

SOLARMOUNT™

Universal PV Module Roof Mounting System Installation Guidelines

Please read and understand these Guidelines completely before installing your SolarMount.

Installer is solely responsible for -

- 1) complying with all applicable building codes,**
- 2) maintaining the waterproof integrity of the roof, and**
- 3) all aspects of the electrical installation of the PV array.**

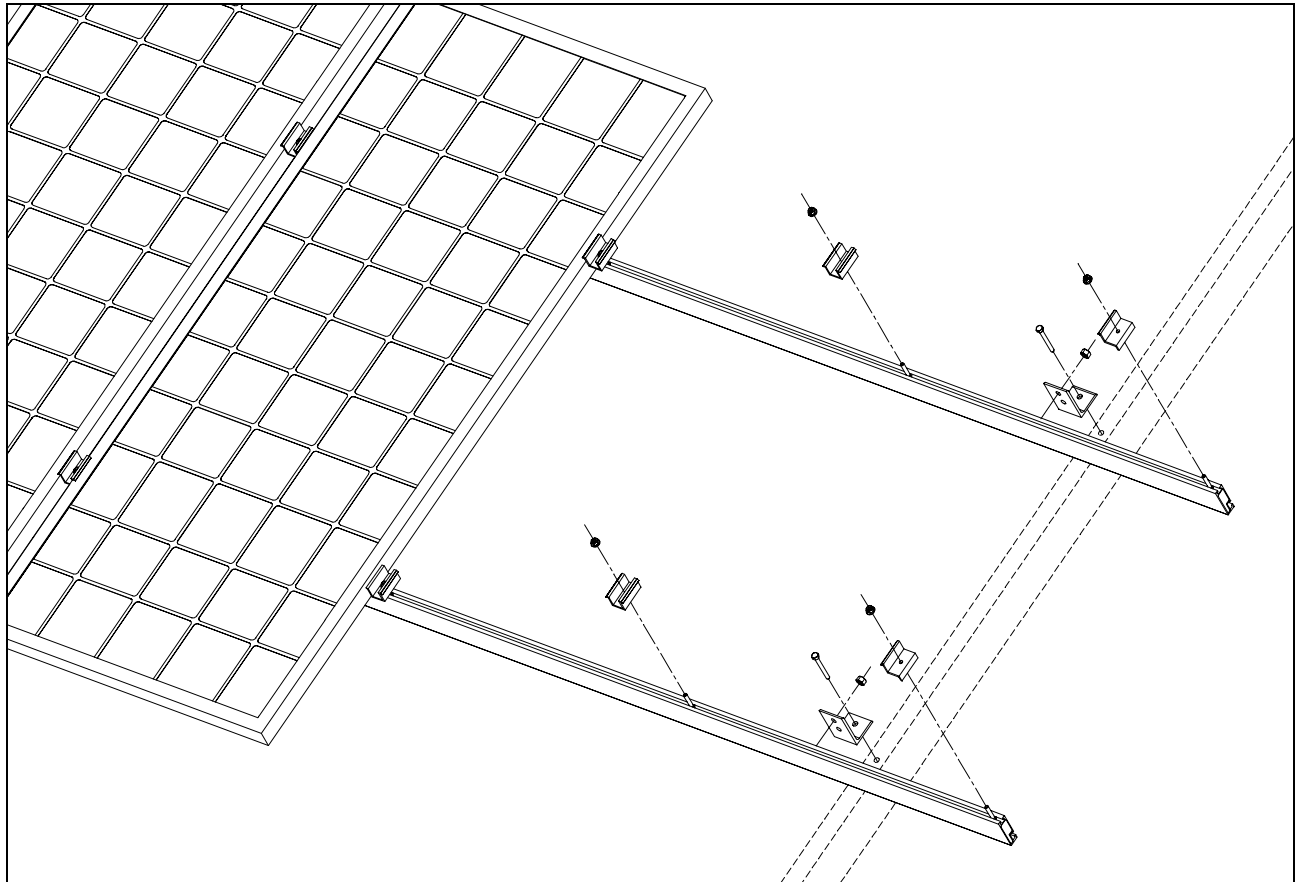


Figure 1 - Exploded view of Landscape Mode Installation with "L" Feet

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UNI RAC® *The New Standard in PV Module Racks™*

