SunModo PV Rack Mounting System

UL2703 Compliant

Please read carefully before installing
The SMR Product is tested and recognized to UL 2703 standards for safety grounding and bonding equipment and meets UL 1703 fire standards.

SunModo PV Rack Mount System can be used to mount photovoltaic (PV) panels in a wide variety of locations. All installations shall be in accordance with NEC requirements in the USA. The self-bonding system is for use with PV modules that have a maximum series fuse rating of 30A. Mechanical design loads per UL 2703: Downward Pressure: 33.42 psf (1600.2 Pa), Upward Pressure: 33.42 psf (1600.2 Pa), Down-Slope: 5 psf (239.4 Pa). Mechanical test loads per LTR AE 2012: Downward Pressure: 50.125 psf (2400 Pa), Upward Pressure: 50.125 psf (2400 Pa).

Warning: In Canada the SMR Pitch Roof System can only be installed with maximum PV module area of 22.3 square feet (2.1 square meters).

Avertissement: Au Canada, le système de toiture en pente SMR ne peut être installé qu'avec une surface de module PV maximale de 22,3 pieds carrés (2,1 mètres carrés).

Table of Contents

SunModo Corporation:
Vancouver, Washington
www.SunModo.com
Ph.: 360-844-0048
info@sunmodo.com

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Intertek
5001753

Installer Responsibility

Before ordering and installing materials, all system layout dimensions should be confirmed by field measurements. SunModo reserves the right to alter, without notice, any details, proposals, or plans. Any inquiries that you may have concerning installation of the PV system should be directed to your SunModo Sales representative. Consult SunModo Sales for any information not contained in this manual. This manual is intended to be used as a guide when installing SunModo's racking system. It is the responsibility of the installer to ensure the safe installation of this product as outline herein.

- Installer shall employ only SunModo products detailed herein. The use of non SunModo components can cancel the letters of UL compliance and product warranties.
- Installer is responsible for determining that the roof, its rafters, connections, and other structural components can sustain the array under all environmental loading conditions per the codes and standards; consult with a licensed professional engineer.
- Installer shall guarantee that screws have adequate pullout strength and shear capacities.
- Installer shall adhere to the torque values specified in this Instruction Manual.
- Installer is responsible to install solar panels over a fire-resistant roof covering rated for the application.
- Installer shall adhere to all relevant local or national building codes. If any details of these installation instructions conflict with code requirements, installer should consult with SunModo.
- Installer shall guarantee the safe placement of all electrical details of the PV array.
- Installer to follow all applicable safety requirements during installation.
- Installer shall ensure bare copper grounding wire does not contact aluminum and zinc-plated steel components to prevent risk of galvanic corrosion.
- Installer is responsible for and shall 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, NEC 690: Solar Photovoltaic Systems, and CSA C22.2, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.
- Installer shall comply with all applicable local, state, and national building codes, including periodic re-inspection of the installation for loose components, loose fasteners, and any corrosion. If loose components, or loose fasteners are found during periodic inspection, re-tighten immediately. If corrosion is found, replace affected components immediately.

Safety

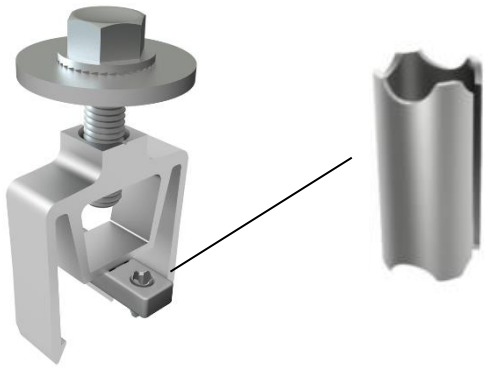
Review relevant OSHA and other safety standards before following these instructions. The installation of solar PV systems is a dangerous procedure and should be supervised by trained and experienced personnel.
It is not possible for SunModo to be aware of all the possible job site situations that could cause an unsafe condition to exist. The installer of the roof system is responsible for reading these instructions and determining the safest way to install the roof system. These instructions are provided only as a guide to show a knowledgeable, trained erector the correct part placement one to another. If following any of the installation steps would endanger a worker, the erector should stop work and decide upon a corrective action. Provide all required and recommended safety equipment for crew members working on the roof.

SunModo Racking Self-Bonding System

SunModo's SMR system meets the stringent requirements of UL 2703 and CSA C22.2 No. 61730-2 which covers rack mounting systems, mounting grounding/bonding components, and clamping/retention devices for photovoltaic (PV) modules. The SMR system is intended for, but not limited to, PV module installations on residential roof tops, commercial buildings, and freestanding ground mount structures.

The SMR system components are designed in accordance with the National Electrical Code, ANSI/NFPA 70 and Model Building Codes. These code requirements cover rack mounting systems and clamping devices intended for use with PV module systems with a maximum system voltage of 1500V.

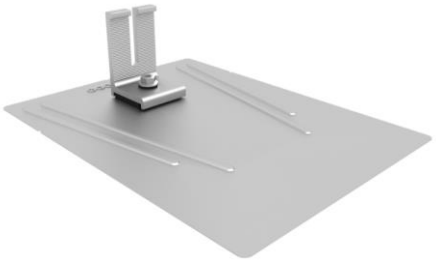
The SMR self-bonding system is for use with PV modules that have a maximum series fuse rating of 30A. This means the maximum number of PV modules in the SMR system is limited by the system voltage, so if a system has multiple inverters, the SunModo racking system can theoretically go on forever.

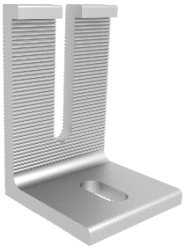


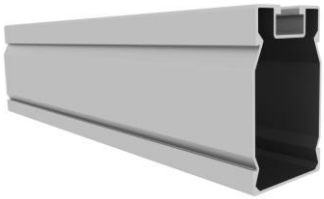
Mid Clamp with Bonding Pins

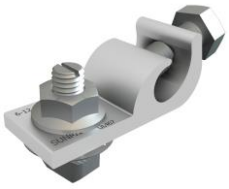
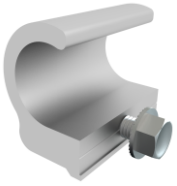
SMR Roof Mount System Components

Primary Materials

	SoloFlash Kit includes: • 9X12 Flashing • 3" L-Foot • 4" Lag Screw • Seal Washer	K50538-003 K50538-BK3
	9X12 Flashing	A50232-001 A50232-BK1
	NanoMount	K50063-BK1
	NanoBit	K50065-BK1
	Lag Bolt with Sealing Washer	K50049-BK1
	#14 Self-tapping Screw with Sealing Washer	K50055-BK2

	TopTile Mount	K10511-105-BK Flat Tile - 5” K10511-107-BK Curved Tile - 7” K10511-108-BK Curved Tile - 8” A20452-001 1” Tall Spacer
	MRB Mount	K50563-001
	Open L-Foot	A50223-XX2 3” Tall Open L-Foot A50253-XX1 4” Tall Open L-Foot
	SMR100 L-Foot Adaptor	K10433-002 K10433-BK2

	SMR End Clamp	K10418-004 K10418-BK4
	SMR Mid Clamp	K10417-004 K10417-BK4 For single use only
	SMR100 Bottom Clamp	K10505-001 K10505-BK1
	SMR100 Rail	A20422-XXX
	SMR100 Structural Rail Splice	K10421-004

	SMR100 Wire Management Clip	C10055-BK1
	SMR100 Rail End Cover	C10051-BK1
	Grounding Lug	K10469-004 For single use only
	MLPE Mount	K50052-004
	Conduit Mounting Clip	K10429-002 1" Conduit Clip K10430-002 3/4" Conduit Clip

