WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

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June 10, 2022

Scott Wyssling, PE

Digitally signed by Scott Wyssling, PE
DN: C=US, S=Utah, L=Alpine, O=Wyssling Consulting, OU=Owner, CN="Scott Wyssling, PE", E=swyssling@wysslingconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2022.06.10 12:32:27-06'00'
Foxit PDF Editor Version: 11.1.0

Green World Renewable Energy
4408 Ritchie Highway
Baltimore, MD 21225

Re: Engineering Services
Geiger Residence
399 Southwest Meadow Terrace, Lake City, FL
16.280 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

***A. Site Assessment Information***

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

***B. Description of Structure:***

| | |
|---|---|
| ***Roof Framing:*** | Assumed prefabricated wood trusses at 24" on center. All truss members are constructed of 2x4 dimensional lumber. |
| ***Roof Material:*** | Composite Asphalt Shingles |
| ***Roof Slope:*** | 38 degrees |
| ***Attic Access:*** | Inaccessible |
| ***Foundation:*** | Permanent |

***C. Loading Criteria Used***

- **Dead Load**
  - Existing Roofing and framing = 7 psf
  - New Solar Panels and Racking = 3 psf
  - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 0 psf
- **Wind Load** based on ASCE 7-16
  - Ultimate Wind Speed = 140 mph (based on Risk Category II)
  - Exposure Category B

*Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the FBC 2020 (7th Edition) including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.*

***D. Solar Panel Anchorage***

1. The solar panels shall be mounted in accordance with the most recent Unirac installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The maximum allowable withdrawal force for a $^{5}/_{16}$" lag screw is 235 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2½", the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using one $^{5}/_{16}$" diameter lag screw with a minimum of 2½" embedment will be adequate and will include a sufficient factor of safety.
3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48" on center.
4. Panel supports connections shall be staggered to distribute load to adjacent framing members.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the FBC 2020 (7th Edition), current industry standards, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
Florida License No. 81558

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SCOTT E WYSSLING
LICENSE
No. 81558
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N Meadowbrook Drive
Alpine UT 84004 COA # RY34912

# DUSTIN GEIGER
# NEW GRID-INTERACTIVE PHOTOVOLTAIC SYSTEM
# DC SYSTEM SIZE (16.28 KW)

## SYSTEM DETAILS

| | |
|---|---|
| DESCRIPTION | NEW GRID-INTERACTIVE PHOTOVOLTAIC SYSTEM WITH NO BATTERY STORAGE |
| DC RATING OF SYSTEM | SYSTEM SIZE :16.28 KW DC STC |
| AC RATING OF SYSTEM | 12.91KW |
| AC OUTPUT CURRENT | 53.65 A |
| NO. OF MODULES | (37) APTOS DNA-144-MF26-440W MODULES |
| NO. OF INVERTERS | (37) ENPHASE IQ7A-72-2-US MICROINVERTERS MICROINVERTERS |
| POINT OF INTERCONNECTION | LINE SIDE TAP IN THE MSP |
| ARRAY STRINGING | (3) BRANCHES OF 9 MODULES<br>(1) BRANCH OF 10 MODULES |

## SITE DETAILS

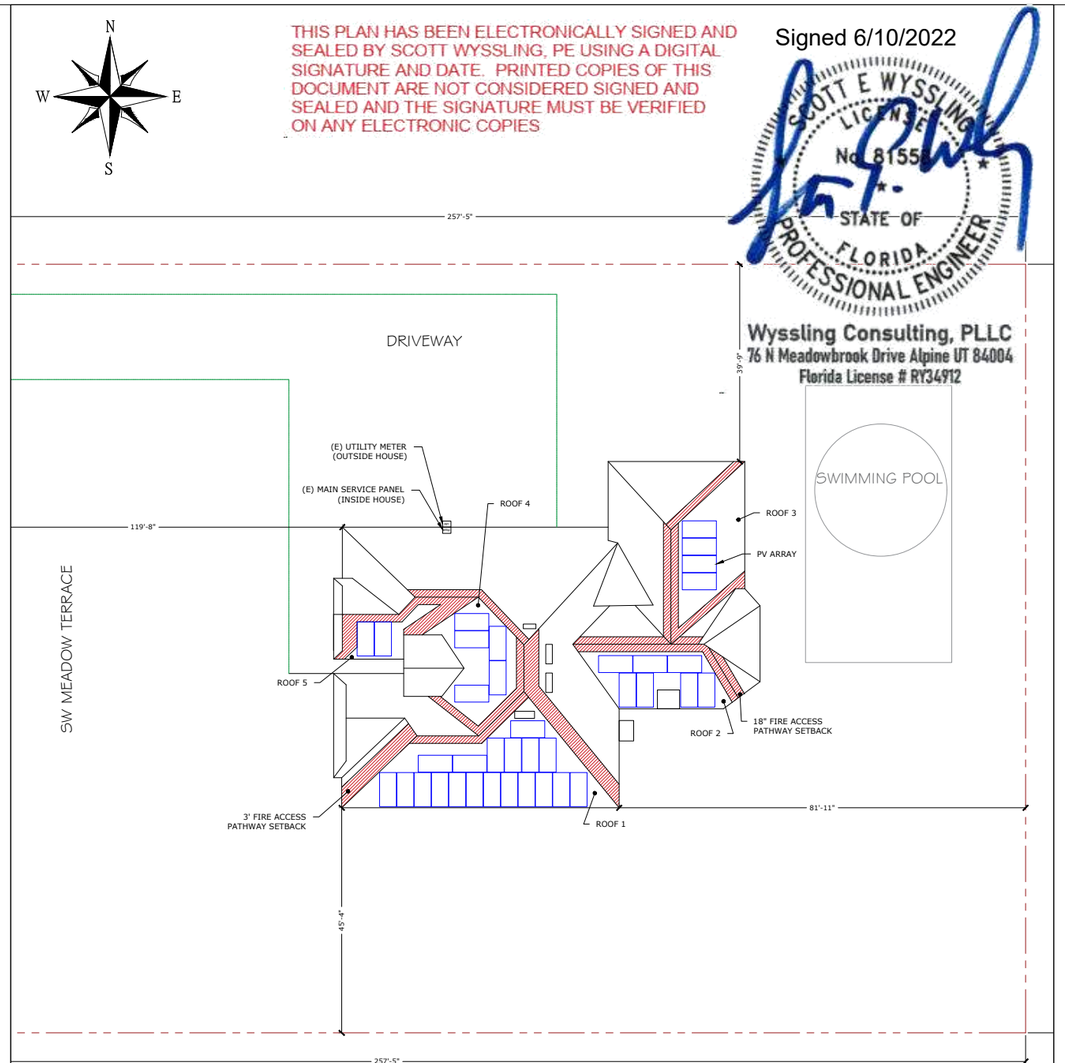
| | |
|---|---|
| ASHRAE EXTREME LOW | -5°C |
| ASHRAE 2% HIGH | 34°C |
| GROUND SNOW LOAD | 0 PSF |
| WIND SPEED | 140MPH (ASCE 7-16) |
| RISK CATEGORY | II |
| WIND EXPOSURE CATEGORY | B |

## GOVERNING CODES

- FLORIDA RESIDENTIAL CODE, 7TH EDITION 2020 (FRC)
- FLORIDA BUILDING CODE, 7TH EDITION 2020 (FBC)
- FLORIDA FIRE PREVENTION CODE, 7TH EDITION 2020 (FFPC)
- NATIONAL ELECTRIC CODE, NEC 2017 CODE BOOK, NFPA 70

