EZ Roof Mount Attachments
With L-Foot, Standoffs and Variants

Pub. D10011-V007

Please read carefully before installing

Patent # US8122648B

SunModo's EZ Roof Mount Attachments can be used to mount PV panels on pitch roofs.
All installations shall be in accordance with NEC requirements in the USA.

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Document Number D10011-V007

IAPMO ES
File 0248

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 EZ Roof Mount System on pitched roofs. It is the responsibility of the installer to ensure the safe installation of this product as outline herein.

- Installer shall employ only SunModo products detail herein. The use of non SunModo components can void the warranty and cancel the letters of UL compliance.
- Installer shall guarantee that screws and anchors have adequate pullout strength and shear capacities.
- Installer shall adhere to the torque values specified in this Instruction Manual.
- Installer shall use anti-seize compound, such as Permatex anti-seize, lubricant is recommended for all threaded parts.
- Installer is responsible to install solar panels over a Fire Resistant roof covering rated for the application.
- Installer is responsible to determine that the roof, its rafters, connections, and other architectural support components can sustain the array under all code level loading conditions.
- Installer shall adhere to all relevant local or national building codes. This takes account of those that supplant this document's requirements.
- Installer shall guarantee the safe placement of all electrical details of the PV array.
- 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, such that if found, the affected components are to be immediately replaced.
- Installer to ensure the structural support members or footings for mounting the array can withstand all code loading conditions. Consult with licensed professional engineer for the appropriate loading conditions.
- Installer to follow all regional safety requirements during installation.
- 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.
- Installer shall 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. 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 required safety railing, netting, or safety lines for crew members working on the roof.

Specifications:

EZ Roof Mount K10068 is certified for International Building Code and International Residential Codes (IRC) by IAPMO. Evaluation Report is 0248, structural test per EC002-2011 and rain test per UL 441-96.

Lag Pull-Out Capacities:

Lag pull-out (withdrawal) capacities (lbs.) in typical lumber:	Specific Gravity	5/16" Shaft per 1" thread depth	5/16" Shaft per 2-1/2" thread depth
Douglas Fir, Larch	.50	266	665
Douglas Fir, South	.46	235	588
Engelmann Spruce, Lodgepole Pine (MSR 1650 f & higher)	.46	235	588
Hem, Fir	.43	212	530
Hem, Fir (North)	.46	235	588
Southern Pine	.55	307	768
Spruce, Pine, Fir	.42	205	513
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	.50	266	665

Sources: American Wood Council, NDS 2005, Table 11.2 A, 11.3.2 A

Notes:

1) Actual test data in Southern Pine: Test Load at 0.250 inch deflection: 1,800 lbs. uplift (withdrawal); 240 lbs. lateral. Test Load at 0.125 inch deflection: 695 lbs. uplift (withdrawal); 130 lbs. lateral.

2) Thread must be embedded in a rafter or other structural roof member.

3) See NDS Table 11.5.1 C for required edge distances.

EZ Roof Mount Series:

EZ Roof Mount Kit includes:

- Flashing
- L-Foot
- Roof Shoe and Gasket
- 4” Lag Bolt
- AL Hex Cap
- 3/8” Flange Nut and Bolt

K10068-XXX
EZ Roof Mount with L-Foot
(-001 as shown)

EZ Roof Mount Decking Kit:

- Flashing
- L-Foot
- Roof Shoe and Gasket
- 4X 1/4 X 3” Decking Screw
- AL Hex Cap
- 3/8” Flange Nut and Bolt

K10068-B20
EZ Roof Mount with L-Foot
(Black as shown)

EZ Roof Mount Standoff Kit:

- Flashing
- Roof Shoe and Gasket
- 4” Lag Bolt
- AL Hex Cap
- 3/8” Flange Nut and Bolt
- Standoff: 2” shown

K10070-XXX
EZ Roof Mount with Standoff
(Standoff heights: 2”, 3”, 5” and 7”)

EZ Roof Mount C-Bracket Kit:

