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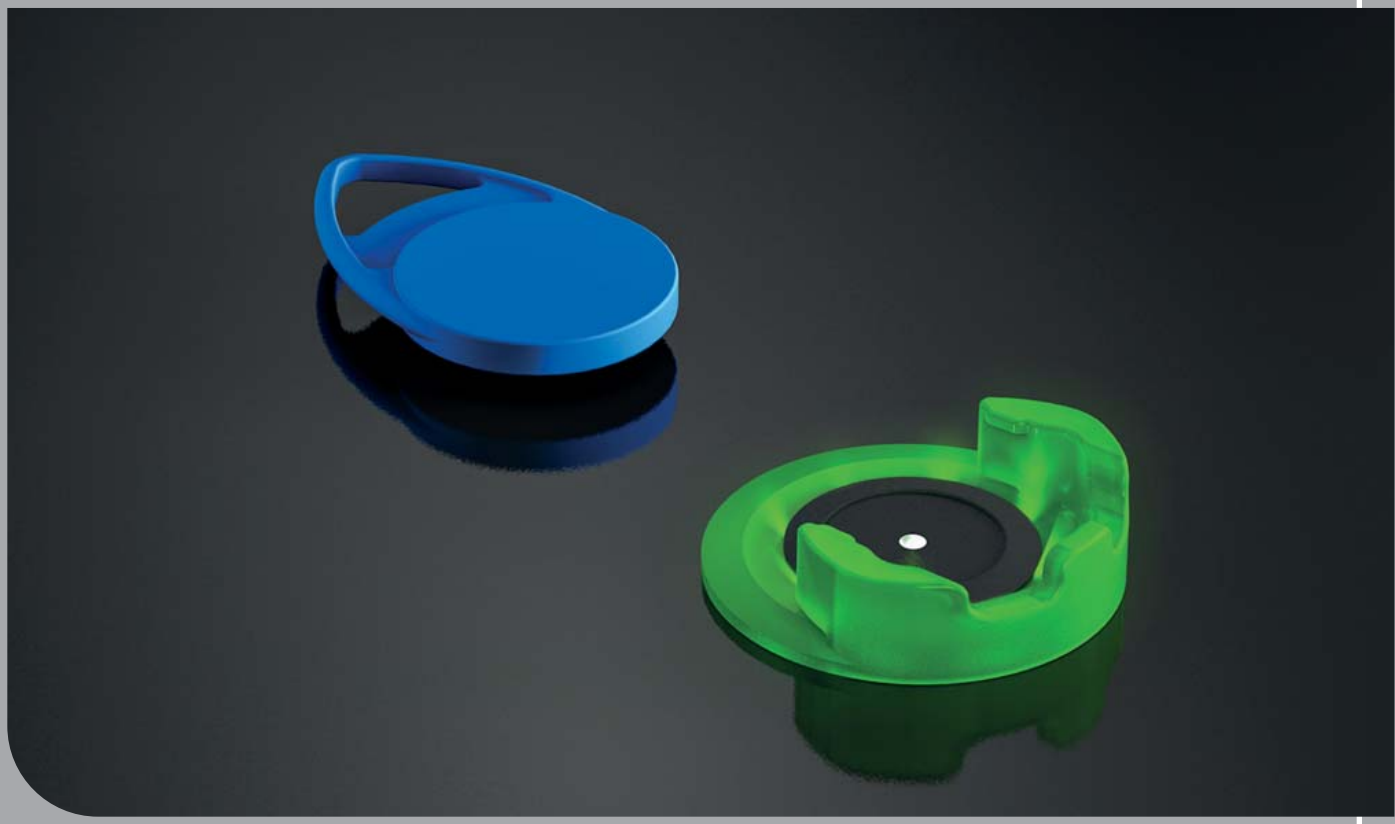
SCHLEGEL®
ELEKTROKONTAKT
Fascinating Electrotechnics



RFID

contactless, safe and robust access technology

RFID

5-6-7

Simple
Reliable
Robust


RFID

➔ RFID

RFID in general

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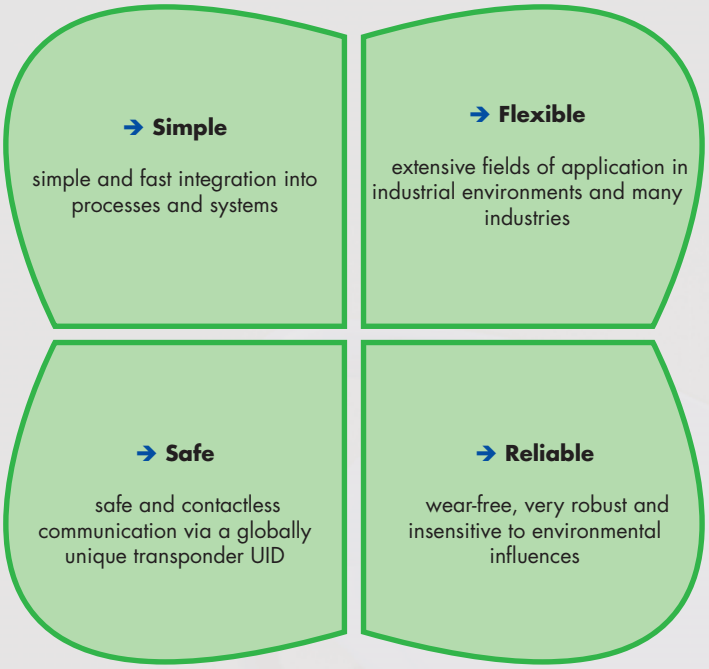
SCHLEGEL® ELEKTROKONTAKT

