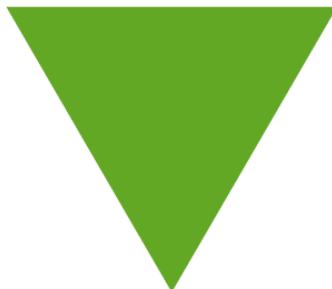


# **Switch2 Installation Manual**



**Paxton**

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# Chapter 1 Introduction

## System overview

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### System overview

Switch2 is a 1 door access control system. It is 'stand alone' so each system is isolated from each other however several Switch2 systems can be used on a single site to suit the majority of multi-door applications where central control is not required.

The access of users through an access point can be controlled using keypad entry, magnetic stripe cards, proximity tokens or a combination of each. The control unit is compatible with the full range of readers and keypads manufactured by Paxton Access Ltd.

Switch2 provides a volt free relay output, so can be used to control access through doors, vehicle barriers, etc. or to switch other electrical equipment.

An exit button can be fitted where 'read-out' security is not required. Where a keypad is fitted it is possible to drive a door bell unless the output is configured for an alarm function (e.g. Door forced) by using door contacts.

Auto-lock is another feature made available when contacts are fitted. The locking mechanism automatically locks when the door shuts even if the door open time has not elapsed.

# Chapter 2 About...

## Operating modes Switch2 control unit Power supplies

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### Operating modes

#### **TOUCHLOCK**

Switch2 can support 2 keypads for Code in and Code out applications. The control unit is programmed through the keypad. Below are the various programming options.

#### **Single/multiple code mode**

Switch2 can be programmed to work with a single code or with more than 1 code. The maximum number of codes is 50.

#### **Normal, Toggle and Duress**

It will be possible to program a code as:

- Normal code – operates the relay for the door open time.
- Toggle code – toggles the relay output
- Duress code – operates the relay for the door open time & the bell output.

#### **Silent operation**

The controller can be programmed to beep or not to beep when keys are pressed.

#### **Lockout**

The keypad can be set to lockout after too many incorrect key presses.

#### **Door Open Time**

The relay can be set to switch the relay contacts for any time from 1 to 60 seconds.

#### **Remote Button**

Switch2 supports exit buttons that can be programmed to either toggle the relay or to power the relay for the defined door open time.

#### **Data Reset**

The Switch2 can be reset from the keypad.

## CARDLOCK & PROXIMITY

Switch2 is programmed using function cards. It is possible to connect 2 readers to the control unit for Read in and Read out applications.

The following function cards are available:

- **Door Open Time card** – changes the length of time the relay is powered
- **Silent Operation card** – the sounder in the Switch2 can be turned off
- **Bar All Users card** – bars every user from the system
- **Time Zone card** – used in conjunction with a Time Clock to configure a second set of coloured zones.
- **RED, AMBER and GREEN Zone cards** – used to enable/disable the security levels associated with the coloured zones.
- **Relay Toggle card** – enables/disables toggle output for the relay.
- **Enrolment card** – initialise the system and re-enrol barred users

**User cards** are associated to a coloured zone and will open the door as long as the respective coloured zone LED is lit.

**Shadow cards** are used to bar individual users.

## PROXIMITY KP series keypads

When using a PROXIMITY KP series keypad Switch2 is programmed using a combination of the TOUCHLOCK programming menu and PROXIMITY function cards. It is possible to connect 2 readers to the control unit for in and out applications.

Three modes are available when using KP readers:

- **Card plus PIN** – In this mode the user is required to present a valid user card and then enter the user's associated PIN number. The specific PIN is allocated to the card during enrolment.
- **Card plus code** – In this mode the user requires both a valid card and one of the valid door codes to gain access.
- **Card or code** – As with card plus code but this time a user can gain access with either a valid card or a valid code.

---

# Switch2 Control Unit

## Inputs

Any **Paxton reader or keypad** can be used with Switch2.

It is possible to connect 2 readers or keypads to a Switch2 control unit where read/code in and out are required.

**Exit buttons** can be used if a handle or reader/keypad is not used. This is a voltage free input and the button needs to be push-to-make. It should be chosen to suit the volume of traffic using the access point. There is no limit to the number of exit buttons that can be fitted.

**Door contacts** can be fitted to Switch2. The door contact circuit must be closed when the door is shut. With contacts connected to the Switch2 control unit, a door forced open alarm can be generated. The Auto-lock feature is also active where the locking mechanism automatically locks when the door shuts even if the door open time has not elapsed.

## Outputs

### Relay – lock output

Relay operation is described in *Appendix (1)*. The relay contacts are voltage free and are rated 4Amps at 40V ac or dc. Having relay contacts means that this output is very versatile and can operate virtually any electrical equipment including fail open and fail closed locks, electric gates, electric barriers, lifts...

There are two main types of locking devices - fail open and fail closed. Refer to *Appendix (2)* for more information.

When using the same power supply for the ACU and electric release, diode suppression must be fitted. A standard 1N4001 diode is fitted as shown in *Wiring – inputs and outputs*.

### Bell/alarm output

This output is a transistor driven 0v DC / 1A output that can be used to sound a bell/buzzer in the event of an alarm or where a keypad is fitted, someone pressing the bell button.

The bell output activates for a minimum of 1 second when the bell button is pushed. If the bell button is held down, the bell output continues until it is released.

If contacts are fitted the bell button is disabled and the output can then be used to sound an alarm. The door forced open alarm will be active for 30 seconds each time it is activated.

### Enclosure Options

The Switch2 control unit is available in two different forms. The first offers the unit on its own with the option to fix it in the PSU with plastic adhesive feet. The second provides a black plastic enclosure containing a 1amp switch mode power supply unit (see Chapter 3 Fitting).

### Power Requirements

Switch2 requires a 12v DC power supply, which should be connected to the terminals marked 12V and 0V. When run from a 12V DC supply, the Switch2 control unit uses a maximum of 80mA not including any power drawn by attached readers or keypads. In the event of mains failure and where no battery backup is fitted, the unit will not function however it will retain all its settings during the power loss.

### Conformity

The board has been CE and FCC certified for immunity and emissions.

---

## Power supplies

### Choosing guide

When choosing a power supply for the Switch2 system there are several considerations.

#### Current rating

The rating of the power supply must be suited to the load. The quiescent current of the various system components are given in the instructions for the individual component.

