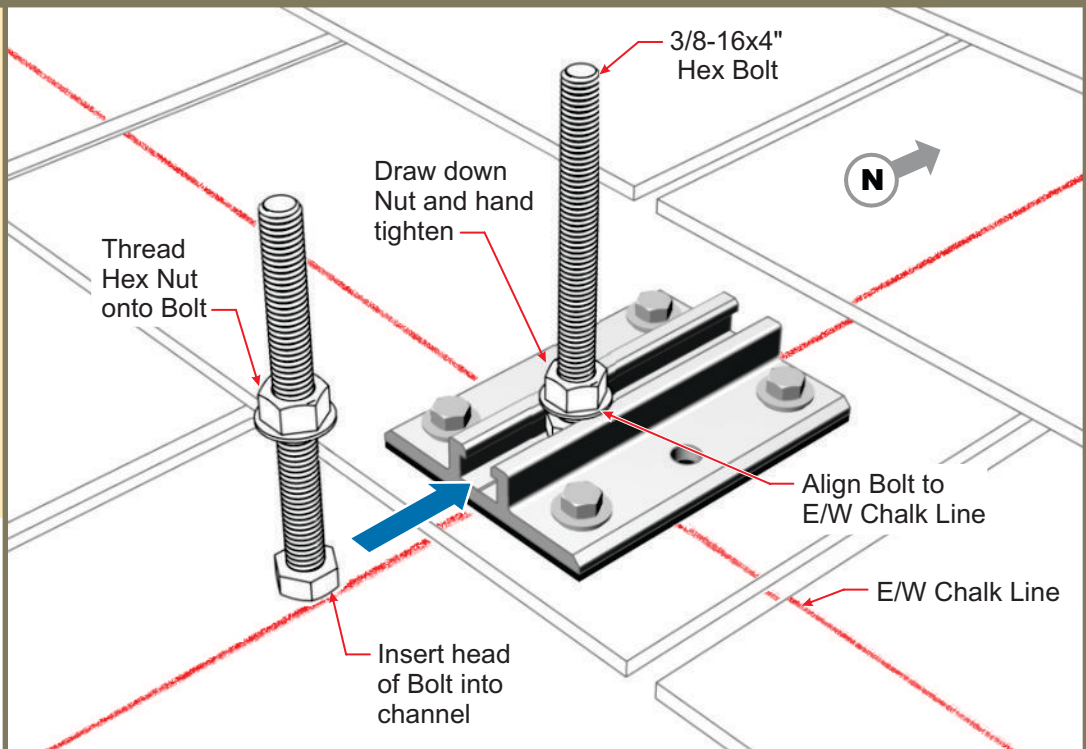
Install a 4" Hex Bolt

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

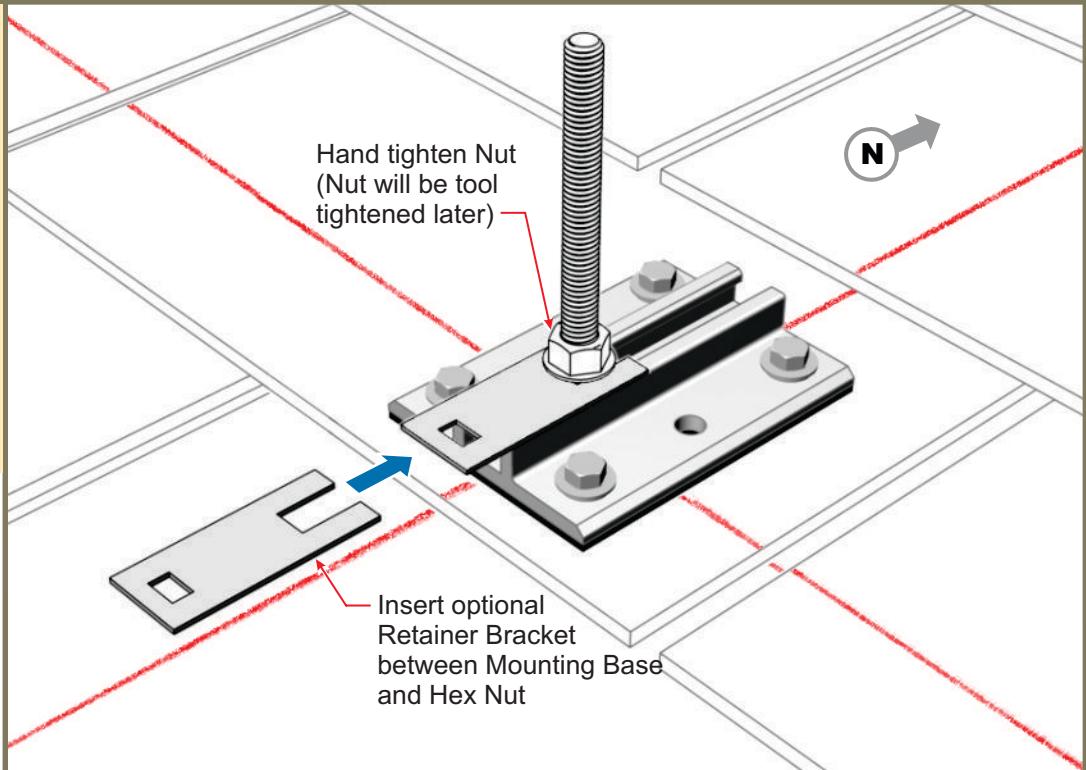
Insert the Retainer Bracket - Southern Row Only

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.



Step 4

Align the 4" Bolts on the Southern Row

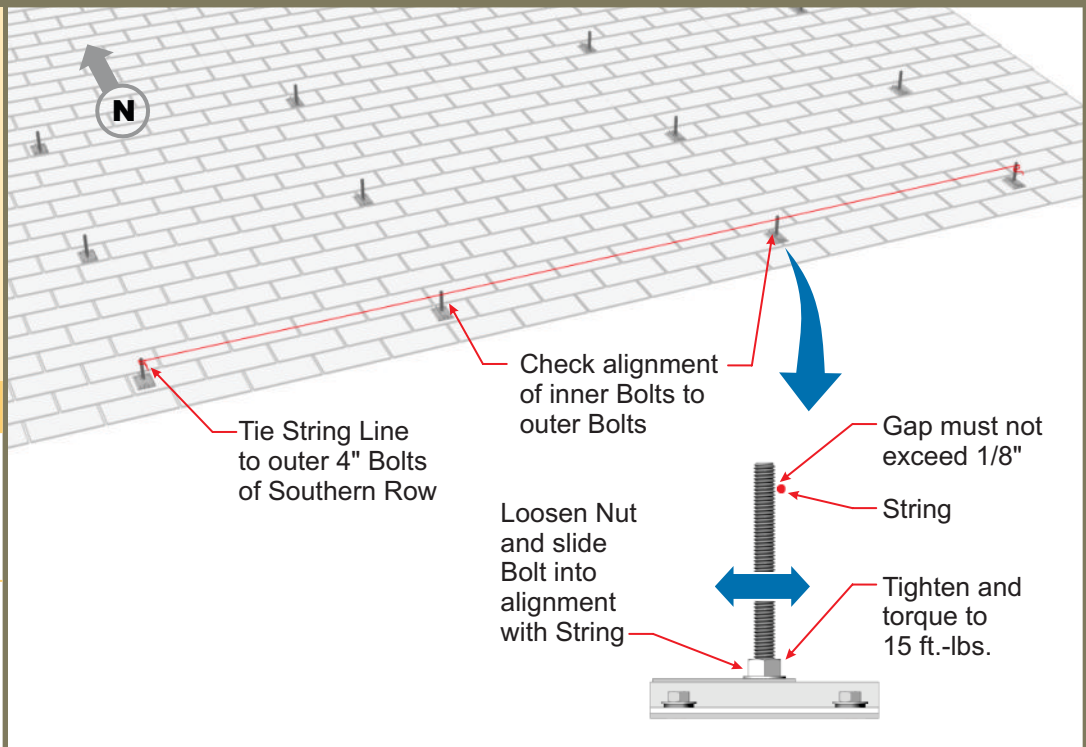
Use a string line and establish a baseline for the array alignment

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.

