



## INSTALLATION MANUAL

# AIR CONDITIONER

Please read this installation manual completely before installing the product.  
Installation work must be performed in accordance with the national wiring standards by authorized personnel only.  
Please retain this installation manual for future reference after reading it thoroughly.

### **AC Smart 5**

PACS5A000

Original instructions



MFL71381701  
Rev.03\_062625

[www.lg.com](http://www.lg.com)

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## SAFETY PRECAUTIONS

- This product must be installed by an installation professional from an LG authorised service center.
- Any issues stemming from an installation by an unauthorised person is the responsibility of the user and will not be covered by warranty.
- The following safety precautions are to prevent any unforeseen contingencies.
- This product has been designed for commercial purposes. This product has successfully cleared the EMI test.

### WARNING

It can result in serious injury or death when the directions are ignored.

### CAUTION

It can result in minor injury or product damage when the directions are ignored.

### WARNING

#### Installation

- To reinstall the product, please contact the dealer from where you purchased the product, or a service center for reinstallation service.
  - Installation of the product by an unauthorized person may result in fire, electric shock, explosion, injury, or a malfunctioning of the product.
- Do not twist or damage the power cord.
  - It may cause fire or electric shock.
- For electrical work, please contact the dealer from where you purchased the product, or a service center.
  - Disassembly or repair by an unauthorized person may result in fire or electric shock.
- Install the product in an area shielded from rain.
  - If water gets into the product, it may malfunction.
- Do not install the product in a humid area.
  - If the product is damp, it may malfunction.
- For installation of the product, please contact the dealer from where you purchased the product, or a service center.
  - Installation of the product by an unauthorized person may result in fire, electric shock, explosion, injury, or a malfunctioning of the product.
- For electrical work, please have an electrician do the work based on the installation manual and specified circuit diagram.
  - Using an unsuitable cord, or having a non-professional work on the electricals may result in fire or electrical shock.
- Do not place the product near a fire source.
  - It may result in the product catching fire.
- If the product is installed in a hospital or a communication base station, provide sufficient protective equipment against electrical noise.
  - The product may malfunction or other products may work abnormally.
- Securely install the product.
  - If the product is not secured during installation, it may fall or malfunction.
- Read the manual thoroughly to correctly install the product.
  - If not, an incorrect installation may cause fire or electric shock.
- When wiring the product, do not use a non-standard cable, nor extend the cable excessively.
  - It may cause a fire or electric shock.

- Securely install the power cord and communication cable.
  - An unsecure installation may result in a fire or electric shock.
- Do not connect the power cord to the communication terminal.
  - It may cause a fire, electric shock, or a product malfunction.
- Do not install the product in an area near combustible gas.
  - It may result in fire, electric shock, explosion, injury, or a malfunctioning of the product.

## Use

- Do not place a heavy object on the power cord.
  - It may cause a fire or electric shock.
- Do not change or extend the power cord arbitrarily.
  - It may cause a fire or electric shock.
- Use the cord specific to the product.
  - Using an unauthorized non-standard cord may result in a fire or electric shock.
- Do not use a heat device near the power cord.
  - It may cause a fire or electric shock.
- Ensure that water never gets into the product.
  - It can result in an electric shock, or the product may malfunction.
- Do not place any container with liquid on the product.
  - The product may malfunction.
- Do not touch the product with wet hands.
  - It may cause a fire or electric shock.
- Use standard components.
  - Use of an unauthorized product may result in fire, electric shock, explosion, injury, or a malfunctioning of the product.
- If the product has been submerged in water, you should contact a service center.
  - It may cause a fire or electric shock.
- Do not shock the product.
  - The product may malfunction.
- Do not store or use any combustible gas or flammable substances near the product.
  - It may cause a fire, or a product malfunction.
- Do not disassemble, repair, or revamp the product arbitrarily.
  - It may cause a fire or electric shock.
- Children and the elderly should use the product under the supervision of a guardian.
  - Carelessness may cause an accident, or the product to malfunction.
- The guardian should prevent children from accessing the product.
  - The product may be damaged or it may fall, causing injury to children.
- Keep in mind the operating temperature range specified in the manual. If there is no operating temperature range in the manual, use the product between 0 and 40 °C (32 and 104 °F).
  - If the product is used outside this range, the product may be severely damaged.
- Do not press the switch or button with a sharp object.
  - It can result in an electric shock, or the product may malfunction.
- Do not wire the product while it is turned on.
  - It may cause a fire or electric shock.
- If the product sounds or smells different, stop using the product.
  - It may cause a fire or electric shock.
- Do not place a heavy object on the product.
  - The product may malfunction.
- Do not spray water on the product, or clean it with a water-soaked cloth.
  - It may cause a fire or electric shock.

