



BAB TECHNOLOGIE GmbH

DATALOGGER V2

Documentation

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EN



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1

DATALOGGER V2

Product:	DATALOGGER V2
Application:	Gateway and data logging
Type:	REG (top hat rail mounting; width: 4TE)

The **DATALOGGER** is a top hat rail device with a maximum power consumption of 5W. It is used for data logging and acts as the gateway between the Ethernet and the KNX TP (Twisted Pair) bus. The internal database has a capacity of more than 18 million KNX telegrams.

Any required software and hardware settings are saved in the **DATALOGGER**. **DATALOGGER** operations do not require any additional software (except for a web browser).

The **DATALOGGER** has a web interface for configuration and administration.

In addition, the **DATALOGGER** offers various services which can be individually configured. Using these services, you can adapt your data logging to your needs.

The **DATALOGGER** also has a KNX IP router function. KNXnet/IP routing and tunnelling services can be activated and used independently of one another.

1.1 FUNCTIONAL OVERVIEW

DATALOGGER configuration does not require any specific software. A PC with a web browser is all you need for the basic settings.

The following services and configurations are set via the web interface:

- network configuration
- general information and settings (name, installation location, device data, date and time)
- mail configuration
- database configuration
- KNX configuration
- activating and deactivating KNXnet/IP tunnelling and routing
- automatic sending of data in XLS, XML, CSV or SQL format (daily, weekly or monthly)
- export of data in XLS, CSV, XML or SQL format
- analysis and creation of charts
- monitoring of KNX group addresses, KNX devices and IP users (as of version 1.2.4)



1.2 TECHNICAL DATA

Article No.: 10411 (KNX)

- Operating voltage: 12-32V DC
- Typical power consumption 300 mA at 12V DC
- Power consumption: ≤ 5 W
- Connection: Power supply via screw-type terminal
- Resistant to climate: EN 50090-2-2
- Ambient temperature: -5 to +35 °C
- Rel. humidity (non-condensing): 5% to 80%

Mechanical data

- Assembly: Modular device (REG) housing 4 TP
- Dimensions (W x H x D) in mm: 72 x 90 x 63
- Housing: Plastic
- Degree of protection: IP20 (according to EN 60529)

Interfaces:

- Ethernet over RJ-45 female connector
- KNX®/TP connection
- 2x USB 2.0

Software requirements

- Operating System independent
- Communication: Network interface
- Browser: current browser

1.3 GENERAL INFORMATION ON THIS 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.



1.4 SCOPE OF DELIVERY AND INTERFACES

The scope of delivery of DATALOGGER includes the following content:

- 1x DATALOGGER V2 KNX
- 1x enclosed CD

A power supply unit for the DATA LOGGER is NOT included in the scope of delivery!

In addition to the connection for the power supply (**12-32 V DC**), the DATALOGGER has the following interfaces:

- 1x RJ 45 Ethernet 100Mbit/s Full Duplex
- 2x USB 2.0
- KNX® / TP connection

FACTORY SETTING ON DELIVERY:

IP address: 192.168.1.225
Username: "admin"
Password: "admin"

1.5 UPDATES

We reserve the right to offer firmware updates free of charge for the DATALOGGER. We inform you about new firmware in our newsletter or on our homepage. The update files are available in the download section on our homepage.

www.bab-tec.de

1.6 IMPORTANT INFORMATION ON THE OPERATING INSTRUCTIONS

We reserve the right to make technical and formal changes to the product in the interests of technical progress. The information in this documentation may therefore not necessarily be up to date. Information on current DATALOGGER firmware and on this description ("DATALOGGER documentation") can be found at

www.bab-tec.de.



2 INSTALLATION AND CONFIGURATION

For initial operation of the device actually valid security information has to be paid attention to. For commissioning besides the usual peripherals (power supply, network, KNX bus), may also be a PC with a network connection and a patch or crossover cable is required.

Important note: Before you disconnect the power supply, please shut down the DATA LOGGER via its web interface first (Configuration/System)!

Do not turn off the DATA LOGGER without shutting down the database service!

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 – 32 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 12-32 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 (EMV-guideline)
- EN 50082-2 (EMV-guideline)
- EN 50090-2-2 (EMV-guideline)

! 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 DATA LOGGER 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 DATALOGGER OVERVIEW

The following picture illustrates DATALOGGER V2.

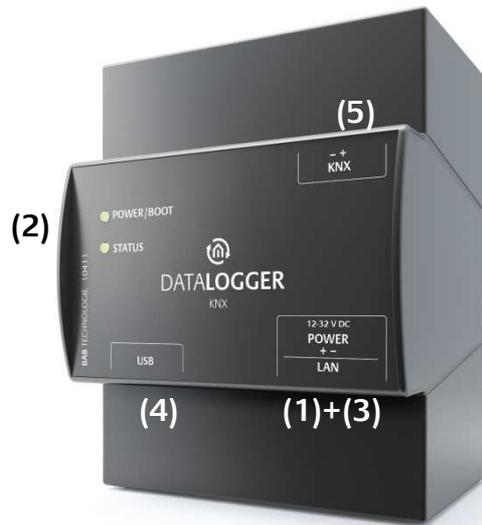


Figure 1: DATALOGGER overview

- (1) Voltage supply: 12-32 V DC (direct voltage)
- (2) Status LEDs
- (3) RJ45 female connector for Ethernet LAN
- (4) 2x USB female connector
- (5) KNX/TP bus terminal

MAINS CONNECTOR

The mains adapter is connected at the bottom right corner of the DATALOGGER (front view). Please note the admissible voltage and polarity!

Important notice: Please shut down the DATALOGGER via the web interface (under configuration / system) before disconnecting it from the power supply. Do not disconnect the DATALOGGER until you have shut down the database service!

KNX BUS (TWISTED PAIR) CONNECTION

The KNX/TP bus connector is at the top right corner of the DATALOGGER. It is used for the KNX TP bus. Please ensure correct polarity!

SIGNAL LEDS



Figure 2: Status LEDs

POWER/BOOT LED (1)

- During booting, the POWER/BOOT LED alternates between orange and green.
- The POWER/BOOT LED changes to green once the DATALOGGER has been completely booted and is ready for operation.