- Flashing
- Roof Shoe and Gasket
- 4” Lag Bolt
- AL Hex Cap
- 3/8” Flange Nut and Bolt

K12005-001
EZ Roof Mount Kit with C-Bracket

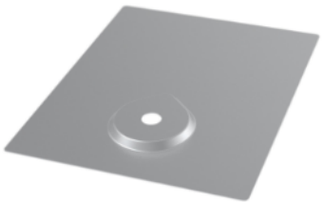
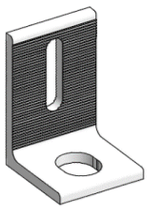
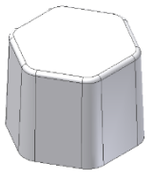
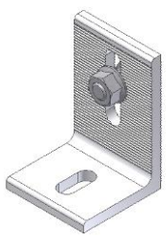
EZ Roof Mount Conduit Kit:

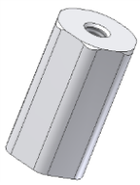
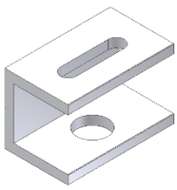
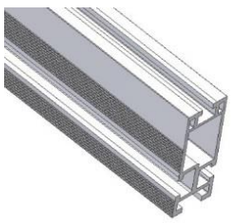
- Flashing
- L-Foot
- Roof Shoe and Gasket
- 4” Lag Bolt
- AL Hex Cap
- 3/8” Flange Nut and Bolt
- Conduit Clamp

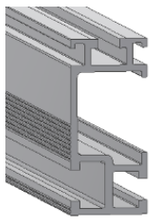
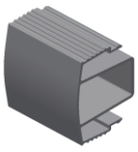
K10205-001
EZ Roof Mount Kit, 1" Conduit

K10205-002
EZ Roof Mount Kit, 3/4" Conduit

Primary Materials:

	Aluminum Flashings are offered in two sizes: 10”X12.5” and 18”X18”. Available in clear, black and brown anodize.	A20052-XXX AL Flashing
	Aluminum L-Foot is offered in clear, black and brown.	A20064-XXX AL L-Foot
	AL Hex Cap Available in clear and black	A20066-001 and -BK1 AL Hex Cap
	Aluminum Shoe is provided with EPDM Sealing Washer installed.	A20065-001 AL Shoe C10006-001 Sealing Washer
	5/16 Stainless Steel Lag Bolts are available lengths: 3.5”, 4”, 4.5” and 5”	B15015-XXX 5/16 Stainless Steel Lag Bolt
	OMG XHD (Extra Heavy Duty) #15 Roofing Fastener	B15040-001 (4 reqd per mount) OMG 1/4 X 3" Decking Screw XHD003B #15X3
	Aluminum L-Foot available in clear and black.	K10066-XXX Standard L-Foot Kit K10096-XXX Tall L-Foot Kit (3/8” Flange Nut and Bolt included)

	Aluminum Standoff heights: 2”, 3”, 5” and 7” (part of EZ Roof Kit K10070-XXX)	A20049-XXX Standoff (multiple lengths)
	Aluminum C-Bracket (part of EZ Roof Kit K12005-001)	A22001-001 C-Bracket
	Conduit Clamp for 3/4” and 1” diameter conduit	A20212-001 1” Conduit Clamp A20213-001 3/4” Conduit Clamp
	Conduit Mount L-Foot	A20064-004 Conduit Mount L-Foot
	Helio Rails: Features both 1/4” and 3/8” side slots, and 1/4” top slot for clamping PV panels. Available in 84”, 124”, 164” and 206” lengths. Last 3 digits denote rail length. 4 stock sizes in clear and black.	A20144-XXX (Clear) A20144-XXX-BK (Black) HR250 (Standard Rail) A20145-XXX (Clear) A20145-XXX-BK (Black) HR350 (Heavy Rail) A20146-XXX (Clear) A20146-XXX-BK (Black) HR500 (Super Rail)
	Rail End Caps available for Helio Standard and Heavy rails (optional)	C10017-001 (Black) C10017-001-GR (Gray) Helio Standard C10021-001 (Black) C10021-001-GR (Gray) Helio Heavy
	Metal Rail End Caps available for Helio Standard and Heavy rails (optional)	A20284-001 A20284-BK1 (Black) HR250 (Helio Standard) A20285-001 HR350 (Helio Heavy) A20263-001 HR500 (Helio Super)

