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CONTROL YOUR LIVING SPACE

Application manual
EK-TR2-TP
EK-TP2-TP
transponder reader/programmer
Access Control System

Sommario

Revision	Changes	Date
1.1.0	Programmer EK-TP2-TP	21/01/2020
1.0.1	Product image update	23/10/2019
1.0.0	Draft, first emission	03/06/2019

1 Document purpose

This manual describes the application details for version A1.0 of the ekinex® transponder reader EK-TR2-TP and for the ekinex® transponder programmer EK-TP2-TP. The document is aimed at the system configurator as a description and reference guide for device functionalities and application programming. For mechanical and electrical details of the devices, please refer to the technical data sheet of the device.

This application manual and application programs for the ETS development environment are available for download at www.ekinex.com.

Document	File name (## = version)	Version	Device review	Last update
Product datasheet	STEKTRTPTH2TP##_EN.pdf		A1.0	01/2020
Application manual	MAEKTRTP2TP##_EN.pdf		A1.0	01/2020
ETS Test Project	APEKTRTPTH2TP##. knxproj	EK-TR2-TP EK-TP2-TP EK-TH2-TP	A1.0	01/2020

You can access the most up-to-date version of the full documentation for the device using following QR codes:

EK-TR2-TP

EK-TP2-TP

2 Description

The EK-TR2-TP reader and the EK-TP2-TP programmer, together with the EK-TH2-TP pocket, constitute a series of KNX devices for controlled access to the rooms and for the detection of presence by means of smart-cards. Ideal for creating KNX standard automation functions in hospitality and hospitality structures (hotels, residences, guesthouses or bed & breakfasts) with the aesthetic uniformity of ekinex® wall products (push-button controls and room thermostats), in combination with products from switchboard (EK-HO1-TP and EK-HU1-TP controllers) and with the ekinex® accédo management and supervision software.

The products are equipped with an RFID-type front antenna capable of feeding the smart-card card that is approached and reading the programmed information. The EK-TR2-TP wall reader enables access following validation of the card based on the configured authorizations. The EK-TH2-TP wall pocket activates presence following the insertion of the card in the appropriate front pocket. Both products can manage guest cards of the accommodation facility, based on the system codes, the reservation and the check-in / check-out period, service cards based on time slots and pass-dates. To program cards, use the product EK-TP2-TP, which is very similar to the reader with the possibility of activating the front antenna also for writing operations. The programming of the cards in the reception area as well as the activation of a reader outside the room and an inside pocket takes place on the KNX network infrastructure. In addition to the power supplied by the KNX bus, an external auxiliary power supply is required for the RFID antenna at 12/24 Vac / dc. The basic programming of the devices as well as the configuration of the automation functions is carried out through the ETS application program; card programming and enabling room and controlled access devices in common areas requires the use of ekinex® accédo management and supervision software. Both devices can notify the passage and validation events of each type of card via the KNX bus with an internal buffer to cope with the unavailability of the communication bus due to excessive data traffic.

The EK-TR2-TP reader has a relay output for the control of an electric lock which can be activated following the validation of a card or via KNX telegrams; the binary input can be used to connect a traditional card holder pocket without a bus connection. The reader has 3-color Led (white, green, red) located on the front for signaling validation in progress (green Led) or unauthorized card (red Led); possibility of activation for "do not disturb" or "room makeover" commands.

The appliances can be completed with a 45 x 45 mm window plate (in plastic, aluminum or fenix NTM®) and with an optional frame from the form, flank or NF 'series (in plastic or aluminum). Plate and frame must be ordered separately. For more information, consult the ekinex® product catalog or go to www.ekinex.com.

3 Technical features

3.1 Transponder reader

The “transponder reader” is a flush-mounting device for wall boxes, designed to realize access control systems with a communication support based on KNX bus.

