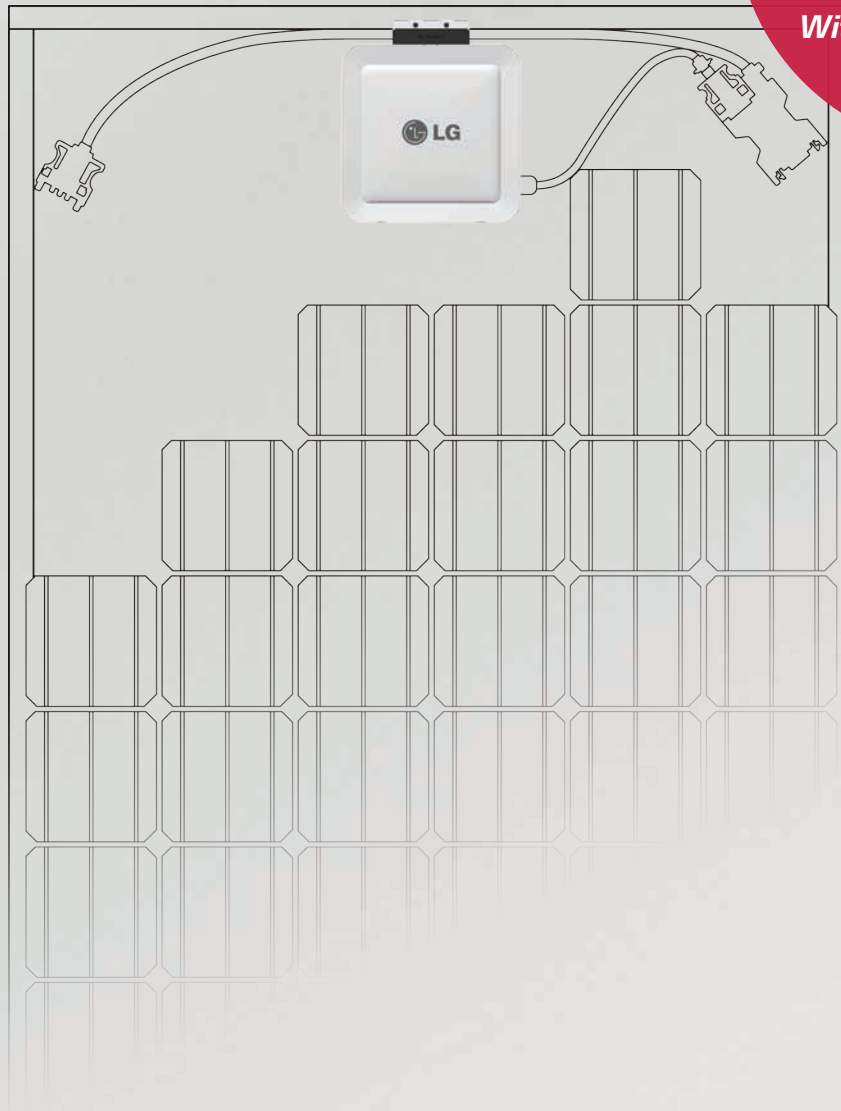


The Difference
Is in the Detail

With LG, it's all possible



Mono X[®] ACe

AC Module System Installation Instructions

LGxxxA1C-B3 / LGENBOX-01

* A minimum slope of 5 in/ft. for roof installations is required to meet fire class ratings.
The array frame must be grounded in accordance with NEC Article 250.

Table of Contents

1 Safety	3
1-1 Safety Symbols	3
1-2 Important Safety Instructions	3
1-3 FCC Guidelines	4
1-3 Circuit Symbols	4
2 Introduction	5
3 AC Module	6
3-1 Before Installation	6
3-2 Inspecting the Area of Installation	6
3-3 Inspecting Components of the AC Module	7
3-4 Measuring AC Voltage of the Utility	7
3-5 Wiring Diagram of AC Module System	8
3-6 Installing the AC Junction Box and PV Rack	9
3-7 Mounting the AC Module	9
3-8 Connecting AC Modules (Trunk Cable)	12
3-9 Grounding	16
3-10 Connecting AC Module Array to Distribution Panel (General AC Cable, Transition Cable) –240VAC, 208VAC	18
3-11 Operation	22
3-12 Maintenance	22
4 EnerBox™ Communication Gateway	23
4-1 Checking Components of the Communication Gateway	23
4-2 Connecting the Communication Gateway	24
4-3 Configuring the Installation App	25
4-4 Website	28
5 Accessories	29
6 Product Specifications	30
6-1 AC Module	30
6-2 EnerBox	32
6-3 Response to Abnormal Conditions	33
6-4 Dedicated Cables	34
7 Warranty	35
8 Transportation and Storage	35
9 Contact	35

Revisions


Date	Version	Description of Change	Remark
6/30/2014	1.0 (1 st Edition)		


1 Safety


Note and comply with the safety guidelines of this manual while handling AC modules. Failure to comply may result in severe damage to the equipment and/or fatal injuries.

1-1 Safety Symbols

Safety symbols are used to minimize loss and injury during handling and operation of the equipment specified in this manual.

 **DANGER** Failure to comply with the instructions may cause fatal injuries or immediate death.

 **WARNING** Failure to comply with the instructions may cause severe injuries or death.

 **CAUTION** Failure to comply with the instructions may cause injuries or damage to property.



Failure to comply with the instructions may cause severe injuries or immediate death by overvoltage.



Failure to comply with the instructions may cause injuries or damage to property by fire.

1-2 Important Safety Instructions

DANGER

- To prevent the risk of electric shock, stay away from current-carrying terminals during operation. And, allow several minutes after the circuit breaker has been turned off. It may be energized in the open position.
- To prevent the risk of overvoltage, do not disconnect the cable connector during operation.

WARNING

- To prevent the risk of burns, do not touch metal parts during operation.
- For safety, only qualified persons should service modules.
- To prevent the risk of electric shock, stay away from damaged module(s). Do not use module(s) with broken glass or torn backsheets.
- Damaged modules must be handled with proper safety equipment. Failure to comply may result in serious bodily injury or death.
- Micro inverter warranty void if cover removed. No serviceable parts inside. Refer servicing to qualified personnel.
- For proper operation, make sure to use exclusively cables, connectors and accessories provided by LG Electronics. Parts that are not listed may cause critical danger.
- For proper operation, the AC module shall be connected only to a dedicated branch circuit.
- To prevent the risk of fire, do not connect any device between the AC module and circuit breaker. Circuit breaker may not work properly.
- Before installation, make sure to check that the area of location meets the required environment specified in **Chapter 6. Product Specification** (Voltage, frequency, temperature, number of AC modules, overcurrent device).

CAUTION

- Use proper equipment, connectors, wires and buttresses for the installation of the module. Failure to comply may result in product damage, product failure and/or bodily injury.
- To reduce the risk of accidents, do not install during inclement weather.
- To prevent the risk of electric shock, do not touch the glass surface or frame of the solar module after installation.
- To prevent the risk of injury, do not apply pressure on the module (ex. placing heavy objects or stepping on the module).
- To prevent the risk of injury, do not drop the module; modules must be gently handled and placed down.
- For proper operation, do not scratch the coating surface of the frame. It may increase the corrosion of the frame.
- For proper operation, do not concentrate sunlight on the module surface.
- Addition of holes in the frame or glass of the module may decrease the strength and integrity of the frame or glass.
- Do not remove warning labels.
- Store the module in its original package until installation.

1-3 FCC Guidelines

For Micro inverter & Communication Gateway

You are cautioned that changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

For Communication Gateway

Indoor use only

FCC Caution: For indoor use only; outdoor use or in any other environments not covered in this manual may violate the FCC regulation and void the user's authority to use the product.

Specially, within the 5.15-5.25 GHz band, U-NII device is restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

FCC RF Radiation Exposure Statement:







This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 8.87 inches (20 cm) between the radiator and your body. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CAUTION: Regulations of the FCC and FAA prohibit airborne operation of radio-frequency wireless devices because their signals could interfere with critical aircraft instruments.

1-4 Circuit Symbols

The following circuit symbols are used to describe the AC module circuit in this manual.

Circuit Symbol	Description
	DC (Direct Current) supply. Generated from PV module.
	AC (Alternating Current) supply. Generated from utility and micro inverter. Used in electric appliances.
	Represents the phase of AC. The number in front of this symbol represents the number of phases.
	Terminal for EGC (Equipment Grounding Conductor) normally used to connect non-current carrying metal parts of equipment together.
	Terminal for GEC (Grounding Electrode Conductor) connecting EGCs and neutral conductors to the ground for grounding.
	Circuit breaker switch. I : ON, O : OFF.

- ⇒ PV module: Equipment that receives solar energy and generates DC power.
- ⇒ Inverter: Equipment that converts DC power into AC power.
- ⇒ Utility-Interactive inverter: Inverter connected in parallel with the grid to supply power.
- ⇒ Micro inverter: Inverter designed with minimal size to supply power to each PV module.

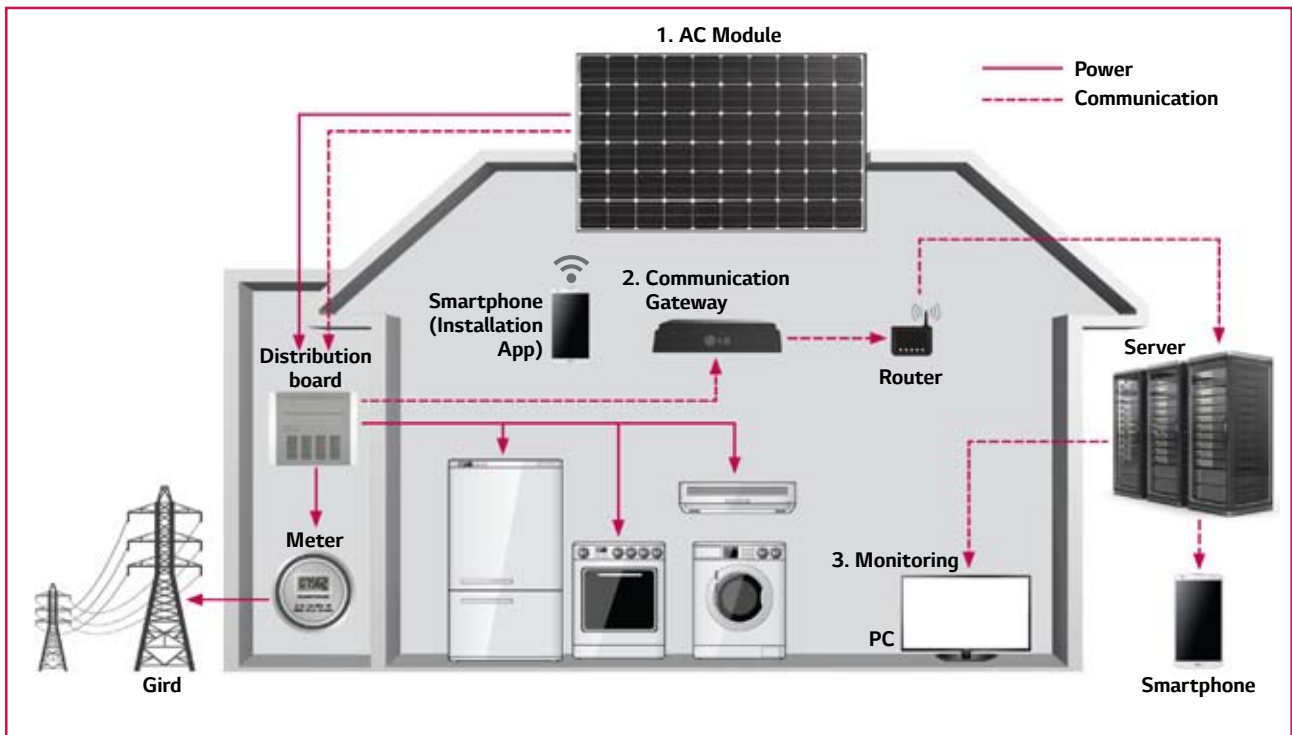
2 Introduction

LG AC module consists of PV(Photovoltaic) module and “Utility-Interactive” micro inverter. Without any additional equipment, it converts the solar energy to AC power used in electric appliances and supplies to the utility.

The Advantages of AC Module System

- The AC module system, unlike a central inverter system, operates with module MPPT. The AC module does not have any adverse effect on the other modules, allowing more power production in comparison to a central inverter system.
- Eliminates installations related to DC voltage, reducing total installation and labor costs.
- Maintenance is easy as the system can be monitored in real time.

AC Module System



1. AC module

- Consists of PV module and micro inverter.
- Performs MPPT function, maximizing power generation.

2. Communication gateway

- Collects information about AC module system via AC cable.
- Stores data inside.
- Uses wireless connection to transmit data to smartphone or tablet.

3. Monitoring

- Monitors and analyzes condition of the solar system.
- Transmits the condition of the system to the service center in case of a problem.

⇒ MPPT : Maximum Power Point Tracking.

3 AC Module

3-1 Before Installation

- LG AC module is “Utility-Interactive”, which requires approval from the corresponding authority prior to system connection. Contact the applicable local government agencies and/or utility company.
- Installation, maintenance, and supervision may only be carried out by an approved installer for the safety of workers and systems.
- Read and follow the installation guidelines specified in this manual. Installation in unapproved methods may result in injuries includes fatal injuries and/or damage to the equipment. Consult with LG Solar for the approval of the installation methods that are not specified in the installation manual. Failure to comply will void the warranty and the module certificate.
- After receipt of LG AC module, check for possible damages from production or transportation. Any damaged module must not be installed. Request an exchange by contacting LG Solar.
- If original modules (or parts) are replaced, check that the modified module works properly. The modified module shall retain its model number.
- Store the AC module in its original packing until installation.
- Do not remove the dust cover from the connector in advance. Any particles in the cable may cause interference to the current.
- Consider the weight of LG AC module before installation. The weight of LG AC module is 39.68lbs.
- Do not work alone. Install as a team unit with at least 2 persons working at a time.
- To prevent the risk of accidents, install with safety gear on at all times.
- Do not install in times of inclement weather. There is a risk of electric shock when it is raining or snowing.
- If installation location is high above ground, make sure to wear safety belt during the installation.
- Check that all parts used during the installation are certified for outdoor usage.
- During the module installation, do not let children near the module and the system.
- Carry out the installation according to the local electric code.

