



Securel

Access Controller – Encrypted Relay

ZIO-SEC

Application Program Version: 1.1
User manual edition: [1.1]_b

CONTENTS

Contents	2
1 Introduction	3
1.1 Securel	4
1.2 Access Control System	5
1.3 Installation	5
2 Pairing with IWAC	8
3 LED Notification	9
4 Securel status	10
4.1 Default status	10
4.2 Status after programming	10
4.3 Status after bus failure	10
4.4 Status after power failure	10
5 Configuration	11
5.1 General	11
ANEXO I. Communication Objects	13

DOCUMENT UPDATES

Version	Changes	Page(s)
[1.1]_b	<ul style="list-style-type: none">Minor corrections.	-

1 INTRODUCTION

1.1 SECUREL

Securel from Zennio is a KNX actuator presented as a secure system for closing and opening doors of access-controlled rooms.

It is located inside the room and it uses encrypted information to communicate with the access control device, known as **IWAC**. In this way, the inviolability of the system is assured.

The most notable features of this device are:

- **Acting on electric strike** using semiconductor element.
- **Encrypted serial communication** with IWAC for door opening.
- **Small dimensions:** 39 x 39 x 14mm.
- Configuration of the **door opening time**.
- **LED indicator** of device status.
- **Heartbeat** or periodical “still-alive” notification.

1.2 ACCESS CONTROL SYSTEM

The following figure shows the main elements involved in an access control system and the interactions between them:

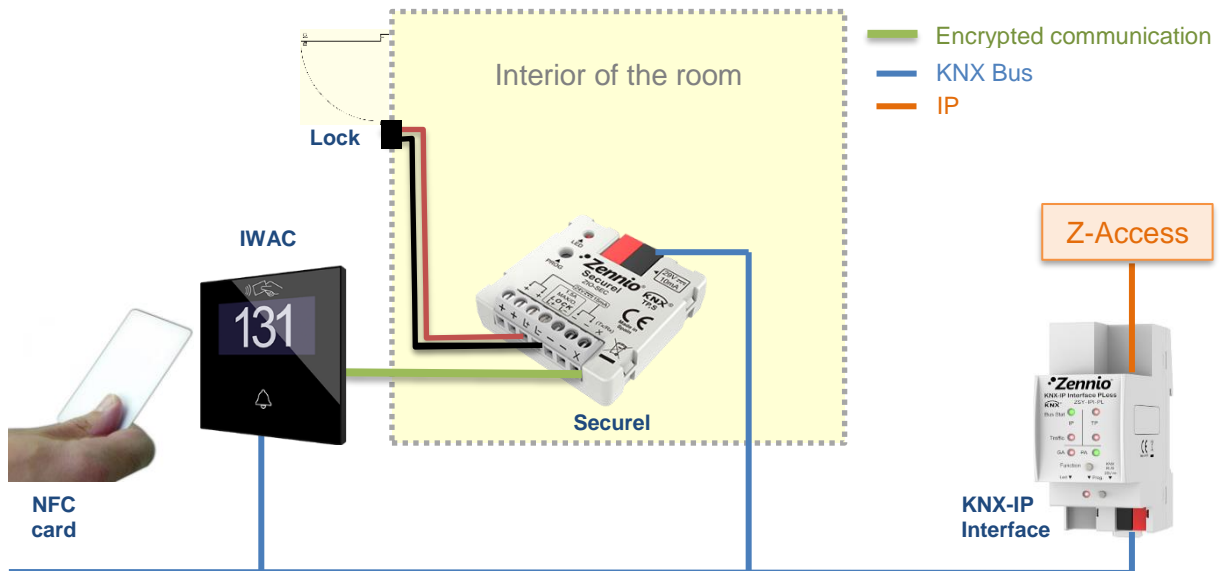


Figure 1. Access control system elements.

- **IWAC** (*In-Wall Access Control*): NFC reader for access control that is installed outside the room.
- **Securel**: final element acting on the lock when granting access from IWAC. It is installed inside the room.

In the idle state, Securel will keep the electric strike locked to prevent the door opening. When the *Open* command is correctly received from IWAC (access granted), Securel will release the lock for a while to open the door.

- **BMS** (*Building Management System*): computer system that assumes the integral automation of the building.
- **Z-Access**: application that allows employees to record access cards. In addition, by means of a specific module of the BMS system, permits the joint coordination of the different IWAC and the notification of certain events.
- **NFC card**: passive element for accessing to certain rooms. IWAC Display is compatible with two types of cards: **MIFARE DESFire** and **MIFARE Classic**.

