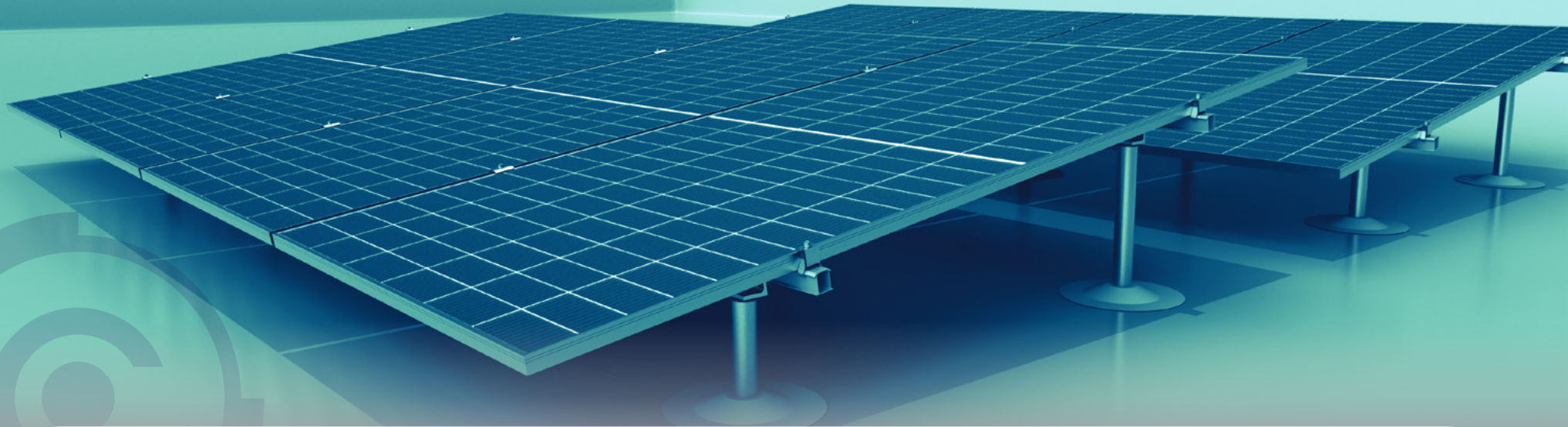




ClickFit Tilt

COMPLETE RAIL-BASED RACKING SYSTEM

INSTALLATION Manual

REVISION DATE: 09/30/26

VERSION: B



TABLE OF CONTENTS	PAGE 01	PREPERATION	PAGE 06
FEATURES & BENEFITS	PAGE 02	TOOLS AND TORQUE	PAGE 07
DISCLAIMER	PAGE 03	INSTALLATION	PAGE 08
COMPONENTS	PAGE 04	GROUNDING	PAGE 20
RATINGS	PAGE 05	ACCESSORIES	PAGE 22

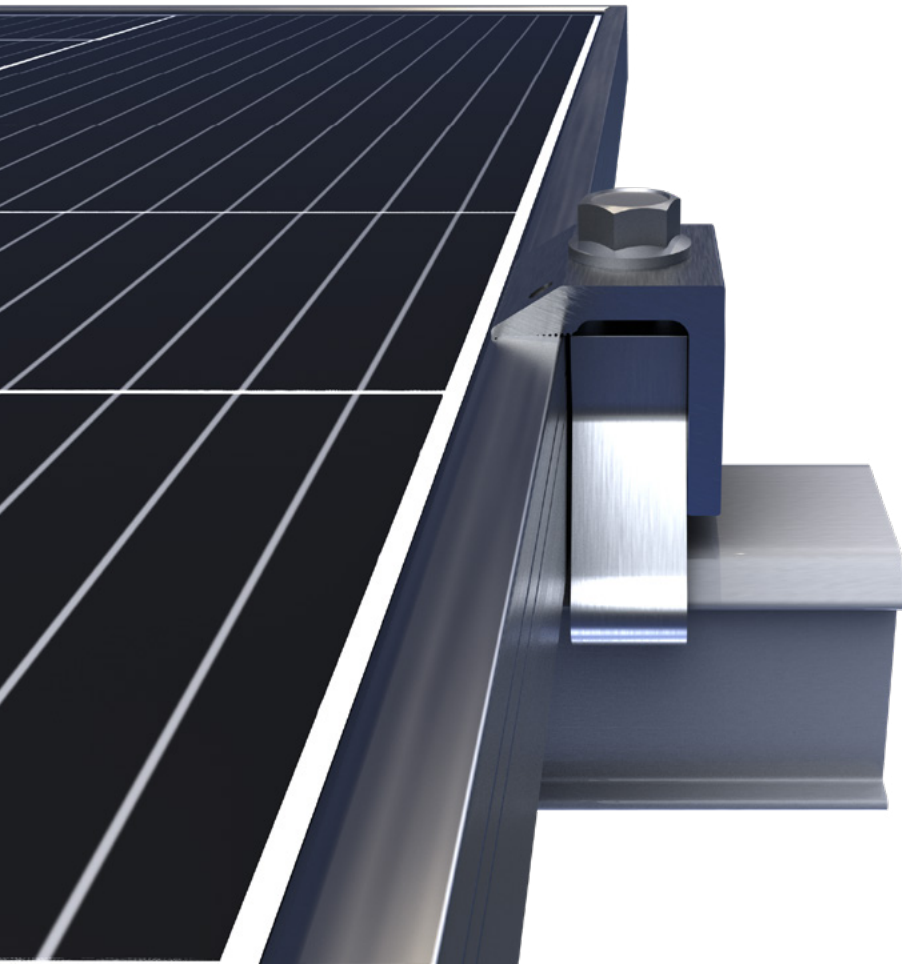
Clicking the page name will take you to that page

CLICKFIT TILT

ClickFit Tilt conforms to UL 2703 and is one of the fastest installing elevated rail-based systems in the industry. Thanks to its elevated height, cylindrical posts, and click-in components the system can be installed on new and old membrane roofs while allowing for future reroofing and resurfacing without removing the photovoltaic array. The ClickFit system is made of robust materials, to ensure longevity. ClickFit has been tested in extreme weather conditions including wind, fire, and snow.

FEATURES

- Fully integrated bonding
- Click-on Mid & End Clamps
- Reroofing friendly
- Rail lengths tailored to Commercial module sizes



DISCLAIMER

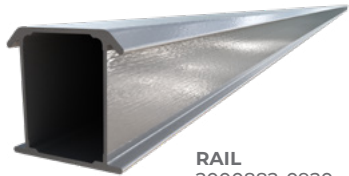
This manual describes proper installation procedures and provides necessary standards required for product reliability. Warranty details are available on the website. All installers must thoroughly read this manual and have a clear understanding of the installation procedures prior to installation. Failure to follow these guidelines may result in property damage, bodily injury or even death.

IT IS THE INSTALLER'S RESPONSIBILITY TO:

- Ensure safe installation of all electrical aspects of the array. All electrical installation and procedures should be conducted by a licensed and bonded electrician or solar contractor.
- All work must comply with national, state and local installation procedures, product and safety standards, including the proper use of PPE.
- Comply with all applicable local or national building and fire codes, including any that may supersede this manual.
- Ensure all products are appropriate for the installation, environment, and array under the site's loading conditions.
- All accessible and exposed rail ends shall be smoothed out to be free of burrs and sharp edges, and installers shall wear cut resistant gloves when handling rails.
- Use only PanelClaw parts or parts recommended by PanelClaw; substituting parts may void any applicable warranty.
- Review the Racking Construction Set to confirm design specifications.
- Ensure provided information is accurate. Issues resulting from inaccurate information are the installer's responsibility.
- Ensure bare copper grounding wire does not contact aluminum and zinc-plated steel components, to prevent risk of galvanic corrosion.
- If loose components or loose fasteners are found during periodic inspection, re-tighten immediately. Any components showing signs of corrosion or damage that compromise safety shall be replaced immediately.
- If storage onsite is unavoidable, remove the plastic and/or cardboard wrapping from the exterior of the packaging and cover with canvas or place components under an open sided tent. Note the use of a plastic cover does more harm than good as it prevents the product from breathing and causes condensation. Storing parts in any other manner is at the customer's own risk. PanelClaw is not liable for claims related to improper storage and any such claims are not covered by the product warranty.
- Provide an appropriate method of direct-to-earth grounding according to the latest edition of the National Electrical Code, including NEC 250: Grounding and Bonding, and NEC 690: Solar Photovoltaic Systems.
- Disconnect AC power before servicing or removing modules, AC modules, microinverters and power optimizers.
- Review module and any 3rd party manufacturer's documentation for compatibility and compliance with warranty terms and conditions.
- Module mounting rails shall not be used as scaffolding, a roof jack, or any form of an anchoring point for roof personnel.
- Ensure that the roof is in good condition prior to installing any PanelClaw components.
- Each PV system is unique and is frequently made up of multiple sub arrays. The Racking Construction Set, which must be onsite at all times during construction, details sub array dimensions and location on the roof. Review the Racking Construction Set in its entirety to prevent unnecessary rework during site construction.
- The furthest extent of the racking components or modules of adjacent sub arrays, whichever defines the outermost array boundaries, must be separated by at least the minimum dimensions documented in the Racking Construction Set. Refer to the general notes and the Minimum Clearance Requirements table, if present, within the Racking Construction Set.
- Module removal is not expected to be a frequent occurrence as a part of routine maintenance, but removal may disrupt the bond path and could introduce the risk of electric shock. Additional steps may be required to maintain the bond path, such as adding approved ground lugs (see page 20) and using bare copper to create a bond path where the modules are no longer connected to ground. Modules should only be removed by qualified persons in compliance with the instructions in this manual.

