



Installation Guide

**5° Flat Roof Mounting System
(60 & 72-Cell V2 Modules)**

Version 3.2

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Chapter 1: Introduction

The 5 Degree Flat Roof Mounting System by Andalay Solar offers reduced system cost and simplified project logistics and installation time by combining the patented Andalay integrated solar panel system with a new lightweight, non-anchored flat roof mounting system constructed of durable aluminum and stainless steel.

1.1: Features & Benefits

Award-Winning Design

- Integrates with the patented Andalay Solar panel technology
- Built-in UL-approved wiring, grounding, and electrical connections

Rapid Design and Installations

- Only 2 major components support both landscape and portrait installations
- Ships flat with minimal part count for easy staging
- Installs and grounds faster than any other mounting system
- Ballasted design minimizes the need for roof anchorages
- Footings can support additional ballast if needed
- Proprietary software automates wind calculations for easy system design

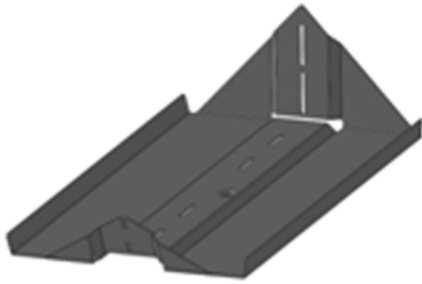
Engineered for Performance

- Non-corrosive aluminum and stainless steel components
- Not susceptible to UV deterioration and combustion hazards
- Lightweight (only 2.8 pounds/ft².)
- Wind tunnel tested based on ASCE 7-05 to minimize ballast requirements
- Does not interfere with roof drainage
- 5° angle maximizes installable KW and annual KWh energy collection

1.2: Parts

Actual parts may vary from the images shown here.

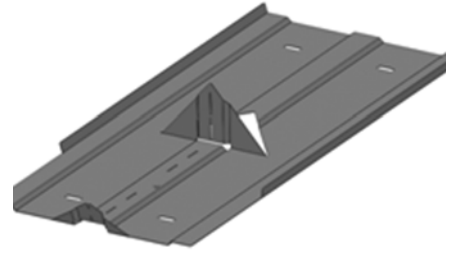
1.2.1: Components



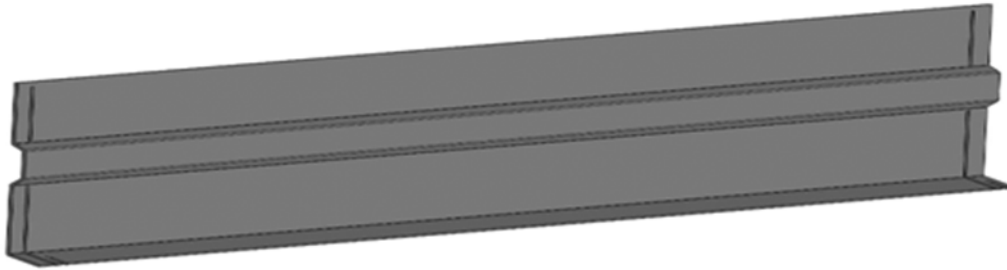
Pan



Support



Ballast Pan *(optional, dep. on system design)*



Fairing *(optional, depending on system design)*

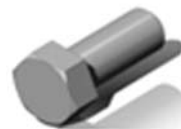
1.2.2: Fasteners



Splice (LH side has 3 dots)



1/4" Ground Screw



End Bolt (LH;
labeled)



End Bolt (RH;
labeled)

1.2.3: Other



Ground Lug



Wire Management Clip (Optional; for AC Systems)

1.3: Additional Considerations:

The following considerations must be determined on a case-by-case basis:

- The Andalay Solar 5° Flat Roof Mounting System has been engineered and tested for non-anchored (ballasted) installation; however, it may be installed as an anchored system depending on factors such as the size of the array, the location of the project site, and the requirements of the Authority Having Jurisdiction (such as a city planning department).
- Determine the size and quantity of ballast blocks required for a non-anchored array based on structural conditions.
- Determine whether any padding material is required between the pans and the roof surface to conform to roofing warranty requirements.
- The Andalay Solar 5° Flat Roof Mounting System is designed to work with the following types of Andalay Solar Modules:
 - 60-cell AC Modules mounted in portrait (vertical) orientation.
 - 72-cell AC Modules mounted in portrait (vertical) orientation.
 - 60-cell DC Modules mounted in landscape (horizontal) orientation.

Please see Section 3.2 for information on array layout and Chapter 4 for Module wiring instructions.

1.4: Required Tools

The following tools are needed in order to install the Andalay Solar 5° Flat Roof Mounting System:



Ratchet (1/4" drive)



Torque Wrench



Pliers



Landscape Splice Driver (available from Andalay Solar)



Portrait Splice Driver (available from Andalay Solar)

1.5: Safety Precautions

Installation procedures should be performed in compliance with local Authority Having Jurisdiction regulations, OSHA protection codes, most recent National Electrical Code, ANSI/NFPA 70, local utility requirements, and other applicable guidelines that pertain. For more information, please check the OSHA Part 1926 for information regarding safety.

1.5.1: General Safety

- **Fall Hazards:** *OSHA Part 1926-Subpart M* contains fall-protection regulations for all roof edges, including all necessary guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other required protective equipment and measures
- **Weather Hazards:** Performing installations in overcast conditions can cause severe bodily injury.
- **Electrical Hazards:** *OSHA Part 1926-Subpart K* contains hazard-protection regulations for working with live electrical equipment and/or high voltage, including a 10' minimum clearance from overhead power lines and using the proper barriers and other forms of guarding when live parts of electric equipment and circuits are exposed.
- **Lifting Hazards:** Always follow smart lifting practices to avoid back and general body injury. For more information, check Section VII: Chapter 1 in the *OSHA Technical Manual*.
- **Hand and Power Tools:** *OSHA Part 1926-Subpart I* contains regulations regarding tool usage during installation. Always check equipment before use to verify correct functionality and avoid any bodily injuries. Always secure and properly store all equipment when not in use.
- **Materials Handling:** *OSHA Part 1926-Subpart H* requires that all materials shall be stacked, interlocked, and secured to prevent sliding, falling, or collapsing, which could cause severe body harm. Handle sharp edges of system components using proper equipment.

1.5.2: Installation Safety

- Installation procedures should be performed by trained and licensed personnel who are experienced in installing photovoltaic systems.
- Do not expose Modules to excessive loads as this might cause damage and malfunction.
- Always use proper safety and installation gear such as (but not limited to) gloves, goggles, hard hats and head protection, hearing protection, safety vests, and proper tools.
- Solar Modules generate electricity when exposed to light and can cause lethal shock and burn hazards.
- Perform all electrical installations in accordance with all local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70.
- Array grounding must comply with the NEC Article 250.

-
- Only qualified personnel should install, service, and/or replace Andalay Modules. Electrical components can be dangerous for installation personnel who are unfamiliar with appropriate safety procedures.
 - Read all instructions and cautionary markings in this manual before installing or using the Andalay Module
 - Tampering with Modules may void the warranty and/or cause serious bodily injury. Modules contain no user-serviceable parts. To replace a defective Module, please contact Andalay customer service to obtain an RMA number.
 - Never connect or disconnect a Module when the system is energized. Only energize the system once all Modules are completely assembled and inspected.
 - Never touch live terminals with bare hands. Use insulated tools for electrical connections.
 - Never strike glass Module surfaces with heavy or sharp objects, and never walk on Module surfaces. The glass surface may fracture, disabling the Module and voiding the warranty.
 - Never direct artificially-concentrated sunlight onto the Modules.

