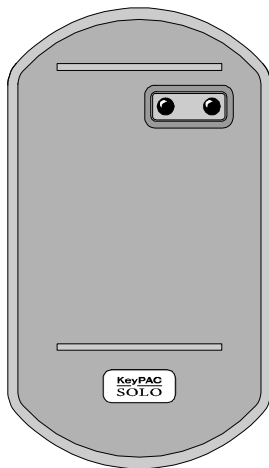
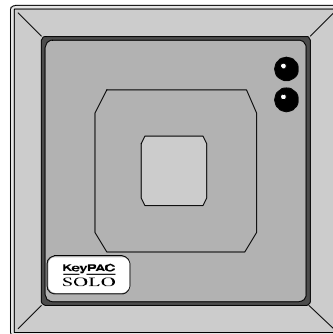


# Universal / Standard / VR KeyPAC Solo Installation and Operation Instructions

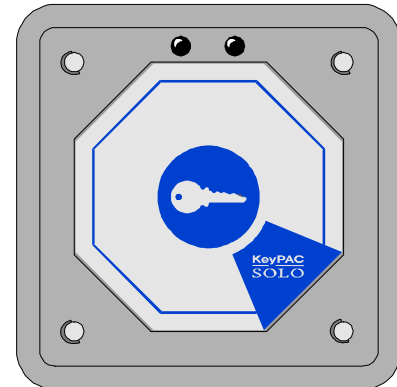
17348 Ver 1.5 April 2005



**KeyPAC Solo**



**Standard**



**Vandal Resistant (VR)**

## 1. Description

The KeyPAC Solo is a single-door controller combined with a proximity-device reader. It has a relay output which is designed to power an electric door-lock. It can unlock a door when a valid ID card is presented or when a Request to Exit (RTE) switch is pressed. It requires an external power supply to operate and to supply the lock. These can be the same power supply where necessary but check the rating before trying this.

The KeyPAC Solo can hold up to 2000 valid ID cards in memory. These are administered by using Master cards (refer to *Section 12.2 Add/Delete Operation – Edit Mode* of this document.)

### 1.1 Compatible ID Devices

The KeyPAC Solo will not work with the older PAC ID devices.

Use the following part codes to order extra ID devices:

Part Number	ID Device
20018	Wallet – card and shadow cards (10 of each)
20019	Wallet – token and shadow cards (10 of each)
20020	Box – card and shadow cards (10 of each)
20021	Box – token and shadow cards (10 of each)

## 2. Shadow ID Devices

The KeyPAC Solo is provided with 10 ID devices and 10 Shadow ID devices.

Each user ID device provided has a corresponding Shadow ID Device, which are held by the KeyPAC Solo administrator; and are used to delete their corresponding user ID device from the KeyPAC Solo database if that ID device is lost.

Shadow ID devices are only to be used to delete user ID devices from the database and not as a replacement, and should be discarded after being used. Refer to *Section 12.2.2 Deleting ID Devices* below on how to use Shadow ID Devices to delete an ID device from the KeyPAC Solo database.

If the ID device and its shadow card are lost then it cannot be deleted from the KeyPAC Solo database. Therefore, in order to remove it, the entire database must be erased. Refer to *Section 12.3 Erase Mode* for information on how to do this.

## 3. Unpacking

Check that all the parts are supplied with your reader. If anything is missing or damaged, contact your suppliers immediately. The KeyPAC Solo is supplied with the following:

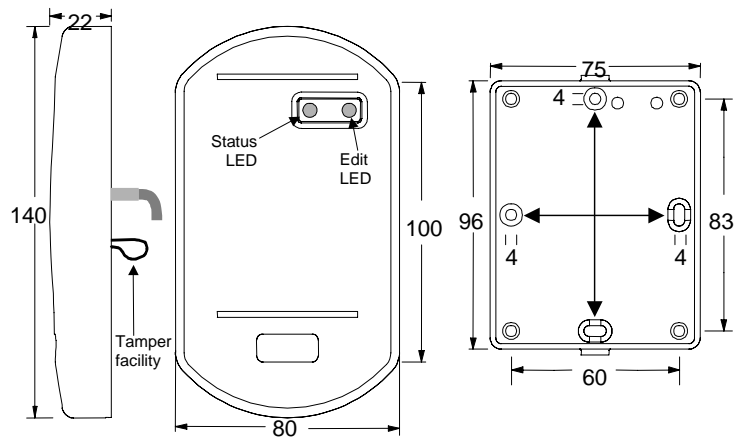
Universal Solo	Standard KeyPAC Solo	Vandal Resistant KeyPAC Solo
Two master cards <sup>1</sup>	Two master cards <sup>1</sup>	Two master cards <sup>1</sup>
ID device wallet, containing: Indelible pen Ten ID devices Ten Shadow ID cards <sup>2</sup>	ID device wallet, containing: Indelible pen Ten ID devices Ten Shadow ID cards <sup>2</sup>	ID device wallet, containing: Indelible pen Ten ID devices Ten Shadow ID cards <sup>2</sup>
Two M3.5x30 screws	Two M3.5x30 screws	Four VR Screws
Ten cable crimps	Ten cable crimps	Ten cable crimps
Octagonal KeyPAC Solo Label	Octagonal KeyPAC Solo Label	Octagonal KeyPAC Solo Label
This document	This document	This document
MOV	MOV	MOV
Snap fit decor cover	Snap fit decor cover	
	Label	Label

<sup>1</sup> Programmed into the KeyPAC Solo.

<sup>2</sup> Shadow cards are distinguished from other ID cards by their thickness and bevelled edge.

## 4. KeyPAC Dimensions

### 4.1 Universal Solo

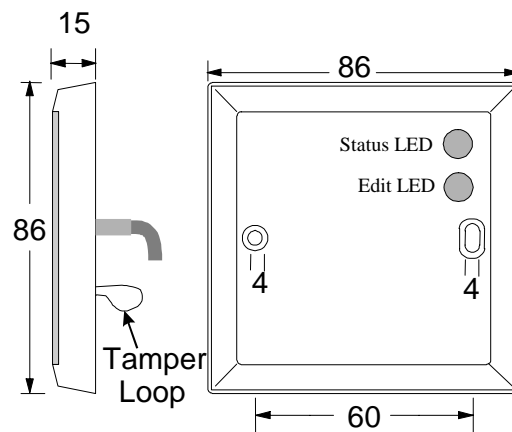


Dimensions in millimetres.

#### Note

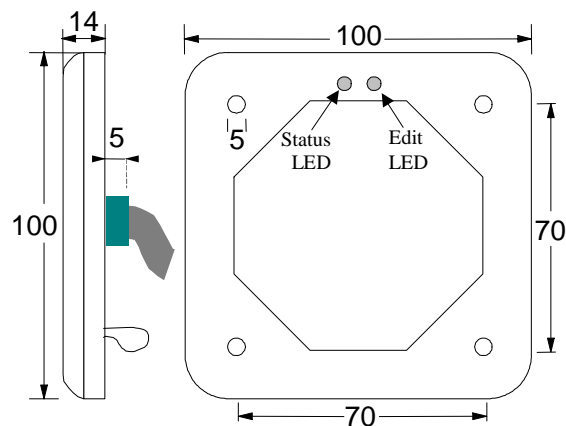
The screw holes indicated by the vertical and horizontal arrows are the recommended mounting points for the back box. Use either the vertical or horizontal screws. Do not use both as this may affect the reader's performance.

### 4.2 Standard



Dimensions in millimetres.

### 4.3 Vandal Resistant



Dimensions in millimetres.

## 5. Locating the Unit

- Mount the Solo next to the door on the unhinged side, at about the same height as the handle.
- You can mount the Solo behind non-metallic materials (glass, plastic, wood) without reducing its range. This is not recommended for the Vandal Resistant Model.
- Do not mount it within one metre of another proximity reader (including the other side of the wall).
- Mount the Solo inside or outside. For units mounted outside use a sealing compound to prevent water ingress (sealing compound not provided).
- The reading range also extends behind the unit so mount it normally on the inside of the wall. However, metal contained in the wall, including a metal back box, reduces the reading range. This may effectively prevent the reader from reading from its back. Fit a dummy reader label provided to the outside wall to indicate where to present ID devices.
- To allow easy viewing of the LED, avoid situating the unit in direct sunlight.
- The screws provided with the Standard Solo are for mounting it in a standard electrical back-box. Where appropriate use the MK back-box MK 2120 WHI (white) for surface mounting the reader.
- Leave enough room behind the unit for making cable connections.
- The Vandal Resistant KeyPAC Solo is provided with four vandal resistant screws. The tool for these screws can be procured from PAC (p/n 1950).

