

# RV Solar Connection Large Dual Tilt RV Mount Manual

[RVSolarConnection.com/mounts.htm](http://RVSolarConnection.com/mounts.htm)



**Pinch Hazard** - When installing and during normal operation of your dual tilt mounts keep hands and fingers clear of end rails when raising or lowering the photovoltaic modules. Raise and lower the module from center of the module only.

## Introduction:

Thank you for purchasing RV Solar Connection's (RVSC) large dual tilt photovoltaic mounts. Your dual tilt mounts are quick and easy to operate and ship partially assembled. Once installed no tools or extra parts are required to tilt your modules.

**RVSC Large Dual Tilt Mounts** are manufactured from 1/8" 5052 grade aluminum and are designed specifically for **Kyocera** KD 135SX-UPU series photovoltaic modules.

**RVSC Dual Tilt Mounts** with their slotted module mounting holes are adaptable to several other manufacturers' photovoltaic modules.

**RVSC Large Dual Tilt Mounts** accept most modules with mounting holes between 16.25" to 25.5" apart. Modules 25" or wider must be mounted to the end rails of the solar module to access the Pivot knobs.

**RVSC Large Dual Tilt Mounts** can be adjusted from 0° (flat) to 50° of tilt angle, which provides sufficient tilt for most North American latitudes. Cable slots located on the bottom rail of the dual tilt mount accept 10 gauge or 8 gauge flat tray cable. This convenient feature makes it simple to pass cabling from one module to the next creating a nice "clean" install.

Although created for roof mounting on RV's. Both sizes of RVSC dual tilt mounts can also be easily mounted on the wall or roof of any out building with bolts or lag screws.

## Required Tools:

*Not supplied*

- 7/16" Box end or open end wrench
- 1/4" drive ratchet and 7/16" socket
- Cordless drill
- 1/4" Drill bit

## Required Materials:

*Not supplied*

- Up to 12 - 14 x 1" or 14 x 3/4" Hex head screws for mounting lower rail to RV roof
- Sealant such as Kool Seal® roof patching cement or Dicor for sealing roof penetrations
- Up to 12 well nuts or anchors for thin skinned RV roofs
- A buddy to help install



Please read and thoroughly understand all installation instructions before installing the RVSC dual tilt mounts to your solar modules or RV.

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## Mounting Upper Rails to Module:

*Step #1 - Mounting module to dual tilt mounts*

### **For Kyocera KD series photovoltaic modules:**

1. Remove the four 1/4" x 5/8" stainless steel module mounting bolts, serrated nuts and washers from the side slot of the dual tilt mount. Assemble mount as pictured below.
2. Turn photovoltaic module over to expose the modules frame.
3. With knob side of mount facing out, line up slots on the mounts with solar module's outside mounting holes.

*The side of the mount with 8 slots is panel side. The side with 6 holes is roof side*

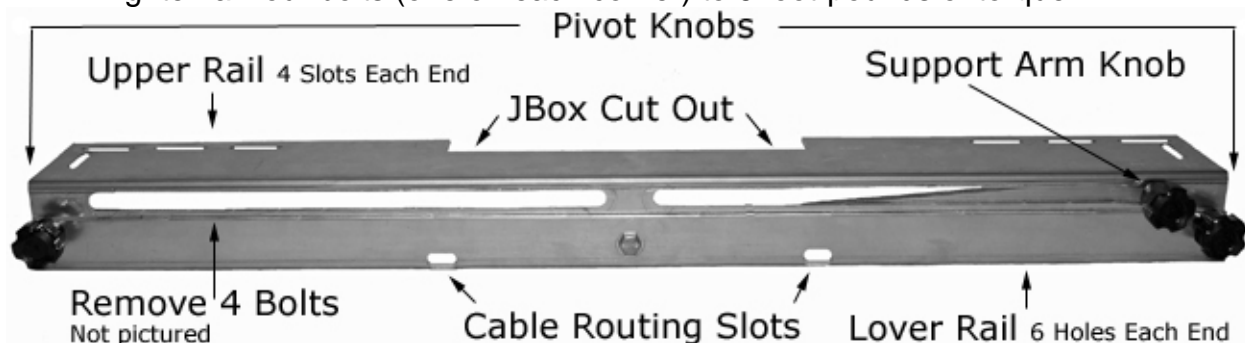
4. With the mount resting on the module install the four (1 each corner) 1/4" stainless steel bolts with flat washers thru the dual tilt mount slot and install flat washer and serrated lock nut under the modules frame.
5. Tighten all four bolts (one on each corner) to 6 foot-pounds of torque.