- Do not use the product for the preservation of animals and plants, precision instruments, art pieces, or for other special purposes.
  - It may cause property damage.
- Dispose the packing material safely.
  - The packing material may result in personal injuries.



## CAUTION

### Installation

- Securely install the product in an area where the weight of the product can be supported.
  - The product may fall and be destroyed.
- Do not use the product where there is oil, steam, or sulfuric gas.
  - It may effect the product's performance, or damage it.
- Check the rated power capacity.
  - It may cause a fire, or a product malfunction.
- Be careful not to drop or damage the product when moving it.
  - The product may malfunction or the person may sustain an injury.
- Ensure that the cord is connected securely to prevent dew, water, or insects from getting into the product.
  - If a foreign substance gets inside, it may cause an electric shock or the product may malfunction.

### Use

- Clean the product with a soft cloth, but not with a solvent-based detergent.
  - The use of a solvent-based detergent may cause a fire or deform the product.
- Do not touch the panel using a pointy or sharp object.
  - It can result in an electric shock, or the product may malfunction.
- Do not let the product come into contact with a metal substance.
  - The product may malfunction.
- When sterilizing or disinfecting, stop using the product.
  - The product may work abnormally.
- Do not touch inside the product.
  - The product may malfunction.
- Check the condition of the product after using the product for an extended period of time.
  - If the product is used for an extended period of time, the product's condition may be worsen, causing injury to the user.
- Do not leave the product near a flower base, water bottle, or any other liquids.
  - It may cause a fire or electric shock.
- If the liquid crystal of the product is broken, please do not let your skin such as face or hands contact with.
  - Personal injury or property damage may occur.

## Harmful substances

Name and content of harmful substances in the product

Partial (AC Smart 5)	Harmful substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated Biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Plastics (enclosure, control box)	O	O	O	O	O	O
Control unit (PCB assembly, fuse)	X	O	O	O	O	O
Metal structural parts (sheet metal and screws)	O	O	O	O	O	O
Cables (power cables and connection cables)	O	O	O	O	O	O
Battery	X	O	O	O	O	O
Packaging materials (cartons, sponges, foam, printed materials)	O	O	O	O	O	O

This form was prepared in accordance with SJ/T 11364.

O: It means that the content of this harmful substance in all homogeneous materials of this part is below the limit specified in GB/T 26572.

X: It means that the content of the harmful substance in at least one homogeneous material of the part exceeds the limit specified in GB/T 26572.

Parts marked with X cannot reduce harmful substances with current technology.

LG Electronics is doing its best to develop technologies to reduce harmful substances.



→ All electronic and electrical products for sales in China must be marked with Environment Protection Use Period (EFUP) logo.

The Environmental Protection Use Period is the time period during which the product can be safely used under normal use conditions, such as normal temperature and humidity.

**Class A device****Notes**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**! CAUTION**

Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

**Disposal of your old appliance**

1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

# PREPARATION

It provides the necessary information regarding the components, installation and setting method of AC Smart 5 which the user should have a fair understanding/be aware of.

## AC Smart 5 Overview

AC Smart 5 is a central controller installed in management room of a building or administration room of a school, which can monitor or control the operation of the IDU, ventilation, DI/DO, DOKIT, system boiler, AHU, and I/O module installed in each room of the building individually or by integration through touch screen.

