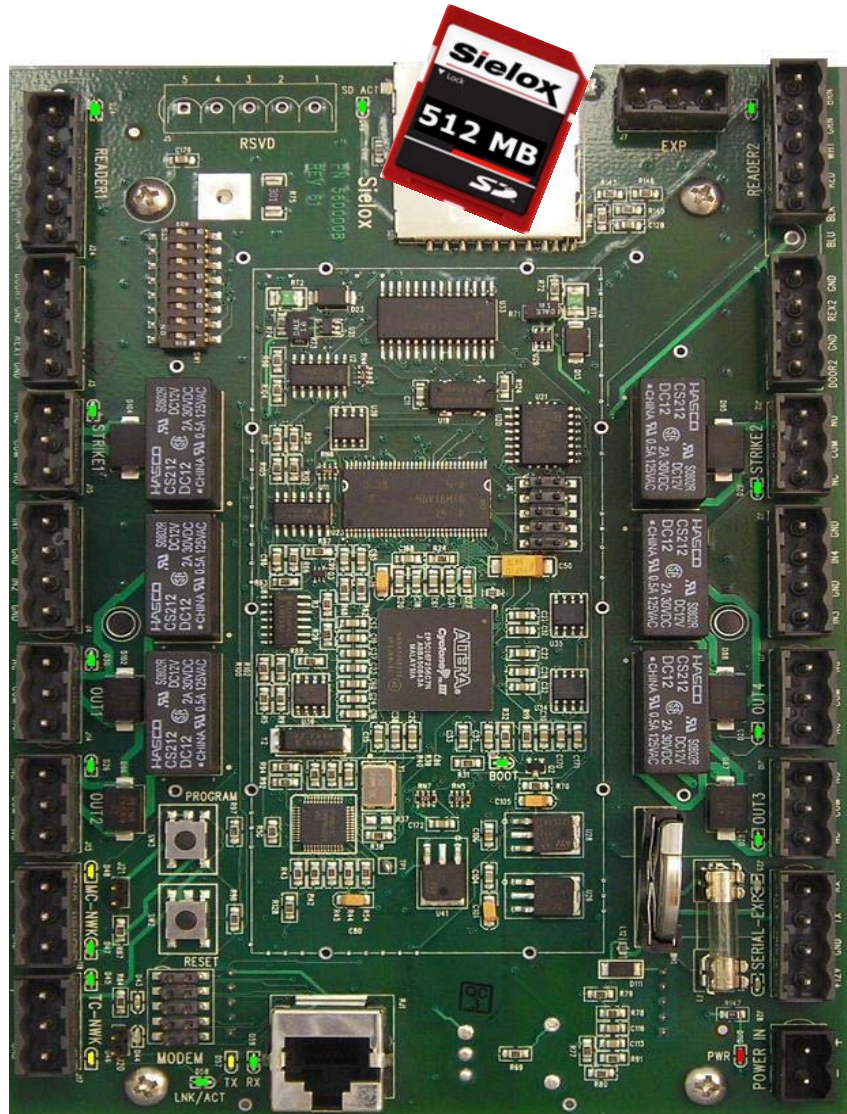


# AC-1700 Controllers Series Installation Manual



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PN: 6300132 Rev: 2.6

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## **Introduction**

The AC-1700, the next generation access control panel from Sielox, is the most advanced controller in the industry. It is a fully-distributed, two-door controller with capacity for 50,000 cards, 10,000 buffered events, four general purpose inputs, four general purpose outputs, and expansion for up to 56 I/O points. The AC-1700 is an access control and proprietary burglar alarm unit.

A true IP solution with data transfer rates up to 100 Mbps and a Web interface for maintenance, the AC-1700 can be deployed as a Main Controller or Terminal Controller. Implemented as a Main Controller, the AC-1700 manages up to 16 Terminal Controllers, including one onboard Terminal Controller. The AC-1700 Main Controller provides regional anti-passback and regional input/output linking. The AC-1700 Main Controller supports AC-1700, AC-1500, and AC-1200 Terminal Controllers. AC-300 and AC-600 Terminal Controllers are not supported.

The AC-1700 features a removable Secure Digital (SD) memory card with a capacity ranging from 128 MBytes to 1 GByte. The SD card stores the controller database and buffered events along with installation and service documents. Using the Web-based Maintenance Port, a technician may view the installation manual. The technician may also save and view service notes, drawings, wiring diagrams, installation photos, etc.

Consistent with previous Sielox product introductions, the 1700 Series offers unparalleled performance and reliability in a total access control solution.

## **Controller Features**

### **AC-1700 Main Controller**

- Regional anti-passback.
- Regional I/O linking.
- Manages up to 16 Terminal Controllers.
- Includes one onboard Terminal Controller.
- Cardholder capacity: 50K with one Access Level or 25K with multiple Access Levels.
- Buffered event storage:10K.
- Real Time Clock with replaceable coin battery. Keeps Terminal Controller time and date during power loss.
- Removable Secure Digital (SD) memory card. Stores the controller database, buffered events and service documents.
- Two doors. Add up to 4 Terminal Controllers in the enclosure for an eight-door panel.
- Four supervised, general purpose, four-state inputs.
- Four general purpose outputs. Programmable for latched, momentary or reflective action.
- Reader Types: FIPS 201, Standard 26 bit Wiegand, Sielox format, HID Corporate 1000, AWID, and ANSI Magnetic Stripe Wiegand.
- I/O Expansion Board option. Expand with an additional combination of 56 Inputs or Outputs.
- Communication: Onboard Ethernet and RS-485 interfaces.
- Supports AC-1500 or AC-1200 Terminal Controllers. Does not support AC-600 or AC-300 Terminal Controllers.
- Auto-Configuration: Pinnacle software automatically detects and configures Main and Terminal Controllers.
- Programmable Flash memory: Upgrade firmware without chip replacement – Local or Remote.
- Web-based Maintenance Port: Perform infield diagnostics and updates using the Web browser.
- Certifications: FCC and ETL certified to UL294 and UL 1076.

## **Sielox AC-1700 Installation Manual**

### **AC-1700 Terminal Controller**

- Cardholder capacity: 50K with one Access Level or 25K with multiple Access Levels.
- Buffered event storage:10K.
- Real Time Clock with replaceable coin battery. Keeps Terminal Controller time and date during power loss.
- Removable Secure Digital (SD) memory card. Stores the controller database, buffered events and service documents.
- Two doors. Add up to 4 Terminal Controllers in the enclosure for an eight-door panel.
- Four supervised, general purpose, four-state inputs.
- Four general purpose outputs. Programmable for latched, momentary or reflective action.
- Reader Types: FIPS 201, Standard 26 bit Wiegand, Sielox format, HID Corporate 1000, AWID, and ANSI Magnetic Stripe Wiegand.
- I/O Expansion Board option. Expand with an additional combination of 56 Inputs or Outputs.
- Communication: Onboard Ethernet and RS-485 interfaces.
- Auto-Configuration: Pinnacle software automatically detects and configures Main and Terminal Controllers.
- Programmable Flash memory: Upgrade firmware without chip replacement – Local or Remote.
- Web-based Maintenance Port: Perform infield diagnostics and updates using the Web browser.
- Certifications: FCC and ETL certified to UL294 and UL 1076.

## Safety Precautions & Compliance

For safety and agency compliance, the following requirements must be followed when installing AC-1700 products.

### **Do Not Connect To A Receptacle Controlled By A Switch**

**Note: For UL 1076 compliance, Do Not Connect To A Receptacle Controlled By A Switch.**

### **UL Listed Power Supply**

The AC-1700 must be powered by a UL listed power supply with a visible AC indicator. All interconnecting devices are to be powered by UL listed power limited power supplies.

### **Electrical Connections**

The AC-1700 controllers must be installed within the protected premise in accordance with the National Electric Code (NFPA70), local codes and the authorities having jurisdiction.

This system shall be installed in accordance to the National Fire Protection Associations Standard 72, Chapter 2.

### **Power Limited Connections**

Those connections not designated as “Power Limited” must be wired according to Class 1 wiring methods with ¼” wire separation.

### **Primary Voltage Restrictions**

Voltages greater than 30V AC or greater than 42.4V DC shall not enter the UL-approved enclosure.

### **Grounding**

All enclosures shall be grounded using local and national code requirements. The AC-1700 shall be grounded according to the requirements in this manual.

See [AC-1700 Enclosure Grounding](#) on page 10.

## AC-1700 Enclosure Grounding

AC-1700 enclosures (part numbers 6800110 and 6800111) must be grounded. Install a ground wire (B) to the green **GND** screw located on the enclosure base. Terminate the ground wire to earth ground or electrical ground. See pictures below.

**Note: Use 14 AWG wire.**



**The enclosure door must be grounded to the enclosure using the wire strap (A).** This wire strap is supplied with the enclosure. Secure to the green screw on the door and the green screw on the enclosure base.



## Sielox AC-1700 Installation Manual

### Selecting Cable

The following shielded Belden or West Penn cables are approved for AC-1700 controller wiring.

| Cable Type                | AWG | Wires | Where Used           | Color Code                      | Max. Dist. |
|---------------------------|-----|-------|----------------------|---------------------------------|------------|
| Belden 8761 (Shielded)    | 22  | 2     | Inputs (Door, REX)   | Clear / Black                   | 500 ft.    |
| Belden 9460 (Shielded)    | 18  | 2     | Outputs (Door Lock)  | Clear / Black                   | *          |
| West Penn 3280 (Shielded) | 18  | 5     | Wiegand Readers      | Red/Black/White/Green/Brown     | 500 ft.    |
| West Penn 3021 (Shielded) | 18  | 6     | Wiegand Readers      | Red/Black/White/Green/Brown/Blu | 500 ft.    |
| Belden 8723 (Shielded)    | 22  | 4     | RS-485 Communication | Red/Black/White/Green           | 4000 ft.   |
| Belden 1307A              | 16  | 2     | Power / Battery      | Red/Black                       | 50 ft.     |

\*Application dependent, but typically runs up to 500 ft.

### AC-1700 Cables

#### Conduit

Sielox recommends that all AC-1700 wiring be installed in conduit. Install conduit in accordance with national and local codes. If conduit is not practical and not required by local building codes, ensure that wiring is concealed. Take extra care not to damage the cable insulation or shielding.

#### Shielding

All AC-1700 cables shall be shielded. For each segment of cable, one end of the shield drain wire shall be terminated to ground. Failure to properly terminate shielding can result in faulty operation of the equipment. Sielox, LLC Shall not be liable for improper operation of the AC-1700 due to improper shielding and or unrecognized cable types.

#### Static Protection

The AC-1700 is susceptible to damage from static electricity. Technicians must take appropriate measures to prevent damage due to static discharge. Sielox recommends the use of an ANSI/ESD S1.1-1998 compliant grounding strap. The strap can be connected to the grounded AC-1700 enclosure. Prior to installation, all electronic products must remain in their respective anti-static bags.

## **Certifications**

### **FCC**

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, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

**WARNING:** Changes or modifications to Sielox equipment not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner. If equipment is not installed and used in accordance with the instructions in the AC-1700 Installation Manual, interference may result. In this case the equipment owners, at their own expense, must take whatever measures are required to correct the interference.

“This Class A digital apparatus complies with Canadian ICES-003.”

«Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.»

### **ETL certified for UL 294**

For UL 294 compliance, only equipment documented in this manual may be used for installation of the AC-1700 controller.

### **ETL certified for UL 1076**

This manual includes specific instructions for UL 1076 compliance. The installation instructions must be implemented when UL 1076 compliance is required.

## Operation and Maintenance

### Operation

Review this AC-1700 Installation Manual and the Pinnacle 7 Users Manual for configuration settings and operation.

### Maintenance

To ensure proper operation, the Real Time Clock coin battery should be checked annually and replaced when necessary. [Real Time Clock Backup Battery](#) on page 38.

### Replacement Parts

1. Real Time Clock coin battery (Sielox part number 6201700): 3V battery type **BR2032**, available from Panasonic and many other suppliers.
2. Fuse (Sielox part number 6801705): 1A, 250V, 5x20mm fast acting.  
Littelfuse part# **0217001.HXP**  
Radio Shack part# **27-1049**

### Technical Support & RMA's

**Phone:** 800-424-2126, prompt 8

**FAX:** 856-939-9306

8:30 am – 7:30 pm Eastern time, Monday - Friday

E-Mail: [tech.support@sielox.com](mailto:tech.support@sielox.com)

## AC-1700 Enclosures



Two types of enclosures are available for AC-1700 controllers.

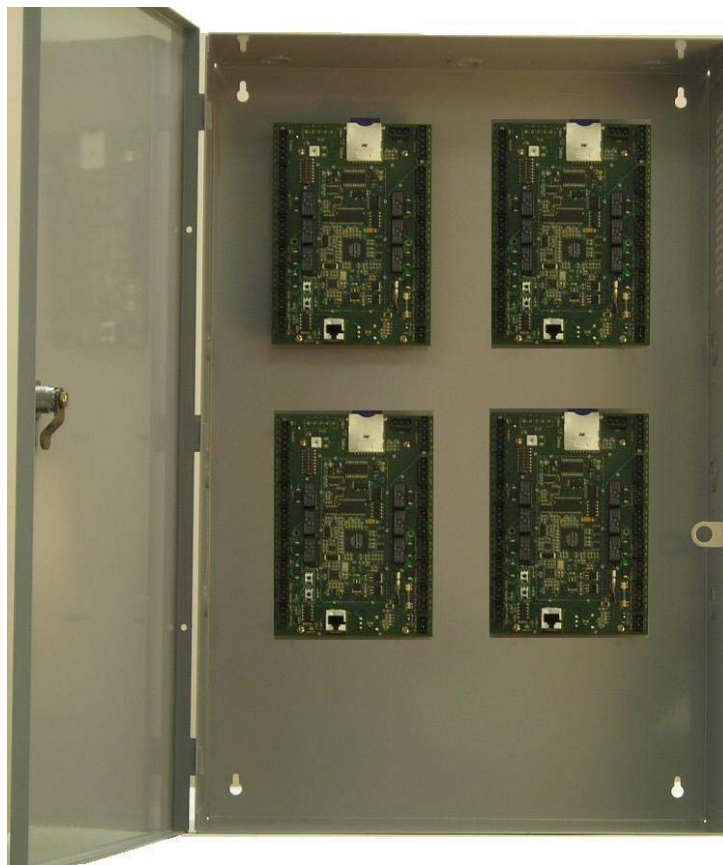
- Large Enclosure (p/n 6800110). Up to eight doors with four AC-1700 controllers. Dimensions: 17" x 22" x 3.5" (43.18 cm x 55.88 cm x 8.89 cm)
- Small Enclosure (p/n 6800111). Up to 2 doors with one AC-1700 controller). Dimensions: 12" x 12" x 3.5" (30.48 cm x 30.48 cm x 8.89 cm)

## **Installing Enclosures**

1. Position the enclosure or template at the desired installation location and mark the four keyhole slot locations for mounting.
2. Install suitable mounting fasteners such as wood screws, molly bolts, or masonry fasteners, but do not tighten completely. Allow room for the enclosure to hang on the bolts.
3. Position the enclosure on the four fasteners, verify alignment and positioning, and tighten the fasteners completely.
4. Install conduit and connect to the enclosure.
5. Install a grounding wire to the enclosure and ensure that the wire is terminated to earth ground or electrical ground.
6. Install the ground strap between the enclosure base and cover.
7. Clean any debris from the enclosure.

### Large Enclosure (p/n 6800110)

Dimensions: 17" x 22" x 3.5" (43.18 cm x 55.88 cm x 8.89 cm)



### Small Enclosure (p/n 6800111)

Dimensions: 12" x 12" x 3.5" (30.48 cm x 30.48 cm x 8.89 cm)



**AC-1700 Mounting Plates**

Sielox offers 3 mounting plates: **AC-1700-MP**, **AC-1700-RMP** and **AC-1700-IOMP**.

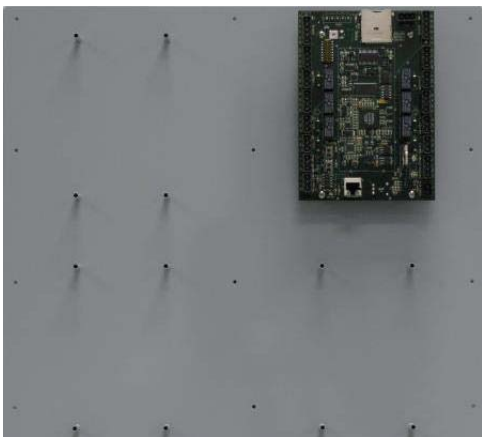
Mounting plates provide options for installation in various types of enclosures.



**AC-1700-MP – 6800125**

Mounting plate for a single AC-1700 controller board in any suitable enclosure.

Dimensions: 5"x 7" – 12.7 cm x 17.78 cm



**AC-1700-RMP – 6900127**

Retrofit mounting plate for mounting up to 4 AC-1700 controller boards inside the AC-1500 large enclosure or other large enclosures.

Dimensions: 17.90"x 16.15" – 45.44 cm x 41.02 cm



**AC-1700-IOMP**

I/O mounting plate for installation of the AC-1500 BP7 or BP5 backplane in the AC-1700 large enclosure.

Dimensions: 15"x 8.60" – 38.1 cm x 21.84 cm

## Installing a Tamper Switch

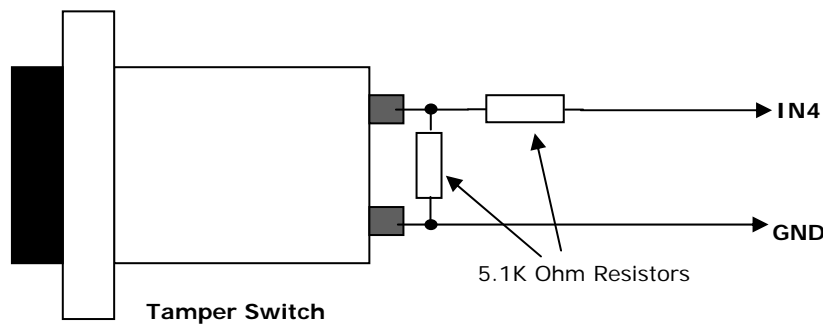
A Tamper Switch is provided with each enclosure. Install the Tamper Switch in the mounting channel at the lower right hand corner of the enclosure. Tamper Switch leads must be connected to an available input of an installed controller. This input shall be configured in Pinnacle software as normally closed with supervision.

Two supervisory resistors, 5.1K Ohm each, shall be inserted in the switch leads. One resistor is installed across the Tamper Switch contact while the other is installed inline with one of the switch leads.

When configured and connected in this manner, the controller will report an **“Input Active”** event when the enclosure door is open and **“Input Secure”** when the door is closed.

**“Input Cut”** or **“Input Shorted”** status will be reported if the Tamper Switch installation or configuration is not done properly.

### Tamper Switch wiring and connection diagram and instructions.



- Connect one lead wire from the tamper switch to the AC-1700 **IN4** Input connector.
- Connect the remaining lead wire from the tamper switch to the adjacent **GND** pin on the same connector.

**Note: IN4 is used in this example. Any available input can be used.**

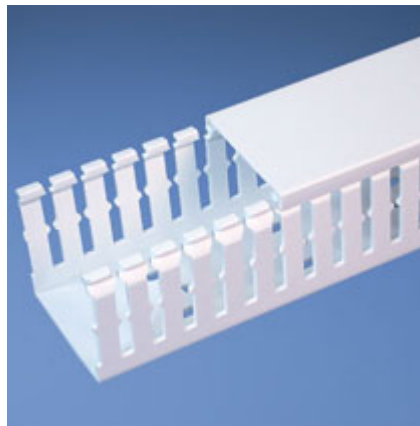
- In Pinnacle software Device Setup screen, expand the device tree and right click on the input used for the Tamper Switch and select **Properties**.
- Under the **Control Properties** tab, enter an appropriate name such as **East Lobby Cabinet Tamper**.
- Under the **Settings** Tab, select **Secure State: Closed**, select **Report State Change: <ALWAYS>**, and check the **Supervised** checkbox

## Managing Cables in the Sielox Enclosure

### Wire Management

Sielox recommends the use of slotted wiring ducts, available from various manufacturers:

- Panduit <http://www.panduit.com/Products/ProductOverviews/WiringDuct/index.htm>
- Thomas & Betts <http://www.tnb.com/ps/fulltilt/index.cgi?check=Y&part=TY1X2NPw6>



The recommended sizes are from 1" to 2" wide and 1" to 3" high.

These slotted wiring ducts are UL, CSA and CE approved. They save maintenance time and give the installation a professional look.

If wiring ducts are not used, cable bundles should be formed and neatly tied.

**Signal Cables**

Connect signal cables to readers, door strikes, outputs, inputs, request-to-exit devices and door switch inputs as necessary according to the following instructions:

1. Use Sielox approved cables (See table below).
2. Pull signal cables through the Sielox Enclosure.
3. Arrange conductors so that they turn at right angles from the duct or bundle.
4. Strip ¼ inch of insulation from each conductor that inserts into a connector block.
5. Insert the stripped conductors into respective removable connectors and tighten set screws. See [AC-1700 Connectors](#) on page 30.
6. Verify cable connections.
7. Insert removable connectors on the appropriate fixed connector socket.

| <b>Cable Type</b>         | <b>AWG</b> | <b>Wires</b> | <b>Where Used</b>    | <b>Color Code</b>                | <b>Max. Dist.</b> |
|---------------------------|------------|--------------|----------------------|----------------------------------|-------------------|
| Belden 8761 (Shielded)    | 22         | 2            | Inputs (Door, REX)   | Clear / Black                    | 500 ft.           |
| Belden 9460 (Shielded)    | 18         | 2            | Outputs (Door Lock)  | Clear / Black                    | *                 |
| West Penn 3280 (Shielded) | 18         | 5            | Wiegand Readers      | Red/Black/White/Green/Brown      | 500 ft.           |
| West Penn 3021 (Shielded) | 18         | 6            | Wiegand Readers      | Red/Black/White/Green/Brown/Blue | 500 ft.           |
| Belden 8723 (Shielded)    | 22         | 4            | Communication RS-485 | Red/Black/White/Green            | 4000 ft.          |
| Belden 1307A              | 16         | 2            | Power / Battery      | Red/Black                        | 50 ft.            |

\*Application dependent, but typically runs up to 500 ft.