It is equipped with:

- one relay (4A @24 Vac/dc)
- one input to be used for connecting external conventional card-holder

The output can be programmed in three different ways:

- “Linked to access control”, receiving in this case switching commands from the device itself (according to transponder card validation). It’s moreover possible to switch the relay according to a standard KNX telegram received from the bus by a KNX device
- Being a standard KNX Switch actuator output, able to be controlled by every KNX-standard devices
- “Linked to card-holder”, that means that the relay is switched according to closing/opening internal input contact available on transponder reader and connected to a conventional card-holder

The bicolor (red-green) LED placed on the front of the device allow you to monitor device operation (for example GREEN = card validation ongoing, RED = card not authorized). The LED can be also switched ON/OFF in the proper color according to KNX telegram (for example for DND/MUR purposes).

The transponder reader requires an external power supply enabling its operation even without bus.

The following functions are available for the relay output:

- Normal switching
- Staircase lighting function with programmable delay (in “Linked to access Control” and “Actuator” modality)
- delayed OFF with programmable delay (in “Linked to card holder” modality)

The available input can be connected to a conventional card-holder in order to make the transponder reader aware about guest presence/absence in the room, and consequently performing some actions (for example sending 1 bit or 1 byte notification scene on the KNX bus) or switching internal relay (this only when the output relay is configured as “Linked to card holder”.

3.1.1 Technical data

Product code	EK-TR2-TP reader EK-TP2-TP programmer
Power supply	via bus KNX (30 Vdc)
External supply	12-24 Vac/dc
Bus cable	KNX standard
Absorption	max 10 mA from bus. External supply to be sized for 1 W peak
Number of outputs	1 bistable relay 4A @24 Vac/dc

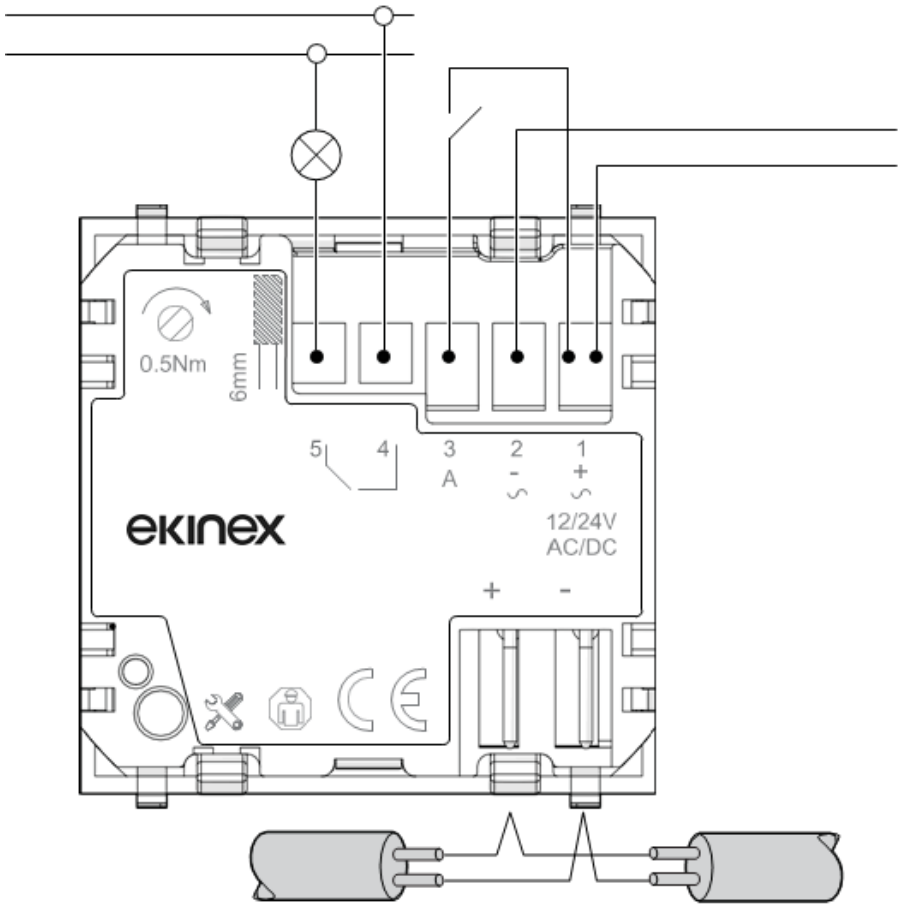
Number of inputs	1 on the rear side, NO, max connection length 10 m
Use environment	class 3k5 (inside, dry)
Operating temperature	-5 °C … +50 °C
Relative humidity	max 90% (non condensating)
Connection to bus	standard bus connector
Electric connections	screw terminal 0.5 Nm
Protection degree	IP20
Dimensions	44 x 44 x 43 mm (L x H x P)
Weight	approx.50 g
Reference standards	EN50090-2-2, EN 50491, EN 50364, ETSI EN 300 330-2

