

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.

ACS I/O Module
PEXPMB000



MFL69157012
Rev.01_082024



www.lg.com

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SAFETY INSTRUCTIONS

The following safety guidelines are intended to prevent unforeseen risks or damage from unsafe or incorrect operation of the appliance. The guidelines are separated into 'WARNING' and 'CAUTION' as described below.

 This symbol is displayed to indicate matters and operations that can cause risk.

Read the part with this symbol carefully and follow the instructions in order to avoid risk.

WARNING

This indicates that the failure to follow the instructions can cause serious injury or death.

CAUTION

This indicates that the failure to follow the instructions can cause the minor injury or damage to the product.

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.

Operation

- 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 °C and 40 °C (32 °F 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.

- The appliance must only be supplied at safety extra low voltage corresponding to the marking on the appliance.
- Do not install the unit in potentially explosive atmospheres.
- Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Operation

- 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.

- Transformer selection:

- Select an insulating product that complies with IEC61558-2-6 and NEC Class 2.
 - In addition, consider the combined power consumption of the modules, accessories, and field devices installed for the selection of an appropriate transformer. Main module current: 24 V~, 500 mA
- The power cable must be used 0.5mm² or more.

According to IEC 60335-1

This appliance is not intended for use by person (including children) with reduced physical, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

According to EN 60335-1

This appliance can be used by children aged from 8 years and above and person with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Class A device**NOTE**

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.

*Safely dispose all materials in accordance with federal/state/local laws or ordinances.

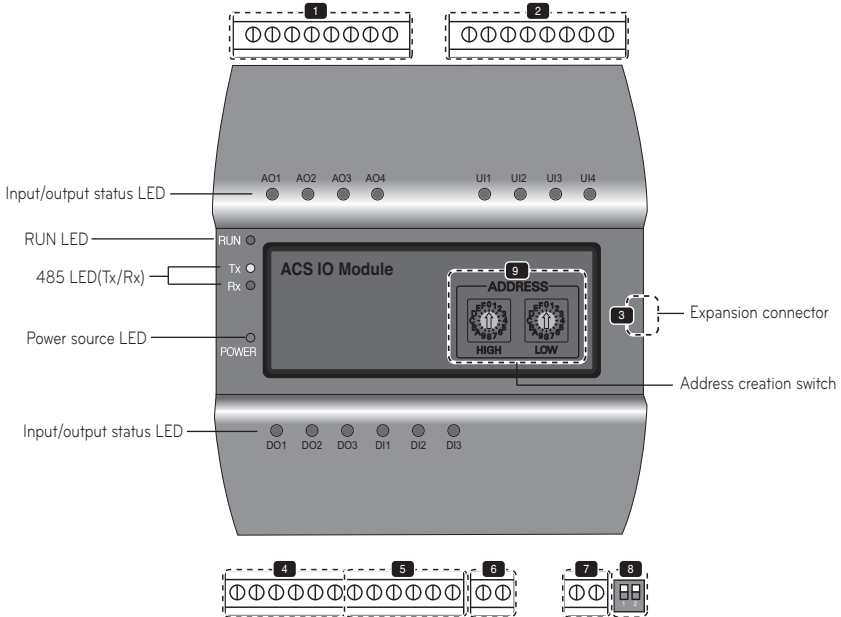
التخلص الآمن من كافة المواد بما يتوافق مع القوانين والأوامر المحلية

PRODUCT FUNCTIONS AND SPECIFICATIONS

The ACS IO is a module that can be connected with the ACS IV Controller (AC Smart IV, and ACP IV) for scalability in case the ACS IV Controller does not have enough DI, DO ports, or in case one wants to use an AI, AO port.

The names of each part

The ACS IO consists of the following types.



