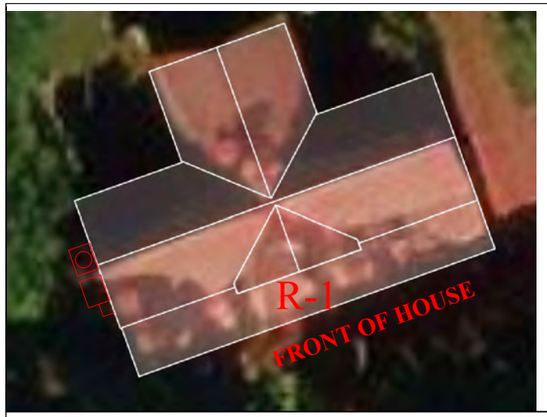

Inverter Type:	Enphase IQ7-60-2-US
PV Panel:	(29) Silfab-SIL-330NL
Racking:	Iron Ridge
Total Wattage:	9,570W
Roof Type:	Metal
Wind Load:	0 to 7 Deg
Fastener Type:	Use S-5-N Clamps

Sheet Index

General Notes:
-Enphase IQ7-60-2-US Micro Inverters are located on roof behind each module.
-First responder access maintained and from adjacent roof.
-Wire run from array to connection is 40 feet.

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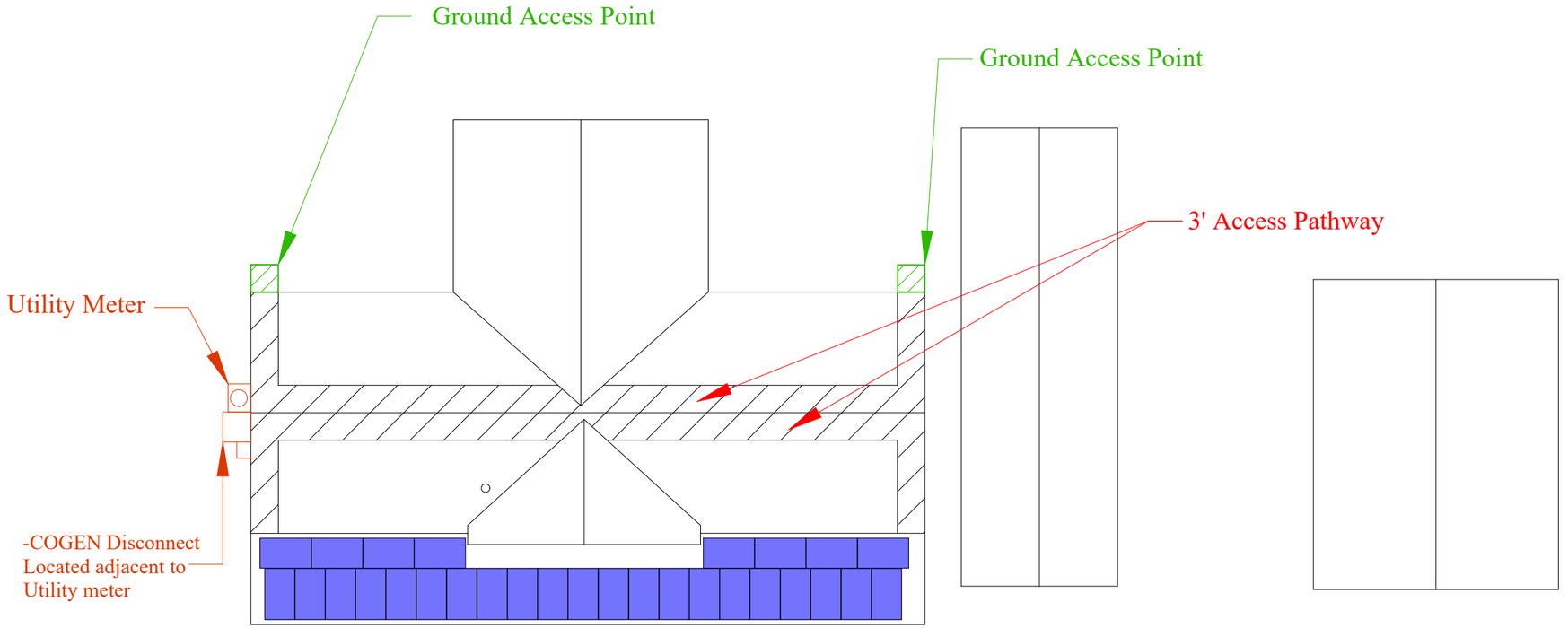
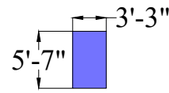