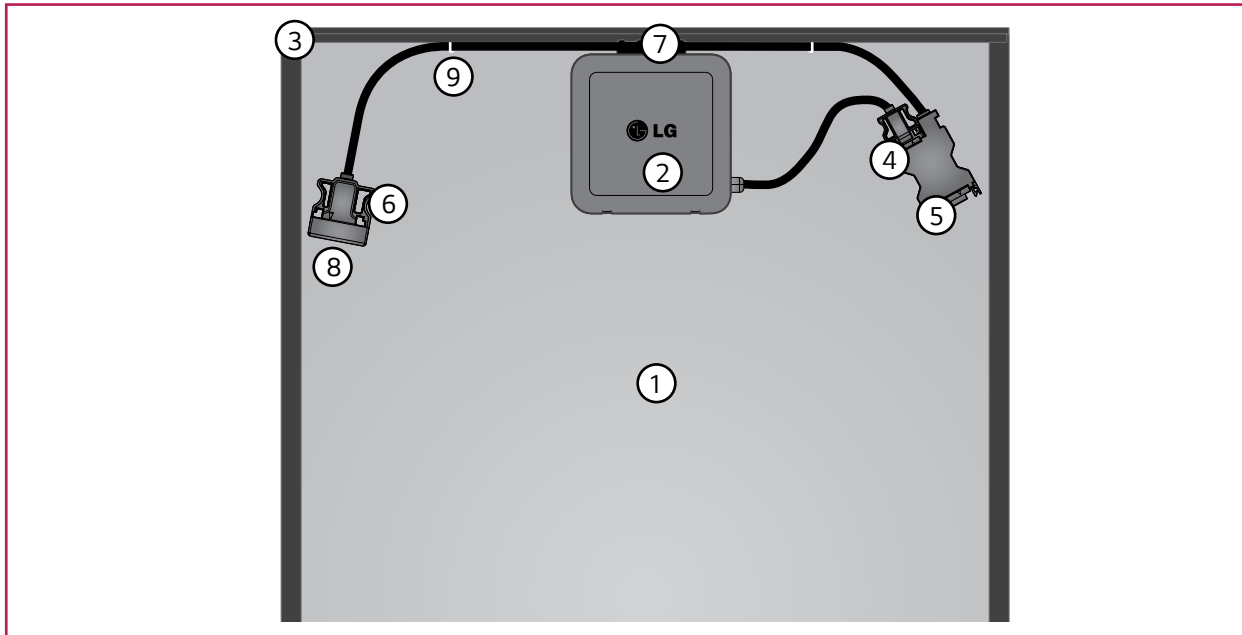
3-2 Inspecting the Area of Installation

Check that the location of installation meets the following requirements.

- Do not install near highly combustible structures or materials.
- Do not install where the maximum ambient temperature exceeds 149°F (65°C).
- Do not install at a place with direct exposure to salt water or ammonia.
- Do not install at a place easily accessible to people.
- Do not install indoors or on a moving vehicle.
- In a place with frequent lightning storms, by installer, an auxiliary grounding may be connected directly from the AC module system to the ground.
- If the target installation structure lies on an unlevelled surface, do not forcefully modify the module to fit the structure. Make sure that the installation structure has been set up to provide a flat surface. Unreliable structures may cause damage to the product during and/or after installation.

3-3 Inspecting Components of the AC Module

After receiving the product, inspect all parts for possible deformity or malfunction.



- ① **PV module**
Converts the solar energy to DC power.
- ② **Micro inverter**
Converts DC power generated by each PV module to AC power.
- ③ **PV frame**
Protects and fixates AC module.
- ④ **AC drop cable**
Connects a micro inverter to trunk cable.
- ⑤ **Trunk male connector**
Junction connector between AC drop cable and trunk female connector.
- ⑥ **Trunk female connector**
Connects to trunk male connector of the next AC module in the array.
- ⑦ **Bracket**
Fixes trunk cable onto PV frame.
- ⑧ **Dust cover**
Prevents entry of foreign particles.
- ⑨ **Cable holder**
Prevents AC trunk cables from moving during transportation.
* Warranty is void if it is broken after installed.

3-4 Measuring AC Voltage of the Utility

Measure the AC voltage of the utility at the distribution panel using a multi-meter. Refer to the table below to determine the number of modules per array.

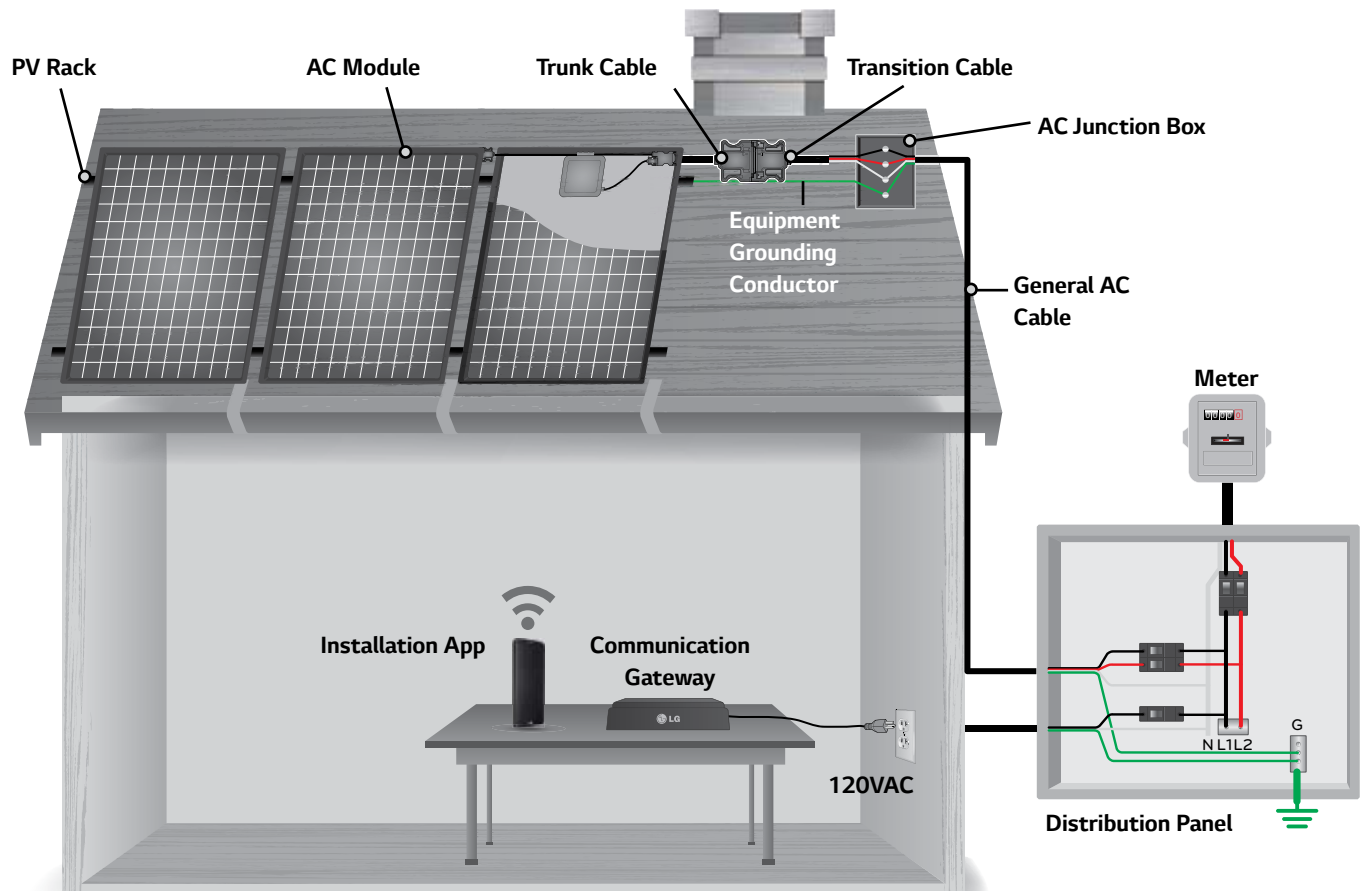
AC Voltage	Number of Maximum AC Modules	20A Circuit Breaker
Single phase 240V (per 1-array)	12 units	2-pole x 1ea
Three phase 208V (per 3-array)	6 units x 3 (merge type)	3-pole x 1ea
	11 units x 3 (split type)	2-pole x 3ea

* For details, refer to **Chapter 3-10. Connecting AC Module Array to the Distribution Panel.**

* Factory setting of AC voltage of the AC modules is 240VAC. If you want to change the operating AC voltage range, you need to set grid configuration directly. For details, refer to **Chapter 4-3. Configuring the Installation App - Step 5.**

3-5 Wiring Diagram of AC Module System

Below is a sample diagram of the AC module system.



Install in the following order. For details, please refer to each chapter.

Chapter 3-6. Installing the AC Junction Box and PV Rack

Install the AC junction box and PV rack at the installation site.

Chapter 3-7. Mounting the AC module

Mount AC modules on PV rack.

Chapter 3-8. Connecting AC Module (Trunk Cable)

Connect to AC modules by using trunk cables.

Chapter 3-9. Grounding

Connect the equipment grounding conductor to the distribution panel.

Chapter 3-10. Connecting Array of AC Modules-to-Distribution Panel (General AC Cable, Transition Cable) - 240VAC, 208VAC

Connect arrays of AC modules to the distribution panel by using transition cables and general AC cables. (Wiring method depends on the voltage of the utility)

Chapter 4-2. Connecting the Communication Gateway

Connect the communication gateway to 120VAC outlet.

- ⇒ PV Rack: Structure used to fix AC modules on surfaces like roofs, empty plots, etc.
- ⇒ AC Junction Box: Container for electrical connections of AC cables, usually intended to conceal them from sight and prevent tampering.
- ⇒ General AC Cable : AC cable, not supplied by LG, used generally for outdoor electrical installation.
- ⇒ Distribution Panel : Component of an electricity supply system which divides an electrical power feed into subsidiary circuits in a common enclosure that provides a protective fuse or circuit breaker for each circuit.

3-6 Installing the AC Junction Box and PV Rack

Before installing the AC junction box and PV rack, be aware of the following requirements:

NOTICE

- To allow ventilation through the backside of the AC module, it is recommended to install the PV rack allowing a gap of at least 4 inches (100mm) between the back of the module and roof surface.
- Install AC junction box near the AC module.
- Install using the parts approved by the relevant local authority of installation site.
- Select appropriate angle for maximum exposure to sunlight.

Construct the over all frame of the solar system in the following order:

1. Install the PV rack according to the number of modules per array and the dimensions of the AC module. (refer to **Chapter 6. Product Specification**)
2. Install the AC junction box near the PV rack. Select the size and type of AC junction box suitable for connection type according to the output voltage. (Refer to **Chapter 3-10. Connecting Array of AC Modules to Distribution Panel**)

3-7 Mounting the AC module

Before mounting AC module in the PV rack, be aware of the following requirements:

NOTICE

- Check that all parts of the product are intact and operational.
- Check that the cable connectors are well fixed.
- It is recommended to install the module at any angle with respect to the horizon, making it easier for dust to be washed off by rain.
- When installed on a roof, the PV module must be mounted over a fire-resistant roof. The fire resistance of the PV module is class C according to ANSI/UL790.
- For proper operation, do not remove PV frame or replace with another frame.
- Additional holes on the frame may weaken, the strength of the frame and cause damage.
- To avoid the tensile strain from the thermal expansion, it is recommended to install with a gap of between 0.236 inches (6mm) to 7.087 inches (180mm) between PV frames considering the length of the trunk cable. If gap exceeds 7.087 inches, use the extension cable.
- Mount LG AC module to PV rack with 8~12N-mtorque.
- For reliable connection, do not place any foreign objects between PV frame and the PV rack.
- When installing modules in areas of heavy snow, special care should be taken to install the modules in a manner that provides sufficient strength while meeting local code requirements.



PV Module Specification (conditions of 1000W/m² irradiance and 77°F (25°C) solar cell temperature)

Operation temperature

Maximum operation temperature: +194°F (90°C).

Minimum operation temperature: -40°F (-40°C).

Design strength

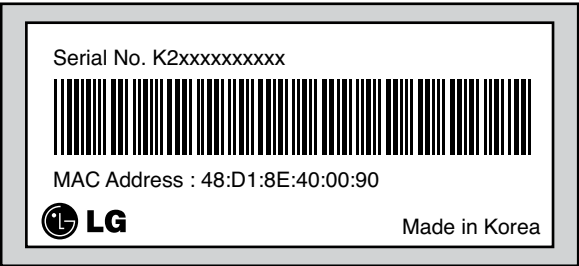
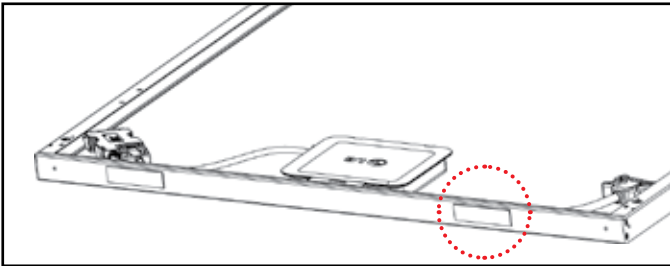
LGE solar modules are certified to basic loads of 50lb/ft².
(about 2400 Pa)

Notes

- LG AC module can not be operated in locations of direct contact to salt water or ammonia.
- LG AC module is thin, so it may bend depending on the type of the PV rack.
- Reflection from snow, water or other weatherly variables may increase the output generated in the module.
- Colder temperatures may substantially increase voltage and power.

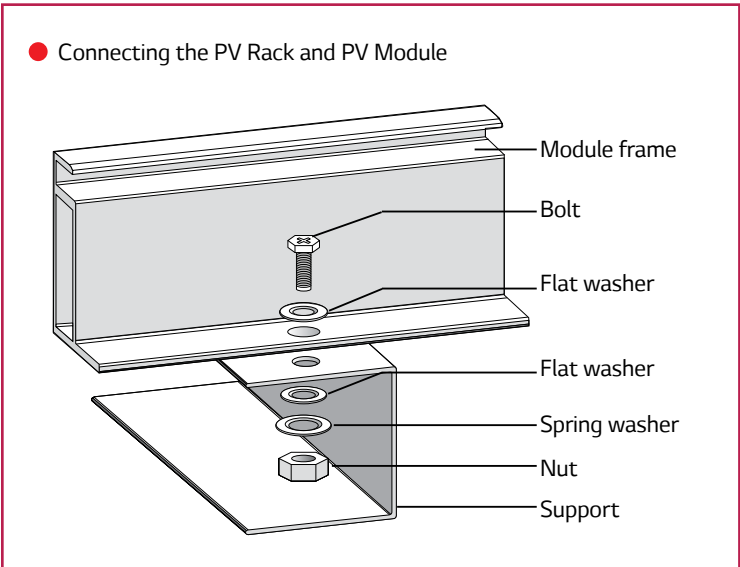
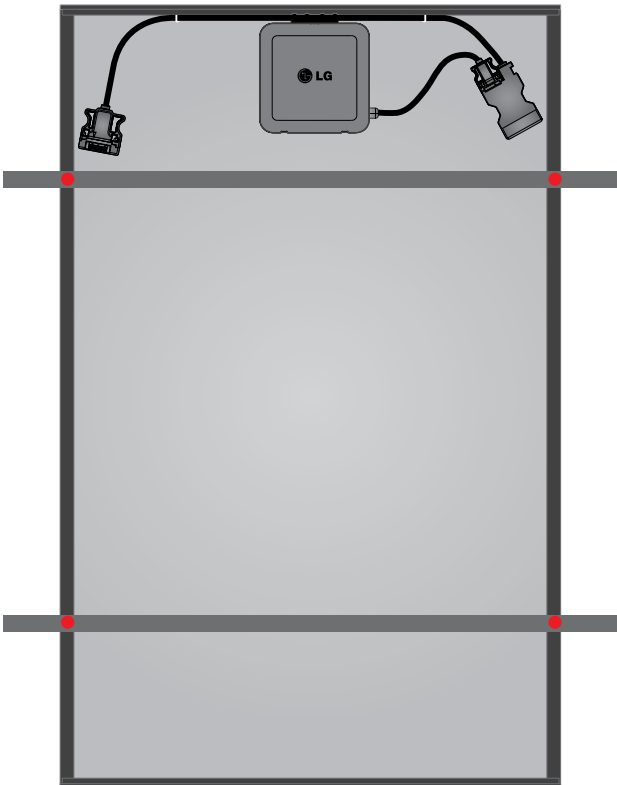
Fix AC module to the PV rack in the following order:

Step 1. Peel adhesive label attached on the side of PV frame of AC modules and stick on a piece of paper mirroring the array to map for monitoring.



