AIPHONE AC Series Access Control Solution Instruction Manual

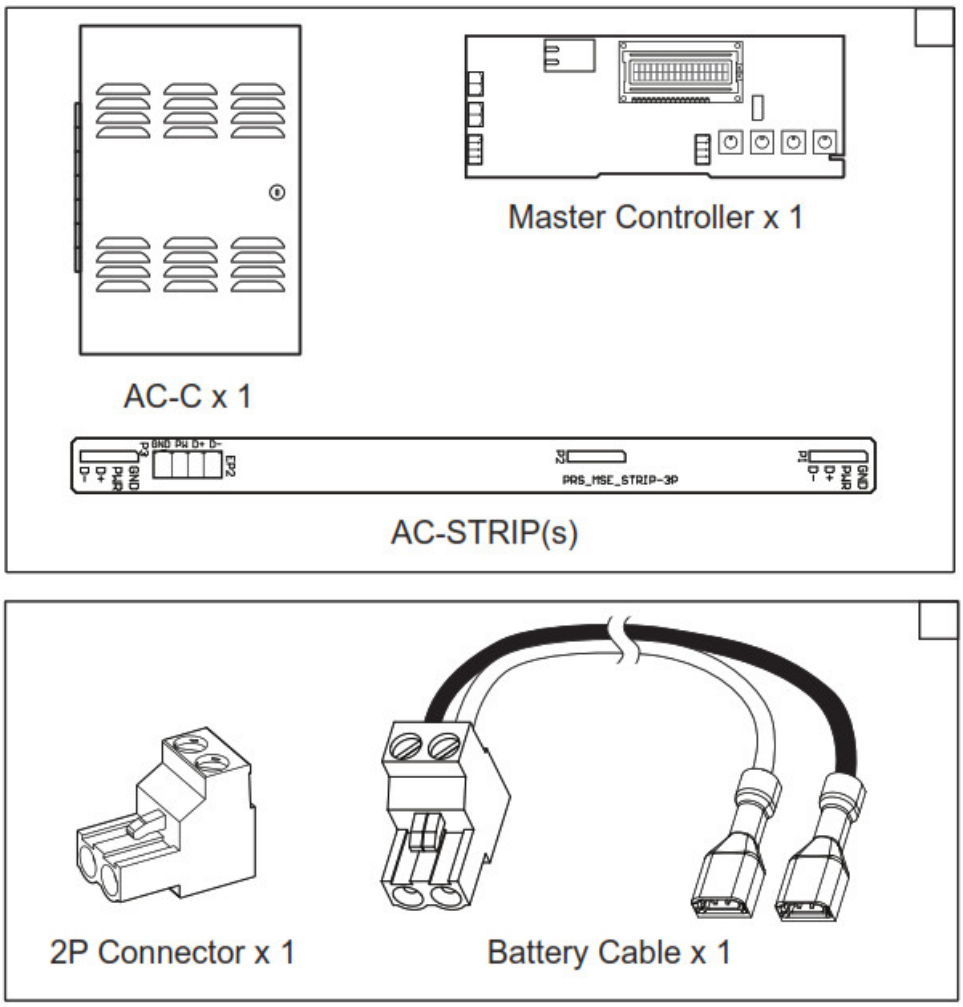
Installation Manual

KIT PART NUMBER	
ACS-2DR-C	
ACS-ELV	
ACS-IO	
ACS-2DR (Trove Starter)	

Part Number	
AC-2DE	
AC-IOE	

Contents

Package Contents



UL 294 / S319 Compliance Notices

This product complies with the following UL294 Access Control Performance Levels when installed as part of the Listed AC-NIO system :

Endurance Level IV (100,000c)

Line Security Level I

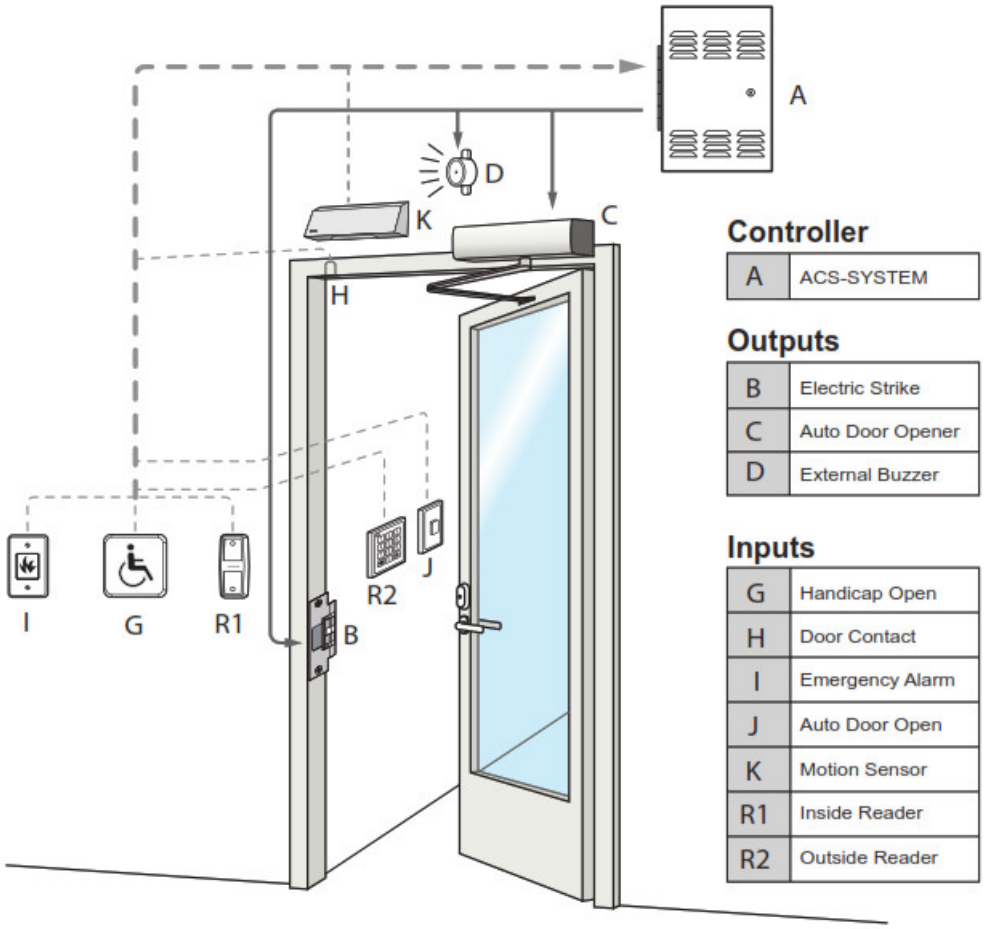
Wiring methods shall be in accordance with the National Electrical Code (ANSI/NFPA70), CSA C22.1, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, Part I, local codes, and the authorities having jurisdiction. All interconnecting devices must be UL Listed, low-voltage Class 2 power limited. The minimum permissible wire size to be used shall not be less than 26 AWG (0.24 mm2).

