

KNXeasy

KNXnet/IP - ASCII Protokoll Gateway

KNXnet/IP made easy

10010111011010111101001010010010010101010
010101010010100101001001001110111011010101
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KNXnet/IP 0 write 1/1 EIS_5 15.3
101001011101101111101010010111011010111
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100100111011101101010100100100100101011
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User Manual

KNXeasY User Manual - Document History

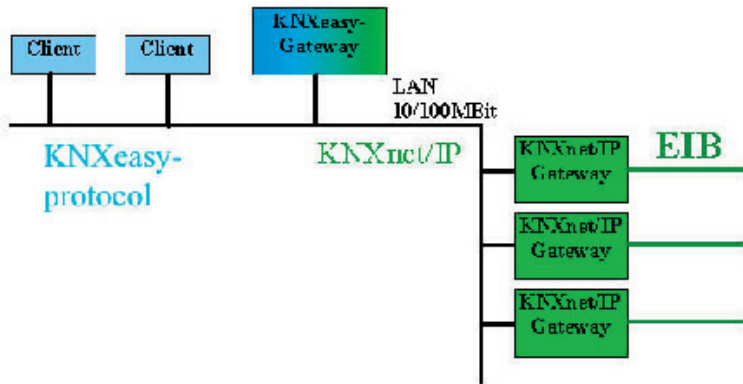
Version	Date	KNXeasY	Manager	Comment
1.0	10.04.2008	0.0.5	0.0.8	Initial version

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Application

KNXeasys is connected to your local area network via ethernet. It translates the binary KNXnet / IP bidirectional into a simple ASCII protocol. Internally, the device uses an address-state table as a snapshot KNX installation. For later analysis, the the KNX telegrams can be stored into a MySQL database. For configuration only the free of charge b.a.b-technology manager software is needed.



Specifications

- Montage top hat rail
- Connectors DC-IN (10-30 V), RJ-45(10 Mbit Ethernet)
- Nominal current 70mA
- Max. current 180mA (Bootvorgang)

The KNXeasy Protocol

The KNXeasy protocol is a very simple ISO-8859-1 encoded ASCII protocol.

Command Structure

Each parameter is divided by space characters and may not contain whitespaces itself.

A B D E F

A: Source- / Targetdescriptor

B: SystemID

C: Command

D: Groupaddress

E: EIS-Type

F: Data

Source- / Targetdescriptor

Defines the source or target protocol. When a telegram is received in the KNXeasy protocol, this descriptor defines into which protocol the telegram will be translated. On the other way it defines the original protocol in which this telegram has been receivedl.

Values:

- KNXnet/IP

SystemID

SystemID of the KNXnet/IP installation. In KNXnet/IP there can be 0 to 255 different system identifiers. for other applications values of 0 to 65535 are possible.

Command

The action which will be or has been executed.

Values:

- write KNXeasy -> KNXnet/IP: The given value (data) will be sent on the bus.

KNXnet/IP -> KNXeasy: The value has been sent on the bus..

- read Request the current value of a group address. The answer will be generated using the internal address status table.
- status The answer to a read request which will only be sent to the requesting client.

Groupaddresses

The groupaddresses (destination address) can be used in two or three layer format.

Three layer:

main group/middle group/sub group

Two layer:

main group/sub group

Comment:

The groupaddresses are packed in an array of two bytes. The format just specifies the presentation of these two bytes. In both formats, the most significant bit differs the physical addressing from the group addressing.

For three layer format, the following 4 bit are used for the main group (b, range 0 - 15). 3 bit are reserved for the middle group (c, range 0 - 7) and the lowest 8 bit defines the sub group (d, 0 - 255).

abbb bccc dddd dddd

The two layer format just combine the middle and sub group as the 2 layer sub group with 11 bit length (c, range 0-2047). The main group still remains as 4 bit (b, range 0-15).