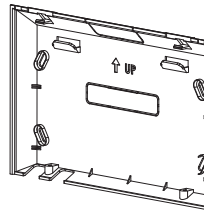
AC Smart 5 is a single machine and can be connected to up to 128 devices (indoor unit, ventilation, DI/DO, DOKIT, system boiler, AHU). Or up to 64 devices (indoor unit, ventilation, DI/DO, DOKIT, system boiler, AHU) and 9 I/O modules.

## Components

The following components are included in the package box. Open the box and verify that all components are included.



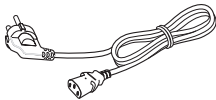
AC Smart 5



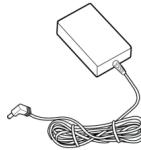
Wall installation plate



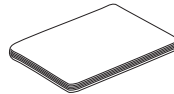
Screw



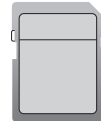
Power Cord



Power Adapter



Manual



SD Card 8 GB

### ! CAUTION

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid potential hazards.

### ! CAUTION


SD Card provided by LG is for the data backup and recovery when specialized service technician supports the service, so be careful not to lose it by using it for other purposes.

### ! NOTE

The schematics of the components and optionally purchased products shown may differ from the actual components and products.

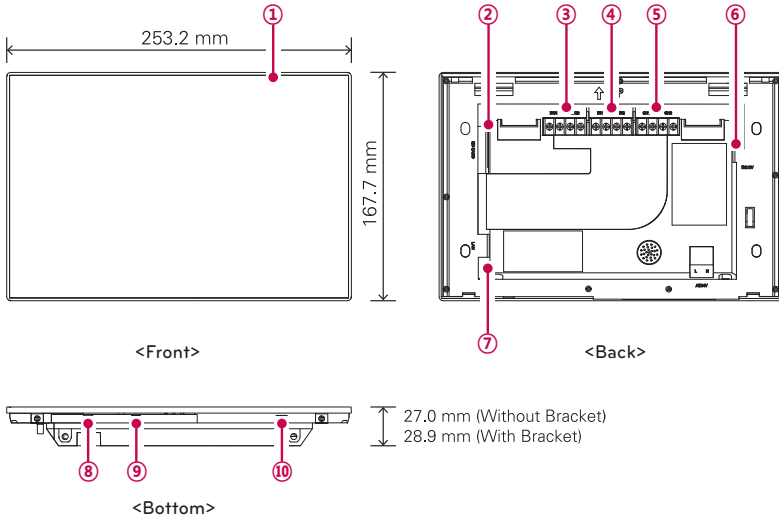
# PRODUCT SPECIFICATION



AC Smart 5 hardware product specification is as follows.

Number	Category	Specification
①	CPU	<ul style="list-style-type: none"> <li>• ARM Cortex A9 1 GHz</li> <li>• Dual Core</li> </ul>
②	MEMORY	2 GB
③	Storage	16 GB
④	LCD	10 inch type(1024 x 600) TFT LCD
⑤	Speaker	Mono
⑥	RS-485	2 Port
⑦	USB/SD	<ul style="list-style-type: none"> <li>- Micro USB 1EA (for external USB memory connection, for service)</li> <li>- Mini USB 1EA</li> <li>- SD Card 1EA</li> </ul>
⑧	Ethernet	10 / 100 BASE-T
⑨	DI	2 Port
⑩	DO	2 Port
⑪	Touch Screen	C-Type Touch Panel
⑫	Button Key	Less than 9 seconds (LCD Power On/Off), 10 seconds (System reset)
⑬	POWER	12 V  (3.33 A)
⑭	Operating temperature	0 °C ~ 40 °C
⑮	Protection class	IP20

## Features and Functions

The features and functions of AC Smart 5 are as follows.