List of Compliant PV Modules

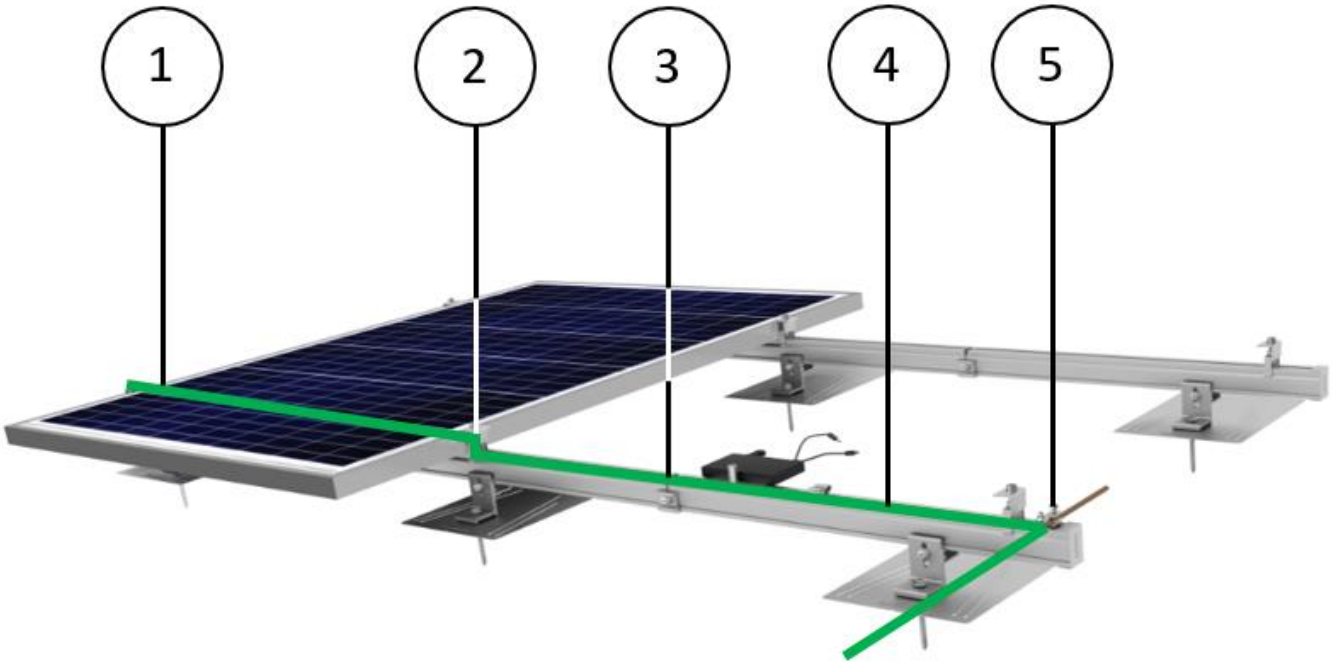
UL 2703 Qualified Modules for use with SunModo PV Racking Systems

Evaluated PV Modules	
Module manufacturer	Model numbers
Aptos	DNA-144-BF26-xxxW, DNA-144-MF26-xxxW
Astronergy	CHSM6612M-xxx, CHSM6612M/HV-xxx
AXITec Solar	AC-xxxP/60S, AC-xxxMH/120S, AC-xxxMH/120V, AC-xxxMH/144S, AC-xxxMH/144V
Boviet Solar	BVM6610M-xxx, BVM6612M-xxx, BVM6610P-xxx, BVM6612P-xxx
C-Sun	CSUNxxx-60M, CSUNxxx-60P, CSUNxxx-72M, CSUNxxx-72P
Canadian Solar	CS3N-xxxMS, CS3W-xxxMB-AG, CS3W-xxxP, CS3W-xxxPB-AG, CS6K-xxxM, CS6K-xxxMS, CS6P-xxxM, CS6U-xxxP, CS6V-xxxM, CS6V-xxxP, CS6X-xxxP,
ET Solar	ET-P672xxxWW
Hansol	HSxxxSE-V01
Hanwha Q Cells	Q.PEAK DUO-L-G4.2 xxxW, Q.PEAK DUO L-G5.2 xxxW, Q.PEAK DUO-G5-BLK xxxW, Q.PEAK DUO L-G6.2 xxx, Q.PEAK DUO L-G7.3 xxx, Q.PEAK DUO-G5 xxxW, Q.PRO L-G2 xxxW, Q.PEAK DUO ML-G10 xxx, Q.PEAK DUO XL-G10 xxx, Q.PEAK DUO XL-G11 xxx, Q.PEAK DUO BLK-G6 xxx, Q.PEAK DUO L-G5.2 xxx, Q.PEAK DUO L-G5.3 xxx, Q.PEAK DUO L-G6.2 xxx, Q.PEAK DUO BLK ML-G9 xxx, Q.PEAK DUO BLK ML-G10 xxx, Q.PEAK DUO BLK-G10 xxx
Hareon	HR-xxxP-24/Ba
Heliene	60M-320-G1-BLK, 66M-360-HJT-M2+BLK, 72M-xxx, 72M-BLK-xxx, 72P-xxx, 96M-xxx
Hyundai	HiS-MxxxTI, HiS-SxxxTI, HiN-SxxxXG (BK), HiS-SxxxYH (BK)
Itek Energy	ITxxxHE, ITxxxSE
JA Solar	JAM60D00-xxx/BP, JAM72S09-xxx/PR, JAP6 72-xxx/3BB, JAM72D00-xxx/PR, JAM72S09 -xxx/PR
Jinko	JKMxxxM-60HL, JKMxxxM-60L, JKMxxx-72L-V, JKMxxx-72HL-V, JKMxxxM-60HBL, JKMxxxM-72HL-V, JKMxxxM-72HL-TV, JKMxxx-7RL3-TV, JKMxxx-60HL4, JKMxxx-60HL4-V, JKMxxx-72HL4, JKMxxx-72HL4-V, JKMxxxM-72HL4-TV, JKMxxxM-72HL4-BDVP, JKM430M-72HLM-TV
Kyocera	KDxxxGX-LFB, KUxxx-6MCA, KDxxxGX-LFB2