abbb bccc cccc cccc

Timestamp

The answer to a status read command contains a timestamp to compare the telegrams to each other:

yyyy/mm/dd HH:MM:SS

y = year; m = month; d = day; H = hour; M = minute; S = second

EIS-type und Data

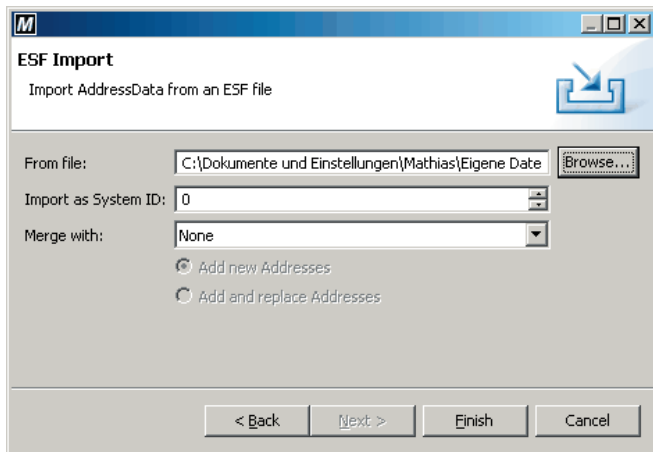
EIS_1	on off 1 0
EIS_2	on off 1 0 brightenX dimX (X = dimming level)
EIS_3	day: Mon Tue Wed Thu Fri Sat Sun or Mo Di Mi Do Fr Sa So time: hour:minute:second
EIS_4	day.month.year
EIS_5	x.y (z.B. 15.3; 2 byte floating point)
EIS_6	x%
EIS_7	up down
EIS_8	on off disabled enabled
EIS_9	x.y (z.B. 15.3; 4 byte floating point)
EIS_10u	x = 0 .. 65535
EIS_10s	x = -32768 .. 32767
EIS_11u	x = 0 .. 4294967295
EIS_11s	x = -2147483648 .. 2147483647
EIS_12	Not supported!
EIS_13	a – z A – Z
EIS_14u	x = 0 .. 255
EIS_14s	X = -128 .. 127
EIS_15	„abcdefghijklmn“ (max 14 letters)
EIS_UNDEF	When a telegram is received from KNXnet/IP, KNXeasy tries to look up the groupaddress in the ESF+ data. If the groupaddress is not configured in the ESF+ file, KNXeasy sends the raw data of the telegram with EIS-type EIS_UNDEF each byte prefixed with 0x. KNXnet/IP 0 write 2/257 EIS_UNDEF 0x19 0x29

Examples:

```
KNXnet/IP 0 write 3/1/4 EIS_1 off
KNXnet/IP 0 write 3/2/4 EIS_15 „Lunchtime“
KNXnet/IP 0 read 1/1
KNXnet/IP 0 status 1/1 2008/04/09 10:18:00 EIS_5 12.80
```

Prepare ESF Data

Since KNXnet/IP telegrams do not contain any information about the data, KNXeasY needs a table in which groupaddresses are linked to EIS-types. Using this table the KNXeasY knows how to convert the data of the telegrams into human readable values. This information gets stored into a so-called ESF+ file.



In the EIB programming software ETS you can export an ESF-file with the OPC export function. In this file all configured groupaddresses are listed and you can import this file into the manager. Go to the file -> import function and you will see the above window.

You have to select a system id for the selected ESF file for clear identification of the KNX installation (default 0). With the merge-option you can integrate this file into an already opened ESF editor. If the ETS project will be changed, you can add those changes to the ESF+ file using the merge function.

If you click finish, the editor will be opened with a tree structure of the project data.

Most important is the column EIS type. Here you have to assign the correct EIS types to the group addresses. You can change the value by clicking into the EIS type field or by selecting one or more rows and using the popup menu with a rightclick. When all groupaddresses are configured correctly export the data into a ESF+ file.

The screenshot shows the MManager software interface. The main window displays a tree view of a project configuration for 'Demotafel Unna rechts_1(2).esf'. The tree view is expanded to show a table of configuration items. The table has four columns: Name, Address, Anzahl, and EIS. The data is as follows:

Name	Address	Anzahl	EIS
Demotafel Unna rechts_1(2)	System ID: 0	15	
Schalten/Dimmen rechts	EIB Maingroup 10	5	
Neue Mittelgruppe	Middlegroup: 0	5	
Schalten 6152 Leuchte 1 rechts	10/0/1		EIS 1 (1 BR On/Off)
Schalten 6152 Leuchte 2 rechts	10/0/2		EIS 1 (1 BR On/Off)
Schalten 6155	10/0/3		EIS 1 (1 BR On/Off)
Dimmen 6155	10/0/4		Undefined
Wert 6155	10/0/5		Undefined
Jalousie rechts	EIB Maingroup 11	2	
Neue Mittelgruppe	Middlegroup: 0	2	
auf/ab	11/0/1		EIS 1 (1 BR On/Off)
stop	11/0/2		EIS 1 (1 BR On/Off)
Heizung rechts	EIB Maingroup 12	6	
Leistung	EIB Maingroup 13	2	

Additionally to the ESF+ file you should save the editor into a .sam file. This file is used for later changes to the project data.

