

OPERATING INSTRUCTIONS



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ekey converter UDP

UDP protocol-based RS485 – Ethernet data converter for the ekey home and ekey multi product groups

ENGLISH

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1. Foreword

Congratulations on the purchase of this premium product

ekey converter UDP.

It has been manufactured with the utmost precision and guarantees the reliable transmission of your data from the *ekey home* and *ekey multi* product groups to other applications. You can now use your fingers to control other applications and make your life more convenient, secure and simple.

Your finger is the key!

We hope you will take a lot of delight in your product.

2. MANUFACTURER'S WARRANTY

ekey biometric systems ('ekey') guarantees, under conditions which you can view on our website www.ekey.net, that the product is free from material or processing defects for

24 months from the date of purchase.

The guarantee applies only in the country in which the product has been sold to you. At ekey, the production of every individual product is recorded and documented.

3. Contact

Visit the website of ekey biometric systems GmbH at:

www.ekey.net

There you can always find the most up to date version of this document, as well as other additional information about this and other products by ekey biometric systems.

If you have any further questions, please contact your ekey dealer.

4. Note on the Operating Instructions

4.1 WARNING SIGNS AND SYMBOLS



CAUTION! This symbol indicates a special notice, which it is imperative that you observe when carrying out the functions described.



INFORMATION! This symbol indicates that you can find useful information and tips about the product in the adjoining text.



STOP! This symbol indicates that you may under no circumstances carry out a given action. In the majority of cases, in order to carry out the given feature, you need first to make some specific settings.



Warning about dangerous electric voltage: This warning symbol indicates that you are working with dangerous electrical voltage when carrying out the described function.

4.2 Depiction Conventions

Depiction	Signification
	Listing
1. 2.	Follow the steps in this order
➤	You are requested to take action

4.3 Validity of the Instructions

These operating instructions are not subject to updating. You can find the most up to date version of these instructions at www.ekey.net. Subject to optical and technical modifications, any liability for misprints excluded.

4.4 Terminology / Abbreviations

ekey home Product group manufactured by ekey biometric systems GmbH

ekey multi Product group manufactured by ekey biometric systems GmbH

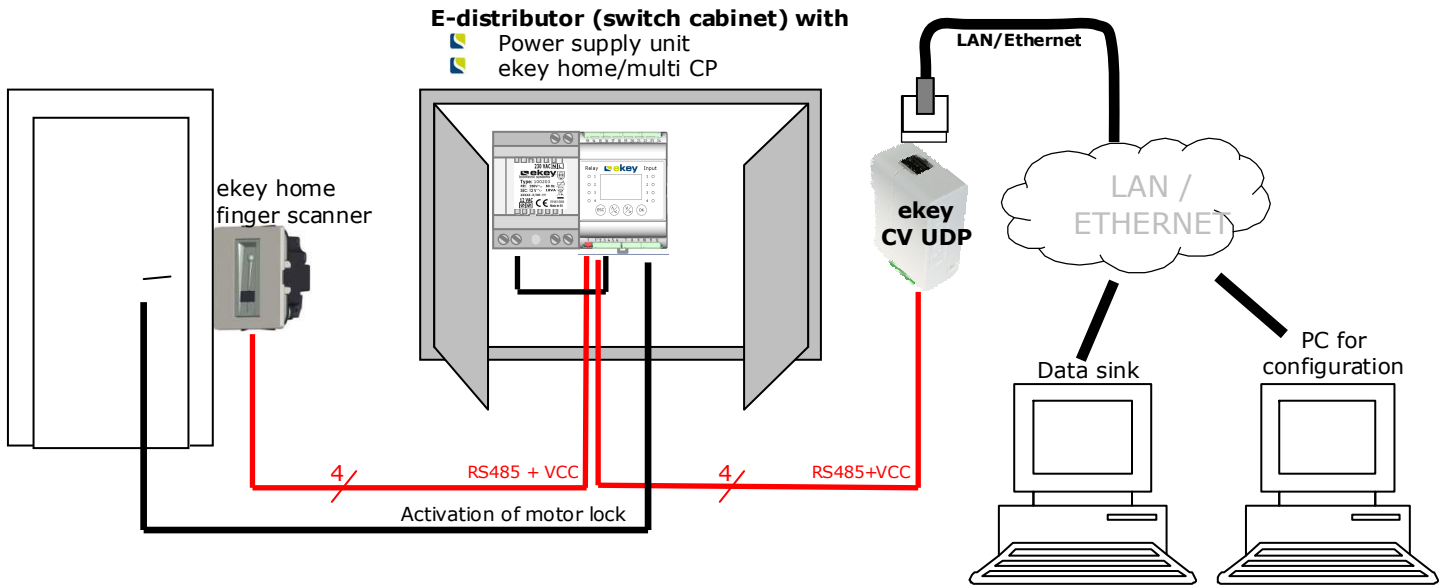
UDP The User Datagram Protocol, abbreviated to UDP, is a minimal connectionless network protocol belonging to the transport layer of the internet protocol family. The role of UDP is to assign data transmitted via the Internet to the right application.

