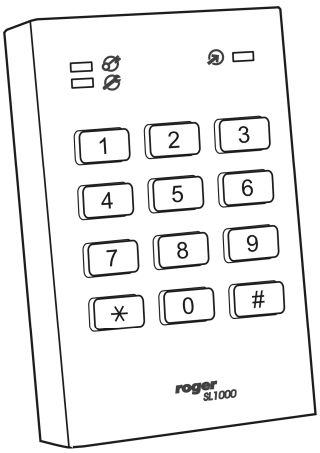
Electronic Code Lock

SL1000A v3.1

CE



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General

The microprocessor-based code lock SL1000A can be used as a standalone unit supervising an electric lock which controls an access to the room. At the same time the SL1000A can be used for controlling other system or device requiring bi-state control method (such as arming/disarming an alarm system, switching light, heating, and so on).

The SL1000A is equipped with two transistor outputs and one relay output. The lock uses four codes, which allow for controlling its outputs as well as for programming. All the configuration parameters which control operation of the device, including codes, are stored in a non-volatile EEPROM memory.

The lock's keypad is made of synthetic silicon. It guarantees a high level of reliability and thanks to a soft illumination is easy to use in darkness.

Features description

RELAY Output

The SL1000A is equipped with one relay output which provides one no-potential (isolated) NO/NC contact. When the RELAY output is on, the LED OPEN is lit, when the output is off, the LED CLOSED is lit. The RELAY output can operate in a *monostable* or *bistable* mode. The selection of used contact type (NO or NC) is done with jumpers.

The AUX output

When the output is on, it shorts potential connected to it with the ground (supply minus), when it is off, remains in a high resistance state. A voltage applied to this output must not exceed 15V, and the sink current must be lower than 150 mA. The AUX output can operate in a *monostable* or *bistable* mode.

The PREAL. output

When triggered, this output shorts potential connected to it with the ground (supply minus), when it is off, it remains in a high resistance state. The PREAL. output can be configured as an indicator for PREALARM plus DURESS alarms or as a DOOR BELL indicator. Programming of the PREAL. output is performed during the **EEPROM Memory Reset** procedure (see C3 setting). A voltage applied to this output must not exceed 15 V and the sink current must be lower than 150 mA.

Controlling the RELAY and AUX outputs

The RELAY output and the transistor AUX output are controlled using specific control commands (codes). Each of these outputs can operate in one of two modes: *monostable* or *bistable*. Selection of the RELAY and AUX outputs operating modes is performed using jumpers.

The monostable (momentary) state

An output operating in this mode is normally off. By using **Command 3** or **Command 6** the output triggers for the time set by the *C4C5* setting. After this, the output automatically switches back to the **off** state. If **Command 3** or **Command 6** have been used again when the output is **on**, the **on** state will last longer and will be counted from the moment, when the last command was issued. The time of triggering the *monostable* output can be defined in a range from 1 to 99 seconds.

The bistable mode (latch)

Every time, the command controlling the *bistable* mode is issued, the output switches to the opposite state relative to the state it was in when the command was issued. The switching the output can be performed immediately after the **Command 1** is issued or after some delay (like in case of **Command 5**). When the *Vault Code*, is enabled switching the output controlled in the *bistable* mode from the **off** to the **on** state additionally requires entering the *Vault Code* (see **Command 8**). Switching back from the **on** to **off** mode does not require the *Vault Code* and is performed only after entering the *Master Code* (see **Command 1**) or the *Close Code* (see **Command 7**). After switching the power on, the *bistable* output will always enter the **off** mode.

LED SYSTEM

Applying a minus to the LED input switches the LED SYSTEM on. The way this indicator is used depends on the installer. For instance, the LED SYSTEM may indicate entering the alarm system into specific mode (e.g. Armed/Disarmed). The SYSTEM indicator can be easy controlled from transistor or relay output of any type both from SL1000A outputs and other devices.

Alarms

The SL1000 can indicate two alarm events:

- PREALARM

- DURESS

The signaling of an alarm state can be performed using PREAL. output if it has been configured for this function.

PREALARM

This type of alarm is triggered after three consecutive unsuccessful attempts to enter the code. The alarm lasts for three minutes. During the whole period of this alarm, the

lock's keypad is blocked and a short, cyclic beep is generated.