**AC-1700 Cables**

## Communications

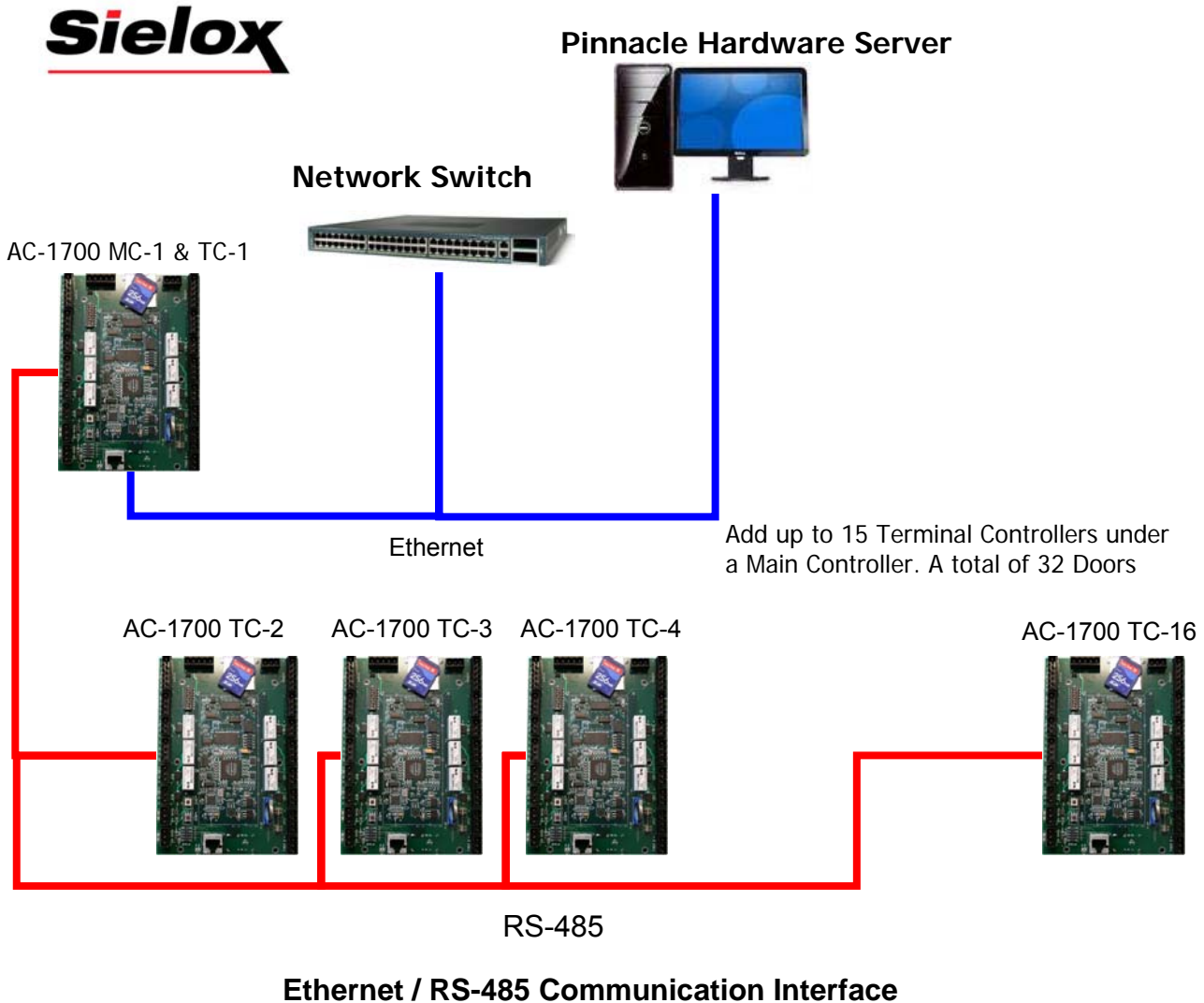
### Ethernet / RS-485

When configured as a Main Controller, the AC-1700 communicates directly to a Pinnacle Hardware Server via Ethernet. The AC-1700 **MC-NWK** port is not enabled for RS-485 communication. The AC-1700 Main Controller communicates to external Terminal Controllers via RS-485 using the **TC-NWK** port.

When configured as a Terminal Controller, the AC-1700 communicates to an AC-1700 Main Controller via RS-485 using the **TC-NWK** port.

The DIP switch is used to configure the AC-1700 as either a Main or Terminal Controller. Unique controller addresses are also configured with the DIP switch.

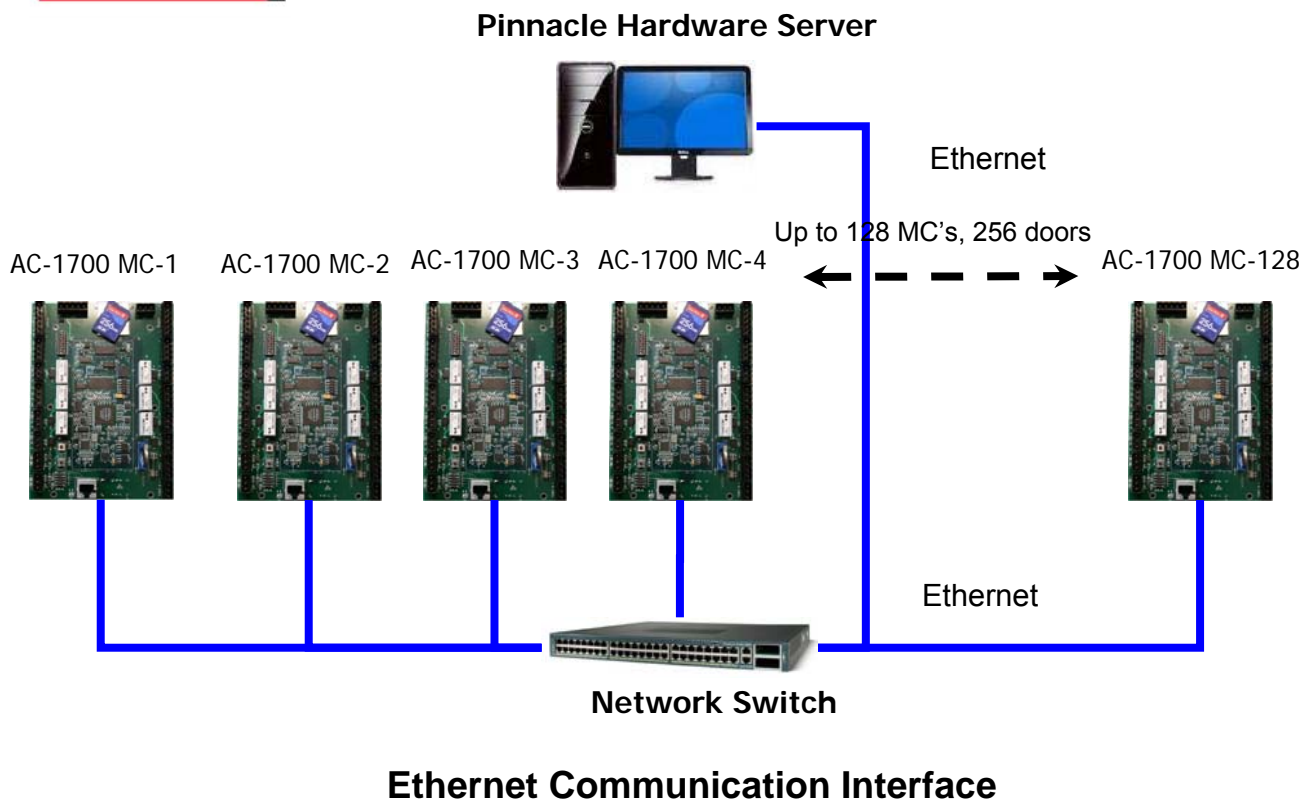
See [DIP switch settings](#) on page 34.



## Ethernet

Each AC-1700 Main Controller communicates directly to the Pinnacle Hardware Server via Ethernet only. The same Ethernet interface provides the Web-based controller maintenance port.

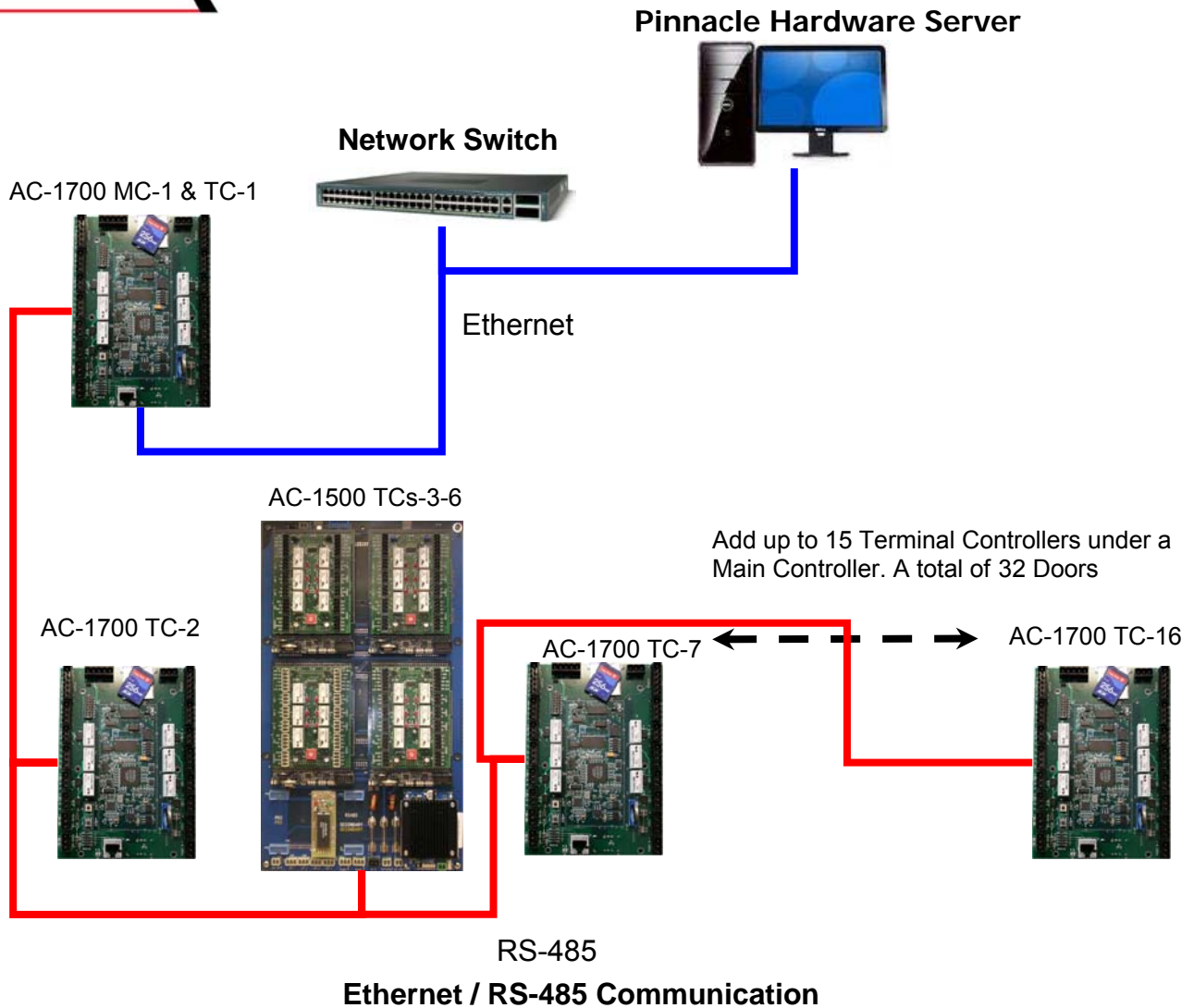
[See Web Maintenance](#) on page 42.



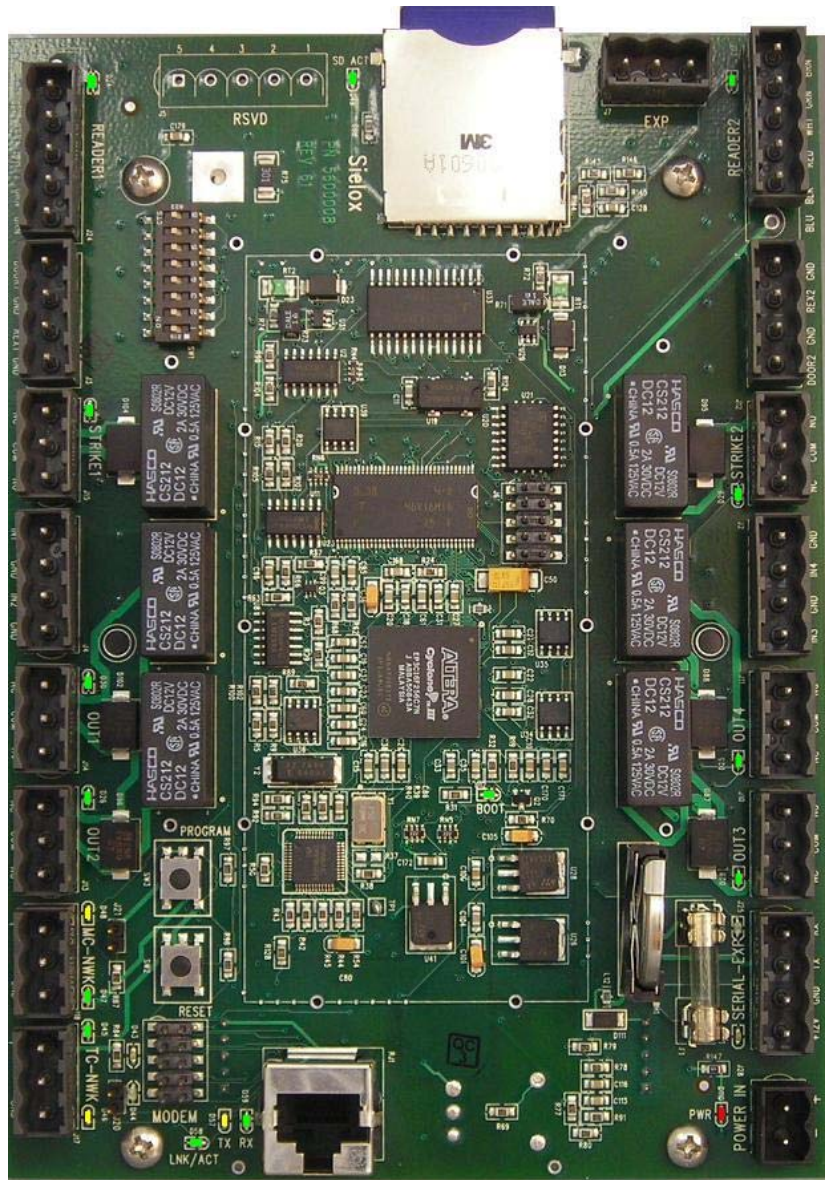
**Ethernet / RS-485 with AC-1500 or AC-1200**

The AC-1200, AC-1500 and AC-1700 Terminal Controllers communicate with the AC-1700 Main Controller via the RS-485 interface (**TC-NWK**). Other Sielox Terminal Controllers such as the AC-300 and AC-600 are not supported.

If an unsupported TC is connected to an AC-1700 Main Controller, Pinnacle will report a “**Legacy TC Detected**” event.



# AC-1700 Board



AC-1700 Board

## Communication

### Connecting the Ethernet Cable

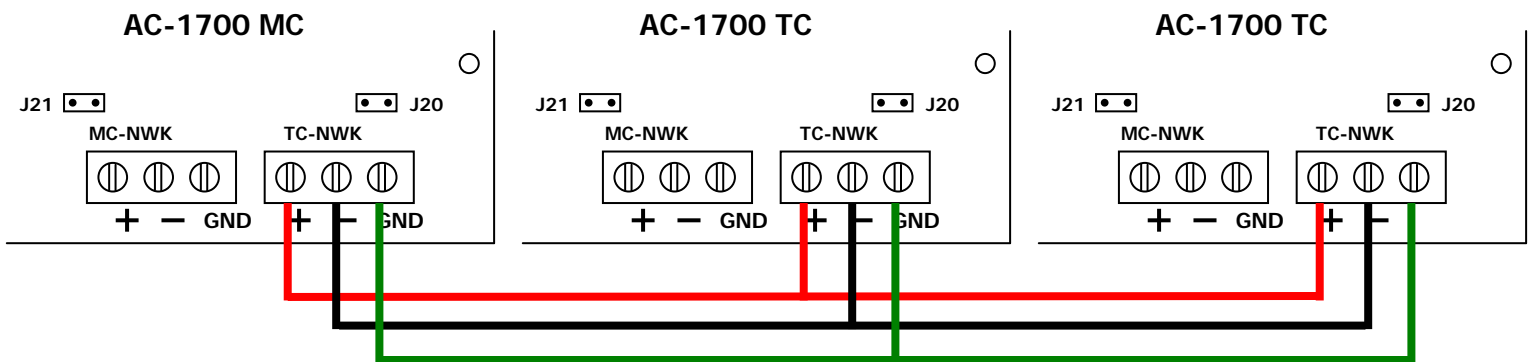
1. Pull the LAN communication cable through the Sielox Enclosure. (See table below)
2. Connect the LAN cable to the Ethernet RJ-45 connection on the AC-1700. See the [Ethernet Connector](#) on page 30.

**Note: For UL 1076 compliance, install Citel part# ZSCAT5-CX Ethernet surge suppressor directly to the AC-1700 Ethernet connector. Connect the LAN cable to the Citel ZSCAT5-CX device.**

| Cable Type    | AWG | Wires | Where Used             | Color Code   | Max. Dist. |
|---------------|-----|-------|------------------------|--|------------|
| Belden 11700A | 24  | 8     | Ethernet Communication | Orange/Blue/Green/Brown<br>Striped Orange/Blue/Green/Brown | 329 ft.    |

### Connecting the RS-485 Cable

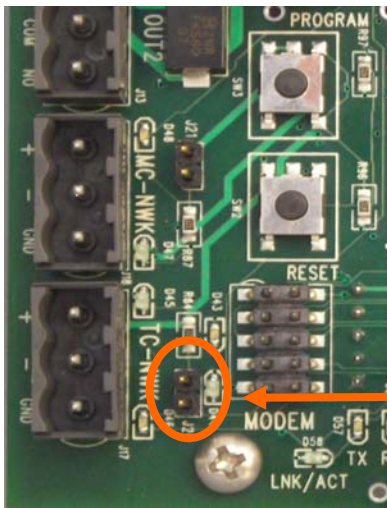
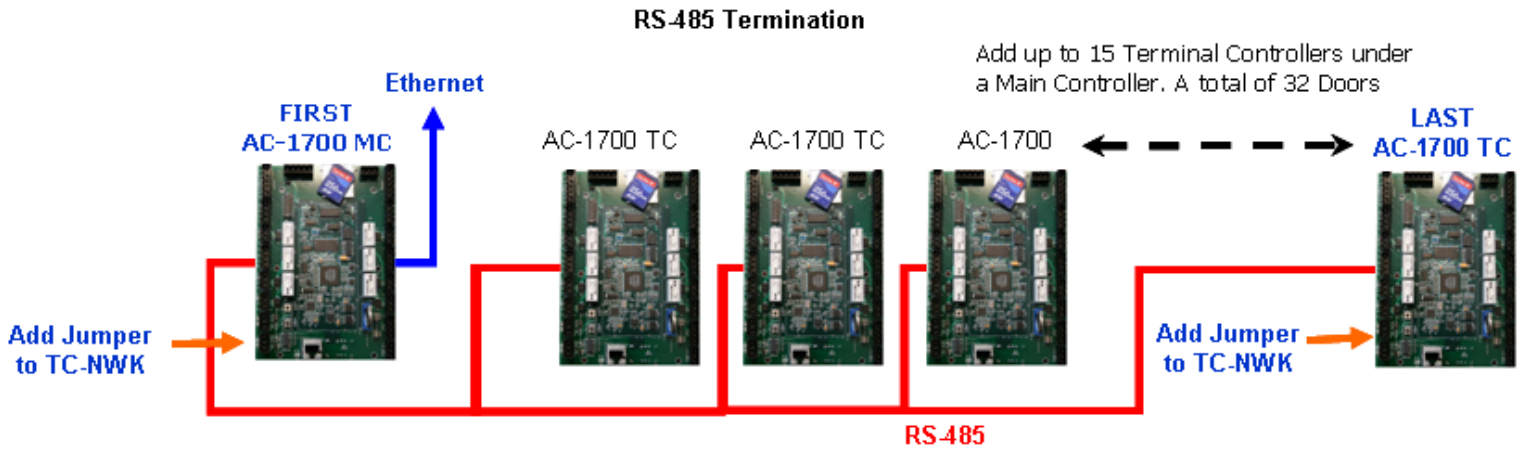
1. Pull the RS-485 communication cable through the Sielox Enclosure. (See table below)
2. Insert the stripped conductors into the removable **TC-NWK** connector and tighten set screws.
3. Observe the polarity.
4. Insert removable connector on the **TC-NWK** connector.



| Cable Type             | AWG | Wires | Where Used           | Color Code            | Max. Dist. |
|------------------------|-----|-------|----------------------|-----------------------|------------|
| Belden 8723 (Shielded) | 22  | 4     | Communication RS-485 | Red/Black/White/Green | 4000 ft.   |

**Note:** The AC-1700 provides a TC-NWK jumper for RS-485 bus termination. The TC-NWK jumper must be installed on the first and last AC-1700 controller connected on a single RS-485 bus. This jumper must not be installed on other controllers on the same RS-485 bus.

Jumpers are provided in the connector kit for each AC-1700 controller.