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Parts List

SolarMount Model #	2 Rails, and ¼" Safety Bolt and Nut	"L" Feet, 3/8" Rail Mounting Bolts and Flange Nuts, 5/16" x 3 ½" Lag bolts	Module Clamps 4 End Clamps, plus Mid-Clamps per below					Sets of ¼" Module Bolts and Flange Nuts				
			Module Group A	Module Group B	Module Group C	Module Group D	Module Group E	Module Group A 1" long	Module Group B 1 ½" long	Module Group C 1 ½" long	Module Group D 1 ½" long	Module Group E 2" long
SM-48	48"	4 of each	2	-	2	-	2	6	-	6	-	6
SM-60	60"	4 of each	2	-	2	-	2	6	-	6	-	6
SM-72	72"	4 of each	4	2	4	2	4	8	6	8	6	8
SM-84	84"	4 of each	-	-	4	-	4	-	-	8	-	8
SM-96	96"	4 of each	6	4	6	-	6	10	8	10	-	10
SM-108	108"	4 of each	-	-	6	4	8	-	-	10	8	12
SM-120	120"	6 of each	8	-	8	-	8	12	-	12	-	12
SM-132	132"	6 of each	-	6	8	-	10	-	10	12	-	14
SM-144	144"	6 of each	10	-	10	6	10	14	-	14	10	14
SM-156	156"	6 of each	-	8	12	-	12	-	12	16	-	16
SM-168	168"	6 of each	12	-	10	8	14	16	-	14	12	18
SM-180	180"	6 of each	-	-	14	-	14	-	-	18	-	18
SM-192	192"	8 of each	14	10	12	-	16	18	14	16	-	20

SolarMount End Clamps and Module Bolts vary in size depending on the Modules to be installed. Check the label of the SolarMount carton to ensure that the SolarMount matches the Modules you are installing.

Laying Out the Installation Area

Note: SolarMount Rails make excellent straightedges for doing layouts.

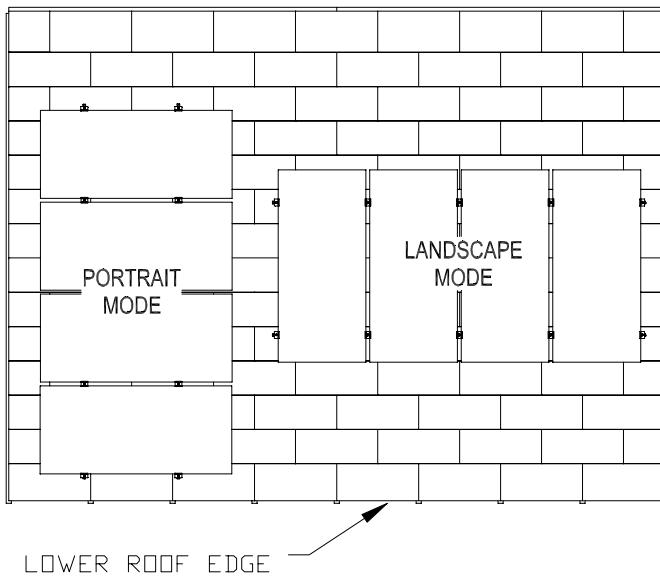


Figure 1

The installation can be laid out in either Landscape Mode or Portrait Mode as shown in Figure 1.

Center the Installation Area over the rafters as much as possible.

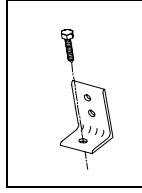
Leave enough room to safely move around the array during installation.

The *width* of the Installation Area is equal to the *length* of one Module.