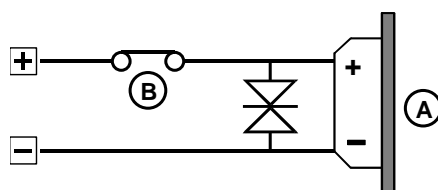
## 6. Health And Safety

Installations must be wired in accordance with National Wiring Regulations (BS7671, IEE National Wiring Regulations in the UK). Failure to do so can result in injury or death by electric shock.

The installation must also comply with any local Fire, Health and Safety regulations.

**WARNING:** A secured door that may be part of an escape route must always be fitted with the following. Failure to heed this advice can lead to injury or death in the event of a fire.

- A Fail-Safe lock (A). So that the door will be released if the power fails. Ideally a magnetic lock should be used because these are less likely to jam or seize.
- A normally-closed Break-Glass or Manual Pull (B) *in the lock supply wiring*. So that in an emergency the fail-safe lock can be immediately depowered.



### CAUTION

Isolate the supply before working on the unit. Failure to do so can damage the unit.

## 7. Wiring

### Note

The unit requires a 12V power supply capable of supplying at least 200mA. If you are planning to power the locks, bell etc. from the same supply take this into consideration when you specify the power supply.

Route the flying lead behind the unit and make the connections using the crimp connectors supplied. If the connections are made in a location that may be wet or damp, then protect the connectors with a sealing compound (not supplied), or use weatherproof crimps (not supplied).

All connections are made to an 8-conductor, flying lead. When using 0.22mm<sup>2</sup> (24AWG) cable, twist the wires together and double them over before inserting them in the crimp. The overall cable length, including the flying lead, should not exceed 3m.

### Note

RS Components supply a suitable crimp tool. At the time of writing the part codes were as follows: Crimps RS 534-907, Tool RS 253-4583.

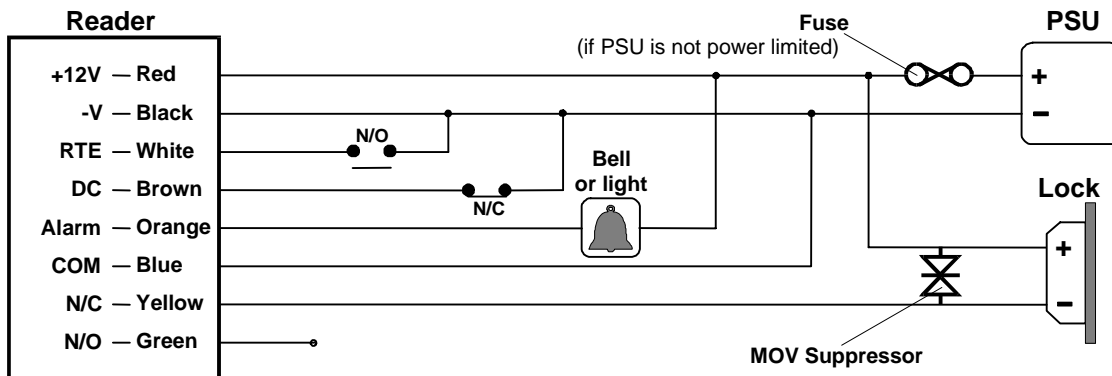
### 7.1 Flying Lead

**Length:** Approximately 1.9m      **Gauge:** 7/0.2, 0.22mm<sup>2</sup>

Colour	Signal	Notes
Black	-V	Power and signal return
Red	+12v	Unregulated 12V DC input 10.5-20V DC
Blue	COM	Common connection on the Solo relay
Green	N/O	Normally Open connection on the Solo relay
Yellow	N/C	Normally Closed connection on the Solo relay
White	RTE	Request to Exit connection
Brown	DC	Door Contact connection
Orange	ALARM	Alarm output pulls down to -V when active (open collector FET maximum current 400mA, maximum voltage 50Vconnection)

### WARNINGS

1. SOME FORM OF POWER LIMITING MUST BE FITTED. FAILURE TO DO SO COULD RESULT IN INJURY OR DEATH BY ELECTRIC SHOCK. THIS MAY BE BUILT INTO THE POWER SUPPLY UNIT OR BE A SUITABLE FUSE (RATING DEPENDS ON LOAD) FITTED AS SHOWN IN THE DIAGRAM OVERLEAF.
2. THE RELAY CONNECTIONS ARE RATED AT MAX 30V DC, MAX 2A. DO NOT ATTEMPT TO CONNECT MAINS ELECTRICITY TO THEM. THIS MAY CAUSE INJURY OR DEATH BY FIRE OR ELECTRIC SHOCK.