STATUS LED (2)

- The status LED lights up green once the DATALOGGER has been completely booted and is ready for operation.
- After having booted the DATALOGGER, the status LED is permanently lit in the form of two quick successive beats (heart beats) with a subsequent short break.
This is also an indication of the DATALOGGER utilisation: the higher the frequency of the flashing LED, the higher the utilisation of the DATALOGGER.

DURING AN EXPORT TO USB

If the status LED slowly flashes red, the export to the USB medium has been started and is currently running.

Fast flashing in red indicates an error, the export has failed (possibly due to full storage). The LED will keep flashing until you remove the USB medium.

If the export finishes successfully, the status LED will quickly flash green. After removing the stick the status LED will resume normal blinking, indicating a heartbeat.

USB FEMALE CONNECTORS

The DATALOGGER is equipped with two USB female connectors. They are arranged at the left side next to the LAN and the voltage supply connection of the DATALOGGER. Both USB connectors can be used for data export.



2.3 INSTALLATION

In order to avoid any unnecessary risks, please observe the following instructions for installation and initial operation.

ATTENTION!

Please make sure that the DATALOGGER is not protected against polarity and surge voltage.

GENERAL

Ambient conditions

Operating voltage:	12 - 32 Volt DC
Power consumption:	<= 5 W
Resistance to climate:	according to EN 50090-2-2
Ambient temperature:	0 - 45°C
Rel. humidity (non-condensing):	5% - 80%

Connecting the device

Simply snap the DATALOGGER onto a top hat rail according to DIN EN 60715.

Voltage supply

When establishing the power supply, please make sure that sufficient power is available. Connect the power supply unit to the screw-type terminals according to the marking.

Network

LAN access is required for DATALOGGER programming. This may be implemented either via an existing LAN or via a direct connection (between PC and DATALOGGER).

Client PC requirements

A network-compatible PC is required for DATALOGGER operations. The PC must have a current browser.

ETS

The DATALOGGER does not require an ETS application. It is not necessary to program the bus coupler. However, the KNX group addresses with corresponding data types are required for DATALOGGER use. For their import to the DATALOGGER, the KNX project as of ETS version 4 is required.



ADDITIONALLY FOR KNX

To provide ideal operating conditions, the **DATALOGGER** should be connected to the KNX bus.

Connecting the device

- Connect the bus line to the bus terminal.
- Switch on the bus voltage.

READINESS FOR OPERATION

Once everything is connected, you can switch on the **DATALOGGER**. To check correct installation, wait until the device is completely booted. This will take approximately 2 minutes. Watch the LEDs at the front to this end. The green **POWER/BOOT** LED must constantly light up after booting.

LANGUAGE

Web interface

The language used for the **DATALOGGER** web interface depends on the language set in the browser. Currently, the languages German and English are provided in the **DATALOGGER**. If the browser is set to a language other than German or English, English is used for the **DATALOGGER** interface.

SYSTEM REQUIREMENTS

- Current browser (e.g. Firefox, Chrome, Safari, etc.)

2.4 INITIAL OPERATION

When the **DATALOGGER** 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 comfortable via the web interface.

ACCESS DATA FOR THE WEB INTERFACE

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

- Default IP address => **192.168.1.225**
- Subnet Mask => **255.255.255.0**
- Standard Username => **admin**
- Default Password => **admin**

ESTABLISH CONNECTION

In order to configure the **DATALOGGER**, a current browser and a network connection to the device are required. If the device is in the condition of delivery, it can be accessed at the above-mentioned IP address and the network settings must be adjusted to the address range, where necessary. Please follow the information given in the chapter "[Adjust the network settings of your computer](#)" for this purpose.

2.4.1.1 ACCESS THE DATALOGGER WEB INTERFACE

The **DATALOGGER** is configured via its web interface so that it can be configured via each web browser. In order to call up the web interface, please proceed as described below:

- Open a browser and enter the IP address of the **DATALOGGER** into the address line (Information about the factory settings can be found in chapter "[2.4 INITIAL OPERATION](#)")

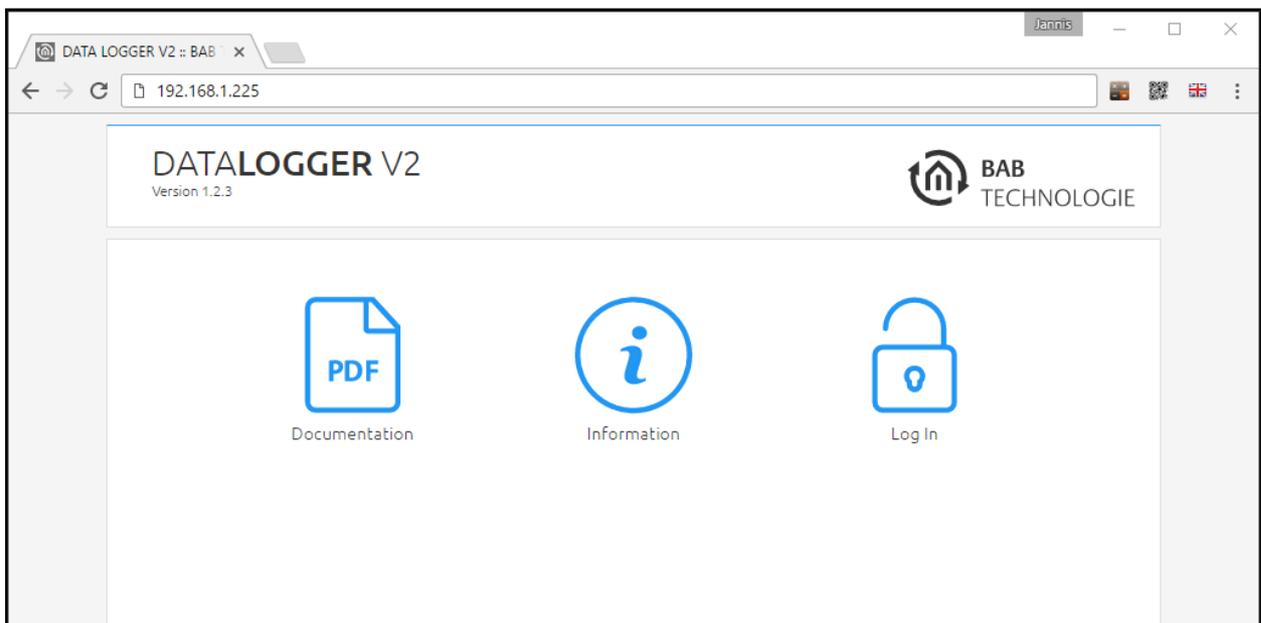


Figure 3: **DATALOGGER** start page



- You will reach the DATALOGGER start page. The "Login" unlocks the "Configuration" Functions whereas "Information" shows general system information.
- Use the user data to log in to the web interface: "Log In". (Information on the authorisation settings can be found in chapter "[2.4 INITIAL OPERATION](#)")
- You can then also access the "Configuration" menu item. See chapter 3.2 "CONFIGURATION" ITEM

After successfully logging in, the following sections are available.

