## SMART RELAIS 2 3063 SREL, SREL.ZK, SREL.ADV, SREL2

Version: August 2012



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## **1.0** Important instructions

#### Safety Instruction:

Warning: – The batteries used in this product may pose a fire or burn hazard if handled incorrectly. Do not recharge, open or burn these batteries, or heat them to over 100°C.

Specialist knowledge in door mechanics, door approvals, electronic system installation and the use of SimonsVoss software is required when installing a SimonsVoss Smart Relay. This is why only trained specialists may install Smart Relay.

SimonsVoss Technologies AG accepts no liability for damage caused by incorrect installation.

Access through a door may be blocked due to defective or incorrectly installed Smart Relays. SimonsVoss AG is not liable for consequences of incorrect installation, such as blocked access to injured persons or those at risk, physical damage or any other losses.

If Smart Relays are placed in storage for longer than a week, the backup battery is to be removed.

Smart Relays must be installed in compliance with ESD (electrostatic discharge) guidelines. You should particularly ensure that you do not touch circuit boards and their integrated circuits.

In the event of doubt, original German language version applies.

## 2.0 **Product Description**

The SimonsVoss Smart Relay is an electronic switch which can be activated with a SimonsVoss ID transponder. The authorisation for transponders which are permitted to operate Smart Relay can be configured using the SimonsVoss software. Smart Relay thus fulfils the function of an access control reader.

## 3.0 Before placing an order

#### 3.1 YOU NEED TO ESTABLISH WHICH VERSION OF SMART RELAY IS REQUIRED

Smart Relay Basic version: Order code: SREL

This relay provides a simple yes/no authorisation for a maximum of 8,184 different transponders.

Smart Relay Plus version with access event logging and time zones: Order code: SREL.ZK

Similar to the basic version, but with the option of separately connectable access event logging for the last 1,024 accesses (firmware version 4.0.01.15 and higher) with date and time, or day – time zones for up to five user groups and automatic locking and unlocking.

Smart Relay Advanced version: Order code: SREL.ADV

Similar to the Plus version but with the following additional functions:

- Connection for external module via a three-wire bus
- Connection to an external antenna
- Connections for serial ports to external time-and-attendance terminals or access control readers
- Connection for external LED or buzzer

#### See also 11.0 New Smart Relay 2 & card readers!

#### 3.2 YOU NEED TO ESTABLISH WHAT ACCESSORIES ARE REQUIRED

- 1. External antenna for unfavourable reception conditions Order code: SREL.AV
- Batteries only for SREL, SREL.ZK and SREL.ADV for installations where these products are operated without a mains power supply: Order code: SREL.BAT
- 3. Optional extension modules (e.g. Smart output module)

#### 3.3 MAINS ADAPTORS NEED TO BE PLANNED AND ACQUIRED

These mains adapters are required for all Smart Relays which are not to be batteryoperated. The mains adapter should be limited to a maximum power of 15 watt and is able to deliver a voltage of 12 V AC or 5 to 24 V DC with a current of 100 mA

<u>Warning</u>! Do not use switching power supplies near Smart Relays. All mains adaptors are to be provided by the customer; they cannot be acquired from SimonsVoss.

#### 3.4 YOU NEED TO DETERMINE THE INSTALLATION LOCATION

The transponder transmission range for Smart Relay (read range) is a max. of 1.5 m, but may be reduced in metallic environments, particularly in magnetic fields or where there is aluminium.

Ideally, you should perform a read range test with an authorised transponder and a battery-operated Smart Relay.

#### 3.5 FURTHER INFORMATION

- All cabling used to connect Smart Relay should be type IY(ST)Y ....x0.6 twisted pair, shielded cable and cables should not exceed 100 m in length. Power losses should be taken into account when dimensioning the power supply.
- The technical data regarding inputs and outputs are to be taken into account (see Technical Data).
- All cabling must be installed and connected as per VDE regulations (VDE = German Association of Electro-technology, Electronics & Information Technology).

