

INSTALLATION/USER MANUAL

V-NET™ ACS

- Make sure to read the cautions for safety before installation and use, and use it correctly.
- It is intended to keep protect the safety of the installer and user and to prevent the property damage, etc.
- After reading the user manual, please keep it at a place where user can access any time.

TYPE : ACS IO MODULE

MODEL : PEXPMB000



P/NO : MFL67657109

www.lg.com

TIPS FOR SAVING ENERGY

Here are some tips that will help you minimize the power consumption when you use the air conditioner. You can use your air conditioner more efficiently by referring to the instructions below:

- Do not cool excessively indoors. This may be harmful for your health and may consume more electricity.
- Block sunlight with blinds or curtains while you are operating the air conditioner.
- Keep doors or windows closed tightly while you are operating the air conditioner.
- Adjust the direction of the air flow vertically or horizontally to circulate indoor air.
- Speed up the fan to cool or warm indoor air quickly, in a short period of time.
- Open windows regularly for ventilation as the indoor air quality may deteriorate if the air conditioner is used for many hours.
- Clean the air filter once every 2 weeks. Dust and impurities collected in the air filter may block the air flow or weaken the cooling / dehumidifying functions.

For your records

Staple your receipt to this page in case you need it to prove the date of purchase or for warranty purposes. Write the model number and the serial number here:

Model number : _____

Serial number : _____

You can find them on a label on the side of each unit.

Dealer's name : _____

Date of purchase : _____

IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE.

Always comply with the following precautions to avoid dangerous situations and ensure peak performance of your product

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 or repairs made by unqualified persons can result in hazards to you and others.
- Installation **MUST** conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA 70/ANSI C1-1003 or current edition and Canadian Electrical Code Part 1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

When installing

- Product installation must be performed at the service center or by an expert.
 - Failure to do so can cause fire, electric shock, malfunction or injury.
- When re-installing the already installed product it must be performed at the service center or by an expert.
 - Failure to do so can cause fire, electric shock, malfunction or injury.
- Use standard parts.
 - Failure to do so can cause fire, electric shock, malfunction or injury.
- Do not store or use combustible gas or flammable substances near the product.
 - Doing so can cause fire and electric shock.
- Do not disassemble, repair or modify the product at your own discretion.
 - Doing so can cause malfunction.
- Do not install in a place that is susceptible to rain.
 - Doing so can cause malfunction.
- Do not install in a place that is susceptible to humidity.
 - Doing so can cause malfunction.
- Do not store the product near heating devices.
 - Doing so can cause fire.
- Install it in a secure place that can withstand the weight of ACS IO.
 - In case it is installed in a place unable to withstand ACS IO it may fall and get damaged.
- Do not use the product in the following particular environments.
 - Product performance may be hindered and the product may be damaged if used in a place where gas, steam, or sulfuric acid is present.
- Do not touch the switch with wet fingers.
 - Doing so may result in electric shock and cause the product to malfunction.
- Any electrical work must be done by an expert from where the product was purchased or at the service center.

4 SAFETY PRECAUTIONS

- Failure to do so can cause fire and electric shock.
- Do not use a power cord that has been damaged, sabotaged or overly bent.
 - Failure to do so can cause fire and electric shock.
- Do not connect the power cord to the control signal line socket.
 - Doing so can cause fire and electric shock.
- Make sure the power cord is disconnected before performing any wiring work.
 - Doing so can cause fire and electric shock.
- When connecting the connector be careful that the cable is not severed.
 - Doing so can cause fire and electric shock.

