

AGENDA

November 1, 2021

PLANNING COMMISSION/BOARD OF ZONING APPEALS

7:00 PM

Roll Call

Minutes

Meeting of October 4, 2021

Cases

CASE NO. 2021-2004

Evan Polaski and Nicole Nichols, the property owners of 3132 Esther Drive are requesting a variance to Zoning Code Section 158.15. If approved, the variance would allow for the installation of roof-mounted solar panels on the front plane of their home.

New Business

Adjournment

**MINUTES OF THE REGULAR MEETING OF THE
AMBERLEY VILLAGE BOARD OF ZONING APPEALS/PLANNING COMMISSION
MONDAY, OCTOBER 4, 2021**

Chairperson Richard Bardach called to order the regular meeting of the Amberley Village Board of Zoning Appeals/Planning Commission at the Amberley Village Municipal Building in Council Chambers on Monday, October 4, 2021 at 7:00 p.m.

Village Manager Scot Larhmer was absent. Roll was taken as follows:

PRESENT:

Rich Bardach
Scott Wolf
Susan Rissover
Scott Rubenstein
Rick Lauer

ALSO PRESENT:

Andrew Kaake, Village Solicitor
Wes Brown, Zoning Administrator
Tammy Reasoner, Clerk of Council

Chairman Bardach welcomed everyone to the meeting and led those in attendance in the Pledge of Allegiance.

Chairman Bardach asked if there were any corrections to the minutes of the September 9, 2021 meeting. There being none, the minutes were accepted as submitted.

CASE NO. 2021-1967

Village Zoning Administrator Wes Brown introduced Case No. 2021-1967, in which John and Jessica Pascoe, the property owners of 3194 North Farmcrest Drive, requested two (2) variances from Zoning Code Section 154.14 (A). The variances would allow a previously installed garden fence to remain in the front yard (the property has three front yards) and allow the garden fence to remain taller than 6 feet in height. Mr. Brown said both variances would be required in order to maintain the fence as it currently exists.

Homeowner John Pascoe testified to having been a resident for three years. He said he had previously tried temporary fencing around his garden, but deer still got to his garden. Mr. Pascoe said he was unaware of the height restrictions until he received a notice from the Village, but that prior to installing his fence, he researched effective deer fence height with both Cincinnati Zoo and Cincinnati Nature Center. Both organizations recommended 8-foot fencing to deter deer. He also said he researched fencing at the Amberley Village Community Garden, which is also 8 feet in height.

Mr. Pascoe said his neighbors seem to enjoy the garden, and he presented two letters in support of his variance approval request (see attached). He also said he had brought some of his neighbors to provide oral testimony in support of the variance request.

Mr. Shai Birmaher of 3127 N. Farmcrest Drive said he felt the garden looked great and was in attendance to demonstrate his support of the variance.

Ms. Shena Jaffee of 3182 N. Farmcrest Drive said the garden was very visible from her home, and that her family found it to be an inspiration. She said the fence height was not objectionable to her and that her family enjoyed watching the garden grow.

Mr. Keith Harris of 6500 Kincaid Road in Cincinnati stated he had sent a letter, but wished to come in person to show his support of the Pascoe's variance request. He said the fence and garden had been constructed with care, and that he had personally witnessed 4 -5 deer in the Pascoe yard every day. He said the garden serves as a hub for the community, and that Mr. Pascoe and his daughter are regularly out there tending to it.

Mr. Gary Hindersman of 3188 N. Farmcrest Drive stated he was in support of the variance, and that the garden is a conversation piece in the neighborhood. He said he has never heard a complaint about the garden or the fence.

Mr. Pascoe added that one additional neighbor who wished to testify was unable to attend, and thanked those present for their support.

Ms. Rissover said the first variance request made perfect sense to her, as the property had three front yards, which created a practical hardship with regard to the location of the garden. She stated, however, that deer in the yard was not a hardship as all residents of the Village experience the same challenge. She said this did not warrant an eight-foot fence. In addition, she said the Board of Zoning Appeals did not have the authority to allow an eight-foot fence, as Council had set the parameters.

Mr. Pascoe said he felt this was a silly issue.

Ms. Rissover said fence height was an issue raised regularly before the Board of Zoning Appeals.

Mr. Pascoe said the fence had been up since March of 2020.

Mr. Wolf said he understood the frustration of having to restrict residents when often enforcement wasn't consistent.

Mr. Lauer reminded Mr. Pascoe that the Board of Zoning Appeals didn't create the code, but it was required to enforce it. He suggested that Mr. Pascoe appeal to Council with a compelling argument for increasing the fence height regulation.

Mr. Pascoe said he didn't understand why the BZA couldn't just go to Council on his behalf.

Mr. Lauer said there was much more to consider than just Mr. Pascoe's fence, as there were multiple considerations to take into account. He suggested that perhaps a petition would be effective in gathering support for increasing the fence height regulations.

Mr. Pascoe said the rule seemed ridiculous.

Mr. Wolf asked if the Board could give Mr. Pascoe some additional time to appeal to Council, to which Mr. Lauer responded he didn't think there was a provision to allow that.

Mr. Pascoe stated if he had known, he would have done differently. He said as an avid runner, he was aware of other fences in the Village that exceed six feet.

Mr. Rubenstein said there had been a few variances in the past, but that he knew of no other municipality that allowed fences to reach an eight-foot height.

Mr. Rubenstein then moved to approve the first variance request to allow the fence to remain in the front yard, but to deny the second request to allow the fence to remain taller than 6 feet in height. The motion was seconded by Mr. Lauer and passed unanimously.

NEW BUSINESS

There being no new business, Chairman Bardach announced the meeting was adjourned at 5:23 p.m.

Tammy Reasoner, Clerk of Council

Richard Bardach, Chairperson



7149 Ridge Road
Amberley Village, OH 45237

513-531-8675 *phone*
513-531-8154 *fax*

amberleyvillage.org

PLANNING COMMISSION/BOARD OF ZONING APPEALS
MEETING NOTICE

WHEN: November 1, 2021 at 7:00 PM
WHERE: Amberley Village Municipal Building, 7149 Ridge Road
FROM: Scot Lahrmer, Village Manager

Please be advised there will be a public meeting held by the Amberley Village Planning Commission and the Board of Zoning Appeals on **Monday, November 1, 2021**, at 7:00 p.m. in the Council Chambers of the Amberley Village Municipal Building, 7149 Ridge Road. The public meeting will be held to review the following item:

Evan Polaski and Nicole Nichols, the property owners of 3132 Esther Drive, are requesting a variance to Zoning Code Section 158.15. If approved, the variance would allow for the installation of roof-mounted solar panels on the front plane of their home.

If you are interested in reviewing the application, you may do so Monday through Friday, 8:00 a.m. to 4:00 p.m. at the Amberley Village Municipal Building, 7149 Ridge Road, or you may attend the **Monday, November 1, 2021**, Planning Commission and Board of Zoning Appeals public meeting. If you have any questions, please feel free to contact Scot Lahrmer at (513) 531-8675.

cc: Nicole Nichols & Evan Polaski, 3132 Esther Drive
Kurt & Tonya Brueggeman, 3116 Esther Drive
Shannon Dunphy & Andrew Kroner, 3117 Esther Drive
David & Chie Weil, 3141 Esther Drive
Jason Phibbs, 3148 Esther Drive
Mary Griswold, 3185 Dot Drive
Sarah & Ryan McCoy, 3153 Dot Drive

POSTED 10/20/2021



7149 Ridge Road
Amberley Village, OH 45237

513-531-8675 *phone*
513-531-8154 *fax*

amberleyvillage.org

Amberley Village Planning Commission Staff Report

November 1, 2021

Subject:

3132 Esther Drive

Variance:

Installation of roof-mounted solar panels on the front plane of the house.

Item: Case#2021-2004

Variance Request: Evan Polaski and Nicole Nichols, the property owners of 3132 Esther Drive are requesting a variance to Zoning Code Section 158.15. If approved, the variance would allow for the installation of roof-mounted solar panels on the front plane of their home.

Zoning Code Review: Chapter 158 Alternative Energy, 158.15 (A) Roof Mounted Systems. Roof-mounted solar energy systems shall not extend beyond the existing roof (with and height) of the structure to which they are attached. Roof-mounted systems shall not exceed the height of the roofline on a pitched roof; SES may project vertically up to five feet above a flat roofline. Roof-mounted systems are not permitted in the front yard or on the front plane of a structure.

Variance Review: Mr. Polaski and Ms. Nichols, are the property owners of 3132 Esther Drive and are requesting a variance to Zoning Code Section 158.15. If approved, the variance would allow for the installation of roof-mounted solar panels on the front plane of their home.

The letter to the board states that they have contracted with Icon Solar to install 42 roof-mounted solar panels on all four planes of the house. This would include 16 on the front plane of the house, which is the south-facing plane, and that the south-facing panels are the most efficient and will create the largest amount of energy. This is due to being exposed to the sun longer and this being the largest plane of the roof.

The letter also states that the panels will be less visible from the street because of the shallow pitch of the roof, the solar panels to be installed are black in color with a black edge and the panels will be setback from the edge of the roof.

Village Code section 158.15 states that roof-mounted systems are not permitted in the front yard or on the front plane of the structure. Therefore, the variance is required for the 16 panels to be installed on the front plane of the house.

Project Recommendations: The project is to be considered on its merits.

Date: 10/5/21

Mr. Scot F. Lahrmer
Village Manager
7149 Ridge Road
Cincinnati, OH 45237

RE: Zoning Approval

Dear Mr. Lahrmer:

I hereby request a zoning approval for:

FLUSH MOUNTED ROOF TOP SOLAR PANELS
ON REAR OF HOME.

The structure is proposed at the following address:

3132 ESTHER DR CIN, OH 45213

I certify the attached plat and measurements are accurate.

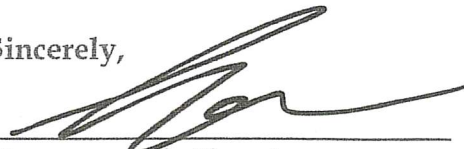
ICON SOLAR
Contractor's Name

50 W TECH/NECENTER DR
MILFORD, OH 45150
Contractor's Address

513-386-7777
Telephone Number

call
ICON

Sincerely,


Homeowner's Signature

EVAN POLASKI
Homeowner's Printed Name

(513)-638-9799
Telephone Number (daytime)

Amberley Village Planning Commission
Board of Zoning Appeals
7149 Ridge Road
Cincinnati, OH 45237

RE: Request for Solar Panels on All Roof Pitches

Board of Zoning Appeals:

We, Evan Polaski and Nicole Nichols, have applied for Zoning approval on a photovoltaic (solar) array for our residence at 3132 Esther Drive. In total, we are seeking 42 panels on our roof. We are contracted to have this system installed by Icon Solar, a long standing and reputable solar contractor.

