



Scott E. Wyssling, PE
Coleman D. Larsen, SE, PE
Gregory T. Elvestad, PE

76 North Meadowbrook Drive
Alpine, UT 84004
office (201) 874-3483
swyssling@wysslingconsulting.com

September 30, 2022

Legacy Solar
3333 Digital Drive #600
Lehi, UT 84043

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
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Date: 2022.09.30 15:59:52-06'00'
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Re: Engineering Services
Kent Residence
190 Kent Lane, Coats NC
12.710 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: 2x8 dimensional lumber at 16" on center with purlin supports at midspan.
Roof Material: Composite Asphalt Shingles
Roof Slope: 33, 45, & 48 degrees
Attic Access: Accessible
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** = 20 psf
- **Wind Load** based on ASCE 7-10
 - Ultimate Wind Speed = 115 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 North Carolina Residential Code (2015 IRC), 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.

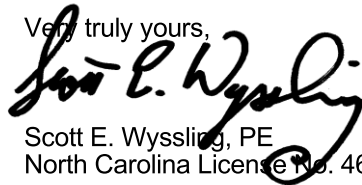
D. Solar Panel Anchorage

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. Connection on the roof is utilizing (4) ½" or #14 screws into the existing decking to resist uplift forces. Contractor to verify installation to be performed in accordance with the Unirac recommendations. Pull out values per screw are based on National Design Specification values for CDX plywood and are identified as 208 lbs/inch. Based on ½" sheathing the value per screw would be 104 lbs providing 416 lbs uplift resistance per attachment.
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 60" 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 North Carolina Residential Code, 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
North Carolina License No. 46546



Wyssling Consulting, PLLC
76 N Meadowbrook Drive Alpine UT 84004
North Carolina COA # P-2308

Signed 9/30/2022

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
Wyssling, PE

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PROJECT DESCRIPTION:

31x410 SOLAREVER USA HC 108M SE-182*91-410M-108N (410W) MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 SYSTEM SIZE: 12.71 KW DC STC
 SYSTEM SIZE: 8.99 KW AC

SYSTEM SUMMARY
 31 SOLAREVER USA HC 108M SE-182*91-410M-108N (410W) MODULES
 31 ENPHASE IQ8PLUS-72-2-US MICRO-INVERTERS, 240V
 01 ENPHASE IQ LOAD CONTROLLER
 01 ENPHASE ENPOWER SMART SWITCH R2

DESIGN CRITERIA	
WIND SPEED	115
EXPOSURE CATEGORY	B
RISK CATEGORY	II
MOUNTING METHOD	ROOF MOUNT
GROUND SNOW LOAD	20

CODE COMPLIANCE

ALL WORK SHALL COMPLY WITH ALL STATE AND LOCAL CODES, ORDINANCES AND ANY OTHER REGULATING AUTHORITIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK.

AHJ NOTES:
 ALL WORK SHALL COMPLY WITH THE
 2018 NORTH CAROLINA BUILDING CODE / 2018 IRC
 2018 NORTH CAROLINA RESIDENTIAL CODE / 2018 IRC
 2018 NORTH CAROLINA FIRE CODE / 2018 IFC

ELECTRICAL CODE:
 ALL ELECTRICAL WORK SHALL COMPLY WITH THE
 2017 NATIONAL ELECTRIC CODE.

GPS COORDINATES: 35.418847, -78.659555

GENERAL INSTALLATION NOTES

1. INSTALLER SHALL ASSUME FULL RESPONSIBILITY AND LIABILITY FOR COMPLIANCE WITH REGULATIONS PER FEDERAL, OSHA AND LOCAL REGULATIONS PERTAINING TO WORK PRACTICES, PROTECTION OF WORKERS AND VISITORS TO THE SITE.
2. INSTALLER SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AT SITE BEFORE COMMENCING WORK.
3. CONTRACTOR SHALL FURNISH ALL MATERIAL EXCEPT AS SPECIFIED IN THE CONTRACT AND/OR THESE DRAWINGS.
4. ALL MATERIALS SHALL BE IN NEW AND UNUSED CONDITION.
5. MANUFACTURER'S MATERIAL EQUIPMENT, ETC. SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
6. THE INSTALLER SHALL BECOME FAMILIAR WITH ALL UTILITY AS-BUILT PLANS AND THE LOCATIONS OF ALL EXISTING UTILITIES, STRUCTURES, PAVEMENT OR IMPROVEMENTS.
7. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND NOTIFY THE OWNER OF DISCREPANCIES REQUIRING FURTHER CLARIFICATION BEFORE PROCEEDING WITH THE WORKS.
8. INSTALL ALL ASPECTS OF THIS PROJECT IN ACCORDANCE WITH THE SPECIFICATIONS AND AS NOTED ON DRAWINGS ISSUED FOR CONSTRUCTION.
9. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER 310.0(D)
10. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26
11. EXACT CONDUIT RUN LOCATIONS SUBJECT TO CHANGE
12. ROOF PENETRATIONS ARE SEALED.
13. INVERTER IS LISTED TO UL-1741 "UTILITY INTERACTIVE"
14. VISIBLE, LABELED, LOCKABLE DISCONNECT LOCATED LESS THAN 10' FROM UTILITY METER

SHEET INDEX

- PV-0 COVER SHEET
- PV-1 PLOT PLAN WITH ROOF PLAN
- PV-2 ROOF PLAN WITH MODULES
- PV-3 ATTACHMENT DETAIL
- PV-4 ELECTRICAL LINE DIAGRAM
- PV-5 ATTIC PHOTO
- PV-6 ELECTRICAL PHOTOS
- PV-7 PLACARDS
- PV-8 ADDITIONAL NOTES
- PV-9 JOB HAZARD ANALYSIS
- PV-10+ EQUIPMENT SPECIFICATIONS



ARRAY LOCATION



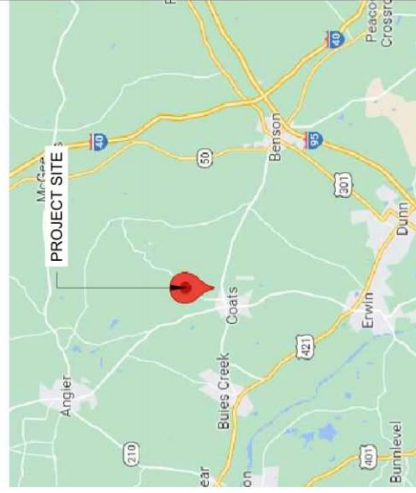
Wyssling Consulting, PLLC
 10000 Mark Drake Drive, Suite 101, 28004
 North Carolina, USA # 919-208

Stamped: 9/30/2022

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1 HOUSE PHOTO

SCALE: NTS



2 VICINITY MAP

SCALE: NTS

LGCY POWER
 LGCY POWER
 3333 DIGITAL DR #600, LEHI,
 UT 84043, UNITED STATES
 855-353-4689

Alex Nelson
 LICENSE NUMBER: US3945

REVISIONS	DATE	BY
DESCRIPTION	09-30-2022	C

ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO.# (919) 622-9514
 APN# 071600026001

SHEET NAME

COVER SHEET

SHEET SIZE
 ANSIB
 11" X 17"

SHEET NUMBER

PV-0

Scott Wyssling, PE
 Digitally signed by Scott Wyssling, PE
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LGCY POWER
 LGCY POWER
 3333 DIGITAL DR #600, LEHI,
 UT 84043, UNITED STATES
 855-353-4689

Alex Nelson
 LICENSE NUMBER: U33945

REVISIONS	DATE	BY
DESCRIPTION	05-30-2022	C



Wyssling Consulting, PLLC
 76 N Westbreak Drive Alpine, UT 84004
 North Carolina CEA # P-2388

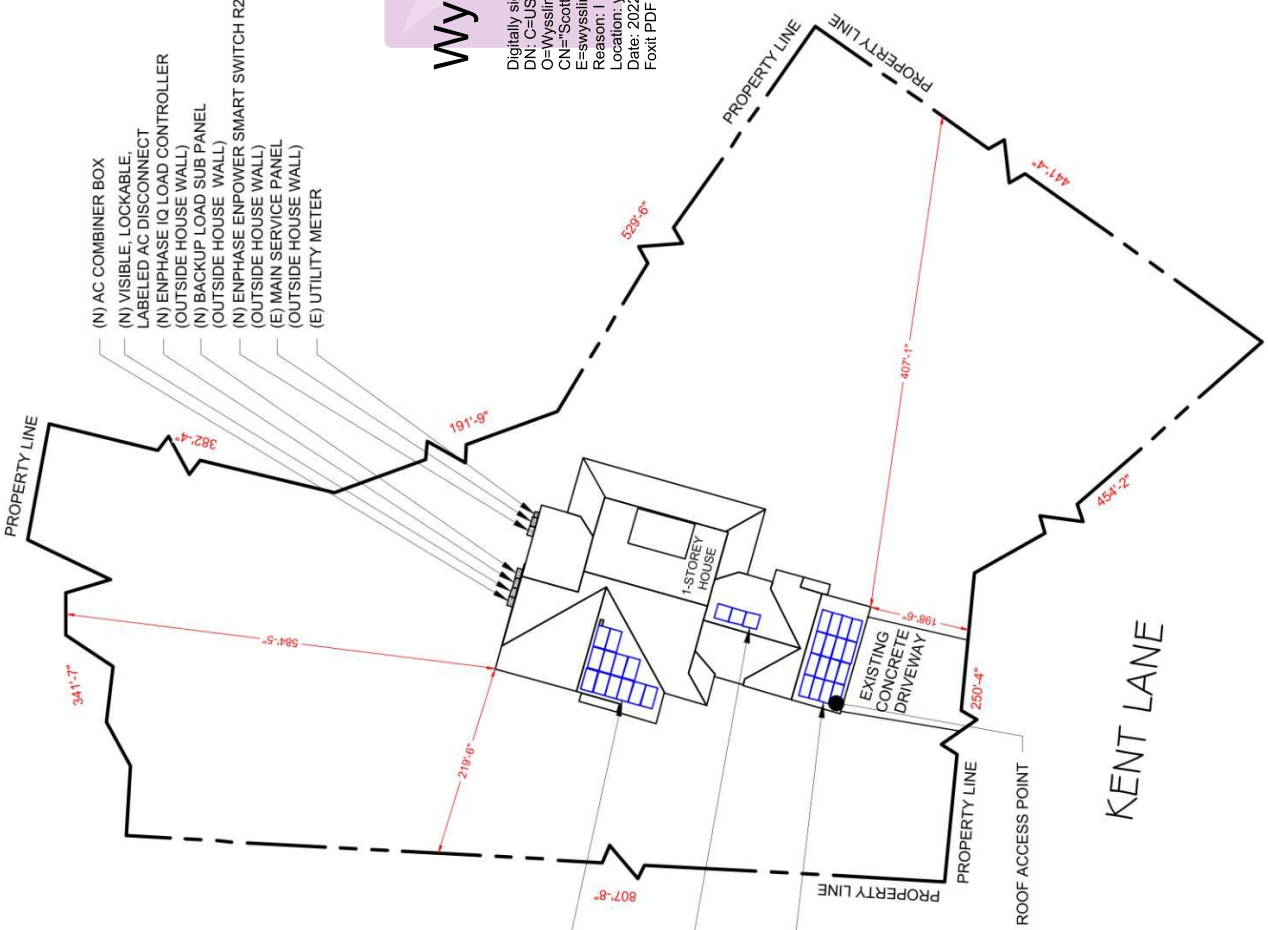
Signed: 9/30/2022
 THIS PLAN HAS BEEN REVIEWED AND APPROVED FOR THE PROFESSIONAL SEAL BY SCOTT E. WYSSLING, P.E., LICENSE NO. 04546, STATE OF UTAH. ALL DIMENSIONS, NOTES, AND SPECIFICATIONS SHOWN ON THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED UNTIL THE SIGNATURE MUST BE VERIFIED ON A HARD COPY OF THIS DOCUMENT.

ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO.# (919) 622-9514
 APN# 071600026001

SHEET NAME	PLOT PLAN WITH ROOF PLAN
SHEET SIZE	ANSI B 11" X 17"
SHEET NUMBER	PV-1

Scott Wyssling, PE

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 DN: C=US, S=Utah, L=Alpine,
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 CN=Scott Wyssling, PE
 E=swyssling@wysslingconsulting.com
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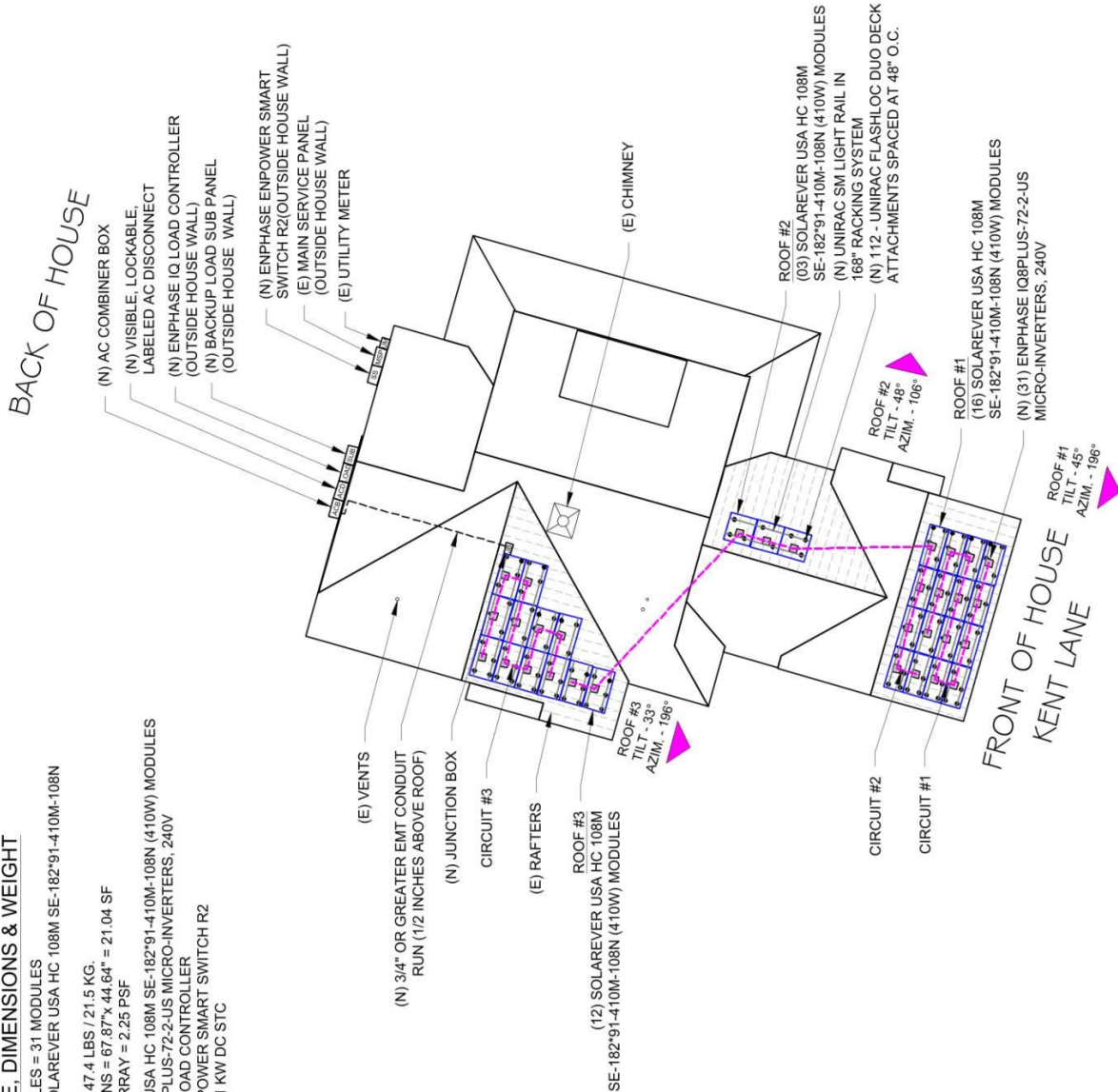


- **ROOF ACCESS POINT**
 ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.
- SYSTEM SUMMARY
- 31 SOLAREVER USA HC 108M SE-182*91-410M-108N (410W) MODULES
- 31 ENPHASE IQ8PLUS-72-2-US MICRO-INVERTERS, 240V
- 01 ENPHASE IQ LOAD CONTROLLER
- 01 ENPHASE ENPOWER SMART SWITCH R2
- SYSTEM SIZE: 12.71 KW DC STC

- ROOF #3
 (12) SOLAREVER USA HC 108M SE-182*91-410M-108N (410W) MODULES
- ROOF #2
 (03) SOLAREVER USA HC 108M SE-182*91-410M-108N (410W) MODULES
- ROOF #1
 (16) SOLAREVER USA HC 108M SE-182*91-410M-108N (410W) MODULES

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 31 MODULES
 MODULE TYPE = SOLAREVER USA HC 108M SE-182°91'-410M-108N (410W) MODULES
 MODULE WEIGHT = 47.4 LBS / 21.5 KG.
 MODULE DIMENSIONS = 67.87" x 44.64" = 21.04 SF
 SYSTEM WEIGHT SUMMARY
 31 SOLAREVER USA HC 108M SE-182°91'-410M-108N (410W) MODULES
 01 ENPHASE IQ8PLUS-72-2-US MICRO-INVERTERS, 240V
 01 ENPHASE IQ LOAD CONTROLLER
 01 ENPHASE ENPOWER SMART SWITCH R2
 SYSTEM SIZE: 12.71 KW DC-STC



ROOF DESCRIPTION		COMP SHINGLE ROOF	
ROOF	ROOF TILT	FRAMING SIZE	SPACING
#1	48°	2"x8"	16" O.C.
#2	48°	2"x8"	16" O.C.
#3	33°	2"x8"	16" O.C.

TOTAL ARRAY AREA WITH MOUNTING ROOF AREA		ROOF AREA COVERED BY ARRAY (%)	
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	MOUNTING ROOF AREA (Sq. Ft.)
#1	16	336.64	371
#2	03	63.12	273
#3	12	252.48	393

TOTAL ARRAY AREA WITH MOUNTING ROOF AREA		ROOF AREA COVERED BY ARRAY (%)	
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	MOUNTING ROOF AREA (Sq. Ft.)
#1-#3	31	652.23	1037

TOTAL ARRAY AREA WITH MOUNTING ROOF AREA		ROOF AREA COVERED BY ARRAY (%)	
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	MOUNTING ROOF AREA (Sq. Ft.)
#1-#3	31	652.23	1037

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#1-#3	31	652.23	1037

North Carolina CEA # 9-2088

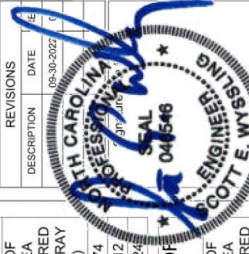
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Signed 9/30/2022

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LGCY POWER
 3333 DIGITAL DR #600, LEHI, UT 84043, UNITED STATES
 855-353-4689

Alex Nelson
 LICENSE NUMBER: U33945



ALLEN KENT
 190 KENT LANE,
 COATS, NC 27221 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO.# (919) 622-9514
 AP# 071600026001

- LEGEND**
- - MICRO-INVERTERS
 - LM - UTILITY METER
 - JB - JUNCTION BOX
 - ACB - AC COMBINER BOX
 - SUB - BACKUP LOAD PANEL
 - SUB - SUB PANEL
 - SS - ENPHASE ENPOWER SMART SWITCH R2
 - IO - ENPHASE IQ LOAD CONTROLLER
 - MSP - MAIN SERVICE PANEL
 - CH - MAIN SERVICE PANEL (VENTS CHIMNEY)
 - OB - (ROOF OBSTRUCTION)
 - CON - CONDUIT RUN
 - RA - RAFTERS
 - ATT - ROOF ATTACHMENT
 - RAIL - RAIL
 - CIR - CIRCUIT



1 ROOF PLAN & MODULES

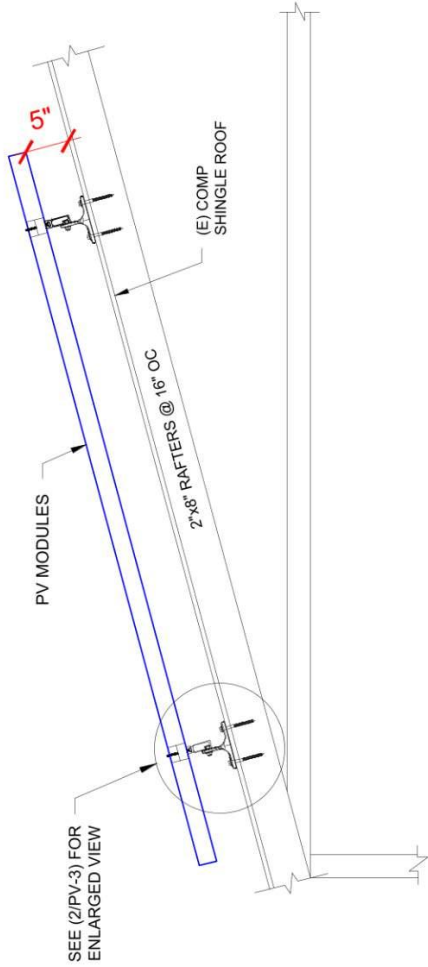
PV/2 SCALE: 1/16" = 1'-0"

SHEET NAME
ROOF PLAN WITH MODULES

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-2

SYSTEM SUMMARY
 31 SOLAREVER USA HC 108M SE-182'91-410M-108N (410W) MODULES
 31 ENPHASE IQ8PLUS-72-2-US MICRO-INVERTERS, 240V
 01 ENPHASE IQ LOAD CONTROLLER
 01 ENPHASE ENPOWER SMART SWITCH R2
 SYSTEM SIZE: 12.71 KW DC STC