Data recipient, data sink Equipment, device or electronic system which receives and processes data in a UDP format from the *ekey CONVERTER UDP RS485*.

IP address: An IP address is an address in computer networks, which - like the Internet for example - are based on the Internet Protocol (IP).

Port: A port is a part of an address, which allocates data segments to a network protocol.

5. Product Overview



The *ekey converter UDP* can, of course, also be placed in the e-distributor. The PC for the data sink and the PC for configuration can physically be one unit.

6. Scope of Delivery

Your *ekey converter UDP* product (item #: 100460) consists of:

Name	Image	Quantity
ekey converter UDP		1
Wall power supply 9 VAC / 800 mA		1
ekey converter UDP CD		1

7. General Safety Information

7.1 INTENDED USE

The *ekey converter UDP* product can only be operated in conjunction with products from the

- ekey home*
- ekey multi*

product groups manufactured by ekey biometric systems GmbH.

The *ekey converter UDP* automatically transmits a data packet in the UDP protocol via the Ethernet network each time a user has been granted access. A recipient (data sink) can interpret this packet and initiate an event based on this packet.

7.2 RISKS ASSOCIATED WITH INTENDED USE

There are no known risks if this product is operated correctly and properly.

7.3 REQUIREMENTS FOR THE USER

The product transmits data that has been supplied by *ekey home* or *ekey multi* via Ethernet to a defined recipient.

- It is the responsibility of the installer of the system to connect up the electrical wiring. The electrical wiring should only be installed by qualified members of staff (electricians).
- Data is transmitted over the ethernet using UDP protocol. The installer of the system requires knowledge of network technology and IP addressing to install and configure the system correctly.
- Relevant knowledge of data systems technology and data processing is indispensable for the developer or operator of data sinks. As data sinks can have many forms (PC, server, automation system, PLC ...), the knowledge required has to be clarified according to the type of the sink.

After installation of the system, the operator of the system requires no knowledge relating to the *ekey converter UDP*. The operator does not need to undertake any modifications, service etc. on the *ekey converter UDP* after installation, providing the basic system properties (network structure, addressing, etc.) do not change.

7.4 NOTE ON PRODUCT LIABILITY

The intended security and protection of the device can be impaired in the following ways. Liability for the operation of the equipment transfers to the operator in these cases:

- The equipment is not used, maintained and cleaned in accordance with the operating instructions.
- The equipment is operated for an application other than as described here and beyond the limits listed in the data sheet.
- Unauthorized modifications have been performed on the equipment by the operator.

8. Installation and Commissioning

8.1 PREPARATION / PREREQUISITES

To operate the system, you need on the one hand

- A product from the ekey home or ekey multi product group supplied by ekey biometric systems GmbH
- A data recipient (data sink), which receives and processes data from the ekey converter UDP

Establish the correct installation and operating conditions for both systems as per the operating instructions enclosed with these products.

The ekey converter UDP is compatible with the following ekey home devices and the corresponding firmware version:

Component	Item #	FW version	Protocol		
			rare	home	multi
ekey home FS WM AN	800 044	4.2.9.12	X	X	X
ekey home FS WM WH	800 197	4.2.9.12	X	X	X
ekey home FS IN	800 591	4.2.9.12	X	X	X
ekey home FS OM	800 310	6.3.2.13	X	X	X
ekey home FS OM I	800 449	6.3.2.13	X	X	X
ekey home FS OM I w/o logo	800 585	6.3.2.13	X	X	X
ekey home FS IN 2.0	800 377	6.3.2.13	X	X	X
Pirnar home FS IN 2.0	800 600	6.3.2.13	X	X	X
ekey home FS WM 2.0	800 568	6.3.2.13	X	X	X
ekey home CP WM 1	800 042	1.34.36.22	X	X	
ekey home CP WM 3	800 043	1.34.36.22	X	X	
ekey home CP IN 1	800 744	1.34.36.22	X	X	
ekey home CP IN 2	800 726	1.34.36.22	X	X	
ekey home CP DRM 1	800 343	2.0.24.20	X	X	
ekey home CP DRM 2	801 477	2.0.24.20	X	X	
ekey multi CP DRM 4	801 324	2.1.13.27	X	X	X

Any newer firmware version on the devices functions as depicted in the chart. For older versions than those listed above, the „rare“ protocol is the only one which functions.