Example KeyPAC Solo wiring diagram showing fail-safe lock

**Note**

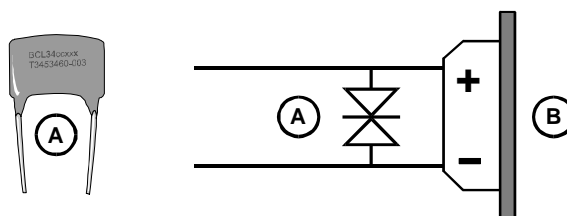
1. The Yellow or Green core will be used depending on the lock type.  
 Fail Safe = Yellow (N/C)  
 Fail Secure = Green (N/O)
2. The Solo relay is isolated so you can use a separate power supply for the lock.
3. If Alarm, RTE or relay contacts are not used they must be prevented from shorting (e.g. crimp the individual ends)
4. If DC (door contact) is not used then it must be connected to -V.
5. Prevent shorting of unused wires (e.g. by crimping the end)

**7.2 MOV - Lock Suppression**

A metal-oxide-varistor (MOV) is provided with each KeyPAC Solo. This device prevents back e.m.f. (high voltage 'spikes') being returned from the electric lock to the unit. High voltage spikes can cause severe damage over a period of time, and erratic operation of the system if not controlled.

**CAUTION**

Failure to fit the MOV at the lock will result in early failure of the unit. It will also invalidate the warranty.



The MOV (A) should be fitted across the power terminals of the lock (B).

## 8. Tamper Facility

A tamper facility is provided by a wire loop on the back of the unit. Snipping this loop, crimping the ends together and then securing the crimp to the wall can provide basic tamper protection. Forcibly removing the unit from the wall will break this connection and trigger the alarm.

Better protection can be provided by snipping the loop and fitting an appropriate normally closed switch. The switch would be mounted so that the contacts open if the reader is forced off the wall.

## 9. Alarm Facility

The unit has an internal sounder and an Alarm output which can be used to activate a bell, light etc when a Warning Condition occurs. The output is activated when:

- The door is opened without a valid card being presented to the unit.
- The door is held open for longer than twice the lock release time.
- The tamper connection is broken.
- Six different invalid cards are presented to the unit in succession.

Removing the warning condition and presenting a valid card will cancel the Alarm output.

For a “door left open” condition closing the door can turn off the Alarm. The door can be left open (e.g. when moving equipment) if the alarm is cancelled by presenting a Master card to the unit.

The table below shows warning conditions and the sounder types they trigger.

Warning Condition	Sounder
Door tamper Six invalid ID devices presented	One tone beeping
Tamper connection broken Door held open for longer than twice lock release time	Two tone beeping

**Note:** The alarm is automatically cancelled after 15 to 20 minutes.

## 10. Using the KeyPAC Solo

Before the KeyPAC Solo can be used, user ID devices must be added to the database. Refer to *Section 12.2 Add/Delete Operation – Edit Mode* for information on how to add ID devices.

**Note:** It is recommended that after an ID device is added to the database, its Shadow card should be clearly identified and stored in a safe place.

## 11. Configuring the KeyPAC Solo

The following table lists KeyPAC Solo configuration options and the sections that describe how to carry them out.

Configuration Option	Section
Adding additional ID devices to the KeyPAC Solo	Refer to <i>Section 12.2 Add/Delete Operation – Edit Mode</i>
Adding additional Master Cards <sup>1</sup>	Refer to <i>Section 12.3 Erase Mode</i>
Changing the Lock Release Time <sup>1</sup>	Refer to <i>Section 12.3 Erase Mode</i>
Enabling Set / Rest Mode <sup>1</sup>	Refer to <i>Section 12.3 Erase Mode</i>

<sup>1</sup> **CAUTION:** Performing any of these actions will erase the KeyPAC Solo database.