### **For other brand photovoltaic modules:**

1. Remove the four 1/4" x 5/8" stainless steel module mounting bolts, serrated nuts and washers from the side slot of the dual tilt mount. Assemble mount as pictured below.
2. Turn photovoltaic module over to expose the modules frame.
3. With knob side of mount facing out, align solar module mounting holes with the mounting slots on the dual tilt mounts.

*The side of the mount with 8 slots is panel side. The side with 6 holes is roof side*

4. If the mounting holes do not line up with slots, new 1/4" holes will need to be drilled either in the modules frame or the upper rail of the dual tilt mount.
5. Solar modules 25" or wider must be mounted to the outside end rails of the solar module to access the pivot knobs. If the solar module does not have pre-drilled holes for end mounting, new 1/4" holes will need to be drilled.
6. With the mount resting on the module install the four (1 each corner) 1/4" stainless steel bolts with flat washers thru the dual tilt mount slot and install flat washer and serrated lock nut under the modules frame.
7. Tighten all four bolts (one on each corner) to 6 foot-pounds of torque.



**Use Extreme Caution** - if you drill the photovoltaic module's frame. Place a small block of wood between the modules backing material and the modules frame to stop the drill bit from contacting the backing material of the module.

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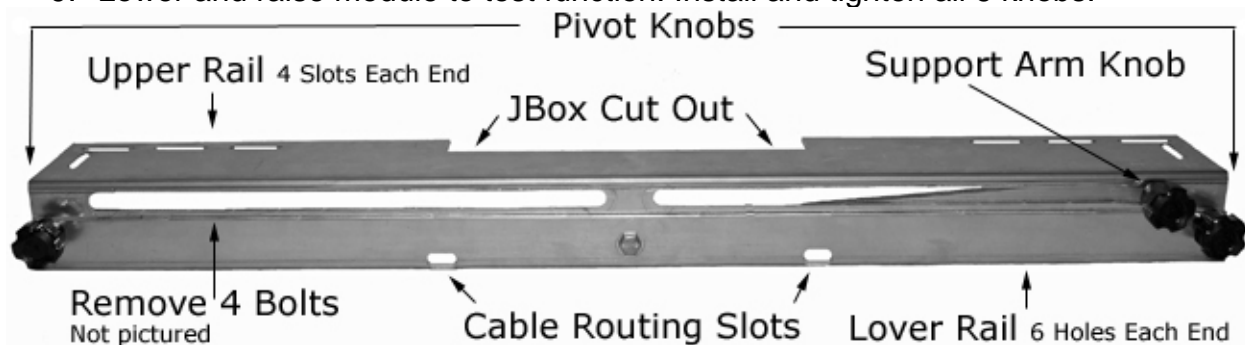
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## Mounting Lower Rails to RV Roof:

### *Step #2 - Mounting module to roof*

#### **For concealed hardware mounting** (as pictured above)

1. With the RVSC dual tilt mounts mounted to the module and all 6 knobs tight, place module in desired location on roof. Be sure that both lower rails are sitting flush (flat) on the roof. Using a marker/pencil trace the outline of the mounts and all four corners of the dual tilt mount on the roof. If possible mark the four outside mounting holes of the lower mount rail.
2. Slightly lift module and place a thick bead of sealant under the mounts where the penetrations will be made into the roof.
3. Gently lower module and align to your marks.
4. Remove the pivot knobs from one side of module. Remove knobs from the support arms. Slightly loosen the pivot knobs on end the other end of the module.
5. Tilt panel to near vertical and install lower rail mounting hardware to the roof of the RV on one mount only, making sure you stay on your alignment marks.
6. After the first lower rail of one the mount is mounted to the roof, lower the module and check the marks of the opposing lower mount rail. If needed redraw alignment marks.  
*This is your last chance to make any needed adjustments. Proper alignment is very important to proper operation.*
7. Again tilt panel up to near vertical, apply sealant under the mount and install mounting hardware on the remaining lower rail of the mount making sure you stay on your alignment marks. Install support arm knob in slot closet to you to support module in tilt position and seal the tops of all fasteners with sealant.
8. If possible leave module tilted until the surface of the sealant has glazed over.
9. Lower and raise module to test function. Install and tighten all 6 knobs.