Number	Item	Description
①	Touch Screen	<ul style="list-style-type: none"> <li>• 10 inch type LCD control panel</li> <li>• AC Smart 5 Premium control and information display</li> </ul>
②	SD Memory Slot	SD card memory slot
③	DO Port	2CH DO port
④	DI Port	2CH DI port
⑤	RS-485 Port	2CH 485 port (CH1: AHU, CH2: devices other than AHU) <ul style="list-style-type: none"> <li>• CH1 default setting : MODBUS / CH2 default setting : LGAP I</li> <li>• To change default setting, refer to 'Device Setting (AC Smart 5) - AC Smart 5 Editing' section in the user manual provided in [Help] category.</li> </ul>
⑥	12 V  Input Port	12 V  power input port (Not used in the US)
⑦	LAN Port	LAN cable port for Ethernet connection (100Mbps/10Mbps)
⑧	Micro USB Port (for service)	Port for upgrading software and reports, statistics, etc. (Requires cable to connect the USB memory sticks, supporting USB 2.0 or later)
⑨	Mini USB Port	PC port for debugging software
⑩	Power ON/OFF	<ul style="list-style-type: none"> <li>• If you press for less than 9 seconds, AC Smart 5 LCD backlight control is enabled.</li> <li>• Push 10 seconds or more to reset AC Smart 5.</li> <li>• If unused for a lengthy period of time, it is recommended that the product be turned OFF to prolong the LCD backlight's life.</li> </ul>

## Installation

To use AC Smart 5, you need to establish an environment for mutual communication between AC Smart 5 and the devices (indoor unit, ventilation, DI/DO, DOKIT, system boiler, AHU, I/O module) and register the corresponding devices through the functions of AC Smart 5.

To use AC Smart 5, it shall be installed in the following order.

### STEP 1. Installation environment inspection and device address setting

Before installing AC Smart 5, check the network for any interfacing devices and assign non-overlapping addresses to the connected devices.

### STEP 2. PI485 setting

Install PI485 and set the DIP switch accordingly.

### STEP 3. Connections

Connect PI485 and AC Smart 5 through RS-485 cable.

### STEP 4. Access and Device Registration

Log in to AC Smart 5 and register device with address set.

## ! CAUTION

Consult a qualified engineer/ technician for the installation of AC Smart 5. If you have any installation queries, contact the LG service center or LG Electronics.

## ! NOTE

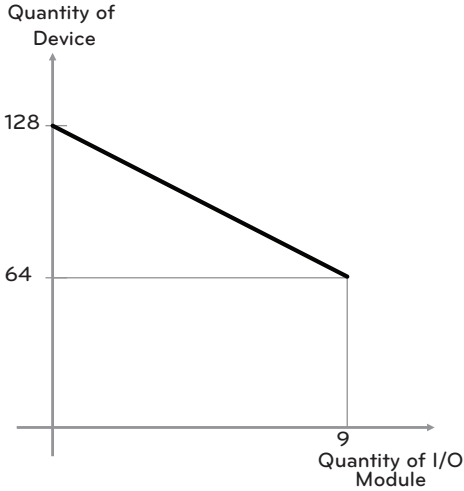
Maximum node numbers which can be connected to RS485 communication line.

- **Multi V**  
Maximum of 16 nodes can be connected to 1 RS485 line.
- **Multi/Single**  
Maximum of 32 nodes can be connected to 1 RS485 line.
- **ERV**  
Maximum of 32 nodes can be connected to 1 RS485 line.

## Check the installation environment and configure the device address

AC Smart 5 can connect up to 128 devices (including indoor units, ERV, DI/DOs, DOKITs, AWHPs, AHUs) or 64 devices (including indoor units, ERV, DI/DOs, DOKITs, AWHPs and AHUs) and 9 I/O Modules. For optimal communication performance, it is recommended to connect up to 64 units to one RS-485 port.