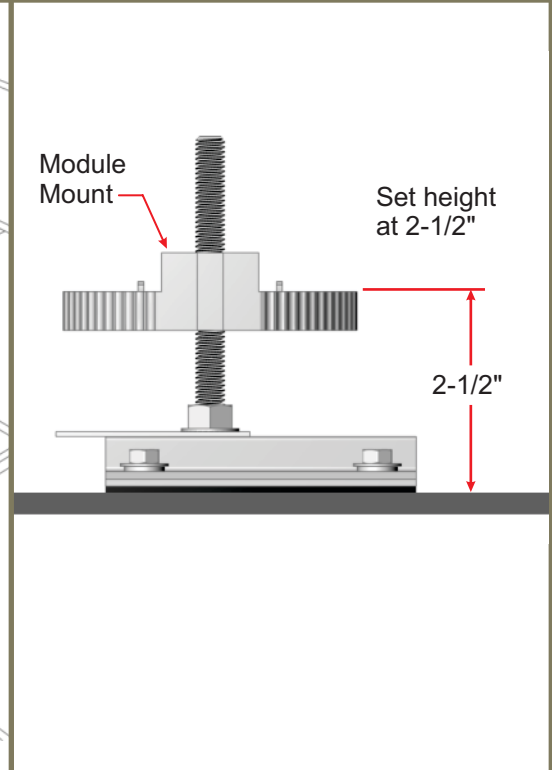
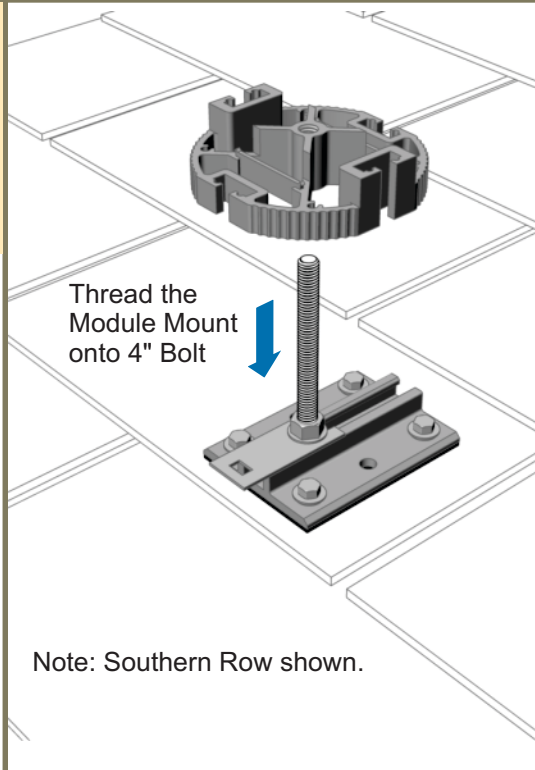
NOTE:

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



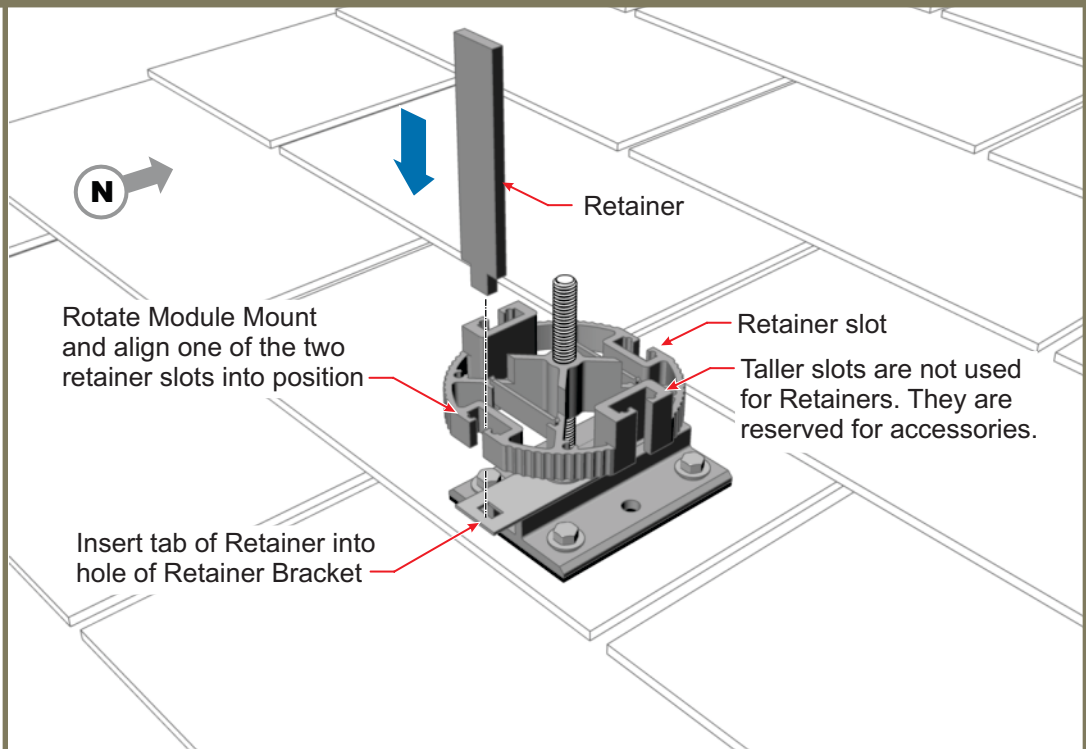
Step 5 Thread the Module Mount onto each of the 4" Bolts Position the Module Mount 2-1/2" above the roof top

Setting the Module Mount at 2-1/2" above the roof surface leaves room for adjustments (up/down) that may be needed to level the plane of Modules due to roof undulations.



Note: Southern Row shown.