8.2 WIRING

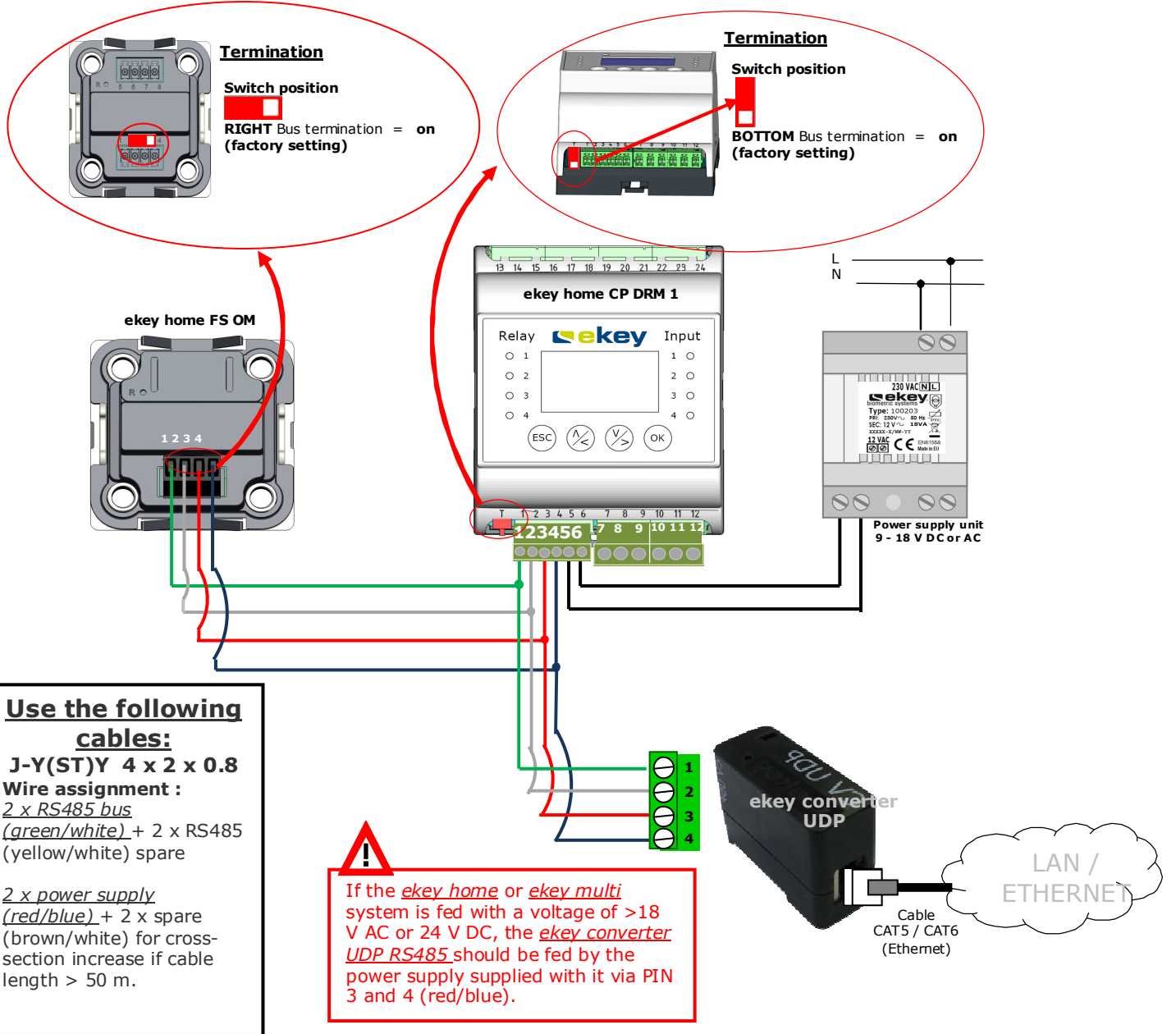
- 1.) Disconnect the ekey home system and if necessary the data recipient as well from the mains voltage supply before laying the cabling.