1 AO Port (control signal interconnect)

2 UI Port (control signal interconnect)

3 Expansion connector (Not used)

4 DO Port (control signal interconnect)

5 DI Port (control signal interconnect)

6 RS-485 Communication unit

7 24 V~ Power input port

8 Dip Switch (Not used)

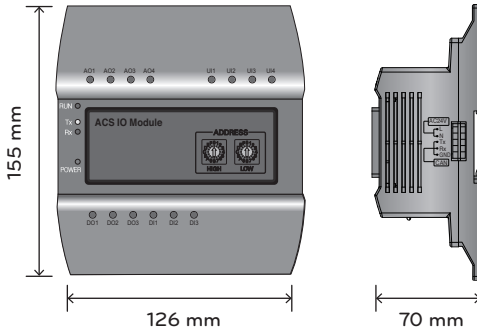
9 Rotary Switch (ACS IO address creation)

CAUTION

When expanding on the product using a connecting product, check the shape of the expansion connector head before attempting to connecting the cord.

Connecting the wrong cord can result in damage and a malfunction of the product.

The size of ACS I/O Module



Components

There are following components in the ACS IO package box.

Open the package box of ACS IO and check whether all the components are enclosed.



ACS IO



Installation Manual



Installation screws



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 a hazard.

NOTE

Components or options may differ from the actual product picture.

PRODUCT INSTALLATION

ACS IO installation methods

There are two methods as seen below for attaching the ACS IO to the wall.

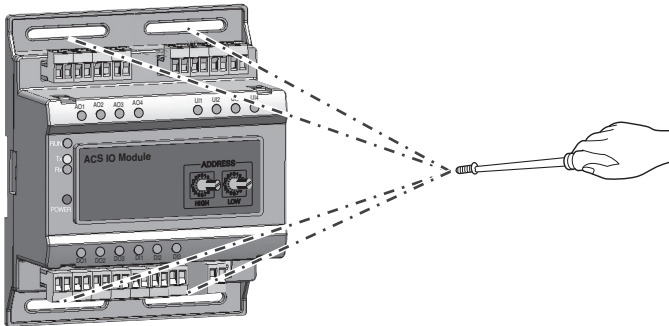
Attaching the ACS IO the wall

The ACS IO can be installed by attaching it to the wall.

- First, decide a suitable place to install the ACS IO.
 - Make sure it is a place that is suitable for connecting the IO, power source, and RS-485 cables.
- Use a screwdriver to attach it to the wall.
- It can be attached according to the location of installation as shown in the illustration.

! CAUTION

- Screw Spec : Screw head height - 1.75 ~ 2.00 (mm)
Screw head diameter - 5.50 ~ 7.05 (mm)

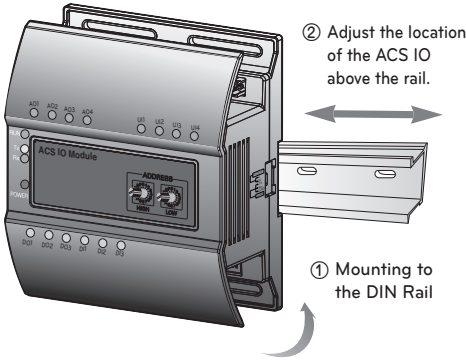


Mounting the ACS IO to a DIN Rail

The ACS IO can be installed on a DIN Rail with a width of 35 mm and a height of 7.5 mm.

Follow the instructions below to install the ACS IO in a suitable location.

- First, decide a suitable place to install the ACS IO.
 - Make sure it is a place that is suitable for connecting the IO, power source, CAN, and RS-485 cables.
- Install the DIN Rail in a place suitable for connecting IO, power and RS-485 cables.
- Place the upper part of the ACS IO on the DIN Rail.
- Make sure you can hear the sound of the lower part of ACS IO make contact when mounting.
- Make sure the ACS IO is secure by tugging at it gently.
- To remove ACS IO from DIN rail, gently lift module upwards while pulling the top away from DIN.