1.6: For Further Information

Please refer to the PV Module *Installation and Operations* manual available at www.Andalaysolar.com for additional information and instructions for installing Andalay Solar AC and DC PV Modules, including:

- Additional safety instructions
- Regulatory information
- Recommended Applications
- Bonding
- Wiring
- Commissioning

The information in the *Installation and Operations* manual varies by Module type/model and is beyond the scope of this manual.

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Chapter 2: System Design

The Andalay Solar 5° Flat Roof Mounting System complies with the structural requirements of the 2006 International Building Code and ASCE 7-05 based on the configurations and criteria provided in the Andalay Solar Design Configuration Tool, which takes a number of environmental variables into account (basic wind speed, exposure category, ground snow load, topographic factor, average roof height, least horizontal building dimension, roof slope, attachment type, roof parapet height) to generate a recommended design layout and any required ballast loading.

2.1: Required Site Information

Begin designing the site by completing a site survey, which allows Andalay Solar to prepare a preliminary design layout.

- For smaller residential systems (~ 10 kW or less), please refer back to the Technical Evaluation Report (available at www.Andalaysolar.com) for anchorage requirements. Proceed to Chapter 3.
- For larger systems, please complete the *Andalay Solar 5° Flat Roof Mounting System Intake Form* (available on our website at www.Andalaysolar.com) and then submit the completed form to Andalay Solar.

Andalay Solar requires the following information in order to prepare a preliminary design layout and Bill of Materials (BOM):

- Project contact name, phone number, and email
- Project address
- Array layout and dimensions
- Other important information such as design wind speed (MPH), obstacles, and roofing material

2.2: Preliminary Design Layout

Andalay Solar uses the information presented in the completed *5° Flat Roof Mounting System Intake Form* to develop a design layout and determine both the exact Bill of Materials required for the project as well as the necessary ballast requirements. The completed design layout will include the plan layout, specification sheets, and Bill of Materials. For every project, the designer in charge must verify any structural engineering review requirements with local Authority Having Jurisdiction (AHJ) officials and obtain a professional structural engineering stamp (P.E.) if needed. Alternatively, Andalay Solar can provide engineering services and/or a P.E. stamp for wind and seismic calculations at an additional cost as stated on the current 5° Flat Roof Mounting System Intake Form available on our website at www.Andalaysolar.com.

2.3: Thermal Expansion Considerations

For thermal expansion, each array should consist of no more than 16 columns by 10 rows (landscape) or 25 columns by 10 rows (portrait). For bigger configurations, you may place separate arrays next to each other to give the appearance of a single array, if desired.

2.4: Ballasted vs. Mounted Arrays

Depending on the size of the system, the 5° Flat Roof Mounting System can be secured to the roof using ballast and/or anchorage roof mounts. The system design for each specific array will specify the type(s) of mounting to use, including:

- Type and weight of ballast blocks, if any.
- Type of roof anchors to use, if any.
- Method of securing the array to the roof anchors. (*Note: This image shows an example of using anchors and lengths of Unistrut to secure the array to the roof.*)



Please refer to the system design for specific instructions about securing the array to the roof.

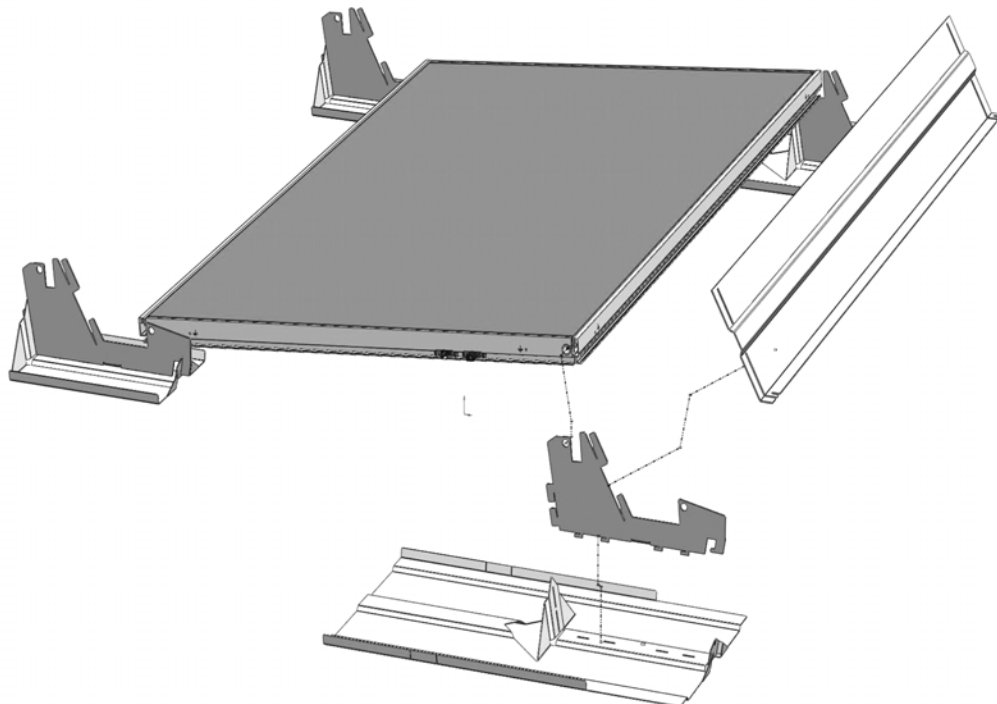
Chapter 3: Installation

This section explains how to install the Andalay Solar 5° Flat Roof Mounting System. Please see Chapter 1 for the full list of required parts, fasteners, and tools. For more information including photos and specification sheets, visit Andalay Solar at <http://www.Andalaysolar.com>.

CAUTION: CONSIDER THE WEIGHT AND PLACEMENT OF STAGED MATERIALS ON THE ROOF TO ENSURE ADEQUATE STRUCTURAL SUPPORT.

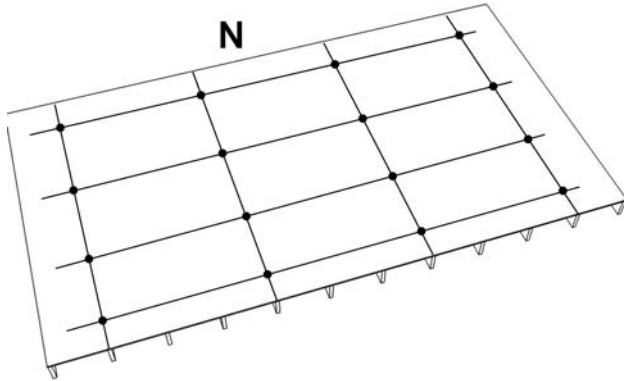
3.1: Overview

This rendering illustrates how the Andalay Solar 5° Flat Roof Mounting System assembles.