1 ATTACHMENT DETAIL (SIDE VIEW)

SCALE: NTS

PV-3

Digitally signed by Scott Wyssling, PE
 DN: cn=Scott Wyssling, o=Wyssling Consulting, ou=Owner, email=Es-wyssling@wysslingco.com, c=US
 Location: your signing location here
 Date: 2022.09.30 11:10
 Font PDF Editor: Version: 11.10



Wyssling Consulting, PLLC
 76 N Woodlark Drive Alpine, UT 84004
 North Carolina CEA # P-2208

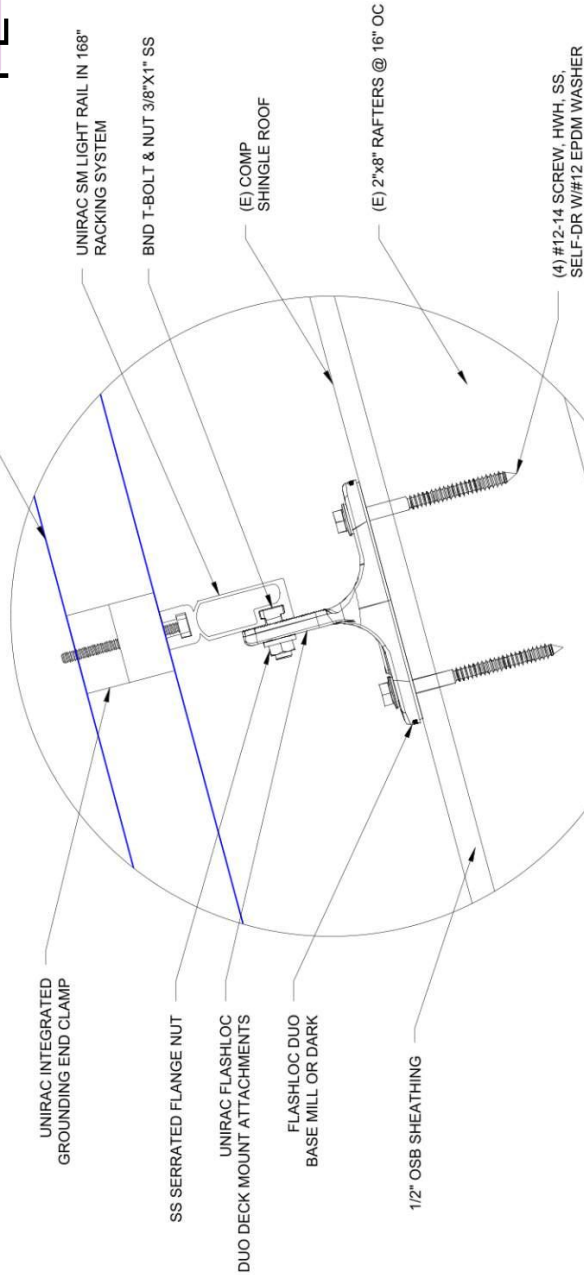
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LGCY POWER
 LGCY POWER
 3333 DIGITAL DR #600, LEHI,
 UT 84043, UNITED STATES
 855-353-4689

Alex Wilson
 LICENSE NUMBER: U33945

REVISIONS	DATE	BY	APP
DESCRIPTION	09-30-2022	C	



2 ATTACHMENT DETAIL ENLARGED VIEW

SCALE: NTS

PV-3

ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO.# (919) 622-9514
 APN# 071600026001

SHEET NAME
**ATTACHMENT
 DETAIL**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-3

INVERTER SPECIFICATIONS

MANUFACTURER	ENPHASE IQ8PLUS-72-2-US
MAX. DC VOLT RATING	60 VOLTS
MAX. POWER AT 40 C	290 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX. AC CURRENT	1.21 AMPS
MAX. OCPD RATING	20 AMPS
MAX. PANELS/CIRCUIT	13
SHORT CIRCUIT CURRENT	15 AMPS

THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)

AC OUTPUT CURRENT	37.51A
NOMINAL AC VOLTAGE	240V

(N) (31) ENPHASE IQ8PLUS-72-2-US
INVERTER EFFICIENCY 97.0%
NEMA 4B, UL LISTED, INTERNAL GFI

SOLAR MODULE SPECIFICATIONS

MANUFACTURER / MODEL #	Solarever USA HC 108M SE-182'91-410M-108N (410W)
VMP	31.35V
IMP	13.08A
VOC	37.12V
ISC	13.96A
MODULE DIMENSION	67.87"L x 44.64"W x 1.37"D (in inch)

(31) SOLAREVER USA HC 108M SE-182'91-410M-108N (410W) MODULES
(N) ENPHASE IQ8PLUS-72-2-US MICRO-INVERTERS, 240V
(01) ENPHASE ENPOWER SMART SWITCH R2
(02) CIRCUIT OF 11 MODULES WITH MICRO INVERTERS & CONNECTED IN SERIES PER CIRCUIT
SYSTEM SIZE: 12.71 KW DC STC

ENPHASE IQ SYSTEM CONTROLLER 2

MANUFACTURER	EP200G101-M240US01
NOMINAL VOLTAGE / RANGE	240 VAC / 100 - 310 VAC
MAX. CONT. CURRENT	160 AMPS
MAX. OUTPUT OCPD	200 AMPS
MAX. OCPD FOR PV COMBINER BRANCH	80 AMPS
MAX. OCPD FOR STORAGE BRANCH	80 AMPS

ENPHASE IQ SYSTEM CONTROLLER 2

WIRE TAG #	WIRE FROM	CONDUIT	WIRE QTY	WIRE GAUGE	WIRE TYPE	TEMP RATING	TEMP DE-RATE	WIRE AMP	CONDUIT FILL	WIRE OCP	TERMINAL INVERTER	STRING GRND
1	ARRAY TO JUNCTION BOX	-	3	#12	Q-CABLE	90°	0.91 x	30A	1.00 x	27.30A	25A	#6
2	JUNCTION BOX TO COMBINER PANEL	3/4" EMT	6	#10	THWN-2	75°	0.88 x	35A	0.80 x	24.64A	35A	#10
3	COMBINER PANEL TO ENPOWER SMART SWITCH	3/4" EMT	3	#6	THWN-2	75°	0.88 x	65A	1.00 x	57.20A	65A	#10

CONDUCTOR SPECIFICATIONS

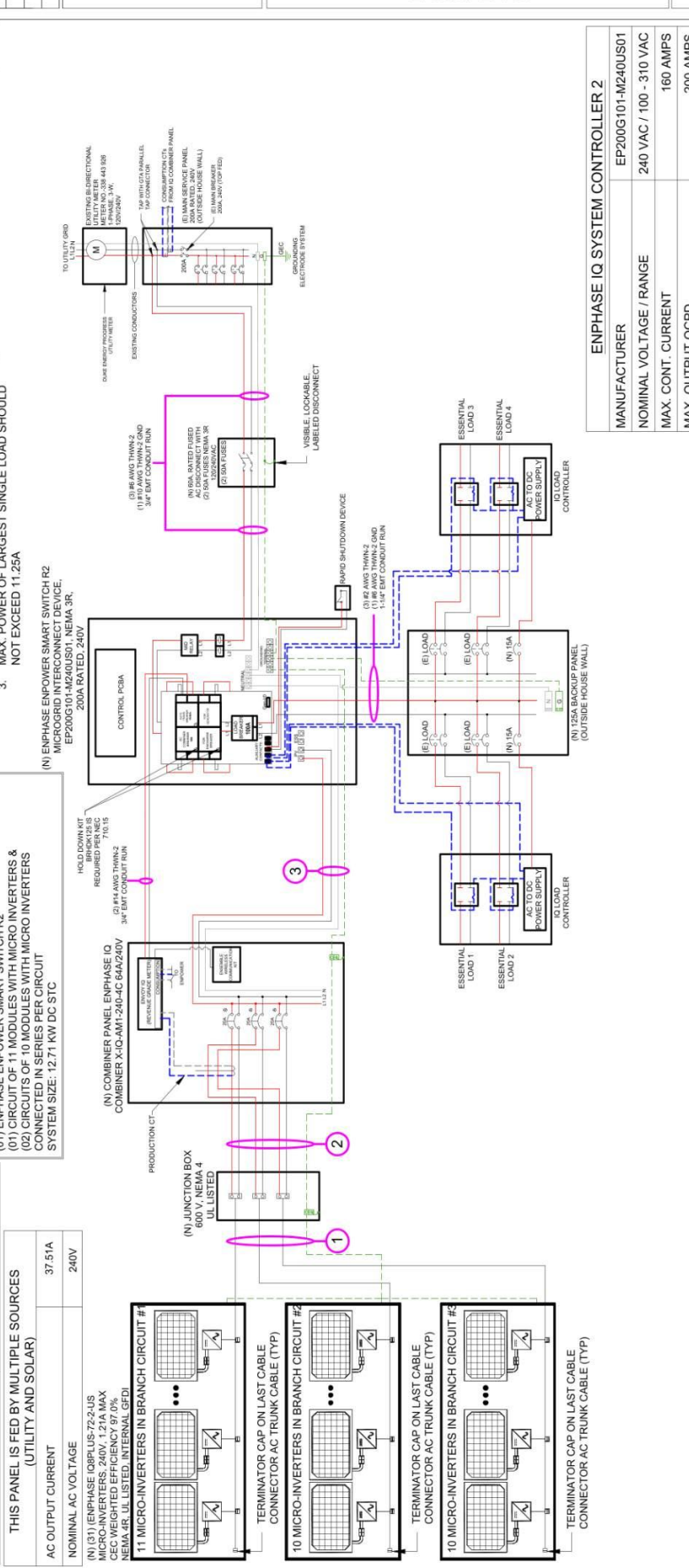
RECORD LOW TEMP	-10°
AMBIENT TEMP (HIGH TEMP 2%)	37°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	59°
CONDUCTOR TEMPERATURE RATE	90°

NOTE:
1. CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
2. 30% OF MICROINVERTER AC POWER = MAX POWER OF LARGEST SINGLE LOAD
3. MAX. POWER OF LARGEST SINGLE LOAD SHOULD NOT EXCEED 11.25A

INVERTER SPECIFICATIONS

MANUFACTURER / MODEL #	Solarever USA HC 108M SE-182'91-410M-108N (410W)
VMP	31.35V
IMP	13.08A
VOC	37.12V
ISC	13.96A
MODULE DIMENSION	67.87"L x 44.64"W x 1.37"D (in inch)

(31) SOLAREVER USA HC 108M SE-182'91-410M-108N (410W) MODULES
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(01) ENPHASE ENPOWER SMART SWITCH R2
(02) CIRCUIT OF 11 MODULES WITH MICRO INVERTERS & CONNECTED IN SERIES PER CIRCUIT
SYSTEM SIZE: 12.71 KW DC STC



CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@icloud.com
PHONE NO# (919) 622-9514
APN# 071600026001