➔ RFID system

The Schlegel RFID systems are based on the principle of contactless communication via radio waves. The data is exchanged via a transponder which contains the data and a reading/writing unit that reads the data from the transponder or writes it onto the transponder. The application options for RFID systems are quite diverse and they require also different system requirements. That is why Schlegel offers various RFID systems so that the customer can have the best possible benefit with the respective system.

➔ Advantages of RFID



➔ Application fields of RFID

- time recording
- driver identification
- ticket registration
- access control
- machine control
- object detection/management
- charging stations
- leisure/sports equipment
- customer/product identification
- product protection
- data collection
- alternative to key switches

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➔ Schlegel RFID Systems - Decision Making Tool

Overview on the characteristics and possibilities of the different systems.

	RFID System				
Features	**Standard**	**SKS**		**TMS**	
Variant	-	**TRA**	**TCA**	**TRA**	**TCA**
Individual programming	✓	✗	✗	✗	✗
Own evaluation electronics	✗	✓	✓	✓	✓
Required interface	USB / RS232	none	none	none	none
Outputs	via PLC/industrial PC	3 relays	5 open collectors	3 relays	8 open collectors
Number of transponders*	unlimited	25	25	unlimited	unlimited
Number of authorisations*	unlimited	7	25	7	255
Group authorisations	✓	✓	✗	✓	✓
Operating modes (reading mode)	cyclic / single	cyclic / single	cyclic	cyclic	cyclic
Integration into fieldbus systems**	via PLC/industrial PC	✗	✓	✗	✓
Management software	✗	✗	✗	✓	✓
Field of application	individually for special requirements	plug & work, less administrative effort, basic requirements		high administrative effort, customisation, complex requirements	

* in theory, an unlimited number is possible

** via the modular bus system of Schlegel for the following fieldbus systems: Profibus, Profinet, CANopen, Ethernet IP, EtherCAT, Powerlink, IO-Link and AS-Interface

➔ Accessories for RFID reader

Holder for RFID reader with LED status indication

LED light ring for status indication

Card holder with LED status indication

RFID Standard

Ø 22.3 mm

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➔ What is RFID Standard?

The RFID Standard is a flexible, freely configurable system. With the help of commands the reading/writing unit can be programmed via an external control (PLC or industrial PC) with USB or RS232 connection according to one's own needs. The user can freely define the data structure on the transponder and evaluate it via the external control according to the requirements. Thanks to the flexible system, theoretically any number of transponders can be managed with RFID Standard.
RFID Standard supports two operating modes: cyclic and single reading. Cyclic reading means that the presence of the transponder is permanently being checked at regular intervals. As long as the transponder is registered, the function activated with the transponder remains active. Single reading means that each new registration of a transponder is being evaluated and that the assigned action is being activated.

➔ USB
➔ RS232

➔ How is the RFID Standard used?

Depending on the operating mode the transponder is either permanently fixed to the tag holder of the reading/writing unit (cyclic reading) or is held on the reading/writing unit for a moment (single reading). The data content of the transponder is transmitted contactlessly to the reading/writing unit and is redirected to the external control (PLC or industrial PC) for further processing from there. Thus it is e.g. possible to assign authorisations to persons, to identify persons, to control processes or to record and evaluate data.

➔ Product features

- individual programming
- any number of transponders can be managed
- simple connection to an external control (PLC/industrial PC)
- reading and writing function
- 2 operating modes (cyclic, single reading)
- LED status indication
- high-quality and appealing design
- black or silver-coloured

➔ Technical features

- USB or RS232 connection
- +5 V DC supply voltage
- 22.3 mm panel cut-out (30.5 mm with LED ring)
- degree of protection IP65/IP69K
- 13.56 MHz frequency (license free worldwide)
- baud rate from 9.600 to115.200 baud
- operating temperature from -20°C to +70°C
- mean operation of 200.000 h
- supports transponders of the standards: ISO 14443A, ISO 14443B, ISO 15693

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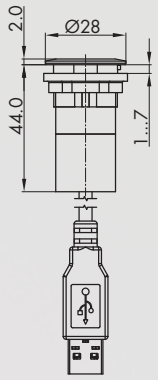
RFID Standard

