

RFID TRANSPONDER TECHNOLOGY

DOC. 121-R6

DOOR OPENER Model SS

THE ADVANTAGES OF THE CONTACTLESS OPENING

KR-REL-SS Full control access. RS485 multi drop connection up to 127 devices. White list of 1000 users. Last 1000 access logging. 99 programmable timings. Power supply 12VDC.

The door opener is available in three models: **KR-REL-SS** Electronic b Electronic board version **KR-REL-SS-ONDA** Enclosed version for external **KR-REL-SS-SHELL** Enclosed version for external **KR-REL-SS-WALL**

All these models can use the: A4002-SHELL A4002-WALL PGZ12_QF KTU

Encashment version External Antenna for SHELL, ONDA External Antenna for WALL Desk Key Programmer

The keys in form Keyfob or Card

For convenience we will use the term KR-REL to indicate the all door opener models. The functions are the same.

The basic KR-REL door opener is composed by:

- One or more KR-REL modules

- More KTU keys.

KR-REL-SL



How to enter



ELECTRICAL

Power Supply	12VDC ± 5% 50 ma	
Output Relay Contact	Max 2 A at 24VAC	
Reading Distance from KR-REL module	Keyfob min 3 cm	Card min 5 cm
Reading Distance from Antenna A-4002	Keyfob min 2 cm	Card min 4 cm

MECHANICAL

Dimension electronic board KR-REL-SL	Height 40 x Length 66 x depth 15 mm
Dimension KR-REL-SL-SHELL	Height 77 x Length 112 x depth 30 mm
Dimension A-4002 – SHELL	Height 55 x Length 75 x depth 19 mm
Dimension KR-REL-SL –WALL	Height 48 x Length 74 x depth 29 mm
Dimension A4002 – WALL	Height 48 x Length 45 x depth 29 mm
Dimension KR-REL-SL-ONDA	Height 51 x Length 115 x depth 24 mm

ENVIRONMENT

Operating Temperature	-15°C a 60°C
Humidity	The SHELL, WALL, ONDA and the External
	Antenna are fully waterproof.

EXTERNAL ANTENNA A-4002

The external antenna A-4002 is provided of a low capacitance cable with a standard 2 meters length. The user can shorten the cable.

For applications with long cables refer to an authorised dealer or contact us.

CONNECTION

The KR-REL-SS dispose of eight wires	at size 0,25 mm2 and length 20 cm.

WIRE	DESCRIPTION
RED	12VDC +
BLACK	12VDC -
WHITE	SOLENOID COMMAND
WHITE	SOLENOID COMMAND
YELLOW	EXTERNAL ANTENNA A-4002 (OPTIONAL)
YELLOW	EXTERNAL ANTENNA A-4002 (OPTIONAL)
BLUE	RS485+ DATA
ORANGE	RS485- /DATA

MOUNTING

Connect the KR-REL as indicated in one of the following connection schematics.

- KR-REL-SS

If the line is too long and the devices are many, good thing is to split the line in more parts from the RS485 PC interface. For long lines, good thing is to use a cable with RS485+, RS485- and GND from the RS485 PC interface. If the distance and charge do permit, the 12VDC supply can be brought from the same cable.

Due to the Radio Frequency emissions of the Reader Antenna is important to avoid The usage of metal panels in front and rear sides of the KR-REL module and External Antenna. Although the KR-REL provides a high resistance to EMC corruption, avoid installing it in high RF emission environments. The reading distance may result reduced or nulled.

KR-REL-SS AT 12VDC/AC WITH RS485 AND EXTERNAL ANTENNA A-4002



FUNCTION

The KR-REL-SS performs a Full Control Access up to 1000 users written in a WHITE LIST. They are two cards coding opportunities: 1) Using R/W CARD type Q5

The Card Code is formed by: PLANT CODE one byte (from 1 to 255) USER CODE four bytes (from 1 to 4.294.967.295 for any plant). In this case is possible to identify a code for any plant and the KR-REL-SS before accepting a User Code verify if the PLANT is correct. The **PLANT CODE** and **USER CODE** are programmed on the CARD using the **PGZ12-QF** Programmer. The same **PLANT CODE** has to be set to the KR-REL-SS parameters.

2) Using Read Only CARD Type UNIQUE

The PLANT CODE has to be set to zero to the KR-REL-SS parameters. In this manner, the KR-REL-SS controls only the USER CODE four bytes. This permits the use of UNIQUE read only cards that are numbered by manufacturer with a random code. In this case, no control will be made on the PLANT CODE. To read the USER CODE to insert into the WHITE LIST the operator can use a KR-REL-SS as a CARD READER or the PGZ12QF in read mode.

The KR-REL-SS can serial connect in RS485 multi drop up to 127 devices.