3.2: Layout the Array

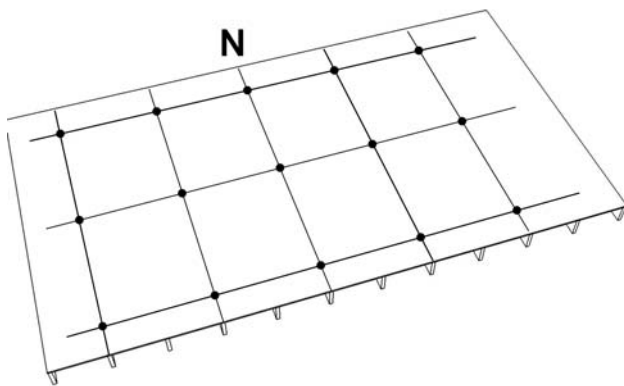
To lay out a LANDSCAPE array:



Use a chalk line to lay out the array using the dimensions from the specification sheet available at www.Andalaysolar.com. North/South lines should be centered on rafters or other structural members if using anchoring roof components (Section 3.9).

Note: The instructions in this manual depict a landscape installation; the procedure is the same for both landscape and portrait installations.

To lay out a PORTRAIT array:

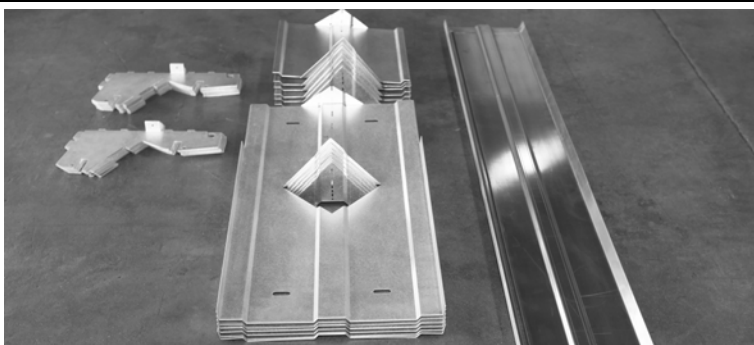


Use a chalk line to lay out the array using the dimensions from the specification sheet available at www.Andalaysolar.com. North/South lines should be centered on rafters or other structural members if using anchoring roof components (see Section 3.9).

Note: The instructions in this manual depict a landscape installation; the procedure is the same for both landscape and portrait installations.

3.3: Unpack and Verify Components

Unpack and stage the components.

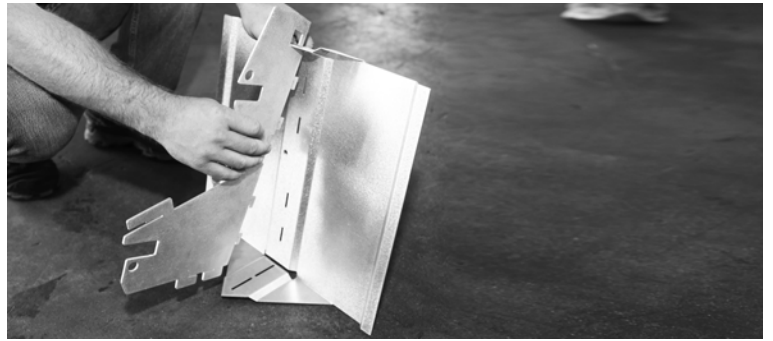


Verify that you have the correct quantities of all required components before beginning the installation.

3.4: Assemble Footings

Hook Support over Pan (1)

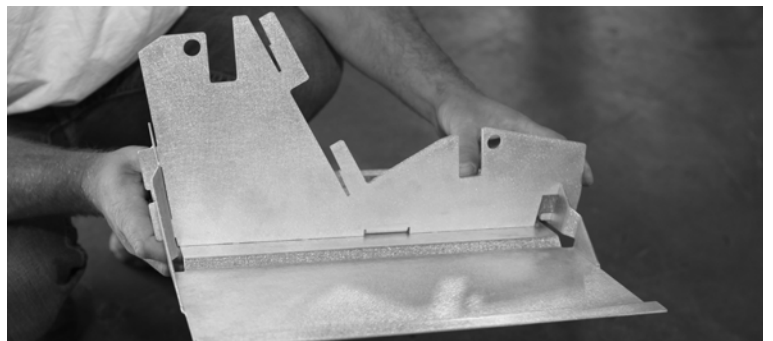
Slide the front tab of the Support over the Pan at an angle and then rotate Support into position.



Slide Support into position on the Pan. (2)

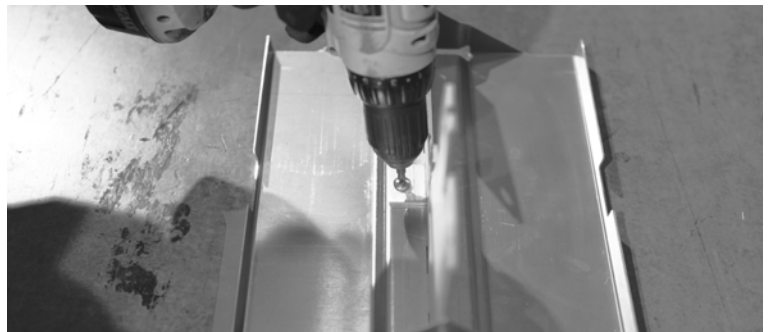
Slide the Support back until all tabs are fully engaged with the slots in the Pan to create a Footing.

Footing assembly is the same for both ballasted and non-ballasted pans.



Secure the Support to the Ballast Pan using a Grounding Screw. (3)

Tighten the screw until snug. Do not over-tighten.

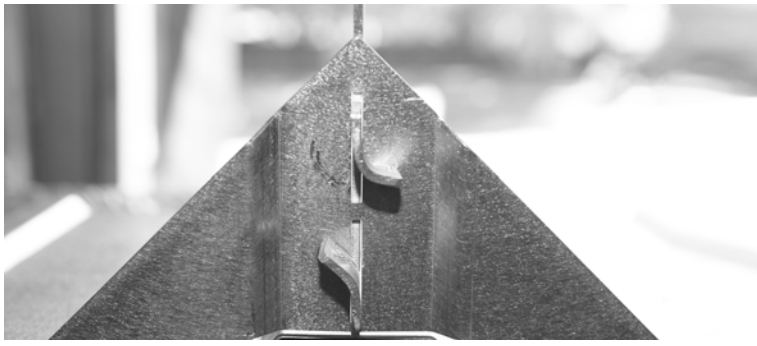


Use pliers to lock the Support in place on the Pan. (4)

Grip the upper end of each rear Support tab with the pliers and bend 45 degrees to lock the Support into position.



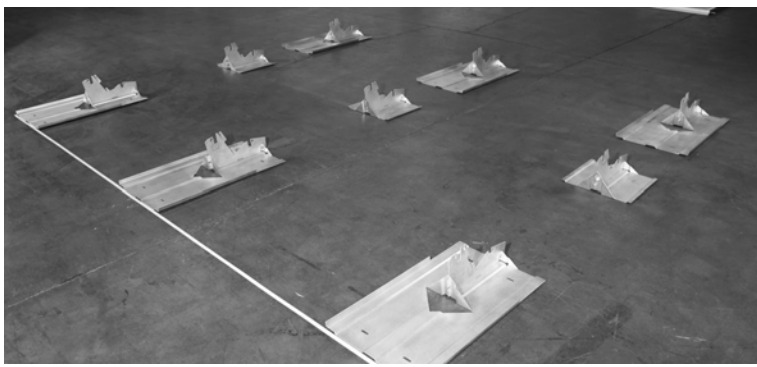
5) The Support should now be firmly locked into the Pan



Verify that the Support tabs are bent as shown here.
Note: The finished Support/Pan assembly is called a Footing.

3.5: Place Footings

Footing layout should appear as follows.