R-1
Modules (29)
Pitch: 4°
Azimuth: 160°



Layout Subject to Change Based on Site Conditions

FRONT OF HOUSE

System meets the requirements of NFPA 70th Edition, Chapter 11.12

Install will be done to Manufacturer Spec

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D. CHAD GODWIN LICENSE No 81360 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Legend

- First responder access
- Utility Meter
- PV Disconnect
- Chimney
- Satellite
- Vent Pipe

Meets All Editions of Florida Fire Prevention Code 7th Edition

Represents all Fire Clearance including Alternative methods

1st Responder Access minimum of 36" unobstructed as per Section R324 of the 2018 IRC

Meets the requirements of the following- (2020 FL Residential Code & FBC, 7th Edition (2018 International Residential Code) - 2nd Printing modified by the FL Building Standards , 2018 International Energy Conservation Code, County of Columbia Code, 2017 National Electric Code.)

Customer Info:

David Carter
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Lake City, FL
32024

Date:	5/12/2021
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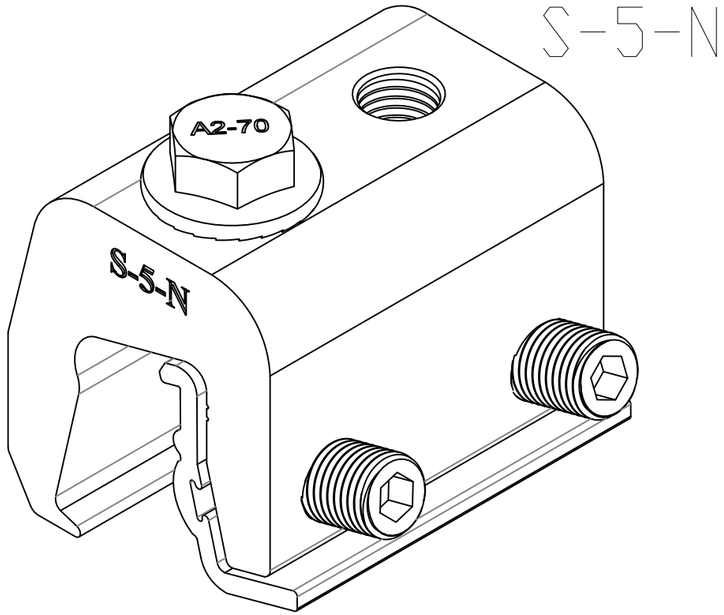
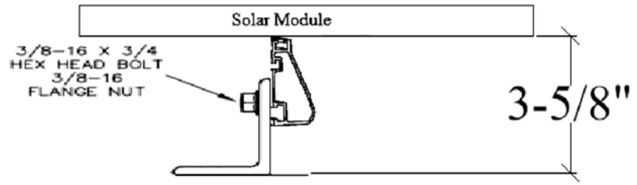
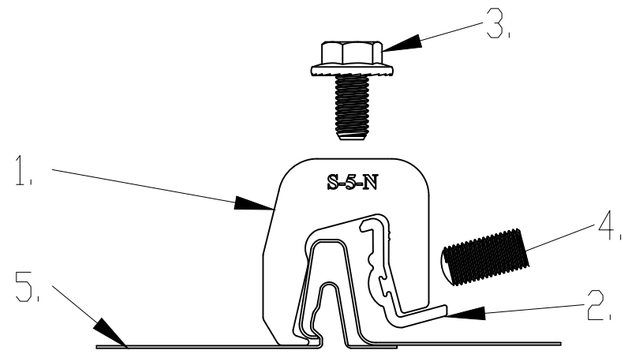
N

Compass for Aerial

Ironridge XR-100







Install will be done to Manufacturer Spec

General Notes:
- S-5-N Clamps are secured to Seams @ 48" O.C. in Zone 1' &1, @ 24" O.C in Zone 2 & 3 using (2) M8 Silver Bullet Fasteners.
- Subject roof has One layer.

