



# SmartLock® Pro

## INSTALLATION MANUAL

April 2009

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# Introduction

The SmartLock® Pro access control panel is a single door controller with inputs for both entry and exit readers. Readers and card formats supported include standard 26-bit and 37-bit (Cansec) Wiegand formats, and Cansec iButton® credentials. Other card formats can be accommodated with the use of **Cansec Protocol Converters** (contact Cansec for further information). SmartLock controllers can be used with SmartLock Pro, SmartLock Connect and SmartLock Online software (SmartLock Online requires legacy firmware; controller ordered as CA-SOLCTRL).

The SmartLock control panel stores all cardholder data in non-volatile memory to ensure continued operation and security in the event that communications are lost to the host PC. Up to two control panels are easily mounted in a SmartLock enclosure along with a Cansec 12 VDC power supply and a back-up battery.

## DIODES

Diodes are **required** for inductive loads such as electric strikes/locks. Failure to use appropriate diodes will void the control panel warranty.

## POWER SUPPLY NOTICE

In some jurisdictions, the use of a UL approved power supply and connection to the fire alarm system for emergency release may be required. Installers should contact the local authority having jurisdiction to verify the specific requirements. Also, a building permit may be required in some jurisdictions for the installation of maglocks.

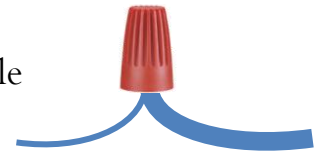
## **TERMINAL STRIPS AND CABLE**

### **Use Appropriate Cable Thickness**

For optimal performance and communication, the terminal strips on the SmartLock control panel are designed to be used with 26 – 18 American Wire Gauge (AWG) stranded, overall-shielded, twisted-pair cable. This is equivalent to Belden 88761 or similar cable.

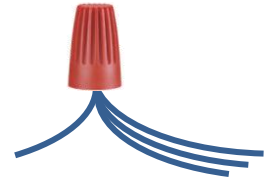
### **Use MARR Connectors**

If you are bringing in cable that is too large for the terminal strip, use a MARR connector (wire nut, marrette, thimble connector, cone connector). Splice the thicker cable to a cable that is the appropriate thickness, and then run the thinner cable to the terminal strip on the control panel.



### **Use Splices for Parallel Wiring**

The terminal strips are designed to allow one cable per hole. If you need to connect multiple cables in a single hole, use a MARR connector (wire nut, marrette, thimble connector, cone connector). Splice multiple cables to a single cable, and then run the single cable to the terminal strip on the control panel.



### **Complimentary Screwdriver**

A standard Cansec screwdriver is included with every control panel for use with terminal strips.



# Specifications

## Power Requirements

- SmartLock<sup>®</sup> Controller: ..... 12 VDC, 100 mA

**NOTE:** *When determining power supply current requirements, you must consider lock and reader current draw if using the same supply for these devices.*

**NOTE:** *In some jurisdictions, the use of a UL approved power supply and connection to the fire alarm system for emergency release may be required. Installers should contact the local authority having jurisdiction to verify the specific requirements. Also, a building permit may be required in some jurisdictions for the installation of maglocks.*

## Communications Cable (multi-drop configuration)

- RS-485 Cable: .....22 AWG, Stranded/Shielded, Twisted Pair  
609 m (2000 ft) max total length  
Belden 88761 or equivalent

## On-Board Outputs

- Lock Control: ..... Form “C”, Rated @ 30 VDC, 1A
- Door Operator: ..... Form “C”, Rated @ 30 VDC, 1A
- Forced/DHO Relays: ..... Form “C”, Rated @ 30 VDC, 1A

## On-Board Inputs

- Exit Button: .....Normally Open
- Door Contact:.....Normally Closed
- Door Operator:.....Normally Open

### Reader Cable

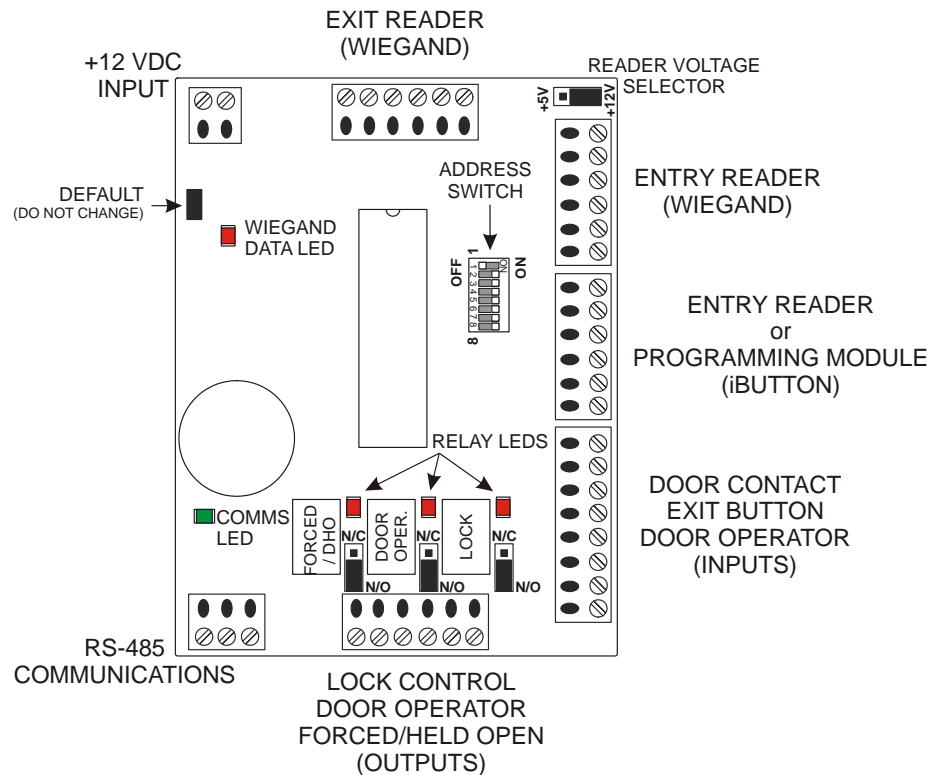
- Wiegand Readers:..... 6 conductor (twisted pair not required)  
22 AWG, overall shield  
152 m (500 ft) max total length
- iButton® Readers:..... 6 conductors  
22 AWG, shielded or unshielded  
15 m (50 ft) max total length

### Dimensions & Weight

- Controller Board: .....84 mm (l) x 65 mm (w)  
[ 3 5/16" (l) x 2 9/16" (w) ]
- SmartLock Cabinet:..... 260 mm (l) x 216 mm (w) x 80 mm (h)  
[ 10 1/4" (l) x 8 1/2" (w) x 3 1/8" (h) ]
- Weight: .....2 kg (4.5 lbs)

*Specifications subject to change without notice.*

# SmartLock Controller Layout



## Important Notes:

1. Each controller must have a unique address.  
*Refer to the Controller Address Table.*
2. Exit reader must be Wiegand only. Native iButton® reader not supported for exit.
3. Before connecting readers with power ON, make sure **Reader Voltage Selection Jumper** is set to proper voltage for reader, otherwise the reader may be damaged.
4. Do **NOT** connect power to any inputs on the controller.
5. The **Door Contact Input** should be bypassed, **if not used**, by using a jumper wire across the input or setting the switch to ignore the input. *Refer to the Door Contact Bypass Switch Setting.*
6. This controller utilizes “self-resetting” fuses. There are no field-serviceable parts.

## LED INDICATORS

1. Relay LEDs turn RED when the corresponding relay is ON or ACTIVATED.
2. The Wiegand data LED is normally ON and briefly flickers when valid Wiegand data is received from the reader. If Wiegand data is not valid or not supported, this LED will stay OFF until the next valid card is read.
3. The communication LED will flicker GREEN while communicating with SmartLock software.

## MOUNTING

Up to two SmartLock controllers can be mounted in the SmartLock enclosure along with a Cansec 12 VDC power supply and a backup battery.