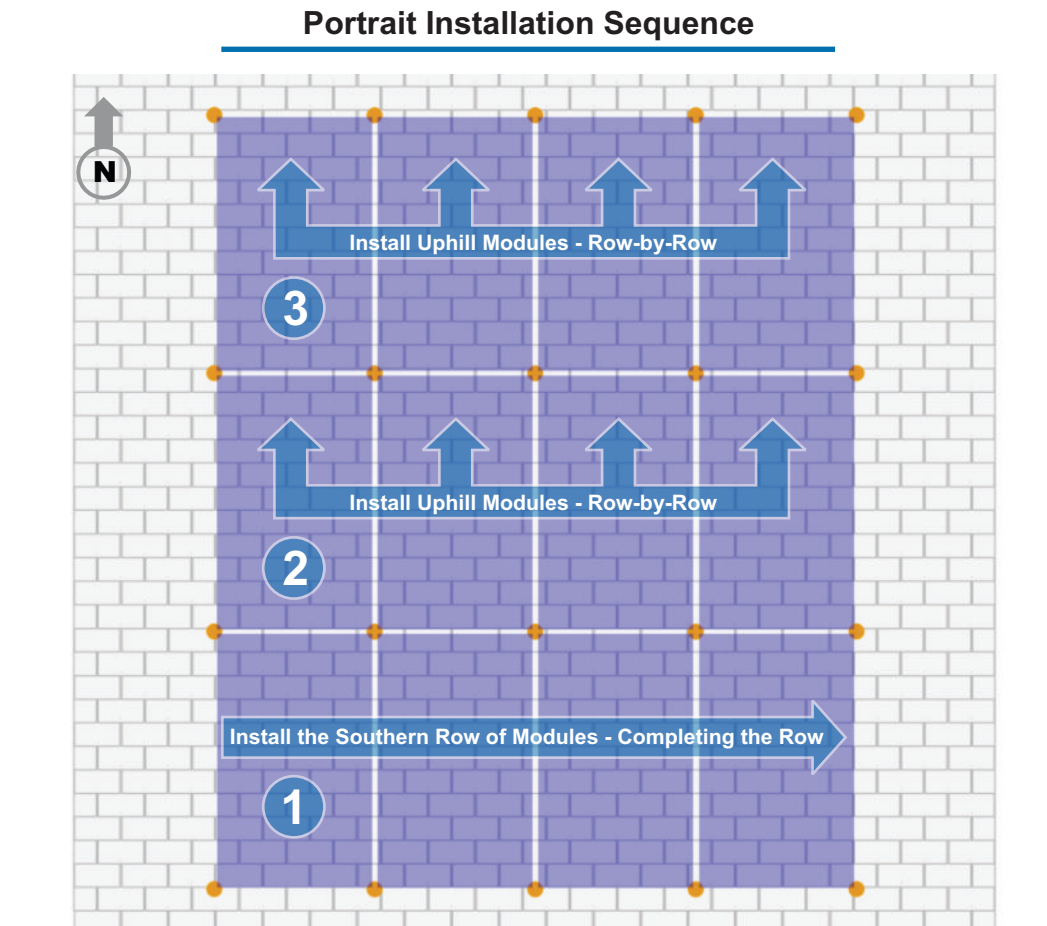
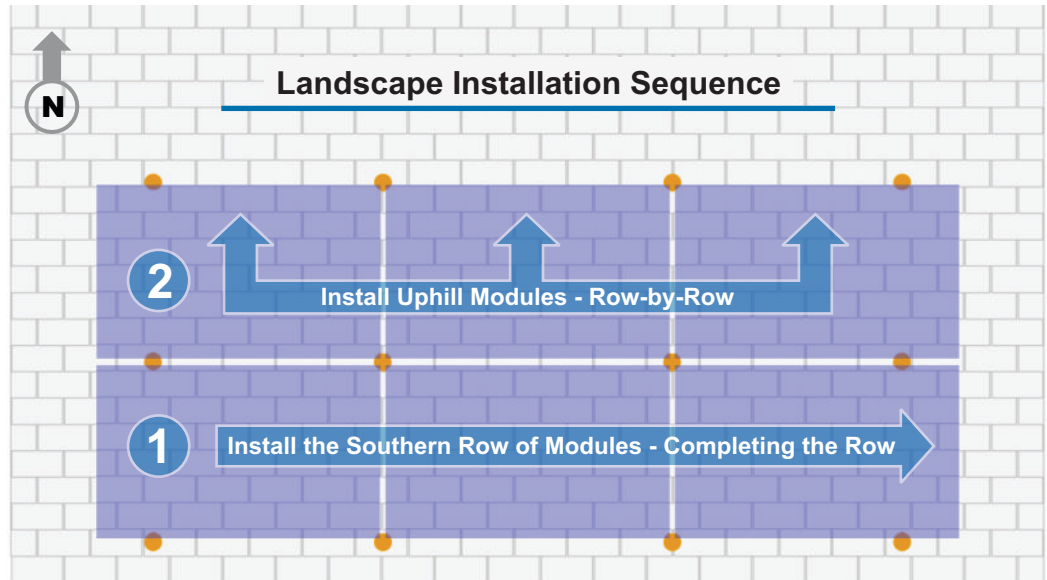
Step 6 On Southern Row only, install the optional Retainers Retainers lock and hold the Module Mounts in position



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.



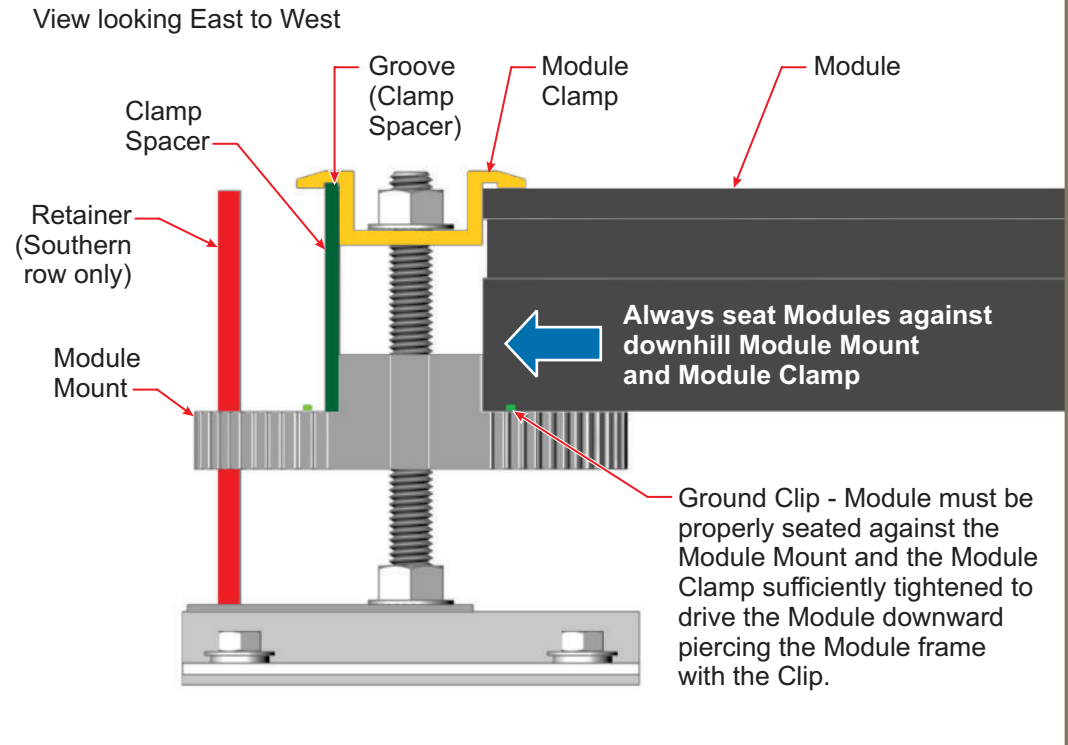
Tips!

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.

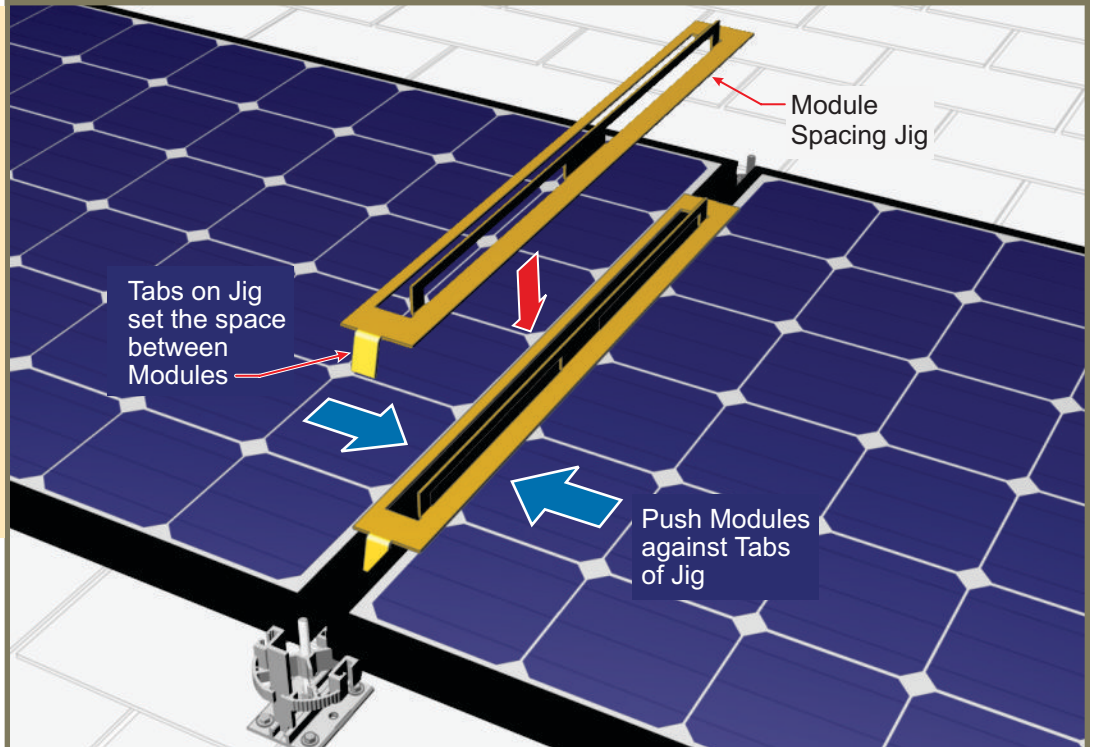


Using the optional Module Spacing Jig

Jig sets the gap between the Modules while also squaring and aligning the Modules.