REQUIRED SYSTEM COMPONENTS

CLICKFIT TILT SYSTEM



RAIL
2000882-0920
2000882-1050
2000882-1830
2000882-2100



**RAIL
SPLICE**
2000877



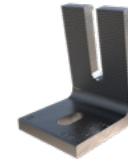
MID CLAMP
5000556/
5000558



END CLAMP
5000557/
5000559



CLICKER
5000547



TILT L-FOOT
2000960



**SHORT &
TALL POSTS**
2000961/
2000962

ROOF ANCHORS



MA, FRA, MEMBRANE
1000420XX



FLAT ROOF ATTACHMENT, MILL
5000555

*EQUIVALENT MECHANICAL
ATTACHMENT



MA, OMG, UNIVERSAL
100041801

HARDWARE



HARDWARE KIT, CF TILT
5000554

OPTIONAL ACCESSORIES

EBOS & WIRE MANAGEMENT



SIDE CLIP
(30MM, 32MM,
35MM & 40MM)
2000957/2000958/2000959



**UNIVERSAL
SIDE CLIP**
5000539



**CF WIRE
MANAGEMENT CLIP**
2000867



**MLPE
MOUNT**
5000548/5000549



**WIRE MANAGEMENT
CLAMP**
5000552



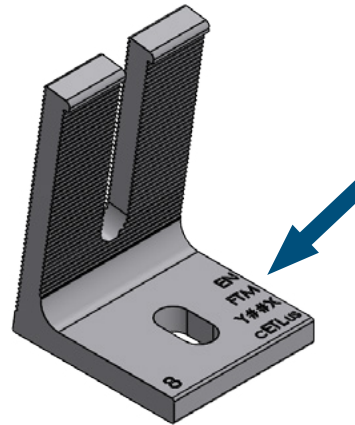
GROUNDING LUG
SEE PAGE 20

RATINGS

Type	Description
Fire Rating	Class A* System Fire Rating
Max System Voltage	1500 VDC
Max Fuse Rating	40A
Certification	Conforms to UL STD 2703
Warranty	25 Year Material and Workmanship
UL 2703 Markings	Markings are located on the L-Foot
Roof Pitch	less than 2:12
UL 2703 Allowable Design Load Rating	10 psf downward, 5 psf upward, and 5 psf lateral
Max Module Size	36.8 sqft
Module Orientation	Portrait
Multiple use Rated Components (Position Independent)	End Clamp, Mid Clamp, Frame MLPE Mount and MLPE Mount
UL 1565 Positioning Device Ratings Conforms to UL STD 1565 Certified to CSA C22.2#18.5	• CF Wire MGT Clip and CF Wire MGT Clamp and Side Clips • Operating Temperature Range: -35 to 90C • Maximum Load: 10lbs • For outdoor use

*Class A System fire rating on Low Slope roofs and with Types 1, 2, 3, 13, 16, 19, 22, 25, 29, 30 and 38 PV modules with no skirt required. Any roof-to-module gap is permitted.

MARKINGS:



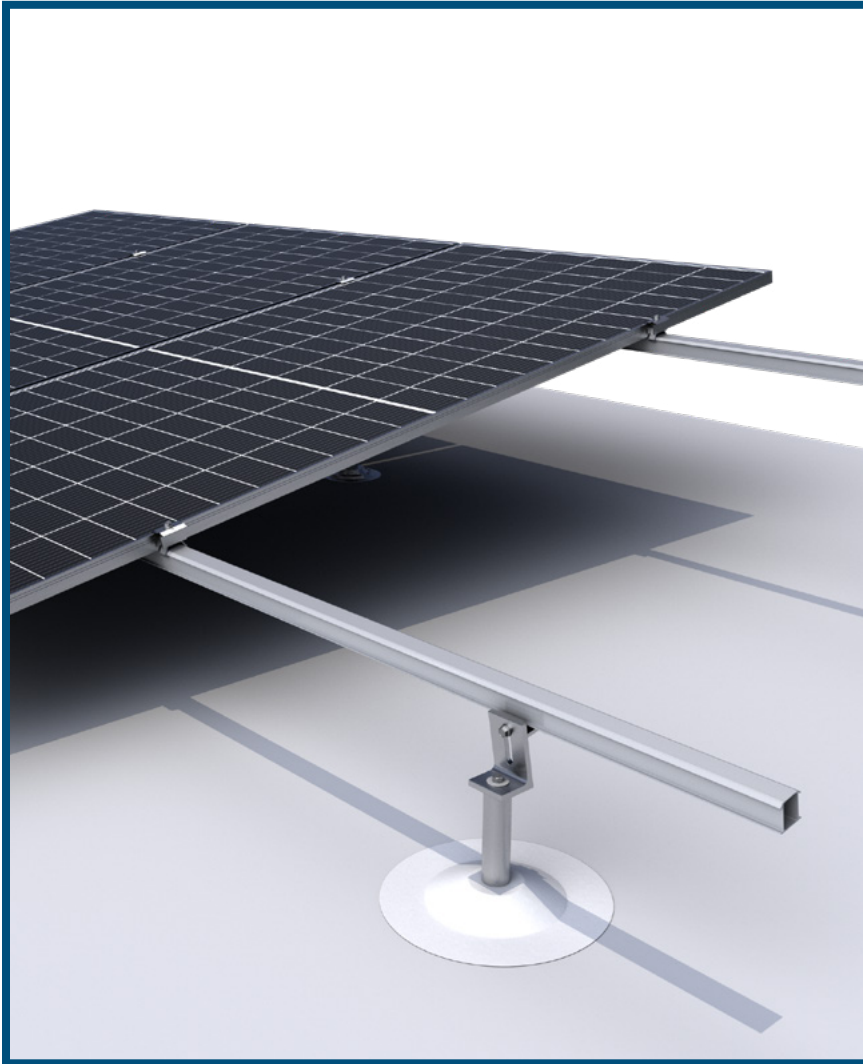
MARKINGS LOCATED ON THE L-FOOT



**5003339
CONFORMS TO UL STD 2703
AND CERTIFIED TO CAN/CSA
STD TIL NO. A-40**

APPROVED MODULES

A list of approved modules can be found in the PanelClaw "clawFR/clawFRplus/Clickfit Tilt UL 2703 List of Ratings and Compatible Modules and MLPEs." The most recent version can be found on the PanelClaw website (www.panelclaw.com/ul-2703).



PREPARATION

- Refer to Racking Construction Set, span tables, local jurisdiction, or engineer of record specifications when determining setbacks from roof edges, attachment spans, etc.
- Mark the perimeter and corners of the array on the roof surface.
- Draw or snap chalk lines where the roof attachments will be installed.
- Determine attachment locations within the area of the array. It may be necessary to shift the array East or West on the roof in order to fall within the rail cantilever specs ($1/3$ of span).

TOOLS & TORQUE SETTINGS

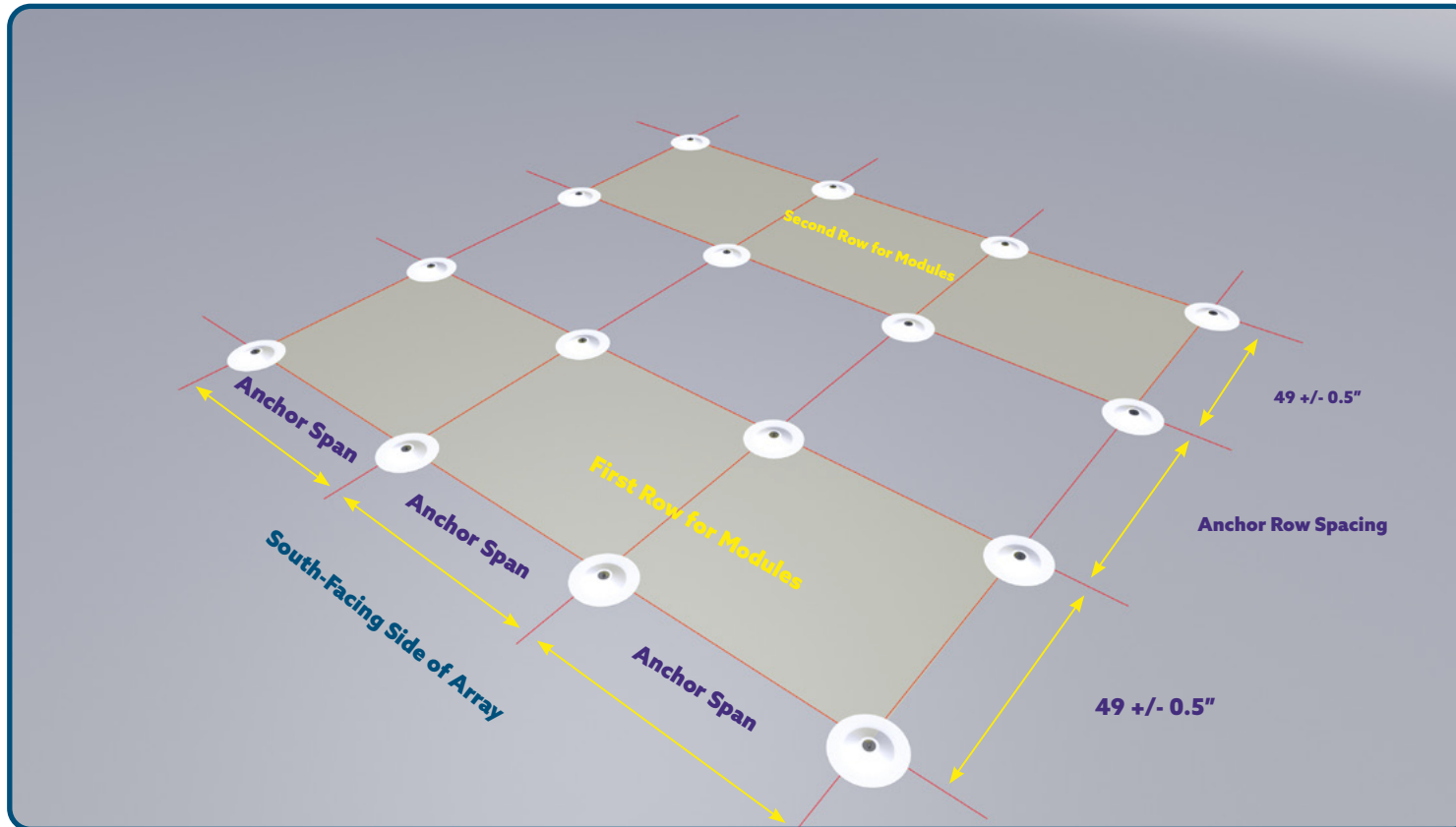
RECOMMENDED TOOLS:

- String line
- Tape measure
- Drivers with 1/2" socket and 9/16 socket
- Inline torque-limiter or Torque Wrench
- ClickFit Tilt Post socket
- Optional: Portable bandsaw or reciprocating saw

TORQUE SPECIFICATIONS

Component	Torque (ft-lb)	Notes
Posts	21	
Mid-Clamp	15	
End-Clamp	15	
Rail Clicker Leveling Bolt	15	
Ground Lug	N/A	Refer to specific ground lug manufacturer's installation manual
MLPE Clip	15	
MLPE Mount	15	

ANCHOR LAYOUT & INSTALLATION



1. Refer to Racking Construction Set for array dimensions and to mark the roof location for each roof anchor.
TIP: Anchor Row Spans and Anchor Row Spacings can vary, but distance between the low side anchors and high side anchors must be 49 +/-0.5".
2. Following the roof anchor manufacturer's installation manual to install roof anchors and flashings.
3. Proceed to next step depending on roof anchor used:
 - Flat Roof Anchor, Mill – Move to Step 2A
 - OMG PowerGrip Universal – Skip to Step 2B

STANCHION ASSEMBLY: FRA

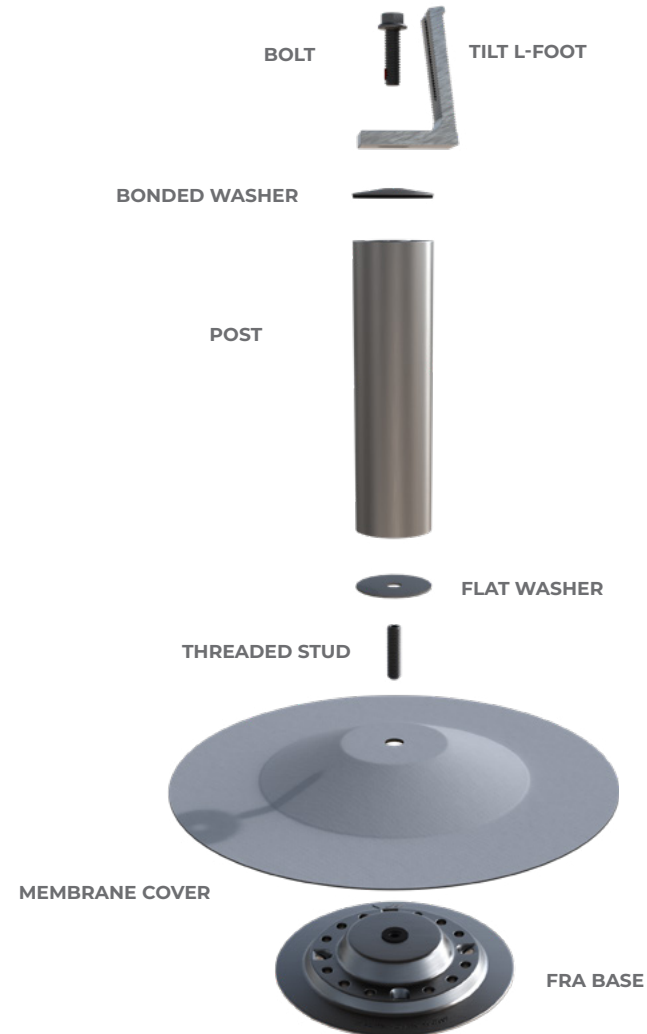
FOR STANCHION ASSEMBLIES OVER FLAT ROOF ANCHOR

1. Insert Threaded Set Screw into the roof anchor until it bottoms out inside the FRA base. (For FRA installation, see manufacturer installation or the Appendix on page 24 of this manual)
2. If a membrane cover is required, place the membrane over the anchor and threaded set screw. Place one Flat Washer over the threaded set screw. Then thread the Post onto stud by hand a couple turns. Torque the post using the CF Post Socket to 21 ft-lbs. Note: Use the short Post for the low side of modules and tall posts for the high side of modules.
TIP: Do not mix Flat Washers and Bonded Washers
3. Place a Bonded Washer over the top of the post followed by the Tilt L-Foot, and the Bolt.
4. Aligning the Tilt L-Foot in one hand as shown, drive the bolt down with a 1/2" socket to torque the entire Stanchion Assembly to 15 ft-lb.
5. Proceed to section on Stanchion Assembly.

**SHORT
STANCHION**
FOR LOW SIDE
OF MODULES



**TALL
STANCHION**
FOR HIGH SIDE
OF MODULES

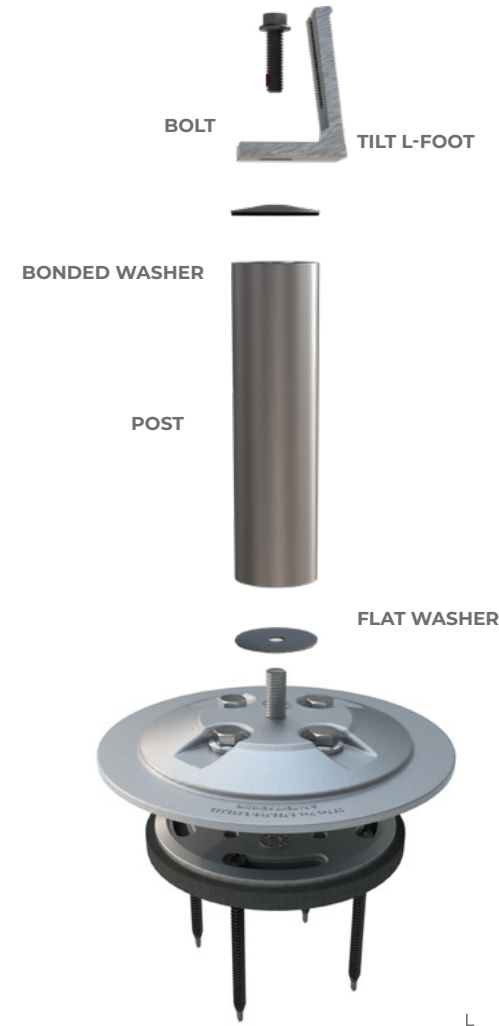


STANCHION ASSEMBLY
← LOW SIDE OF MODULE

2B. STANCHION ASSEMBLY: OMG UNIVERSAL

FOR STANCHION ASSEMBLIES OVER OMG POWERGRIP UNIVERSAL 7 ROOF ANCHORS

1. Place one Flat Washer over the anchor stud. Then thread Post onto stud by hand a couple turns. Torque the post using the CF Post Socket to 20 ft-lbs.
Note: Use the short Post for the low side of modules and tall posts for the high side of modules.
TIP: Do not mix Flat Washers and Bonded Washers
2. Place a Bonded Washer over the top of the post followed by the Tilt L-foot and the Bolt.
3. Aligning the Tilt L-foot in one hand as shown, drive the bolt down with a 1/2" socket to torque the entire Stanchion Assembly to 12 ft-lb.
4. Proceed to section on Stanchion Assembly.



