SL 2000
ELECTRONIC KEYPAD LOCK

roger

Operation manual

Electronic keypad lock SL2000

- Monostable (momentary) NO/NC relay output
- Bistable (switched) transistor output
- BELL transistor output
- Installer code for programming
- Main code controls the bistable output
- 55 user codes controls monostable output
- Non-violate memory of codes and configuration
- Digitally controlled time periods
- Door contact (DC) input
- Door release (DR) input
- Two special functions FBWP and FBK
- Programmed length of codes
- Code reprogramming disable option
- Bed code timed lockout
- "Open door" alarm function
- Bell signalling function
- TAMPER contact

Design and use

The SL2000 electronic keypad is designed for operation in stand alone access control systems. The device itself offers a relay switch output for controlling an electromagnetic door lock as well as two transistor outputs. One of them operates in a bistable mode and is used for interfacing with an alarm system or other device or system that require a dual state (bistable) control mechanism. The BELL output is utilised for signalling of "open door" alarm and/or can be used for indication of entrance intention to the monitored accommodation (BELL function). The electronic lock offers two inputs of NO type. One of them (DR input) is used for connecting a switch usually pushbutton , which will activate the relay output. The other one can be interfaced with an door open sensor (DC input). All codes and parameters configuring the lock's operation are stored in non-violate EEPROM memory – insensitive to power failures. The electronic keypad lock is available in two different casings:

| SL2000B | ABS plastic casing and silicone based keypad |
| SL2000S | Vandalism-proof metal casing. Device can operate outdoors. |

Important!
The C1C2, C3C4, C5C6, C7, C8, C9 and C10 symbols used in this manual refer to adequate digits entered in the configuration process of the electronic lock (see Configuration chart).

Monostable relay output

This output is activated each time a user code sequence is entered ([User code 01..55]). Activation takes place after a [C1C2] delay and lasts for the time specified by the [C3C4] parameter. Each time the RELAY switch of SL2000B lock is activated the yellow led ENTRANCE lights up.

INPORTANT !
By using the Main code it is possible to temporary disable/enable activity of all user codes (see FBWP function).

Open collector outputs

The Bistable and BELL outputs of SL2000 lock are an open collector transistor type. Some care must be taken in order to protect them from damage. When transistor output is switched off it remains in high impedance state, when switched on it shorts connected to it potential with supply minus. The maximum shorted current must not exceed pre-declared value (see installation drawings).

Bistable transistor output

This output is an open collector type. When the output is switch ON the green led OPEN lights up. When the output is OFF the red led CLOSED lights up. Every time the Main code is entered the bistable output is switched to an opposite state. After supply power up bistable output is set to OFF state (led CLOSED lights up).
When output is switched to the OFF state the lock generates two series of short acoustic signals (beeps), when switched to ON state the lock generates a single series of signals

NOTICE !
If the FBWP function is set the user codes are enabled only when the bistable output is in the ON state (the green led OPEN lights up).

BELL transistor output

This output is an open collector type. This output automatically switches OFF when the device is powered. Activation of the BELL output takes place after the [#] key is pressed and held down longer than 0,3 s. It remains active for the whole time the [#] key is held down. This output returns to the OFF state after 2 seconds from the moment the [#] key was released. The BELL output is also activated if the device signals the "Open door" event (see configuration chart). If such a situation takes place the output is activated as pulse and deactivates when the signal of the "open door" alarm ends.

DR input

The NO type DR input is used for connecting an external "push button" switch utilised for activating the relay output. When DR is shorted to the minus of the power supply it activates the relay output for the time specified by the [C3C4] parameter (see configuration chart).

DC input

The NO type DC input is used for connecting the door contact sensor. It signals an "Open door" event when shorted to the minus of the power supply. This input should remain unconnected if it is not utilised. If used, the DC input enables signalling of "Open door" alarm on the BELL output.

"Open door" alarm

In case of unauthorised door opening (i.e. without entering a valid code or without pressing the button connected to the DR input), the "open door" alarm signal is activated. This signalling is performed by pulse activation of the transistor BELL output and by a constant acoustic signal. Pressing a random key on the keypad will cancel the acoustic signal – however this does not cancel the alert on the BELL output. This alarm automatically turns off after 60 seconds or when someone closes the door. The "Open door" alarm is also activated if the door remains open for a time longer than specified in the configuration ([C5C6] parameter) – even if it was opened in the correct manner (using a valid user code or the DR button).

Keypad blocking function – FBK

If this function is enabled the lock's keypad becomes blocked for 60 seconds after three incorrect codes are entered. After this time the lock unblocks the keypad and is ready to accept new commands (codes).

Relay output blocking function – FBWP

If this function is OFF the state of Bistable output has no influence on opening the door, it means that all users codes function normally. If this function is ON all users code may open the door only if the bistable output is switched on (led OPEN lights up), when bistable output is switched OFF (led CLOSED lights up) all user codes are blocked. This function enables restriction for all user codes via use of a main code.

Lock's codes

Main Code
The main code controls the stable transistor output. Every time this code is used the bistable output reverses its state.