DURESS

This type of alarm triggers when the user enters the *Master Code* with one, additional digit.

- [MC][N][#]
- [MC][N][*][#]

During the DURESS alarm, the lock's keypad is not blocked and can accept additional commands.

DOOR BELL function

The purpose of this function is to signal the user's intention to enter the room. In order to initiate the DOOR BELL signal, the user should press and hold the [#] key for at least 0.5 sec. If programmed the PREAL. output will go **on** state as long as the key [#] is pressed. After the [#] key is released, the output remains in the **on** state for additional two seconds and then switches back to the **off** state.

Anti-tamper protection

The lock is equipped with the anti-tamper switch. During the normal operation, this switch is closed (contacts shorted). Removing the device cover or moving the lock out of the surface causes entering the switch in the open state (contacts open). The contacts of the anti-tamper protection can be connected to the relevant input of the alarm system or used for initiating any alarm device (such as a buzzer).

Lock codes

Note: The term "*monostable output"* refers to a RELAY or AUX output configured for operation in *monostable* mode. The term "*bistable output"* refers to a RELAY or AUX output configured for operation in *bistable* mode.

Master Code [MC]

The code may consist of 2 up to 6 digits. The MC can be used for controlling both *monostable* and *bistable* outputs. Every time this code is entered, the *monostable output* is switched **on** for the time defined by the C4C5 settings and the *bistable output* is switched into opposite state.

Vault Code [VC]

The code of constant length: four digits. Using this code can be enabled or disabled during the lock configuration (see C2 setting). In case the installer has enabled the code, switching a *bistable output* into **on** state requires two codes: *The Master Code* and the *Vault Code* (see **Command 8**).

Note: The *Vault Code* is not required to switch *a bistable output* to the **off** state.

Door Code [DC]

The code consists of four digits. Using the code causes triggering the *monostable output* for the time defined by the C4C5 settings.

Close Code [CC]

The code consists of four digits. Entering the code causes switching the *bistable output* into the **off** state. The *Close Code* is a so called "one-time code". Every use of this code requires a special permission which is granted using the **Command 4**.

Lock commands

The lock generates a different acoustic signal for the three stages of entering a command:

- one short signal (*) indicates that a key has been pressed;
- two series of two signals (** **) indicate that a part of a command has been entered properly and the system waits for the remaining part;
- a series of three signals indicates that a command has been entered properly;
- a one long signal (-) which lasts for approx. 2 sec indicates that an error has occurred.

Command 1: [MC] [#]

Switches the *bistable output* to the opposite state relatively to the state it was before the command was issued. When during configuration state the *Vault Code* has been enabled, the **Command 1** stops working, and its functionality is replaced by the **Command 8**.

Command 2: [MC][N][#]

Switches the *bistable output* into the opposite state, additionally triggers the DURESS alarm.

Command 3: [MC] [*] [#]

Triggers the *monostable output* for the time of a C4C5 delay. It is equivalent to the **Command 6**.

Command 4: [MC] [*] [*] [#]

Enables a one-time use of **Command 7**.

Command 5: [MC] [*] [*] [*] [#] [H] [M] [M] [#]

The command switches the *bistable output* to the opposite state after **H** hours and **MM** minutes. The number of hours can be any value from 0 to 9 and the number of minutes can range from 00 to 59. If the **Command 5** is issued again during the count down of a time delay (switching has not yet been done), the old values **H** and **MM** will be replaced with new ones. When **Command 1** is issued during the count down of a delay, the **Command 5** will be cancelled and the lock will immediately change the state of the *bistable output*. If the lock performs the **Command 5**, and the time till the end of the time delay (set by **HMM**) is more than 15 minutes, the system generates a short acoustic signal every minute. If there is less than 15 minute to the end of **HMM** delay, the lock generates an acoustic signal every two seconds. This informs that the moment of switching the *bistable output* is close.

Note: If the *Vault Code* has been enabled, the lock accepts the **Command 5** only for switching the *bistable output* off. Switching the output on is not possible.

Command 6: [DC] [#]

Triggers the *monostable output* for the time (number of seconds) set by the C4C5 setting.

Command 7: [CC] [#]

Issuing this command switching the *bistable output* off. Every use of the *Close Code* requires a separate permission given by the **Command 4**.