As indicated before, for security reasons, the communication between IWAC and Securel is encrypted.

Both IWAC and Securel are connected to the KNX bus.

1.3 INSTALLATION

Securel connects to the KNX bus through the on-board KNX connector. Moreover, an **additional power supply** of 24 VDC is required.

1. 24VDC+ Power Supply.
2. Electric strike output [L-].
3. 24VDC- Power Supply.
4. Encrypted Communication.
5. KNX Connector.
6. Programming LED.
7. Programming Button.

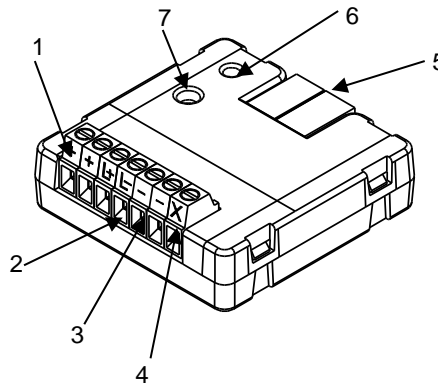


Figure 2. Securel.

Securel is connected to the external power supply through any of its three positive terminals (1) and any of its two neutral connectors (3).

On the other hand, Securel powers the electric strike also using one of the other positive supply terminals (1) and the terminal of the electric strike output as neutral (2).

Moreover, the relay also will power IWAC with 24VDC through its remaining terminals (1) and (3).

Finally, the Securel communicates with IWAC through the Tx/Rx transmit and receive terminal (4).

It should be recalled that, in order to ensure the inviolability of our access control system, it is necessary to locate Securel inside the room of the management module, establishing an encrypted communication with IWAC.

Figure 3 shows a connection diagram of IWAC, Securel, power supply and electric strike:

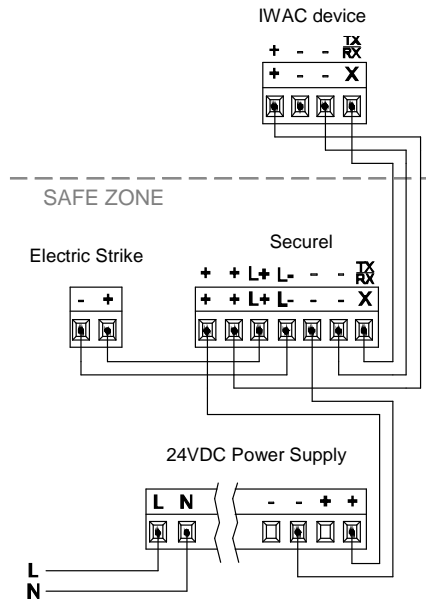


Figure 3. Access Control System connection diagram.

To get detailed information about the technical features of this device, as well as on the installation and security procedures, please refer to the corresponding **Datasheet**, bundled with the original package of the device and also available at www.zennio.com.

2 PAIRING WITH IWAC

To make it possible the communication between IWAC and Securel, they must be paired. The aim of the pairing is to ensure that the communication between these devices is exclusive, this means, Securel will only handle orders from the IWAC to which is paired.

To pair a Securel with an IWAC:

- If **Securel has not been paired with any IWAC before**, it will be in pairing mode. Only connect the Securel to the IWAC desired to pair with and they will be automatically paired.
- If **Securel is paired with an IWAC**, press the programming button for three seconds to remove the pairing. Securel is then in pairing mode. Connect the Securel to the IWAC desired to pair with and they will be automatically paired.

Notes:

- *Whenever Securel is not paired, it will try to get paired by keeping the pairing mode active.*
- *While the device is in pairing mode no action can be performed in the output.*

For more information of the LED status during pairing, see section 3.

3 LED NOTIFICATION

The programming LED will notify the **programming mode**, the **pairing mode** and the **lock status**.

If the device is not paired, it will be in **pairing mode** and this will be notified by a **blue flicker**.

On the other hand, if the device is paired, the relay status will be notified with **the LED green lighted if the relay is closed** (door opened). The LED **turn off when the relay gets open** (door closed).

When the **programming mode** is activated, only this mode will be notified by **lighting the LED in red**.

Note: *Securel can be paired or open/close the relay while the programming mode is active, but only the programming mode is notified (i.e., the LED remains lighting in red).*

A long press (longer than three seconds) **will always activate the pairing mode**, regardless of if the programming mode is active or not (if it is active, is deactivated).