Step 2. Place AC modules on the PV rack with a minimum gap of 0.236 inch (6mm) between each module. To prevent the risk of slipping during installation, mount AC modules one by one. Connect trunk cables to each mounted AC module. (Refer to **Chapter 3-8. Connecting AC Modules**)

Step 3. Fixate the PV module to the PV rack on the four mounting holes (marked by ● points below) with 4 M6 stainless bolts, 4 nuts, 4 spring washers, and 8 flat washers. (To mount according to the different type of PV racks, refer to the next page under **Mounting According to the Different PV Racks**)

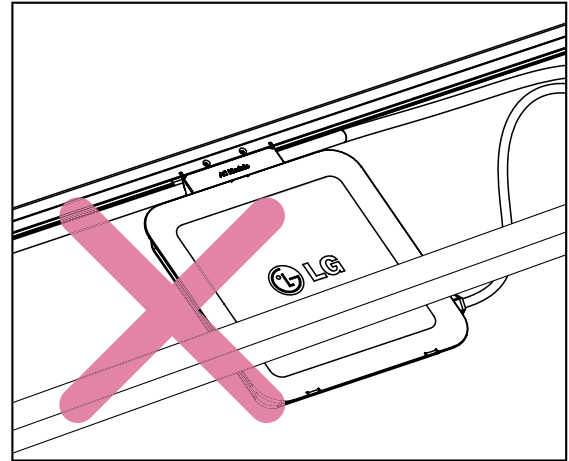
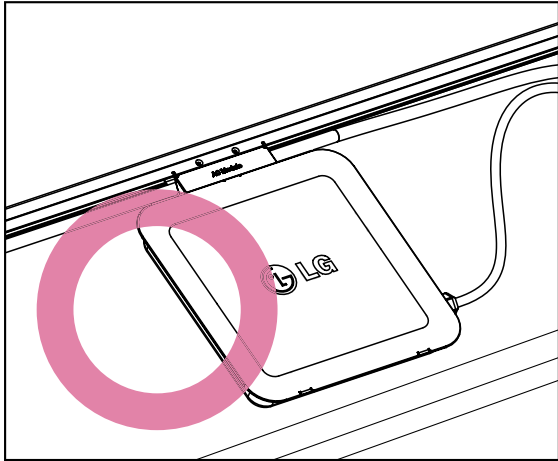


WARNING



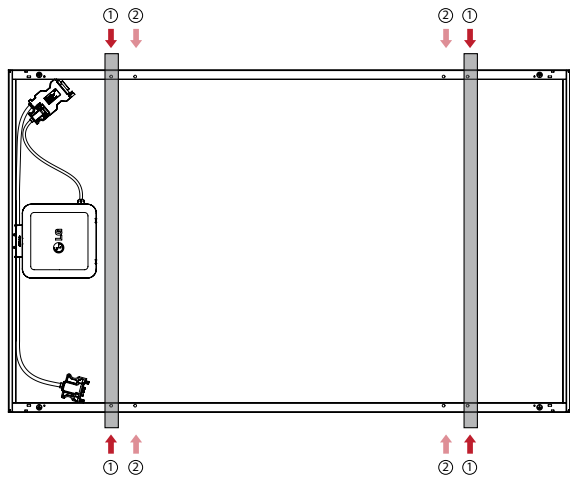
• To prevent the danger of the electric shock, make sure to turn off the circuit breaker prior to installation.

Mounting According to the Type of PV rack



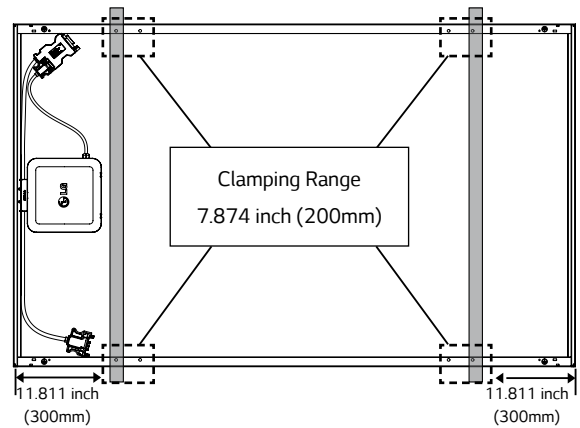
Minimum distance between module edge to PV rack is 10.236 inch (260mm).

Mounting Type



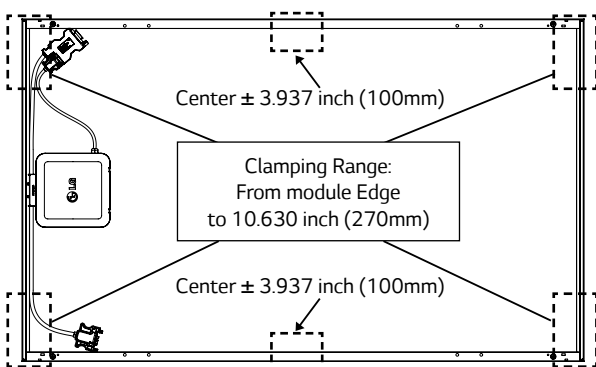
Use four mounting holes on two opposite sides.

Clamping Type (Long Side)



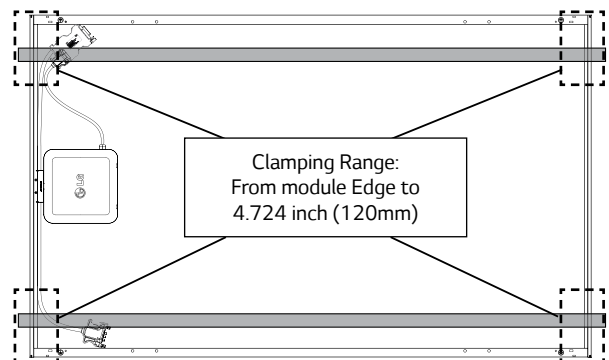
Use four clamps on the long frame.

Clamping Type (Short Side)



Use four clamps on the short frame and two clamps at the center of long frame.

This method is not tested by IEC/UL.



Use four clamps on the short frame.

This installation is allowed in the following cases:

1. Slope roof: If module is installed parallel to the rooftop.
2. Flat roof: If installed with an additional stand such as wind shield or deflector.

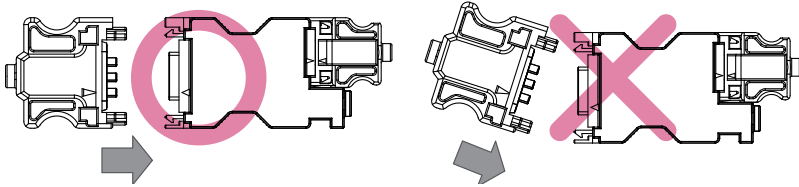
* Please check that PV rack does not interfere with a micro inverter.

3-8 Connecting AC Modules (Trunk Cable)

Before connecting AC modules in each array, be aware of the following precautions:

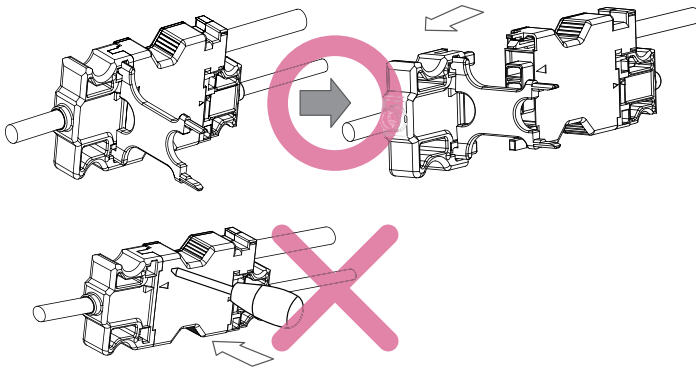
Trunk connector insertion

- Insert trunk female connector into trunk male connector in horizontal direction. If you insert at wrong angle, the connector can be damaged.
- Insert fully into the end of the connector until you hear a click.



Trunk connector removal

- Use the dedicated unlocking tool to remove the connector. Do not use any other tools.

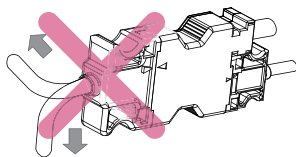


Checking Accessory

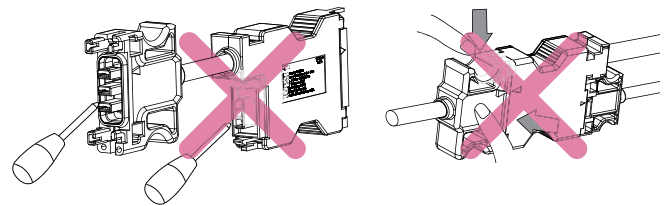


Trunk cable usage and maintenance

- Do not bend the cable more than 10 times. It may result in mechanical and/or electrical problems.



- Avoid all external interference to the connector. Do not impose force on the side direction of the connector.



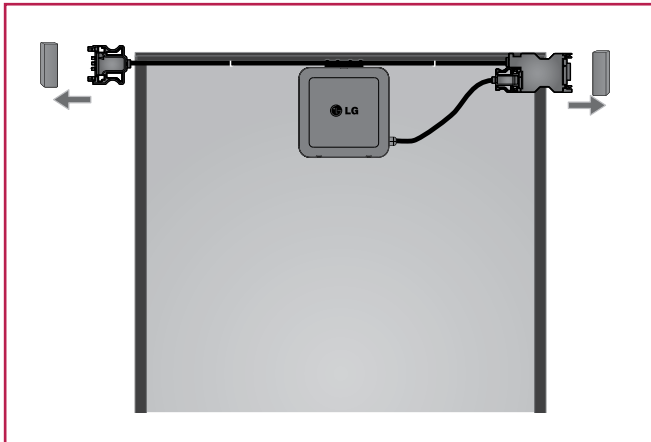
- Do not let cable be pulled too tight or hang too loose. Internal conductor may break.
- Do not allow any liquid inside to prevent danger of electric shock.
- Do not use damaged cables.
- Do not cut or transform the dedicated cables for use.
- Frequent disassembly or connection may damage the cable.
- The size of dedicated cables are decided by NEC2014. (For the size, refer to **Chapter 6. Product Specification**)
- For information about accessory, refer to **Chapter 5. Accessory**.



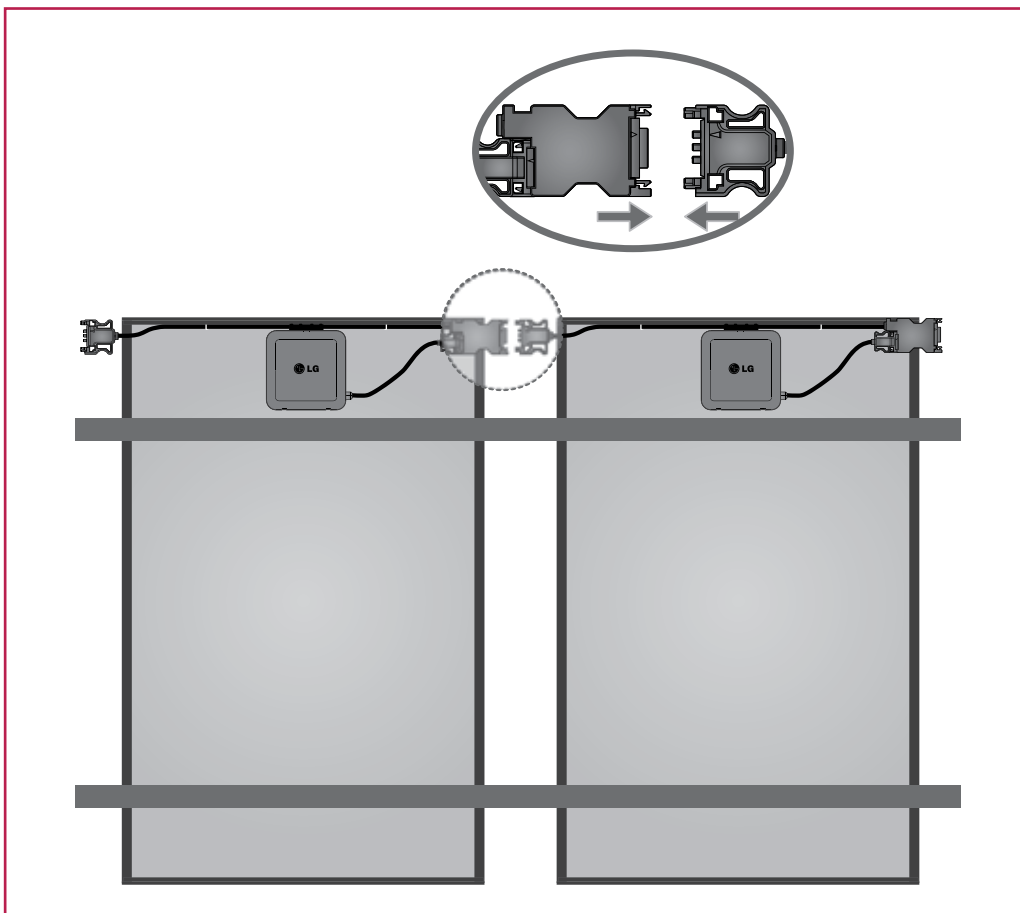
- For easy cable connection, the trunk male connector is detachable from the back sheet of PV module.

To prevent dust from collecting, connect each AC module one by one in the following order:

- Step 1. Take the female connector out from the cable holder on the PV frame.
(Do not take the unused connector out of the last AC module to prevent sagging.)
- Step 2. Remove the dust cover of the trunk female connector of the module you want to install and trunk male connector of next one.



- Step 3. Insert the trunk female connector into the trunk male connector in the illustrated direction below until you hear a clicking sound to connect all AC modules of each array.