Installer code
This code enables entry to programming mode.

Users codes

These codes are used for triggering the relay output (open door). After a valid user code is entered the SL2000 starts count [C1C2] delay and after it switch on relay output for [C3C4] period. After the time defined by [C3C4] passes, the relay output returns to the off state. The electronic lock enables 55 different ([User01]..[User55]) codes to be set.

Lock operating commands

COMMAND	OPERATION
[User code xx] [#] xx=01…. 55	After this command is entered the lock starts count [C1C2] delay and after it relay output is activated for [C3C4] period.
[Main code] [#]	After this command the bistable output reverse its state.
[Installer code] [#]	After this command lock goes to the programming mode.
[*] [old Installer code] [#] [new Installer code] [#]	Programming of the new installer code.
[*] [old Main code [#][new Main Code] [#]	Programming of the new Main code.
[#]	If this key is held down for more than 0.3 seconds it activates the transistor BELL output and sounds a constant acoustic signal.

Programming of user codes

The electronic keypad lock enables 55 different user codes to be set. The user codes can be programmed/deleted/changed only in the programming mode. In order to program user codes entry to the programming mode must be done :

[Installer code] [#] - After this command lock enters programming mode.

In programming mode the following functions are available:

[0] [1] [#] [code] [#] [0] [2] [#] [code] [#] .. .. .. [5] [5] [#] [code] [#]	Sets user code no. 1 Sets user code no. 2 Sets user code no. 55
[0] [0] [#]	Deletes all user codes.
[9] [9] [#] [code] [#]	Deletes entered [code] if it exists.
[#]	Exit from the programming mode.

It is important to remember that the number of digits in the new codes should be the same as in old one. The lock will not accept two identical codes.

Important!
If the device accepts the new code it will sound two beeps. A single long beep signals an error or indicates that the given code already exists in the memory. Three beeps indicate that the user code programming mode has been ended properly.

Installing the electronic keypad lock

The device should be fastened to a vertical plane of a construction. The electromagnetic door lock can be connected to the same power source as the keypad unit, but it is important to feed the negative potential using a separate wire, this eliminates interference when the electromagnetic coil is activated. An overvolatge component (varistor) is connected in parallel with the relay's contacts. This element protects the relay's contacts from damage due to overtension when activating the electromagnetic coil.
Only the SL2000S lock is protected from atmospheric influences such as rain or snow. That's why it can be mounted outdoors without additional shielding or protection. It is mandatory to use the gasket seal shipped with the unit. The gasket should be placed between the SL2000S keypad and the device's back panel for protection of the PCB from water and moisture.

Configuration chart – EEPROM reset

In order to configure the electronic keypad lock the EEPROM reset procedure should be carried out first and a sequence of ten digits [C1..C10] should be entered to configure the device. The EEPROM reset procedure restores factory defaults for codes as well as other configuration parameters.

EEPROM reset procedure:
- *Turn off the power supply.*
- *Switch the jumper from the NORMAL position to EEPROM RESET position.*
- *Turn on the power supply.*
- *Wait for about 3 seconds, the device will sound three beeps when factory defaults are restored.*
- *Move the jumper from the EEPROM RESET to NORMAL position.*
- *Enter ten digits [C1..C10] according the scheme below:*
- *After last digit lock confirm end of configuration and goes to operation mode.*

Meanings of configuration digit :

[C1C2] : Delay before activation of the relay output (00..99s)

[C3C4] : Relay output activation time (00..99s)

[C5C6] : Maximum time for door to remain open (00..99s), (00 sets unlimited time)

[C7] : Multiple programming of the Main and Installer code enabled, enter 0,1,2 or 3.

	[Main code]	[Installer code]
[0]	YES	YES
[1]	NO	YES
[2]	YES	NO
[3]	NO	NO

Important!
If multiple code programming is disabled – the device will only permit a single attempt to programming of the selected code. Once code is programmed, it will not be possible to change the code without a need for EEPROM RESET. This function is used if installer wants to disable any later reprogramming of the lock.

[C8] : Sets on/off the FBK function (Keypad blocking function) and FBWP (relay output blocking function), enter 0,1,2 or 3.

	FBK	FBWP
[0]	OFF	OFF
[1]	ON	OFF
[2]	OFF	ON
[3]	ON	ON

[C9] : Sets the length of the users codes, enter 0,1,2 or 3.
    [0] ;   User codes are 2 digits long
    [1] ;   User codes are 4 digits long
    [2] ;   User codes are 6 digits long
    [3] ;   User codes are 8 digits long

[C10] : Sets the length of the Master and Installer codes, enter 0,1,2 or 3.
    [0] ;   Both codes are 4 digits long
    [1] ;   Both codes are 6 digits long
    [2] ;   Both codes are 8 digits long
    [3] ;   Both codes are 10 digits long

It is recommended to set the Master and Installer codes to be longer then the users codes.