The minimum power supply rating is equal to the sum of all loads plus 10% (safety factor).

#### Battery backup

The time that the Switch2 system will continue to operate when the mains supply fails is dependent on the current consumption of the system and the battery backup in the power supplies.

$\text{Backup time (hours)} = \frac{\text{Amp hour of backup batteries (Amp hours)}}{\text{Current consumption of system (Amps)}}$
--

Power supplies vary in the features they offer relating to battery backup. A few considerations are:

- **Deep discharge** – When a backup battery is drained too much it can reach a state whereby it cannot be recharged. This is deep discharge. Some power supplies have the ability to prevent this happening.
- **Recharge limit** – Some power supplies limit the current consumption of a battery whilst it is recharging. If a power supply does not do this then the system may not be immediately operational when mains power is resumed, i.e. the power will be consumed by the battery recharge.
- **Battery capacity** – the size of the enclosure will limit the amount/size of the backup batteries.

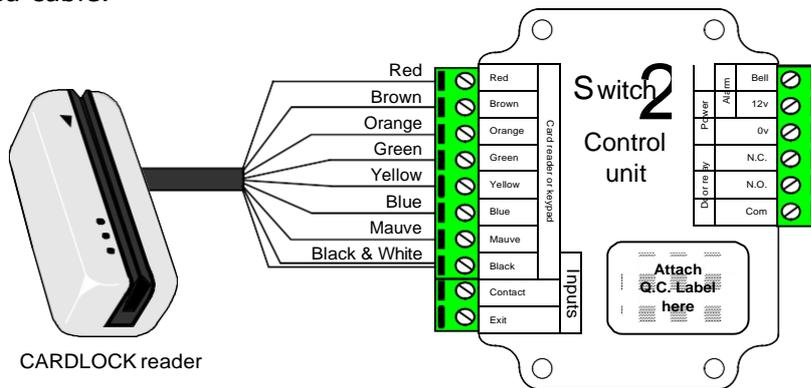
# Chapter 3 Wiring

- Readers/keypads
- Power supply
- Inputs
- Outputs

## Readers/keypads

### CARDLOCK readers (5v & 12v)

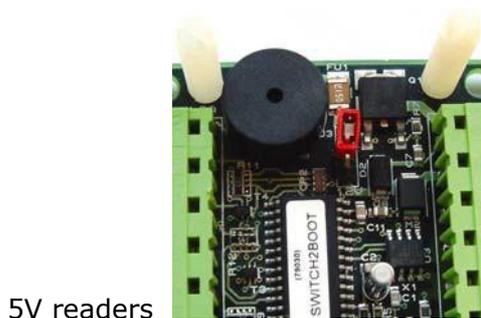
CARDLOCK readers come supplied with 5 metres of cable. The colours of the cable cores correspond directly to the colours on the Switch2 control unit label. When extending the cable distance beyond 5 metres, do not use twisted pair cable as the data signals may become distorted. Belden 9540 or General Cable C0745A is recommended. The screen should be connected to 0V (Black terminal) for all readers and keypads that have a screened cable.



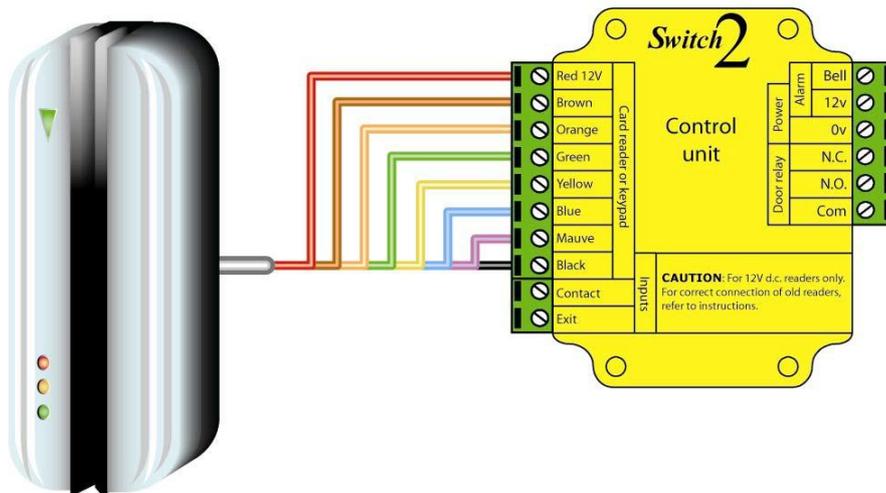
### **\*IMPORTANT\***

When 5v CARDLOCK readers or TOUCHLOCK SS keypads are connected to Switch2 control units with yellow wiring labels the jumper setting on the PCB must be changed from the 12V setting to the 5V setting.

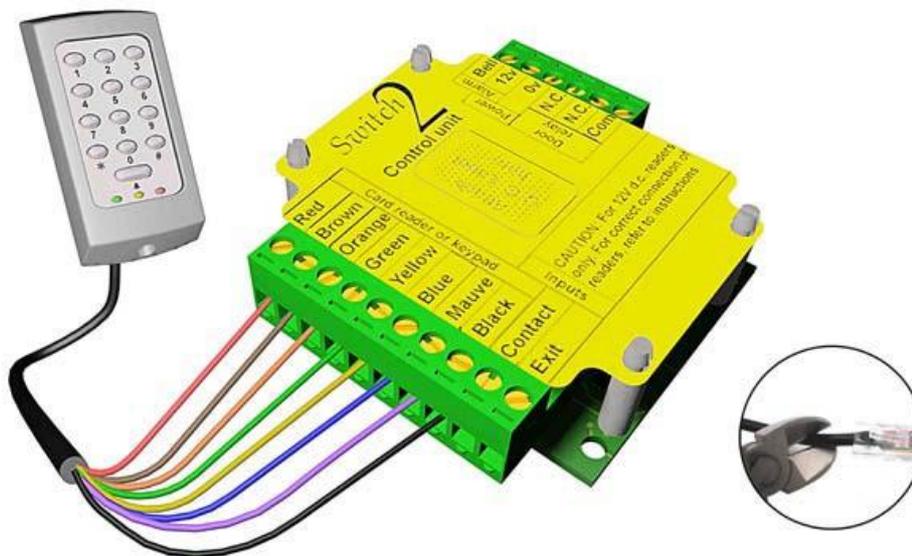
NOTE: TOUCHLOCK membrane keypads are NOT compatible with yellow label Switch2.