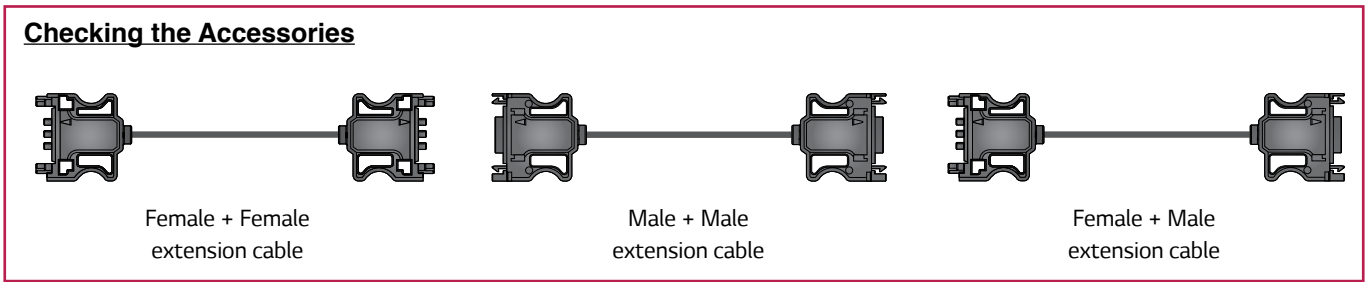


⚠ WARNING

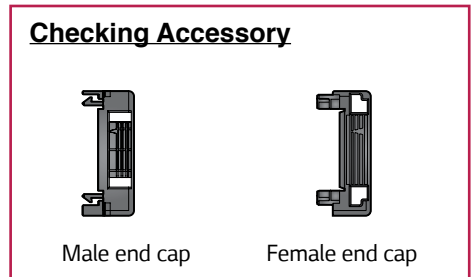
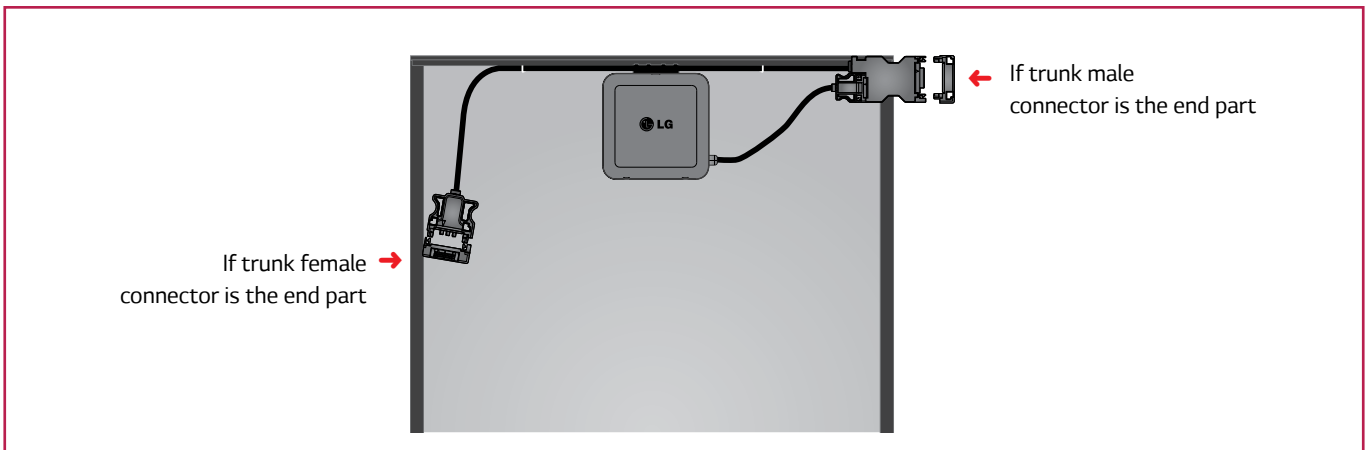


- Make sure to use only dedicated cable connectors provided by LG. Non-genuine connector may not be waterproof and/or non-genuine cable may limit the current flowing inside.
- To prevent the danger of the electric shock, firmly connect all connectors and endcaps.


Step 4. To connect AC modules in different rows, use the extension cable.
 (Refer to the next page under **Cable Usages According to AC Junction Box Locations**)



Step 5. Remove the dust cover of the female connector of the last AC module and seal with end cap to ensure waterproofing and dust prevention. Insert the end cap into the trunk male connector in the arrow direction until you hear a clicking sound. Seal the end part by referring to the following drawing.



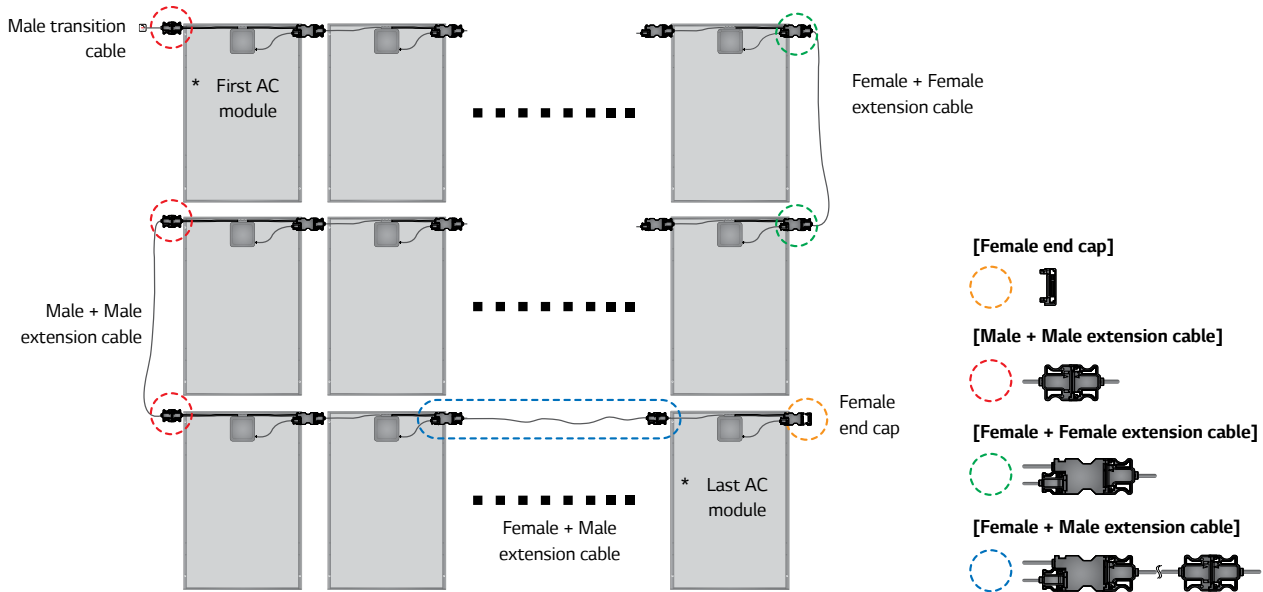
Step 6. Check the cables to verify they have not been pulled too tight or are hanging too loose. If necessary, fixate them using the cable fixing holes on PV module frame with fixing holders, such as cable ties, so that the cables do not touch the ground.

 Trunk connector and end cap serve to prevent collection of dust and waterproof functions.

Cable Usages According to AC Junction Box Locations

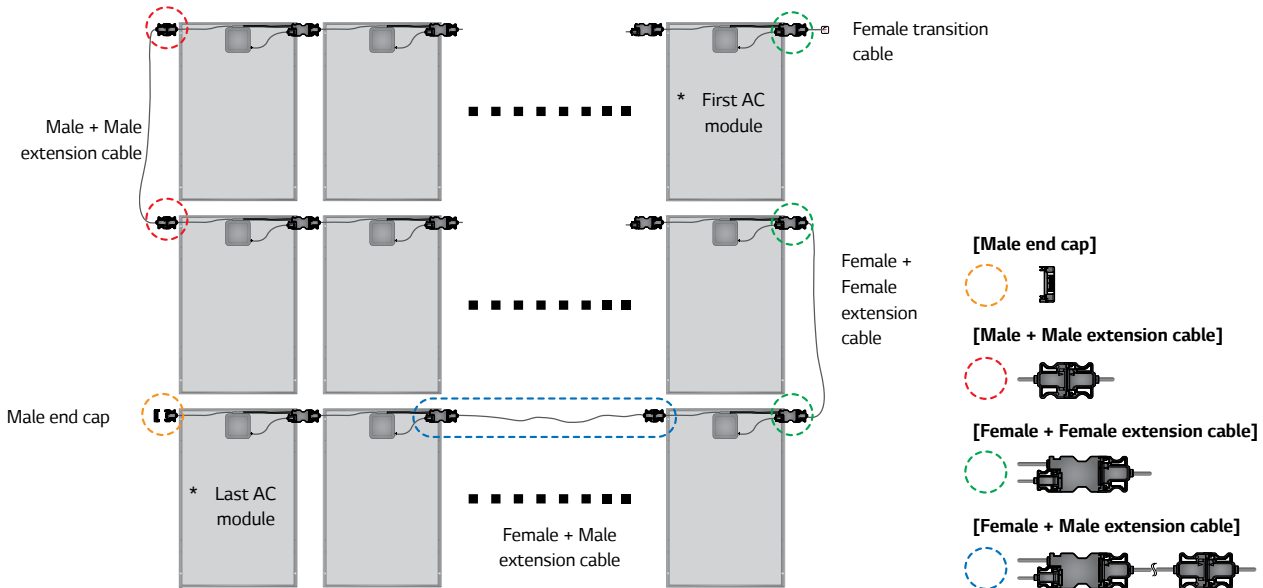
If first AC module connected to AC junction box is on the top left side

Use male transition cable for connection between array and AC junction box.
Seal the trunk male connector of the last AC module using a female endcap.



If first AC module connected to AC junction box is on the top right side

Use female transition cable for connection between array and AC junction box.
Seal the trunk female connector of the last AC module using male endcap.

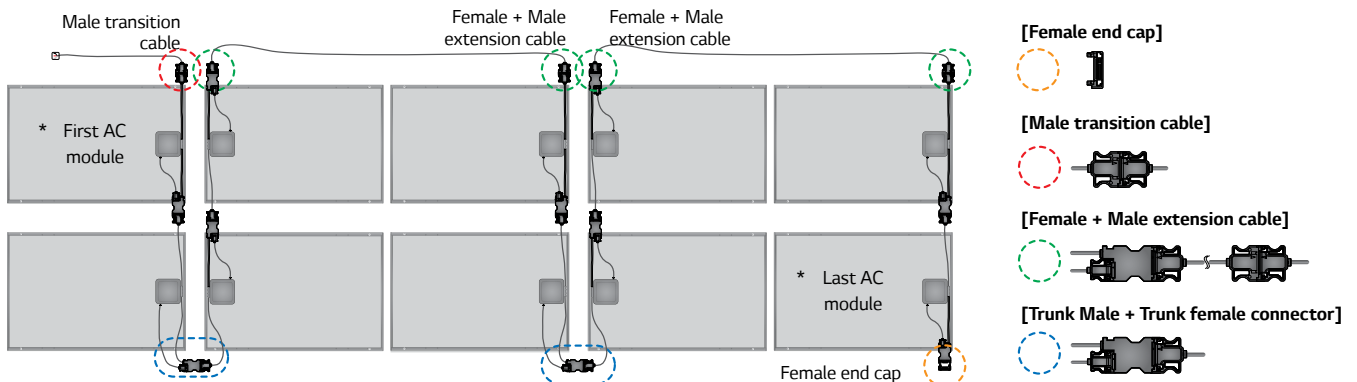


If AC module is installed in landscape mode

Place AC modules as illustrated in the following diagram.

Step 1. Connect the AC modules facing each other using trunk cables.

Step 2. Connect the AC modules that do not face each other using extension cables.




3-9 Grounding

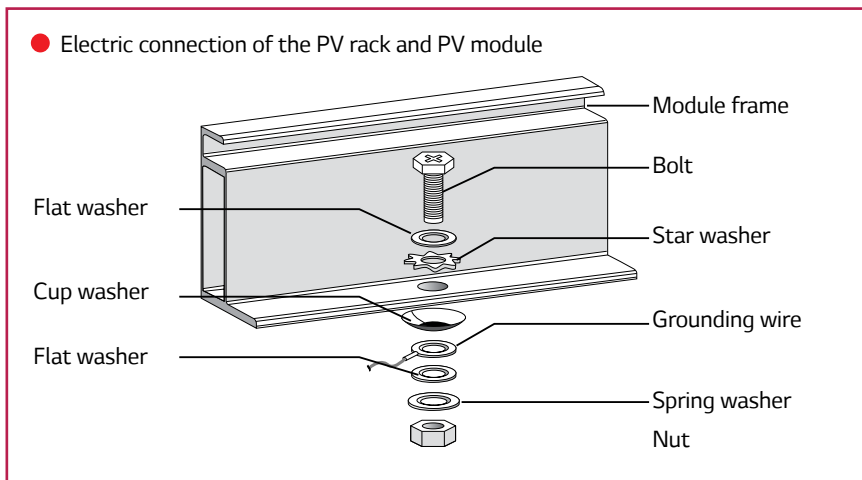
Check your information below before grounding.

NOTICE

- Grounding is largely classified into equipment grounding and neutral grounding. The purpose of the equipment grounding is to prevent electric shock from contact with metal parts. Equipment grounding allows the abnormal current to flow from the equipment to the earth.
- The equipment grounding conductor and the neutral conductor are separated. Depending on the local code, connection between the equipment grounding conductor and the neutral conductor may be required in the distribution panel.
- The neutral conductor of LG AC module is built into the AC cables. (For neutral grounding, refer to **Chapter 3-10. Connecting AC Module Array-to-Distribution Panel**)
- In a place with frequent lightning storms, by installer, an auxiliary grounding may be connected directly from the AC module system to the ground.
- To form an effective equipment grounding path, do not make any unnecessary paths.
- Practice according to the local electricity code.
- A module with exposed conductive parts is considered to be in compliance with UL 1703 only when is electrically grounded in accordance with the instructions presented below and the requirements of the National Electrical Code.

Form the equipment grounding path from AC module to the grounded distribution panel with one connection in the following order:

Step 1. To form the effective grounding path, connect the one of points marked  of a PV frame, ● point, to the PV rack. To electrically connect, it recommends that you use one M4 stainless steel bolt, one nut, one spring washer, two flat washers, one cup washer and, one star washer. (Minimum torque : 4~5 Nm)



Step 2. Connect an equipment grounding conductor from AC module arrays to AC junction box, to form one equipment grounding system. (For grounding method, refer to next page's **Samples for Grounding**)

※ The installation instructions shall include:

1. Wiring must be compliant with NEC Article 705.
2. Grounding methods must be compliant with NEC Article 250.
3. CNL model instruction manuals shall also include a statement that installation shall be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part1.