Ø 22.3 mm

RFID

Illustration	Dimensions	Description	Type

IP65 IP69K

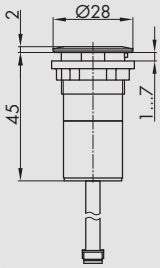


RFID reading/writing unit with USB interface

- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- read and write function
- LED status indication
- USB drivers for Windows, Linux, Android 4.2 and Macintosh OSX
- 2 operating modes: cyclic reading (continuous operation) or manual reading (on/off)
- supply voltage from USB port (5V)
- cable length: 80 cm (other lengths on request)
- transponder standards ISO 14443A/B (MIFARE-Classic/-DESFire), ISO 15693 and compatibles like EM4135, EM4043

colour	silver-coloured		**RRJ_RFID_USB**
	black		**RRJSW_RFID_USB**

IP65 IP69K

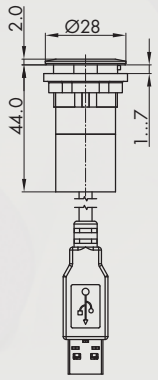


RFID reading/writing unit with RS232 interface

- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- baud rate 9600 up to 115200 bit/s
- read and write function
- LED status indication
- USB drivers for Windows, Linux, Android 4.2 and Macintosh OSX
- 2 operating modes: cyclic reading (continuous operation) or manual reading (on/off)
- supply voltage of 5V is necessary
- cable length: 80 cm (other lengths on request)
- transponder standards ISO 14443A/B (MIFARE-Classic/-DESFire), ISO 15693 and compatibles like EM4135, EM4043

colour	silver-coloured		**RRJ_RFID_RS2**
	black		**RRJSW_RFID_RS2**

IP65 IP69K



RFID/HID keyboard interface

Simulation of a keyboard input.
The transponder UID is being read via the RFID reader and outputed and terminated at the actual cursor position of the operating system via the simulated HID keyboard interface. This allows e.g. to implement an automatic password entry and login to an application in case the password corresponds to the transponder UID.

- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- LED status indication
- supply voltage from USB port (5V)
- cable length: 80 cm
- supports the standards ISO 14443A/B (MIFARE-Classic/-DESFire), ISO 15693 and compatibles like EM4135, EM4043

colour	silver-coloured		**RRJ_RFID_HID**
	black		**RRJSW_RFID_HID**

RFID Standard

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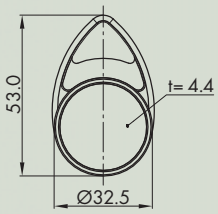
RFID

Illustration	Dimensions	Description	Type

Zubehör

RS232 interface connector — **RFID_ST_24V**

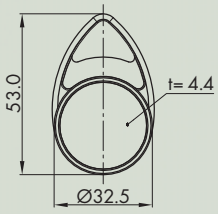
The RS232 interface connector is equipped with an internal 5V/DC voltage converter to operate the RFID reader in an electrical system of 10 to 24V/DC. The connector is directly screwed to the RS232 interface with the 9-pole Sub-D socket. A 2-pole screw terminal is included. The connection cable of the RFID reader is being plugged inside.



RFID tag drop-shaped 1 KB

NXP Mifare Classic EV1
inscription on request

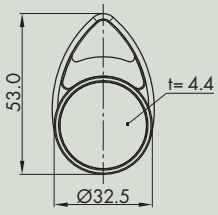
colour	blue	ESRT1_B
	red	ESRT1_R
	yellow	ESRT1_Y
	green	ESRT1_G
	black	ESRT1_S



RFID tag drop-shaped 2 KB

NXP Mifare DESFire EV1
inscription on request

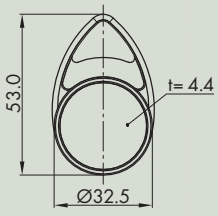
colour	blue	ESRT2_B
	red	ESRT2_R
	yellow	ESRT2_Y
	green	ESRT2_G
	black	ESRT2_S



RFID tag drop-shaped 4 KB

NXP Mifare Classic
inscription on request

colour	blue	ESRT4_B
	red	ESRT4_R
	yellow	ESRT4_Y
	green	ESRT4_G
	black	ESRT4_S



RFID tag drop-shaped 8 KB

NXP Mifare DESFire EV1
inscription on request

colour	blue	ESRT8_B
	red	ESRT8_R
	yellow	ESRT8_Y
	green	ESRT8_G
	black	ESRT8_S

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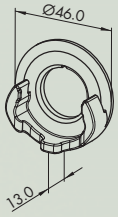
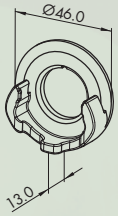
RFID Standard

RFID

Illustration	Dimensions	Description	Type
		**RFID chip card 1 KB** NXP Mifare Classic EV1 - length: 85 mm, width: 54 mm, height: 0.9 mm	**ESRC1**
		**LED light ring for status indication** LED light ring for an optical amplification of the status indication - system connection to the RFID reader - colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard) - panel cut-out Ø 30.5 mm delivery without RFID reader colour blue/green	**LR22K5DUO_GB_619**
		**RFID tag holder** for fixing the transponder from the top or from the front, e.g. combined with a bunch of key, - panel cut-out Ø 30.5 mm Only suitable for the use of Schlegel RFID tags! colour white black	**RRJ_RFID_HR_WS** **RRJ_RFID_HR_SW**
		**RFID tag holder with LED status indication** for fixing the transponder from the top or from the front, e.g. combined with a bunch of key, with LED illuminated ring for an optical amplification of the status indication - system connection to the RFID reader - colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard) - panel cut-out Ø 30.5 mm Only suitable for the use of Schlegel RFID tags! Delivery without RFID reader. colour blue/green	**RRJ_RFID_HR_LBG**