In our plans, we have planned for solar panels to be installed on all four pitches of our roof, including 16 total panels on our "front" pitch. Our front pitch is the south facing pitch which will create the largest amount of energy through the system due to both the direction it faces, as well as being the largest pitch of the roof.

Our roof has a very shallow pitch on all faces. Therefore, even while standing in the middle of Esther Dr, our roof is barely visible. The solar panels to be installed are black in color and will therefore blend into the charcoal grey roof shingles currently installed on the roof. Additionally, they will be set back from the edge, as shown on plan, creating even less visual impact from street level, with a simple black edge likely being all that is visible.

Due to the discrete appearance of the panels, and the fact that the front pitch of our roof is the most advantageous and efficient location for the panels, we would like to have our a variance approved for our plans.

We a grateful for your consideration.

Kindly,
Evan Polaski and Nicole Nichols
3132 Esther Drive

Evan Polaski



3132 Esther Dr

Cincinnati, Ohio

[View on Google Maps](#)

**FLUSH MOUNTED
ALL BLACK EQUIPMENT
TOP OF PANELS
TO BE LESS THAN 6"
ABOVE THE SURFACE
OF THE SHINGLES**

PARC ID-526-0130-0051-00



POLASKI RESIDENCE

3132 ESTHER DR CINCINNATI, OHIO 45213

New Millennium Building Engineers, LLC.

Art J. Hunkele Professional Engineer

3146 Mount Carmel Road Cincinnati, OH 45244

Phone (513) 528-1092 cell (513) 258-8050

Fax (513) 528-0761 e-mail ajhunkele@cinci.rr.com

Website: www.newmillenniumengineers.com



September 30, 2021

ICON Solar Power
Attn: Mr. Jaye Meier
50 W. Techne Center Drive
Milford, OH 45150

Re: Proposed addition of (42) roof mount solar panels on the house roof
Polaski Residence-3132 Esther Drive
Cincinnati, OH 45213

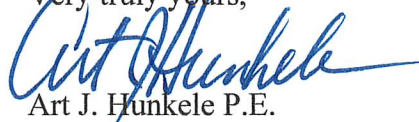
Dear Jaye,

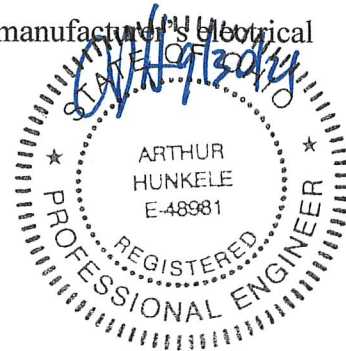
I have reviewed the proposed installation of the (42) roof mounted solar panels on the house roof. The roof is adequate to support the solar panels and wind and snow loads as well as a second layer of shingles. This analysis is based on;

1. Solar panels are Trina TSM.DD06M.05(II) Module solar panels. Panel weight is 2.25 psf.
2. Wind force is calculated from I-115 wind speed, Exposure C
3. Ground snow load is 20 psf.
4. Panels are mounted using Ironridge standard rails.
5. Mounting anchors shall be located at 4'-0" o.c. Anchor to penetrate minimum 2 1/2" into framing. Use 5/16" x 3" stainless steel lag screws.
6. Utilize Enphase IQ7-Plus-72-2-US MicroInverters.
7. All work to be installed per NEC local electrical code and manufacturer's electrical requirements per wiring schematic.

Should you have any questions, please do not hesitate to call.

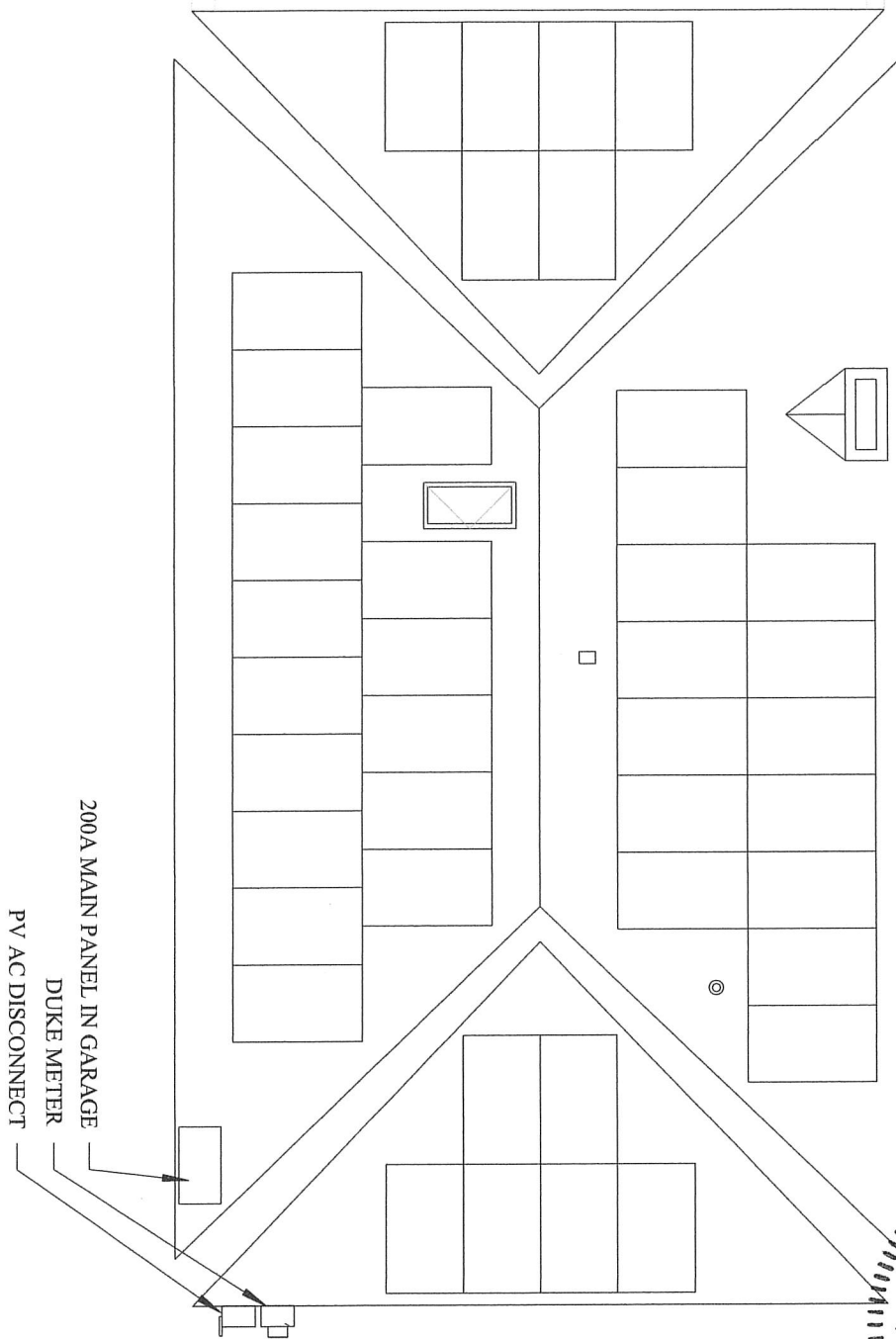
Very truly yours,


Art J. Hunkele P.E.

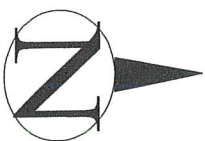


**Note-this inspection report is prepared for the sole, exclusive, and confidential use of Client. Any distribution to third parties is not authorized by Inspector and shall be done at Client's sole risk and liability. Client agrees to indemnify and hold harmless Inspector for any claim advanced by any third party as a result of the distribution of the inspection report.*

42-TRINA TSM.DDO6M.05(II)
 330W EACH MODULE
 13.86KW DC RATING TOTAL
 42- ENPHASE IQ7PLUS-72-2-US
 .29KW EACH
 12.18KW MAX CONT. AC TOTAL
 SHINGLE ROOF ON PLY DECKING
 2X4 TRUSS 24" OC
 PITCH- 4:12
 AZ-225-45-135



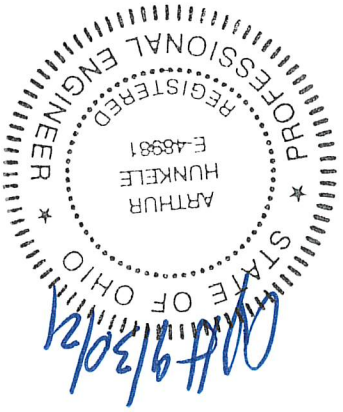
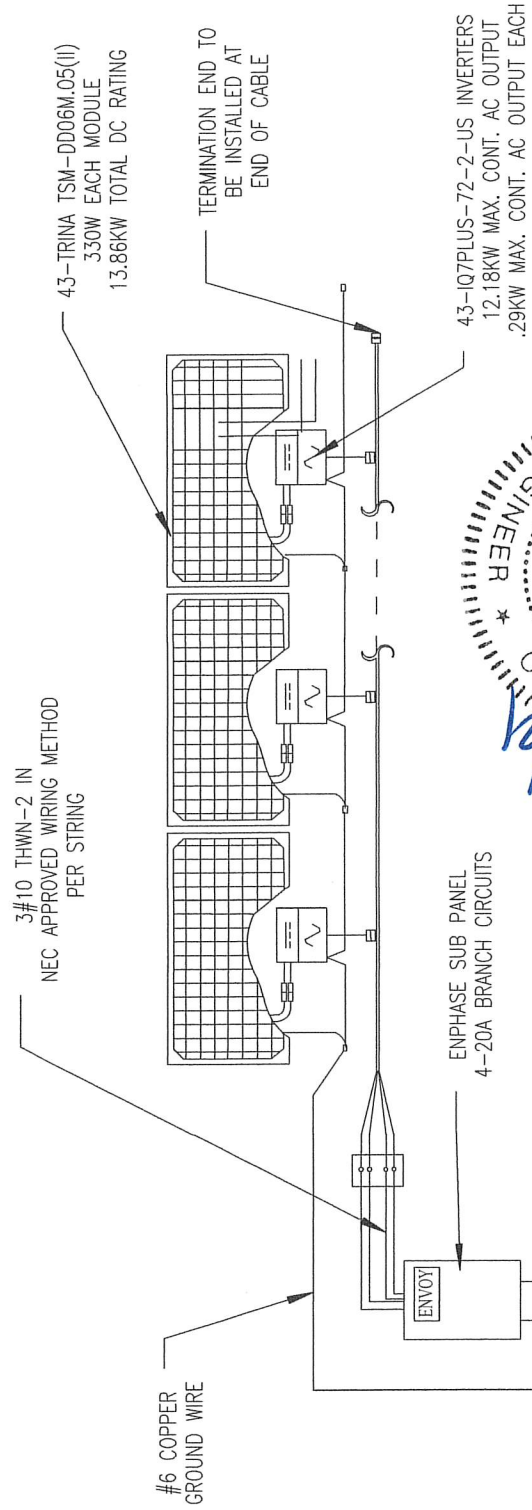
ROOFPLAN
 SCALE-1/8" = 1'-0"