To set the gap between Modules, use the Module Spacing Jig. Place the Jig between the two Modules and push the second Module up against the tabs of the Jig to set the gap.

When aligning the Modules to the Mounts & Clamps, keep the Jig in place. The Jig will maintain the gap between Modules and be useful in accurately centering that gap to the Module Clamp.



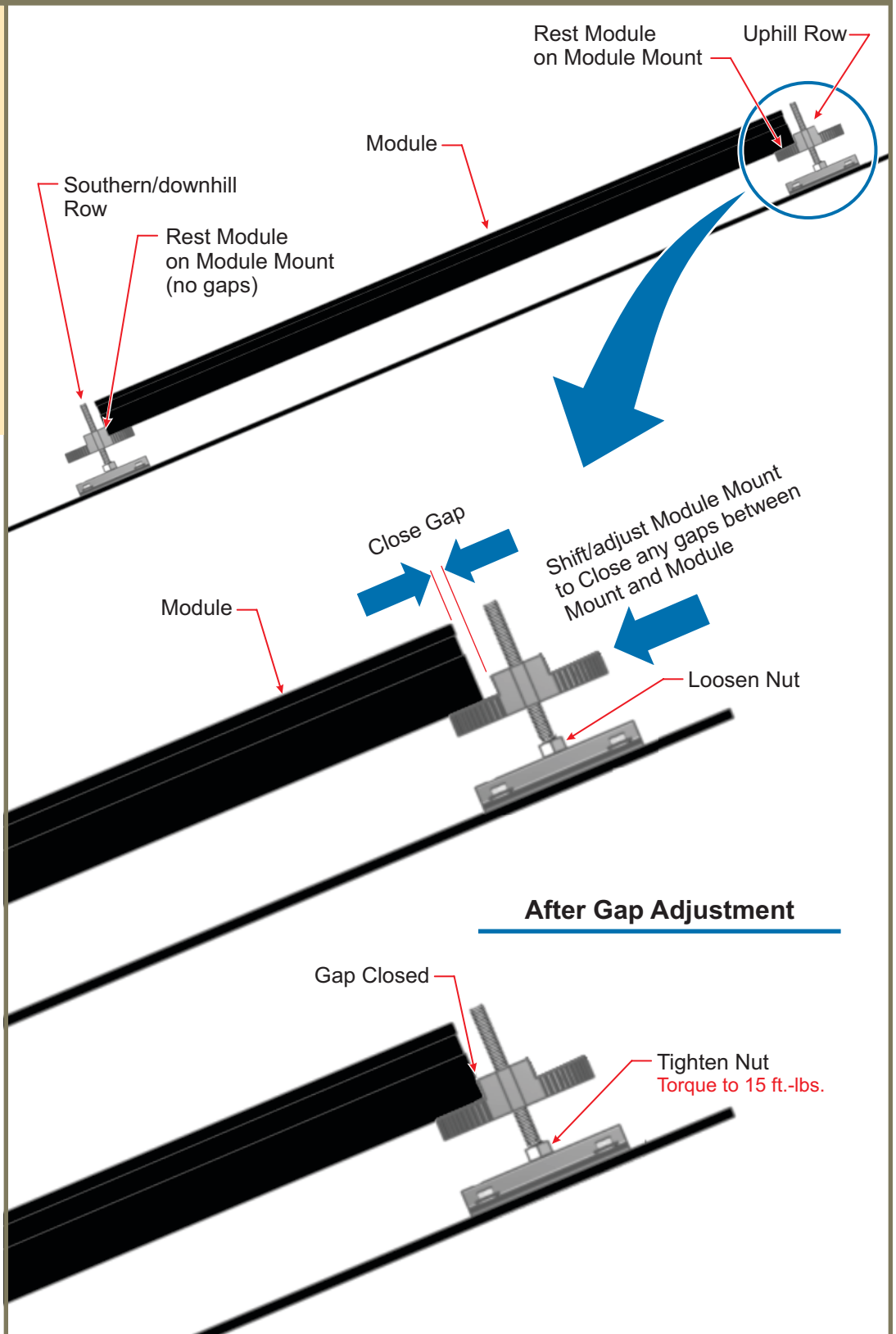
Step 8

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:

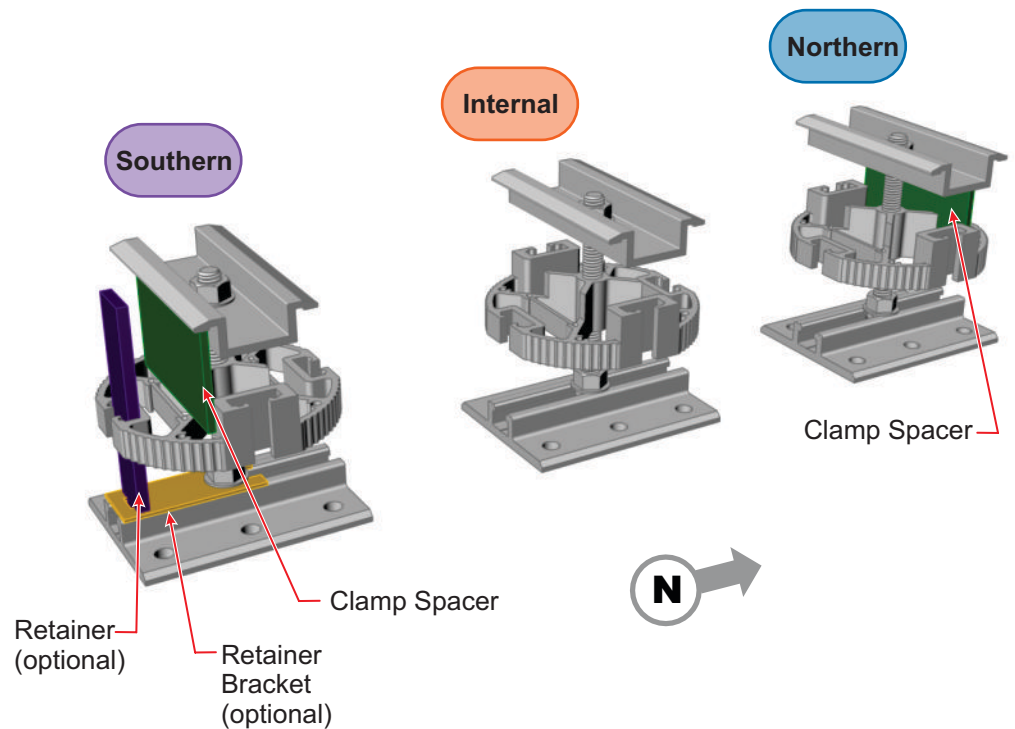
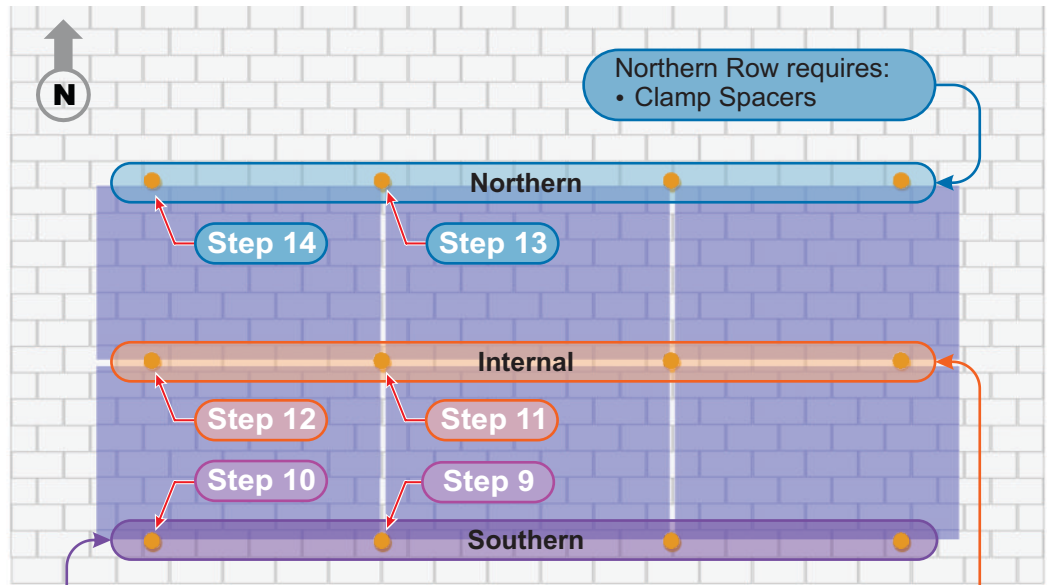
- Southern row
- Internal row(s)
- Northern row