Device type	Application program	Maximum number of communication objects	Maximum number of group addresses	Maximum number of associations
EK-TR2-TP EK-TP2-TP	Access control transponder reader	16	255	255

3.1.2 Access Control function

TAG validation scheme	White list - local scheme (communication bus not required), Black list - local scheme (communication bus not required) Central scheme (White or Black list) - Requires KNX bus
Event notification upon system supervision	Only possible if the communication bus is available. Available modes: ▪ Spontaneous Emission ▪ Spontaneous Emission with receipt confirmation request upon supervision (handshake)
Notifications and validation events characteristics	Information about: Event time stamp (HH,MM,SS), TAG ID, event outcome (access granted or denied)
Buffer memory for events	The device can store up to 64 events to deal with the communication bus unavailability due to heavy traffic.
Timeslots	On a weekly basis (Sunday-Saturday) A specific access profile can be associated with each different 256 user groups. Each profile can be a combination of 12 simple timeslots.
Maximum number of TAGs in white-list memory	128
Maximum number plant codes in memory	128
Maximum number time-slot that can be defined	12

3.1.3 Connection diagram



Assignment of the physical address

The assignment and programming of the physical address is carried out in the ETS. The device features a Programming button to assign the physical device address.

The red Programming LED lights up, after the button has been pushed. It switches off, as soon as the ETS has assigned the physical address or the Programming button is pressed again.

Cleaning

If devices become dirty, they can be cleaned using a dry cloth or a cloth dampened with a soapy solution. Corrosive agents or solutions should never be used.

Download behaviour

Depending on the PC, which is used, the progress bar for the download may take up to one and a half minutes, before it appears, due to the complexity of the device.

Maintenance

The device is maintenance-free. No repairs should be carried out by unauthorised personnel if damage occurs, e.g. during transport and/or storage.

3.2 Power supply

All devices in the range require an external 12-24 Vac/dc power supply, allowing them to operate (e.g. opening of electric lock) even in the event of a lack of bus voltage.

For system sizing (number and type of power supplies to use), bear in mind that each access control device draws a peak power of 1W.

We recommends using a dedicated power supply/transformer to power the electric lock (not the same one used for the access control devices range), as the power draw of the electric lock is not usually known beforehand and can invalidate the correct sizing of the power supply for the access control devices, causing outages and malfunctions. Where installation requirements should necessitate the use of a common power supply/transformer (for example one in each room for applications such as hotels), it is essential to consider the maximum possible power draw of the electric lock and subtract this from the available power provided by the power supply/transformer: the residual power must be sufficient to power all access control devices running on that power supply/transformer.

For powering the access control devices, we recommends the use of stabilised power supplies as opposed to transformers. When powering access control devices with alternating current, it is important to remember that transformers for discontinuous loads can not be used to power the access control devices.

An example of an ideal configuration for the sizing of the access control devices' power supply is given below:

- Dedicated power supply/transformer for electric lock
- DC power supply for the access control devices with dedicated stabilised transformer, chosen on the basis of the number of devices to control.

3.3 Connection and wiring

For the supplementary power supply of the devices (12-24 Vac/dc), a standard cable can be used; the sizing of this must be based on the total length of cable required for the installation. Specifically, we recommends a dedicated insulated cable for the power supply of the access control devices, of cross section 1 mm². It is not possible to use the additional pair of conductors present in a KNX 4-wire cable (white-yellow), unless a power supply which meets SELV specifications can be guaranteed on this pair (in particular the presence of a power supply unit with isolation transformer). In general, seeing as it is not always possible to guarantee a SELV power supply beforehand or to know whether a power supply which meets SELV specifications has been supplied, it is in any case recommended to use a dedicated cable to power the access control devices, as indicated above. For connecting the input it's suggested to use a dedicated 2 x 0,50 mm shielded cable. Maximum distance covered is 10 meters.