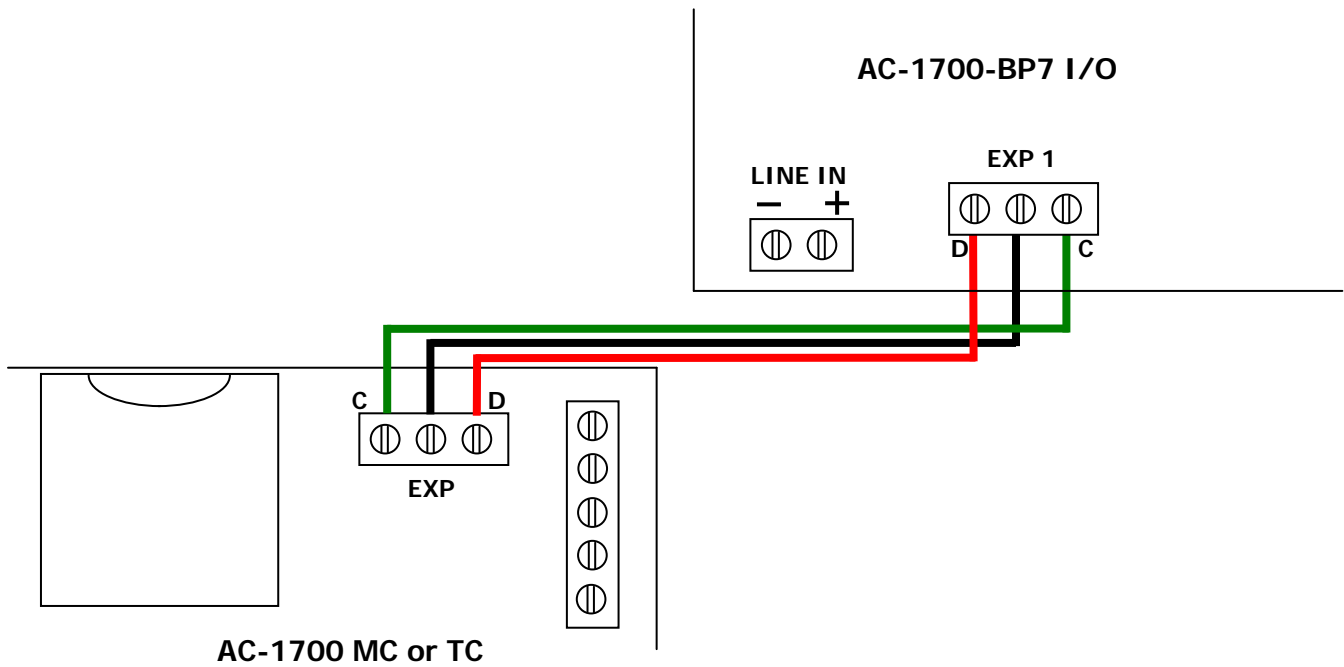
The RS-485 termination jumper J20 is located next to the TC-NWK connector J17.

Install this jumper on the first and last AC-1700 controller connected on a single RS-485 bus.

**Note 2:** If a mix of AC-1700 and AC-1200 or AC-1500 Terminal Controller are installed on the same RS-485 bus and an AC-1200 or AC-1500 is the LAST controller on the bus, install the RS-485 termination jumper on the FIRST AC-1700 only. In this case, the RS-485 termination jumper is installed on just one controller on the RS-485 bus.

### Connecting the I/O Expansion Cable to an AC-1700-BP7 I/O

1. Pull three-conductor cable, 22 GA or better, through the Sielox Enclosures. Connect AC-1700 MC or TC “**EXP**” connector to AC-1700-BP7 “**EXP 1**” connector, “**C**” pin to “**C**” pin, “**D**” pin to “**D**” pin, and center pin to center pin. Maximum cable length is 15 ft.



## Installing the AC-1700

### Connecting signal cables

Connect signal cables to readers, door strikes, outputs, inputs, request-to-exit inputs and door switch inputs as necessary:

1. Pull signal cables through the Sielox Enclosure. (See table below)
2. When connecting these cables to the AC-1700 reader, input or output modules, form a cable bundle using plastic cable ties (Tie wraps).
3. Arrange conductors so that they split out at the right angles from the bundle. Allow enough slack so that the enclosure door can shut easily without pinching the cable bundle.
4. Strip ¼ inch of insulation from each conductor.
5. Insert the stripped conductors into respective removable connectors and tighten set screws.
6. Verify cable connections.
7. Insert removable connectors on the appropriate module fixed connector.

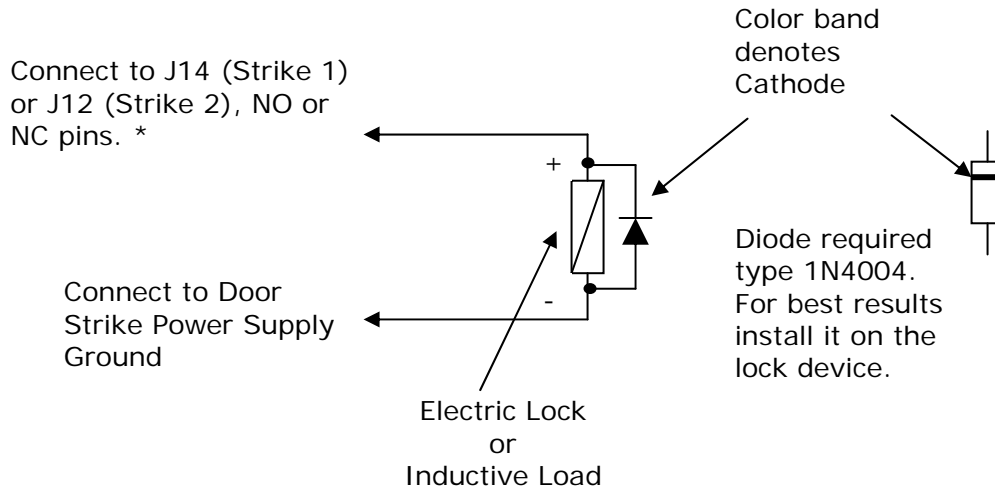
| Cable Type                | AWG | Wires | Where Used          | Color Code                      | Max. Dist. |
|---------------------------|-----|-------|---------------------|---------------------------------|------------|
| Belden 8761 (Shielded)    | 22  | 2     | Inputs (Door, REX)  | Clear / Black                   | 500 ft.    |
| Belden 9460 (Shielded)    | 18  | 2     | Outputs (Door Lock) | Clear / Black                   | *          |
| West Penn 3280 (Shielded) | 18  | 5     | Wiegand Readers     | Red/Black/White/Green/Brown     | 500 ft.    |
| West Penn 3021 (Shielded) | 18  | 6     | Wiegand Readers     | Red/Black/White/Green/Brown/Blu | 500 ft.    |

\*Application dependent but typically runs 500 ft.

**Note:** See [AC-1700 Connectors](#) on page 30.

### Transient Suppressors for Door Strike and Output Relays

Installation of suppression diodes is required for all electric door locks or other inductive loads connected to relay outputs. See diagram below.

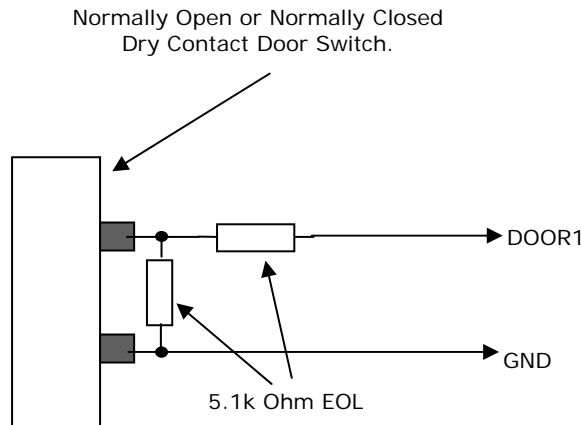


**\*Note1: Use NO when using Maglock. (Fail Safe)**  
**Note2: Use NC when using Electric Strike (Fail Secure)**  
**NO-Normally Open NC-Normally Closed**

### Supervised Inputs

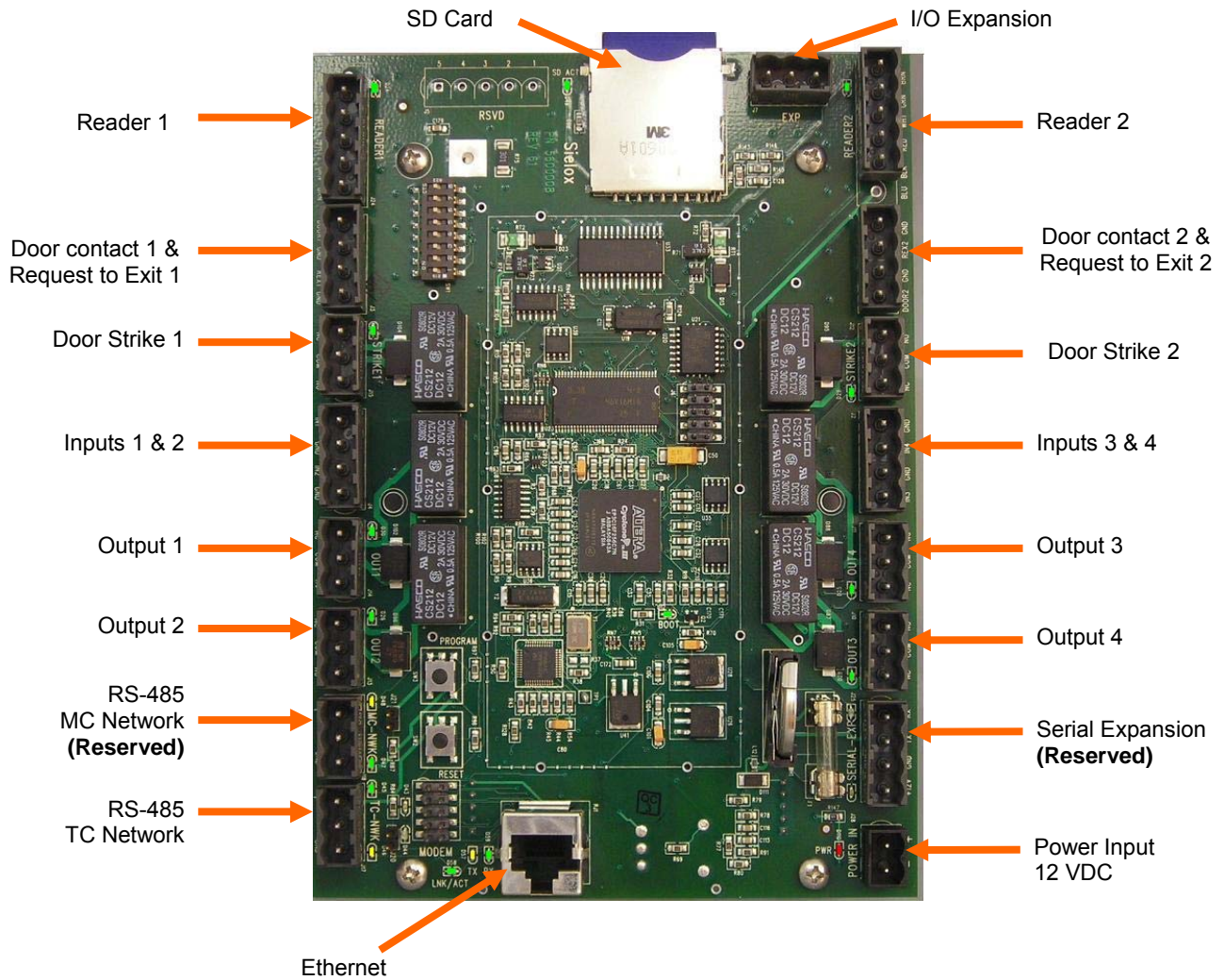
All AC-1700 inputs can be supervised including door contacts and REX inputs.

Install two 5.1K Ohm, end of line resistors as close as possible to the switch. One resistor is connected in parallel with the switch contact and the other inline with one contact.



**Note: Remember to configure the Door Properties or Inputs Properties in Pinnacle Device Setup for the proper switch state and supervision.**

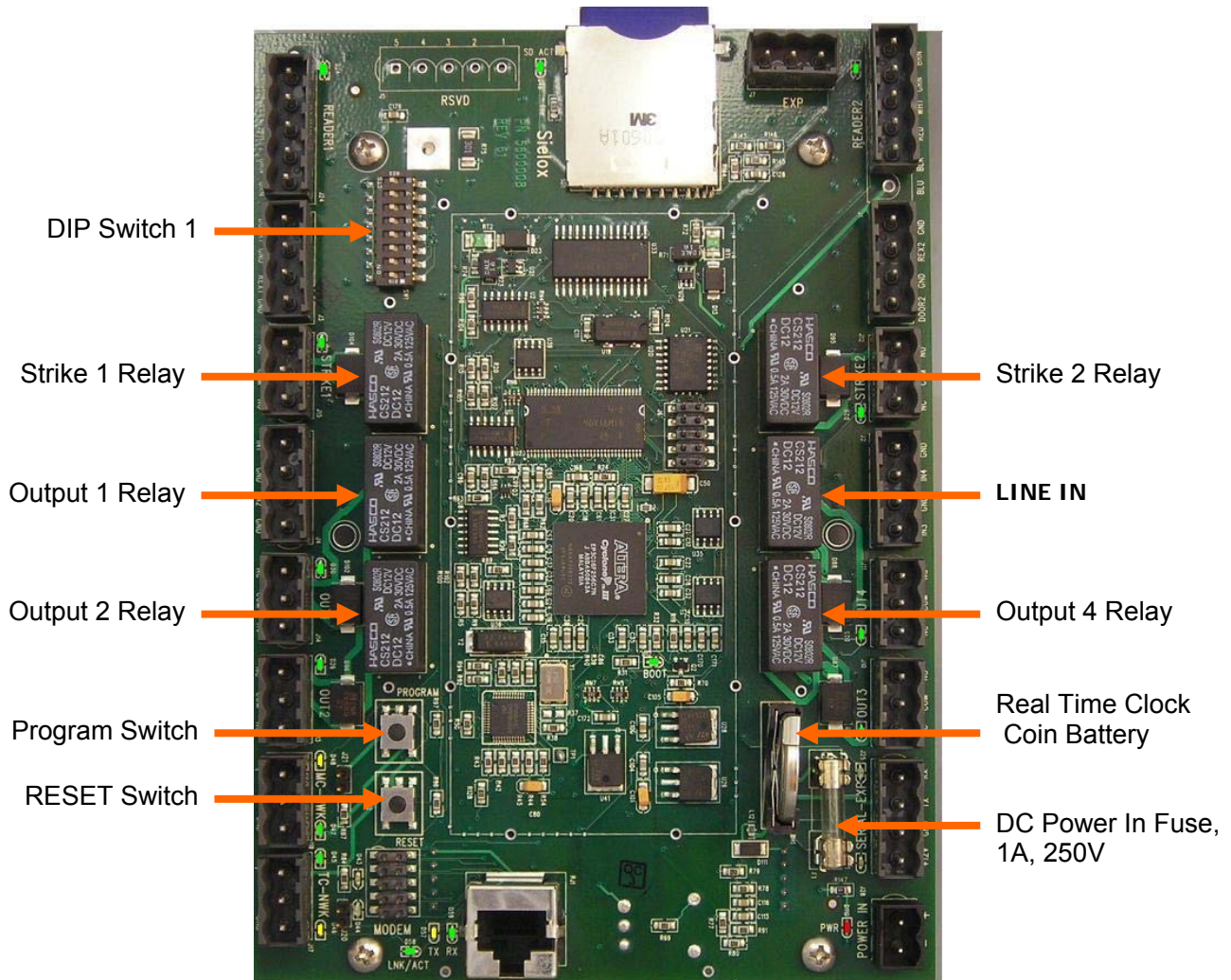
## AC-1700 Connectors



AC-1700 Controller Board  
(Actual Size 5" x 7" – 12.7 cm x 17.78 cm)

### AC-1700 Connectors

## AC-1700 Switches, Relays, Coin Battery and Input Fuse



**AC-1700 Connectors**

**Readers 1 & 2 – J24 & J23**

| PIN | Name         | Wire Color |
|-----|--------------|------------|
| BLK | Ground       | Black      |
| RED | Power 12 VDC | Red        |
| WHT | Data 1       | White      |
| GRN | Data 0       | Green      |
| BRN | LED          | Brown      |

**Door Contact 1, 2, Request to Exit (REX) 1 & 2 Connectors J3, J1**

| PIN   | Name   | Wire Color |
|-------|--------|------------|
| DOOR1 | Signal | Clear      |
| GND   | Ground | Black      |
| REX1  | Signal | Clear      |
| GND   | Ground | White      |

**Door Strike 1 & 2– J15 and J12**

| PIN | Name            | Wire Color |
|-----|-----------------|------------|
| NC  | Normally Closed | Any        |
| COM | Common          | Any        |
| NO  | Normally Open   | Any        |

**Inputs 1, 2, 3 & 4 – J4, and J2**

| PIN | Name   | Wire Color | PIN | Name   | Wire Color |
|-----|--------|------------|-----|--------|------------|
| IN1 | Signal | Black      | IN3 | Signal | Black      |
| GND | Ground | Clear      | GND | Ground | Clear      |
| IN2 | Signal | Black      | IN4 | Signal | Black      |
| GND | Ground | Clear      | GND | Ground | Clear      |

**Outputs 1, 2, 3 & 4 – J10, J11, J13 & J14**

| PIN | Name            | Wire Color |
|-----|-----------------|------------|
| NC  | Normally Closed | Any        |
| COM | Common          | Any        |
| NO  | Normally Open   | Any        |

**MC-NWK & TC-NWK – J18 & J17 (RS-485 Communication)**

| PIN | Name    | Wire Color |
|-----|---------|------------|
| +   | TX/RX + | Red        |
| -   | TX/RX - | Black      |
| GND | Green   | Green      |

**Power IN – J28**

| PIN | Name     | Wire Color |
|-----|----------|------------|
| +   | + 12 VDC | Red        |
| -   | GND      | Black      |

## Sielox AC-1700 Installation Manual

### I/O Expansion (EXP) – J7

| <b>PIN</b> | <b>Name</b> | <b>Wire Color</b> |
|------------|-------------|-------------------|
| C          | Clock       | Green             |
|            | GND         | Black             |
| D          | Data        | Red               |

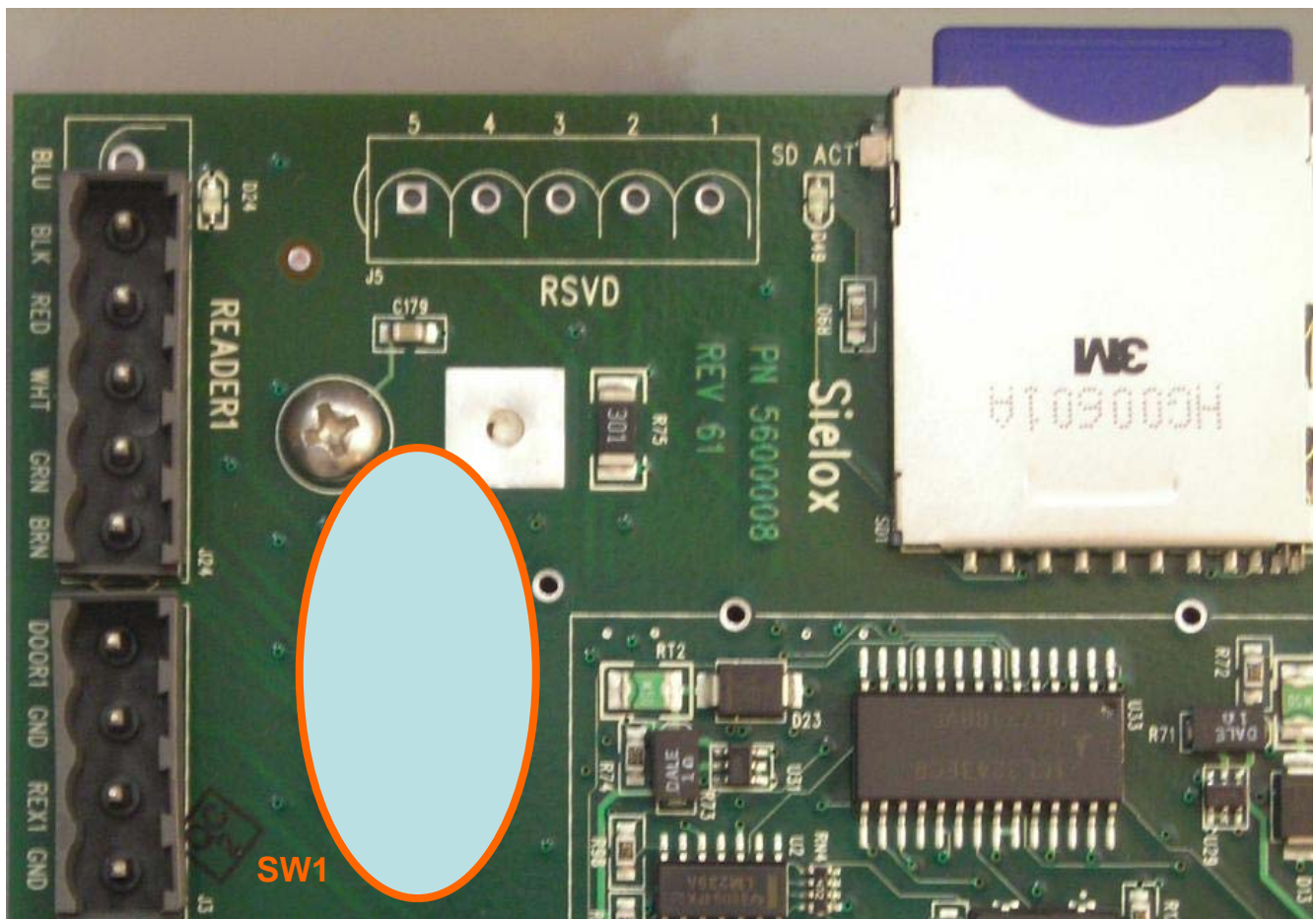
### Setting the Main Controller IP Address

For communication to the Pinnacle hardware server and Web-based Maintenance, the AC-1700 must be configured with a suitable IP Address, Subnet Mask, and Gateway.