RFID Standard

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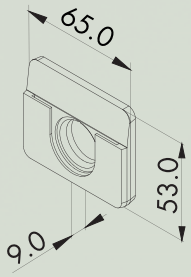
SCHLEGEL® ELEKTROKONTAKT

RFID

Illustration	Dimensions	Description	Type



RFID card holder with LED status indication

for fixing the chip card,
with LED illuminated ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID chip cards!
Delivery without RFID reader.

colour blue/green **RRJ_RFID_KH_LBG**

Empty enclosure with LED illuminated ring **RFID_SL**

aluminium enclosure with LED illuminated ring for the installation of an RFID interface
- Ø 100 mm, height: 70 mm

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➔ What is RFID SKS?

The RFID SKS is an independent RFID system which is designed for a simple and fast integration into existing operating environments. It does not require special connections, like e.g. USB or RS232 and the outputs can be accessed directly. The system consists of a reader, evaluation electronics, a master key (admin transponder) and the user keys (user transponder). Reader, evaluation electronics and master key are components that are assigned to each other. This means that the reader can only communicate with the appropriate evaluation electronics and that the system can only be set up with the appropriate master key.
On the SKS RFID the validation of transponders is done via the reader, they have not to be programmed via an external control. If a transponder has been detected by the reader, the read UID of the transponder is validated via an internal table. If the UID is valid, the reader transmits the internal transponder number to the evaluation electronics. This information will then be processed by the RFID SKS variants SKS TRA and SKS TCA differently.

➔ What is SKS TRA?

The SKS TRA is an evaluation electronics with 3 potential-free relay outputs and a special housing for quick mounting on a standard top-hat rail. Terminal devices can be connected directly via the 3 relay outputs, that is why no external control such as e.g. a PLC or an industrial PC is necessary. The evaluation electronics has an internal assignment table which is used to determine which relay outputs are switched to the respective transponder and which functions are thus enabled (TRA = transponder relay assignment). The assignment table contains several programmes with different combinations of transponder number and relay outputs to be enabled (see table 1). The programme can be set by a selector switch on the evaluation electronics.
The SKS TRA supports two operating modes: cyclic and single reading. Cyclic reading means that the presence of the transponder is permanently being checked at regular intervals. As long as the transponder is registered, the function switched with the transponder is active. Single reading means that each new registration of a transponder is being evaluated and that the assigned action is being activated.

Up to 25 user keys can be managed with the SKS TRA. Depending on the selected programme up to 7 authorisation levels for different user groups are possible.

➔ What is SKS TCA?

The evaluation electronics of the SKS TCA is designed as an embedded plug-in module and has 5 open collector outputs which can be connected directly to the inputs of a PLC or any other control system with open collector inputs. These inputs can thus be addressed directly via the SKS TCA. In combination with the modular bus system of Schlegel** the SKS TCA can also be used with fieldbus systems. For this purpose, the status of the open collector outputs is transmitted to the corresponding fieldbus system via the modular bus system and can be evaluated there. The transponder number validated by the reader is switching the outputs. This number is mapped as a binary value to the open collector outputs of the evaluation electronics (TCA = transponder collector assignment) and therefore is defined for each transponder (see table 2). As each transponder has a unique combination of outputs, this means that no user groups can be formed on the SKS TCA. SKS TCA supports the operating mode of cyclic reading. Cyclic reading means that the presence of the transponder is permanently being checked at regular intervals. As long as the transponder is registered, the function switched with the transponder is active.
The SKS TCA can manage up to 25 user keys. Each user key has its own authorisation level.

** The modular bus system of Schlegel allows an easy integration of operating units into the following fieldbus systems: Profibus, Profinet, CANopen, Ethernet IP, EtherCAT, Powerlink, IO-Link and AS-Interface. The modular bus system communicates externally via the corresponding bus node, internally the communication is done via a proprietary protocol from Schlegel.

➔ How to set up the RFID SKS

The programming of the user keys (transponders) on the RFID SKS is always done via the master key. The master key is specially set for the reader, so that only the RFID SKS that matches the master key can be set up. The set-up mode of the systems is activated on the reader with the master key. Then the user keys can be read one by one by simply placing them on the reader. The reader saves the UID of the user key in its internal table. Once all the required user keys have been registered the set-up mode is completed by placing the master key on the reader once again. The system is then completely set up and can be used immediately. For each user key, the respective outputs on the evaluation electronics can now be activated via the reader.

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RFID SKS

➔ How is the RFID SKS used?

Depending on the operating mode and the RFID SKS variant the transponder is either permanently fixed to the tag holder of the reader (cyclic reading) or is held on the reader for a moment (single reading). The data content of the transponder is transmitted contactlessly to the reading device and from the reading device to the evaluation electronics. The evaluation electronics then releases the outputs that match the user key and thus the associated function. With the RFID SKS, it is e.g. possible to assign authorisations to persons, to identify persons, to control processes or to record and evaluate data.