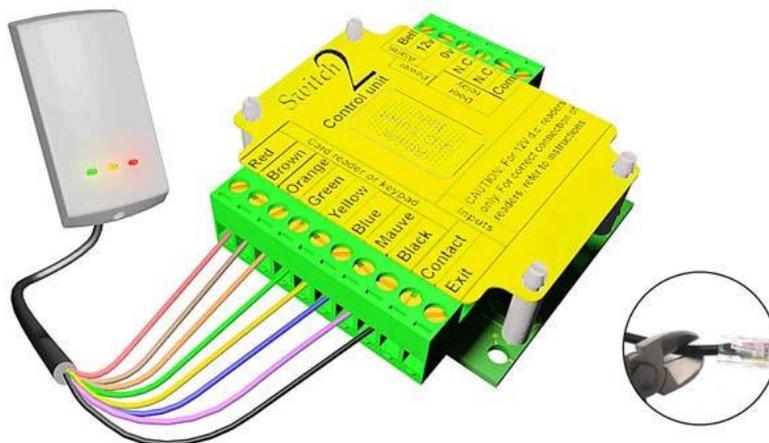
## CARDLOCK readers (12v)



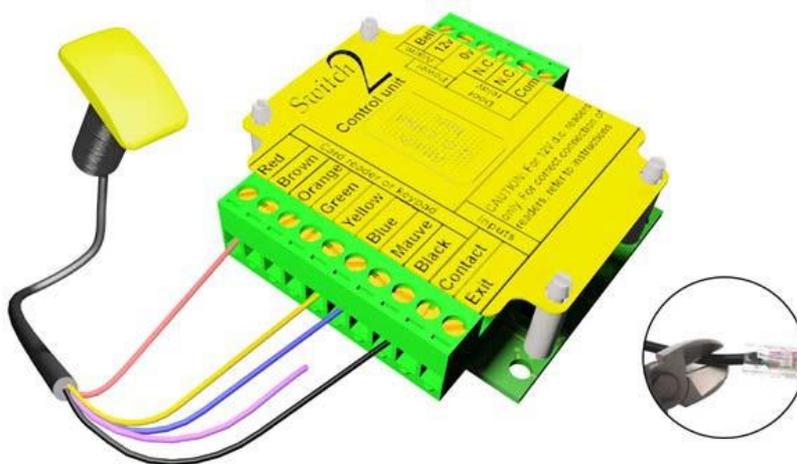
## TOUCHLOCK K series keypads



## PROXIMITY P series reader

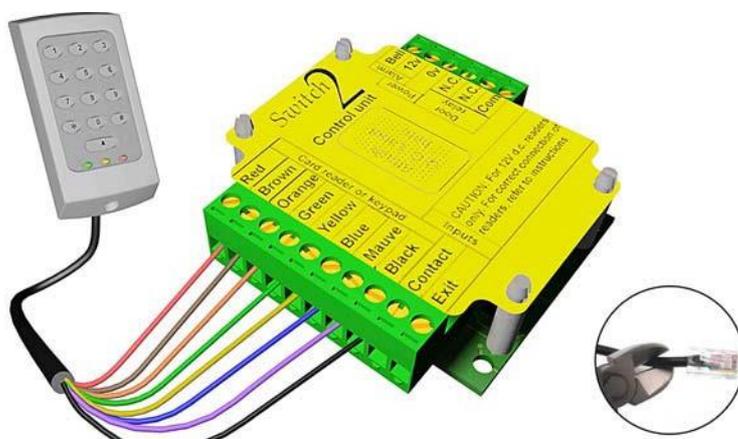


## PROXIMITY vandal proof reader



NOTE: Only Red & Black (Power) and Blue & Yellow (Data) are required.

## PROXIMITY KP series keypad

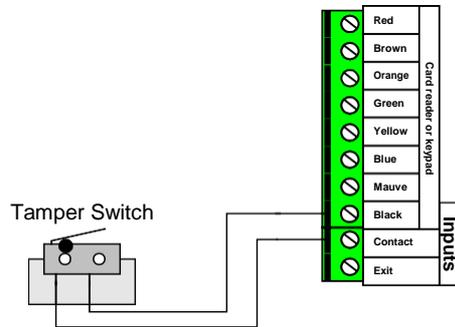


**NOTE: All devices.**

**If two readers or keypads are required they are both be wired to same terminals.**

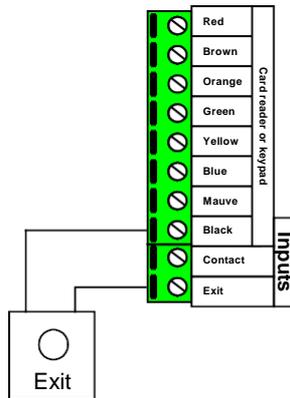
# Inputs

## Tamper Switch



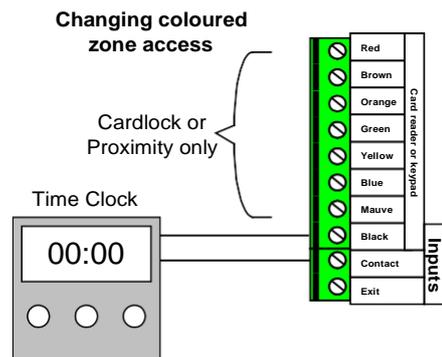
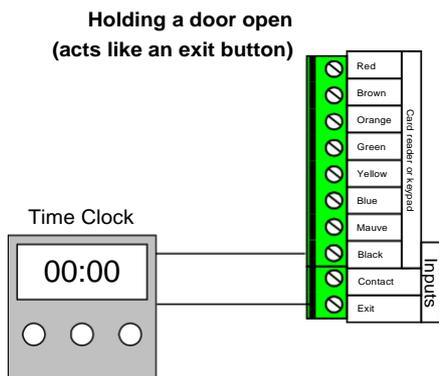
If a tamper switch is required, it should be Normally Open – held closed by the cover. It is fitted across Black and Contact and will operate in the same manner as a Door Contact. That is to say an alarm will be generated if the switch opens and no valid access has been granted. NOTE: Fitting this will disable the TOUCHLOCK keypad bell button and should be wired in series with any door contacts if they also be fitted.