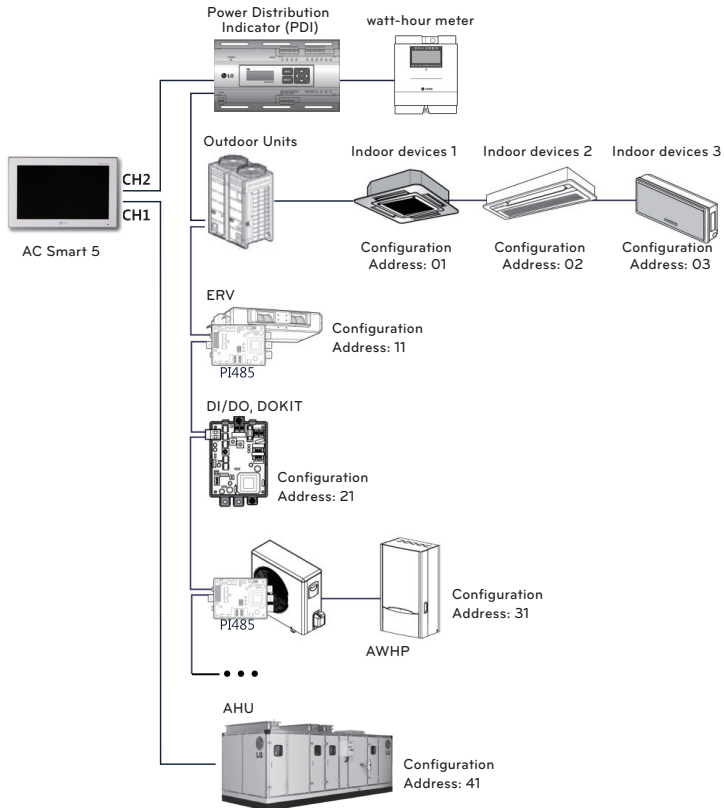
The following shows an example of connecting AC Smart 5 with such devices.



Quantity of I/O Module	Quantity of Device
0	128
1	121
2	114
3	107
4	100
5	93
6	86
7	79
8	72
9	64

\* Devices : Indoor units, ERV, DI/DOs, DOKITs, AWHPs, AHUs

AC Smart 5 connects with PI485 and uses RS485 to communicate and exchange information. Allocate unique addresses to those devices (internal units, ERV, DI/DOs, DOKITs, AWHPs, AHUs, I/O Modules) that shall connect with AC Smart 5. The addresses are hexadecimal numbers that can be chosen from 00 to FF. In order to control all indoor units with the central controller and use the TMS function, both the master and slave indoor units need to set the central control address. Slave indoor units must set the central control address in the master state before setting them as slaves.



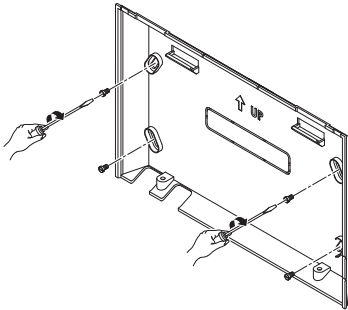
### NOTE

- The maximum allowed communication distance guaranteed by LG Electronics is 1,000 m. It means that the distance between AC Smart 5 and the farthest device should NOT exceed 1 000 m. For the RS-485 communication line, shield cable with a core area of 1.0 ~ 1.5 mm<sup>2</sup> must be used.
- For indoor units, ERV, DI/DOs, DOKITs, AWHPs, AHUs and I/O Modules, you can allocate different but NOT identical addresses amongst devices of the same type. (the indoor unit and DOKIT cannot use the same address.)
- Each device which can be used with PDI must be set to a unique address when connected with PDI. For further information about the devices can be used with PDI, please refer to the PDI manual.
- Connecting I/O Module, address setting should not be 00 as 00 is used to Broadcast in MODBUS communication.
- CH1 is set as MODBUS and CH2 is set as LGAP by default. To change default setting, refer to the contents of 'Device Setting (AC Smart 5) - AC Smart 5 Editing' in the user manual provided (Section 'Help').

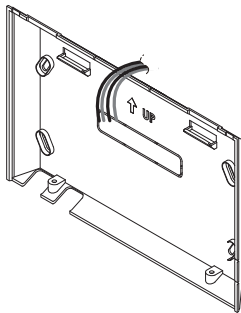
### Connect AC Smart 5

You can install AC Smart 5 and its cables as follows.