➔ Product features

Bundle **SKS TRA**	Bundle **SKS TCA**
• plug & work: no programming required, no external control necessary • terminal devices can be connected directly • easy mounting on top-hat rail • 3 potential-free relay outputs • up to 25 transponders • up to 7 authorisation levels • single or group authorisations • 2 operating modes (cyclic, single reading) • LED status indication • high-quality and appealing design	• plug & work: no programming required, outputs go directly to the external control • embedded pluggable module • integration in fieldbus systems via Schlegel's modular bus system • 5 open collector outputs • up to 25 transponders • up to 25 authorisation levels • no group authorisations • cyclic reading operating mode • LED status indication • high-quality and appealing design

➔ Technical features

Bundle **SKS TRA**	Bundle **SKS TCA**
SKS reader	
• 22.3 mm panel cut-out (30.5 mm with LED ring) • degree of protection IP65/IP69K • frequency 13.56 MHz (license free worldwide) • baud rate from 9.600 to 115.200 • baud operating temperature from -20°C to +70°C • mean operation of 200.000 h	
SKS TRA evaluation electronics	SKS TCA evaluation electronics
• system voltage 24 V DC ±10% • relay outputs: AC15 230V / 3A, DC13 24V / 1A • degree of protection IP20 • operating temperature from -20°C to +70°C • mean operation of 200.000 h • mounting on DIN rail N35	• system voltage 24 V DC ±10% • open collector outputs: 50 mA low active • degree of protection IP00 • operating temperature from -20°C to +70°C • mean operation of 200.000 h • mounting via pin connectors, 2.54 mm grid

Allocation table SKS TRA

Pos	Relay 1	Relay 2	Relay 3	Relay 1,2	Relay 1,3	Relay 2,3	Relay 1,2,3
0	Pairing						
Cyclic reading							
	Assignment of the transponders to the individual relay						
1	1, 7, 13, 19	2, 8, 14, 20	3, 9, 15, 21	4, 10, 16, 22		5, 11, 17, 23	6, 12, 18, 24
2	1, 4, 7, 10, 13, 16, 19, 22			2, 5, 8, 11, 14, 17, 20, 23			3, 6, 9, 12, 15, 18, 21, 24
3	1, 4, 7, 10, 13	2, 5, 8, 11, 14		3, 6, 9, 12, 15			
4	1, 8, 15, 22	2, 9, 16, 23	3, 10, 17, 24	4, 11, 18	5, 12, 19	6, 13, 20	7, 14, 21, 25
5	1, 5, 9, 13, 17	2, 6, 10, 14, 18	3, 7, 11, 15, 19				4, 8, 12, 16, 20
6	1, 2, 3, 4, 5	6, 7, 8, 9, 10	11, 12, 13, 14, 15	16, 17, 18	19, 20, 21	22, 23, 24	25
Single reading							
	Assignment of the transponders to the individual relay						
7	1, 7, 13, 19	2, 8, 14, 20	3, 9, 15, 21	4, 10, 16, 22		5, 11, 17, 23	6, 12, 18, 24
8	1, 4, 7, 10, 13, 16, 19, 22			2, 5, 8, 11, 14, 17, 20, 23			3, 6, 9, 12, 15, 18, 21, 24
9	1, 4, 7, 10, 13	2, 5, 8, 11, 14		3, 6, 9, 12, 15			
A	1, 8, 15, 22	2, 9, 16, 23	3, 10, 17, 24	4, 11, 18	5, 12, 19	6, 13, 20	7, 14, 21, 25
B	1, 5, 9, 13, 17	2, 6, 10, 14, 18	3, 7, 11, 15, 19				4, 8, 12, 16, 20
C	1, 2, 3, 4, 5	6, 7, 8, 9, 10	11, 12, 13, 14, 15	16, 17, 18	19, 20, 21	22, 23, 24	25
D..F	reserved						

table 1: Allocation of the transponders to the relay outputs. Customised table possible on request.

Allocation table SKS TCA

Transponder	OC 1	OC 2	OC 3	OC 4	OC 5
1	•				
2		•			
3	•	•			
4			•		
5	•		•		
6		•	•		
7	•	•	•		
8				•	
...					
24				•	•
25	•			•	•

table 2: Binary-coded assignment of the transponders to the open collector outputs.

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RFID SKS

Ø 22.3 mm

RFID

Illustration	Dimensions	Description	Type

SKS bundle TRA

SKS bundle comprising:
- 1 x RFID reader RRJ(XX)_RFID_SKS01 (incl. 1 x master key ESRTM)
- 1 x evaluation electronics RFID_SKS_TRA
- 5 x user key ESRTU_S

Data reader:
- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- only reading function
- LED status indication
- cable length: 80 cm (other lengths on request)
- IP65/IP69K
- incl. 1 master key (ESRTM)

Data evaluation electronics:
- 3 potential-free relay outputs
- max. 7 authorisation levels
- max. 25 transponders
- supply voltage 24V / DC
- contacts designed for AC15 230V / 3A, DC13 24V / 1A
- design with housing
- mounting on standard DIN rail for switching cabinets
- IP20

colour	silver-coloured		**SKS_RRJ_TRA**
	black		**SKS_RRJSW_TRA**

SKS bundle TCA

SKS bundle comprising:
- 1 x RFID reader RRJ(XX)_RFID_SKS01 (incl. 1 x master key ESRTM)
- 1 x evaluation electronics RFID_SKS_TCA
- 5 x user key ESRTU_S