LGCCY POWER
LGCCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-353-4889

Max Nelson
LICENSE NUMBER: U33945

REVISIONS
DESCRIPTION DATE REV
09-30-2022 01

Signature with Seal

ENPHASE Q CABLE TO BE ATTACHED TO RAIL MIN. 3'-1/2" ABOVE ROOF SURFACE

FOR WIRES SMALLER THAN #1 REMOVE LUG AND USE AN APPROVED UL RING TERMINAL

NOTE:
1. CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
2. 30% OF MICROINVERTER AC POWER = MAX POWER OF LARGEST SINGLE LOAD
3. MAX. POWER OF LARGEST SINGLE LOAD SHOULD NOT EXCEED 11.25A

ENPHASE IQ SYSTEM CONTROLLER 2

MANUFACTURER	EP200G101-M240US01
NOMINAL VOLTAGE / RANGE	240 VAC / 100 - 310 VAC
MAX. CONT. CURRENT	160 AMPS
MAX. OUTPUT OCPD	200 AMPS
MAX. OCPD FOR PV COMBINER BRANCH	80 AMPS
MAX. OCPD FOR STORAGE BRANCH	80 AMPS

ENPHASE IQ SYSTEM CONTROLLER 2

WIRE TAG #	WIRE FROM	CONDUIT	WIRE QTY	WIRE GAUGE	WIRE TYPE	TEMP RATING	TEMP DE-RATE	WIRE AMP	CONDUIT FILL	WIRE OCP	TERMINAL INVERTER	STRING GRND
1	ARRAY TO JUNCTION BOX	-	3	#12	Q-CABLE	90°	0.91 x	30A	1.00 x	27.30A	25A	#6
2	JUNCTION BOX TO COMBINER PANEL	3/4" EMT	6	#10	THWN-2	75°	0.88 x	35A	0.80 x	24.64A	35A	#10
3	COMBINER PANEL TO ENPOWER SMART SWITCH	3/4" EMT	3	#6	THWN-2	75°	0.88 x	65A	1.00 x	57.20A	65A	#10

ELECTRICAL LINE DIAGRAM

SHEET NAME

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-4

LGCY POWER

LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-353-4889

Alex Nelson

LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@icloud.com
PHONE NO # (919) 622-9514
APN# 071600026001

SHEET NAME

ATTIC PHOTO

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-5



LGCY POWER

LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Nelson

LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

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190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@icloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

ELECTRICAL
PHOTOS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-6



Alex Nelson
 LICENSE NUMBER: U33945

REVISIONS	DATE	REV
DESCRIPTION	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

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 190 KENT LANE,
 COATS, NC 27521 USA
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 PHONE NO.# (919) 622-9514
 APN# 07160026001

SHEET NAME	PLACARDS
SHEET SIZE	ANSI B
SHEET NUMBER	11" X 17"
	PV-7

LABELING NOTES:

- LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
- LABELING REQUIREMENTS BASED ON THE NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
- MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
- LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED (NEC 110.21) THEY SHALL BE PERMANENTLY ATTACHED, WEATHER/SUNLIGHT RESISTANT, AND SHALL NOT BE HAND WRITTEN NEC 11.21(B)
- LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND, REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

7) ELECTRIC SHOCK HAZARD
 NEC 690.13(B)
 LOCATED ON AC DISCONNECT & PRODUCTION METER

WARNING

ELECTRIC SHOCK HAZARD

TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

8) DUAL POWER SUPPLY
 NEC 705.12(B)(3)
 MUST BE LOCATED ON THE MAIN SERVICE PANEL

WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

5) RAPID SHUTDOWN
 NEC 690.56(C)(2)
 LOCATED ON AC DISCONNECT

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

6) DUAL POWER SOURCES
 NEC 690.56(C)
 MUST BE LOCATED ON THE MAIN SERVICE PANEL

SOLAR 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

1) COMBINER PANEL
 NEC 705.12(B)(3)(4)
 LOCATED AT AC COMBINER PANEL

WARNING

PHOTOVOLTAIC SYSTEM COMBINER PANEL DO NOT ADD LOADS

2) AC DISCONNECT
 NEC 690.54
 LOCATED ON AC DISCONNECT

PHOTOVOLTAIC SYSTEM AC DISCONNECT

OPERATING VOLTAGE 240 VOLTS
 OPERATING CURRENT 37.51 AMPS

3) PV SOLAR BREAKER
 NEC 705.12(B)(3)(2)
 LOCATED NEXT TO THE PV BREAKER

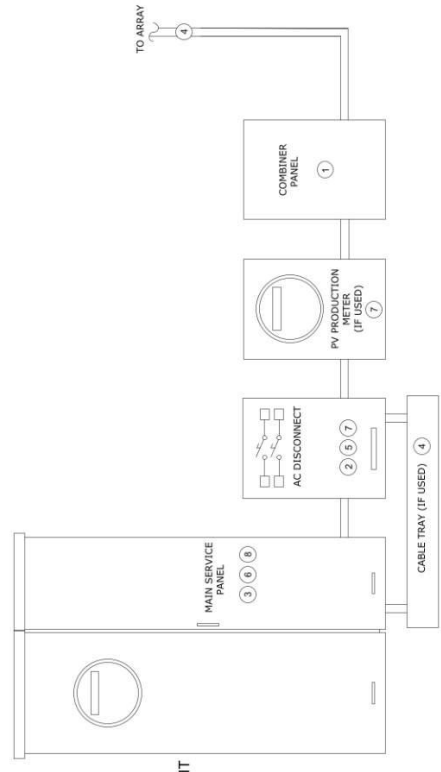
PV SOLAR BREAKER

DO NOT RELOCATE THIS OVERCURRENT DEVICE

4) PV CONDUCTORS
 NEC 690.31(D)(2)
 LOCATED ON CABLE TRAYS, JUNCTION BOXES AND CONDUIT

WARNING: PHOTOVOLTAIC POWER SOURCE

LABELS MUST BE VISIBLE AFTER INSTALLATION. LABELS MUST BE LOCATED ON EVERY SECTION OF THE WIRING SYSTEM SEPARATED BY WALLS, FLOORS OR OTHER PARTITIONS AND MUST NOT BE SEPARATED BY MORE THAN 10'



CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN AT:

- ☒ MAIN SERVICE PANEL & UTILITY METER
- ☒ AC COMBINER BOX, ENPOWER, BACKUP LOAD PANEL

KENT LANE

(E) UTILITY METER (OUTSIDE HOUSE WALL)
 (E) MAIN SERVICE PANEL (OUTSIDE HOUSE WALL)
 (N) ENPHASE ENPOWER SMART SWITCH R2 (OUTSIDE HOUSE WALL)
 (N) AC COMBINER BOX (OUTSIDE HOUSE WALL)
 (N) VISIBLE LOCKABLE LABELED AC DISCONNECT (OUTSIDE HOUSE WALL)
 (N) BACKUP LOAD PANEL (OUTSIDE HOUSE WALL)
 (N) ENPHASE IQ LOAD CONTROLLER (OUTSIDE HOUSE WALL)

190 KENT LANE, COATS, NC 27521 USA

ALL LABELS MUST BE PERMANENTLY ATTACHED, MUST BE WEATHER AND SUNLIGHT RESISTANT AND MAY NOT BE HAND-WRITTEN

ELECTRICAL NOTES:

1. EACH MODULE TO BE GROUNDED USING THE SUPPLIED CONNECTION POINT PER MANUFACTURER'S REQUIREMENTS. ALL SOLAR MODULES, EQUIPMENT, AND METALLIC COMPONENTS ARE TO BE BONDED. IF THE EXISTING GROUNDING ELECTRODE SYSTEM CAN NOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING.
2. ALL PLAQUES AND SIGNAGE REQUIRED BY THE LATEST EDITION OF NATIONAL ELECTRICAL CODE. LABEL SHALL BE METALLIC OR PLASTIC, ENGRAVED OR MACHINE PRINTED IN ACCORDANCE WITH NEC REQUIREMENTS. PLAQUE SHALL BE UV RESISTANT IF EXPOSED TO SUNLIGHT.
3. EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH 250.134 OR 250.138(A).
4. CONFIRM LINE SIDE VOLTAGE AT ELECTRIC UTILITY SERVICE PRIOR TO CONNECTING INVERTER. VERIFY SERVICE VOLTAGE IS WITHIN INVERTER VOLTAGE OPERATIONAL RANGE.
5. OUTDOOR EQUIPMENT SHALL BE NEMA-3R RATED OR BETTER.
6. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.
7. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE, AND FOR ROOF-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELP OFF OF THE ROOF SURFACE. NEC 110.2 - 110.4 / 300.4



LEGACY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
865-553-4689

Alex Wilson
LICENSE NUMBER: U33945

REV/SIONS	DATE	REV
DESCRIPTION	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

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EMAIL ID# - Arken81@icloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

ADDITIONAL NOTES

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

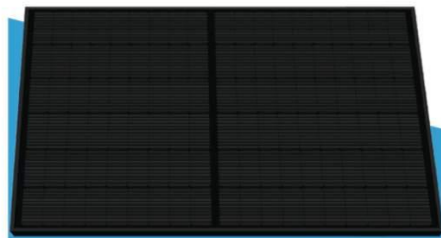


Module HC 108M 400-410 Watt

Positive power tolerance of 0+~3%
HALF CELL - MONO PERC 108 CELL

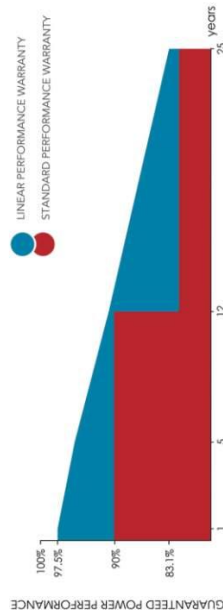
KEY FEATURES

- 9 Busbar Solar Cell**
9 busbar solar cell adopts new technology to improve the efficiency of modules, offers a better aesthetic appearance, making it perfect for rooftop installation.
- High Efficiency**
Higher module conversion efficiency (up to 20.38%) benefit from half cell structure (low resistance characteristic).
- PID Resistance**
Excellent Anti-PID performance guarantees limited power degradation for mass production.
- Low-light Performance**
Advanced solar cell surface textured design ensure excellent performance in low-light environment.
- Severe Weather Resilience**
Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).
- Durability Against Extreme Environmental Conditions**
High salt mist and ammonia resistance.