Electrical wiring for the system should only be carried out by qualified members of staff (electricians, ...)!

- 2.) Lay the cabling for the system as follows (suggested cabling):

! The diagram only shows the connection of the ekey converter UDP RS485 to the ekey home or ekey multi system. Please refer to the operating instructions supplied with the product for the cabling of the ekey home or ekey multi system to the door or door button.

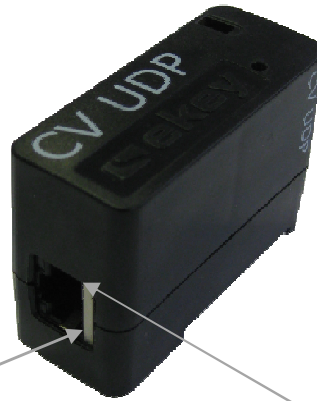


Connect all units to the mains power supply following completion of cabling.

! **Electrical wiring for the system should only be installed by a qualified member of staff (electrician...)!**

Your ekey home or ekey multi system should still operate without any limitations as before. Test the good operation of the finger scanner before starting to configure the ekey converter UDP.

9. Optical Signalling




LINK LED: left, bicolored	
Color	Signification
Off	No connection
Amber	10 Mbps
Green	100Mbps

ACTIVITY LED: right, bicolored	
Color	Signification
Off	No activity
Amber	Half duplex
green	Full duplex



10. Configuration for Operation in the Network

You will need a PC program supplied on the enclosed CD or DVD to configure and parameterize the ekey converter UDP.




 *The PC program is designed for MS Windows operating systems and can only be run on them!*

Insert the supplied CD or DVD into the PC for configuration. The PC should naturally be connected to the network (Ethernet) to which the ekey converter UDP RS485 is also connected. If Windows Explorer does not open automatically, open it via the Windows Start menu and navigate to the CD or DVD drive.


You will find 2 files on the DVD

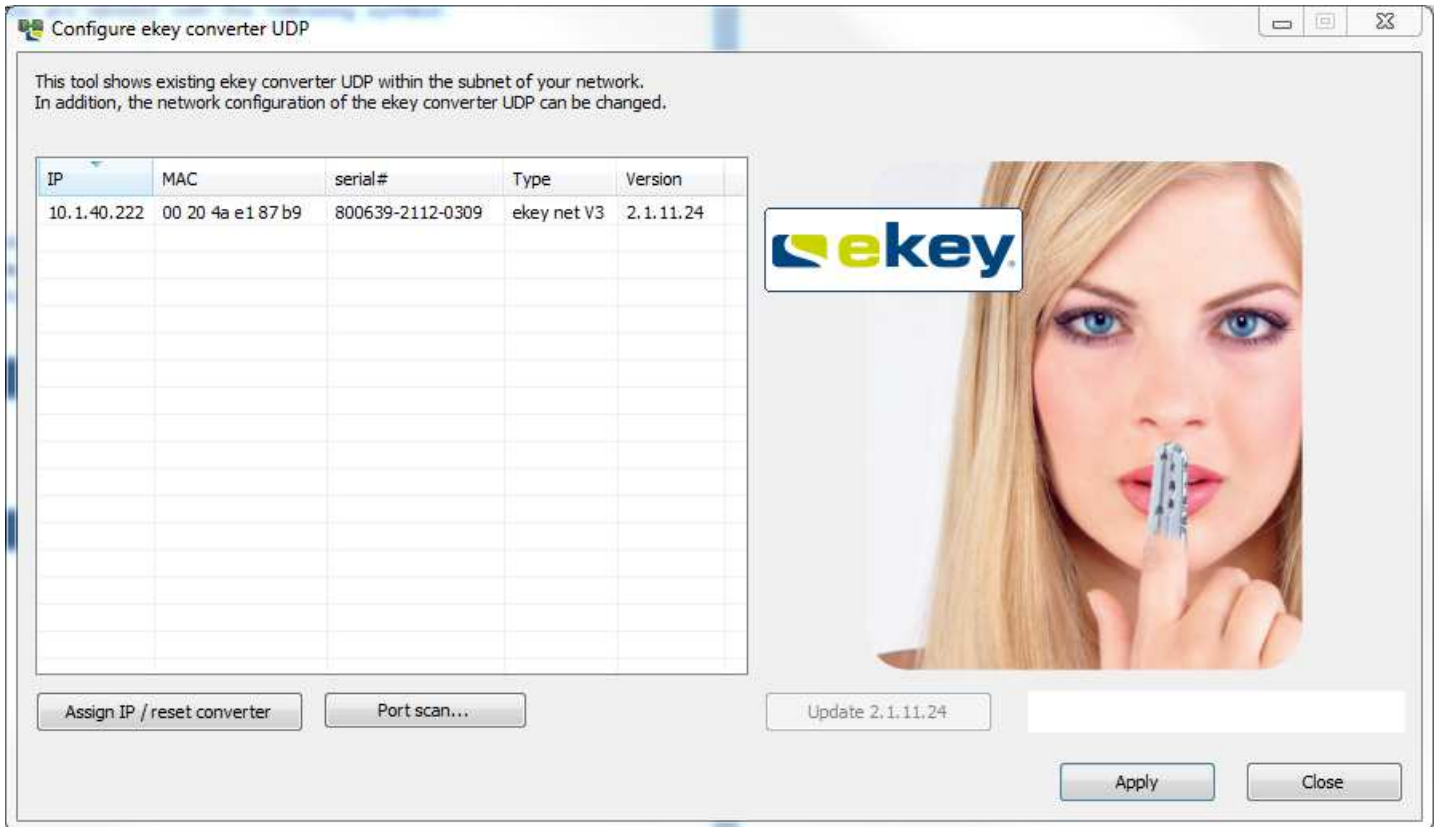
-  CV UDP : Configuration program for ekey converter UDP
-  Specification : Manuals, technical data etc.

