

# Schlage

## Electronic security

### Access Control & Video Systems

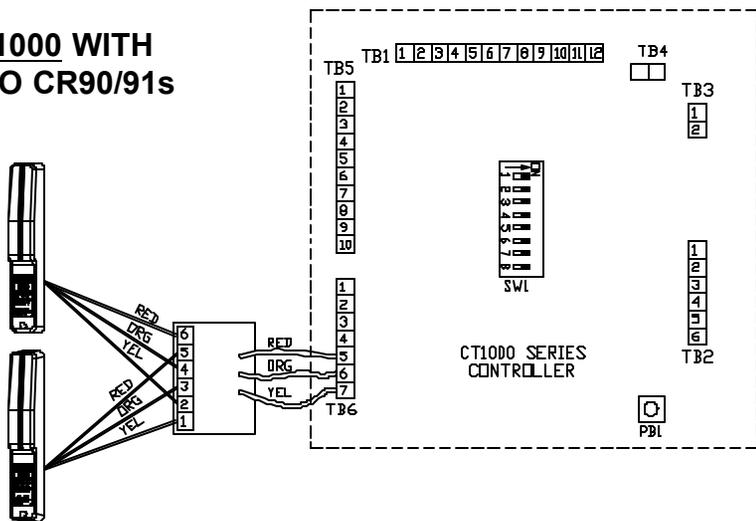
### Installation Manuals

Master Index

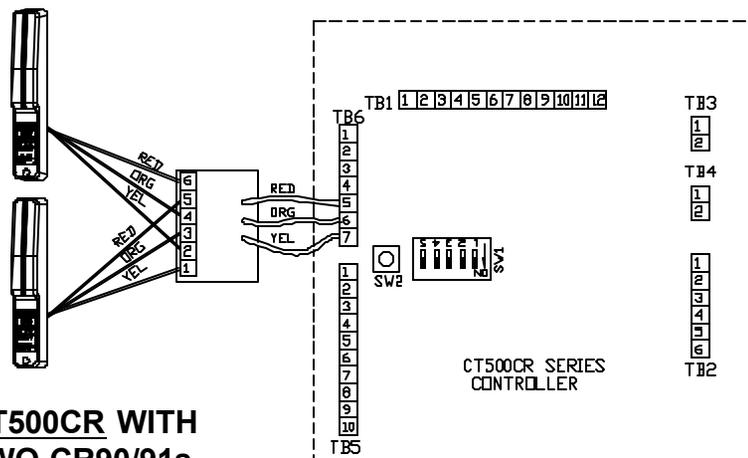


## CR2 CARD READER ADAPTER BOARD WIRING TWO CARD/PROX READERS TO ONE CT1000 OR CT500CR

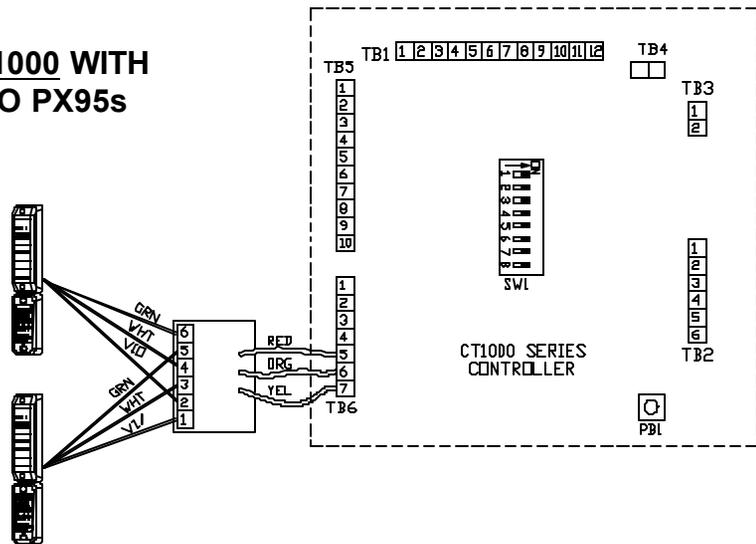
**CT1000 WITH  
 TWO CR90/91s**



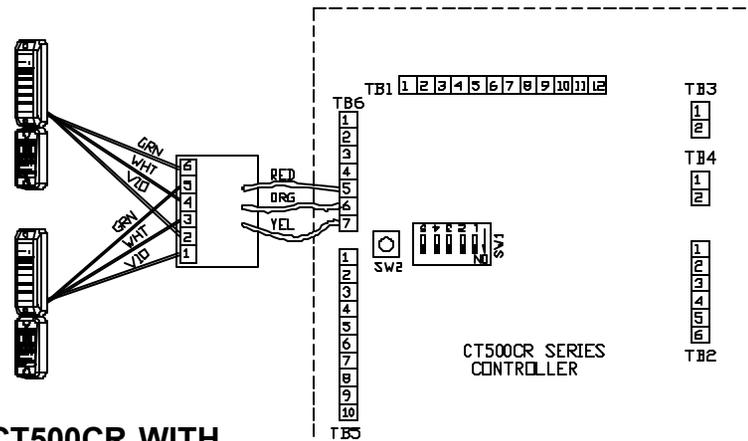
**CT500CR WITH  
 TWO CR90/91s**



**CT1000 WITH  
 TWO PX95s**



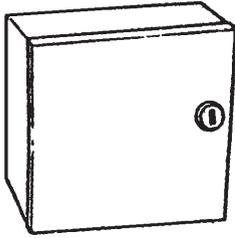
**CT500CR WITH  
 TWO PX95s**





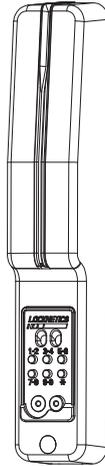
# CT1000

## UNIVERSAL ACCESS CONTROL SYSTEM INSTALLATION AND WIRING INSTRUCTIONS

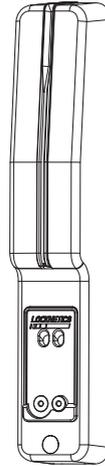


### CT1000 CONTROLLER

MEMORY UP TO 1000  
KEYPAD CODES,  
IBUTTON ELECTRONIC KEYS  
MAGNETIC STRIPE CARDS,  
PROXIMITY CARDS,  
1000 AUDIT EVENTS.  
SOFTWARE-MANAGED  
TIME ZONES AND  
HOLIDAY EVENTS  
(SMARTIME FUNCTIONALITY)



**CR90**  
CARD READER  
WITH  
KEYPAD



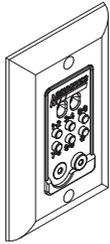
**CR91**  
CARD READER  
WITH  
IBUTTON READER



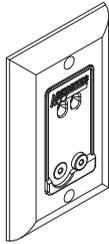
**PX95xKP78+**  
PROX CARD  
READER  
WITH  
KEYPAD



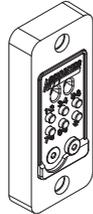
**PX95xTR83**  
PROX CARD  
READER  
WITH  
IBUTTON READER



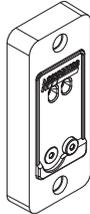
**KP79+**  
MINI-KEYPAD  
SINGLE-GANG



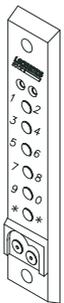
**TR84**  
IBUTTON  
READER  
SINGLE-GANG



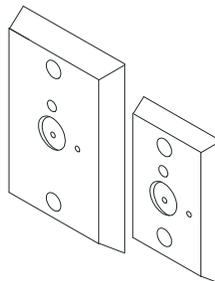
**KP78+**  
MINI-KEYPAD  
NARROW STYLE



**TR83**  
IBUTTON  
READER  
NARROW STYLE



**KP74+ / KP76+**  
KEYPAD



**TR81 / TR80**  
IBUTTON  
KEY READERS

### TABLE OF CONTENTS:

Specifications.....	2
How to Get Started.....	2
Typical System Installation.....	2
Overview of Installation Steps.....	3
Dip Switch Settings.....	3
Terminal Layout.....	4
Access Control Device Wiring.....	5
Programming: General Information.....	6
Definition of Functions.....	6
Default Codes.....	6
Programming Master iButton/card... 7	7
Erasing Memory.....	7
Setting Time Delays.....	7
Advanced Programming Features... 8	8
Auxiliary Relay Credentials.....	9
Sample Wiring Diagrams.....	10
Programming Error Codes.....	11
Use of Diagnostic Button PB1.....	11
Troubleshooting.....	11
Use of the MOV spike suppressor... 11	11
NOTES.....	12

**For manual programming steps see "1000 User Quick Guide" (form 57001).**

**PLEASE READ ALL INSTRUCTIONS PRIOR TO INSTALLING THE SYSTEM.**

**HANDLE THE EQUIPMENT CAREFULLY.**

**IMPORTANT!** This manual is intended to be kept for programming, maintenance, and trouble shooting purposes. *Do not dispose of after installation.* Please present this manual to facility manager upon completion of installation.

**Schlage Lock Company**  
575 Birch Street, Forrestville, CT 06010  
technical support: 866-322-1237  
email: SESsupport@irco.com  
web: www.irsupport.net



**SPECIFICATIONS:**

**Electrical:**

Input Voltage: 12 to 28 VAC/VDC  
 Current Draw: 200mA max.  
 DC Output Voltage (with AC input): 1 amp max. (Matches input voltage)

**Control Relays:**

Main -DPDT contacts, 5 amp max @ 30VDC  
 Aux -SPDT contacts, 5 amp max @ 30VDC  
 Alarm -SPDT contacts, 5 amp max @ 30VDC

**Programmable Users:**

1000 Access credentials

**ENVIRONMENTAL:**

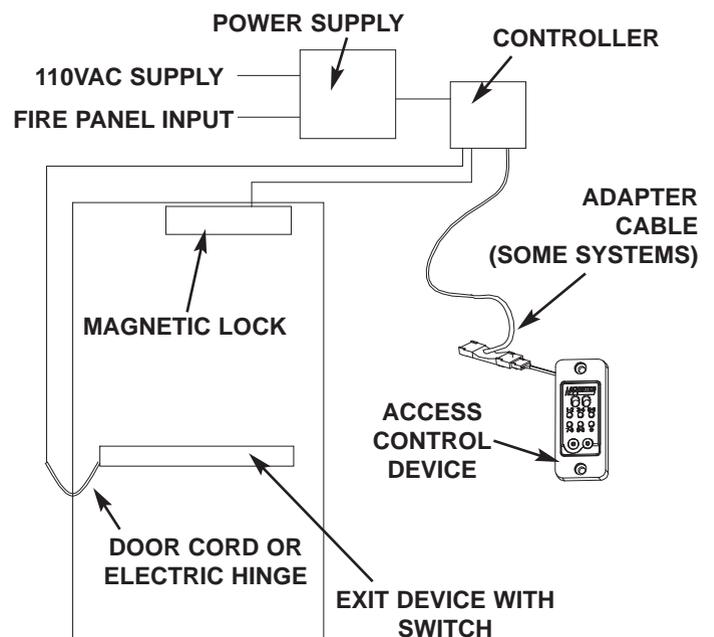
MODEL:	TEMP (C/F):		ENVIRONMENTAL: WET?	DISTANCE TO CONTROLLER(MAX) Meters/Feet
	LOWER:	UPPER:		
KP73+,KP74+,KP76+,KP77+	-20/-4	55/131	yes	61/200
KP78+,KP79+,TR83,TR84	-20/-5	55/132	Interior or sheltered exterior	61/200
100CAB	-20/-4	60/140	Dry only	61/200
TR80	-40/-40	60/140	yes	61/200
CR90	-20/-4	55/131	Interior or sheltered exterior	61/200
PX95	-30/-22	60/140	yes	61/200
CT1000	0/32	55/131	Dry only	N/A
CT1000xPS	0/32	40/104	Dry only	N/A

**HOW TO GET STARTED:**

The CT1000 universal access controller can be interfaced to any Schlage access control devices such as iButton readers or keypads, mag-stripe emulation output HID Prox Card readers as well as magnetic stripe card readers. The unit may have been ordered with the PS option (505 power supply in the same enclosure). If it does not have a supply, one will be required. Make sure that the supply chosen will meet the electrical requirements of all components in the system. Note that electrical power gets dissipated over long wire runs so it is important that the equipment be located close to the opening it is controlling.

*Consult national electric code handbook for information regarding wire run lengths and minimum required wire gauge and type for the voltage and current in the system.*

**TYPICAL SYSTEM INSTALLATION:** A typical installation consists of a locking device (magnetic lock, electric strike, etc.), a power supply, a CT1000 controller, an adapter cable (in some cases), an access control (keypad, card reader, etc.), an exit control (exit device, pushbutton, etc.), and door cord or electric hinge. Any installation involving modification or specification of an opening which is considered to be a *means of egress* (emergency exit) or a *fire rated opening* must conform to all local and national life safety and building codes. The specific gage and number of wires will vary with the kind of equipment used, the intended function, and local and national building codes. In most cases it is required that magnetic locks open in the event of a fire alarm condition. (Consult local authority having jurisdiction.)



**OVERVIEW OF INSTALLATION STEPS:**

**1. INSTALL COMPONENTS**

- A. Determine where each component will be located. Mount Controller and Power Supply to Wall. Run conduit as required by local and national codes.
- B. Follow instructions included with Access Control device to mount it and run wires to controller.
- C. Mount Lock.

**2. MAKE WIRING CONNECTIONS**

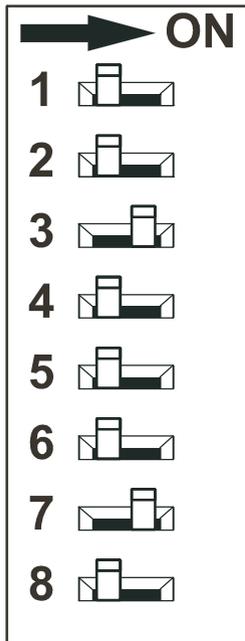
- A. Set Dipswitches correctly for your system.
- B. Make wiring connections as required.
- C. Use of the MOV spike suppressor (see page 11).
- D. Connect Power

**3. CONFIGURE AND PROGRAM SYSTEM**

- A. Initialize Master iButton/Card and programmer as required.
- B. Configure and Program System.
- C. Test System.