While in use

- Do not alter or stretch the power cord.
 - Doing so can cause fire and electric shock.
- Do not pour water in the product.
 - Doing so can cause electric shock and malfunction.
- Do not use heating appliances near the power cord.
 - Doing so can cause fire and electric shock.
- Do not place heavy items on top of the product.
 - Doing so can cause malfunction.
- Do not place heavy items on top of the cord.
 - Doing so can cause fire and electric shock.
- Children and seniors must be supervised when the product is in use.
 - Failure to do so may result in electric shock and cause the product to malfunction.
- In case water has entered the product, a request for repair must be made at the service center or by an installation expert.
 - Failure to do so can cause fire and electric shock.
- Do not knock the product.
 - Doing so can cause the product to malfunction.
- When cleaning or inspecting be sure to turn off the power to the appliance.
- Do not touch the power source part with wet fingers.
 - Failure to do so can cause fire and a deformation in the product.
- Confirm the operating temperature.
 - Using the product in at a temperature that exceeds the operation temperature range can cause severe damage. Confirm the prescribed range of service temperature enclosed in the manual. If there is no prescribed temperature use within a range of between 0~40 °C.
- Do not place a liquid-filled container on top of the product.
 - Doing so can cause fire and electric shock.



CAUTION

When installing

- Confirm the rated capacity of the power source.
 - Failure to do so can cause fire and a deformation in the product.
- When selecting a transformer
 - When selecting a transformer you must select a product with safety isolation that meets IEC61558-2-6 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. **The ACS IO Consumption Current: 24 V~, 500 mA**
 - This is device current only. External loads must be added when using common power supply.

While in use

- Do not use a powerful solvent as a detergent for cleaning, use a soft cloth instead.
 - Failure to do so can cause fire and a deformation in the product.

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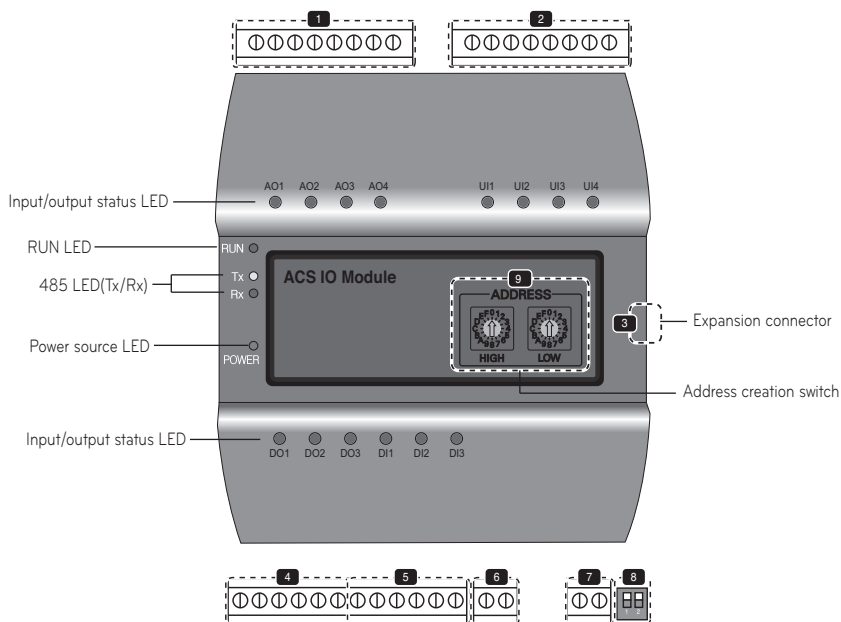
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PRODUCT FUNCTIONS AND SPECIFICATIONS

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) | 4 DO Port (control signal interconnect) |
| 2 UI Port (control signal interconnect) | 5 DI Port (control signal interconnect) |
| 3 Expansion connector (Not used) | 6 RS485 Communication unit |
| | 7 24 V~ Power input port |
| | 8 Dip Switch (Not used) |
| | 9 Rotary Switch (ACS IO address creation) |

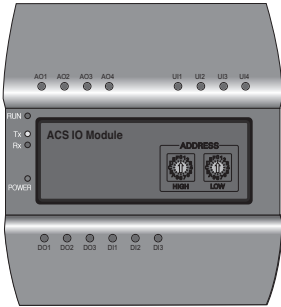
CAUTION

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 results in damage and a malfunction of the product.

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



User guidelines



Installation screws

Hardware and exterior specifications

The ACS IO hardware specification are as follows.