Open the CONVERTER UDP RS485 folder in which you will find the following files:

-  ConfigConverterUDP.exe
-  ekeyres_DEU.dll
-  LANconv.rom

You can now copy these files onto your PC or into your network or also start the configuration program from the CD.


Start the  ConfigConverterUDP.exe program by double-clicking using the left mouse key. The following window will appear.



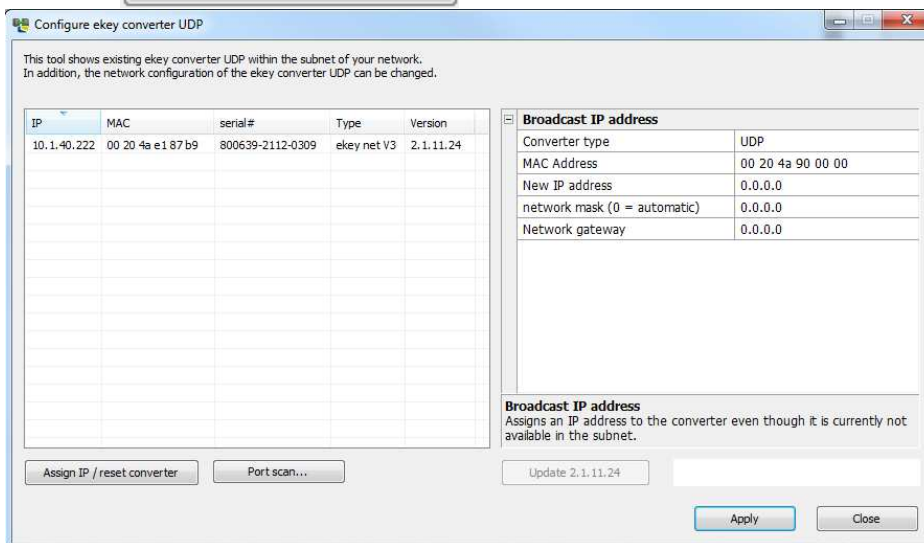
In the first step, establish a connection to the ekey converter UDP to configure it. To do so, assign the required IP address to it.

Proceed as follows:

- 1) Determine the MAC address of the ekey CONVERTER UDP. You will find this on the label on the ekey CONVERTER UDP itself. The address is 12 characters long and formatted in groups of 2: e.g. 00 20 4a bf d6 dc

 Your ekey converter UDP is delivered with a preconfigured IP address (192.168.1.250). If this IP address corresponds to the requirements of your network, it is possible that the ekey converter UDP appears immediately in your device list. Proceed in the same way for the other settings.

- 2) Click on 



- 3) The input screen opens on the right side of the configuration program. Now enter the MAC address found under item 1) under "**MAC Address**".
- 4) Enter the IP address under "**New IP Address**", the network mask under "**Network mask**" and, if necessary, the address of the gateway under "**Network gateway**".