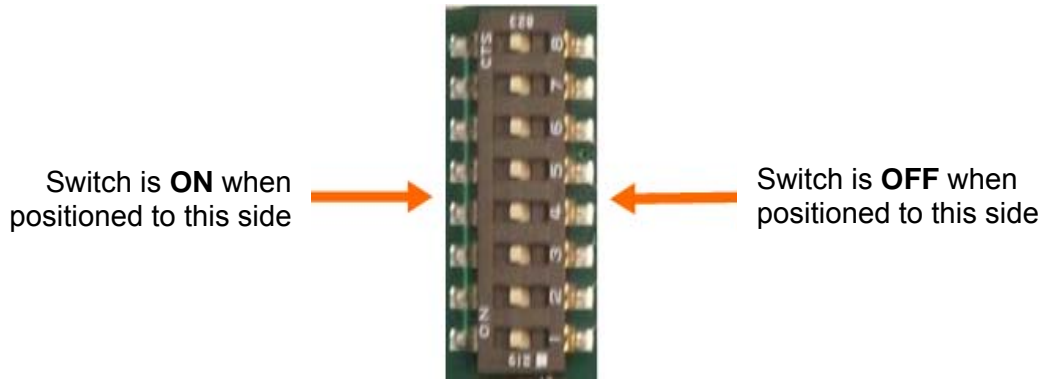
[See Web Maintenance](#) on page 42.

### Setting the Controller DIP Switch SW1

Each Main Controller must have a unique Main Controller address and each Terminal Controller connected to a given Main Controller must have a unique Terminal Controller address. The controller address is set on the DIP Switch, SW1, located in the upper left corner of the AC-1700 board.



**Notes:** The controller address for the onboard Terminal Controller of an AC-1700 Main Controller is fixed as 1. The controller addresses of all external Terminal Controllers may be 2 through 16.



**Controller Type**

Switch 8 sets the controller type: **OFF** = Main Controller **ON** = Terminal Controller

**Controller Address**

Use the following table to setup Main Controllers or Terminal Controller addresses.

| Switches 1-7 Controller Addresses |     |     |     |     |     |    |    |
|-----------------------------------|-----|-----|-----|-----|-----|----|----|
| Address                           | 1   | 2   | 3   | 4   | 5   | 6  | 7  |
| 1                                 | ON  | ON  | ON  | ON  | ON  | ON | ON |
| 2                                 | OFF | ON  | ON  | ON  | ON  | ON | ON |
| 3                                 | ON  | OFF | ON  | ON  | ON  | ON | ON |
| 4                                 | OFF | OFF | ON  | ON  | ON  | ON | ON |
| 5                                 | ON  | ON  | OFF | ON  | ON  | ON | ON |
| 6                                 | OFF | ON  | OFF | ON  | ON  | ON | ON |
| 7                                 | ON  | OFF | OFF | ON  | ON  | ON | ON |
| 8                                 | OFF | OFF | OFF | ON  | ON  | ON | ON |
| 9                                 | ON  | ON  | ON  | OFF | ON  | ON | ON |
| 10                                | OFF | ON  | ON  | OFF | ON  | ON | ON |
| 11                                | ON  | OFF | ON  | OFF | ON  | ON | ON |
| 12                                | OFF | OFF | ON  | OFF | ON  | ON | ON |
| 13                                | ON  | ON  | OFF | OFF | ON  | ON | ON |
| 14                                | OFF | ON  | OFF | OFF | ON  | ON | ON |
| 15                                | ON  | OFF | OFF | OFF | ON  | ON | ON |
| 16                                | OFF | OFF | OFF | OFF | ON  | ON | ON |
| 17                                | ON  | ON  | ON  | ON  | OFF | ON | ON |
| 18                                | OFF | ON  | ON  | ON  | OFF | ON | ON |
| 19                                | ON  | OFF | ON  | ON  | OFF | ON | ON |
| 20                                | OFF | OFF | ON  | ON  | OFF | ON | ON |
| 21                                | ON  | ON  | OFF | ON  | OFF | ON | ON |
| 22                                | OFF | ON  | OFF | ON  | OFF | ON | ON |
| 23                                | ON  | OFF | OFF | ON  | OFF | ON | ON |
| 24                                | OFF | OFF | OFF | ON  | OFF | ON | ON |
| 25                                | ON  | ON  | ON  | OFF | OFF | ON | ON |
| 26                                | OFF | ON  | ON  | OFF | OFF | ON | ON |
| 27                                | ON  | OFF | ON  | OFF | OFF | ON | ON |
| 28                                | OFF | OFF | ON  | OFF | OFF | ON | ON |

| Switches 1-7 Controller Addresses |     |     |     |     |     |     |     |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|
| Address                           | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| 29                                | ON  | ON  | OFF | OFF | OFF | ON  | ON  |
| 30                                | OFF | ON  | OFF | OFF | OFF | ON  | ON  |
| 31                                | ON  | OFF | OFF | OFF | OFF | ON  | ON  |
| 32                                | OFF | OFF | OFF | OFF | OFF | ON  | ON  |
| 33                                | ON  | ON  | ON  | ON  | ON  | OFF | ON  |
| 34                                | OFF | ON  | ON  | ON  | ON  | OFF | ON  |
| 35                                | ON  | OFF | ON  | ON  | ON  | OFF | ON  |
| 36                                | OFF | OFF | ON  | ON  | ON  | OFF | ON  |
| 37                                | ON  | ON  | OFF | ON  | ON  | OFF | ON  |
| 38                                | OFF | ON  | OFF | ON  | ON  | OFF | ON  |
| 39                                | ON  | OFF | OFF | ON  | ON  | OFF | ON  |
| 40                                | OFF | OFF | OFF | ON  | ON  | OFF | ON  |
| 41                                | ON  | ON  | ON  | OFF | ON  | OFF | ON  |
| 42                                | OFF | ON  | ON  | OFF | ON  | OFF | ON  |
| 43                                | ON  | OFF | ON  | OFF | ON  | OFF | ON  |
| 44                                | OFF | OFF | ON  | OFF | ON  | OFF | ON  |
| 45                                | ON  | ON  | OFF | OFF | ON  | OFF | ON  |
| 46                                | OFF | ON  | OFF | OFF | ON  | OFF | ON  |
| 47                                | ON  | OFF | OFF | OFF | ON  | OFF | ON  |
| 48                                | OFF | OFF | OFF | OFF | ON  | OFF | ON  |
| 49                                | ON  | ON  | ON  | ON  | OFF | OFF | ON  |
| 50                                | OFF | ON  | ON  | ON  | OFF | OFF | ON  |
| 51                                | ON  | OFF | ON  | ON  | OFF | OFF | ON  |
| 52                                | OFF | OFF | ON  | ON  | OFF | OFF | ON  |
| 53                                | ON  | ON  | OFF | ON  | OFF | OFF | ON  |
| 54                                | OFF | ON  | OFF | ON  | OFF | OFF | ON  |
| 55                                | ON  | OFF | OFF | ON  | OFF | OFF | ON  |
| 56                                | OFF | OFF | OFF | ON  | OFF | OFF | ON  |
| 57                                | ON  | ON  | ON  | OFF | OFF | OFF | ON  |
| 58                                | OFF | ON  | ON  | OFF | OFF | OFF | ON  |
| 59                                | ON  | OFF | ON  | OFF | OFF | OFF | ON  |
| 60                                | OFF | OFF | ON  | OFF | OFF | OFF | ON  |
| 61                                | ON  | ON  | OFF | OFF | OFF | OFF | ON  |
| 62                                | OFF | ON  | OFF | OFF | OFF | OFF | ON  |
| 63                                | ON  | OFF | OFF | OFF | OFF | OFF | ON  |
| 64                                | OFF | OFF | OFF | OFF | OFF | OFF | ON  |
| 65                                | ON  | ON  | ON  | ON  | ON  | ON  | OFF |
| 66                                | OFF | ON  | ON  | ON  | ON  | ON  | OFF |
| 67                                | ON  | OFF | ON  | ON  | ON  | ON  | OFF |
| 68                                | OFF | OFF | ON  | ON  | ON  | ON  | OFF |
| 69                                | ON  | ON  | OFF | ON  | ON  | ON  | OFF |
| 70                                | OFF | ON  | OFF | ON  | ON  | ON  | OFF |
| 71                                | ON  | OFF | OFF | ON  | ON  | ON  | OFF |
| 72                                | OFF | OFF | OFF | ON  | ON  | ON  | OFF |
| 73                                | ON  | ON  | ON  | OFF | ON  | ON  | OFF |
| 74                                | OFF | ON  | ON  | OFF | ON  | ON  | OFF |
| 75                                | ON  | OFF | ON  | OFF | ON  | ON  | OFF |
| 76                                | OFF | OFF | ON  | OFF | ON  | ON  | OFF |
| 77                                | ON  | ON  | OFF | OFF | ON  | ON  | OFF |
| 78                                | OFF | ON  | OFF | OFF | ON  | ON  | OFF |

| Switches 1-7 Controller Addresses |     |     |     |     |     |     |     |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|
| Address                           | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| 79                                | ON  | OFF | OFF | OFF | ON  | ON  | OFF |
| 80                                | OFF | OFF | OFF | OFF | ON  | ON  | OFF |
| 81                                | ON  | ON  | ON  | ON  | OFF | ON  | OFF |
| 82                                | OFF | ON  | ON  | ON  | OFF | ON  | OFF |
| 83                                | ON  | OFF | ON  | ON  | OFF | ON  | OFF |
| 84                                | OFF | OFF | ON  | ON  | OFF | ON  | OFF |
| 85                                | ON  | ON  | OFF | ON  | OFF | ON  | OFF |
| 86                                | OFF | ON  | OFF | ON  | OFF | ON  | OFF |
| 87                                | ON  | OFF | OFF | ON  | OFF | ON  | OFF |
| 88                                | OFF | OFF | OFF | ON  | OFF | ON  | OFF |
| 89                                | ON  | ON  | ON  | OFF | OFF | ON  | OFF |
| 90                                | OFF | ON  | ON  | OFF | OFF | ON  | OFF |
| 91                                | ON  | OFF | ON  | OFF | OFF | ON  | OFF |
| 92                                | OFF | OFF | ON  | OFF | OFF | ON  | OFF |
| 93                                | ON  | ON  | OFF | OFF | OFF | ON  | OFF |
| 94                                | OFF | ON  | OFF | OFF | OFF | ON  | OFF |
| 95                                | ON  | OFF | OFF | OFF | OFF | ON  | OFF |
| 96                                | OFF | OFF | OFF | OFF | OFF | ON  | OFF |
| 97                                | ON  | ON  | ON  | ON  | ON  | OFF | OFF |
| 98                                | OFF | ON  | ON  | ON  | ON  | OFF | OFF |
| 99                                | ON  | OFF | ON  | ON  | ON  | OFF | OFF |
| 100                               | OFF | OFF | ON  | ON  | ON  | OFF | OFF |
| 101                               | ON  | ON  | OFF | ON  | ON  | OFF | OFF |
| 102                               | OFF | ON  | OFF | ON  | ON  | OFF | OFF |
| 103                               | ON  | OFF | OFF | ON  | ON  | OFF | OFF |
| 104                               | OFF | OFF | OFF | ON  | ON  | OFF | OFF |
| 105                               | ON  | ON  | ON  | OFF | ON  | OFF | OFF |
| 106                               | OFF | ON  | ON  | OFF | ON  | OFF | OFF |
| 107                               | ON  | OFF | ON  | OFF | ON  | OFF | OFF |
| 108                               | OFF | OFF | ON  | OFF | ON  | OFF | OFF |
| 109                               | ON  | ON  | OFF | OFF | ON  | OFF | OFF |
| 110                               | OFF | ON  | OFF | OFF | ON  | OFF | OFF |
| 111                               | ON  | OFF | OFF | OFF | ON  | OFF | OFF |
| 112                               | OFF | OFF | OFF | OFF | ON  | OFF | OFF |
| 113                               | ON  | ON  | ON  | ON  | OFF | OFF | OFF |
| 114                               | OFF | ON  | ON  | ON  | OFF | OFF | OFF |
| 115                               | ON  | OFF | ON  | ON  | OFF | OFF | OFF |
| 116                               | OFF | OFF | ON  | ON  | OFF | OFF | OFF |
| 117                               | ON  | ON  | OFF | ON  | OFF | OFF | OFF |
| 118                               | OFF | ON  | OFF | ON  | OFF | OFF | OFF |
| 119                               | ON  | OFF | OFF | ON  | OFF | OFF | OFF |
| 120                               | OFF | OFF | OFF | ON  | OFF | OFF | OFF |
| 121                               | ON  | ON  | ON  | OFF | OFF | OFF | OFF |
| 122                               | OFF | ON  | ON  | OFF | OFF | OFF | OFF |
| 123                               | ON  | OFF | ON  | OFF | OFF | OFF | OFF |
| 124                               | OFF | OFF | ON  | OFF | OFF | OFF | OFF |
| 125                               | ON  | ON  | OFF | OFF | OFF | OFF | OFF |
| 126                               | OFF | ON  | OFF | OFF | OFF | OFF | OFF |
| 127                               | ON  | OFF | OFF | OFF | OFF | OFF | OFF |
| 128                               | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

**AC-1700 Status LED**

| LED                      | Description  |
|--------------------------|--|
| <b>Power Indicator</b>   |  |
| PWR                      | ON = 12 Volts present. OFF=No Power <sup>1</sup>                   |
| <b>CPU Status</b>        |  |
| BOOT                     | ON =CPU Running. OFF=CPU Boot Failed <sup>2</sup>                  |
| <b>SD Card</b>           |  |
| SD ACT                   | ON = Reading or Writing data to the SD Card <sup>3</sup>           |
| <b>Ethernet</b>          |  |
| LNK/ACT                  | ON = Connected BLINKING = Receiving/Transmitting Data <sup>4</sup> |
| RX                       | ON= AC-1700 Receiving Data <sup>4</sup>                            |
| TX                       | ON= AC-1700 Transmitting Data <sup>4</sup>                         |
| <b>MC-NWK or TC-NWK</b>  |  |
| GREEN LED                | ON= Receiving Data <sup>5</sup>                                    |
| YELLOW LED               | ON= Transmitting Data <sup>5</sup>                                 |
| <b>STRIKE 1 and 2</b>    |  |
| GREEN LED                | ON = Output on. OFF = Output off <sup>6</sup>                      |
| <b>OUT 1, 2, 3 and 4</b> |  |
| GREEN LED                | ON = Output on. OFF = Output off <sup>6</sup>                      |

- <sup>1</sup> Located next to the POWER IN connector
- <sup>2</sup> Located under the AC-1700 shield.
- <sup>3</sup> Located next to the SD Card.
- <sup>4</sup> Located next to the RS-485 connectors.
- <sup>5</sup> Located next to the respective strike relay connector.
- <sup>6</sup> Located next to the respective output relay connector.

**Real Time Clock Backup Battery**

The AC-1700’s coin battery allows the Real Time Clock to keep the date and time in the event of power loss. This battery should be checked annually and replaced as needed.

**Real Time Clock coin battery check procedure:**

1. Turn off power by removing the POWER-IN connector.
2. Using a digital voltmeter, measure the battery voltage. (Do not remove the battery from the socket)
3. The voltage should be between 2.7 to 3 volts.
4. Replace the battery if below 2.7 volts.

**CAUTION**

**Danger of explosion if battery is incorrectly replaced.  
 Replace only with the same or equivalent type recommended by the manufacturer.  
 Dispose of used batteries in accordance with manufacturer instructions.  
 Battery type: Lithium Battery PANASONIC BR2032.**

**Power Cables**

Connect the power to the AC-1700 **POWER IN** connector, J28:

1. Pull power cable through the Sielox Enclosure. (See table below)
2. Insert the stripped conductors into the removable POWER IN connector and tighten set screws.
3. Observe the polarity.
4. Insert the removable connector on the **POWER IN** connector.

| <b>Cable Type</b> | <b>AWG</b> | <b>Wires</b> | <b>Where Used</b> | <b>Color Code</b> | <b>Max. Dist.</b> |
|-------------------|------------|--------------|-------------------|-------------------|-------------------|
| Belden 1307A      | 16         | 2            | Power / Battery   | Red/Black         | 50 ft.            |

**AC Power Surge Suppressor**

Sielox highly recommends the use of AC power surge suppressors such as the Ditek DTK-1F or DTK-120S15A.

For more information go to

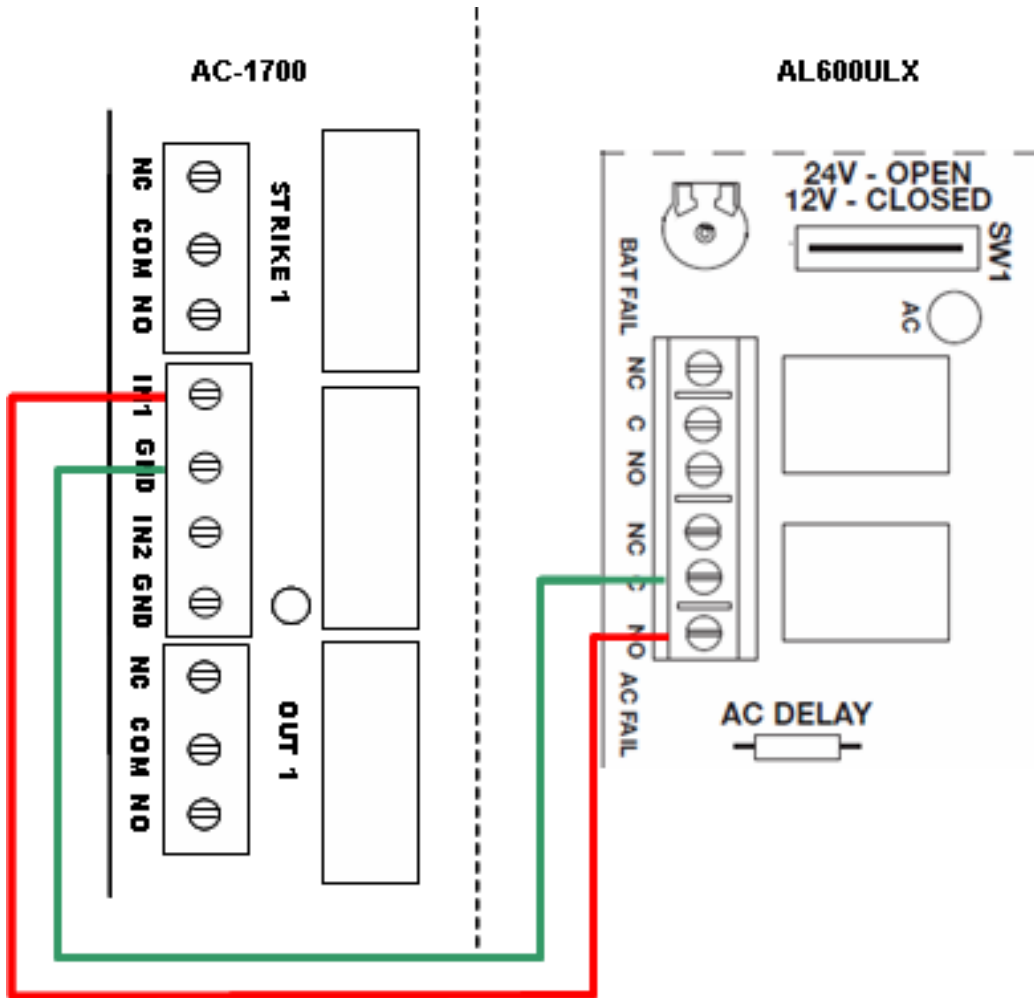
- <http://www.ditekc corp.com/product-details.asp?ProdKey=11>
- <http://www.ditekc corp.com/product-details.asp?ProdKey=8>

**Backup Power**

For standby operation in the event of power loss, Sielox recommends the Altronix AL600ULX, Sielox part number 7199616, with one 12 VDC 7AH sealed lead acid battery. The AL600ULX is a UL-listed power supply.

**AC Power Fail**

For compliance with UL 294 and UL 1076 standards, the **AC FAIL** monitoring relay on the AL600ULX power supply board must be connected to one of the general purpose AC-1700 inputs: **IN1**, **IN2**, **IN3** or **IN4**.



- Connect a wire from the AC-1700 **IN1** to the AL600ULX AC FAIL **NO** terminal block.
- Connect a wire from the AC-1700 **GND** to the AL600ULX AC FAIL **C** terminal block.

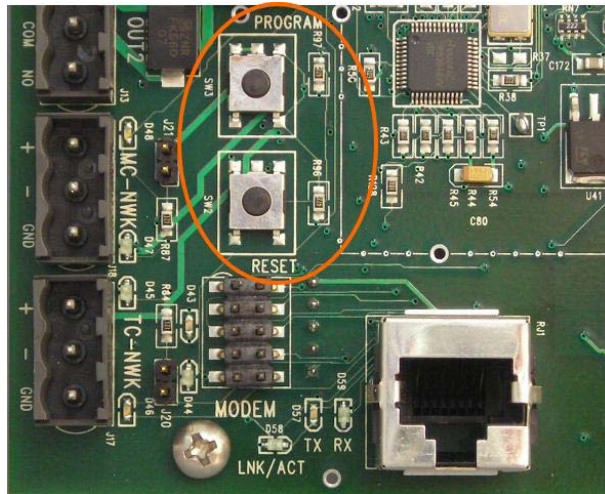
**Note:** IN1 is used in this example. Any available general purpose input on the AC-1700 can use any available input. Use the above picture for details.

- In Pinnacle got to the device tree and right click on the input 1 and select **Properties**.
- Under the **Control Properties** tab label the input appropriately, in our example we will label it **AC-FAIL**.