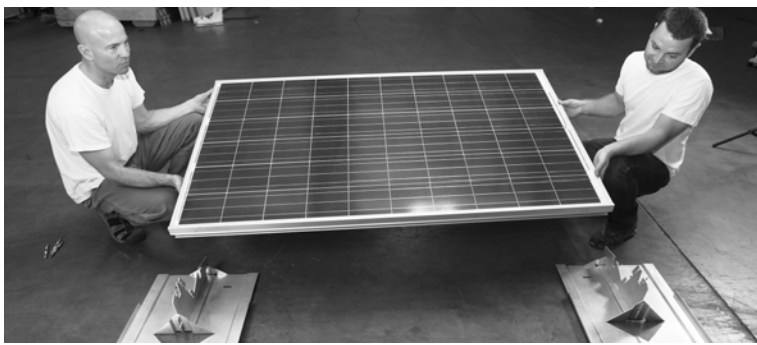


Place the Footings on the roof on the North/South chalk lines using the spacing described in the system design. Start from one corner and proceed all the way across from front to back.

Note: Refer to the system design for guidance on where to place ballasted and non-ballasted Footings.

3.6: Place the First Module of the First Row

1) Always have at least two people lifting Modules.



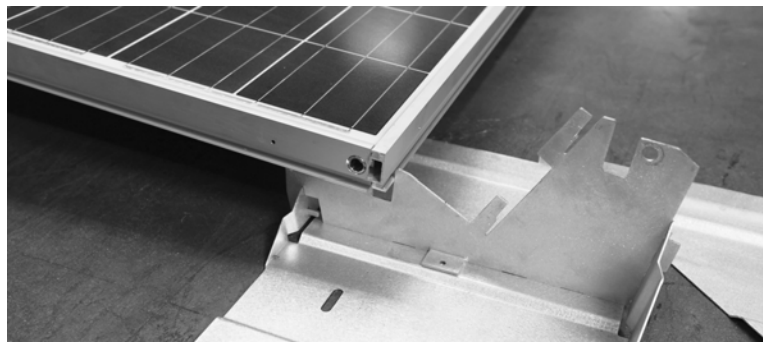
Lift the first Module over the Footings.

Module electrical connections should be toward the higher end.

Rest Module on Footing tabs. (2)

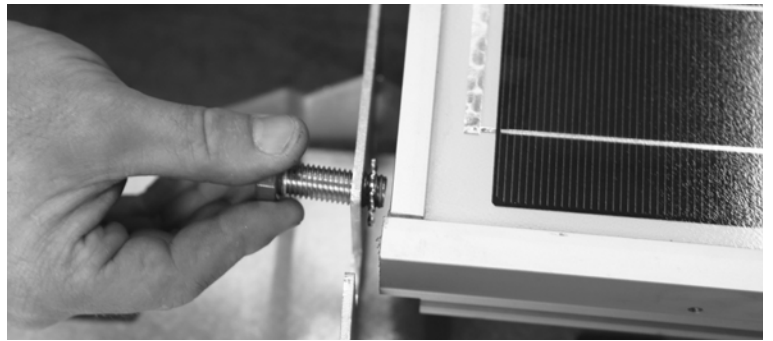
Gently set the Module down on top of the Footing tabs.

Note: The Module frame is designed to rest in the vertical slot in the Footing.

**Insert End Bolts and Lock Washers on the outside edge of the Module. (3)**

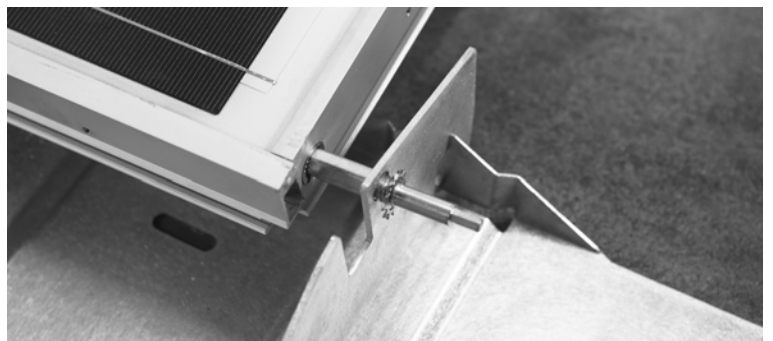
Insert an End Bolt (RH) through the lower (front) holes in the outer Footings using Lock Washers with the sharp edges facing the Module. Repeat at the top (rear) with an End Bolt (LH).

Thread the End Bolts into the Module, and then torque to 10-15 foot-pounds.

**Insert Splices and Lock Washers. (4)**

Insert a Splice (LH end) into the Module through the lower (front) hole in the inner Footings and another splice (RH end) in the upper (rear) using Lock Washers with the sharp side facing away from the Module. Lock Washers must be on the same side of both Splices.

Thread the Splices into the Module approximately 1/2 turn.



3.7: Add Ballasts

Add paver blocks to Ballast Pans (if specified in the system design)

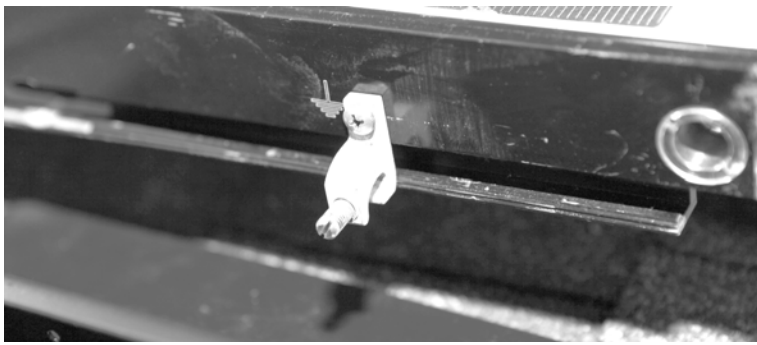


If needed, place paver blocks in the Ballast Pans as you install the Modules.

Each system design specifies which Ballast Pans receive ballast and the type of pavers to use.

3.8: Ground the First Module

Attach a Ground Lug and ground wire to the first Module.



Attach a Ground Lug to the grounding hole in the outer edge of the first Module in each row, then connect a #6 solid bare copper grounding wire (or other gauge as required by local codes) to the building ground as described in Section 4.3.

3.9: Finish the First Row

1) Place the next Module.



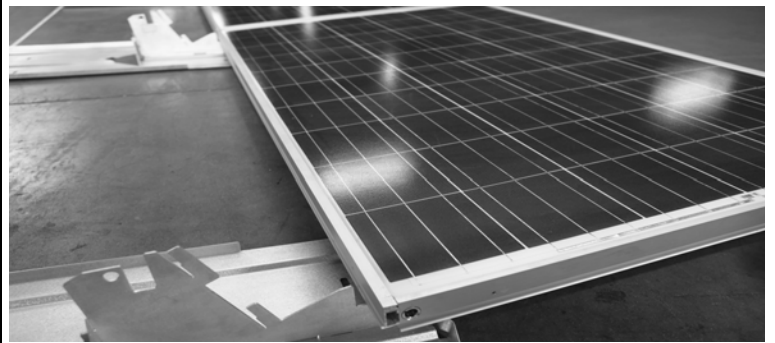
Lift the next Module into position.

The Splices in the first Module should go into the holes in the next Module.

Note: Pre-wire the Modules as described in Chapter 4 as you go.