- DATALOGGER V2
 - Configuration
 - Information
 - Log Out
- To return to the main menu, just click on the header graphic or the BAB TECHNOLOGIE logo.

2.4.1.2 FIND THE DATALOGGER IN THE NETWORK USING THE BAB STARTER

If you do not know the network settings of the device, the BAB STARTER can help you to find out with which IP address the device is available. The software is available for Windows and MAC systems and can be found on the supplied CD or at www.bab-tec.de in the download section. For detailed information, please observe the separate documentation with respect to BAB STARTER!

BAB STARTER INSTALLATION

For Microsoft Windows you receive a *.zip file to download. For MAC OS X, a *.mpkg file is available.

Note: A detailed description for BAB STARTER can be found in the related documentation on the supplied CD or can be downloaded at www.bab-tec.de.

Windows installation

- Run "BAB_STARTER_[Version]_setup.exe" to start the installation.
- Follow the instructions in the InstallShield Wizard and click on "Continue".
- In the end, confirm the installation with "Finish".

Thereafter, the BAB STARTER can be found in the Windows Start menu folder "BAB TECHNOLOGIE GmbH".

MAC OS installation

- Double click on "BAB STARTER_[Version].mpkg".

Note: It is possible that your system will advise you of a non-verified developer. In this regard, please note the information on the "[Apple Gatekeeper](#)"; see: <https://support.apple.com/de-de/HT202491> (as of 5 October 2015)

- Follow the instructions of the installation process and click on "Continue" to continue the installation.

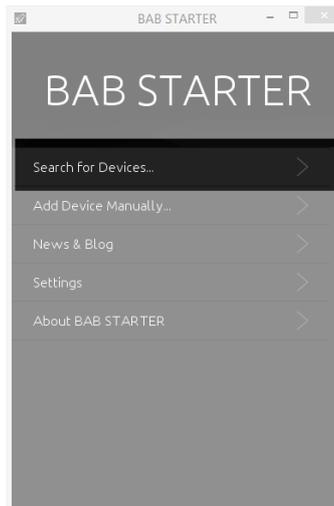
The message "The installation was successful" confirms the successful installation. The BAB STARTER icon now appears in the "Programs" folder.

RUN BAB STARTER

Click on the BAB STARTER program icon to start the application



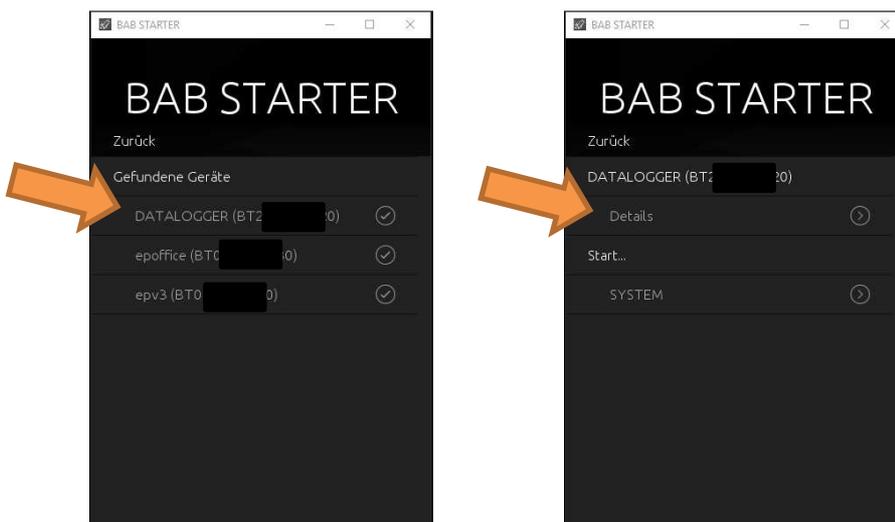
To display all active BAB devices in the network, click on the "Search for Devices..." menu after you have called up the STARTER.



DEVICES IN THE FOREIGN NETWORK AREA

Whether a device is in the network area of your computer is highlighted by the contrast intensity of the entries. If the entry is displayed with low contrast, the device is not in the same network area (subnet) and cannot be reached without changes.

To learn more about the network settings of the device, click on the respective entry and then on "Details".



The following display shows the serial number, firmware and IP address (host).



- To bring the device into the network area of your computer, please proceed as described in chapter "*ADJUST THE NETWORK SETTINGS OF YOUR COMPUTER*".

DEVICES IN THE SAME NETWORK AREA

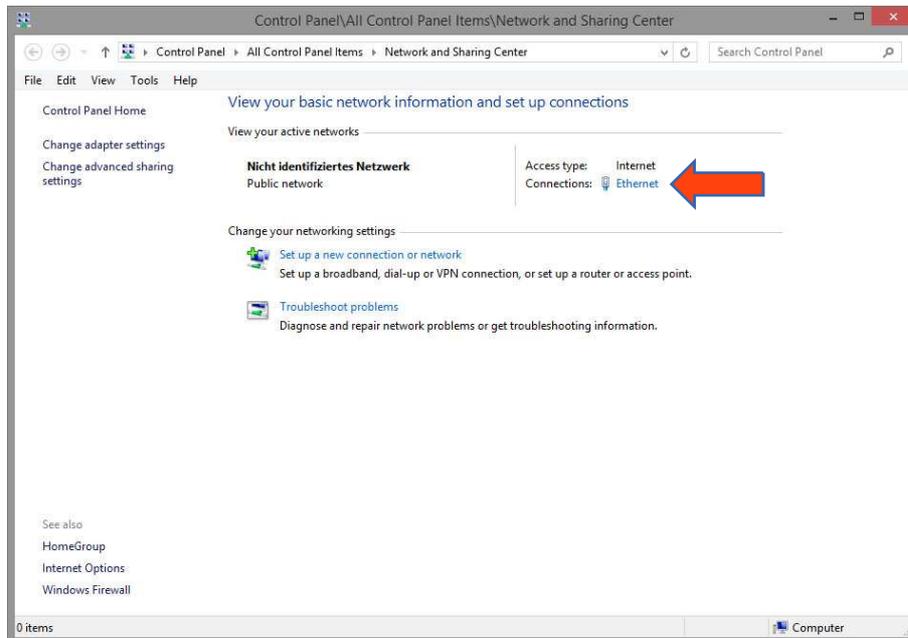
If check mark is visible, this means that the device is in the same network area (subnet) and can be accessed immediately.