# RS-485 Communications Wiring

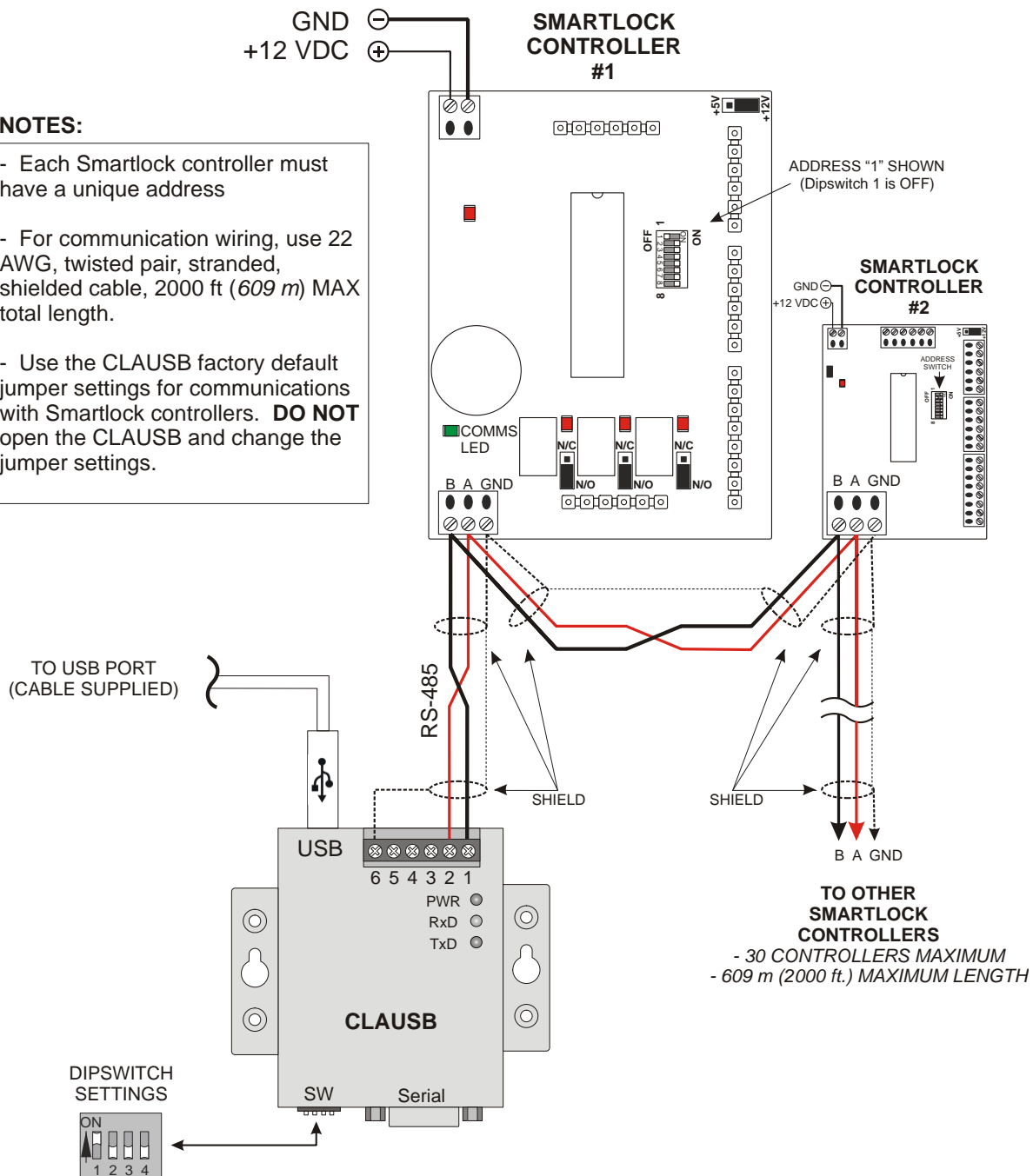
Up to 30 SmartLock access control panels may be connected on an RS-485 bus. An additional 30 control panels may be connected via a Cansec communications device.

**NOTE:** For CLA50 communications device wiring (for use with SmartLock Connect dial-up configurations) please see *Appendix I*.

## CLAUSB COMMUNICATIONS DEVICE

### NOTES:

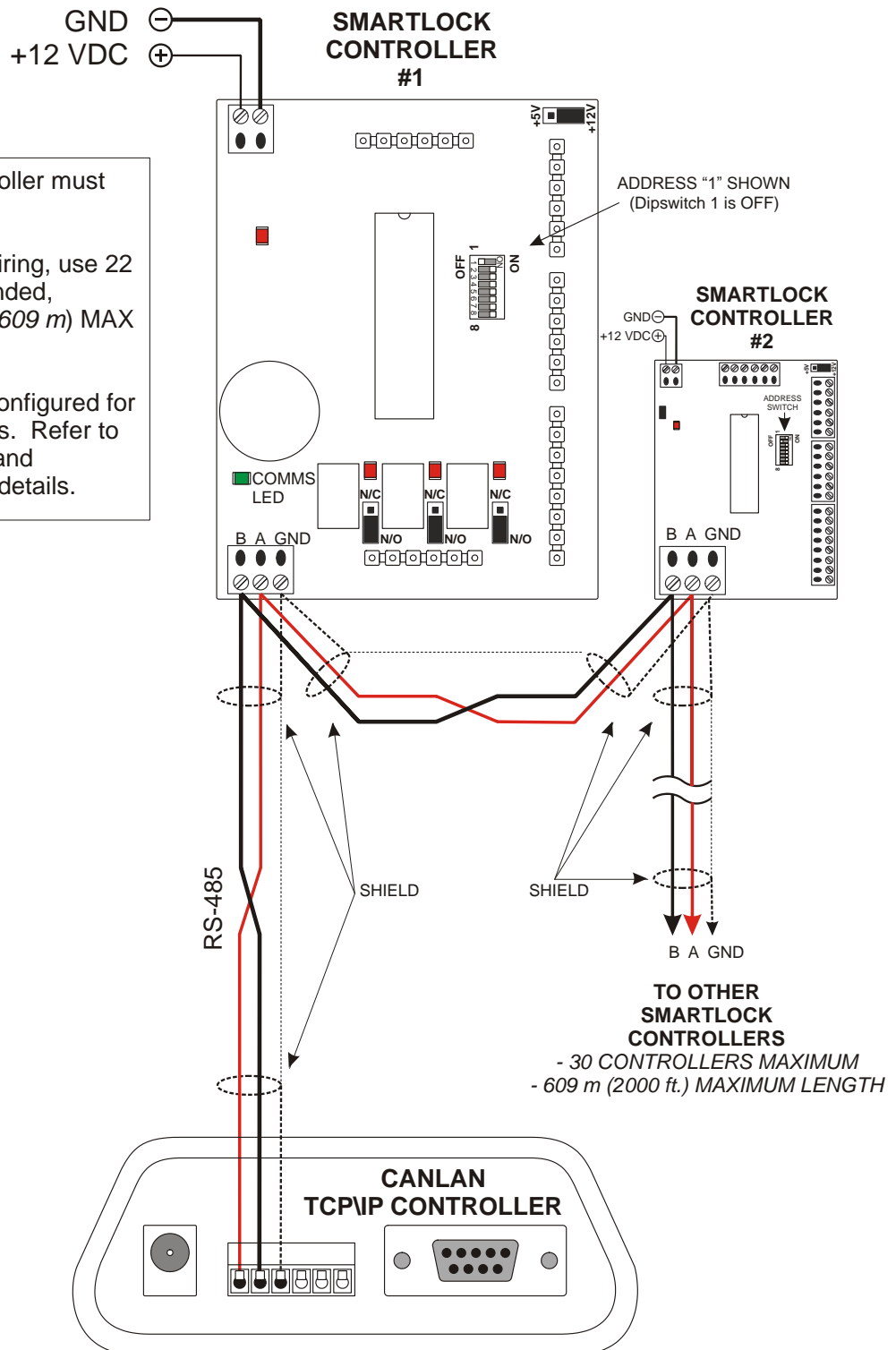
- Each Smartlock controller must have a unique address
- For communication wiring, use 22 AWG, twisted pair, stranded, shielded cable, 2000 ft (609 m) MAX total length.
- Use the CLAUSB factory default jumper settings for communications with Smartlock controllers. **DO NOT** open the CLAUSB and change the jumper settings.