For supervision on this input see [Supervised Inputs](#) on page 29

### AC-1700 Program and Reset Buttons

The AC-1700 has two push buttons labeled PROGRAM and RESET. They provide the ability to reboot the controller, reprogram Flash memory, and restore factory default network settings. The two buttons are located in the lower left corner of the AC-1700 board, above the Ethernet connector.



#### RESET

Press and hold the **RESET** button for 5 seconds. The Ethernet **TX** and **RX** LED and the **SD ACT** LED all turn on for about one second. The **RESET** button can be released at this point. The AC-1700 then reboots. The database files on the SD card and network settings are not affected by this operation.

#### PROGRAM

1. Download and save the latest firmware files from the Sielox Web site to your computer. You may need to contact Sielox Technical Support to obtain the AC-1700 firmware. The SD card files will be included in a .zip file.
2. Extract the .zip file. The extracted files will include favicon.ico along with subfolders /sys and /web.
3. Remove the SD card from the AC-1700 controller. Insert the SD card into a card reader on the computer. A USB memory card reader may be used. Copy the extracted files and subfolders for the new firmware to the SD card. Verify that the SD card contains the new /sys and /web folders.
4. Eject the SD card from the card reader and re-insert into the AC-1700 controller. Press and hold the RESET button or cycle power to reboot the controller. Allow about 30 seconds for the controller to boot up.
5. Press and hold the PROGRAM button on the AC-1700 for about 5 seconds. The Ethernet TX and RX LED and the SD ACT LED all turn on for about one second. The PROGRAM button can be released at this point. The controller reprograms its Flash memory from the firmware file on the SD Card. Flash programming is aborted if the

## Sielox AC-1700 Installation Manual

firmware file is not found on the SD card. As the controller reprograms and then verifies Flash memory, the SD ACT, Ethernet TX LED, and Ethernet RX LED all flash in unison once a second indicating that reprogramming and verification are in progress. Once the reprogramming and verification are complete, the controller reboots itself.

**Warning:** Do not remove power until this process is completed!

6. If the Flash memory PROGRAM is successful, the green RX LED will repeatedly blink for several seconds followed by an automatic reboot. A Flash memory PROGRAM failure is indicated by a repeating LED pattern with a single green RX LED blink followed by three yellow TX LED blinks. The PROGRAM attempt will automatically retry three additional times before aborting.

### RESET and PROGRAM (Restore Factory Default Network Settings)

Press and hold both **RESET** and **PROGRAM** buttons for 5 seconds. The Ethernet **TX** and **RX** LED and the **SD ACT** LED all turn on for about one second. The **PROGRAM** and **RESET** buttons can be released at this point. The AC 1700 restores the factory default IP Address of 192.168.1.170 and automatically reboots.

### Web Maintenance Port

The AC-1700 controller features a Web Server, which is used as the controller's Maintenance Port. Access to the AC-1700 Web-based Maintenance Port requires a computer with a Web Browser and an Ethernet (LAN) port. For best Browser results, use the Microsoft Internet Explorer 7 or later.

To connect to the AC-1700 Maintenance Port, the computer's network settings must be compatible with the AC-1700 network settings.

**Note: Configuration of the AC-1700 network settings requires basic knowledge of networking. Experience with TCP/IP Network configuration on Windows operating systems is required. When necessary, obtain assistance from the Network Administrator or other networking professional.**

The AC-1700 ships from the factory with the following default network settings:

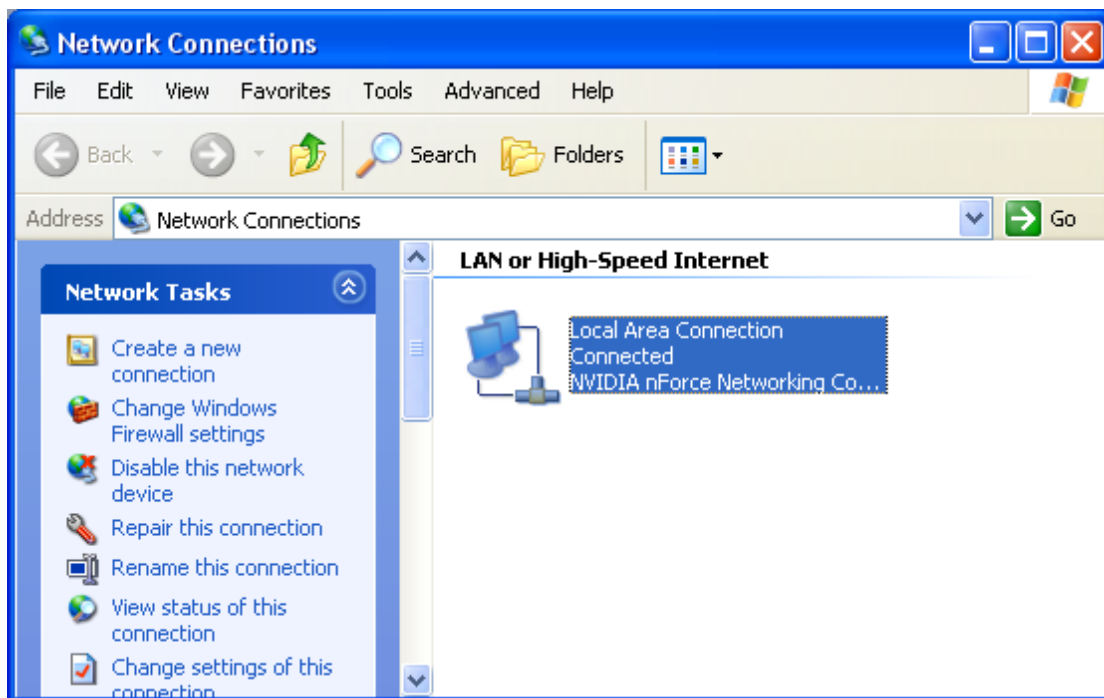
|                         |                      |
|-------------------------|----------------------|
| <b>IP Address:</b>      | <b>192.168.1.170</b> |
| <b>Subnet Mask:</b>     | <b>255.255.255.0</b> |
| <b>Default Gateway:</b> | <b>192.168.1.1</b>   |

The AC-1700 network settings are normally modified by the installer for operation on the customer's network. The AC-1700 requires a static IP Address. Obtain an IP Address from the Network Administrator along with the Subnet Mask and Default Gateway settings. The IP Address cannot conflict with any other device on the network.

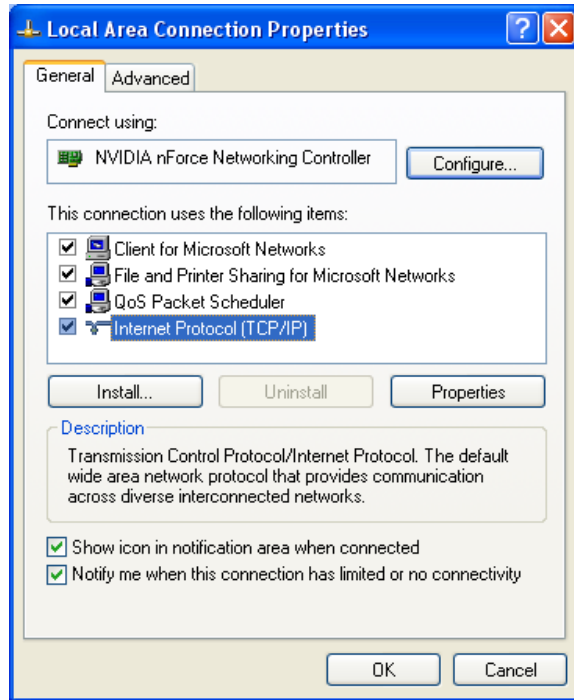
## Changing the AC-1700 default Network Settings

Use the following procedure to set or modify the AC-1700 Network Settings to values provided by the Network Administrator. To begin, the computer's network interface must be in the same IP class as the AC-1700 default IP Network Settings:

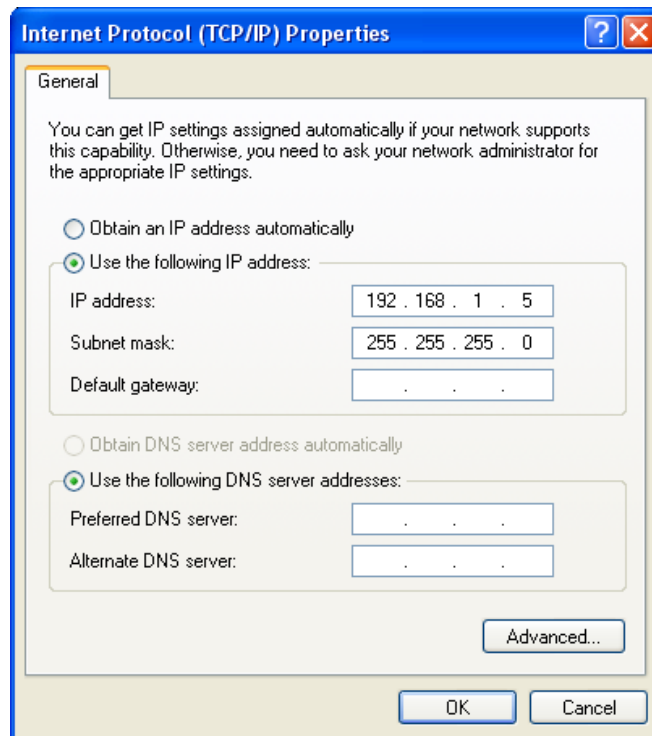
1. Obtain a unique IP Address from the Network Administrator, including the Subnet Mask and Gateway Address.
2. Open the network connection on the computer, right click on the Local Area Connection and select properties.



3. Select the Internet Protocol(TCP/IP) and click on the Properties button.

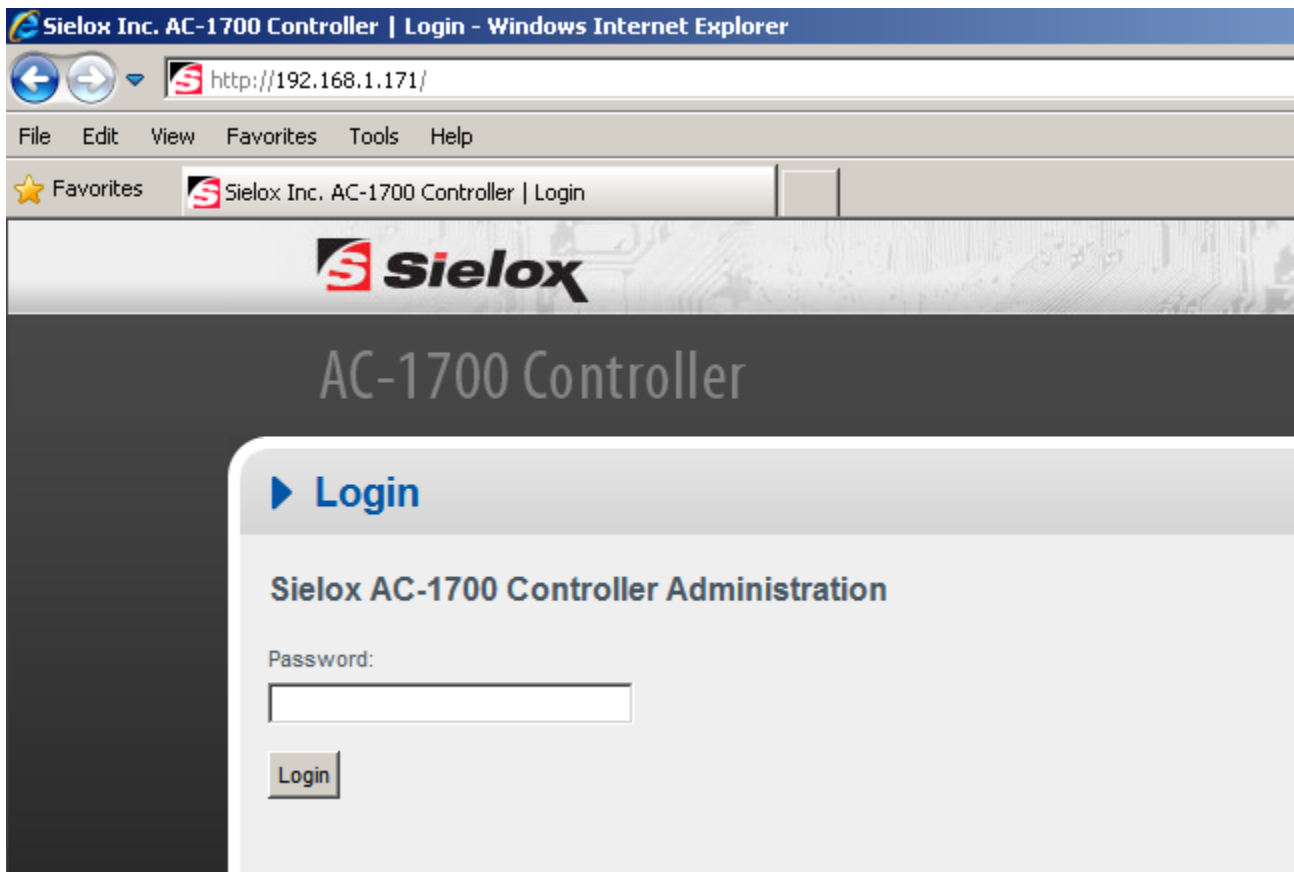


4. If “Use the following IP address” is selected, make note of the IP address, Subnet mask, and Default gateway values. These values will be needed later.
5. Select the “Use the following IP Address” and enter the information shown below.



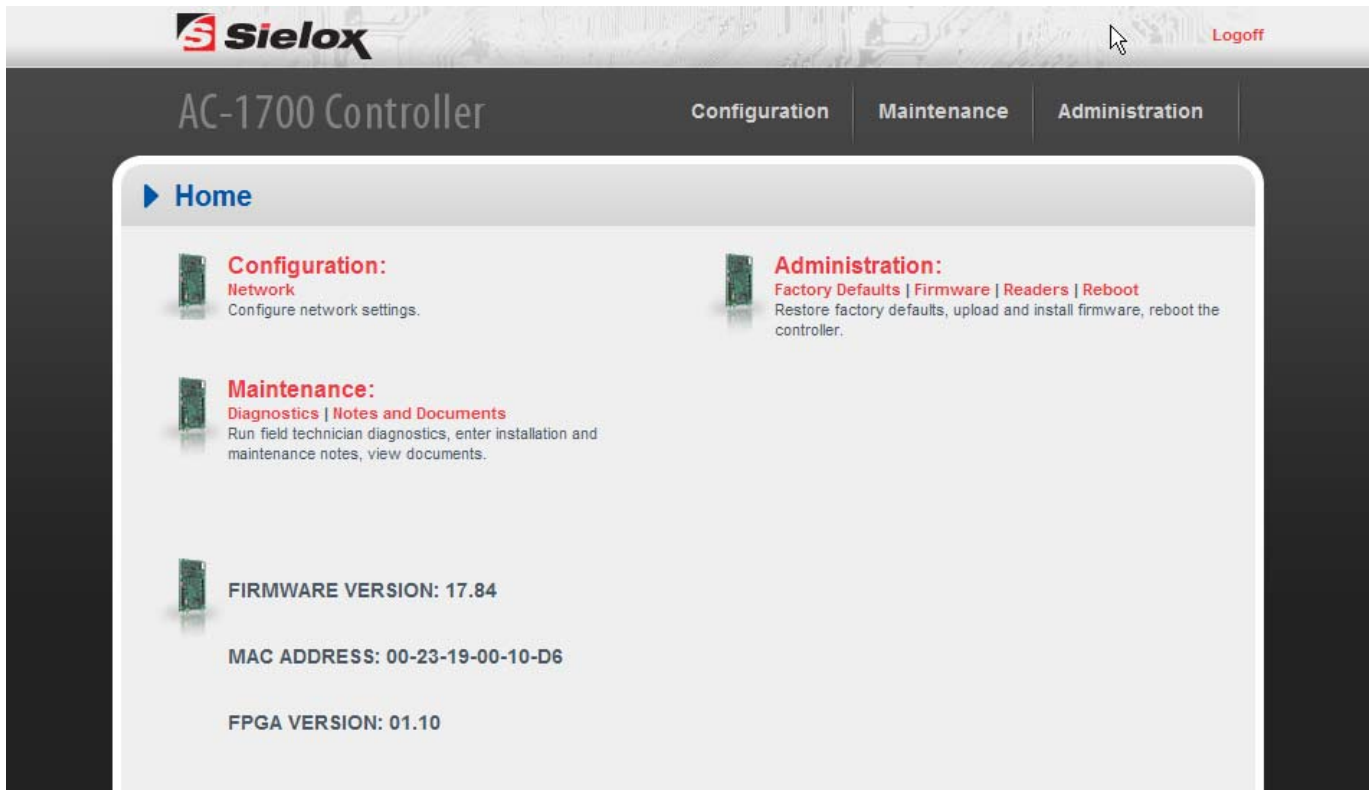
## Sielox AC-1700 Installation Manual

6. Click Ok button and then the close button on the Local Area Connection Properties window.
7. Make sure the AC-1700 is powered and connected to the computer with a crossover LAN cable.
8. Open the Web browser and type in the address bar: <http://192.168.1.170>. Click the GO icon or press “Enter” on the keyboard. The AC-1700 login page will be displayed.



9. The factory default Password is “admin”. If the AC-1700 controller has never been connected to a Pinnacle, enter “admin” for the Password. Click on the Login button or press “Enter” on the keyboard. The AC-1700 main screen will be displayed.

**Note:** If the AC-1700 controller has previously been connected to a Pinnacle system, it may already have a login password. Use the Maintenance Port password from that Pinnacle system. If no Maintenance Port password was required in that Pinnacle system, leave the Password blank and click the Login button.



10. Select "Network" under configuration.



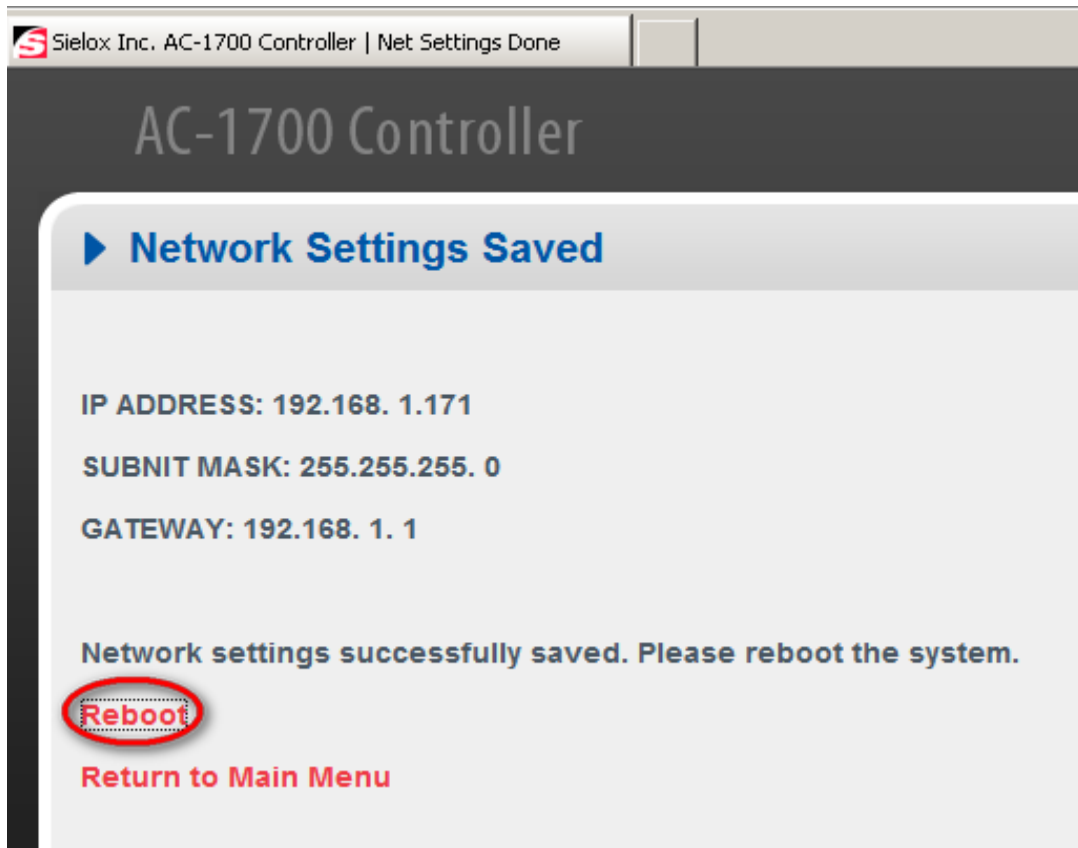
## Sielox AC-1700 Installation Manual

11. Enter the new IP address, Subnet Mask, and Default Gateway. Click the “Save Network Settings” button. The following screen will be displayed.