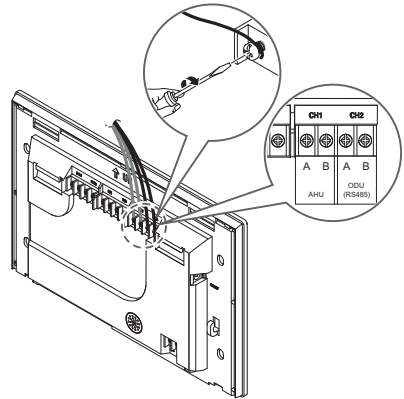
- 1 Select an installation area for AC Smart 5.
  - Prior to securing AC Smart 5, check if the space is suitable for installing AC Smart 5, an RS485 cable, power cord, and an Ethernet cable.
- 2 Secure the back panel of AC Smart 5 to the wall under which the RS485 cable is located.



- 3 Extend the RS485 cable through the top opening of the back panel.



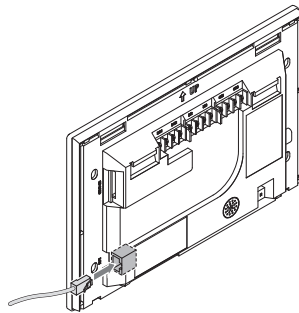
- 4 Connect the RS485 cable, which is located behind the AC Smart 5, to the RS485 terminal.



### CAUTION

Connect the +VE and -VE terminals of the cables to the respective terminals of the RS485 cable ensuring accurate electrical polarity.

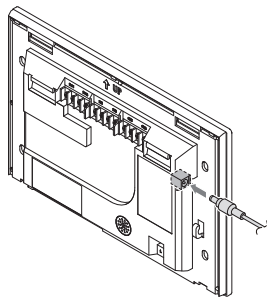
- 5 To access the network functions (email transmission and web control) provided by AC Smart 5, connect an Ethernet cable to the LAN port on the back of AC Smart 5.



## 6 Establish a power connection:

## • For global models

- On the back of AC Smart 5, connect the power adapter to the 12 V  $\text{---}$  Input power port.

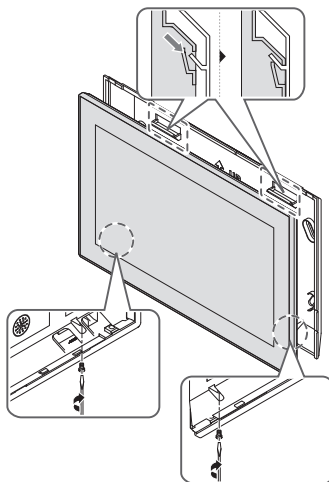


The adaptor is not provided with the AC Smart 5 package sold in the U.S.

**!** NOTE

You can hang the power cord on the power cord hanger located below the power port.

## 7 After attaching the hook on the top of the main body to the top of the rear panel installed on the wall, please push the top of the main body unit forward for firm attachment.



**!** CAUTION

Remove 2 screws from the bottom of the unit to prevent the AC Smart 5 from falling.

**!** NOTE

Product removal

After removing 2 screws from the bottom of the body, slightly pull the body using the flatblade screwdriver and lift the body upwards to remove the product.

# INITIALISING

It describes about how to access the system before completely using the AC Smart 5.

## Login and logout

The following explains how to log in and out of AC Smart 5.

AC Smart 5, can be controlled either by the equipment or the web. If you enter the IP address of the AC Smart 5 in the address bar of the command window of web browser (Run>cmd>ipconfig) without the installation of another program, the central control program AC Smart 5 Web server is executed automatically.

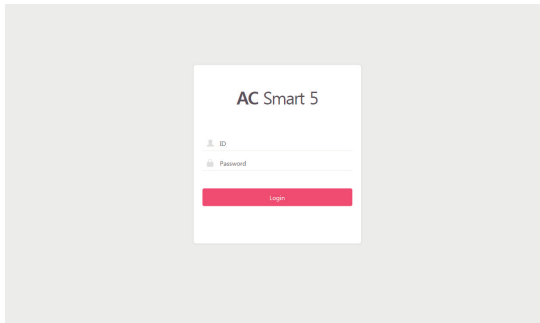
### ! NOTE

- Special characters (^), ('), ("), (,), (|), (\) cannot be used.