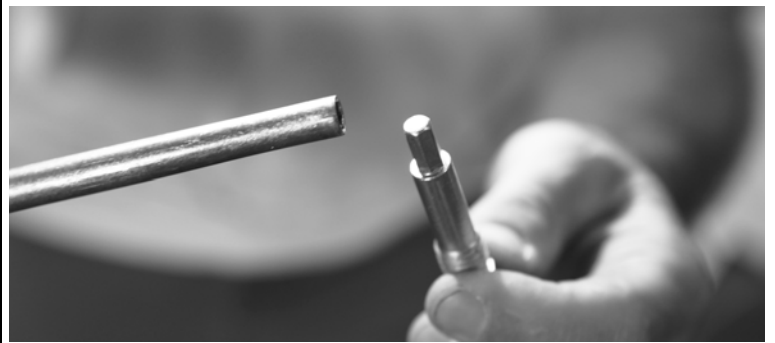
Rest the other side of the Module on Footing tabs. (2)

Gently set the Module down on top of the Footing tabs.

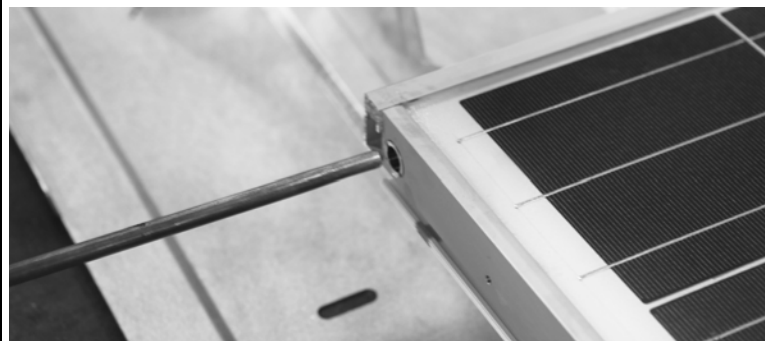
**Use a Splice Driver to tighten the Splices and secure the Modules. (3)**

The hex end of a Splice fits into the socket at the end of the Splice Driver.

Attach a ratchet to the other end of the Splice Driver.

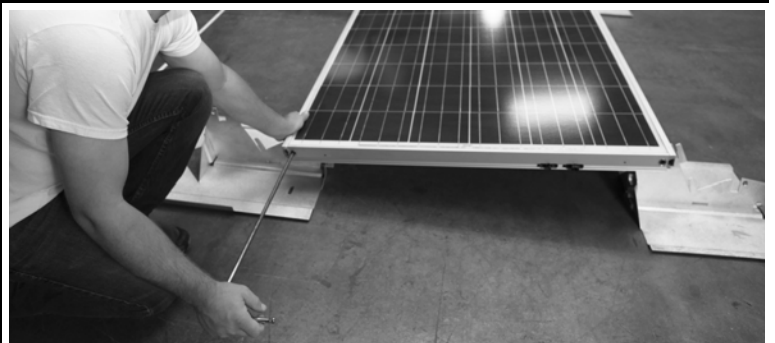
**Insert the Splice Driver into the holes in the Module. (4)**

The Splice Driver slides through the Module to engage with the Splices at the inside end of the Module.

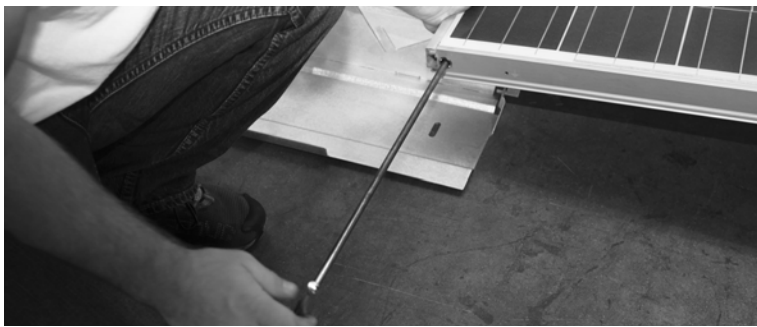
**Tighten the Splices to connect the Modules. (5)**

Torque the bottom and top Splices to 5-7 foot-pounds. The lower (front) Splice tightens LH (counterclockwise) and the upper (rear) Splice tightens RH (clockwise).

Have a helper ensure that the Modules are tightening against the Footings.



6) Repeat Steps 1-6 for the remaining Modules in the first row.



Secure the rest of the Modules in the current row to the array as described in Steps 1-5.

Proceed to Step 7 when you reach the end of the row.

7) Insert End Bolts and Lock Washers on the end of the row.



Insert an End Bolt (LH) through the lower (front) hole in the Footings at the end of the row using Lock Washers with the sharp edges facing the Module. Repeat at the top (rear) of the Module with an End Bolt (RH).

Torque the End Bolts to 10-15 foot-pounds.

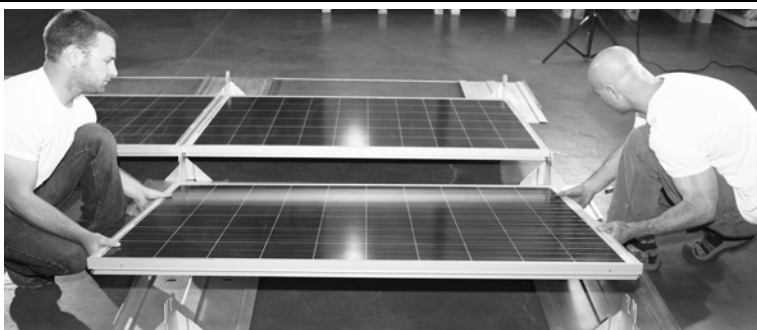
8) Add roof mounts, if specified in the system design.



If the system design calls for the use of anchoring roof mounts, install and secure the roof mounts per manufacturer instructions. Refer to the *Technical Engineering Report* available at www.Andalaysolar.com for more information on using roof mounts.

3.10: Add the First Module of the Next Row

Lift the Module into position.



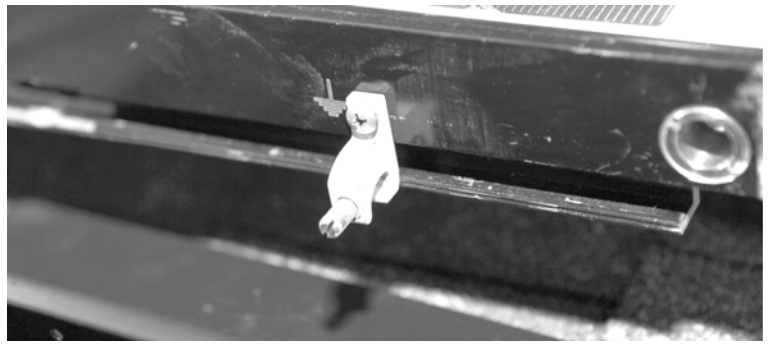
Secure the Module into place using two End Bolts (one each LH and RH) and Lock Washers, as described in Section 3.6. Ballast as needed per the system design. See Section 3.7.

Torque the End Bolts to 10-15 foot-pounds.

3.11: Ground the Module

Attach a Ground Lug and ground wire to the Module.

Attach a Ground Lug to the grounding hole in the outer edge of the Module, then connect a #6 solid bare copper grounding wire (or other gauge as required by local codes) to the building ground as described in Section 4.3.



Note: Ground Lug may vary.

3.12: Complete the Second Row

Attach the remaining Modules to the second row.