An example is shown below:

Broadcast IP address	
Converter type	UDP
MAC Address	00 20 4a bf d6 dc
New IP address	10.1.28.11
network mask (0 = automatic)	255.255.255.0
Network gateway	0.0.0.0



The IP address, network mask and network gateway for the ekey converter UDP are based on your existing network configuration. Contact your system administrator for detailed information!

- 5) Click on
- 6) It will now take a few seconds before the ekey CONVERTER UDP with the address data entered appears in the device list.

IP	MAC	serial#	Type	Version
10.1.28.11	00 20 4a bf d6 dc	800639-2610-0002	ekey net V3	2.1.6.16

IP address of the ekey CV UDP RS485

MAC address of the ekey CV UDP RS485

Serial number of the ekey CV UDP RS485

ekey internal system type

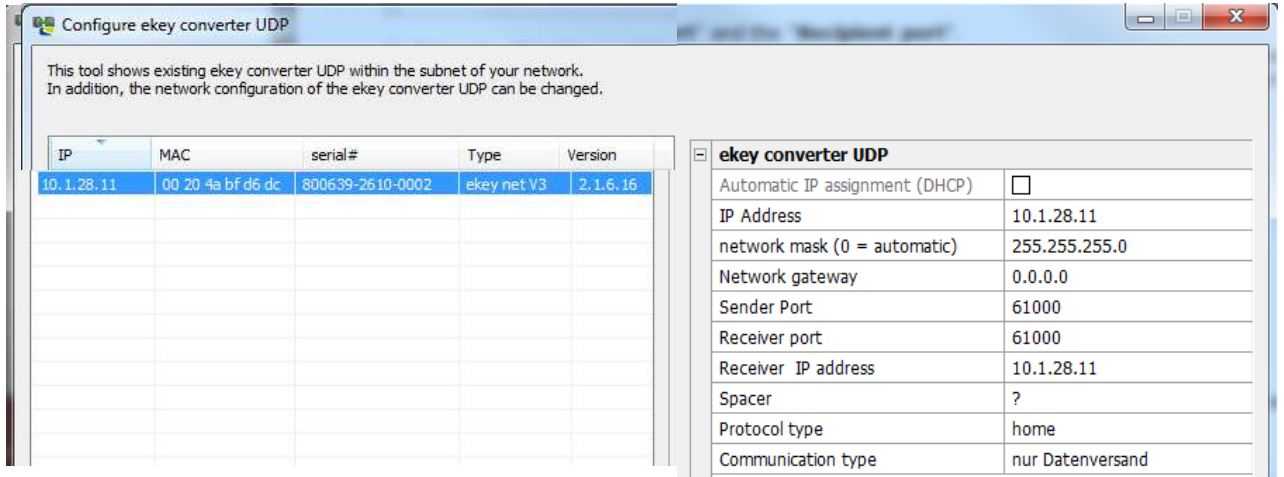
Firmware version

Your ekey converter UDP is now accessible in the network and is ready for further configurations. Now define the settings for the data packet (transmitter and recipient)

11. Data Packet Sender and Receiver

The ekey converter UDP needs to know to whom it is to send the data packets. You have to inform it of the receiver's IP address and port. Process as follows to do so:

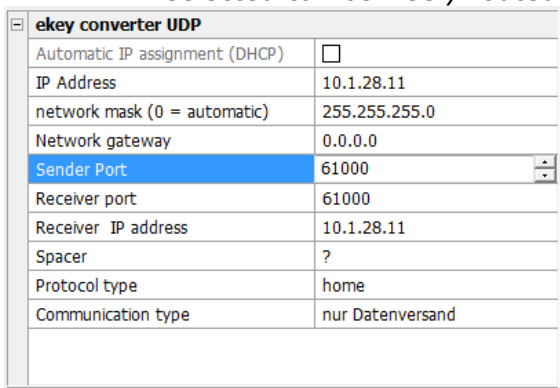
- 1) Select the ekey converter UDP by clicking in the device list. The input screen appears on the right for further configuration.



2) Enter the "**Sender port**" and the "**Receiver port**".



The ports must be enabled in the network! It is quite usual for certain ports to be blocked in networks. Therefore check in particular your router settings etc. to ensure that the port selected can be freely routed to the recipient.



3) Enter the IP address of the device which is to receive the ekey converter UDP data packets under "Receiver IP address".

4) Click on 

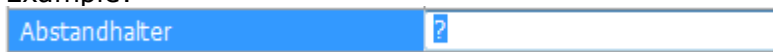
This will ensure that all data packets from the ekey CONVERTER UDP reach the required recipient.