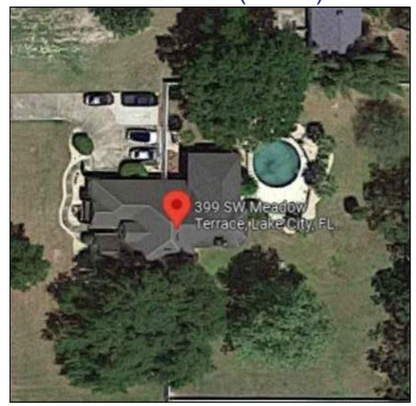
## SHEET INDEX



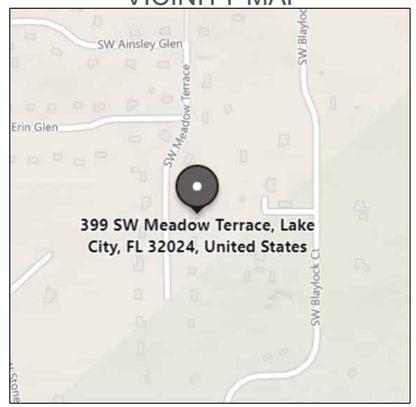



Columbia County Building Department
Plans Reviewed for Code Compliance
State of Florida

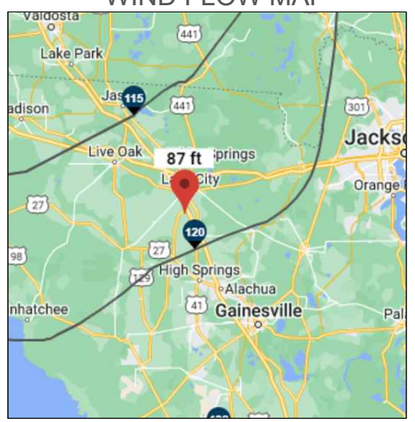
## SITE MAP (N.T.S)




## VICINITY MAP




## WIND FLOW MAP





Unicity Solar Energy
ADD : 612 FLORIDA AVENUE, PALM HARBOR, FL 34683, USA
CONTACT : 727 945 6060
LICENSE #EC13010036
#CBC1263094


Signature with Seal

DUSTIN GEIGER
399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

| REVISIONS | DATE | DESCRIPTION | ENGG. |
|---|---|---|---|
| REV | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME
SITE MAP & VICINITY MAP

SHEET NUMBER
A-01



Wyssling Consulting, PLLC
76 N Meadowbrook Drive Alpine UT 84004
Florida License # RY34912

Signed 6/10/2022

## MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 37 MODULES
MODULE TYPE = APTOS DNA-144-MF26-440W SOLAR MODULES
MODULE WEIGHT = 53.13 LBS / 24.1 KG.
MODULE DIMENSIONS = 82.48" X 40.9" = 23.43 SF

NUMBER OF INVERTER = 37 MICROINVERTERS
INVERTER TYPE = ENPHASE IQ7A-72-2-US MICROINVERTERS
MICROINVERTERS

DC SYSTEM SIZE: 16.28 KW
AC SYSTEM SIZE: 12.91KW

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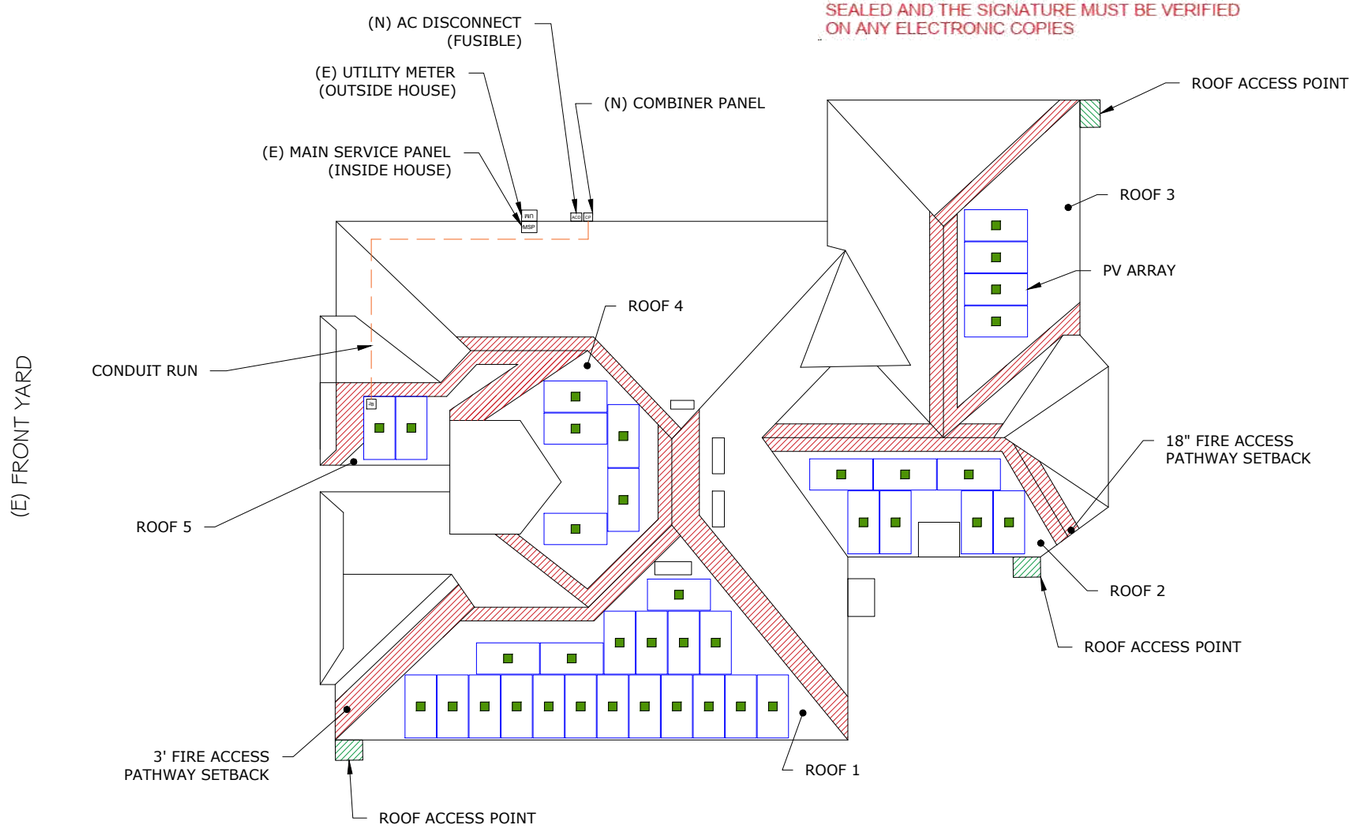



## GENERAL INSTALLATION PLAN NOTES:

(1) PANEL DESIGNATIONS SHOWN ON THESE DRAWINGS ARE GIVEN FOR CLARIFICATION OF THE CIRCUITING ONLY AND MAY NOT CORRESPOND TO THE DESIGNATIONS FOUND IN THE FIELD

2) ROOF ATTACHMENTS TO TRUSSES SHALL BE INSTALLED AS SHOWN IN SHEET S-01 AND AS FOLLOWS FOR EACH WIND ZONE:

WIND ZONE 1: MAX SPAN 4'-0" O.C.
WIND ZONE 2: MAX SPAN 4'-0" O.C.
WIND ZONE 3: MAX SPAN 2'-0" O.C.

3) EXISTING RESIDENTIAL BUILDING ROOF WITH MEAN ROOF HEIGHT 25 FT AND 2"X4" WOOD ROOF TRUSSES SPACED 24" O.C.

CONTRACTOR TO FIELD VERIFY AND SHALL REPORT TO THE ENGINEER IF ANY DISCREPANCIES EXIST BETWEEN PLANS AND IN FIELD CONDITIONS.

I CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC: RESIDENTIAL CHAPTER 3.BUILDING STRUCTURE WILL SAFELY ACCOMMODATE LATERAL AND UPLIFT WIND LOADS, AND EQUIPMENT DEAD LOADS.