We recommend using all 12 lower rail mounting holes (6 per side). Due to a wide variety of roofing materials used on RV's, it is up to you to determine the best method for securely fastening the module to your roof. Anchors, well nuts, hex head screws, 3M VHB tape, etc.

**Note:** Two slots in the lower mount rail have been provided for quick and tidy flat tray cable routing. Allow enough cable slack under the module for tilting.

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## Mounting Lower Rails to RV Roof:

*Optional Step #2 - Mounting dual tilt module to roof*

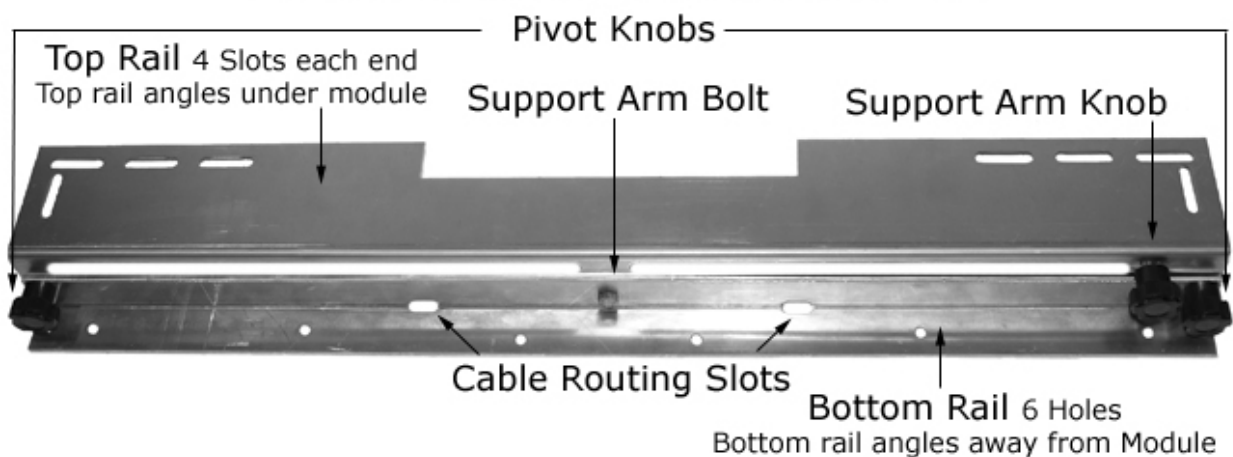
### **For exposed hardware mounting**

The RVSC dual tilt mount can be converted into a z bracket type mount by removing the lower rail from the mounts and reversing them. This method is the simplest way to install the mount and module to the RV roof.

### **Follow these steps before installing the RVSC dual tilt mount to the module.**

1. Remove all pivot knobs from mounts and remove the support arm pivot bolts.
2. Reverse the lower rail so that the 6 holes face way from the top rail. The mount should now be in the shape of a Z with the top rail inside of the lower rail.
3. Re-assemble support arm bolt making sure support arm inner nut is tight. Do not over tighten the outer lock nut on the support arm. The support arm should swing freely.
4. Tightly re-install all pivot and support arm knobs.
5. With the RVSC dual tilt mounts installed on the module and with all 6 knobs tight, place module in desired location on roof.
6. Lift one side of module and place a thick bead of sealant under each of the 6 mounting holes.
7. Loosely install roof mounting hardware on one mount only to RV roof.
8. Slightly raise the other mount and place a thick bead of sealant under the 6 mounting holes.
9. Tightly install mounting hardware to RV roof.
10. Tighten mounting hardware on the other mount.
11. Seal the tops of all fasteners with sealant.