**SHORT
STANCHION**
FOR LOW SIDE
OF MODULES

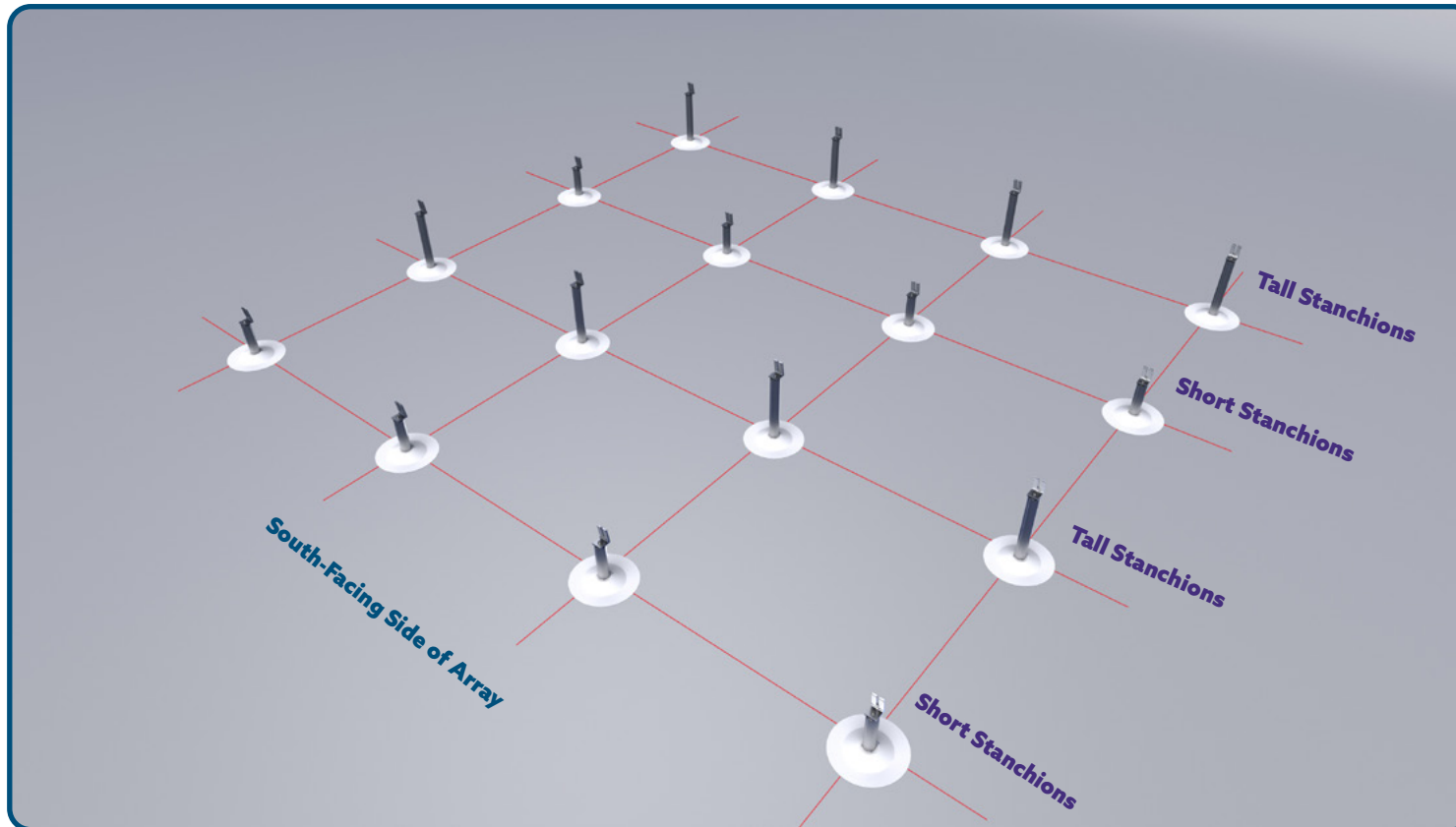


**TALL
STANCHION**
FOR HIGH SIDE
OF MODULES



STANCHION ASSEMBLY
← LOW SIDE OF MODULE

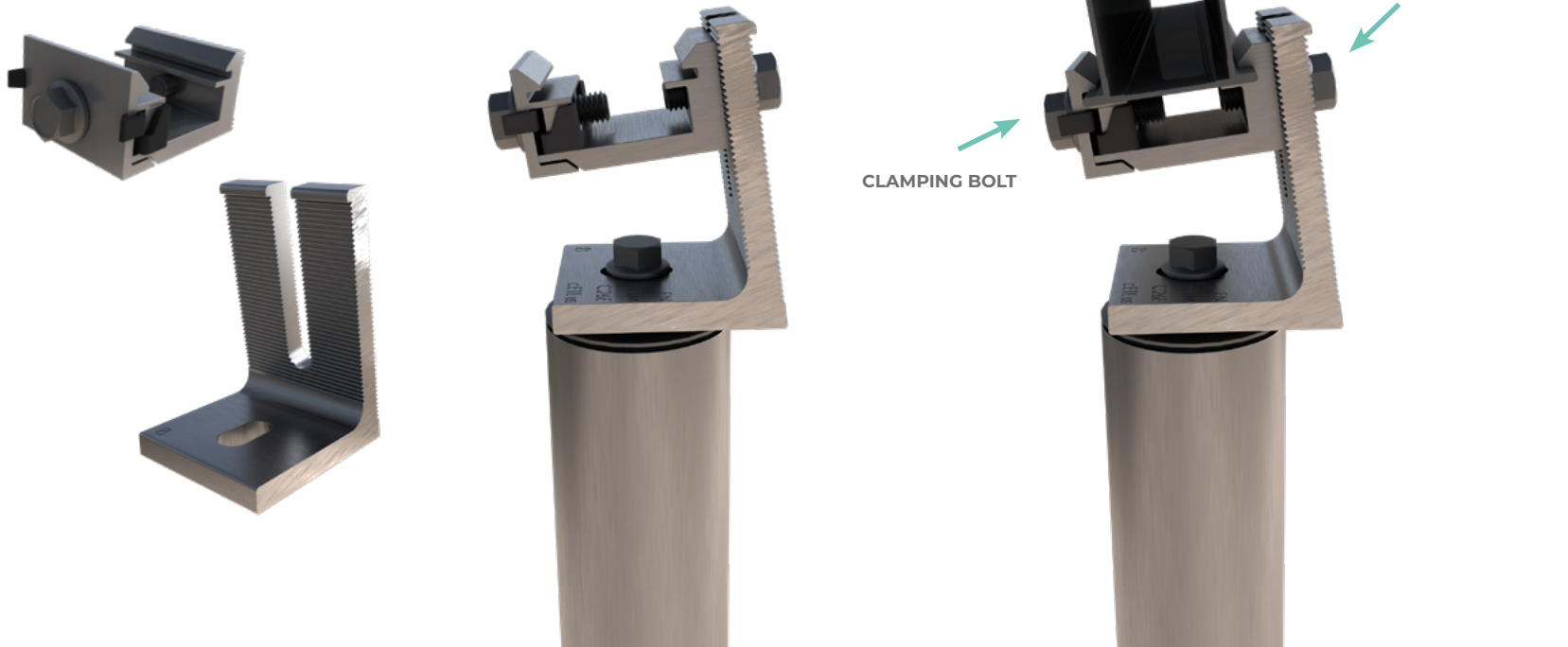
STANCHION ASSEMBLY



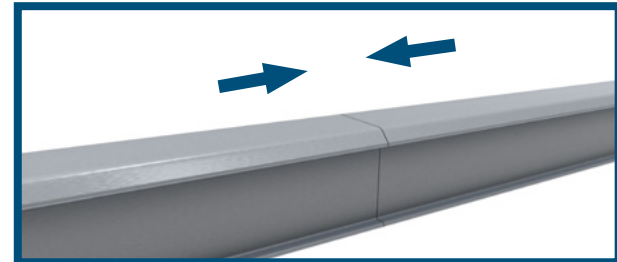
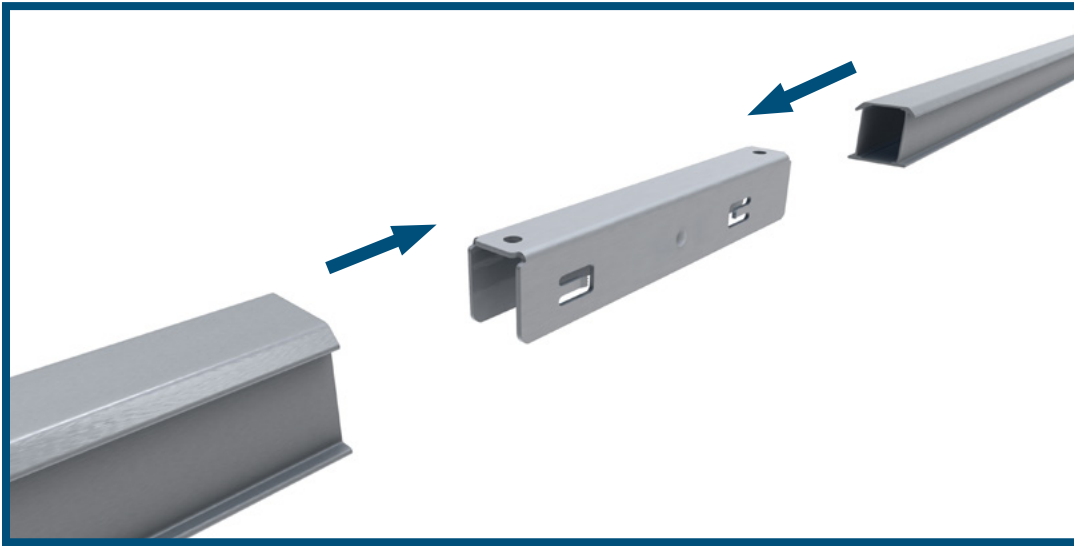
1. Install all posts throughout the array, following the installation steps for the project anchor.
2. Ensure all Tilt L-Feet are aligned along the row to aid rail installation.
3. Check the torque of the Tilt L-feet prior to installing clickers (see page 9).