## Exit Button

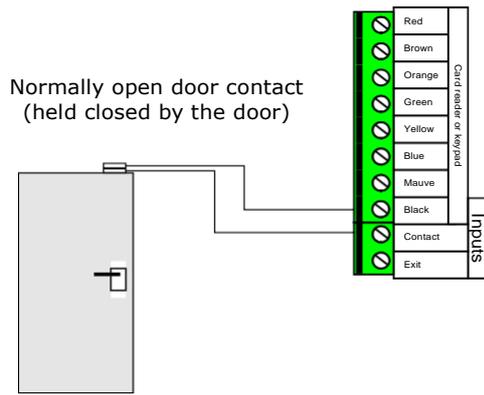


**NOTE: The exit button should be push-to-make**

## Time Clock



## Door Contacts

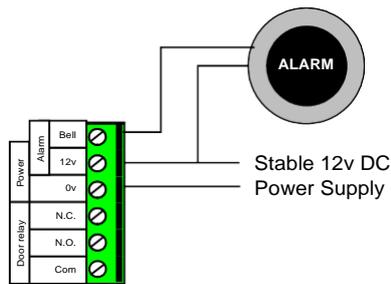


If door contacts are fitted on a TOUCHLOCK system the bell/alarm output is activated during an alarm (Door Forced) condition and the door bell input on the keypad is disabled.

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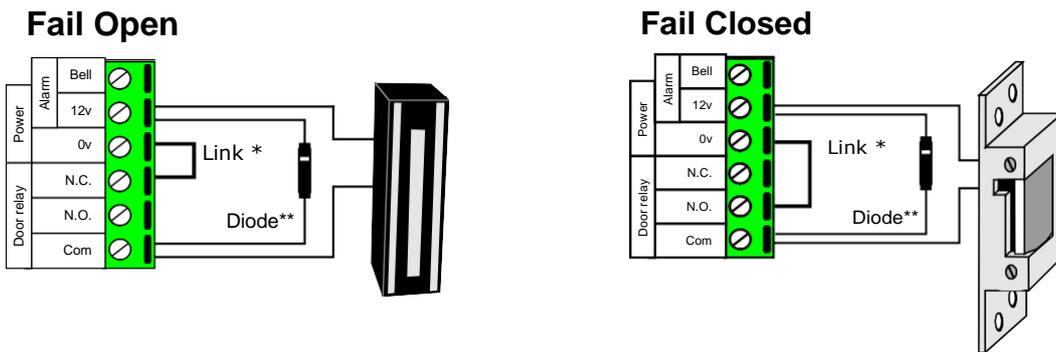
## Outputs

### Bell/Alarm Output



This output is capable of driving a 12V bell/buzzer up to 1A. This load must be taken into consideration when selecting a suitably rated power supply.

## Locks

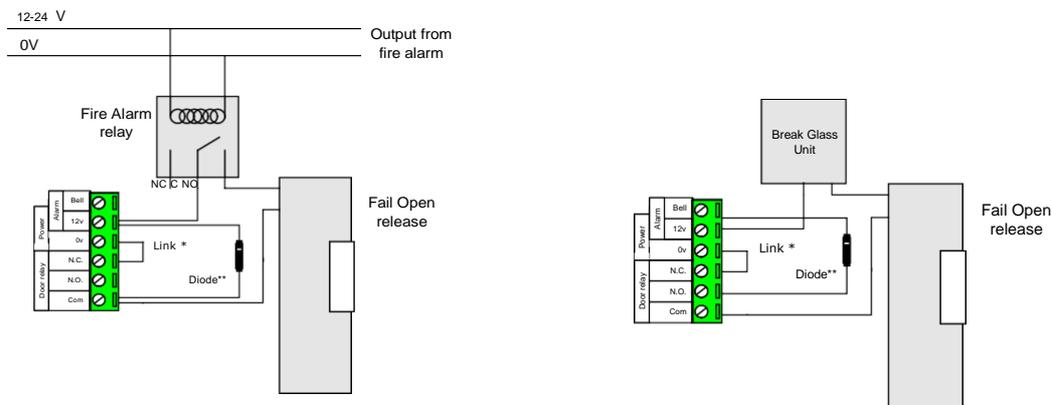


The diagrams above show the two main types of 12V dc electric lock. Other electrical devices can be switched using the voltage free relay contacts.

\* The 0v link must be connected for the lock to work

\*\* The diode is supplied in the fitting kit and must be fitted with correct orientation as show in the diagram. If an ac lock is used then a transient absorber must be fitted instead

## Wiring to a Fire Alarm or Break Glass unit



All Fire systems must be Fail-Safe. Fail secure locks are not permitted. The exit button terminal must NOT used as the Switch2 may not be functional during the emergency.

### Fire Alarm Relay

Under normal conditions, the fire alarm system will provide a constant voltage to the fire alarm relay which will transfer and maintain the 12v supply to the lock. Should the alarm be triggered or the cable disconnected or burnt, the relay will drop cutting the 12v supply and the fail open release will always unlock.

### Break Glass

The break glass unit provides a method of removing the 12v supply from the fail-open lock. This ensures a reliable method of escape in an emergency.

These two methods of lock release are often combined in the same circuit by routing the 12v lock feed through both the relay contacts and the break glass in turn.



# Chapter 4 Commissioning

## TOUCHLOCK system

## CARDLOCK & PROXIMITY system

## PROXIMITY KP series keypad

---

### TOUCHLOCK system

#### Initialising the system

After the system has been wired up, be sure to check over the connections against the wiring diagrams provided before powering up for the first time. When the system is powered up for the first time the control will bleep 3 times a second. This indicates that Switch2 is waiting to be initialised. The **RED** LED will be on, the **AMBER** LED will flash slowly and the **GREEN** LED will be flashing quickly.