## CANLAN NETWORK COMMUNICATIONS DEVICE

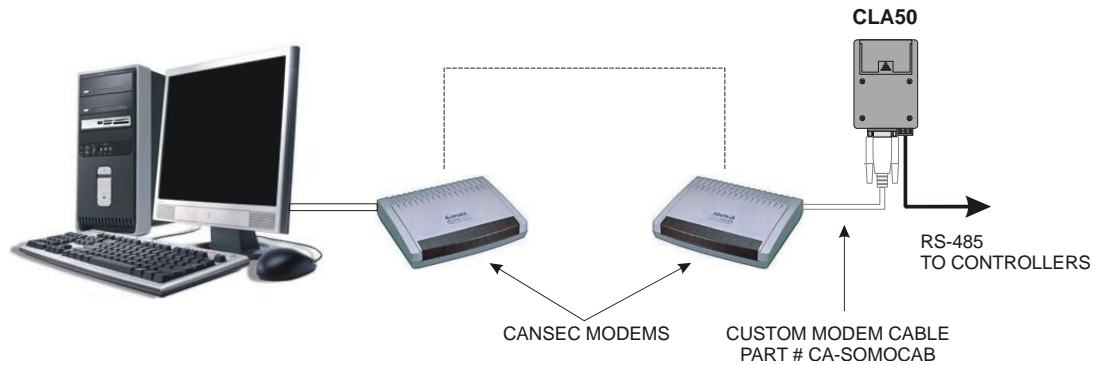
### NOTES:

- Each Smartlock controller must have a unique address
- For communication wiring, use 22 AWG, twisted pair, stranded, shielded cable, 2000ft (609 m) MAX total length.
- Canlan needs to be configured for RS-485 communications. Refer to the Canlan Installation and Configuration guide for details.

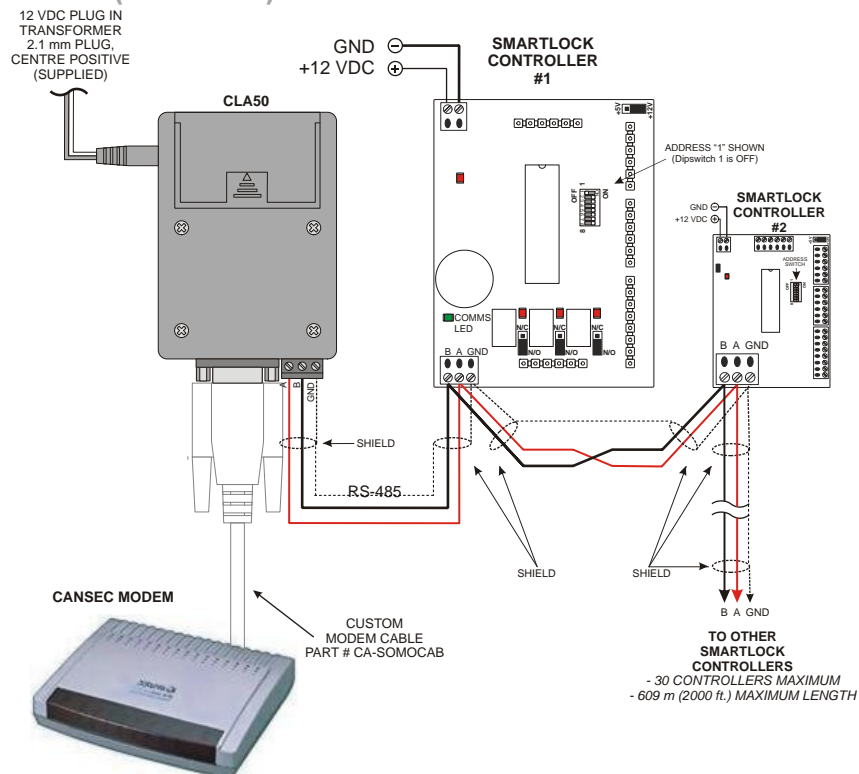


# SmartLock Connect Wiring

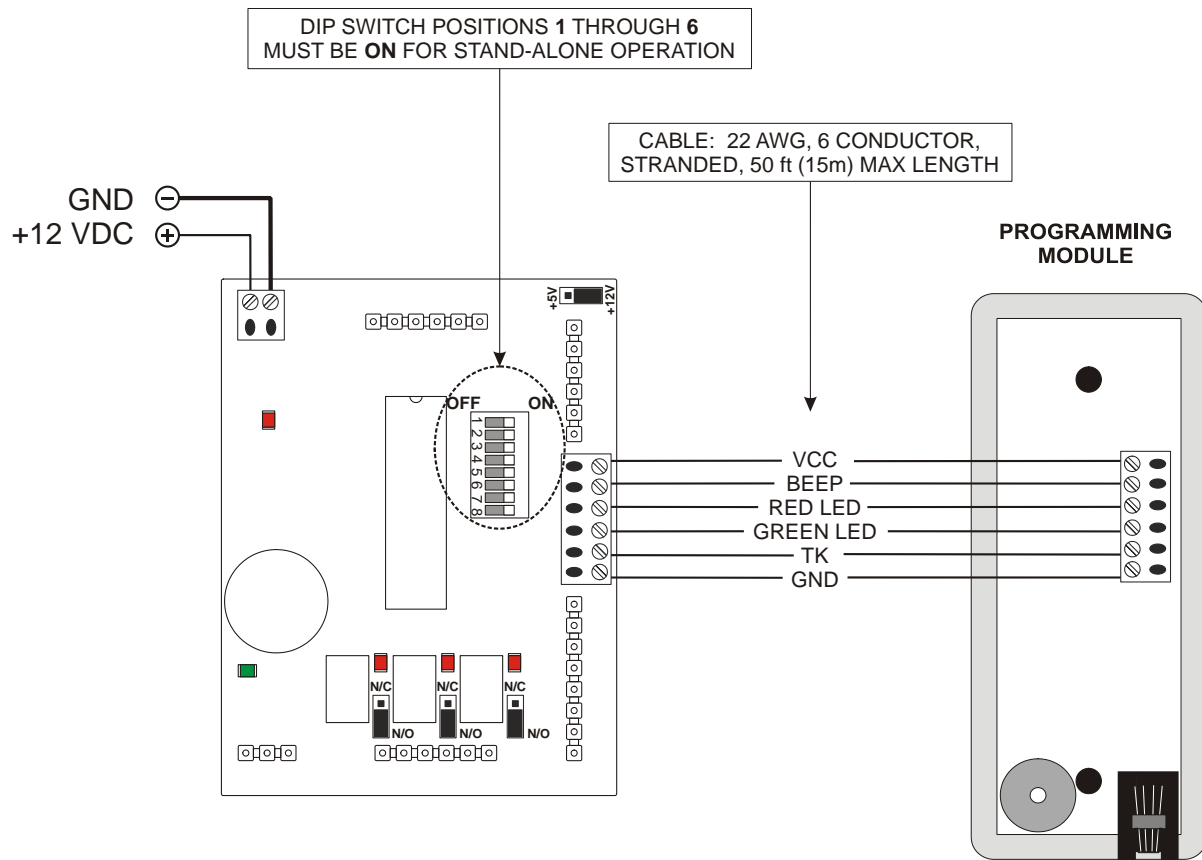
## MODEM CONFIGURATION (DIAL-UP)