Data reader:
- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- only reading function
- LED status indication
- cable length: 80 cm (other lengths on request)
- IP65/IP69K
- incl. 1 master key (ESRTM)

Data evaluation electronics:
- 5 OC outputs
- max. 1 authorisation level
- max. 25 transponders
- supply voltage 24V / DC
- pluggable module version
- suitable for the integration in bus systems via Schlegel's modular bus system

colour	silver-coloured		**SKS_RRJ_TCA**
	black		**SKS_RRJSW_TCA**

RFID SKS

Ø 22.3 mm

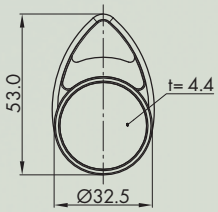
MADE IN GERMANY

SCHLEGEL ELEKTROKONTAKT

RFID

Illustration	Dimensions	Description	Type

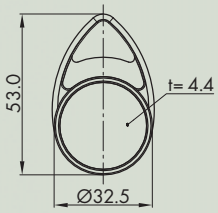
Zubehör



RFID master key SKS

red RFID tag, drop-shaped, for the administrative access to the Schlegel Control System,
the master key can only be used with the SKS evaluation electronics belonging to the master key
inscription on request

colour red **ESRTM**



RFID user key for Schlegel Control System (SKS)

black RFID tag, drop-shaped, for the user access to the Schlegel Control System
further colours (blue, green, yellow) and inscription on request

colour black **ESRTU_S**

RFID user card SKS **ESRCU**

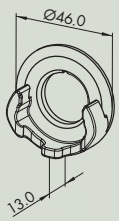
RFID chip card for the user access to the Schlegel Control System
- length: 85 mm, width: 54 mm, height: 0.9 mm

LED light ring for status indication

LED light ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

delivery without RFID reader

colour blue/green **LR22K5DUO_GB_619**



RFID tag holder

for fixing the transponder from the top or from the front, e.g. combined with a bunch of key,
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID tags!

colour white **RRJ_RFID_HR_WS**
black **RRJ_RFID_HR_SW**

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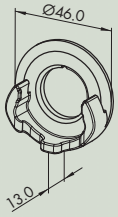
RFID SKS

Ø 22.3 mm

RFID

Illustration	Dimensions	Description	Type

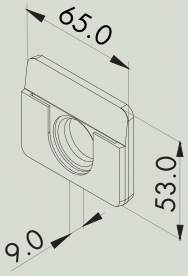


RFID tag holder with LED status indication

for fixing the transponder from the top or from the front,
e.g. combined with a bunch of key,
with LED illuminated ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID tags!
Delivery without RFID reader.

colour blue/green **RRJ_RFID_HR_LBG**



RFID card holder with LED status indication

for fixing the chip card,
with LED illuminated ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID chip cards!
Delivery without RFID reader.

colour blue/green **RRJ_RFID_KH_LBG**

Interference filter

external filter for disturbances from 2000 V for extreme EMC requirements
- mounting on top-hat rail (N35)

colour silver-coloured **EE_ESF_1**

➔ What is RFID TMS?

The RFID TMS is an independent RFID system which is designed for a simple and fast integration into existing operating environments. It does not require special connections, like e.g. USB or RS232 and the outputs can be accessed directly. The system consists of a reading/writing unit, an evaluation electronics, transponders and a management software. The transponders, the evaluation electronics and the software are protected through a customised serial number. That means that the evaluation electronics can only communicate with the appropriate transponders and those transponders can only be programmed with the appropriate management software.

On the RFID TMS the validation of transponders is done via the evaluation electronics, they have not to be programmed via an external control. If the reading/writing unit detects a transponder with a valid serial number, the data of the transponder is processed by the evaluation electronics and the corresponding outputs are activated. For RFID TMS there are two variants, TMS_TRA and TMS_TCA. Both systems need the SKS_TMS_xxxxxx for the installation and the management.
In case customer wants to use the system without software Schlegel can also programme the transponders on request.

➔ What is SKS TMS?

The SKS TMS consists of a management software and a programming station. The software is absolutely necessary for programming the transponders, as the software is created with a customer-specific serial number, which is saved when the transponders are programmed. This means that the transponders can only be processed by the evaluation electronics that have the same serial number. This ensures that no functions can be activated by external transponders. In addition to the serial number there are two other sectors on the transponder on which the customer can save data with the software. On the one hand, this is a special password-protected sector where the customer can store an own number for his own customers so that the systems remain unique across the customers. On the other hand, the software can be used to manage the transponder. This includes defining the outputs that are to be activated by the evaluation electronics for the transponder and the optional possibility of user-specific data, e.g. to file the name of the user. The management software can be installed on a standard PC with the latest Windows operating system and USB connection. All required programmes, files and instructions are available on the USB stick being supplied with the SKS TMS.

The programming station belonging to the management software consists of a desktop housing and a reading/writing unit with USB connection. Together with the management software the transponders can be programmed simple and easy.

➔ What is TMS TRA?