Configuration

To configure the KNXeasY you need the Manager software. Open the connection dialog in the menu Configuration -> KNXeasY.

The delivery status of KNXeasY is IP address 192.168.1.2 and SSH port 22.

If all necessary changes were made, the configuration can be saved using the save button in the upper right corner of the editor window.

Network Parameters

To integrate KNXeasY into your network you might need to change the network parameters.

Network Parameters	
Network Interface Configure the settings for the network interface.	Advanced Network Settings Configure advanced network parameters
DHCP <input type="checkbox"/>	SSH Port <input type="text" value="22"/>
IP-Address <input type="text" value="172.31.49.58"/>	
Netmask <input type="text" value="255.255.255.0"/>	
Gateway <input type="text" value="172.31.49.7"/>	
DNS Server #1 <input type="text" value="172.31.49.1"/>	
DNS Server #2 <input type="text"/>	
DNS Server #3 <input type="text"/>	

Here you can configure the following parameters:

Network Interface

DHCP With the Dynamich Host Configuration Protocol (DHCP) the network parameters will automatically be configured by a DHCP server. If you check this box all other fields will be deactivated. You should not enable this function if there is no DHCP server in your network.

IP address The IP address of the KNXeasY. (Default 192.168.1.2)

Netmask Subnet mask which identifies the Network in combination with the ip address. (Default 255.255.255.0)

Gateway The gateway which can be used for broadcast messages or a database connection. The gateway must be reachable for the current IP address and subnet configuration.

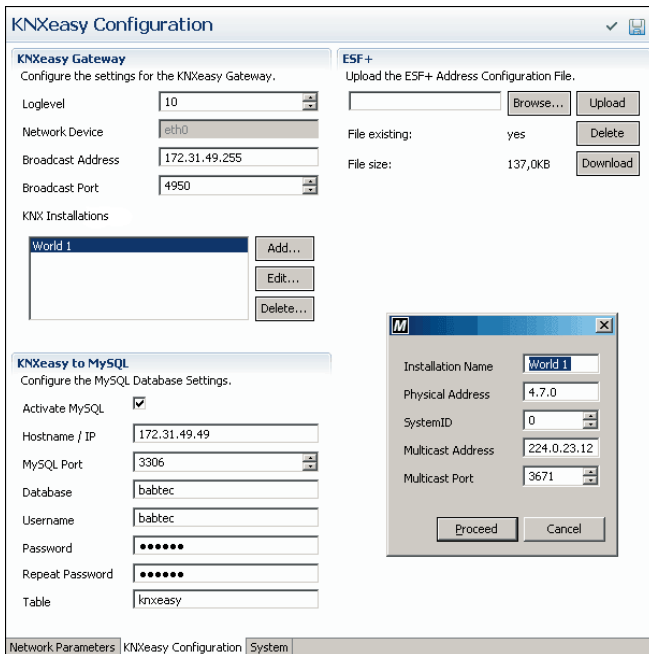
DNS server You can define three DNS server. These will be used to resolve hostnames e.g. for the database connection.

Additional Settings

SSH port This is the port of the internal SSH File server for configuration and maintenance purposes.

KNXeasy Configuration

If you click on the second tab, the KNXeasy configuration page will be opened.



KNXeasy Gateway

Loglevel The loglevel is used for maintenance purposes and should not be changed. This will decrease overall performance of KNXeasy.

Network interface

The internal network interface to use for KNXnet/IP and KNXeasy protocol.

Broadcast address

This address can be a broadcast or unicast address. KNXeasy messages will be sent to this address via UDP. If you change the IP address or subnet mask of your device, it might be necessary to adapt the broadcast address, too. If you are not sure which address to use, try out 255.255.255.255. Then KNXeasy will send messages to every available network.