- **Press the bell button**  
*(The unit will stop bleeping and the **GREEN** LED flashes faster)*
- **Enter your chosen 6 digit programming code\* and press the bell button.**  
*(The **GREEN** LED will flash faster still)*
- **Confirm your chosen programming code by entering the same 6 digit code and pressing the bell button.**  
*(The **GREEN** LED goes out and the unit will acknowledge that the programming code has been accepted by bleeping twice after a short pause. All LEDs are now on)*

**\* Note that the programming code SHOULD NOT have the sequence of numbers 1234 in, as this is the default user code**

#### What is the next step?

The keypad/s now has a default user code 1234. The programming code you just set will let you into programming mode, where configuration changes can be made. The system will work according to the default settings (See **Operation – TOUCHLOCK**).

Check the system operates correctly using the default settings.

- **Type in the user code 1234**  
*(The **GREEN** LED will flash on the keypad/s and the relay will switch over for 7 seconds)*
- **Type in the master code you set**  
*(There will be 2 beeps to confirm that the correct master code has been entered and the **GREEN** LED will flash)*

- **If a buzzer/bell is connected, press the bell button**  
(The buzzer/bell will sound for 1 second each time the bell button on the keypad is pressed)
- **If an exit/remote button is connected, press it.**  
(The relay will switch over for the door open time)
- **Check that the Switch2 control unit beeps each time a button is pressed on the keypad.**
- 
- **Check that lockout is disabled by pressing more than 20 buttons in a sequence that does not include the user or master code.**

---

## CARDLOCK & PROXIMITY system

### \* IMPORTANT \*

#### CARDLOCK or PROXIMITY

In all the explanations below, the actions for a CARDLOCK system have been used. These actions are also used with the PROXIMITY system except that the instead of the action "Swiping" a card for a CARDLOCK reader, the term "presenting" a PROXIMITY card applies to PROXIMITY.

As you may notice there is no Arrow LED on the PROXIMITY reader and so any note about this can be ignored with PROXIMITY. Also, **ALL** PROXIMITY readers have a fixed sounder. This means they will always beep if a PROXIMITY card is presented to them.

#### PROXIMITY vandal proof reader

There are no LEDs on the vandal proof reader! This means visual indication does not apply. The reader will indicate the various actions (presenting a PROXIMITY card etc.) with high (accept) or low (reject) beeps.

#### Initialising the system

After the system has been wired up, be sure to check over the connections against the wiring diagrams provided before powering up for the first time. When the system is powered up for the first time the control unit will beep 3 times a second. This indicates that Switch2 is waiting to be initialised. If a CARDLOCK reader is connected the arrow LED will also be flashing.

- **Swipe the enrolment card through the reader**

*(All the LEDs will go out and then after about 2-3 seconds all the LEDs will come back on and the unit will beep twice)*

#### Checking the system over

Now that the system has been initialised the operation of the system will need to be checked. It will be working from the default settings (See **Operation – CARDLOCK**)

Check the system operates correctly using the default settings.

- **Check that all the LEDs on the reader are lit up.**
- **Try a number of user cards randomly from the pack/s. Swipe them through the reader.**  
*(The **GREEN** LED will flash and the relay will change state for the door open time)*
- **Swipe one of the user cards through a number of times to make sure the reader will read the card every time.**
- **Check that the control unit beeps every time a card is swiped.**

- **Check a user can be barred from the system. Swipe a shadow card through the reader and then swipe the user card through the reader.**  
*(The RED LED will flash and the relay will not switch over)*
- **Check that the user can be re-enrolled onto the system. Swipe the enrolment card through the reader followed directly by swiping the user card, that was just barred, through the reader.**  
*(The AMBER LED will flash and the RED and GREEN LEDs go out. The Switch2 control unit will continually beep until the "Barred" user card is swiped through the reader. The Switch2 control unit will then stop beeping and the LEDs will return to their normal state.)*
- **Check that the user card can be used again to gain access.**  
*(make sure the relay will switch over for the door open time)*

#### Other checks

- **If an exit button is fitted, check that it releases the lock for the door open time.**
- **If contacts are fitted make sure that auto-lock is working.**
- **If an alarm bell/buzzer has been fitted make sure that this works in a door forced situation.**
- **If a time clock is fitted to hold the door open, make sure the door opens when the contacts are made.**
- **If a time clock is fitted to change coloured zones, make sure the coloured zones change over OK when the contacts are switched.**

---

## PROXIMITY KP series keypad

### Initialising the system

When installing PROXIMITY KP series keypads, follow exactly the same sequence described previously for TOUCHLOCK systems.

**Note:** If a KP system is enrolled, using the PROXIMITY enrolment card, the Switch2 controller will have to be reset in order to initiate any of the combined PROXIMITY keypad modes. The Switch2 must be enrolled as a TOUCHLOCK first.

# Chapter 5 Operation

## TOUCHLOCK system

## CARDLOCK & PROXIMITY system

## PROXIMITY KP series keypad

---

### TOUCHLOCK system

#### Programming Switch2

Switch2 can be programmed using the master code. To understand each setting read the following explanations. For more information on how to program each setting, refer to the Programming Guide.

#### Single/multiple code mode

By default Switch2 will operate in single code mode, only allowing one 4-8-digit code to operate the door. It is possible to change this code as many times as are needed. If more than one code is required then the unit can be programmed for multiple codes (up to 50). Again, each code can be 4-8 digits long. In either mode it will be possible to set the code as a toggle, normal or duress code. Codes can be easily deleted by using either keypad connected.

**\* Note that increasing the number of digits in the user code decreases the chance of the code being guessed by someone randomly pressing keys.**

#### Master code

This code is used to enter the programming procedure for the Switch2 control unit. It is set during the initialisation of the unit and can be changed later if necessary.

#### Normal, toggle and duress

The default user code (1234) will be a Normal code. By this we mean it will operate the relay for the door open time. A code can also be programmed in as a Toggle code. This means every time the correct code is entered, the relay output will be toggled from N/C to N/O (See Operation of a relay). Lastly, the code could be programmed in as a Duress code. When this code is entered the relay will switch for the door open time and the 12V alarm output will be activated for 30 secs.

#### Silent operation

By default the Switch2 control unit will beep when a button is pressed. This can be turned off if necessary. When turned off the control unit does not emit a beep unless it is in programming mode.

#### Lockout

By default the lockout feature is disabled. To decrease the risk of someone guessing the code by randomly pressing the buttons, lockout can be enabled. If lockout is enabled and someone enters more than 20 incorrect digits, the keypad will stop working completely for 60 seconds. **This time cannot be altered.** Once this time is elapsed the keypad will operate normally.