In short, the different states that are notified are:

- Programming mode: **Red LED ON**.
- Pairing mode (Securel not paired): **Blue LED blinking**.
- Relay Status (Securel paired):
 - Open (door closed): **Green LED off**.
 - Closed (door opened): **Green LED on**.

4 SECUREL STATUS

The different performances that Securel will have facing several possible situations during its operation are explained below.

4.1 DEFAULT STATUS

In the factory default state, Securel is in **pairing mode**. This way, Securel will automatically pair with the first IWAC connected to it.

4.2 STATUS AFTER PROGRAMMING

After programming:

- If Securel was paired: **keeps the pairing** and the relay **will not carry out any action on the lock** until a first order is received from the IWAC.
- If Securel was not paired: remains in **pairing mode**.

4.3 STATUS AFTER BUS FAILURE

A KNX bus power failure **does not imply any change in the device status because Securel has external power supply**. It will continue to operate normally (although, logically, it will not send the Heartbeat object to the bus).

4.4 STATUS AFTER POWER FAILURE

When a power failure occurs, **the electric strike is no longer powered; therefore it remains closed**.

When recovering from the power failure, Securel returns to idle state and therefore, the lock will be closed.

On the other hand, after power failure, **Securel keeps the previous pairing with the IWAC**.

5 CONFIGURATION

5.1 GENERAL

After importing the corresponding database in ETS and adding the device into the topology of the desired project, the configuration process begins by entering *Parameters* tab of the device.

ETS PARAMETERISATION

The only parameterisable screen available is “General”. From this screen it is possible to configure all the required functionality.

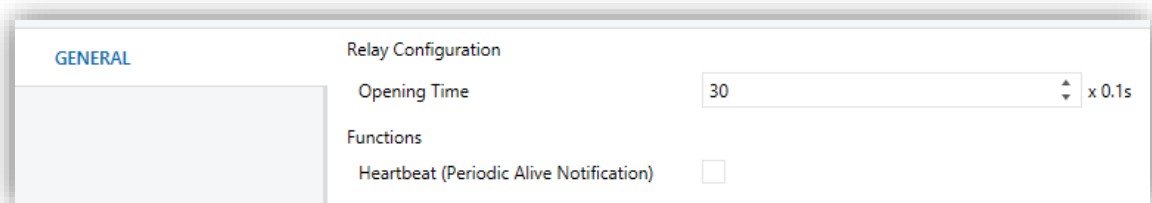


Figure 4. General Configuration.

- **Opening Time:** time the lock remains open after receiving the opening command. Range: 10 to 255 tenths of a second (30 by default). The maximum recommended opening time will depend on the lock type.
- **Heartbeat (Periodical Alive Notification):** incorporates a one-bit object to the project (“[Heartbeat] Object to Send ‘1’”) that will be sent periodically with a value of “1” to notify that the device is still working (still *alive*).

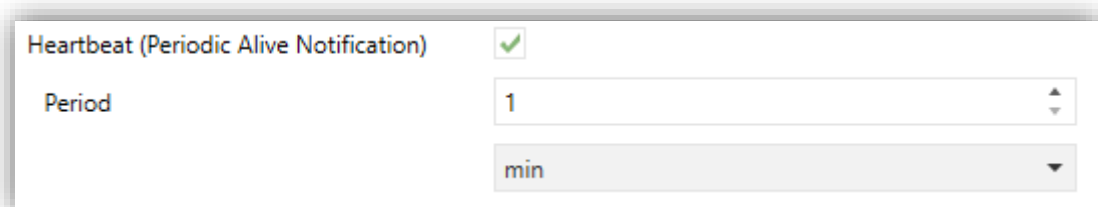


Figure 5. Heartbeat (Periodical Alive Notification).

Note: *The first sending after download or bus failure takes place with a delay of up to 255 seconds, to prevent bus overload. The following sendings match the period set.*

Note *Take into account that Securel must be paired with the corresponding access control device (IWAC) to work properly (for further information, see section 2).*

ANEXO I. COMMUNICATION OBJECTS

- “**Functional range**” shows the values that, with independence of any other values permitted by the bus according to the object size, may be of any use or have a particular meaning because of the specifications or restrictions from both the KNX standard or the application programme itself.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit		CT----	DPT_Trigger	0/1	[Heartbeat] Object to Send '1'	Sending of '1' Periodically

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Zennio Avance y Tecnología S.L.
C/ Río Jarama, 132. Nave P-8.11
45007 Toledo. Spain

Tel. +34 925 232 002

www.zennio.com
info@zennio.com



RoHS