## REMOTE END (DIAL-UP)



## PROGRAMMING MODULE (STAND-ALONE)



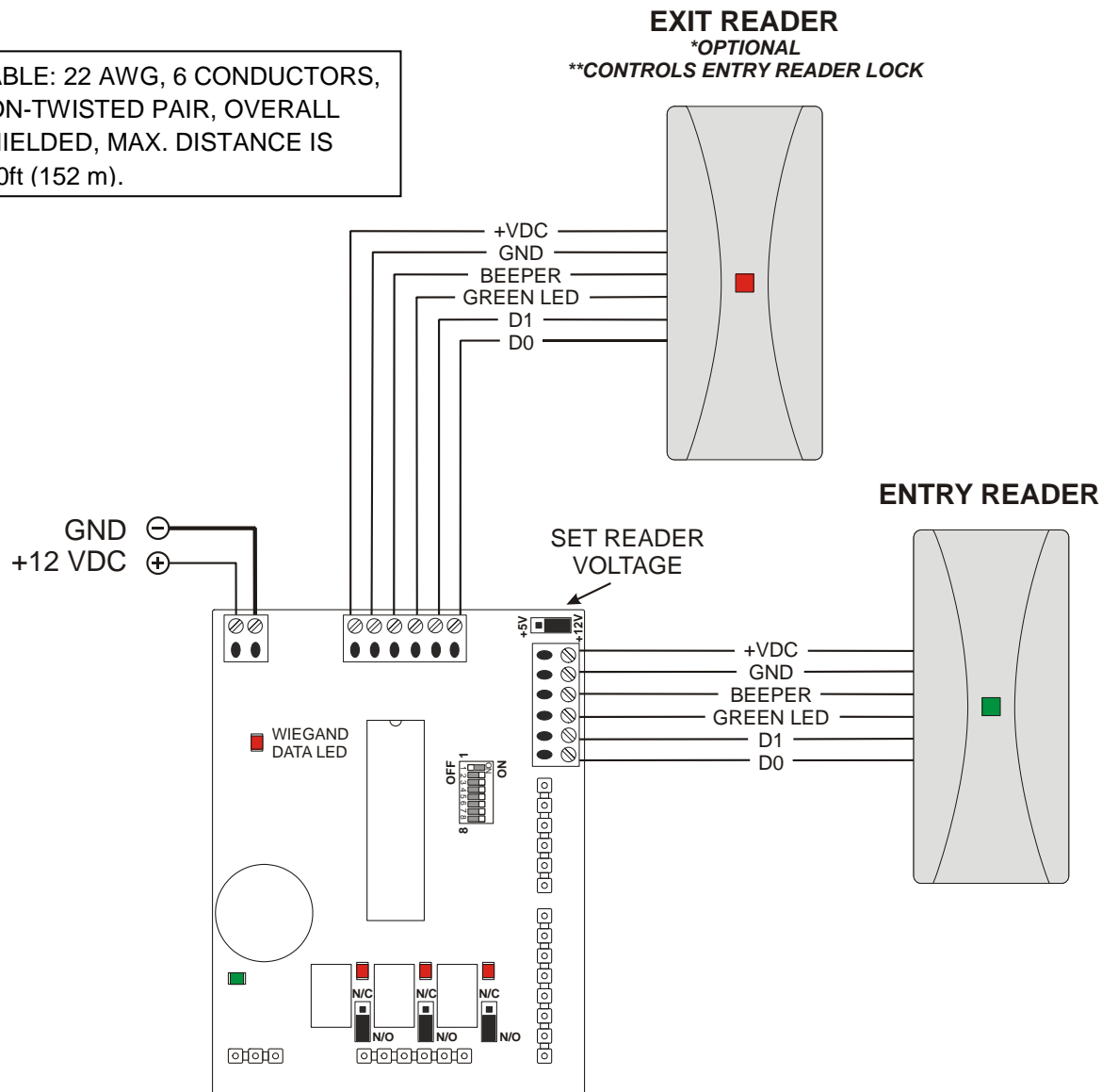
### NOTES:

- The stand-alone programming module must be installed within 50 feet of the SmartLock controller in a location accessible for programming using the portable programming key.
- The programming module should be installed on the secure side of the door in a dry location.
- If an iButton<sup>®</sup> reader is being used, wire it to the same reader port in parallel with the programming module.
- The programming module comes in a plastic box. Drill the required holes for mounting and feed the cable through the cable feed-through.
- See the *SmartLock Connect Operator Guide* for complete instructions on programming using the portable programming key.

# Reader Wiring

## WIEGAND READER

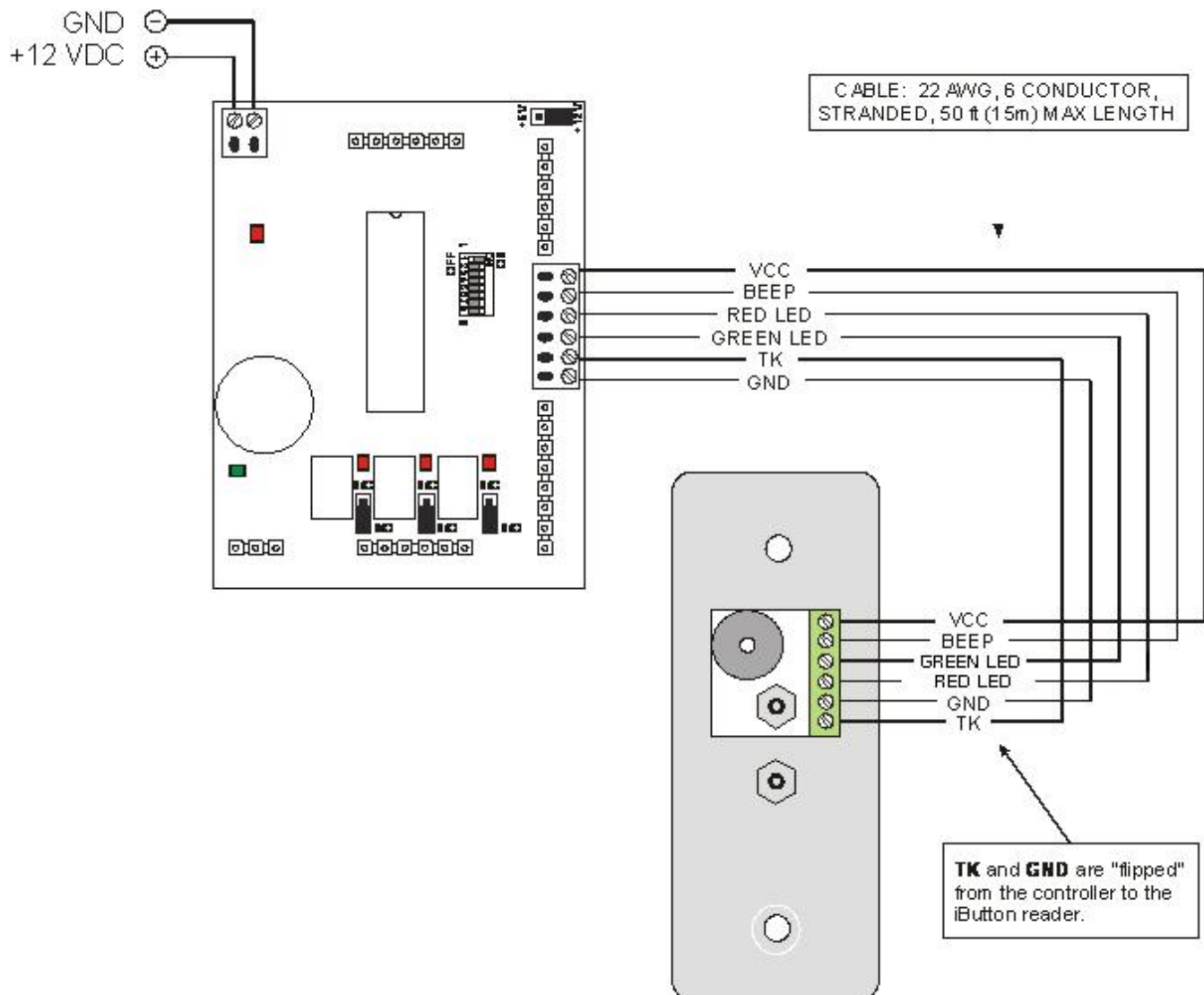
CABLE: 22 AWG, 6 CONDUCTORS,  
NON-TWISTED PAIR, OVERALL  
SHIELDED, MAX. DISTANCE IS  
500ft (152 m).



**IMPORTANT:** Before applying power to the controller, verify that the reader voltage jumper is set correctly for the reader being connected. Connecting a 5 V reader to a 12 V power supply will damage the reader.