Finally define the protocol properties. Proceed as described in the following chapters.

12. Spacers

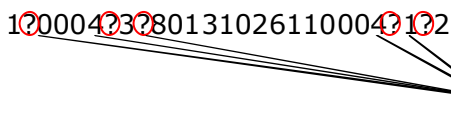
A spacer is a symbol defined by the user, which separates the individual data fields within the data packet. It can make it easier for the user to process the data content. The spacer is only effective with the "**home**" and "**multi**" types of protocol.

Example:



A data packet could thus look like the one shown below:

1000413280131026110004112

 The "?" separates the individual data fields within the data set

13. Protocol Type

The *ekey CONVERTER UDP* can transmit the access data from the *ekey home* or *ekey multi* systems in 3 different protocols.

- **rare:** complex protocol for system developers for *ekey home*. This protocol is identical to version 1.0 of the *ekey CONVERTER UDP* protocol and also corresponds to the factory setting.
- **home:** simple protocol for automation technicians (data in text (string) for *ekey home* systems)
- **multi:** simple protocol for automation technicians (data in text (string) for *ekey multi* systems)

ekey converter UDP	
Automatic IP assignment (DHCP)	<input type="checkbox"/>
IP Address	10.1.28.11
network mask (0 = automatic)	255.255.255.0
Network gateway	0.0.0.0
Sender Port	61000
Receiver port	61000
Receiver IP address	10.1.28.11
Spacer	?
Protocol type	rare
Communication type	rare home multi

13.1 "RARE" PROTOCOL

The "rare" protocol can only be used in *ekey home* systems. The *ekey converter UDP* is supplied with the "rare" setting. The content of this type of protocol appears as follows:

Position	Data set	Data type	Values with ekey home
1	nVersion	long	3
2	nCmd	long	0x88 = decimal 136.. open door with finger 0x89 = decimal 137.. poor quality or unknown finger
3	nTerminalID	long	Address of finger scanner. See calculation below
4	strTerminalSerial	char[14]	0
5	nRelayID	char[1]	0.. Channel 1 (Relay1) 1.. Channel 2 (Relay2) 2.. Channel 3 (Relay3)
6	nReserved	char[1]	Empty
7	nUserID	long	User number as per storage location in <i>ekey home control panel</i> 0... User 1 1.. User 2 2.. User 3 . . 98 .. User 99
8	nFinger	long	Finger number as per ekey home control panel 0 .. Finger 1 1 .. Finger 2 . . 9 .. Finger 0
9	strEvent	char[16]	0

10	sTime	char[16]	0
11	strName	unsigned short	0
12	strPersonalID	unsigned short	0

Calculation of the address of the finger scanner = nTerminalID

You need the serial number of the ekey home finger scanner to calculate this. You will find it on a label on the device itself:



Serial number: 80131010110405

The serial number consists of different parts: 801310 ww yy ssss

Calculate the address as follows:

Address = (((yy * 53 + ww) << 16) | ssss) | 0x70000000

In this example, the address is calculated as follows:

ww= 10 = 0xA
 yy = 11 = 0xB
 ssss = 0405 = 0x195

Address = (((0xA * 53 + 0xB) << 16) | 0x195) | 0x70000000
 = ((0x21D << 16) | 0x195) | 0x70000000
 = ((0x21D0000) | 0x195) | 0x70000000
 = 0x21D0195 | 0x70000000
 = **0x721D0195**

13.2 "HOME" PROTOCOL

Data packets with the following content are transmitted to the configured recipient with each finger recognized by the finger scanner, with each rejection by the finger scanner and with an opening by means of the digital input. The data fields within the data packet are coded as HEXASCII.

Data field name	Number of digits	Data type	Value range	Signification
PACKET TYPE	1	String	1	"User data" packet type
USER ID	4	String (decimal)	0000-9999	User number (default 0000)
FINGER ID	1	String (decimal)	0-9	1 = left-hand little finger 2 = left-hand ring finger . . 0 = right-hand little finger , - = no finger
SERIAL NO. FS	14	String	xxxxxxx xxxxxxx	Digits 1-6 = item number Digits 7-10 = week code Digits 11-14 = running number 1)
ACTION	1	String	1, 2, 8	1... Open 2... Rejection of unknown finger 8... Digital input 1)
RELAY	1	String	1-4, '-',	1... Relay 1

				2... Relay 2 3... Relay 3 4... Relay 4 ,-, ... no relay
--	--	--	--	--

1) If activation is via a digital input, the data field SERIAL NO. FS is not defined.