## Login

You can login as follows.

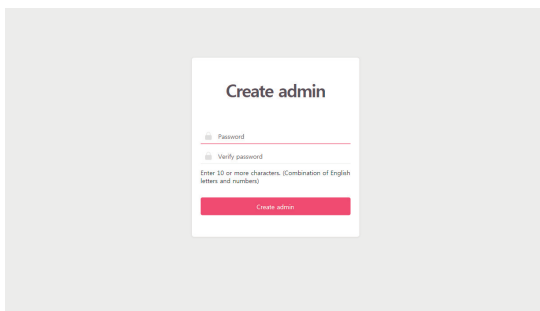
- 1 Run AC Smart 5.
- 2 Input ID and password in log-in window and touch [Log in] button.



## Log-in (for first time access)

In case of initially accessing, set password for the manager account (ID : admin).

- 1 Run AC Smart 5.
- 2 Input password of manager account to use in the account creation window and touch [Create admin] button.



**! CAUTION**

- Do NOT disclose account related info to unauthorised personnel.
- In case you have forgotten your password, contact the installer.

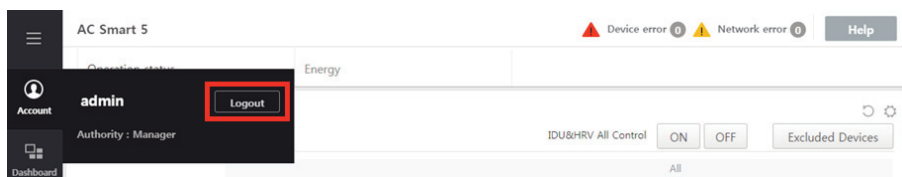
**! NOTE**

- To maintain confidentiality, change the password once in every 90 days (as prompted by the pop-up window).

**Logout**

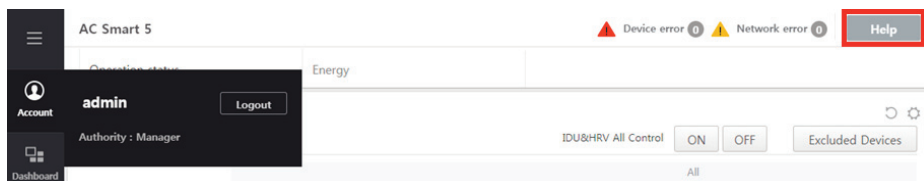
You can logout as follows.

- 1 In AC Smart 5 menu, choose the sub-menu 'Account'.
- 2 From the list of options as displayed by the 'Account' sub-menu press 'Log Out'.

**User manual**

You can view the user manual as follows.

- 1 In AC Smart 5 log-in screen, input ID and password and touch [Log in] button.
- 2 Press 'Help' at the top right side of AC Smart 5 screen.
  - The user manual is displayed.



## Pre-Tech Support Checklist

If the product malfunctions, please check the following before calling the service center.

Issue	Check	Actions
The alarm sound does not stop.	<ul style="list-style-type: none"> <li>• Is the demand controller working normally?</li> <li>• Is the LAN cable connected to the product?</li> </ul>	<ul style="list-style-type: none"> <li>• Check if the demand controller is normal.</li> <li>• Check if the LAN cable is connected to the device properly.</li> </ul>
All products remain in the disabled mode.	Is DI1 CH short-circuited?	Check if DI1 CH is open or short circuited. (DI1 CH should always be open except when an emergency occurs.)
The product was reset at midnight.	The product is automatically reset daily morning at 02:05 am.	
The device is not controlled.	Is the device you want to control unlocked?	Check if the lock is enabled and if so, disable the lock.
The device icon has an error mark.	Are the devices properly connected?	If devices are not connected, the error sign is displayed. Check the connection status of the devices.