**1. SET THE EIGHT DIPSWITCHES ON SW1 FOR PROPER FUNCTION:**

**SW1**



- Dipswitch 1 NOT USED
- Dipswitch 2 REX ALARM RESET: OFF= REX DOES NOT RESET ALARM  
ON = REX DOES RESET ALARM
- Dipswitch 3 \*ALARM RELAY: OFF=RELAY DE-ENERGIZED IN ALARM  
ON = RELAY ENERGIZED IN ALARM
- Dipswitch 4 \*\*ANTI-TAILGATE: OFF=DISABLE, ON=ENABLE
- Dipswitch 5 NOT USED
- Dipswitch 6 \*\*DOOR FORCED/PROPPED: OFF=DISABLE, ON=ENABLE
- Dipswitch 7 AUTOMATIC RELOCK ON POWER-UP: OFF=RESET REQUIRED  
ON=AUTOMATIC RELOCK
- Dipswitch 8 NOT USED

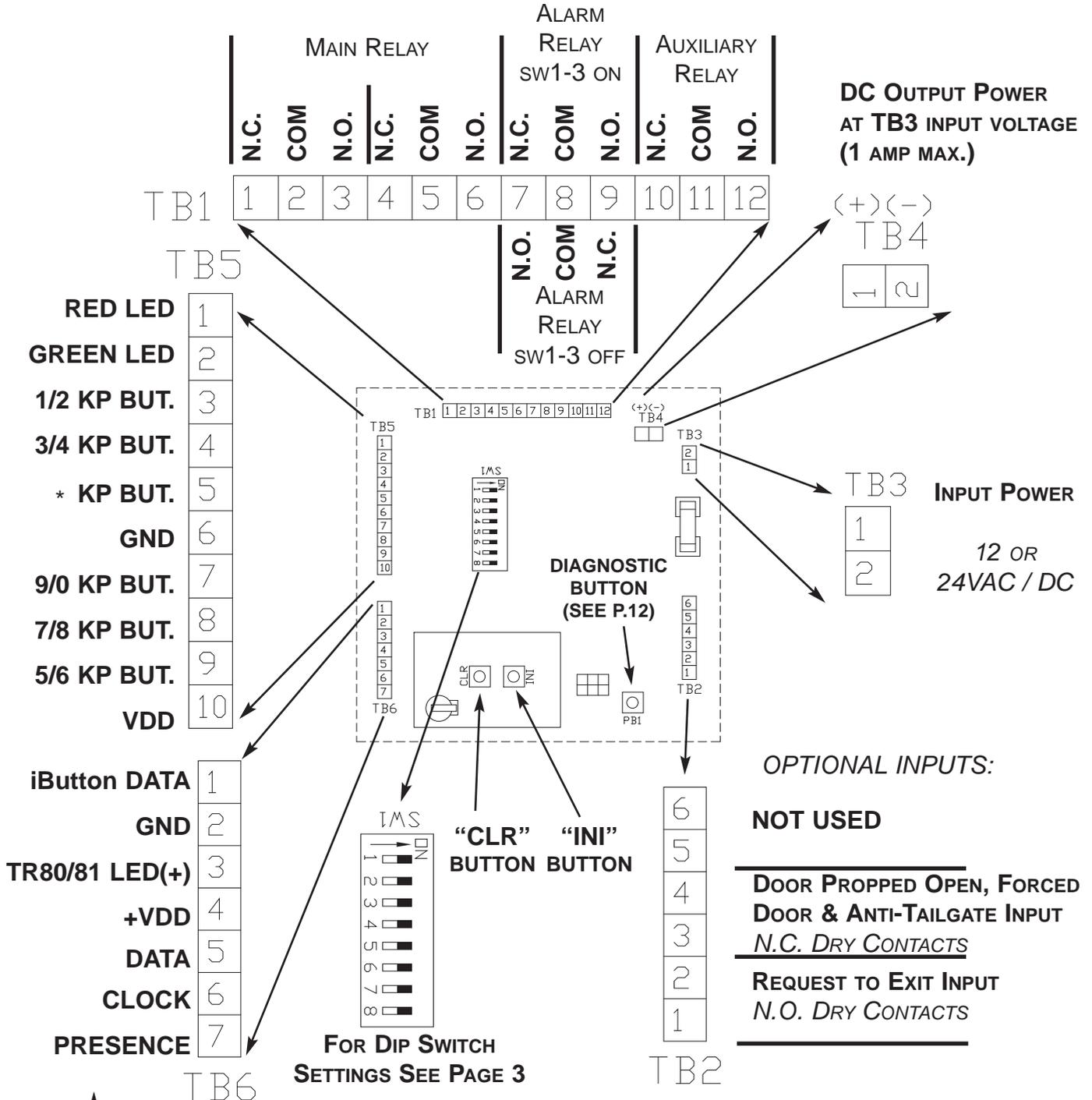
**NOTES:**

\* Default SW1-3 OFF: Alarm relay is energized under normal condition. Therefore, when power is lost, an alarm condition will occur. If SW1-3 is set to ON, then the controller will energized the relay in an alarm condition. With this setting, loss of power will not be an alarm condition.

IMPORTANT! This setting will affect the "normal" condition of the relay terminals. (See wiring on next page.)

\*\* These functions require a door status switch to be wired to the controller. The switch must be closed when the door is closed. (See wiring on next page.)

**2. MAKE WIRING CONNECTIONS:** Note that the main relay is a double pole, double throw relay. TB4 will put out DC unregulated voltage up to one Amp. Note that it is not necessary to use this terminal if your system already uses DC voltage from a power supply. NOTE: Terminal blocks are removable (except TB4). See p. 10 for illustrations.



**Request to Exit:** Closing contacts will activate relays for six seconds (timer adjustable see page 7)  
**Door Prop:** Triggers Alarm Relay when door is held open for 30sec. (Requires door position switch.)  
**Anti-Tailgate:** Allows relocking of door immediately upon reclosing. (Requires door position switch.)  
**Forced Door:** Triggers Alarm Relay when door is forced open without a legal release. (Requires door position switch.)



Make connections to the access control device or adapter cable as required. *Be sure that all wiring is correct before power is applied. If more than one card reader or prox card reader must be wired, a CR2 adapter board will be required. Refer to the instructions included with the adapter board for special wiring instructions.*

TR80/81 CABLE	770CAB (KP70+ & TR83/84)	CR90/CR91 CARD READER	PX95 PROX CARD READER																																																												
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	3																																																														
	4																																																														
	5																																																														
	6																																																														
	7																																																														
<BROWN>	1																																																														
<BLACK>	2																																																														
	3																																																														
<VIOLET>	4																																																														
<RED>	5																																																														
<ORANGE>	6																																																														
<YELLOW>	7																																																														
1																																																															
BLACK	2																																																														
3																																																															
RED	4																																																														
GREEN	5																																																														
WHITE	6																																																														
VIOLET	7																																																														

**NOTES:**  
1. Two TR80 or TR81 touch readers can be wired in parallel.

**NOTES:**  
\*1. New 770CAB adapter cables are shipped with the brown wire clipped. It is not necessary to connect it.

**NOTES:**  
1. All 15 wires shown must be connected on the CR90 models.  
2. On CR91 models connect the 9 wires which are <bracketed> to the terminals shown.

**NOTES:**  
1. The PX95 requires the use of device which has programming ports for programming by computer or a keypad for programming manually. Use connection information for appropriate device as shown in addition to information above (usually, a 770CAB with a keypad or iButton reader). There will therefore be two wires on some terminals. This is normal.

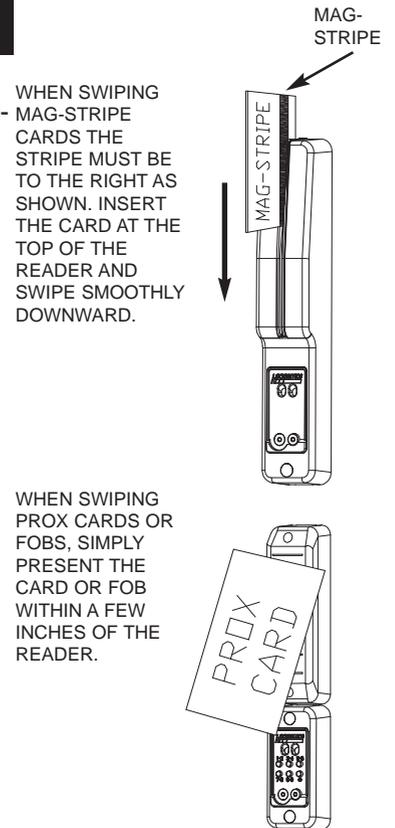
**REFER TO THE 1000 USER QUICK REFERENCE (FORM 57001)  
 FOR MANUAL PROGRAMMING STEPS.**

**PROGRAMMING: GENERAL INFORMATION**

Programming the CT1000 can be done either by computer programming or manually, using the keypad. The standard unit can have up to 1000 codes, cards, or iButtons. Their functions can be chosen using software or by manually adding the code/card/iButton and function (see "DEFINITION OF CODE/IBUTTON FUNCTIONS AND FACTORY DEFAULTS" below). Time zone controls are possible with computer programming. See help files and software documentation for details. When manual programming, it is critical to keep a record of the people and codes/cards/iButtons which are issued to them along with their functions and PIN numbers (for cards or iButtons). This will enable the ability to manage the access system properly. Time delays can be set either manually or using computer programming.

The units come from the factory with preset factory default codes (described below). When the lock is reset (memory erased) it will return to factory default codes. Initializing a master card/iButton, changing the master code, or computer programming, will erase the factory default codes and iButtons.

When programming with a computer, it is possible to enable or disable manual programming. If manual programming is enabled, and a code, card, or iButton is entered manually, the Audit Trail Report will be corrupted. (See next page.)



**DEFINITION OF ACCESS FUNCTIONS AND FACTORY DEFAULTS:**

	FACTORY DEFAULT
<i>MASTER</i>	97531
<i>NORMAL ACCESS</i>	13579
<i>TOGGLE</i>	135135
<i>LOCKOUT</i>	9115

Allows access to programming functions. Will not activate relays.

Activates main relay for relock time delay. Will reset alarm condition.

Activates main relay until same or another Toggle code/card/iButton is entered.

"Freezes" the lock in its present condition, either locked or unlocked, until the same or another Lockout code/card/iButton is entered.

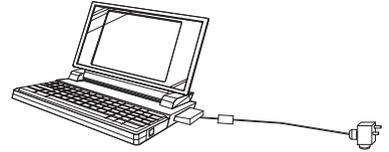
*ONE-TIME ACCESS* No factory default. This type of code/card/iButton will allow access only once. It will then become deleted from memory.

*SUPERVISED ACCESS* No factory default. This type of code/card/iButton allows access only when used with another Supervised Access code/card/iButton. The second code/card/iButton must be entered within five seconds of the first one. The order that they are entered does not matter. The second supervised access credential entered will be reported on the audit trail report.

*PASS-THRU* No factory default. This type of access code/card/iButton allows access even if the lock is in the "Freeze/Lockout" mode. After the relock time delay, the controller will resume its "Lockout" status.

### Creating a Master iButton/Card (For Computer Programming):

- A. Open the cover of the controller.
- B. Press the "INI" button three times (the red LED will come on and stay on (TR80/TR81 will do nothing - they only have a green LED.)
- C. Touch Master iButton to reader (or swipe the Master card) . The LED(s) will flash to indicate acceptance.
- D. When you are finished, press the "INI" button once. The red LED will turn off.



#### NOTES:

1. Refer to instructions included with the programmer/software that you will use to program for more information regarding programming.
2. The Master iButton or card is used for initiating programming. It will not unlock the door.
3. When a master programming credential is created, all factory default codes will be deleted.

---

### ERASING MEMORY (RETURN TO FACTORY DEFAULT SETTINGS):

**Important:** Resetting will delete all Keypad codes, iButtons/Cards and Master iButton/Card from the lock memory. All time delays and default codes will be restored to default values.

1. Open cover of controller and set dipswitches according to chart on page 3.
2. Depress "CLR" microswitch three times. The red LED will turn on. (Note: with 100CAB, TR80, or TR81, the LED(s) will not turn on.)
3. The operation is complete when the red LED turns off. (approx. 10 sec)

---

### SETTING TIME DELAYS:

#### RELOCK TIME DELAY:

1. Enter master programming code/iButton/Card.
2. press "9 9 \*" - wait for the LED(s) to stop flashing.
3. press "1 \*" - wait for the LED(s) to stop flashing.
4. press the "1" button once for every second of relock delay desired.
5. press "\*" to complete setting.

#### DOOR PROPPED TIME DELAY:

1. Enter master programming code/iButton/Card.
2. press "9 9 \*" - wait for the LED(s) to stop flashing.
3. press "7 \*" - wait for the LED(s) to stop flashing.
4. press the "1" button once for every second of relock delay desired.
5. press "\*" to complete setting.

Note: If a long time delay is desired, you may press "5" instead of "1" (in step 4). This will enter time in 5 second increments. Press "0" instead of "1", for 10 second add. The CT1000 will add up the seconds. It doesn't matter what order the numbers are entered.



**ADVANCED PROGRAMMING FEATURES:**

There are several advanced features which the CT1000 supports when manually configured:

**DURESS ALARM:** (Requires the use of a keypad) When a person is making an access attempt and wishes to set off an alarm condition he/she can set off a “duress alarm” condition by pushing any keypad button within three seconds of entering a valid access credential (including a code, card, or iButton.) Once this is done, the alarm relay will change state and remain in such a state until a manual reset is given, either by a valid access credential, or by a REX input (provided that the rex input is configured to clear an alarm condition - see dipswitch settings p. 3.) *Note: when using this feature it is important to train staff in the use of the feature to prevent false alarms and effectively provide the added security.*

**DOORBELL FUNCTION:** The doorbell function will change the state of the AUX relay for one second anytime the \* key is pressed. This can be used to sound a buzzer to alert someone inside that someone is at the door. (Best if used with a sign which informs the guest that the \* button is a doorbell.

**LAMP FUNCTION:** The lamp function will change the state of the AUX relay for 5 seconds anytime any of the keypad buttons are pressed. The AUX relay is generally used in this case to light an otherwise dark entry whenever keypad activity is detected. This feature could also, however, be used to alert security personnel of activity at a keypad.

**REX INPUT CONFIGURATION:** The request to exit input can be configured to activate the MAIN or the AUX relays or both, depending on the requirements of the system. Note that the REX input can also be configured to clear or not to clear an alarm condition (see dipswitch settings on p.3)

**HOW TO CONFIGURE ADVANCED PROGRAMMING FEATURES:**

A simple manual programming step is required to configure the above advanced features. Simply follow the steps outlined below:

- |   |                                  |
|---|----------------------------------|
| 1. ENTER A MASTER PROGRAMMING CODE/iBUTTON/CARD | (wait for LEDs to stop flashing) |
| 2. PRESS <b>7 9 9 *</b>                         | (wait for LEDs to stop flashing) |
| 3. DURESS: ENTER <b>1 or 0</b>                  | (1 = enable 0 = disable)         |
| 4. DOORBELL ENTER <b>1 or 0</b>                 | (1 = enable 0 = disable)         |
| 5. LAMP ENTER <b>1 or 0</b>                     | (1 = enable 0 = disable)         |
| 6. REX - MAIN ENTER <b>1 or 0</b>               | (1 = enable 0 = disable)         |
| 7. REX - AUX ENTER <b>1 or 0</b>                | (1 = enable 0 = disable)         |
| 7. ENTER <b>*</b>                               |                                  |

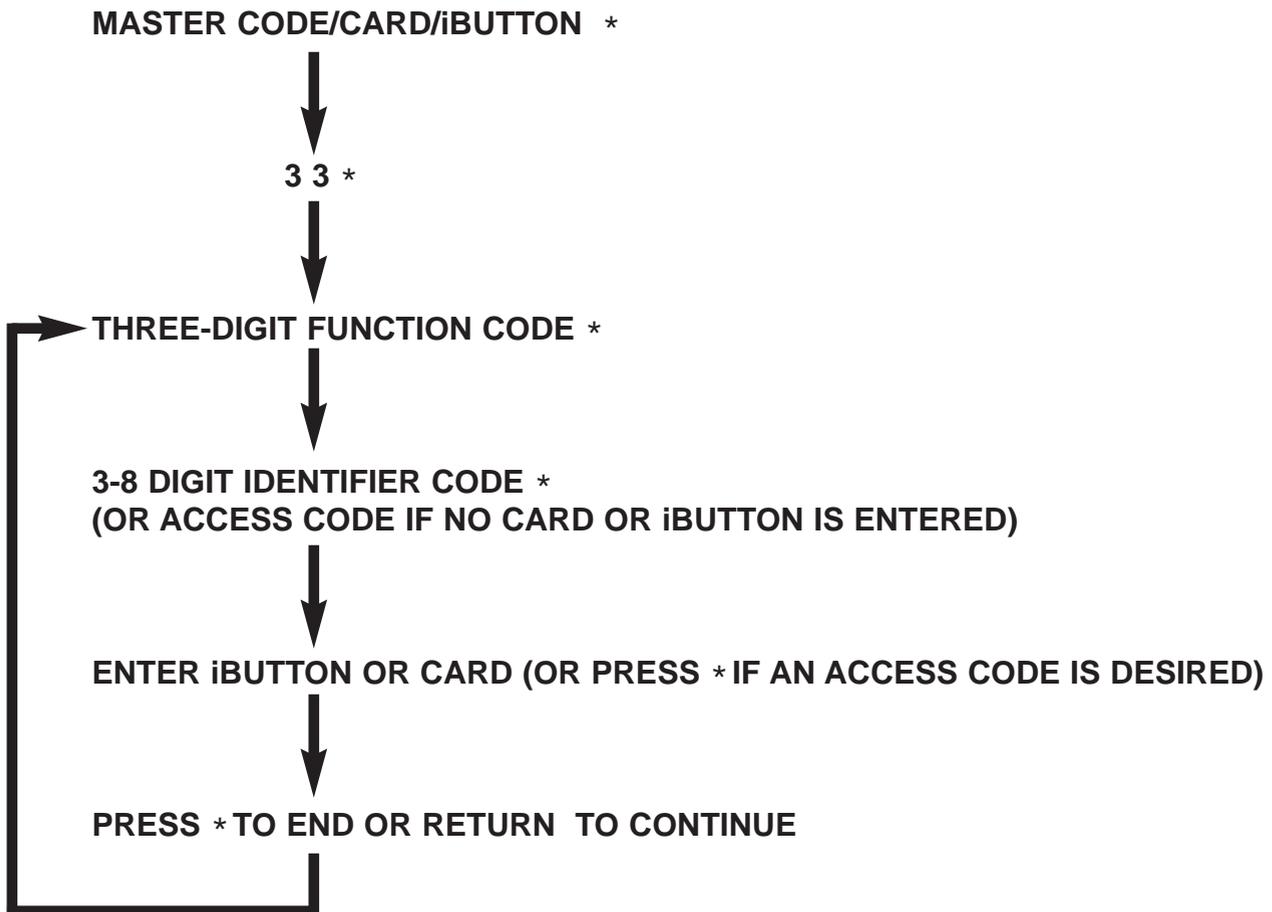
END OF SEQUENCE

**IMPORTANT NOTES!**

1. If both DOORBELL and LAMP functions are enabled, the default will be that LAMP function is enabled.
2. If the REX - AUX function is enabled, the lamp and doorbell functions will not be enabled.
3. COMPUTER PROGRAMMED codes/cards/iButtons which are configured to activate the AUX relay will NOT disable the doorbell or lamp function.

