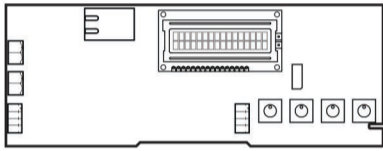




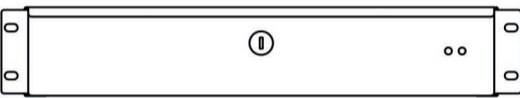
# VAX Multi-Door Controller Quick Start Guide TROVE™

Part number	VAX-EXP-2D
VAX-TROVE-2DR-RK	1
VAX-TROVE-4DR-RK	2
VAX-TROVE-6DR-RK	3
VAX-TROVE-8DR-RK	4

## Package Contents



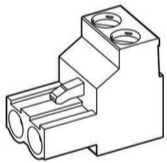
VAX-MDK



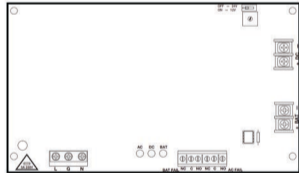
TROVE1R



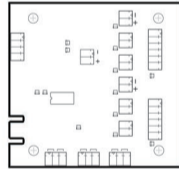
3P Strip(s)



2P Connector



AL600ULXB



VAX-EXP-2D

## Hardware Components Included:

Part	Description
VAX-MDK-Master	Master controller that distributes power, communication and commands to up to 4 VAX-EXP-2D boards.
VAX-EXP-2D	Two door expansion boards. Receives commands and power from VAX-MDK-Master.
Trove1R	Steel, lockable 2U rackmount Enclosure. 19" W x 3.375" H x 26.4" D with THC1R backplate.
AL600ULXB	Altronix 12VDC@6A power supply mounted inside enclosure.

## UL 294 / S319 Compliance Notices

This product complies with the following UL294 Access Control Performance Levels when installed as part of the Listed VAX UL system:

Endurance Level IV (100,000c)  
Line Security Level I

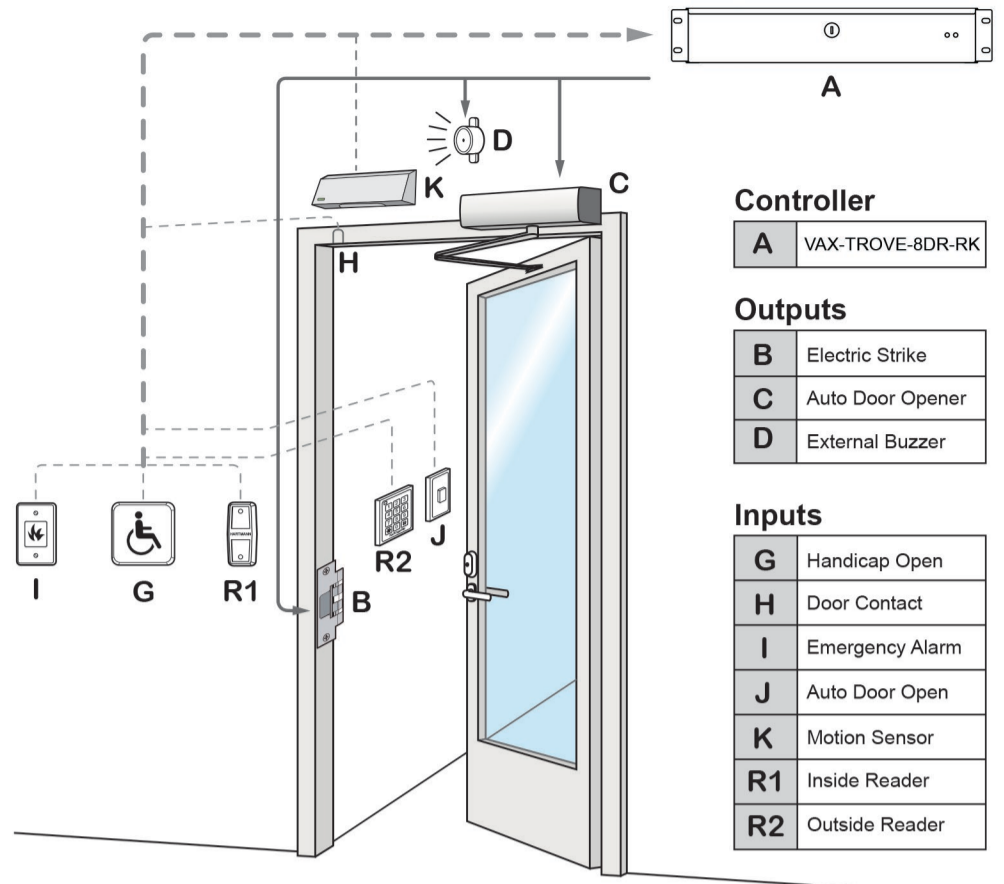
Wiring methods shall be in accordance with the National Electrical Code (ANSI/NFPA70), CSA C22.1, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, Part I, local codes, and the authorities having jurisdiction. All interconnecting devices must be UL Listed, low-voltage Class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

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.