PROPOSED:
POLASKI RESIDENCE
3132 ESTHER DR
CINCINNATI, OH 45213

ICON SOLAR

50 W TECHNECENTER DR. SUITE K
 MILFORD, OHIO 45150



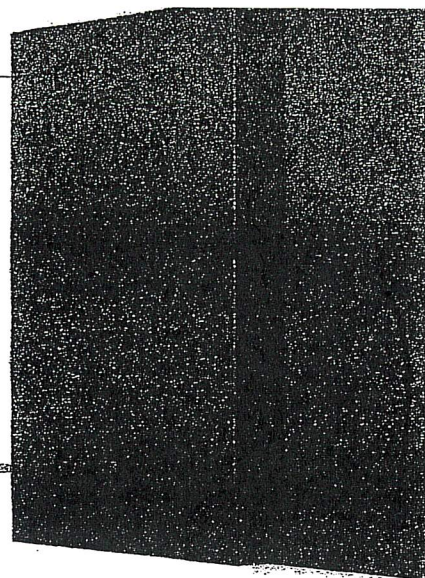
POLASKI RESIDENCE 3132 ESTHER DR CINCINNATI, OH 45213	IQ7PLUS-72-2-US
FIELD WIRING DIAGRAM 240 VAC SINGLE PHASE IQ7+MICROINVERTER	
DO NOT SCALE DRAWING	

ALL SOLAR BREAKERS
 SHALL BE SUITABLE FOR
 BACKFEEDING NEC705.12(D)(5)
 $1.21(\text{AMP}) \times 13 \text{ MODULES} \times 1.25 = 19.6625 \text{ AMPS}$
 NEC 690.8(A)(2) MAX PER STRING

THE

Residential Module

MULTI-BUSBAR 120 HALF-CELL BOB MODULE



120-Cell

MONOCRYSTALLINE MODULE

310-335W

POWER OUTPUT RANGE

19.7%

MAXIMUM EFFICIENCY

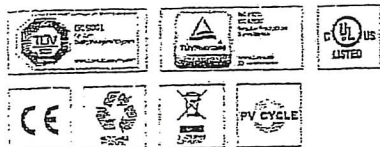
0~+5W

POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina as a strong, bankable brand. Trina Solar now distributes its PV products to over 100 countries all over the world. We are committed to building strategic, mutually beneficial collaborations with installers, developers, distributors and other partners in driving smart energy together.

Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 OHSAS 18001: Occupation Health and Safety Management System



Trina solar

PRODUCTS	BACKSHEET COLOR	POWER RANGE
TSM-DD06M.05(II)	Black	310-335W
FRAME COLOR: Black		



High power output

- Reduce BOS cost with high power bin and module efficiency
- New cell string layout and split J-box location reduces the energy loss caused by inter-row shading
- Lower resistance of half-cut cells and increased MBB (Multi Busbar) reflectance ensure higher power



High energy generation, low LCOE

- Excellent 3rd party validated IAM and low light performance with cell process and module material optimization
- Low Pmax temp coefficient (-0.36%) increases energy production
- Better anti-shading performance and lower operating temperature



Outstanding visual appearance, easy to install

- Designed for superior rooftop aesthetics
- Thinner wires give a eye catching all black look
- Safe and easy to transport, handle, and install

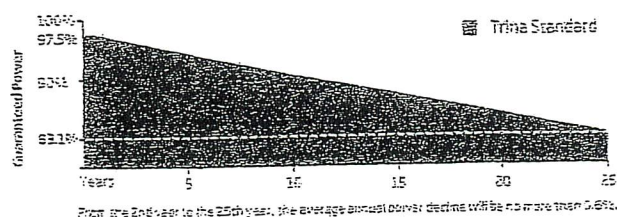


Certified to perform in highly challenging environments

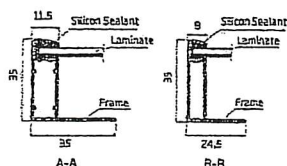
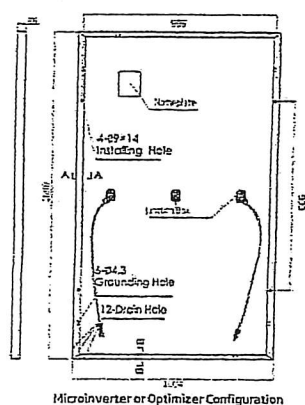
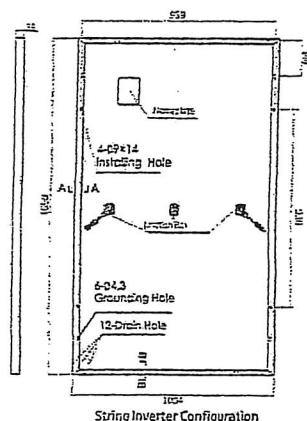
- High PID resistance through cell process and module material control
- Resistant to salt, acid, sand, and ammonia
- Over 30 in-house tests (UV, TC, HF etc)
- Certified to 5400 Pa positive load and 2400 Pa negative load

PERFORMANCE WARRANTY

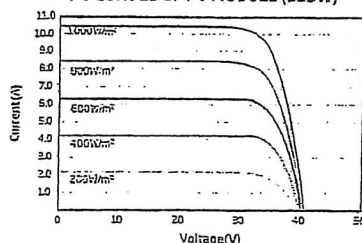
10 Year Product Warranty • 25 Year Power Warranty



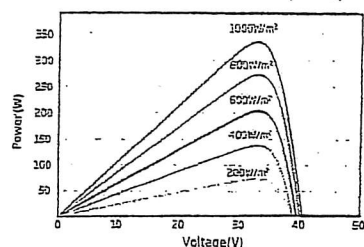
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE (335W)



P-V CURVES OF PV MODULE (335W)



ELECTRICAL DATA (STC)

Peak Power Watts- P_{MAX} (W)*	310	315	320	325	330	335
Power Output Tolerance- P_{MAX} (W)	0 ~ +5					
Maximum Power Voltage- V_{MP} (V)	33.0	33.2	33.4	33.6	33.8	34.0
Maximum Power Current- I_{MP} (A)	9.40	9.49	9.58	9.67	9.76	9.85
Open Circuit Voltage- V_{OC} (V)	39.9	40.1	40.3	40.4	40.6	40.7
Short Circuit Current- I_{SC} (A)	10.03	10.12	10.20	10.30	10.40	10.50
Module Efficiency η (%)	18.2	18.5	18.8	19.1	19.4	19.7

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.

*Measuring tolerance: ±3%

ELECTRICAL DATA (NMOT)

Maximum Power- P_{MAX} (W)	235	238	242	246	250	254
Maximum Power Voltage- V_{MP} (V)	31.0	31.2	31.4	31.6	31.7	31.9
Maximum Power Current- I_{MP} (A)	7.57	7.64	7.71	7.79	7.86	7.94
Open Circuit Voltage- V_{OC} (V)	37.6	37.8	38.0	38.1	38.3	38.4
Short Circuit Current- I_{SC} (A)	8.08	8.15	8.22	8.30	8.38	8.46

NMOT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	120 cells (6 × 20)
Module Dimensions	1698 × 1004 × 35 mm (66.85 × 39.53 × 1.38 inches)
Weight	18.7kg (41.2lb)
Glass	3.2mm (0.13 inches), High Transmission, AR Coated Tempered Glass
Encapsulant Material	EVA
Backsheet	Black
Frame	35 mm (1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²) Portrait: N 140mm/P 285mm (5.51/11.22 inches) Landscape: N 1200 mm /P 1200 mm (47.24/47.24 inches)
Connector	MC4

TEMPERATURE RATINGS

NMOT (Nominal Module Operating Temperature)	41°C (±3°C)
Temperature Coefficient of P_{MAX}	-0.36%/°C
Temperature Coefficient of V_{OC}	-0.26%/°C
Temperature Coefficient of I_{SC}	0.04%/°C

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

MAXIMUM RATINGS

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1000V DC (IEC)
	1000V DC (UL)
Max Series Fuse Rating	20A

WARRANTY

- 10 year Product Workmanship Warranty
- 25 year Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

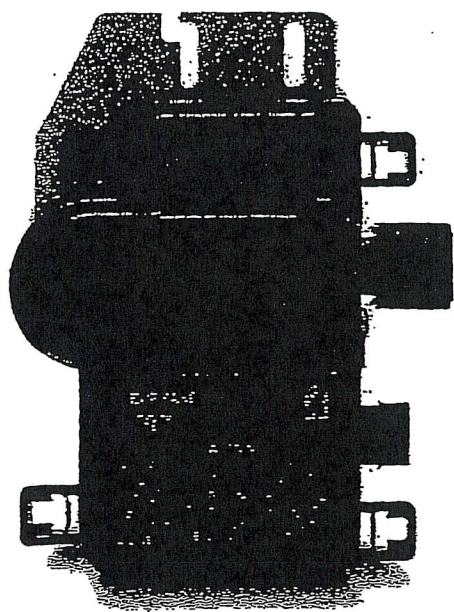
- Modules per box: 30 pieces
- Modules per 40' container: 780 pieces

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready Enphase IQ 7 Micro™ and Enphase IQ 7+ Micro™ dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate seamlessly with the Enphase IQ Envoy™, Enphase Q Aggregator™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

*The IQ 7+ Micro is required to support 72-cell modules.