**MANUALLY PROGRAMMING CREDENTIALS TO ENERGIZE MAIN AND/OR AUX RELAYS:**

When a code, card, or iButton is programmed using manual programming (as in form 57001) the *main relay only will be actuated*. There are some applications in which it is desirable to actuate the auxiliary relay or both the main and auxiliary relay together, such as when a lock is used in conjunction with an automatic operator. Though these functions are fully programmable when using computer programming the steps below will show how to manually program these functions. Use the table on the bottom of the page to select three digit function codes.



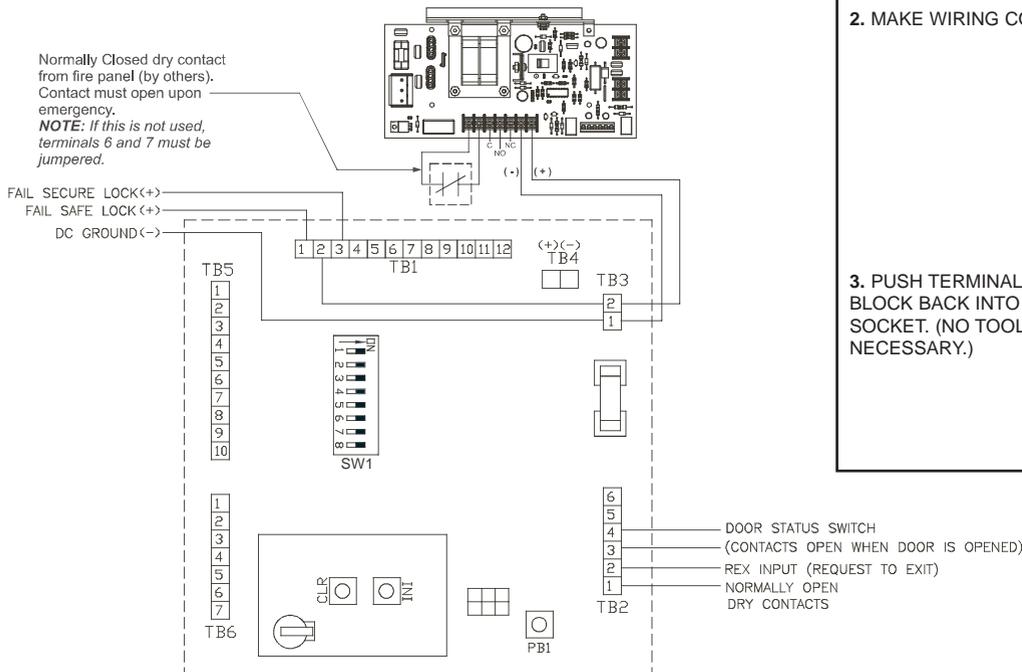
Function Code	1st Key	2nd Key	3rd Key	Function
711	Aux Relay only	Default Delay	Normal	Aux Default release
713	Aux Relay only	Default Delay	One use	Aux One-use
717	Aux Relay only	Default Delay	Double	Aux Double Use
719	Aux Relay only	Default Delay	Pass Thru	Aux Pass Thru
791	Aux Relay only	Toggle	Normal	Aux Toggle
793	Aux Relay only	Toggle	One use	Aux One-use Toggle
911	Main + Aux	Default Delay	Normal	Main + Aux Default release
913	Main + Aux	Default Delay	One use	Main + Aux One-use
917	Main + Aux	Default Delay	Double	Main + Aux Double Use
919	Main + Aux	Default Delay	Pass Thru	Main + Aux Pass Thru
991	Main + Aux	Toggle	Normal	Main + Aux Toggle
993	Main + Aux	Toggle	One use	Main + Aux One-use Toggle

**SAMPLE WIRING DIAGRAMS:**

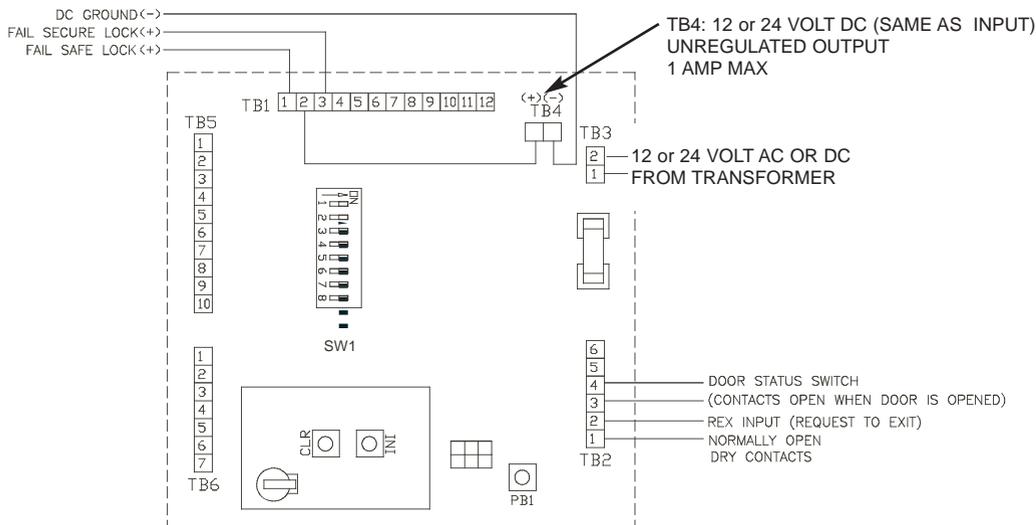
Below are two sample wiring diagrams showing only the power supply connections, connections to fail safe or fail secure lock, request to exit (REX) and door status switch. Note that the door status switches completely optional, depending on the design of your system. See dip switch settings on page 3.

**IMPORTANT: SEE PAGE 11 FOR USE OF THE MOV SPIKE SUPPRESSOR (INCLUDED).**

**CT1000/ MODEL 505 POWER SUPPLY (OR PS OPTION):**



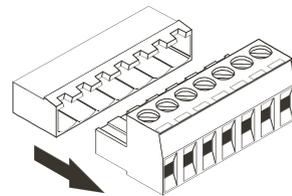
**CT1000 W/ AC TRANSFORMER:**



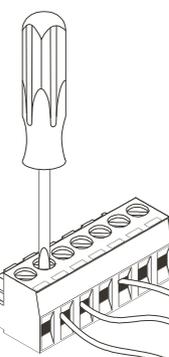
**REMOVABLE TERMINALS:**

**IMPORTANT! REMOVE SYSTEM POWER BEFORE REMOVING TERMINAL BLOCKS. ALL TERMINAL BLOCKS ARE REMOVABLE EXCEPT TB4.**

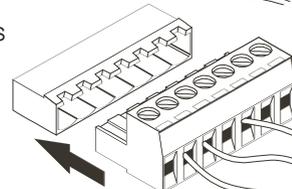
1. PULL TERMINAL BLOCK OUT OF IT'S SOCKET. (NO TOOL IS NECESSARY.)



2. MAKE WIRING CONNECTIONS.



3. PUSH TERMINAL BLOCK BACK INTO ITS SOCKET. (NO TOOL IS NECESSARY.)



**ERROR CODES:**

If an error is made while manually programming a lock, an error code indication will be indicated at the iButton reader or keypad. The LED(s) will flash several times. Count the number of flashes and refer to the chart below for diagnosis.

**No. Flashes:    Meaning:**

- 2      Code too long. Must be 3-8 digits.
- 3      Memory full, must delete some codes/iButtons/cards.
- 4      Can not delete master code: use *Change Programming* procedure (See quick guide, form 57001.)
- 5      Second entry did not match first. (occurs when attempting to change master programming code.)
- 6      Invalid entry, start over (verify any codes entered prior to this error, they may operate the lock.)
- 7      Code to be deleted does not exist.
- 8      Code too short, 3 digit minimum.
- 9      Duplicate code, code already exists.

**USE OF THE DIAGNOSTIC BUTTON PB-1:**

The pushbutton PB-1 (see page 4 for location) is for diagnosing wiring problems which can occur during installation. When pushed, it will change the state of all three relays for as long as it is pushed (Exception: if the alarm relay is already set to be energized on powerup - see page 3 for setting - it will not change state.) In addition, LED(s) on a keypad, reader, etc. will light while the button is being depressed. When the button is released, the relays will remain energized for the remainder of the relock time delay if the button is held past the relock delay, the relays will de-energize as soon as it is released. This button is intended for checking out wiring logic etc. before the system is programmed.

**TROUBLE SHOOTING:**

Some common problems associated with the installation of the CT1000 series can be easily recognized and corrected:

**Problem:**

**Possible Solution:**

System has power but lock won't lock.  
No lights on.

Check wiring. Possibly the relay is wired wrong or power is not applied to lock.

System has power but lock won't lock.  
LEDs on keypad/reader flashing.

Check wiring. Possibly the rex input is closed (instead of open).  
Dipswitch SW1-7 is off. Switch to ON. Remove power. Reapply power.

Keypads lights work but programming steps don't seem to function.

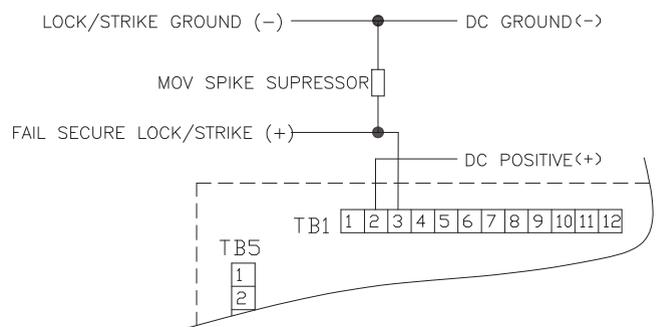
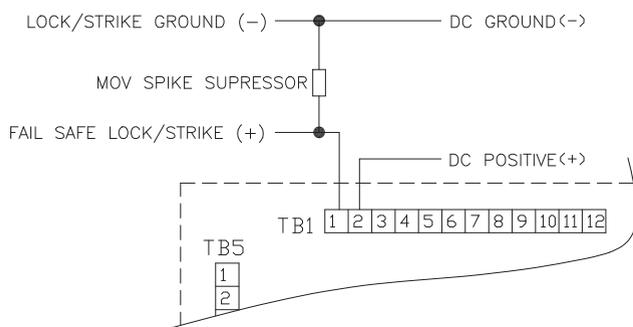
Initialized Keypad (100CAB only)  
Wrong master code, iButton, or Card.

Door Forced/Propped Alarm configured but not Active

Door Position switch not installed or wired properly.  
SW1-6 not set to ON.

**USE OF THE MOV SPIKE SUPPRESSOR:**

Some manufacturers of electric locks do not include built in spike suppressors. When the lock is turned off a high voltage spike can cause sensitive controller electronics to malfunction. If there is any doubt about the presence of spike suppression devices in a product the use of the MOV provided is required. It should be wired into the system as shown:

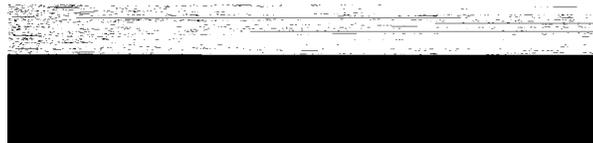




## NOTES

# Universal Controller Manual Programming Guide

See page:	For information on:
2	Universal Controller Board Layout
4	Fail Safe and Fail Secure Wiring Examples
4	Default Factory Codes
4	Clearing Memory
5	Making a Master Programming TEK, Mag Card, or Prox
5	Initializing three-wire keypads
<b>6</b>	<b>Manually Programming User Codes Only</b>
<b>7</b>	<b>Manually Programming Codes, TEKs, Cards, or Prox</b>
<b>8</b>	<b>Advanced Programming</b>
<b>9</b>	<b>Configuring Relays and Timers</b>
10	TEP1 and TEP2 Programmers (for products without keypads)
11	System 7 Programming Procedures
12	Error Codes
12	User Code Combinations
13	User Records



575 Birch Street, Forestville, CT 06010  
 Phone (860) 584-9158 ▪ Fax (860) 584-2136  
[WWW.LOCKNETICS.COM](http://WWW.LOCKNETICS.COM)

## Controller Board Layout

Refer to the Installation Instructions (Form77080) for additional information.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
NC	COM	NO	NC	COM	NO	NC	COM	NO	NC	COM	NO

Activates when a valid credential is presented or a closure is sensed on the **Request to Exit** inputs

**Main Relay (DPDT)**

Activates when a closure is sensed on the **Security Inputs**

**Alarm Relay**

Activated with advanced credentials (see Adv. Prog.)

**Aux Relay**

Relays Rating: 5 A @ 30VDC

<b>Input Power</b>	<b>1</b>
12/24 DC/AC (not polarity sensitive)	<b>2</b>

<b>Output Power</b>	<b>1</b>
(equal to input)	<b>2</b>

See Installation Instructions for Keypad/Reader Connection



SW2

DIP Switch (SW1)

5	4	3	2	1	
					NO

For normal operation set switch 4 to **ON**  
(for TEK readers only, set switch 3 & 4 to ON)

Optional Inputs (dry contact)

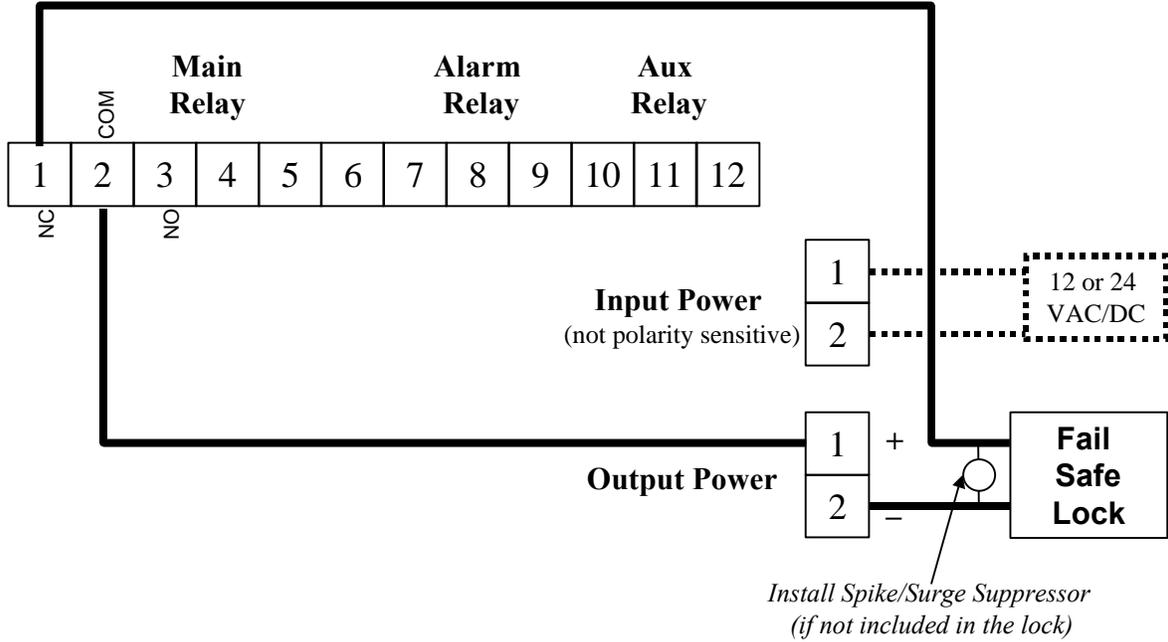
<b>Request to Exit:</b> A closure from a request to exit product will activate the <b>Main Relay</b>	<b>1</b>
	<b>2</b>
<b>Security Input:</b> A closure from a door position switch will activate the <b>Alarm Relay</b> when door is propped open or when door is forced open, also door will relock immediately upon closing	<b>3</b>
	<b>4</b>
<b>External Timer:</b> Inputs from an external timer allow credentials to work only during certain times (NO=Day, NC=Night)	<b>5</b>
	<b>6</b>