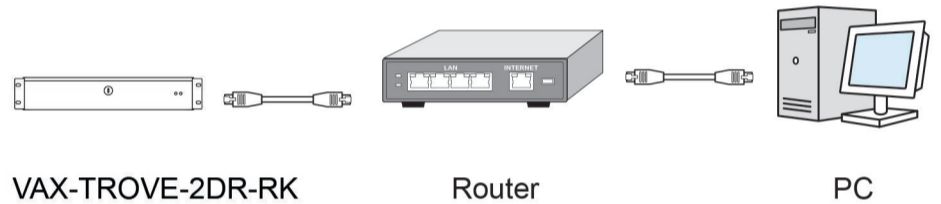
All recommended connected peripherals such as power supplies, UPS/battery backups, PoE switches, electrified strikes, readers require to be UL Listed.

Please refer to the VAX UL Reference document for more comprehensive information available via the installation USB drive or downloadable from our website. Hard copy of the VAX UL Reference Manual document is available - call for pricing.

## Door Installation Example



## Networking Example



## Cable Requirements

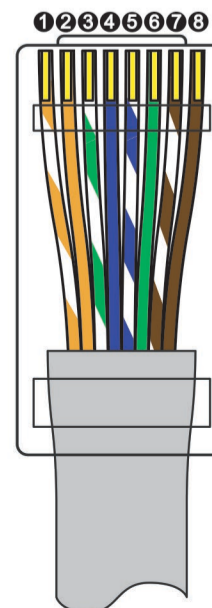
Name	Maximum Distance	Cable Type	Code
Network Cable***	328' (100 m)	twisted pair, 4 pairs	Cat5 100BASE-T or better
Reader Cable	500' (152 m)	6 conductor stranded not twisted, 24 AWG or thicker, 100% overall shielded	Belden 9537 or equivalent
Door Strike Cable	500' (152 m)	2 conductor stranded 18 AWG	Belden 9740 or equivalent*
Output Cable	500' (152 m)	2 conductor stranded 22 AWG	Belden 8740 or equivalent*
Input Cable	500' (152 m)	2 conductor stranded 22 AWG, shielded	Belden 8723 or equivalent*
RS-485 Cable with Power	2000' (600 m)	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.

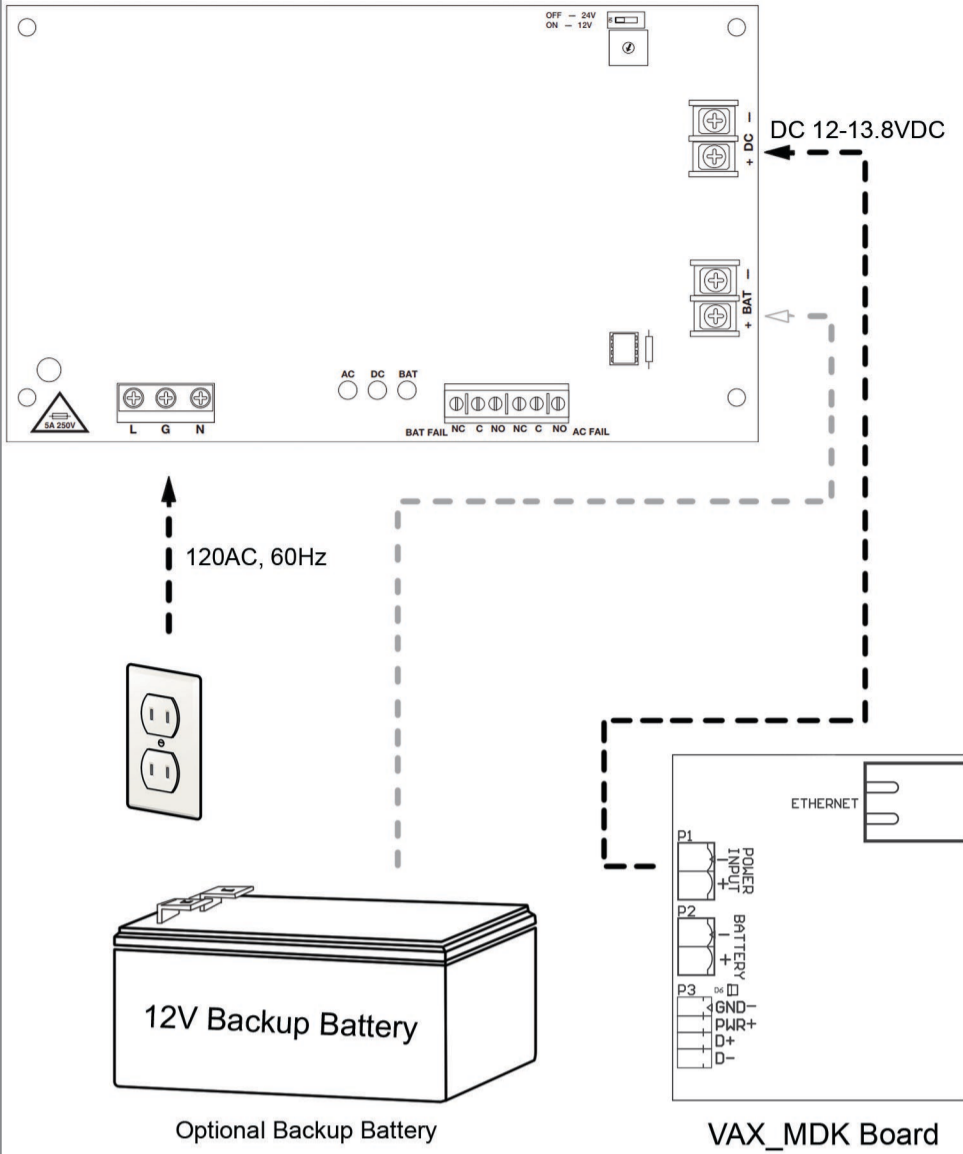
\*\*\* Recommended the following T568B wiring for both ends.