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)		IQ7-60-2-US		IQ7PLUS-72-2-US	
Commonly used module pairings		235 W - 330 W		235 W - 440 W	
Module compatibility		60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage		48 V		60 V	
Peak power tracking voltage		27 V - 37 V		27 V - 45 V	
Operating range		16 V - 48 V		16 V - 60 V	
Min/Max start voltage		22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module ISC)		15 A		15 A	
Overvoltage class DC port		II		II	
DC port backfeed current		0 A		0 A	
PV array configuration		1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
OUTPUT DATA (AC)		IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power		250 VA		295 VA	
Maximum continuous output power		240 VA		290 VA	
Nominal L-L voltage/range		240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current		1.0 A	1.15 A	1.21 A	1.39 A
Nominal frequency		60 Hz		60 Hz	
Extended frequency range		47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current (over 3 cycles)		5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit ³		16 (240 VAC) 13 (208 VAC)		13 (240 VAC) 11 (208 VAC)	
Overvoltage class AC port		II		II	
AC port backfeed current		0 A		0 A	
Power factor setting		1.0		1.0	
Power factor (adjustable)		0.7 leading ... 0.7 lagging		0.7 leading ... 0.7 lagging	
EFFICIENCY		@240 V	@208 V	@240 V	@208 V
Peak CEC efficiency		97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency		97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA		IQ 7 Microinverter			
Ambient temperature range		-40°C to +65°C			
Relative humidity range		4% to 100% (condensing)			
Connector type		MC4 or Amphenol 2400X with additional 20-DC-C-5 adapter ³			
Dimensions (WxHxD)		212 mm x 175 mm x 30.2 mm (without bracket)			
Weight		1.08 kg (2.38 lbs)			
Cooling		Natural convection - No fans			
Approved for wet locations		Yes			
Pollution degree		PD3			
Enclosure		Class II, double-insulated, corrosion-resistant polymeric enclosure			
Environmental category / UV exposure rating		NEMA Type 6 / outdoor			
FEATURES		Power Line Communication (PLC)			
Communication		Enlighten Manager and MyEnlighten monitoring options.			
Monitoring		Both options require installation of an Enphase IQ Envoy.			
Disconnecting means		The AC and DC connectors have been evaluated and approved by UL for use as the load break disconnect required by NEC 690.			
Compliance		CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.			

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.

2. Nominal voltage range can be extended beyond nominal if required by the utility.

3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com

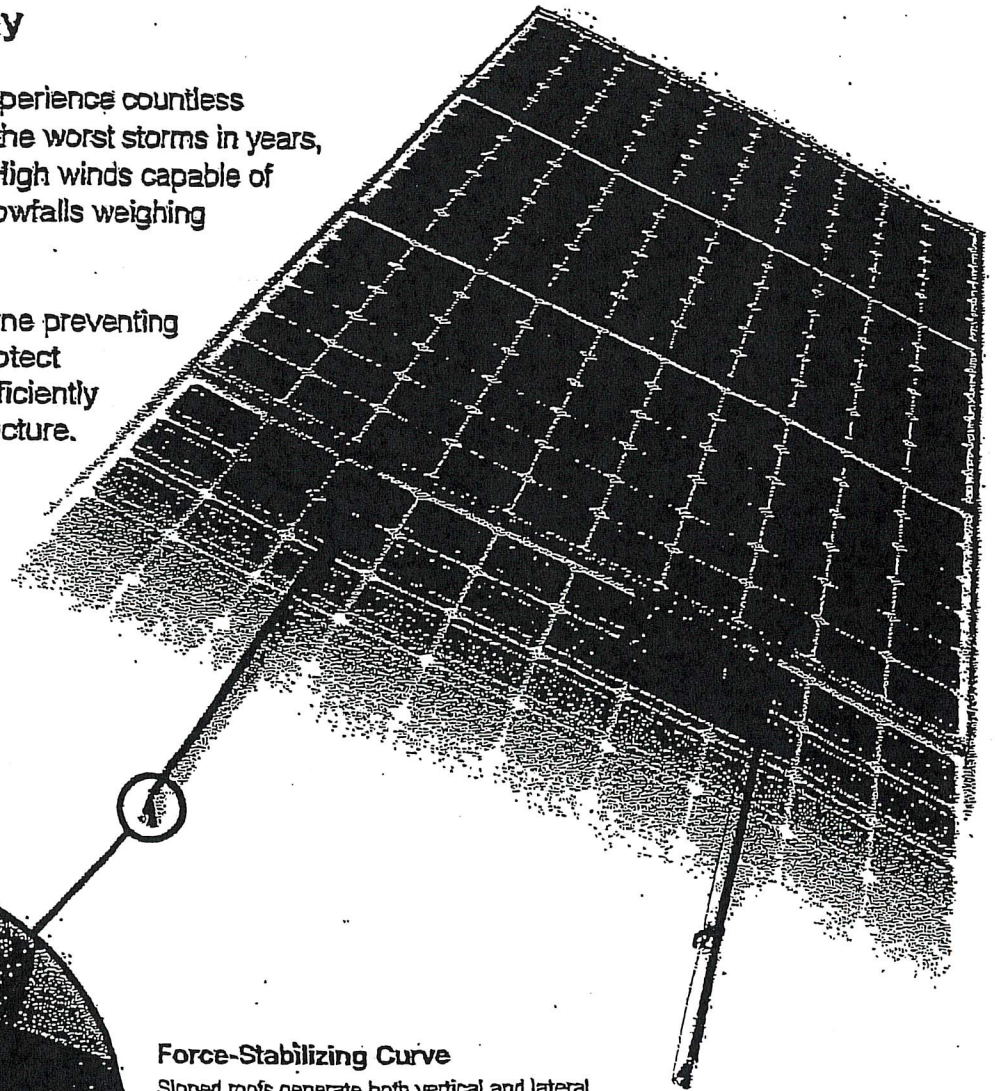


© 2018 Enphase Energy. All rights reserved. All trademarks or brands used are the property of Enphase Energy, Inc.

Solar Is Not Always Sunny

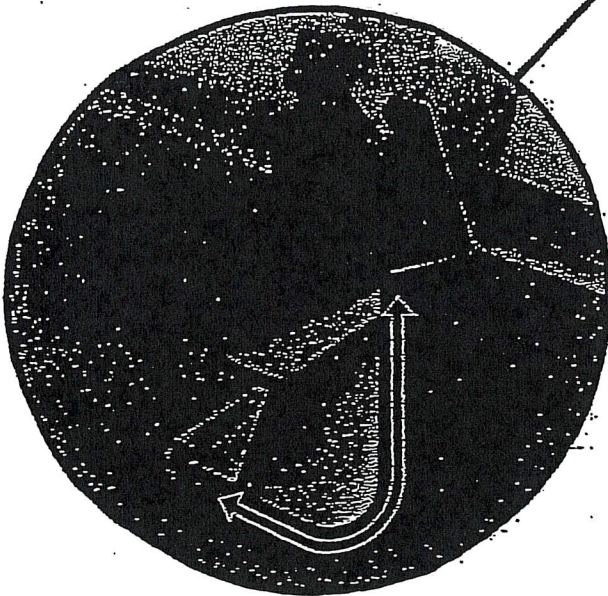
Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.



Compatible with Flat & Pitched Roofs



XR Rails are compatible with FlashFoot and other pitched roof attachments.



IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



XR Rail Family

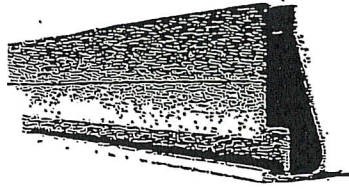
The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

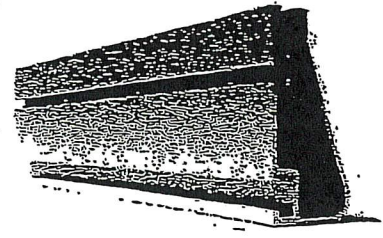
- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

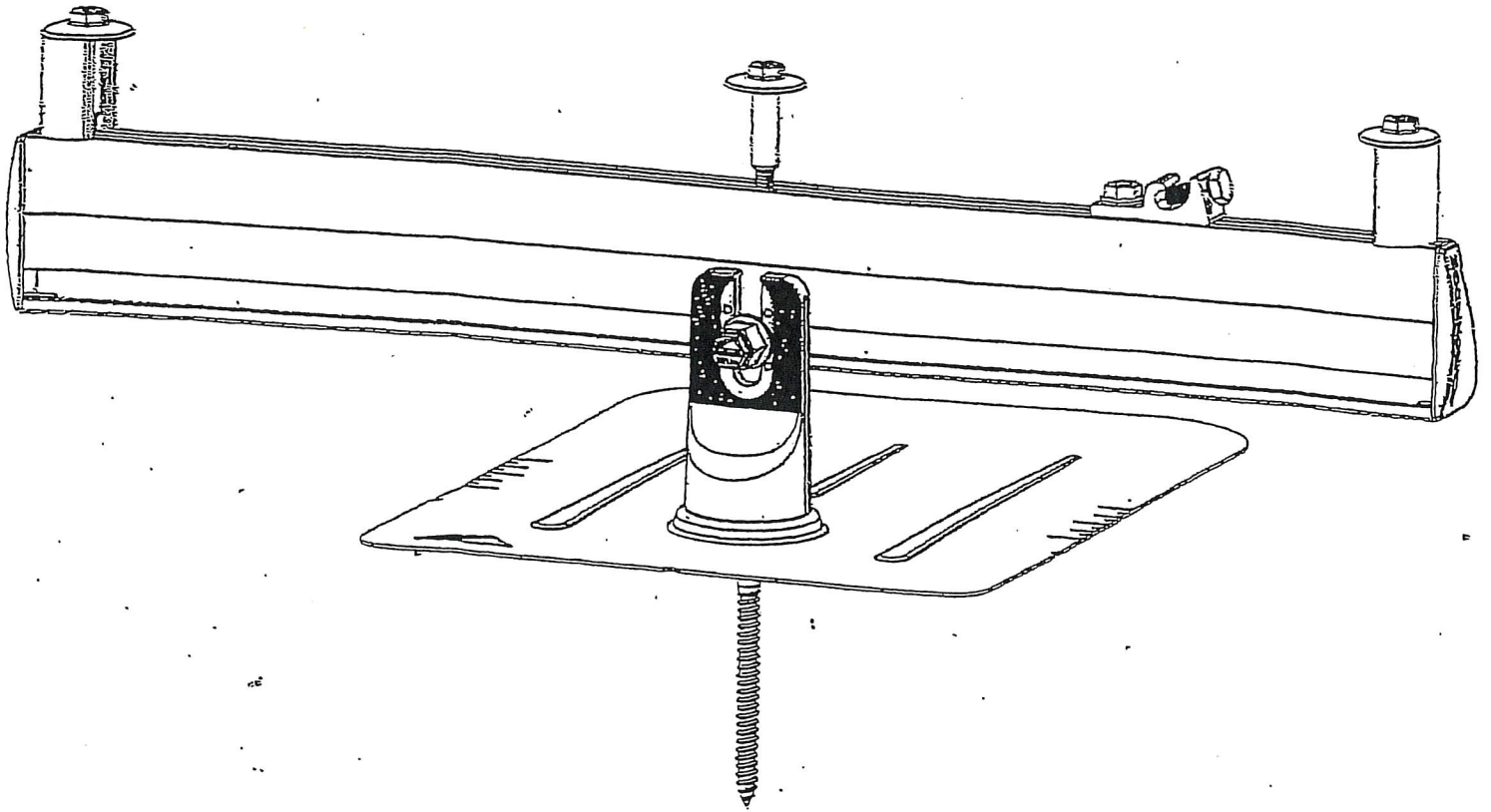
- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	120						
	140						
	160						
10-20	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	120						
	140						
	160						
30	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	160						
40	100	XR10	XR100	XR1000	XR1000	XR1000	XR1000
	160						
50-70	160	XR10	XR100	XR1000	XR1000	XR1000	XR1000
80-90	160	XR10	XR100	XR1000	XR1000	XR1000	XR1000

FLUSH MOUNT



CONTENTS

DISCLAIMER	1
RATINGS	2
MARKINGS	2
CHECKLIST	3
1. ATTACH BASES	4
2. PLACE RAILS	4
3. SECURE LUGS	5
4. SECURE MODULES	5
EXPANSION JOINTS	6
ELECTRICAL DIAGRAM	6
FLASHFOOT2	7
END CAPS	7
WIRE CLIPS	7
FLUSH STANDOFFS	7
MICROINVERTER KITS	8
SYSTEMS USING ENPHASE MICROINVERTERS	8
FRAMELESS MODULE KITS	8
MODULE COMPATIBILITY	9
WARRANTY	10

DISCLAIMER

This manual describes the proper installation procedures and provides minimum standards required for product reliability and warranty. Thoroughly understanding this manual is imperative to proper installation; failure to follow the guidelines set forth can result in property damage, bodily injury, or even death.