LG	LGxxxA1C-A6, LGxxxM1C-A6, LGxxxM1K-A6, LGxxxN1C-A6, LGxxxN1C-E6, LGxxxN1C-G4, LGxxxN1C-N5, LGxxxN1K-A6, LGxxxN1K-B6, LGxxxN1K-E6, LGxxxN1K-G4, LGxxxN1K-V5, LGxxxN1T-G4, LGxxxN2T-E6, LGxxxN2W-A5, LGxxxN2W-B3, LGxxxN2W-E6, LGxxxN2W-G4, LGxxxN3K-A6, LGxxxQAC-A6, LGxxxQAK-A6, LGxxxQ1C-A6, LGxxxQ1C-V5, LGxxxQ1K-A6, LGxxxQ1K-V5, LGxxxS1C-G4, LGxxxS2W-G4
LONGi	LR4-60HPB-xxxM, LR4-72HPH-xxxM LR6-60PE-BOW-xxxW, LR6-60HPH-BOB-xxxW, LR672HPH-SOW-xxxW
Mission Solar	MSExxxSQ5T, MSExxxSQ8T, MSExxxSO9J, MSExxxSQ9S, MSExxxSR8T, MSExxxSR9S, MSExxxSX5T, MSExxxSX5R, MSExxxSX6Z, MSExxxSX6W
Mitrex	Mxxx-A1F, Mxxx-B1F, Mxxx-H1H, Mxxx-I1H, Mxxx-L3H
Mitsubishi	PV-MLExxxHD
Panasonic	EVPVxxxK, EVPVxxxPK, VBHNxxxKA01, VBHNxxxKA03, VBHNxxxKJ01, VBHNxxxSA16, VBHNxxxSA17
Phono Solar Tech	PSxxxM-20/U, PSxxxP-24T, PSxxxM1-24/TH, PSxxxM1H-24/TH, PSxxxM1-24/TH
REC Solar	RECxxxNP, RECxxxTP2, RECxxxTP2 BLK2, RECxxxTP2S 72, RECxxxTP2SM 72 RECxxxNP2 BLACK, RECxxxNP3 BLACK, RECxxxAA BLACK, RECxxxTP4 BLACK, RECxxxAA PURE, RECxxxAA PURE-R
RECOM	RCM-xxx-SMS, RCM-xxx-SMD2, RCM-xxx-SMA, RCM-xxx-SMD2, RCM-xxx-6ME, RCM-xxx-6MF
Renesola	JC xxx M-24/Bbs, JC xxx M-24/Bb, JC xxx M-24/Abs, JC xxx S-24/Abs, JC xxx S-24/Bbs
Risen Solar	RSM40-8-xxxM, RSM120-8-xxxM, RSM144-6-xxxM, RSM150-8-xxxM, RSM156-6-xxxM
Sanyo	HIP-xxxBA3, HIT-NxxxA01
Seraphim	SRP-xxx-6MA, SRP-xxx-6MA-DG, SRP-xxx-6MB, SRP-xxx-6MB-DG, SRP-xxx-6MB-HV, SRP-xxx-6PA, SRP-xxx-6PA-DG, SRP-xxx-6PA-HV, SRP-xxx-6PB, SRP-xxx-6PB-DG, SRP-xxx-6PB-HV, SEG-xxx-BMA, SEG-xxx-BMA-HV, SEG-xxx-BMB-HV, SEG-6MA-xxxBB, SEG-6MA-xxxBW, SEG-6MA-xxxWB, SEG-6MA-xxxWW, SEG-6MB-xxxBB, SEG-6MB-xxxBW, SEG-6MB-xxxWB, SEG-6MB-xxxWW, SEG-BMA-xxxBB, SEG-BMA-xxxBW, SEG-BMA-xxxBB, SEG-BMA-xxxWB, SEG-BMA-xxxWW, SRP-xxx-BMA, SRP-xxx-BMA-HV, SRP-xxx-BMB, SRP-xxx-BMB-HV, SRP-xxx-BMZ, SRP-xxx-BMZ-HV, SRP-xxx-BPA, SRP-xxx-BPA-HV
Silfab	SLAxxxM, SLGxxxM, SLAxxxMCH, SLAxxxMWT, SLA-M xxx, SLA-X-xxx, SLG-X-xxx, SIL-xxx NL/BL/HC/HC+/HL/NT/ML/BK/NX/NU
Solaria	PowerX-xxxR, PowerXT-xxxR-AC, PowerXT-xxxR-BX, PowerXT-xxxR-PX, PowerXT-xxxR-BD, PowerXT-xxxR-PD, PowerXT-xxxC-PD

Solar 4 America	S4Axxx-72MH5, S4Axxx-72MH5BB, S4Axxx-108MH10, S4Axxx-144MH10, S4A-USxxxB
SolarWorld (V2.5 frame)	Sunmodule SW series: SW xxx mono and poly, SW xxx mono, SW xxx poly Sunmodule Plus series: xxxW mono Sunmodule Protect xxxW mono, Sunmodule SW xxx poly / Pro-Series
SolarWorld (33mm frame)	Sunmodule Pro-Series: xxxW poly, xxxW XL mono Sunmodule Plus: xxxW mono
Stion	STO-xxxA
SunEdison	FxxxSMRD, FxxxSMRC, RxxxSMRC
SunPower Maxeon Technology	SPR-xxxE-WHT-D, SPR-Axxx, SPR-E19-xxx, SPR-E19-xxx-COM, SPR-E19-xxx, SPR-E20-xxx, SPR-E20-xxx, SPR-E20-xxx-COM, SPR-E20-xxx-D-AC, SPR-P17-xxx-COM, SPR-P5-xxx-UPP, SPR-X20-xxx-BLK, SPR-X20-xxx-BLK-B-AC, SPR-X20-xxx-C-AC, SPR-X21-xxx-BLK, SPR-X21-xxx-BLK-D-AC, SPR-X21-xxx, SPR-X21-xxx-COM, SPR-X21-xxx-D-AC, SPR-X21-xxx-BLK, SPR-X21-xxx-BLK-D-AC, SPR-X21-xxx-BLK, SPR-X21-xxx-COM, SPR-X22-xxx, SPR-X22-xxx-COM, SPR-X22-xxx-D-AC, SPR-X22-xxx-D-AC, SPR-MAX3-xxx-BLK-R, SPR-MAX6-xxx-BLK-E3-AC, SPR-MAX6-xxx-BLK-E4-AC
Trina	TSM-xxx PC/PA05, TSM-DE15M(II), TSM-DEG15MC.20(II), TSM-DE15H(II), TSM-DEG15HC.20(II), TSM-DE15V(II), TSM-DEG15VC.20(II), TSM-DEG18MC.20(II) TSM-DE19, TSM-DEG19C.20, TSM-DE21, TSM-DEG21C.20
URE	FAMxxxE7G-BB, FAMxxxE8G-BB, FBMxxxMFG-BB, F6MxxxE7G-BB, FBMxxxMFG-BB
Yingli	YLxxxP-29b
ZnShine	ZXM6-NHLDD144 Series, ZXM6-NH120 Series, ZXM7-SHLDD144 Series, ZXM7-SH144 Series

Fault Current Path Diagram



Items are listed in the fault current path in order from the PV Panel to the Grounding Lug:

1. PV Panel
2. Mid Clamp Kit
3. SMR Rail Splice
4. SMR Rail
5. Ground Lug

Fault Current Path

Tools Required for Installation

Impact Driver	
Band Saw	
Adjustable Torque Wrench, 0 – 35 Nm	
Tape measure	
Chalk line or laser	
Caulk gun and silicon sealant • ChemLink M1 (or equivalent) for wood and composite roofs • ChemLink DuraLink (or equivalent) for metal roofs	
Shingle Ripper Pry Bar	
Male hex drive impact socket adapter	

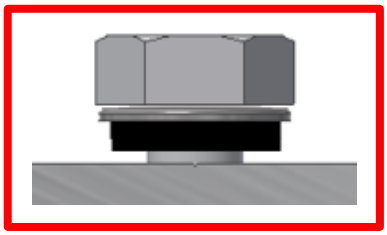
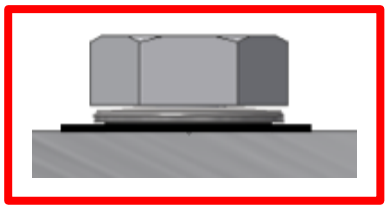
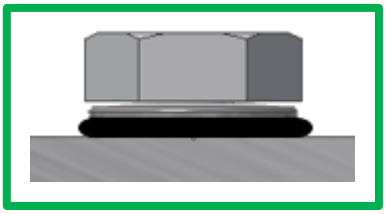
13mm (1/2") 6-point Socket	
TopTile Installation only: 28mm (1-1/8") 6-point Socket	
TopTile Installation only: SHDIATOOL Diamond Core Drill Bits 2 Inch for Hard Stone Concrete Marble Granite Brick Laser Welded Dry or Wet Hole Saws 50mm	
TopTile Installation only: SHDIATOOL Core Drill Bit Adapter 5/8"-11 Thread Male to SDS Plus Shank	
TopTile Installation only: T25 Torx/Star Bit	
TopTile Installation only: Dow Great Stuff FireBlock Polyurethane Spray Foam (or equivalent)	
Anti-seize compound (Permatex 80071 or equivalent)	

Torque Values

These values must be adhered to both for mechanical strength and to insure the performance of the integral grounding and bonding features. It is required that a torque wrench be used to measure the bolt torque during final assembly, and it is recommended that anti-seize compound be applied to the screw threads.