### T568B (TIA/EIA568B) Wiring



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

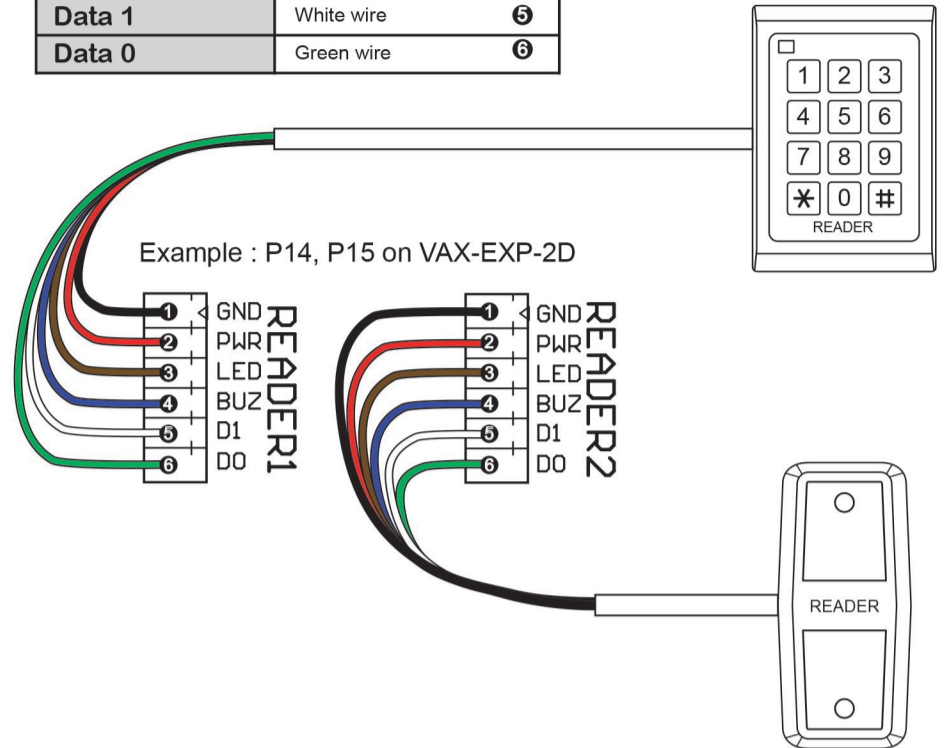
# Power Connection



# Readers & Usage Example

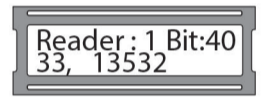
## Wiring Specification

Ground	Black and shield wires	1
Power (12V DC)	Red wire	2
LED	Brown wire	3
Buzzer	Blue wire	4
Data 1	White wire	5
Data 0	Green wire	6



## Note: Reader Test

- Get in Setup Menu Edit Mode by pressing Enter Key and hold.
- Select Reader Test menu. (↑↓ Enter keys)
- Select board type and address. (↑↓ Enter keys)
- Scan a card or press numbers and # (keypad reader only). LCD shows the data information.