There are also four configurable onboard timers:

- **Relock Timer A, B, and C**, that can be applied to user credentials  
(see *Advanced Programming* to use a relock other than the A Relock Timer (8sec. default)  
(see *Configuring Timers* to change the relock time of any Relock Timer)
- **Door Prop Alarm Delay Timer**  
(see *Configuring Relays and Timers* to turn on the Door Prop Alarm Delay and change the delay time)

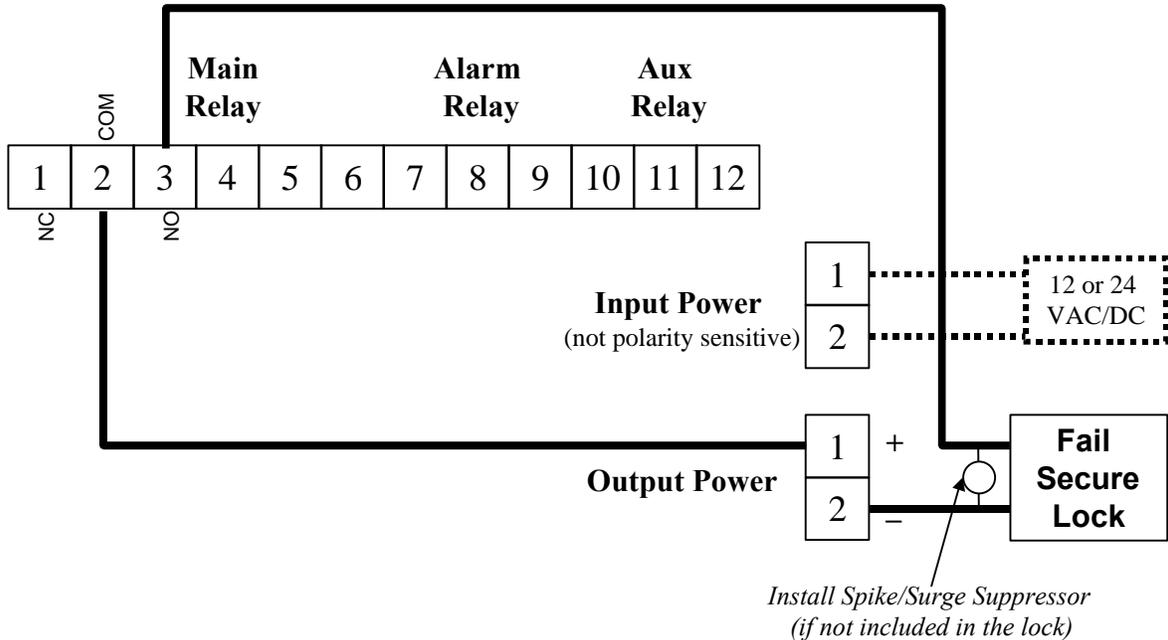
### FAIL SAFE Wiring

Refer to the installation instructions (Form77080A) for additional information.



### FAIL SECURE Wiring

Refer to the installation instructions (Form77080A) for additional information.



### Code Functions / Factory Default Codes

<i>Factory Code</i>	<i>Function</i>	<i>Description (applies to Codes, TEKs, Mag Cards, and Prox)</i>
<b>13579</b>	<i>Normal Use</i>	Normal Use codes will release a lock. While the lock is released the green LED will flash quickly. The lock remains released for a programmable amount of relock delay time.
<b>135135</b>	<i>Toggle</i>	Toggle codes will release a lock, the lock will remain released until any Toggle code is entered to reset the lock to a locked position.
<b>9115</b>	<i>Lockout</i>	Lockout codes disable all codes from operating the lock until any Lockout code is entered to reset the lock to an accessible state. When a valid code is entered while a lock is in Lockout mode, the red LED will flash quickly twelve times (indicating that the code is valid but access is not permitted.) Think of the Lockout function as a “freeze” function, it will freeze the lock in its current state (locked or unlocked) not allowing any codes to operate the lock, until a Lockout code is entered to return the lock to an accessible state.
none	<i>One Time Use</i>	One Time Use codes will only release the lock one time.
none	<i>Supervised Access</i>	Supervised Access codes require two users to be present to release the lock, two Supervised Access codes must be entered within approximately five seconds to release the lock.
<b>97531</b>	<i>Master Prog.</i>	A Master Programming Code allows access to programming functions. <b>The Master Programming Code will not release a lock</b> , it just initiates programming. When a Master Programming Code plus * is entered, the LEDs alternately flash several times indicating the lock is in programming mode. If more than 30 seconds pass between programming entries, the lock returns to the normal operational state. <b>For security reasons the factory default Master Programming Code should be changed. Changing the default Master Programming Code (or creating a Master Programming TEK/Card/Prox) automatically deletes all default factory codes.</b>
<p><b>For security reasons, change the factory default Master Programming Code (or make a Master Programming TEK / Card / Prox) this process deletes all factory default codes</b></p>		

When entering codes, if a wrong button is pressed, press \* to clear the keypad then reenter the entire code. The keypad will clear itself if no button is pressed within approximately five seconds. If any keypad buttons are pressed forty times in succession, without a successful code being entered, the keypad will shutdown for approximately thirty seconds.

### Clearing / Resetting Memory

Clearing the memory of the Universal Controller **deletes all** information that has been manually or computer programmed and configured, and **restores** the factory default values.

<p><b>To clear memory and return to the default Factory Codes</b></p>	<ol style="list-style-type: none"> <li>1. Open the cover of box that houses the Universal Controller board</li> <li>2. Press and release the microswitch pushbutton labeled <b>SW2</b>, <b>three</b> times. <i>You will hear three quick relay clicks, then a fourth after about 10 seconds.</i></li> <li>3. Close the cover.</li> </ol>
---	--

## Creating a Master Programming TEK, Mag Card, or Prox

Creating a Master Programming credential (TEK, Mag Card, or Prox) deletes all the default factory codes. Master Programming credentials only initiate programming they will not release the lock.

**A Master Programming TEK, Mag Card or Prox must be used to initiate programming if you intend to manually add user TEK, Mag Card, or Prox credentials.** (If you intend to issue only User Codes, a Master Programming Code may be used to initiate programming.)

Only one Master Programming TEK, Mag Card or Prox is allowed, any of which can be used to manually program any user credential. (Since TEKs and Prox are each unique only one TEK or Prox can be the Master Programmer for all locks - so keep it in a safe place! If a Master Mag Card is used, multiple similar coded cards may be used.)

<p><b>To make a Master Programming TEK, Master Card, or Master Prox</b></p>	<ol style="list-style-type: none"> <li>1. Open the cover of box that houses the Universal Controller board.</li> <li>2. Set the DIP switch <b>5</b> to the <b>ON</b> position (leave the rest as is).</li> <li>3. Press and release the microswitch pushbutton labeled <b>SW2</b> once. <i>The red LED will light.</i></li> <li>4. Momentarily touch/swipe the credential (TEK, Mag Card or Prox) to the reader. <i>The green and red LEDs will alternately flash several times, then the red LED remains on.</i></li> <li>5. Press and release the microswitch pushbutton labeled <b>SW2</b> once. <i>The red LED will go out.</i></li> <li>6. Return the DIP switch <b>5</b> to the <b>OFF</b> position.</li> <li>7. Close the cover.</li> </ol>
---	--

## Keypad Initialization

The following steps must be performed **only if you have a keypad connected with a three-wire cable** (100CAB), typical 12 wire cabling does not require initialization. Three-wire keypads will not function unless the following initialization procedure is performed.

<p><b>Initializing 3-wire keypads only</b> (not required for 12-wire keypads)</p>	<ol style="list-style-type: none"> <li>1. Open the cover of box that houses the Universal Controller board.</li> <li>2. Set the DIP switch <b>5</b> to the <b>ON</b> position (leave the rest as is).</li> <li>3. Press and release the microswitch pushbutton labeled <b>SW2</b> once. <i>The red LED will light.</i></li> <li>4. Momentarily touch a TEK to the reader ports on the keypad (this TEK is now the Master Programming TEK). <i>The green and red LEDs will alternately flash several times.</i></li> <li>5. After the the LEDs stop flashing press the keypad in the following order: <i>The LEDs will alternately flash after each key is pressed, wait for flashing to stop before pressing the next key.</i> <b>1 2, 3 4, 5 6, 7 8, 9 0, *</b></li> <li>6. Return the DIP switch <b>5</b> to the <b>OFF</b> position.</li> <li>7. Close the cover.</li> </ol>
---	---

## Manually Programming User Codes using a Master Programming Code

User Codes programmed in this fashion will activate the Main Relay on the controller board. The Main Relay relock time is based upon the programmed value of “A” Timer (8 sec. default). If more functionality is required see Advanced Programming procedure tables.

Programming Guidelines:

- After each step of a procedure, the red and green LEDs will alternately flash several times, WAIT FOR THE FLASHING TO STOP before continuing with the next step.
- If at any time the red LED remains on while the green LED flashes, an error has occurred (refer to page 12 for Error Code Descriptions).
- Entered codes must be 3-8 digits in length.

<i>Add Normal Use Code</i> ↓	<i>Add Toggle Code</i> ↓	<i>Add Lockout Code</i> ↓	<i>Add One Time Use Code</i> ↓	<i>Add Supervised Access</i> ↓
MasterCode *	MasterCode *	MasterCode *	MasterCode *	MasterCode *
<b>3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>
▶ NewCode *	▶ <b>1 9 1 *</b>	▶ <b>1 1 5 *</b>	▶ <b>1 1 3 *</b>	▶ <b>1 1 7 *</b>
...to add more	...to add more	...to add more	...to add more	...to add more
* to complete	* to complete	* to complete	* to complete	* to complete

<i>Change a Code</i> ↓	<i>Delete a Code</i> ↓	<i>Delete a Code with Alarm*</i> ↓	<i>Change Master Code (5 digit min)↓</i>	<i>Change “A” Timer Relock Time↓</i>
MasterCode *	MasterCode *	MasterCode *	MasterCode *	MasterCode *
<b>1 *</b>	<b>5 *</b>	<b>5 5 *</b>	<b>7 *</b>	<b>9 9 *</b>
OldCode *	▶ OldCode *	▶ OldCode *	NewMaster *	<b>1 *</b>
NewCode *	...delete more	...delete more	NewMaster *	Press and hold * for the desired time
Automatically completed	* to complete	* to complete	Automatically completed	Release * to complete

\* Deleting a user code with alarm will deny access to specified user and will activate the alarm relay.

## Manually Program User Credentials (Codes, TEKs, Cards, Prox) using a Master Programming TEK/Card/Prox

User Credentials programmed in this fashion will activate the Main Relay on the controller board. The Main Relay relock time is based upon the programmed value of “A” Timer (8 sec. default). If more functionality is required see Advanced Programming procedure tables.

Programming Guidelines:

- After each step of a procedure, **the red and green LEDs will alternately flash several times, WAIT FOR THE FLASHING TO STOP** before continuing.
- If at any time **the red LED remains on while the green LED flashes, an error has occurred** (refer to page 12 for Error Code Descriptions).
- When adding a user credential (TEK, Mag Card, or Prox) a code (3-8 digits) is entered just prior to swiping or touching the credential. This code becomes an identifier used to identify the credential (this allows a credential to be deleted by entering the identifying code during the deletion procedure - without physically having the credential to be deleted). Codes used to identify a credential will NOT operate the lock (unless the lock is also computer programmed – mixing manual and computer programming on the same lock is not recommended).

<i>Add Normal Use credential</i> ↓	<i>Add Toggle credential</i> ↓	<i>Add Lockout credential</i> ↓	<i>Add One Time Use credential</i> ↓	<i>Add Supervised Access credential</i> ↓
Initiate programming, by touching/swiping the <b>Master TEK/Card/Prox</b> , then continue ...				
<b>3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>
▶ <b>NewCode *</b>	▶ <b>1 9 1 *</b>	▶ <b>1 1 5 *</b>	▶ <b>1 1 3 *</b>	▶ <b>1 1 7 *</b>
swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only
...to add more	...to add more	...to add more	...to add more	...to add more
* to complete	* to complete	* to complete	* to complete	* to complete

<i>Change a User Code or Identifier Code</i> ↓	<i>Delete a credential</i> ↓	<i>Delete a credential with alarm</i> † ↓	<i>Change Master Prog. credential</i> ↓	<i>Change “A” Timer Relock Time</i> ↓
Initiate programming, by touching/swiping the <b>Master TEK/Card/Prox</b> , then continue ...				
<b>1 *</b>	<b>5 *</b>	<b>5 5 *</b>	<b>7 *</b>	<b>9 9 *</b>
OldCode *	▶ OldCode *	▶ OldCode *	swipe/touch new Master Prog credential	<b>1 *</b>
NewCode *	... delete more	... delete more		Press and hold * for the desired time
** to complete	* to complete	* to complete	Automatically completed	Release * to complete

† Deleting a user code with alarm will deny access to specified user and will activate the alarm relay.

## ADVANCED PROGRAMMING

The advanced programming procedures must be used to allow for:

- User credentials to have different relock delay timers (regular programming defaults to Timer A)
- User credentials to activate different relays (regular programming defaults to Main relay only)
- User credentials to work during the Day, Night, or 24hrs (for this functionality an external electronic timer, or switch, must be connected to the External Timer inputs of the Controller board)

<b>The programming procedures below contain two variables Y and Z:</b>	
<p><i>Replace the Y with one of the following</i></p> <p><b>1 = Day credential, activates Main relay only</b></p> <p><b>3 = Night credential, activates Main relay only</b></p> <p><b>5 = 24hr credential, activates Main relay only</b></p> <p><b>7 = 24hr credential, activates Aux relay only</b></p> <p><b>9 = 24hr credential, activates Main &amp; Aux relay</b></p>	<p><i>Replace the Z with one of the following</i></p> <p><b>1 = apply the A Relock Timer (8 sec default)</b></p> <p><b>5 = apply the B Relock Timer (2 sec default)</b></p> <p><b>7 = apply the C Relock Timer (20 sec default)</b></p>

Add Normal Use credential ↴	Add Toggle credential ↴	Add Lockout credential ↴	Add One Time Use credential ↴	Add Supervised Access credential ↴
Initiate programming, by touching/swiping the <b>Master TEK/Card/Prox</b> , then continue ...				
<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>	<b>3 3 *</b>
➔ <b>Y Z 1 *</b>	➔ <b>Y 9 1 *</b>	➔ <b>Y 1 5 *</b>	➔ <b>Y Z 3 *</b>	➔ <b>Y Z 7 *</b>
NewCode *	NewCode *	NewCode *	NewCode *	NewCode *
swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only	swipe/touch the user credential or press * for User Code only
...to add more	...to add more	...to add more	...to add more	...to add more
* to complete	* to complete	* to complete	* to complete	* to complete

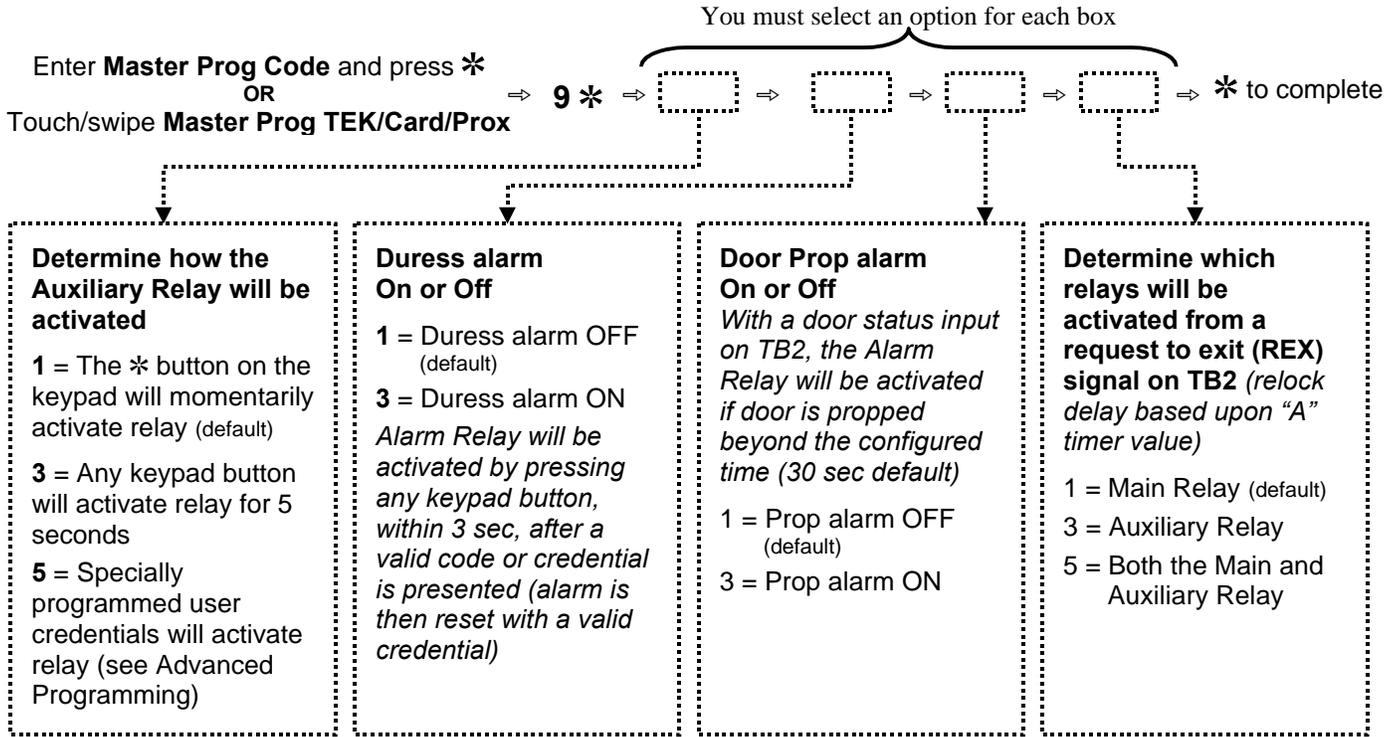
Change a User Code or Identifier Code ↴	Delete a credential ↴	Delete a credential with alarm <sup>†</sup> ↴	Change Master Prog. credential ↴	Change Relock Time ↴
Initiate programming, by touching/swiping the <b>Master TEK/Card/Prox</b> , then continue ...				
<b>1 *</b>	<b>5 *</b>	<b>5 5 *</b>	<b>7 *</b>	<b>9 9 *</b>
OldCode *	➔ OldCode *	➔ OldCode *	swipe/touch new Master Prog credential	Choose timer ⇒
NewCode *	... delete more	... delete more		Press and hold * for the desired time
** to complete	* to complete	* to complete	Automatically completed	Release * to complete

1 \* for Timer A  
 3 \* for Timer B  
 5 \* for Timer C  
 7 \* for Door Prop Alarm Delay

<sup>†</sup> Deleting a user code with alarm will deny access to specified user and will activate the alarm relay.