The *length* of the Installation Area is equal to -

- a) the total *width* of the Modules,
- b) plus 1" spacing between each Module for Mid-Clamps,
- c) plus 1 ½" for each set of End Clamps. (3" total)

Laying Out and Installing "L" Feet



"L" Feet are used for installation through existing low profile roofing material, such as asphalt shingles or sheet metal.

Use Figure 2 or Figure 3 below to locate and mark the "L" Feet lag bolt holes within the Installation Area.

Landscape Layout

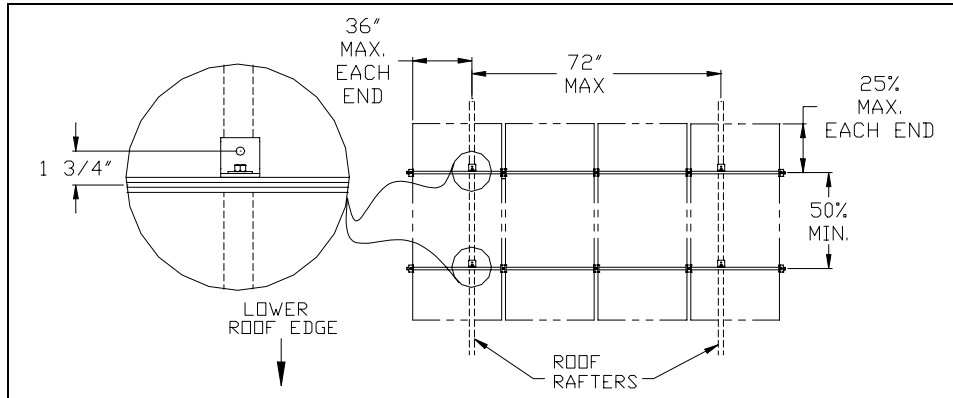


Figure 2

Portrait Mode Layout

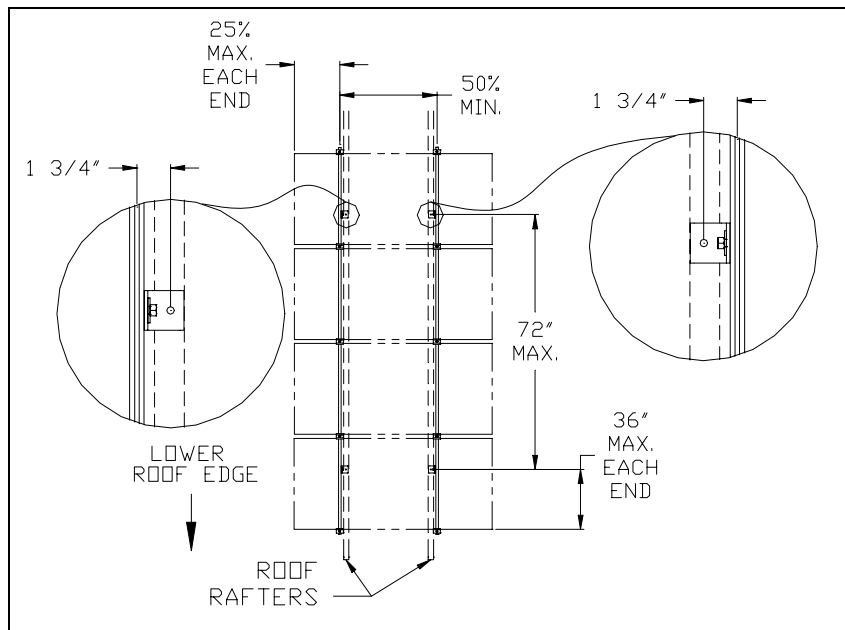


Figure 3

When determining the distance between the Rails in Portrait Mode, keep in mind that the center of each Rail will be offset from the "L" Foot lag bolt holes by 1 3/4".

If multiple Portrait Mode rows are to be installed adjacent to each other, it will not be possible for each row to be centered above the rafters. Adjust as needed following the guidelines in Figure 3 as closely as possible.