1. S-5-N Clamp
2. S-5-N Insert
3. M8-1.25 SS Hex Flange Bolt (13mm Socket)
4. 3/8-24 SS Round Point Setscrew (3/16 Hex Drive)
5. Example Roof

Roof Section	Pitch	Roof Rafter and Spacing	Overhang	Notes:
R1	1/12	2"x4" @ 24 O.C.	12"	Truss

-Designed as per ASCE7-16
-Roof Height 15"
-Per 2020 FBC, the Roof Mounted PV System will be subject to the following design criteria: Design Wind Speed(Vult) - 118mph 3 sec gust, Exposure Category - B

Inverter Type:	Enphase IQ7-60-2-US
PV Panel:	(29) Silfab-SIL-330NL
Racking:	Iron Ridge
Total Wattage:	9,570W
Roof Type:	Metal
Wind Load:	0 to 7 Deg
Fastener Type:	Use S-5-N Clamps

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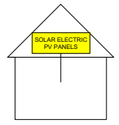
3/8 IN MIN. TEXT

3/16 IN MIN. TEXT

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY.



PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

WARNING: DEDICATED SOLAR PANEL DO NOT CONNECT ANY OTHER LOADS

WARNING: DUAL POWER SUPPLY SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

! WARNING !

POWER SOURCE OUTPUT CONNECTION: DO NOT RELOCATE THIS OVERCURRENT DEVICE

WARNING: INVERTER OUTPUT CONNECTION: DO NOT RELOCATE THIS OVERCURRENT DEVICE

Enphase IQ Trunk Cable
Q-12-240
#12AWG THHN-THWN-2
UL 9703

Grounding Conductor to be bare #8 Awg

Photovoltaics:
(29) Silfab-SIL-330NL

Inverters:
(29) Enphase IQ7-60-2-US Micro Inverters

Circuits:
(1) circuit of (15) Modules
(1) circuit of (14) Modules
Maximum Inverters Per 20A Circuit (16)

#10 AWG THWN for Home runs
(1) Line 1
(1) Line 2
Per Circuit
#8 AWG THWN
(1) EGC
Inside @ least 3/4" Conduit (tbd on site)

NEMA 3R Junction Box
Black - L1
Red - L2
Green - Ground

Roof

WARNING
ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

PHOTOVOLTAIC SYSTEM
! AC DISCONNECT !

RATED AC OUTPUT CURRENT: 29A
NOMINAL OPERATING VOLTAGE: 240VAC

Enphase Combiner Box

(1) - 20A Breaker
Per Circuit
2 Circuits
240V
15A Breaker for Envoy
Disconnect

Solar Combiner Box
#X-IQ-AM1-240

#8 AWG THWN
(1) Line 1
(1) Line 2
(1) Neutral
#8 (1) EGC
in @ least 3/4" Conduit Typically

Manual Lockable Disconnect

60A Service Rated
Fused Disconnect
Neutral to Ground Bond
AC Disconnect
40A Fuse

Located Adjacent to Utility Meter

#6 AWG THWN
(1) Line 1
(1) Line 2
(1) Neutral
in @ least 3/4" Conduit Typically

(1)#8 AWG EGC & GEC

Meter

Line Side Tap

Main Distribution Panel
200A Main

In Compliance with NEC 705.12(B)

Refer to NEC 312.8 for Conditions on taps in switch and over current devices Enclosures.
If the conditions are not met a tap box will need to be installed.

Enphase Output Ckt Per String	
To Overcurrent Protection Device	
AC Max Output Current	15
AC Max Output Current * 1.25%	18.8
Overcurrent Protection (A)	20
No. of Current Carrying Cond	<4
Conductor Gauge (AWG)	10
Enphase Total Output Ckt	
AC Max Output Current	29
AC Max Output Current * 1.25%	36.25
Overcurrent Protection (A)	40
No. of Current Carrying Cond	<4
Conductor Gauge (AWG)	8

NEC LABEL NOTES:
1. THE WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH NEC 110.21(B)
2. LABELS SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE THEY ARE INSTALLED.
3. LABELS TO BE A MIN LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.
4. LABELS SHALL ALSO COMPLY WITH THE SPECIFIC REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

WARNING:PHOTOVOLTAIC POWER SOURCE

System meets the grounding requirements of NEC 690.43

Including the label below

In Case of Emergency Call
Solar Bear
at 727-471-7442
EC #: EC13006630

Note:
-All wiring to meet the 2017 NEC and Florida electric codes.
60A Disconnect
-Type of conduit to be determined on site by contractor.