	HR150 (Open Rail): Features wire management channel and both 1/4” and 3/8” side slots, and 1/4” top slot for clamping PV panels. Available in 84”, 124”, 164” and 206” lengths. Last 3 digits denote rail length. 4 stock sizes in clear and black.	A20242-XXX (Clear) A20242-XXX-BK (Black) HR150 (Open Rail)
	1/4” Slot Open Rail Splice Kit with 4X 1/4-20 Bolts and Flange Nuts with integral grounding***. May be repositioned until torqued to final value.***	K10236-001 HR150 Splice Kit **For single-use only**
	Rail End Cap available for HR150 rails (optional)	A20250-001 (Clear) A20250-BK1 (Black) HR150 Rail End Cover
	HR150 Channel Clip: snaps into the open rail to manage wire bundles where needed. Available in clear and black.	A20252-001 (Clear) A20252-BK1 (Black) HR150 Wire Cover

The HR150 family of products are shown assembled above. Two HR150 Rails are spliced together with an HR150 Rail Splice. PV electrical wires are shown routed in the channels of the HR150 Rails, retained with two HR150 Channel Clips snapped into place.

Tools Required for Installation:

Electric Drill or impact driver. Note that the use of an impact driver is strongly discouraged for all stainless nut and bolt hardware.

Roofing Bar

Drill Bit for lag bolts, pilot hole 7/32” diameter for 5/16” lag bolt

3/8” Socket Wrench

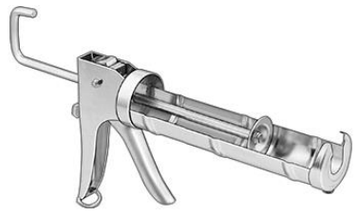
Sockets for 3/8” drive sockets, 7/16”, 1/2”, 9/16” and 1-1/16”

Torque Wrench 3/8” drive, 0 to 35 ft. lbs.

Anti-seize compound (Permatex 80071 or equivalent).

Caulk gun and silicon sealant

- **ChemLink M1 (or equivalent) for wood and composite roofs.**
- **ChemLink DuraLink (or equivalent) for metal roofs.**



Tape measure

Saws for cutting aluminum posts and rails as necessary

Other items that can be useful:

- **Chalk or roofer's marker to layout roof.**
- **Adaptor for 3/8" socket to drill chuck.**
- **#3 Phillips bit**

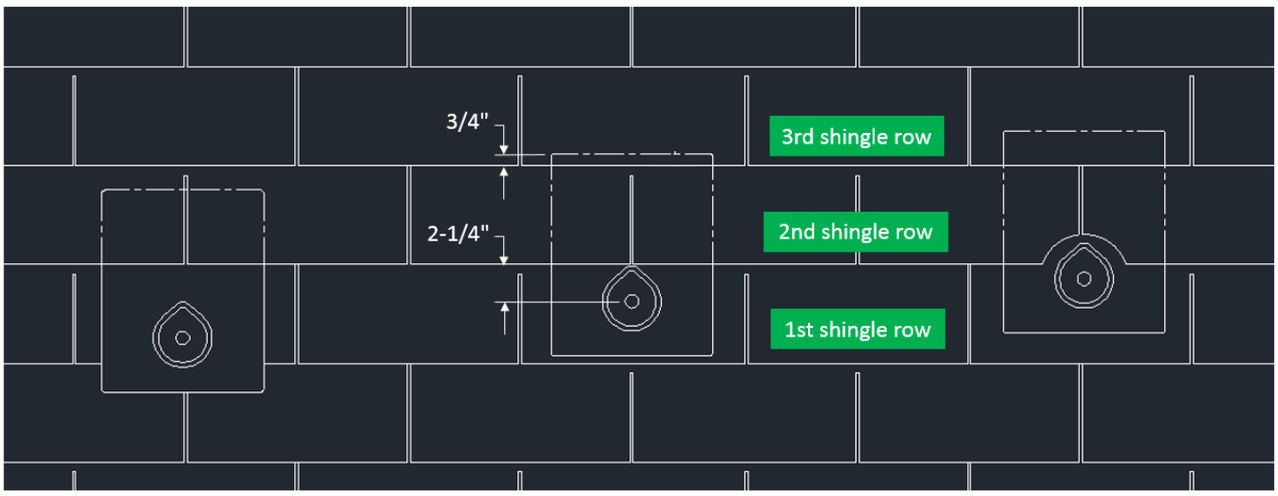
Torque Values:

These values must be adhered to for mechanical strength. 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, such as Permatex, be applied to the screw threads.

Hardware	Torque
1/4" Bolts and Hex Flange Nuts	7.5 ft. lbs.
1/4 X 3" Decking Fastener	As Required
5/16 X 4" Lag Bolt	25 ft. lbs.
3/8" Bolts and Hex Flange Nuts	15 ft. lbs.
3/8" T-Bolts and Hex Flange Nuts	15 ft. lbs.
Mid or End Clamp, 1/4-20 Female Standoff with 7/16" Hex Head Collar Nut	7.5 ft. lbs.
Ground Lug: 1/4" Flange Nut with 7/16 hex drive head	7.5 ft. lbs.
Ground Lug: 1/4" setscrew with1/8 Allen drive	4.2 ft. lbs. (50 in. lbs.)
HEX Cap: 1-1/16" socket	15 ft. lbs.

Note: We strongly recommend against the use of an impact wrench except for the installation of the Lag Bolts.

Flashing Placement:



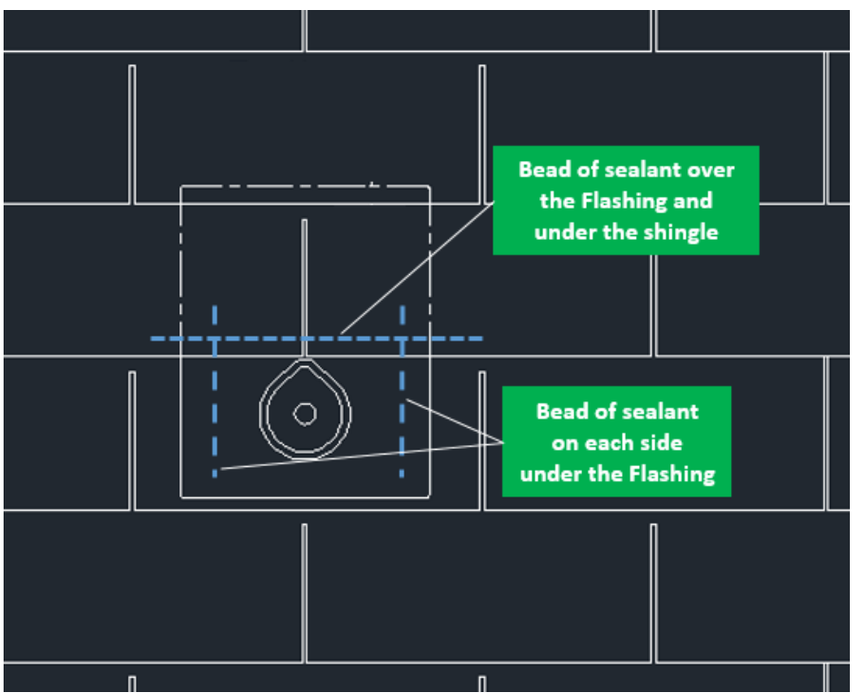
INCORRECT Position
Moisture and debris can accumulate causing early shingle degradation

CORRECT Position
No shingle cutting required

Acceptable Position
If shingle cutting is required a 1/2“ gap between the raised feature of the Flashing and the shingle is recommended

If cutting the shingle to reposition the flashing proves to be impractical, apply sealant around the edges of the flashing to prevent debris from accumulating under the shingle.