3.4 Outdoor installation

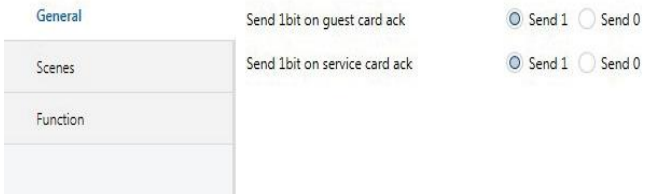
The access control devices are rated IP20 and therefore cannot be installed outdoors.

4 Commissioning

The main functions of the access control devices are described in this section. Parametrisation is performed via the Engineering Tool ETS Software application program. For the parametrisation you need a pc desktop or a laptop with ETS and connection to the KNX system (obtainable for example by means of RS232, USB or IP Interface).

4.1 General

In this menu is possible to choose the value of the 1 bit object sent on the KNX bus on card validation event.



Send 1 bit on guest card acknowledgment

With this parameter you can choose the value (1 or 0) of the 1 bit KNX telegram sent by the reader on recognition of a valid guest card

Options:

- Send 1
- Send 0

Send 1 bit on service card acknowledgment

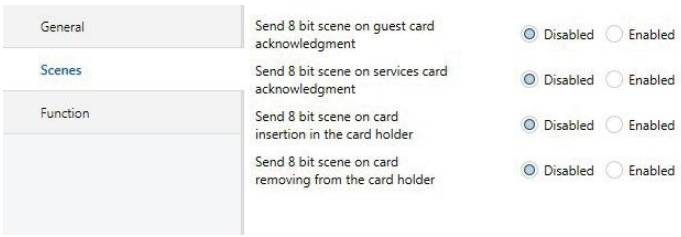
With this parameter you can choose the value (1 or 0) of the 1 bit KNX telegram sent by the reader on recognition of a valid service card

Options:

- Send 1
- Send 0

4.2 Scenes

In this menu it’s possible to enable/disable sending of 8 bit scenario KNX telegram on specific events (guest/service card validation, card insertion/removal in/from the card holder)



Send 8 bit scene on guest card acknowledgment

With this parameter you can choose to send one KNX telegram with 8 bit scene on guest card validation from transponder reader.

Options:

- **Disabled**
- Enabled

When “Enabled” is selected, with the “Scene” parameter is possible to select the Scene number to send on guest card validation.

Send 8 bit scene on service card acknowledgment

With this parameter you can choose to send one KNX telegram with 8 bit scene on service card validation from transponder reader.

Options:

- **Disabled**
- Enabled

When “Enabled” is selected, with the “Scene” parameter is possible to select the Scene number to send on service card validation.

Send 8 bit scene on card insertion in the card holder

With this parameter you can choose to send one KNX telegram with 8 bit scene when a card is inserted into the conventional card-holder connected to transponder reader through its internal input.

Options:

- **Disabled**
- Enabled

When “Enabled” is selected, with the “Scene” parameter is possible to select the Scene number to send on card insertion in the card holder.

Send 8 bit scene on card removing from the card holder

With this parameter you can choose to send one KNX telegram with 8bit scene when a card is removed from the conventional card-holder connected to transponder reader through its internal input.

Options:

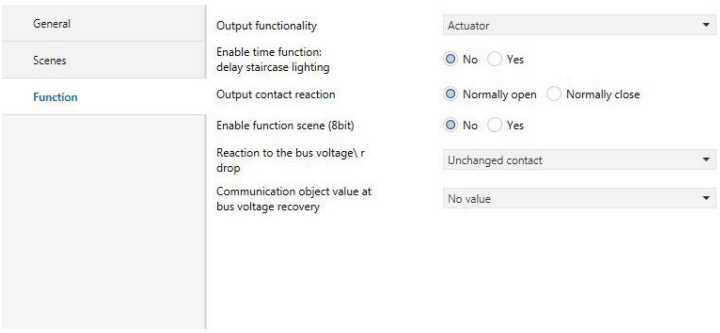
- **Disabled**
- Enabled

4.3 Function

In this menu it's possible to configure the functionalities of transponder reader, and in particular the behavior of its output relay.