**NOTE:** The SmartLock<sup>®</sup> controller supports Cansec's 37-bit format as well as standard 26-bit format.

## iBUTTON® READER

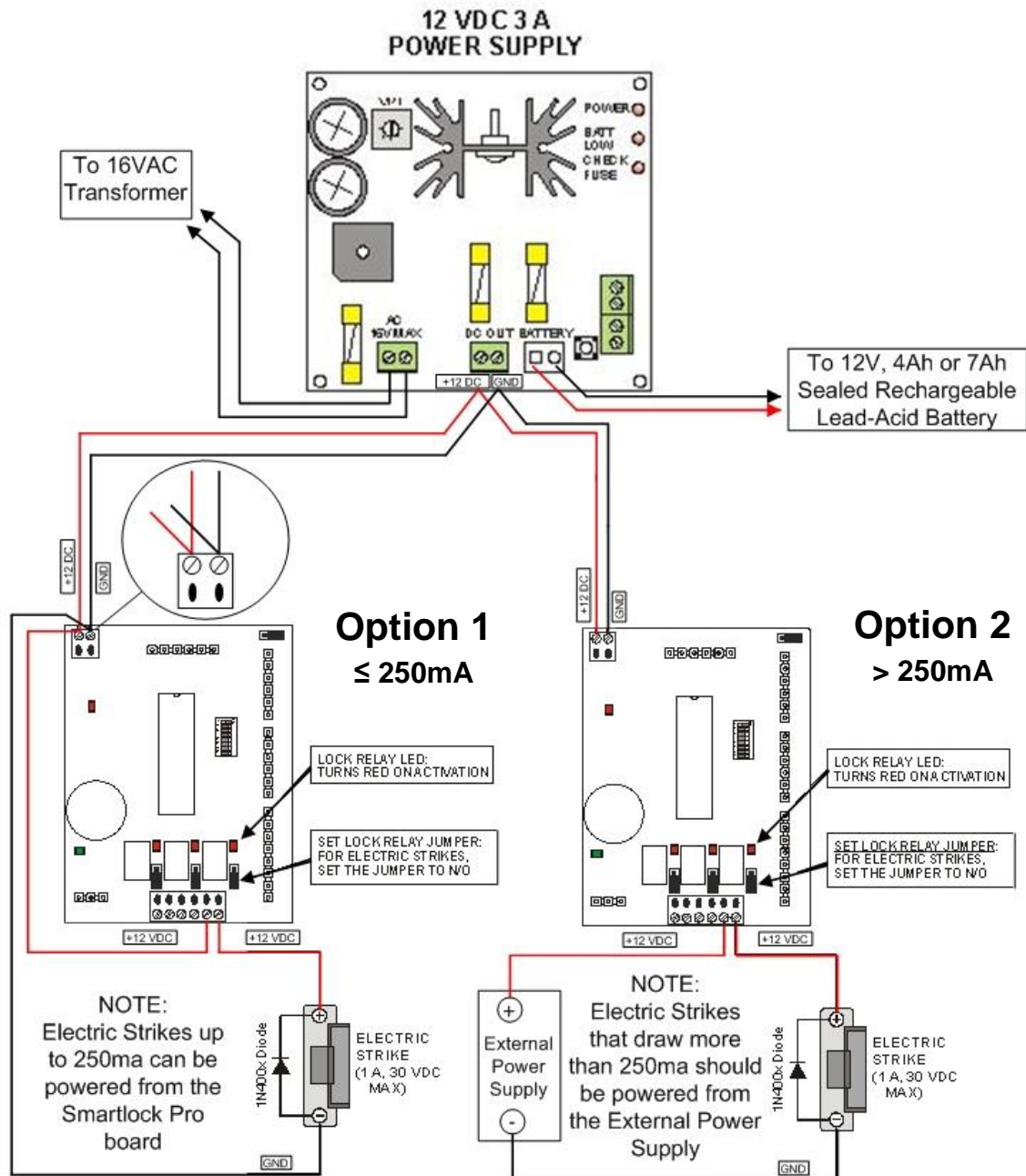


**NOTE:** Exit reader not supported with SmartLock iButton readers.

**NOTE:** If using the SmartLock Connect Programming Module with iButton readers, connect the programming module in parallel with the iButton reader.