CLICKER & RAIL INSTALLATION

1. Place Clickers into the slot of each Tilt Leg
TIP: Do not tighten Leveling Bolt
2. Ensure the rails extend a minimum of 2" past the last attachments in each row. Push the rail into the Clicker starting on the side with the plastic clips first, then roll the rail into seated position. Verify the rail is sitting flush with both ledges. If attachments are extremely misaligned it may be necessary to loosen the leveling bolt and adjust the height of the Universal L-foot
3. Torque the clamping bolt to 15 ft-lbs.



INSTALLING RAIL SPLICES



1. Determine the number of rails required per row of modules.
2. Insert a Rail splice into one rail. **Do not push it past the indicator bump.**
3. Slide the next rail onto the rail splice until the two rail ends meet.
4. Repeat steps 2 and 3 until the desired length is achieved.

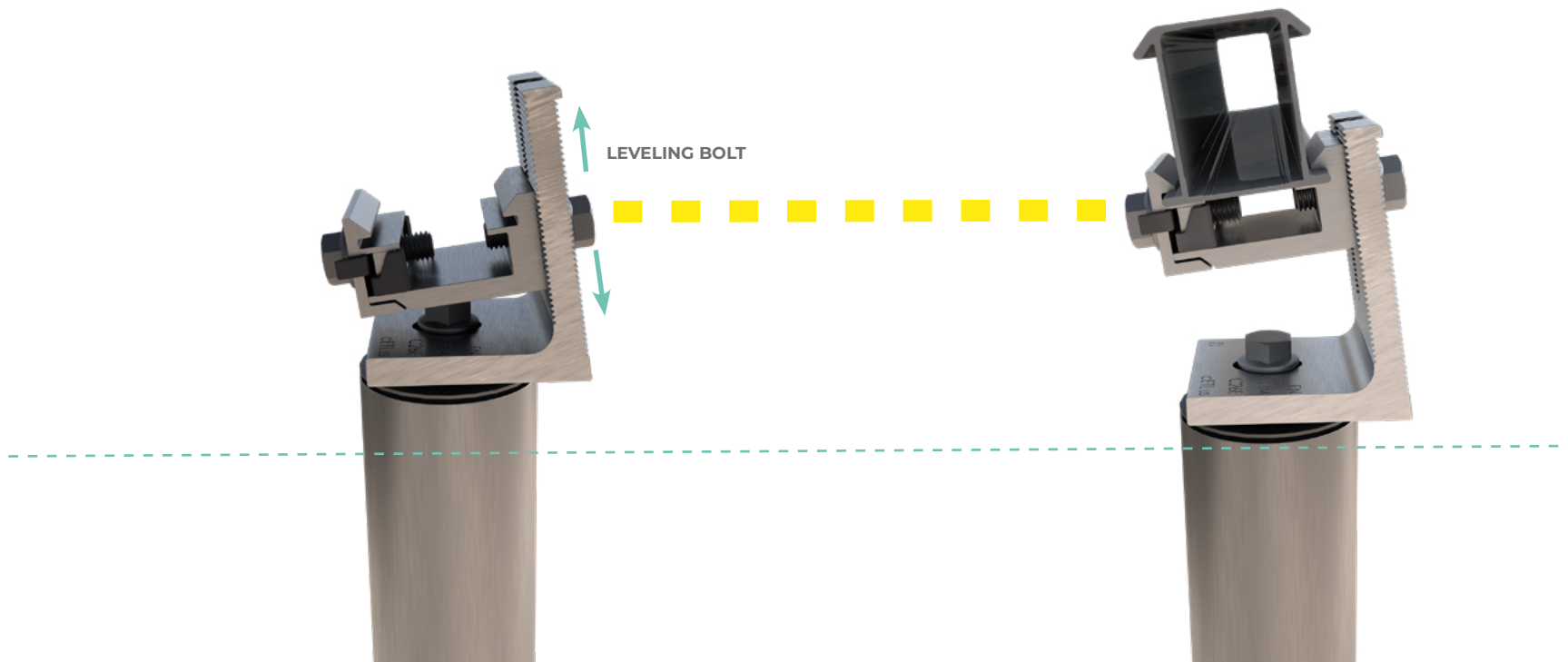
THERMAL EXPANSION

- A thermal expansion gap is required per each continuous 90' length of modules.
- Leave a 2" minimum gap between the ClickFit rails when creating a thermal expansion gap
- Bonding across the thermal gap should be accomplished with an approved grounding method.
- The 2" minimum gap is applicable to an installation range of -15°F to 125°F. If the system is being installed outside of that range, the gap may need to be increased.

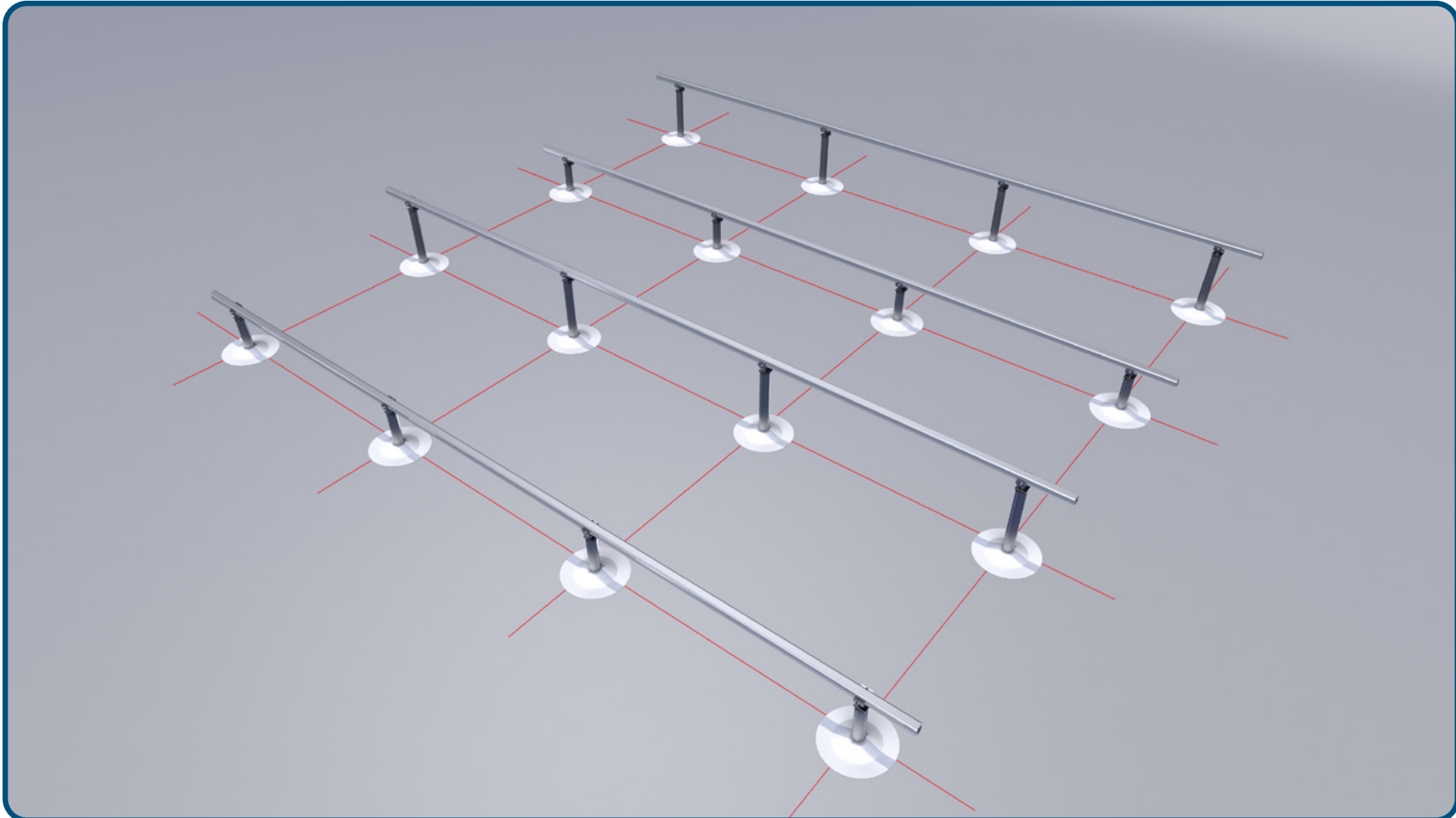
RAIL LEVELING

1. Level the row of Rails and tighten the leveling bolt on Clickers with a 1/2" socket to 15 ft-lbs.

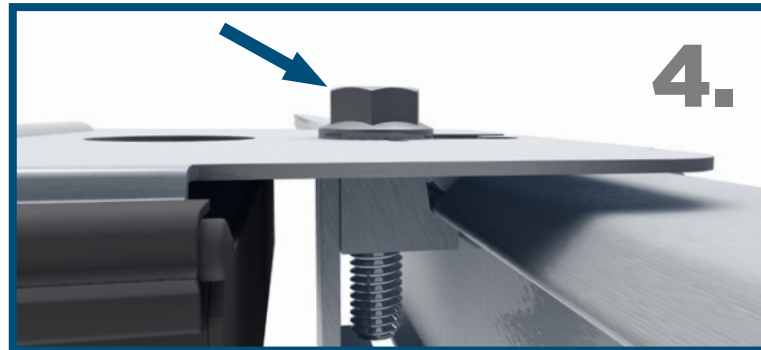
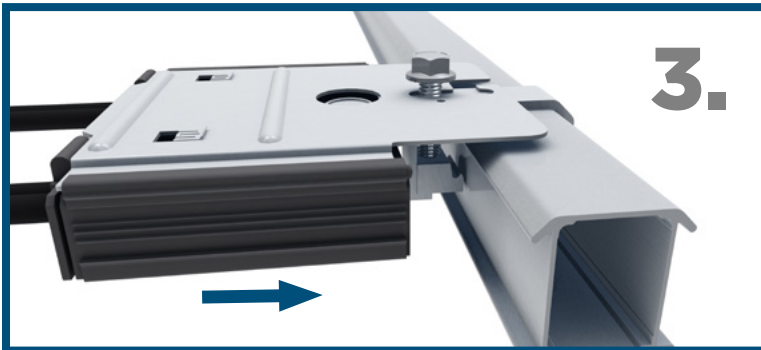
NOTE: The system will accommodate roof surface levelness variations up to 1.5" within a row. If it varies by more than this amount, break the row into two or more sections.