IT IS THE INSTALLER'S RESPONSIBILITY TO:

- Ensure that the installation is completed by a licensed solar professional. All electrical installation and procedures should be conducted by a licensed and bonded electrician or solar contractor. Routine maintenance of a module or panel shall not involve breaking or disturbing the bonding path of the system.
- Comply with all applicable local or national building and fire codes, including any that may supersede this manual.
- Ensure all products are appropriate for the installation, environment, and array under the site's loading conditions.
- Use only IronRidge parts or parts recommended by IronRidge; substituting parts may void any applicable warranty.
- Review the Design Assistant and Certification Letters to confirm design specifications.
- Refer to IronRidge's Structural Certification letters for state specific design conditions including allowable rail spans, cantilever length, and splice location requirements.
- Comply with all applicable fire codes including, but not limited to, keeping walkways clear and avoiding obstacles
- Ensure provided information is accurate. Issues resulting from inaccurate information are the installer's responsibility.
- 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.
- 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, and NEC 690: Solar Photovoltaic Systems.
- Disconnect AC power before servicing or removing microinverters and power optimizers.
- Review module manufacturer's documentation to ensure compatibility and compliance with warranty terms and conditions.

RATINGS

UL 2703 LISTED



#5003320

Intertek

- Conforms to ANSI/UL 2703 (2015) Standard for Safety First Edition: Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
- Max Overcurrent Protective Device (OCPD) Rating: 25A
- Max Module Size: 24" ~~W~~
- Module Orientation: Portrait or Landscape
- Mechanical Load Rating: meets minimum requirements of the standard (10 PSF downward, 5 PSF upward, 5 PSF lateral). Actual system structural capacity is defined by PE stamped certification letters.

CLASS A SYSTEM FIRE RATING PER UL 1703

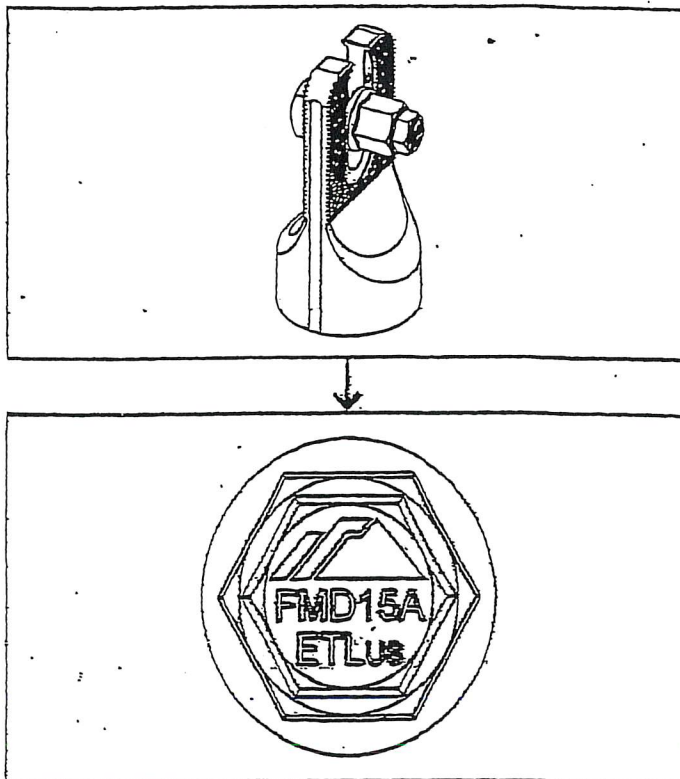
- Any Roof Slope with Module Types 1, 2, and 3
- Any module-to-roof gap is permitted, with no perimeter guarding required. This rating is applicable with any third-party attachment.
- Class A rated PV systems can be installed on Class A, B, and C roofs without affecting the roof fire rating.

STRUCTURAL CERTIFICATION

- Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7

MARKINGS

Product markings are located on the 3/8" flange hex nut.



PRE-INSTALLATION

- ☐ Verify module compatibility. See [Page 9](#) for info.

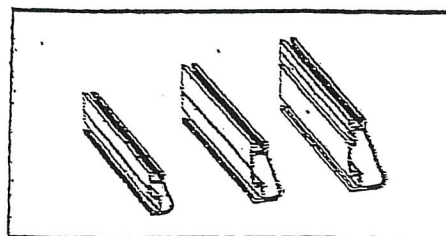
TOOLS REQUIRED

- ☐ Cordless Drill (non-impact)
- ☐ Impact Driver (for lag bolts)
- ☐ Torque Wrench (0-250 in-lbs)
- ☐ 5/16" Socket
- ☐ 7/16" Socket
- ☐ 1/2" Socket
- ☐ String Line

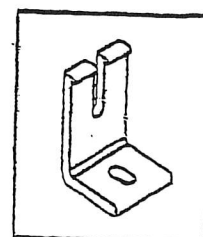
TORQUE VALUES

- ☐ FlashFoot2 Lag Bolts (7/16" Socket): Fully seat
- ☐ Bonded Splice Screws (5/16" Socket): 20 in-lbs
- ☐ Grounding Lug Nuts (7/16" Socket): 80 in-lbs
- ☐ Grounding Lug Terminal Screws (7/16 Socket): 20 in-lbs
- ☐ Universal Fastening Object (7/16" Socket): 80 in-lbs
- ☐ Expansion Joint Nuts (7/16" Socket): 80 in-lbs
- ☐ Flush Standoffs (1/2" Socket): 140 in-lbs
- ☐ Microinverter Kit Nuts (7/16" Socket): 80 in-lbs
- ☐ Frameless Module Kit Nuts (7/16" Socket): 80 in-lbs
- ☐ 3/8" Bonding Hardware Kit Nuts (7/16" Socket): 250 in-lbs

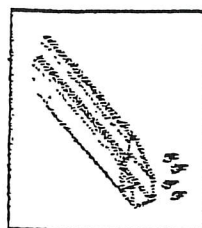
IRONRIDGE COMPONENTS



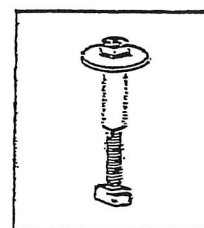
XR Rail



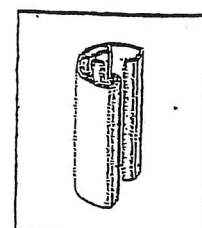
L-Foot



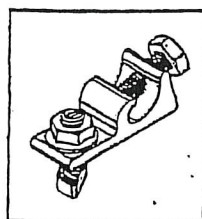
Bonded Splice



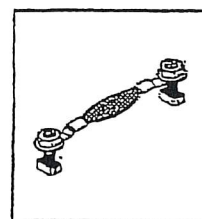
UFO



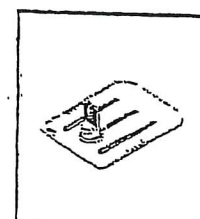
Stopper Sleeve



Grounding Lug



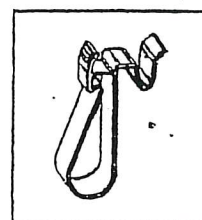
Expansion Joint



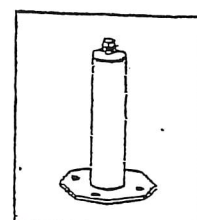
FlashFoot2



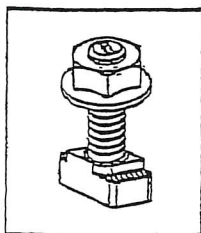
End Cap



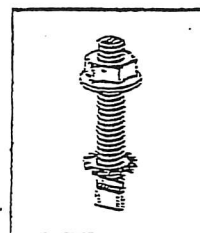
Wire Clip



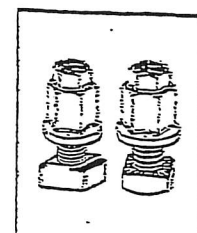
Flush Standoff



Microinverter Kit



Frameless
Module Kit



3/8" Bonding
Hardware Kits

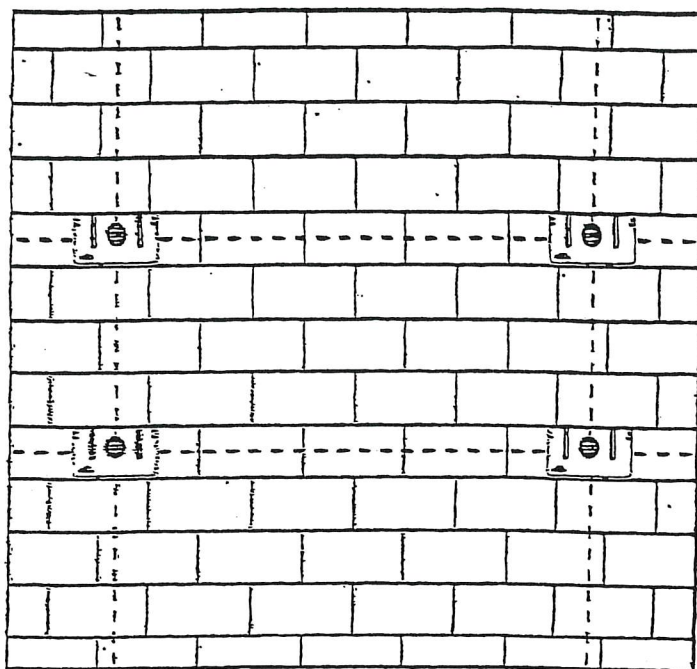
⚠ If using previous version of FlashFoot, Integrated Grounding Mid Clamps, Grounding Lug, End Clamps, and Expansion Joints, please refer to Alternate Components Addendum (Version 1.10).