⚠ WARNING



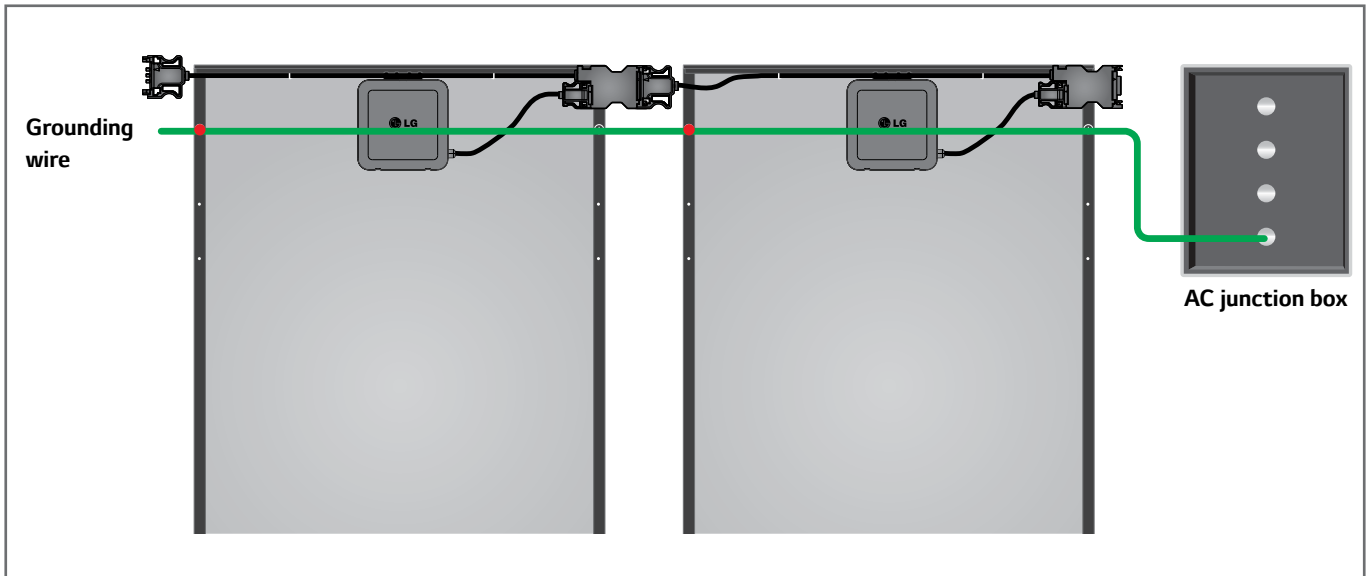
- Do not use bare-copper grounding lugs for grounding. The lugs can corrode which could result in a faulty ground circuit thereby, posing risk for electric shock, electrocution or fire hazard.

Samples for Grounding

There is two of samples for grounding below.

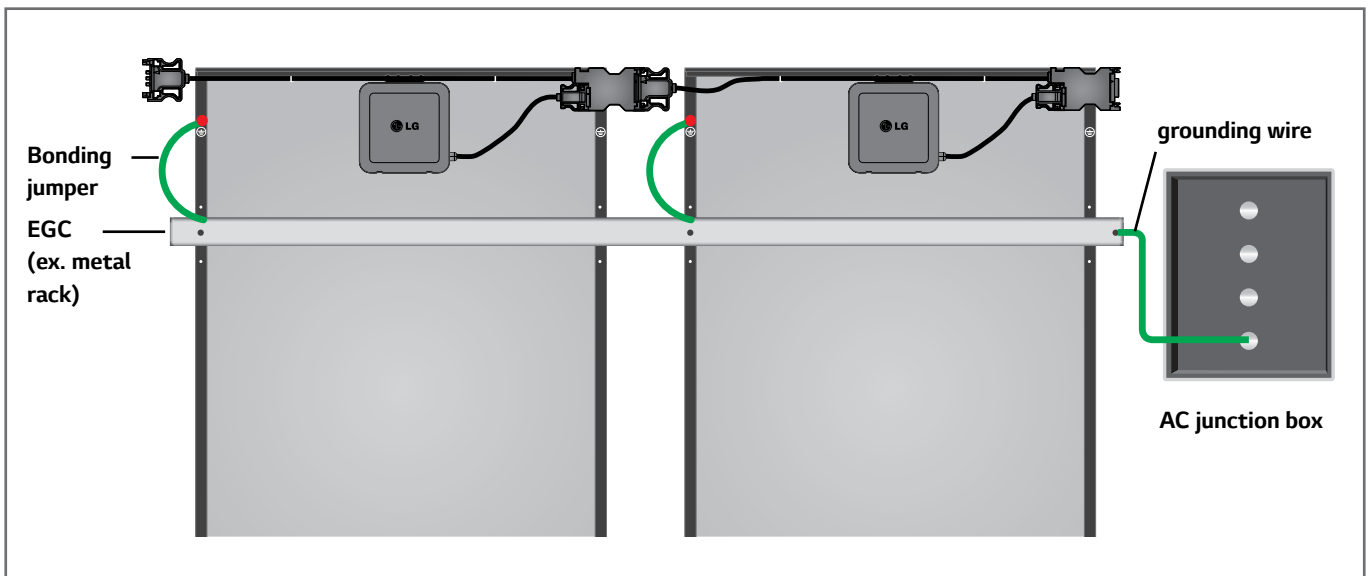
Using a grounding wire

- Determine the size of an external ground wire according to Article 690.46, NEC2014. (Equipment grounding conductors smaller than 6 AWG shall be protected from physical damage.)
- A grounding conductor with insulation or bare (no insulation) may be used, provided the terminations are reliably available.



Using listed EGC

- Use equipment grounding conductors approved by Article 250.118, NEC2014.



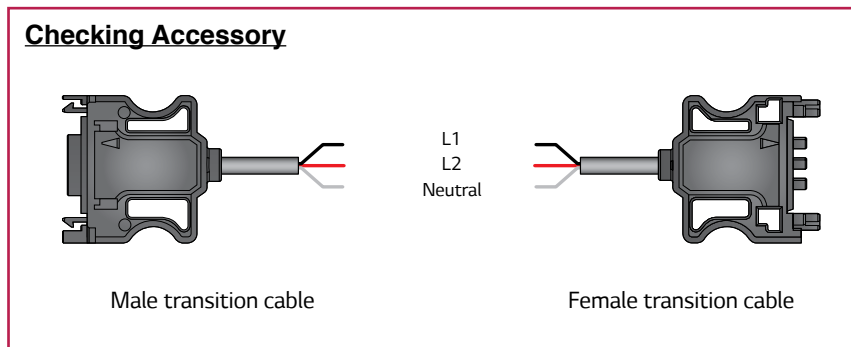
- LG AC module includes DC cables in the module's internal wiring, so no grounding is required for DC input.
- For equipment grounding, LG AC Module uses an external grounding equipment conductor. AC cable does not provide a grounding conductor, grounding is provided only by the external connection to the module frame.

3-10 Connecting AC Module Array to Distribution Panel (General AC Cable, Transition Cable) – 240VAC, 208VAC

Before connecting general AC cable from the AC junction box to distribution panel, adhere to the following items:

NOTICE

- To prevent the danger of electric shock, check again if the circuit breaker is surely turned off.
- LG does not provide separate general AC cables between AC junction box and the distribution panel.
- Install using certified materials and system components.
- Do not put in any liquid. There is a danger of electric shock.
- Do not use any damaged cables.
- Do not cut or transform the dedicated cables for use.
- There is an extra wire in the transition cable. Do not use it.
The wire is blocked by a shrink tube at section of the outer jacket and works on shrink tubes must be done at the factory only.



Neutral is a common conductor uses only for AC module voltage measurement reference. This conductor does not carry current under normal or abnormal conditions.

⚠ WARNING

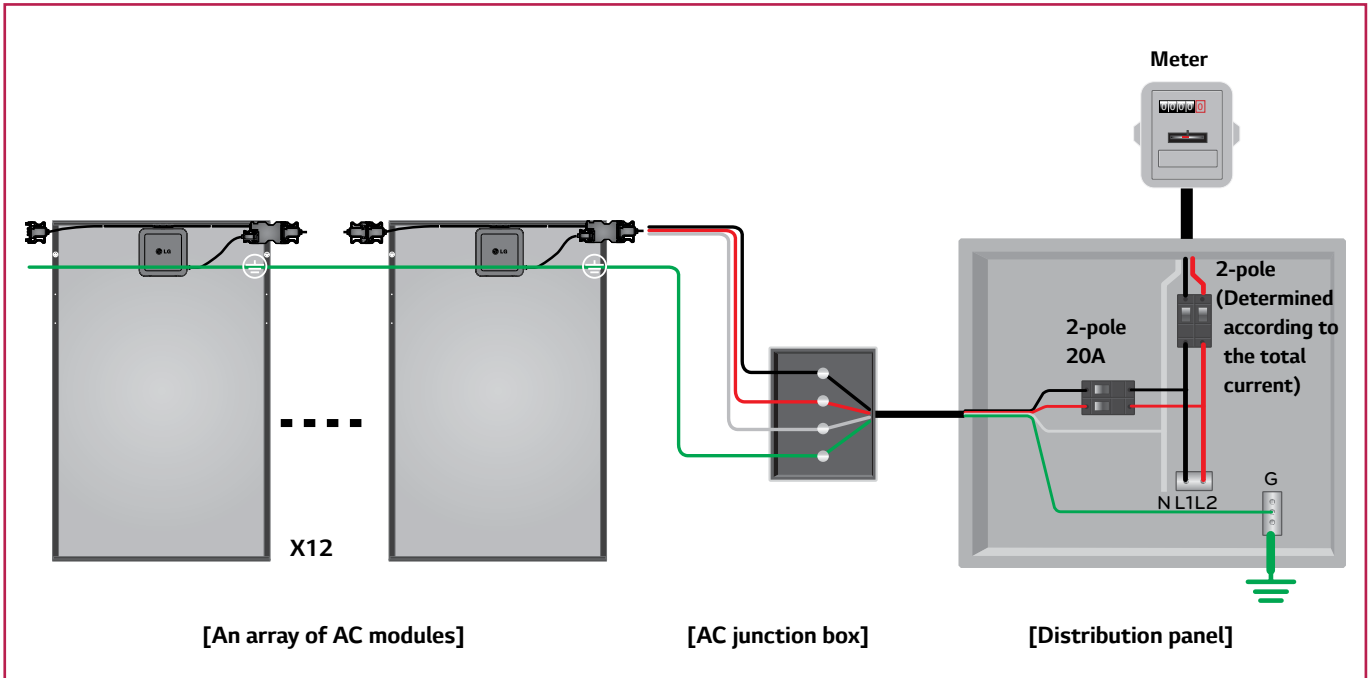


- To prevent property damage or danger to human life by fire or explosion, do not connect any consumable device between AC module and the circuit breaker.
- To prevent the danger of the electric shock, make sure to turn off the circuit breaker.
- Make sure to use the dedicated cable provided by LG Electronics. Outside parts may cause critical danger.

Connect the general AC cables in the following order:

AC output single phase 240VAC

There is a sample for AC output cables connection of single phase 240VAC below.

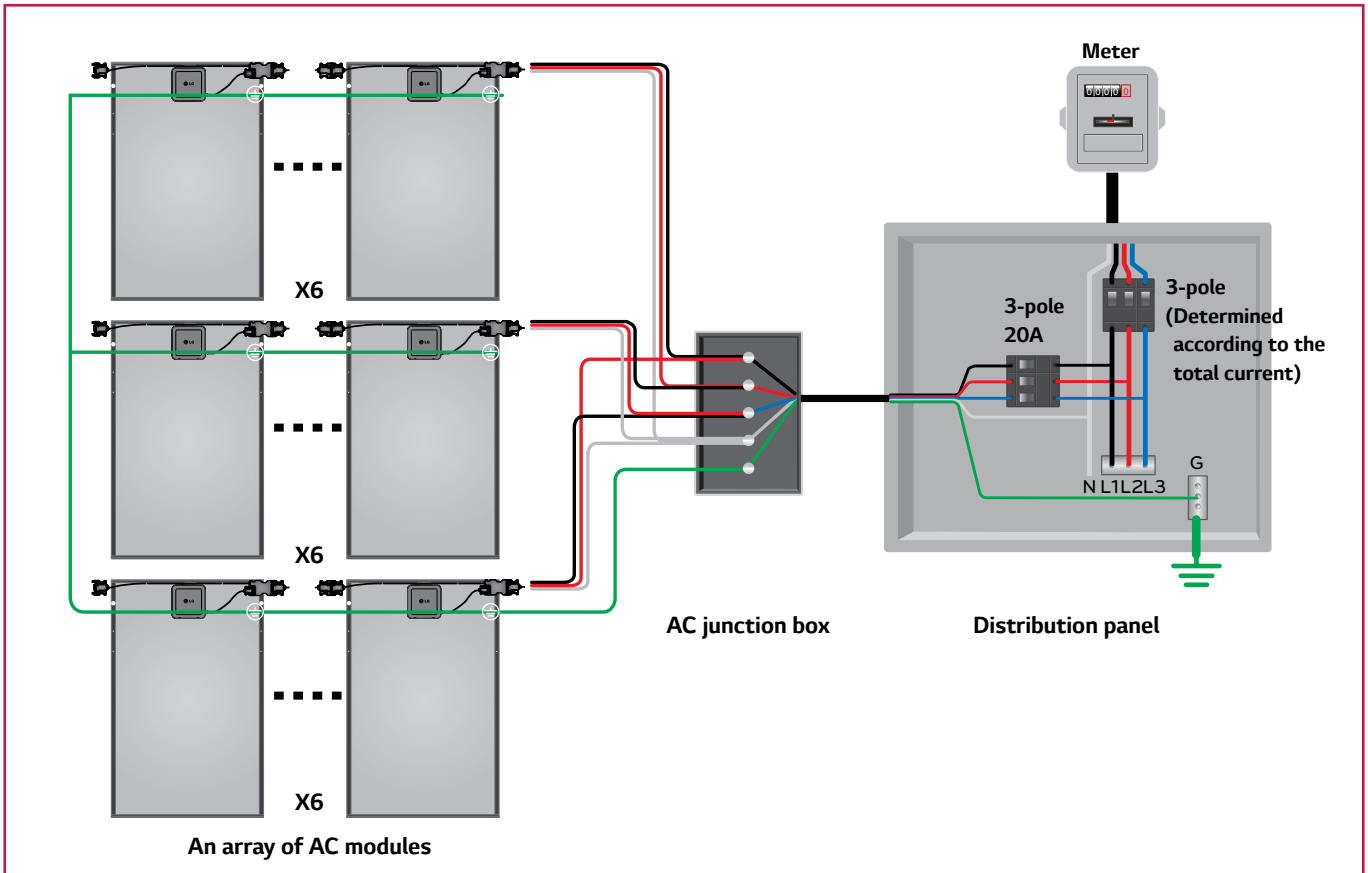


Transition Cable (Array ↔ AC Junction Box)		
Conductor	Color	Description
L1	Black	Line to neutral voltage 120VAC.
L2	Red	Line to neutral voltage 120VAC.
Neutral	White	Common conductor used in the AC module for voltage measurements.
External Equipment Grounding Conductor (Array ↔ AC Junction Box)		
Ground	Green	Conductor to connect normally non-current carrying metal parts of equipment together.
General Cable (AC Junction Box ↔ Distribution Panel)		
L1	Black	Line to neutral voltage 120VAC.
L2	Red	Line to neutral voltage 120VAC.
Neutral	White	Neutral wire.
Ground	Green	Conductor to connect normally non-current carrying metal parts of equipment together.

- Step 1. Connect the equipment grounding conductor from the AC junction box to the terminal for grounding in the distribution panel.
- Step 2. ① Connect hot conductors and neutral conductor in a general AC cable from the AC junction box to the designated terminal in the distribution panel.
 ② Then, connect conductors in transition cables to the AC junction box as shown above.
- Step 3. Check the cables to verify they have not been pulled too tight or are hanging too loose. If necessary, fixate them using the cable fixing holes on PV module frame with fixing holders, such as cable ties, so that the cables do not touch the ground.