LINEAR PERFORMANCE WARRANTY

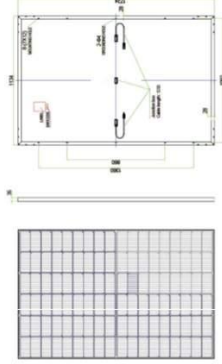
12 Year Product Warranty 25 Year Linear Power Warranty



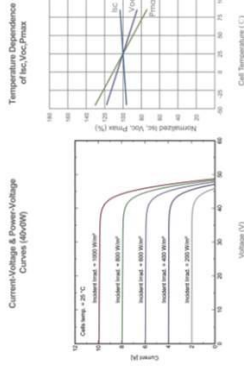
LINEAR PERFORMANCE WARRANTY
STANDARD PERFORMANCE WARRANTY



ENGINEERING DRAWINGS



ENGINEERING DRAWINGS



MECHANICAL CHARACTERISTICS

Cell Type	Monocrystalline PERC
Module Dimensions	1724x1134x35mm (67.87x44.64x1.37 inch)
Weight	21.5 kg (47.4 lb)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmittance Low Iron Glass
Frame	6063 Anodized Aluminum Alloy
Junction Box	IP67 Rated
Output Cables	100% UV Protected 450mm (1120mm - for Customized Length)

PACKAGING CONFIGURATION

(Two pallets = One stack)

31pcs/pallet, 62pcs/stack, 866pcs/32FT Truck

SPECIFICATIONS

Module Type	SE-182791-400M-108N		SE-182791-410M-108N	
	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	400W	300W	405W	304W
Maximum Power Voltage (Vmp)	31.06	28.86	31.21	29.04
Maximum Power Current (Imp)	12.88	10.38	12.88	10.47
Open-circuit Voltage (Voc)	36.83	35.01	36.86	35.16
Short-circuit Current (Isc)	13.76	11.09	13.86	11.18
Module Efficiency (STC) (%)	20.46%		20.72%	
Operating Temperature (Tc)	-40°C ~ +85°C			
Maximum System Voltage	1500VDC (IEC)			
Maximum Series Fuse Rating	20A			
Power Tolerance	0+~3%			
Temperature Coefficients of Pmax	-0.35%/°C			
Temperature Coefficients of Voc	-0.29%/°C			
Temperature Coefficients of Isc	0.048%/°C			
Nominal Operating Cell Temperature (NOCT)	45±2°C			

STC:	Irradiance 1000W/m ²	Cell Temperature 25°C	AM=1.5
NOCT:	Irradiance 800W/m ²	Ambient Temperature 20°C	AM=1.5
			Wind Speed 1m/s

*Power measurement tolerance: ± 3%

Contact us!

Become the best solar company for the world +1(956) 308 3075 contact@solareverusa.com

LGCV POWER
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3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Nelson
LICENSE NUMBER: U33945

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Signature with Seal

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EMAIL ID# - Arken81@cloud.com
PHONE NO# (919) 622-9514
APN# 071600026001

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

Alex Nelson
 LICENSE NUMBER: U33945

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SHEET NAME

EQUIPMENT
 SPECIFICATION

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-11

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)	IQ8-8P-2-US	IQ8PLUS-72-2-US
Commonly used module pairings ¹	235 - 350	235 - 440
Module compatibility	60-cell/720 half-cell	60-cell/720 half-cell and 72-cell/144 half-cell
MPPT voltage range	27 - 37	29 - 45
Operating range	25 - 48	25 - 58
Min/max start voltage	30 / 48	30 / 58
Max input DC voltage	50	60
Max DC current ² (module I _{sc})	A	15
Overvoltage class DC port	II	II
DC port backfeed current	mA	0
PV array configuration	1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)	IQ8-8P-2-US	IQ8PLUS-72-2-US
Peak output power	245	300
Max continuous output power	240	290
Nominal (L-L) voltage/range ³	V	240 / 211 - 264
Max continuous output current	A	1.0
Nominal frequency	Hz	60
Extended frequency range	Hz	50 - 68
AC short circuit fault current over 3 cycles	Arms	2
Max units per 20 A (L-L) branch circuit ⁴	16	13
Total harmonic distortion	%	<5%
Overvoltage class AC port	III	III
AC port backfeed current	mA	30
Power factor setting		1.0
Grid-tied power factor (adjustable)		0.85 leading - 0.85 lagging
Peak efficiency	%	97.5
CEC weighted efficiency	%	97
Night-time power consumption	mW	80

MECHANICAL DATA

Ambient temperature range	-40°C to +60°C (-40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	MC4
Dimensions (HxWxD)	212 mm (8.37" x 175 mm (6.97" x 30.2 mm (1.27"
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - no fans
Approved for wet locations	Yes
Pollution degree	PO3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

CERTIFICATIONS

CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class E, CAN/CSA-C22.2 NO. 107.1-01
 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 (C22.2-2018 to 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.
 (1) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility>
 (2) Maximum continuous input DC current is 10.0A (3) Nominal voltage range can be extended beyond nominal if required by the utility; (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-D5-0002-01-EN-US-2022-03-17

DATA SHEET



IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.

Easy to install

- Lightweight and compact with plug-in-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complex with the latest advanced grid support**
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) requirements

* Only when installed with IQ System Controller 2, meets UL 1741
 ** IQ8 and IQ8plus supports split phase, 240V installations only.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Batteries, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.



Connect PV modules quickly and easily to IQ8 Series Microinverters using the included O-DCC-2 adapter cable with plug-in-play MC4 connectors.

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IQ8SP-D5-0002-01-EN-US-2022-03-17

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4
X-IQ-AM1-240-4C



X-IQ-AM1-240-4C

X-IQ-AM1-240-4

The **Enphase IQ Combiner 4/4C** with Enphase IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ microinverters 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 Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-US), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

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

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed



To learn more about Enphase offerings, visit enphase.com



Enphase IQ Combiner 4/4C

MODEL NUMBER

IQ Combiner 4 (X-IQ-AM1-240-4)

IQ Combiner 4C (X-IQ-AM1-240-4C)

ACCESSORIES AND REPLACEMENT PARTS

- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-US with 5-year Sprint data plan for Ensemble sites
- 4G based LTE-M1 cellular modem with 5-year Sprint data plan
- 4G based LTE-M1 cellular modem with 5-year AT&T data plan
- 4G based LTE-M1 cellular modem with 5-year Verizon data plan
- Support for Eaton BR210, BR220, BR230, BR240, BR250, and BR260 circuit breakers.
- Circuit breaker, 2 pole, 10A, Eaton BR210
- Circuit breaker, 2 pole, 15A, Eaton BR215
- Circuit breaker, 2 pole, 20A, Eaton BR220
- Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support
- Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
- Power line carrier (communication bridge pail), quantity - one pair
- XA-SOLARSHIELD-ES
- XA-PLUG-128-3
- XA-ENV-PCBA-3
- X-IQ-NA-HD-125A

ELECTRICAL SPECIFICATIONS

Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 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. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption metering CT (CT-200-SPLIT)	A pair of 200 A split core current transformers

MECHANICAL DATA

Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63")
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	<ul style="list-style-type: none"> • 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined input: 10 to 2/0 AWG copper conductors • Main lug combined input: 10 to 2/0 AWG copper conductors • Main lug combined input: 10 to 2/0 AWG copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6560 feet)

INTERNET CONNECTION OPTIONS

Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-US, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, CAT5E (or Cat 6) UTP Ethernet cable (not included)

COMPLIANCE

Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 197.1, 47 CFR Part 15, Class B, ICES 003, FCC Part 15, Class B, FCC Part 15.247, FCC Part 15.249, FCC Part 15.245, FCC Part 15.246, FCC Part 15.248, FCC Part 15.249, FCC Part 15.250, FCC Part 15.251, FCC Part 15.252, FCC Part 15.253, FCC Part 15.254, FCC Part 15.255, FCC Part 15.256, FCC Part 15.257, FCC Part 15.258, FCC Part 15.259, FCC Part 15.260, FCC Part 15.261, FCC Part 15.262, FCC Part 15.263, FCC Part 15.264, FCC Part 15.265, FCC Part 15.266, FCC Part 15.267, FCC Part 15.268, FCC Part 15.269, FCC Part 15.270, FCC Part 15.271, FCC Part 15.272, FCC Part 15.273, FCC Part 15.274, FCC Part 15.275, FCC Part 15.276, FCC Part 15.277, FCC Part 15.278, FCC Part 15.279, FCC Part 15.280, FCC Part 15.281, FCC Part 15.282, FCC Part 15.283, FCC Part 15.284, FCC Part 15.285, FCC Part 15.286, FCC Part 15.287, FCC Part 15.288, FCC Part 15.289, FCC Part 15.290, FCC Part 15.291, FCC Part 15.292, FCC Part 15.293, FCC Part 15.294, FCC Part 15.295, 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Enphase IQ Envoy

The **Enphase IQ Envoy™** communications gateway delivers solar production and energy consumption data to Enphase Enlighten™ monitoring and analysis software for comprehensive, remote maintenance and management of the Enphase IQ System.

With integrated revenue grade production metering and optional consumption monitoring, Envoy IQ is the platform for total energy management and integrates with the Enphase Ensemble™ and the Enphase IQ Battery™.

Smart

- Enables web-based monitoring and control
- Bidirectional communications for remote upgrades
- Supports power export limiting and zeroexport applications

Simple

- Easy system configuration using Enphase Installer Toolkit™ mobile app
- Flexible networking with Wi-Fi, Ethernet, or cellular

Reliable

- Designed for installation indoors or outdoors
- Five-year warranty



To learn more about Enphase offerings, visit enphase.com



To learn more about Enphase offerings, visit enphase.com

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Enphase IQ Envoy

MODEL NUMBERS

Enphase IQ Envoy™
ENV-IQ-AMT-240

Enphase IQ Envoy communications gateway with integrated revenue grade PV production metering (ANSI CT12.20 +/- 0.5%) and optional consumption monitoring (+/- 2.5%), one 200A continuous rated production CT (current transformer).

ACCESSORIES (Order Separately)

Enphase Mobile Connect™
CELLMODEM-M1 (4G LTE-M/5-year data plan)
CELLMODEM-M1-B (4G-based LTE-M/5-year data plan)
Consumption Monitoring CT
CT-200-SPLIT

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.)
Split-core consumption CTs enable whole home metering.

ENSEMBLE COMMUNICATIONS KIT

COMMS-KIT-01

Installed at the IQ Envoy. For communications with Enphase Enlighten™ storage and Enphase Power™ smart switch. Includes USB cable for connection to IQ Envoy or Enphase IQ Combiner™ and allows wireless communication with Enphase and Empower.

POWER REQUIREMENTS

Power requirements
Max 20 A overcurrent protection required.
5W

TYPICAL POWER CONSUMPTION

Typical Power Consumption
5W

CAPACITY

Number of microinverters polled
Up to 600

MECHANICAL DATA

Dimensions (WxHxD)
21.3 x 12.6 x 4.5 cm (8.4" x 5" x 1.8")
Weight
17.6 oz (498 g)
Ambient temperature range
-40° to 65° C (-40° to 149° F)
-40° to 46° C (-40° to 115° F) if installed in an enclosure

ENVIRONMENTAL RATING

IP30. For installation indoors or in an NRTL-certified, NEMA type 3R enclosure.
To 2000 meters (6,560 feet)

PRODUCTION CT

• Limited to 200A of continuous current / 250A OCPD - 72kW AC
• Internal aperture measures 19.36mm to support 250MCM THWN conductors (max)

CONSUMPTION CT

• UL2808 certified for revenue grade metering
• For electrical services to 250A with parallel runs up to 500A
• Internal aperture measures 0.84" x 0.96" (21.33mm x 24.38mm) to support 3/0 THWN conductor
• UL2808 certified, for use at service entrance for services up to 250Vac

INTERNET CONNECTION OPTIONS

Integrated Wi-Fi
802.11b/g/n
Ethernet
802.3 Cat5e (or Cat 6) UTP Ethernet cable (not included)
Mobile
CELLMODEM-M1 (4G) or CELLMODEM-M1-B (4G). Not included. Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.