## NOTES:

1. LOCATION OF JUNCTION BOX(ES), AC DISCONNECTS(S), AC COMBINER PANEL(S), AND OTHER ELECTRICAL EQUIPMENT(S) RELEVANT TO PV INSTALLATION SUBJECT TO CHANGE BASED ON SITE CONDITIONS.
2. SETBACKS AT RIDGES CAN BE REDUCED TO 18 INCHES IN COMPLIANCE WITH FBC R 324.6.2:
TOTAL PLAN VIEW AREA = 4373 SQFT
TOTAL PV AREA = 37(82.48 IN)(40.9 IN)/(144 IN^2)
= 866.78 SQFT
( 866.78 SQFT/ 4373 SQFT)100 = 19.82 %
TOTAL PV AREA POPULATES 19.82 % OF TOTAL PLAN VIEW AREA AND IS WITHIN THE 33% REQUIREMENT.

## LEGENDS

- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- M - METER MAIN COMBO
- JB - JUNCTION BOX
- ACD - AC DISCONNECT
- PM - PRODUCTION METER
- CP - COMBINER PANEL
- - FIRE SETBACK
- - ROOF ACCESS POINT
- - MICROINVERTER
- - VENT, ATTIC FAN (ROOF OBSTRUCTION)
- - CONDUIT

NOTE : INSTALLERS MAY MOVE PANELS IF NEEDED TO BE WITHIN THE MEANS OF THE SETBACKS.

Unicity Solar Energy
ADD : 612 FLORIDA AVENUE, PALM HARBOR, FL 34683, USA
CONTACT : 727 945 6060
LICENSE #EC13010036
#CBC1263094

Signature with Seal

DUSTIN GEIGER

399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

| REVISIONS | DESCRIPTION | DATE |
|---|---|---|
| REV | ENGG. | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME
ROOF PLAN & MODULES

SHEET NUMBER
A-02

## ROOF DESCRIPTION:

**(ROOF #1)**
MODULES - 19
ROOF TILT - 38°
ROOF AZIMUTH - 180°
TRUSSES SIZE - 2"X4" @ 24" O.C.

**(ROOF #2)**
MODULES - 7
ROOF TILT - 38°
ROOF AZIMUTH - 180°
TRUSSES SIZE - 2"X4" @ 24" O.C.

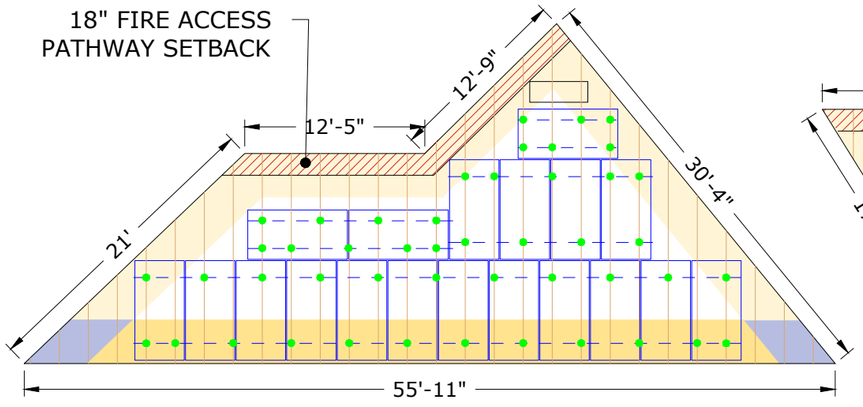
**(ROOF #3)**
MODULES -4
ROOF TILT - 38°
ROOF AZIMUTH - 90°
TRUSSES SIZE - 2"X4" @ 24" O.C.

**(ROOF #4)**
MODULES -5
ROOF TILT - 38°
ROOF AZIMUTH - 270°
TRUSSES SIZE - 2"X4" @ 24" O.C.

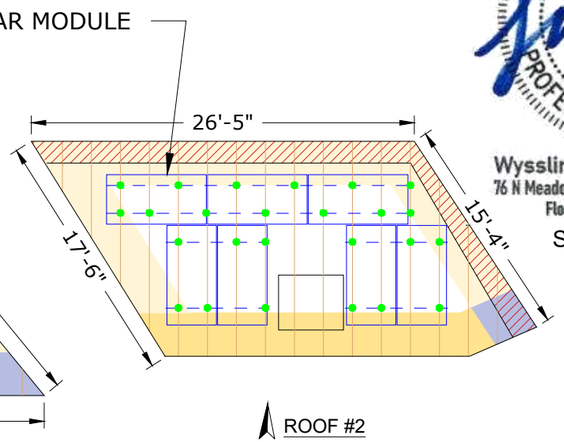
**(ROOF #5)**
MODULES -2
ROOF TILT - 38°
ROOF AZIMUTH - 180°
TRUSSES SIZE - 2"X4" @ 24" O.C.

TRUSS LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS MAY DIFFER AND CONTRACTOR MAY NEED TO ADJUST MOUNT LOCATIONS. IN NO CASE SHALL THE MOUNT SPACING EXCEED "MAX. MOUNT SPACING"

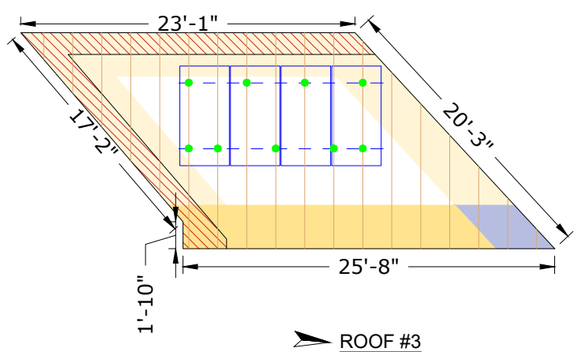
WIND LOAD INFORMATION:
THIS SYSTEM HAS BEEN DESIGN TO MEET THE REQUIREMENTS OF THE 7TH EDITION OF THE FLORIDA BUILDING CODE AND USED THE FOLLOWING DESIGN PARAMETERS:
ULTIMATE WIND SPEED: 140 MPH
EXPOSURE CATEGORY: B
RISK CATEGORY: II
MEAN ROOF HEIGHT: 25 FEET
ROOF SLOPE: 20-27°



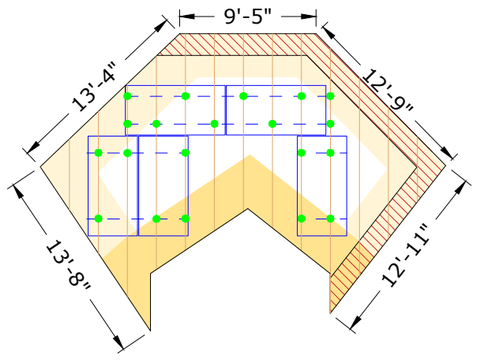

ROOF #1



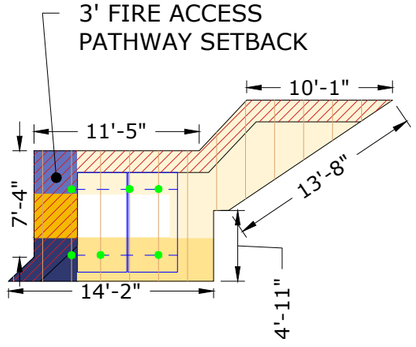

ROOF #2




ROOF #3




ROOF #4




ROOF #5

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## LEGENDS

- FIRE SETBACK
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- PV ROOF ATTACHMENT
- RAIL
- RAFTERS / TRUSSES
- METAL SEAM

WIND ZONE 1
- WIND ZONE 1
- WIND ZONE 1'

WIND ZONE 2
- WIND ZONE (2)
- WIND ZONE (2r)
- WIND ZONE (2e)
- WIND ZONE (2n)

WIND ZONE 3
- WIND ZONE (3)
- WIND ZONE (3r)
- WIND ZONE (3e)