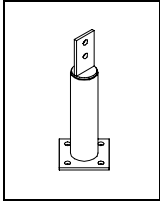
Installing the "L" Feet

Drill 3/16" pilot holes through the roof into the center of the rafter at each "L" Foot lag bolt hole location.

Squirt sealant into the hole, and on the shafts of the lag bolts. Seal the underside of the "L" Feet with a suitable weatherproof sealant.

Securely fasten the "L" Feet to the roof with the lag bolts. Ensure that the "L" Feet face as shown in Figure 2 or Figure 3, as appropriate.

Laying Out and Installing Standoffs



Standoffs are used for all flashed installations, such as tile and shake shingles.

Use Figure 4 or Figure 5 to locate and mark the Standoff lag bolt holes within the Installation Area.

Remove the tile or shake underneath each Standoff location, exposing the roofing underlayment. Ensure that the Standoff base lies flat on the underlayment, but remove no more material than required for the flashings to be installed properly.

Use the Standoff base as a template to mark lag bolt hole locations on underlayment above the center of the rafters as shown in Figure 4 or Figure 5 below.

Landscape Mode Layout

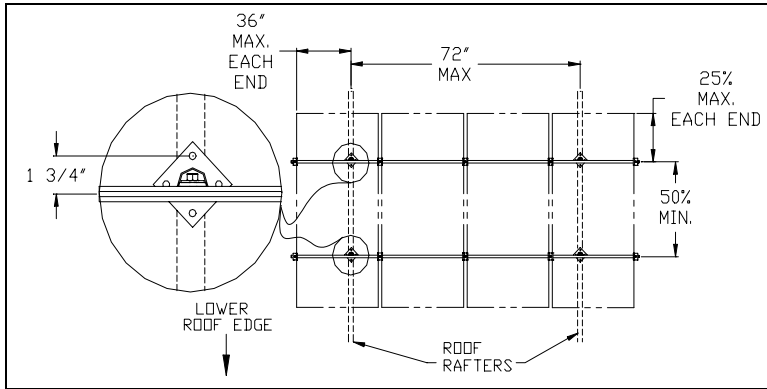


Figure 4

Portrait Mode Layout

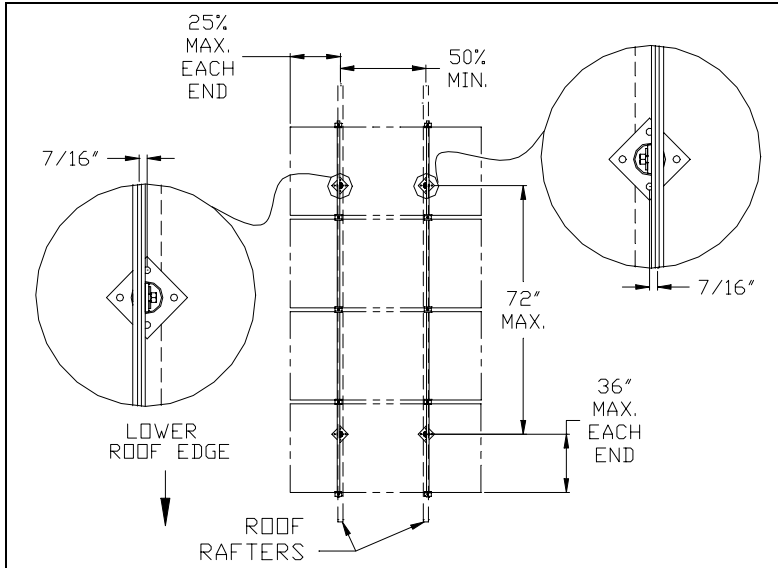


Figure 5

When determining the distance between the Rails in Portrait Mode, keep in mind that the center of each rail will be offset from the Standoff lag bolt holes by 7/16".

If multiple Portrait Mode rows are to be installed adjacent to each other, it will not be possible for each row to be centered above the rafters. Adjust as needed following the guidelines in Figure 5 as closely as possible.