The DEVICE number is written by the operator into the internal non-volatile memory of the KR-REL-SS using the RS485 connection.

The Operator can write, read or erase a 1000 user White list, where are written the USER CODES to be accepted.

The Last 1000 access logging are registered into the KR-REL-SS memory and can be read any time from the RS485. The calendar clock inside the KR-REL-SS ensures all the temporal timings.

A calendar day list of 366 days can be defined day by day in one of 4 day types: Weekday/Half-holiday/Holiday/Special-day Example:

Day 0 Weekday Day 1 Half Holiday Day 2 Holiday Day 112 Special day Day 363 Weekday Day 364 Holiday

Day 365 Holiday (valid only in leap year)

This day list has to be updated at any new year.

A list of 99 access timings (begin HH-MM to end HH-MM) can be defined for any KR-REL-SS.

nple:	Timina	1	from 08:00	to 12:00	-	
	Timing	2	from 09:00	to 12:30		
	Timing	3	from 14:00	to 20:00		
	Timing	98	from 20:00	to 23:59		
	Timing	99	from 00:01	to 23:59		
CARD C	ODE memorised in	the WHITE	LIST can be	associated to three	e timings for any	day type (max 12 timings).
nple:						
D CODE	00000001H	Weekday	,	timing associated:	22 28 00	verify timing 22 and 28
		, Half-holio	lav	-	12 20 32	. 5

The operation on the DOOR LOCK are automatically executed by the KR-REL-SS if detects a valid KEY/CARD.

The operation mode and timing can be selected through RS485 in PULSE MODE or in BISTABLE MODE.

NO INTERRUPTION ON DOOR OPENING PROCEDURE DURING RS485 DATA EXCHANGE! All the serial procedures are explained in the PROTOCOL part of this Document.

00 31 00

16 00 17

verify only timing 31

verify timing 16 and 17

INSTALL

IF R/W Q5 CARDS USED. CREATE KEY/CARDS ON PGZ12-QF

Holiday

Special day

PGZ12QF SETTINGS

Fxar

CAR

- Set Comm Port 1)
- 2) Set Transponder Type as OFIVE
- Select in Format menu the type KR-REL-SS 3ý
- 4) Mark Auto Program if you want that the programming of keys happens at any new key insertion, bypassing the Program button
- Mark Auto Program and Auto Increment if you want increment the User code at any new key insertion 5)
- 6) Mark only Auto Increment if you want increment the User code, but use for programming the Program button
- 7) The **Read** button activate the reading of a key
- 8) The Clear button reset the actual value in field Plant and User
- The Exit button, exit the program 9)
- The Version button, show the actual firmware release. 10)
- 11) The **Download** button, permit the firmware update with new release
- The operator writes in the windows:
- PLANT the actual plant number in the range of 1 to 255.

USER the initial number to assign to the USER code in the range from 1 to 4.294.967.295.

Now the user can program the KEY/CARD following the method chosen.

IF READ ONLY CARDS Unique USED. Do not need the PGZ12QF use to program.

INITIALIZE KR-REL-SS

SET DEVICE NUMBER

Simply connect the KR-REL-SS, one at time, to the PC and send it the **SET DEVICE** string with the **DEVICE NUMBER** desired. It will be written in the internal memory of KR-REL-SS. Be sure do not set devices with the same number. Good thing is to numerate any device with a label.

RESET

Send a command **RESET** device. This command set the default parameters to initialize the KR-REL-SS. Clear the WHITE LIST, the LOGGING LIST, the access timings and the calendar days. **DEFAULT PARAMETERS:**

 MODE:
 PULSE

 ACTIVATION TIME:
 0,5sec

 SUMMER TIME:
 20 April

 SAVING TIME:
 20 October

 PLANT CODE:
 0

SET CURRENT DATA

Send a command SET CURRENT DATA. This command set the calendar clock into the KR-REL-SS.

SET PARAMETERS

Send a command SET PARAMETERS. This command set the working parameters into the memory of KR-REL-SS.

RUN

- Approach the KEY to the KR-REL module or the Antenna A-4002 if mounted.
 If the KEY CODE is present into the WHITE LIST and the associated timings are valid, the solenoid will turn ON and the LED on the KR-REL module goes GREEN for
- second.
 If the KEY CODE was not valid, the LED on the KR-REL module goes RED for 1 second.

In normal use the PC can: **READ LOGGING** to verify access logging. **READ/WRITE WHITE LIST** with codes to be enabled and associated access timings. **READ/WRITE TIMING LIST READ/WRITE CALENDAR DAYS**

PROTOCOL

Serial interface Data = 8bit	Parity = none	Stop = 1bit	BINARY asynchronous half duplex
Baud Rate			9600 bits per second
The protocol FORMAT is described STX DEVICE LENGTH	below.	Start of string synchroniz Is the Device Number. Is the number of bytes fo	ation code.