Products have been evaluated for “Indoor Use” only, and to be installed within the “protected” or “restricted” area. This product is not intended for outside wiring as covered by Article 800 in the National Electrical Code, NFPA 70. Products are not intended to be installed or mounted in air-handling spaces. Products are intended to be installed by manufacturer trained service installers only All recommended connected peripherals such as power supplies, UPS/battery backups, PoE switches, electrified strikes, readers require to be UL Listed.

Please refer to the AC-NIO UL Reference document for more comprehensive information available via the

installation USB drive or downloadable from our website. Hard copy of the AC-NIO UL Reference Manual document is available – call for pricing.

Door Installation Example



Controller

A	ACS-SYSTEM

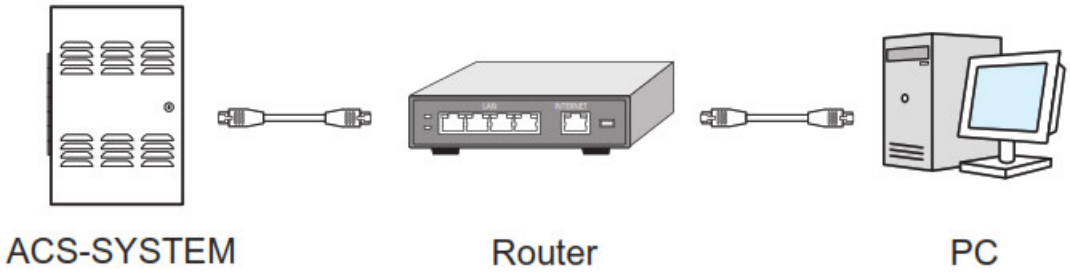
Outputs

B	Electric Strike
C	Auto Door Opener
D	External Buzzer

Inputs

G	Handicap Open
H	Door Contact
I	Emergency Alarm
J	Auto Door Open
K	Motion Sensor
R1	Inside Reader
R2	Outside Reader

Networking Example

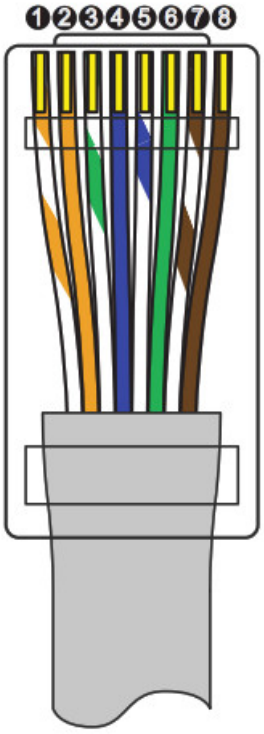


Cable Requirements

Name	Maximum Distance	Cable Type	Code
Network Cable***	100 m (328′)	twisted pair, 4 pairs	Cat5 100BASE-T or better
Reader Cable	18 AWG: 152 m (500′) 22 AWG: 76.2 m (250′)**”	6 conductor stranded not twisted, 22 AWG or thicker, 100% overall shielded	Belden 5304FE or equivalent
Door Strike Cable	152 m (500′)	2 conductor stranded 18 AWG	Aiphone 821802 or equivalent*
Output Cable	152 m (500′)	2 conductor stranded 22 AWG	Aiphone 822202 or equivalent*
Input Cable	152 m (500′)	2 conductor stranded 22 AWG, shielded	Aiphone 822202 or equivalent*
RS-485 Cable with Power	600 m (2000′)	4 conductor stranded, twisted pair, 2 pairs, 22 — 16 AWG**, shielded	Belden 9402 or equivalent*

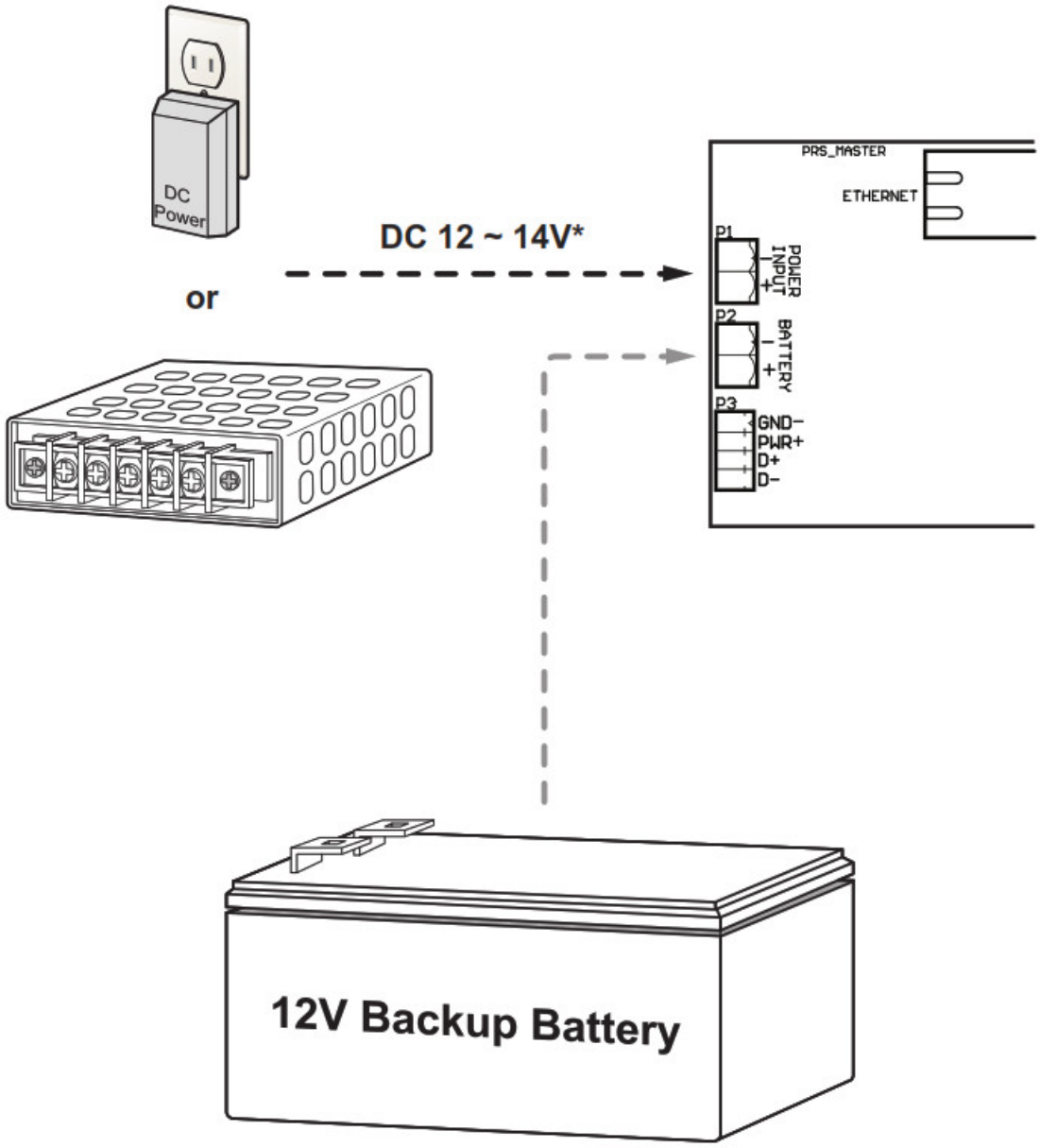
* Unless otherwise specified by manufacturer.
** Varies by current consumption of the other side.
*** RecommendedT T568B wiring for both ends.
**** Max distance may vary depending on cable gauge, environmental conditions and reader model.