### **Door open time**

The door open time will be set to 7 seconds as default. This is the time the relay will stay activated for once either a correct code is entered or an exit button has been pressed. The time can be changed to suit the situation and can be set to anything from 1 to 60 seconds.

### **Remote button**

An exit/remote button can be connected to Switch2. It can be set-up to work in one of two ways. The button can be programmed to open the door for the door open time. This is set as default. The button can also be programmed to toggle the relay. This second option will change the door condition to the opposite of its current condition every time the button is pressed.

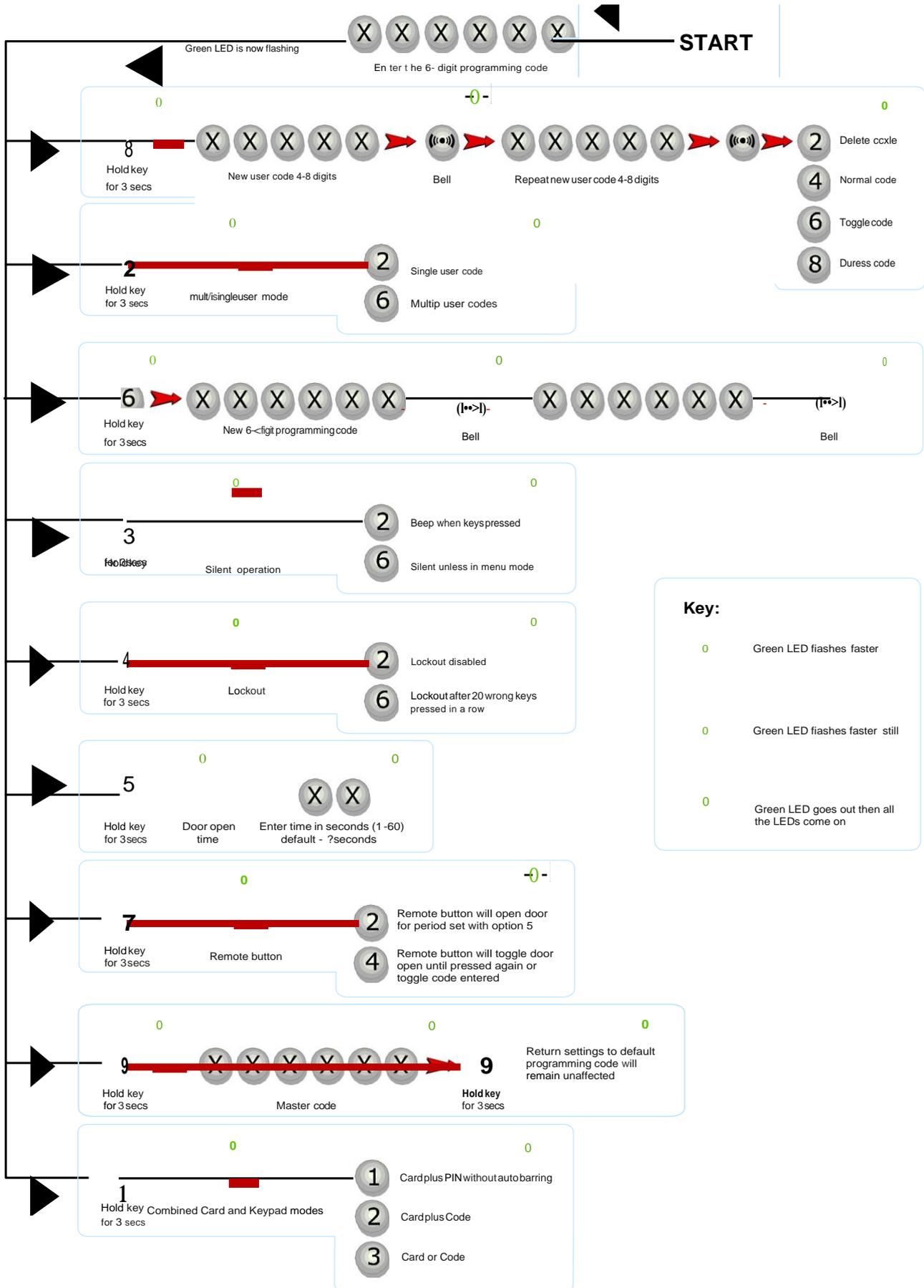
### **Data resetting the keypad**

The Switch2 control unit can be reset to the default conditions below. It can either be reset from the keypad by following the programming guide or by following the procedure below.

## **Default Settings**

User code	1 2 3 4
Master code	Set by installer when unit is initialised
Code mode	Single
Squeak setting	Activated
Door open time	7 seconds
Remote button	Switch relay for door open time
Lockout mode	Lockout disabled

## TOUCHLOCK programming guide for Switch2



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# CARDLOCK & PROXIMITY

## \* IMPORTANT \*

### CARDLOCK or PROXIMITY

In all the explanations below, the actions for a CARDLOCK system have been used. These actions are also used with the PROXIMITY system except that the instead of the action "Swiping" a card for a CARDLOCK reader, the term "presenting" a PROXIMITY card applies to PROXIMITY.

As you may notice there is no Arrow LED on the PROXIMITY reader and so any note about this can be ignored with PROXIMITY. Also, ALL PROXIMITY readers have a fixed sounder. This means they will always beep if a PROXIMITY card is presented to them.

### PROXIMITY vandal proof reader

There are no LEDs on the vandal proof reader! This means visual indication does not apply. The reader will indicate the various actions (presenting a PROXIMITY card etc.) with high (accept) or low (reject) beeps.

### Initialising the system

After the system has been wired up, be sure to check over the connections against the wiring diagrams provided before powering up for the first time. When the system is powered up for the first time the control unit will beep 3 times a second. This indicates that Switch2 is waiting to be initialised. If a CARDLOCK reader is connected the arrow LED will also be flashing.

All the user cards will now work.

### User cards

These are the cards the everyday user of the system will have. They can gain access through a door by **presenting the card to the reader**. If the corresponding colour LED on the reader is lit then the user can enter, assuming they have not been barred. If the card is accepted the GREEN LED will flash (the RED and AMBER go out) and the door can be opened. If the card is not accepted then the RED LED will flash (all the other LEDs will go out).