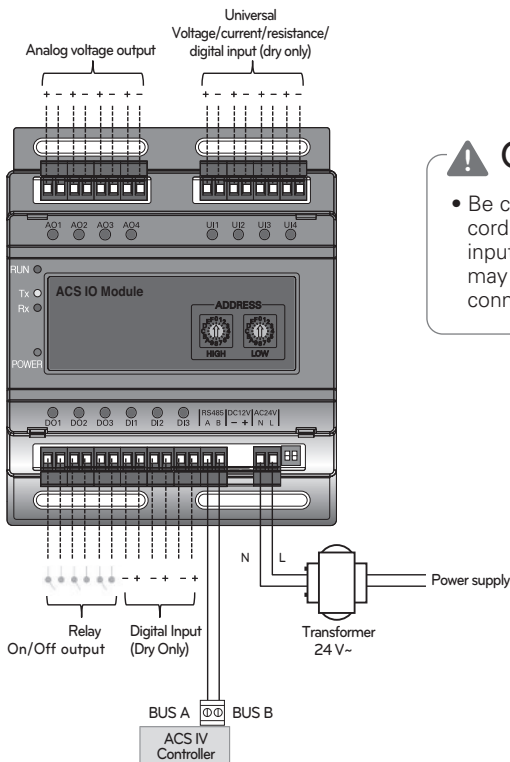


CAUTION

- Do not attach screws to the wall after installing the DIN Rail. Doing so can damage the product.
- DIN Rail attaching Screw Spec : M3, screw head height 1.75 ~ 2.00 mm screw head diameter 5.50 ~ 7.05 mm.
- After the product has been completely mounted the installer should consider using a DIN Rail stopper.

Connecting the product

The illustration below shows all the cable connections of the ACS IO.



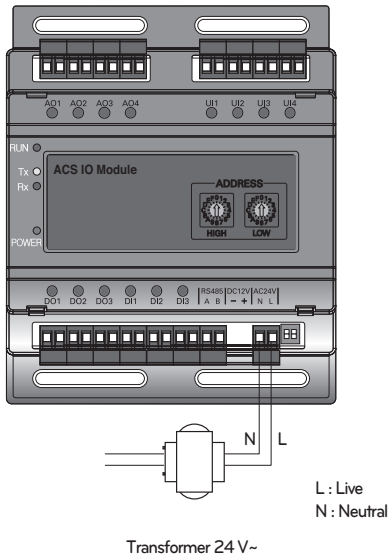
CAUTION

- Be careful not to plug in the wrong cord when connecting to the various input/output sockets. The product may be damaged an improper +/- connection is made.

< Illustration of ACS IO cable connections >

Inputting power source

Use a power source of 24 V~ conforming to local and national codes.



CAUTION

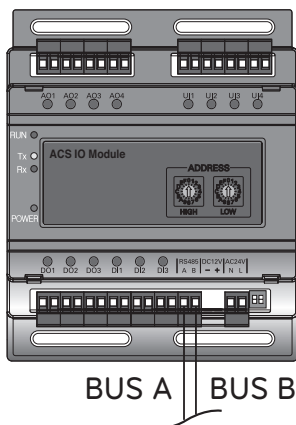
- When connecting the power source confirm the location of the power source connector and connect it firmly.
- When selecting a transformer you must select a product with safety isolation that meets IEC61558-2-6 and NEC Class 2 regulations. Also, when selecting an appropriate transformer, each installed module, accessory and volume of total energy consumption of the field devices must be considered.
- When power source must be supplied after completely connecting the product.

Connecting the communication Link

Connecting the RS-485 communication link

The two RS-485 cables must be connected to the BUS A of the ACS IO and the BUS B to connect the ACS IO with the ACS IV Controller

Refer to the following illustration when connecting the RS-485 cable.



CAUTION

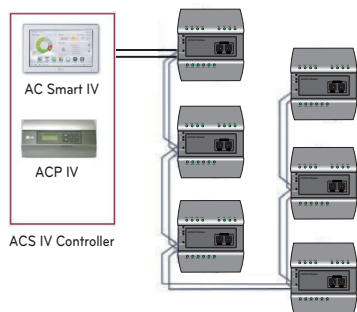
- Polarity exists when connecting the RS-485 cable, therefore when connecting the two cables caution must be taken so that they are not switched.