T568B (TIA/EIA568B) Wiring



1 .White/Orange 2. Orange 3. White/Green 4. Blue	5. White/Blue 6. Green 7. White/Brown 8. Brown

Power Connection



Optional Backup Battery
* DC 12.8V ~ 14V recommended if a backup battery is used.

Outputs & Usage Example

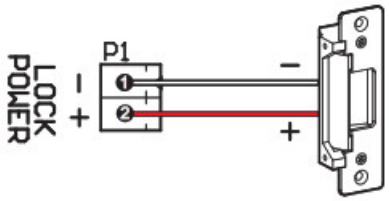
Specification (AC-2DE)

Lock Power(wet)	Lock power relay, 1GND, 2 12V DC 500mA
12V Out	12V DC output, 1 GND, 2 12V DC 500mA
Relay(dry)	30V DC 1A limit

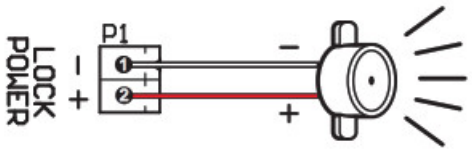
Specification (AC-IOE)

12V Out	12V DC output,1 GND, 2 12V DC 200mA
Relay(dry)	30V DC 500mA limit

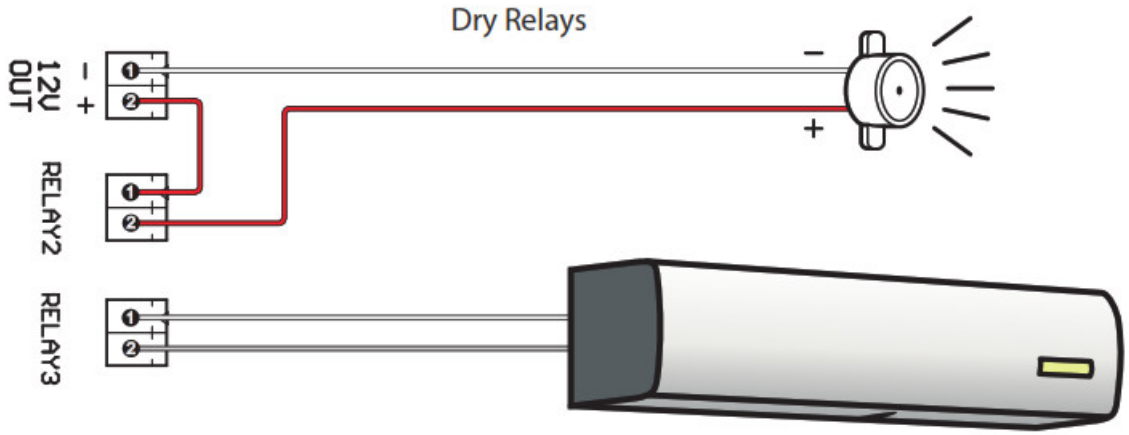
* All the relay outputs are configurable.
For example, any relay can be configured to a door strike.