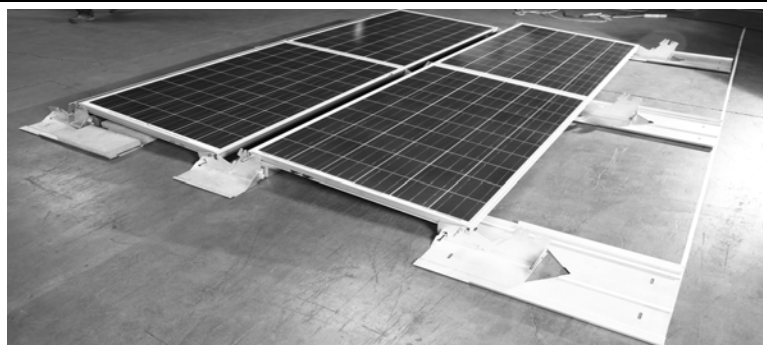
Complete Steps 1-8 in Section 3.9 for the remainder of the second row of Modules.



3.13: Add the Remaining Rows

Complete the remainder of the array.

Refer to Sections 3.10 through 3.12 for instructions on completing the remaining rows of the array.



Note: Ballasting and roof mounts are not shown here. Ballast and/or mount the array as you go in accordance with the system design.

If you are building a landscape installation then continue to Section 3.14.

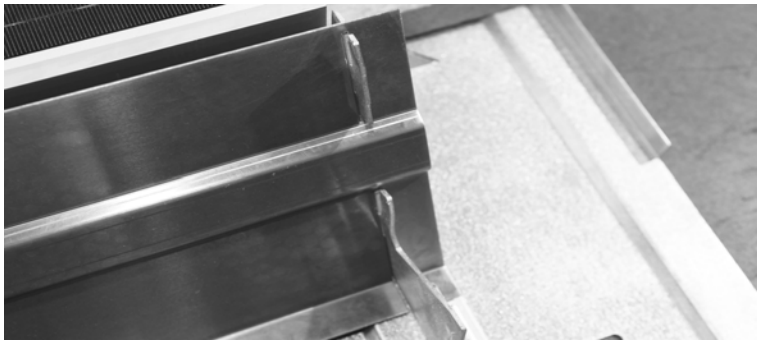
3.14: Install the Fairings (Ballasted Systems)

1) Lift the first Fairing into position.



The side of the Fairing with the angled lip should be facing down.

2) Attach the Fairing to the Footings.



Engage the tabs in the Footings with the slots in the Fairing.

Slide the Fairing down firmly to fully engage with the Footings.

3) Bend the outside Footing tabs to 45 degrees.



Use pliers to bend the two outside Footing tabs to 45 degrees.

Do not bend the inside Footing tabs yet.

4) Screw the Fairing to the Footing.



Use a 1/4" Grounding Screw to secure the Fairing to the outside Footing.

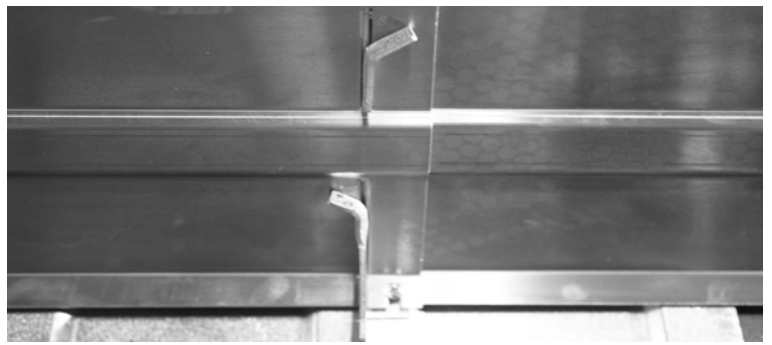
Tighten until secure. Do not overtighten.

Attach the next Fairing to the Footing. (5)

The inside edge of the next Fairing overlaps the previously installed Fairing.

**Secure the Fairings to the Footing. (6)**

Use pliers to bend the Footing tabs to 45 degrees where the Fairings overlap.

**Screw the Fairings to the Footing. (7)**

Use a 1/4" Grounding Screw to secure the Fairings to the inside Footing.

Tighten until secure. Do not overtighten.

**Place the rest of the Fairings. (8)**

Repeat Steps 5-7 for the remaining Fairings.

Once the final Fairing is in place, bend the outside Footing tabs at the end of the row to finish securing the final Fairing.



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Chapter 4: Wiring

This chapter contains instructions for wiring Andalay Solar PV Modules. Find the type of Module being used in the system and wire it as you build the array.

4.1: DC Modules

Note: DC Modules install in landscape (horizontal) orientation only.

Andalay Solar DC Modules are designed to be self-wiring in each string. The first Module in each string connects to extension cables that typically lead to a combiner box. The last Module in each string can be reconfigured by attaching the two end MC-4 connectors together, thereby completing the string circuit. Secure extra cabling to the Module frames using Wire Management Clips.

CAUTION: MODULE WIRING IS ARRANGED FOR SERIES CONNECTIONS ONLY.

4.1.1: String Sizes

Determine string sizes based on the voltage limit window for the central inverter selected during the system design phase. (Most strings have a maximum of 14-16 Modules, depending on the voltage window for the inverter being used.)

Some system designs may require splitting one array row into more than one string. In this case, treat the last Module of the string in the same way as you would treat any other string end. Be sure not to connect that Module to the first Module in the next string. The positive (+) and negative (-) MC-4 connector ends should be attached for the last Module in the string.

4.1.2: Wiring Requirements

Always comply with the following wiring requirements:

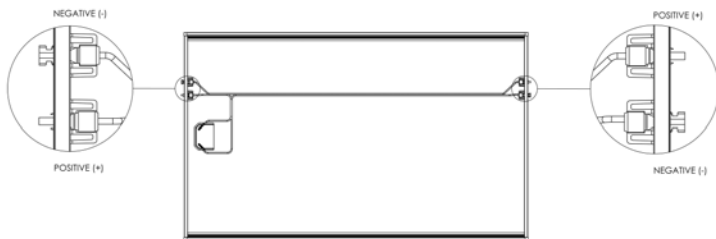
- End-row extension wires must be USE-2/RHH/RHW-2 stranded sunlight resistant, and rated to 90°C. Route these wires to the main combiner box closest to the array using wire management hooks per the system design.

- Any other connections to Modules other than inter-Module connections must be done using two #12AWG type USE-2 sunlight-resistant output cables with male and female MC-4 connectors, or equivalent.
- Manage end-row cabling using approved wire-management products purchased separately.

CAUTION: ALWAYS FOLLOW SAFE WIRING PRACTICES TO AVOID SHOCK HAZARDS.

4.1.3: Wiring DC Modules

1) Use one pair of MC-4 Connectors between Modules.



Each pair of MC-4 Connectors joins two Modules together in series. Modules ship without the MC-4 Connectors inserted. Insert the Connectors into the frame before installing the Modules.

Insert both MC-4 Connectors into the wiring connections in the Module you just placed.

2) Note the locations of the Module electrical connections.



Wiring connections are at each end of the Module on the short side, for use in a landscape (horizontal) installation.

3) Slide the next Module over the MC-4 Connectors.