Unicity Solar Energy
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LICENSE #EC13010036
#CBC1263094


Signature with Seal

DUSTIN GEIGER

399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

| REVISIONS | DATE | DESCRIPTION | ENGG. | REV |
|---|---|---|---|---|
| | | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

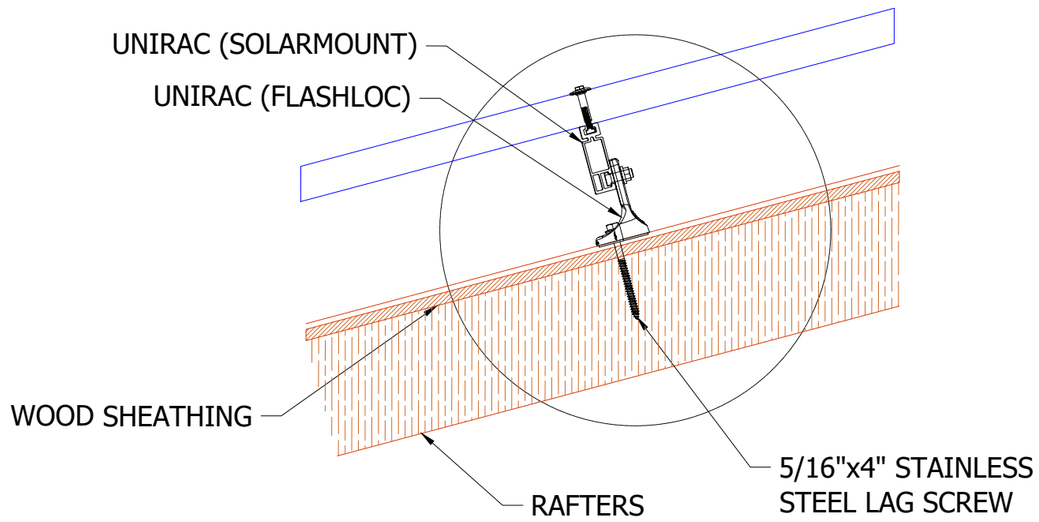
SHEET NAME
ARRAY LAYOUT

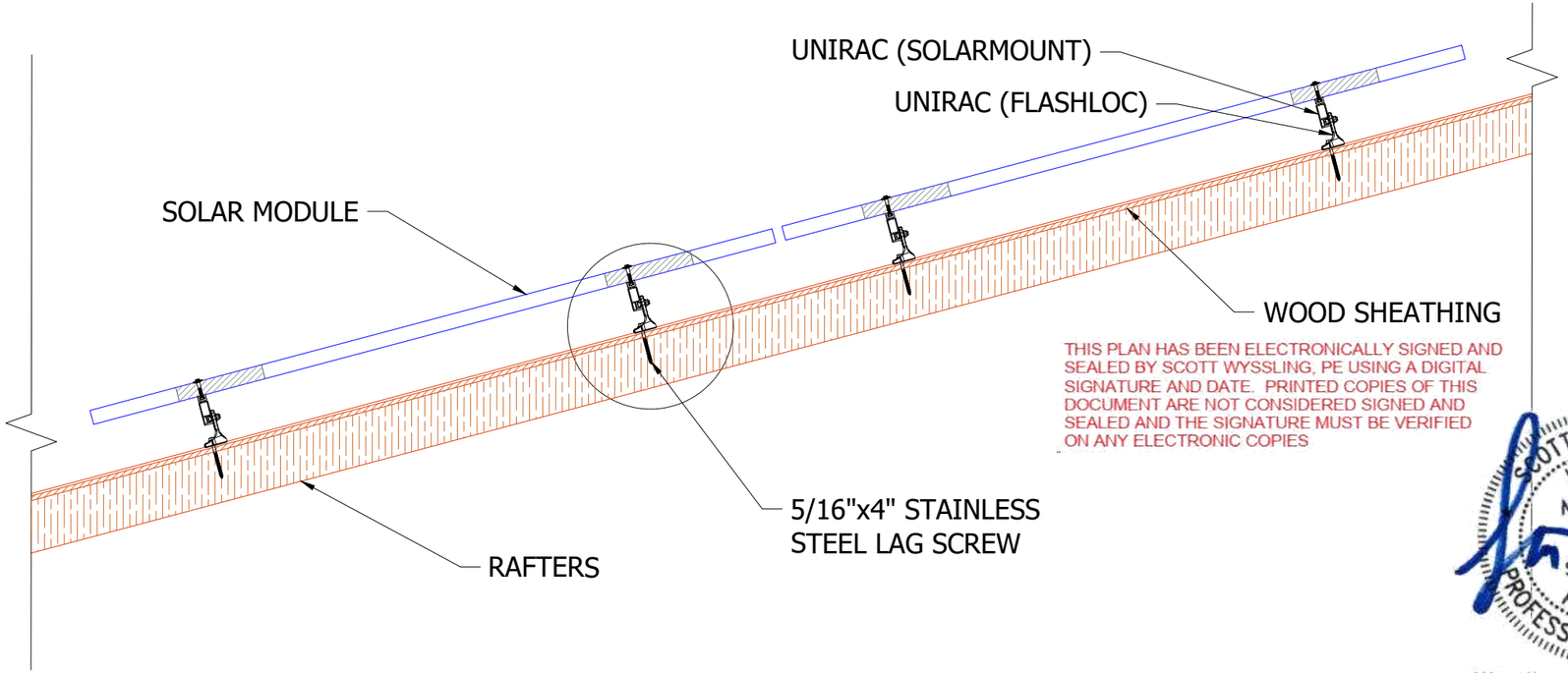
SHEET NUMBER
S-01

# PHOTOVOLTAIC MODULE GENERAL NOTES:

FOR PITCHED ROOF

1. APPLICABLE CODE: 2020 FLORIDA BUILDING CODE 7th ED. & ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES
2. BOLT DIAMETER AND EMBEDMENT LENGTHS ARE DESIGNED PER NDS(2012) REQUIREMENTS. ALL BOLT CAPACITIES ARE BASED ON A WOOD ROOF TRUSS AS EMBEDMENT MATERIAL.
3. ALL WIND DESIGN CRITERIA AND PARAMETERS ARE FOR HIP AND GABLE RESIDENTIAL ROOFS, CONSIDERING FROM A 7° TO A MAXIMUM 27° (2/12 TO A MAXIMUM 6/12 PITCH) ROOF IN SCHEDULE. ALL RESIDENTIAL ROOFS SHALL NOT EXCEED 30'-0" MEAN ROOF HEIGHT.
4. ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511.
5. THIS SHEET REFLECTS STRUCTURAL CONNECTIONS ONLY. REFER TO MANUFACTURER'S MANUAL FOR ALL ARCHITECTURAL, MECHANICAL, ELECTRICAL AND SOLAR SPECS.
6. ALL ALUMINIUM COMPONENTS SHALL BE ANODIZED ALUMINIUM 6105-T5 UNLESS OTHERWISE NOTED.
7. LAG BOLTS SHALL BE ASTM A276 STAINLESS STEEL UNLESS OTHERWISE NOTED.
8. ALL RAILING AND MODULES SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
9. I CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC:BUILDING CHAPTER 16 AND FRC:RESIDENTIAL CHAPTER 3. BUILDING STRUCTURE WILL SAFELY ACCOMMODATE CALCULATED WIND LATERAL AND UPLIFT FORCES AND EQUIPMENT DEAD LOADS.