 DEVICE.
 Is the Device Number.

 LENGTH.
 Is the Device Number of bytes following the LENGTH itself.

 FUNCTION /STATUS.
 Is the FUNCTION to be executed or the STATUS of an operation executed.

 DATA0 to DATAn.
 Are the data exchanged.

 BCC.
 Is calculated as the XOR of all bytes from STX to last DATA included.

 Example: STX-DEVICE-LENGTH-STATUS-BCC → 02H-00H-02H-01H-BCC where BCC= 01H.
 02H-00H-02H-01H-BCC

STRINGS FROM HOST to KR-REL-SS

COMMAND #0 :	SET DEV	ICE									
DESCRIPTION	STX	DEVICE	LENGTH	FUNCTIO	ON DATA	0 BC	С				
HEX VALUE	02H	FH	03H	61H (a) 00H to 7	7EH 00H-I	FFH				
DESCRIPTION:	In DATAC) insert the D	EVICE NUM	BER that wil	l be written into	the KR-REL	non vol	latile mem	ory.		
	Must be e	executed on	any KR-REL is accepted b	one-by-one	befor the insta	ll.					
	DEVICE			by all the de	VICCS						
COMMAND #1:	RESET										
DESCRIPTION	STX	DEVICE	LENGTH	FUNCTIO	DN BCC						
HEX VALUE	02H (00H – 7EH	02H	78H (x) 00H-FFI	+					
DESCRIPTION:	Erase all	Data FILES i	n the KR-RE	L and set DI	EFAULT PARAM	ETERS.					
COMMAND #2 ·	FTI F WD	TTE									
DESCRIPTION	STX DE	VICE	ENGTH F	UNCTION	FILE	FLAG	NR	ECS	DATAn	BCC	
HEX VALUE	02H 00H	– 7EH 🛛 v	ariable	77H (w)	See below	00H-01H	varia	able n	RECORDS, See below	v 00H-FFH	
DESCRIPTION:	Write a fi	le formatted	by records.	To begin a	file write, the fi	rst packet mu	st be tr	ansmitted	with FLAG=0.		
	To contin	ue the file w	rite, next pa	ckets will be	e sended with F	LAG=1. NREC	S is the	e number	of records present in	DATA field, MAX_	RECS inicates
	the maxir	num numbe	r of records,	for each file	e, that can be fi	tted into one	frame				
	10 termir At every	nacket KR re	nte, last pack	IMANID STAT	Senaea with FL	AG=1, NRECS	s=0 and		neia (, INRECS, BC	.C).	
	Files CLO	CK(74H) and	I PARAMETE	RS(70H) coi	ntains only one	record					
				. ,							
FILE:											
WHITE LIST	63H	Send to t	he KR-RFI	the KEY C	ODES to be in	serted into t	he WH	HITE LIS	т.		
		MAX_RE	CS	3							
		RECLEN		16	The 16 bytes	that compo	se the	e user co	de to be enabled a	nd the associate	ed timings.
		RECORD:	1	4 bytes	USER CODE	aciated for l					
				3 bytes	3 Timings ass 3 Timings ass	ociated for h	HALFH	OLIDAYS			
				3 bytes	3 Timings ass	ociated for l	HOLID	AYs			
				3 bytes	3 Timings ass	ociated for S	SPECIA	ALDAYs			
	TS MAN			WHITEIT				DOCDES			
	15 PIAN				ST USER COD			NOUNES.	JIVE MODE.		
		Example	: CODE 000	000000	01 00 35 34-	31 16 87- 6	54 OO O	00- 01 00	00		
			CODE 001	. 000000	002 96 00 22	- 22 23 00- (04 09 (00-1100	01		
			CODE 002			- 14 15 12- (0000	00-0000			
			CODE 319	000123	310 23 24 25	- 00 00 00- 0	01 00 0	00- 12 13	14		
01 0 0V					(.)						
CLOCK	74H	Set the II	iternal cale	endar clock	the KR-RE	:L.					
		RECORD	:	1 byte	YY (BCD)	00-9	9				
				1 byte	MM (BCD)	01-1	2				
				1 byte	DD (BCD)	01-3	1				
				1 byte	MN (BCD)	00-2	3 9				
				1 byte	SS (BCD)	00-5	9				
				1 byte	Day of Year H	IIGH from	0000H	H to 0160	H or 016DH if a le	ap year.	
				1 byte	Day of Year L	ow					
PARAMETERS	70H	Set the w	vorking par	ameters o	f the KR-REL.						
		RECLEN		7							
		RECORD:		1 byte	MODE	00-00	1 0	00=the re	lay works PULSE	01=works BIS	TABLE.
				1 byte		(BCD) 05-9	0 b ว	base time	1/10 sec. Range	from 0.5 to 9 se	С
				1 byte	DD SOL-LEG	(BCD) 01-3	1				
				1 byte	MM LEG-SOL	(BCD) 01-1	2				
				1 byte	DD LEG-SOL	(BCD) 01-3	1				
				1 byte	PLANT CODE	(HEX) 00-F	F				
CALENDAR DAYS	64H	Set the t	ype of each	yearday o	on the KR-REL						
		MAX_RE	CS	48							
		RECLEN		1		00-1		AV 01 -1			
		KECORD:		т руте	ITPE OF DAY	00=1	VEEKD	JAT U1=H	IALF HULIDAY U2=	-HULIDAY 03=	SPECIAL DAY
ACCESS TIMINGS	62H	Set the li	st of timin	gs							
		MAX_RE	CS	12							
		RECLEN		4 1 huta	from ULL (D)	וחי					
		RECORD		1 byte	from MM (BC	CD)					
				1 byte	to HH (BC	CD)					
				1 byte	to MM (BC	CD)					