Examples:

1) Open

User no. 46 scans his left index finger, which switches relay 2 via the finger scanner. The finger is recognized and switches relay 2. The finger scanner has serial number 80004426110003 and the following data set is now sent to the recipient

1 0046 4 80004426110003 1 2

2) Rejection

An unknown finger is scanned over the finger scanner with serial number 80004426110003.

1 0000 – 80004426110003 2 –

3) Open with digital input

Digital input 1 is enabled by a door button.

1 0000 – XXXXXXXXXXXXXXX 8 1

X = undefined.



The digital input on the ekey home CP DRM automatically affects relay 1, which is why relay 1 is switched.

13.3 "MULTI" DATA PACKET

The "multi" protocol should be selected if the ekey CONVERTER UDP is operated in an ekey multi system. Data packets with the following content are transmitted to the configured recipient with every recognized finger, with every rejection by the finger scanner and with every opening by means of the digital input. It is irrelevant at which of the up to 4 finger scanners this is triggered. The ekey CONVERTER UDP transmits the corresponding data packet in every case. The data fields within the packet are coded as HEXASCII.

Data field name	Number of digits	Data type	Value range	Signification
PACKET TYPE	1	String	1	"User data" packet type
USER ID	4	String (decimal)	0-9999	User number 0000 – undefined
USER NAME	10	String	XXXXXXXXXX	Username, alphanumeric ("*****", – undefined)
USER STATUS	1	String	0;1;-	0 ... User is disabled 1 ... User is enabled - ... undefined
FINGER ID	1	String	0-9,'-`	1 = left-hand little finger 2 = left-hand ring finger . . 0 = right-hand little finger ,-, = no finger

KEY	1	String	1-4,'-'`	Key ID 1=Key 1, ... - = undefined
SERIAL NO. FS	14	String	xxxxxxx xxxxxxx	Digits 1-6 = item number Digits 7-10 = week code Digits 11-14 = running number "*****" - undefined
NAME FS	4	String	4-digit	Finger scanner name "*****" undefined
ACTION	1	String		1.... Open 2... Rejection of unknown finger 3 ... Rejection time zone A 4 ... Rejection time zone B 5 ... Rejection inactive 6 ... Rejection "Only ALWAYS users" 7... FS not coupled to CP 8... digital input
INPUT ID	1	String	1-4,'-'`	1... digital input 1 2... digital input 2 3... digital input 3 4... digital input 4 '-' no digital input

Examples:

1.) Open

User # 03 called "Josef" swiped his right index finger on finger scanner # 2 called "GAR" (= garage). He therefore triggers key 2 and switches relay 2. The serial number of the finger scanner is: 80131004120001.

1 0003 -----JOSEF 1 7 2 80131004120001 -GAR 1 -

2.) Rejection due to *time zone A*

All data is identical to point 1, only now access is denied due to a time zone restriction. This means that Josef may not open the garage door at the time of the required access.

1 0003 -----JOSEF 1 7 2 80131004120001 -GAR 3 -

14. Factory Settings

Your *ekey converter UDP* is supplied from the factory with the following settings.

ekey converter UDP	
Automatic IP assignment (DHCP)	<input type="checkbox"/>
IP Address	192.168.1.250
network mask (0 = automatic)	0.0.0.0
Network gateway	0.0.0.0
Sender Port	51000
Receiver port	51000
Receiver IP address	192.168.1.1
Spacer	-
Protocol type	rare
Communication type	nur Datenversand

15. Maintenance

The *ekey converter UDP* does not require specific maintenance, nevertheless check the device from time to time for obvious damage and take action accordingly.

16. Disposal

Please note the relevant statutory regulations when disposing of this product. **Information on disposal of electrical and electronic equipment in the European Union:**

Within the European Union the disposal of electrically-operated equipment is governed by national regulations based on the EU Directive 2002/96/EC concerning Waste Electrical and Electronic Equipment (WEEE). According to statutory regulations, all equipment supplied after 13.08.2005 in the business-to-business sector, in which this product is classified, can no longer be disposed of with municipal or household waste. To document this, the products are labeled with the following symbol:



Used batteries should be disposed of in compliance with statutory regulations. **Batteries must not be disposed of together with household waste.** As the regulations relating to disposal vary from country to country within the EU, please contact your supplier if necessary.

17. TECHNICAL DATA

Refer to data sheet.

18. ekey Branch Offices

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