## STRUCTURAL ATTACHMENT DETAILS

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SCOTT E WYSSLING LICENSE No. 81555 STATE OF FLORIDA PROFESSIONAL ENGINEER

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76 N Meadowbrook Drive Alpine UT 84004
Florida License # PP34912

Signed 6/10/2022


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Signature with Seal

DUSTIN GEIGER

399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

| REVISIONS | DESCRIPTION | DATE |
|---|---|---|
| REV. ENGG. | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME: STRUCTURAL ATTACHMENT DETAILS

SHEET NUMBER: S-02

| MODULE SPECIFICATION | |
|---|---|
| MODEL NO. | APTOS DNA-144-MF26-440W |
| PEAK POWER | 440W |
| RATED VOLTAGE (Vmpp) | 41 V |
| RATED CURRENT (Impp) | 10.74A |
| OPEN CIRCUIT VOLTAGE (Voc) | 49.9V |
| SHORT CIRCUIT CURRENT (Isc) | 11.33A |

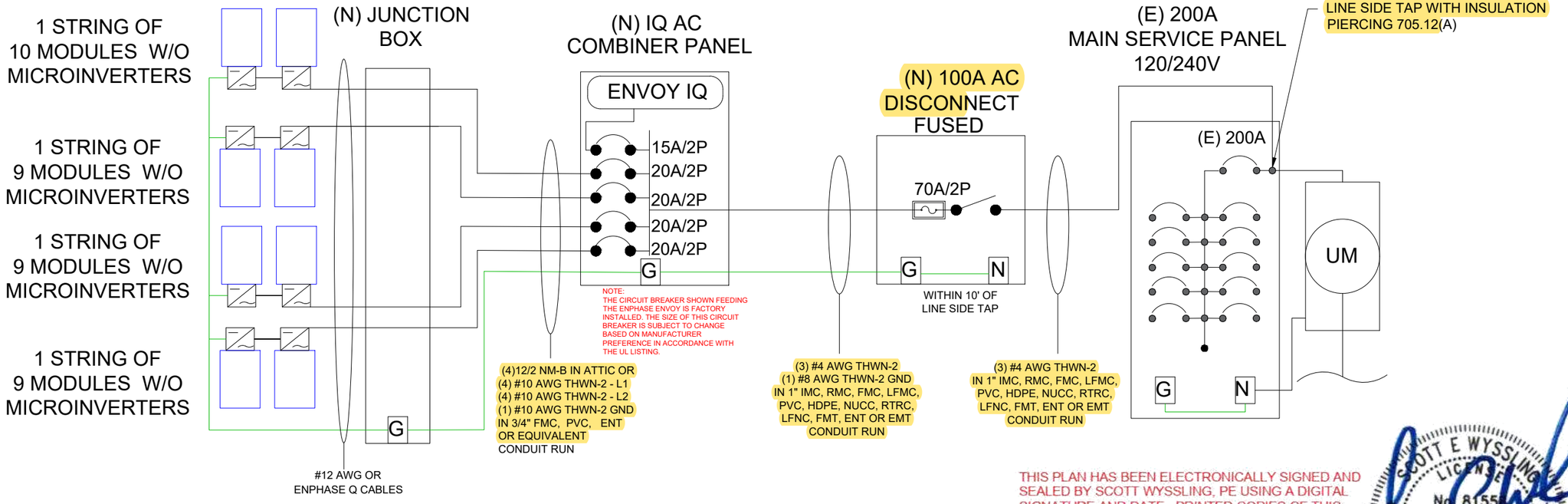
| INVERTER SPECIFICATIONS | |
|---|---|
| MANUFACTURER | ENPHASE |
| MODEL NO. | IQ7A-72-2-US |
| MAX DC INPUT VOLTAGE | 58 V |
| MAX OUTPUT POWER | 349 VA |
| NOMINAL AC OUTPUT VOLTAGE | 240 V |
| NOMINAL AC OUTPUT CURRENT | 1.45 A |

NOTE:
1. ALL ELECTRICAL EQUIPMENTS SHALL COMPLY WITH NEC CODE AND MAY CHANGE AS PER THE SITE CONDITION, NEC OR AHJ REQUIREMENTS.
2. LEGEND: (E) = EXISTING, (N) = NEW; APPLICABLE TO CONDUCTORS, CONDUITS, ELECECTRICAL ENCLOSURES, ETC.

**NOTE:**
1. SUBJECT PV SYSTEMS HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEC 2017, NFPA 70 AND THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTER CERTIFICATION, INCLUDING MAXIMUM NUMBER OF MODULE STRINGS, MAXIMUM NUMBER OF MODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURER AND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER, AS APPLICABLE.
2. PROVIDE TAP BOX IN COMPLIANCE WITH 312.8 IF PANEL GUTTER SPACE IS INADEQUATE.

SOLAR ARRAY (16.28 KW-DC STC)

(37) APTOS DNA-144-MF26-440W
(3) BRANCHES OF 9 MODULES
(1) BRANCH OF 10 MODULES

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SCOTT E WYSSLING LICENSE No. 81558 STATE OF FLORIDA PROFESSIONAL ENGINEER


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| | | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME
SINGLE LINE DIAGRAM

SHEET NUMBER
E-01

## ELECTRICAL CALCULATIONS:

### 1. CURRENT CARRYING CONDUCTOR

(A) BEFORE IQ COMBINER PANEL

AMBIENT TEMPERATURE = 34°C
CONDUIT INSTALLED AT MINIMUM DISTANCE OF 7/8 INCHES ABOVE ROOF .....NEC 310.15(B)(3)(c)
TEMPERATURE DERATE FACTOR - 0.96 ...NEC 310.15(B)(2)(a)
GROUPING FACTOR - 0.7...NEC 310.15(B)(3)(a)

CONDUCTOR AMPACITY
= (INV O/P CURRENT ) x 1.25 / A.T.F / G.F ...NEC 690.8(B)
= [(10 x 1.45) x 1.25] / 0.96 / 0.7
= 26.97 A
SELECTED CONDUCTOR - #10 THWN-2 ...NEC 310.15(B)(16)

(B) AFTER IQ COMBINER PANEL

TEMPERATURE DERATE FACTOR - 0.96
GROUPING FACTOR - 1

CONDUCTOR AMPACITY
=(TOTAL INV O/P CURRENT) x 1.25 / 0.96 / 1 ...NEC 690.8(B)
=[(37x 1.45) x 1.25] /0.96 / 1
=69.86 A
SELECTED CONDUCTOR - #4 THWN-2 ...NEC 310.15(B)(16)

### 2. PV OVER CURRENT PROTECTION ..NEC 690.9(B)

=TOTAL INVERTER O/P CURRENT x 1.25
=(37 x 1.45) x 1.25 = 67.06 A
SELECTED OCPD = 70A

SELECTED EQUIPMENT GROUND CONDUCTOR (EGC) = #8 THWN-2 ... NEC 250.122(A)

MAX VOLTAGE DROP CALCULATION

| CABLE SIZE | CABLE DESCRIPTION | ONE WAY DISTANCE IN FEET (D) | BRANCH CURRENT (I) | RESISTANCE OF CONDUCTOR(R) | VOLTAGE (V) | % VOLTAGE DROP=(0.2*D*I*R)/V |
|---|---|---|---|---|---|---|
| #10 THWN-2 | JUNCTION BOX TO COMBINER PANEL | 20 | 53.65 | 1.24 | 240 | 1.11 |

ELECTRICAL NOTES

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL ANDLABELED FOR ITS APPLICATION.
2. COPPER CONDUCTORS SHALL BE RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.THE TERMINALS ARE RATED FOR75 DEGREE C ROMEX/NM-B (NONMETALLIC-SHEATHED) CABLE MAY BE USED FOR BOTH EXPOSED AND CONCEALED WORK IN NORMALLY DRY LOCATIONS AT TEMPERATURES NOT TO EXCEED 90°C (WITH AMPACITY LIMITED TO THAT FOR 60°C CONDUCTORS) AS SPECIFIED IN THE NATIONAL ELECTRICAL CODE. VOLTAGE RATING FOR NM-B CABLE IS 600 VOLTS.
3. CONDUCTOR TERMINATION AND SPLICING AS PER NEC 110.14 WIRING, CONDUIT AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS
4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.265. WORKING CLEARANCES AROUND ALL NEW AND EXISTING
5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10. THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE.
11. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
12. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
13. RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
14. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).
15. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C)