### 4.0 Before installation

- Unpack Smart Relay and check for any damage.
- Connect Smart Relay to a power supply or a battery.
- If Smart Relay is to be operated via a mains adapter, insert the backup battery in the designated holder (see Installation of backup battery).
- Check that Smart Relay functions with a transponder in its as-delivered condition.
- Remove the housing if you install in a flush-fitted masonry box.
- If mounted on the surface, the base plate can be used as a template for the drill holes (6 mm).

### 4.1 INSTALLATION OF BACKUP BATTERY

Only use the backup battery if the Smart Relay is powered via a mains adapter. Do <u>not</u> use this battery if the Smart Relay is powered by SREL.BAT.



## 5.0 Installation

- Switch off the power supply (disconnect the plug or battery if necessary).
- Connect all cables to their designated terminals on the Smart Relay (see Terminal Assignment on the next page).

# It is essential to ensure the polarity is correct if you connect a DC mains adapter.

- You will achieve the largest reader range possible if the Smart Relay antennas are aligned in parallel to that of the transponder.
- Switch on the power supply (connect the plug or battery if required).
- Check that Smart Relay functions with a transponder in its as-delivered condition.
- Programme Smart Relay with the SimonsVoss software (we recommend software versions LDB. 1.50a or higher, or LSM 2.2 or higher).
- Check that Smart Relay functions again using a newly authorised transponder.

## 6.0 Terminal Assignment

### 6.1 SREL AND SREL.ZK



## 6.2 SREL.ADV



## 6.3 DESCRIPTIONS OF CONNECTIONS IN SREL, SREL.ZK AND SREL

Name	Symbol	Description
Mains adapter	+ / ~	Either positive pole when connected to a direct current (5 to 24 V DC) or one of the two alternating current connections (12 V AC)
Mains adapter	- / ~	Either negative pole when connected to a direct current (5 to 24 V DC) or the second alternating current connection (12 V AC)
Battery		Plug-in connector for a battery (when operated without a mains adapter) Battery order code, including plug connector: SREL.BAT
Relay NC		Normally closed contact in the relay changeover contact. This contact is closed against Relay COM when not connected
Relay COM		Common contact in the relay changeover contact. This contact is wired either against an NC relay (break contact) or against a NO relay (closing contact)
NO relay		Normally open contact in the relay changeover contact. This contact is closed against Relay COM when not connected
External antennas		Connection for colour-coded cables in an external antenna (Order code: SRELAV)
Brown	BN	Brown
White	WH	White
Green	GN	Green
Grev	GY	Grev
Yellow	YL	Yellow
RS-485COM	С	Bus connection for external modules
RS-485A	Ă	
RS-485B	В	
+ Vaux	+V	Type 3.0 - 5.0V +/- 0.5V for external LED or buzzer, max. 10mA
LED / buzzer / Input 1 / CLS	F3	Multi-function connection
Serial 1 / Input 2	F2	Multi-function connection
Serial 2	F1	Multi-function connection

## 7.0 Programming and configuration

If Smart Relay is selected as the lock type in the SimonsVoss software (LDB Version 1.40 or higher, or LSM 2.1 or higher), the following configuration options are available:

Schließung Eigenschaften	X				
Name Generalebenen Transponder D	aten Konfiguration Transpondergruppen				
Zugangskontrolle	Zeitumschaltung				
Zeitzonensteuerung	C OMRON				
Fip Flop					
Repeater					
Erweiterte Eigenschaften					
Pulslänge	3 Sek.				
Zeitgesteuerte Relaisumschaltung-					
C Manuelle Verriegelung	Automatische Verriegelung				
Manuelle Entriegelung	O Automatische Entriegelung				
Transponder aktiv:					
C immer	• nur, wenn verriegelt				
<ul> <li>Begrenzte Reichweite (nur bei interner Antenne)</li> <li>Unberechtigte Zutritte protokollieren</li> </ul>					
Advanced Funktionen					
Anzahl der Erweiterungmodule	0				
- Schnittstelle	Wiegand 33-bit				
🗖 Keine akustischen Programmier-Qi	uittungen				
Externe LED	C Externer Piepser				
Interne/externe Antenne:					
Autodetektion	O beide aktiv				
ОК	Abbrechen Übernehmen Hilfe				

### 7.1 ACCESS CONTROL

Only possible in SREL.ZK und SREL.ADV versions. The 1,024 most recent transponder transactions are logged with the date and time.

#### 7.2 TIME ZONE CONTROL

Only possible in SREL.ZK und SREL.ADV versions. A time zone plan can be uploaded and the transponders are approved or blocked according to their time zone group.

#### 7.3 OVERLAY

Replacement transponders can overwrite their corresponding original transponders. The original transponder is blocked once the replacement transponder is used for the first time.

#### 7.4 FLIP FLOP

Pulse mode (default setting) is switched off and the pulse duration no longer plays a role. When flip flop mode is activated, Smart Relay changes its status from on to off or vice versa each time it is activated using a transponder. This mode is ideal for switching lights, machines and other systems on and off.

Where applicable, you should ensure that mains adapters and electric strikes are suitable for continuous current operation in such an installation.

#### 7.5 REPEATER

Smart Relay receives a transponder signal, which it amplifies and forwards. This function allows Smart Relay to be used to bridge longer radio transmission paths. The distance to the next Smart Relay can be up to 2 m.

#### 7.6 TIME SWITCHOVER

For SREL.ZK and SREL.ADV only: when the time switchover is activated, a time zone plan needs to be uploaded which allows the Smart Relay to remain released during the indicated times (in Group 5). During the day, the door can be used freely while only a transponder will open the door at night.

You should ensure that mains adapters and electric strikes are suitable for continuous current operation in such an installation.

If you select time switchover, the following options are available to you in the 'Timecontrolled switchover' box (several options can be selected):

- 1. Manual lock The door does not lock automatically after the pre-set point in time until an authorised transponder makes a booking after this time.
- Automatic lock (basic setting) The door is locked precisely at the point in time specified in the time zone plan.
- Manual unlocking (basic setting) The door is not unlocked automatically after the pre-set point in time until an authorised transponder makes a booking after this time.
- 4. Automatic unlocking

The door is not normally opened after the pre-set point in time, but when the first transponder activates it. If you specifically want the door to unlock automatically at the pre-set time, then select this option.

- 5. Transponder, active
  - Always

Normally, a transponder cannot be used during the release interval. However, if you wish the door to be locked whenever required (when everybody has left the building, for example), select this option.

#### - Only if locked

In this operating mode, the transponder is not operative during the unlocked interval.

#### 7.7 OMRON

Only for SREL.ADV: many access control and time-and-attendance systems feature serial interfaces to connect card readers. A Smart Relay can also be connected via these interfaces, thus also allowing you to use SimonsVoss transponders in third-party systems.

Select this option on both the Smart Relay and the cylinder if you wish the Smart Relay to transmit transponder data to a third-party system and a remote opening command to be sent from Smart Relay to a cylinder after clearance by the third-party system.

Set the type of external system under 'Interfaces'. The following options are available:

### 7.7.1 SMART RELAY IN OMRON MODE



#### 7.7.2 NO AUDIBLE PROGRAMMING ACKNOWLEDGEMENT SIGNALS

#### SREL.ADV only

You should check this field if you do not want audible programming acknowledgement signals to be emitted from a connected buzzer or beeper while you are programming Smart Relay.

#### 7.7.3 EXTERNAL LED / EXTERNAL BEEPER

#### SREL.ADV only

This indicates which external component group is connected. In flip flop mode, Smart Relay emits a permanent signal when switched on if there is an external LED; in the case of a beeper, an audible signal is only emitted when there is a change of status.

#### 7.7.4 INTERNAL/EXTERNAL ANTENNAS

SREL.ADV only

- Auto-detection
   If an external antenna is connected, this is the one which is used. Smart Relay
   switches off the internal antenna in such cases. If no external antenna is con nected (standard case), Smart Relay functions with the internal antenna.
- Both active Smart Relay is able to use both antennas to verify transponder bookings.

#### 7.7.5 NUMBER OF EXTENSION MODULES

This is where you indicate the number of external modules connected to the Smart Relay. These modules are connected to the terminals RS-485 **C**OM, RS-485 **A** and RS-485 **B**. You will find more detailed information in the documentation for individual modules.

#### 7.7.6 PULSE LENGTH

This is where you indicate the number of seconds for the switch pulse duration. The value can be set at 0.1 to 25.5 seconds. If you enter 3 seconds, for example, an electric strike is released for 3 seconds before it locks again.

#### 7.7.7 INTERFACE

For SREL.ADV only

You can enter the type of card reader here which the Smart Relay is to simulate for operation as a serial interface.

The following options are available:

- Wiegand, 33 bit
- Wiegand, 26 bit
- Primion
- Siemens
- Kaba Benzing
- Gantner Legic
- Isgus

You can find the relevant information on cabling in the section "Smart Relay as a serial interface."

#### 7.7.8 LIMITED RANGE

If you select this option, the reader range from the transponder  $\rightarrow$  Smart Relay is reduced from 1.5 m to about 0.4 m. This option can be used when several Smart Relays are in close proximity to one another and individual transponders are authorised for use on several Smart Relays, for example.

#### 7.7.9 EXTERNAL BEEPER/ EXTERNAL LED

For SREL.ADV only

Smart Relay is normally configured for connection to an LED. If you wish to connect a beeper or buzzer as an external signalling device, check this option. This will allow the beeper or buzzer to be used instead of the LED to emit an audible acknowledgement signal.

The wiring diagram may look as follows when the connected components require a maximum current of less than 10 mA at 3 V DC.



If the current for the external component is greater than 10 mA, this component must be fed via an external power supply. If this is the case, you should install the connection as follows:



#### 7.7.10 LOGGING UNAUTHORISED ATTEMPTED ACCESS EVENTS

Only for SREL.ZK und SREL.ADV

Normally, only authorised transponder operations are logged. If you also wish to record an attempt to open the door with a non-authorised transponder, you need to select this option.

## 8.0 Summary of diode signals

#### 8.0 DESCRIPTION OF FUNCTIONS

In order to use a Smart Relay as a card reader in a third-party access control or timeand-attendance system, the hardware (cabling and signal emitter) and data formats must match those of the card reader precisely. This is the only way that the third-party system will be able to understand and evaluate data from SimonsVoss transponders.

First of all, the transponder data are read by the Smart Relay. If the transponder is authorised for use in the Smart Relay, these data are transmitted to the third-party system via the serial interface. You will receive detailed specifications for individual data formats from SimonsVoss Product Management.

The right reader type is selected in the Smart Relay configuration in the SimonsVoss software, version 1.40 and higher. The connections for the different reader variants are listed below.

## 8.1 WIEGAND INTERFACE (33 BIT AND 26 BIT)



## 8.2 KABA BENZING, SIEMENS, GANTNER LEGIC, PRIMION, ISGUS INTERFACE



## 9.0 Maintenance

# 9.1 BATTERY WARNING AND BATTERY REPLACEMENT WHEN THE BATTERY SREL.BAT IS USED

A Smart Relay can emit a battery warning as follows when the battery capacity is depleted:

SREL, SREL.ZK, SREL.ADV

- Inside LED flashes 8x each time a transponder is used and before the relay switches.
- This LED should be visible from the outside in the case of battery-powered operation.

SREL.ADV only

 External LED flashes 8x or external buzzer beeps 8x each time a transponder is used.

Around another 100 transactions are possible after a battery warning; the battery should thus be replaced as soon as possible.

#### 9.2 BACKUP BATTERY

A discharged backup battery may lead to the internal clock stopping in Smart Relay types SREL.ZK and SREL.ADV. We therefore recommend checking the time on the clock at regular intervals. A backup battery will last for about ten years if the power supply to the Smart Relay is not interrupted. If Smart Relay draws on the backup battery at regular intervals due to frequent power failures, this battery should be replaced on a periodical basis.

If Smart Relay is powered by a battery (SREL.BAT), the backup battery must <u>not</u> be used.

## 10.0 Technical data for SREL

Housing made of black plastic: dimen-	
sions I x w x h	72 x 57 x 25.5 mm
Protection rating	IP20, not tested for outside use
Temperature	When operating: -22°C to 55°C In storage: 0°C to 40°C
Humidity	< 95% without condensation
Circuit board dimensions I x w x h	50 x 50 x 14 mm
Mains voltage	12 V AC or 5-24 V DC (no reverse polarity protection)
Power limitation	Mains adapter must be limited to 15 VA
Standby current	< 5 mA
Max. current	< 100 mA
Pulse duration programmable	0.1 to 25.5 seconds
Output relay type	Changeover contact
Output relay continuous current	Max. 1.0 A
Output relay switch-on current	Max. 2.0 A
Output relay switching voltage	Max. 24 V
Output relay switching power	10 <sup>6</sup> operations at 30 V A
Multi-function connections F1, F2, F3	Max. 24 V DC, max. 50 mA
Vibrations:	15 G for 11 ms, 6 shocks as per IEC 68-2-27 Not approved for use when subject to perma- nent vibrations

## 11.0 Smart Relay 2

#### 11.1 SMART RELAY 2 VERSIONS



**SREL2.G2.W**: The SREL2 is basically used with transponders, i.e. as purely "active" components. There is also the option of using a Compact Reader and operating the SREL with Mifare Classic/DERFire<sup>®</sup> cards.

This relay provides a simple yes/no authorisation for a maximum of 64,000 different transponders.

**SREL2.G2.W.WP**: As described above, but with a waterproof design. You must seal the bushing yourself under your own responsibility. It is recommended to use suitable materials such as silicon or another <u>resistant</u> sealing material. The housing features an IP65 design.

**SREL2.ZK.G2.W**: The same as the basic version, but with the option of separately connectable access event logging for the last 1,024 accesses with date and time, or day – time zones for up to 100 user groups and automatic locking and unlocking (time-controlled switchover). This version can also be used as a gateway in a virtual network.

**SREL2.ZK.G2.W.WP**: As described above, but with a waterproof design. You must seal the bushing yourself under your own responsibility. It is recommended to use suitable materials such as silicon or another <u>resistant</u> sealing material. The housing features an IP65 design.

**SREL2.ZK.MH.G2.W**: As the ZK version above. Two external card readers (SC.M.E.G2) and an internal card reader (SC.M.I.G2) can be connected to this version. Mifare Classic/DERFire<sup>®</sup> cards can be used with this particular SREL2.

**SREL2.ZK.MH.G2.W.WP**: As described above, but with a waterproof design. You must seal the bushing yourself under your own responsibility. It is recommended to use suitable materials such as silicon or another <u>resistant</u> sealing material. The housing features an IP65 design.

Use of the backup battery (CR1220 Sony) is described in Section 4.1.



### 11.2 CARD READER VERSIONS IN CONJUNCTION WITH SREL2

The SC components can be operated with Mifare Classic<sup>®</sup> or Mifare DESFire<sup>®</sup>.

**SC.M.E.G2.W**: <u>S</u>mart <u>C</u>ard <u>M</u>ifare <u>E</u>xternal (external card reader) <u>G2</u> (Generation 2) <u>W</u> (white housing)

A maximum of two external card readers (SC.M.E.G2.W) and one internal card reader (SC.M.I.G2) can be connected to <u>an</u> SREL2.ZK.MH.G2.W or SREL2.ZK.MH.G2.W.WP. If two external card readers are connected to an SREL2,

then a dip switch placed at the "on" position **must** be connected to <u>one</u> external card reader. The dip switch is found on the right-hand side beneath the 26-pin plug connector on the card reader (see diagram).

The cabling type used to wire components should be CAT5 (FTP) or a higher quality. Shielded control cabling may also be used. Cable length: max. 10 m. If the cable line length is > 3 m for the external card reader, its own power supply and its own wiring should be installed

**SC.M.E.G2.W.WP**: As above, but the waterproof design of card readers is supplied with a cable about 1 m long pre-attached ready for use.