COMPLETED RAIL INSTALLATION



MLPE MOUNT INSTALLATION

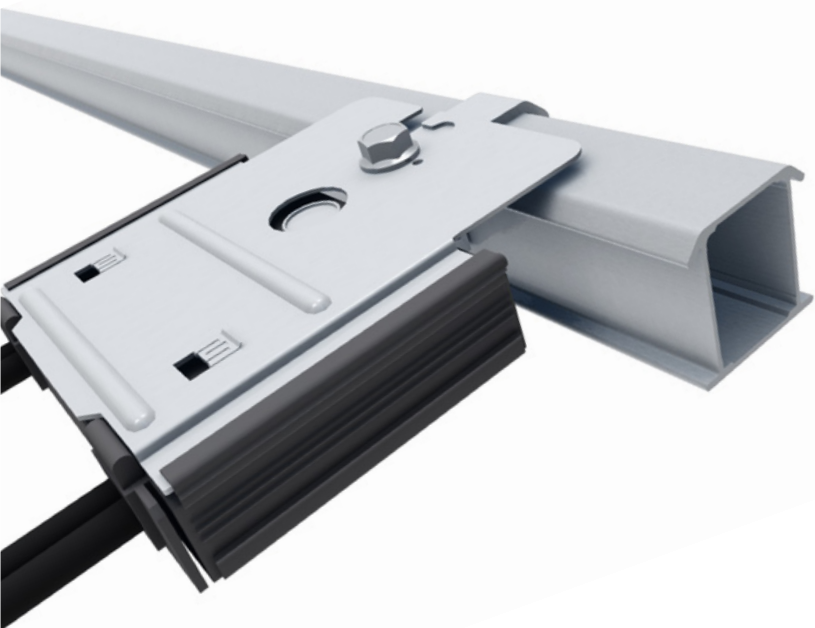


1. Lower the MLPE Mount to the rail. Tilt and hook the mount around the top “dog ear” of the rail
2. Set the MLPE Mount flush with the top of the rail

3. Slide the microinverter flange between the MLPE Mount and the serrated bolt flange
4. Tighten the bolt to 15 ft-lbs.

MLPE MOUNT INSTALLATION

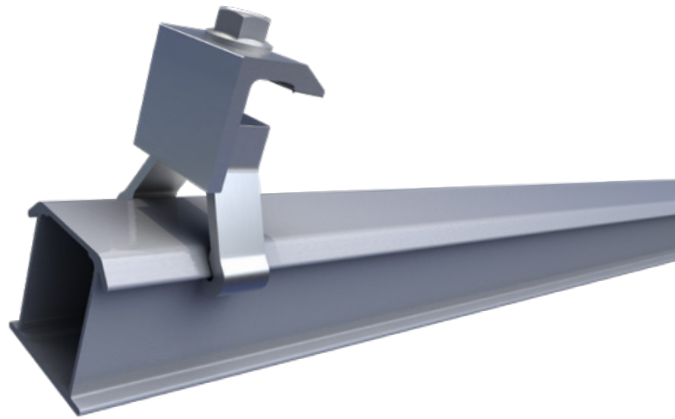
MLPE MOUNT IS COMPATIBLE WITH
THE FOLLOWING MLPE DEVICES:



AP Systems	DS3, DS3-H, DS3-L, DS3-S, QS1, QS2, QT2, QT2-208, QT2-480 and YC600 Rapid Shutdown Devices: RSD-S-PLC and RSD-D-20* *Frame only. Do not remove clip
Darfon	MIG240, MIG300, G320, G640
Duracell	D350-M1, D350-M1A-xxx, D400-M1A-xxx, D600-M2A-xxx, D700-M2, D800-M2A-xxx, D1500-M4 Where "xxx" can be blank, 208A or 240A
Enphase	M250-72, 250-60, M215-60, C250-72, S230, S280, IQ 6, IQ 6+, IQ7, IQ 7A, IQ 7+, IQ7 PD, IQ 7X, Q Aggregator; IQ8-60, IQ8PLUS-72, IQ8A-72, IQ8AC-72, IQ8H-3P-72, IQ8H-208-72, IQ8H-240-72, IQ8HC-72, IQ8M-72, IQ8MC-72, IQ8P-72, IQ8P-3P-72, IQ8X-80; may be followed by -2-US, -E-US, -M-US, or M-DOM US
Generac	S2502, PM-820
Hiitio	HCM300/400/500SN, HCM300/400/500WN, HCM600/800/1000SN, HCM600/800/1000WN, HCM1600/1800/2000SN, HCM1600/1800/2000WN,
Hoymiles	HMA-xxxYY-ZZ where "A" can be blank or S, xxx can be 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1200, 1500, 1600, 1800 or 2000; "YY" can be NT, IT, 2T, 4T; and "ZZ" can be blank, NA or 208-NA
Hyxi Power	HYX-M300/400/500-S-NA, HYX-M300/400/500-SW-NA HYX-M600/800/1000-S-NA, HYX-M600/800/1000-SW-NA HYX-M1600/1800/2000-S-NA, HYX-M1600/1800/2000-SW-NA
Lunar Energy	Maximizer 10-005220 or 10-00522D
NEP	NEP MICROINVERTERS BDM-xxx-yyy Where "xxx" can be 300, 300X2, 350, 400, 500, 550, 650, 800, 1000, 1200, 1600 or 2000; and "yyy" can be blank, 208A or 240A NEP RAPID SHUTDOWN PVG-1, PVG-2, PVG-3, PVG-4
SMA	RoofCommKit-P2-US, TS4-R Module Retrofit Kits (TS4-R-S, TS4-R-O, TS4-R-F)
Solar Edge	C651U, C652U, M1600, P300, P320, P340, P370, P400, P401, P405, P485, P505, P600, P700, P730, P750, P800p, P800s, P801, P850, P860, P950, P960, P1100, P1101, S440, S500, S500B, S650B, S1200, S1201, U650 and U650B
Tigo	Tigo Access Point (TAP) TS4-R-X (where X can be F, M, O, or S) TS4-R-X-DUO (where X can be M, O, or S) TS4-A-X (where X can be F, 2F, O, O-DUO, or S)
Yotta	DPI 208/480

MODULE & CLAMP INSTALLATION

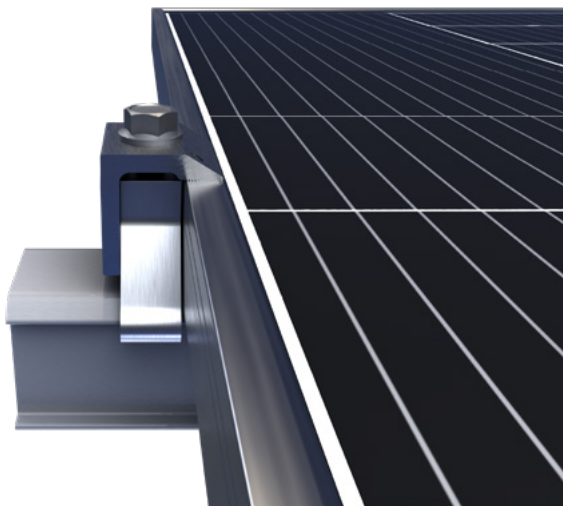
1.



2.