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.

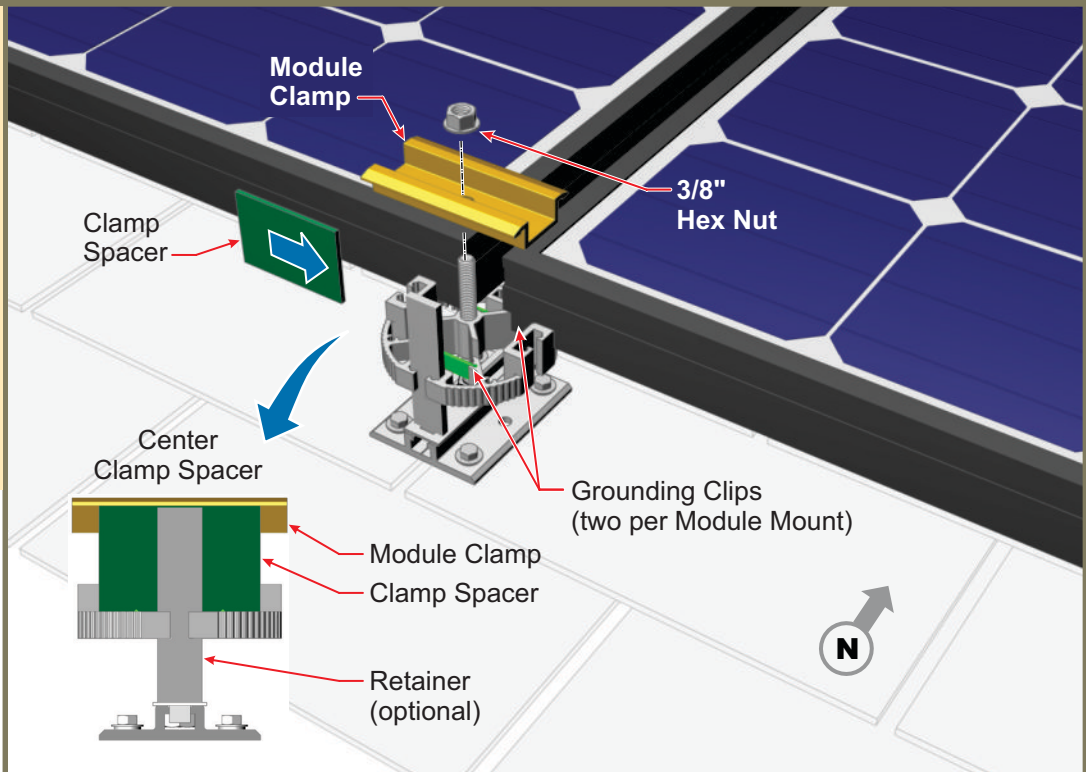


Step 9

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)

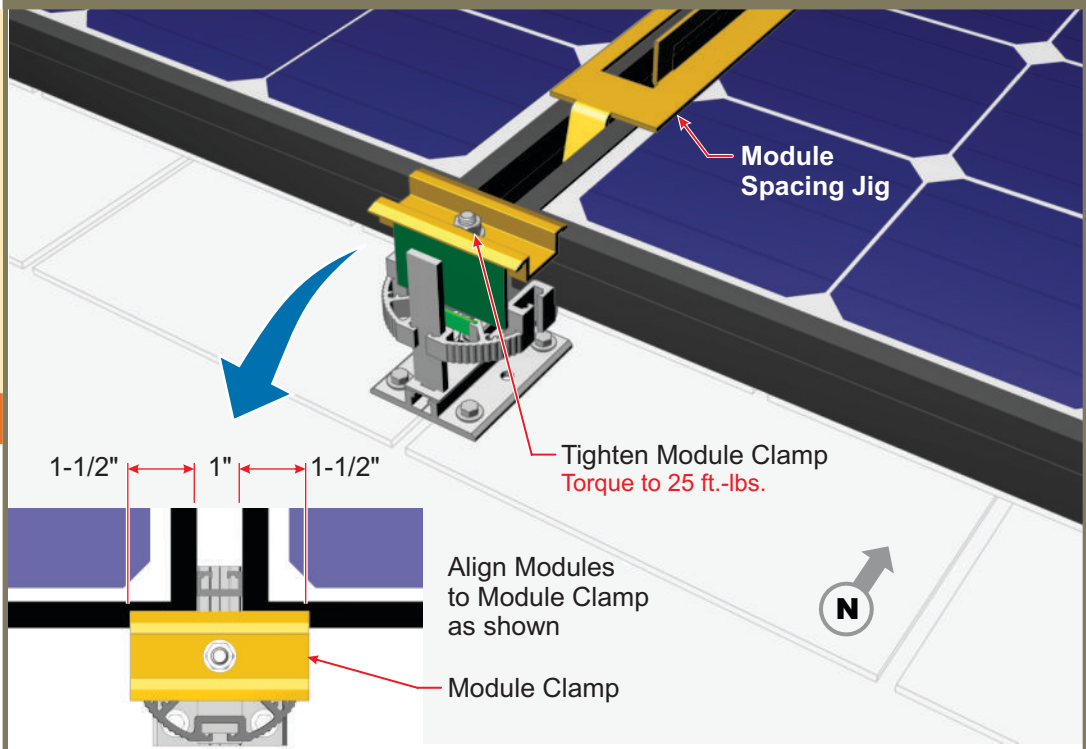


Align the Modules to the Clamp and Secure the Clamp Use Jig to set spacing and carefully align the Modules to the Module Clamp.

Using the Module Spacing Jig, carefully 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.