# Outputs & Usage Example

## Specification (VAX-EXP-2D)

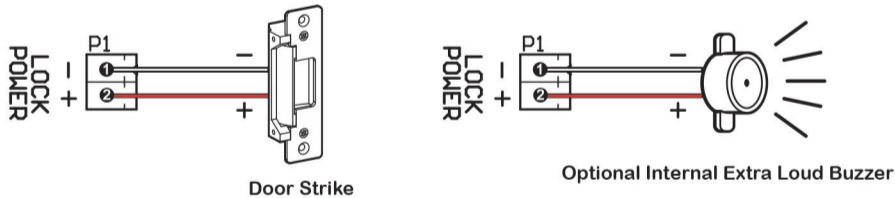
Lock Power (wet)	Lock power relay, 1 GND, 2 12V DC 500mA
12V Out	12V DC output, 1 GND, 2 12V DC 500mA
Relay (dry)	30V DC 1A limit

## Specification (VAX-IO-EXP8-PCB)

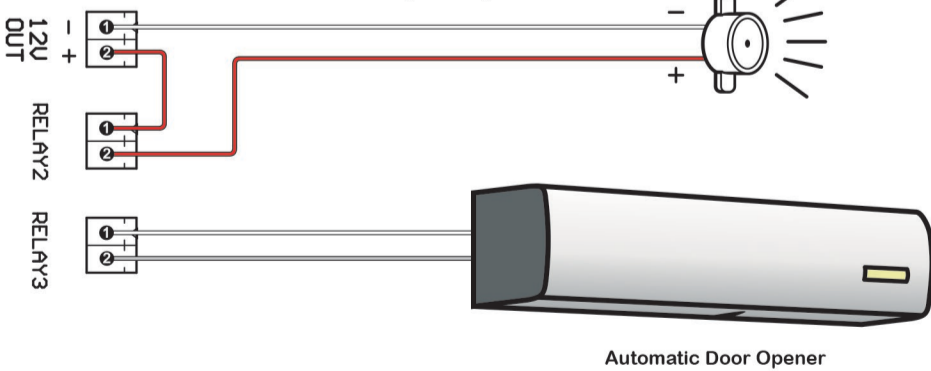
12V Out	12V DC output, 1 GND, 2 12V DC 200mA
Relay (dry)	30V DC 500mA limit

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

## Wet Relays

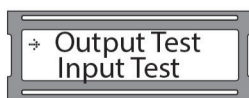


## Dry Relays



## Note: Output Test

- Get in Setup Menu Edit Mode by pressing Enter Key and hold.
- Select Output Test menu. (↑↓ Enter keys)
- Select board address. (↑↓ Enter keys)
- Toggle selected relay by pressing Enter. (Select change: ←→ keys, 0 = Off, 1 = On)
- Select board type. (↑↓ Enter keys)

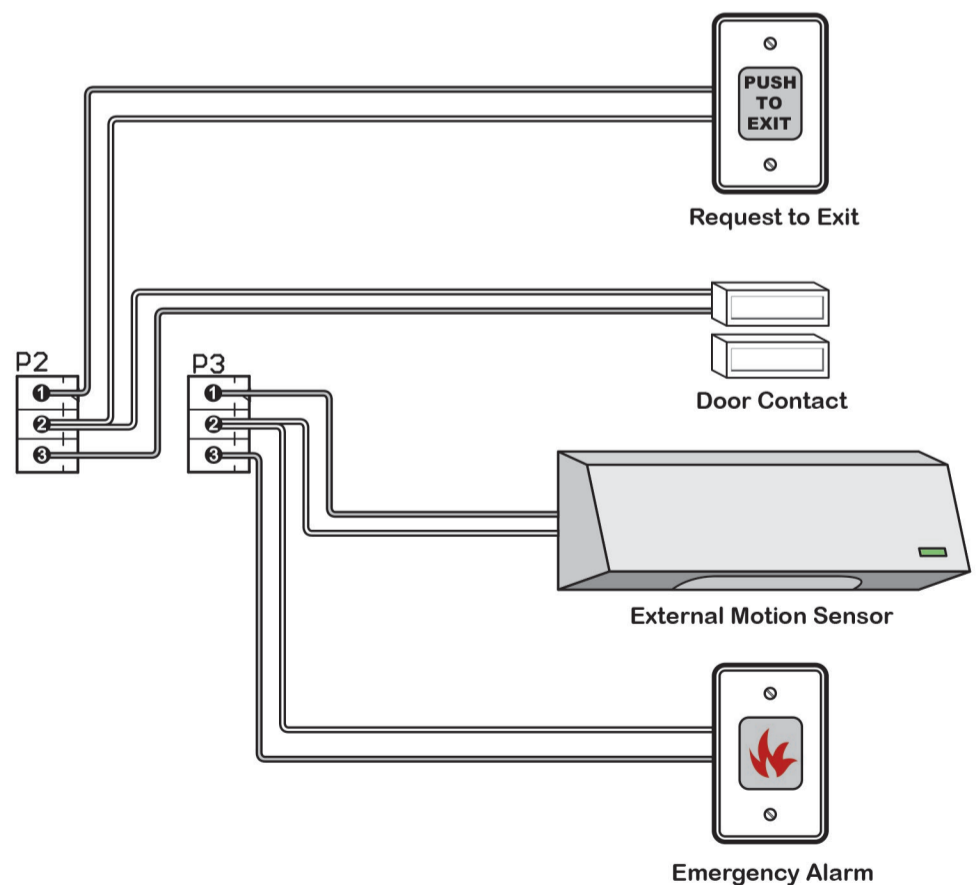


# Inputs & Usage Example

## Specification

1-2 Pin (Input1)	1 Input	2 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



## Note: Input Test

- Get in Setup Menu Edit Mode by pressing Enter Key and hold.
- Select Input Test menu. (↑↓ Enter keys)
- Select board type and address. (↑↓ Enter keys)
- LCD displays current input states. (D = Digital, S = Supervised, o = open, c = closed)