Hardware	Torque
Ground Lug, Screw to secure Ground Wire	5.6 Nm (4.2 ft.-lbs)
SMR End/Mid Clamps	9.4 Nm to 10.2 Nm (6.9 ft-lbs to 7.5 ft-lbs)
SMR L-Foot Adaptor	13 Nm to 15 Nm (10 ft-lbs to 11 ft-lbs)
Self-tapping Screws	As required
Lag Screw	As required

Sealing Gasket Compression

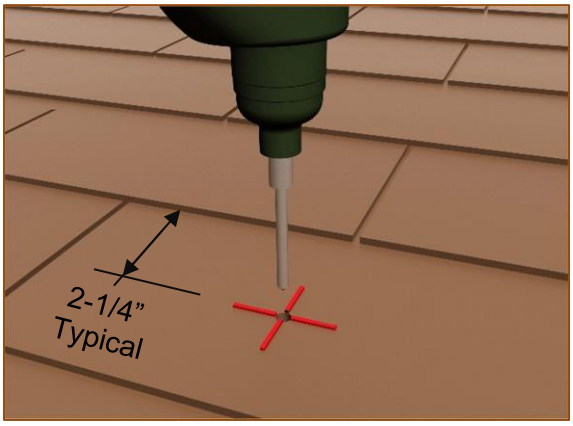
Incorrect:	Incorrect:	Correct:
Under compressed EPDM Sealing Gasket	Over compressed EPDM Sealing Gasket	Compression of EPDM Sealing Gasket
		

SoloFlash Installation Instructions

Pilot Hole

From the desired rafter location, move down the roof 2-1/4" [57mm] from the bottom of the shingle, and drill the pilot hole for the Lag Bolt with a 7/32" [6mm] drill bit. For maximum strength, the hole should not be more than 3" in depth, and a drill stop may be used to insure this.

Clean sawdust, and fill hole with sealant, such as Chem-link M1 for wood and composite roofs.

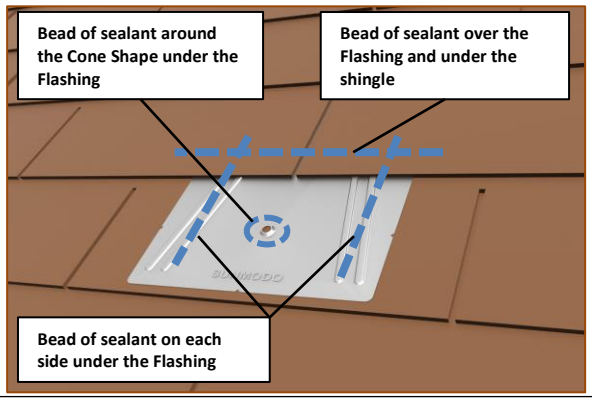


Flashing Installation

Use a roofing bar to lift the roof shingle, slide the flashing under the shingle.

Best practice tip:

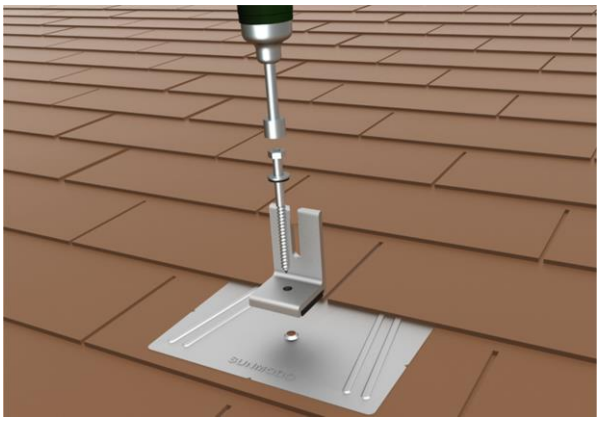
For additional waterproofing apply beads of sealant as shown.



Lag Screw Installation

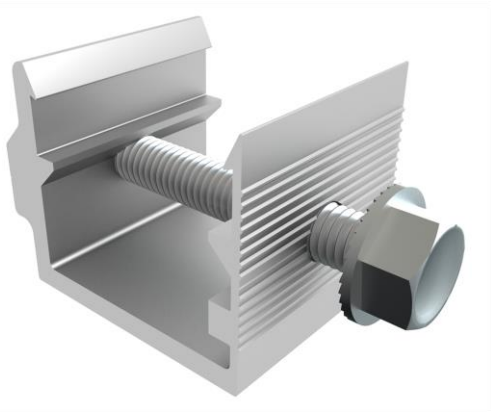
Place the L-Foot onto the Flashing and install the 5/16" [M8] Lag Screw using a 13mm (1/2") hex socket.

Do not over tighten.

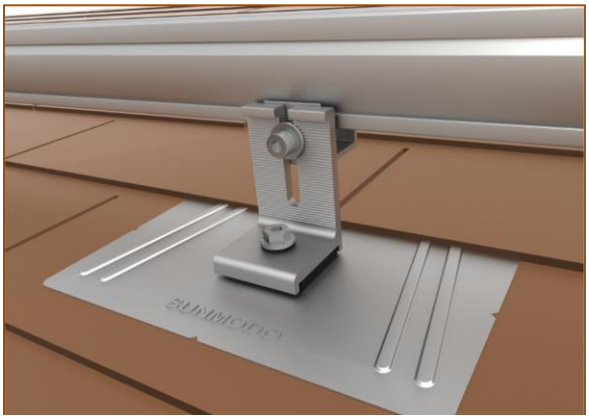


L-Foot Adaptor Installation Instructions

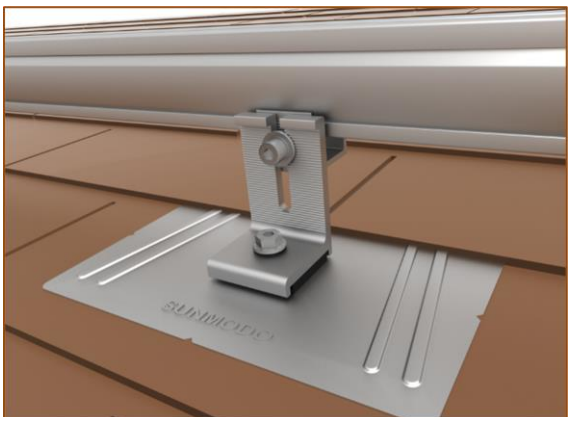
L-Foot Adaptor

Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided.	

L-Foot Connection

Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail.	

Rail to L-Foot Connection

Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).	

NanoMount Installation Instructions

Nano Rafter Mount Sealant Application

Apply a circular bead of composite roof sealant around the bottom of the NanoMount.

Apply additional sealant to the roof if needed to seal gaps between shingles or to smooth uneven surfaces.

Roof Attachment

Locate the center of the rafter in the desired roof location and drill a 7/32" [6mm] pilot hole. Clean sawdust, and fill hole with sealant, such as Chem-link M1 for wood and composite roofs.

Use a 13mm (1/2") hex socket to install the 5/16" [M8] Lag Screw.

Do not over tighten.

Rail Attachment

Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided.

Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail.

Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).

Nano Deck Mount Sealant Application

Apply a circular bead of composite roof sealant around the bottom of the NanoMount.