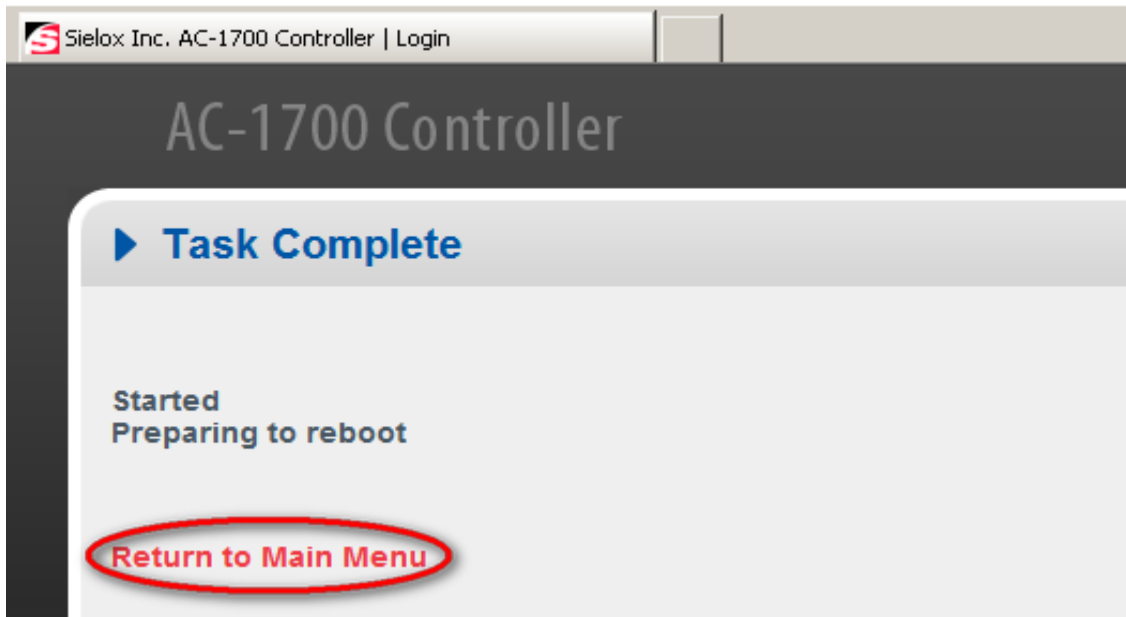
Note: See [Network Defaults](#) on page 42

12. In order for the new Network Setting to take effect, the AC-1700 must be rebooted. Click the “Reboot” link”



## Sielox AC-1700 Installation Manual

13. Click on 'Return to the Main Menu'. You will be asked to login again.



**Note:** Once the AC-1700 reboots and uses the new Network Settings, the IP class may now be different from the Network Interface on the computer. To log into the AC-1700 Maintenance Port again, the computer's Network Interface properties may need to be modified to match the new IP class of the AC-1700 controller.

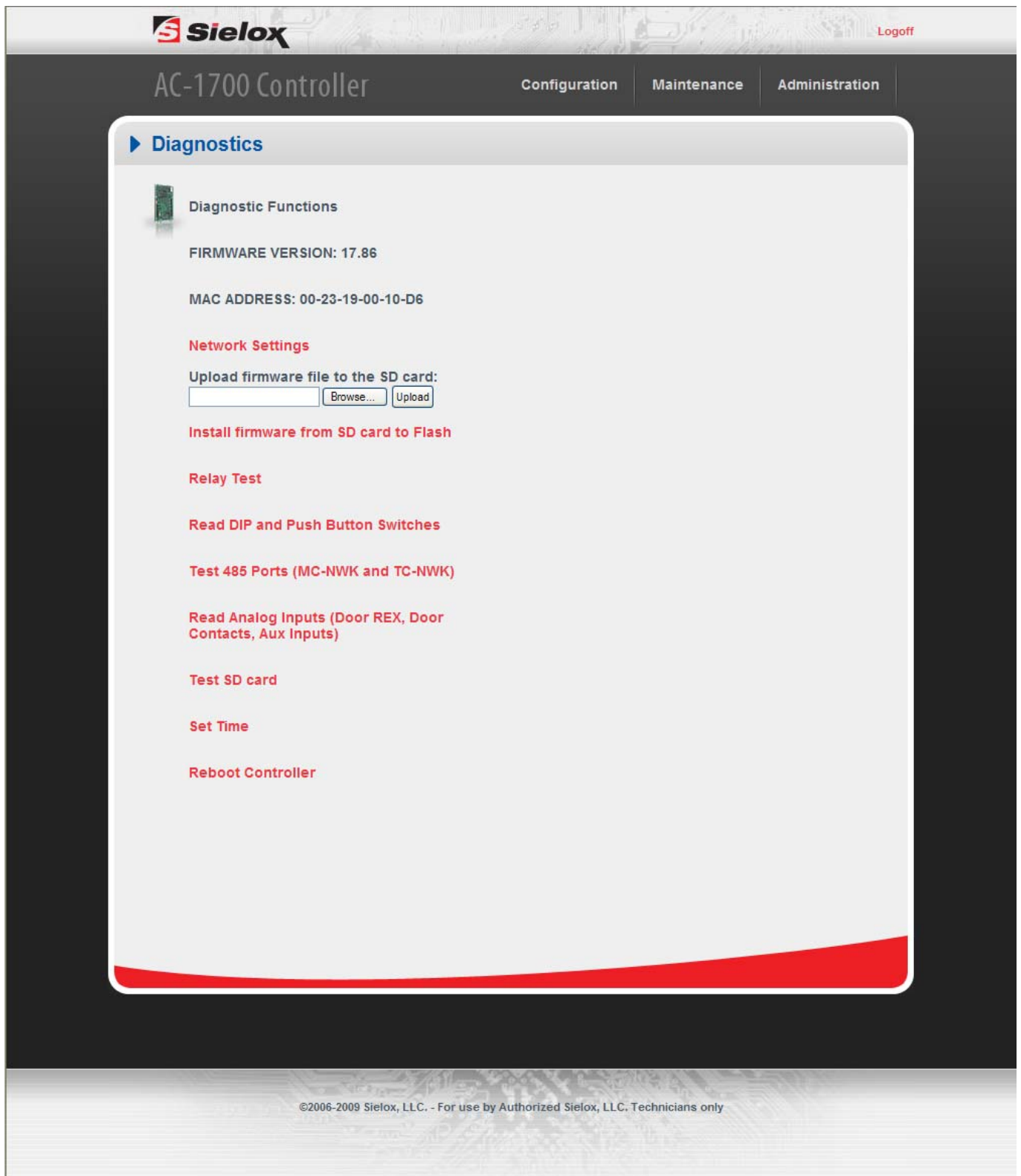
## Diagnostics

The following configuration and diagnostic tests are available through the AC-1700 Web-based Maintenance Port:

- **Relay Test:** Toggles the six onboard relays (Strike 1 and Strike 2, Outputs 1, 2, 3 and 4), one at a time.
- **Read DIP and Push Button Switches:** Displays the current position of the individual switches of the **DIP Switch**, SW1, (controller type and controller address). Also, displays the current position of the **RESET** and **PROGRAM** buttons.
- **Test 485 Ports (MC-NWK and TC-NWK):** Tests both RS-485 ports. Requires a loop back cable.
- **Read Analog Inputs (Door REX, Door Contacts, Aux Inputs):** Reads and displays the current state of the Door Contact 1, Door Contact 2, REX 1, REX 2, Inputs 1, 2, 3 and 4.
- **Test SD card:** Writes, reads, and verifies a file on the SD card.
- **Set Time:** Sets the AC-1700 Real Time Clock date and time.
- **Reboot Controller:** Reboots the AC-1700.

## Sielox AC-1700 Installation Manual

Select “**Diagnostics**” under the “**Maintenance**” menu to display the **Diagnostics** page:



The screenshot displays the web interface for the Sielox AC-1700 Controller. At the top, the Sielox logo is on the left, and a "Logoff" link is on the right. Below the logo, the text "AC-1700 Controller" is visible. A navigation bar contains three tabs: "Configuration", "Maintenance", and "Administration". The "Maintenance" tab is active, and a sub-menu titled "Diagnostics" is expanded, showing a list of diagnostic functions. The "Diagnostic Functions" section includes a small image of a circuit board and the following information: "FIRMWARE VERSION: 17.86" and "MAC ADDRESS: 00-23-19-00-10-D6". Under the "Network Settings" heading, there is a section for "Upload firmware file to the SD card:" with a text input field, a "Browse..." button, and an "Upload" button. Below this, there are several other diagnostic options listed in red text: "Install firmware from SD card to Flash", "Relay Test", "Read DIP and Push Button Switches", "Test 485 Ports (MC-NWK and TC-NWK)", "Read Analog Inputs (Door REX, Door Contacts, Aux Inputs)", "Test SD card", "Set Time", and "Reboot Controller". The bottom of the page features a copyright notice: "©2006-2009 Sielox, LLC. - For use by Authorized Sielox, LLC. Technicians only".

## Set Time

1. Select “**Set Time**” on the **Diagnostics** page:

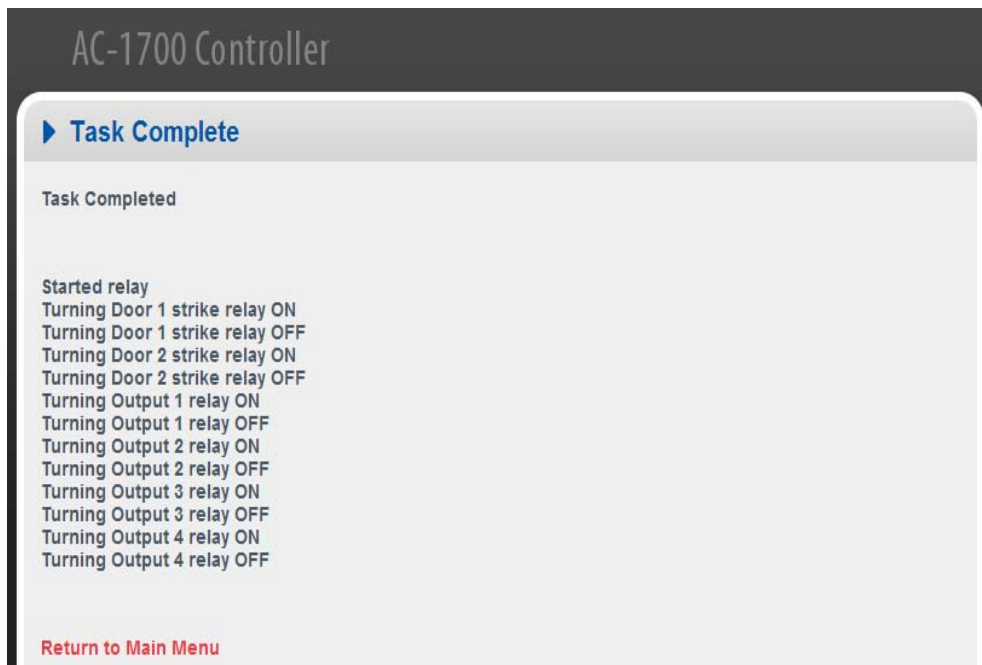


The screenshot shows the Sielox AC-1700 Controller web interface. At the top left is the Sielox logo. At the top right is a "Logoff" link. Below the logo is the text "AC-1700 Controller". To the right of this text are three tabs: "Configuration", "Maintenance", and "Administration". The "Configuration" tab is selected. Below the tabs is a "Time" section with a blue arrow icon. Under "Time", there are two sections: "Date" and "Time". The "Date" section has three input fields: "Month (1-12)" with the value "6", "Day (1-31)" with the value "4", and "Year (yyyy)" with the value "2009". The "Time" section has three input fields: "Hours (0-23)" with the value "14", "Minutes (0-59)" with the value "10", and "Seconds (0-59)" with the value "6". Below these fields is a button labeled "Set Date/Time".

2. Enter the Date and Time and press the “**Set Date/Time**” button.
3. Click the “**Main Menu**” link.

**Relay Test – This is strictly a relay contact continuity test. (Ohmmeter required)**

1. Select “**Relay Test**” on the **Diagnostics** page.
2. The technician may use an Ohmmeter on the associated door or output connector pins to check for continuity of the relay contact as the relay state is toggled.



3. Click “**Return to Main Menu**”.

## Read Analog Inputs (Door REX, Door Contacts, Aux Inputs)

Reads and displays the current state of the Door Contact 1, Door Contact 2, REX 1, REX 2, Inputs 1, 2, 3 and 4:

1. Select **“Read Analog Inputs”** on the **Diagnostics** page:



The Normally Open/Normally Closed and Supervised configuration settings in Pinnacle software do not affect this diagnostic information.

If the input contact is currently open, the displayed status will be “open”.

If the input contact is currently closed, the displayed status will be “closed”.

If end of line resistors are installed, the displayed status will be “supervised”.

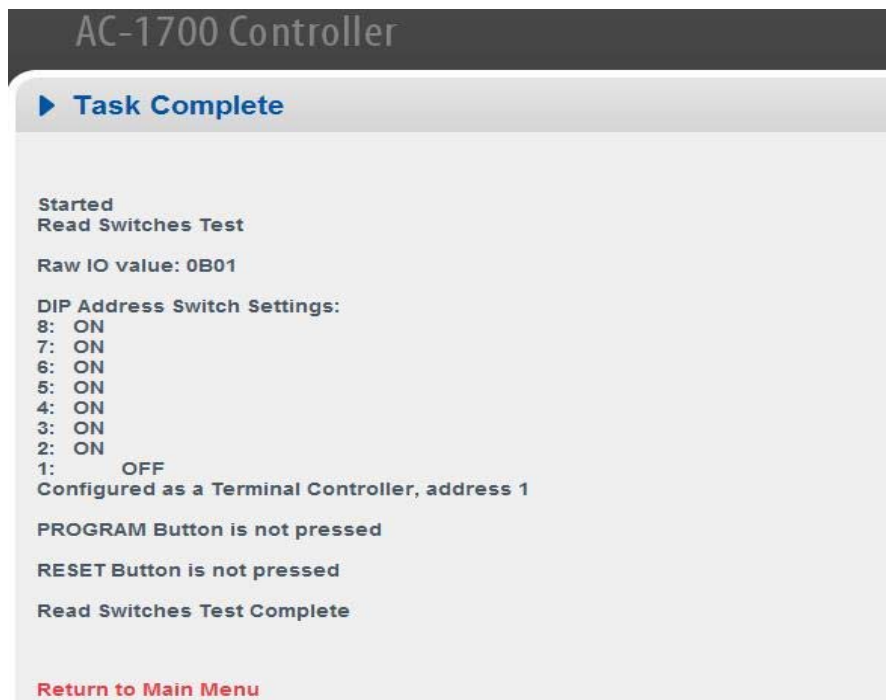
If end of line resistors are not installed, the displayed status will be “not supervised”.

2. Press the **“Return to Main Menu”** link.

## Read DIP and Push Button Switches

Displays the **DIP Switch** settings, including controller type and controller address. Also displays the current position of the **RESET** and **PROGRAM** buttons.

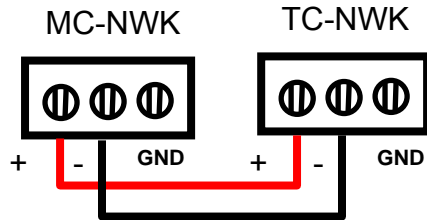
1. Select the “Diagnostic” under the “Maintenance option” on the AC-1700 main Web page.
2. Select “read Switches”, the following screen will be displayed, with the value read from the switches.



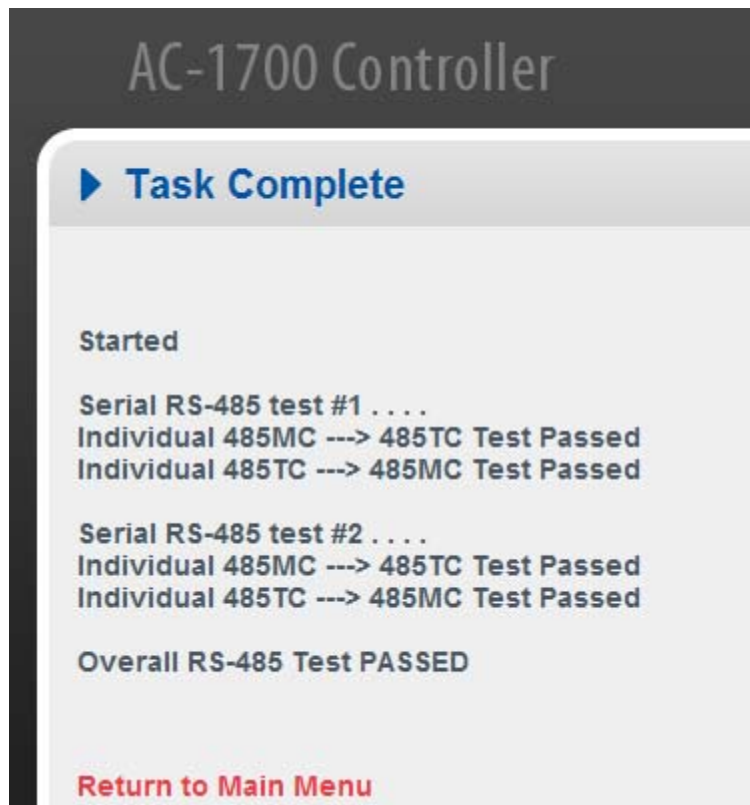
3. Press Return to Main Menu.

### Test 485 Serial

The RS-485 ports are tested using a loop-back cable. Two inches of red and black wires are required for the loop-back cable. Install the red and black wires to the **MC-NWK** and **TC-NWK** connectors as shown.



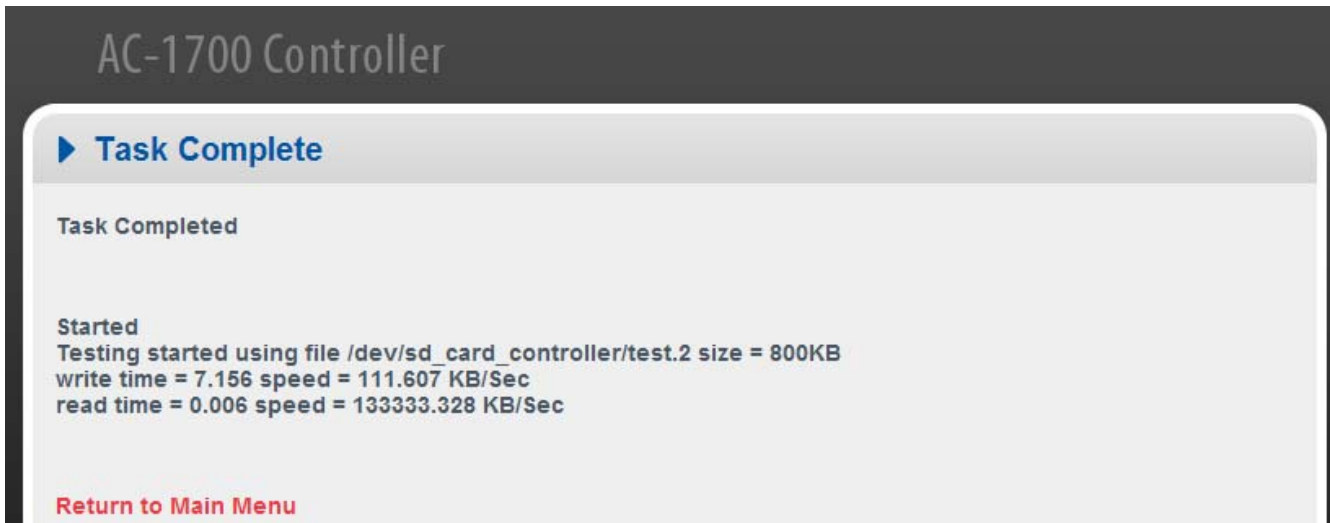
1. Connect the loop-back cable to the AC-1700 connectors labeled **MC-NWK** and **TC-NWK**.
2. Select “**Test 485 Ports**” on the **Diagnostics** page of the AC-1700 Web interface. The PASSED or FAILED test result is displayed.



3. Press Return to Main Menu.

## Test SD Card

1. Select “**Test SD Card**” on the **Diagnostics** page of the AC-1700 Web interface. A successful test displays the file write time and read time.



2. Press Return to Main Menu

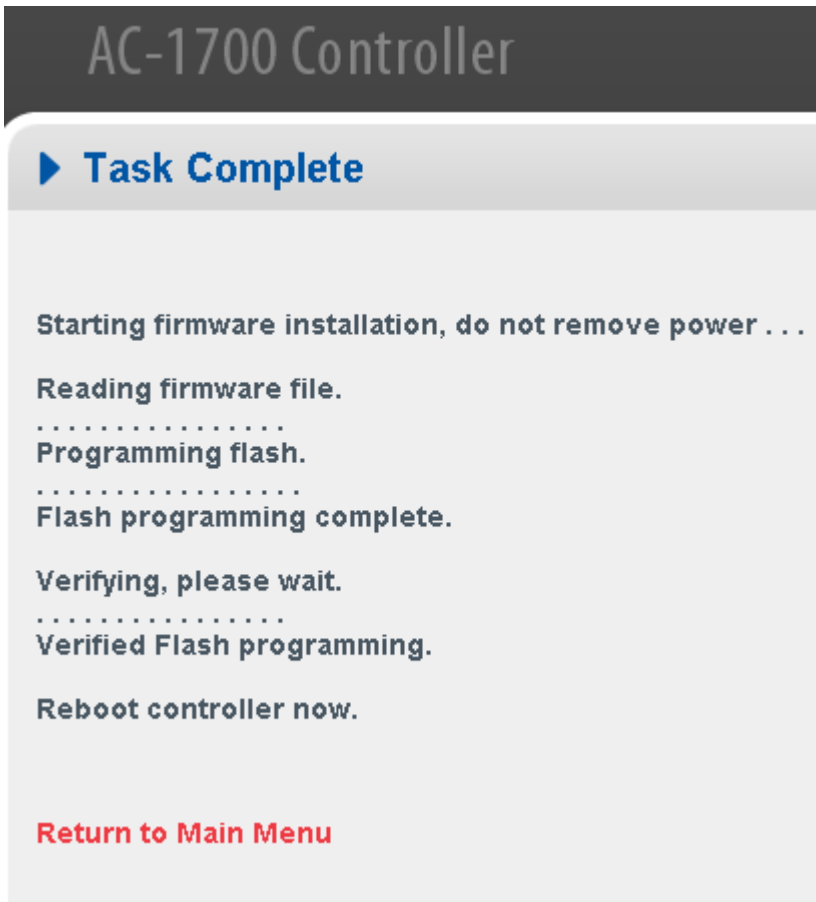
### Upgrading Firmware

Firmware upgrades can be accomplished using one of three methods:

- Upload from web interface and install from web interface.
- Manually copy files to the SD card and install from the web interface.
- Manually copy files to the SD card and install using the onboard PROGRAM button.