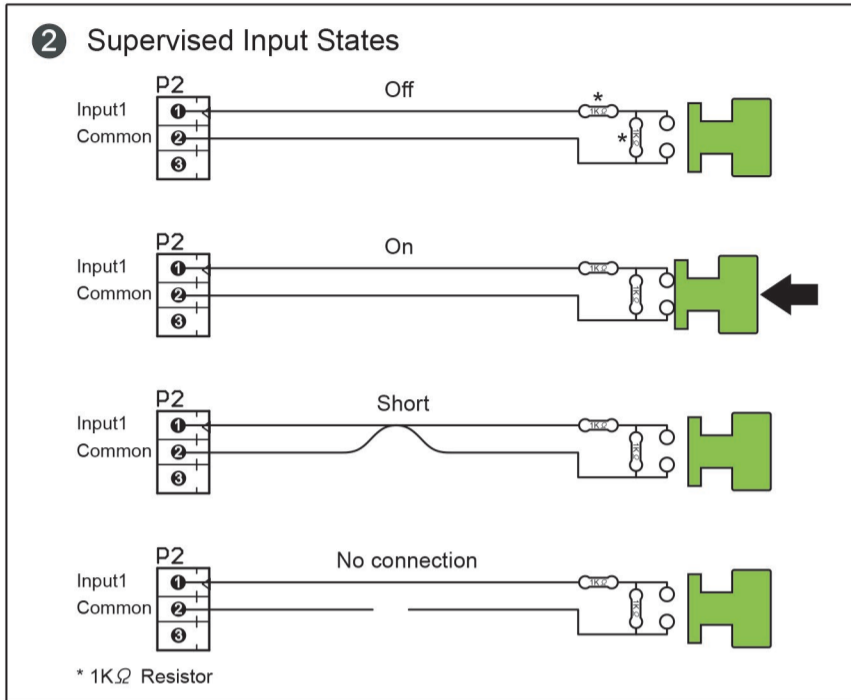
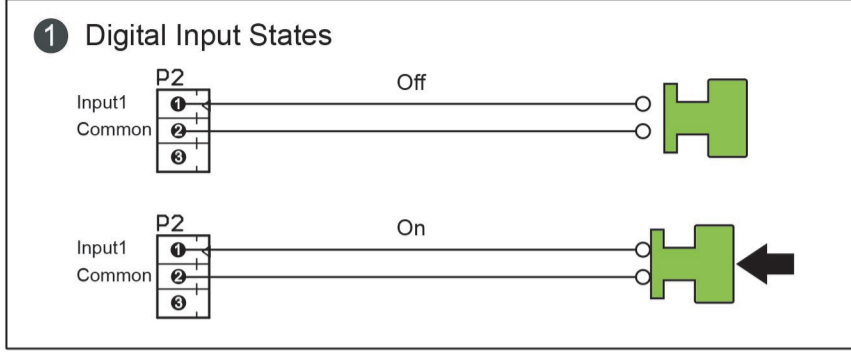


# Input Types

## Specification

<b>Digital*</b>	Off (DO), On (DC)
<b>Supervised*</b>	Off (SO), On (SC), Short(DC), No connection (DO)

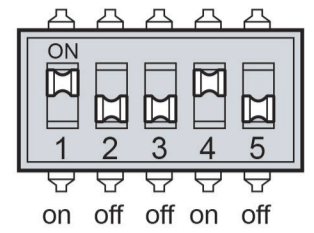
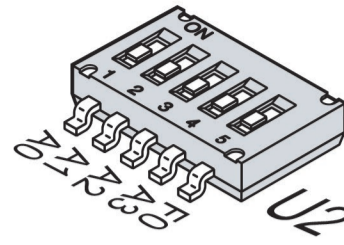
\* Software selectable



# Address Setting

Each expander board must be set an unique address to talk to VAX-MDX Master. A DIP switch is used to set the address.