Connecting the ACS IV Controller to the ACS IO

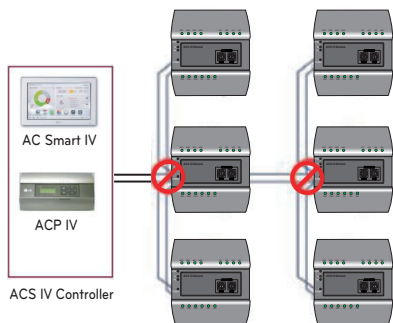
A maximum of 16 ACS IO's can be connected to a single ACS IV Controller.

When there are multiple ACS IO, RS-485 communication cable must be installed using the daisy chain method.

Failure to do so may cause the ACS IV Controller to malfunction.



<Correct example: Connection to the RS-485 BUS type>



<Incorrect example: Connection to the RS-485 STAR type>

ACS IO Address Creation

When one ACS IV Controller(AC Smart IV, ACP IV) is connected to multiple ACS IO, to classify each module a unique address must be used by selecting rotary switches.

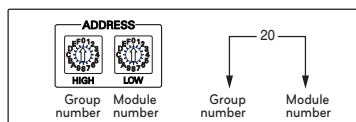


Using the ACS IO rotary switch a 16 digit between 01~F7 can be created.

(00 addresses may not be created because they are used for broadcasting at MODBUS communications.)

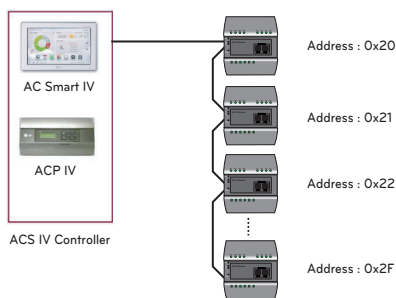
Numbers 20~2F are recommended for creating an ACS IO address.

A maximum of 16 ACS IO can be connected.



Recommended address

- Recommended address range : 20~2F
- Valid address range : 01~F7



CAUTION

- The maximum allowed communication length for the RS-485 cable is 1 000 m. Meaning, that the furthest away an ACS IO can be installed is 1 000 m from the ACS IV Controller.
- It is suggested to use 18/2 AWG twist-shielded pair cable.

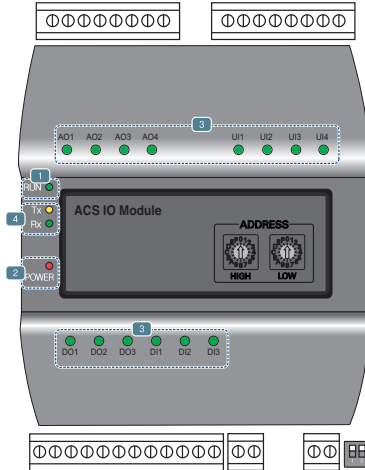
CAUTION

- Please create a unique address for each module.
- Do not create an address with 00. (00 addresses may not be created because they are used for broadcasting MODBUS communications.)
- After changing the address be sure to cycle power.

USING THE PRODUCT

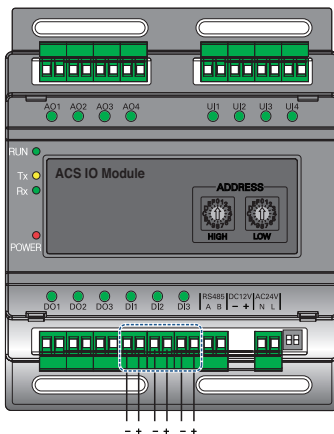
This chapter will describe about the methods of use for the ACS IO.