**SC.M.I.G2**: <u>S</u>mart <u>C</u>ard <u>M</u>ifare <u>I</u> (internal card reader) <u>G2</u> (Generation 2) The internal card reader is simply plugged directly into the SREL2.

## 12.0 Description of the SREL2 connections

Name	Symbol	Description
Mains adapter	+ DC	Direct current 9 to 24 V DC
Mains adapter	- DC	Direct current 9 to 24 V DC
Battery		CR1220, Sony – Backup battery
Relay COM		Common contact in the relay. This contact is wired against NO relay (closing contact)
NO relay		Normally open contact in the relay. This contact is closed against Relay COM when not connected Can be inverted in LSM
External antennas		Connection for colour-coded wires in an external antenna (order code SREL.AV)
Brown	BN	Brown
White	WH	White
Green	GN	Green
Grey	GY	Grey
Yellow	YL	Yellow
Functions connection	F1	← Input ext. Trigger input (3-24 V DC ext. contact must be
		isolated)
		→ Omron output / Wiegand CLS
	F2	$\rightarrow$ Omron data / Wiegand D0
	F3	→ Omron CLK / Wiegand D1
		→ LED / buzzer (external)
		$\rightarrow$ Card reader line link
	SVB	SimonsVoss bus - card reader line link

Open drain outputs up to max. 24 V DC / 0.5 A. Earth connection to power supply's negative pole. If a CLS (card loading signal) is featured, the SREL2 must be configured for CLS in its properties.

#### Housing made of white plastic: dimensions I x w x h about 78 x 78 x 19 mm Semi-transparent base plate Protection rating See note in 11.0 When operating: -22°C to 55°C Temperature In storage: 0°C to 40°C Humidity < 95% without condensation about 50 x 50 x 14 mm Circuit board dimensions I x w x h Mains voltage 9-24 V DC Power limitation Mains adapter must be limited to 15 VA Standby current < 100 mA Max. current < 300 mA Pulse duration programmable 1 to 25.5 seconds Closing contact Output relay type Output relay continuous current Max. 1.0 A Max. 2.0 A Output relay switch-on current Output relay switching voltage Max. 24 V Output relay switching power 10<sup>6</sup> operations at 30 V A Multi-function connections F1, F2, F3 Max. 24 V DC, max. 50 mA Vibrations: 15 G for 11 ms, 6 shocks as per IEC 68-2-27 Not approved for use when subject to permanent vibrations

## 13.0 Technical data for SREL2

All work must be carried out with the unit fully disconnected!



## **14.0 PRODUCT DESCRIPTION**

#### 14.1 ORDER CODE

WN.CN.UR.SCHALT, referred to as INPUT NODE below.

#### 1.2 HIGHER-RANKING LOCKING LEVEL

The text field placed under Level 2 automatically receives the "standard" template. The text is indented 1.25 cm.

## **15.0 WARNING**

#### 2.1 SAFETY

- Specialist knowledge in access control systems, door mechanics, door approvals, electronic system installation and the use of SimonsVoss software is required when installing a SimonsVoss INPUT NODE. This is why only trained specialists may install this terminal.
- SimonsVoss Technologies AG accepts no liability for damage caused by incorrect installation.
- Access through a door may be blocked due to defective or incorrectly installed INPUT NODES. SimonsVoss AG is not liable for consequences of incorrect installation, such as blocked access to injured persons or those at risk, physical damage or any other losses.
- The INPUT NODE must be installed in compliance with ESD (electrostatic discharge) guidelines. You should particularly ensure that you do not touch circuit boards and their integrated circuits.
- Those fitted with electronic medical implants (pacemakers, hearing aids and similar) must keep a minimum distance of 30 cm between the implant and the INPUT NODE and are to be specifically informed of this precaution.

As a precaution, people who have implants should consult their doctor regarding any possible hazards caused by radio component assemblies (868 MHz).

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This product fulfills essential requirements of CE-Conformity. The declaration of conformity can be found at www.simonsvoss.com