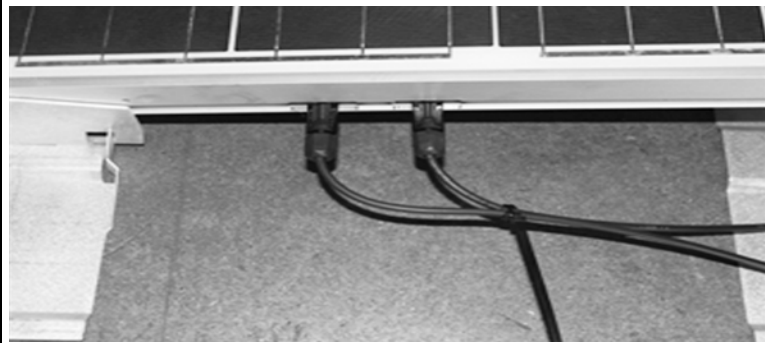


Verify that the MC-4 Connectors engage properly.

Connect the first and last Modules in each row. (4.

The last Module at the end of each string is usually the last Module in the row. The positive (+) and negative (-) MC-4 connectors should be removed from the frame and connected together. Secure the connector to the inside of the frame.

The first Module in a string must have two (2) extension cables plugged to the MC-4 wiring connections, as shown here.



4.2: AC Modules

Note: AC Modules install in portrait (vertical) orientation.

Andalay AC Modules come with integrated micro-inverters. Please refer to the micro-inverter documentation for more information.

CAUTION: MODULE WIRING IS ARRANGED FOR BRANCH CONNECTIONS ONLY.

4.2.1: Branch Sizes

- Single-phase AC branch circuits using the Andalay Solar module can have a maximum of 15 modules; three-phase branch circuits can have a maximum of 21 modules. Please refer to the *Installation and Operations Manual* for more information (available from www.Andalaysolar.com).
- Protect each AC branch circuit with a 15A maximum breaker.
- The AC connectors are oppositely sexed so that multiple inverters can be connected to form one continuous AC branch circuit.
- The last Module at the end of each branch is usually the last Module in the row.
- Some system designs may require splitting one array row into more than one branch. In this case, treat the last Module of the string in the same way as you would any other branch end. Be sure not to connect that Module to the first Module in the next branch.

Please refer to your inverter and Module documentation for further information and instructions.

4.2.2: Wiring Requirements

Always comply with the following wiring requirements:

- End-row extension wires must be USE-2/RHH/RHW-2 stranded sunlight resistant, and rated to 90°C. Route these wires to the junction box closest to each string using wire management products per the current National Electric Code (NEC) and Authority Having Jurisdiction (AHJ).
- All connections and other wiring must conform to the requirements specified in the Enphase documentation.
- Manage cabling using the Wire Management Clips as instructed in this manual. You may purchase Wire Management Clips from Andalay Solar.

CAUTION: ALWAYS FOLLOW SAFE WIRING PRACTICES TO AVOID SHOCK HAZARDS.

4.2.3: Wiring AC Modules

1) Connect the long tail (male) on the first Module to the short tail (female) on the next Module.



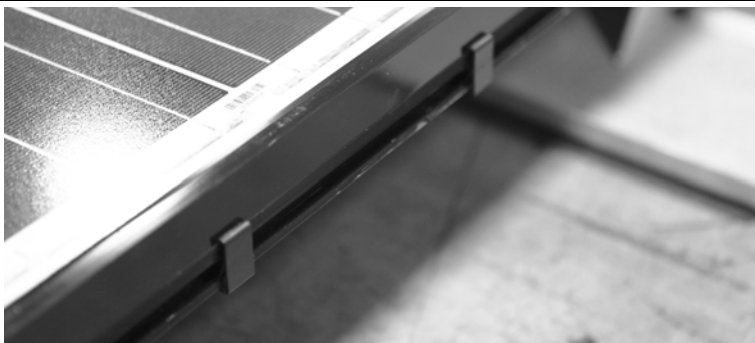
Push the connectors together until firmly seated.

2) Tighten the connection.



Twist the twist-lock knob until finger tight.

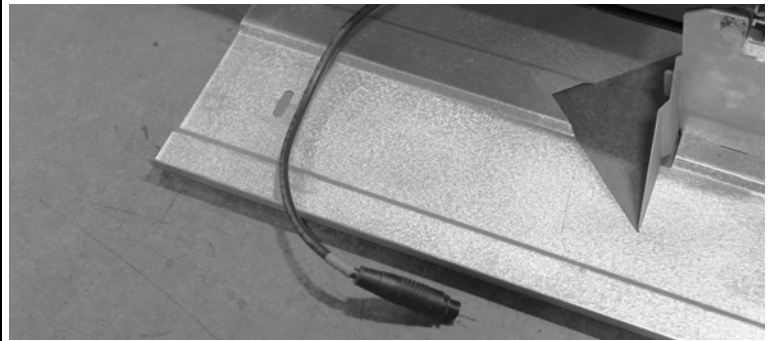
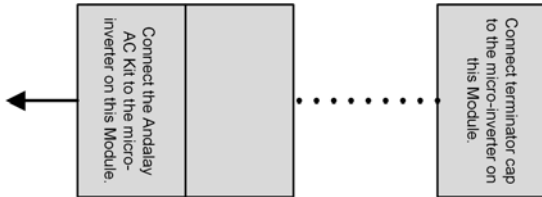
3) Manage the cables using Wire Clips.



Secure wires to the Module frames using Wire Management Clips as needed to prevent loose/dangling cables.

Connect the last Module to the home run that leads to the main panel. (4)

Use the Andalay AC Kit to connect the string of Modules to the system wiring.

**Add a Terminator Cap to the short tail of the last micro-inverter in the string. (5)**

Screw Terminator Cap to the tail until finger tight. Do not over-tighten.



4.3: Grounding the Array

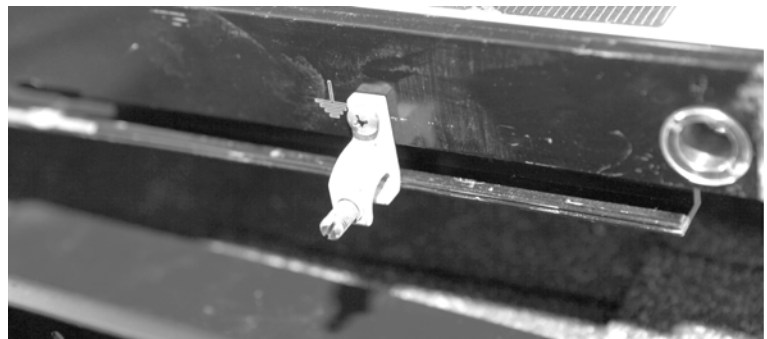
Array rows are grounded using End Bolts and Splices. All End Bolts and Splices must be fully threaded into the Modules and properly secured to ensure proper grounding. Following the Module installation instructions provided in this manual will ensure properly grounded rows.

Entire rows are grounded by attaching a Ground Lug to one of the 0.173" diameter (4.4 mm) holes on the Module frame

marked with the "ground" symbol using an ILSCO GBL-4DB or Burndy CL50-1TN lug, Star Washer, and self-tapping 10-32 X ½" Taptite II stainless steel screw torqued to 20 foot-pounds. The grounding wire used must be a solid copper from AWG 4-12 (#6 recommended, or as required by local codes).

Note: The Ground Lug may vary from that shown in the image.

Splices in between the Modules ensure that a continuous path for grounding across each array row is maintained in accordance with Section 690.43 of the National Electric Code (NEC).



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Chapter 5: Servicing

This chapter contains maintenance information for the Andalay Solar 5° Flat Roof Mounting System and instructions for removing a Module for servicing or replacement.