## Configuring Relay Activation

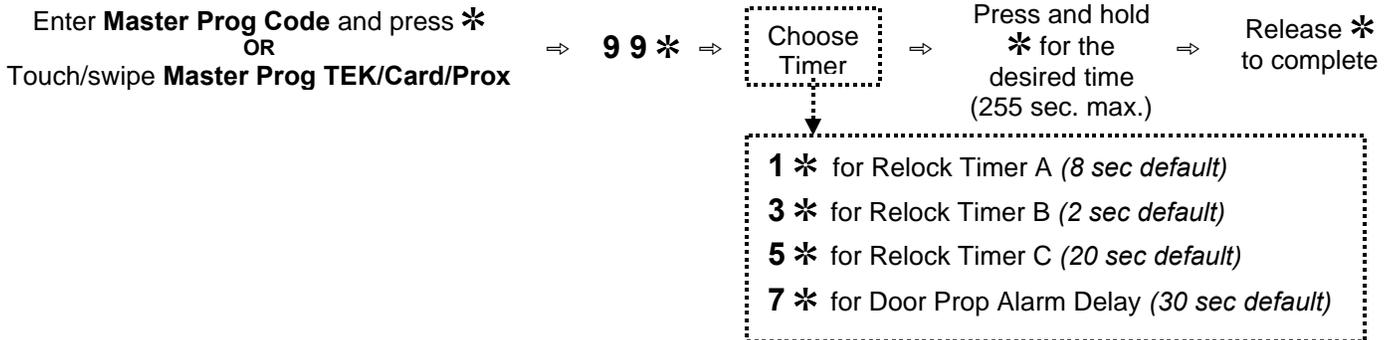
There are three configurable relays on the Controller Board; Main, Alarm, and Auxiliary. If desired, configure how the relays are to be activated by performing the following programming sequence (left to right):



*If you reset the Controller memory, the relay settings will return to the factory default values.*

## Configuring Timers

There are four configurable timers on the Controller Board; A, B, and C Relock Timers, and Door Prop Alarm Timer. The A Timer is the default relock timer used on the Main Relay (see Advanced Programming for more functionality). If desired, configure the timer values by performing the following programming sequence (left to right):



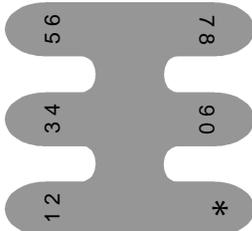
*If you reset the Controller memory, the timer settings will return to the factory default values.*

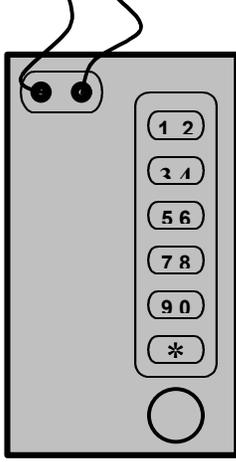
## TEP1 and TEP2 Programmers

TEP1 and TEP2 Programmers are used to manually program locking devices that do not have an on-board keypad. The TEP1 and TEP2 Programmers act as the keypad during programming.

The TEP1 or TEP2 Programmers must be initialized with each lock in order for the lock to recognize the Programmers as a keypad. During the initialization procedure (outlined in the tables below), a Master Programming Credential (TEK, Card, Prox) is created.

When programming with a TEP1 or TEP2 Programmer, the Master Programming Credential created during the initialization procedure is used to initiate programming, then the TEP1 or TEP2 Programmer is used as the keypad.

<p><b>TEP1 Initialization</b></p> 	<ol style="list-style-type: none"> <li>1. Open the cover of box that houses the Universal Controller board</li> <li>2. On the DIP switch, set switch <b>5</b> to the <b>ON</b> position (keep others as is)</li> <li>3. Press and release the microswitch pushbutton labeled <b>SW2</b> one time. <i>The red LED will light.</i></li> <li>4. Touch and release a TEK to the reader on the TEP2 <b>OR</b> swipe a credential (Mag Card or Prox) to the lock reader, this credential is now the Master Programming Credential. <i>The green and red LEDs will alternately flash several times, then the red LED remains on.</i></li> <li>5. Take the TEP1 Programmer and touch each TEK to the reader in the following order: <b>1 2, 3 4, 5 6, 7 8, 9 0, *</b> (<i>LEDs will flash after each entry</i>) Note: If more than 30 seconds pass between entries, you must start over.</li> <li>6. Return the DIP switch <b>5</b> to the <b>OFF</b> position</li> <li>7. Close the cover of box that houses the Universal Controller board</li> </ol>
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<p><b>TEP2 Initialization</b></p> 	<ol style="list-style-type: none"> <li>1. Open the cover of box that houses the Universal Controller board</li> <li>2. Connect the TEP2 Programmer to the reader on the lock as follows: RED wire to LEFT SIDE of the reader BLACK wire to the RIGHT SIDE of the reader</li> <li>3. On the DIP switch, set switch <b>5</b> to the <b>ON</b> position (keep others as is)</li> <li>4. Press and release the microswitch pushbutton labeled <b>SW2</b> one time. <i>The red LED will light.</i></li> <li>5. Touch and release a TEK to the reader on the TEP2 <b>OR</b> swipe a credential (Mag Card or Prox) to the lock reader, this credential is now the Master Programming Credential. <i>The green and red LEDs will alternately flash several times.</i></li> <li>6. After the the LEDs stop flashing press the keypad in the following order: <i>The LEDs will alternately flash after each key is pressed, wait for flashing to stop before pressing the next key.</i> <b>1 2, 3 4, 5 6, 7 8, 9 0, *</b> Note: If more than 30 seconds pass between entries, you must start over.</li> <li>7. Return the DIP switch <b>5</b> to the <b>OFF</b> position</li> <li>8. Close the cover of box that houses the Universal Controller board</li> </ol>
---	---

## System 7 Programming

This procedure allows you to manually program up to 7 TEKs, Cards, or Prox credentials without the use of a programming computer or any knowledge of manual programming procedures. This method is primarily intended for the installer to quickly create a few credentials after installation (this method conveniently deletes the factory default codes; Normal, Lockout, and Toggle).

Seven credentials are programmed sequentially as follows:

- Credential #1 – Normal User
- Credential #2 – Toggle
- Credential #3 – Lockout
- Credential #4 – Normal User
- Credential #5 – Normal User
- Credential #6 – Normal User
- Credential #7 – Normal User

*Be sure to label credentials #2 and #3 since they have different functions.*

### System 7 Programming Procedure

1. Open the cover of box that houses the Universal Controller board.
2. On the DIP switch, set switch **1** to the **ON** position (leave other switches as is).
3. Press and release the microswitch pushbutton labeled **SW2** one time.  
*The red LED will light.*
4. Swipe/touch a credential to the reader.  
*The red and green LEDs will alternately flash several times, indicating acceptance. Wait for the LEDs to stop blinking before continuing.*
5. Repeat step 4 for the remaining credential (be sure to wait for the LEDs to stop blinking before swiping/touching the next credential).
6. If seven credentials are programmed the red LED will turn off after the seventh credential is accepted. If less than seven credentials are programmed, press the **SW2** microswitch once to end the programming.  
*The red LED will turn off.*
7. Return the DIP switch **1** to the **OFF** position .
8. Close the cover.

**NOTES:**

- a) System 7 Programming will delete all factory default codes except for the default Master Programming Code
- b) If the lock is later computer programmed, all System 7 programmed credentials will be deleted.  
**Manual programming does not delete any System 7 programmed credentials.**
- c) Reprogramming using System 7 Programming procedures:  
System 7 Programming can be done more than once for each credential type (TEK, Card or Prox). During the reprogramming of a credential type, any previously programmed System 7 data will be erased for that given credential type only (not both). Therefore, if the intent of reprogramming is to add new credential and delete any existing credentials, the lock memory must be cleared prior to reprogramming. (Refer to page 3 for instructions on clearing memory.) *For example, if a set of Cards and a set of TEKs were programmed using System 7, and then System 7 Programming was performed again for another set of Cards, all the previously programmed Card data would be deleted, but the TEK data would **not** be deleted. For the TEK data to also be deleted, the lock memory would have to be cleared **before** the reprogramming is done.*

## Error Code Descriptions

If an error occurs during programming, the red LED remains lit while the green LED flashes an error code. **A flashing error code is repeated three times (with a pause in between each set of flashes).** Count the number of flashes to determine the error code, then consult the chart below.

<i>Number of Green LED Flashes</i>	<i>Error Description</i>
2	Code entered is too long, 8 digits max. (7 digits max. on Pro Series locks)
3	Memory full, user code capacity of lock has been exceeded
4	Master Prog Code must be changed with <i>Change Master Prog Code</i> procedure
5	The second entry for verification of a new Master Prog Code did not match the first
6	Invalid command, press * and start over (previous programming, up to this error, may still be valid)
7	Code to deleted does not exist
8	Code entered is too short (3 digits min. for user codes, a Master Prog Code must be 5 digits min.)
9	Duplication, the code entered already exists
10	Manual programming has been disabled (a <i>Preference</i> option set during computer programming)

## User Code Combinations

When entering codes, if a wrong button is pressed, press \* to clear the keypad then reenter the entire code. The keypad will clear itself if no button is pressed within approximately five seconds.

If any keypad buttons are pressed forty times in succession, without a successful code being entered, the keypad will shutdown for approximately thirty seconds.

User codes must be 3-8 digits in length (3-7 digits on Pro Series locks). Security increases as the number of digits in a user code increases. The chart below provides the total number of possible combinations, based upon the length of the user code.

<i>User Code Length</i>	<i>Possible Combinations</i>
3	125
4	625
5	3125
6	15625
7	78125
8	390625

Keep in mind that the keypads contain 5 buttons, and each button represents two numbers, so the code 2468 is identical to code 1357 (as far as the lock is concerned). If you plan to administer and track codes manually, **issue codes exclusively with all odd or all even numbers**, this practice will make it easier to spot duplicate codes (the final page of this document provides space for you to record issued codes). An error code will occur during programming if a duplicate code is attempted.

Codes of varying length can be used in the same lock but this will effect the total number of possible combinations. For example, if you choose five digit User Codes to be the standard, and then add a three digit User Code such as 246, no other five digit code beginning with 246 can be used.



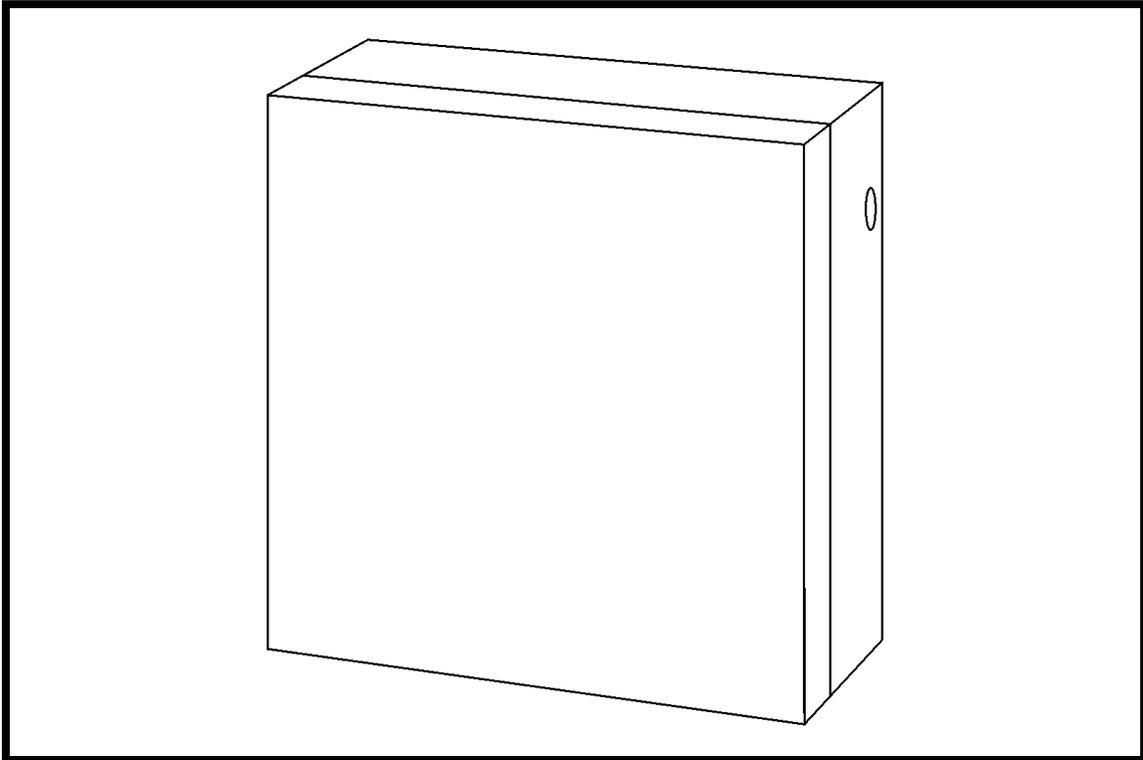




# Offline Hardwired Access Control Systems

## INSTALLATION & PROGRAMMING MANUAL

### CT500



### UNIVERSAL ACCESS CONTROLLER



# CT500 INSTALLATION & PROGRAMMING MANUAL

## Table of Contents / Contact Information

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**PLEASE READ ALL INSTRUCTIONS PRIOR TO INSTALLING THE SYSTEM.**  
**HANDLE ALL EQUIPMENT CAREFULLY.**

**IMPORTANT:** This manual is intended to be kept for programming, maintenance, and trouble shooting purposes. Do not dispose of after installation. Please present this manual to facility manager upon completion of installation.