Sealant Application:



Installation Instructions:

EZ Roof Mount Kit K10068-XXX

1. From the marked location, move down the roof 2-1/4” from the bottom of the shingle, and drill the pilot hole for the Lag Bolt with a 7/32” 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.

2. Clean sawdust, and fill hole with sealant, such as Chem-link M1 for wood and composite roofs, or ChemLink DuraLink for metal roofs. Install AL Shoe to roof by using 5/16” Lag Bolt. Tighten to 25 ft. lbs. torque.

3. Make sure the Sealing Washer is positioned correctly on the threaded shank of the AL Shoe. Use roofer bar to lift roof shingle, slide the flashing under shingle, and insert the Flashing on threaded shank as shown. For additional waterproofing apply beads of sealant as shown.

4. Insert L-Foot to AL Shoe on top of Flashing. Place AL Hex Cap on Shoe, and lightly hand tighten Hex Cap.

5. Install AL Rail to L-Foot to the specific orientation. Then, tighten 3/8” Flange Nut to 15 ft-lbs. and Hex Cap to 15 ft-lbs. torque.

Installation Instructions

EZ Roof Mounting Standoff Kit K10070-XXX

Mount the AL Shoe using steps 1-3 (shown above).

A. Place AL Standoff on AL Shoe threads and tighten by hand, then by wrench. Use 15 ft.-lbs. nominal torque.

B. Using the 3/8” Flange Bolt (supplied with AL L-Foot) attach to the top of the Standoff.

C. Install AL Rail to L-Foot to the specific orientation. Then, tighten 3/8” Flange Nut to 15 ft-lbs. and Hex Cap to 15 ft-lbs. torque.

Installation Instructions

EZ Roof Mount with C-Bracket Kit K12005-001

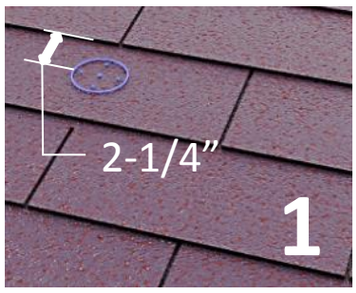
Mount the C-Bracket using steps 1-3 (shown above).

D. Mount the C-Bracket instead of an L-Foot, using the Hex Nut. The C-Bracket can be used to mount a variety of rails and other rooftop equipment.

Optional Mounting Instructions:

EZ Roof Mount Kit K10068-B20

1. From the desired location, move down the roof 2-1/4” from the bottom of the shingle, and locate the EZ Roof Mount AL Shoe center. The AL Shoe will be used as a template to locate the 4 screws.



2. Place a bead of Chem-link M1 for wood and composite roofs along the length of the screw four (4) 1/4” X 3” self-drilling Decking Screws. Mount the AL Shoe to the roof through the shingles using the four Decking Screws. The screws will penetrate the roof sheathing and should protrude through the sheathing at least 1/2”. Maximum pullout strength requires that the threads extend below the sheathing.

3. Make sure the Sealing Washer is positioned correctly on the threaded shank of the AL Shoe. Use roofer bar to lift roof shingle, slide the flashing under shingle, and insert the Flashing on threaded shank as shown. For additional waterproofing apply beads of sealant as shown.

4. Insert L-Foot to AL Shoe on top of Flashing. Place AL Hex Cap on Shoe, and lightly hand tighten Hex Cap.

5. Install AL Rail to L-Foot to the specific orientation. Then, tighten 3/8” Flange Nut to 15 ft-lbs. and Hex Cap to 15 ft-lbs. torque.

Warning: The self-drilling decking screw mount option is only suitable for roofs less than 5/12 pitch and should only be used with a direct L-Foot attachment.

Avertissement: L'option de montage à vis à plate-forme auto-perçage ne convient que pour des toits de moins de 5/12 et ne doit être utilisée qu'avec une fixation L-Foot directe.

See www.sunmodo.com for current warranty documents and information.

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