

SL 1000

ELECTRONIC KEYPAD LOCK



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DESIGN AND USE

The SL1000 electronic keypad lock is designed for operation in anti-burglary alarm systems. The device can simultaneously function as a standalone access control unit based on an electromagnetic lock. The SL1000 is equipped with three outputs. Two of which are transistor outputs and the third is a relay output with a pair of NO/NC connectors. The electronic keypad lock has four codes that enable programming and control of its outputs. All codes and parameters configuring the lock's operation are stored in non-volatile EEPROM memory – insensitive to power failures. Different configuration variations enable effective adaptation to specific applications by choosing the desired operating manner. The lock's synthetic silicone based keypad guarantees long life operation. Operation in the dark is easy because the lock's keypad is lit up. The SL1000 is available in several designs differing in mechanical construction. The following versions are currently available:

SL1000A	Metal casing, lit up keypad, freely available.
SL1000B	ABS plastic casing, lit up keypad, freely available.
SL1000C	Metal casing with special keypad protection lid. Lit up keypad.
SL1000H	Metal casing, moisture-proof, special keypad protection lid. The keypad is designed for outdoors operation.

INSTALLING THE ELECTRONIC KEYPAD LOCK

The device should be fastened to a vertical plane of a construction. All electric connections should be done before connecting the lock to a power supply. If the electromagnetic door lock is connected to the same power source as the keypad unit it is important to feed the negative potential using a separate wire. SL1000A, SL1000B and SL1000C units should be protected from atmospheric influences such as rain or snow as well as away from heat and humidity sources. The SL1000H lock is protected from atmospheric influences such as rain or snow. That's why it can be mounted outdoors without additional shielding or protection.

RELAY SWITCH OUTPUT

The relay output can operate in pulse or stable mode. When the relay is activated the OPEN led is lit whereas the CLOSED led lights if the relay is not active. An overvoltage component (oxide varistor) is connected in parallel with the relay's contacts. This element protects the relay's contacts from damage due to overvoltage when switching inductive loads (such as the electromagnetic lock) therefore extending the relay's life.

TRANSISTOR OUTPUT – AUX

When this output is activated, the potential connected to its circuit is shorted to negative ground of the power supply. When the output is turned off it stays in a state of high impedance. The AUX output can operate in both pulse and stable modes. Potentials connected to the AUX cannot exceed values of the power supply's positive potential and the switched current cannot exceed 150 mA.

TRANSISTOR OUTPUT – PREALARM

When this output is activated, the potential connected to its circuit is shorted to negative ground of the power supply. When the output is turned off it stays in a state of high impedance. This output is used to signal PREALARM-DURESS or retransmit the pressing of [#] in BELL function. Potentials connected to this output cannot exceed values of the power supply's positive potential and the switched current cannot exceed 150 mA.

CONTROLLING THE OUTPUTS

Both the relay and the AUX outputs are controlled by codes entered from the lock's keypad and can operate in pulse as well as stable mode. The PREALARM output can be controlled by the PREALARM-DURESS or BELL function. Operating modes are selected by jumper settings on the back of the lock's PCB.

Pulse output mode

Outputs operating in pulse mode are normally in the OFF state. Commands 3 or 6 activate the output for a period of time defined by the calibrated delay ([C4C5] parameters). When this time period surpasses the output returns to the OFF state. If the activating commands are entered during the calibrated delay the total active time is extended by [C4C5] counting from the time of a previous command. The delay on the stable output can be set from 1 to 99 seconds.

Stable output mode

Every time a appropriate code is initiated the stable output is flipped to a state opposite of the state that the output was previously in. The output can be switched immediately after command 1 is entered or with a delay if command 5 was entered. **If the vault code [KS] is enabled the stable mode output will switch from OFF to ON only after the main code [KG] is entered followed by the vault code [KS] (command 8).** Switching back to the OFF state does not require entering the vault code and is done immediately after the main code [KG] (command 1) or the locking code [KZ] (command 7) is entered. After the power supply is connected the electronic lock's outputs operating in stable mode are automatically switched off.

SYSTEM LED INDICATOR

The led SYSTEM is lit when the negative ground of the power supply is connected to the LED connector located on the connector terminal. It is not mandatory to utilise this indicator. This led can be used for example for indicating that the alarm system is armed. Open collector output types such as PREALARM or AUX can control direct the led SYSTEM.

PREALARM-DURESS FUNCTION

This function activates the PREALARM transistor output when three consecutive attempts of entering access codes fail or command 2 is used. The PREALARM output automatically switches off after 60 seconds. A short acoustic signal sequence is generated in addition to activation of the PREALARM output when three consecutive attempts of entering access codes fail. The PREALARM-DURESS function is usually utilised for signalling keypad manipulation or silent alarm generation due to entering the main code under duress (command 2).

BELL FUNCTION

This function activates the PREALARM output after the [#] key is pressed down longer than 0.5 seconds. The output remains in the active state for as long as the [#] key is held pressed down. After the [#] key is released the output remains active for two seconds after which it switches off. This function is usually used for calling security or signalling the intention to enter the premises.