### Table of Contents:

Contact Information: .....	2
Compatible Readers: .....	3
Specifications: .....	4
Getting Started: .....	4
Typical System Installation: .....	5
Overview on Installation: .....	6
Set Dipswitches: .....	6
Wiring: .....	7
Wire Colors: .....	8
Programming: .....	9
Definition of Access Functions and Factory Defaults: .....	10
Creating a Master iButton/Card: .....	11
Keypad/100CAB Initialization: .....	11
Programmer Initialization TEP1: .....	11
System 7 Programming: .....	12
Erasing Memory: .....	12
Setting Time Delays: .....	13
Configuring the System: .....	14
Manual Programming - Keypad - Codes Only: .....	15
Manual Programming - Codes, Cards and iButtons: .....	16
3-Digit Function Codes: .....	17
Sample Wiring Diagrams: .....	18
Error Codes: .....	19
Troubleshooting: .....	19
NOTES: .....	20

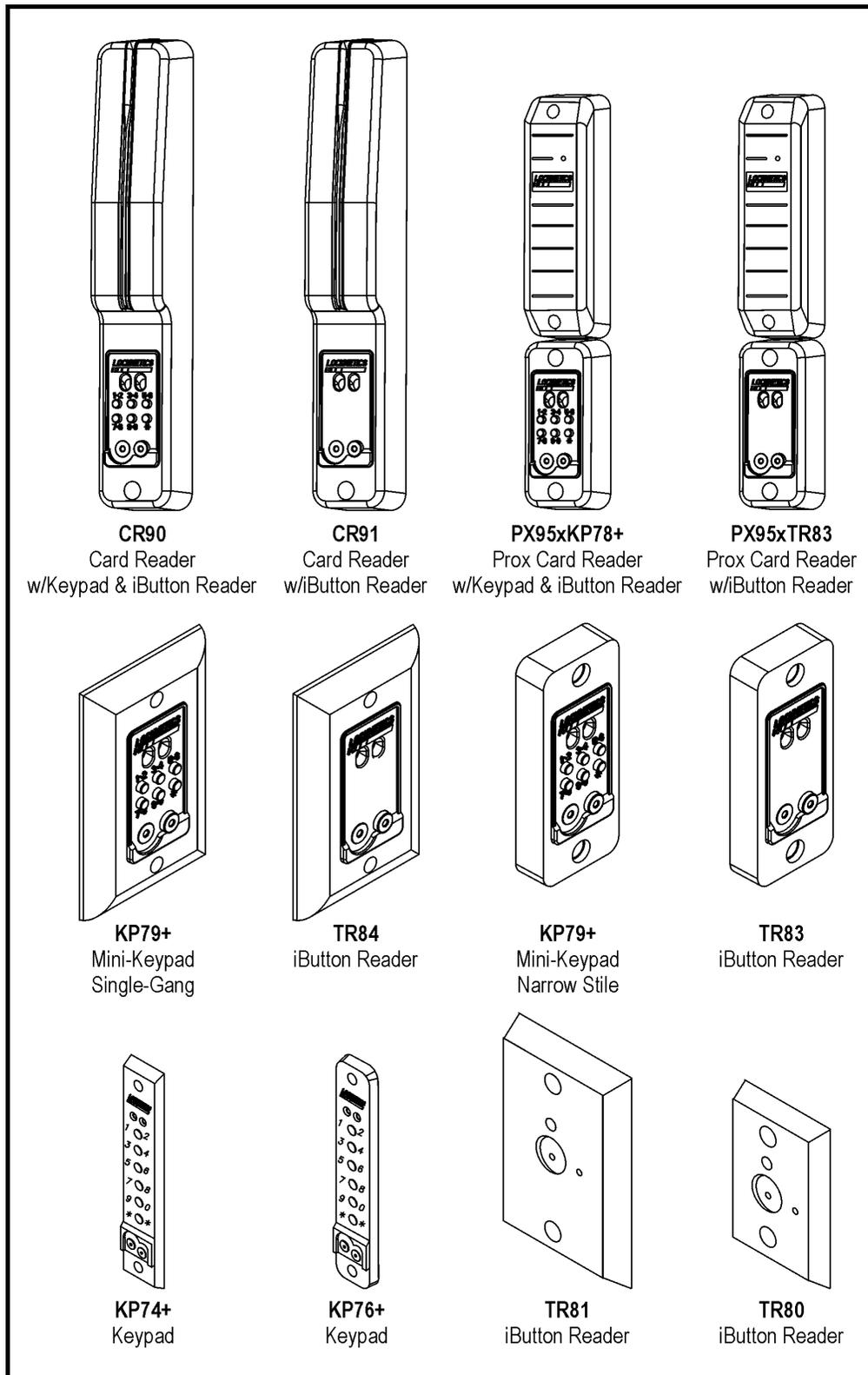
### Contact Information:

**Schlage Lock Company**  
575 Birch Street  
Forestville, CT 06010  
technical support: 866-322-1237  
fax: 860-584-2136  
<http://www.irsupport.net>

# CT500 INSTALLATION & PROGRAMMING MANUAL

## Compatible Readers

### Compatible Readers:



# CT500 INSTALLATION & PROGRAMMING MANUAL

## *Specifications / Getting Started*

---

### **Specifications:**

#### **Electrical:**

Input Voltage: 12 to 24 VAC/VDC

Current Draw: 200mA max.

DC Output Voltage (with AC input): 1 amp max. (Matches input voltage)

#### **Control Relays:**

Main -DPDT contacts, 5 amp max @ 30VDC

Aux -SPDT contacts, 5 amp max @ 30VDC

Alarm -SPDT contacts, 5 amp max @ 30VDC

#### **Programmable Users:**

500 User Codes/iButtons, mag-stripe or prox cards.

#### **4 Internal “Timers”:**

All Adjustable 0-255 Seconds.

### **Getting Started:**

The CT500 universal access controller can be interfaced to any Schlage access control devices such as iButton readers or Keypads. The CT500 can also be used with mag-stripe emulation output HID Prox Card readers as well as magnetic stripe card readers. The unit may have been ordered with the PS option (505 power supply in the same enclosure). If it does not have a supply, one will be required. Make sure that the supply chosen will meet the electrical requirements of all components in the system. Note that electrical power gets dissipated over long wire runs so it is important that the equipment be located close to the opening it is controlling.

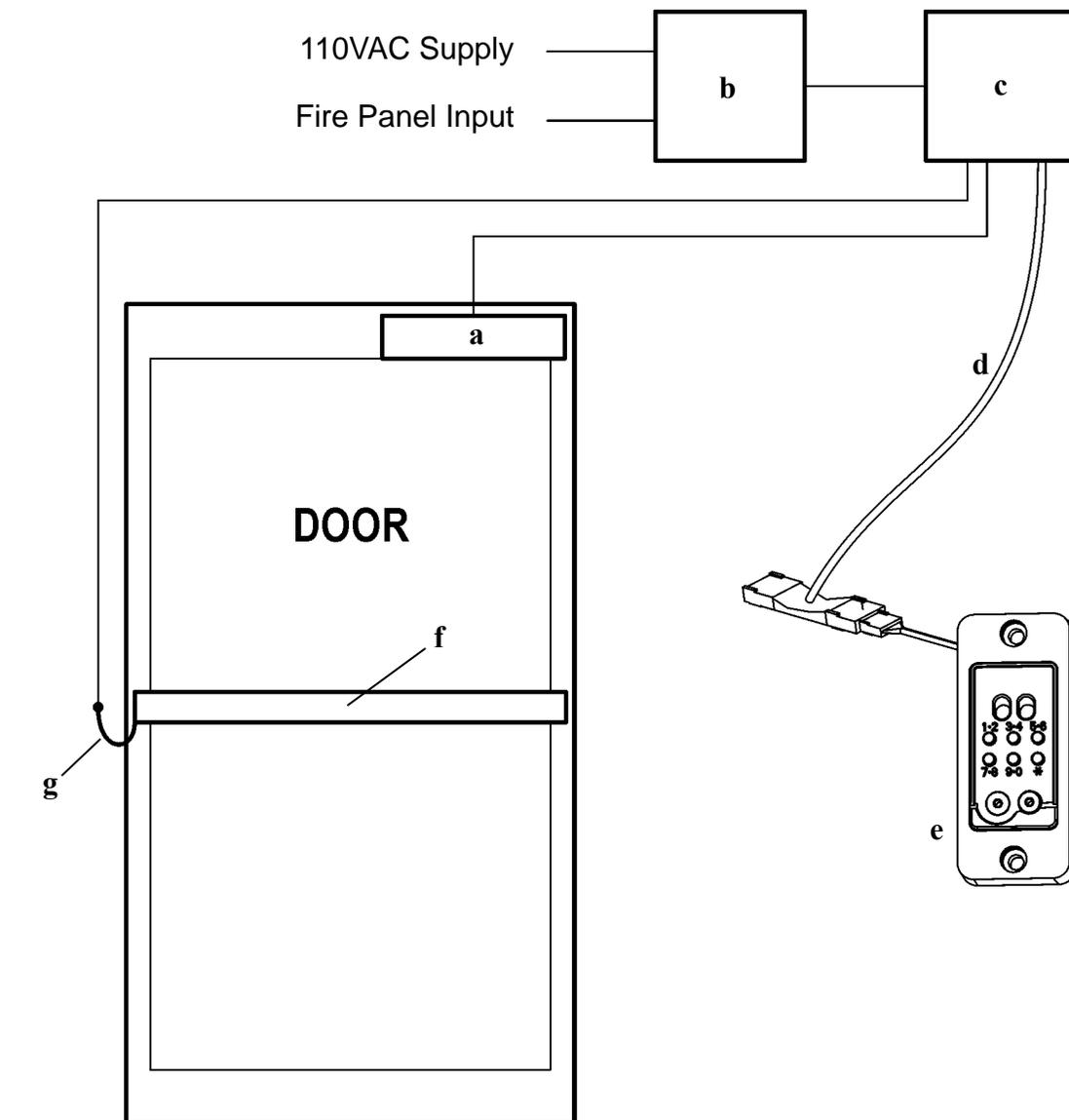
Consult national electric code handbook for information regarding wire run lengths and minimum required wire gauge and type for the voltage and current in the system.

# CT500 INSTALLATION & PROGRAMMING MANUAL

## Typical System Installation

### Typical System Installation:

A typical installation consists of a locking device (magnetic lock (a), electric strike, etc.), a power supply (b), a controller (c), an adapter cable (d) (in some cases), an access control (keypad (e), card reader, etc.), an exit control (exit device (f), pushbutton, etc.), and door cord (g) or electric hinge. Any installation involving modification or specification of an opening which is considered to be a means of egress (emergency exit) or a fire rated opening must conform to all local and national life safety and building codes. The specific gage and number of wires will vary with the kind of equipment used, the intended function, and local and national building codes. In most cases it is required that magnetic locks open in the event of a fire alarm condition. (Consult local authority having jurisdiction.)



# CT500 INSTALLATION & PROGRAMMING MANUAL

## Overview on Installation / Set Dipswitches

### Overview on Installation:

#### 1) 1. INSTALL COMPONENTS

- A. Determine where each component will be located. Mount Controller and Power Supply to Wall. Run conduit as required by local and national codes.
- B. Follow instructions included with Access Control device to mount it and run wires to controller.
- C. Mount Lock.

#### 2) 2. MAKE WIRING CONNECTIONS

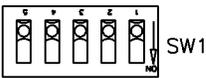
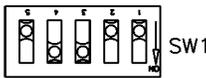
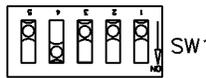
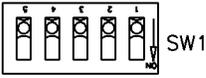
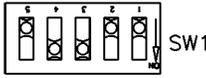
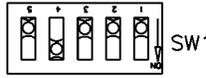
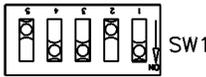
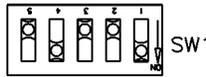
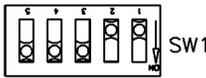
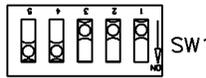
- A. Set Dipswitches correctly for your system.
- B. Make wiring connections as required.
- C. Connect Power.

#### 3) 3. CONFIGURE AND PROGRAM SYSTEM

- A. Initialize Master iButton/Card and programmer as required.
- B. Configure and Program System.
- C. Test System.

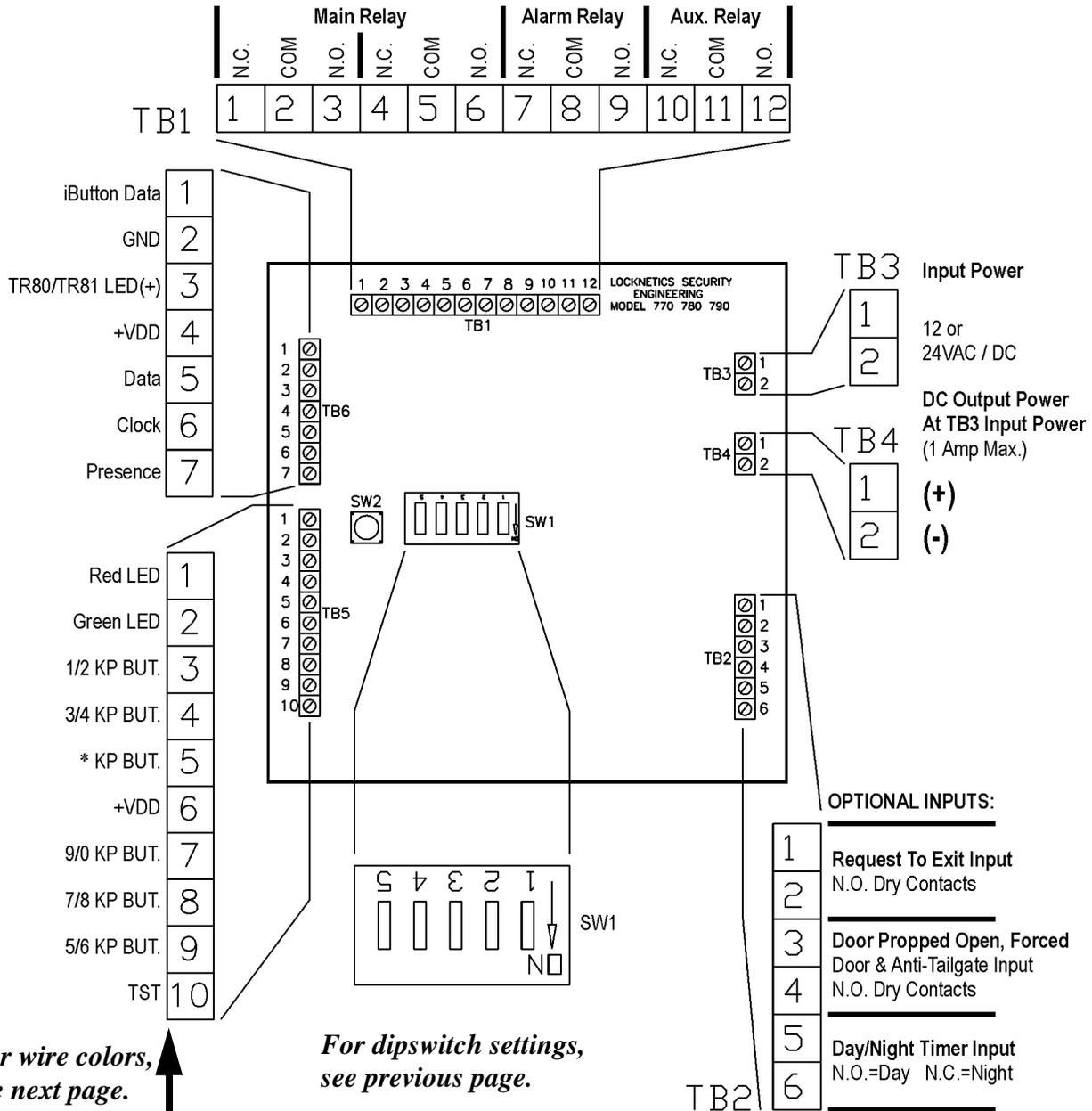
### 1) Set Dipswitches:

The Universal Access Control Board can accommodate virtually all types of Schlage access control. Set the dipswitches (SW1) according to your system requirements for "Normal Operation". Consult the table below for the desired setting. Note that different positions are required depending on the function desired. Keypad only access control is also available. Note: if the board is replacing an older board, CT500 Universal controller can be used with almost any type of keypad or iButton reader offered by Schlage in the past; simply connect all wires which were previously connected as shown in the board layout in this document.

	<b>Keypad Only/770CAB</b> Enables simplified programming of codes only by keypad. Computer programming also possible.	<b>TR80/TR81/100CAB</b> Manual programming by TEP1, TEP2, or computer programming	<b>770CAB</b> Magstripe or prox cards, codes, iButtons, manual or computer programming.
NORMAL OPERATION	 SW1	 SW1	 SW1
CLEAR MEMORY (PRESS SW2 three times)	 SW1	 SW1	 SW1
"SYSTEM 7" (PRESS SW2 one time)		 SW1	 SW1
PROGRAMMING INITIALIZATION MASTER iBUTTON/CARD (PRESS SW2 one time)		 SW1	 SW1

### 2) Wiring:

Note that the main relay is a double pole, double throw relay. TB4 will put out DC unregulated voltage up to one Amp. Note that it is not necessary to use this terminal if your system already uses DC voltage from a power supply.