COMPLIANCE

Compliance
UL 61010-1
CAN/CSA C22.2 No. 61010-1
47 CFR, Part 15, Class B, ICES 003
IEC/EN 61010-1:2010,
EN50065-1, EN61000-4-5, EN61000-6-1, EN61000-6-2
Metering: ANSI CT12.20 accuracy class 0.5 (PV production only)

Alex Nelson
LICENSE NUMBER: U33945

REVISIONS	DESCRIPTION	DATE	REV
		09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO# (919) 622-9514
APN# 071600026001

SHEET NAME

EQUIPMENT SPECIFICATION

SHEET SIZE

**ANSI B
11" X 17"**

SHEET NUMBER

PV-13

Enphase Q Cable and Accessories

The **Enphase Q Cable™** and accessories are part of the sixth generation Enphase IQ System™. These products provide simplicity, reliability, and faster installation times.



Enphase Q Cable

- Two-wire, double-insulated Enphase Q Cable is 50% lighter than the previous generation Enphase cable
- Four-wire (three-phase) option also available
- New cable numbering and plug and play connectors speed up installation and simplify wire management
- Link connectors eliminate cable waste

Field-Wireable Connectors

- Easily connect Q cables on the roof without complex wiring
- Make connections from any open connector and center feed any section of cable within branch limits
- Available in male and female connector types

Enphase Q Cable Accessories

Q CABLE SPECIFICATIONS

Voltage rating	600V (connector rating up to 250 V)
Cable temperature rating	90° C wet/dry
UV exposure rating	EN ISO 497-2
Environmental protection rating	IEC 60529 IP67
Compliance	RoHS, OIL RES I, CE, UV resistant
Cable insulator rating	H07BQ-F
Flame rating	IEC 60332-1-2

Q CABLE TYPES / ORDERING OPTIONS

Model Number	Max Nominal Voltage	Amplitude Rating	Connector Spacing	PV Module Orientation	Connector Count per Box
Q-25-10-240 (single-phase)	250 VAC	25 A	1.3 m	Portrait	240
Q-25-17-240 (single-phase)	250 VAC	25 A	2.0 m	Landscape (60-cell)	240
Q-25-20-200 (single-phase)	250 VAC	25 A	2.3 m	Landscape (72-cell)	200
Q-25-10-3P-200 (three-phase)	250 VAC	25 A	1.3 m	Portrait	200
Q-25-17-3P-160 (three-phase)	250 VAC	25 A	2.0 m	Landscape (60-cell)	160
Q-25-20-3P-160 (three-phase)	250 VAC	25 A	2.3 m	Landscape (72-cell)	160

ENPHASE Q CABLE ACCESSORIES

Name	Model Number	Description
Raw Q Cable (single-phase)	Q-25-RAW-300	300 meters cable with no connectors
Raw Q Cable (three-phase)	Q-25-RAW-3P-300	300 meters cable with no connectors
Field-wireable connector (male)	Q-CONN-R-10M	Make connections using single-phase cable
Field-wireable connector (female)	Q-CONN-3P-10M	Make connections using three-phase cable
Field-wireable connector (male)	Q-CONN-R-10F	Make connections from any Q Cable (single-phase) open connector
Field-wireable connector (female)	Q-CONN-3P-10F	Make connections from any Q Cable (three-phase) open connector
Cable Clip	ET-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling
Disconnect tool	Q-DISC-10	Disconnect tool for Q Cable connectors, DC connectors, and AC module mount
Disconnect tool	Q-DISC-3P-10	Disconnect tool for three-phase Field wireable connectors
Q Cable sealing caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling
Terminator (single-phase)	Q-TERM-R-10	Terminator cap for unused single-phase cable ends
Terminator (three-phase)	Q-TERM-3P-10	Terminator cap for unused three-phase cable ends
Replacement DC Adaptor (MC4)	Q-DCC-2-INT	DC adaptor to MC4 (max voltage 100 VDC)



TERMINATOR
 Terminator cap for unused cable ends, sold in packs of ten (Q-TERM-R-10 / Q-TERM-3P-10)



DISCONNECT TOOL
 Plan to use at least one per installation, sold in packs of ten (Q-DISC-10)
 Three-phase model (Q-DISC-3P-10)



SEALING CAPS
 Sealing caps for unused cable connections, sold in packs of ten (Q-SEAL-10)



CABLE CLIP
 Used to fasten cabling to the racking or to secure looped cabling, sold in packs of one hundred (ET-CLIP-100)

REV/SIONS	DATE	REV
DESCRIPTION	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO# (919) 622-9514
 APN# 071600026001

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"
 SHEET NUMBER
PV-14

Enphase IQ System Controller 2

The **Enphase IQ System Controller 2** connects the home to grid power, the IQ Battery system, and solar PV. It provides microgrid interconnection device (MID) functionality by automatically detecting and seamlessly transitioning the home energy system from grid power to backup power in the event of a grid failure. It consolidates interconnection equipment into a single enclosure and streamlines grid independent capabilities of PV and storage installations by providing a consistent, pre-wired solution for residential applications.

Reliable

- Durable NEMA type 3R enclosure
- Ten-year limited warranty

Smart

- Controls safe connectivity to the grid
- Automatically detects grid outages
- Provides seamless transition to backup

Simple

- Connects to the load or service equipment¹ side of the main load panel
- Centered mounting brackets support single stud mounting and bottom right side
- Supports whole home and partial home backup and subpanel backup
- Up to 200A main breaker support
- Includes neutral-forming transformer for split-phase 120/240V backup operation
- IQ System Controller supports backward compatibility with older generation of PV microinverters (M215, M250 and S series), making it simple for home owners to upgrade their systems
- Easy integration with generator from major manufacturers

1. IQ System Controller 2 is not suitable for use as service equipment in Canada.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ System Controller 2

MODEL NUMBER EP2000-101-M24N0501	Enphase IQ System Controller 2 with neutral-forming transformer (NFT), Microgrid Interconnect Device (MID), Breaker, and Service. Streamlines grid independent capabilities of PV and Battery installations.
ACCESSORIES AND REPLACEMENT PARTS	Replacement IQ System Controller 2 printed circuit board Eaton type BR circuit breaker hold-down screw kit, BRHDC125 200A split core current transformers for Generator metering (4-2.5kV) Not included, must order separately. - BRK-100A-2P-240V Main breaker, 2 pole, 100A, 25kAIC, CSB2150 - BRK-150A-2P-240V Main breaker, 2 pole, 150A, 25kAIC, CSB2150N - BRK-200A-2P-240V Main breaker, 2 pole, 200A, 25kAIC, CSB2200N - BRK-100A-2P-240V 48 Circuit breaker, 2 pole, 20A, 10kAIC, BR2208 - BRK-30A-2P-240V Circuit breaker, 2 pole, 30A, 10kAIC, BR2208 - BRK-40A-2P-240V Circuit breaker, 2 pole, 40A, 10kAIC, BR2208 - BRK-60A-2P-240V Circuit breaker, 2 pole, 60A, 10kAIC, BR250 - BRK-80A-2P-240V Circuit breaker, 2 pole, 80A, 10kAIC, BR250 IQ System Controller 2 installation handle kit (order separately) IQ System Controller 2 hardware kit, including labels, feed-through headers, screws, filler plates, and OIG 2 pole, 200A/40A, 10kAIC, BQC220240
ELECTRICAL SPECIFICATIONS	Continuous operation at 100% of its rating 240 VAC / 100 - 110 VAC 48 VAC 11V Nominal (11.2V to 12.8V AC) Auxiliary contact for load control, excess PV control, and generator low-voltage control 24V, 1A Normal frequency / range 60 Hz / 50 - 63 Hz Frequency measurement accuracy ±0.1 Hz Maximum continuous current rating 160A Maximum input overcurrent protection device 200A Maximum output overcurrent protection device 200A Maximum overcurrent protection device rating for Generator circuit* 80A Maximum overcurrent protection device rating for storage branch circuit* 80A (The storage branch circuit can be replaced with PV) Maximum overcurrent protection device rating for OIB PV combiner branch circuit* 80A Neutral Forming Transformer (NFT) • Breaker rating (pre-installed) 40A, between L1 and Neutral, 40A between L2 and Neutral • Continuous rated power 3600VA • Maximum current 100A @ 120V • Peak unbalanced current 80A @ 120V for 30 seconds
MECHANICAL DATA	Dimensions (WxHxD) 50cm x 11.6cm x 24.6cm (19.7 in. x 4.6 in. x 9.7 in.) Weight 39.4 kg (87 lb) Ambient temperature range -40°F to 50°F (-40°F to 122°F) Coating Natural connection, plus heat shield Enclosure environmental rating Outdoor, NEMA type 3R, polycarbonate construction To 2500 meters (8200 feet) WIRE SIZES Connections (All lugs are rated to 95C) • Main lugs and backup load lugs • CIR breaker bottom wiring lugs • 4 AWG (wire provided) • 2 AWG (Charge lugs, and generator lugs) • Neutral (large lugs) • Large Nuts (5/16-24 UNF) • Small Nuts (10-32 UNF) Neutral and ground bars 14 AWG - 10 AWG 14 AWG - 6 AWG
COMPLIANCE	Compliance ILS, ITH, UL, ITC, SA, UL, ENEC, UL998, UL864A, UL878, UL9557, UL507, CSA C22.2 No. 1071, IEC 60300, AC156 IQ System Controller 2 is approved for Use as Service Equipment in the United States ¹ . 2. Compatible with BRHDC125 Hold-Down Kit to comply with 2017 NEC 710.13E for back-fed circuit breakers. 3. The IQ System Controller 2 is rated 12 kAIC. 4. The IQ System Controller 2 is not suitable for use as service equipment in Canada. 5. Sections from these standards were used during the safety evaluation and included in the ILS, ITH listing.

To learn more about Enphase offerings, visit enphase.com
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Alex Nelson
LICENSE NUMBER: U33945

REV	DATE	DESCRIPTION
01	09-30-2022	

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO# (919) 622-9514
APN# 07160026001

SHEET NAME
**EQUIPMENT
SPECIFICATION**

SHEET SIZE
**ANSI B
11" X 17"**

SHEET NUMBER
PV-15



LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Wilson
LICENSE NUMBER: U33945

REVISONS	
DESCRIPTION	DATE
	09-30-2022
	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-16

FLASHLOC™ DUO

BETTER SOLAR STARTS HERE

INSTALLATION GUIDE



PRE-INSTALL - CLEAN SURFACE AND MARK LOCATION
Ensure existing roof structure is capable of supporting loads prescribed in Flashloc Duo D&E Guide. Clean roof surface of dirt, debris, snow and ice.
Snap chalk lines for attachment rows. On shingle roofs, snap lines 1/4" below upslope edge of shingle course. This line will be used to align the upper edge of the mount.
NOTE: Space mounts per span charts found in Flashloc Duo D&E Guide.