LED status



- 1 RUN LED : This is used to confirm that normal operations have been established after connecting to ACS IO.
 - Under normal conditions. Under normal conditions flashes 5 times per second when a power source is applied.
 - When an error occurs. When an error occurs between the ACS IV Controller and the ACS IO, it will flash twice in 2 seconds. When error occurs in ACS IOs 2 though 16, it will flash 3 times every 2 seconds.
- 2 Power source LED : This is used to confirm the condition of the power source supply.
 - LED is ON while power is applied.
 - Otherwise LED is OFF.
- 3 This is used to label the status of each port. (Refer to port descriptions for details of each of the lights.)
- 4 485 communication LED(Tx/Rx) : This is used to confirm of the operation of RS-485 communication.
 - It will flash according to the communication condition of 485 Tx/Rx.

Connecting to an external device (DI port)



+ : Input
- : GND

The dry contact input method is provided for DI ports.

Do not apply external power to DI ports. Damage will occur and warranty will be voided.

There are a total of 3 DI ports.

LED status (DI port)

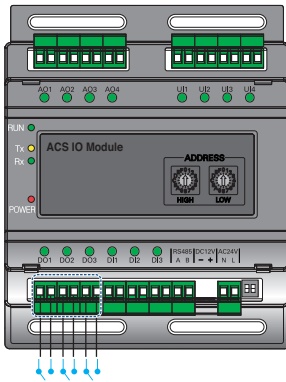
The input status LED will light up under the following circumstances.

- When there is an input value : ON
- When no input value is present : OFF

Connecting to an external device (DO port)

As for the DO port, this is a contact output port.

There are a total of 3 DO ports.



LED status (DO port)

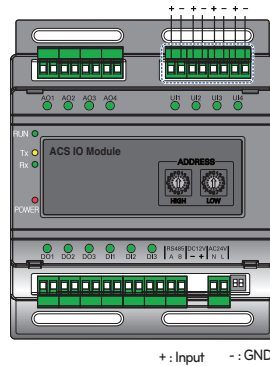
The input status LED will light up under the following circumstances.

- When output shorts : ON
- When output opens : OFF

Connecting to an external device (UI port)

Each of four UI ports can be configured for use as analog in or digital in only.

There are a total of 4 UI ports.



CAUTION

- The maximum output possible for switching through digital output is 30 V~ / 30 V=== and the maximum current is 2 A.
- Deviating from the intended range can cause the product to be damaged.

The table below shows the valid configuration values for each of four UI ports.

Types of input		Minimum value	Maximum value
Analog Input	NTC 10k	0.68 kΩ	177 kΩ
	PT 1000	803 Ω	1 573 Ω
	Ni 1000	871.7 Ω	1 675.2 Ω
	DC(Voltage)	0 V	10 V
	DC(Current)	0 mA	20 mA
Digital Input	Binary (Dry contact)	-	-

CAUTION

- Using input other than the conditions of use list above can cause product damage and malfunction.
- Polarity matters in DC voltage and current configuration, you must follow external 3rd party device wiring to be sure that polarity is applied correctly.

LED status (UI port)

The input status LED will light up under the following circumstances.

Types of LED input		Minimum value
Analog Input	NTC 10k	OFF
	PT 1000	OFF
	Ni 1000	OFF
	DC(Voltage)	OFF
	DC(Current)	OFF
Digital Input	Binary (Dry contact)	When there is an input value, ON

	Minimum	Maximum
Voltage	0 V	10 V

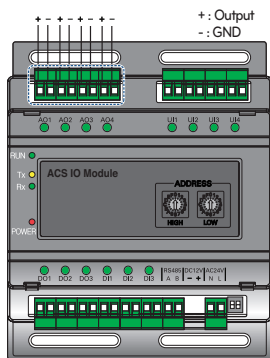
LED status (AO port)

The input status LED will light up under the following circumstances.

- When creating port output from the ACS IV Controller : ON
- When creating as port reserves from the ACS IV Controller : OFF

Connecting to an external device (AO Port)

Each of four analog output ports will provide between 0 and DC 10 V depending on central controller configuration.



CAUTION

- Connecting the wrong size cable results in damage and a malfunction of the product.
- Check the size of the connector head before attempting to terminate wiring.
- The maximum output current is 20 mA.



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