1. ATTACH BASES

Install roof attachments. Mount Slotted L-Foot, FlashFoot2, or other compatible roof attachment per manufacturer's instructions.

- ☞ IronRidge's all-in-one FlashFoot2 roof attachment is for pitched, composition shingle roofs. Refer to [Page 7](#) or [provided manual](#).
- ☞ Tested or evaluated third-party roof attachments:
 - Anchor Products - U-Anchor
 - S-51 Standing Seam Metal Roof Clamps - Certification of metal roof clamps includes bonding to both painted and galvalume metal roofs. Tighten clamp set screws to 130-150 in-lbs (24 gauge) or 160-180 in-lbs (22 gauge) roofs. Tighten S-51 1/2" bolt to 240 in-lbs or S-51 Mini 1/2" bolt to 150 in-lbs.
 - EcoFasten Green Fasten GF-1 Anchors
 - QuickMount PV Roof Mounts and Tie Hooks - Tie Hook attaches to XR Rail using 3/8" Bonding Hardware Kit torqued to 250 in-lbs.
 - Quickscrews Solar Roof Hooks, Ejo Aluminum Roof Hooks, or Unirac Crestec Tie Hooks - Attach to XR Rails using either L-Foot Kit or 3/8" Bonding Hardware Kit torqued to 250 in-lbs.

☞ Refer to [Page 7](#) for installing Standoffs

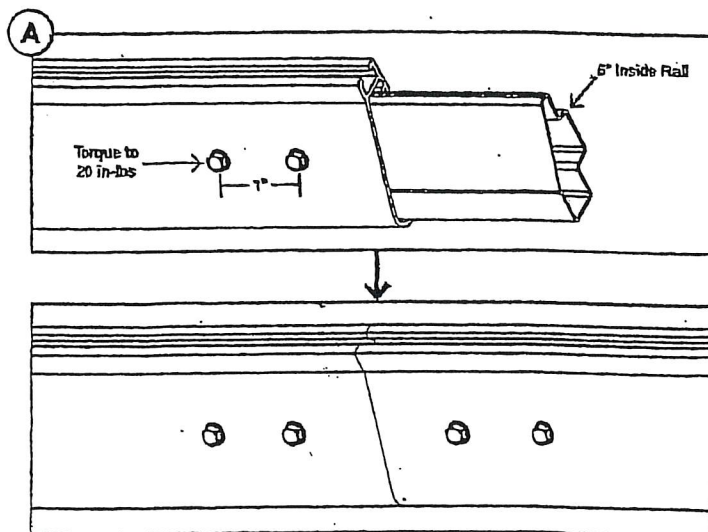


2. PLACE RAILS

A. CONNECT SPLICES

Use Bonded Splices, when needed, to join multiple sections of rail. Insert Bonded Splice 6" into first rail and secure with two self-drilling screws, spacing them approximately 1" apart and tightening to 20 in-lbs. Slide second rail over Bonded Splice and secure with two more self-drilling screws.

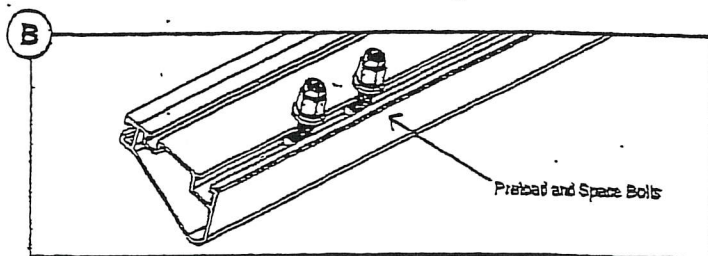
- ☞ Rows exceeding 100 feet of rail must use Expansion Joints.
- ☞ For XR10 and XR100 rails, insert screws along the provided lines.
- ☞ Refer to Structural Certification letters for rail splice location requirements.
- ☞ Screws can be inserted on front or back of rails.



B. PREPARE HARDWARE

On the ground, slide square-headed or t-bolt hardware into side-facing rail slot. Space out bolts to match attachment spacing.

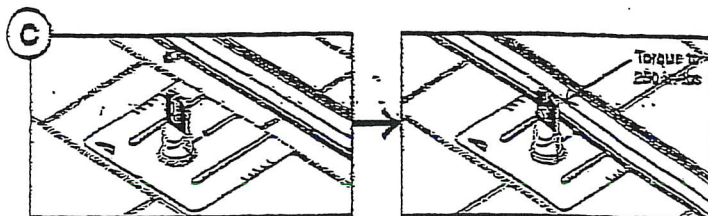
- ☞ Tape ends of rail, to keep bolts from sliding out while moving.



C. ATTACH RAILS

Drop rail with hardware into roof attachment. Level rail at desired height, then torque to 250 in-lbs.

- ☞ Rail can face either upslope or downslope on roof.



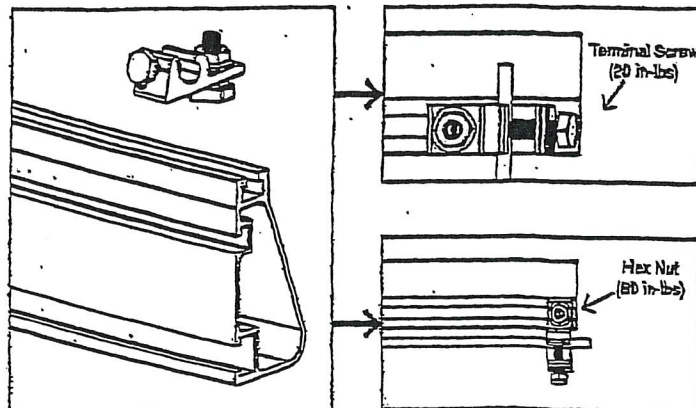
3. SECURE LUGS

Insert T-bolt in top rail slot and torque hex nut to 80 in-lbs. Install a minimum 10 AWG solid copper or stranded grounding wire. Torque terminal screw to 20 in-lbs.

⚡ Grounding Lugs are only needed on one rail per row of modules (unless frameless modules are being used, see Page 8).

⚡ If using Enphase microinverters, Grounding Lugs may not be needed. See Page 8 for more information.

⚡ Grounding Lugs can be installed anywhere along the rail and in either orientation shown.



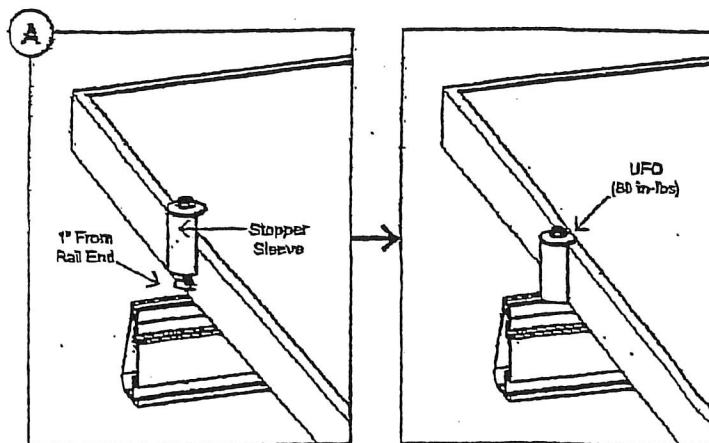
4. SECURE MODULES

A. SECURE FIRST END

Place first module in position on rails, a minimum of 1" from rail ends. Snap Stopper Sleeves onto UFO. Fasten module to rail using the UFO; ensuring that the UFO is hooked over the top of the module. Torque to 80 in-lbs.

⚡ Ensure rails are square before placing modules.

⚡ Hold Stopper Sleeves on end while torquing to prevent rotation.

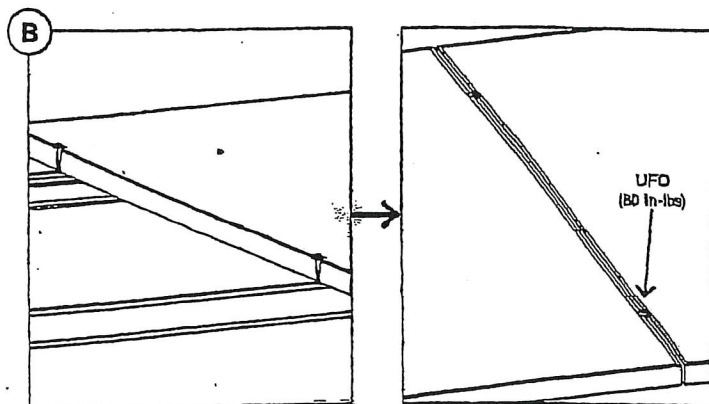


B. SECURE NEXT MODULES

Place UFO into each rail, placing them flush against first module. Slide second module against UFO. Torque to 80 in-lbs. Repeat for each following module.

⚡ When reinstalling UFO, move modules a minimum of 1/16" so UFOs are in contact with a new section of module frame.

⚡ If using Wire Clips, refer to Page 7.

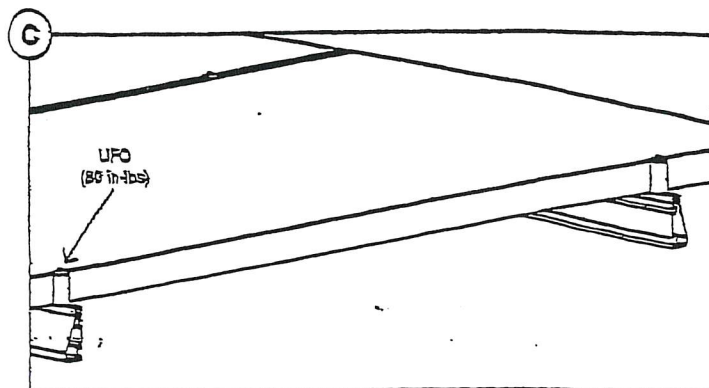


C. SECURE LAST END

Place last module in position on rails, a minimum of 1" from rail ends. Snap Stopper Sleeves onto UFO. Secure UFO Clamps on rails, ensuring they are hooked over top of module. Torque to 80 in-lbs.

⚡ Hold Stopper Sleeves on end while torquing to prevent rotation.

⚡ Repeat all steps for each following row of modules.