Door Strike

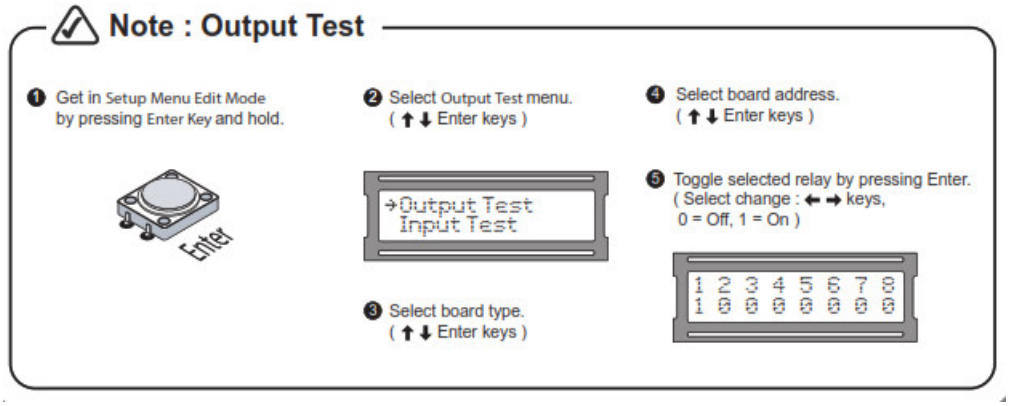


Optional Internal Extra Loud Buzzer



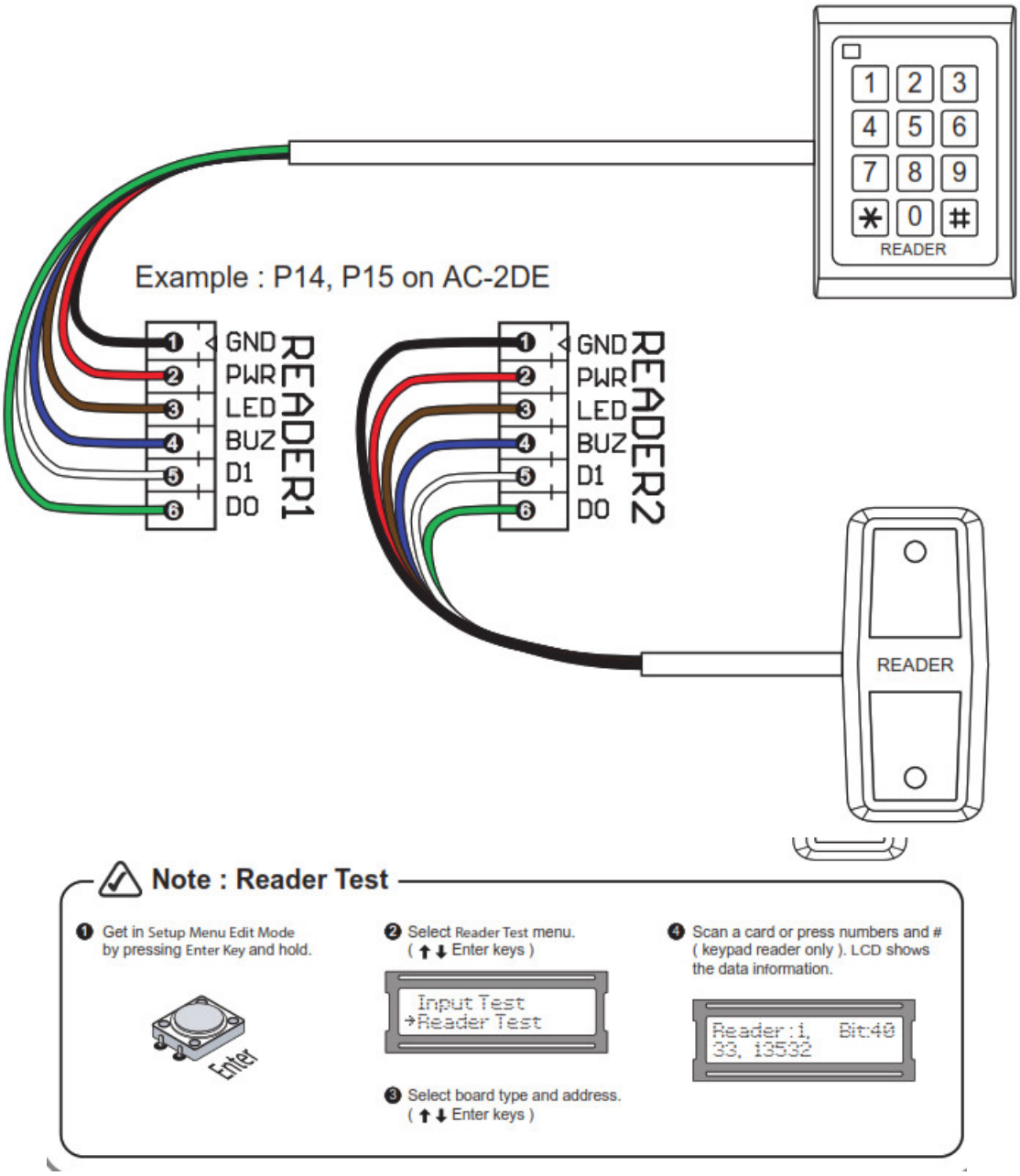
Automatic Door Opener

Note : Output Test



Readers & Usage Example
Wiring Specification

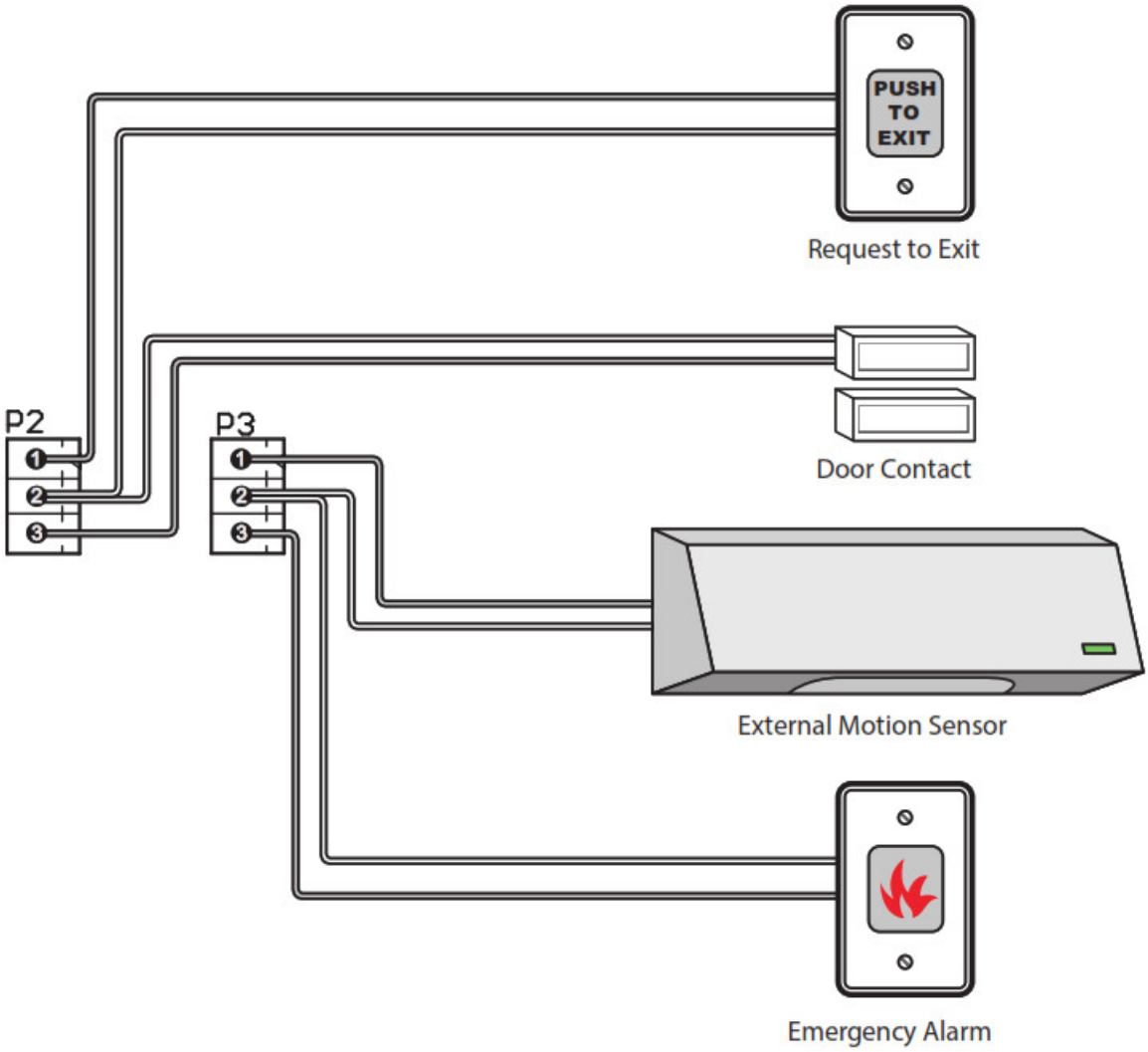
Ground	Black and shield wires 1
Power (12V DC)	Red wire2
LED	Brown wi3re
Buzzer	Blue wire4
Data 1	White wire5
Data 0	Green wire6