Click on the entry so that the next menu opens. Apart from the device details, you can access the SYSTEM here, which leads you to the configuration surface of the DATALOGGER.

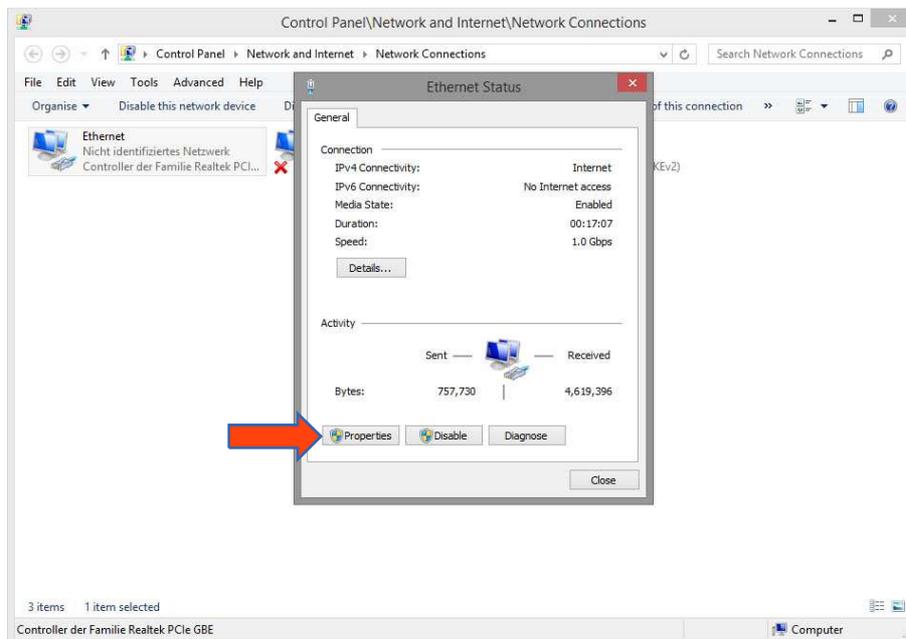
2.4.1.3 ADJUST THE NETWORK SETTINGS OF YOUR COMPUTER

In order to adjust the network settings of your computer and establish a connection to the device, please proceed as described below:

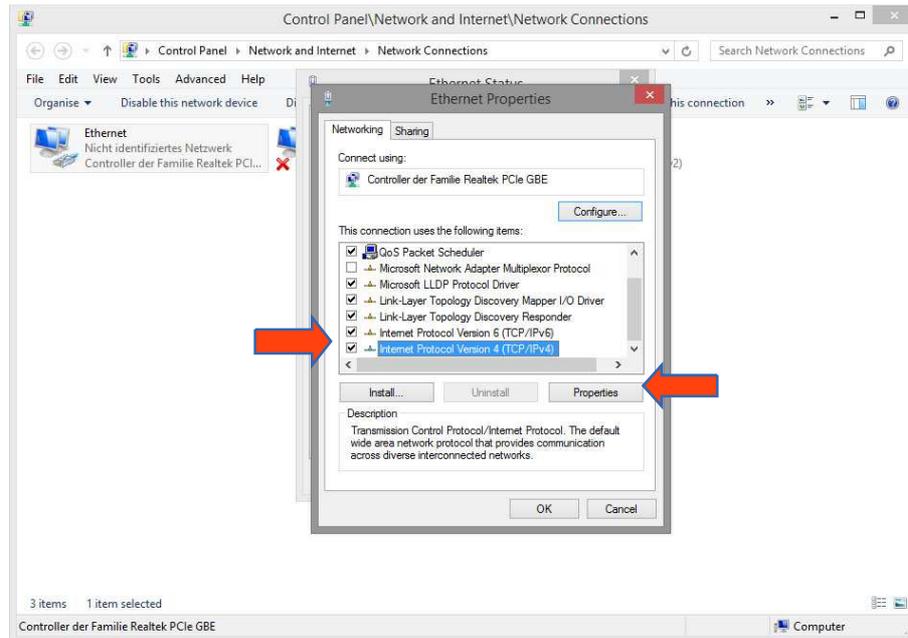
- Open the IP address settings (under Windows 7):
- Click "Start Button" --> "Control Panel" --> "Network"
- Select "Network Connection", then "LAN Connection" ("Intel PRO1000 GT" in the figure below).



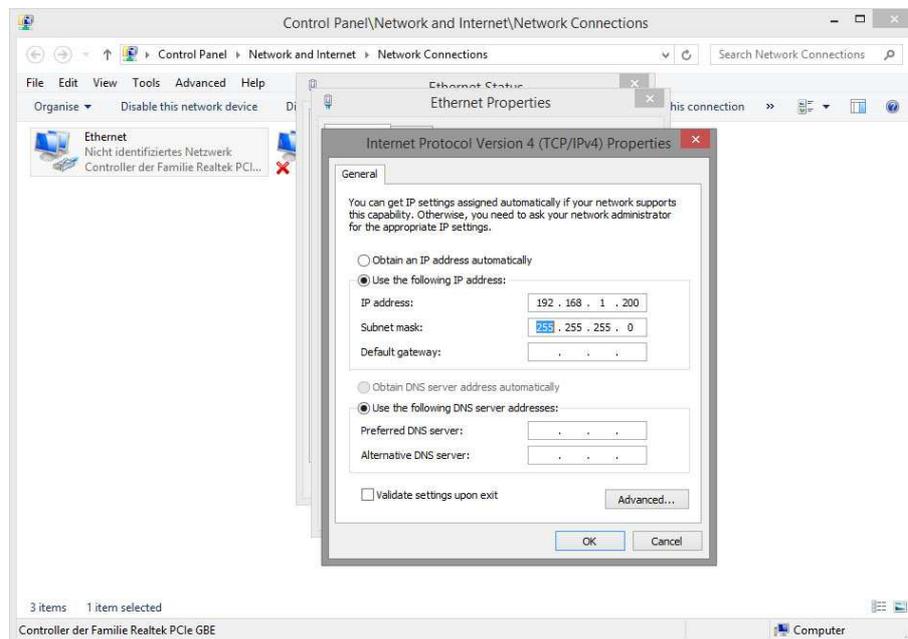
- Then click "Properties":