Broadcast port

This port will be used for sending and receiving KNXeasy messages. (Default 4950)

KNX installations

KNXeasy can handle multiple KNX installations. Each installation is identified with the SystemID in the KNXeasy protocol and the multicast address and port for the KNXnet/IP protocol. Additionally the KNXeasy has a physical source address for each KNX installation.

ESF+

In this section you can upload delete or download the ESF+ file.

KNXeasy to MySQL

The KNXeasy offers the possibility to store all telegrams in a MySQL database for later analysis and evaluation. This MySQL Server can be used in the local network as well as on the Internet (Gateway and DNS must be correct).

In the database the plain text of the KNXeasy protocol is stored. In addition to this, the timestamp of the KNXeasy as well as from the database server is saved for each dataset.

Activate MySQL

This option allows you to enable or disable the MySQL interface. If the database is not available for a longer period of time, it is recommended to deactivate the MySQL interface.

Hostname / IP

The IP address or hostname of the MySQL server. If you use an external server, the gateway and DNS settings must be correct.

Database The name of the database to use for KNXeasy data.

Username The username for this database.

Password The password for this database

Table The name of the table which will be used to store KNXeasy data.

This is the create-statement for the KNXeasy table in a database called 'babtec':

```
CREATE TABLE `babtec`.`knxeasy` (  
  `id` int(11) NOT NULL auto_increment,  
  `source_protocol` varchar(20) NOT NULL,  
  `sernr` varchar(12) NOT NULL,  
  `timestamp` varchar(50) NOT NULL,  
  `source` varchar(10) default NULL,  
  `dest` varchar(10) default NULL,  
  `eistype` varchar(10) default NULL,  
  `data` varchar(50) default NULL,  
  `sysid` varchar(10) default NULL,  
  `pid` varchar(10) NOT NULL,  
  `db_time` timestamp NOT NULL default  
    CURRENT_TIMESTAMP,  
  PRIMARY KEY (`id`)  
) ENGINE=MyISAM  
  AUTO_INCREMENT=865  
  DEFAULT CHARSET=latin1;
```

The table can be created using the MySQL Client software or phpMyAdmin. This is the table structure:

id	int(11) NOT NULL auto_increment
	Primary Key, Unique id of the dataset
source_protocol	varchar(20) NOT NULL
	Source protocol. KNXnet/IP KNXeasY
sernr	varchar(12) NOT NULL
	The serial number of the KNXeasY
timestamp	varchar(50) NOT NULL
	Internal KNXeasY time
source	varchar(10) default NULL
	physical source address
dest	varchar(10) default NULL
	Destination groupaddress
eistype	varchar(10) default NULL
	EIS type: EIS_UNDEF EIS_1 EIS_2 ...
data	varchar(50) default NULL
	The converted data as plain text
sysid	varchar(10) default NULL
	Used SystemID for this telegram
pid	varchar(10) NOT NULL
	Internal process id for maintenance
db_time	timestamp NOT NULL default CURRENT_TIMESTAMP
	Time of the database server

System

On the System tab you can change the internal time of KNXeasy. This time is used to correctly timestamp the internal address table and the telegrams stored in the database.

System Information		Firmware Update	
Information about the device and firmware.			
Time (dd.mm.yyyy HH:MM)	09.04.2008 15:30	Refresh	
	Local Time	Commit Time	Upload
Serial Number	BT0170000311		
Firmware Version	KNXeasy 0.0.5		
System Control			
Control the Device.			
Restart KNXeasy	Restart		
Reboot Device	Reboot		