**Request to Exit:** Closing contacts will activate relays for eight seconds (timer adjustable see page 13)

**Door Prop:** Triggers Alarm Relay when door is held open for 30sec. (Requires door position switch.)

**Anti-Tailgate:** Allows relocking of door immediately upon reclosing. (Requires door position switch.)

**Forced Door:** Triggers Alarm Relay when door is forced open without a legal release. (Requires door position switch.)

**Day/Night Timer:** Input from an external timer allows codes to work only during certain times of day.

# CT500 INSTALLATION & PROGRAMMING MANUAL

## Wire Colors

### • Wire Colors:

Make connections to the access control device or adapter cable as required. Be sure that all wiring is correct before power is applied. If more than one card reader or prox card reader must be wired, a CR2 adapter board will be required. Refer to the instructions included with the adapter board for special wiring instructions.

* 100CAB or TR80/TR81 Cable	770CAB (KP70+ & TR83/TR84)	CR90/CR91 Card Reader	PX95 Prox Card Reader
TB6 White 1 Black 2 Red 3 4 5 6 7	TB6 Tan 1 Grey 2 3 4 5 6 7	TB6 <Brown> 1 <Black> 2 3 4 <Red> 5 <Orange> 6 <Yellow> 7	TB6 1 Black 2 3 Red 4 Green 5 White 6 Violet 7
1 2 3 4 5 6 7 8 9 10 TB5	Green 1 Blue 2 Violet 3 Yellow 4 Orange 5 *Brown 6 Red 7 White 8 Black 9 Pink 10 TB5	<Green> 1 <Blue> 2 White 3 White/Black 4 White/Brown 5 <Violet> 6 White/Red 7 White/Orange 8 White/Yellow 9 <Grey> 10 TB5	1 2 3 4 5 6 7 8 9 10 TB5

**NOTES:**

- \*1. 100CAB must be initialized to function with a keypad.
- 2. Only one 100CAB adapter cable can be wired. Two keypads can be connected to a single 100CAB.
- 3. Two TR80 or TR81 touch readers can be wired in parallel.

**NOTES:**

- \*1. New 770CAB adapter cables are shipped with the brown wire clipped. It is not necessary to connect it.
- 2. Consult factory when connecting older keypads that do not use the 770CAB cable to new controller

**NOTES:**

- 1. All 15 wires shown must be connected on the CR90 models.
- 2. On CR91 models, connect the 9 wires which are <bracketed> to the terminals shown.

**NOTES:**

- 1. The PX95 requires the use of a iButton capable device for programming. Use connection information for appropriate device as shown in addition to information above (usually, a 770CAB with a keypad or iButton reader). There will therefore be two wires on some terminals. This is normal.

### 3) Programming:

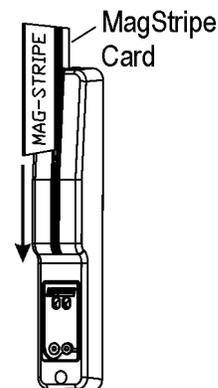
#### GENERAL INFORMATION:

Programming the CT500 can be done either by computer programming or manually, using the keypad, or TEP1 programmer. The standard unit can have up to 500 codes, cards, or iButtons. Their functions can be chosen using software or by manually adding the code/card/iButton and function (see “Definition of Code/iButton functions and factory defaults” on page 10). Day/Night time zones can be arbitrarily established with an external timer. (See page 7 for terminal details and “day/night/24 hour” information on page 10) When manual programming, it is critical to keep a record of the people and codes/cards/iButtons which are issued to them along with their functions and PIN numbers (for cards or iButtons). This will enable the ability to manage the access system properly. Time delays can be set either manually or using computer programming.

The units come from the factory with preset factory default codes (described on page 10). When the lock is reset (memory erased), it will return to factory default codes. A keypad (using the 100CAB) or TEP1 and Master Card/iButton will need to be initialized again. Initializing a Master Card/iButton, TEP1, or changing the Master Code, or computer programming, will erase the factory default codes and “System 7” cards and iButtons.

When programming with a computer, it is possible to enable or disable manual programming. If manual programming is enabled, and a code, card, or iButton is entered manually, the Audit Trail Report will be corrupted. Using the “System 7” programming method, up to 7 iButtons and/or cards can be entered into a unit. (See page 12.)

WHEN SWIPING MAG-STRIPE CARDS THE STRIPE MUST BE TO THE RIGHT AS SHOWN. INSERT THE CARD AT THE TOP OF THE READER AND SWIPE SMOOTHLY DOWNWARD.



WHEN SWIPING PROX CARDS OR FOBS, SIMPLY PRESENT THE CARD OR FOB WITHIN A FEW INCHES OF THE READER.



# CT500 INSTALLATION & PROGRAMMING MANUAL

## Definition of Access Functions and Factory Defaults

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### • Definition of Access Functions and Factory Defaults:

	Factory Default	
MASTER	97531	Allows access to programming functions. Will not activate relays.
NORMAL ACCESS	13579	Activates main relay for relock time delay. Will reset alarm condition.
TOGGLE	135135	Activates main relay until same or another Toggle code/card/iButton is entered.
LOCKOUT	9115	“Freezes” the lock in its present condition, either locked or unlocked, until the same or another Lockout code/card/iButton is entered.

**ONE-TIME ACCESS:** No factory default. This type of code/card/iButton will allow access only once. It will then become deleted from memory.

**SUPERVISED ACCESS:** No factory default. This type of code/card/iButton allows access only when used with another Supervised Access code/card/iButton. The second code/card/iButton must be entered within five seconds of the first one. The order that they are entered does not matter. The second supervised access credential entered will be reported on the ATR.

**DAY/NIGHT/24 HOUR:** Closed dry contact from an external timer on TB2 terminals 5 and 6 sets the lock into “night” mode. Open or no contacts set the lock into “day” mode. Code/card/iButtons can be entered into memory by computer or manually. For manual entry use “Add User Code/card/iButton and Function” programming sequences on page 15 (for codes only) or page 16 (for codes/cards/iButtons)

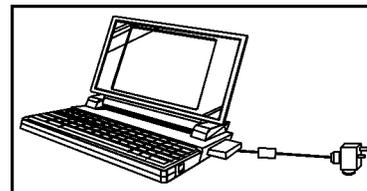
# CT500 INSTALLATION & PROGRAMMING MANUAL

## Creating a Master iButton & Card / Keypad & 100CAB Init. / TEP1

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### 4) Creating a Master iButton/Card: (for computer programming)

- 1) Open the cover of the controller and set dipswitch SW1 for Master iButton/card initialization according to the type of system you are using (see page 6).
- 2) Press SW2 once.
- 3) Touch Master iButton to reader (or swipe the Master Card). The LED(s) will flash to indicate acceptance.
- 4) When you are finished, return the dipswitches to “normal” operation.



#### NOTES:

1. Refer to instructions included with the programmer/software that you will use to program for more information regarding programming.
2. The Master iButton is used for initiating programming. It will not unlock the door.
3. If audit trail is required, be sure that the lock controllers being used have the ATR chip installed.

*IMPORTANT: This version of the CT500 is not compatible with the DOS-based LockTrak software. Schlage software which supports magstripe/prox cards is required. Consult your distributor for product offering and availability.*

### 5) Keypad/100CAB Initialization: (required to enable keypad)

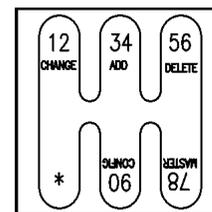
It is necessary to initialize the keypad/100CAB any time that the memory is erased.

- A. Set SW1 dipswitch for iButton Programmer Initialization (see page 6).
- B. Press SW2 one time. The relay on the board should “click”.
- C. Touch the iButton which will be used as the master iButton to the reader. When The LEDs stop flashing, press the 1-2 key. When the lights stop flashing press the 3-4 key, and so on until you press the (\*) key.
- D. Return SW1 dipswitch to its original position.
- E. Follow programming instructions on page 15 and page 16.

### 6) Programmer Initialization TEP1:

TEP1 programmers are intended to simulate a keypad and are required to manually program iButtons or Cards using an iButton-only device. It is necessary to initialize the TEP1 and Master iButton or Card any time that the memory is erased.

1. Open controller cover and set dipswitches for TEP1 initialization. Press SW2 once.
2. Touch Master iButton to reader (or swipe Master Card).
3. Take the TEP1 programmer and touch reader with each disc in the following order:
  - Wait for LEDs to stop flashing before touching next key or pushing next button.
  - Waiting longer than 30 seconds will terminate initialization.
4. After the last key/button is entered, the LEDs will flash, indicating that programming has ended.
5. Return dipswitch to its original position.



TEP1

# CT500 INSTALLATION & PROGRAMMING MANUAL

## System 7 Programming / Erasing Memory

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### 7) System 7 Programming:

Follow this procedure to create 7 iButtons (or cards) without the use of a separate programmer. Note that 7 iButtons or 7 cards can be entered and up to 7 more, provided that the first 7 were all cards or all iButtons. (If the first 7 were cards then the second 7 must be iButtons and visa versa). The function will be determined by the order they are entered, as shown below. Each time system 7 programming is done, previously "System 7" programmed cards/iButtons will be erased. Computer programming, initializing a master iButton/card, or erasing memory will also delete iButtons/cards programmed by this method.

1. Label the 7 iButtons/Cards as follows:

#1 User iButton/Card

#2 Toggle iButton/Card

#3 Lockout iButton/Card

#4 User iButton/Card

#5 User iButton/Card

#6 User iButton/Card

#7 User iButton/Card

2. Open cover of controller and set dipswitches for "System Seven" according to the system you have (See page 6).

3. Momentarily depress SW2 microswitch once. The red LED (or both LED's w/ 100CAB) will turn on.

4. Touch iButton #1 to the reader (or swipe card). The LED will flash indicating acceptance.

5. Wait for the LED(s) to stop flashing before entering the next iButton (or swiping the next card).

Repeat Step 4 using iButton/card #2 thru iButton/card #7.

6. If fewer than 7 iButtons (or cards) were programmed, press SW2 microswitch once to end programming. The LED will turn off.

### 8) Erasing Memory:

(return to factory defaults)

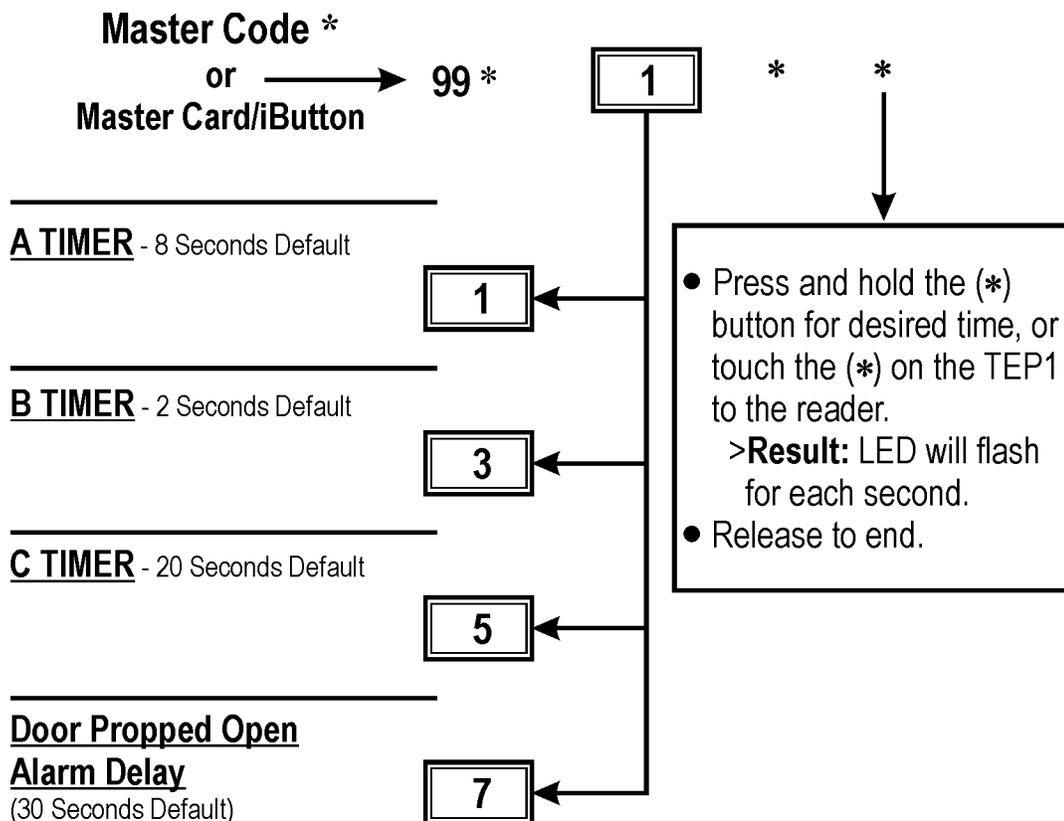
**IMPORTANT: Resetting will delete all Keypad codes, iButtons/Cards, Master iButton/Card, and TEP programmers from the lock memory. All time delays and default codes will be restored to default values.**

1. Open cover of controller and set dipswitches according to chart on page 6.

2. Depress SW2 microswitch three times. Relay clicking may be heard.

### 9) Setting Time Delays:

In most cases, the default time delays are sufficient. If advanced functions are required, follow the steps below to change any or all of the four timers shown below. Note that timers A, B, and C can be assigned to codes, cards or iButtons with different functions. It may be necessary to configure the system (see page 14) for your system to function as desired.



“A” timer is the default timer for normal access codes. timers A, B, and C can be assigned to codes using three digit function codes (see page 17).

The door propped delay is the time (starts counting after relock delay ends) before the alarm relay will close. The alarm will clear once the door closes again. The Door Propped Alarm must be enabled (see page 14)

# CT500 INSTALLATION & PROGRAMMING MANUAL

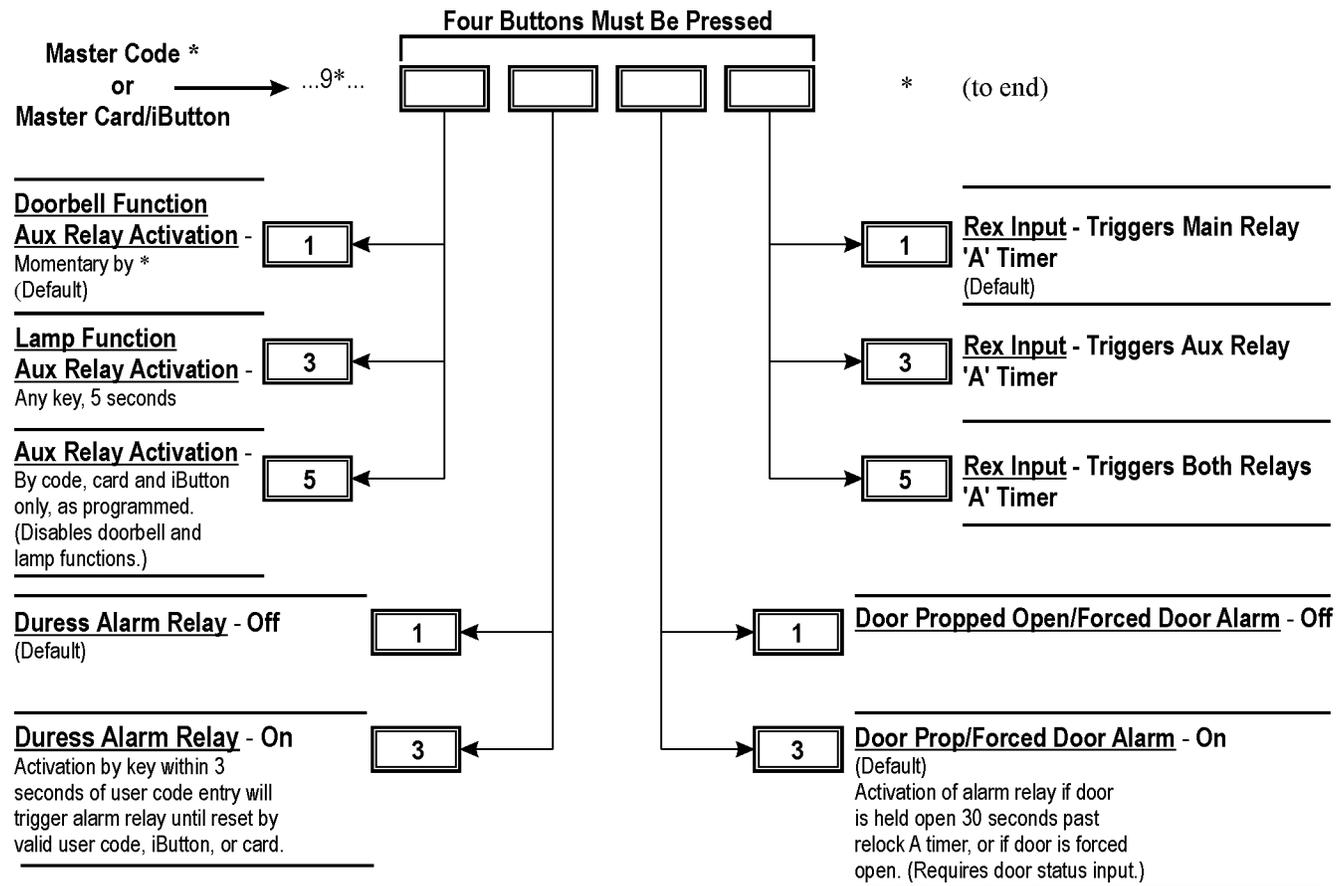
## Configuring the System

### 10) Configuring the System:

In many cases it will not be necessary to configure the system. If, however, certain functions are desired it will be necessary. Follow the steps below. Note that many functions require that the system be outfitted with additional equipment.