Item	Description
Rotary Switch	2EA (ACS IO Address creation)
Dip Switch	1EA (Not used)
LED	18EA (485 communication status x2, power source status x1, operation status x1, IO input status x14)
Product size and weight	155 x 126 x 64.8(width x length x height mm), 250 g
DIN Rail Specifications	Standard size width 35 mm DIN Rail
Communication port	1 channel RS485 communication, 1 channel CAN communication
External input/output port	DI x 3EA, DO x 3EA, UI x 4EA, AO x 4EA
Rated voltage	24 V~, 60 Hz / 500 mA
Range of service temperature	-20 ~ 60 °C

PRODUCT INSTALLATION

ACS IO installation methods

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

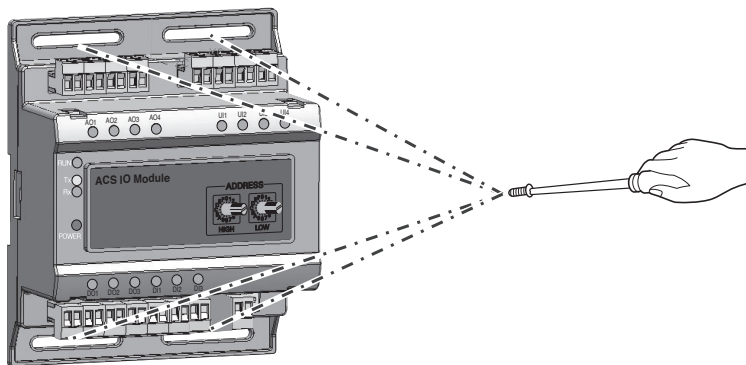
Attaching the ACS IO the wall

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 RS485 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 - 2.00 ~ 1.75 (mm)
Screw head diameter - 7.05 ~ 5.50 (mm)

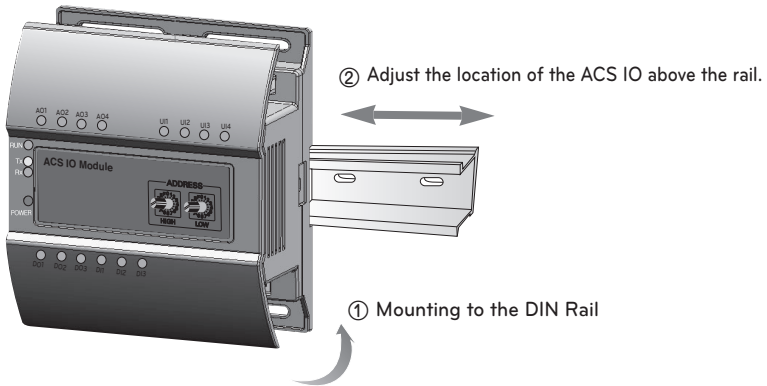


Mounting the ACS IO to a DIN Rail

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 RS485 cables.
- Install the DIN Rail in a place suitable for connecting IO, power and RS485 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.

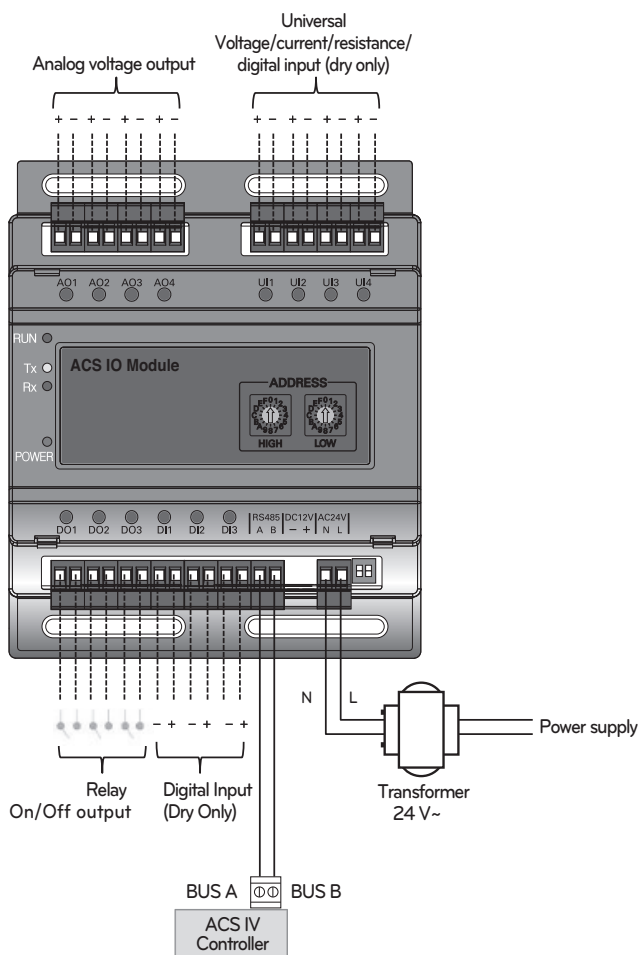


CAUTION

- 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 2.0 ~ 1.75 mm screw head diameter 7.05 ~ 5.5 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.



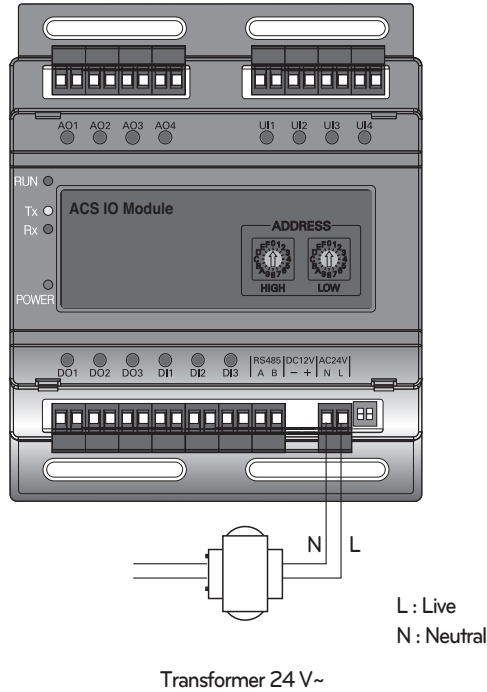
< Illustration of ACS IO cable connections >

! 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.

Inputting power source

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



CAUTION

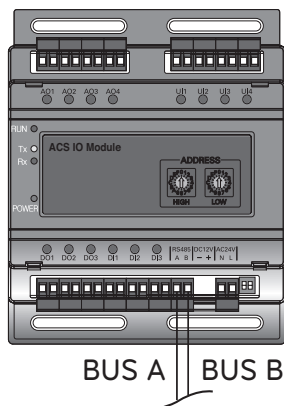
- When connecting the power source confirm the location of the power source connector and connect it firmly.
- When selecting a transformer you must select a product with safety isolation that meets IEC61558-2-6 and NEC Class 2 regulations. Also, when selecting an appropriate transformer, each installed 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 RS485 communication link

The two RS485 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 RS485 cable.



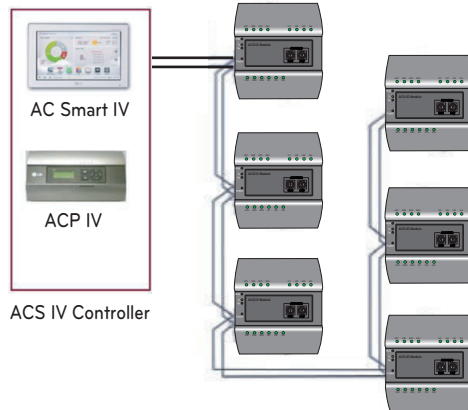
CAUTION

- Polarity exists when connecting the RS485 cable, therefore when connecting the two cables caution must be taken so that they are not switched.

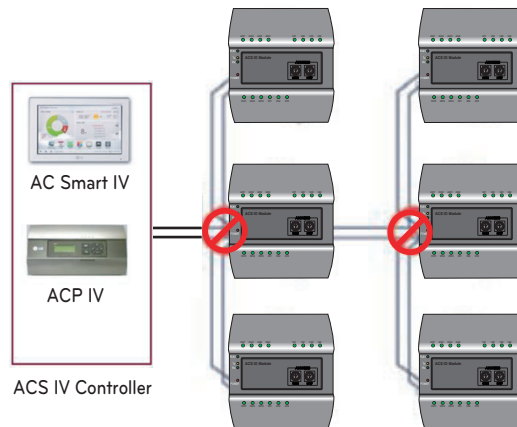
Connecting the ACS IV Controller to the ACS IO

A maximum of 16 ACS IO's can be connected to a single ACS IV Controller.
When there are multiple ACS IO, RS485 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 RS485 BUS type>



<Incorrect example: Connection to the RS485 STAR type>

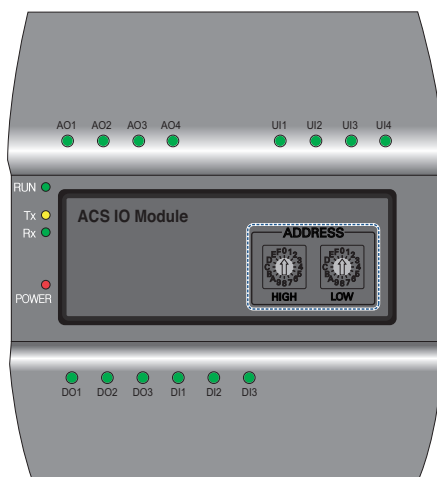
CAUTION

- The maximum allowed communication length for the RS485 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 twisted shielded pair cable.

Address creation

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.

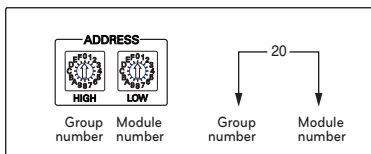


Using the ACS IO rotary switch a 16 digit between 01~F7 can be created.

(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.

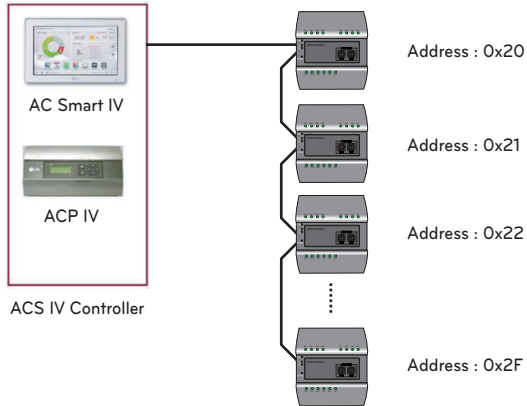


CAUTION

- 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.

Recommended address

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

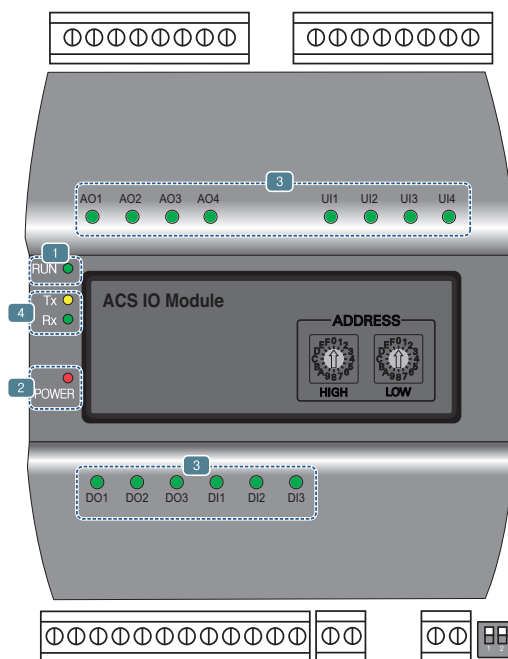
**CAUTION**

- 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 be 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 RS485 communication.
 - It will flash according to the communication condition of 485 Tx/Rx.