Install will be done to Manufacturer Spec

GEC NOTES
- Ungrounded system per 690.41(A)(4)
- GEC must be installed per 250.64
- GEC must be continuous un-spliced or irreversibly spliced from inverter to existing service ground system or continuous from the arrays to the existing service ground system.
- GEC must be min #8 AWG and installed in conduit
- If GEC is not in conduit, it must be #6 min

All Labels & Markings for photovoltaic system will be reflective and meet all requirements for NFPA 11.12

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727-471-7442

Date:	5/12/2021
Drawn by:	DL
Revised by:	.
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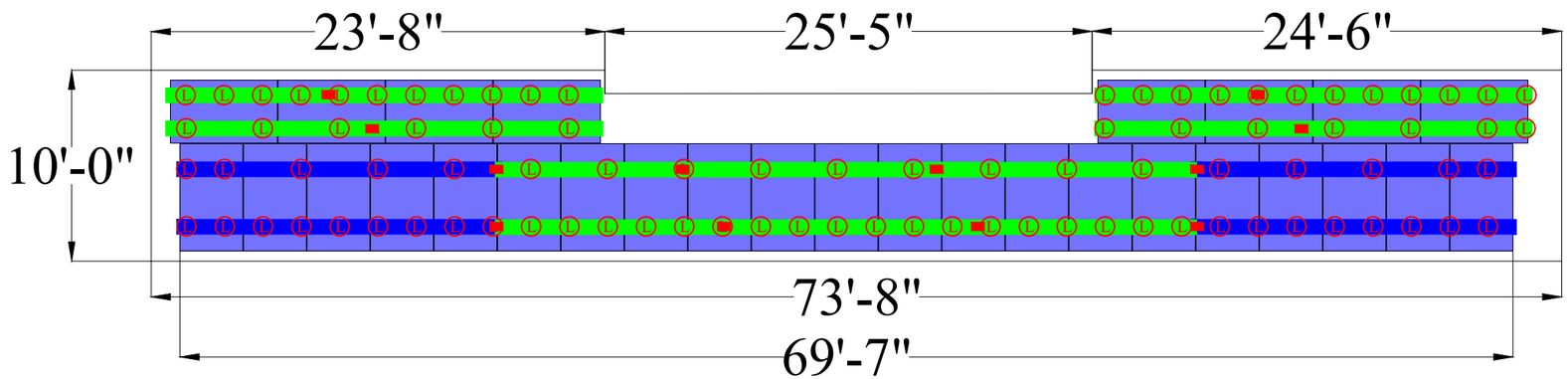
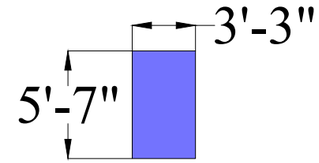
Page:	E-1

Inverter Type:
Enphase IQ7-60-2-US
PV Panel:
(29)
Silfab-SIL-330NL
Total Wattage:
9,570W

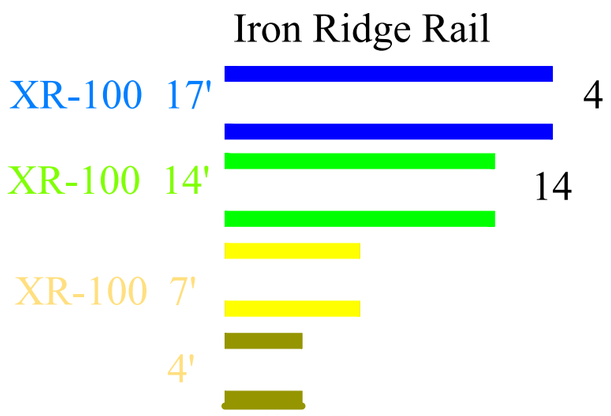
L ← Proposed Mounting locations



R-1
Modules (29)
Pitch: 4°
Azimuth: 160°



Plans satisfy zones FBC-1510.7.1
Install will be done to Manufacturer Spec



Splice Bar	12
S-5-N Clamps	90
Iron Ridge UFO's	64
Iron Ridge Sleeves/End Caps	12
6x6x6 J-Box	1
Iron Ridge Ground Lugs	3
Silfab-SIL-330NL	29
Enphase IQ7-60-2-US	29
60A Fused Disconnect	1
40A Fuses	2
20A Breakers	2
Enphase Combiner Box	1