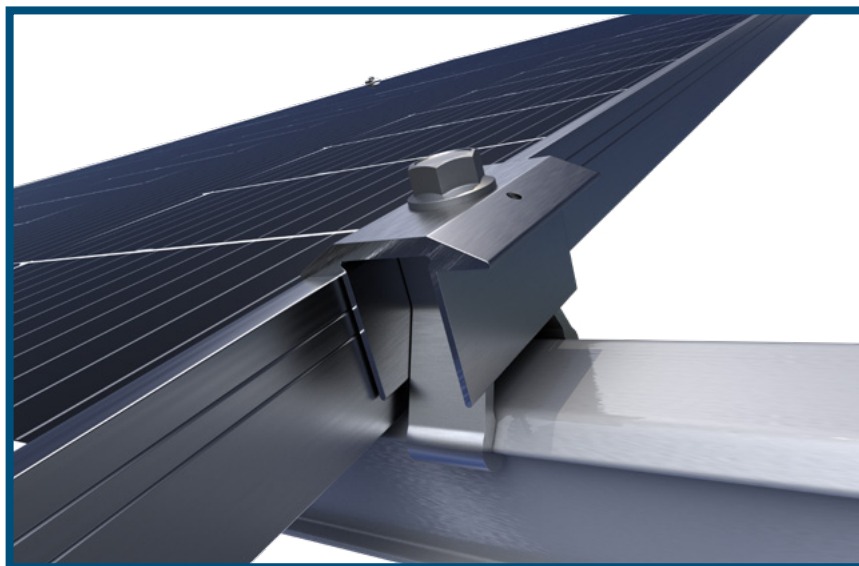
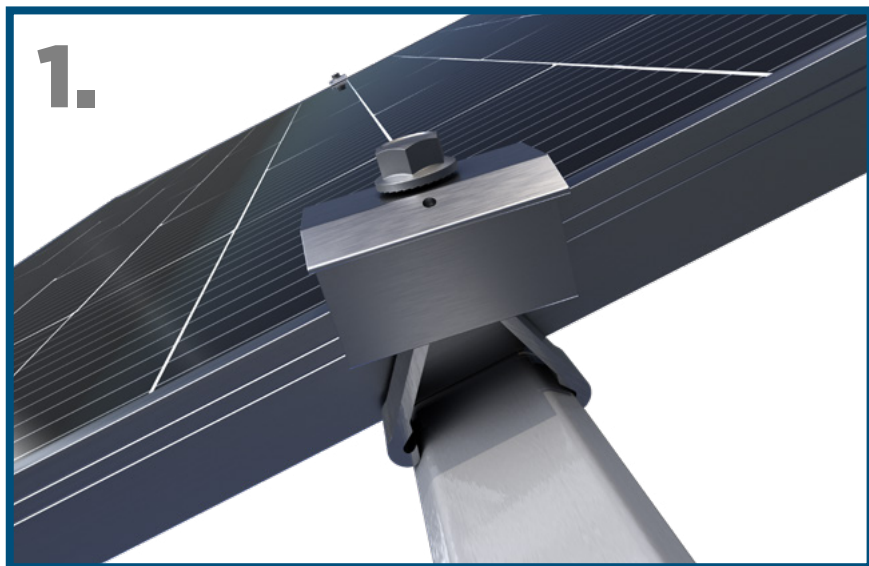


3.



1. With the rails in position and leveled, start by clicking on the end clamps.
2. Place the first module on the rails and slide the module to the End Clamps. Ensure the end of each rail extends 0.75" past the module (cut rail if necessary.)
3. Tighten the end clamp to 15 ft-lbs.

MODULE & CLAMP INSTALLATION

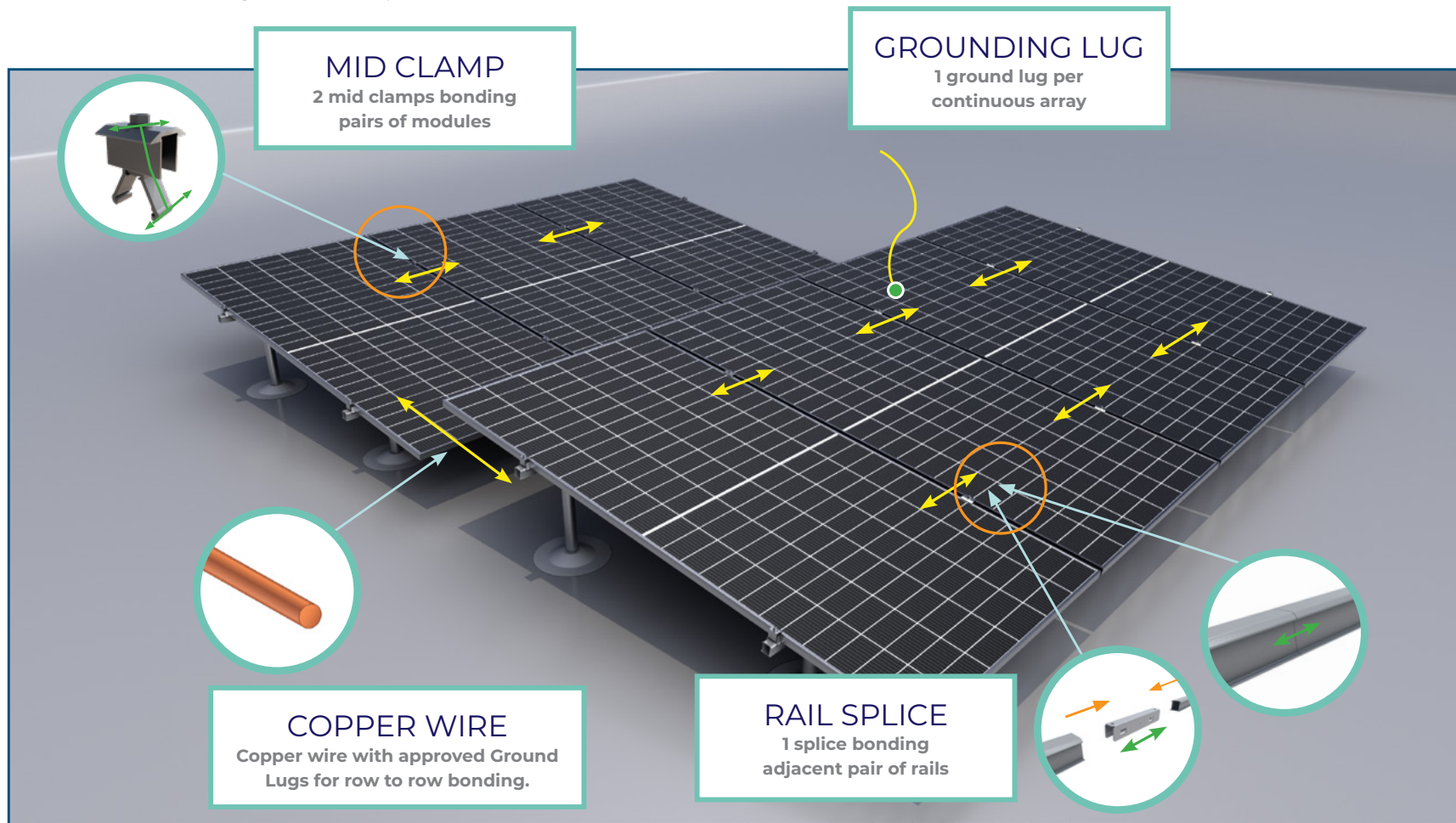


- 1.** Click a mid clamp onto each rail.
- 2.** Slide the Mid Clamps until they are flush with the side of the existing module.
- 3.** Place and slide the next module firmly against the mid clamps. Align the bottom edges of the modules. Tighten mid clamps to 15 ft-lbs.

BONDING PATHS AND GROUNDING

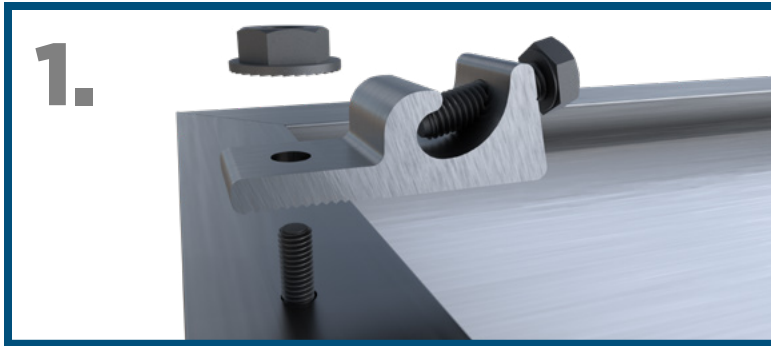
Bonding paths are carried throughout the array in a variety of ways. They are carried module-to-module and module-to-rail through mid clamps, carried at rail-to-rail

connections through the splices, and carried row-to-row using grounding lugs with bare copper.

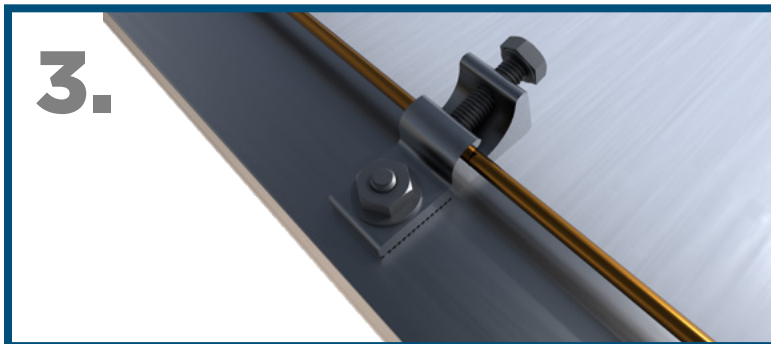


Module removal is not a frequent occurrence and should not be necessary for routine maintenance. If a module that contains the attached copper ground wire needs to be removed during maintenance, then the copper ground wire shall be removed and reattached to the adjacent module with the approved ground lugs found on page 20. Modules shall only be removed by qualified persons in compliance with the instructions in this manual.

GROUNDING LUG INSTALLATION



1. Install the UL2703 compliant PV ground lug (see list below) to the grounding lug hole on the module flange using the bolt and flange nut
2. Refer to manufacturer's installation manual for required torque values of ground lugs shown below.
3. Equipment grounding wire should be sized in accordance with the National Electrical Code, NFPA70 and a minimum of 1/4" clearance is required between bare copper wires and aluminum components.