## 12. KeyPAC Solo Modes

KeyPAC solo modes are indicated by the colour of the two LEDs present on the front of the unit. Their locations are indicated in the diagrams in section 4.

On power up of the KeyPAC Solo the LEDs on the front of the reader will show red.

### 12.1 Normal Operation – Access Mode

Normal operation occurs after 1 or more Master Cards have been added to the KeyPAC Solo database, and is characterised by the Status LED being red and the Edit LED not illuminated.

In normal operation mode a card presented to the unit that is:

- **Valid** (present in the KeyPAC Solo Database) will cause the Status LED to go from red to green and the lock will operate. The LED stays green for the specified lock release time (see *Section 0 Changing Lock Release Time State*)
- **Invalid** (not present in the KeyPAC Solo Database) will cause the Status LED to flash red/green for a few seconds and a low pitch tone will indicate it is an invalid card.

**Note:** If a Master card is used then, when the Status LED goes green, and the Edit LED briefly flashes yellow to indicate that the card is a Master.

### 12.2 Add/Delete Operation – Edit Mode

Edit mode is entered by presenting a Master card to the unit three times.

1. First presentation will cause the Edit LED to go yellow (ignore the Status LED).
2. After the yellow LED has gone out, present the Master card for a second time causing the Edit LED to go yellow (ignore the Status LED).
3. After the Yellow LED has gone out, present the Master card to the unit for a third time. The unit will indicate Edit Mode been entered by two “beeps”, the Status LED going out and the Edit LED staying on.

Once in Edit mode, you can Add/Delete cards by presenting them to the unit.

**Note:** Do not leave an ID device within the reading range of the KeyPAC, otherwise it will be repeatedly added and deleted.

#### 12.2.1 Adding ID Devices

To add an ID device to the KeyPAC Solo database present it to the unit and its addition will be indicated by the status LED turning green briefly, followed by a low/high tone.

#### 12.2.2 Deleting ID Devices

To delete an ID device from the KeyPAC Solo Database present it to the unit and its deletion of will be indicated by the status LED turning red briefly, followed by a high low tone.

If an ID device becomes lost, then it can be deleted from the KeyPAC solo database by presenting its corresponding shadow card.

#### 12.2.3 Exiting Edit Mode

Once ID devices have added/deleted as required, you can leave Edit mode by:

- Presenting the Master card to the unit

or

- Leaving the unit to time-out (20 seconds) causing it to return to Normal Operation Mode.



## 12.3 Erase Mode

Erase Mode performs the following functions, in the listed order.

1. Erases the KeyPAC Solo Database.
2. Add new Master Cards.
3. Changes the Lock Release Time.
4. Enables Set / Reset Mode.

### 12.3.1 Entering Erase Mode

Erase Mode can be entered with or without the use of a Master Card.

#### Using a Master Card

To enter Erase Mode using a Master Card:

1. Tape the Master Card to the front of the KeyPAC Solo.
2. Push and hold the RTE button for at least 10 seconds.
3. Release the RTE button and remove the ID Device.

The unit will then enter Erase Mode.

#### Not Using a Master Card

To enter Erase Mode without using a Master Card:

1. Remove power from the unit.
2. Prop the door open (DC input floating) and remove power from the controller.
3. Short RTE (white), Bell (orange) and N/O (green).
4. Attach COM (blue) to ground (black) if not already connected.
5. Re-apply power.

The unit will then enter Erase Mode.

### 12.3.2 Erase Mode

Once erase mode has been entered the KeyPAC Solo will carry out the following functions one after the other:

1. Database Erase.
2. Master Card Addition State.
3. Changing Lock Release Time State (optional).
4. Enabling Set/Reset State (optional).

#### Database Erase

This will occur immediately upon entering Erase Mode, and is indicated by the Edit LED flashing, and upon completion the sounder will beep twice. This process may take up to 15 seconds.

After the erase is complete:

1. if Erase Mode was entered using a Master Card the KeyPAC Solo will enter into the **Master Card Addition State**.
2. If Erase Mode was entered without using a Master Card:
  - a) Remove power and reconnect the wiring to the RTE, Alarm etc.
  - b) Re-apply power to start up in the **Master Card Addition State**.