Zone 1' & 1: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=48"*(⅓)=16"

Zone 2 & 3: Max cantilever is 8" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=24"*(⅓)=8"

Inverter Type:	Enphase IQ7-60-2-US
PV Panel:	(29) Silfab-SIL-330NL
Racking:	Iron Ridge
Total Wattage:	9,570W
Roof Type:	Metal
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Rev Date:	.
Page:	S-1A

SIL-330 NL

BAA ARRA · 25 YEAR PRODUCT WARRANTY · AUTOMATED MANUFACTURING · JUST-IN-TIME · PVEL DNV·GL TOP PERFORMER · TIER 1 BANKABLE $$$ · HIGH EFFICIENCY

HIGH EFFICIENCY PREMIUM MONO-PERC PV MODULE

CE · ETL Intertek · ETL Intertek · IEC · Fraunhofer ISE

CHUBB
* Chubb provides error and omission insurance to Silfab Solar Inc.

INDUSTRY LEADING WARRANTY
All our products include an industry leading 25-year product workmanship and 30-year performance warranty.

35+ YEARS OF SOLAR INNOVATION
Leveraging over 35+ years of worldwide experience in the solar industry, Silfab is dedicated to superior manufacturing processes and innovations such as Bifacial and Back Contact technologies, to ensure our partners have the latest in solar innovation.

NORTH AMERICAN QUALITY
Silfab is the leading automated solar module manufacturer in North America. Utilizing premium quality materials and strict quality control management to deliver the highest efficiency, premium quality PV modules.

BAA / ARRA COMPLIANT
Silfab panels are designed and manufactured to meet Buy American Act Compliance. The US State Department, US Military and FAA have all utilized Silfab panels in their solar installations.

LIGHT AND DURABLE
Engineered to accommodate high wind load conditions for test loads validated up to 4000Pa uplift. The light-weight frame is exclusively designed for wide-ranging racking compatibility and durability.

QUALITY MATTERS
Total automation ensures strict quality controls during the entire manufacturing process at our ISO certified facilities.

DOMESTIC PRODUCTION
Silfab Solar manufactures PV modules in two automated locations within North America. Our 500+ North American team is ready to help our partners win the hearts and minds of customers, providing customer service and product delivery that is direct, efficient and local.

AESTHETICALLY PLEASING
All black sleek design, ideal for high-profile residential or commercial applications.

PID RESISTANT
PID Resistant due to advanced cell technology and material selection. In accordance to IEC 62804-1.

Electrical Specifications		SIL-330 NL mono PERC	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	330	235
Maximum power voltage (Vpmax)	V	33.3	30.2
Maximum power current (Ipmax)	A	9.92	7.8
Open circuit voltage (Voc)	V	40.5	36.7
Short circuit current (Isc)	A	10.42	8.2
Module efficiency	%	19.4	17.3
Maximum system voltage (VDC)	V	1000	
Max series fuse rating	A	20	
Power Tolerance	Wp	0 to +10	

Measurement conditions: STC 1000 W/m2 • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
• Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10W.

Temperature Ratings	SIL-330 NL mono PERC
Temperature Coefficient Isc	0.064 %/°C
Temperature Coefficient Voc	-0.28 %/°C
Temperature Coefficient Pmax	-0.36 %/°C
NOCT (± 2°C)	46 °C
Operating temperature	-40/+85 °C

Mechanical Properties and Components	SIL-330 NL mono PERC	
	Metric	Imperial
Module weight	18.6 kg ±0.2 kg	41 ±0.4 lbs
Dimensions (H x L x D)	1700 mm x 1000 mm x 38 mm	66.9 in x 39.4 in x 1.5 in
Maximum surface load (wind/snow)*	4000 Pa rear load / 5400 Pa front load N/m²	83.5/112.8 lb/ft^2
Hail impact resistance	ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells	60 - Si mono PERC - 5 busbar 158.75 x 158.75 mm	60 - Si mono PERC - 5 busbar 6.25 x 6.25 Inch
Glass	3.2 mm high transmittance, tempered, DSM anti-reflective coating	0.126 in high transmittance, tempered, DSM anti-reflective coating
Cables and connectors (refer to installation manual)	1200 mm, ø 5.7 mm, MC4 from Staubli	47.2 in, ø 0.22 in (12AWG), MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame	Anodized Aluminum (Black)	
Bypass diodes	3 diodes-30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP67 rated	