AC output three phase 208VAC - merge type

To form balanced three phases, it is recommended to use 3-array and equal to the number of AC modules in each array . Below is one example for AC output cables connection of three phase 208VAC.

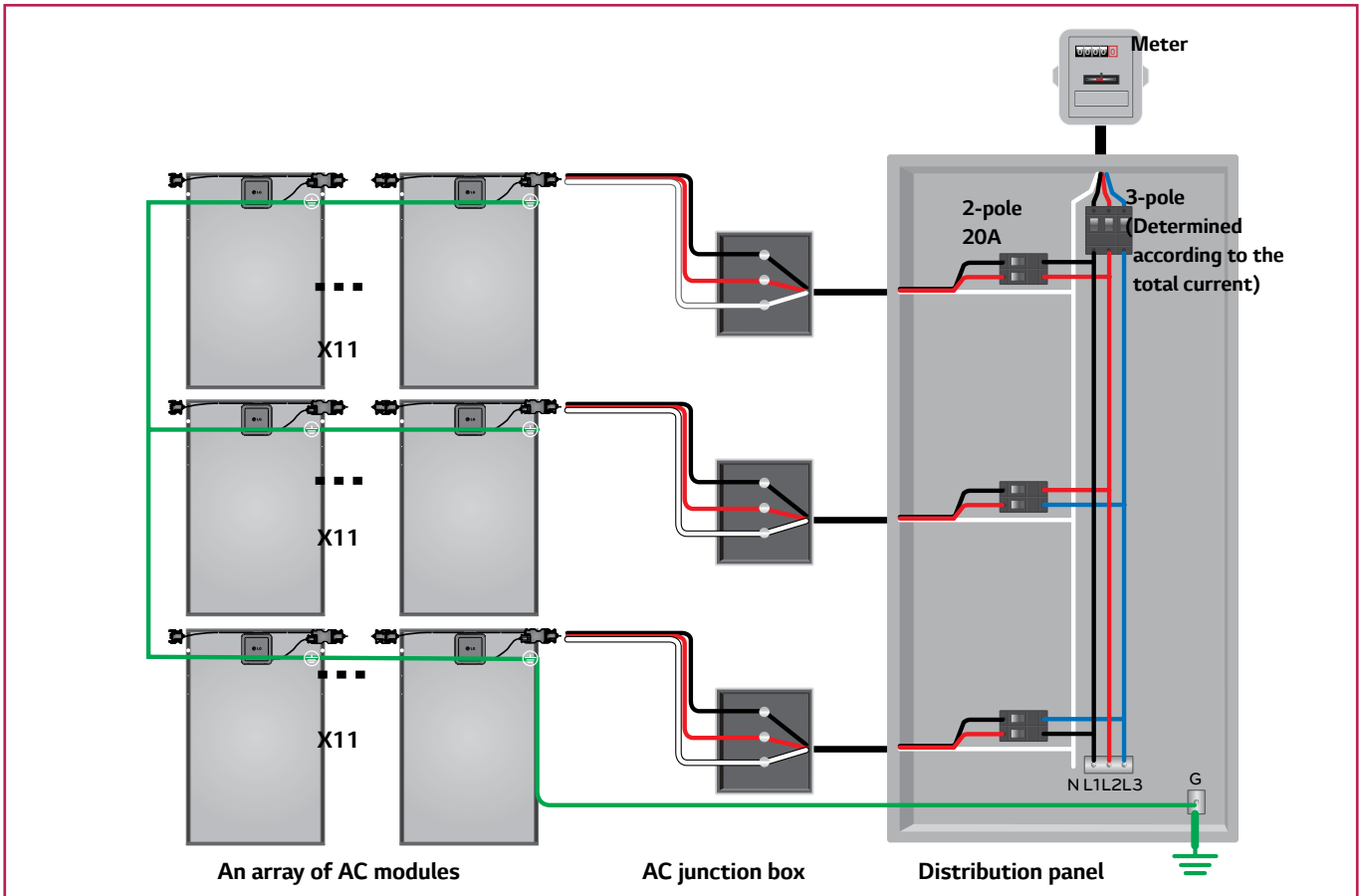


Transition Cable (Array ↔ AC Junction Box)		
Conductor	Color	Description
L1	Black	Line to neutral voltage 120VAC.
L2	Red	Line to neutral voltage 120VAC.
Neutral	White	Common conductor used in the AC module for voltage measurements.
External Equipment Grounding Conductor (Array ↔ AC Junction Box)		
Ground	Green	Conductor to connect normally non-current carrying metal parts of equipment together.
General Cable (AC Junction Box ↔ Distribution Panel)		
L1	Black	Line to neutral voltage 120VAC.
L2	Red	Line to neutral voltage 120VAC.
L3	Blue	Line to neutral voltage 120VAC.
L1-L2	-	Line to line voltage 208VAC.
L2-L3	-	Line to line voltage 208VAC.
L3-L1	-	Line to line voltage 208VAC.
Neutral	White	Neutral wire.
Ground	Green	Conductor to connect normally non-current carrying metal parts of equipment together.

- Step 1. Connect the equipment grounding conductor from the AC junction box to the terminal for grounding in the distribution panel.
- Step 2. ① Connect hot conductors and neutral conductor in a general AC cable from the AC junction box to the designated terminal in the distribution panel.
② Then, connect conductors in transition cables to the AC junction box as shown above.
- Step 3. Check the cables to verify they have not been pulled too tight or are hanging too loose. If necessary, fixate them using the cable fixing holes on PV module frame with fixing holders, such as cable ties, so that the cables do not touch the ground.

AC output three phase 208VAC - split type

To form balanced three phases, it is recommended to use 3-array equal to the number of AC modules in each array . Below is other example for AC output cables connection of three phase 208VAC.



Transition Cable (Array ↔ AC Junction Box)		
Conductor	Color	Description
L1	Black	Line to neutral voltage 120VAC.
L2	Red	Line to neutral voltage 120VAC.
Neutral	White	Common conductor used in the AC module for voltage measurements.
External Equipment Grounding Conductor (Array ↔ Distribution Panel)		
Ground	Green	Conductor to connect normally non-current carrying metal parts of equipment together.
General Cable (AC Junction Box ↔ Distribution Panel)		
L1	Black	Line to neutral voltage 120VAC.
L2	Red	Line to neutral voltage 120VAC.
L3	Blue	Line to neutral voltage 120VAC.
L1-L2	-	Line to line voltage 208VAC.
L2-L3	-	Line to line voltage 208VAC.
L3-L1	-	Line to line voltage 208VAC.
Neutral	White	Neutral wire.

- Step 1. Connect the equipment grounding conductor from arrays of the AC modules system to the terminal for grounding in the distribution panel.
- Step 2. ① Connect the hot conductors and neutral conductor in a general AC cable from the AC junction box to the designated terminal in the distribution panel.
② Then, connect conductors in transition cables to the AC junction box as shown above.
- Step 3. Check the cables to verify they have not been pulled too tight or are hanging too loose. If necessary, fixate them using the cable fixing holes on PV module frame with fixing holders, such as cable ties, so that the cables do not touch the ground.

3-11 Operation

After completing installation for the AC module system, operate the AC module in the following order.

- Step 1. Check connection and condition of the AC cable.
- Step 2. Turn on the circuit breaker for the solar system.
- Step 3. Wait about 10 minutes for the system check of micro inverters.
- Step 4. Monitor the operation of the solar system through a smartphone or PC.



3-12 Maintenance

- Water, ethanol or a conventional glass cleanser with a micro-fiber cloth can be used for regular washing or rinsing of the front glass to remove dust, dirt or other deposits.
- No aggressive and abrasive cleansers or chemicals such as alkali chemicals including ammonia based solution should ever be used on the front glass.
- Always wear rubber gloves for electrical insulation while maintaining, washing or cleaning panels.
- Deposits of foreign material on the frame surface can be cleaned using a wet sponge or soft cloth and dried in air.
- All works related to repair should only be performed by an approved installer for the safety of workers and systems.

WARNING



- To prevent risk of burn, do not touch the metal part of an operating AC module with bare hands.



- To prevent the risk of over voltage, do not disconnect the cable connect in operation.

4 EnerBox™ Communication Gateway

After installation of AC modules is completed, next step is to install the communication gateway for monitoring. Before installing the gateway, adhere to the following notices:

NOTICE

- For reliable communication, it is recommended that the gateway is installed near the distribution panel.
- To avoid damage and failure of the gateway, do not use at temperatures outside of 32 ~ 104°F (0 ~ 40°C).
- To avoid damage of the gateway, install the gateway indoors only.
- To avoid malfunction of the gateway, be sure to use only the enclosed adapter and cables.
- To avoid risk of the electric shock, do not disassemble or expose to pressure.
- To avoid risk of the electric shock, do not bend or cut cables used to connect to the gateway.
- Do not expose to water.
- Only clean with a dry cloth.

4-1 Checking Components of the Communication Gateway



Declaration of Conformity

Trade Name : LG
Model : LGENBOX-01
Responsible Party : LG Electronics Inc.
Address : 1000 Sylvan Ave, Englewood
Cliffs, NJ 07632, U.S.A
TEL : 201-266-2534

- ① **Power Port (12V / 1A)**
Powers communication gateway via AC adapter.
- ② **PLC IN Port**
Delivers signal of AC modules to communication gateway via AC cable.
- ③ **LAN Port**
Connects to network via LAN cable. (Green light will turn on if connected properly.)
- ④ **RS-485 Port**
Connects to serial network via RS-485 cable. (Administrator only)
- ⑤ **Power LED (Green)**
Green when AC adapter is connected properly.
- ⑥ **GFDI LED (Red)**
Turns on in case of ground fault in solar system.
- ⑦ **PLC LED (Green / Red)**
Green: AC cable is connected properly.
Red: Connection disruption.
- ⑧ **Wireless LAN LED (Green / Red)**
Green: Wireless communication is operating properly.
Red: Problem with wireless communication.
- ⑨ **USB Port (Charge Only)**
Charge smart device via supplied USB.
- ⑩ **Gateway Reset Pin**
Used to reset gateway if malfunctioning.
- ⑪ **Wireless LAN Reset Pin**
Used to reset WAP password.
* Default password : 87654321

⚠ WARNING

- This product contains chemicals known to the California State of to cause cancer and birth defects or other reproductive defects. **Wash hands after handling.**
- EnerBox warranty void if cover removed. No serviceable parts inside. Refer servicing to qualified personnel.
- To avoid communication interference, do not connect the product to power strips, surge protectors, or surge protector-embedded power strips. It is recommended the gateway is directly connected to a 120VAC outlet.



For problems with the gateway, please use the troubleshooting guide below. If the problem is still not resolved, please turn off the system circuit breaker and contact the service center (1-888-865-3026, lg.solar@lge.com).

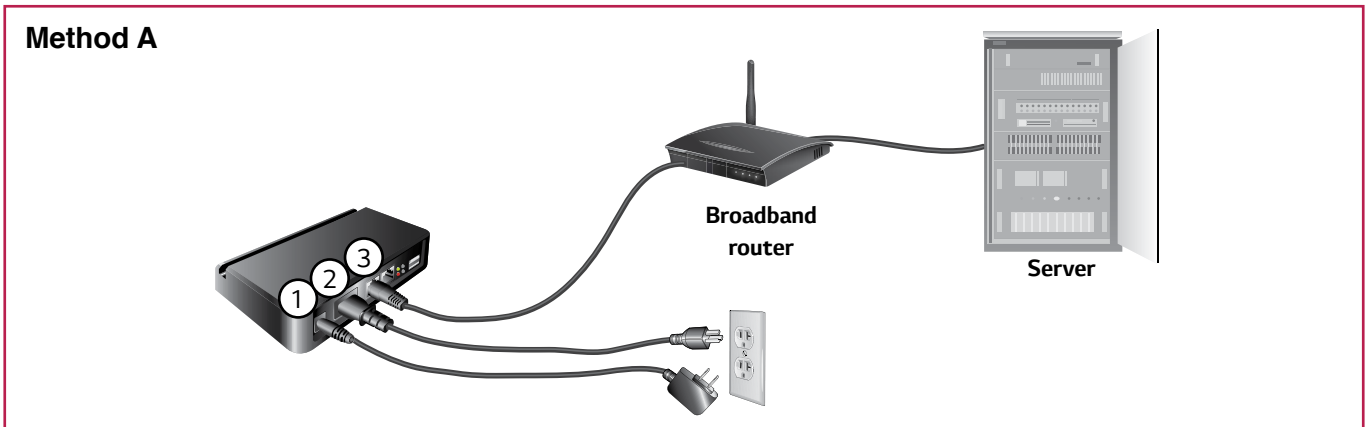
LED status	Troubleshooting
Power LED(No Light)	AC adapter may be incorrectly connected. Check the AC adapter and outlet in use; if power still does not come on, contact your electricity provider for possible power grid problems.
GFDI ON (Red)	Possible wiring problems within the system. Turn off then on using the system circuit breaker, and wait 10 minutes.
PLC ON (Red)	Connection between AC cable and outlet or system and power grid may be interrupted. Reconnect the AC cable; if light does not change to green, try other outlets.
Wireless LAN ON (Red)	Possible problem with the wireless module inside the gateway. Contact the service center.

4-2 Connecting to the Communication Gateway

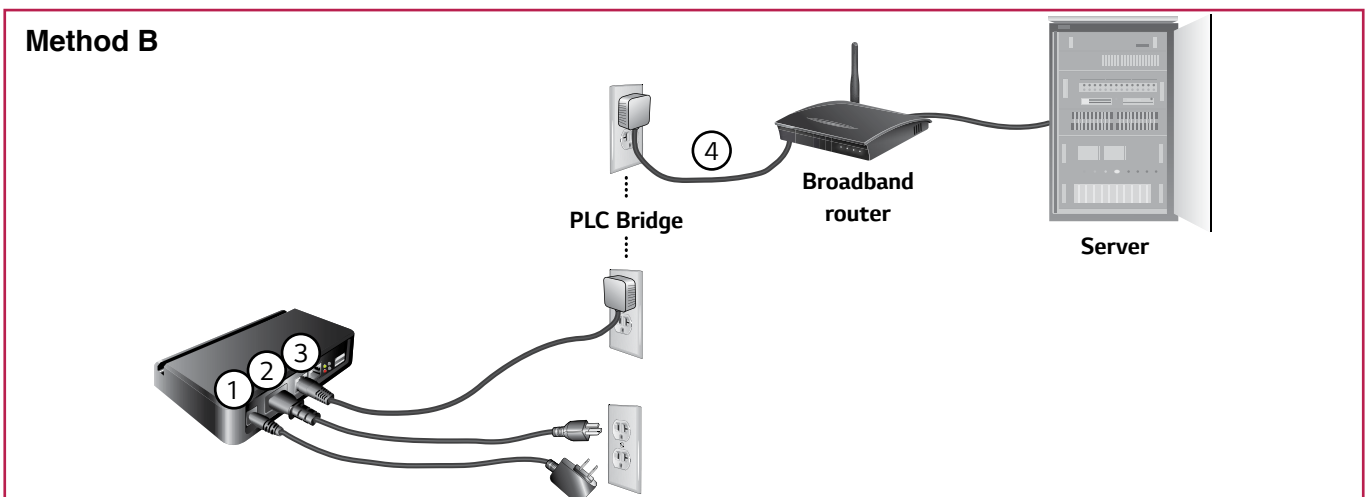
Before connecting the gateway, check that the below equipment are working properly.