5.1: Maintenance Considerations

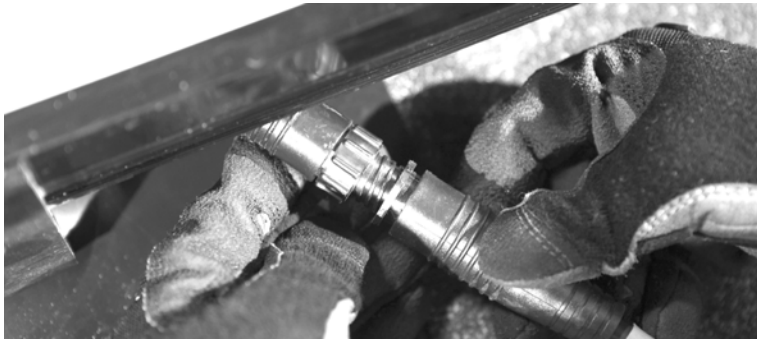
- Normal rainfall is usually sufficient to keep the glass Module surfaces clean. If excessive dirt builds up on the Modules, gently clean the Modules using a soft cloth with water and a mild detergent.
- Do not spray the Modules with a hose as this could cause thermal shock and damage the Module.
- Cleaning with ordinary tap water may create mineral scaling on the Module glass, which can be removed with commercial scale remover cleaners.
- Check the general condition of the array, Modules, wiring, and mounting hardware annually. This check should be performed by qualified personnel.
- Always use the correct tools during maintenance operations to avoid damaging the solar system.
- Always use replacement parts and hardware from Andalay Solar to ensure full system functionality and efficiency.
- Always follow the instructions in the following section when removing a Module from the array.

5.2: Removing a Module

Always tag out all breakers, fuse panels, and disconnections to prevent accidental energizing and possible injury or death. Follow all of the safety precautions in Section 1.6 when servicing Modules.

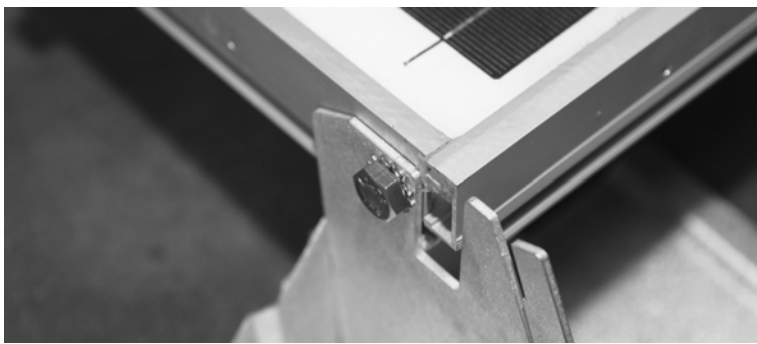
CAUTION: NEVER ATTEMPT ANY SERVICING OR REPAIR ON AN ENERGIZED ARRAY AS THIS COULD CAUSE SERIOUS INJURY OR DEATH.

1) Disconnect all wiring from the row with the Module being serviced.



Unplug the MC-4 wires from the Modules in the affected row.

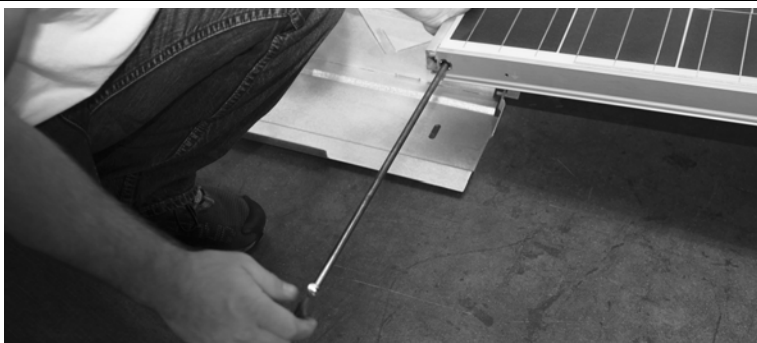
2) Remove the End Bolts from the East end of the affected rows.



The front (lower) End Bolt (LH) loosens by turning clockwise.

The upper (rear) End Bolt (RH) loosens by turning counterclockwise.

3) Loosen the Splices to disconnect the Modules.



The front (lower) Splice (LH) loosens by turning clockwise.

The upper (rear) Splice (RH) loosens by turning counterclockwise.

Lift the first Module up and away from the Footings and Splices. (4)

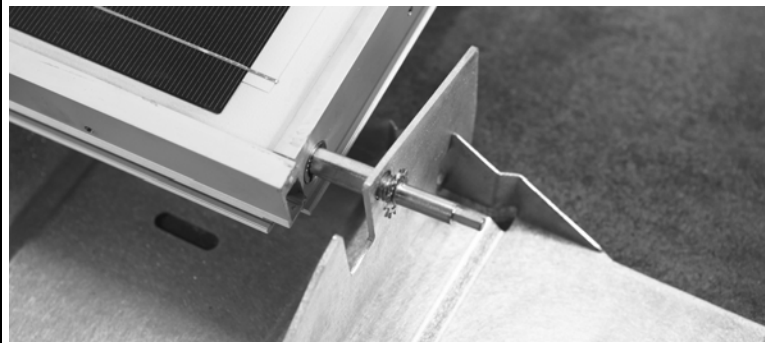
Lift the Module slightly while sliding it off the Splices and then lift it up and out of the way.

Note: If this the Module you intend to service, stop here and replace with a new Module as described in Section 3.9.

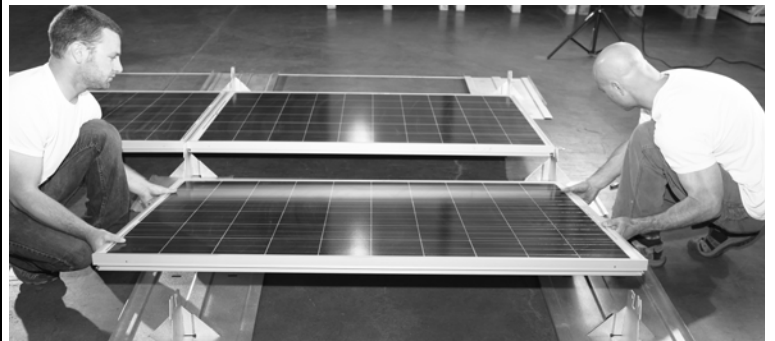
**Remove the Splices and Lock Washers. (5)**

Twist Splices right (clockwise) to remove from the next Module.

Continue removing Modules until you reach the Module you intend to service.

**Replace the defective Module with a new Module. (6)**

Follow the instructions in Sections 3.6 or 3.7 as appropriate to replace the Module.

**Reassemble the array. (7)**

Reassemble the array, following the directions in Chapter 3, as appropriate.

Be sure to restore the MC-4 connections and any removed grounding connections.



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Chapter 6: Support

Andalay Solar offers a number of convenient ways to contact us to answer questions about the product, installation, operation, or warranty.

6.1: Contacting Andalay Solar

You may contact Andalay Solar in any of the following ways:

Phone:	1.888.395.2248
Email:	techsupport@andalaysolar.com
Fax:	1(866) 685-7702
Mail:	Andalay Solar Attention: Tech Support 1475 South Bascom Ave Suite 101 Campbell, CA 95008

5° Flat Roof Mounting System Installation Guide - V2 60-Cell & 72-Cell V2 Modules

v3.2 - September, 2013

Andalay Solar
Attention: Tech Support
1475 South Bascom Ave
Suite 101
Campbell, CA 95008

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