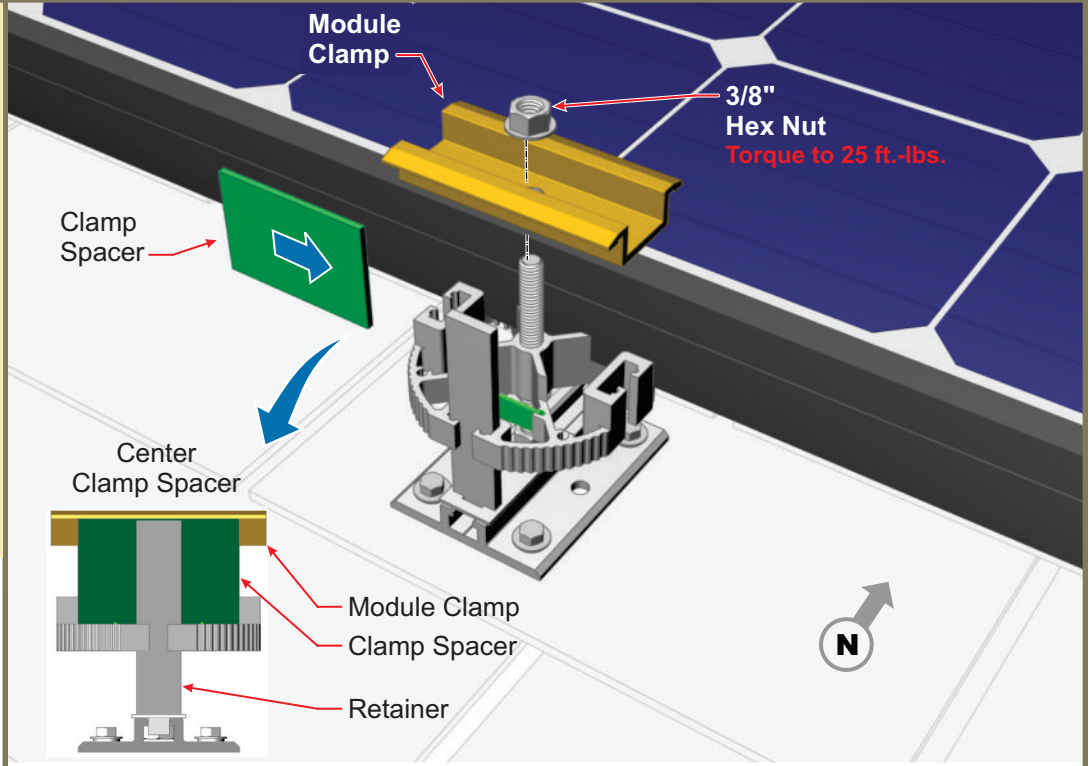


Step 10 Assemble the Outer Module Mounts - Southern Row

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.



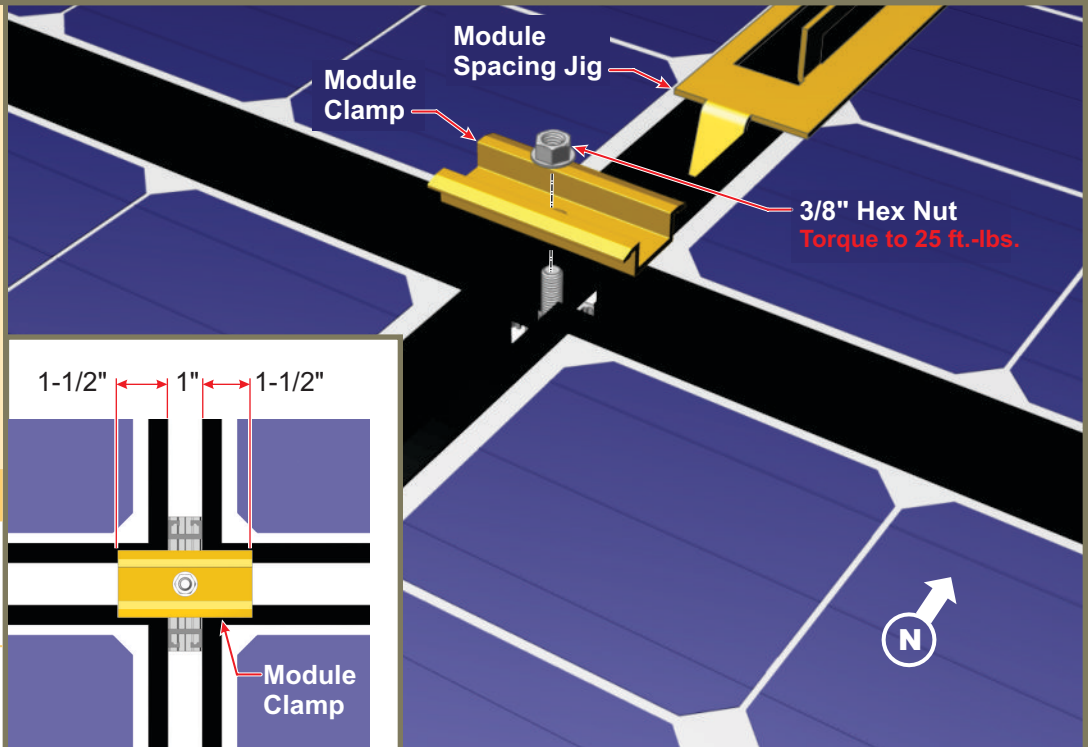
Step 11 Assemble the Inner Module Mounts - Internal Rows

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

Install the next row of the uphill Modules. Again, utilize the Module Spacing Jig to set the gap between Modules and then align the Modules to the Clamp. 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.



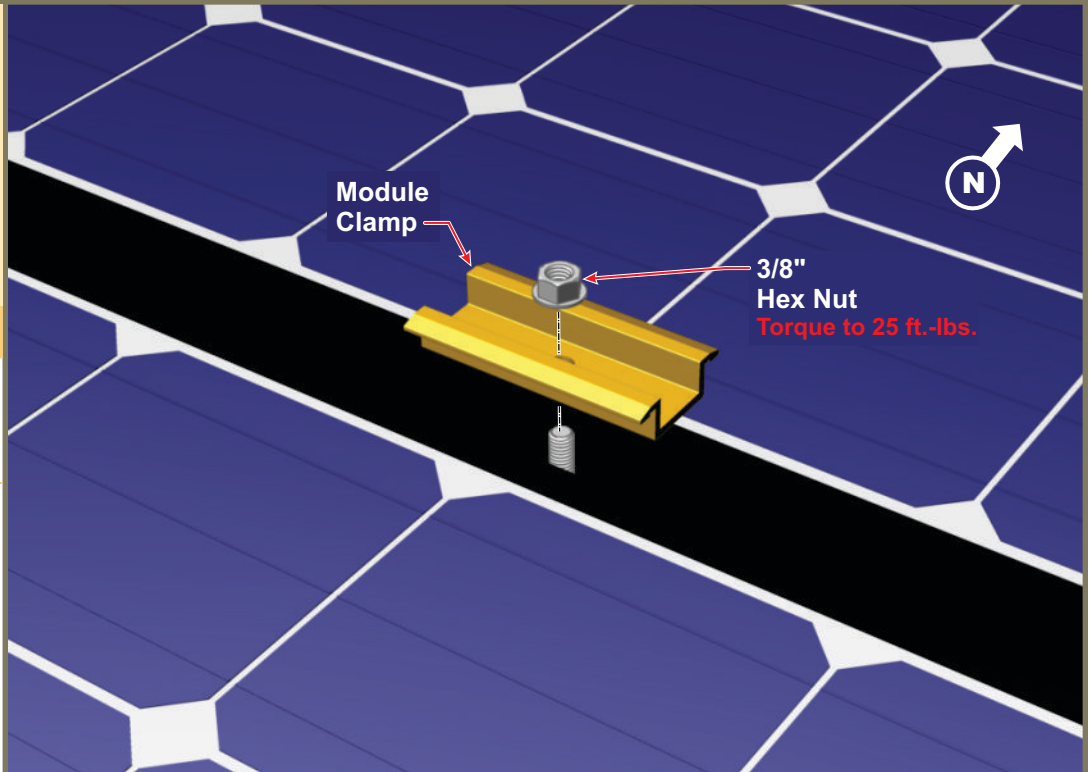
Step 12 Assemble the Outer Module Mounts - Internal Rows

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:

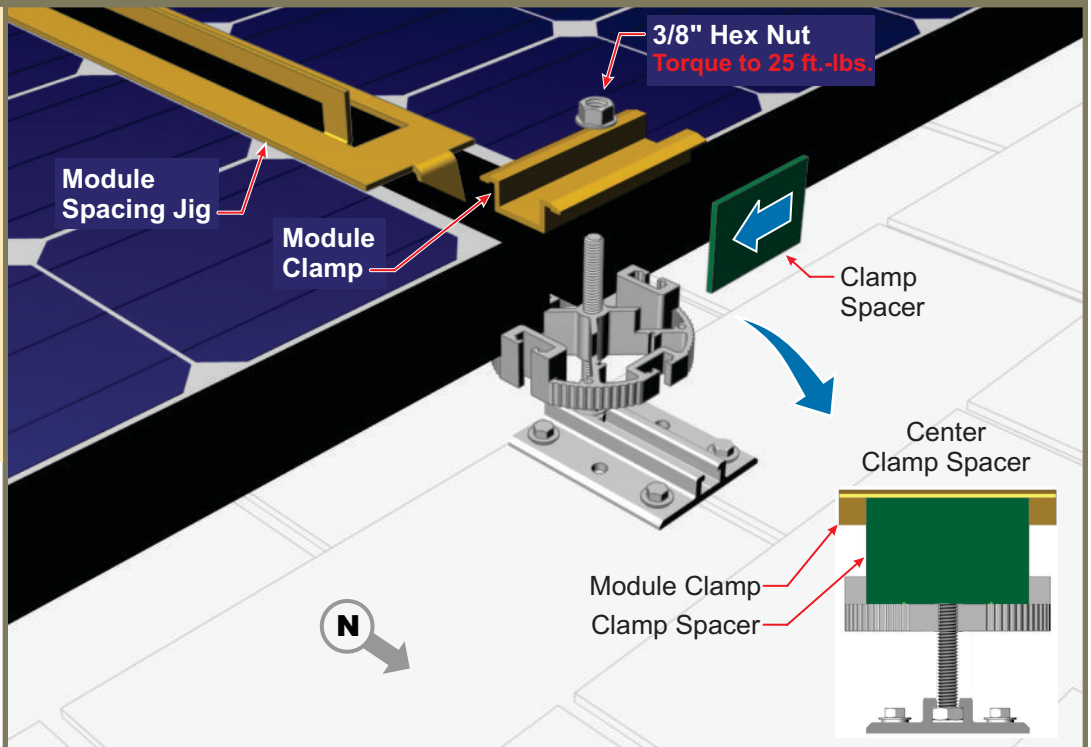
The internal Mounts do not use Clamp Spacers, Retainer Brackets or Retainers.



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. Again, utilize the Module Spacing Jig to set the gap between the Modules and the align the Modules to the Clamp. 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.

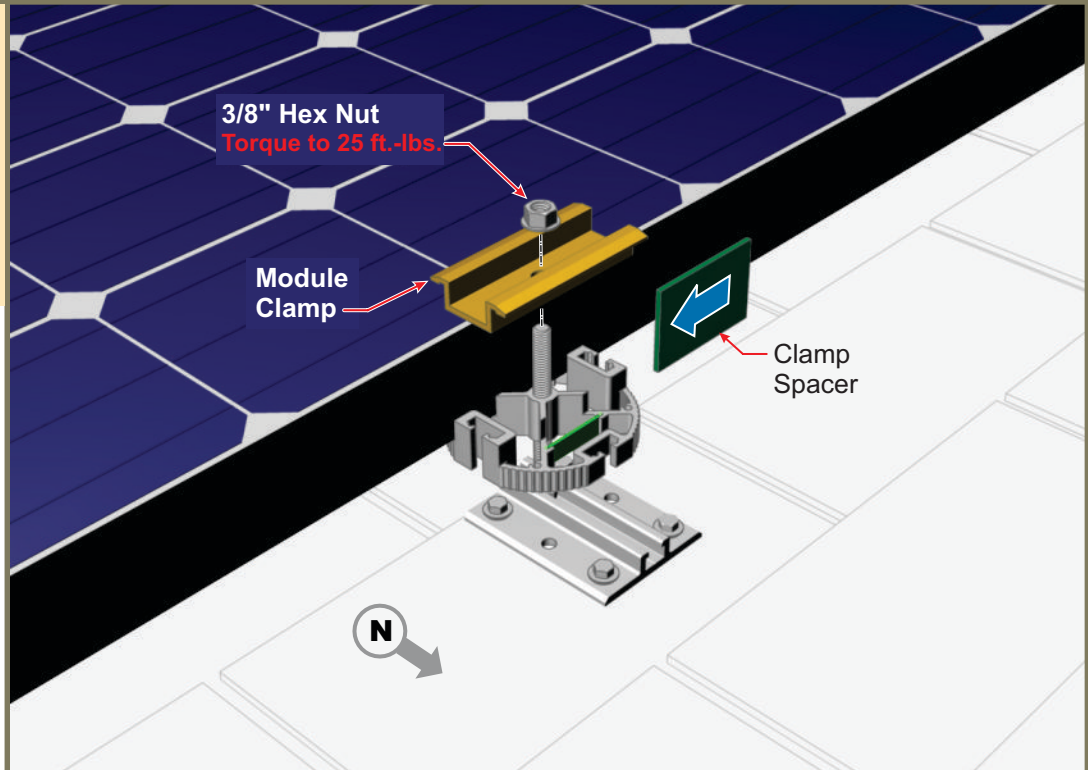




Step 14 Assemble the Outer Module Mounts - Northern Row

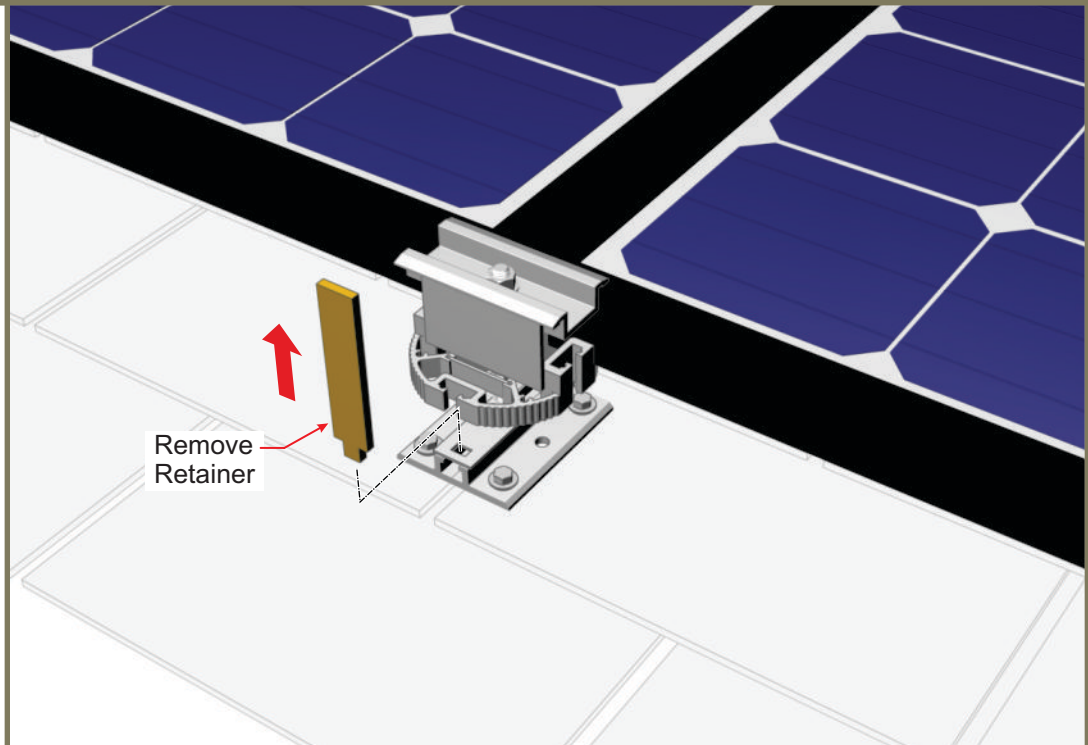
Install the Module Clamp, Clamp Spacer and Hex Nut.

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 Southern Row

No longer required, the Retainers can be safely removed.