LOCK'S CODES

[KG] Main code

This code can consist of 2 to 6 digits. It is used to control all of the lock's outputs as well as for programming.

[KS] Vault code

This is a four-digit code which can be enabled or disabled during the lock configuration procedure. **If this code is enabled the stable mode output will only switch from OFF to ON after the main code [KG] is entered followed by the vault code [KS].**

[KD] Door code

This is a four-digit code which is only used for controlling the output operating in the pulse mode. It is used for switching on the pulse output for a time defined by [C4C5].

[KZ] Locking code

This is a four-digit code which is only used for controlling the output operating in the stable mode. It causes the stable mode output to switch from ON to OFF. Use of this code requires command 4 to be entered before.

PROGRAMMING OF CODES

Programming of codes can be done only once or can be done any number of times after the EEPROM RESET procedure. It depends on setting of [C1] parameter. The following scheme illustrates how code programming is performed:

[*] [PREVIOUS KG] [#] [NEW KG] [#] [NEW KG] [#]
{ [#] } [NEW KD] [#] { [#] } [NEW KZ] [#]

IMPORTANT !

Pressing [#] in places specified by { } enables the user to exit the programming function earlier while saving all previously programmed settings. If the use of the [KS] code is enabled (parameter [C2]=[1]), it can be programmed according to the following scheme:

[*][PREVIOUS KS][#][NEW KS][#][NEW KS][#]

LOCK'S COMMANDS

The electronic keypad lock uses acoustic signals to indicate three phases of command entry:

- a single short signal (*) indicates that a key has been pressed
- two series of two signals (** **) indicate that part of a command was entered correctly and that the device awaits further entry
- three acoustic signals (***) indicate that the entire command was entered successfully
- a single long signal (-), lasting for about 2s, indicates an error

Command 1 [KG][#]

Switches the output operating in stable mode to an opposite state of that before the command was initiated.

Command 2 [KG][N][#]

Acts in the same manner as command 1 and switch on signalling the PREALARM-DURESS function.

Command 3 [KG][*][#]

Switches on the output operating in pulse mode for a time defined by the calibrated delay. It works identical to command 6.

Command 4 [KG][*][*][#]

Allows for a single use of command 7.

Command 5 [KG][*][*][*][#][H][M][M][#]

Switches the output operating in stable mode to the opposite state after H-hours and MM-minutes. The H parameter can be from 0 to 9 and the MM parameter from 00 to 59. If a new command 5 is entered during an already initiated command 5 the new settings of H and MM will take place of the previous ones. If command 1 is entered during an already initiated command 5 it will override command 5 and the lock will immediately switch the stable output. If the lock is currently processing command 5 and the countdown is greater than 15 minutes the device generates a short acoustic signal every minute. If this time is shorter than

15 minutes the lock will generate a short acoustic signal every 2 seconds. This is used to indicate that the switching of stable output will take place.

Command 6 [KD][#]

Switches ON the output operating in pulse mode for a time of [C4C5] seconds being the calibrated delay.

Command 7 [KZ][#]

Switches the output operating in stable mode from ON to OFF. This only takes place if the main code (command 4) permits this. Command 4 must be entered every time before command 7 is to be use.

Command 8 [KG][#][KS][#]

If the use of the [KS] code is enabled (parameter [C2]=[1]) then stable output can only be switched from OFF to ON after this command is initiated. The [KS] code must be entered within 30 seconds from the entry of the main code [KG].

Command 9 [#]

Usually this key is used to end code entry. Additionally if [C3]=[1] was set during configuration and [#] is held down the PREALARM output is activated. After the [#] key is released the output remains active for 2 seconds after which it switches off. This key can be used for calling security or signalling the intention to enter the premises.

CONFIGURATION – EEPROM RESET

In order to configure the electronic keypad lock the EEPROM reset procedure should be carried out first. Then a sequence of five digits [C1..C5] should be entered according to the steps below:

- Turn off the power supply.
- Switch the jumper from the NORMAL position to EEPROM RESET.
- Turn on the power supply.
- Wait few second, the device will generate sound periodically,
- Switch the jumper from the EEPROM RESET position to NORMAL.
- Wait until two sounds,
- Enter five digits [C1..C5] to configure the lock.
- Wait for the device to sound three beeps, which will acknowledge the new configuration.

The unit is ready for operation.

Configuration parameters definition:

[C1] Enables multiple code reprogramming
 [C1]=[0] ; codes can only be set once
 [C1]=[1] ; codes can be set any number of times

IMPORTANT !

If multiple code programming is disabled ([C1]=[0]) – the device will only permit a single entry of the selected code. Once programmed, it will not be possible to

change the code without a need for EEPROM RESET.