THIS PLAN HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY SCOTT WYSSLING, PE USING A DIGITAL SIGNATURE AND DATE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES

SCOTT E WYSSLING LICENSE No. 81551 STATE OF FLORIDA PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N Meadowbrook Drive Alpine UT 84004
Florida License # RY34912

Signed 6/10/2022

Unicity Solar Energy
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CONTACT : 727 945 6060
LICENSE #EC13010036
#CBC1263094

Signature with Seal

DUSTIN GEIGER

399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

REVISIONS

| REV | ENGG. | DESCRIPTION | DATE |
|---|---|---|---|
| | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME: WIRING CALCULATIONS

SHEET NUMBER: E-02

**⚠ WARNING**

**ELECTRIC SHOCK HAZARD**
**DO NOT TOUCH TERMINALS**
**TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION**

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION, COMBINER PANEL
(PER CODE: NEC 690.13(B))

**WARNING PHOTOVOLTAIC POWER SOURCE**

LABEL LOCATION:
CONDUIT RUNWAY
(PER CODE: NEC690.31(G)(3)(4))

⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
MAIN SERVICE DISCONNECT
(NEC 705.12(B)(3-4) & NEC 690.59)

ADHESIVE FASTENED SIGNS:

·ANSI Z535.4-2011 PRODUCT SAFETY SIGNS AND LABELS, PROVIDES GUIDELINES FOR SUITABLE FONT SIZES, WORDS, COLORS, SYMBOLS, AND LOCATION REQUIREMENTS FOR LABELS. NEC 110.21(B)(1)
·THE LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. NEC 110.21(B)(3)
·ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT. IFC 605.11.1.3

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**
RATED AC OPERATING CURRENT 53.65 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT, INVERTER
(PER CODE: NEC 690.54)

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

LABEL LOCATION:
POINT OF INTERCONNECTION, MAIN SERVICE DISCONNECT
(PER CODE: NEC 705.12 (B)(2)(c))
[Not required if panelboard is rated not less than sum of ampere ratings of all overcurrent devices supplying it]

DATA PER PANEL

| | | |
|---|---|---|
| **NOMINAL OPERATING AC VOLTAGE -** | 240 | V |
| **NOMINAL OPERATING AC FREQUENCY-** | 60 | Hz |
| **MAXIMUM AC POWER-** | 349 | VA |
| **MAXIMUM AC CURRENT-** | 1.45 | A |
| **MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION PER CIRCUIT-** | 20 | A |

LABEL LOCATION:
COMBINER PANEL, AC DISCONNECT
(PER CODE: NEC 690.52)

**PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

LABEL LOCATION:
AC DISCONNECT, DC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.56(C)(3))

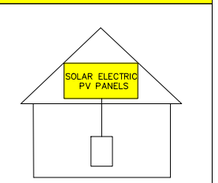
**⚠ WARNING**
INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

**EMERGENCY CONTACT**
727-945-6060

**⚠ WARNING**
DEDICATED SOLAR PANELS DO NOT CONNECT ANY OTHER LOADS

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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




IFC 605.11.3.1(1) & 690.56(C)(1)(a) Label for PV Systems that Shut down the array and the conductors leaving the array

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|---|---|---|---|---|
| | | | | |

| PERMIT DEVELOPER | |
|---|---|
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| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME
SYSTEM LABELING

SHEET NUMBER
E-03

# DNA™ 144

Solar for Innovators

Residential I Commercial

## Designed & Engineered in Silicon Valley

### 440W I 435W I 430W

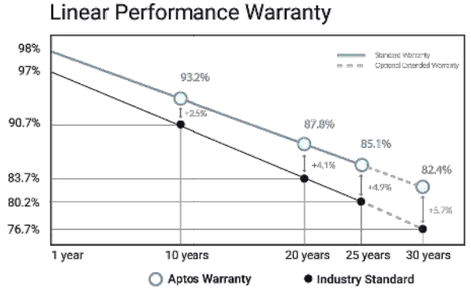
Our DNA™ Split Cell Series impressively combines advanced solar technologies to maximize performance. Our patented Dual Nano Absorber (DNA™) Technology allows the panel to operate at high-efficencies in extreme temperatures. Contact our sales team today to learn more about our line of high-efficienty solar panels.

- Patented DNA™ technology boosts power performance & module efficiency
- Advanced split cell technology with 9 ultra-thin busbars allows for less resistance and more photon capture
- Ideal solution for applications affected by shading
- All-black design for pristine aesthetics
  No excessive silver bussing or ribbons
- Robust product design is reslient in extreme weather. Up to 5400 Pa snow load and 210 mph wind speeds

intertek CE

30 Year Warranty | 3X IEC Standards | RETC Top Performer

### Linear Performance Warranty





aptos solar technology

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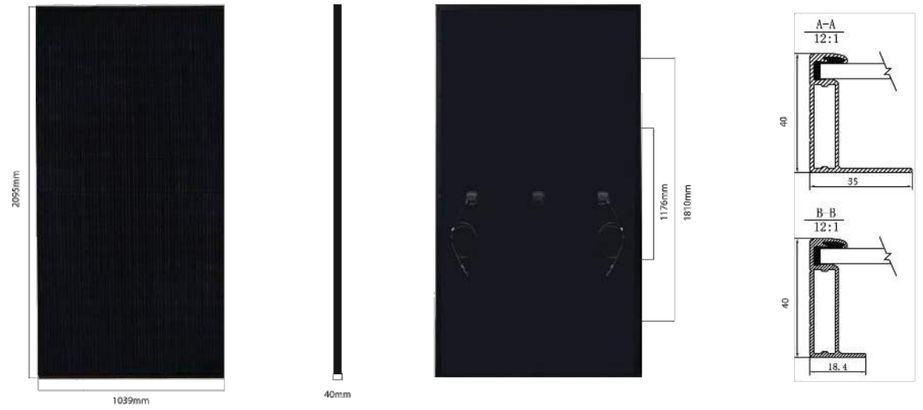
DNA™ 144

Solar for Innovators


| Electrical Specifiactions | DNA-144-MF26-440W | DNA-144-MF26-435W | DNA-144-MF26-430W |
|---|---|---|---|
| STCrated Output $P_{mpp}$ (W) | 440W | 435W | 430W |
| Module Efficiency | 20.21% | 19.98% | 19.76% |
| Open Circuit Voltage $V_{voc}$ (V) | 49.9 | 49.7 | 49.5 |
| Short Circuit Current $I_{sc}$ (A) | 11.33 | 11.26 | 11.19 |
| Rated Voltage $V_{mp}$ (V) | 41.0 | 40.8 | 40.6 |
| Rated Voltage $I_{mp}$ (A) | 10.74 | 10.67 | 10.60 |

Standard Test Conditions for front face of panel: 1000 W/m², 25°C, measurement uncertainty ≤3%