- Select "Internet protocol Version 4 (TCP/IPv4)" and click "Properties" again:



- Now note down the current IP address settings or take a screenshot in order to ensure that you can reset the IP address setting following the configuration of the DATALOGGER.
- Now change the IP address settings (IP address and subnet mask) as required:



Example of a valid configuration for the factory settings of the DATALOGGER:

- Free IP address: 192.168.1.228
- Subnet mask: 255.255.255.0
- Now confirm your input with "OK".
- Close all windows until the "Windows Network and Sharing Center Settings" window is shown.

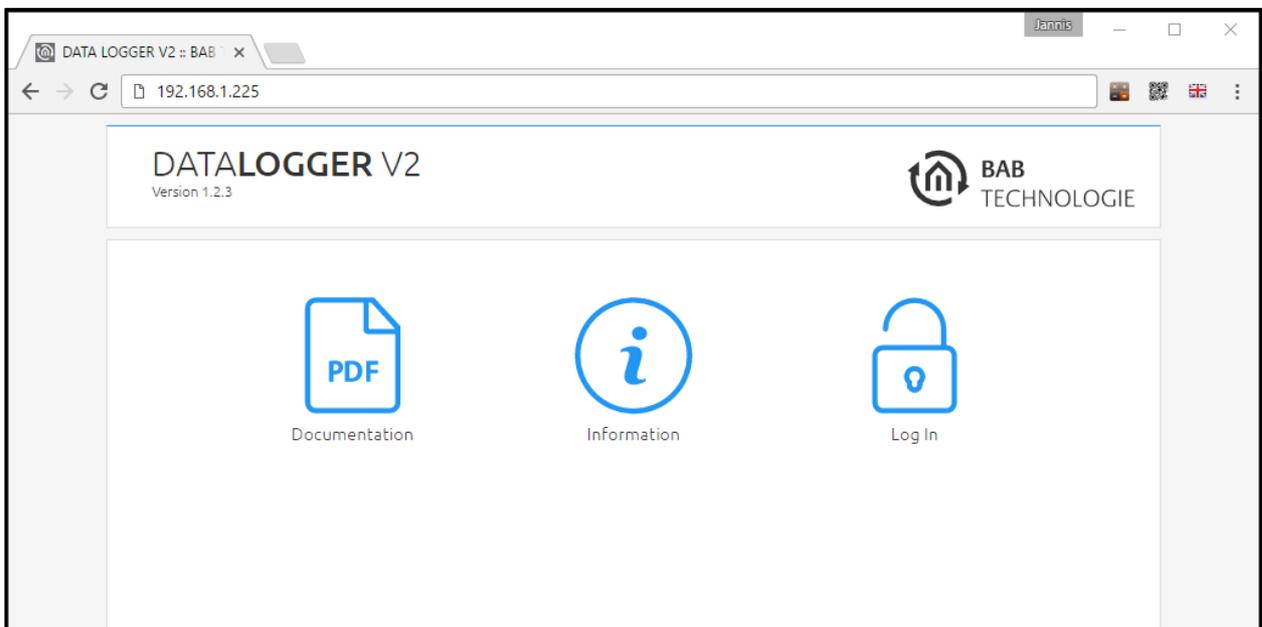
Thus, you have adjusted the network settings of your PC to those of the DATALOGGER. You can access the web interface of the DATALOGGER by means of the browser. Restore the original network settings of your PC by following the steps described above as soon as you have configured the DATALOGGER correspondingly.

If the IP address of your PC and your DATALOGGER are in the same network mask, you can continue with the configuration.

2.4.1.4 ADJUST THE NETWORK SETTINGS OF THE DATALOGGER

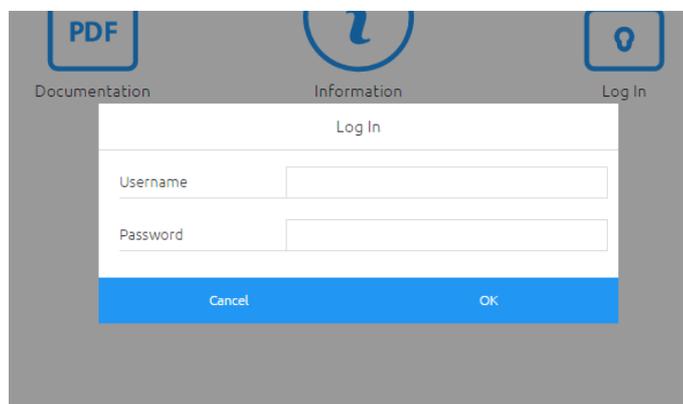
If the network prerequisites have been created, you can now access the configuration of the DATALOGGER in order to adjust the network settings to the local requirements there. To do this, please proceed as described below:

- Enter the IP address of the DATALOGGER in the address line of your browser (for factory settings: 192.168.1.225).



- The start page of the DATALOGGER opens up. Click "Log In".
- A login dialog appears. For factory settings, the login data is as follows:

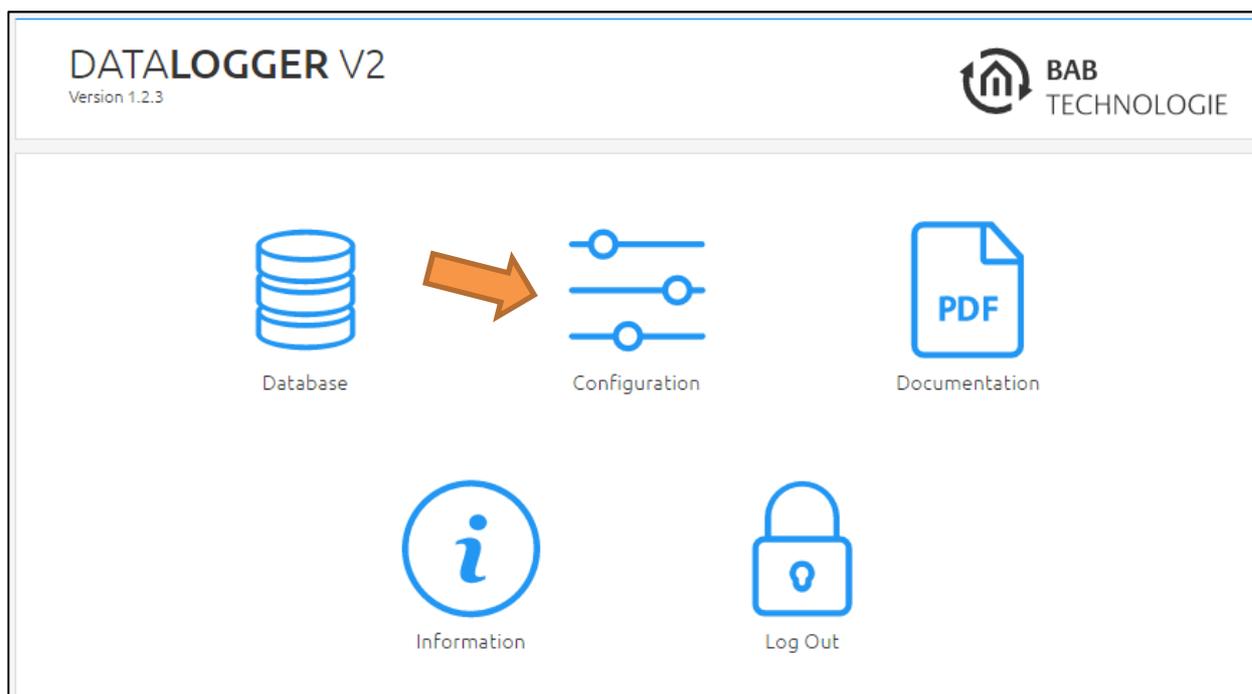
User name: **admin**
 Password: **admin**



Note: The password must be changed immediately when logging in for the first time. If the password is lost, the device cannot be reset!

Note: Logging in only works if the browser is authorised to save cookies!

- The view on the start page changes. You can now access the following levels:
 - Database
 - Configuration
 - Documentation
 - Information
 - Log Out
- In order to change the IP address of the DATALOGGER, please click "Configuration"



The configuration menu opens up. You can make the following settings in the "Network" menu item:

- DHCP:** If DHCP is active, the device automatically obtains the network settings. A DHCP server must be available in the local network.
- IP address / subnet mask / gateway:** Field for the static assignment of IP addresses. Please make also sure that the subnet mask (often 255.255.255.0) and the gateway entry are correct. (Often the IP address of the WLAN router).
Note: Without a correct gateway entry, the device will not be able to communicate with the Internet.
- DNS server:** DNS is the abbreviation for Domain Name System. The DNS server converts Internet addresses, for example "www.bab-tec.de" into the IP address "121.21.21.175" and vice versa. Without a valid DNS entry, NTP-, weather- or UPnP services do not work.
- NTP server:** NTP is a free service for synchronising the system time of Internet-compatible devices. If it is not possible to establish the connection to an NTP-Server, the system time must always be checked and adjusted manually (see menu "Configuration/General")
NTP-Server list: e.g. <http://www.pool.ntp.org/zone/europe>



DATALOGGER V2

Version 1.2.4

> Start > Configuration

✓ Save Configuration

General

Network >

KNX

Services

Email Account

Monitoring

Internal Database

External Database

User Administration

Backup / Restore

System

Network

DHCP

IP Address 192.168.1.225

Netmask 255.255.255.0

Gateway 192.168.1.1

DNS Server

DNS Server #1 192.168.1.1

DNS Server #2 8.8.8.8

DNS Server #3

NTP Server

NTP Server #1 0.de.pool.ntp.org

NTP Server #2

NTP Server #3

Check IP address

IP address / Hostname: 192.168.1.1

Ping

✓ Save Configuration

Change the IP address settings as required. **In order to save the settings made, click "Save Configuration".** The server in the device is restarted, the browser automatically connects to the new IP address if possible.

Note: Please bear in mind that you might have to reset the IP address of your computer to the initial value in order to be able to access the DATA LOGGER after the change has been made.

Specialty when activating DHCP

If you have activated DHCP for the DATALOGGER according to the steps mentioned above, please use the BAB STARTER like depicted in the chapter “*Find the DATALOGGER in the network using the BAB STARTER*” to find out the current IP-address.

3 DATALOGGER MENU

Description of each item in the main menu in the listed order.

3.1 DATABASE ITEM

DATABASE EXPORT (DOWNLOAD VIA THE WEB INTERFACE)

In the menu under “DATALOGGER” > “Database export”, the export is configured and started. Start the export with “Start export”.

The screenshot shows the DATALOGGER V2 web interface. The page title is "DATALOGGER V2" with the version "Version 1.2.4". The logo for "BAB TECHNOLOGIE" is in the top right. The breadcrumb navigation is "> Start > Database". The left sidebar has "Database Export" selected. The main content area is titled "Database Export" and contains several configuration options:

Export	Telegrams
Range	Current Month
Columns	All
Export Addresses	All
Format	CSV (.csv)
Compression	None

Below these options is a "Start Export" button. Underneath is a section titled "Clean Up Database" with a "Delete oldest ..." dropdown set to "Month" and a "Delete" button.

By pressing “**Export**” (see illustration on this page) you define the data which are to be exported. You have the following options:

- Telegrams (recorded KNX telegrams from the table “eib_tele_<Year>_<Month>”)
- Address database (KNX group addresses from the table “dw_knx_groupaddress”)
- Topology database (KNX topology (address ranges) from the table “dw_knx_grouprange”)



The “**Range**” field defines the period range. You have the following options:

- Last day
- Last week
- Last month
- Own period, freely defined (with “from” “to” date)

The columns for export are selected under “**Column**”. You have the following options:

- All
- Select

These are the columns which are included in the database table (for further information please see chapter “4.2.1.3 Table „dw_knx_grouprange“”):

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

Under “**Export addresses**” (see figure on the previous page), the group address(es) whose telegrams are to be exported are defined:

- All (export all KNX group addresses)
- List (export of 10 group addresses max.)
- Area (export of an area of group addresses.
Example: Export of group address “1/1/1” to “1/1/21”)

Under “**Format**”, the file format of the exported data is selected:

- CSV (.csv file)
- Excel (.xls file)
- XML (.xml file)
- Complete database export in SQL format.
- Database export of the last month in SQL format.
- Backup of the complete database. This backup can be restored.
- Backup of the database of the previous month. This backup can be restored.