Apply additional sealant to the roof if needed to seal gaps between shingles or to smooth uneven surfaces.

Roof Attachment

Locate the desired roof location and install the 4X Self-Tapping Screws with Sealing Washers.

Use a 13mm (1/2") hex socket to install the Self-Tapping Wood Screws.

Do not over tighten.

Rail Attachment

Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided.

Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail.

Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).

Optional Nano Rafter Mount Sealant Application

Apply a circular bead of composite roof sealant around the bottom of the NanoMount.

Apply additional sealant to the roof if needed to seal gaps between shingles or to smooth uneven surfaces.

Rafter Attachment

Locate the desired rafter or joist location and install the 2X Self-Tapping Screws with Sealing Washers.

Use either a 13mm (1/2") hex socket to install the Self-Tapping Wood Screws into the rafter or joist.

Do not over tighten.

Rail Attachment

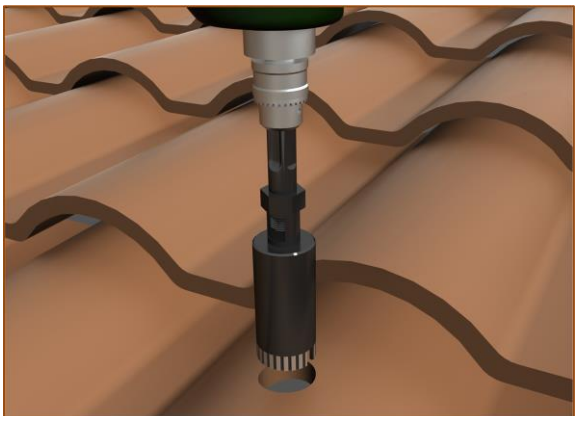
Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided.

Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail.

Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).

TopTile Installation Instructions

Tile Hole

Locate the desired location of the TopTile Mount. Using a 2" tile hole saw, drill a hole into the tile. Remove the tile dust from around the hole and the tile dust on the underlayment.	

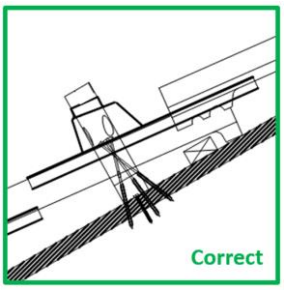
Underlayment Foam Application

After clearing away the tile dust on the underlayment, spray a 4" to 6" circular bead of polyurethane foam sealant onto the underlayment. We recommend Great Stuff FireBlock, but any polyurethane spray foam approved in your jurisdiction is acceptable.	

Stanchion Installation

Install the Stanchion using a 38mm Socket.	

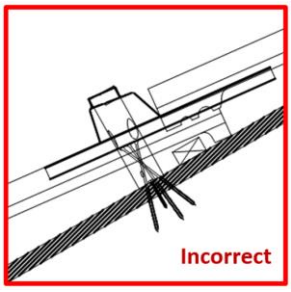
TopTile "Correct" Installation

The 3 wood screw stanchion holes are above the tile and below the collar of the EPDM cover on the Flashing. Note: Repositioning the stanchion higher or lower along the tile will increase or decrease the position of the 3 wood screw stanchion holes.	

TopTile "Acceptable" Installation

The 3 wood screw stanchion holes are above the tile, and also above the collar of the EPDM cover on the Flashing. Addition Great Stuff FireBlock spray foam can be used to prevent water infiltration.	

TopTile "Incorrect" Installation

The 3 wood screw stanchion holes are below the tile profile. In this position the wood screws cannot be installed. In this situation we recommend adding a 1" Spacer to the stanchion.	

1" Spacer Assembly

If required add a 1" Spacer to the bottom of the stanchion. Remove the EPDM Washer, install the 1" Spacer, and replace the EPDM Washer with the rubber gasket facing down.	

Deck Screw Installation

Install the 3 wood screws into the stanchion using a T25 Torx/Star Bit. Due to the side driving force of installing the screws into the sides of the stanchion, care should be taken to keep the stanchion plumb.	

Stanchion Sealing

Spray a circular bead of polyurethane foam sealant around the hole and the Stanchion to create a watertight seal.	

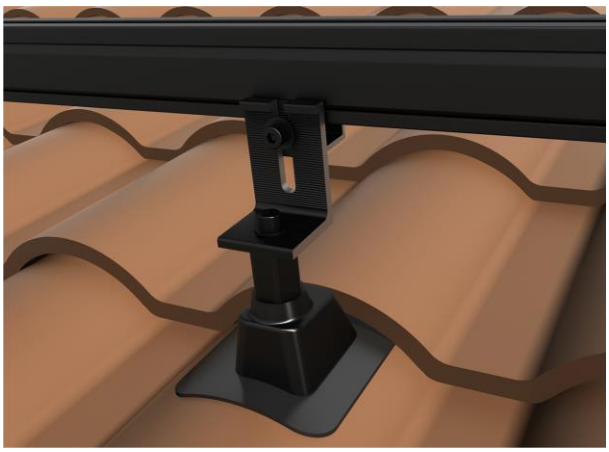
Flashing Installation

Remove the protective linear covering the butyl tape. Install Flashing over Stanchion and onto the tile.	

L-Foot Attachment

Install the L-Foot with its M8 Bolt onto the top of the Stanchion; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).	

Rail Attachment

Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided. Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail. Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).	

NanoBit Installation Instructions

NanoBit Sealant Application

To ensure a strong and watertight seal, wipe away excess dirt or debris from the mounting location.

Apply a circular bead of sealant around the bottom of the NanoBit.

Roof Attachment

Locate the center of the truss, rafter, or purlin in the desired roof location and drill a 7/32" [6mm] pilot hole. Clean sawdust, and fill hole with sealant, such as Chem-link M1.

Use a 13mm (1/2") hex socket to install the 5/16" [M8] Lag Screw.

Do not over tighten.

Rail Attachment

Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided.

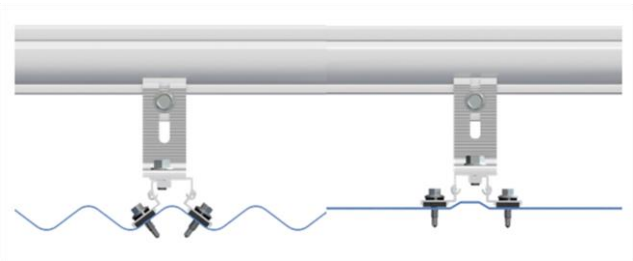
Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail.

Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).

MRB Mount Installation Instructions

MRB Mount Installation

The MRB Mount installs into 26-gauge sheet metal, 1/2 plywood or 7/16 OSB roof decking material. Mount is designed to fit on the most popular R-Panel and U-Panel trapezoidal and corrugated types of metal roofs.

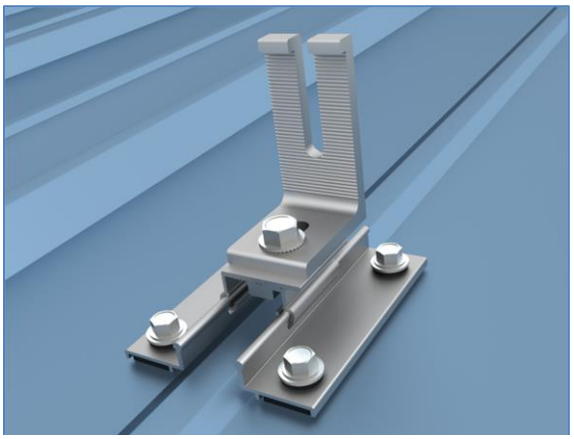


MRB Mount Attachment

Remove the protective linear covering the EPDM gasket adhesive.