Command 8: [MC] [#] [VC] [#]

When the *Vault Code* is enabled, the *bistable output* can not be controlled using **Command 1** but **Command 8**. The *Vault Code* needs to be entered no later than 30 seconds after the *Master Code* was entered.

Command 9: [#] (long press)

Normally pressing this key terminates entering the command but if the C3=1 setting was entered during the lock configuration, pressing the [#] key for extended time will switch the PREAL. output **on**. After the [#] key is released, the output remains in the **on** state for the additional two seconds and then switches back to the **off** state. The way the [#] key works can be utilized for creating acoustic or light signaling of somebody's intention to enter the room controlled by the lock.

Lock configuration / Memory reset

In order to perform the lock configuration, you need to carry out the **EEPROM Memory Reset** procedure. Then enter five digits (from C1 to C5). The C1-C5 digits configures the lock's operation.

Perform the following steps:

- switch power off;
- remove the jumper from J6 position and put it into J5;
- using J1, J2, J3 and J4 jumpers select proper operation modes for RELAY and AUX output lines;
- switch power on, the lock will signal that the EEPROM memory has been cleared by generating short beeps;
- move the jumper from J6 to J5 position;
- wait until you hear the prompt signal (** ** - two series of two short beeps);
- enter five digits C1-C5 which configure operation of the lock (one after another);
- wait while the lock is storing new settings until it generates a series of three acoustic signals (***);

After this step, proceed to the code programming stage. Code programming concludes the lock configuration process.

C1-C5 lock configuration settings		
C1	The C1 setting enables/disables multiple re-programming of lock's codes	
	0	Lock code programming allowed only one time
	1	Lock code programming allowed any number of times
	Note: If the code programming is allowed only one time (C1=0), then after configuration is complete the lock allows only one attempt of programming the *Master Code* and the *Vault Code*. The next attempt to change the codes will require memory reset and performing the lock configuration procedure from scratch.	
C2	The C2 setting enables/disables the *Vault Code*	
	0	The *Vault Code* [VC] disabled
	1	The *Vault Code* [VC] enabled
C3	The C3 setting determines a function of the PREAL. transistor output	
	0	The output signals PREALARM and DURESS alarms
	1	The output signals BELL function
C4C5	Determines the time for which the *monostable output* is triggered (C4C5=01..99 sec.)	

Entering the C5 digit ends the lock configuration. After this step, the settings are saved in memory. After configuration is complete, the lock codes have the following default values:

Master Code [MC]	[MC] = [1234]
Vault Code [VC]	[VC] = [9999]
Door Code [DC]	[DC] = [1111]
Close Code [CC]	[CC] = [2222]

When during the process of entering C1-C5 settings an error occurs due to improper value entered, an error signal will be generated, and the previously entered settings will be cleared. The system will return back to the beginning of configuration procedure. In such case you should enter the C1-C5 settings again.

Example

The installer has carried out the EEPROM memory reset procedure and immediately after entered digits [1][0][1][2][5]. It means that:

- lock code programming is allowed any number of times (C1=1);

- The Vault Code [VC] is disabled (C2=0);

- the PREAL output signals BELL function (C3= 1).

- The time of triggering the monostable output is 25 seconds. (C4C5=25)

Code programming

Depending on the configuration settings, code programming can be performed only one time, after completing the **EEPROM Memory Reset** (C1=0) or can be performed any number of times (C1=1). Code programming is done according to the following schemes:

a) *Master Code* re-programming

[*][Old MC][#][New MC][#][New MC][#][#]

a) *Master Code* and *Door Code* re-programming:

[*][Old MC][#][New MC][#][New MC][#][New DC][#][#]

c) *Master Code*, *Door Code* and *Close Code* re-programming

[*][Old MC][#][New MC][#][New MC][#][NEW DC][#][NEW CC][#]

If the *Vault Code* is enabled, its re-programming is done according to the following scheme:

[*][Old VC][#][New VC][#][New VC][#]

Installing the Code Lock

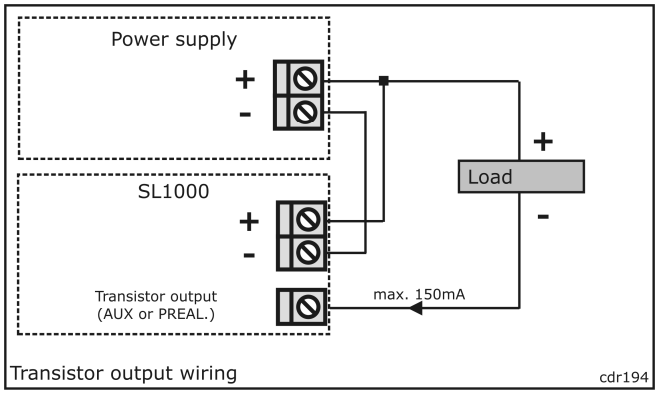
The code lock should be mounted near the controlled door on a vertical surface. The working element which unlocks the door (a door strike or magnetic lock) should be connected directly to the power supply using a separate pair of wires. The general purpose semiconductor diode (e.g. 1N4007) should be connected in parallel to the lock contacts. It is to avoid inductive overvoltages. The diode should be connected as close as possible to the lock nodes. The SL1000A has not been designed to work in an outdoor conditions and should be installed in protected places only.

Note: It is forbidden to supply door lock directly from the DC input terminals of the code lock.

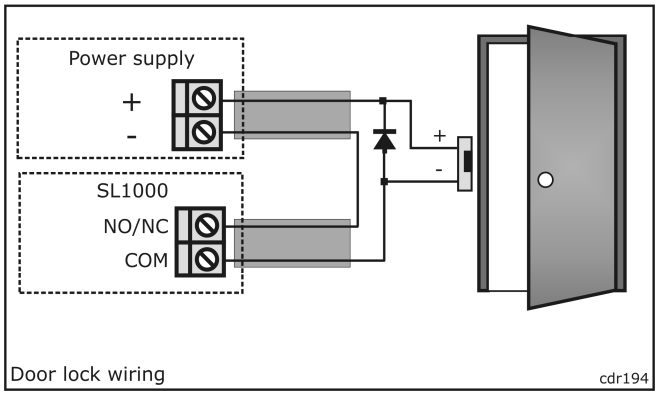
Technical specification

Supply voltage	10..15V DC
Average current consumption	15mA@12V
Current consumption with the relay on	60mA@12V
Relay output	1.5A/24V DC/AC

Transistor outputs	150mA/15V DC
Anti-tamper protection	NC contact, 50mA/24V
Operating temperature	-25°..+60°
Relative humidity	10-95% (non-condensing)
IP Code	IP30
Dimensions (W x H x D)	68X104X23
Weight	Approx. 490g
Certificates	CE



Transistor output wiring cdr194



Door lock wiring cdr194

SL1000A code lock configuration example

It is assumed that the lock will perform the following functions:

- The RELAY output will work in a monostable mode with triggering time of 10 sec and will be used for door unlocking
- The AUX output will operate in the bistable mode and will be used for re-arming of an alarm system
- The PREAL. output should indicate PREALARM and DURESS alarms
- code re-programming should be allowed

In order to prepare the SL1000A to performing the tasks defined, the **EEPROM Memory Reset** procedure should be carried out according to the following scheme:

- Switch power off;
- Move the jumper from J6 to J5 position;
- Put jumpers on J2 and J4 contacts (RELAY output: *monostable,* The AUX output: *bistable).*
- Put the NO/NC jumper in the NO position
- Switch power on, the lock will be signaling that the EEPROM memory has been cleared by generating short acoustic signals (* * *…);
- move the jumper from J5 to J6 position;
- Wait until the acoustic signal is generated: ** ** (two series of two signals)
- Enter five digits for C1-C5 settings: [11010]
- Wait until the lock generates three acoustic signals (***)

After this step the lock is prepared to normal operation.

AUX mode selection	
JP1 JP2	Monostable mode (momentary)
JP1 JP2	Bistable mode (latch)

PREAL. mode selection	
JP3 JP4	Monostable mode (momentary)
JP3 JP4	Bistable mode (latch)

Memory Reset	
JP5 JP6	EEPROM memory reset
JP5 JP6	Normal (without reset)

RELAY contact selection	
NC-NO	Normally open contact (NO)
NC-NO	Normally close contatc (NC)

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