Warranties	SIL-330 NL mono PERC
Module product workmanship warranty	25 years**
Linear power performance guarantee	30 years ≥ 97.1% end 1st year | ≥ 91.6% end 12th year | ≥ 85.1% end 25th year ≥ 82.6% end 30th year

Certifications	SIL-330 NL mono PERC
Product	ULC ORD C1703, UL1703, CEC listed***, UL 61215-1/-1-1/-2, UL 61730-1/-2, IEC 61215-1/-1-1/-2***. IEC 61730-1/-2***, CSA C22.2#61730-1/-2***, IEC 62716 Ammonia Corrosion; IEC61701:2011 Salt Mist Corrosion Certifed, UL Fire Rating: Type 2
Factory	ISO9001:2015

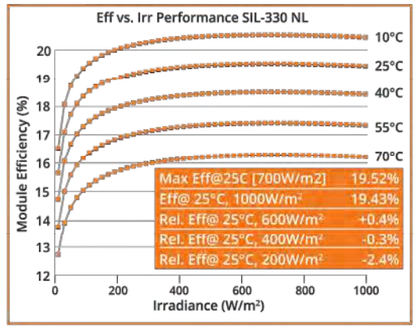
- Modules Per Pallet: 26
- Pallets Per Truck: 36
- Modules Per Truck: 936

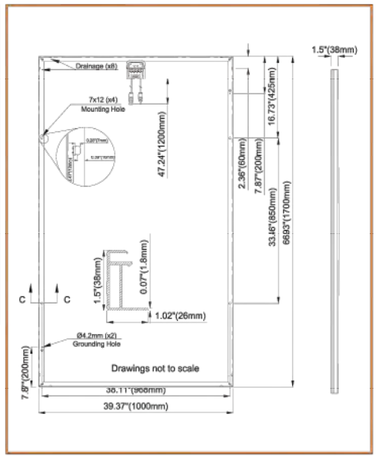
*⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.

**12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at www.silfabsolar.com.

***Certification and CEC listing in progress. August 2020 expected completion date for CEC listing, IEC 61730/61215 and CSA C22.2#61730-1/-2

Third-party generated pan files from Fraunhofer-Institute for Solar Energy Systems ISE are available for download at: www.silfabsolar.com/downloads





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2020 TOP PERFORMER PVEL DNV-GL PV MODULE RELIABILITY SCORECARD

Data Sheet
Enphase Microinverters
Region: AMERICAS

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 with the Enphase IQ Envoy™, 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.

UL CERTIFIED
SAFETY US-CA E341165

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US / IQ7-60-B-US		IQ7PLUS-72-2-US / IQ7PLUS-72-B-US	
Commonly used module pairings[1]	235 W - 350 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[2]	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 (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
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	III		III	
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				
Ambient temperature range	-40°C to +65°C			
Relative humidity range	4% to 100% (condensing)			
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)			
Connector type (IQ7-60-B-US & IQ7PLUS-72-B-US)	Friends PV2 (MC4 intermateable). Adaptors for modules with MC4 or UTX connectors: - PV2 to MC4: order ECA-S20-S22 - PV2 to UTX: order ECA-S20-S25			
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				
Communication	Power Line Communication (PLC)			
Monitoring	Enlighten Manager and MyEnlighten monitoring options. 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**

ENPHASE.