# Lock Output Relay Wiring

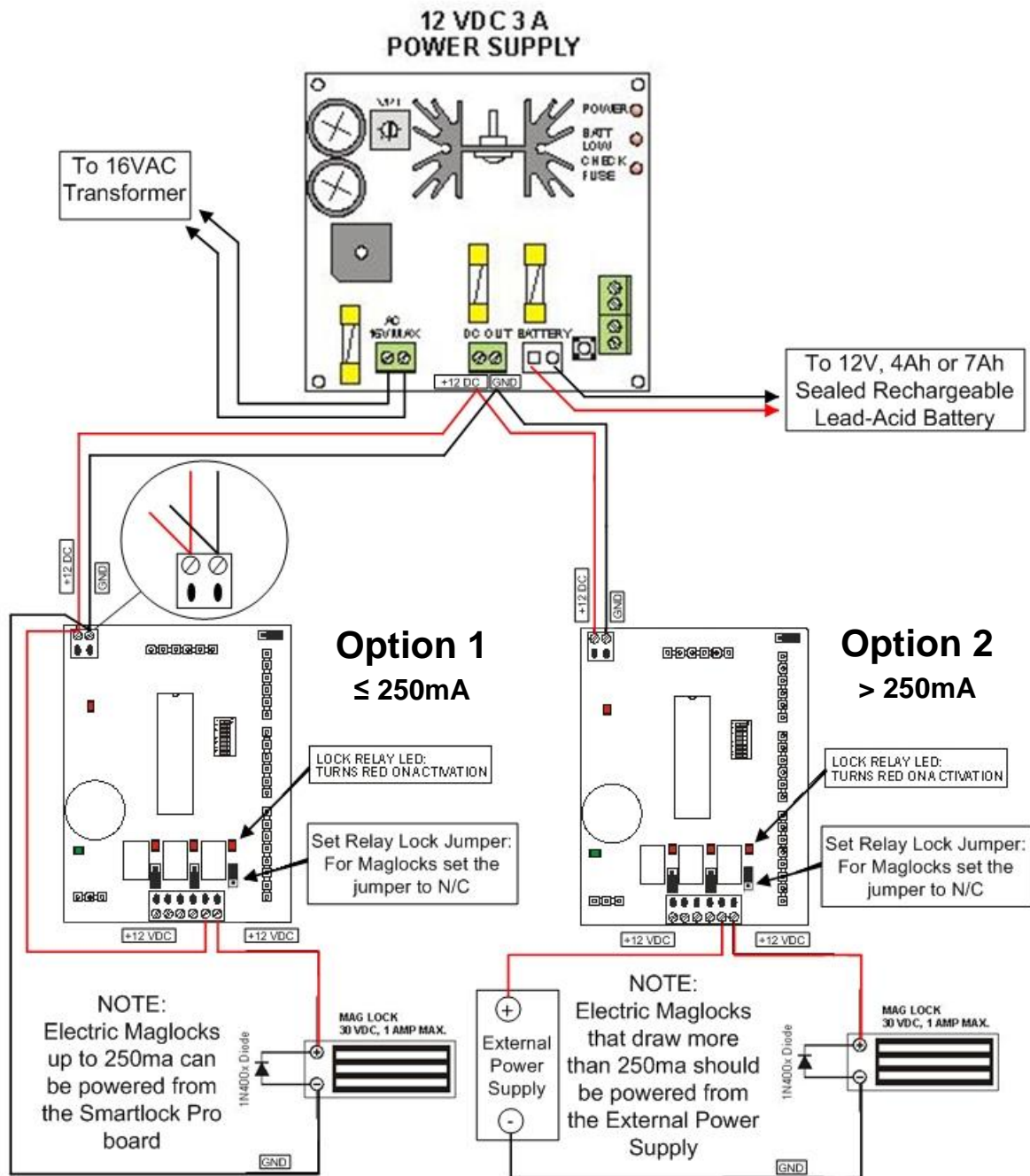
## DC ELECTRIC STRIKES



**NOTE:** Use 1N400x series diode as shown, to prevent “back EMF” from damaging the controller.

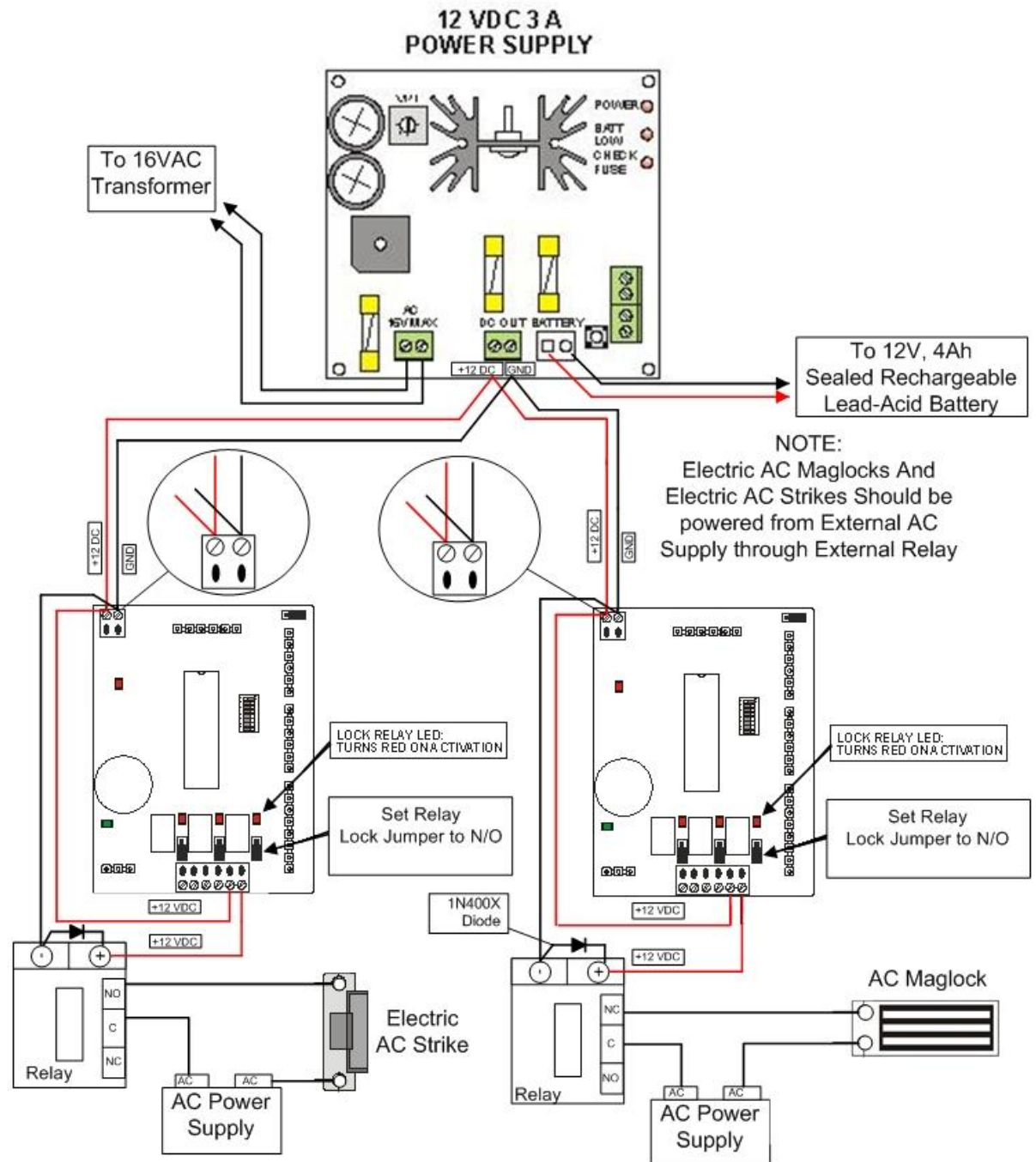


## DC MAGLOCKS



**NOTE:** Use 1N400x series diode as shown to prevent “back EMF” from damaging the controller if the maglock is not equipped with sufficient spike and surge protection. Check the maglock specifications for details.

## AC MAGLOCKS AND AC ELECTRIC STRIKES

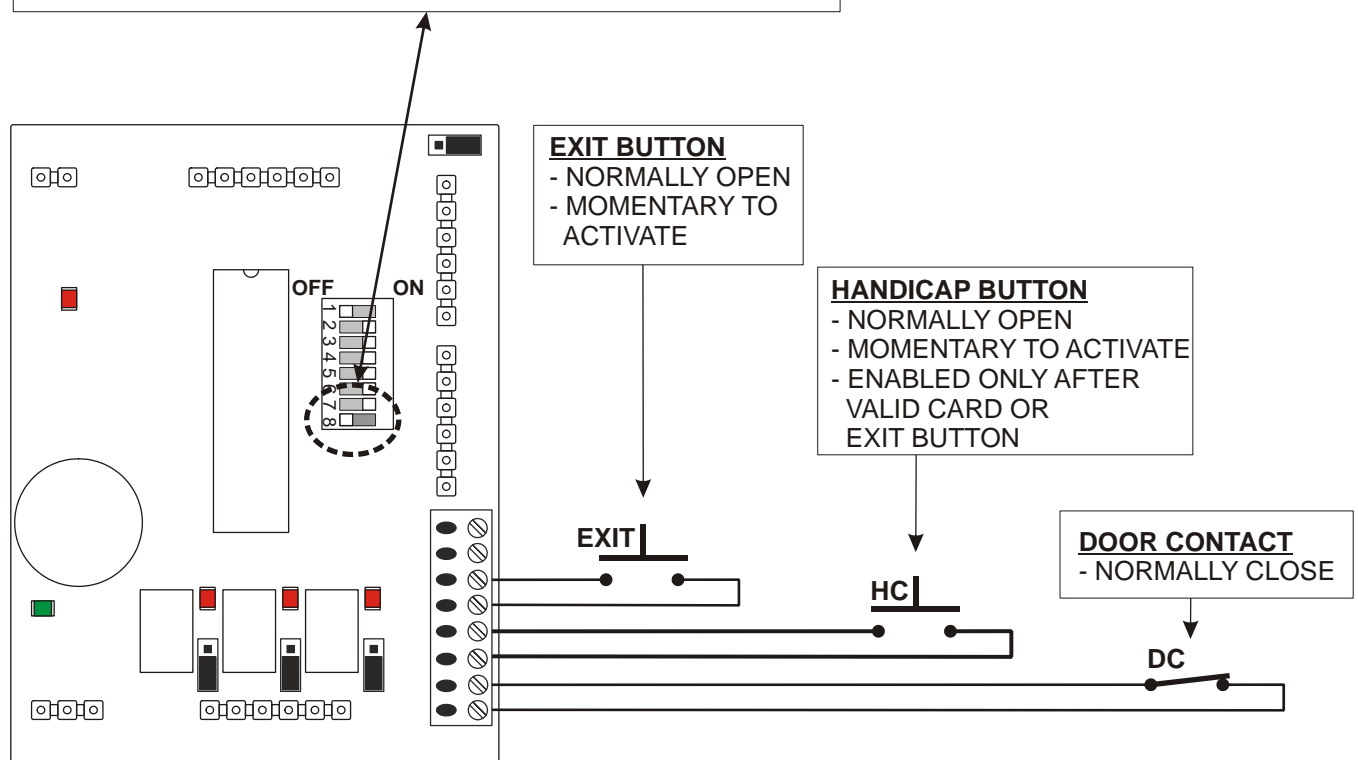


# Input Wiring

## EXIT BUTTON, HANDICAP BUTTON, DOOR CONTACT

IF YOU ARE CONNECTING A DOOR CONTACT  
SET DIP SWITCH 8 TO OFF (LEFT)

IF YOU ARE **NOT** CONNECTING A DOOR CONTACT  
SET DIP SWITCH 8 ON (RIGHT)



**NOTE:** DO NOT apply power or attempt to switch any current through these inputs as this will result in damage to the controller.