### **Exposed Hardware Mounting Outside View**

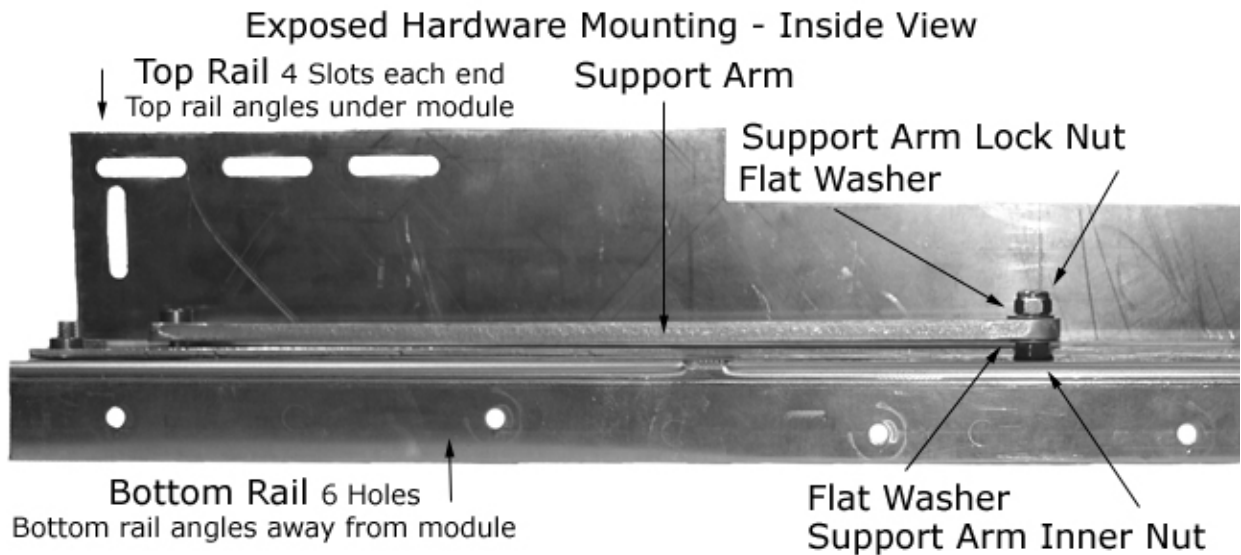


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## Mounting Lower Rails to RV Roof: Continued

*Optional Step #2 - Mounting dual tilt module to roof*



We recommend using all 12 lower rail mounting holes (6 per side). Due to a wide variety of roofing materials used on RV's, it is up to you to determine the best method for securely fastening the module to your roof. Anchors, well nuts, hex head screws, 3M VHB tape, etc.

**Note:** Two slots in the lower mount rail have been provided for quick and tidy cable routing. Allow enough cable slack under the module for tilting.



Modules must be in the flat stowed position, with all knobs tight when the RV is moving. When traveling periodically check tightness of all knobs.

## Tilting the Photovoltaic Modules

*Time: Less than 3 minutes*

1. Remove pivot knobs from end of module you wish to tilt up.
2. Slightly loosen support arm knobs.
3. Slightly loosen pivot knobs at the other end of the mount.
4. Raise the module to desired angle and hold in place.
5. Tighten support arm knobs.
6. Tighten pivot knobs on low end of module.
7. Stow unused pivot knobs in the upper mounts rail.

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## Changing Tilt Direction

*Time: Less than 4 minutes*

1. Remove pivot knobs from end of module nearest to you. Slightly loosen pivot knobs furthest from you.
2. Remove support arm knobs, lift module and rotate support arms to the other side of center.
3. Re-install support arm knobs leaving them slightly loose.
4. Lower module and re-install pivot knobs nearest you leaving them slightly loose.
5. Remove pivot knobs from side farthest from you.
6. Tilt module to desired angle and tighten support arm knobs.
7. Tighten pivot knobs on low end of module.
8. Stow unused pivot knobs in the upper mounts rail.

## Achieving 50° Degrees of Tilt Angle

*Time: Less than 3 minutes*

1. With module previously tilted slightly loosen pivot knobs on low end of module.
2. While supporting module with one hand remove both support arm knobs.
3. Move one support arm to the high side of the slot on the other side of center and replace support arm knob. Re-repeat this procedure for the other support arm.
4. Tighten all knobs. Your modules are now at 50° degrees of tilt angle.



**Do not tilt modules vertically or past 50° degrees of tilt angle.** Doing so could create a dangerous condition in high winds.

## Operational Tips

1. Occasionally lubricate the top and bottom ends of the support arms.
2. If the RVSC Dual tilt mount is not mounted on the end rail of the solar module a washer or two may need to be placed between the top rail of the mount and the frame of the solar modules mounting holes to provide clearance for the support arm knob.
3. Stow modules if high winds are in the weather forecast.

**What's in the Box:** One set (2) RVSC dual tilt mounts with hardware. Four stainless steel 1/4-20 x 5/8" bolts, eight stainless 1/4" flat washers, four 1/4-20 stainless steel serrated hex lock nuts.



This product is proudly made in Colorado, USA. Helping to create American jobs. Patent pending