The TMS TRA is an evaluation electronics with 3 potential-free relay outputs and a special housing for quick mounting on a standard top-hat rail. Terminal devices can be connected directly via the 3 relay outputs, so no external control such as e.g. a PLC or an industrial PC is necessary when using the TMS TRA. The evaluation electronics enables the relay outputs depending on the transponder information received (TRA = transponder relay assignment). The authorisation levels are mapped in binary code to the outputs of the evaluation electronics (see table 1).
TMS TRA supports the operating mode of cyclic reading. Cyclic reading means that the presence of the transponder is permanently being checked at regular intervals. As long as the transponder is registered, the function activated with the transponder remains active. With TMS TRA any number of user keys can be managed and up to 7 different authorisation levels can be assigned to individual persons or groups.

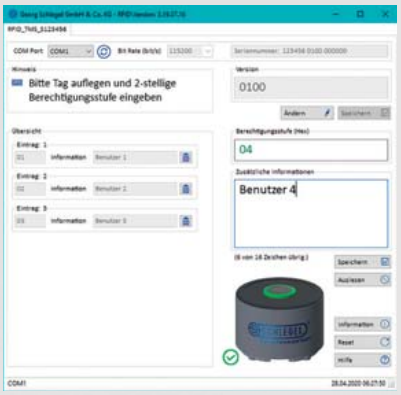
➔ What is TMS TCA?

The evaluation electronics of the TMS TCA is designed as an embedded plug-in module and has 8 open collector outputs which can be connected directly to the inputs of a PLC or any other control system with open collector inputs. These inputs can thus be addressed directly via the TMS TCA. In combination with the modular bus system of Schlegel** the TMS TCA can also be used with fieldbus systems. For this purpose, the status of the open collector outputs is transmitted to the corresponding fieldbus system via the modular bus system and can be evaluated there. The evaluation electronics enables the open collector outputs depending on the transponder information received (TCA = transponder collector assignment). The authorisation levels are mapped in binary code to the outputs of the evaluation electronics (see table 2).
TMS TCA supports the operating mode of cyclic reading. Cyclic reading means that the presence of the transponder is permanently being checked at regular intervals. As long as the transponder is registered, the function activated with the transponder remains active.
With TMS TCA any number of user keys can be managed and up to 255 different authorisation levels can be assigned to individual persons or groups.

** The modular bus system of Schlegel allows an easy integration of operating units into the following fieldbus systems: Profibus, Profinet, CANopen, Ethernet IP, EtherCAT, Powerlink, IO-Link and AS-Interface. The modular bus system communicates externally via the corresponding bus node, internally the communication is done via a proprietary protocol from Schlegel.

➔ How to set up RFID TMS

The complete setup and administration of the RFID TMS is done via the TMS management software. The operating instructions for the management software are supplied with the SKS TMS software bundle.



➔ How is the RFID TMS used?

With the RFID TMS the data is read cyclically. This means that the data content of the transponder is recorded by the reading/writing unit at regular intervals and transmitted to the evaluation electronics. As long as the data collected by the transponder is valid, the evaluation electronics releases the outputs that match the user key and thus the associated function.
With the RFID TMS it is e.g. possible to assign authorisations to persons, to identify persons, to control processes or to record and evaluate data.

➔ Product features

Bundle **TMS TRA**	Bundle **TMS TCA**
• plug & work: no programming required, no external control necessary - terminal devices can be connected directly • easy mounting on top-hat rail • 3 potential-free relay outputs • any number of transponders • up to 7 authorisation levels • single or group authorisations • cyclic reading operating mode • LED status indication • high-quality and appealing design	• plug & work: no programming required, outputs go directly to the external control • embedded pluggable module • integration in fieldbus systems via Schlegel's modular bus system • 8 open collector outputs: • any number of transponders • up to 255 authorisation levels • single or group authorisations • cyclic reading operating mode • LED status indication • high-quality and appealing design

Technical features

Bundle **TMS TRA**	Bundle **TMS TCA**
TMS reading/writing unit	
• 22.3 mm panel cut-out (30.5 mm with LED ring) • degree of protection IP65/IP69K • 13.56 MHz frequency (license free worldwide) • baud rate from 9.600 to115.200 baud • operating temperature from -20°C to +70°C • mean operation of 200.000 h • supports transponders of the standards: ISO 14443A, ISO 14443B, ISO 15693	
TMS TRA evaluation electronics	TMS TCA evaluation electronics
• system voltage 24 V DC ±10% • relay outputs: AC15 230V / 3A, DC13 24V / 1A • degree of protection IP20 • operating temperature from -20°C to +70°C • mean operation of 200.000 h • mounting on DIN rail N35	• system voltage 24 V DC ±10% • open collector outputs: 50 mA low active • degree of protection IP00 • operating temperature from -20°C to +70°C • mean operation of 200.000 h • mounting via pin connectors, 2.54 mm grid

Authorisation levels TMS TRA

Level	Relay 1	Relay 2	Relay 3
1	•		
2		•	
3	•	•	
4			•
5	•		•
6		•	•
7	•	•	•

Table 1: Binary-coded assignment of the transponder to the relay outputs.