Important!
If an illegal option is entered or an error occurs during configuration process the device will signal an error beep and return to the beginning of the procedure. All digits configuring the lock's operation will have to be re-entered. The configuration procedure automatically comes to an end when the [C10] digit is entered correctly. The device stores the configuration in a non-violate EEPROM it can only

be changed after the EEPROM RESET function is executed. After the configuration procedure comes to an end the all codes are set to default values (listed below).

Default values of codes:

[Main code]:   [1111(1)] , all digits are "1", the number of digits depends on the C10 parameter,

[Installer code]:   [2222(2)], all digits are "2", the number of digits depends on the C10 parameter,

[User code 01]:   [33(3)], all "3", the number of digits depends on C9 parameter,

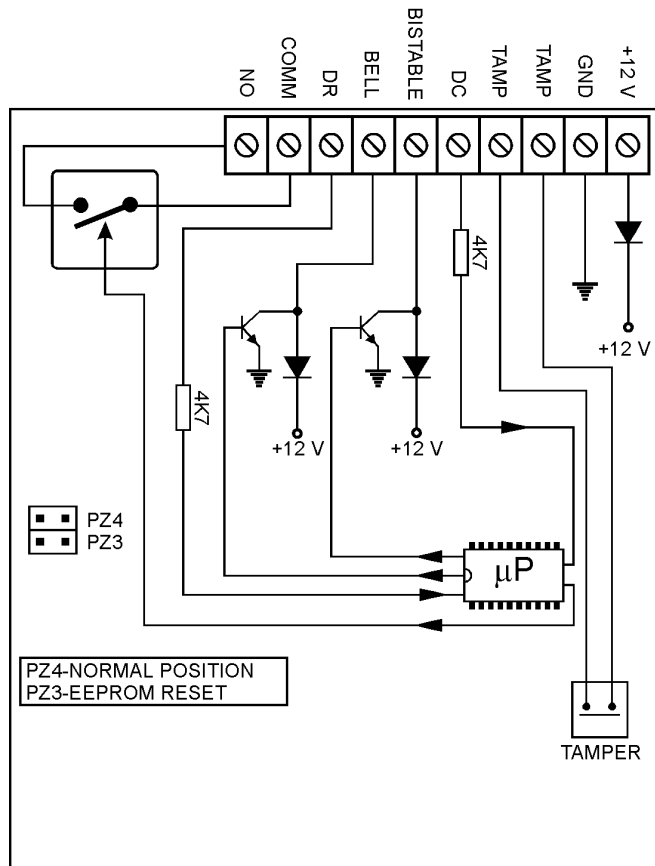[User code 02..55]: are blank, does not exist.

Example of configuration:
The following digits were entered after the EEPROM RESET function [0][1][0][2][3][3][1][0][2][3],
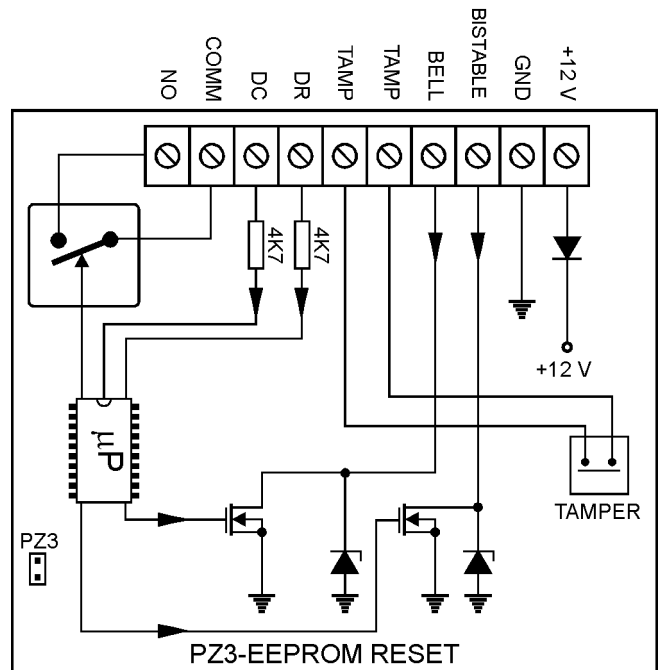*This sequence sets the following values:*
[01] seconds - delay before the door will be open,
[02] seconds - time for open the door,
[33] seconds - maximum time for door to remain open
[1] - re-programming of [Main code] disabled], [Installer code} – enabled
[0] - FBK function OFF, FBWP function OFF
[2] - length of [User codes] codes set to 6 digits
[3] - length of [Main code] and [Installer code] set to 10 digits

Technical specification

Power supply voltage:	from 11 to 15VDC
Current consumption:	typical 15mA @ 12VDC
	Maximum 60mA @ 15VDC & relay output activated
Operating environment temperature range:	0..+50 degrees C (SL2000B)
	-20..+50 degrees C (SL2000S)
Relay output	1.5A 24Vdc/ac
Transistors output switch current:	150mA for the (SL2000B)
	1.0A for the (SL2000S)

PZ4-NORMAL POSITION
PZ3-EEPROM RESET

SL2000B

PZ3-EEPROM RESET

SL2000S