Output functionality

With this parameter, you can choose the behavior of output relay:

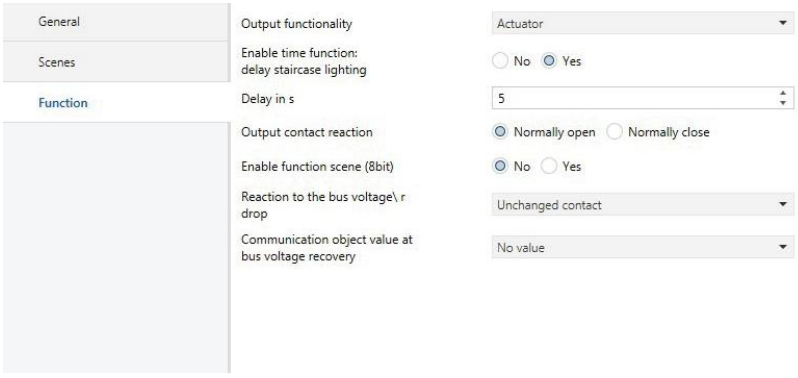


Options:

- **Actuator**
- Linked to access control
- Linked to card holder

4.3.1 Actuator

With the "Actuator" configuration the transponder reader relay acts as a standard KNX output channel, being able to be controlled through standard KNX telegram sent by standard KNX devices. Once the output has been configured as "Actuator", it is possible to additional parametrize it with the two following parameter:



Enable time function: delay staircase lighting

It's possible to choose staircase lighting function, if needed Options:

- No
- **Yes**

Delay in s

If enabled “delay staircase lighting” option with the parameter above, you can configure the value of the delay in seconds.

Options:

- [0 … **5** … 65.535]

Enable functions scene (8 bit)

It’s possible to add the 8 bit scene functionality to transponder reader relay, when configured as “Actuator”. In this case the output reacts to standard KNX 8bit telegram sent by standard KNX devices.

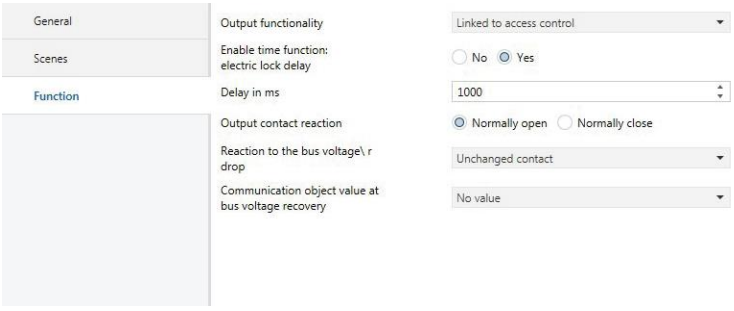
Options:

- **No**
- Yes

4.3.2 Linked to access control

With the “Linked to access control” configuration, the transponder reader relay is switched if it recognizes a valid card. Moreover the output is able to be switched also by means of standard KNX 1 bit telegram sent on proper communication object (Switch).

Once the output has been configured as “Linked to access control”, it is possible to additional parametrize it with the two following parameter:



Enable time function: electric lock delay

It’s possible to choose electric lock delay function, if needed Options:

- No
- **Yes**

Dealy in s

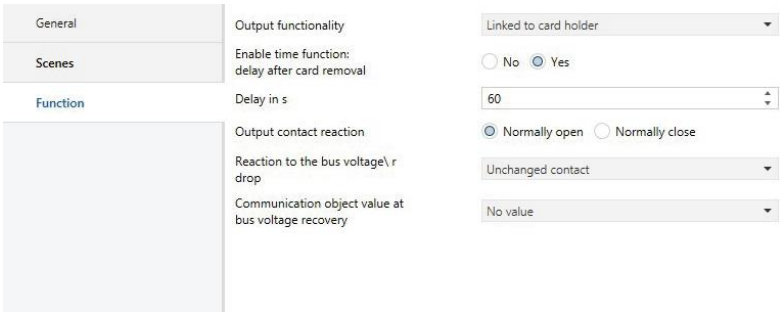
If enabled “electric lock delay” option with the parameter above, you can configure the value of the delay in milliseconds. Options:

- [0 … **1000** … 65.535]

4.3.3 Linked to card holder

With the “Linked to card holder” configuration, the transponder reader relay is switched when a card is inserted into or removed from a conventional card holder connected to transponder reader with its internal binary input.

Once the output has been configured as “Linked to card holder”, it is possible to additional parametrize it with the two following parameter:



Enable time function: delay after card removal

It’s possible to choose delay after card removal, if needed Options:

- No
- **Yes**

Delay in s

If enabled “delay after card removal” option with the parameter above, you can configure the value of the delay in seconds.

- Options: [0 … **60** … 65.535]

4.3.4 Common parameters

The following parameters are related to every kind of configuration of transponder reader (Actuator, Linked to access control, Linked to card holder) and are related to configuration of main functionalities of device.

Output contact reaction

With this parameter you can determine whether the output works as a “Normally closed contact” or as a “Normally open contact”

Options:

- **Normally open**
- Normally closed

Reaction to the bus voltage drop

With this parameter you can define the output status upon device switch off, on bus voltage drop Options:

- **Unchanged contact**
- Open contact
- Closed contact

Communication object value at bus voltage recovery

With this parameter you can define the output status upon device switch on (communication object value), on bus voltage recovery

Options:

- **No value**
- Write 0
- Write 1

The above parameters related to behavior of output on bus voltage drop and bus voltage recovery do not apply to “Linked to card holder” configuration, since in this case “Switch” communication object is not present and status of the relay is defined by a “physical” condition, hence insertion/removal of card into card-holder connected to the input of transponder reader.

Please notice that “Reaction to the bus voltage drop” parameter refer to behavior of output on KNX bus voltage failure. On power supply failure (12-24 Vac/dc), the device stops working and is not able to fix the relay in the position defined with this parameter.

5 Operation of communication objects

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	Switch	Switch			1 bit	C	-	W	-	-		Low
1	Scene	Scene			1 byte	C	-	W	-	-		Low
2	Status Switch	Status Switch			1 bit	C	R	-	T	-		Low
3	Guest in the room	Guest in the room			1 bit	C	R	-	T	-		Low
4	Acc1 Command	Acc1 Command			1 byte	C	R	W	T	U		Low
5	Acc14 Command	Acc14 Command			14 bytes	C	R	W	T	U		Low
6	Date	Date			3 bytes	C	-	W	-	-		Low
7	Time	Time			3 bytes	C	-	W	-	-		Low
9	Guest card acknowledgment scene	Guest card ack scene			1 byte	C	-	-	T	-		Low
10	Services card acknowledgment scene	Services card ack scene			1 byte	C	-	-	T	-		Low
11	Guest card acknowledgment	Guest card acknowledgment			1 bit	C	-	-	T	-		Low
12	Services card acknowledgment	Services card acknowledgment			1 bit	C	-	-	T	-		Low
13	Card insertion scene	Card insertion scene			1 byte	C	-	-	T	-		Low
14	Card removal scene	Card removal scene			1 byte	C	-	-	T	-		Low
15	Green Led	Green Led			1 bit	C	-	W	-	-		Low
16	Red Led	Red Led			1 bit	C	-	W	-	-		Low