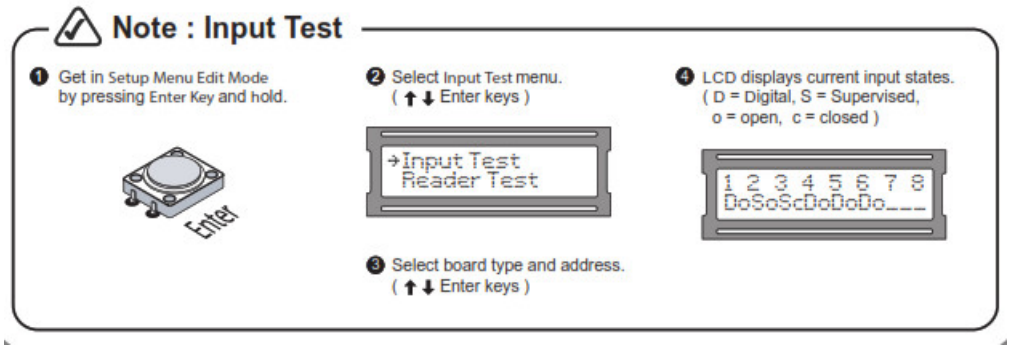


Inputs & Usage Example
Specification

1-2 Pin (Input1)	1. Input2. Common (GND)
2-3 Pin (Input2)	2 . Common (GND) 3.Input

*** All the inputs are configurable.**
For example, Input1 can be configured to a doorbell or a door contact of Door_2



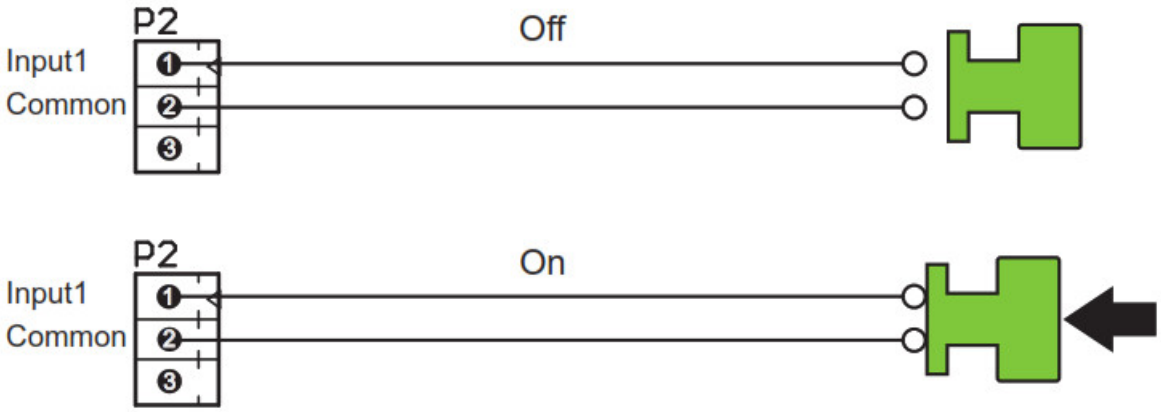


Input Types
Specification

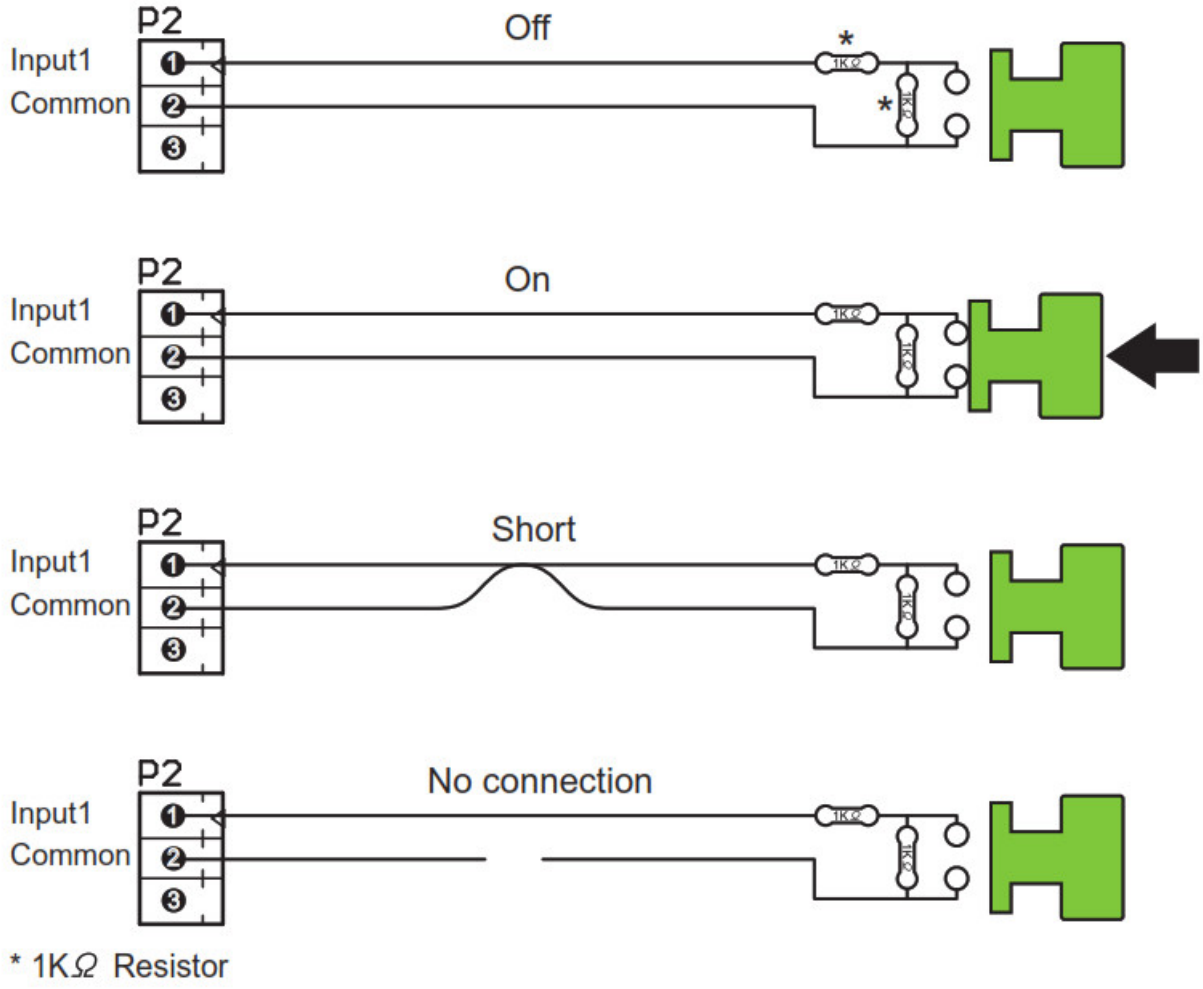
Digital*	Off(DO), On(DC)
Supervised*	Off(SO), On(SC), Short(DC), No connection(DO)