STEP ONE: SECURE

ATTACHING TO A RAFTER: Place FLASHLOC DUO over rafter, location and align upper edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws. BACKFILL ALL PILOT HOLES WITH SEALANT.

ATTACHING TO SHEATHING: Place FLASHLOC DUO over desired location and align upper edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws. Next, secure mount with four (4) deck screws by drilling through the FLASHLOC DUO deck mount hole locations. Unirac recommends using a drill as opposed to an impact gun to prevent over-tightening or stripping roof sheathing.

IMPORTANT: SECURELY ATTACH MOUNT BUT DO NOT OVERTIGHTEN SCREWS.

STEP TWO: SEAL

Insert tip of UNIRAC approved sealant into port and inject until sealant exits vent. Continue array installation, attaching rails to mounts with provided T-bolts.

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

CUT SHINGLES AS REQUIRED: DO NOT INSTALL THE FLASHLOC SLIDER ACROSS THICKNESS VARIATIONS GREATER THAN 1/8" SUCH AS THOSE FOUND IN HIGH DEFINITION SHINGLES.

NOTE: When installing included rail attachment hardware, torque T-bolt nut to 30 ft-lbs.
NOTE: If an exploratory hole falls outside of the area covered by the sealant, flash hole accordingly.

USE ONLY UNIRAC APPROVED SEALANTS. PLEASE CONTACT UNIRAC FOR FULL LIST OF COMPATIBLE SEALANTS.

FLASHLOC™ DUO

BETTER SOLAR STARTS HERE

THE MOST VERSATILE DIRECT TO DECK ATTACHMENT

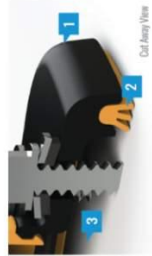
FLASHLOC™ DUO is the most versatile direct to deck and rafter attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the required number of screws to secure the mount and inject sealant into the base. FLASHLOC's patented TRIPLE SEAL technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with two rafter screws, sealant and hardware for maximum convenience (deck screws sold separately). Don't just divert water, **LOC it out!**



PROTECT THE ROOF

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

APRIL 2021, FLASHLOC DUO, V1



LOC OUT WATER

With an outer shield **1** contour-conforming gasket **2** and pressurized sealant chamber **3** the Triple Seal technology delivers a 100% waterproof connection.



HIGH-SPEED INSTALL

Simply drive the required number of screws 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

FASTER INSTALLATION. 25-YEAR WARRANTY.

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



LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Wilson
LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@icloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

EQUIPMENT
SPECIFICATION

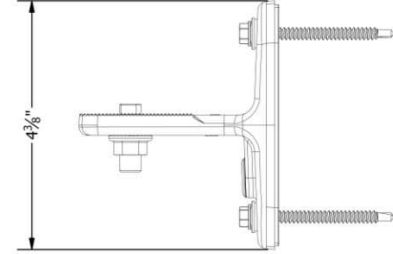
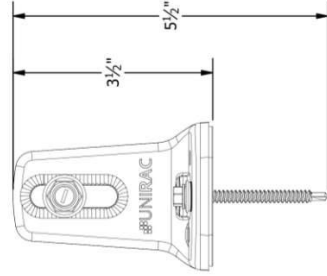
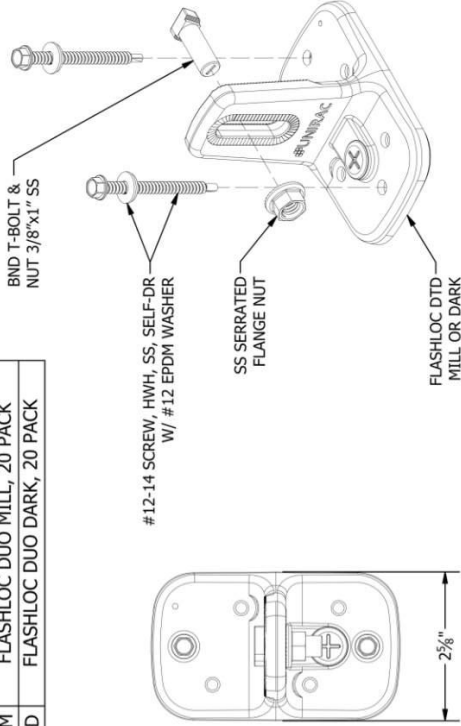
SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-17

PART TABLE	
P/N	DESCRIPTION
004275M	FLASHLOC DUO MILL, 20 PACK
004275D	FLASHLOC DUO DARK, 20 PACK



UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	ASSEMBLY DETAIL
DESCRIPTION:	FLASHLOC DUO KIT
REVISION DATE:	4/29/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

PRODUCT PROTECTED BY
ONE OR MORE US PATENTS

LEGAL NOTICE

FL-A04

SHEET



LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Nelson

LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-18

PART # TABLE		
P/N	DESCRIPTION	LENGTH
315168M	SM LIGHT RAIL 168" MILL	168"
315168D	SM LIGHT RAIL 168" DRK	168"
315240M	SM LIGHT RAIL 240" MILL	240"
315240D	SM LIGHT RAIL 240" DRK	240"

SM-P02 SHEET

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

PRODUCT PROTECTED BY
ONE OR MORE US PATENTS

LEGAL NOTICE

PRODUCT LINE: SOLARMOUNT
DRAWING TYPE: PART DETAIL
DESCRIPTION: LIGHT RAIL
REVISION DATE: 9/11/2017

UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PART # TABLE	
P/N	DESCRIPTION
302035M	ENDCLAMP PRO
302030M	MIDCLAMP PRO - MILL
302030D	MIDCLAMP PRO - DRK

END CAP
INCLUDED WITH END CLAMP

SM-A01 SHEET

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

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ONE OR MORE US PATENTS

LEGAL NOTICE

PRODUCT LINE: SOLARMOUNT
DRAWING TYPE: PART & ASSEMBLY
DESCRIPTION: PRO SERIES
BONDING CLAMPS
REVISION DATE: 10/26/2017

UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

REV/SIONS	DESCRIPTION	DATE	REV
01 <td></td> <td>09-30-2022 <td></td> </td>		09-30-2022 <td></td>	

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CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO# (919) 622-9514
APN# 07160026001

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-19

SM SOLAR MOUNT
ENDCLAMP, FIRST MODULE & TRIM
INSTALLATION GUIDE : PAGE K

INSTALL END CLAMPS ON RAIL: Slide the end clamp onto the rail until the bolt head engages with the top of the rail. Ensure the bolt is extended as far as possible. End clamp is positioned on the rail prior to installing end modules.

INSTALL MODULE END CLAMPS: The End Clamp should be accessible at the end of the rails. The clamp should be installed on the rails prior to installing end modules.

POSITION END CLAMPS: Slide the end clamp onto the rail until the bolt head engages with the top of the rail. Ensure the bolt is extended as far as possible. End clamp is positioned on the rail prior to installing end modules.

INSTALL FIRST MODULE: Install the first end module flange in full contact with the rail, rotate end clamp until the clamp engages with flange to provide clamp force. To ensure bolt is not over-torqued, use low torque setting on torque wrench. Drive, stop rotation as soon as you hear the click of the end clamp.

ENGAGE CLAMP: While holding module in position and with clamp in full contact with rail, rotate end clamp until the clamp engages with flange to provide clamp force. To ensure bolt is not over-torqued, use low torque setting on torque wrench. Drive, stop rotation as soon as you hear the click of the end clamp.

TORQUE VALUE (See table and notes on PG. 1)
End clamp bolt to 3 Ft-Lbs. No anti-rattle.

NOTE: To assist insertion of clamp into rail, use a screwdriver to push the top of side of bracket as shown. Do not force clamp into rail by pushing on bolt with excessive force.

SM SOLAR MOUNT
BONDING MIDCLAMP & TRIM
INSTALLATION GUIDE : PAGE L

INSERT MIDCLAMP ASSEMBLY: Insert 1/4" Bolt into top slot of rail.

MIDCLAMP: Place midclamp assembly and slide until clamp is against module frame. Do not tighten until next module is in position. Ensure bolt is perpendicular to rail.

POSITION INDICATOR - SERIATED T-BOLT: Tighten nut to required torque. T-Bolt position indicator is perpendicular to the rail.

PLACE ADJACENT MODULE AGAINST CLAMPS: Place adjacent module against clamps with no gaps. Tighten nut to required torque.

TORQUE VALUE (See table and notes on PG. 4)
1. 1 Ft-Lbs. No anti-rattle.

SM SOLAR MOUNT
CODE COMPLIANCE NOTES
INSTALLATION GUIDE : PAGE C

SYSTEM LEVEL FIRE CLASSIFICATION
The system fire class rating requires installation in the manner specified in the SOLAR MOUNT Installation Guide. SOLAR MOUNT has been classified to the system level UL705 certification. The system level fire classification is based on the system level fire classification of the components used in the system. The fire classification for the system level fire classification is based on the system level fire classification of the components used in the system. The fire classification for the system level fire classification is based on the system level fire classification of the components used in the system.

Module Type	System Level Fire Rating	Rail Direction	Module Orientation	Midclamp Orientation
Standard Rail	Class A, Class B & Class C	East-West	Landscape OR Portrait	None Required
Light Rail	Class A, Class B & Class C	East-West	Landscape OR Portrait	None Required

UL705 CERTIFICATION MARKING LABEL: The UL705 certification marking is embossed on all rail clamps as shown. Label should be applied to the SOLAR MOUNT rail at the edge of the array. Note: The sticker label should be placed such that it is visible, but not outward facing.

UNIRAC
UNIRAC SM
UNIRAC MTR COMPONENTS
UNIRAC MTR DOWRY
266009

SM SOLAR MOUNT
BONDING CONNECTION GROUND PATHS
INSTALLATION GUIDE : PAGE 0

BONDING MIDCLAMP ASSEMBLY: Aluminum mid clamp with stainless steel bonding pins that pierce module frame. Stainless steel nut, torque aluminum clamp to stainless steel T-bolt. Torque to 20 Ft-Lbs.

BONDING RAIL SPICE BAR: 1. Add nut and cap screw to splice bar. 2. Insert splice bar into rail. 3. Tighten nut and cap screw. 4. Torque to 20 Ft-Lbs.

RAIL TO L-FOOT W/ BONDING T-BOLT: 1. Insert T-bolt into rail. 2. Tighten nut to 20 Ft-Lbs. 3. Torque to 20 Ft-Lbs.

BONDING MICROINVERTER MOUNT: 1. Add nut and cap screw to microinverter mount. 2. Insert microinverter mount into rail. 3. Tighten nut and cap screw. 4. Torque to 20 Ft-Lbs.

BACK SYSTEM GROUND: 1. Add nut and cap screw to back system ground. 2. Insert back system ground into rail. 3. Tighten nut and cap screw. 4. Torque to 20 Ft-Lbs.



LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Nelson

LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@icloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

EQUIPMENT
SPECIFICATION

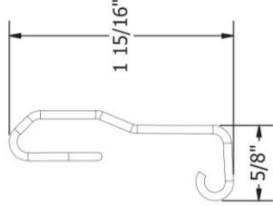
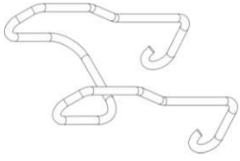
SHEET SIZE

ANSI B
11" X 17"

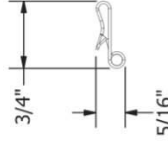
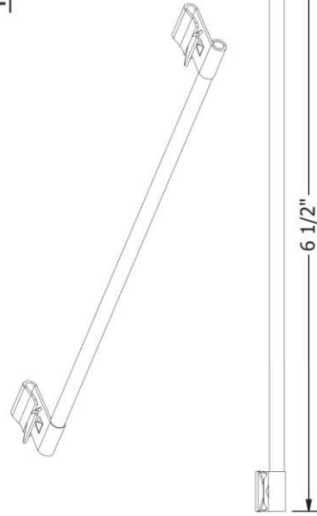
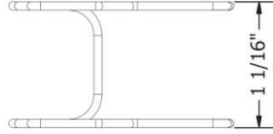
SHEET NUMBER

PV-20

PART # TABLE	
P/N	DESCRIPTION
240905C	SFM TRIM CLIP
008015S	SFM WIRE BONDING CLIP



TRIM CLIP



WIRE BONDING CLIP

SFMCR-P04 SHEET

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

PRODUCT PROTECTED BY
ONE OR MORE US PATENTS
LEGAL NOTICE

PRODUCT LINE:	SFMCR
DRAWING TYPE:	PART
DESCRIPTION:	TRIM CLIP / WIRE BONDING CLIP
REVISION DATE:	6/27/2018

UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

Alex Wilson
 LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

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CUSTOMER INFORMATION

ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO.# (919) 622-9514
 APN# 071600026001

SHEET NAME

EQUIPMENT
 SPECIFICATION

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-22



UNIRAC #0080155 Wire Bonding Clip



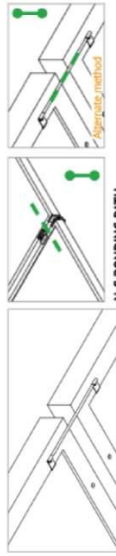
ILSCO SGB-4 Optional method for bonding module to EGC in the junction box using bare #6, completing the array bonding.



Webb Grounding Lug Optional method for bonding a single rail to the EGC in the junction box using bare #6, completing the array bonding.



Compliant With:
NEC 690.43(A) Photovoltaic Module Mounting Systems and Devices. Devices and systems used for mounting PV modules that are also used for bonding module frames shall be listed, labeled, and identified for bonding PV modules. Devices that mount adjacent PV modules shall be permitted to bond adjacent PV modules.



N-S BONDING PATH:
 N-S module to module bonding is accomplished with bonding clamp with 2 integral bonding pins. (refer also to alternate method)





August 23, 2022

Dear customer,

Thank you for your inquiry regarding the Wire Bond Clip (Part Number 008015S, pictured below) and the electrical bonding capabilities.



This letter is to report that when properly installed along the outside edge of an array, connecting two rows of panels, the connection accomplishes the bonding required by UL2703. The part has been tested and meets the requirements stated in UL2703. The part is a UL2703-recognized part, meeting NEC 690.43(A) requirements.

For further information, please contact Unirac, Inc. We're looking forward to seeing you making solar happen with us!

Best regards,

Keegan Sutantanto

Keegan Sutantanto
Product Manager, Residential
Unirac, Inc.

Unirac, Inc. • www.unirac.com

1411 Broadway Blvd. NE • Albuquerque, NM • 87102-1545 • Ph: (505) 742-1545 • Ph: (505) 742-6411 • Fax: (505) 742-6412

LG CY POWER
LG CY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Nelson

LICENSE NUMBER: U33945

REVISIONS		
DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-23



LGCY POWER
3333 DIGITAL DR #600, LEHI,
UT 84043, UNITED STATES
855-553-4689

Alex Nelson

LICENSE NUMBER: U33945

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DESCRIPTION	DATE	REV
	09-30-2022	01

Signature with Seal

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ALLEN KENT
190 KENT LANE,
COATS, NC 27521 USA
EMAIL ID# - Arken81@cloud.com
PHONE NO.# (919) 622-9514
APN# 071600026001

SHEET NAME

EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-24



October 3, 2019

UniRac

1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102-1545
TEL: (505) 242-6411
FAX: (505) 242-6412

Attn.: Unirac Engineering Department,

Re: Engineering Certification for UniRac's SolarMount Design & Engineering Guide

PZSE, Inc.-Structural Engineers has reviewed UniRac's "SolarMount Design & Engineering Guide" and specifically the enhancements of the SolarMount Flush-to-Roof System, Pressure Lookup Tables, and Downward & Upward Span Length Tables.

This certification excludes connections to building structures and the effects on building structure components. All information, data and analysis contained within the Installation Manual are based on, and comply with the following:

1. 2018 North Carolina Building Code, by The North Carolina State Building Code Council
2. 2009, 2012, 2012, & 2015 International Building Code, by International Code Council, Inc.
3. ASCE/SEI 7-05 & 7-10: Minimum Design Loads for Buildings and other Structures
4. 2010 & 2015 Aluminum Design Manual, by The Aluminum Association, 2015

This letter certifies that the structural calculations contained within UniRac's "SolarMount Design & Engineering Guide" are in compliance with the above Codes.

If you have any questions on the above, do not hesitate to call.

Prepared By:
PZSE, Inc. - Structural Engineers
Roseville, CA



1478 Stone Point Drive, Suite 190, Roseville, CA 95661
T 916.961.3940 F 916.961.3965 W www.pzse.com

Experience | Integrity | Empowerment

Alex Nelson
 LICENSE NUMBER: U33945

REVISIONS	DESCRIPTION	DATE	REV
		09-30-2022	01

Signature with Seal

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ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO# (919) 622-9514
 APN# 071600026001

SHEET NAME

**EQUIPMENT
 SPECIFICATION**

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-25



Certificate: 70131735
Project: 80060420

Master Contract: 266909
Date Issued: 2021-02-23

SolarMount

The system listed is designed to provide bonding/grounding, and mechanical stability for photovoltaic modules. The system is secured to the roof with the L-Foot components through the roofing material to building structure. Modules are secured to the racking system with stainless steel or aluminum mid clamps and Aluminum end clamps. The modules are bonded to the racking system with the stainless steel bonding mid clamps with piercing points. The system is grounded with 10 AWG copper wire to bonding/grounding lugs. Fire ratings of Class A with Type 1, 2, 3, or 10 for steep slope. Tested at 5" interstitial gap which allows installation at any stand-off height.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

The system may employ optimizers/micro-inverters and used for grounding when installed per installation instructions.

UL 2703 Mechanical Load ratings:

Downward Design Load (lb/ft ²)	113.5
Upward Design Load (lb/ft ²)	50.7
Down-Slope Load (lb/ft ²)	16.1

Test Loads:

Downward Load (lb/ft ²)	112.8
Upward Load (lb/ft ²)	50.13
Down-Slope Load (lb/ft ²)	7.5

Unirac Large Array

ULA is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules. ULA aluminum components merge with SM rails and installer-supplied steel pipe. The SM rail system is secured to the horizontal Pipe using the Rail Bracket components. The Rear and Front cap secures the horizontal Pipe to the vertical Pipe. The Front cap is also used to secure the Cross brace. A Slider is attached to the vertical Pipe to secure the Cross brace. The SM rails, caps, slider, rail brackets, and cross braces materials are 6105-T5 aluminum extrusion. Fasteners materials are 304 stainless steel. Horizontal and vertical pipe materials meet the minimum requirements of ASTM A53 for galvanized steel pipe in 2" and 3" diameter.

The mechanical load ratings from the SM test data will be applied to the ULA model. Fire Testing is not applicable due to being a ground mount system.



Certificate of Compliance

Certificate: 70131735

Master Contract: 266909

Project: 80060420

Date Issued: 2021-02-23

Issued To:
 Unirac
 1411 Broadway NE
 Albuquerque, New Mexico, 87102
 United States

Attention: Klaus Nicolaeidis

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Issued by: *Michael Hoffmaagle*
 Michael Hoffmaagle

PRODUCTS

CLASS - C531302 - POWER SUPPLIES- PHOTOVOLTAICS- PV Racking
 CLASS - C531382 - POWER SUPPLIES- PHOTOVOLTAICS PV Racking and clamping systems-Certified to US Standards

Models: SM SOLARMOUNT Flush-to-Roof is an extruded aluminum rail PV racking system that is installed parallel to the roof in landscape or portrait orientations.

ULA Unirac Large Array is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules.

Alex Nelson
 LICENSE NUMBER: U33945

REV/SIONS	DATE	REV
DESCRIPTION	09-30-2022	01

Signature with Seal

CUSTOMER INFORMATION

ALLEN KENT
 190 KENT LANE,
 COATS, NC 27521 USA
 EMAIL ID# - Arken81@cloud.com
 PHONE NO# (919) 622-9514
 APN# 071600026001

SHEET NAME
**EQUIPMENT
 CERTIFICATION**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-26

CERTIFICATE OF COMPLIANCE

Certificate Number 20220223-E341165
 Report Reference E341165-20210317
 Issue Date 2022-02-23

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Standards for Safety:

UL 62109-1, STANDARD FOR SAFETY OF POWER CONVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS - PART 1: GENERAL REQUIREMENTS, Edition 1, Revision Date 04/30/2019

IEC 62109-2, SAFETY OF POWER CONVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS - PART 2: PARTICULAR REQUIREMENTS FOR INVERTERS, Edition 1, Issue Date 06/2011

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 2, Revision Date 06/10/2021, including the requirements in UL 1741 Supplement SA, sections as noted in the Technical considerations.

IEEE 1547, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.

IEEE 1547.1, IEEE Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.

CSA C22.2 No. 62109-1, Safety of Power Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements, Edition 1, Issue Date 07/2016

CSA C22.2 No. 62109-2, Safety of Power Converters for Use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters, Edition 1, Issue Date 07/2016

B. Maloff
 Bruce Maloff, Director North American Certification Program
 UL LLC
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CERTIFICATE OF COMPLIANCE

Certificate Number 20220223-E341165
 Report Reference E341165-20210317
 Issue Date 2022-02-23

Issued to:
 Enphase Energy Inc.
 1420 N. McDowell Blvd, Petaluma, CA 94954-6515

This is to certify that representative samples of Grid Support, Utility Interactive Supporting Energy Storage, Multimode, Bi-directional Microinverters

Models IQ8-60, IQ8PLUS-72, IQ8M-72, IQ8A-72, IQ8H-208-72, IQ8H-240-72, may be f/b -2, -5, -E, or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RWA, may be f/b -&, where -&, designates additional characters.

Has been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: See Page 2

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

This Certificate of Compliance is provided as a courtesy to help our customers communicate product compliance information, as documented in our UL Follow-Up Services procedure. This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark shall be considered as being UL Certified and covered under UL's Follow-Up Services. Look for the UL Certification Mark on the product.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

B. Maloff
 Bruce Maloff, Director North American Certification Program
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