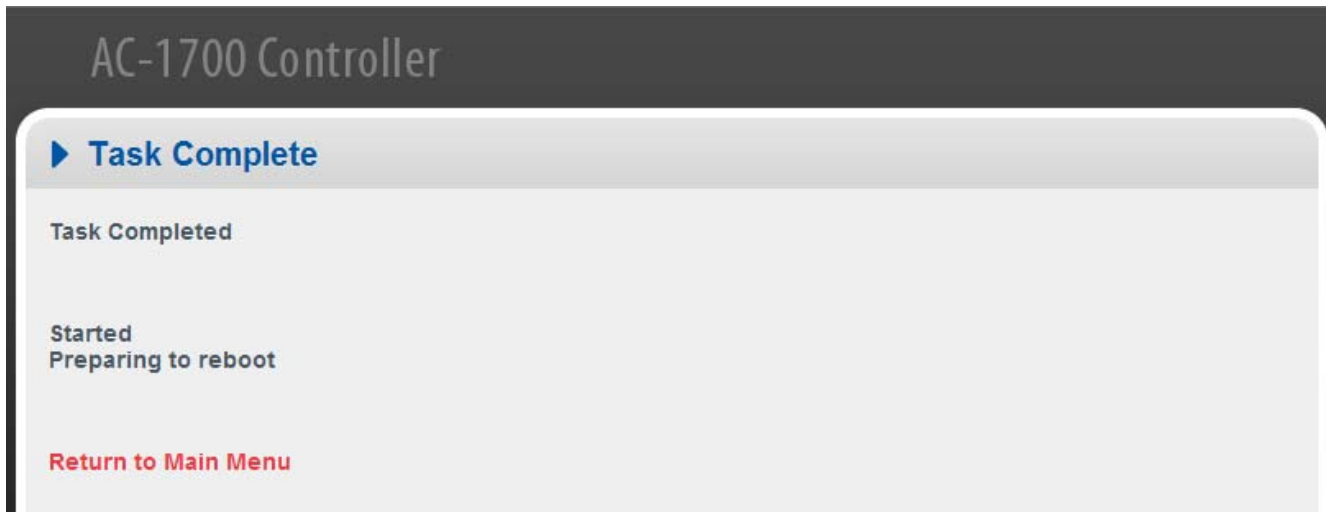
### Upload and Install Firmware from Web Interface

1. Download and save the latest firmware from the Sielox Web site to your computer. You may need to contact Sielox Technical Support to obtain the AC-1700 firmware.
2. Open a Web browser and connect to the AC-1700 Web interface of the controller to be upgraded. Log in with the system Maintenance Port password.
3. On the Main Menu page, click the **Firmware** link under **Administration**
4. On the “**Firmware Administration**” page, click the **Browse** button under **Upload firmware file to the SD card**. Browse to and select the AC-1700 firmware file that was saved to your computer. The firmware filename is ac17.flash. Other SD card files are not uploaded at this time.
5. Click the **Upload** button and wait for the upload to complete. This can take a couple of minutes. The web page should display a "successfully uploaded" message..
6. Navigate back to the Firmware Administration page and click the link "**Install firmware from SD card to Flash**". The installation process takes several minutes to complete. Progress updates are provided on the web page. When the firmware installation is complete and the Flash programming is verified, the web page will prompt the technician to ‘Reboot’ controller now.



**Note:** Wait until the process is finished. Failure to do so may leave the AC-1700 inoperable.

7. Click the **Return to Main Menu** link.
8. Click the **Reboot** link under **Administration**.
9. Click the OK button when prompted “Are you sure you want to reboot?”
10. Wait for the page to display “Task Completed”.



11. Click the **Return to Main Menu** link. You will be directed to Log In. Log into the web interface. The main page should display the new firmware version.

### Manually Copy Files to the SD Card and Install Firmware from Web Interface

1. Download and save the latest firmware files from the Sielox Web site to your computer. You may need to contact Sielox Technical Support to obtain the AC-1700 firmware. The SD card files will be included in a .zip file.
2. Extract the .zip file. The extracted files will include favicon.ico along with subfolders /sys and /web.
3. Remove the SD card from the AC-1700 controller. Insert the SD card into a card reader on the computer. A USB memory card reader may be used. Copy the extracted files and subfolders for the new firmware to the SD card. Verify that the SD card contains the new /sys and /web folders.
4. Eject the SD card from the card reader and re-insert into the AC-1700 controller. Press and hold the RESET button or cycle power to reboot the controller. Allow about 30 seconds for the controller to boot up.
5. Open a Web browser and connect to the AC-1700 Web interface of the controller to be upgraded. Log in with the system Maintenance Port password.
6. Navigate back to the Firmware Administration page and click the link "**Install firmware from SD card to Flash**". The installation process takes several minutes to complete. Progress updates are provided on the web page. When the firmware installation is complete and the Flash programming is verified, the web page will prompt the technician to Reboot controller now.
7. Click the **Return to Main Menu** link.
8. Click the **Reboot** link under **Administration**.
9. Click the OK button when prompted "Are you sure you want to reboot?"
10. Wait for the page to display "Task Completed".

**Manually copy files to the SD card and install using the onboard PROGRAM button.**

7. Download and save the latest firmware files from the Sielox Web site to your computer. You may need to contact Sielox Technical Support to obtain the AC-1700 firmware. The files will be included in a .zip file.
8. Extract the .zip file. The extracted files will include favicon.ico along with subfolders /sys and /web.
9. Remove the SD card from the AC-1700 controller. Insert the SD card into a card reader on the computer. A USB memory card reader may be used. Copy the extracted files and subfolders for the new firmware to the SD card. Verify that the SD card contains the new /sys and /web folders.
10. Eject the SD card from the card reader and re-insert into the AC-1700 controller. Press and hold the RESET button or cycle power to reboot the controller. Allow about 30 seconds for the controller to boot up.
11. Press and hold the PROGRAM button on the AC-1700 for about 5 seconds. The Ethernet TX and RX LED and the SD ACT LED all turn on for about one second. The PROGRAM button can be released at this point. The controller reprograms its Flash memory from the firmware file on the SD Card. Flash programming is aborted if the firmware file is not found on the SD card. As the controller reprograms and then verifies Flash memory, the SD ACT, Ethernet TX LED, and Ethernet RX LED all flash in unison once a second indicating that reprogramming and verification are in progress. Once the reprogramming and verification are complete, the controller reboots itself.

**Warning:** Do not remove power until this process is completed!

12. If the Flash memory PROGRAM is successful, the green RX LED will repeatedly blink for several seconds followed by an automatic reboot. A Flash memory PROGRAM failure is indicated by a repeating LED pattern with a single green RX LED blink followed by three yellow TX LED blinks. The PROGRAM attempt will automatically retry three additional times before aborting.

## **Uploading New Web Page Files**

New AC-1700 web page files can be uploaded using the Upload function found on the Firmware Administration page or the Diagnostics page. The new web page filenames must end in **.html** or **.htm**. The new web page files must be located on the local computer.

1. Log into the AC-1700 web interface and navigate to Firmware Administration page or the Diagnostics page.
2. Click the Browse button under "Upload firmware file to the SD card". Select the new web page file on the local computer.
3. Click the Upload button. The web page should display a "successfully uploaded" message.

## **Notes and Documents**

Notes and Documents can be saved to and downloaded from the SD Card which is mounted on the AC-1700 controller. The AC-1700 Installation Manual can also be viewed.

Login to the AC-1700 Web Interface. See [Web Interface Login](#) on page 45.

Click the **Notes and Documents** link under **Maintenance**. Existing documents will be listed. Click on a document name to view or download.

Directions are provided for uploading files to the SD card. The size of uploaded files is limited to 5MB.

Documents can be deleted by checking the associated box and clicking the **Delete Checked Files** button.

For technical support purposes, a link is provided for downloading the AC-1700 Log File.

## Reader Installation

### Reader Addressing

The reader's device address is determined by its connection to the AC-1700, either Reader 1 or Reader 2.

### Indicators

The Sielox AC-125 Performa readers and AC-151 Mirage reader have a bi-color status LED indicator providing Red, Green, and Amber color states.

### Reader Wiring

The AC-1700 reader port connector has five pins. A five-conductor, 18 gauge, stranded, shielded cable is required for connecting the reader to the AC-1700 controller. Because of possible lower material cost, six-conductor cables are acceptable. The reader can be mounted up to 500 feet from the AC-1700 controller.

**Note: Check local codes for approved equivalents, especially if plenum rated cable is required.**

| Cable Type               | AWG | Conductors | Connector                                | Color Code                              | Max. Dist. |
|--------------------------|-----|------------|--|---|------------|
| West Penn 3280, shielded | 18  | 5          | LED<br>"0" Data<br>"1" Data<br>+V<br>GND | Brown<br>Green<br>White<br>Red<br>Black | 500'       |
| West Penn 3021, shielded |     | 6          | Not connected                            | Blue                                    |            |

### AC-125SG Performa Reader

P/N 882580, Performa Switch Plate reader (gray).

### AC-125SW Performa Reader

P/N 347151, Performa Switch Plate reader (white).

### AC-125MG Performa Reader

P/N 304627, Performa Switch Plate reader (gray).

### AC-125MW Performa Reader

P/N 347151, Performa Switch Plate reader (white).

### Performa Reader Feature Set

- Offered in single gang (AC-125SG, AC-125SW) and mullion (AC-125MG, AC-125MW) housings.
- May be mounted on a metal surface, such as a door mullion, with no impact on performance.
- Outputs 26-Bit Wiegand data format.
- Operates at 12VDC, 150mA, with an input voltage range of 10.8VDC to 14.8VDC and an ambient temperature range from –22°F to 150°F.
- Read range of up to 4" using the *Performa Proximity Plus* cards from Sielox..
- Certified to comply with FCC part 15 and UL 294.
- Pigtail cable provided for wiring connections.

### Performa Reader Installation

1. Remove the reader's cover plate. Position the reader or template at the desired installation location. Mark the two mounting holes and the reader cable location.
2. If necessary, drill holes for the two mounting fasteners.
3. Drill a hole for the reader cable. Install a grommet or other device as required by national and local codes. Pull the main reader cable through the cable hole for connection to the reader's pigtail cable.
4. Splice the main reader cable to the reader's pigtail cable. Set the reader's DIP switches.
5. If possible, connect the main reader cable to the AC-1700 reader port and test the reader.
6. Mount the reader to the installation surface using suitable mounting fasteners such as wood screws, molly bolts, or masonry fasteners. Gradually tighten the fasteners, making sure that the reader cable is not bound or pinched.
7. Replace the reader cover plate.
8. Clean any debris from the area.

**Performa Reader DIP Switch Settings**

LED and Piezo beeper functions are controlled by a DIP switch located on the back of the reader. The first three positions of the DIP switch are used to configure LED and beeper behavior. The fourth switch is reserved for future use. The following chart shows the DIP switch settings and associated functionality of the LED and beeper. The LED is bi-color and can provide Red, Green, and Amber states.

**LED Definition**

|                          |  | <i>LED Definition</i>  |
|--------------------------|--|------------------------|
| <b>Switch position 1</b> |  | <b>Ready LED Color</b> |
| ON                       |  | Red                    |
| OFF                      |  | Green                  |

**Performa Reader DIP Switch Configuration Settings**

| <b>Switches</b>  |                  | <b>LED</b> |              | <b>Beeper</b> |        |
|------------------|------------------|------------|--------------|---------------|--------|
| Switch 2         | Switch 3         | Denied     | Admit        | Denied        | Admit  |
| ON <sup>1</sup>  | ON <sup>1</sup>  | R/G Flash  | Color change | 3 Short       | None   |
| ON <sup>1</sup>  | OFF <sup>1</sup> | R/G Flash  | Color change | 3 Short       | 1 Long |
| OFF <sup>2</sup> | ON <sup>2</sup>  | No change  | No change    | 3 Short       | 1 Long |
| OFF <sup>3</sup> | OFF <sup>3</sup> | R/G Flash  | Flickers     | Chirps        | Chirps |

1. Controlled by the brown LED control line.
2. For future use, controlled by the blue beeper control line.
3. Reader test mode. This strictly tests the reader itself and indicates no functionality of the terminal controller. LED and beeper control lines should be disconnected in this mode.

## **AC-151U Proximity Reader**

P/N 125699, Proximity Reader

### **AC-151U Feature Set**

- Outputs 33-Bit Wiegand data in Sielox format.
- Operates at 12VDC.
- Read range of up to 4" using the *Mirage Proximity* cards from Sielox..
- Certified to comply with FCC part 15 and UL 294.
- Pigtail cable provided for wiring connections.

### **AC-151 U Installation**

The Sielox AC-151U reader may be fastened to a wall with bolts, double-backed tape, or the AC-15D docking bay (P/N 357455). If fasteners are used, 3/16" holes may be drilled through the reader, one in each corner. Indentations mark the location where each hole should be drilled.

1. When mounting with bolts, position the reader or template at the desired location. Mark the four mounting holes and the reader cable location.
2. Drill a hole for the reader cable. Install a grommet or other device as required by national and local codes. Pull the main reader cable through the cable hole for connection to the reader's pigtail cable.
3. Splice the main reader cable to the reader's pigtail cable.
4. If possible, connect the main reader cable to the AC-1700 reader port and test the reader.
5. Mount the reader to the installation surface. If using bolts, gradually tighten while making sure that the reader cable is not bound or pinched.
6. Clean any debris from the area.

## **AC-151SG Proximity Reader**

P/N 605954, Proximity Reader (Not evaluated for UL compliance)

### **AC-151SG Feature Set**

- Outputs 33-Bit Wiegand data Sielox format.
- Operates at 12VDC.
- Read range of up to 4" using the *Mirage Proximity* cards from Sielox.
- Certified to comply with FCC part 15.
- Pigtail cable provided for wiring connections.

### **AC-151SG Installation**

The Sielox AC-151SG proximity reader is fastened to a wall using the supplied mounting plate. The reader attaches to the mounting plate with the four supplied screws.

1. Position the mounting plate or template at the desired installation location and mark the four mounting hole and wire locations.
2. Drill a hole for the reader cable. Install a grommet or other device as required by national and local codes. Pull the main reader cable through the cable hole for connection to the reader's pigtail cable.
3. Splice the main reader cable to the reader's pigtail cable.
4. If possible, connect the reader cable to the AC-1700 reader port and test the reader.
5. Attach the reader to the mounting plate using the four supplied screws Clean any debris from the area.

## **AC-160R**

P/N 938458, Keypad

### **Purpose and Feature Set**

- Outputs 26-Bit Wiegand data format.
- Operates at 12VDC.
- Pigtail cable provided for wiring connections.

### **Installation and Wiring of AC-160R**

Same as AC-151-SG

### **Other Readers**

See the manufacturers' documentation for features and installation instructions for the following readers.

**AC-AW-911:** P/N 7657264, Sentinel-Prox LR-911 Long Range card reader.

**AC-181MP:** P/N 86267, MiniProx Proximity Reader

**AC-181SP:** P/N 157528, ThinLine II Switch Plate Proximity Reader

**AC-181P:** P/N 602152, ProxPro Proximity Reader.

**AC-181PII:** P/N 398757, ProxPro II Proximity Reader

**AC-181PK:** P/N 356152, ProxPro Proximity Reader with Keypad

## Performa Card Data Format

Sielox offers a variety of Performa proximity cards and keytag products.

- Performa Clamshell (P/N 261353)
- Performa Printable Proximity Plus (P/N 268456)
- Performa Printable Proximity Card w/Mag Stripe (P/N 373095)
- Performa Proximity Plus Key Tag (P/N 330702)

The Performa cards and keytags conform to the Wiegand 26-bit data format:

| 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |    |
|----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| P1 | C | C | C | C | C | C | C | C | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | P2 |
| P1 | E | E | E | E | E | E | E | E | E  | E  | E  | E  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | P2 |

**P1:** First parity bit with even parity

**C:** Card Code bits

**P2:** Second parity bit with odd parity.

**E::** Bits used to calculate even parity for P1.

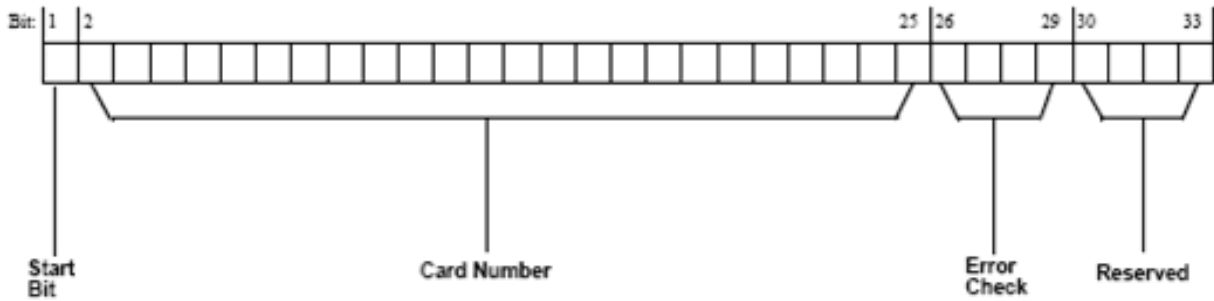
**O:** Bits used to calculate odd parity for P2.

### MIRAGE Card Data Format

Sielox offers several Mirage proximity card and keytag products:

- Mirage Proximity card (P/N 040267).
- Mirage Proximity Tag (P/N 509848).

The Mirage proximity cards and keytags are formatted as follows.



**Start Bit:** Fixed value of 1

**Card Number:** 24 bits organized as six hex digits

**Error Check Value:** 4 bits organized as one hex digit.

**Reserved:** 4 bits with a fixed value of 0000(binary).

The Error Check value is calculated as the One's-Compliment of the Exclusive-Or value of all six Card Number digits.

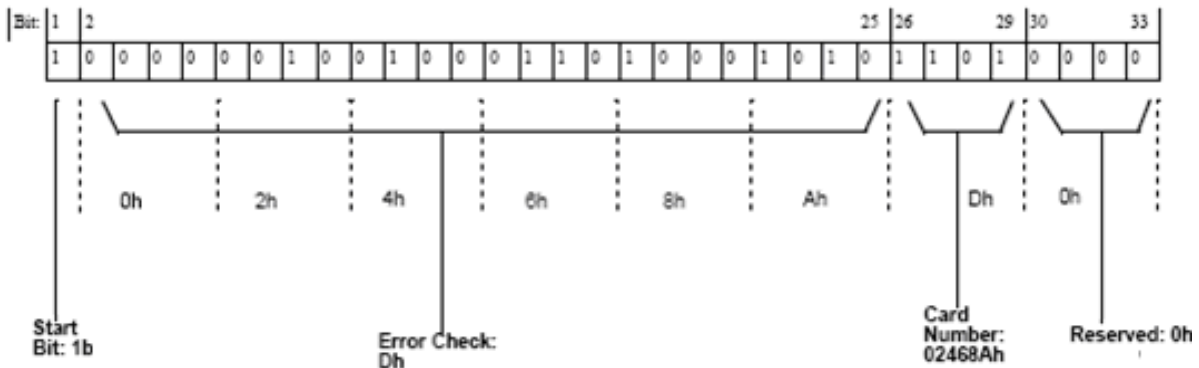
**Example:**

**Card Number:** 0 2 4 6 8 A (hex)

**Exclusive-Or value of all card number digits:** 2(hex)

**One's-Compliment of the Exclusive-Or value:** D(hex)

This example above would result in the following 33-bit data stream from the Mirage card:



## AC-1700 Power Ratings

Input Voltage: 12 VDC @ 350 mA for the 1700 controller, not including reader power consumption.

## Power Supply & Standby Battery Configuration (UL 1076)

UL 1076 requires that the protective circuit be electrically-supervised. See manufactures installation manual. These manuals are shipped with the Power Supply/UPS and should be used when installing this power supply.

## Ethernet Interface Transient Suppression (UL 1076)

Citel part# ZSCAT5-CX, Ethernet Surge Suppressor, must be connected directly to the AC-1700 Ethernet jack. The LAN cable connects directly to the Citel ZSCAT5-CX. See instructions provided with the Citel product.

The Citel transient suppressor is not necessary for UL 294 compliance.

## Conditions Which May Result In False Alarms

Any signal wires *not* installed in accordance with this manual may result in the occurrence of false alarms.

## Conditions Which May Result In Impaired Operation

Any wiring *not* installed in accordance with the National Electric Code (NFPA70) may result in improper operation of the AC-1700 equipment described in this manual.