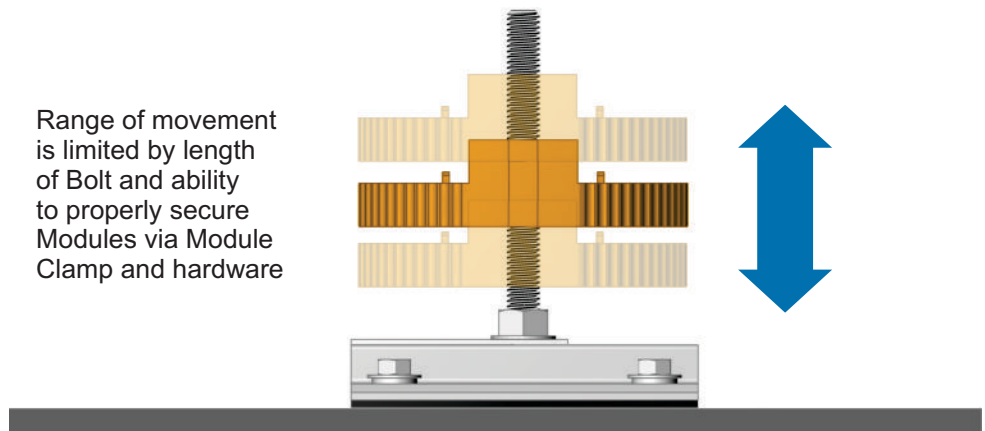
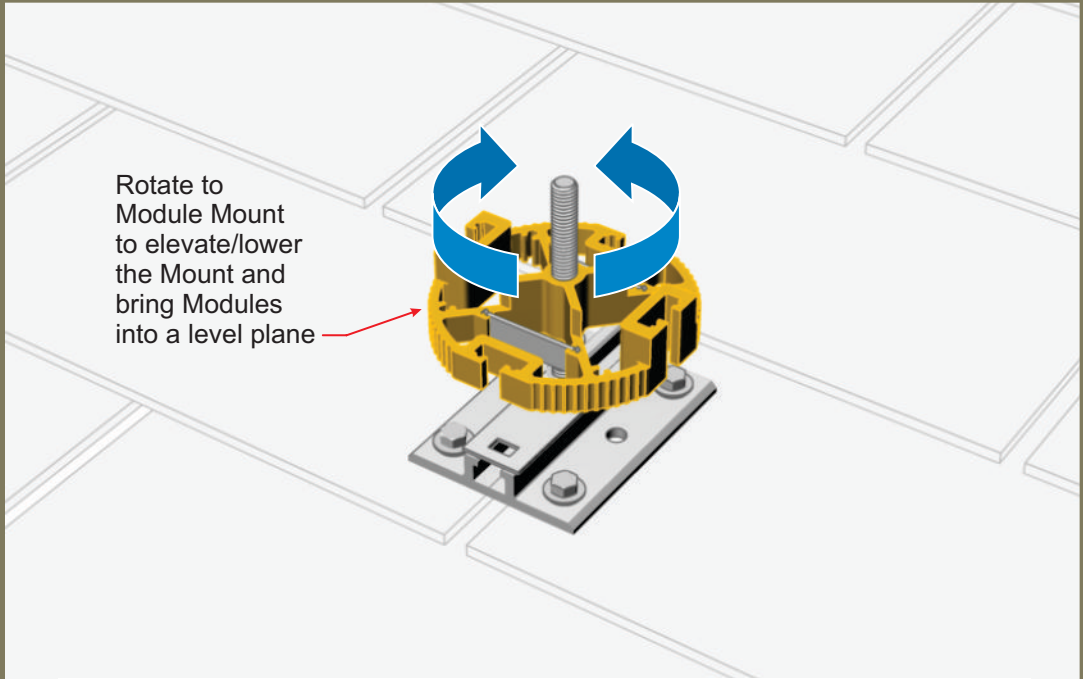
Step 16 Leveling the Array

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.

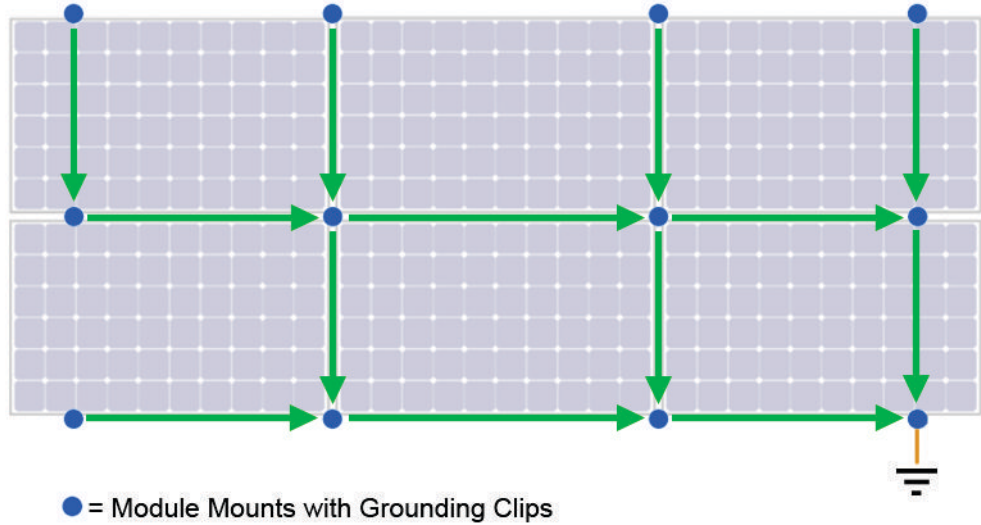


APPENDIX A

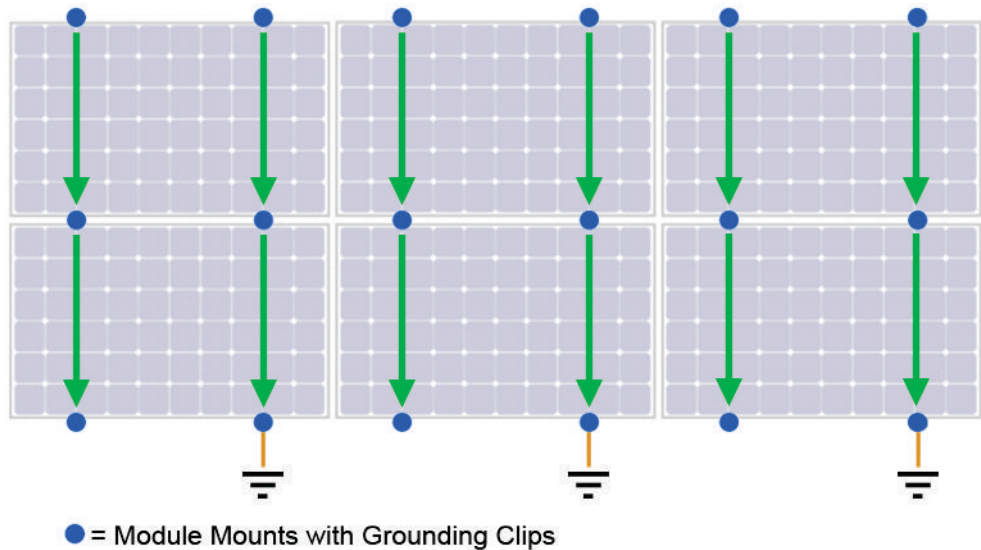
System Grounding Bonding via Module Mounts and Module Frames

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





PREFORMED LINE PRODUCTS

Albuquerque Office
1700 Louisiana Blvd., Suite 130
Albuquerque, New Mexico 87110

Telephone: 800.260.3792
Fax: 505.889.3548
Web Site: www.DPWSolar.com
E-mail: info@dpwsolar.com

Corporate Headquarters
660 Beta Drive
Mayfield Village, OH 44143

Telephone: 440.461.5200
Web Site: www.prefomed.com
E-mail: inquiries@prefomed.com