In the “**Compression**” field you can select whether data should be packed or not:

- None (do not pack data)
- ZIP (pack data in a ZIP archive)

Finally, the export is started by pressing the “**Start export**” button. The progress of the export is shown by the progress bar:



DELETING THE DATABASE

Since there is only limited memory capacity for the internal database, you will receive a mail once the database is full (only if an SMTP server is configured). If this is the case, you can delete data via the web interface.

If you do not manually delete data from the database, data are automatically deleted. The **DATALOGGER** initially deletes the oldest data. If this should be avoided, you can specify an external database with larger capacity in the **DATALOGGER**. In this case, the **DATALOGGER** does not only save data on an internal database but also on an external database.

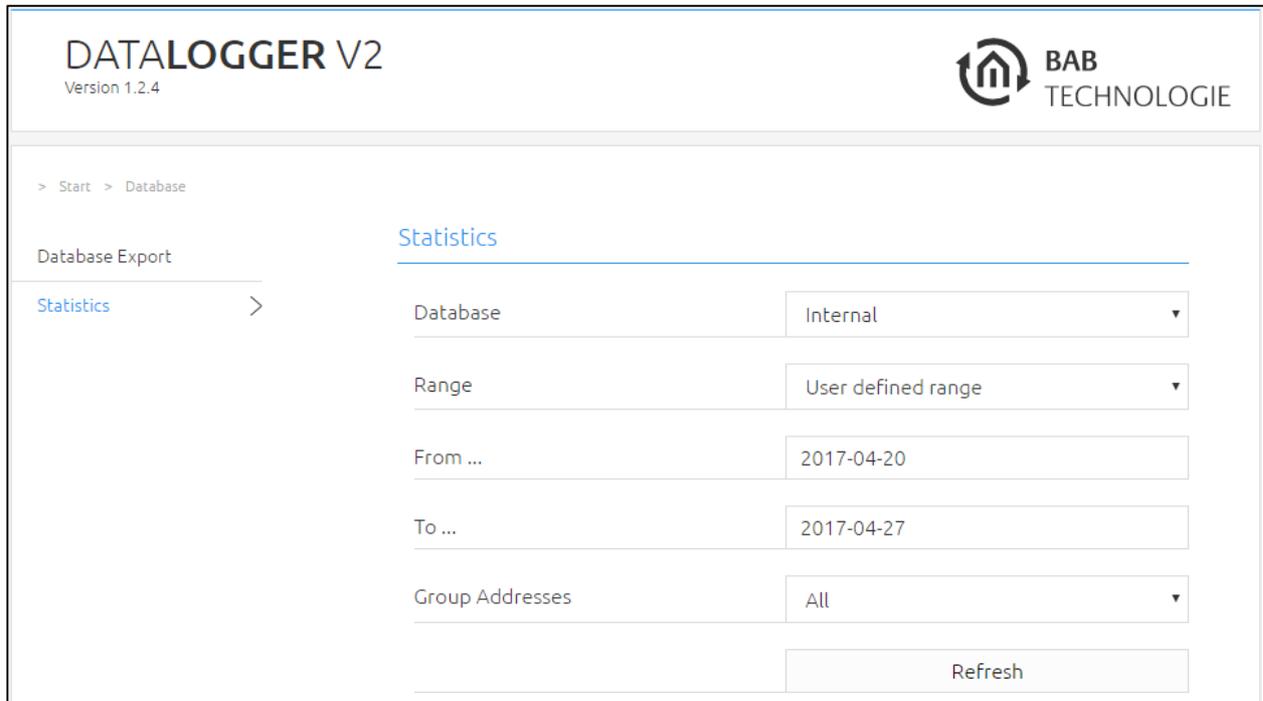
NOTE: The menu item “Delete the database” is on the web interface under “Database” > “Database export”.

STATISTICS

The **DATALOGGER** can generate a statistics about the internal and the external database. It is possible to define this statistics for a period and/or group addresses.

This statistics includes an overview of the number of all telegrams, the period and the date stamp of the oldest and the latest telegram.

The statistics is provided on the web interface under “DATALOGGER” > “Statistics”. Click on “Refresh” (see next figure) to generate the output. You can also create charts from this output.



The screenshot shows the 'Statistics' configuration page in the DATALOGGER V2 web interface. The page has a header with the product name and version, and the company logo. A breadcrumb trail indicates the user is in the 'Database' section. On the left, there is a sidebar with 'Database Export' and 'Statistics' (which is active). The main content area contains several configuration fields: 'Database' (set to 'Internal'), 'Range' (set to 'User defined range'), 'From ...' (set to '2017-04-20'), 'To ...' (set to '2017-04-27'), and 'Group Addresses' (set to 'All'). A 'Refresh' button is located at the bottom of the configuration area.

The “Database” field defines whether the “internal” database (in the **DATALOGGER**) or the “external” database is to be used to generate the statistics. Your own “Charts” can only be generated for the “internal” database (see “Own chart”).

The “Range” field defines the period of the data to be analysed. You have the following options:

- Last day
- Last week
- Last month
- Own period (if you chose this option, the “From ...” and “To ...” fields are shown)

In the “Group addresses” field, the group addresses for the statistics are selected:

- All (all KNX group addresses)
- List (list for 10 group addresses max.)
- Area (in this selection, the fields “From address” and “To address” are shown, e.g. “From address” = 1/1/1 and “To address” = 1/1/21)

With “Update”, you can start the analysis.

Once the analysis has been completed, the three fields “General”, “Range” and “Chart” are shown.