Example : Address 09 setting



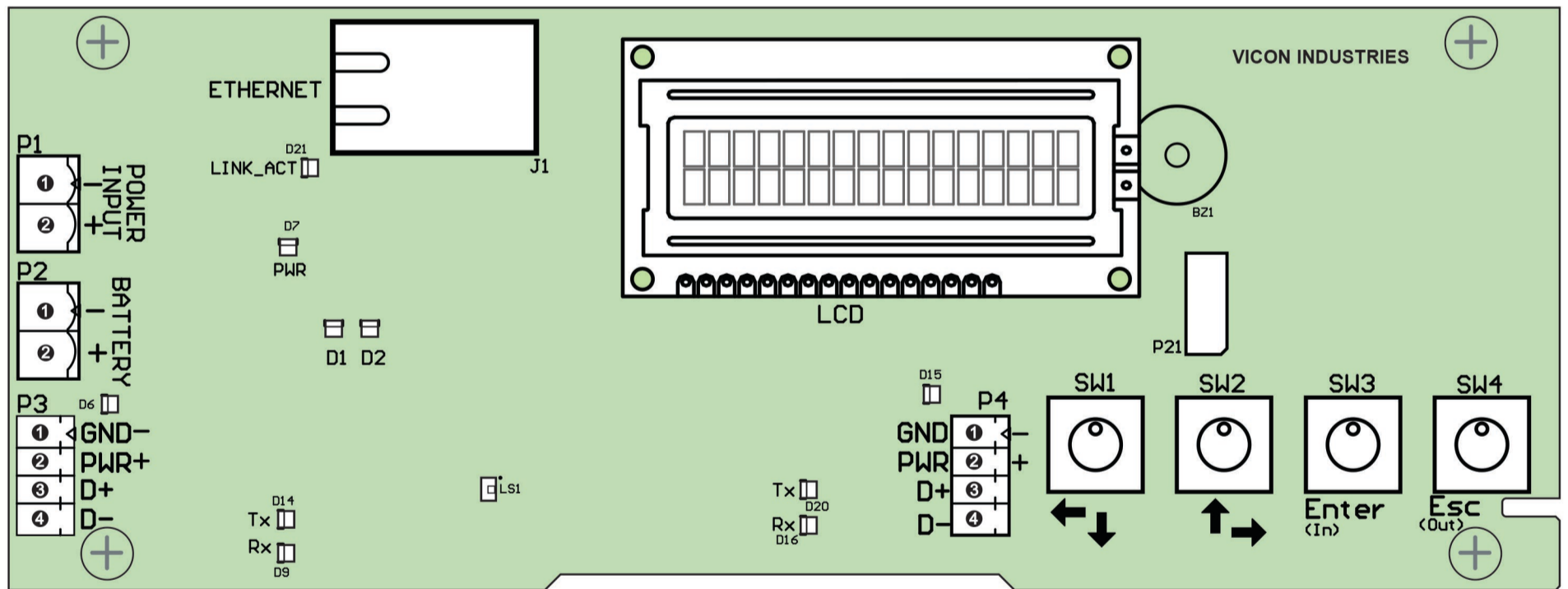
Example : U2 DIP switch on VAX-EXP-2D

on off off on off  
SW: up down down up down  
Only A0 ~ A3 is used for address

Address*	A0	A1	A2	A3
01	on	off	off	off
02	off	on	off	off
03	on	on	off	off
04	off	off	on	off
05	on	off	on	off
06	off	on	on	off
07	on	on	on	off
08	off	off	off	on
09	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: VAX-IO-EXP8-PCB(01 ~ 08), other boards(01 ~ 15)

# Board I/O and Connections VAX-MDK Master



## 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

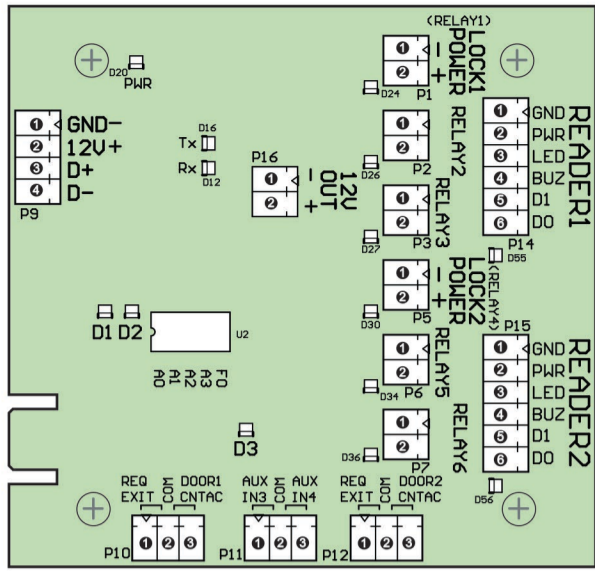
Get in	Press and hold Esc (beeps after 2 sec)
Get out	Esc
Move cursor	Up(Right),Down(Left)
Select menu	Enter
Exit menu	Esc

## Note

\* For the first time installation, get in this mode and do 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: 1-800-34-VICON**  
(800-348-4266) TECH SUPPORT