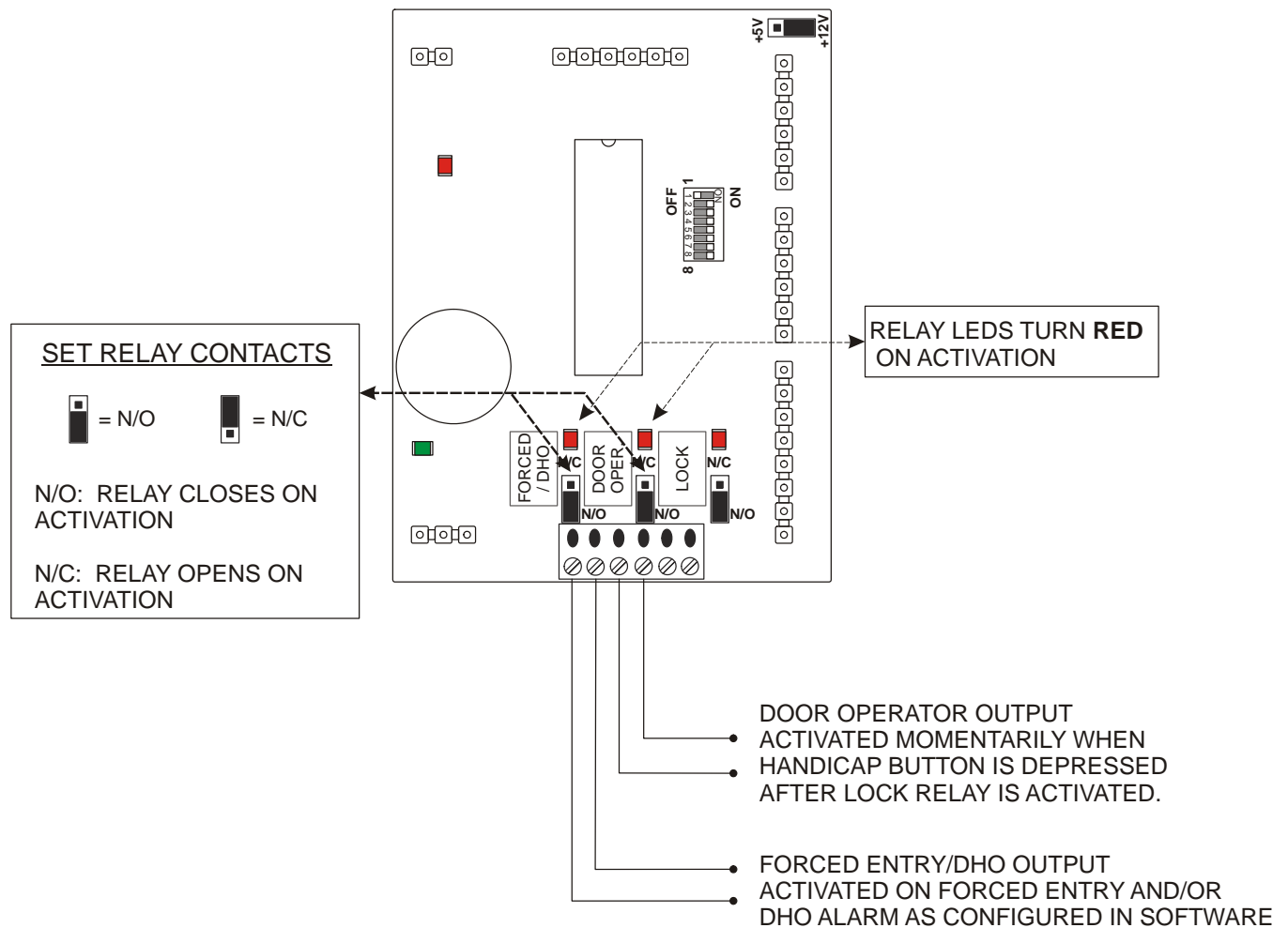
**NOTE:** If not connecting a door contact, make sure you set switch position 8 to ON (right in orientation show) to bypass/disable the door contact input. Otherwise, the door will be in alarm condition.

**NOTE:** Exit Button requires momentary closure to activate relay. Door Contact is used for forced-entry and door-held-open annunciation, and also deactivates the lock relay when the door closes.

# Output Wiring

## DOOR OPERATOR, FORCED ENTRY, DOOR-HELD-OPEN

Use dry contact relays.



**NOTE:** Maximum power through any of these relays is 30 VDC at 1 A.

**NOTE:** Door Operator requires momentary closure to activate relay.

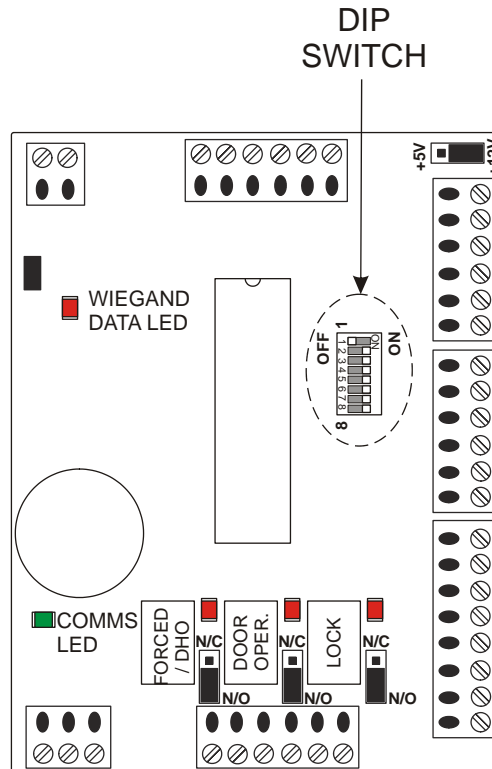
# DIP Switch

## FUNCTION

The DIP switch is used:

- to erase the controller's memory and run diagnostics;
- to enable or bypass the door contact input; and
- to set the controller address from 0 to 60 (0 for stand-alone only).

## LOCATION



## ERASE CONTROLLER MEMORY, DIAGNOSTICS

1. Disconnect communication and device wiring.
2. To erase controller memory (factory default), set all switches to the **OFF** position (left on diagram above).
3. Disconnect power from the board momentarily, then re-connect power.
4. The controller's memory will be erased. All three relays will cycle **ON/OFF** once the memory has been cleared. Relay outputs can be verified during this stage.

**NOTE:** If the relays do not cycle **ON/OFF**, there may be a problem with the unit.

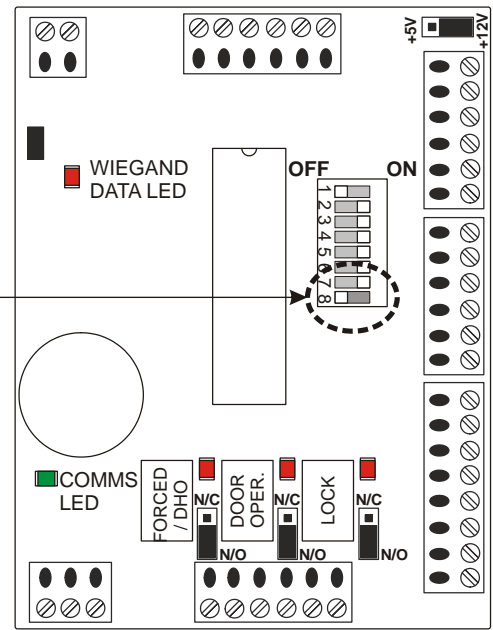
5. Continue to set controller address and door contact bypass switch settings.

**NOTE:** Switch setting changes do not take effect until the power is disconnected, then reconnected.

## DOOR CONTACT BYPASS SWITCH SETTING

IF YOU ARE CONNECTING A DOOR CONTACT  
SET DIP SWITCH 8 TO OFF (LEFT)

IF YOU ARE **NOT** CONNECTING A DOOR CONTACT  
SET DIP SWITCH 8 ON (RIGHT)



Door Contact **Connected:** Set switch 8 **OFF (LEFT)** on diagram

Door Contact **Not Connected:** Set switch 8 **ON (RIGHT)** on diagram

**NOTE:** If door contacts are not installed, but door contacts are enabled on the control panel via switch 8, unlock schedules will fail to take effect.

## SET ADDRESS FOR SMARTLOCK CONNECT (STAND-ALONE)

To enable stand-alone operation and programming using the **Stand-Alone Programming Module**, set the controller switch settings as follows:

1. Locate DIP switch position 8 using the diagram above.
2. Set switch positions 1 through 6 to the **ON** position (address 0).
3. Set switch position 8 to enable/disable door contact input.

**NOTE:** Switch setting changes do not take effect until the power is disconnected, then reconnected.



# Controller Address Table

Set the unique address of each controller from 0 to 60 as per the table below. Address “0” is used for **ALL** stand-alone units to be programmed using SmartLock® Connect software. For SmartLock, the same address used must be programmed in the software in order to establish communications. Switch setting changes do not take effect until the power is disconnected, then reconnected.