[C2] Enables the use of [KS] code.
 [C2]=[0] ; disables the use of the [KS] code
 [C2]=[1] ; enables the use of the [KS] code

[C3] Defines the function of the PREALARM transistor output.
 [C3]=[0]; the output signalling the PREALARM-DURESS function
 [C3]=[1] ; the output signalling the BELL function

[C4C5] Defines the calibrated delay on the stable output (00..99 seconds)

After the [C5] digit is entered the lock is configured and changes are stored in memory. After configuration the device automatically sets the lock's codes to the following values:

[KG] - [1234]
 [KS] - [9999]
 [KD] - [1111]
 [KZ] - [2222]

If an error is made during the entry of [C1..C5] digits the device signals it by sounding the error beep. All previous settings are cancelled and the lock restart configuration procedure. The user must re-enter digits [C1...C5].

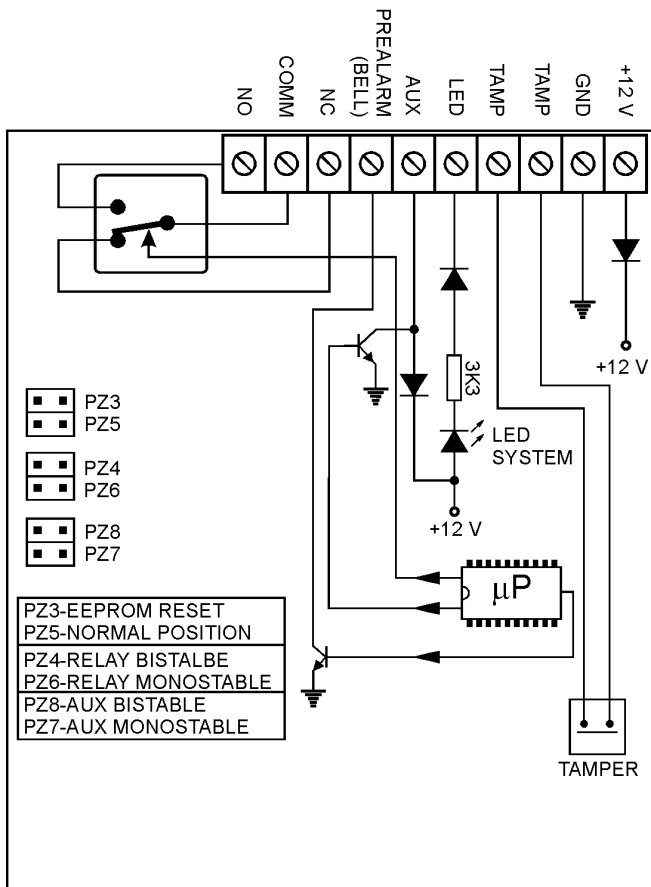
Example:

The installer has RESET the EEPROM and entered the following digit sequence [1][0][1][2][5]. This has the following meaning:

- codes can be set any number of times [C1]=[1]
- the use of the vault code [KS] is disabled [C2]=[0]
- the PREALARM output performs the BELL function when the [#] key is held pressed down [C3]=[1]
- the calibrated delay on the stable output is set to 25 seconds [C4C5]=[25]

TECHNICAL DATA

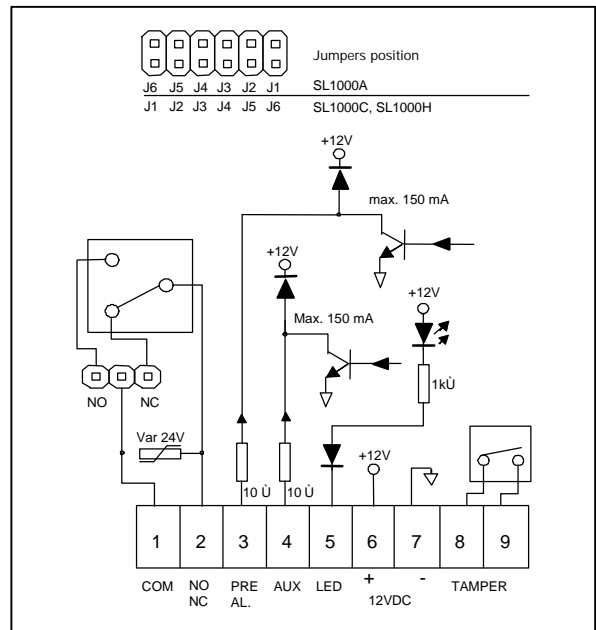
Power supply voltage: 11..15 Vdc
 Current consumption: Typical 15mA
 Current consumption with activated relay output: Max. 60mA
 Operating environment temperature range: 20..+50 degrees C
 Relay output load: Max. 1.5A 24Vdc/ac
 PREALARM and AUX output load: Max. 150mA



SL1000B

Output control modes								
Jumper		AUX output	Relay output	Function				
J1	J2	J3	J4	J5	J6	STABLE	STABLE	
						STABLE	PULSE	
						PULSE	STABLE	
						PULSE	PULSE	
								Unit RESET
								Normal operation

Jumper	Relay contact selection
NO NC	Contacts normally open (NO)
NO NC	Contacts normally closed (NC)



SL1000A, SL1000C, SL1000H