Installing Standoffs

Drill 3/16" pilot holes through the underlayment into the center of the rafters at each Standoff location. Securely fasten Standoffs to the rafters with the lag bolts. Ensure that the Standoffs face as shown in Figure 4 or Figure 5, as appropriate.

SolarMount Standoffs are designed for easiest installation with Oatey® 1 1/4" – 1 1/2" No-Calk® flashings. They can be obtained at most plumbing and/or roofing supply companies.

Install and seal flashings and Standoffs using standard building practices.

Installing the SolarMount Rails

Keep Rail slots free of roofing grit or other debris.
Foreign matter will cause bolts to bind as they slide in the slots.

Installing Splices

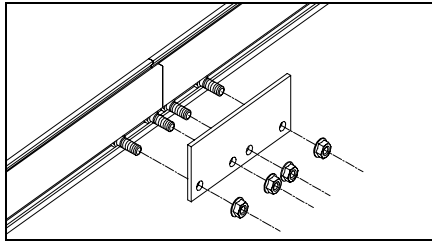


Figure 6

If your installation uses SolarMount Splices, then attach the Rails together as shown in Figure 6 before mounting the Rails to the Footings.

Mounting Rails on Footings

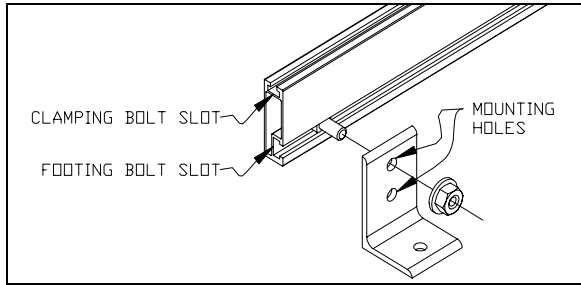


Figure 7

Rails may be attached to either of two mounting holes in the Footings. See Figure 7. Mount in the lower hole for a low profile, more aesthetically pleasing installation. Mount in the upper hole for a higher profile, which will maximize airflow under the Modules. This will cool them more and may enhance performance in hotter climates.

Slide the 3/8" mounting bolts into the Footing bolt slots. Loosely attach the Rails to the Footings with the flange nuts.

Ensure that the Rails are oriented to the Footings as shown in Figure 2, 3, 4 or 5 above, whichever is appropriate.

Aligning the Rail Ends

Align one pair of Rail ends to the edge of the Installation Area as shown in Figure 8 or Figure 9 below.

The opposite pair of Rail ends will overhang the side of the Installation Area. Do not trim them off until the installation is complete.

Landscape Mode

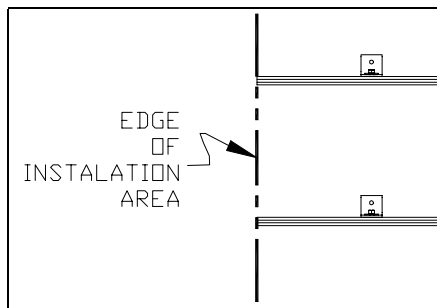


Figure 8

Either end of the Rails can be aligned, but keep in mind that the aligned end will be where the first Module is installed.

Portrait Mode

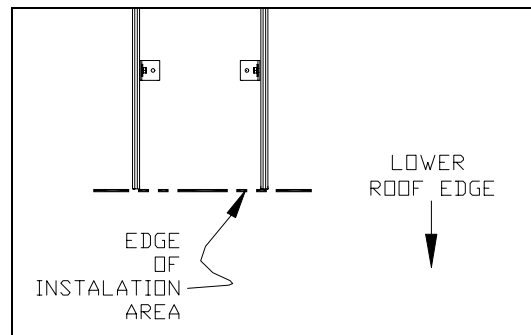


Figure 9

For the safest installation, the aligned end of the Rails must face the lower edge of the roof as shown above.

Securely tighten the flange nuts on the mounting bolts after alignment is complete. (16-20 ft. lbs.)