**NOTES:**

1. The doorbell function and the lamp function require that something be connected to the auxiliary relay.
2. The door forced open or door propped open alarm require that there be a door position switch (normally open) which closes when the door opens, connected to TB2 terminals 3 and 4, as well as an alarm of some kind connected to the alarm relay output.
3. The duress alarm requires that there be an alarm (silent or audible) connected to the alarm relay output.
4. The REX input is for a remote or local control other than a keypad. For example, an exit pushbutton, electrified exit device, keyswitch, or remote console button. It must be connected to TB2 terminals 1 and 2, normally open.



# CT500 INSTALLATION & PROGRAMMING MANUAL

## Manual Programming - Keypad - Codes Only

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### 11) Manual Programming - Keypad - Codes Only: (Using Master Code)

When manually programming the CT500, using a keypad, the keypad must first be initialized. It is recommended that the factory default Master Code be changed. Doing so will delete all factory default codes and ensure the security of the system. After entering the Master code the LEDs on the keypad will flash. They will also flash each time that \* is entered. Wait for the LED to stop flashing before entering the next sequence.

#### TO CHANGE MASTER CODE:

Master Code \*...7 \*...New Master Code (5-8 digits)\*...New Master Code \*

**TO ADD NORMAL ACCESS CODES:** - Will unlock door for relock time delay period. Will also reset lock in alarm.

Master Code \*...3 \*... New Code (3-8 digits) \*...\* (to end)

↑  
Up to 150 new codes can be added by returning here.

Note: If an external timer is used, the code will be a "Day Only" code and will not function if the lock is set to "Night" mode. See terminal layout information on page 14.

**TO ADD CODES WITH SPECIAL FUNCTION:** (See page 12 for "3-DIGIT FUNCTION CODES")

Master Code \*...33 \*...(3-DIGIT FUNCTION CODE) \*...New Code (3-8 digits) \*...\* (to end)

↑  
Up to 150 new codes w/functions can be added by returning here.

#### TO CHANGE CODES:

Master Code \*...1 \*...Old Code\*...New Code (3-8 digits) \*...\* (to end)

↑  
More codes can be changed by returning here.

#### TO CHANGE FUNCTION AND/OR PIN:

Master Code \*...11\*...Old Code\*... (New/Same 3-digit function code) \*...New/Same Code (3-8 digits) \*...\* (to end)

↑

#### TO DELETE CODES:

Master Code \*...5 \*...Old Code \*...\* (to end)

↑  
More codes can be deleted by returning here.

**TO DELETE CODES WITH ALARM/ATR NOTICE:** Codes will be not be allowed to function but will remain in memory. When the code is used, the alarm relay will close. The door will not unlock. If the ATR option is present and the unit was programmed by computer, an access attempt will show in the audit trail.

Master Code \*...55 \*...Old Code \*...\* (to end)

↑  
More codes can be deleted by returning here.

# CT500 INSTALLATION & PROGRAMMING MANUAL

## Manual Programming - Codes, Cards and iButtons

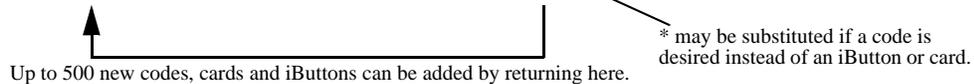
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### 12) Manual Programming - Codes, Cards and iButtons: (Using Master Card or iButton)

A Master Card or iButton must be used to enter the programming mode in order to program cards or iButtons. If the system does not have a keypad, a TEP1 must be used to manually program cards or iButtons. It must first be initialized. See steps below. After entering the Master Card/iButton the red and green LEDs flash. They will also flash each time that \* is entered. Wait for the LED(s) to stop flashing before entering the next sequence.

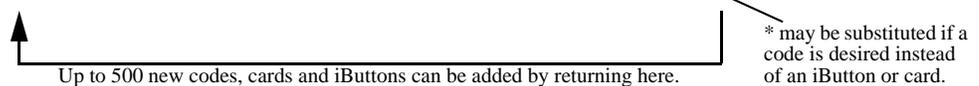
**TO ADD NORMAL ACCESS (DAY) CARDS/iBUTTONS/CODES:** Will unlock door for relock time delay period. Will also reset lock after an alarm condition.

Master Card/iButton...3\*...New PIN(3-8 digits)\*...New Access card/iButton...\* (to complete)



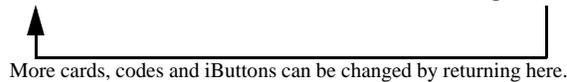
**TO ADD FUNCTION CARDS/iBUTTONS/CODES:** (Note that a three digit function code sets the function. See page 17)

Master Card/iButton...33\*...(3-digit FUNCTION CODE)\*...PIN(3-8 digits)\*...card/iButton...\* (to end)



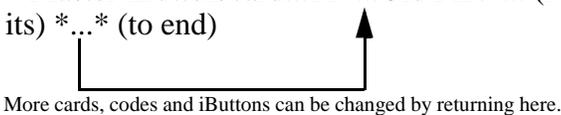
**TO CHANGE CODE/PIN:**

Master iButton/card...1\*...Old PIN\*...New/Same PIN (3-8 digits) \*...\* (to end)



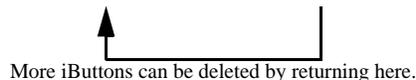
**TO CHANGE FUNCTION AND/OR CODE/PIN:**

Master iButton/card...11\*...Old PIN\*... (New/Same 3-digit function code) \*...New/Same PIN (3-8 digits) \*...\* (to end)



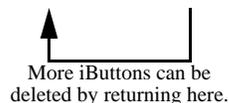
**TO DELETE CARDS/iBUTTONS/CODES:**

Master Card/iButton...5 \*...Old Code/PIN\*...\* (to end)



**TO DELETE CARDS/iBUTTONS/CODES (with alarm/ATR notice):** Codes will be not be allowed to function but will remain in memory. When the code is used, the alarm relay will close. The door will not unlock. If the ATR option is present and the unit was programmed by computer, an access attempt will show in the audit trail.

Master Card/iButton...55 \*...Old PIN\*...\* (to complete)



# CT500 INSTALLATION & PROGRAMMING MANUAL

## 3-Digit Function Codes

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### 13) 3-Digit Function Codes:

The following 3-digit function codes can be used to attribute certain special functions to codes, cards, or iButtons. Only one function can be manually assigned to a code/card/iButton. Note that different timers can be assigned. The time delay may be changed manually (see page 13).

**NOTE:**

Cards/iButtons/codes generated using 3-digit function codes in this column will change the state of the  
**MAIN RELAY ONLY.**

111...Day Access Code: timer A  
151...Day Access Code: timer B  
171...Day Access Code: timer C  
113...Day One-Time Access Code: timer A  
153...Day One-Time Access Code: timer B  
173...Day One-Time Access Code: timer C  
117...Day Supervised Access Code: timer A  
157...Day Supervised Access Code: timer B  
177...Day Supervised Access Code: timer C  
191...Day Toggle Code  
193...Day One-Time Toggle Code  
197...Day Supervised Toggle Code  
115...Day Lockout Code

**FOR USE WITH EXTERNAL TIMER ONLY:**

311...Night Access Code: timer A  
351...Night Access Code: timer B  
371...Night Access Code: timer C  
313...Night One-Time Access Code: timer A  
353...Night One-Time Access Code: timer B  
373...Night One-Time Access Code: timer C  
317...Night Supervised Access Code: timer A  
357...Night Supervised Access Code: timer B  
377...Night Supervised Access Code: timer C  
391...Night Toggle Code  
393...Night One-Time Toggle Code  
397...Night Supervised Toggle Code  
315...Night Lockout Code

511...24Hr. Access Code: timer A  
551...24Hr. Access Code: timer B  
571...24Hr. Access Code: timer C  
513...24Hr. One-Time Access Code: timer A  
553...24Hr. One-Time Access Code: timer B  
573...24Hr. One-Time Access Code: timer C  
517...24Hr. Supervised Access Code: timer A  
557...24Hr. Supervised Access Code: timer B  
577...24Hr. Supervised Access Code: timer C  
591...24Hr. Toggle Code  
593...24Hr. One-Time Toggle Code  
597...24Hr. Supervised Toggle Code  
515...24Hr. Lockout Code

**NOTE:**

Cards/iButtons/codes generated using 3-digit function codes below will change the state of the  
**AUXILIARY RELAY ONLY.**

711...24Hr. Access Code: timer A  
751...24Hr. Access Code: timer B  
771...24Hr. Access Code: timer C  
713...24Hr. One-Time Access Code: timer A  
753...24Hr. One-Time Access Code: timer B  
773...24Hr. One-Time Access Code: timer C  
717...24Hr. Supervised Access Code: timer A  
757...24Hr. Supervised Access Code: timer B  
777...24Hr. Supervised Access Code: timer C  
791...24Hr. Toggle Code  
793...24Hr. One-Time Toggle Code  
797...24Hr. Supervised Toggle Code  
715...24Hr. Lockout Code

**NOTE:**

Cards/iButtons/codes generated using 3-digit function codes below will change the state of the  
**MAIN AND AUXILIARY RELAYS**

911...24Hr. Access Code: timer A  
951...24Hr. Access Code: timer B  
971...24Hr. Access Code: timer C  
913...24Hr. One-Time Access Code: timer A  
953...24Hr. One-Time Access Code: timer B  
973...24Hr. One-Time Access Code: timer C  
917...24Hr. Supervised Access Code: timer A  
957...24Hr. Supervised Access Code: timer B  
977...24Hr. Supervised Access Code: timer C  
991...24Hr. Toggle Code  
993...24Hr. One-Time Toggle Code  
997...24Hr. Supervised Toggle Code  
915...24Hr. Lockout Code

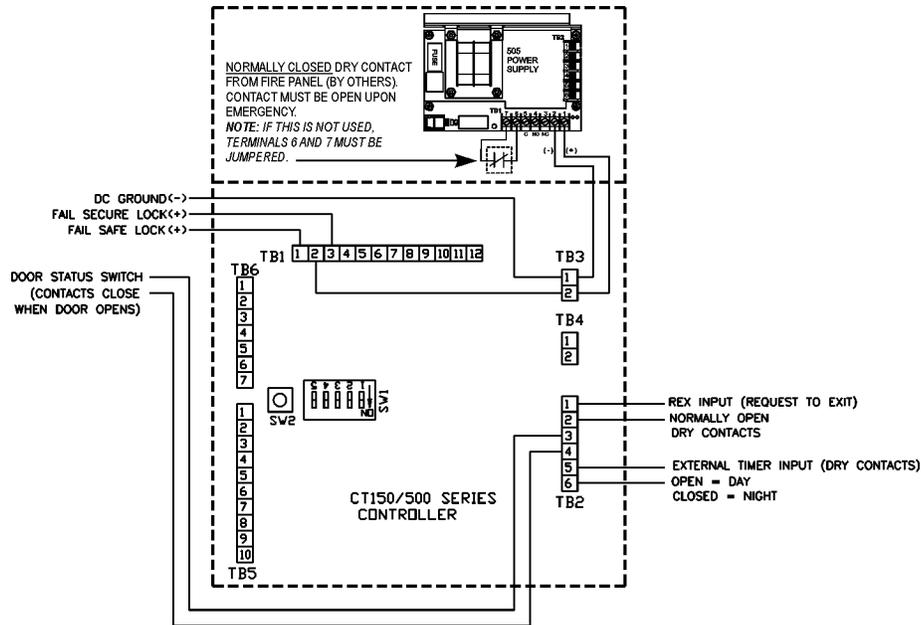
# CT500 INSTALLATION & PROGRAMMING MANUAL

## Sample Wiring Diagrams

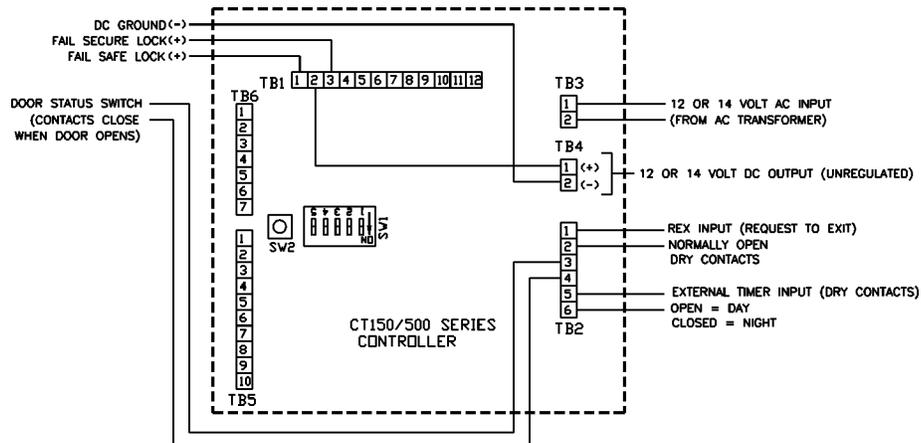
### • Sample Wiring Diagrams:

Below are two sample wiring diagrams showing only the power supply connections, connections to fail safe or fail secure lock, request to exit (REX), door status switch, and external timer. Note that the door status switch and timer are completely optional, depending on the design of your system.

#### CT500 w/MODEL 505 POWER SUPPLY (OR PS OPTION):



#### CT500 w/AC TRANSFORMER:



# CT500 INSTALLATION & PROGRAMMING MANUAL

## Error Codes / Troubleshooting

### • Error Codes:

If an error is made while manually programming a lock, an error code indication will be indicated at the iButton Key reader or keypad. The LED(s) will flash several times. Count the number of flashes and refer to the chart below for diagnosis.

#### ERROR CODES

Number of Flashes	Error
2	Code entered too long. Code length cannot exceed 8 digits.
3	Memory full - too many codes/iButtons entered.
4	Master Code cannot be deleted, only changed.
5	Second entry of Master Code does not match first. Master Code unchanged.
6	Invalid commend.
7	Code does not exist. (For "Delete With Alarm/ATR" only.)
8	Code too short. Minimum Master Code=5-digits. Minimum User Code=3-digits.
9	Not a unique code/iButton.
10	Manual Programming disabled.

### • Troubleshooting:

Some common problems associated with the installation of the CT500 series can be easily recognized and corrected:

#### Problem:

System has power but lock won't lock.  
No lights on.

System has power, but lock won't lock.  
Light/Lights always flashing.

Keypads lights work, but programming steps don't seem to function.

When programming, unit will not accept iButtons or Cards.

Door Forced/Propped Alarm configured, but not Active.

Door Position installed and wired properly.  
Door Forced/Propped Alarm not working.

#### Possible Solution:

Check wiring. Possibly the relay is wired wrong or power is not applied to lock.

REX (request to exit) input device wired closed instead of open.

Initialized Keypad (100CAB only)  
Wrong master code, iButton, or Card.

Must use master iButton or Card to program iButtons or Cards.

Door Position switch not installed or wired properly.

System not configured properly.  
Alarm not wired properly.

# CT500 INSTALLATION & PROGRAMMING MANUAL

## Notes

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- NOTES: