b.a.b-technologie gmbh

Datalogger documentation

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TABLE OF CONTENTS

1 Introduction 6

1.1 Function Survey 6
1.2 General information about the present manual 6

2 Initial operation and installation 7

2.1 Safety instructions 7
2.2 Device Overview 8
Power Supply connector 8
BUS 2 (Twisted pair) connector 9
Navigation buttons 9
Signal LEDs 10
Power LED 10
Status LED 10
USB sockets 10
2.3 Installation 11
General 11
Additionnal for KNX 12
Operational readiness 12
2.4 Initial operation 12
LCD configuration 12
Date and time 12
Network 12
general 13
KNX 13
Web Interface 14
Access to the web interface 14
Log in to the web interface 14
User administration 14
Reset configuration settings 15
Backup / restore configuration 15
Date and time 16
Network 17
General 17
KNX 18
Services 19
Database statistics 22
Info 23

3 Database 23

3.1 Introduction 23
3.2 Database overview 23
dw_knx_groupaddress 23
3.2.1.1 id 24
3.2.1.2 parent_id 24
3.2.1.3 title 24
3.2.1.4 address_ID 24
3.2.1.5 address 24
3.2.1.6 datatype 24
3.2.1.7 unit 24
dw_knx_grouprange 25
3.2.1.8 id 25
3.2.1.9 parent_id 25
3.2.1.10 title 25
3.2.1.11 range_end 25
3.2.1.12 Range_start 25
eib_tele_<year>_<month> 25
3.2.1.13 id 26

3.2.1.14 Service ... 26
3.2.1.15 Channel ... 26
3.2.1.16 ip_address and port ... 26
3.2.1.17 source_id and source ... 26
3.2.1.18 destination_id and destination ... 26
3.2.1.19 apdu ... 26
3.2.1.20 APCI ... 26
3.2.1.21 raw_data ... 26
3.2.1.22 value ... 26
3.2.1.23 unit ... 27
3.2.1.24 priority ... 27
3.2.1.25 last_time ... 27
3.3 Configuration ... 27
Internal Database ... 27
3.3.1.1 Filter ... 27
3.3.1.2 Database External access ... 28
3.3.1.3 E-Mail Export ... 29
External database ... 30
Windows server ... 31
Linux server ... 32
Configure datalogger for your server ... 33
3.4 Database Export ... 33
Export database into a USB flash drive ... 34
Send database via E-Mail ... 34
dowload from web interface ... 34
Import database from Excel ... 35
4 Update ... 38

LIST OF FIGURES

Figure 1: Device Overview 8
Figure 2: Power supply connector 8
Figure 3: BUS 2 connector 9
Figure 4: Navigation buttons 9
Figure 5: Signal LEDs 10
Figure 6: BAB TECHNOLOGIE Logo 14
Figure 7: User Administration 14
Figure 8: Reset Configuration 15
Figure 9: Backup / Restore 16
Figure 10: Date and Time 16
Figure 11: Network Configuration 17
Figure 12: General configuration 17
Figure 13: KNX Date / Time 18
Figure 14: KNX 18
Figure 15: Upload ETS 4 Project File 19
Figure 16: Services 19
Figure 17: SMTP Server 20
Figure 18: 7zip 21
Figure 19: E-Mail Export 22
Figure 20: Statistics 23
Figure 21: Filter 28
Figure 22: Address Range 28
Figure 23: External Database Access 28
Figure 24: User Parameter 29
Figure 25: E-Mail Event 30
Figure 26: Clean Up Database 31
Figure 27: External database Server 33
Figure 28: Database Export 34
Figure 29: MySQL for Excel bar 35
Figure 30: MySQL for Excel 36
Figure 31: Add database connection 37
Figure 32: Import database in Excel 37

1 INTRODUCTION

Product: Datalogger
Application: Gateway – Data logging
Type: REG (DIN Rail mounted)

Datalogger is a device for DIN rail mounting with an electric power consumption of less than 5W.
Actually Datalogger serves as a gateway between Ethernet LAN and KNX Twisted Pair.

All required software and hardware settings are already stored in the Datalogger. No additional software is needed for operation.

Datalogger has its own user interface as a LCD display allowing to configure the device without a PC. It has also a configuration web interface reachable from any updated browser. As Datalogger device is connected to LAN it may be operated from anywhere.

Moreover Datalogger provides several services which can be configured individually. Those allow you to adapt the device regarding your data logging needs.

In addition Datalogger can be a full substitution of an IP-Router. KNXnet/IP tunneling and routing can be activated.

1.1 FUNCTION SURVEY

You do not require any special software to configure the Datalogger. For basic requirements you can simply use the LCD display and navigation buttons integrated to the device. Thus, a PC is not necessary.

For depth requirements the web interface allows you to sharpen your configuration and access to specific functions. Any up-to-date standard-internet browser allows you to connect to your Datalogger's web interface.

Following services and configuration are available from the LCD display:

- Network configuration
- General information and configuration (Name, location, Device info., Date and time, language ...)
- KNX configuration
- Export database in XLS or CSV format to a USB stick or via email
- Reset configuration to factory default
- Update Datalogger to a new version

Following services and configuration are available from the web interface:

- Network configuration
- General information and configuration (Name, location, Device info., Date and time, language ...)
- Email configuration
- Database configuration
- KNX configuration
- Enable or disable services (Tunneling, Routing)
- Automatically send the database in XLS or CSV format (daily, weekly or monthly)
- Download the database in XLS or CSV format

1.2 GENERAL INFORMATION ABOUT THE PRESENT MANUAL

Please note that all information and images published in this manual are without liability. The software described in this manual is developed persistently for the purpose of our customers, so the content in the manual may differ from the actual status.

2 INITIAL OPERATION AND INSTALLATION

For initial operation of the device actually valid security information has to be paid attention to.

2.1 SAFETY INSTRUCTIONS

Working on low-voltage systems and on the EIB is only allowed to trained and qualified personnel. Installation and connection of the bus mains, the 12 – 30 Volt DC mains as well as the integrated units, have to be performed in accordance with current DIN VDE guidelines as well as the EIB-manual.

This component is intended to be installed for application in distribution boards resp. control panels and can be used for installation in

- Indoor applications,
- Dry rooms,
- Low-voltage distributors,
- Mini-boxes

Doing so, you have to respect the environment-requirements, compliant with the protection class and permitted operating temperature of the EIB-unit.

The line with integrated choke cannot be used as the operating voltage of 12-30 V DC.

Safety and regulatory compliance standards:

- DIN EN 55024 Einrichtungen der Informationstechnik (equipments of information technology)
- DIN EN 60950 Sicherheit von Einrichtungen der Informationstechnik. (safety of information technology)
- DIN EN 50090-2-2 Elektrische Systemtechnik für Heim und Gebäude (electrical systems for home and buildings)

CE- qualification according to:

- EMV- Richtlinie (Wohn- und Zweckbau) (EMV-guideline, residential- and functional building)
- EN 50081-1
- EN 50082-2
- EN 50090-2-2

! Note - Functional security!
In case of special requirements regarding risks to life or property (functional safety), appropriate additional measures have to be taken. These measures must have the necessary independence from the operation of the Datalogger and always have to be available.

Measures to reduce risk you can take from the Tables "Functional safety" of the "Building Control Handbook, Fundamentals" from ZVEH / ZVEI.

2.2 DEVICE OVERVIEW

The image below shows Datalogger.

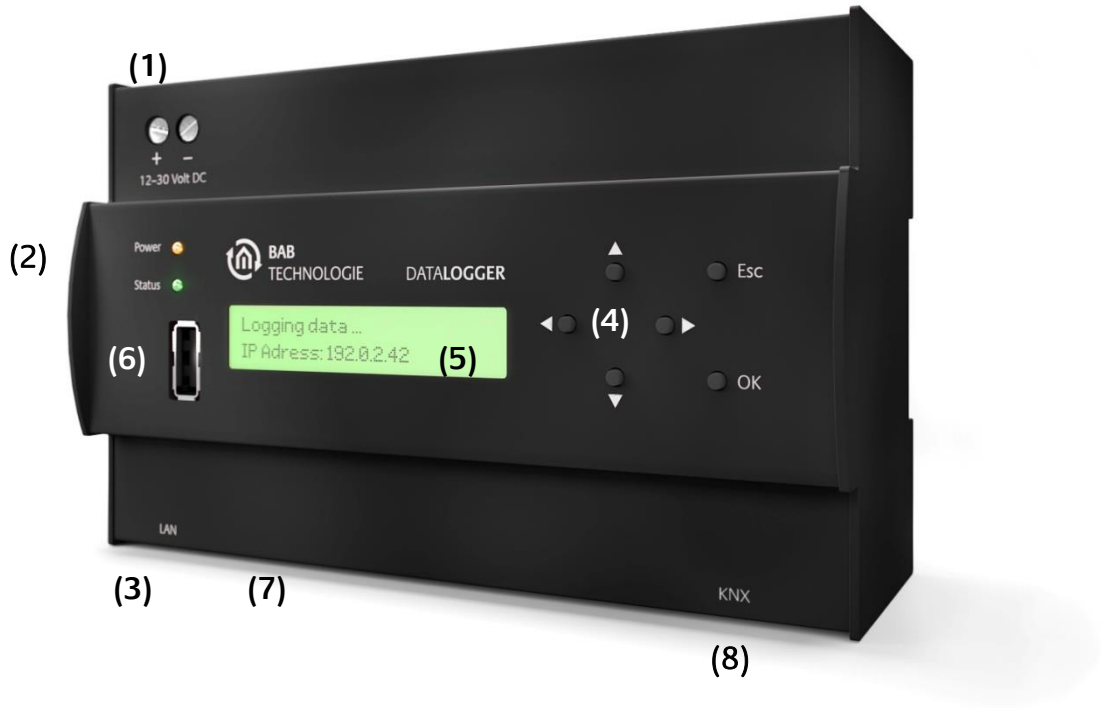


Figure 1: Device Overview

(1) Power supply 12 - 30 Volt DC
(2) Signal LEDs
(3) RJ45-socket for Ethernet LAN
(4) Navigation buttons
(5) LCD display
(6) Front USB socket
(7) Bottom USB socket
(8) Connector KNX/EIB

POWER SUPPLY CONNECTOR

The power supply connector takes place in the top left corner. Please be careful of voltage and polarity.

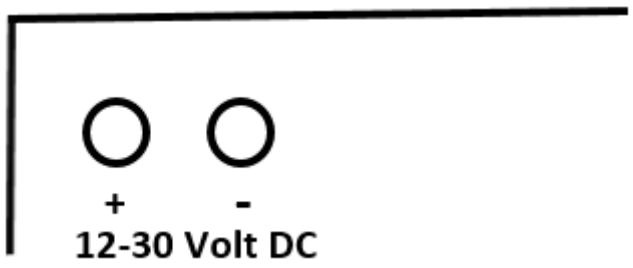


Figure 2: Power supply connector

BUS 2 (TWISTED PAIR) CONNECTOR

The BUS 2 connector takes place in the right corner on the bottom side. It is used for KNX Twisted Pair. Please be careful of the polarity.

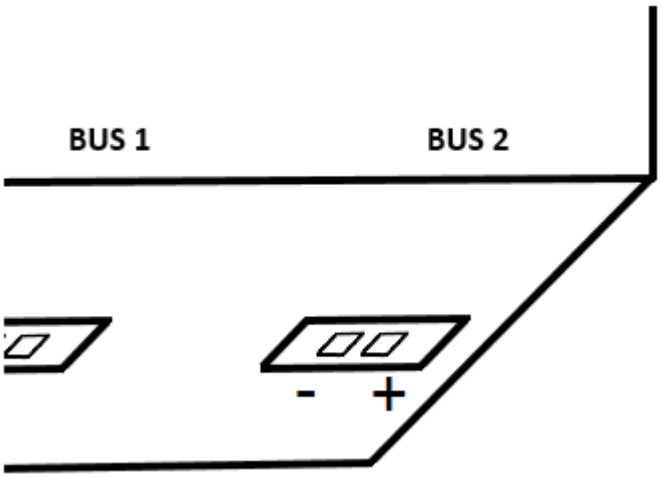


Figure 3: BUS 2 connector

NAVIGATION BUTTONS

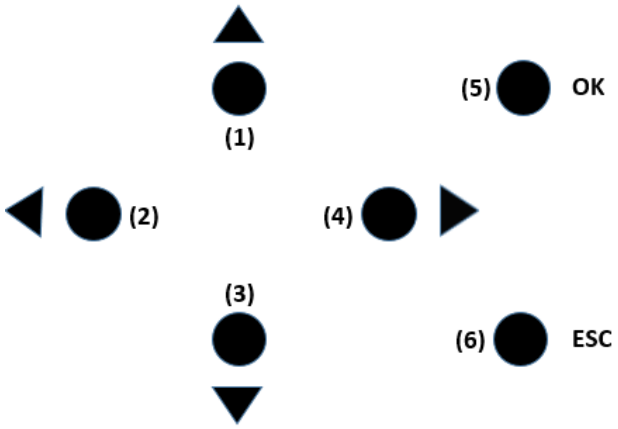


Figure 4: Navigation buttons

(1) Up button (navigate to upper menu, decrease numbers, precedent letter of alphabet)
(2) Left button (go left for configuration of KNX and IP addresses, hosts, names …)
(3) Down button (navigate to lower menu, increase numbers, next letter of alphabet)
(4) Right button (go right for configuration of KNX and IP addresses, hosts, names …)
(5) OK button (navigate to next menu, confirm a configuration, get out of a pure informative field such as “Device info” or “Free memory”)
(6) ESC button (navigate to precedent menu, erase a character of the string you are configuring such as “Name” string or “Host” string, stop error/warning/info messages when they occur)

A long press on Up or Down button allows you to scroll faster.

SIGNAL LEDS

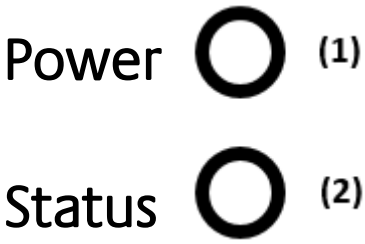


Figure 5: Signal LEDs

(1) Power LED
(2) Status LED

POWER LED

- The Power LED turns green when the device is totally started and usable.
- The Power LED turns red and back to green each time a telegram is received and logged.
- During update process the power LED may blink red.

STATUS LED

- The Status LED turns green when the device is totally started and usable.
- The Status LED blinks red in case of error, warning or info messages.
- The Status LED blinks yellow during database's export process.
- During update process the Status LED may blink red or yellow.

USB SOCKETS

Two USB sockets on the front and the bottom side are available on the Datalogger. Both of them allow you to plug a USB flash drive in order to export the database or update the Datalogger.

2.3 INSTALLATION

When mounting the device and during the initial operation please take care and note the following information to prevent any risk.

Attention!
Device may be destroyed in case of wrong use. Operations under voltage may cause residual voltage. Before connecting the device please disconnect the installation environment from voltage.

Please pay attention, that Datalogger is protected against polarity reversal, but not against surge voltage. In case excessive voltage will be connected, Datalogger can be destroyed.

GENERAL

Environment

Voltage:	12 - 30 Volt DC
Power consumption:	<= 5 W
Climate persistent:	acc to EN 50090-2-2
Ambient temperature:	0 - 45°C
Rel. humidity (not condensing):	5% - 80%

Plugging the device
Snap the device onto the top-hat rail acc to 60715

Power supply
Please care for sufficient performance when selecting the power supply. Datalogger needs 300mA at 12 Volt DC during the boot phase!
Connect the power supply according to the marking with the spring clips
For power supply, the non-choked output of an EIB-power supply can be used, if available. (Please consider of adequate power reserves).

To supply the Datalogger Power Over Ethernet (POE) can be used. Plug in the network cable (LAN) into the RJ 45- connector.

Ethernet
For programming the Datalogger it is necessary to access via LAN. This can be done both using an existing LAN network or via direct connection. Plug in the network cable (LAN) into the RJ 45- connector.

Prerequisites of the Client PC
If you need to configure *Datalogger* with the web interface, a PC with network adapter and an up-to-date browser is necessary.

ETS
Datalogger does not require ETS application. BCU does not require programming. However for the best use of Datalogger, KNX group address information are necessary. To import them into Datalogger the ETS version 4 is needed.

The device warms up during operation. Take care about the maximum ambient temperature and for sufficient thermal discharge. If a SMTP server is configured (see "E-Mail: SMTP Server**"), an email will be send to you if the maximum temperature (90°C) is reached. Otherwise an error message will be displayed on the LCD display. You can check the temperature on the LCD menu (see "**general**") or in the web interface (see "**Info**").**

ADDITIONAL FOR KNX

To establish optimum operating conditions and performance the Datalogger should be connected to the KNX bus system (BUS 2). It is of prior importance that the device is supplied with bus voltage; real devices on the bus system are not needed.

Plugging the device

- Connect the bus wire with the connector on the BUS 2 connector
- Switch on the bus voltage

OPERATIONAL READINESS

When all connections are made correctly the device may be supplied with power. Please wait until the device has booted completely before checking the correct installation. The boot phase takes about 3 minutes. Have a look at signal LEDs. Both of them should be green. In addition the menu should appear on the LCD screen and you should be able to navigate to the menu thanks to the navigation buttons.

2.4 INITIAL OPERATION

When the device is booted up proper it can be put into operation. For this, it may happen that some basic settings have to be adjusted. These settings have to be made via the LCD screen or the web interface.

LCD CONFIGURATION

DATE AND TIME

Datalogger needs date and time to be set in order to init the database. If at first boot time it is not able to connect to a NTP server in order to get the right date and time, it will display the warning message “Please configure date and time”.

To configure date and time use the navigation buttons and go to “Configuration” > “General” > “Date and time” > “Set DateTime”. You have there three submenus “Date”, “Time” and “Save”. Go to “Date”, configure the right date. When it is done, press “OK” button. You should see a “OK” field on the display, press “OK” button again to confirm your configuration. You should be back to the three submenus “Date”, “Time” and “Save”.

To configure time, go to “Time”, configure the right time. When it is done, press “OK” button. You should see a “OK” field on the display, press “OK” button again to confirm your configuration. . You should be back to the three submenus “Date”, “Time” and “Save”.

To save your configuration, go to “Save” and press “OK” button. To check that date and time has been correctly set, go to “Configuration” > “General” > “Date and time” > “Get DateTime”

Date and time will be then internally saved. You should not have to configure them again.

NETWORK

In order to configure the network, go thanks to the navigation buttons to “Configuration” > “Network”. There, for a fast configuration of the network, you can use DHCP. Go to “DHCP” > “Enable”. You can then find out the IP address assigned to your device in “Configuration” > “Network” > “IP Address”.
You can also manually configure the network. In “Configuration” > “Network”, set up the IP-Address / Netmask / Default Gateway / DNS Server(s) / NTP server(s). You can configure up to three DNS and NTP servers.

For IP-Address / Netmask / Default Gateway go to the corresponding menu, configure it and go to “OK”. For example to configure the IP-Address go to “Configuration” > “Network” > “IP Address”. Configure the right IP-Address and press the “ok” button. You should see now “OK” on the LCD display, press again the “OK” button to confirm.

For DNS Server(s) go to “Configuration” > “Network” > “DNS”. You have there access to the list of configured DNS server(s). If you press the “OK” button you are able to edit the current configured DNS server (“Edit”), to add a new DNS server (“Add IP”) or to remove the current DNS server (“Remove”). Go for example to “Edit“, configure a DNS server address and confirm with “OK”.

For NTP Server(s) go to “Configuration” > “Network” > “NTP”. You have here access to the list of configured NTP server(s). If you press the “OK” button you are able to edit the current configured NTP server (“Edit”), to add a new NTP server address (“Add IP”), to add a new NTP server hostname (“Add Host”) or to remove the current NTP server (“Remove”). Go for example to “Edit“, configure a NTP server and confirm with “OK”.

As soon as you have configured all your Network settings, go to “Save”. The network settings are now updated.

GENERAL

In order to configure the name of your Datalogger, go to “Configuration” > “General” > “Name”. You see now the default name of your device and you can edit it. If you press “OK” button again you can change the case (lowercase, number, special character) and save. As soon as you save the name setting is updated. This name will be the name of the KNXnet/IP server visible on ETS and your hostname. Therefore you will be able to access to the web interface with the hostname “[Name].local” or the IP address you have configured.

For example the default name is “datalogger”. You should be able to access to the web interface when you type “datalogger.local” in your browser. In addition “datalogger” should be one of the visible KNXnet/IP servers in ETS.

Only lowercase, numbers and minus (‘-’) are allowed for the Datalogger’s name.

You have access to many information in this “General” menu. “Device info”, “Date and time”, “Free memory” (this is the rest of memory available in the device for the database), “Temperature” (internal temperature, should never be over 90°C).

To configure the timezone of your device go to “Configuration” > “General” > “Location”. Choose the right location and save.

You are also able to change the language of your Datalogger. English, German and French are available. Go to “Configuration” > “General” > “Language” and choose the language.

“Debug Level” is available in case of problem for debugging purpose.

KNX

In order to configure the KNX individual address of your Datalogger, go to “Configuration” > “KNX” > “Phy Addr”. You see now the default KNX address of your device. Set the KNX address according to your KNX topology and save. As soon as you save the KNX individual address setting is updated. This address will be the KNX individual address of the KNXnet/IP server.

WEB INTERFACE

ACCESS TO THE WEB INTERFACE

The Datalogger is delivered with factory-made settings. In order to access to the web interface, type the default IP address or the default hostname in your browser:

- Default IP address => **192.168.1.225**
- Default hostname => **datalogger.local**

LOG IN TO THE WEB INTERFACE

Connect to Datalogger's configuration page is protected by username and password. In delivery status the following access data is valid:

Area:	Username	Password:
Configuration:	admin	datalogger

Enter now the default username "admin" and password "dataLogger". After logging in, you reach the menu page.

At any moment you can go back at the beginning of the web interface, clicking on the "BAB TECHNOLOGIE" logo.

Figure 6: BAB TECHNOLOGIE Logo

USER ADMINISTRATION

In the Web interface, go to "Configuration" -> "User Administration" you can modify the admin user or configure new ones.

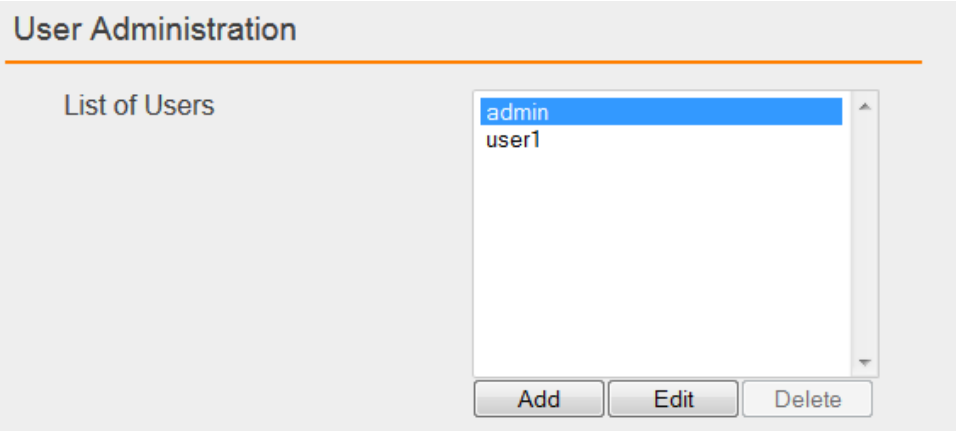


Figure 7: User Administration

Click on "Add" to add a new user. A new window appears where you have to enter the user name and the password twice.

To just modify the admin user, click on “admin”, then click on “Edit”. A new window appears where you can modify the admin user name and enter the new password twice.

RESET CONFIGURATION SETTINGS

In the web interface go to “Configuration” -> “User Administration” to configure your security question.

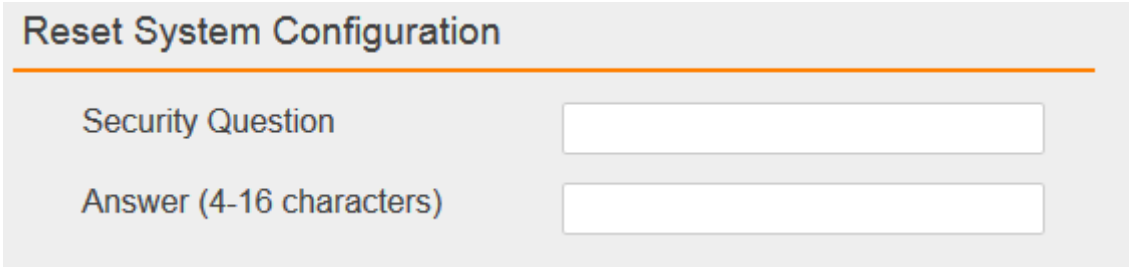


Figure 8: Reset Configuration

If you realize your configuration is totally wrong and for example you are not able to access to the web interface anymore, you can reset the configuration to factory.

In the LCD menu, navigate to “Reset Config”. The security question you have been configuring appears on the LCD display. Push “OK” button to answer. Write your answer. If you push “OK” again you can write numbers or special characters. Press “OK” again to confirm your answer. If your answer is right, the configuration will be reset to factory otherwise an error message will be displayed.

BACKUP / RESTORE CONFIGURATION

At any moment you can create a backup of your configuration and restore it in case of problem or after an update for example.

In the web interface go to “Configuration” -> “Backup / Restore”. Click on “Create a Backup” and save the file in a safe place. To restore it, click on “Browse”, search for your backup file and click on “Restore”.

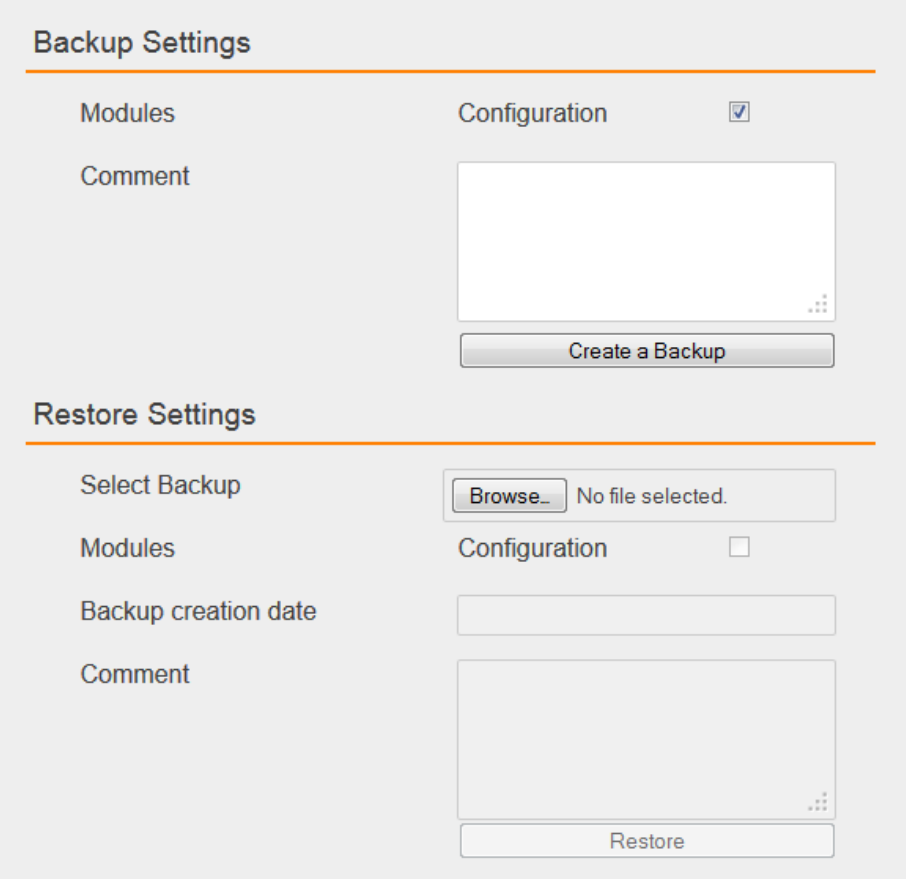


Figure 9: Backup / Restore

DATE AND TIME

Datalogger needs date and time to be set in order to init the database. If at first boot time it is not able to connect to a NTP server in order to get the right date and time, it will display the error message “Please configure date and time”.

To configure date and time, in the web interface go to “Configuration” -> “General”. Click on the datetime button in the “Systemtime” field. A window will open and ask for “synchronize with pc time”, click on “OK”. Date and time will be then internally saved. You should not have to configure them again.

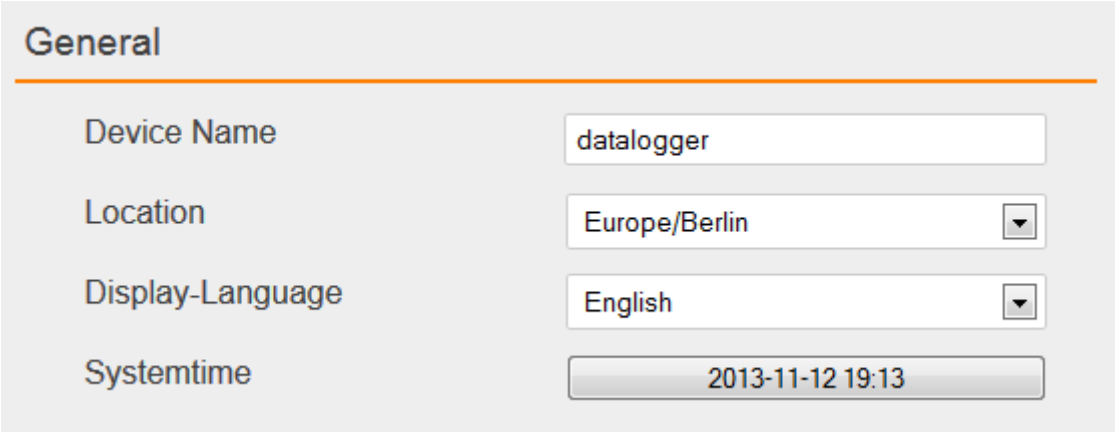


Figure 10: Date and Time

NETWORK

In the Web interface, go to “Configuration” -> “Network”. You can set the IP address, the netmask, the gateway, and up to three DNS and NTP servers.

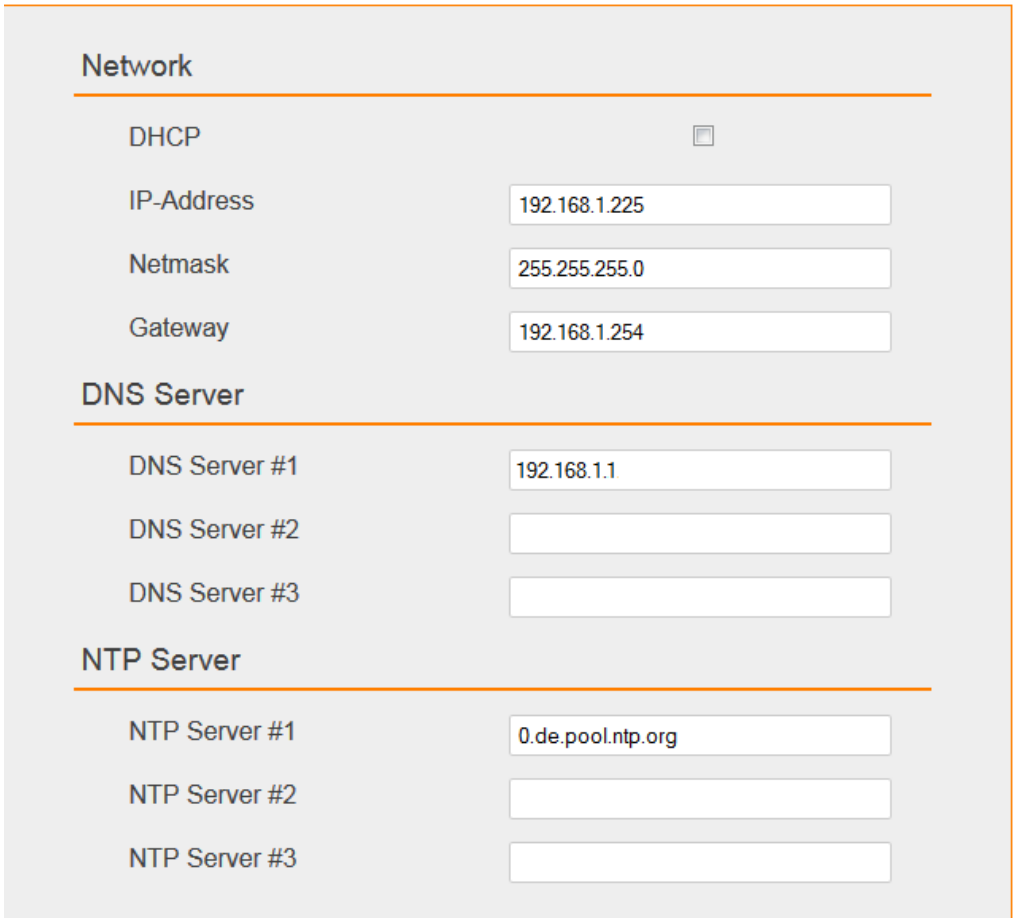


Figure 11: Network Configuration

GENERAL

In the Web interface, go to “Configuration” -> “General”. You can set the “Device Name”, the “Location” and the “Display-Language” of your Datalogger.

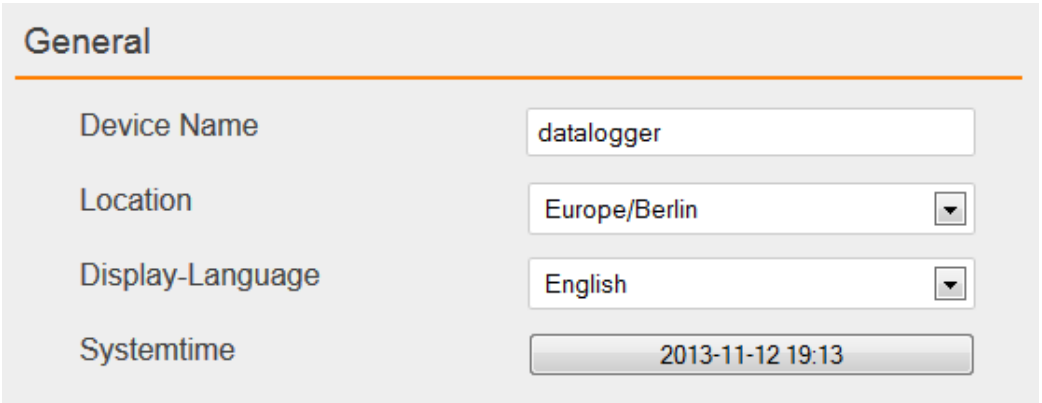


Figure 12: General configuration

KNX

In the Web interface, go to “Configuration” -> “KNX”.

KNX DATE / TIME

In order to synchronize Datalogger’s time to a KNX Date / Time device, enter both KNX group addresses in the “KNX Date / Time” settings.

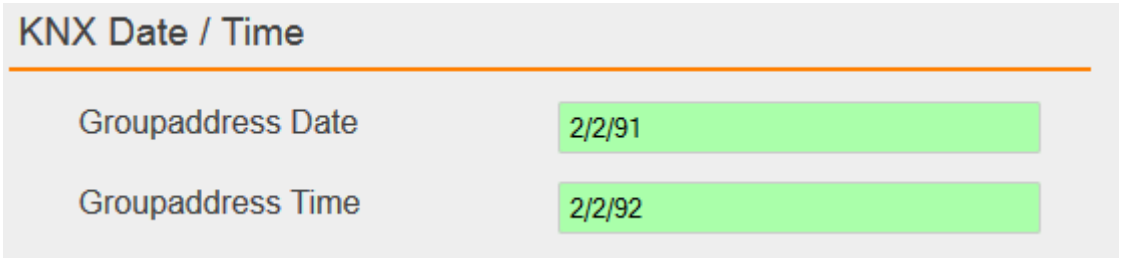


Figure 13: KNX Date / Time

PHYSICAL AND KNXNET/IP TUNNELING ADDRESS

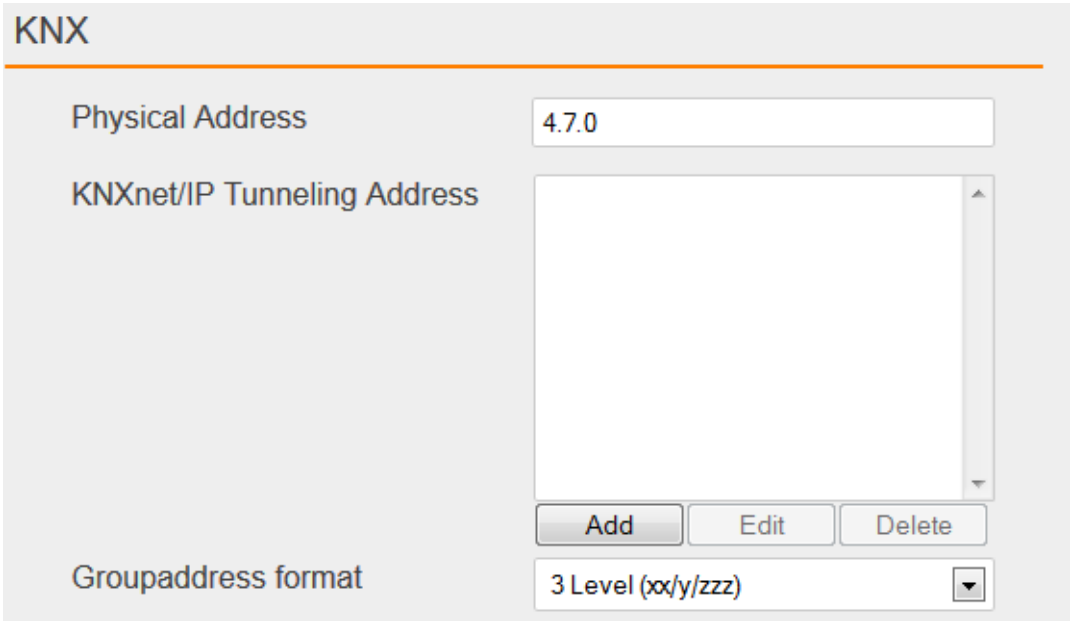


Figure 14: KNX

As soon as you save the configuration. This physical address will be the KNX individual address of the KNXnet/IP server. And each Tunneling address you configured will be assigned to a Tunneling connection.

ETS 4 PROJECT UPLOAD

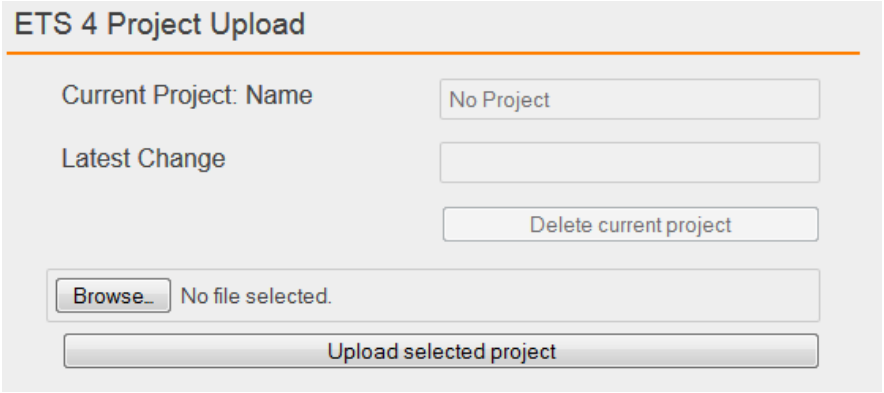


Figure 15: Upload ETS 4 Project File

It is possible from ETS 4 to export an archive with the extension ".knxproj" which contains many information about your KNX installation. For example in ETS 4 you are able to configure the Data Type. A KNX switch device could be a Data Type "on/off" for instance. This information will be in the archive ".knxproj". To export this archive, in ETS4 go to "Projects", select your project, click on export.

You can from the web interface, import the archive so that all those useful information are available directly from the database.

Click on "Browse" and search for the archive you have exported from ETS 4. Finally click on "Upload selected project".

Uploading an ETS 4 project allows you to get your KNX topology information in your database. Thus, you can know exactly the DatapointType of your data. In addition in "dw_knx_groupaddress" and "dw_knx_grouprange" tables (see "Database overview"), you would get your KNX topology hierarchy.

SERVICES

In the Web interface, go to "Configuration" -> "Services", different services can be enable or disable: Tunneling, Routing and Email.

Services

Tunneling and Routing are KNXnet/IP services.

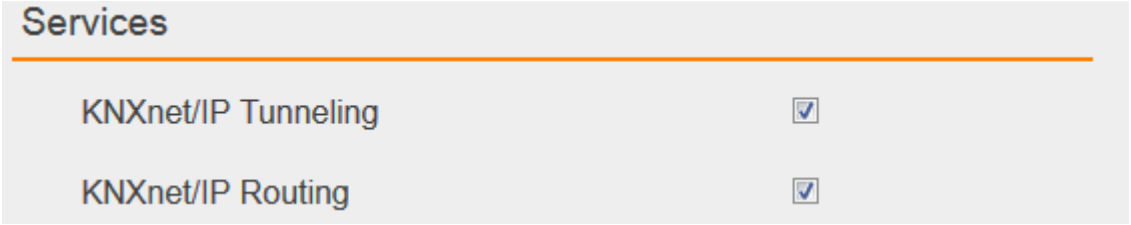


Figure 16: Services

E-Mail: SMTP Server

To be able to send e-mail, a SMTP server needs to be configured.

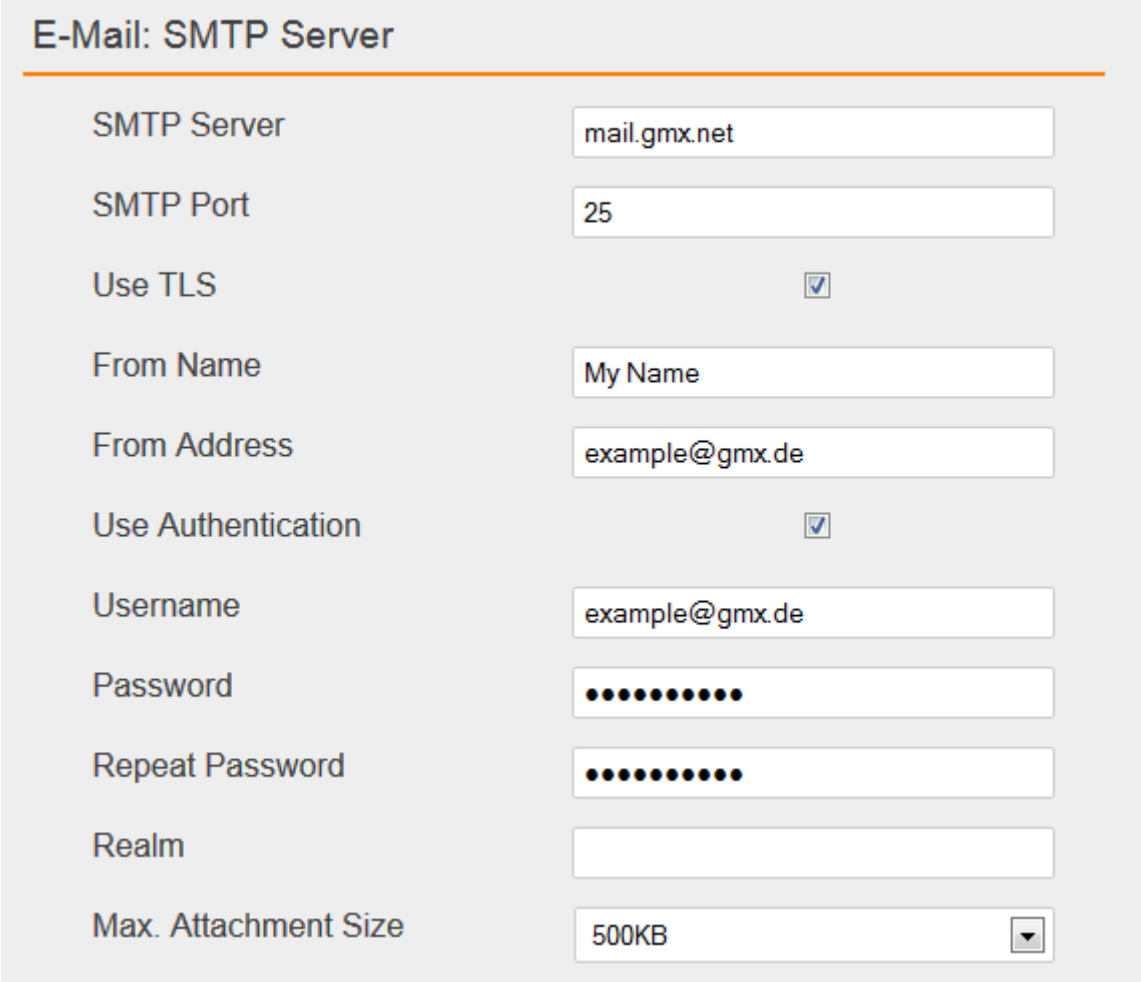
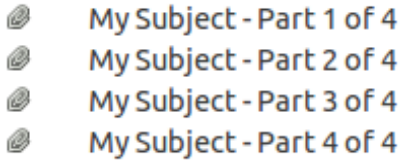
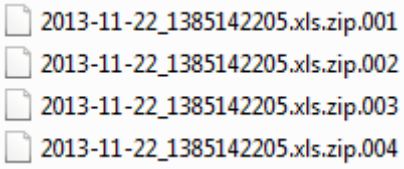


Figure 17: SMTP Server

A maximum attachment size needs to be set. If this one is reached while an email has to be sent, this attachment is splitted in several peaces. Each peace size is equal or less than the maximum attachment size. Each peace of attachment is sent in a different email. In the email subject, an indication is added to know how many peaces needs to be sent. For example:



In order to re-create the attachment and access to the data, you have first to extract each attachment of each email to the the same directory. Each attachment has the extension ".zip.00x" where 'x' is the number of the peace.



Then, you need the software "7zip". It can be downloaded from that link: http://www.7-zip.org/download.html. Open it and add every peace of attachment:

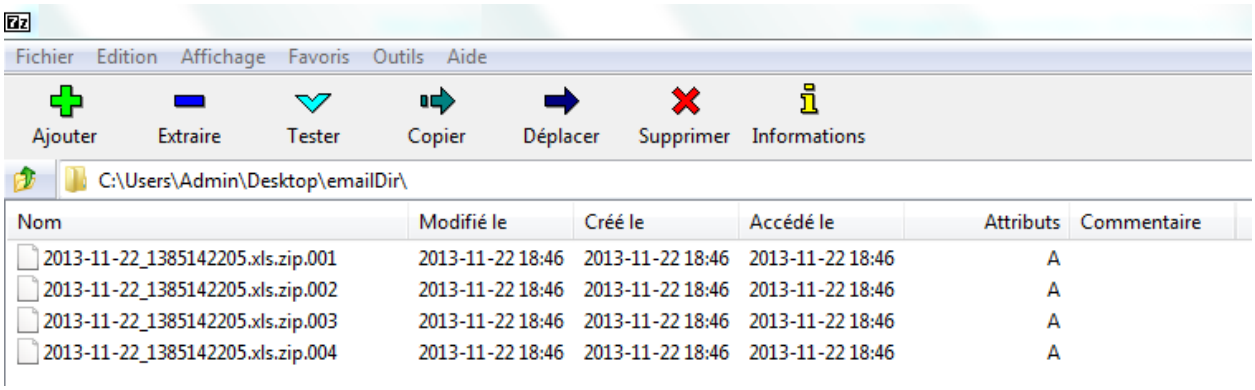


Figure 18: 7zip

Finally, select all peaces of attachment in 7zip and click on "Extract". Your original attachment will be regenerated.

E-Mail Export via Display

To export the database and send it via e-mail from the LCD display, you need to configure an email export.

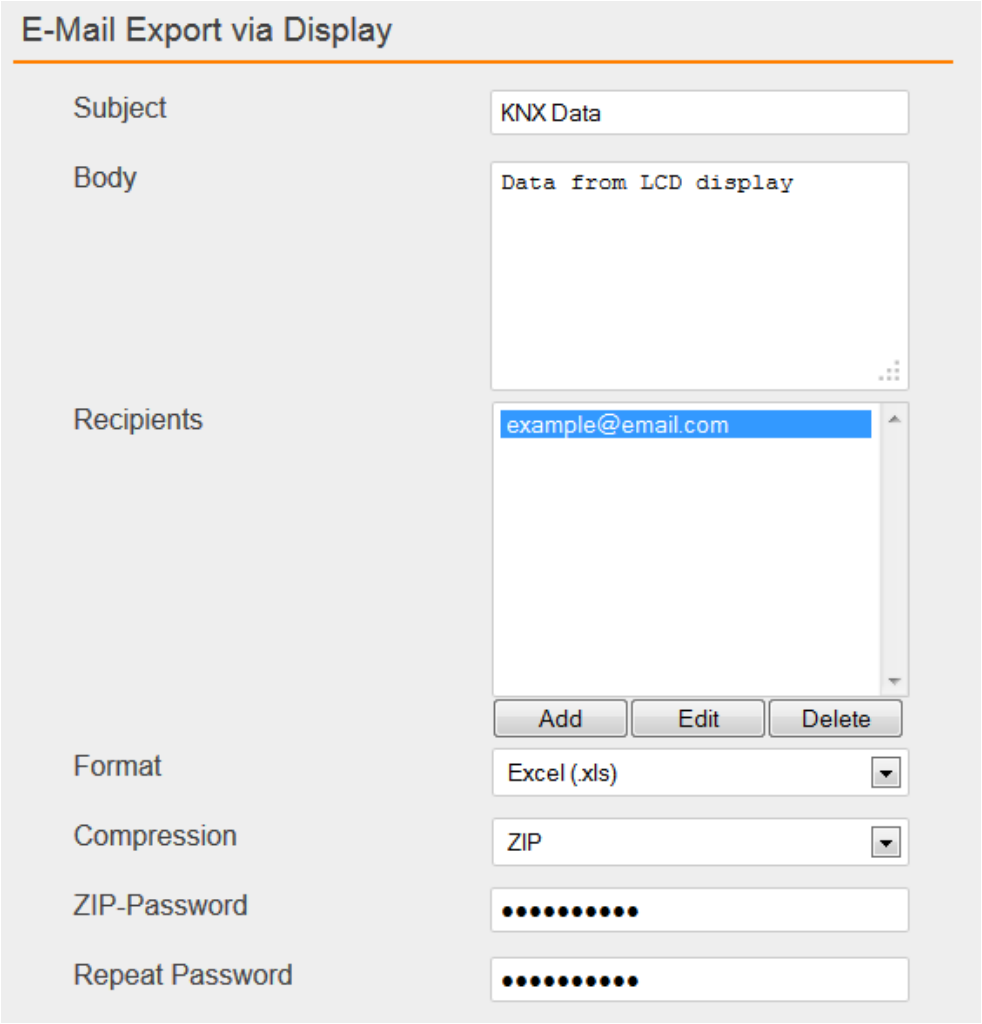


Figure 19: E-Mail Export

DATABASE STATISTICS

At any moment you can check statistics of your entire database, number of telegrams per month and so on. In the web interface go to “Datalogger” -> “Statistics” and click on “Refresh”.

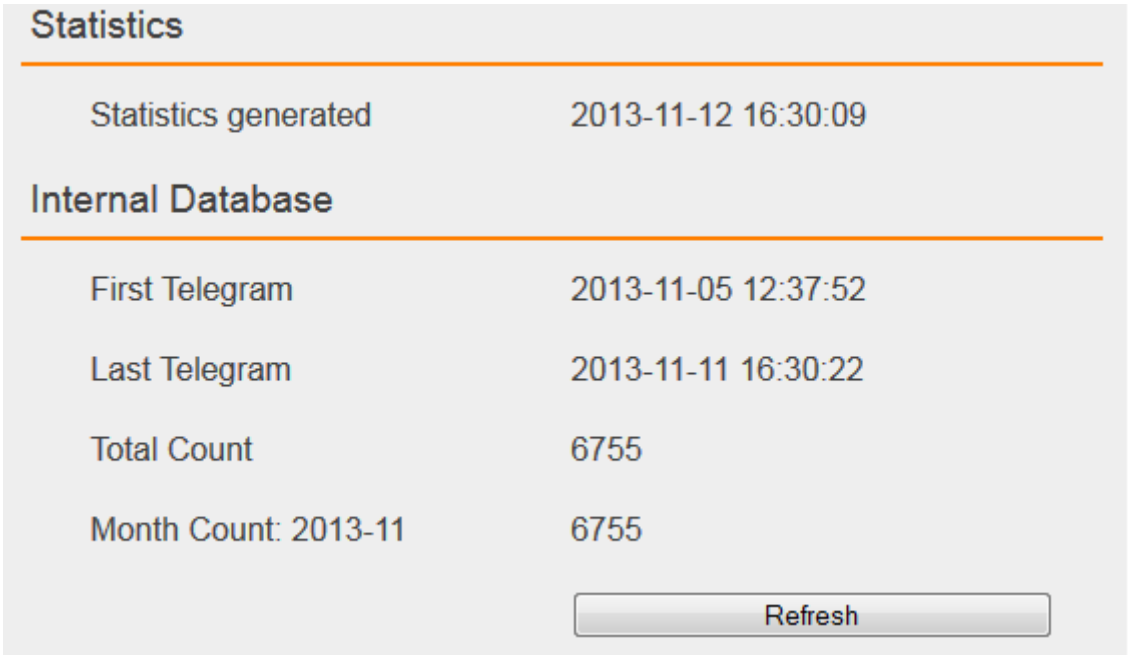


Figure 20: Statistics

INFO

In the web interface go to the main menu “Info”. You can there check many information such as “Version”, “Serial Number”, “Temperature (System)” ...

3 DATABASE

3.1 INTRODUCTION

Datalogger logs data into a MySQL database. This database takes place in a 7 GB internal USB flash drive. It is able to log data up to ten telegrams per second. That represents about 1000 hours of data logging at full speed (36 million telegrams). The user is also able to log data into his own database.

3.2 DATABASE OVERVIEW

The database contains three tables:

- dw_knx_groupaddress
- dw_knx_grouprange
- eib_tele_<year>_<month>

DW_KNX_GROUPADDRESS

This table contains all information about group addresses on your KNX installation. These information come from the archive you have uploaded. This is field details:

- id
- parent_id
- title
- address_id

- address
- datatype
- unit

3.2.1.1 ID

This field represents the number of your group address.

3.2.1.2 PARENT_ID

This field represents the number of the group range that your group address is part.

3.2.1.3 TITLE

This field is the name of your group address.

3.2.1.4 ADDRESS_ID

This field is the address id of your group address. It is a part of KNX specification.
Level 3:
Id = main x 2048 + middle x 256 + address

Level 2:
Id = main x 2048 + address

Free:
Id = address

Example:
1/1/2 => 1 x 2048 + 1 x 256 + 2 = 2306

3.2.1.5 ADDRESS

This field is the address of your group address.

3.2.1.6 DATATYPE

This field is the datatype of your group address.

For example: DPT - 1 - 1
(1) (2) (3)

(1) Means Datapoint Type
(2) KNX type
(3) KNX sub-type

3.2.1.7 UNIT

This field is the unit of values coming from your group address.

This is an example:

id	parent_id	title	address_id	addess	datatype	unit
GA-1	GR-2	Switch1	2305	1/1/1	“DPT-1-0”	“on/off”

DW_KNX_GROUPRANGE

This table contains all information about the topology of your KNX installation. These information come from the archive you have uploaded. This is field details:

- id
- parent_id
- title
- range_end
- range_start

3.2.1.8 ID

This field is the number of the current group range.

3.2.1.9 PARENT_ID

This field is the number of the parent group range.

3.2.1.10 TITLE

This field is the name of your group.

3.2.1.11 RANGE_END

This field is the end number of the group range.

3.2.1.12 RANGE_START

This field is the start number of the group range.

This is an example:

id	parent_id	title	range_end	Range_start
GR-1	NULL	Main	8191	6144
GR-2	GR-1	Middle	6399	6144

EIB_TELE_<YEAR>_<MONTH>

These tables contain all telegrams coming from KNX installation. As well from KNX Twisted pair as from KNXnet/IP. A new table is created every month, “eib_tele_2013_10” for instance. This is field details:

- id
- service
- channel
- ip_address
- port
- source_id
- source
- destination_id
- destination
- apdu
- apci
- raw_data
- value
- unit
- priority

- last_time

3.2.1.13 ID

The field “id“ represents the number of the telegram.

3.2.1.14 SERVICE

A telegram may come from twisted pair, KNXnet/IP Routing or KNXnet/IP Tunneling. Thus, this field can take three values:

- TWISTED_PAIR
- ROUTING
- TUNNELING

3.2.1.15 CHANNEL

This field represents the number of the Tunneling connection that a telegram comes from. Datalogger supports up to ten connections. This field is NULL if the telegram comes from Twisted Pair or Tunneling.

3.2.1.16 IP_ADDRESS AND PORT

If a telegram comes from KNXnet/IP, these fields are the IP address and the port of the device that the telegram comes from. If a telegram comes from Twisted Pair, these fields are NULL.

3.2.1.17 SOURCE_ID AND SOURCE

These fields are the KNX individual address where the telegram comes from. KNX individual address id does not exist in KNX specification. It is built as KNX group address id is built.

Id = zone x 2048 + line x 256 + device

Example:
4.7.13 => 4 x 2048 + 7 x 256 + 13 = 9997

3.2.1.18 DESTINATION_ID AND DESTINATION

These fields are the destined KNX individual address or the KNX group address of the telegram.

3.2.1.19 APDU

APDU represent the whole Application layer of a KNX telegram.

3.2.1.20 APCI

APCI represent the type of telegram:

- GV_READ
- GV_WRITE
- GV_RESPONSE

3.2.1.21 RAW_DATA

This field is the pure date from the telegram.

3.2.1.22 VALUE

Thanks to the archive you have uploaded, the datatype of each telegram is known. Therefore it is possible to translate the raw_data into a real value. If the datatype is unknown, the value is NULL.

3.2.1.23 UNIT

Thanks to the archive you have uploaded, the datatype of each telegram is known. Therefore it is possible to know the unit of the value. If the datatype is unknown, the value is "no datapoint".

3.2.1.24 PRIORITY

This is the priority of the telegram:

- low
- normal
- urgent

3.2.1.25 LAST_TIME

This is the date and time when the telegram has been logged.

This is an example:

id	service	channel	ip_address	port
523	TWISTED_PAIR	\N	\N	\N

source_id	source	destination_id	destination	apdu	apci
4609	2.2.1	6146	3/0/2	0 81	GV_WRITE

raw_data	value	unit	priority	last_time
1	1	"on/off"	low	2013-10-12 17:21:54

3.3 CONFIGURATION

INTERNAL DATABASE

Database configuration is set in the web interface. The default internal database is pre-configured (only the port can be changed). Nevertheless you can configure additional settings. Go to "Internal Database".

3.3.1.1 FILTER

Telegrams are logged twice, when they are received and when they are sent to the right service (Routing, Tunneling, Twisted Pair). For example a telegram is received from KNX Twisted Pair. This telegram is logged with "service" field set to "TWISTED_PAIR". The same telegram is then send (routed) via Routing. Therefore another telegram is logged with "service" field set to "ROUTING". When a telegram sent by Datalogger is logged, the field "ip_address" is the IP address of the Datalogger.

As telegrams are logged twice, this takes more memory and might become annoying if you do not need those information. Therefore you can check the box "Exclude Sent Telegrams" and only received telegrams will be logged.

It is also possible to add filters in order to log into the database only telegrams you need. You can add inclusion or exclusion filters which allows you to log only telegrams regarding the KNX group addresses you have configured. You can include or exclude special KNX group addresses or choose a range of KNX group addresses. Click on "Add" to configure a new filter.

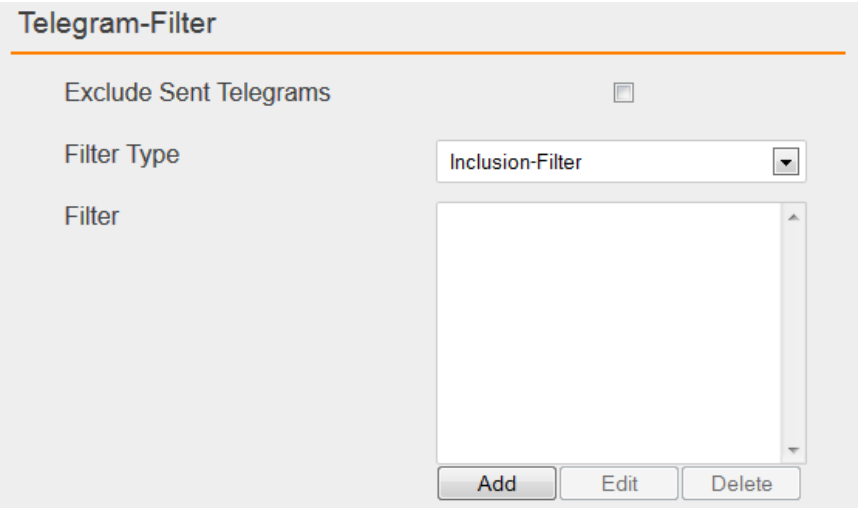


Figure 21: Filter

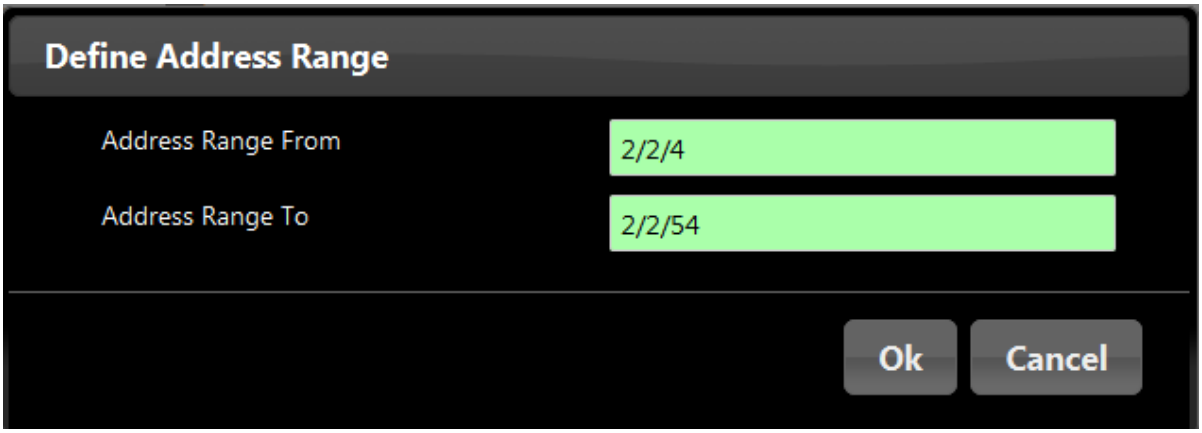


Figure 22: Address Range

3.3.1.2 DATABASE EXTERNAL ACCESS

In order to access to the internal database, your PC needs to have a permission. It is possible to add access permissions from the web interface. For each new permission, you click on “Add” and you configure the user, the host and a password. For example:

User: user
Host: 192.168.1.56
Password: dataLogger

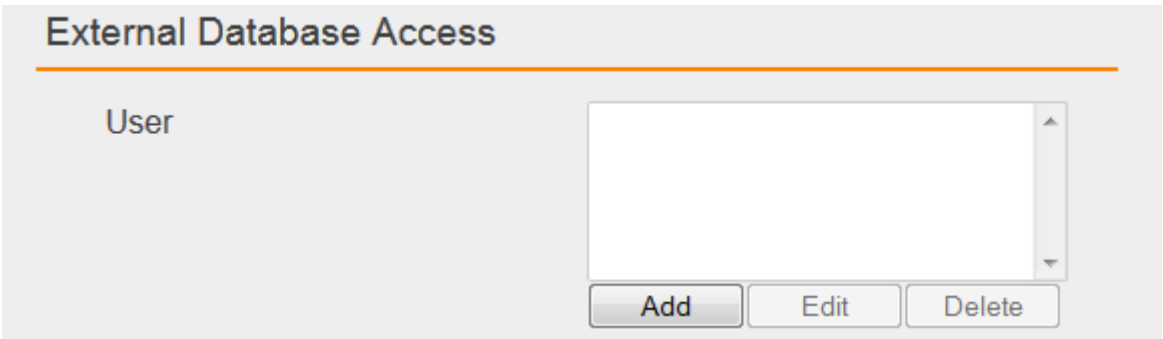


Figure 23: External Database Access

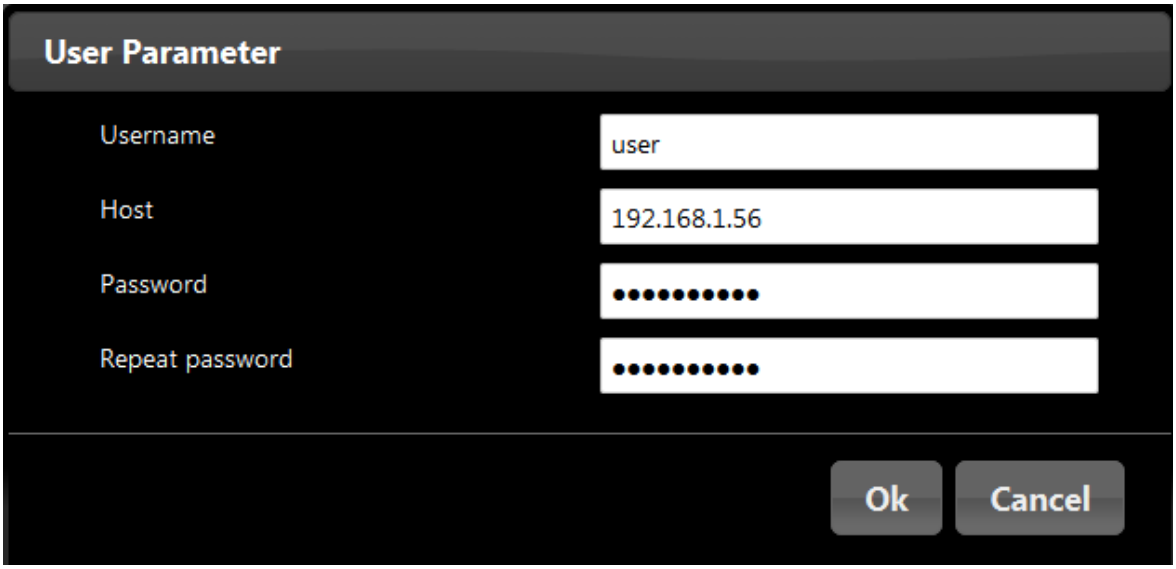


Figure 24: User Parameter

3.3.1.3 E-MAIL EXPORT

It is possible to program a daily / weekly / monthly exportation of the database and send it via e-mail regarding your configuration.

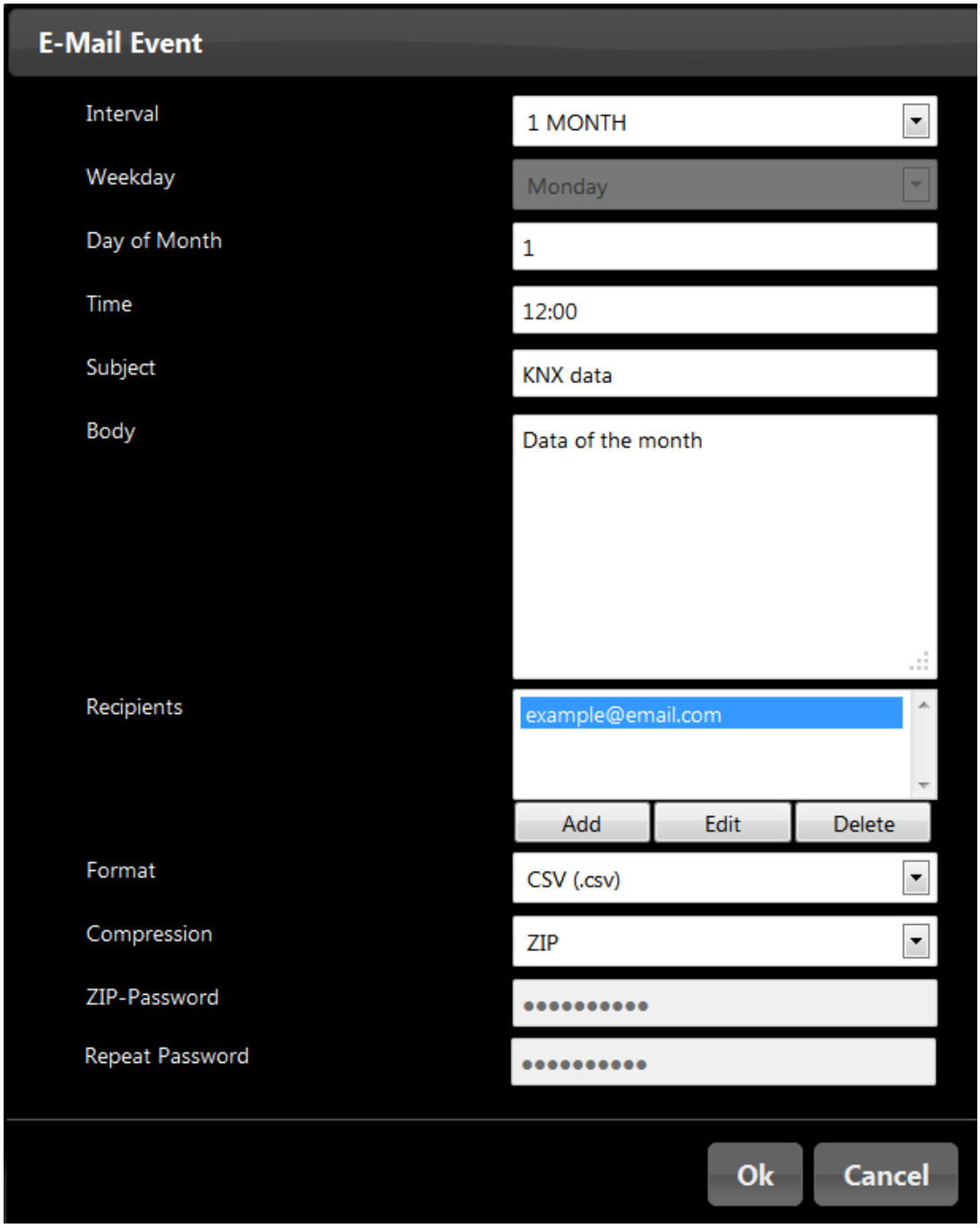


Figure 25: E-Mail Event

EXTERNAL DATABASE

Memory to log data is limited so that a message will be displayed on the LCD display or send via e-mail (if SMTP server is configured) if the memory is full. You are then able to delete some data from the web interface in main “Datalogger“ menu.

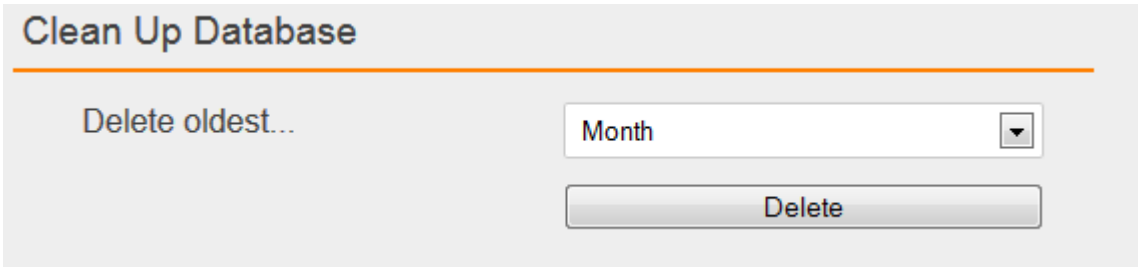


Figure 26: Clean Up Database

If you do not, the oldest data would be automatically deleted. To prevent data loss, you can configure an external database on your own server. Data are then logged in both database at the same time.

WINDOWS SERVER

The process to install and configure MySQL might change, please refer to MySQL website in case of problem. **http://www.mysql.com**

First of all, you have to download the MySQL Installer in order to get a MySQL Server and create your External Database for Datalogger. You can download the MySQL Installer on that page:

http://dev.mysql.com/downloads/installer/

As soon as the MySQL file is downloaded, exexute it. When the "welcome" page is opened, click on "Install MySQL Products". Accept the license terms and click on "Next", then click on "Execute" to start the check operation. When it is done, click on "Next". In this page "Choosing a Setup type" choose "Custom" and click on "Next". On the new page uncheck "Applications" and "Documentation". "MySQL Server [version]" needs to be checked. Click now on the "+" close to "Applications" to open applications submenus. There check "MySQL for Excel [version]". Click then on "Next", "Next", "Execute". MySQL products are installing.

"MySQL Server [version]" is necessary to create the external database for Datalogger and "MySQL for Excel [version]" is necessary to import Datalogger's data directly into Excel (see "Import database from Excel).

As soon as MySQL products are installed, click on "Next" and "Next" again. Now you should be on "MySQL Server Configuration" page. In "Root Account Password" enter your root password. In "MySQL User Accounts" click on "Add User". Enter your "username" and your "password" and click on "OK". Then click on "Next" until "Finish". MySQL products are now installed and your MySQL Server is configured.

Click now on Windows "Start" button and type "cmd" in the search bar, then press "Enter". A terminal should appear. You have to connect to MySQL with the user you have been creating. For this type:

```
C:\>"Program Files\MySQL\MySQL Server [vers]\bin\mysql.exe" –u[username] –p
```

Type your MySQL version instead of **[vers]** and your username instead of **[username]**.

The path of "mysql.exe" might be different!

MySQL should ask for your password, type it and you should be in the MySQL console ("mysql >").

Create a database where Datalogger will log data. Replace **[database name]** with the name of your choice.

```
mysql> CREATE DATABASE [database name] CHARACTER SET 'utf8';
```

You need then to give permissions to the Datalogger for the database **[database name]** you have created. Replace **[database name]** with the name of the database you have created, **[Datalogger IP]** with the IP address of the Datalogger and **[password for Datalogger]** with the password of your choice.

```
mysql> GRANT ALL PRIVILEGES ON [database name].* TO 'root'@'[Datalogger IP]'
    ->     IDENTIFIED BY '[password for Datalogger]';

mysql> FLUSH PRIVILEGES;
```

Finally type this command to get out of MySQL console :

```
mysql> exit
```

LINUX SERVER

The process to install and configure MySQL might change, please refer to MySQL website in case of problem. http://www.mysql.com

For Debian based system, in order to install MySQL, type this command in a terminal and press Enter:

```
apt-get install mysql-server mysql-client mysql-common
```

During installation, a password will be asked for MySQL root account.

When MySQL is installed, connect to your root account, type this command in a terminal:

```
mysql –uroot –p
```

MySQL should ask for your password, type it and you should be in the MySQL console (“mysql >”). Type this command to create a new user. Replace **[username]** with the username of your choice and **[user password]** with the password of your choice.

```
mysql> CREATE USER '[username]'@'localhost' IDENTIFIED BY '[user password]';
```

Create a database where Datalogger will log data. Replace **[database name]** with the name of your choice.

```
mysql> CREATE DATABASE [database name] CHARACTER SET 'utf8';
```

Then give all privileges to your user:

```
mysql> GRANT ALL PRIVILEGES ON *.* TO '[username]'@'localhost' WITH GRANT
OPTION;
```

You need then to give permissions to the Datalogger for the database **[database name]** you have created. Replace **[database name]** with the name of the database you have created, **[Datalogger IP]** with the IP address of the Datalogger and **[password for Datalogger]** with the password of your choice.

```
mysql> GRANT ALL PRIVILEGES ON [database name].* TO 'root'@'[Datalogger IP]'
    ->     IDENTIFIED BY '[password for Datalogger]';

mysql> FLUSH PRIVILEGES;

mysql> exit
```

In addition, you have to change your MySQL configuration file in order to authorize distant clients to connect to your MySQL server.

Edit “/etc/mysql/my.cnf“ with this command in your terminal:

```
nano /etc/mysql/my.cnf
```

Then modify "**bind-address = 127.0.0.1**" with "**#bind-address = 127.0.0.1**". To save and quit, do a "**Ctrl + o**", press "**Enter**" and do a "**Ctrl + x**".

Restart the MySQL server, type this command in your terminal:

```
service mysql restart
```

CONFIGURE DATALOGGER FOR YOUR SERVER

Go to "Configuration" -> "External Database" menu.

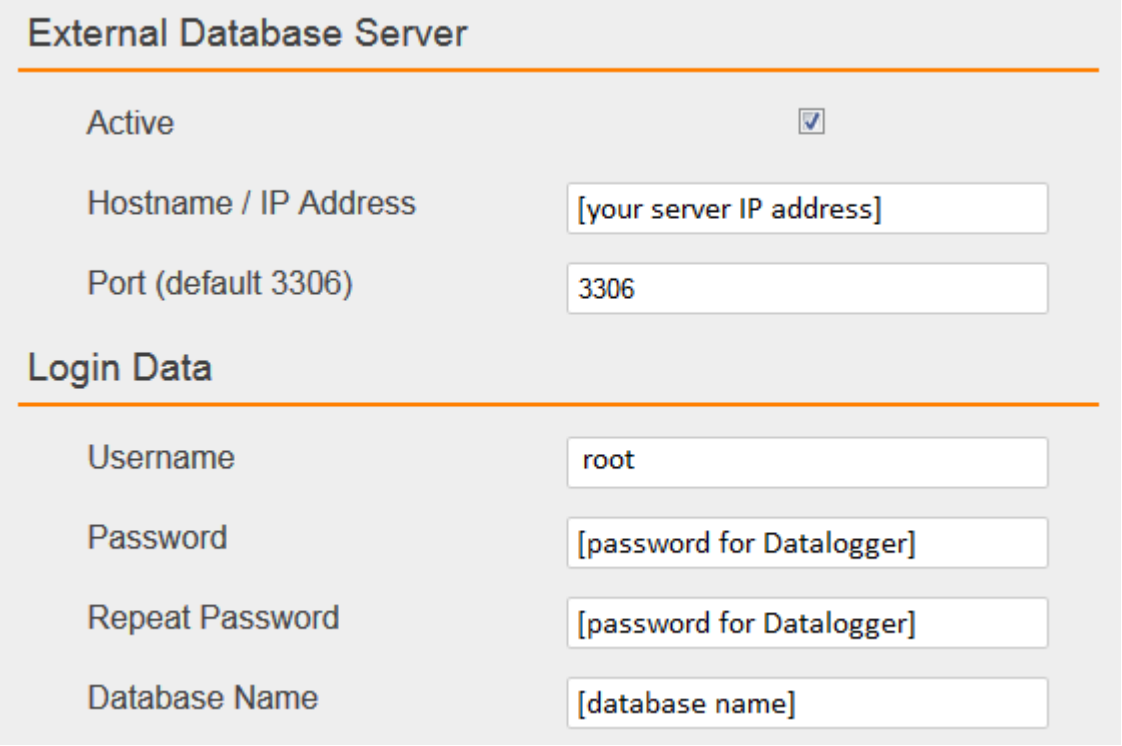


Figure 27: External database Server

First of all, do not forget to check the "Active" box. Then enter the IP address or hostname of your MySQL server. The port should be the default port unless you changed it. In "Username" and "Password", enter the [username] and [password] you have been configuring. Eventually, in "Database Name", enter your [database name].

If Datalogger cannot connect to your database, error messages explaining the reason will be displayed on the LCD display. After few tries, Datalogger will stop trying to connect to the database. To try again, go back to the web interface, check your configuration and your MySQL server and save the configuration again.

3.4 DATABASE EXPORT

There are five methods to access to your data. E-mail events (already seen in "E-Mail Export"), export into a USB flash drive plugged in your Datalogger, send it via e-mail, download it from the web interface or import it from Excel.

EXPORT DATABASE INTO A USB FLASH DRIVE

You can from the LCD screen export your data into a USB flash drive. Your data is available with a CSV or XLS format file. In order to export your database, plug a USB drive in one of the USB ports and go to "Export" > "USB" > "XLS" (or "CSV"). You are there able to export "Group Range", Group Address (both are only available if a ETS4 project has been imported), "Current Day", "Current Week", "Current Month", "From > To" (there you have to configure From-date and To-date). Wait for the end of the transfer and plug out the USB drive. Your data is now available on your USB flash drive.

SEND DATABASE VIA E-MAIL

If SMTP server is configured and email export from LCD, You can send your database via e-mail from the LCD screen.
Your data is available with a CSV or XLS format file. In order to export your database go to "Export" > "Email" > "XLS" (or "CSV"). Choose the e-mail recipient. You are then able to export "Group Range", Group Address (both are only available if a ETS4 project has been imported), "Current Day", "Current Week", "Current Month", "From > To" (there you have to configure From-date and To-date).

Note: Be sure that you have filled in a guilty DNS / Gateway / IP Address.

DOWLOAD FROM WEB INTERFACE

In the main menu "Datalogger", in the web interface, configure your export and click on "Start Export".

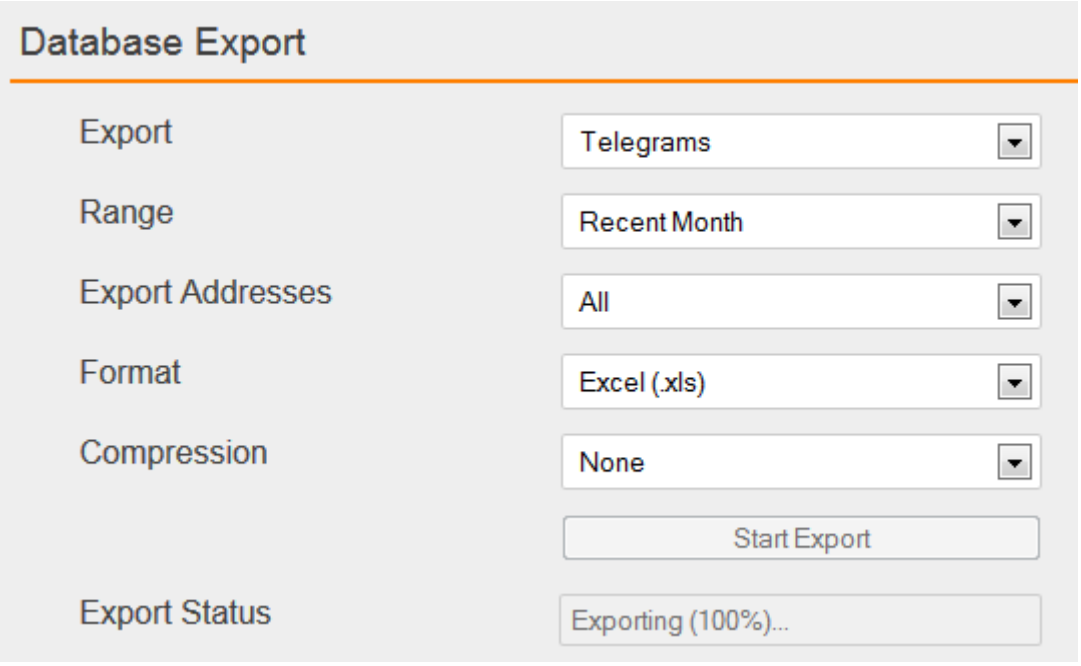


Figure 28: Database Export

In "Export" field, you can choose to export:
- Telegrams (KNX telegrams logged in "eib_tele_year_month" tables)
- Address Database (KNX group addresses information saved in "dw_knx_groupaddress" table)
- Topology Database (KNX group ranges information saved in "dw_knx_grouprange" table)

In "Range" field, you can choose to export:
- Recent Day
- Recent Week
- Recent Month
- User defined range (in this case you have to set "From…" and "To…" fields)

In "Export Addresses" field, you can choose to export:
- All (export all KNX group addresses)

- List (export a list of group addresses)
- Range (export a range of group addresses. Example: export from 1/1/1 to 1/1/56)

In "Format" field, you can choose to export:

- CSV (.csv file)
- Excel (.xls file)

In "Compression" field, you can choose between:

- None (no compression)
- ZIP (compress with zip)

In "Export Status" field, you can see the export process.

IMPORT DATABASE FROM EXCEL

MySQL for Excel has already been installed (see "Windows server"). This plugin allows you to import the database in Excel. When the plugin is well installed, you get this "MySQL for Excel" in "Data" bar:

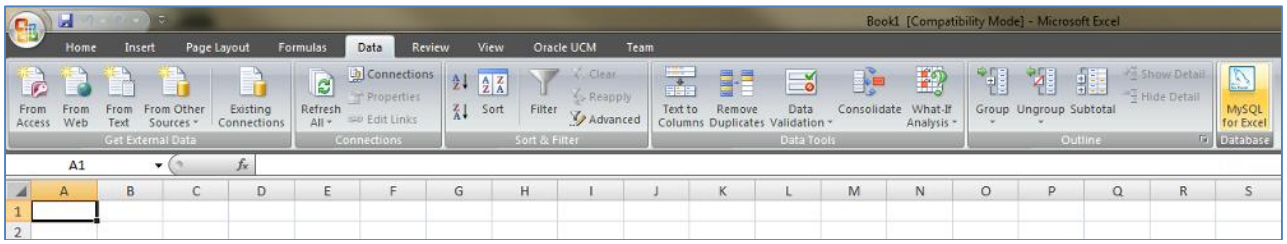


Figure 29: MySQL for Excel bar

In order to access to the database, your PC needs to have a permission. It is possible to add access permissions from the web interface. We take the example see before (see "Database External access").

User: user
Host: 192.168.1.56
Password: dataLogger

When permission has been set, click on "MySQL for Excel" in "Data" Excel bar. You should see this window on the right side.

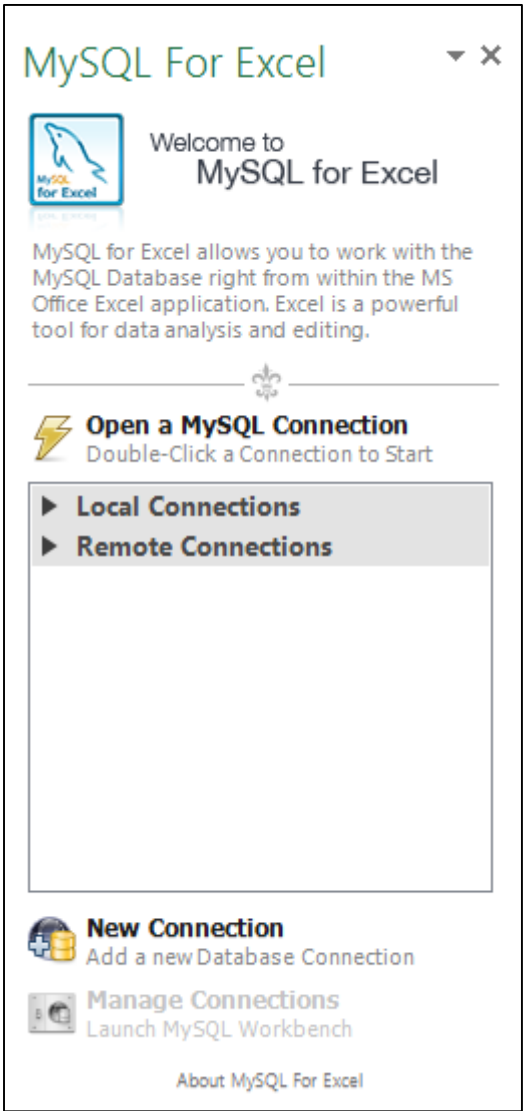


Figure 30: MySQL for Excel

Click on “New Connection” to add a new database connection with the Datalogger. Configure this new connection regarding your network settings (see “Network” – IP address) and your internal database settings (see “Internal Database” and “Database External access”).

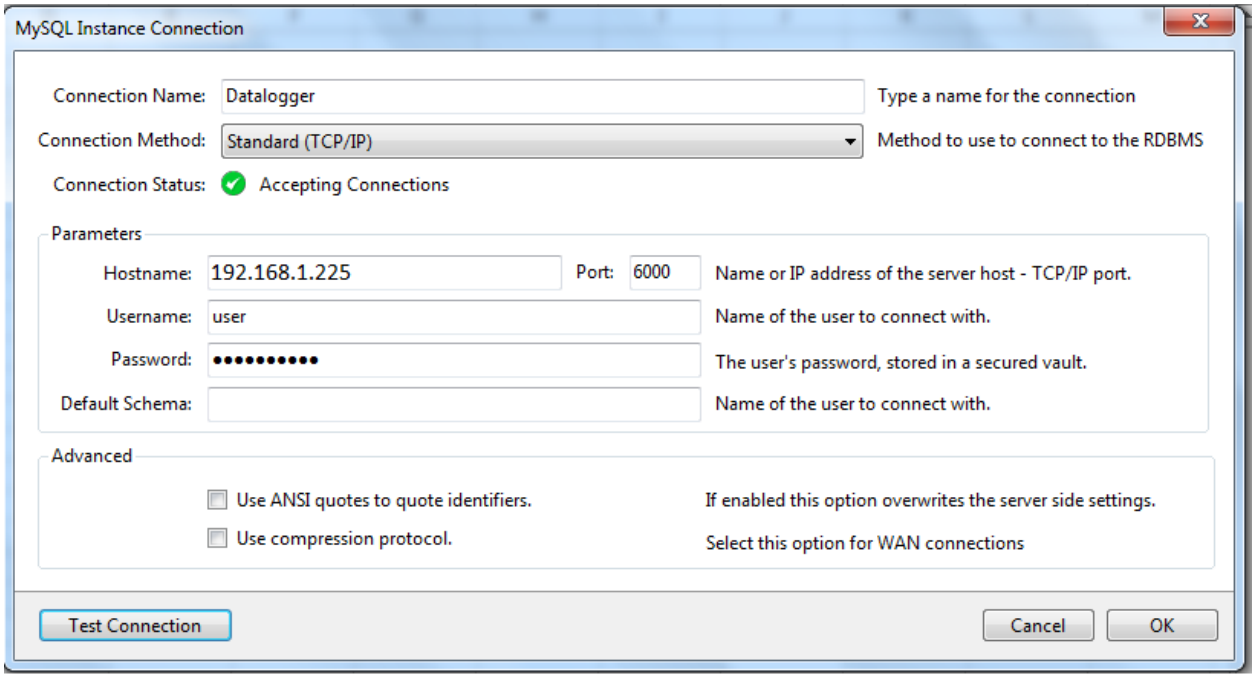
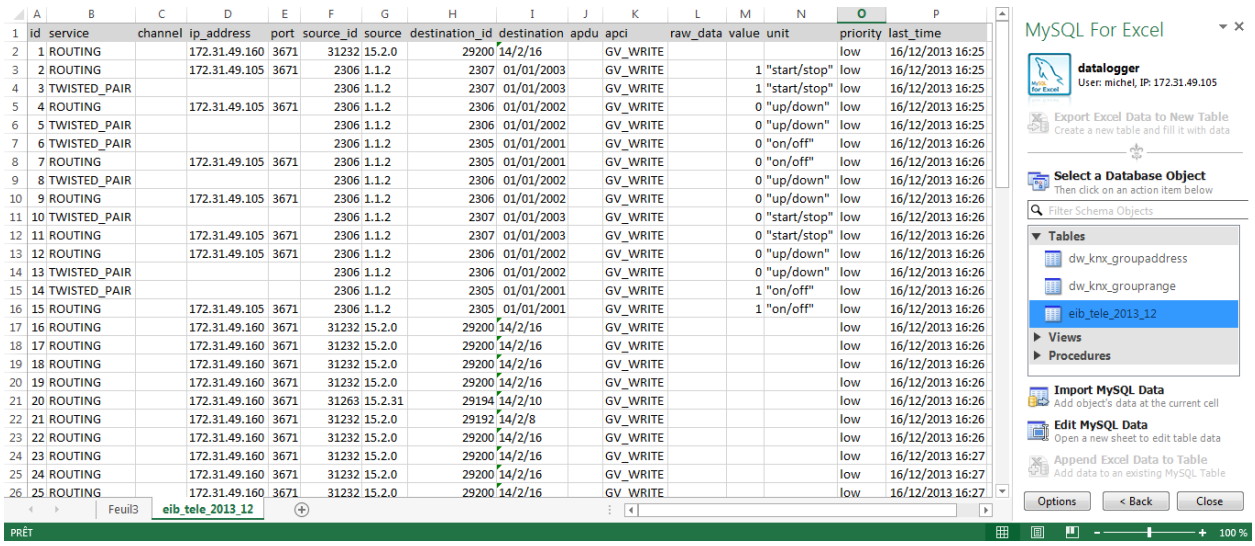


Figure 31: Add database connection

Click then on "Test Connection", a "Connection Success" window should appear. Click then on "OK".

Double click on your new connection (here named "Datalogger"). A database called "datalogger" should be there. Double click on it, you should see all tables available on the database. Click on one table you want to import in Excel and click on "Import MySQL Data". Another window should appear. Note that all columns are not available because Excel cannot deal with all MySQL data types. Moreover, it seems that it is not possible to prevent Excel for reformatting KNX group addresses into dates.

You see below an example of how look a database import in Excel.



id	service	channel	ip_address	port	source_id	source	destination_id	destination	apdu	apci	raw_data	value	unit	priority	last_time
1	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:25
2	ROUTING		172.31.49.105	3671	2306	1.1.2	2307	01/01/2003		GV_WRITE		1	"start/stop"	low	16/12/2013 16:25
3	TWISTED_PAIR				2306	1.1.2	2307	01/01/2003		GV_WRITE		1	"start/stop"	low	16/12/2013 16:25
4	ROUTING		172.31.49.105	3671	2306	1.1.2	2306	01/01/2002		GV_WRITE		0	"up/down"	low	16/12/2013 16:25
5	TWISTED_PAIR				2306	1.1.2	2306	01/01/2002		GV_WRITE		0	"up/down"	low	16/12/2013 16:25
6	TWISTED_PAIR				2306	1.1.2	2305	01/01/2001		GV_WRITE		0	"on/off"	low	16/12/2013 16:26
7	ROUTING		172.31.49.105	3671	2306	1.1.2	2305	01/01/2001		GV_WRITE		0	"on/off"	low	16/12/2013 16:26
8	TWISTED_PAIR				2306	1.1.2	2306	01/01/2002		GV_WRITE		0	"up/down"	low	16/12/2013 16:26
9	ROUTING		172.31.49.105	3671	2306	1.1.2	2306	01/01/2002		GV_WRITE		0	"up/down"	low	16/12/2013 16:26
10	TWISTED_PAIR				2306	1.1.2	2307	01/01/2003		GV_WRITE		0	"start/stop"	low	16/12/2013 16:26
11	ROUTING		172.31.49.105	3671	2306	1.1.2	2307	01/01/2003		GV_WRITE		0	"start/stop"	low	16/12/2013 16:26
12	ROUTING		172.31.49.105	3671	2306	1.1.2	2306	01/01/2002		GV_WRITE		0	"up/down"	low	16/12/2013 16:26
13	TWISTED_PAIR				2306	1.1.2	2306	01/01/2002		GV_WRITE		0	"up/down"	low	16/12/2013 16:26
14	TWISTED_PAIR				2306	1.1.2	2305	01/01/2001		GV_WRITE		1	"on/off"	low	16/12/2013 16:26
15	ROUTING		172.31.49.105	3671	2306	1.1.2	2305	01/01/2001		GV_WRITE		1	"on/off"	low	16/12/2013 16:26
16	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:26
17	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:26
18	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:26
19	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:26
20	ROUTING		172.31.49.160	3671	31263	15.2.31	29194	14/2/10		GV_WRITE				low	16/12/2013 16:26
21	ROUTING		172.31.49.160	3671	31232	15.2.0	29192	14/2/8		GV_WRITE				low	16/12/2013 16:26
22	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:26
23	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:27
24	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:27
25	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:27
26	ROUTING		172.31.49.160	3671	31232	15.2.0	29200	14/2/16		GV_WRITE				low	16/12/2013 16:27

Figure 32: Import database in Excel

4 UPDATE

The software update is for free but can be executed within one hardware variant.
If the software update of a newer hardware should be used the hardware has to be updated too. This is not a simple update but an upgrade; this will be charged and the device has to be sent in to b.a.b-technologie gmbh.

Before updating, do not forget to create a backup of your configuration so that you will just need to restore it with the new version of Datalogger (see “backup / restore configuration”).

When a new version of Datalogger is available on our website, you can update it. Copy the update archive on a USB stick (be sure the usb stick has been properly unmount before plugging it out), and plug it on the Datalogger. In the LCD menu go to “Update” and press twice “OK” to confirm.

A complete update takes about 45 min, an error message will be displayed in case of problem.