Installing the Modules

Pre-wiring Modules

If Modules are the "plug-n-play" type, no pre-wiring is required, and you can proceed directly to "Installing the First Module" below.

If Modules have standard j-boxes, each Module should be pre-wired with one end of the inter-module cable for ease of installation.

For safety reasons, Module pre-wiring should not be performed on the roof.

Leave covers off j-boxes. They will be installed when the Modules are installed on the Rails.

Installing the First Module

In Portrait Mode installations, the Safety Bolt and Flange Nut must be fastened to the aligned (lower) end of each Rail. This will prevent the lower End Clamps and clamping bolts from sliding out of the Rail slot during installation.

Slide half of the 1/4" clamping bolts onto each Rail, spacing them evenly along the Rails.

Drop End Clamps over the clamping bolts at the aligned end of each Rail. Loosely attach them with flange nuts. Allow 1/2" between the Rail ends and the End Clamps. See Figure 10.

If there is a return cable to the inverter, connect it to the first Module. Close the j-box cover.

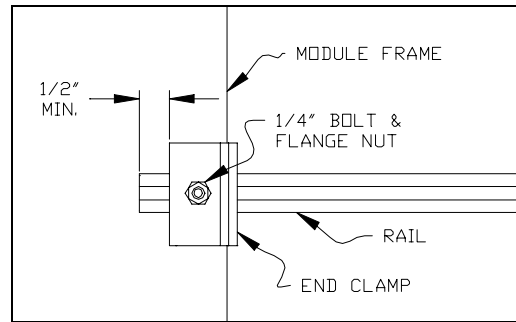


Figure 10

Slide the first Module under the End Clamps. Center and align as needed. Securely tighten the flange nuts onto the End Clamps. (12-15 ft. lbs.)

Installing the Other Modules

Slide the next clamping bolt on each Rail up to the first Module. Drop Mid-Clamps over these clamping bolts and loosely attach them with flange nuts.

Lay the second Module face down (glass to glass) on the first Module. Connect inter-module cable to the second Module and close the j-box cover.

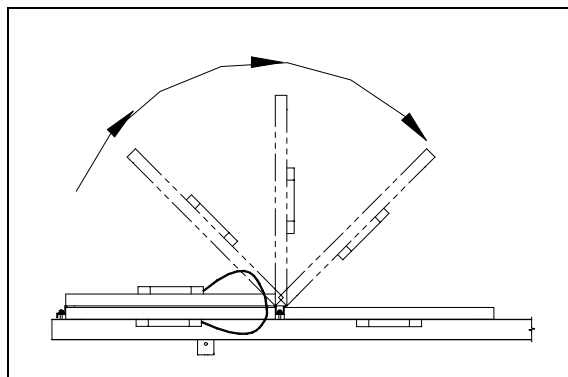


Figure 11

Turn the second Module face up as shown in Figure 11. Slide it under the Mid-Clamps. Align it and securely tighten the flange nuts onto the Mid-Clamps between Modules. See figure 12.

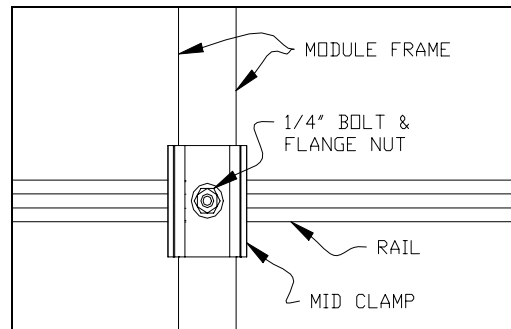


Figure 12

For a neat installation, fasten cable clamps to Rails with self-tapping screws.

Repeat the above procedure until all Modules are installed. Attach the outside edge of the last Module to the Rail with End Clamps, rather than Mid-Clamps.

Trim off any excess Rail, being careful not to cut into the roof. Allow 1/2" space between the end of the Rail and the End Clamp. See Figure 10.

Check that all flange nuts on clamping bolts are securely fastened. Your SolarMount installation is complete.