ADDRESS	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
<b>STAND-ALONE</b>						
<b>0</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>
<b>1</b>	<b>OFF</b>	ON	ON	ON	ON	ON
<b>2</b>	ON	<b>OFF</b>	ON	ON	ON	ON
<b>3</b>	<b>OFF</b>	<b>OFF</b>	ON	ON	ON	ON
<b>4</b>	ON	ON	<b>OFF</b>	ON	ON	ON
<b>5</b>	<b>OFF</b>	ON	<b>OFF</b>	ON	ON	ON
<b>6</b>	ON	<b>OFF</b>	<b>OFF</b>	ON	ON	ON
<b>7</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	ON	ON	ON
<b>8</b>	ON	ON	ON	<b>OFF</b>	ON	ON
<b>9</b>	<b>OFF</b>	ON	ON	<b>OFF</b>	ON	ON
<b>10</b>	ON	<b>OFF</b>	ON	<b>OFF</b>	ON	ON
<b>11</b>	<b>OFF</b>	<b>OFF</b>	ON	<b>OFF</b>	ON	ON
<b>12</b>	ON	ON	<b>OFF</b>	<b>OFF</b>	ON	ON
<b>13</b>	<b>OFF</b>	ON	<b>OFF</b>	<b>OFF</b>	ON	ON
<b>14</b>	ON	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	ON	ON
<b>15</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	<b>OFF</b>	ON	ON
<b>16</b>	ON	ON	ON	ON	<b>OFF</b>	ON

ADDRESS	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
17	OFF	ON	ON	ON	OFF	ON
18	ON	OFF	ON	ON	OFF	ON
19	OFF	OFF	ON	ON	OFF	ON
20	ON	ON	OFF	ON	OFF	ON
21	OFF	ON	OFF	ON	OFF	ON
22	ON	OFF	OFF	ON	OFF	ON
23	OFF	OFF	OFF	ON	OFF	ON
24	ON	ON	ON	OFF	OFF	ON
25	OFF	ON	ON	OFF	OFF	ON
26	ON	OFF	ON	OFF	OFF	ON
27	OFF	OFF	ON	OFF	OFF	ON
28	ON	ON	OFF	OFF	OFF	ON
29	OFF	ON	OFF	OFF	OFF	ON
30	ON	OFF	OFF	OFF	OFF	ON
31	OFF	OFF	OFF	OFF	OFF	ON
32	ON	ON	ON	ON	ON	OFF
33	OFF	ON	ON	ON	ON	OFF
34	ON	OFF	ON	ON	ON	OFF
35	OFF	OFF	ON	ON	ON	OFF
36	ON	ON	OFF	ON	ON	OFF
37	OFF	ON	OFF	ON	ON	OFF
38	ON	OFF	OFF	ON	ON	OFF
39	OFF	OFF	OFF	ON	ON	OFF
40	ON	ON	ON	OFF	ON	OFF
41	OFF	ON	ON	OFF	ON	OFF

ADDRESS	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
42	ON	OFF	ON	OFF	ON	OFF
43	OFF	OFF	ON	OFF	ON	OFF
44	ON	ON	OFF	OFF	ON	OFF
45	OFF	ON	OFF	OFF	ON	OFF
46	ON	OFF	OFF	OFF	ON	OFF
47	OFF	OFF	OFF	OFF	ON	OFF
48	ON	ON	ON	ON	OFF	OFF
49	OFF	ON	ON	ON	OFF	OFF
50	ON	OFF	ON	ON	OFF	OFF
51	OFF	OFF	ON	ON	OFF	OFF
52	ON	ON	OFF	ON	OFF	OFF
53	OFF	ON	OFF	ON	OFF	OFF
54	ON	OFF	OFF	ON	OFF	OFF
55	OFF	OFF	OFF	ON	OFF	OFF
56	ON	ON	ON	OFF	OFF	OFF
57	OFF	ON	ON	OFF	OFF	OFF
58	ON	OFF	ON	OFF	OFF	OFF
59	OFF	OFF	ON	OFF	OFF	OFF
60	ON	ON	OFF	OFF	OFF	OFF

**NOTES:**

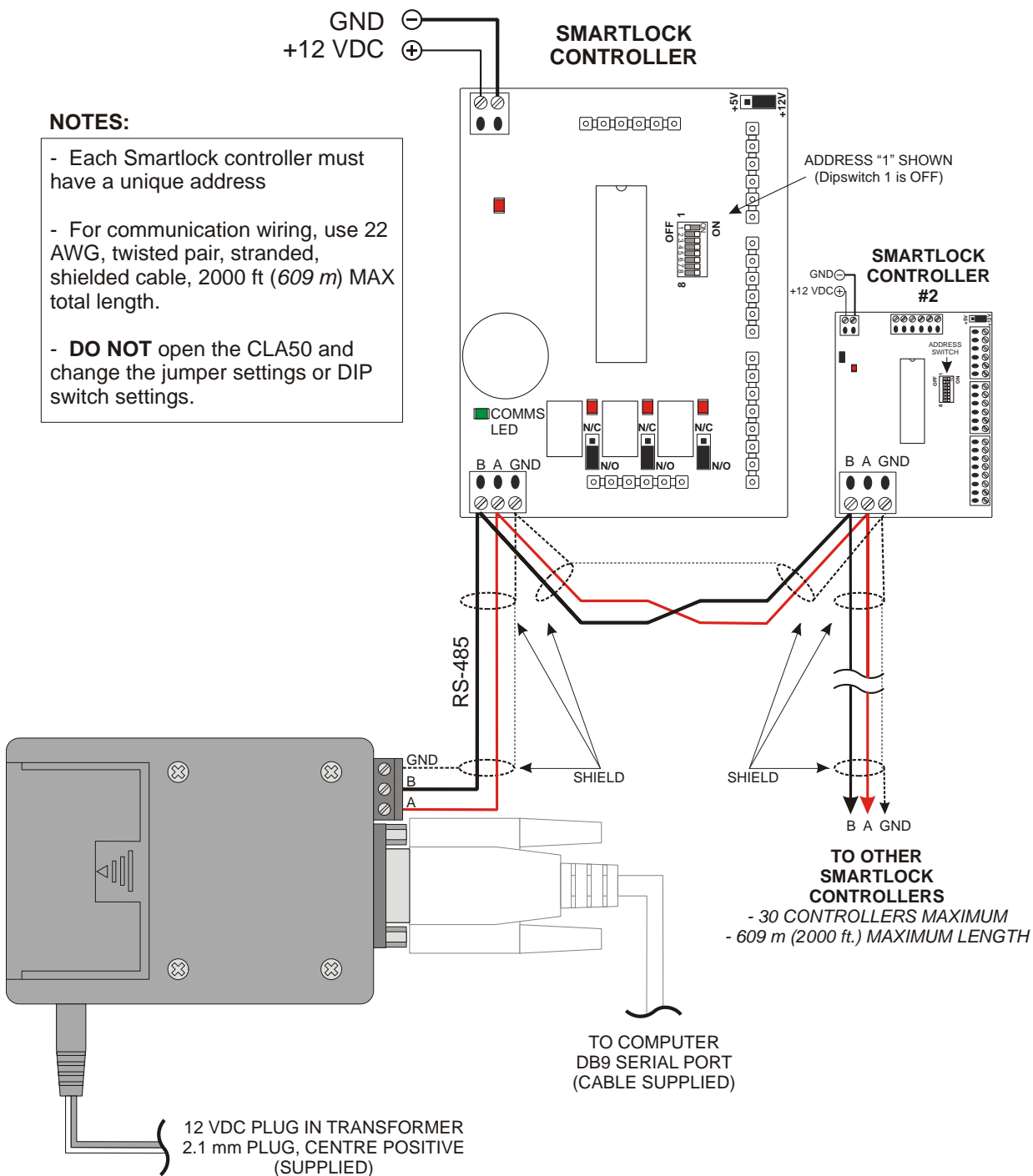
1. Switch setting changes do not take effect until the power is disconnected, then reconnected.
2. All stand-alone units must be addressed as "0".

# Appendix

## CLA50 COMMUNICATIONS WIRING

### NOTES:

- Each Smartlock controller must have a unique address
- For communication wiring, use 22 AWG, twisted pair, stranded, shielded cable, 2000 ft (609 m) MAX total length.
- **DO NOT** open the CLA50 and change the jumper settings or DIP switch settings.



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® iButton is a registered trademark of Maxim Integrated Products, Inc.