* Software selectable

1. Digital Input States



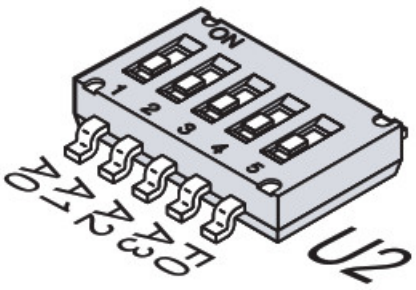
2. Supervised Input States



Address Setting

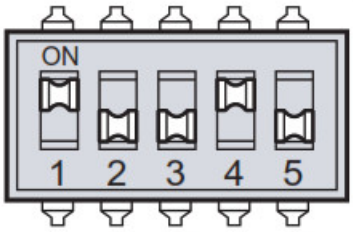
Each expander board must be set an unique address to talk to the master controller. A DIP switch is used to set the address.

Elevator kits require that AC-2DE dip switch be set to 9 as per dip switch adressing table.



Example : U2 DIP switch on AC-2DE

Example : Address 09 setting



on off off on off

SW: up down down up down

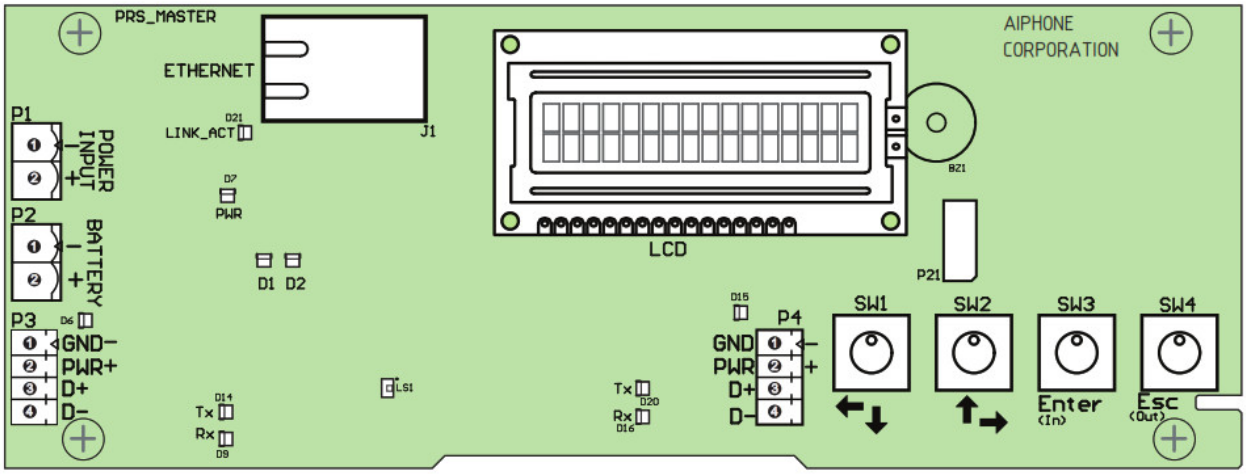
Only A0 ~ A3 is used for address

Address*	A0 A1 A2 A3
1	on off off off
2	off on off off
3	on on off off
4	off off on off
5	on off on off
6	off on on off
7	on on on off
8	off off off on
9	on off off on
10	off on off on

11	on	on	off	on
12	off	off	on	on
13	on	off	on	on
14	off	on	on	on
15	on	on	on	on
00 (disabled)	off	off	off	off

*Address range restriction : AC-IOE board(01 ~ 08), other boards(01 ~ 15)

Board I/O and Connections



LEDs

D1	System heart beat
D2	Server log on/off state Key pressed
D6	P3(left strip) power
D7	System power
D9	P3(left strip) Rx data
D14	P3(left strip) Tx data
D15	P4(right strip) power
D16	P4(right strip) Rx data
D20	P4(right strip) Tx data
D21	Ethernet linked/activity

Connectors

P1	DC 12V ~ 14V input
P2	DC 12V Backup battery
P3	Power and communication for the left strip
P4	Power and communication for the right strip
P21	Expansion
J1	Ethernet

Keys

SW1	Left(←), down(↓)
SW2	Right(→), up(↑)
SW3	Enter, get in
SW4	Esc, exit

Etc

LS1	Tamper sensor
BZ1	Embedded buzzer
LCD	LCD display

Setup Menu Edit Mode*

Get in	Press and hold Enter (beeps after 2 sec) Enter password**
Toggle cursor	Enter White blink: move Black blink: edit
Get out	Esc
Move cursor	Up(Right),Down(Left)
Select menu	Enter
Exit menu	Esc

Setup Menu View Mode

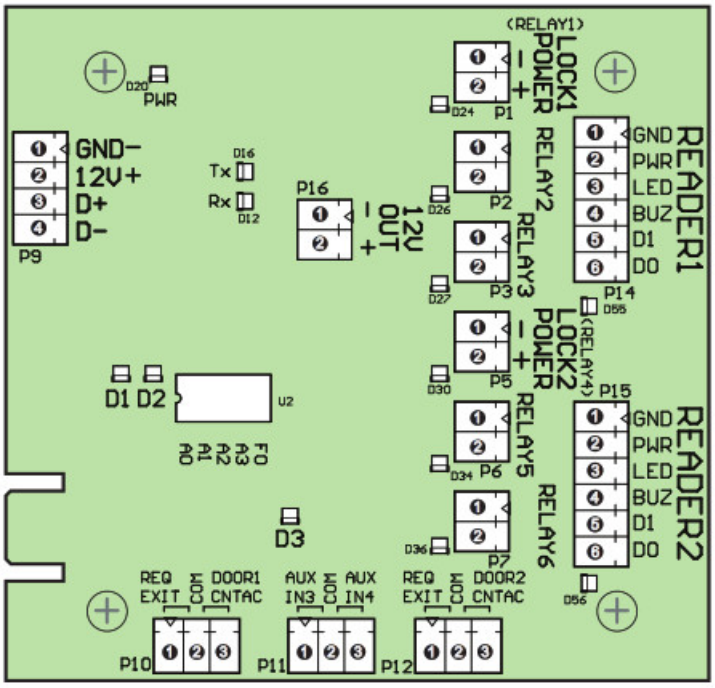
Get in	Press and hold Esc (beeps after 2 sec)
Get out	Esc
Move cursor	Up(Right),Down(Left)
Select menu	Enter
Exit menu	Esc