EXPANSION JOINTS

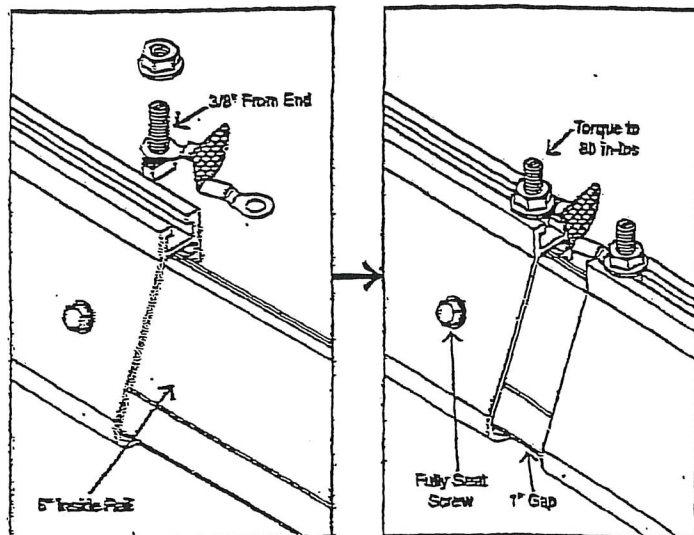
GROUNDING STRAP EXPANSION JOINT

Grounding Strap Expansion Joints are required for thermal expansion of rows exceeding 100 feet of rail.

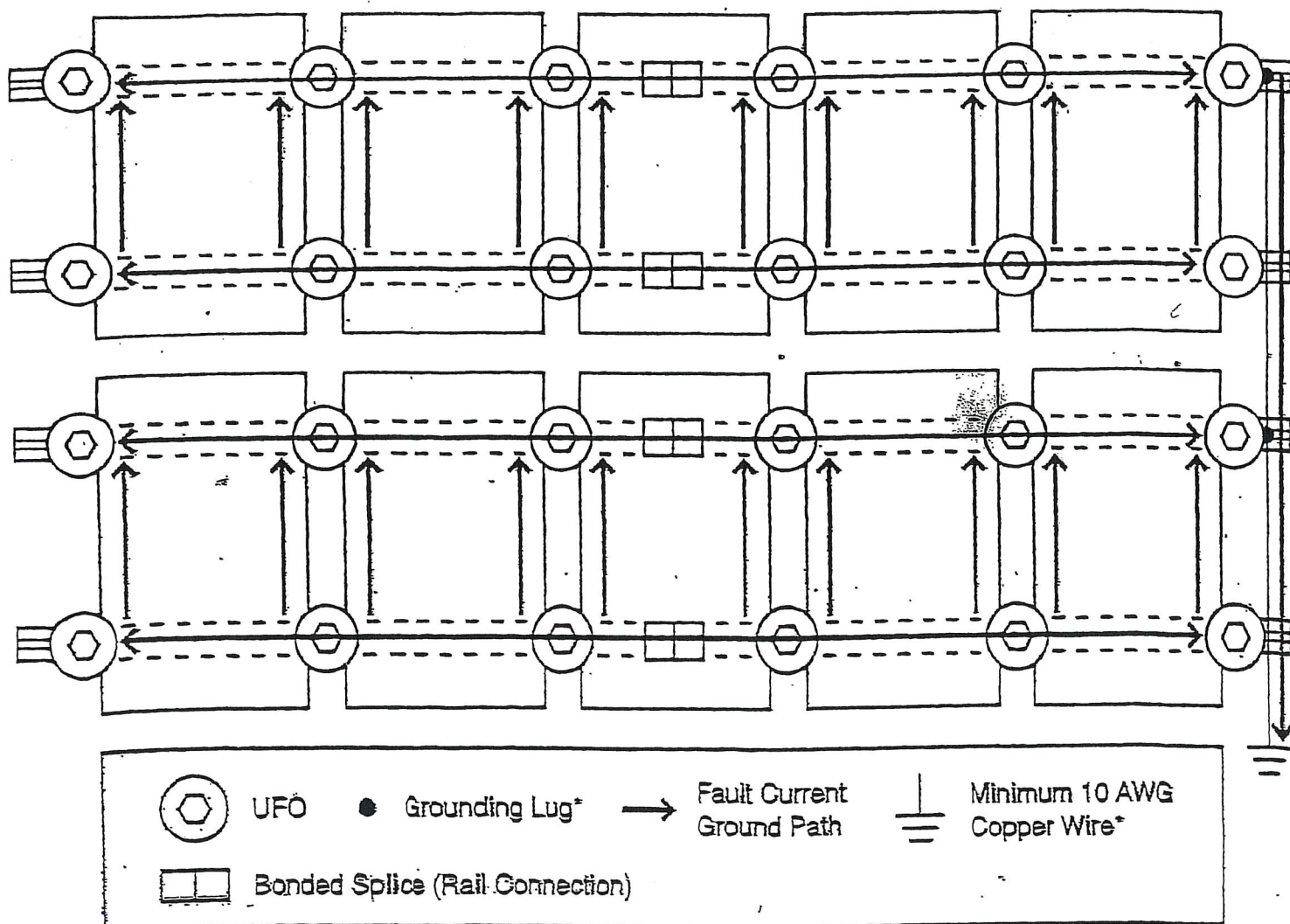
Insert Internal Splice into first rail and secure with screw. Assemble and secure Grounding Strap $3/8"$ from rail end. Slide second rail over Internal Splice leaving $1"$ gap between rails. Attach other end of Grounding Strap with hardware, and torque hex nuts to 80 in-lbs.

⚠ Second Bonded Splice screw is not used with Expansion Joints.

⚠ Do not install module over top of expansion joint location.



ELECTRICAL DIAGRAM



*Grounding Lugs and Wire are not required in systems using certain Enphase microinverters.

MICROINVERTER KITS

Use IronEdge's Microinverter Kit to bond compatible microinverters and power optimizers to the racking system.

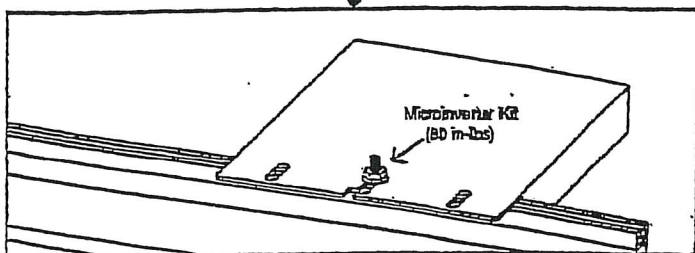
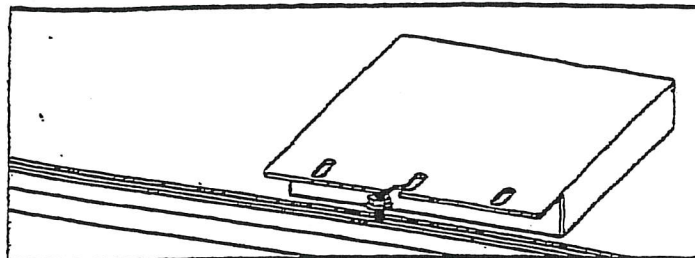
Insert Microinverter Kit T-bolt into top rail slot. Place compatible microinverter or power optimizer into position and tighten hex nut to 80 in-lbs.

COMPATIBLE PRODUCTS

Enphase
M250-72, M250-60, M215-60, C250-72, S230, S230, IQ 6, IQ 6 PLUS, Q-Assembler

Devcon
MG240, MG300, G320, G640

Solar Edge
P300, P320, P400, P405, P600, P700, P730, P800p, P800s



SYSTEMS USING ENPHASE MICROINVERTERS

IronEdge systems using approved Enphase products eliminate the need for lay-in lugs and field installed equipment grounding conductors (EGC). This solution meets the requirements of UL 2703 for bonding and grounding and is included in this listing.

The following Enphase products are included in this listing: Microinverters M250-72, M250-60, M215-60, C250-72, and Engage cables ETXX-240, ETXX-208, ETXX-277.

- A minimum of two inverters mounted to the same rail and connected to the same Engage cable are required.
- The microinverters must be used with a maximum 20 A branch rated overcurrent protection device (OCPD).

FRAMELESS MODULE KITS

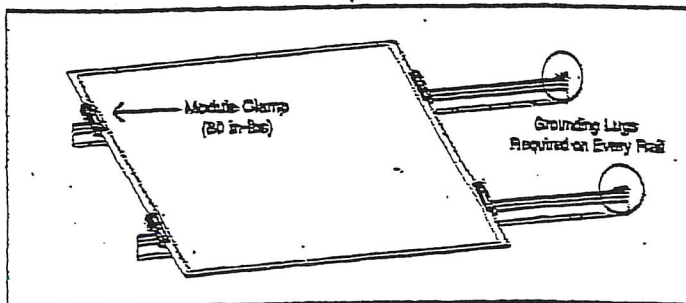
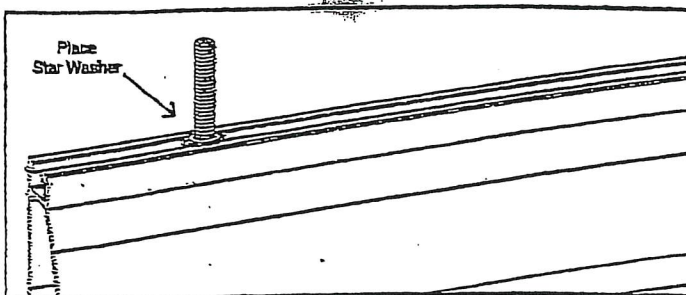
Insert Frameless Kit T-bolt in top rail slot. Place star washer over T-bolt, allowing it to rest on top of rail. Secure module clamps with a hex nut and torque to 80 in-lbs.

Tested or evaluated module clamps:

- SunPower silver or black SFS-UTMC-200(B) mid and SFS-UTEC-200(B) end clamps.
- SunPower silver or black mid and end clamps with part numbers 7500105X where X can be 1, 5, 6 or 7.
- IronEdge silver or black mid and end clamps with part numbers FNLS-XC-001-Y where X can be "E" or "M" and Y can be "B" or blank.

Follow module manufacturer's installation instructions to install the module clamps. If required to use slide prevention hardware, see Module Slide Prevention Addendum (Version 1.0).

Frameless modules require using a Grounding Lug on every rail.



MODULE COMPATIBILITY

The Flush Mount 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. Unless otherwise noted, "xxx" refers to the module power rating and both black and silver frames are included in the certification.