**NOTE:** The control unit will beep each time a user card is used unless the system is set for silent operation.

### Shadow cards

To bar a user from entering an area guarded by a reader, the shadow card is used. Swipe the shadow card through the reader (the reader beeps once and the control unit beeps twice). If the barred user now tries to use the reader to gain entrance their access will be denied.

### Programming Switch2 using function cards

With the CARDLOCK or PROXIMITY reader connected to Switch2 the function cards are used to alter system features. Some function cards come in the starter pack and others come in the function card pack.

## Using function cards – Starter pack

### Order card

This card is not used in all card packs. If present, it needs to be sent back with an order form if more cards are needed. (See order form located in the card pack for more details)

### Enrolment card

This card is used to both initialise the system and re-enrol barred users. It can be swiped through once to initialise the system after it is first powered up (**See Initialising the system**).

If a user has been barred from a door and needs to be re-enrolled the enrolment card is used with the user card.

- First swipe the enrolment card through the reader (The **AMBER** LED will flash and the **RED** and **GREEN** LED will go out. The control unit will continually beep)
- Swipe the user card within 60 seconds. The control unit will stop beeping and the LEDs will return to their normal state. The user card will now be granted access.

### Door Open Time card

This card is used to adjust the time the relay is powered. To change the time

- Swipe the card once (all the LEDs go out and the arrow LED flashes. The Switch2 control unit will then beep once per second)
- Swipe the card again after the desired interval (all the LEDs come back on)

### Silent Operation card

This card is used to toggle the beeping of the Switch2 control unit on and off. By default the Switch2 control unit beeps when a user card is swiped. If necessary this beep can be silenced by swiping the silent operation card through the reader.

After the card has been swiped the LEDs will go out and the **GREEN** arrow LED stays on. The unit beeps twice and all the LEDs will come on again. Now the Switch2 control unit will not beep when a user card is swiped. To return to normal operation again, swipe through the silent operation card again.

### Fail Open Release card

This is not required for Switch2. (The relay has NO and NC connections – see Diagram)

## Using function cards – Function card pack

### **GREEN, AMBER and RED** Zone cards

These 3 cards toggle the **GREEN**, **AMBER** and **RED** access levels on and off. By default all the levels are active (this means all the LEDs are lit up on the reader). This in turn allows users with **GREEN**, **AMBER** and **RED** user cards access through this particular entrance.

If you wish to bar users from a particular colour zone, for example **GREEN**, take the **GREEN** zone card and swipe it through the reader. The **GREEN** LED will go out and the reader will beep. All **GREEN** user cards will now be barred. To re-enable these users, swipe the **GREEN** zone card again and the **GREEN** LED will come back on.

This happens for each colour zone card and its corresponding colour LED.

### Remote Release card

This card is not used with Switch2.

### Card Plus PIN card

This card is not used with Switch2.

### Time Zone card

#### (Used to replace the door contact function with the time zone function)

The time zone function allows two different sets of colour zones to be set up and then a time clock is used to switch between these two sets at programmed times. (See Wiring – Time Clock). For example, a site may allow full access to all colour zones during the day and then switch to only RED card holders at night.

To enable the time zone function, swipe this card through the reader. The control unit beeps and all the LEDs go out and come back on. To return the 'Contact' input to its default function, just swipe the time zone card through the reader again.

The time clock can now be programmed and coloured zones set up. (To enable/disable coloured zones see - GREEN, AMBER and RED Zone cards).

Set the clock to short together the Contact and Black terminals. Configure the colour zones with their zone cords and observe the LEDs as confirmation. Remove the short from the clock output and set up any changes required in the 'Default' state. The two colour zone sets will then be enabled/disabled depending on the state of the time clock connection.

### Bar All Users card

This card should be used if the majority of users on the system need to be barred. The card should be swiped through the reader once. After 2 seconds the control unit will beep twice and the GREEN, AMBER and RED LEDs will go out and come back on. All users will now be barred. To re-enrol individual users back on the system see – Enrolment card.

### Relay Toggle card

This card should be used if the output from the Switch2 control unit needs to be a toggle output. Toggle means that instead of the relay opening for a set time and then closing, the relay will stay open until a user card is swiped through the reader to close it again. By default the control unit is set up in timed mode.

To set the system in toggle mode the relay toggle card needs to be swiped through the reader. The control unit will beep twice and the GREEN and AMBER LEDs will go out. The RED and arrow LED lit. (Default condition)

If a user card is swiped through the reader, the relay output will change state and the GREEN LED will come on by itself. If the card is swiped through again the relay state will change back, the RED LED comes on alone - and so on.

To return to the standard relay timed mode, swipe the Toggle card again. The Switch2 control unit will beep twice and all the LEDs will now be on.

## Default Settings

User cards .....	all cards encoded will be valid
Zone LED status .....	all LEDs/zones will be on
Squeak setting .....	activated
Door open time.....	7 seconds
Remote button .....	Switch relay for door open time
Time zones .....	Inactive
Relay toggle .....	Disabled

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# PROXIMITY KP keypad

## Card plus PIN mode

If Card plus PIN mode is required the KP reader must first be initialised as a TOUCHLOCK keypad. Once this is done Card plus PIN mode can be entered using the programming menu, menu option 1 (see programming chart).

Once in Card plus PIN mode the PROXIMITY card pack can be enrolled, this is done in the same way as for a PROXIMITY system, by presenting the PROXIMITY enrolment card. Unlike in a PROXIMITY system none of the user cards will be valid at the door, as no PIN's have been assigned to cards yet.

To assign a PIN to a card:

- Present the enrolment card to the keypad; the reader will start to beep and the **AMBER** LED will flash.
- Present the user card, the **AMBER** and **GREEN** LED's will flash.
- Enter the PIN number to be associated with the user card.
- Press the bell button, the LED's will flash faster.
- Enter the PIN again to confirm.
- Press the bell button.

The user card and PIN are now valid, when the user card is presented at the keypad the **AMBER** LED will light indicating that the keypad is waiting for the PIN. When the correct PIN is entered the door will open.

All of the user cards must have a PIN assigned to them in the same way.

## Card plus Code mode

If Card plus Code mode is required the KP reader must first be initialised as a TOUCHLOCK keypad. Once this is done Card plus Code mode can be selected using the programming menu, menu option 1 (see programming chart).