Note

* For a first time installation, use this mode to do the following tests.
- Output Test : Toggle relays with Enter
- Input Test : Shows input states
- Reader Test : Shows scanned card info

** Factory default password is 0000.
Toll Free: 1-800-692-0200

AC-2DE I/O and Connections



LEDs

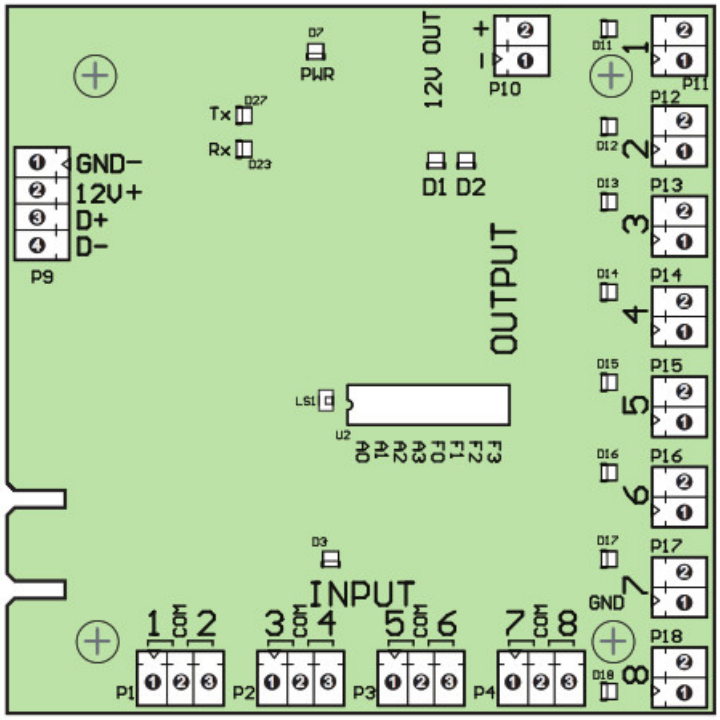
D1	System heart beat
D2	Server log on/off state Blink : Incorrect address
D3	Input Changed
D12	Receive data
D16	Transmit data
D20	Power
D24	Relay1 on
D26	Relay2 on
D27	Relay3 on
D30	Relay4 on
D34	Relay5 on
D36	Relay6 on
D55	Reader1 data flow
D56	Reader2 data flow

Connectors & Etc

P1	Relay1, DC 12V 500mA, wet
P2	Relay2, dry*
P3	Relay3, dry*
P5	Relay4, DC 12V 500mA, wet
P6	Relay5, dry*
P7	Relay6, dry*
P9	Power, communication data
P10	Input1, Common, Input2
P11	Input3, Common, Input4
P12	Input5, Common, Input6
P14	Reader1
P15	Reader2
P16	DC 12V out, max 500mA
U2	DIP switch A3~A0 : Panel address F0 : Function_0

*DC 24V, 1A limit

AC-IOE I/O and Connections



LEDs

D1	System heart beat
D2	Server log on/off state Blink : Incorrect address
D3	Input Changed
D7	Power
D11	Relay1 on
D12	Relay2 on
D13	Relay3 on
D14	Relay5 on
D15	Relay6 on
D16	Relay7 on
D17	Relay7 on
D18	Relay8 on
D23	Receive data
D27	Transmit data