NECESSARY COMPONENTS

**One of the following grounding lugs
(or any UL 2703 Compliant ground Lug):**

- BurndyCL50-1TN Ground Lug
(UL 2703 - E3514343 / UL 467-E9999)
- ILSCO SGB-4 Ground Lug
(UL 2703 - E354420 / UL 467 - E34440)
- ILSCO GBL-4DBT
(UL 2703 - E354420 / UL467 - E34440)
- ILSCO GBL-4DBTH
(UL 2703 - E354420 / UL 467 - E34440)
- ILSCO GBL-4SS
(UL 2703 - E354420 / UL 467 - E34440)

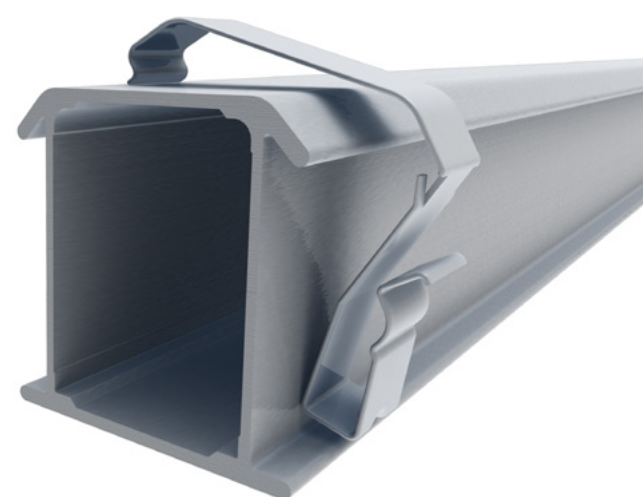
*GENERIC GROUNDING LUG IMAGE, SEE APPROVED OPTIONS IN THE COLUMN ON THE RIGHT

WIRE CLIP INSTALLATION

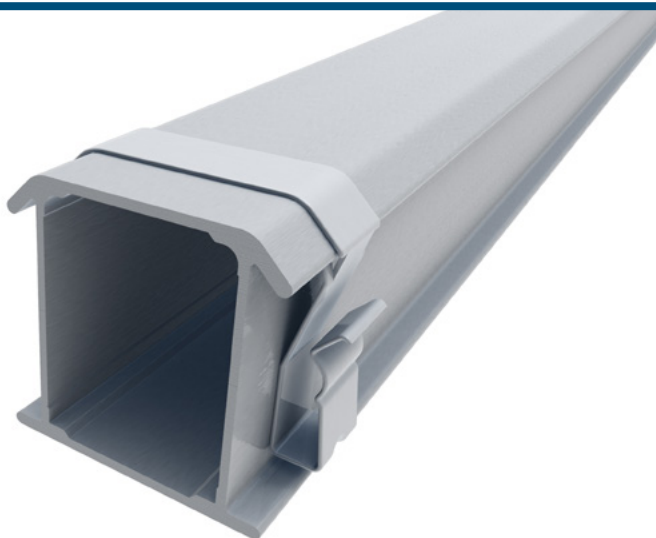
1.



2.



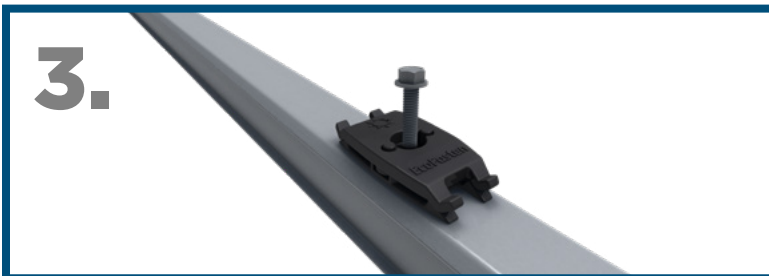
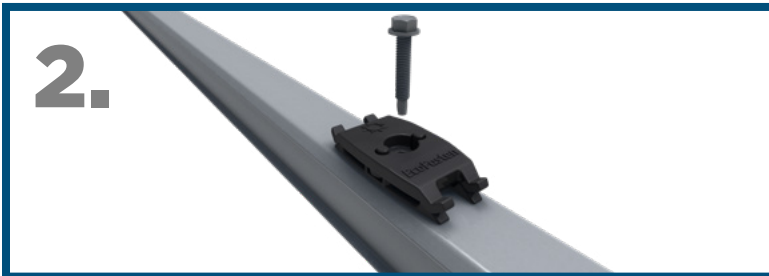
3.



1. Place the wire clip on the rail at the angle shown in diagram 2 - engage the small teeth first and then click onto the rail
2. With the wire end touching the bottom lip of the rail, roll and click-in the Wire Clip to the opposite end of the rail.
3. You will hear an audible click when the Wire Clip is set in place.

NOTE: The ClickFit Wire Clip clicks onto the top of the rail and accommodates 1-3 PV wires (up to 10AWG) or 1 Q cable and 1-2 PV wires (up to 10AWG).

INSTALLING WIRE MANAGEMENT CLAMP



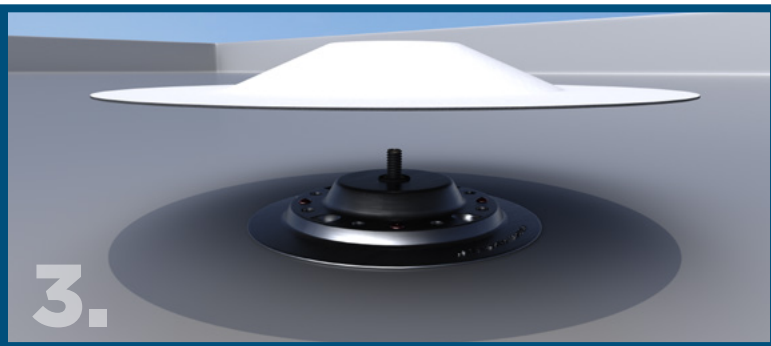
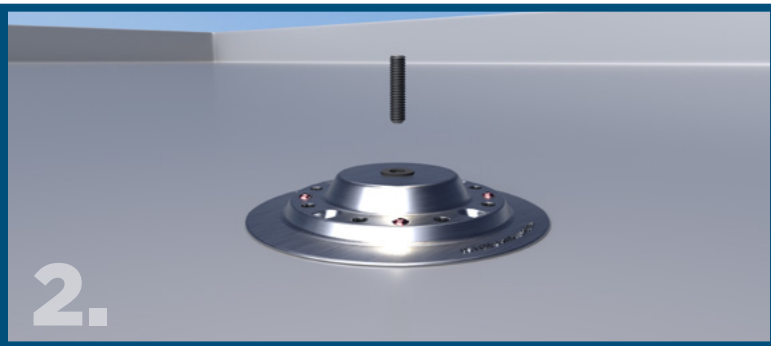
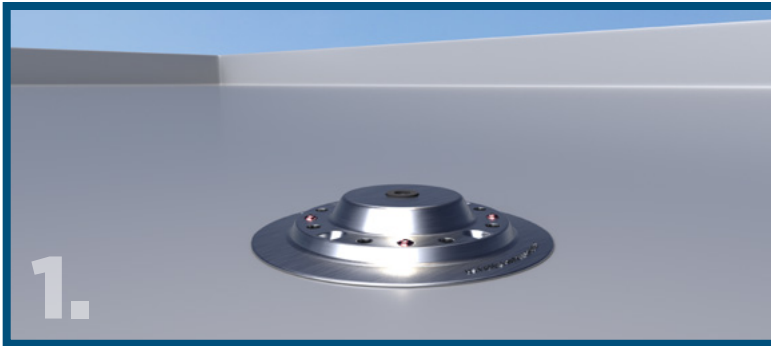
1. Assemble the screw, top, and bottom clamp as shown.

NOTE: The bottom clamp has two vertical columns which help guide and align the top clamp during installation.

2. The clamp can be placed anywhere on the top or side of the rail where needed.
3. Using an 5/16" socket and an impact or drill, drive the self-drilling screw through the assembly and halfway into the rail.
4. Insert the PV wires or Trunk cables into the assembly on either or both sides and fully tighten the self-tapping screw making sure not to strip. Be sure that the clamp is not pinching the wires when fully seated to the rail.

NOTE: The wire clamp can hold up to 4 PV Wires (up to 10AWG) or 2 trunk cables. Although easiest to install the wires after the screw has been slightly inserted into the rail, installers have the flexibility to place wires in the clamp before or after the screw has been drilled through the rail.

APPENDIX: INSTALLING THE FLAT ROOF ATTACHMENT



1. Mark locations for Flat Roof Attachment (FRA). Roof screws can be installed before or after racking has been installed. Type, size and quantity of roof screws to be specified by Structural Engineer. Fastener size not to exceed #15. Screws should be installed symmetrically with each other.
2. Install the Set Screw into the hole on the top of the FRA
3. If using a membrane flashing, remove the silicone washer's protective liner prior to attaching the membrane. Place the membrane over the FRA with the Set Screw threaded through the hole in the center of the membrane. Ensure membrane flashing is compatible with the existing roof material.

PRODUCT SPECIFICATIONS

Structural Certification

Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7.

UL 2703

Conforms to UL 2703 (2015) Mechanical and Bonding requirements.

LA Research Reports (LARR)

Approved for use in City of Los Angeles per LARR #26185