Network Parameters | KNXeasy Configuration | System

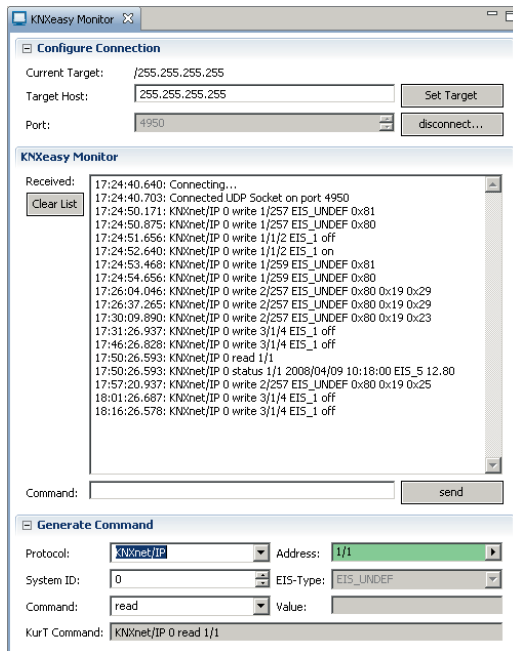
The refresh button loads the current system time from the device. You can manually insert the correct time or use the local time button to insert your client system time. The commit time button saves the time to KNXeasy.

In the System Control section you can restart the internal KNXeasy software or do a complete system reboot. If you use the reboot option, the device will not be available for about a minute.

If there are new firmware revisions you can update your KNXeasy using the Firmware Update section.

KNXeasy Monitor

The KNXeasy monitor can be used to listen to KNXeasy messages on the network. You can also send messages or do status requests.



To open the KNXeasy monitor click on the window menu and choose Show View > Monitor > KNXeasy Monitor.

To send KNXeasy messages you have to configure a UDP broadcast or unicast address. With the preconfigured address 255.255.255.255 you send KNXeasy messages into every network. If there is a router between your client PC and the KNXeasy, it must be configured to route the UDP packages into the target network.

The default port for KNXeasy is 4950. If you have a firewall, it must not block this port to see the messages. To start recording click on the connect button.

In the main record window you will see all KNXeasy messages. Every message will be labeled with the local PC time. This timestamp does not belong to the KNXeasy protocol. Using the command input you can send KNXeasy messages on your own. These messages can be entered manually or generated using the input mask.

KNXeasy Function

KNXeasy bidirectionally translates KNXnet/IP data into the very simple KNXeasy ASCII protocol.

KNXnet/IP to KNXeasy

When KNXeasy receives a telegram from KNXnet/IP it decodes the groupaddress and tries to fetch this to the ESF+ data. If an EIS type has been assigned to that groupaddress, the KNXeasy transforms the data into plain text values.

The generated KNXeasy message will be sent as a write command to the configured UDP broadcast or unicast address. All clients which are listening on the KNXeasy port (default 4950) will receive this message.

The message will also be saved into the internal address state table and to the optional configured MySQL database.

KNXeasy to KNXnet/IP

When KNXeasy receives a KNXeasy message, its data will be written to the address state table and the optional MySQL database. The data object will be transformed using the EIS specification in the message. KNXeasy generates a KNXnet/IP package and sends it to the configured Multicast address for the given SystemID.

KNXeasy Status Requests

A KNXeasy status request (read) will be answered with data from the address state table. There is no option to request a status from the KNX installation defined for the KNXnet/IP protocol. When the KNXeasy is installed into an installation, it will take some time until all addresses have been sent at least once and are recorded into the address status table. The answer on the read command (status) will be sent to the client via UDP unicast.

FAQ

- F:** How do I discover KNXeasY if I have lost the IP address?
- A:** Open the discovery window in your manager. Klick on the Window menu and choose Show View > Other > Device Overview. You can only discover KNXeasY devices which are in the same network than your client PC or every router between your PC and KNXeasY is configured to forward Multicast messages for the group 239.192.168.27 on port 1735.
- F:** I don't see any KNXeasY data in the KNXeasY monitor.
- A:** Verify the KNXeasY configuration for broadcast address and broadcast port. If the broadcast address is not in the configured subnet, you have to enter a valid gateway. The gateway can be KNXeasY itself. if you dont have a network router.
- F:** Why are KNXeasY messages not translated into KNXnet/IP or not sent on EIB?
- A:** Verify if your entered broadcast address covers the KNXeasY, too. Check the filter rules in your KNXnet/IP gateways. The groupaddresses and physical address configured for KNXeasY must not be blocked.

b.a.b-technologie gmbh
Heinrich-Hertz-Straße 4

59423 Unna



Tel. 0 23 03 25 301-0
Fax. 0 23 03 25301-490
E-Mail. info@bab-tec.de
Internet: www.bab-tec.de