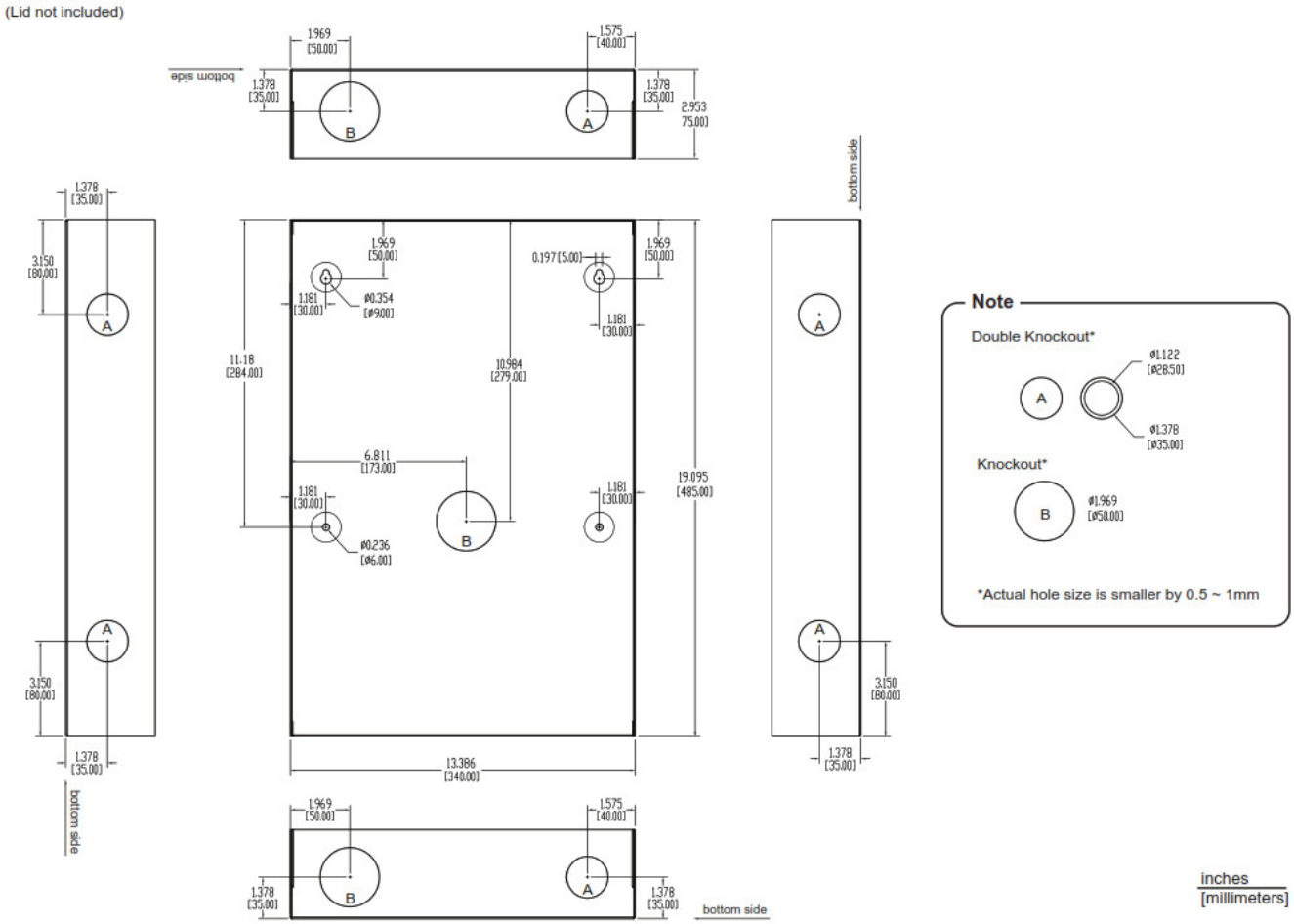
Connectors

P1	Input1, Common, Input2
P2	Input3, Common, Input4
P3	Input5, Common, Input6
P4	Input7, Common, Input8
P9	Power, comm data
P10	DC 12V out, max 200mA
P11	Relay1, dry*
P12	Relay2, dry*
P13	Relay3, dry*
P14	Relay4, dry*
P15	Relay5, dry*
P16	Relay6, dry*
P17	Relay7, dry*
P18	Relay8, dry*

Etc

LS1	DC 12V out
U2	DIP switch A3~A0 : Panel addr F0 : Function_0 F1 : Function_1 F2 : Function_2 F3 : Function_3

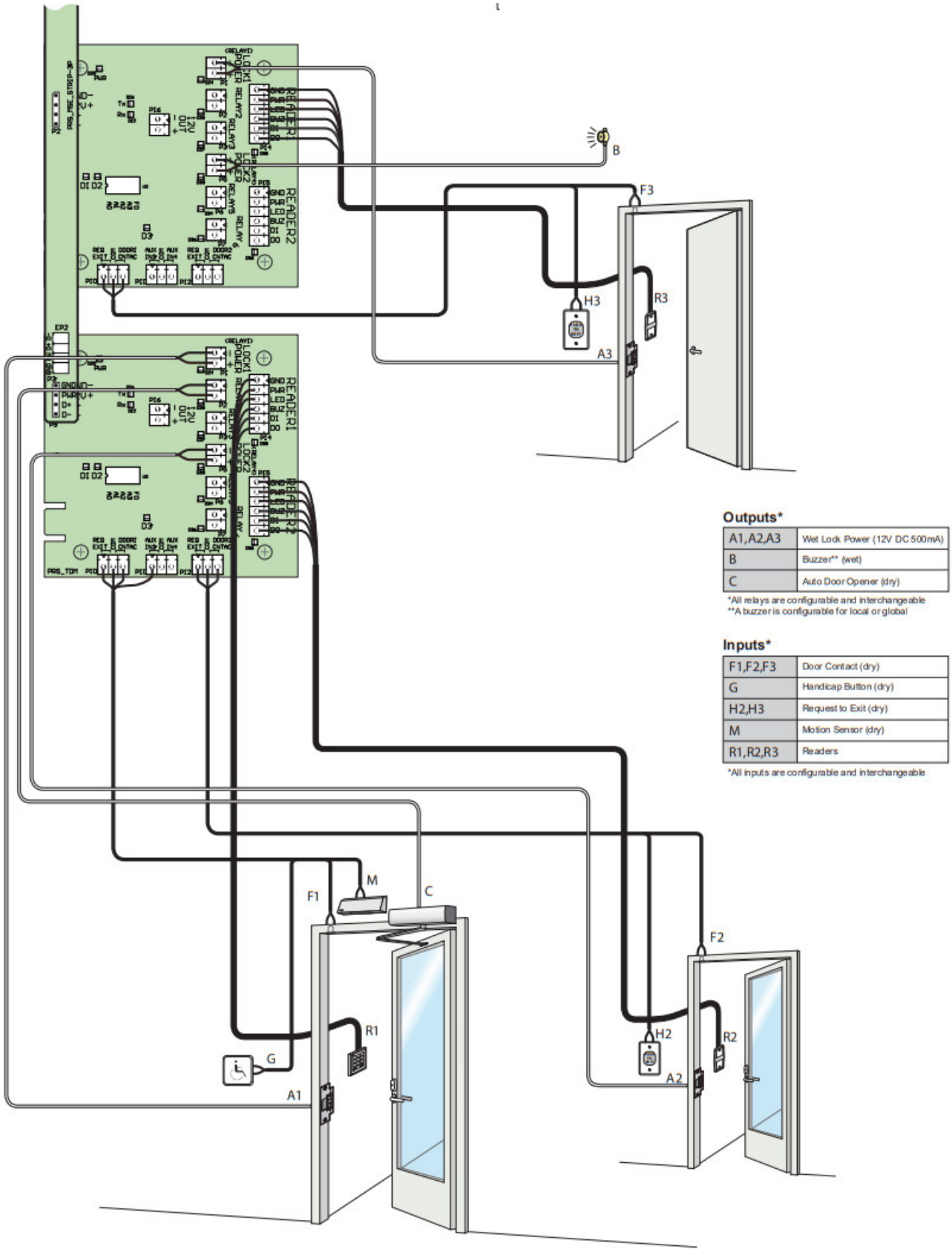
AC-C(Large) Dimensions
(Lid not included)



Three Door Typical
(with two AC-2DE boards)

FCC Compliance Notices

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.
(2)This device must accept any interference received, including interference that may cause undesired operation.
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 you will be required to correct the interference at your own expense.



Outputs*

A1,A2,A3	Wet Lock Power (12V DC 500mA)
B	Buzzer** (wet)
C	Auto Door Opener (dry)

*All relays are configurable and interchangeable
**A buzzer is configurable for local or global

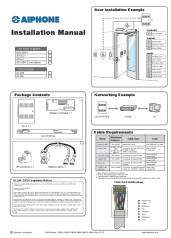
Inputs*

F1,F2,F3	Door Contact (dry)
G	Handicap Button (dry)
H2,H3	Request to Exit (dry)
M	Motion Sensor (dry)
R1,R2,R3	Readers

*All inputs are configurable and interchangeable

Aiphone Corporation
Part Number : 19601-19602-19603-19604-19612-19614 Rev 12.22
www.aiphone.com

Documents / Resources

	**AIPHONE AC Series Access Control Solution** [pdf] Instruction Manual ACS-2DR-C, ACS-ELV, ACS-IO, ACS-2DR Trove Starter, AC-2DE, AC-IOE, AC Series, Access Control Solution, AC Series Access Control Solution

References

- Home - Aiphone