Secure to 26-gauge minimum thickness sheet metal using four 1/4 x 1" Hex Washer Head Self-drilling Screws.

Adjust the L-Foot with its M8 Bolt onto the top of the clamp; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).

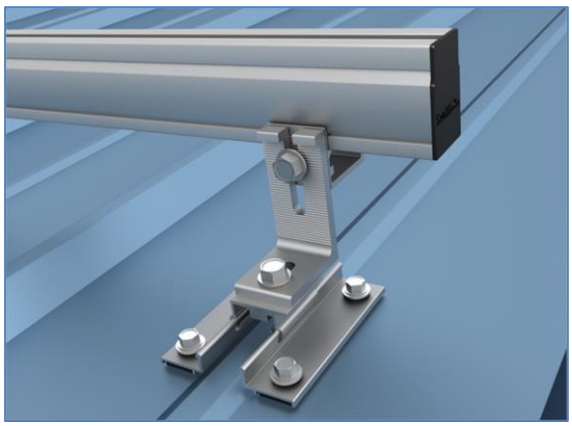


MRB Mount with L-Foot

Loosely install the L-Foot Adaptor to the L-Foot using the M8 Bolt provided.

Install the Rail onto the L-Foot and L-Foot Adaptor. Confirm that the hooks on the L-Foot Adaptor are fully engaged with the hooks on the side of the Rail.

Adjust the Rail to the desired height and then secure the Rail to the L-Foot Adaptor using the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).

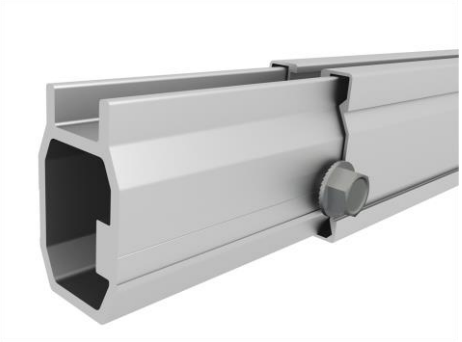


Rail Splice Installation Instructions

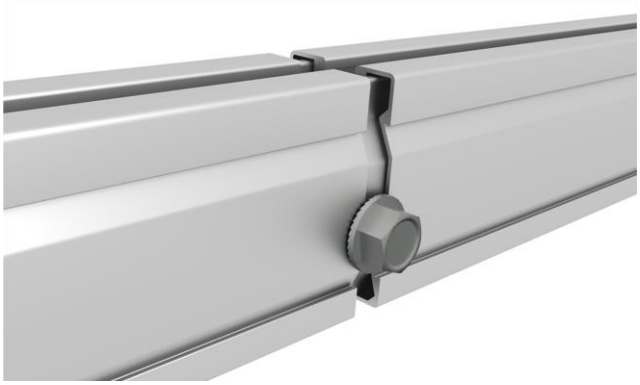
SMR Splice

The SMR Rail Splice has been designed to be both a structural and bonding rail splice.	

SMR Splice to First Rail

Insert the SMR Splice into the first Rail.	

SMR Splice to Second Rail

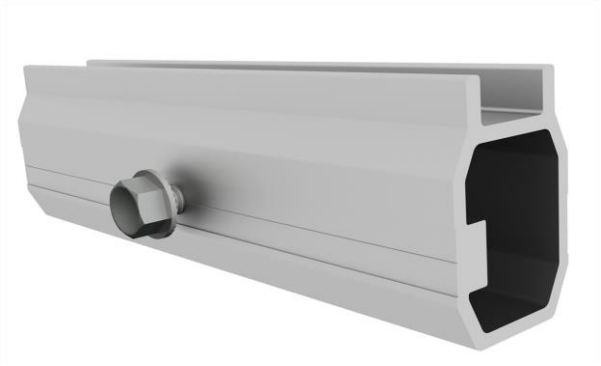
Insert the SMR Splice into the second Rail until both Rails are stopped by the M8 Bolt. Secure the SMR Rail Splice by tightening the M8 Bolt; use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs). See the SMR Rail and Splice Use Case section for permissible Splice locations.	

Thermal Break Installation Instructions

SMR Splice

The maximum permissible continuous Rail run before a thermal break is 60 feet.

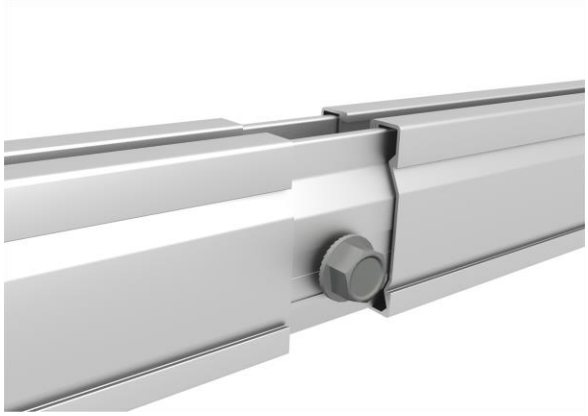
In cases where a thermal break is necessary it is recommended to use an SMR Splice in conjunction with the Wiley Bonding Jumper (WEEBBNDJMP8.0) to insure continuous bonding across the thermal break.



Gap Between Rails

Insert the SMR Splice into the Rails with a 1-1/4-inch gap between Rails.

Modules cannot be installed over a thermal break. The row of continuous modules must end before the thermal break and a new row must start after the thermal break.

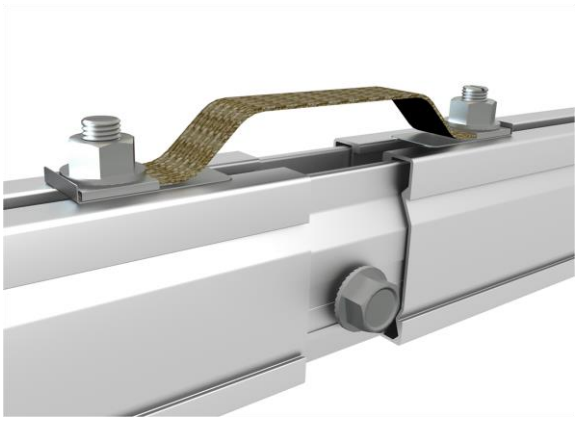


Bonding

Secure the Wiley Bonding Jumper to the Rails using either the SMR Microinverter Mounting Kit (shown) or by using M8 Nuts and Bolts.

Ensure a loop is left in the Bonding Jumper to allow for thermal expansion and torque to 13Nm (10 ft-lbs).

See the SMR Rail and Splice Use Case section for permissible Splice locations.