- EnerBox™ Communication Gateway (LGENBOX 01)
- AC Adapter (WA-12M 12FU)
- PLC Cable (KKDK KKS-15U)
- LAN Cable (RJ-45)

Connect to a broadband router using one of the following two methods:



- ① Connect the AC adapter from **Power (12V/1A) Port** of the gateway to a dedicated 120VAC outlet.
- ② Connect the PLC cable from **PLC IN Port** of the gateway to a dedicated a 120VAC outlet.
- ③ Connect the LAN cable from **LAN Port** of the gateway to a spare port on the broadband router.



- ① Connect the AC adapter from **Power (12V/1A) Port** of the gateway to a dedicated 120VAC outlet.
- ② Connect the PLC cable from **PLC IN Port** of the gateway to a dedicated 120VAC outlet.
- ③ Connect one of power line adapters from **LAN Port** of the gateway to a 120VAC outlet.
- ④ Connect another of power line adapters from a spare port on the broadband router to a 120VAC outlet.



- The stand integrated into the gateway is designed specifically for the LG G Pad™. Other tablets may not be properly supported.
- The gateway will not log energy production if the power is off or AC cable and PLC are connected improperly.

4-3 Configuring the Installation App

After installation of the gateway is completed, you can monitor the solar system by installation app. To check and configure AC module system, follow the steps below.

Step 1. Running the Installation App



Connect mobile device (phone or tablet) to the gateway via wireless connection and run the installation app.

- Default SSID : LGE_EnerBox

- Default password : 87654321

- ※ When changing SSID, do not include any special characters, symbols or spaces.

- ※ When running the app via other gateway, please exit the running app.

Step 2. Entering installer mode



Press the title bar for 3-5 seconds to enter installer mode.

CAUTION



- Only certified installers should enter the installer mode. PV system may malfunction.



[Installer Mode]

MAC Address List (Step 3)

Register Installed AC modules.

AC Module Status (Step 4)

Check conditions of installed AC modules.

Grid Configuration (Step 5)

Check/Change the grid configuration.

System Status

Check conditions of installed solar system.

System Update

Update firmware for the gateway.

System Configuration (Step 6)

Check the Ethernet and set the NTP, web server, service type.

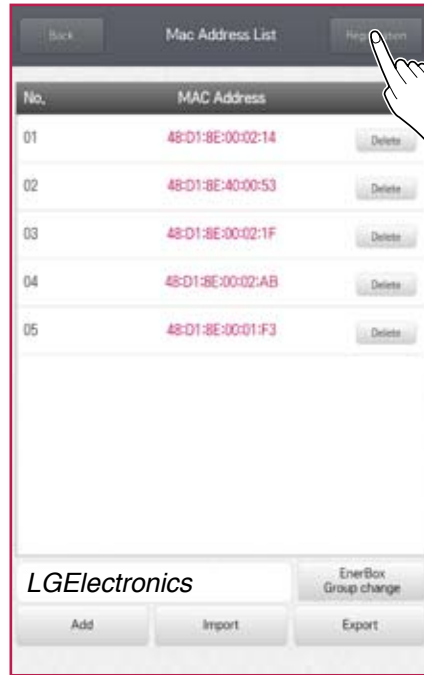
LGE Mode

Engineer-only mode.



- For reliable communication, it is not recommended to access through satellite Internet or 3G mobile Internet.

Step 3. Checking installed AC modules



① After connecting the AC module system at the grid, press **MAC Address List**. Within 15 minutes, check that all installed AC modules are displayed. After 15 minutes, the AC modules may enter sleep mode.

② If all are displayed, press the **Registration** button. Otherwise, press **Back** button. After waiting 2~3 minutes, check that all modules are synced.

- * The PLC LED will turn to orange during updates. Do not press the **Registration** button. Allow about 5 seconds per module for update.
 - * If modules are still not detected, turn off then turn back on the circuit breaker for AC module system to wake up modules in sleep mode. If this does not work, try plugging in the PLC cable to a different outlet near the distribution panel.
- ③ Go to the next step and check that all modules have been registered.



- Hitting the **Registration** button will configure the AC module system group that is visible to that gateway only. Any AC modules not registered to the group need to be re-registered after returning the gateway into the initial condition.
- **Add, Import, Export** buttons can be used when replacing the gateway.



Note 1.
Adding AC modules:

If you pressed **Registration** button before listing all AC modules, or you need to add the unlisted AC module, follow steps below.

- ① Enter *LGElectronics* (initial password) on the blank box in figure and press **EnerBox Group change** button to return the gateway into the initial condition.
Check PLC LED. It should turn red.
 - ② Press the **Back** button. Wait for a minute and check that the PLC LED has changed green. Then, press **MAC Address List** and check if the additional AC modules have been listed.
- * If you can't check the additional AC modules, connect the gateway to another outlet near the distribution panel and search for the unlisted AC modules.
- ③ Press **Registration** button to finish.



Note 2.
Changing the EnerBox:

If the EnerBox is not working correctly, follow steps below to troubleshoot.

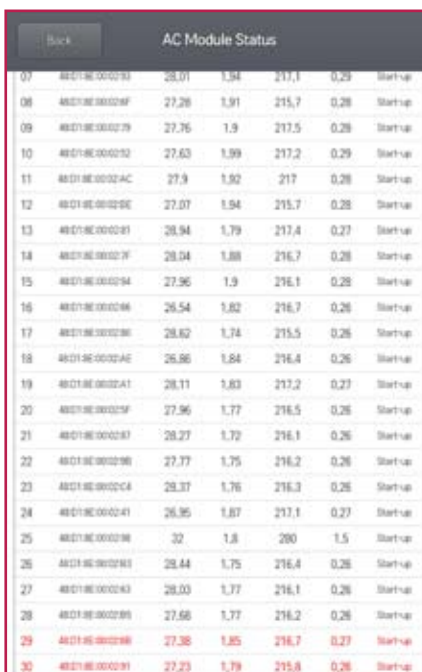
- ① After connecting a new EnerBox, enter the serial number of the failed EnerBox on the blank and press **EnerBox Group change** button.
- ② Compare MAC addresses listed in app and web server.
- ③ If matching, press **Registration** button to finish.



Note 3.
Exchanging the AC module:

If you need to exchange an AC module, follow the steps below.

- ① Enter *LGElectronics* (initial password) on the blank box in the figure and press the **EnerBox Group change** button to return the gateway to the initial condition.
Check that the PLC LED has turned red.
- ② Press **Back** button. Wait for a minute and check that PLC LED is now turned to green. Then, press **MAC Address List** and check if the additional AC modules have been listed.
* If you can't see the additional AC modules, connect the gateway to another outlet near the distribution panel and search for the unlisted AC modules.
- ③ Press **Delete** button to delete the exchanging AC module MAC address.
- ④ Press **Registration** button to finish.



Note 4.
Moving the EnerBox to a different location:

After the EnerBox is connected to a 120VAC outlet of the new location, enter into **AC Module Status** and check that all previously registered MAC addresses colors are shown in black.

- * MAC address color is red : Unreliable link detection.
If some MAC addresses colors are red, the EnerBox must be connected to a different AC outlet.

Step 4. Checking conditions of installed AC modules

- ① Enter into **AC Module Status** to check the operating status of the AC module system.
- ② If all AC modules status is not updated, press **Back** button and wait about 15 minutes until the next sync period. (Information is updated every 15 minutes.)
- ③ Enter into **AC Module Status** to check the operating status of the AC module system again.

MAC Address	Vm	Bn	Vm	Ict	Status
48-D1-8E-00-02-5F	25.44	2.5	217.1	0.28	Start-up
48-D1-8E-00-02-80	24.85	2.55	215.8	0.28	Start-up
48-D1-8E-00-02-AE	25.07	2.56	216.7	0.28	Start-up
48-D1-8E-00-02-87	24.44	2.52	216.4	0.27	Start-up
48-D1-8E-00-02-B3	25.85	2.5	217.1	0.28	Start-up
48-D1-8E-00-02-A1	25.92	2.57	217.8	0.29	Start-up
48-D1-8E-00-02-C4	25.83	2.53	216.7	0.29	Start-up
48-D1-8E-00-02-66	25.53	2.49	218	0.28	Start-up
48-D1-8E-00-02-63	24.96	2.61	217.4	0.29	Start-up
48-D1-8E-00-02-98	32	1.6	280	1.5	Start-up
48-D1-8E-00-02-41	25	2.65	218	0.29	Start-up
48-D1-8E-00-02-89	25	2.71	217.2	0.3	Start-up
48-D1-8E-00-02-95	24.45	2.75	218.2	0.3	Start-up
48-D1-8E-00-02-80	25	2.66	218.5	0.29	Start-up
48-D1-8E-00-02-97	25.45	2.6	217.8	0.29	Start-up
48-D1-8E-00-02-C3	25.62	2.72	218	0.31	Start-up
48-D1-8E-00-02-6F	25.28	2.7	217.1	0.3	Start-up
48-D1-8E-00-02-93	24.99	2.73	217.8	0.3	Start-up
48-D1-8E-00-02-88	25.25	2.78	217.6	0.31	Start-up
48-D1-8E-00-02-79	25.61	2.73	218.6	0.31	Start-up
48-D1-8E-00-02-52	24.5	2.88	218.3	0.31	Start-up
48-D1-8E-00-02-AC	25.27	2.79	218.1	0.31	Start-up

AC Module Error Status

MAC ID : 48-D1-8E-00-02-5F
 Grid Volt : Normal
 Grid Freq : Normal
 Temp. Protection : Normal
 GFDI : Normal
 Connecting : OK

OK

• If ground fault occurs, AC module automatically detects and stops.

Step 5. Setting the grid configuration

- ① Enter into **Grid Configuration** and set the grid configuration to suit your environment. If the grid configuration is wrong, AC modules may not operate correctly.
- ② Press the **Set** button. It takes about 5 seconds per module for setting.
- ③ Press the **Update** button and check that the selected grid setting is correct. If all AC modules are not updated, please try again.

No.	MAC Address	Grid Configuration
1	48-D1-8E-00-02-5F	10 240V (default)
2	48-D1-8E-00-02-80	10 240V (default)
3	48-D1-8E-00-02-AE	10 240V (default)
4	48-D1-8E-00-02-87	10 240V (default)
5	48-D1-8E-00-02-B3	10 240V (default)
6	48-D1-8E-00-02-A1	10 240V (default)
7	48-D1-8E-00-02-C4	10 240V (default)
8	48-D1-8E-00-02-66	10 240V (default)
9	48-D1-8E-00-02-63	10 240V (default)
10	48-D1-8E-00-02-98	10 240V (default)
11	48-D1-8E-00-02-41	10 240V (default)
12	48-D1-8E-00-02-89	10 240V (default)
13	48-D1-8E-00-02-95	10 240V (default)
14	48-D1-8E-00-02-80	10 240V (default)
15	48-D1-8E-00-02-97	10 240V (default)

Grid Configuration

10 240V (default) ← Factory setting

30 208V (default)

30 240V (default)

10 240V (Hawaii)

30 208V (Hawaii)

30 240V (Hawaii)

No.	MAC Address	Grid Configuration
1	48-D1-8E-00-02-5F	10 240V (default)
2	48-D1-8E-00-02-80	10 240V (default)
3	48-D1-8E-00-02-AE	10 240V (default)
4	48-D1-8E-00-02-87	10 240V (default)
5	48-D1-8E-00-02-B3	10 240V (default)
6	48-D1-8E-00-02-A1	10 240V (default)
7	48-D1-8E-00-02-C4	10 240V (default)
8	48-D1-8E-00-02-66	10 240V (default)
9	48-D1-8E-00-02-63	10 240V (default)
10	48-D1-8E-00-02-98	10 240V (default)
11	48-D1-8E-00-02-41	10 240V (default)
12	48-D1-8E-00-02-89	10 240V (default)
13	48-D1-8E-00-02-95	10 240V (default)
14	48-D1-8E-00-02-80	10 240V (default)
15	48-D1-8E-00-02-97	10 240V (default)

	Default Mode	Hawaii Mode ¹⁾
Frequency	59.3 ~ 60.5 Hz	57.0 ~ 60.5 Hz

¹⁾ In Hawaii mode, Transient Over-Voltage (TOV) mitigation is applied.
For details, refer to **Chapter 6-3. Response to Abnormal Conditions.**

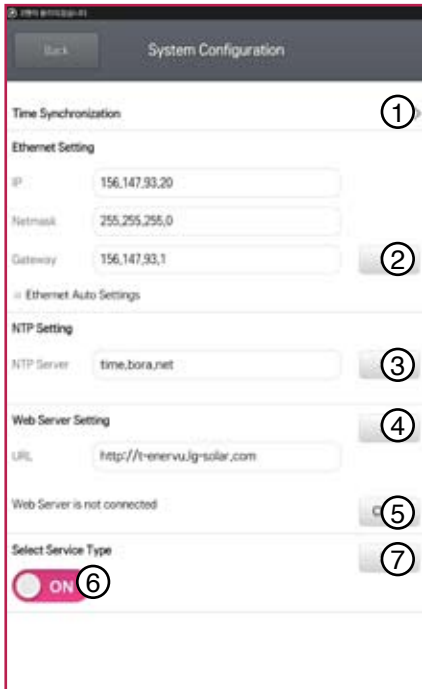
⚠ CAUTION



• Set the grid configuration best suited to the installation area. PV system may malfunction otherwise.

Step 6. Setting System Configuration

Entering **System Configuration**, you can select Ethernet, NTP sever, web server or service type.



To preventing set up error, it is recommended to set in the following order.

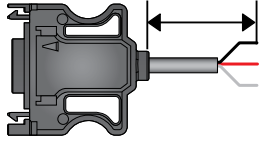
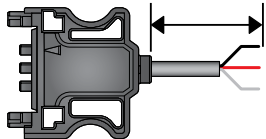
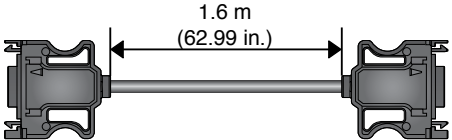
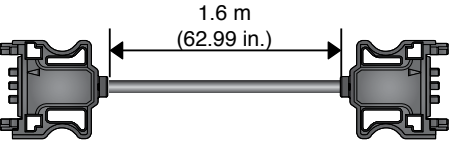
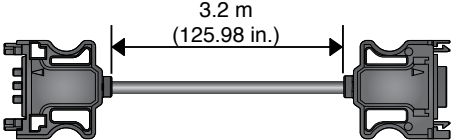


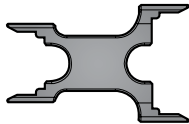
- ① After running the app, click **Time Synchronization** to sync the time zone of the gateway and web server .
- ② If the IP address is assigned from the broadband router automatically . Check that it has been assigned.
- ③ Network time protocol.
- ④ Enter URL, press **Set** button.
- ⑤ Check Web server connection after pressing the **Set** button. When connected it will read, "**Web Server has been connected**". If not connected it will read, "**Web Server is not connected**".
- ⑥ Determine the web server communication. If you do not accept the personal information agreement, set **OFF** in order to disable the Ethernet communication.
- ⑦ Next, press **Set** button to finish web server activation.