N°	*Function*	*Object name*	*Data type*	*Flag*
0	**Switch**	**Switch**	**1 bit**	**C, W**
This object is used to switch the output ON/OFF. The device receives a switching command via the communication object. If the output is programmed as “normally open” contact, the relay is closed with a “1” telegram value and opened with a “0” telegram value (and the opposite is true when it is programmed as “normally open” contact). Moreover, the output can be controlled without communication object, associating it with the transponder TAGs validation events (on “Linked to access control” mode) or card insertion/removal in the card-holder connected to the transponder reader (“Linked to card holder” mode). In “Linked to card holder” mode “Switch” communication object is not available and the output can be controlled only with card insertion/removal in the card-holder connected to the transponder reader.				
2	**Status switch**	**Status switch**	**1 bit**	**C, R, T**
This object is always visible. The object value indicates the relay contact position (open or closed).				
1	**Scene**	**Scene**	**1 byte**	**C, W**
This communication object is available only when the output functionality is configured as “Actuator”. Using this 8 bit communication object, a scene telegram can be sent using a coded telegram. The telegram contains the number of the scene concerned as well as the information on whether the scene is to be recalled or if the current contact position is to be assigned to the scene.				
3	**Guest in the room**	**Guest in the room**	**1 bit**	**C, R, T**
This object is used to send a 1 bit telegram with information about presence of guest in the room (1 = guest is in the room, 0 = guest is outside the room). The information is taken from card-holder connected to transponder reader with its input (card insertion/card removal).				
4	**ACC1 Command**	**ACC1 Command**	**1 byte**	**C, R, W, T, U**
5	**ACC14 Command**	**ACC14 Command**	**14 byte**	**C, R, W, T, U**
These communication objects are used to interface transponder reader with supervision and control software. Objects have to be associated with group addresses which, in turn, are indicated in the software, in the menu for configuration of the individual devices.				
6	**Date**	**Date**	**3 byte**	**C, W**
7	**Time**	**Time**	**3 byte**	**C, W**
These communication objects are used to receive date and time updates from supervisor software (or				

KNX clock). These objects are linked to the corresponding Date and Time boxes in the “Settings” menu (tab “Timers”) via group addresses.				
9	**Guest Card Ack Scene**	**Guest card acknowledgment scene**	**1 byte**	**C, T**
10	**Services Card Ack Scene**	**Service card acknowledgment scene**	**1 byte**	**C, T**
These objects are available only if previously enabled in the menu “Scenes”. With these objects is possible to send 1 byte scene telegram on transponder cards validation events (Guest Card/Service Card)				
11	**Guest card acknowledgment**	**Guest card acknowledgment**	**1 bit**	**C, T**
12	**Service card acknowledgment**	**Service card acknowledgment**	**1 bit**	**C, T**
With these objects is possible to send 1 bit telegram on transponder cards validation events (Guest Card/Service Card)				
13	**Card insertion scene**	**Card insertion scene**	**1 byte**	**C, T**
14	**Card insertion removal**	**Card insertion removal**	**1 byte**	**C, T**
These objects are available only if previously enabled in the menu “Scenes”. With these objects is possible to send 1 byte scene telegram on card insertion/removal into the card-holder connected to transponder reader with its input.				
15	**Green Led**	**Green Led**	**1 byte**	**C, W**
16	**Red Led**	**Red Led**	**1 byte**	**C, W**
Through these communication objects you can control the two color LEDs’ status directly over the bus. To switch the LED on, you simply need to send a telegram containing the value 1 to switch it on, or value 0 to switch it off.				

6 Warnings

- Installation, electrical connection, configuration and commissioning of the device can only be carried outby qualified personnel in compliance with the applicable technical standards and laws of the respective countries
- Opening the housing of the device causes the immediate end of the warranty period
- In case of tampering, the compliance with the essential requirements of the applicable directives, for which the device has been certified, is no longer guaranteed
- ekinex® KNX defective devices must be returned to the manufacturer at the following address:

Ekinex S.p.A. Via Novara 37, 28010 Vaprio d'Agogna (NO), Italy

7 Other information

- The instruction sheet must be delivered to the end customer with the project documentation
- For further information on the product, please contactthe ekinex® technical support at the e-mail address: support@ekinex.com or visit the website www.ekinex.com
- Each ekinex® device has a unique serial number onthe label. The serial number can be used by installersor system integrators for documentation purposes and has to be added in each communication addressed to the Ekinex technical support in case of malfunctioning of the device
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