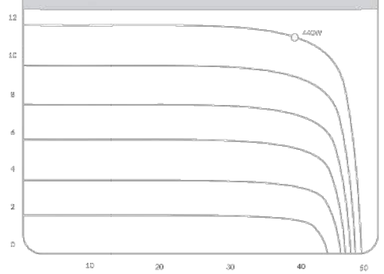
| Temperature Coefficients | |
|---|---|
| Temperature Coefficients $P_{mpp}$ | -0.36% |
| Temperature Coefficients $I_{sc}$ | +0.05%/°C |
| Temperature Coefficients $V_{oc}$ | -0.29%/°C |
| Normal Operating Cell Temperature (NOCT) | 44°C |

| Test Operating Conditions | |
|---|---|
| Maximum Series Fuse | 20A |
| Maximum System Voltage | 1,000 VDC (UL&IEC) |
| Maximum Load Capacity (Per UL 1703) | 5400 PA Snow Load / 210mph Wind Rating |
| Fire Performance Class | Class C/Type 1 |

| Packaging Configuration | |
|---|---|
| Number of Modules per Pallet | 27 |
| Number of Pallets per 40ft. Container | 22 |
| Pallet Dimensions | 2110 X 1120 X 2365 |
| Pallet Weight (kg) | 680 |
| Container Weight (kg) | 14960 |

| Mechanical Properties | |
|---|---|
| Cell Type | Monocrystalline |
| Glass | 3.2mm, anti-reflection coating, high transmission, low iron, tempered glass |
| Frame | Anodized Aluminum Alloy |
| Junction Box | IP68 |
| Dimensions | 2095 X 1039 X 40mm |
| Output Cable | 4mm2 (EU)12/AWG,39.37in.(1200mm) |
| Weight | 53.13lbs.(24.1kg) |
| Cable Length | 1200mm |
| Encapsulant | POE |

### I-V Curve




### Certifications

intertek CE

UL61730-1, UL61730-2

Aptos Solar Technology reserves the right to make specification changes without notice

aptos solar technology


Unicity Solar Energy

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| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME

MODULE DATASHEET

SHEET NUMBER

DS-01

Data Sheet
**Enphase Microinverters**
Region: AMERICAS

# Enphase IQ 7A Microinverter

The high-powered smart grid-ready **Enphase IQ 7A Micro**™ dramatically simplifies the installation process while achieving the highest system efficiency for systems with 60-cell and 72-cell modules.

Part of the Enphase IQ System, the IQ 7A Micro integrates with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

The 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.


### High Power
- Peak output power 366 VA @ 240 VAC and 295 VA @ 208 VAC

### Easy to Install
- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014, 2017 & 2020)

### Efficient and Reliable
- Optimized for high powered 60-cell and 72-cell modules
- Highest CEC efficiency of 97%
- 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
- Envoy and Internet connection required
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

CERTIFIED

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

ENPHASE

## Enphase IQ 7A Microinverter

| INPUT (DC) | IQ7A-72-2-US | |
|---|---|---|
| Commonly used module pairings[1] | 295 W–460 W + | |
| Module compatibility | 60-cell, 66-cell and 72-cell PV modules | |
| Maximum input DC voltage | 58 V | |
| Power point tracking voltage range[2] | 18 V–58 V | |
| Min/Max start voltage | 33 V / 58 V | |
| Max DC short circuit current (module Isc)[3] | 15 A | |
| Overvoltage class DC port | II | |
| DC port backfeed current | 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 (AC)** | **@ 240 VAC** | **@ 208 VAC** |
| Peak output power | 366 VA | 295 VA |
| Maximum continuous output power | 349 VA | 290 VA |
| Nominal (L-L) voltage/range[4] | 240 V / 211–264 V | 208 V / 183–229 V |
| Maximum continuous output current | 1.45 A (240 VAC) | 1.39 A (208 VAC) |
| Nominal frequency | 60 Hz | |
| Extended frequency range | 47–68 Hz | |
| AC short circuit fault current over 3 cycles | 5.8 Arms | |
| Maximum units per 20 A (L-L) branch circuit[5] | 11 (240 VAC) | 11 (208 VAC) |
| Overvoltage class AC port | III | |
| AC port backfeed current | 18 mA | |
| Power factor setting | 1.0 | |
| Power factor (adjustable) | 0.85 leading .. 0.85 lagging | |
| **EFFICIENCY** | **@240 VAC** | **@208 VAC** |
| CEC weighted efficiency | 97.0 % | 96.5% |
| **MECHANICAL** | | |
| Ambient temperature range | -40°C to +60°C | |
| Relative humidity range | 4% to 100% (condensing) | |
| Connector type: DC (IQ7A-72-2-US) | MC4 | |
| Dimensions (HxWxD) | 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<br>Compatible with 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)<br>UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01<br>This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020, 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. CEC peak power tracking voltage range is 38 V to 43 V.
3. Maximum continuous input DC current is 10.2A.
4. Voltage range can be extended beyond nominal if required by the utility.
5. 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**


11-04-2021

ENPHASE

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| REVISIONS | | | | | | |
|---|---|---|---|---|---|---|
| REV | ENGG. | DESCRIPTION | DATE | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME
INVERTER DATASHEET

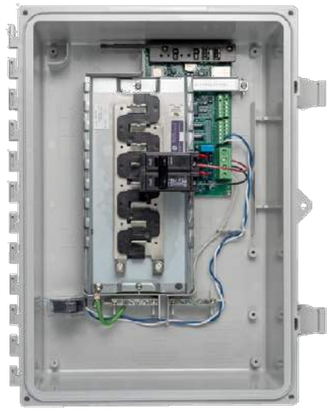
SHEET NUMBER
DS-02

Data Sheet
**Enphase Networking**

# Enphase IQ Combiner 3

**(X-IQ-AM1-240-3)**

The **Enphase IQ Combiner 3™** with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



### Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring
- Supports Ensemble Communications Kit for communication with Enphase Encharge™ storage and Enphase Enpower™ smart switch

### Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- Supports back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

### Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- UL listed

UL LISTED

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

ENPHASE.

## Enphase IQ Combiner 3

| | |
|---|---|
| **MODEL NUMBER** | |
| IQ Combiner 3<br>X-IQ-AM1-240-3 | IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%). |
| **ACCESSORIES** and **REPLACEMENT PARTS** (not included, order separately) | |
| Enphase Mobile Connect™<br>CELLMODEM-03 (4G/12-year data plan)<br>CELLMODEM-01 (3G/5-year data plan)<br>CELLMODEM-M1 (4G based LTE-M/5-year data plan) | Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) |
| Consumption Monitoring* CT<br>CT-200-SPLIT<br>* Consumption monitoring is required for Enphase Storage Systems | Split core current transformers enable whole home consumption metering (+/- 2.5%). |
| Ensemble Communications Kit<br>COMMS-KIT-01 | Installed at the IQ Envoy. For communications with Enphase Encharge™ storage and Enphase Enpower™ smart switch. Includes USB cable for connection to IQ Envoy or Enphase IQ Combiner™ and allows wireless communication with Encharge and Enpower. |
| Circuit Breakers<br>BRK-10A-2-240<br>BRK-15A-2-240<br>BRK-20A-2P-240 | Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers.<br>Circuit breaker, 2 pole, 10A, Eaton BR210<br>Circuit breaker, 2 pole, 15A, Eaton BR215<br>Circuit breaker, 2 pole, 20A, Eaton BR220 |
| EPLC-01 | Power line carrier (communication bridge pair), quantity - one pair |
| XA-SOLARSHIELD-ES | Replace the default solar shield with this Ensemble Combiner Solar Shield to match the look and feel of the Enphase Enpower™ smart switch and the Enphase Encharge™ storage system |
| XA-PLUG-120-3 | Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01) |
| XA-ENV-PCBA-3 | Replacement IQ Envoy printed circuit board (PCB) for Combiner 3 |
| **ELECTRICAL SPECIFICATIONS** | |
| Rating | Continuous duty |
| System voltage | 120/240 VAC, 60 Hz |
| Eaton BR series busbar rating | 125 A |
| Max. continuous current rating (output to grid) | 65 A |
| Max. fuse/circuit rating (output) | 90 A |
| Branch circuits (solar and/or storage) | Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included) |
| Max. continuous current rating (input from PV) | 64 A |
| Max. total branch circuit breaker rating (input) | 80 A of distributed generation / 95 A with IQ Envoy breaker included |
| Envoy breaker | 10A or 15A rating GE Q-line/Siemens Type QP /Eaton BR series included |
| Production Metering CT | 200 A solid core pre-installed and wired to IQ Envoy |
| **MECHANICAL DATA** | |
| Dimensions (WxHxD) | 49.5 x 37.5 x 16.8 cm (19.5" x 14.75" x 6.63"). Height is 21.05" (53.5 cm with mounting brackets). |
| Weight | 7.5 kg (16.5 lbs) |
| Ambient temperature range | -40° C to +46° C (-40° to 115° F) |
| Cooling | Natural convection, plus heat shield |
| Enclosure environmental rating | Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction |
| Wire sizes | • 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors<br>• 60 A breaker branch input: 4 to 1/0 AWG copper conductors<br>• Main lug combined output: 10 to 2/0 AWG copper conductors<br>• Neutral and ground: 14 to 1/0 copper conductors<br>Always follow local code requirements for conductor sizing. |
| Altitude | To 2000 meters (6,560 feet) |
| **INTERNET CONNECTION OPTIONS** | |
| Integrated Wi-Fi | 802.11b/g/n |
| Ethernet | Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included) |
| Cellular | CELLMODEM-M1 4G based LTE-M cellular modem (not included). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations. |
| **COMPLIANCE** | |
| Compliance, Combiner | UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003<br>Production metering: ANSI C12.20 accuracy class 0.5 (PV production) |
| Compliance, IQ Envoy | UL 60601-1/CANCSA 22.2 No. 61010-1 |