Codes can be programmed using the standard TOUCHLOCK methods; multiple codes can be used by activating the multiple codes function on the keypad.

The PROXIMITY card pack can then be enrolled. This is done in the same way as for a PROXIMITY system, by presenting the PROXIMITY enrolment card. All of the cards in the pack will now be valid as in a standard PROXIMITY system but a valid code must also be entered when a user attempts to gain access.

## Card or Code mode

Card or Code mode is programmed in exactly the same way as Card plus Code but a user can gain access through the door by either presenting a valid token or entering a valid code.

# Chapter 6 Fault-finding

## System problems

## Reset procedures

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### System problems

#### Fault-finding guide

Sometimes problems occur during installation. It is important to be able to find the problem and a fix quickly.

#### Technical help line

Feel free to contact the Technical help line.

Before calling, run through the following

- Be prepared to give out company details
- Be next to or very near to the system in question
- Have a copy of the instructions ready to hand
- Have the Switch2 control unit serial number to hand
- Have appropriate tools ready to use.

#### Reset procedure

To set the Switch2 control unit back to its factory settings:

- Disconnect the power
- Disconnect the **GREEN** and **MAUVE** wires from the reader or keypad
- Insert a wire link between the **GREEN** and **MAUVE** terminals
- Reconnect the power (the unit will bleep 4 times)
- Disconnect the power, remove the link wire
- Reconnect the **GREEN** and **MAUVE** wires and then reconnect the power (the unit will bleep 3 times per second)

#### **\* IMPORTANT \***

When checking equipment connected to the control unit, be sure that all other input/output devices are disconnected. This aids the fault-finding process by testing and proving a single part of the system.

# Chapter 7 Appendix

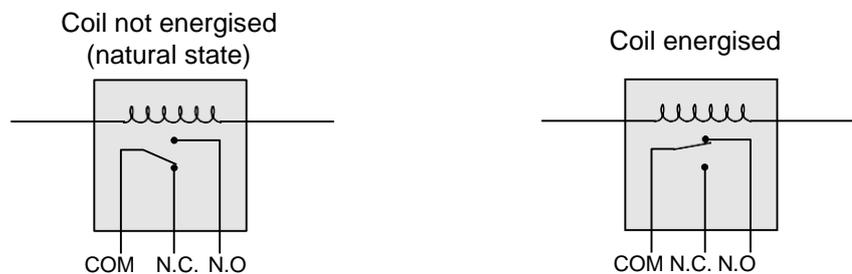
## (1) Operation of a relay explained

## (2) Fail open & fail closed locks explained

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### Appendix (1) Operation of a relay explained

The Switch2 ACU contains one relay and has output terminals common (COM), normally open (N.O.) and normally closed (N.C.).



In the de-energised state, COM and N.C. are connected. When the coil is energised, the relay operates and COM and N.O. are connected. As soon as the coil is de-energised the connection returns to the COM and N.C. position.

The output terminals COM, N.O. and N.C. are voltage free. This means that they can be used to control power using the same supply that drives the Switch2 or may be included as part of an independent circuit to signal other electrical devices e.g. Car Park Barrier.

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### Appendix (2) Fail open & fail closed locks explained

#### Fail open (fail safe)

Fail open devices require power to lock, i.e. if there is no power to the device it is unlocked. An example of a fail open device is a magnetic lock (maglock).

A fail open locking device is a requirement for fire doors. This is because it is not reliant on electrical power to unlock.

It is advisable to have a battery backup for systems using fail open devices. Otherwise a mains power failure would lead to doors unlocking for the period of the mains failure.

Fail open devices are inefficient in terms of power consumption when compared to fail closed devices. This is because they are powered for the majority of the time, i.e. when the door is locked.

#### Fail closed (fail secure)

Fail closed devices require power to unlock, i.e. if there is no power to the device it is locked. Most standard electric releases are fail closed.

If battery backup is not fitted, mains loss would result in doors being locked for the period of the power failure.

Fail closed devices are more efficient than fail open devices. This is because they are only powered when the door is unlocked.

# Chapter 8 Specifications

## **CARDLOCK and PROXIMITY**

Maximum number of users .....	10,000 (3,000 in card plus PIN mode)
User tokens.....	Passive cards and keyfobs
Colour access zones .....	Up to 3 (Note 1)
Individual access rights.....	All Users
Number of time zones.....	2 (Note 2)
Bar all users .....	yes
Second (out) reader can be added .....	yes
Time clock input.....	yes
Max distance for reader/keypad from control unit .....	100m (Note 3)

## **TOUCHLOCK**

Maximum number of users .....	unlimited
User codes .....	Up to 50 codes 4 to 8 digits
User PIN codes in card plus PIN mode .....	4 digits
Second (out) keypad.....	yes
Exit Time clock input .....	yes (Note 4)
Sounder connection.....	yes (Note 5)
Duress code.....	yes
Lock out after 20 incorrect digits .....	programmable
Relay toggle.....	Yes
Max distance for 5V TOUCHLOCK stainless steel keypad from control unit.....	30m
Max distance for TOUCHLOCK K series keypad from control unit.....	100m
Max distance for TOUCHLOCK K series stainless steel keypad from control unit .....	100m

## **System**

Exit button .....	yes
Sounder connection.....	yes (Note 5)
Door forced alarm .....	yes
Door relock on closing .....	yes (Note 6)
Silent Operation .....	yes
Door Open time .....	1 to 60 seconds
Card plus PIN (Personal identification number) .....	yes (Note 7)
Fail open locks .....	yes
Operates a relay.....	yes
Water resistant .....	no
Operating temperature .....	-20°C to 55°C
Size of control unit board .....	71 x 70 x 23mm
Supply Voltage .....	9V to 14v DC.
Continuous output current.....	relay switches 4A
Output current for sounder .....	1A
Quiescent current.....	80mA for control unit only

Note 1: Function cards are required to enable this feature

Note 2: A time clock must be fitted to implement this feature

Note 3: Use CR 9540 cable. Use spare cores to double the +12V and 0V connections.

Note 4: Wire the time clock across Black/Exit to mimic the exit button being held closed.

Note 5: Can be used with contacts for door forced open alarm

OR as a bell/duress code output with a keypad

Note 6: This feature only works with door contacts fitted to the system.

Note 7: Requires the PROXIMITY KP keypad.