COMMAND #3 :	FILE F	READ						
DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	FILE	FLAG	BCC	
HEX VALUE	02H	00H – 7EH	04H	72H (r)	See below	00H-01H	00H-FFH	
DESCRIPTION:	Read a	Read a file formatted by records. To begin a file read, the first packet must be transmitted with FLAG=0.						
	To continue the file read, next requests will be sended with FLAG=1. NRECS is the number of records present in DATA field							
	At every packet, KR replies REPLY#1 or REPLY#0 (described below) if any error occur reading file.							
	A packet with NRECS=0 and no DATA field indicates the end of file							

COMMAND #4 :	FILE E	ERASE					
DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	FILE	BCC	
HEX VALUE	02H	00H – 7EH	03H	65H (e)	6CH (I)	00H-FFH	
DESCRIPTION:	Erase f	the content of	a FILE . The o	only FILE that ca	an be erased is l	.OGGING (6CH	i) and erase only records that has been read b

STRINGS FROM KR-REL-SS to HOST

In all these strings the received DEVICE number is the KR-REL address with bit 7 set.

REPLY#0 : CO	MMAND	STATUS				
DESCRIPTION	STX	DEVICE	LENGTH	STATUS	BCC	
HEX VALUE	02H	80H-FEH	02H	See below	00H-FFH	
DESCRIPTION:	The ST	ATUS is the r	elated comma	nd code if exec	uted otherwise	e is the code with bit 7 set
STATUS		VALUE	DESCRIP	TION		

SET DEVICE OK	61H	The set device command has been correctly executed.
SET DEVICE ERR	E1H	The set device command wasn't executed.
RESET DEVICE OK	78H	The reset device command has been correctly executed.
RESET DEVICE ERR	F8H	The set device command wasn't executed.
FILE WRITE OK	77H	The set device command has been correctly executed.
FILE WRITE ERR	F7H	The File write command wasn't executed.
FILE ERASE OK	65H	The File erase command has been correctly executed.
FILE ERASE ERR	F5H	The File erase command wasn't executed.
FILE READ ERR	F2H	An Error occurred reading FILE
		-

REPLY #1: READ DATA

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	FILE	NRECS	DATAn	BCC
HEX VALUE	02H	80H – FEH	Variabile	72H (r)	See below	variable	nRECORDS, See below	00H-FFH
DECODIDITION	Deplice the second state NDECC is the second second second in DATA. Gold							

DESCRIPTION:	Replies the requested FILE, NRECS is the number of records present in DATA field.
DESCRIPTION.	Replies the requested FILL, NRECS is the number of records present in DATA field.

FILES WHITE LIST CALENDAR DAYS ACCESS TIMINGS CLOCK PARAMETER	63H 64H 62H 74H 70H	The record structure of this file is described before. The record structure of this file is described before.							
LOGGING	6CH	The KR-REL send the logged data (max 1000 log). MAX_RECS3							
		RECIEN	13						
		RECORD:	1 byte	STATUS :					
			,	Valid Code	00H				
				No WHITE LIST present	01H				
				Not Valid Code	02H				
				File Type of day not present	03H				
				Wrong Type of day	04H				
				Timing not programmed	05H				
				Wrong Access timing	06H				
				No timing associated	07H				
				Wrong Plant Code	08H				
			1 byte	DEVICE ADDRESS KR-REL	00H-7EH				
			1 byte	PLANT CARD CODE	00H-FFH				
			4 bytes	USER CARD CODE	00000000H-FFFFFFFF				
			6 bytes	LOGGING TIME	YY-MN-DD-HH-MM-SS				
VERSION	76H	The KR-REL sends the Firmware version.							
		RECLEN	2						
		RECORD:	1 byte	MODEL	01H= KR-REL-SS				
			1 byte	REVISION	23H= Rev. 2.3				