# VAX-EXP-2D and Connections



## LEDs

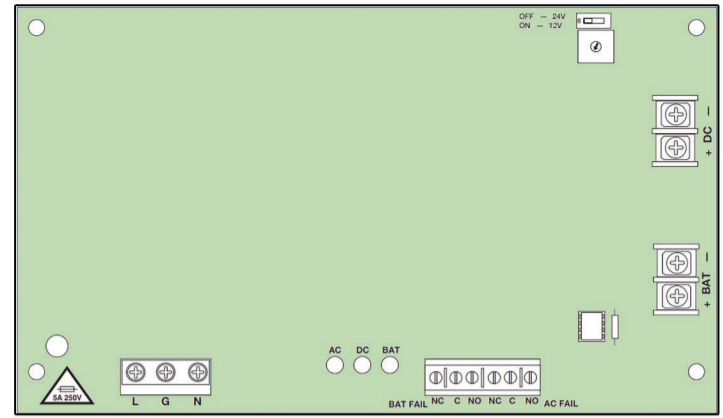
D1	System heart beat
D2	Server log on/off state Blink : Incorrect address
D3	Input Changed
D12	Receive data
D16	Transmit data
D20	Power
D24	Relay1 on
D26	Relay2 on
D27	Relay3 on
D30	Relay4 on
D34	Relay5 on
D36	Relay6 on
D55	Reader1 data flow
D56	Reader2 data flow

## 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 30V, 1A limit

# AL600ULXB Connections



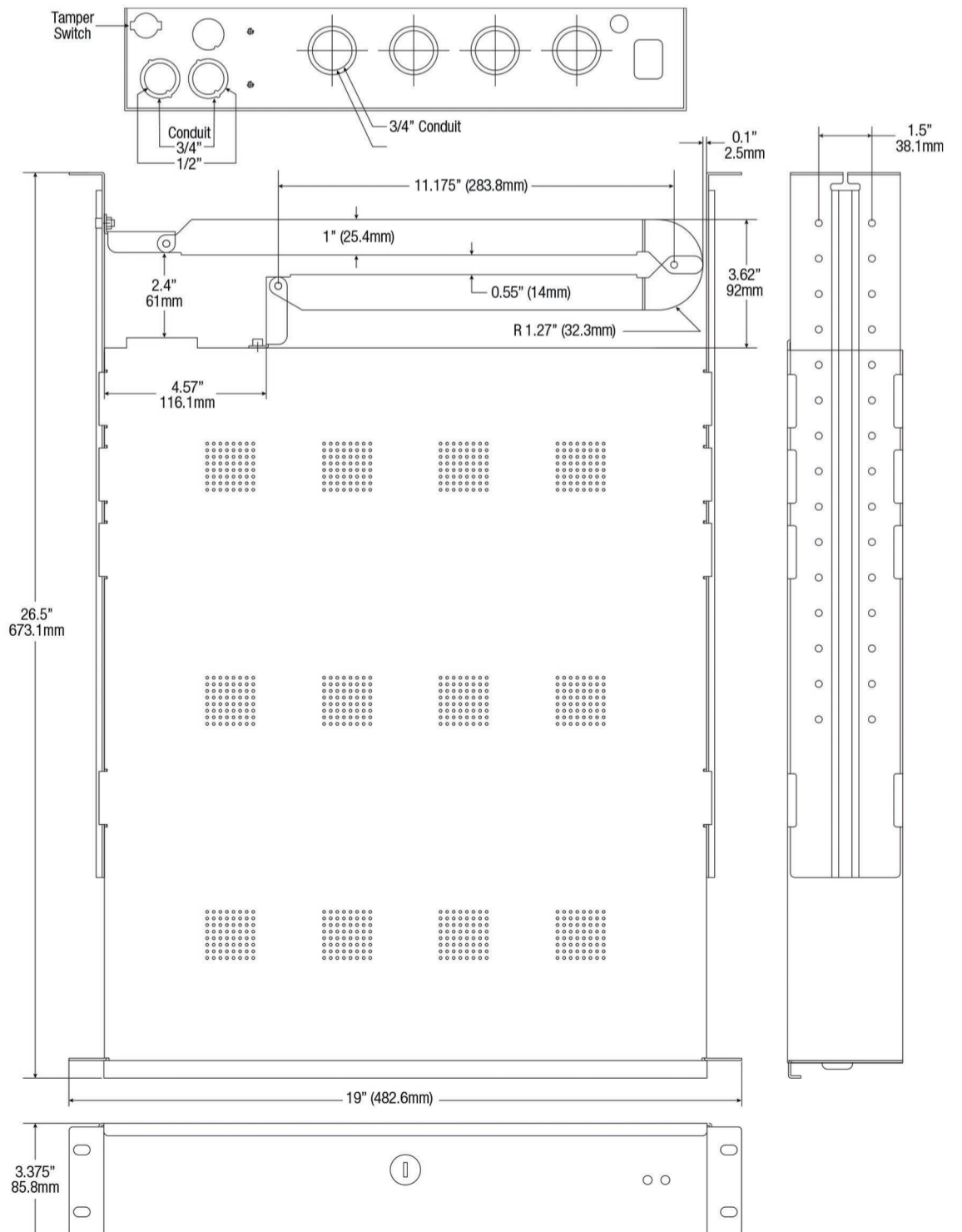
## Terminal Identification

Terminal Legend	Function/Description
L, G, N	Connect 120V AC 60Hz to these terminals: L to hot, N to neutral, G to ground (non power-limited).
- DC +	eFlow6NB: 12VDC or 24VDC @ 6A continuous output (Non Power-Limited output).
AC Fail NC, C, NO	Indicates loss of AC power, e.g. connect to audible device or alarm panel. Relay normally energized when AC power is present. Contact rating 1A @ 30VDC (Power-Limited).
Bat Fail NC, C, NO	Indicates low battery condition, e.g. connect to alarm panel. Relay normally energized when DC power is present. Contacting rating 1A @ 30VDC. A removed battery is reported within 5 minutes. Battery reconnection is reported within 1 minute (Power-Limited).
- BAT +	Stand-by battery connections. Maximum charge current 0.7A (non power-limited).