4-4 Website

For more information on monitoring, please refer to AC module web server manual at <http://enervu.lg-solar.com/support/downloads>.




5 Accessories

Item		Model Number	Diagram	Details
Transition Cable	Male	LTC10-M3 (1.0m)		1.0 m (39.37 inch)
		LTC15-M3 (1.5m)		1.5 m (59.06 inch)
	Female	LTC10-F3 (1.0m)		1.0 m (39.37 inch)
		LTC15-F3 (1.5m)		1.5 m (59.06 inch)
Extension Cable	Male + Male	LEC16-MM3		- Used to connect to remote modules.
	Female + Female	LEC16-FF3		
	Female + Male	LEC32-FM3		
End Cap	Male	LECAP-M3		- Seal the unused connector of the last AC module.
	Female	LECAP-F3		- Dust prevention. - Waterproof.
Unlocking Tool		LAC-UNLOCK		- Used for disassembly of the connector.

6 Product Specifications

6-1 AC Module

DC Input				
Parameter	Section	Value		
Power	Max.	295 W	300 W	305 W
	Tolerance	3 %	3 %	3 %
Voltage	Open Circuit	39.7 V	39.8 V	40.0 V
	Max Power Point	31.8 V	32.0 V	32.1 V
Current	Short Circuit	9.85 A	9.98 A	10.10 A
	Max Power Point	9.28 A	9.40 A	9.52 A
Efficiency	Relative Reduction	< 2.0 %		
	Note : Relative efficiency reduction in respect to irradiance.			
Note : Rated electrical characteristics are within 10 percent of above figures. PV module was measured at STC. (Standard Test Condition: Irradiation 1,000W/m ² , Cell temp. 77°F(25°C), 1.5AM)				
AC Output				
Parameter	Section	240VAC	208VAC	
Power	AC Continuous ¹⁾	280W(@DC Module 295W) / 285W(@DC Module 300W) / 290W(@DC Module 305W)		
	Inverter Rated Continuous	305 W	300W	
Voltage	Rated	240 V (211 ~ 264 V)	208 V (187 ~ 229 V)	
Current	Rated	1.27 A	1.44 A	
	Max Fault Current	77 A		
Frequency	Nominal	60 Hz (59.3 ~ 60.5 Hz)		
	Extended ²⁾	57.0 Hz ~ 60.5 Hz		
Power Factor		> 0.95		
CEC Weighted Efficiency (California Energy Commission)		96.5 %	96.0 %	
Max. Number of AC Modules ³⁾		12 units	11 units	
¹⁾ AC Continuous = Max Input DC Power x CEC Efficiency. ²⁾ For setting frequency rage, refer to Chapter 4-3. Configuring the Instalation App - Step 5. ³⁾ For details, refer to Chapter 3-10. Connecting AC Module Array to Distribution Panel.				
Protection				
Ground Fault Detection and Interrupt (GFDI)		Applied		
Fuse (Internal of the Micro Inverter)		2A		
 CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.				
Over Current Protection Device (OCPD) ³⁾		20A		
³⁾ For details, refer to Chapter 3-10. Connecting AC Module Array to Distribution Panel.				

Mechanical Data

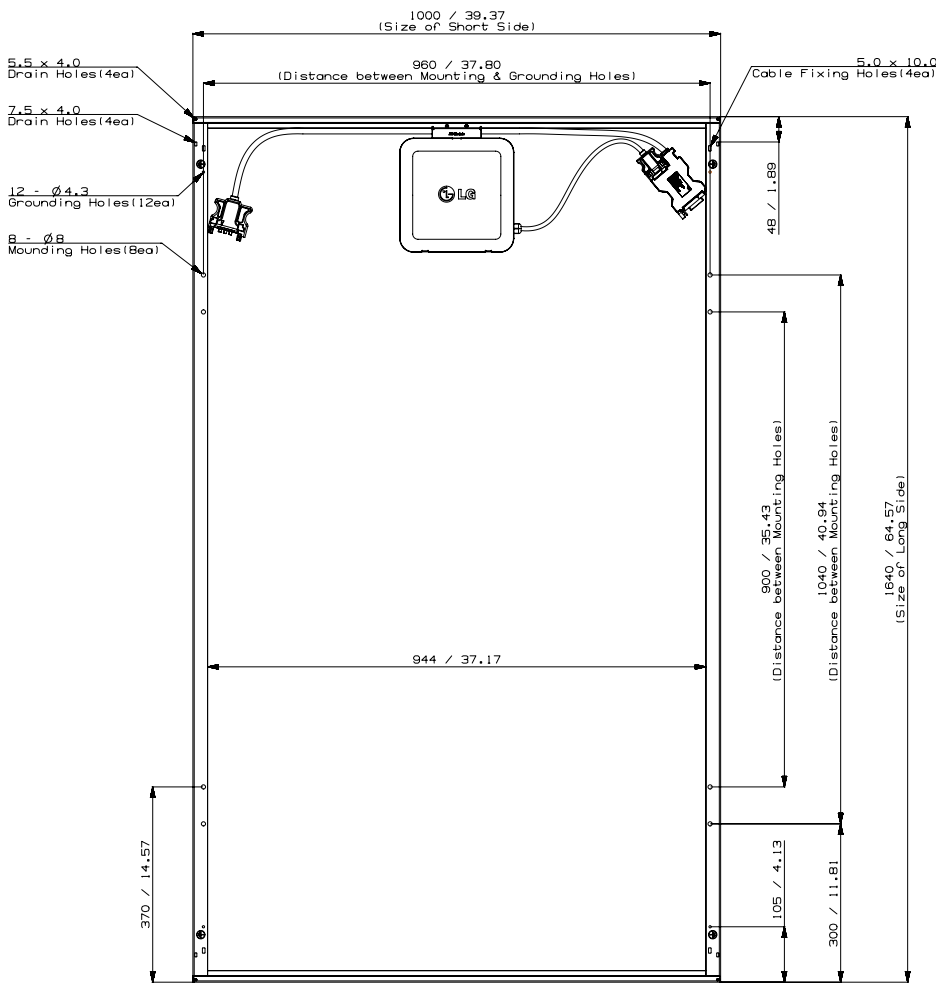
Micro Inverter Model (Utility Interactive)	LM305UE-G1
Enclosure Environmental Rating	Type 6
Operating Ambient Temperature	-40 ~ 65 °C (-40 ~ 149 °F)
Operating Temperature(Internal)	-40 ~ 90 °C (-40 ~ 194 °F)
Storage Temperature	-40 ~ 90 °C (-40 ~ 194 °F)
Weight	18.0 kg

Certification

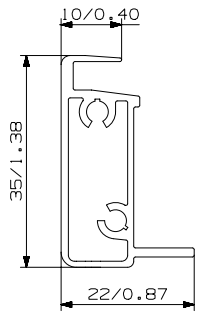
UL1703, IEC61215 Ed.2, IEC 61730 Safety Class II, CE, ISO9001
 UL1741 / IEEE1547 CSA C22.2 No. 107.1-01
 FCC Part 15 Class B

Dimensions

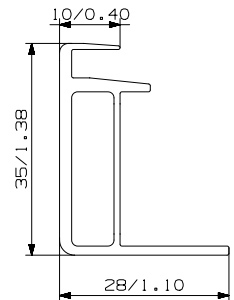
Unit: mm / in.



Cross-sectional Drawings



Short Side Frame



Long Side Frame

6-2 EnerBox

Internal Communication with AC module	
Type	Broadband Power Line Communication (IEEE 1901)
Sample Rate	15 minutes
Bandwidth	2 MHz ~ 28 MHz
Transmission Rate	10Mbps
Max Node	50
External Communication	
Wired Communication	10/100 auto-sensing, auto-negotiating, 802.3
Wireless Communication (Only for Installation)	IEEE 802.11 b/g/n compatible W-LAN (Local)
Power Requirements	
AC Supply	120 VAC, 60 Hz
Power Consumption @ DC 12V	3.8 watts typical, 5.4 watts maximum
Mechanical Properties	
Dimensions (W X D X H)	150 mm x 101.8 mm x 32.7 mm (5.9 in x 4.0 in x 1.3 in)
Weight	210 g (7.4 oz.)
Temperature Range	0 ~ 40 °C (32 ~ 104°F), Installed Indoors
Enclosure Rating	IP20
Certification	
Certifications	UL 60950-1, FCC Part 15 Class B
Limited Warranty	2 years

Wireless LAN Module(TWFM-B600D, FCC ID : BEJTWFM006D)				
Specification		IEEE802.11b	IEEE802.11g	IEEE802.11n
Frequency		2.4 ~ 2.484GHz	2.4 ~ 2.484GHz	2.4 ~ 2.484GHz
Modulation		DSSS/CCK	OFDM	OFDM
DATA rate		1,2,5.5,11Mbps	6,9,12,18,24,36, 48,54Mbps	6.5,13,19.5,26,39, 52,58.5,65Mbps
RF Power	Min	13 dBm	13 dBm	11 dBm
	Typ	15 dBm	15 dBm	13 dBm
	Max	17 dBm	17 dBm	15 dBm
Sensitivity	Min	-87dBm @8%PER	-72dBm @10%PER	-72dBm @10%PER
	Max	≥ -10dBm @8%PER	≥ -30dBm @20%PER	≥ -30dBm @10%PER

6-3 Response to Abnormal Conditions

IEEE 1547 (Default)		
Parameter	Range	Clearing Time (s)
Phase Voltage	$V < 60V$	< 0.16
	$60V \leq V < 106V$	< 2.00
	$132V \leq V < 144V$	< 1.00
	$V \geq 144V$	$< 0.16 (< 0.016, \text{Hawaii mode} - \text{TOV})^{1)}$
Frequency	$> 60.5\text{Hz}$	< 0.16
	$< 59.3\text{Hz} (< 57 \text{ Hz, Hawaii mode})^{1)}$	< 0.16

¹⁾ For setting to Hawaii mode, refer to **Chapter 4-3. Configuring the Installation App - Step 5.**

Note 1 : This test is performed in nominal conditions, except for test parameter.
 Note 2 : After clearing, if grid returns to the normal state, it takes about 5 minutes for operation of the AC module.

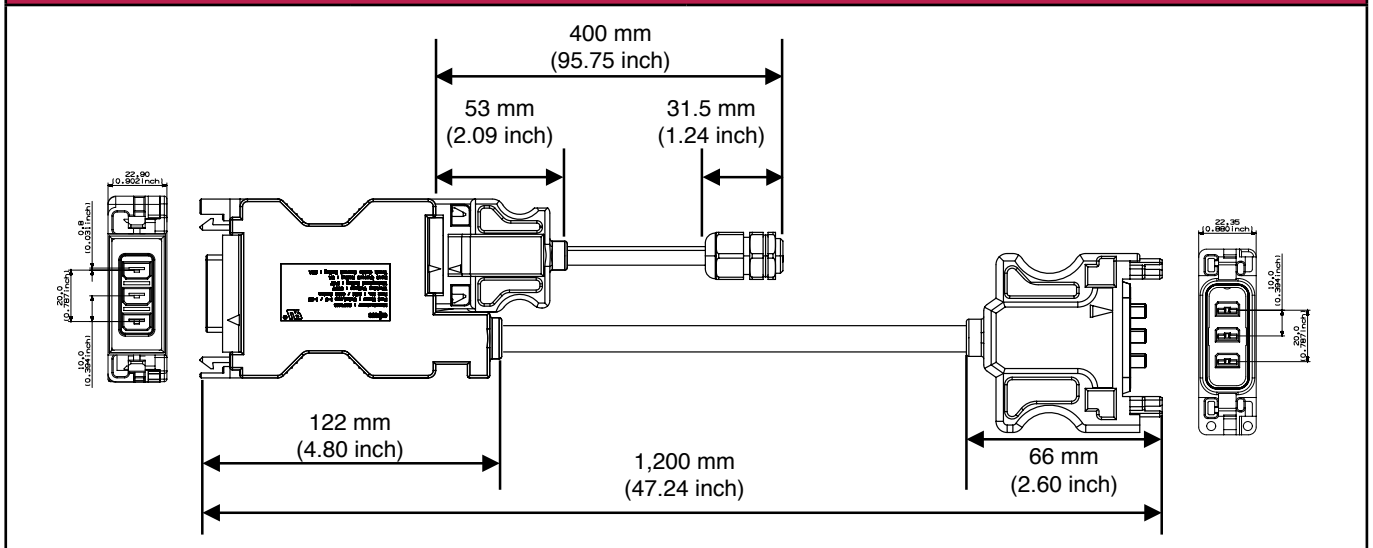
6-4 Dedicated Cables

Trunk		
Cable	Type	TC-ER sunlight resistant
	Max. Voltage	600V
	Max. Current	20A
	Size	12AWG
Connector	Max. Voltage	300V
	Max. Current	20A
Drop		
Cable	Type	TC-ER sunlight resistant
	Max. Voltage	600V
	Max. Current	5A
	Size	18AWG
Connector	Max. Voltage	300V
	Max. Current	5A

Certification

UL9703, UL6703A

Dimensions



7 Warranty

Disclaimer of Liability

- By starting the installation process the installer is acknowledging that he/she has read and completely understands this Installation Manual. He/She further acknowledges that if he/she had any questions regarding this installation manual he/she would have contacted LG with any questions or concerns prior to installation. By installing an LG Solar module, the installer is fully agreeing not to sue LG, its affiliated companies, successors, or assigns, its administrators, directors, agents, officers, volunteer and employees, other participants in any activity connected to installation, operation, or service of LG Solar Modules, and if applicable, will discharge above listed parties from all liabilities, claims, demands, losses, or damages on his/her account caused or alleged to be caused in whole or in part by the negligence of the LG its affiliated companies, successors, or assigns, its administrators, directors, agents, officers, volunteer and employees.

Disposal

- Please contact us, if you have any inquiries related to the disposal or recycling of solar modules from LG Electronics.

8 Transporting and Storage

- Do not loosen the banding, when module is transported by truck, ship and etc. Loose banding may cause damage, like breakage of glass.
- Maximum stacking is two pallets. Excessive stacking can stress the AC modules and cause product damage.
- Keep the module in its original packing prior to installation.

9 Contact

LG Electronics U.S.A Inc.
1000 Sylvan Avenue, Englewood Cliffs, NJ 07632, U.S.A
1-888-865-3026
lg.solar@lge.com
<http://www.lg-solar.com>



Due to our policy of continuous product innovation, some specifications may change without notification.
©LG Electronics U.S.A., Inc., Englewood Cliffs, NJ. All rights reserved. "LG" is a registered trademark of LG Corp.