### Master Card Addition State

This state is entered after a database erase has occurred, and is indicated by the LEDs alternately flashing: the Status LED will flash red and the Edit LED will flash yellow.

To add a master card:

1. Present an ID device to the KeyPAC Solo.
2. The KeyPAC Solo will then indicate successful addition of a master card by both LEDs flashing simultaneously three times (the Status LED will flash green, and the Edit LED flashes yellow), and the sounder emitting a low/high tone.

### Changing Lock Release Time State

To change the lock release time (LRT), whilst in the Master Card Addition State:

1. Hold the RTE switch closed and count the number of beeps made by the KeyPAC Solo; one beep is equal to one second.
2. When the desired LRT has been reached release the RTE switch to set the lock release time.

### Enabling Set/Reset Mode State

When Set/Reset Mode is enabled a valid ID device is used to unlock or lock the KeyPAC Solo controlled door. A valid ID device will lock the door when unlocked, and unlock it when locked.

#### Note

Before using Set/Reset mode check that your lock is capable of constant operation.

To enter the enable Set/Reset state, whilst in the Master Card Addition state:

- Hold the RTE switch down and the KeyPAC Solo will begin to beep; after 15 beeps, there will be a different pitched beep to indicate the state change.

### 12.3.3 Exiting Erase Mode

To exit Erase Mode (and retain any settings that have been made):

1. Remove and reconnect the power.
2. Allow the KeyPAC Solo to time out, which occurs after approximately 4 minutes.

#### Note

Erase Mode can only be exited when at least one Master Card has been added. If no Master cards have been added:

- And power is disconnected and then reconnected the KeyPAC Solo will start up again in the Add Master Card State.
- Erase Mode will not time out.

## 13. LED / Sounder Behaviour

The following table shows KeyPAC Solo operation modes and their accompanying LED and Sounder states.

Mode Description	LED State		Sounder
	Status	Edit	
<b>Add Master Mode</b> See the section "Operation – Add Master Mode"	Flashing red then yellow	N/A	N/A
<b>Erasing Database</b>	N/A	Flashing yellow	Several low, low, high beeps
<b>Access Mode</b> Default state	Red	N/A	N/A
<b>Access Mode</b> Valid access	Green <sup>1</sup>	N/A	N/A
<b>Access Mode</b> Invalid Access	Red / green flashing	N/A	Low tone for several seconds
<b>Edit Mode</b> See the section "Add / Delete Operation – Edit Mode"	N/A	Continuous yellow	N/A
<b>Alarm</b> Door tamper	N/A	N/A	Continuous low beeping
<b>Alarm</b> Tamper connection broken	N/A	N/A	Continuous low-high beeping

<sup>1</sup> The status LED will stay green for the specified lock release time, and will then return to red.

## 14. KeyPAC Solo Features

Integral LEDs: Status–Red/Green; Edit – Yellow	Door Monitoring
Included in kit - two pre-programmed Master cards and 10 Access cards.	External Alarm Output
Tamper facility	Programmable Lock Time
Integral sounder	Supports Fail Safe and Fail Secure locks
RTE Input	Set/Reset option

# 15. Specification

## 15.1 Dimensions

See diagrams in *Section 4 KeyPAC Dimensions*.

## 15.2 Reading Range

Standard Solo, typically 20cm for ISO cards.

Vandal Resistant Solo, typically 50mm for ISO cards.

The reading range will reduce if:

- there is metal in close proximity to the unit
- there is electromagnetic noise in the vicinity, for example, from cabling close to the unit
- a noisy power supply is used, for example a switched mode PSU.

## 15.3 Power Requirements

### Voltage

The units require the following power supply:

12V DC (nominal), tolerance +10.5V to +20V.

### Current

Current consumption:

**Idle:** 85mA      **Relay activated:** 120mA

### Lock Relay

Single pole changeover 2A at 30V maximum

## 15.4 Environmental

**Temperature:**    Operating    -20°C to +55°C

                          Storage         -30°C to +80°C

**Humidity:**        Operating    0-90% RH at 30°C ±2C for 24 hours

## 15.5 Standards

**Application of Council Directives**                  73/23/EEC

**Standard(s) to which conformity is declared**    ETS 300.330, ETS 300.683