MAKE	MODELS
Astronergy Solar	Modules with 35, 40, and 45mm frames and model identifier aaSM6yyPZZ-xxx; where "aa" can be CH or A; "yy" can be either 10 or 12; "ZZ" can be blank or (BL). Frameless modules with model identifier CHSM6510P(DG)-xxx.
Aditec	Modules with 35 and 40mm frames and model identifier AG-xxx/aa-ZZ; where "Y" can be M or P; "aa" can be 125 or 156; and "ZZ" can be 54S, 60S or 72S.
Canadian Solar	Modules with 40mm frames and model identifier CS6Y-xxZ; where "Y" can be K, P, U, V, or X; and "Z" can be M, P, FX, or P-SD. Frameless modules with model identifier CS6Y-xxP-FG; where "Y" is K or X.
ET Solar	Modules with 35, 40, and 50mm frames and model identifier ET-Y6ZZ-xxAA; where "Y" can be P, L, or M; "ZZ" can be 60 or 72; and "AA" can be WB, VW, BB, WBG, VWBG, WBAG, WBOG, VWOG, VWBOG or BBAG.
Flex	Modules with 35, 40, and 50mm frames and model identifier FXS-xxYY-ZZ; where "xxx" is the module power rating; "YY" can be BB or BC; and "ZZ" can be MAA1B, MA1TW, MA3TW, SA1B, SA3TW, SAC1B, SAC1W, SAD1W, SB1B, SB3TW, SBC1B, or SBC1W.
GigaWatt Solar	Modules with 40mm frames and model identifier GW-xxYY; where "YY" can be either PB or MB.
Hanwha Solar	Modules with 40, 45, and 50mm frames and model identifier HSLaaP6-YY-1-xxZ; where "aa" can be either 60 or 72; "YY" can be PA or PB; and "Z" can be blank or B.
Hanwha Q CELLS	Modules with 32, 35, 40, and 42mm frames and model identifier Q.YY-ZZ-xxx; where "YY" can be PLUS, PRO, PEAK, B.LINE PRO, or B.LINE PLUS; and "ZZ" can be G3, G4, G4.1, L-G3, L-G4, L-G3y, L-G4y, BFR-G3, BLK-G3, BFR-G3.1, BLK-G3.1, BFR-G4, BFR-G4.1, BFR-G4.1XXX, BFR-G4.3, BLK-G4.1, G4SC, G4.1SC, G4.1TAA, BFR-G4.1TAA, BLK-G4.1TAA, or G4.1MAX.
Heliene	Modules with 40mm frames and model identifier YYZZ-xxx; where "YY" can be 36, 60, 72, or 96; and "ZZ" can be M, P, or MBLK.
Hyundai	Modules with 35 and 50mm frames and model identifier H1S-YxxZZ; where "Y" can be M or S; and "ZZ" can be M1, M5, M6, SG, R1, R6, T1, or TG.
Itek	Modules with 50mm frames and model identifier IT-xxx-YY; where "YY" can be blank, HE, or SE.
JA Solar	Modules with 40 and 45mm frames and model identifier JAYyz-bb-xxx/aa; where "yy" can be M6 or P6; "zz" can be blank, (K), (L), (R), (V), (BK), (FA), (TA), (FA)(R), (L)(BK), (L)(TG), (R)(BK), (R)(TG), (V)(BK), (BK)(TG), or (L)(BK)(TG); "bb" can be 48, 60, or 72; and "aa" can be MP, SI, PR, 3BB, 4BB, 48B/RE.
Jinko	Modules with 35 and 40mm frames and model identifier JKMYxxZZ; where "Y" can be either blank or S; and "ZZ" can be M, P, PP, P-B, or P-V. Frameless modules with model identifier JKMXxxPP-DV.
Kyocera	Modules with 45mm frames and model identifier KY-xxZZ-AA; where "Y" can be D or U; "ZZ" can be blank, GX, or SX; and "AA" can be LPU, LFU, UPU, LPS, LPB, LFB, LFB5, LFB2, LPB2, 3AC, 3BC, 3FC, 4AC, 4BC, 4FC, 4UC, 5AC, 5BC, 5FC, 5UC, 6BC, 6FC, 6BC, 6MCA, or 6MPA.
LG	Modules with 35, 40, and 46mm frames and model identifier LG-xxYz-bb; where "Y" can be A, N, Q, or S; "a" can be 1 or 2; "Z" can be C, K, T, or W; and "bb" can be A3, A5, B3, G3, G4, or K4.
Mitsubishi	Modules with 46mm frames and model identifier PV-MYY-xxZZ; where "YY" can be LE or JE; and "ZZ" can be either HD, HD2, or FB.
Motech	IM and XS series modules with 40, 45, and 50mm frames.
Panasonic	Modules with 35mm frames and model identifier VBHNxxYYZ; where "YY" can be SA or KA; and "Z" can be 01, 02, 06, 06B, 11, 11B, 15, 15B, 16 or 16B.
Phono Solar	Modules with 35, 40, or 45mm frames and model identifier PSpox-YZZ/A; where "Y" can be M or P; "ZZ" can be 20 or 24; and "A" can be F, T or U.
Prism Solar	Frameless modules with model identifier BNY-xxxBSTC; where "YY" can be 48 or 60.
REC Solar	Modules with 38 and 45mm frames and model identifier REC-xxYYZZ; where "YY" can be M, PE or L; and "ZZ" can be blank, BLK, SLV, or 72.
Renesola	Modules with 35, 40 and 50mm frames and model identifier JCxxY-ZZ; where "Y" can be F, M or S; and "ZZ" can be Ab, Ab-b, Abh, Abh-b, Abv, Abv-b, Bb, Bb-b, Bbh, Bbh-b, Bbv, Bbv-b, Db, or Db-b.
Renogy	Modules with 40 and 50mm frames and model identifier RNG-xxY; where "Y" can be D or P.
Sharp	Modules with 35 and 40mm frames and model identifier NUYY-xx; where "YY" can be SA or SC.
Sifab	Modules with 38mm frames and model identifier SYY-Z-xxx; where "YY" can be SA or LA; SG or LG; and "Z" can be M, P, or X.
SolarWorld	Sunmodule Plus, Protect, XL, Bisun, Bisun XL, may be followed by mono, poly or duo and/or black or bk; modules with 31, 33 or 46mm frames and model identifier SW-xxx.
Stion	Thin film modules with 35mm frames and model identifier STO-xxx or STO-xxxA. Thin film frameless modules with model identifier STL-xxx or STL-xxxA.
SunEdison	Modules with 35, 40, and 50mm frames and model identifier SE-YxxZABCDE; where "Y" can be B, F, H, P, R, or Z; "Z" can be 0 or 4; "A" can be B, C, D, E, H, I, J, K, L, M, or N; "B" can be B or W; "C" can be A or C; "D" can be 3, 7, 8, or 9; and "E" can be 0, 1 or 2.
Suniva	Modules with 35, 38, 40, 46, and 50mm frames and model identifiers OPT-xx-AA-B-YYY-Z or MVX-xx-AA-B-YYY-Z; where "AA" is either 60 or 72; "B" is either 4 or 5; "YYY" is either 100, 101, 700, 1B0, or 1B1; and "Z" is blank or B.
Sunpower	SPR-A-xx-series with standard (G3) or InvisiMount (G5) 46mm frames; where "A" is either E or X; and "xx" is the series number.
Sunprime	Frameless modules with model identifier GXB-xxYY; where "YY" can be blank or SL.
Suntech	Vd, Vem, Wdb, Wde, and Wd series modules with 35, 40, and 50mm frames.
Trina	Modules with 35, 40 and 46mm frames and model identifier TSM-xxYYZZ; where "YY" can be PA05, PG05, PD05, PA14, PC14, PD14, PE14, or DD05; and "ZZ" can be blank, A, A.05, A.08, A.10, A.16, .05, .08, .10, .18, D0D, .18D, 0.82, A.082(II), .002, .005, 0.85, A(II), A.08(II), A.05(II), A.10(II), or A.16(II). Frameless modules with model identifier TSM-xxYY; and "YY" can be either PEG5, PEG5.07, PEG14, DEG5(II), DEG5.07(II), or DEG14(II).
Vinaico	Modules with 35 and 40mm frames and model identifier Wsy-xxz6; where "y" can be either P or T; and "z" can be either M or P.
Yingli	YGL, YGE, and YGE-U series modules with 35, 40, and 50mm frames.

WARRANTY

Effective for Products manufactured after April 1st, 2012, IronRidge provides the following warranties, for Products installed properly and used for the purpose for which the Products are designed:

(a) Products with finishes (ie excluding without limitation Products that are mill finished) shall be free of visible defects, peeling, or cracking, under normal atmospheric conditions, for a period of three years from the earlier of (i) the date of complete installation of the Product or (ii) 30 days after the original purchaser's date of purchase of the Product ("Finish Warranty"); (b) components shall be free of structurally-related defects in materials for a period of ten years from the earlier of (i) the date of complete installation of the Product or (ii) 30 days after the original purchaser's date of purchase of the Product; and (c) components shall be free of functionally-related manufacturing defects for a period of 20 years from date of manufacture.

The Finish Warranty does not apply to: (d) surface oxidation of the galvanized steel components or any foreign residue deposited on Product finish; and (e) Products installed in corrosive atmospheric conditions, as defined solely by IronRidge; corrosive atmospheric conditions include, but are not limited to, conditions where Product is exposed to corrosive chemicals, fumes, cement dust, salt water marine environments or to continual spraying of either salt or fresh water.

The Finish Warranty is VOID if (f) the practices specified by AAMA 609 & 610-02 – "Cleaning and Maintenance for Architecturally Finished Aluminum" (www.aamanet.org) are not followed by Purchaser for IronRidge's aluminum based components; and (g) if the practices specified by ASTM A780 / A780M - 09 "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings" are not followed by Purchaser for IronRidge's galvanized steel-based components.

The warranties above do not cover any parts or materials not manufactured by IronRidge, and exclude non-functionally-related defects, as defined solely by IronRidge. The warranties do not cover any defect that has not been reported to IronRidge in writing within 20 days after discovery of such defect.

In the event of breach of or non-compliance with the warranties set forth above, IronRidge's sole obligation and liability, and the sole and exclusive remedy for such breach or non-compliance, shall be correction of defects by repair, replacement, or credit, at IronRidge's sole discretion. Such repair, replacement or credit shall completely satisfy and discharge all of IronRidge's liability with respect to these warranties.

Refurbished Product may be used to repair or replace the defective components. Transportation, installation, labor, or any other costs associated with Product replacement are not covered by these warranties and are not reimbursable. These warranties additionally do not cover (h) normal wear, or damage resulting from misuse, overloading, abuse, improper installation (including failure to follow professional instruction and certification), negligence, or accident, or from force majeure acts including any natural disasters, war or criminal acts; and (i) Products that have been altered, modified or repaired without written authorization from IronRidge or its authorized representative; and (j) Products used in a manner or for a purpose other than that specified by IronRidge. A formal document proving the purchase and the purchase date of the Product is required with any warranty claim.

Except as set forth above, IronRidge sells the Products on an "AS IS" basis, which may not be free of errors or defects, and ALL EXPRESS OR IMPLIED REPRESENTATIONS AND WARRANTIES, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY, WORKMANLIKE EFFORT, CORRESPONDENCE TO DESCRIPTION, DESIGN, TITLE OR NON-INFRINGEMENT, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR TRADE PRACTICE, ARE HEREBY DISCLAIMED.