## To Reduce the Risk of Electric Shock or Fire

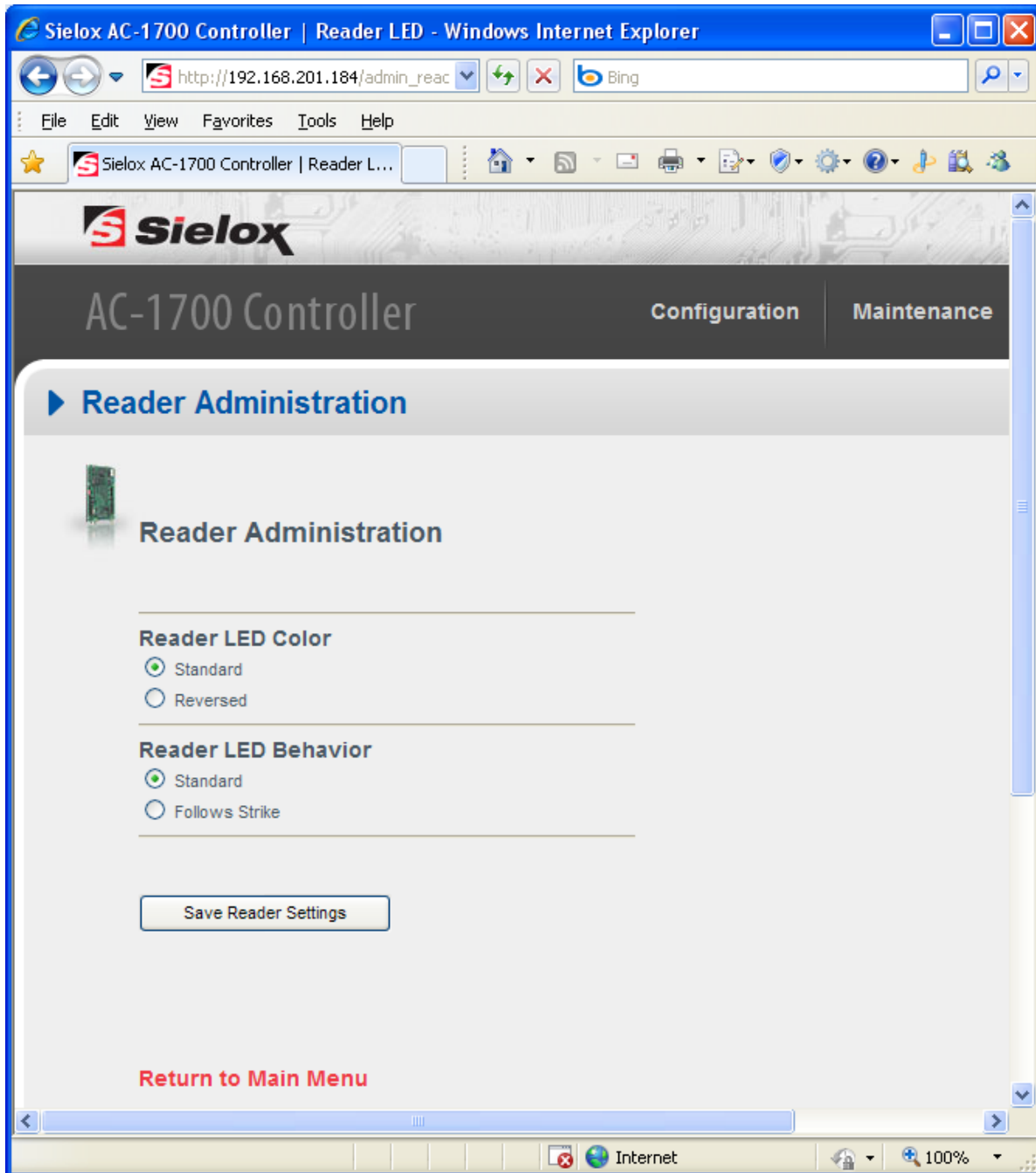
To reduce the risk of electric shock and fire, use ETL-certified Sielox steel enclosures:

- Large Enclosure p/n 6800110
- Small Enclosure p/n 6800111

## Reader LED Color and Behavior

To configure the reader LED color orientation and behavior, login to the AC-1700 Web Interface. See [Web Interface Login](#) on page 45.

Click the **Readers** link under **Administration**, which will navigate to the **Reader Administration** page:



## Reader LED Color

This setting can be used to reverse the red/green reader LED color. If the connected reader's LED color is opposite to the desired color, select the alternate option and click the **Save Reader Settings** button.

The **Standard** setting should be used for Sielox Mirage and Sielox Performa readers. The **Reversed** setting may be desired for readers from other manufacturers.

## Reader LED Behavior

With the **Standard** Reader LED Behavior setting, the LED will remain red until a card is presented. If the cardholder is admitted, the LED will momentarily turn solid green to signal the admittance. If a cardholder is not admitted, the LED will momentarily flash red/green.

With the **Follows Strike** Reader LED Behavior setting, the LED will remain green while the door is unlocked and red while the door is locked. If a cardholder is not admitted, the LED will momentarily flash red/green. If a cardholder is admitted when the door is already unlocked and the LED is green, the LED will momentarily turn solid red.

Click the **Save Reader Settings** button after making a change.

Note: The Reader LED Behavior Follows Strike feature is not supported by the Sielox Performa reader.

## **Grounding**

All enclosures shall be grounded using local and national code requirements. The AC-1700 shall be grounded using the detailed descriptions in the respective sections of the manual.

### **AC-1700 Grounding Procedure**

The AC-1700 enclosures (part numbers 6800110 and 6800111) must be grounded to suitable ground, normally a cold water pipe or electrical ground. The enclosure door must be grounded to the enclosure base using the using the provided wire strap.

See [AC-1700 Enclosure Grounding](#) on page 10.

### **UL Listed Power Supply**

The AC-1700 must be powered with a UL listed power supply with a visible AC power indicator. All interconnecting devices are to be powered by UL listed power limited power supplies. Sielox recommends the Altronix AL600ULX, Sielox part number 7199616, with one 12 VDC 7 amp-hour sealed lead acid battery. The AL600ULX is a UL-listed power supply.

### **Electrical Connections**

The AC-1700 must be installed within the protected premise in accordance with the National Electric Code (NFPA70), local codes and the authorities having jurisdiction.

This system shall be installed in accordance to the National Fire Protection Associations Standard 72, Chapter 2.

### **Power Limited Connections**

Those connections not designated as “Power Limited” must be wired according to Class 1 wiring methods with ¼” wire separation.

### **Primary Voltage Restrictions**

Voltages greater than 30V AC or greater than 42.4 VDC shall not enter the UL-approved enclosures listed in this document.

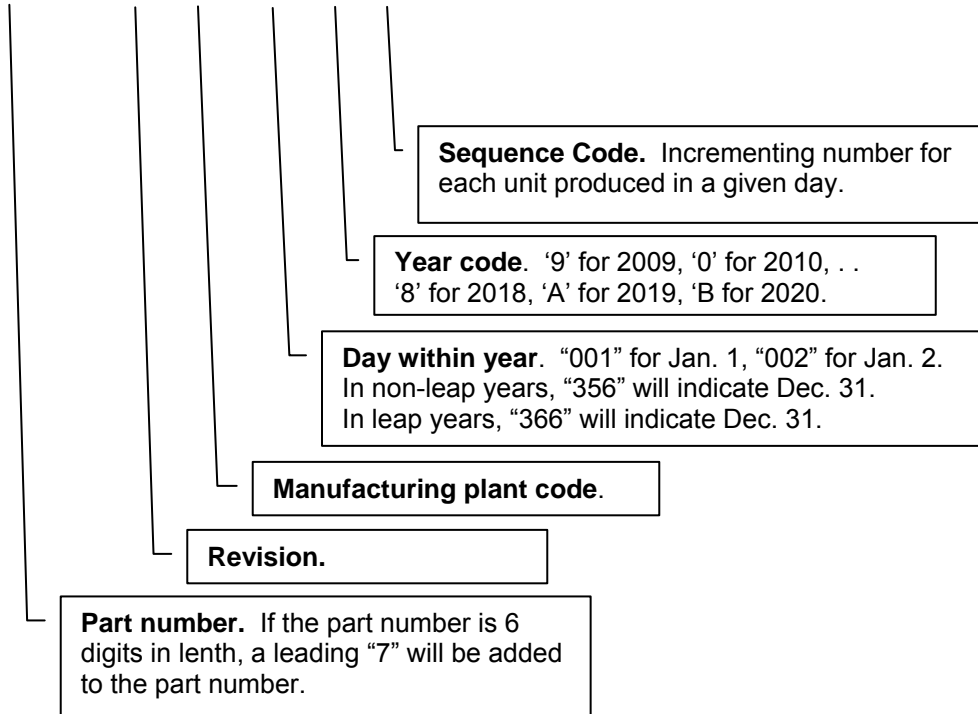
## AC-1700 Serial Number Label Format

The serial number label information includes the product part number, revision, manufacturing location, and manufacturing date code. The following example describes the format of the serial label markings.

Sample Serial Number label ma: **712345603P02454001**

Encoding:

**7123456 03 P0 245 4 001**



## AC-1700 Wiring Diagrams

The AC-1700 controller operates in the following applications.

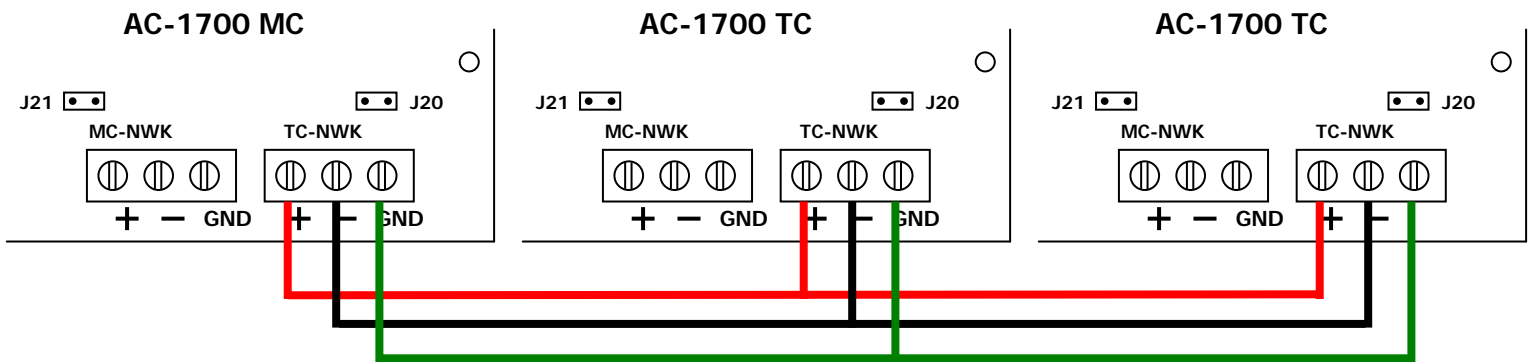
- Access Control System Unit.
- Proprietary Burglar Unit.

The signaling function supports both standard line security and encrypted line security.

### RS-485 Wiring

Connect the RS-485 **+**, **-** and **GND** signals to each controller on the RS-485 bus.

Terminate one end of the cable shield drain wire to ground.

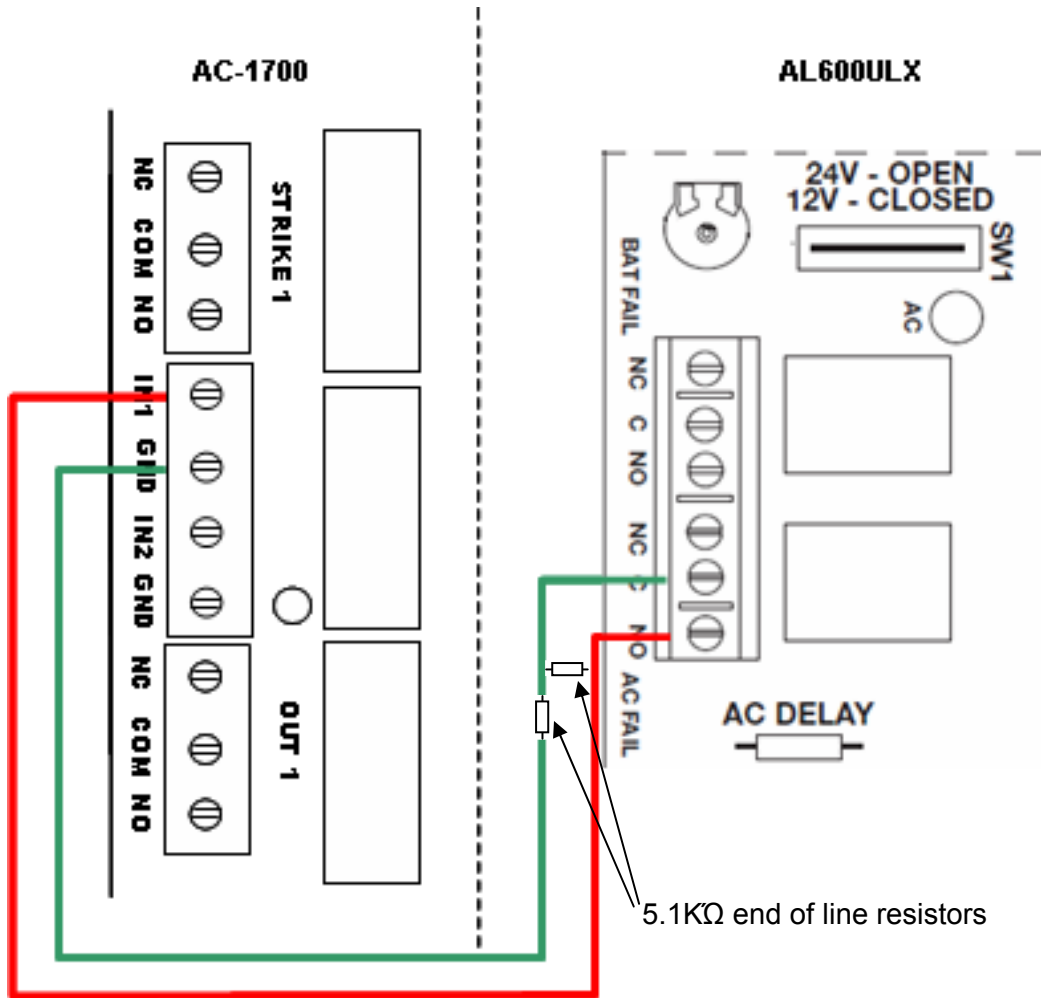


### AC Power Fail Wiring

Connect the Altronix AL600ULX AC FAIL signal Common ( C ) and Normally Open ( NO ) to an AC-1700 general purpose input.

Terminate one end of the cable shield drain wire to earth ground.

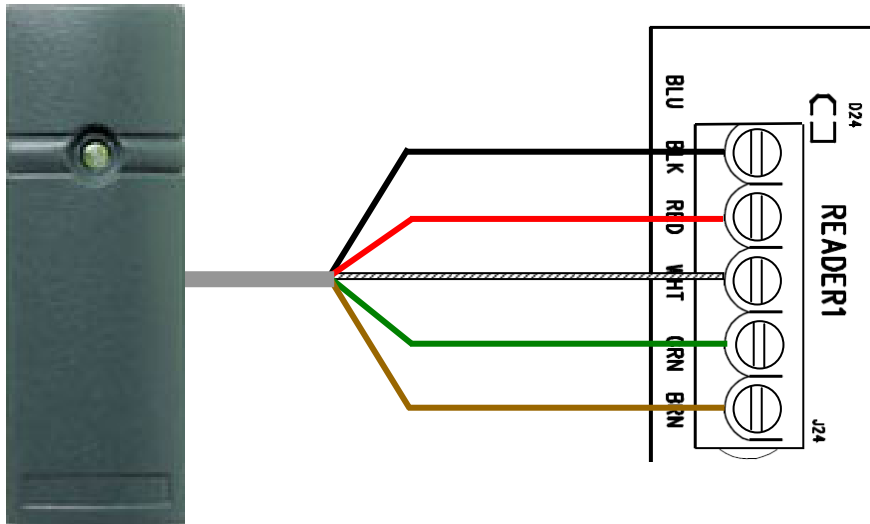
End of line 5.1KΩ resistors may be installed for supervision.



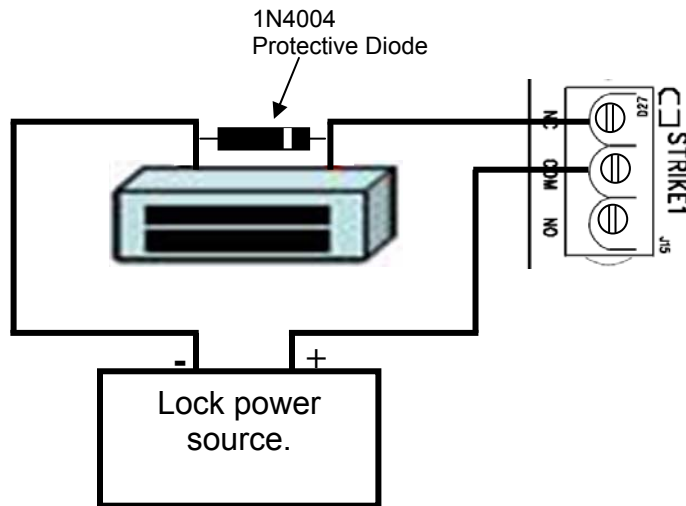
### Reader Wiring

Wire the Black (GND), Red (12V), White (Data 1), Green (Data 0), and Brown (LED) between the reader and the AC-1700 reader port.

Terminate one end of the cable shield drain wire to earth ground.



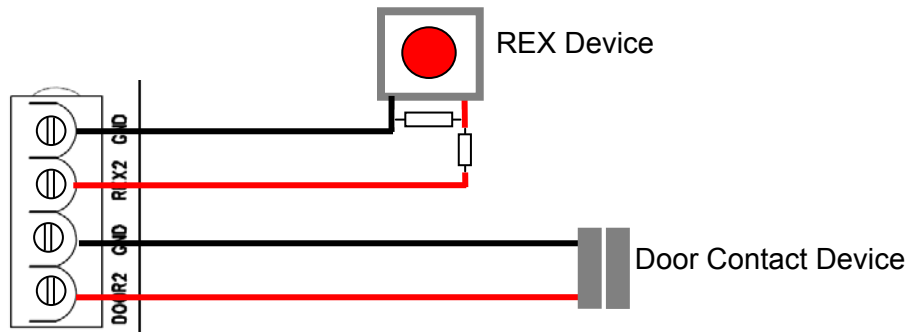
### Door Magnetic Lock Wiring



### Door Contact and REX Inputs

Install and connect the leads of the Door Position Switch and the REX Switch. End of line 5.1K $\Omega$  resistors may be installed for supervision.

Terminate one end of each cable shield drain wire to earth ground.

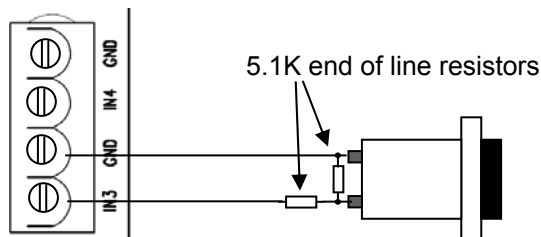


### Door Tamper Switch and Other Input Devices

Connect the two leads of a tamper switch to one of the general purpose inputs of the AC-1700.

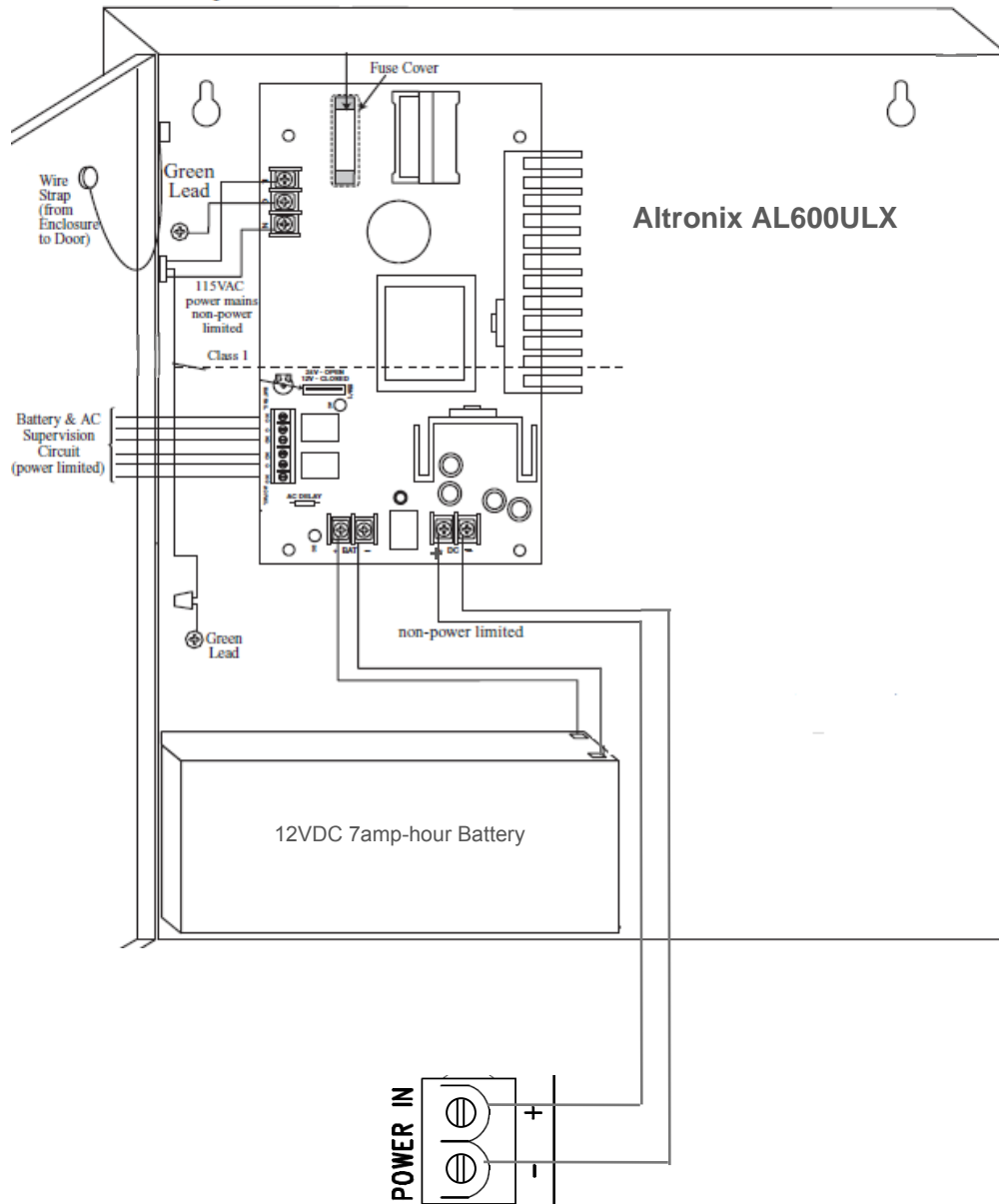
Terminate one end of the cable shield drain wire to earth ground.

End of line 5.1K $\Omega$  resistors may be installed for supervision.



**Power In**

Install an Altronix AL600ULX Power Supply with a 12VDC 7AH sealed lead acid battery. Connect the + and - output of the Altronix AL600ULX to the + and - pins of the AC-1700 **Power In** connector.



## I/O Expansion

1. Pull three-conductor cable, 22 GA or better, through the Sielox Enclosures. Connect AC-1700 MC or TC “**EXP**” connector to AC-1700-BP7 “**EXP 1**” connector, “**C**” pin to “**C**” pin, “**D**” pin to “**D**” pin, and center pin to center pin. Maximum cable length is 15 ft.