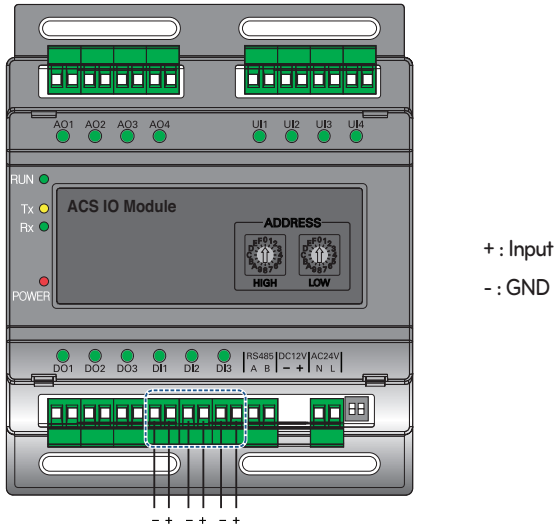
Connecting to an external device (DI port)

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)

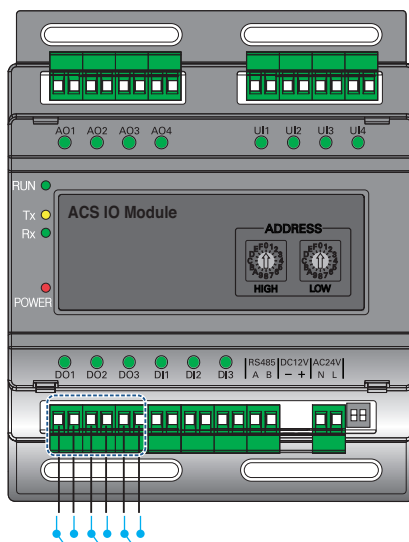
The input status LED will light up under the following circumstances.

- 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.



! CAUTION

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

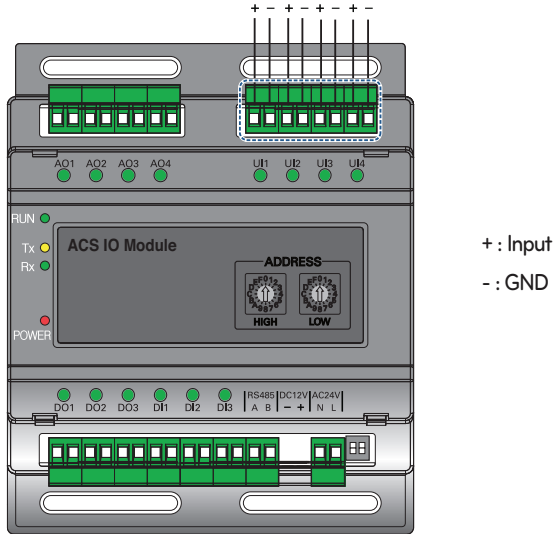
LED status (DO port)

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.



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 k Ω	177 k Ω
	PT 1000	803 Ω	1573 Ω
	Ni 1000	871.7 Ω	1675.2 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.

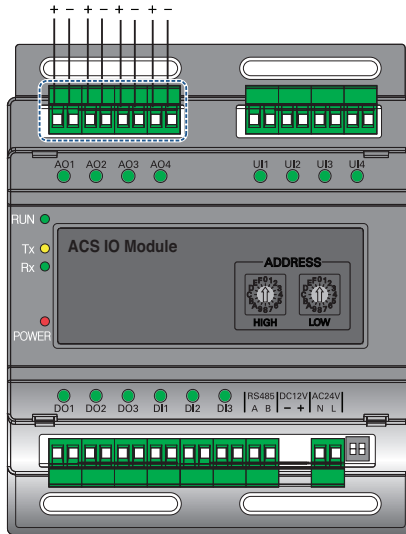
LED status (UI port)

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

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.



+ : Output

- : GND

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.

	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

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.