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



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399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

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| | | | |

| PERMIT DEVELOPER | |
|---|---|
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| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME
COMBINER BOX DATASHEET

SHEET NUMBER
DS-03

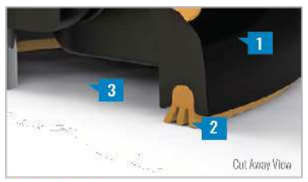
# FLASH LOC

UNIRAC
BETTER SOLAR STARTS HERE

**FLASH**LOC is the ultimate attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the lag bolt and inject sealant into the base. **FLASH**LOC's patented TRIPLE SEAL technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with lag bolts, sealant, and hardware for maximum convenience. Don't just divert water, **LOC it out!**


### PROTECT THE ROOF

Install a high-strength waterproof attachment without lifting, prying or damaging shingles.




### LOC OUT WATER

With an outershield 1 contour-conforming gasket 2 and pressurized sealant chamber 3 the Triple-Loc Seal delivers a 100% waterproof connection.


### HIGH-SPEED INSTALL

Simply drive lag bolt and inject sealant into the port 4 to create a permanent pressure seal.

**FASTER INSTALLATION. 25-YEAR WARRANTY.**

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

# FLASH LOC

INSTALLATION GUIDE

UNIRAC
BETTER SOLAR STARTS HERE


### PRE-INSTALL

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1-3/4" below upslope edge of shingle course. Locate rafters and mark attachment locations.

At each location, drill a 7/32" pilot hole. Clean roof surface of dirt, debris, snow, and ice, then fill pilot hole with sealant.

NOTE: Space mounts per racking system install specifications. When down pressure is ≥34 psf, span may not exceed 2 ft.

### STEP 1: SECURE

Place **FLASH**LOC over pilot hole with lag on down-slope side. Align indicator marks on sides of mount with chalk line. Pass included lag bolt and sealing washer through **FLASH**LOC into pilot hole. Drive lag bolt until mount is held firmly in place.

NOTE: The EPDM in the sealing washer will expand beyond the edge of the metal washer when proper torque is applied.

### STEP 2: SEAL

Insert tip of UNIRAC provided sealant into port. Inject until sealant exits both vents.

Continue array installation, attaching rails to mounts with provided T-bolts.

NOTE: When **FLASH**LOC is installed over gap between shingle or tabs or vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.

Use only provided sealant.

**FASTER INSTALLATION. 25-YEAR WARRANTY.**

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702


Unicity Solar Energy
ADD : 612 FLORIDA AVENUE, PALM HARBOR, FL 34683, USA
CONTACT : 727 945 6060
LICENSE #EC13010036
#CBC1263094


Signature with Seal

DUSTIN GEIGER

399 SW MEADOW TERRACE ,LAKE CITY, FL 32024, USA

| REVISIONS | DATE | DESCRIPTION | ENGG. | REV |
|---|---|---|---|---|
| | | | | |

| PERMIT DEVELOPER | |
|---|---|
| DATE | 06/10/2022 |
| DESIGNER | OSD |
| REVIEWER | |

SHEET NAME

ATTACHMENT DATASHEET

SHEET NUMBER

DS-04

# SOLARMOUNT

UNIRAC

**SOLARMOUNT** defined the standard in solar racking. Features are designed to get installers off the roof faster. Our grounding & bonding process eliminates copper wire and grounding straps to reduce costs. Systems can be configured with standard or light rail to meet your design requirements at the lowest cost possible. The superior aesthetics package provides a streamlined clean edge for enhanced curb appeal, with no special brackets required for installation.


Now Featuring:

## THE NEW FACE OF SOLAR RACKING

Superior Aesthetics Package


### LOSE ALL OF THE COPPER & LUGS

System grounding through Enphase microinverters and trunk cables

### SMALL IS THE NEXT NEW BIG THING

Light Rail is Fully Compatible with all SM Components

### ENHANCED DESIGN & LAYOUT TOOLS

Featuring Google Map Capabilities within U-Builder

## FAST INSTALLATION. SUPERIOR AESTHETICS

OPTIMIZED COMPONENTS • VERSATILITY • DESIGN TOOLS • QUALITY PROVIDER


# SOLARMOUNT

UNIRAC


## OPTIMIZED COMPONENTS

### INTEGRATED BONDING & PRE-ASSEMBLED PARTS

Components are pre-assembled and optimized to reduce installation steps and save labor time. Our new grounding & bonding process eliminates copper wire and grounding straps or bonding jumpers to reduce costs. Utilize the microinverter mount with a wire management clip for an easier installation.

## VERSATILITY

### ONE PRODUCT - MANY APPLICATIONS

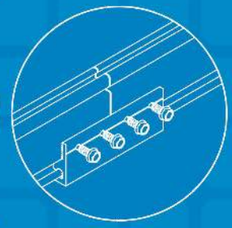
Quickly set modules flush to the roof or at a desired tilt angle. Change module orientation to portrait or landscape while securing a large variety of framedmodules on flat, low slope or steep pitched roofs. Available in mill, clear and dark anodized finishes to outperform your projects financial and aesthetic aspirations.

## AUTOMATED DESIGN TOOL

### DESIGN PLATFORM AT YOUR SERVICE

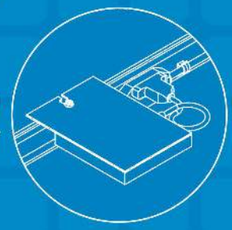
Creating a bill of materials is just a few clicks away with U-Builder, a powerful online tool that streamlines the process of designing a code compliant solar mounting system. Save time by creating a user profile, and recall preferences and projects automatically when you log in. You will enjoy the ability to share projects with customers: there's no need to print results and send to a distributor, just click and share.

INTEGRATED BONDING MIDCLAMP



INTEGRATED BONDING SPLICE BAR

INTEGRATED BONDING L-FOOT w/ T-BOLT



INTEGRATED BONDING MICROINVERTER MOUNT w/ WIRE MANAGEMENT

LISTED **UL2703** BONDING & GROUNDING MECHANICAL LOADING SYSTEM FIRE CLASSIFICATION

## UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT

UNMATCHED EXPERIENCE | CERTIFIED QUALITY | ENGINEERING EXCELLENCE | BANKABLE WARRANTY | DESIGN TOOLS | PERMIT DOCUMENTATION

### TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

### CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2015, 14001:2015 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

### BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. SOLARMOUNT is covered by a twenty five (25) year limited product warranty and a five (5) year limited finish warranty.

**PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN**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| REVIEWER | |

SHEET NAME

RACKING DATASHEET

SHEET NUMBER

DS-05