Note: Refer to ULBX Series Power Supply/Charger Boards Installation Guide for full details

# Enclosure Dimensions

(H x W x D approximate):  
19" x 3.375" x 26.5"  
482.6mm x 85.8mm x 673.1mm  
Shown with Z Bracket attached.



# Three Door Typical

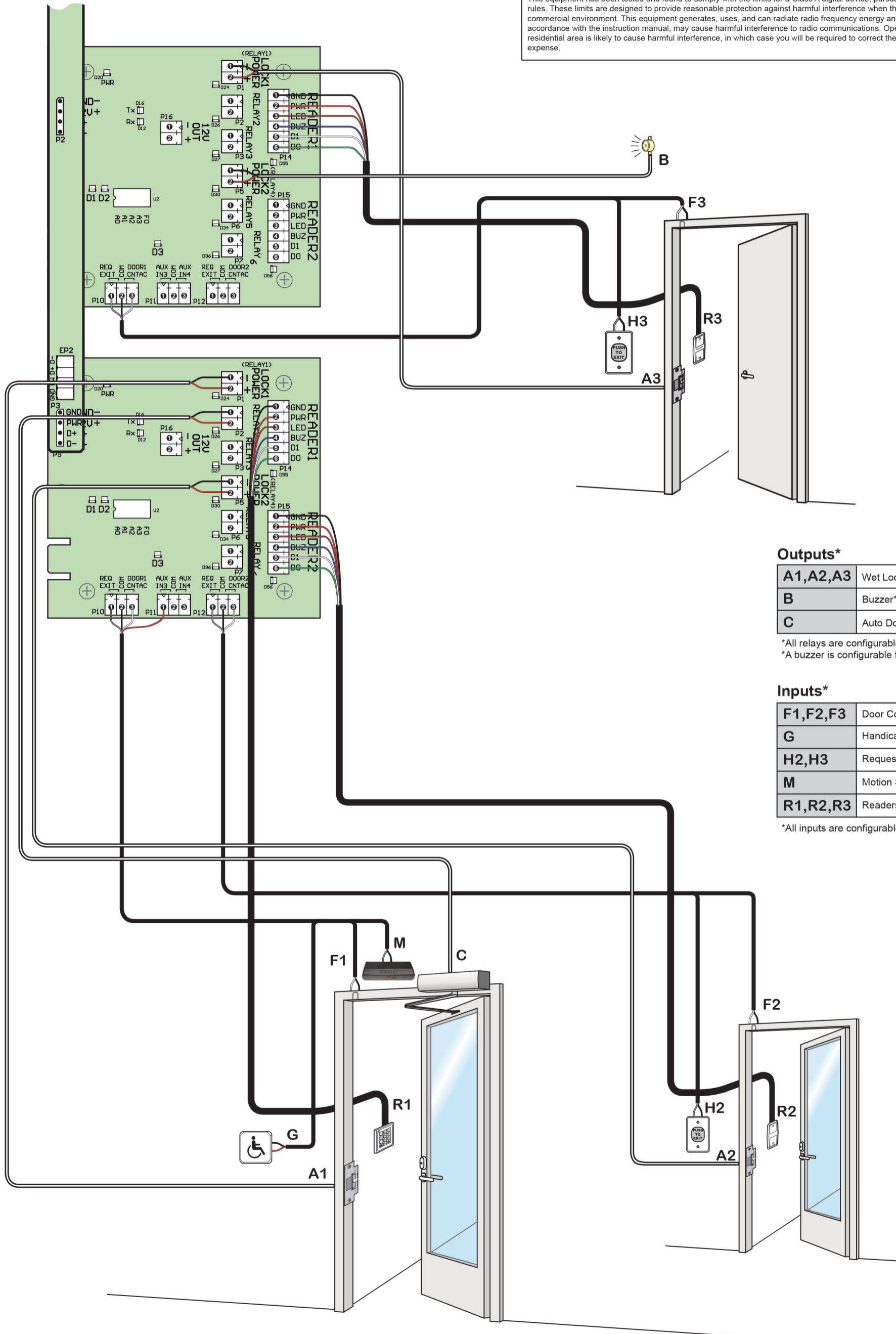
(with two VAX-EXP-2D)

## 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