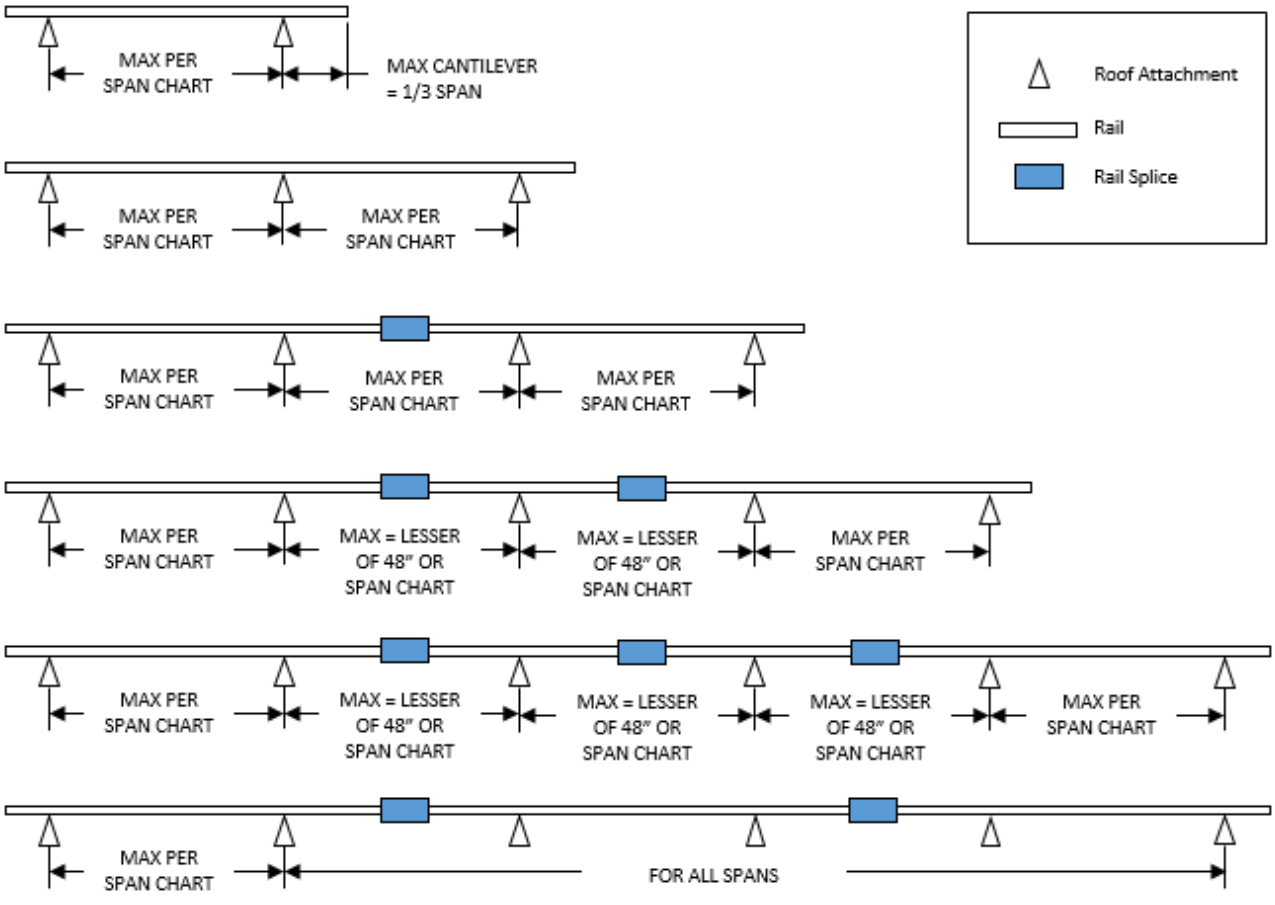
SMR Rail and Splice Use Cases

SMR span charts are available for download on the SunModo website.

Rail shall be continuous and not spliced over a minimum of 2 supports except for approved span lengths per SunModo's span charts. In these cases, it is acceptable to use a minimum of 1 support per rail section as long as all supports are located at a minimum of 48-inches on center and the first and last rail sections have a minimum of 2 supports.

Installation over roof overhangs or within 10" of any roof edge is not recommended.

Maximum end cantilever of aluminum support rail shall not exceed 1/3 of allowable span in the roof wind pressure zone of the cantilever.



SMR Rail and Splice Use Cases (Continued):

- Rails installed with (2) Roof Attachments (1 rail span):
  SMR Rail Splice where required shall be installed within a distance of L/4 from either Roof Attachment, where "L" is the rail span.
- Rails installed with (3) or more Roof Attachments (2 or more rail spans):
  SMR Rail Splice where required shall not be installed within a distance of L/8 from any Roof Attachment, where "L" is the rail span.

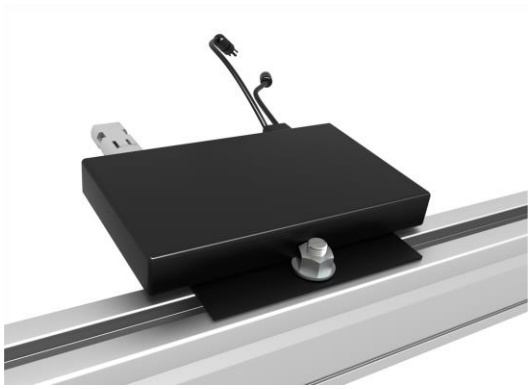
Module Configuration:

With a full range of components, the SMR Pitched Roof System can be configured in an endless variety of designs. The system is IBC compliant for roof waterproofing, wind and wind driven rain tested, UL 1703 compliant for Class-A Fire Rated (Type 1 and 2) PV Modules and UL 2703 compliant for electrical bonding tested by ETL.

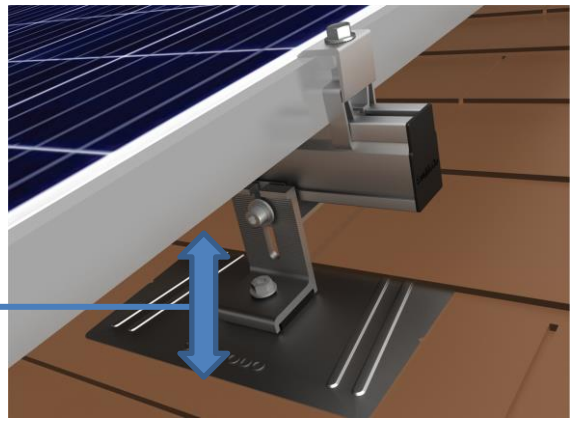
Proceed with the mounting of the PV panels using the roof attachment, Mid Clamps and End Clamps. Specific mounting instructions are shown in the following sections for portrait mounting.

A roof layout features two East-West rails. Mid Clamps are used between PV panels, they will produce 0.47" [12] spacing between PV panel frames. End Clamps are used to secure PV panels at the ends of a row.

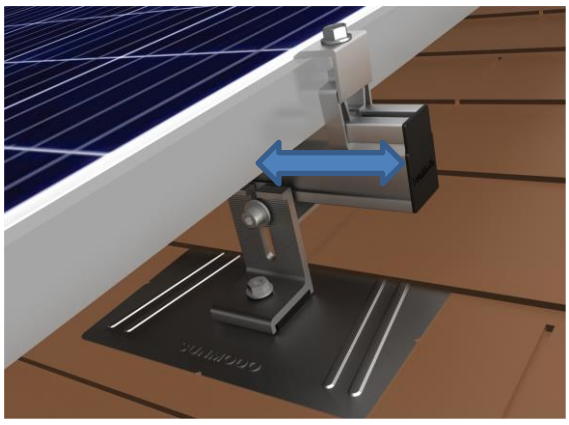
MLPE Installation

Install the T-Bolt into the Rail in the desired location. Install the MLPE and secure using the hex nut. Use a 13mm (1/2") hex socket and torque to 13Nm (10 ft-lbs).	

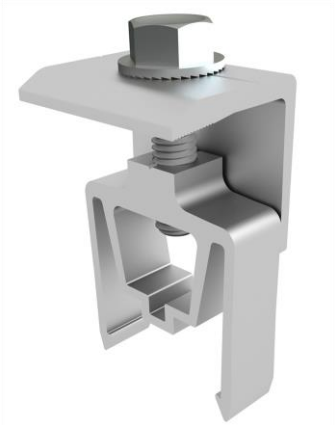
Minimum Panel Height

Minimum leading-edge height to meet the UL1703 PV module fire standard is 3.0" [76.2mm]. 3.0" [76.2mm] minimum from bottom of PV module frame to the roof covering	

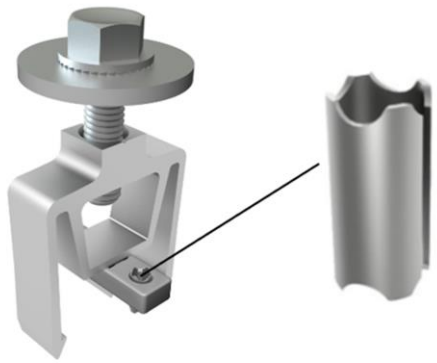
End Clamp Location

There must be a minimum of 1.5" [38.1mm] of Rail extending beyond the PV panel frame. Secure the PV panel frame to the Rail using the End Clamp; use a 13mm (1/2") hex socket and torque to 9.4 Nm (6.9 ft-lbs).	