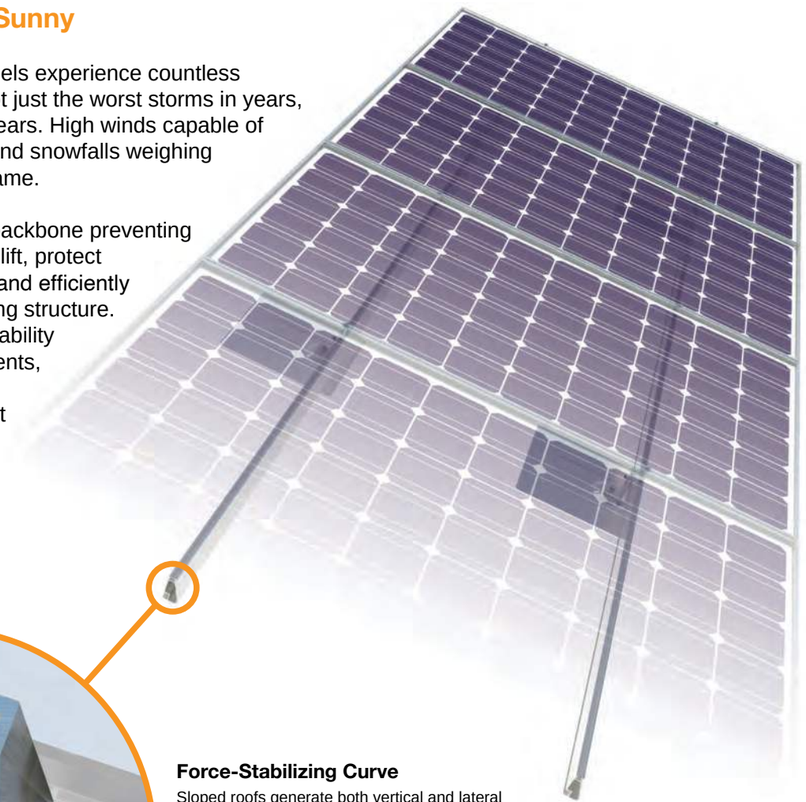
2018-05-24

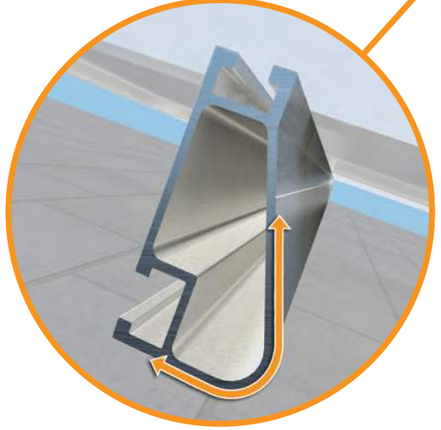
XR Rail Family

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 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

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 spans up to 6 feet, while remaining light and economical.

- 6’ spanning capability
- Moderate load capability
- Clear & black 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 10 feet.

- 10’ 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 up to 12 feet for commercial applications.

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

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4’	5’ 4”	6’	8’	10’	12’
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

GODWIN ENGINEERING AND DESIGN, LLC

8378 Foxtail Loop, Pensacola, FL 32526 | (850)712-4219 | chad@godwineng.com

May 12, 2021

To: Columbia County Building Department
135 NE Hernando Ave
Lake City, FL 32055

Re: Carter – Residential PV Roof Mount Installation
503 SW Mary Terr.
Lake City, FL 32024

Plan Reviewer,

This letter is regarding the installation of a new roof mounted Solar PV System on the existing residential structure at the address above. I have reviewed the attachment plan and have determined that the roof mounted PV system is in compliance with the applicable sections of the following Codes as amended and adopted by the jurisdiction:

2020 Florida Building Code 7th Edition, FBC
ASCE 7 Min. Design Loads for Buildings & Other Structures

Per 2020 FBC, the Roof Mounted PV system will be subject to the following design criteria:
Design Wind Speed(V_{ult}) - 120mph 3sec gust, Exposure Category – B

The PV System consist of the modules, railing, and connection hardware. The system will add a dead load of approximately 3 psf to the roof.

The existing roof covering is 24ga. Metal panel with min. ½" plywood decking and 2" x 4" roof trusses 24" O.C. The roofing, decking, and roof trusses are in good condition. The existing structure will be adequate for supporting the additional PV dead load and wind loads.

The securement method of the PV system is to be flush mounted to the metal panel roof with the Ironridge railing and the S-5-N Clamps. The flashings/attachments can be attached up to 48" apart in roof zones 1', & 1, and 24" apart in roof zones 2, & 3. The mounts should be staggered, where possible, to allow distribution of the design loads evenly to the structure. The mounts shall be installed with (2) M8 Silver Bullet Fasteners.

Please see attached documents and contact me should you have any questions.