Authorisation levels TMS TCA

Level	OC 1	OC 2	OC 3	OC 4	OC 5	OC6	OC7	OC8
1	•							
2		•						
3	•	•						
4			•					
5	•		•					
6		•	•					
7	•	•	•					
8				•				
9	•			•				
10		•		•				
11	•	•		•				
12			•	•				
...								
250		•		•	•	•	•	•
251	•	•		•	•	•	•	•
252			•	•	•	•	•	•
253	•		•	•	•	•	•	•
254		•	•	•	•	•	•	•
255	•	•	•	•	•	•	•	•

Table 2: Binary-coded assignment of a transponder to the open collector outputs. Authorisations levels TMS TCA.

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RFID TMS
Ø 22.3 mm

RFID

Illustration	Dimensions	Description	Type

TMS bundle TRA

TMS bundle comprising:
- 1 x RFID reader RRJ(XX)_RFID_RS2
- 1 x evaluation electronics RFID_TMS_TRA
- 5 x user key ESRT1_S

Data reader:
- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- baud rate 9600 up to 115200 bit/s
- read and write function
- LED status indication
- cable length: 80 cm
- IP65/IP69K

Data evaluation electronics:
- 3 potential-free relay outputs
- max. 7 authorisation levels
- any number of transponders
- supply voltage 24V / DC
- contacts designed for AC15 230V / 3A
- design with housing
- mounting on standard DIN rail for switching cabinets
- IP20

For the programming of the transponders the transponder management software RFID_TMS_Sxxxxxx is required

colour	silver-coloured		**TMS_RRJ_TRA**
	black		**TMS_RRJSW_TRA**

TMS bundle TCA

TMS bundle comprising:
- 1 x RFID reader RRJ(XX)_RFID_RS2
- 1 x evaluation electronics RFID_TMS_TCA
- 5 x user key ESRT1_S

Data reader:
- panel cut-out Ø 22.3 mm
- frequency range 13.56 MHz
- baud rate 9600 up to 115200 bit/s
- read and write function
- LED status indication
- cable length: 80 cm
- IP65/IP69K

Data evaluation electronics:
- 8 OC outputs
- max. 255 authorisation levels
- any number of transponders
- supply voltage 24V / DC
- pluggable module version
- suitable for the integration in bus systems via Schlegel's modular bus system

For the programming of the transponders the transponder management software RFID_TMS_Sxxxxxx is required

colour	silver-coloured		**TMS_RRJ_TCA**
	black		**TMS_RRJSW_TCA**

RFID TMS

Ø 22.3 mm

MADE IN GERMANY

SCHLEGEL ELEKTROKONTAKT

RFID

Illustration	Dimensions	Description	Type

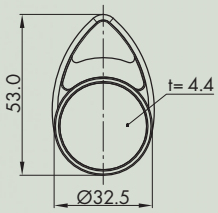
RFID programming bundle — **SKS_TMS_XXXXXX**

For the RFID_SKS_TMS / RFID_TMS_TCA for writing the RFID transponders via a PC with USB connection

Consisting of:
- RFID programming station
- RFID programming software

Requirement:
Microsoft Windows® XP / 7 / 8 / 10 32-Bit / 64-Bit

Zubehör



RFID tag drop-shaped 1 KB

NXP Mifare Classic EV1
inscription on request

colour	blue		ESRT1_B
	yellow		ESRT1_Y
	green		ESRT1_G
	red		ESRT1_R
	black		ESRT1_S

RFID chip card 1 KB — **ESRC1**

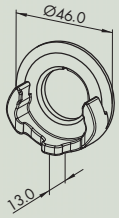
NXP Mifare Classic EV1
- length: 85 mm, width: 54 mm, height: 0.9 mm

LED light ring for status indication

LED light ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

delivery without RFID reader

colour	blue/green		LR22K5DUO_GB_619



RFID tag holder

for fixing the transponder from the top or from the front, e.g. combined with a bunch of key,
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID tags!

colour	white		RRJ_RFID_HR_WS
	black		RRJ_RFID_HR_SW

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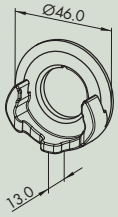
RFID TMS

Ø 22.3 mm

RFID

Illustration	Dimensions	Description	Type

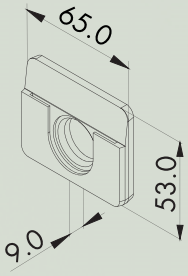


RFID tag holder with LED status indication

for fixing the transponder from the top or from the front,
e.g. combined with a bunch of key,
with LED illuminated ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID tags!
Delivery without RFID reader.

colour blue/green **RRJ_RFID_HR_LBG**



RFID card holder with LED status indication

for fixing the chip card,
with LED illuminated ring for an optical amplification of the status indication
- system connection to the RFID reader
- colouring via the RFID reader (SKS, TMS) or an external control (RFID Standard)
- panel cut-out Ø 30.5 mm

Only suitable for the use of Schlegel RFID chip cards!
Delivery without RFID reader.

colour blue/green **RRJ_RFID_KH_LBG**

Interference filter

external filter for disturbances from 2000 V for extreme EMC requirements
- mounting on top-hat rail (N35)

colour silver-coloured **EE_ESF_1**

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