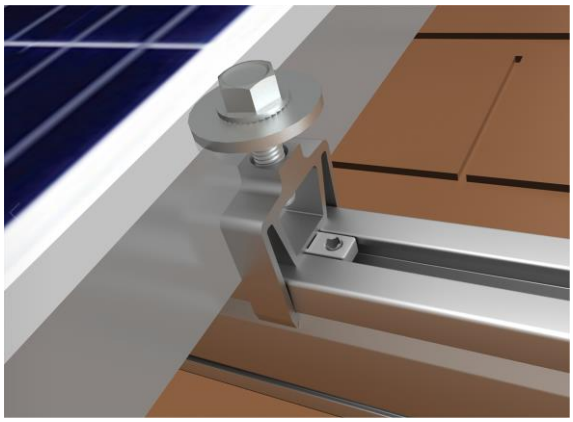
SMR End Clamp

Install the End Clamp on the Rail at the ends of the PV module array: ➢ Confirm that the hooks on the End Clamp are fully engaged with the hooks on the side of the Rail. ➢ Use your free hand to support the End Clamp against the panel frame while tightening. ➢ Use a 13mm (1/2") hex socket and torque to 9.4 Nm (6.9 ft-lbs).	

SMR Mid Clamp

The SMR self-bonding system is for use with PV modules that have a maximum series fuse rating of 30A.	

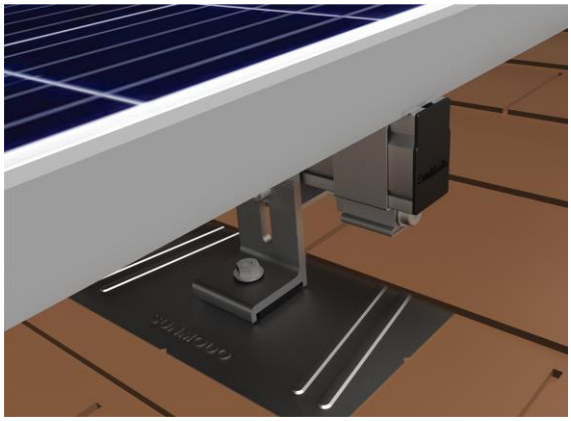
SMR Mid Clamp Attachment

Install the Mid Clamp on the Rail between PV panels. ➢ Confirm that the hooks on the Mid Clamp are fully engaged with the hooks on the side of the Rail. ➢ Secure the PV panel frame to the Rail using the Mid Clamp; use a 13mm (1/2") hex socket and torque to 9.4 Nm (6.9 ft-lbs).	

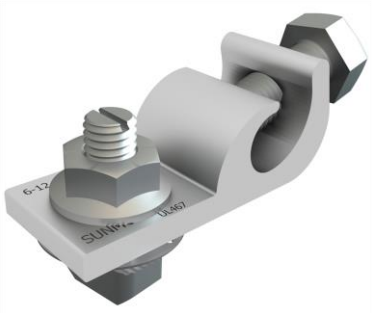
SMR100 Bottom Clamp

The SMR100 Bottom Clamp secures the PV panel frame flange to the Rail which allows the Rail to be cut flush with the module frame.	

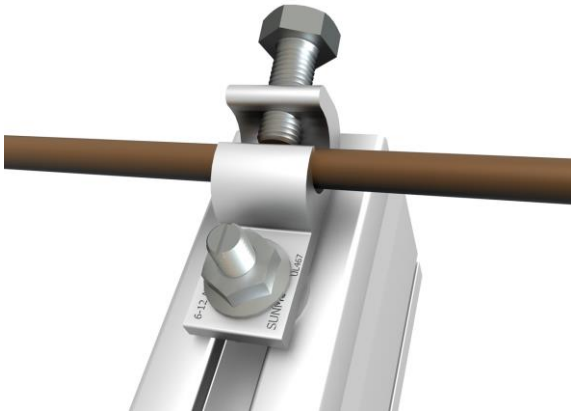
SMR100 Bottom Clamp Attachment

Install the SMR100 Bottom Clamp on the Rail at the ends of the PV panel array: ➢ Slide the SMR Bottom Clamp onto the Rail and pull forward to fully engage the panel frame flange. ➢ Use your free hand to support the Bottom Clamp against the panel frame flange while tightening. ➢ Use a 13mm (1/2") hex socket and torque to 9.4 Nm (6.9 ft-lbs).	

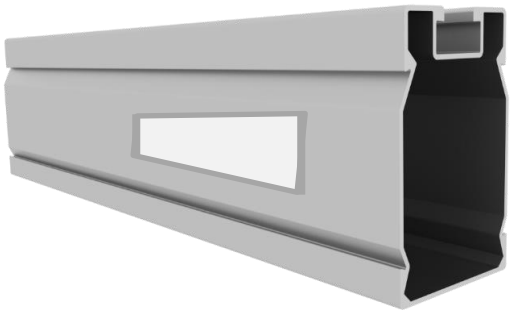
Ground Wire Attachment

The Ground Lug is intended for a single use after final torque values are reached and is designed to terminate or pass thru: #6 thru #12 AWG cable, either solid or stranded, including #6 thru #12 THHN or THWN jacketed cable. See PV module's installation instructions when mounting the Ground Lug to the PV module.	

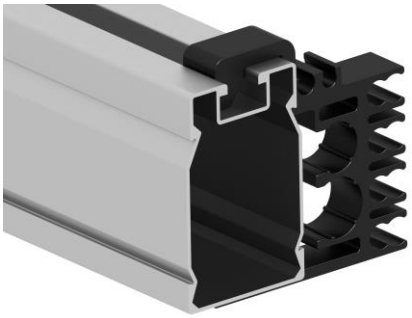
Ground Lug Installation

The picture shows a Ground Lug mounted on one Rail per row of panels. Ground Lug K10179-001 and K10469-001 detailed installation document D10003 are available from SunModo separately.	

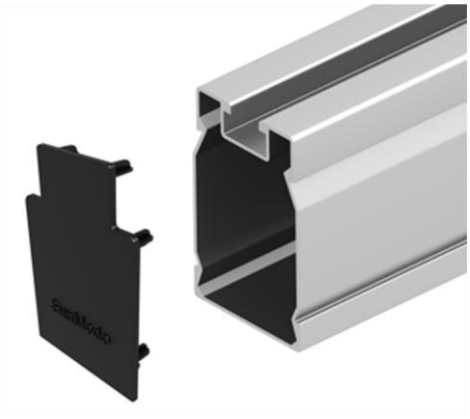
UL 2703 Label Placement

When requested the UL 2703 Label can be located on the Rail. 	

Wire Management Clip Installation

Install the Wire Management Clip into the top Rail channel and secure by locking into place. PV wires, trunk cable, and other wires in the clip.	

Rail End Cap Attachment

End Caps can be attached to the end of the Rail as shown.	

Conduit Clamp

Combine the Conduit Clamp with any L-Foot to create conduit supports in the desired locations.