Sincerely,

D. Chad Godwin, PE 81360
Exp. 02/28/2023

Donnie C Godwin
2021.05.14 13:26:36 '00'05-

D. CHAD GODWIN LICENSE No 81360 STATE OF FLORIDA PROFESSIONAL ENGINEER

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ASCE 7-16 CHAPTER 29 WIND LOADS - Rooftop Solar Panels Minimum Design Loads - Part 1: Enclosed(, h<60ft, 0°<θ<7°)

Risk Category		II		Table 1.5-1	
Basic Wind Speed (Ult)		120		Figure 26.5-1B	
Wind Speed (asd)		93		IBC 1609.3.1	
Roof Angle		3	°		
Effective Wind Area		21.75	ft^2	26.20	
Wind Load Parameters					
Wind Directionality	K_d	0.85		Table 26.6-1	
Exposure Cat.	B,C, or D	B		Section 26.7	
Topographic factor	K_{zt}	1.00		26.8 or 26.8.2	
Ground Elevation Factor	K_e	1.00		Table 26.9-1	
Velocity Exposure Coefficient	K_z	0.70		Table 26.10-1	
Array Edge Factor	γ_E	1.50		29.4.4	
Solar Panel Equalization Factor	γ_a	0.67		Fig. 29.4-8	
Velocity Pressure	q_p	13.16	psf	$q_h=0.00256\ K_zK_{zt}K_dK_eV^2$	
Mean Roof Height	h	15.00	ft	h_2	5 in
	0.4h	6.00	ft	$2h_2$	10 in
	least horizontal dim	360	in		0.25 in
	10% of least horizontal dim	3.00	ft	d1	1.00 ft
Roof Zone Set Back	a	3.00	ft	d2	0.25 ft
				0.5h	7.50 ft

Load Types	Load, PSf
Dead Load, D	3
Weight of Ice, D_i	0
Earthquake, E	0
Fluid, F	n/a
Flood Load, F_a	n/a
Lateral Earth psi, H	n/a
Live Load, L	n/a
Roof Live, L_r	n/a
Rain, R	n/a
Snow, S	0
Self-Straining, T	n/a
Wind, W	see calc
Wind-on-Ice, Wi	n/a

Not > 10in(height above roof)

*min distance array shall be from the roof edge, Gable Ridge, or hip ridge

min gap between all panels but not > 6.7ft

Horizontal distance orthogonal to panel edge

Horizontal distance from edge of one panel to the nearest edge in the next ro

Figure 30.3-2G(Hip roof, h<60ft, 7°<θ<20°)

	Zone 1'	1	2	3			
GC_p	-0.90	-1.70	-2.30	-3.20		uplift	
GC_p	0.30	0.30	0.30	0.30		downward	
$p = q_h(GC_p)(\gamma_E)(\gamma_a)$	-11.82	-22.32	-30.20	-42.01	psf	uplift	29.4-7
$p = q_h(GC_p)(\gamma_E)(\gamma_a)$	3.94	3.94	3.94	3.94	psf	downward	29.4-7

Design Calculations for the Use of Attachment

Module Length	C	6.61				ft	
Module Width	B	3.29				ft	
Module Area	A	21.75				ft^2	
Total Design Load (Uplift)	P_{design}	-8.82	-19.32	-27.20	-39.01	psf	
Total Design Load (Downforce)	P_{design}	3.94	3.94	3.94	3.94	psf	
Design Load per Module	T_{up}	-191.71	-420.11	-591.41	-848.36	lbs	$T_{up} = A * P_{design}$
Design Load per Module	T_{down}	85.65	85.65	85.65	85.65	lbs	$T_{dn} = A * P_{design}$
Distributed Load (Uplift)	$P_{dist.\ Up}$	-29.14	-63.85	-89.88	-128.93	plf	$T_{up} / B*2$
Distributed Load (Down)	$P_{dist.\ Down}$	13.02	13.02	13.02	13.02	plf	$T_{dn} / B*2$
Railspan Between Anchor Points	L	4	4	2	2	ft	
Point Load per Mount (Uplift)	R	-116.54	-255.39	-179.76	-257.86	lbs	
Point Load per Mount (Down)	R	26.03	26.03	13.02	13.02	lbs	2.00
		1'	1	2	3		

Table 1.1 - Pullout Value for S-5 Standing Seam Clamp

Metal Panel Roof Ga		24					
Set Screw Tension	D	115				in/lbs	
Ultimate Tensile Load	W	950	950	950	950	lbs/in	S-5! Load Test
Safety Factor for S-5! Load Test	SFU	2	2	2	2		

Donnie C Godwin 2021.05.14 13:27:01 '00'05-

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