DATALOGGER V2

Version 1.2.4

BAB
TECHNOLOGIE

> Start > Database

Database Export

Statistics >

Statistics

Database	Internal	▼
Range	Current Month	▼
Group Addresses	All	▼
<input type="button" value="Refresh"/>		

General

Statistics generated	2017-04-27 15:12:13
First Telegram	2016-12-19 13:00:22
Last Telegram	2017-04-26 10:59:38
Total Count	4292651

Period

First Telegram	2017-04-01 00:00:06
Last Telegram	2017-04-26 10:59:38
Total Count	807092

Chart

Generate	All	▼	
Top	10		
Telegram per	Hour	▼	
Chart title	<input type="text"/>		
Group address list	<input type="text"/>		
	<input type="button" value="Add"/>	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
	<input type="button" value="Generate"/>		



GENERAL

The General field includes information on the complete (selected) database. This includes:

- The date on which the statistics was generated
- The time stamp of the first (oldest) telegram
- The time stamp of the last (latest) telegram
- The number of telegrams

PERIOD

This item shows the analysis over the user-defined period (over the last day, week, month or your own period). It is selected before generating the database. In addition to the period, the selected group addresses are also taken into account. This includes:

- The date on which the statistics was generated
- The time stamp of the first (oldest) telegram
- The time stamp of the last (latest) telegram
- The number of telegrams

for the specified period (see figure of the Statistics).

CHART

In the last item, you can select and configure the chart types. The following types of charts are possible (an explanation of the charts is provided in the following chapters):

- **Top X group addresses**
- **Top X physical addresses**
- **Telegram rate**
- **Own chart**

(the following fields are only shown if “All” and “Own chart” has been selected)

- “Chart title” - the name of the chart
- “List of group addresses” - these group addresses are used for the chart

Finally, the “**Generate**” button generates the charts.

3.1.1.1 TOP X: GROUP ADDRESSES

This pie chart shows the share of group addresses which were most frequently recorded by the DATALOGGER.

Select “Top X group addresses” in the “Generate” field. The “X” stands for the number of top list entries.

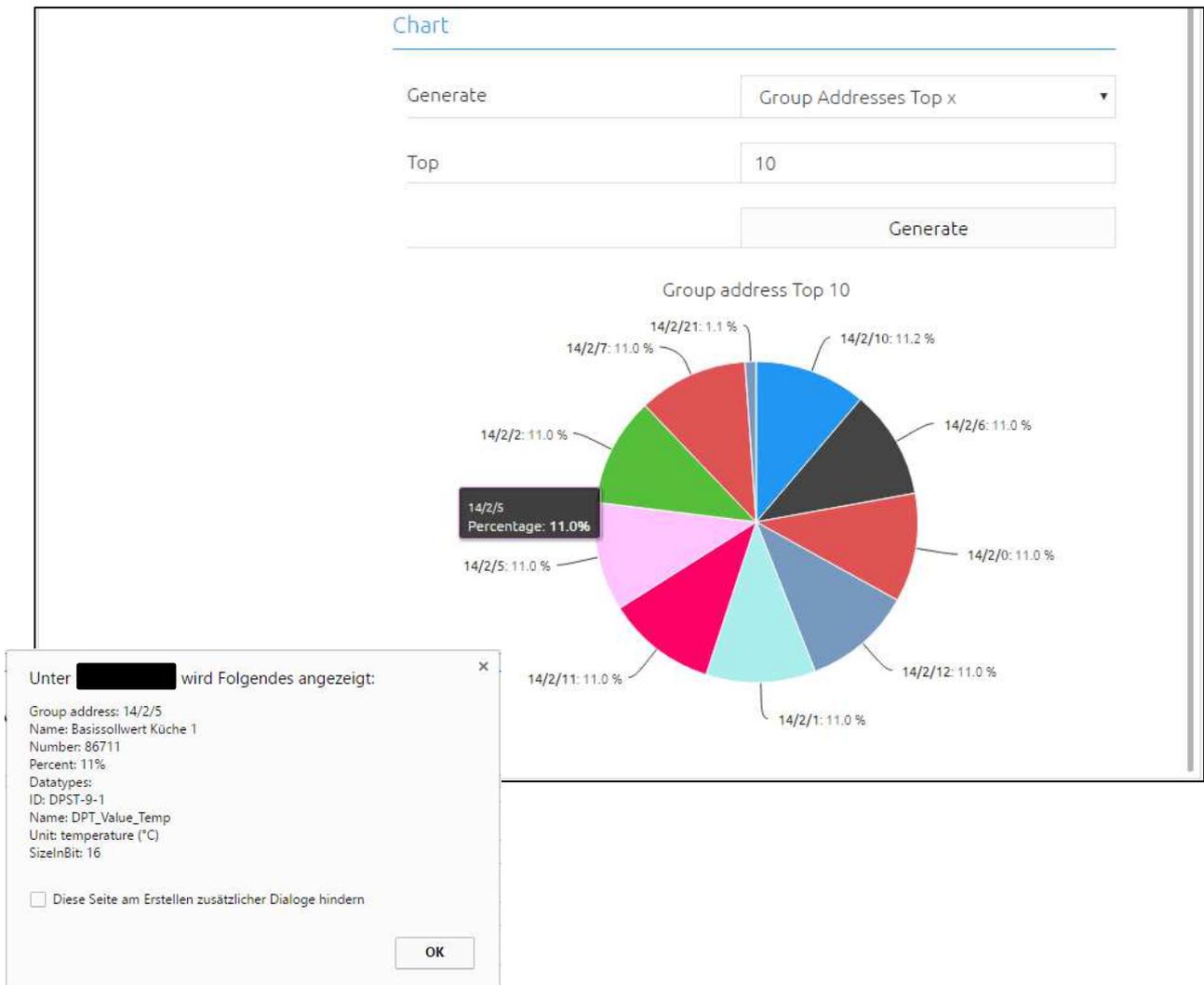
The “Top” field selects the number of top entries. In the figure, 10 is selected as an example. Thus, the first 10 group addresses which have been sent most frequently are illustrated in the pie chart (see next figure). You can enter numbers from 1 to 30.

The “Generate” button generates the chart.

The figure on this page shows the pie chart with the 10 most frequently sent group addresses in the specified period. The group addresses are listed in descending order.

IF the group address was parametrised in the ETS project, you can get additional information by clicking on the share of the pie chart. The following information text is provided in the information window:

- Group address
- Name
- Number (telegrams)
- Share (of the total number of telegrams) in per cent
- Data point type
- Name of the data point type
- Unit
- Size



3.1.1.2 TOP X: PHYSICAL ADDRESSES

This pie chart shows the share of physical addresses which were most frequently recorded by the DATALOGGER.

Select “Top X physical addresses” in the “**Generate**” field. The “X” stands for the number of top list entries.

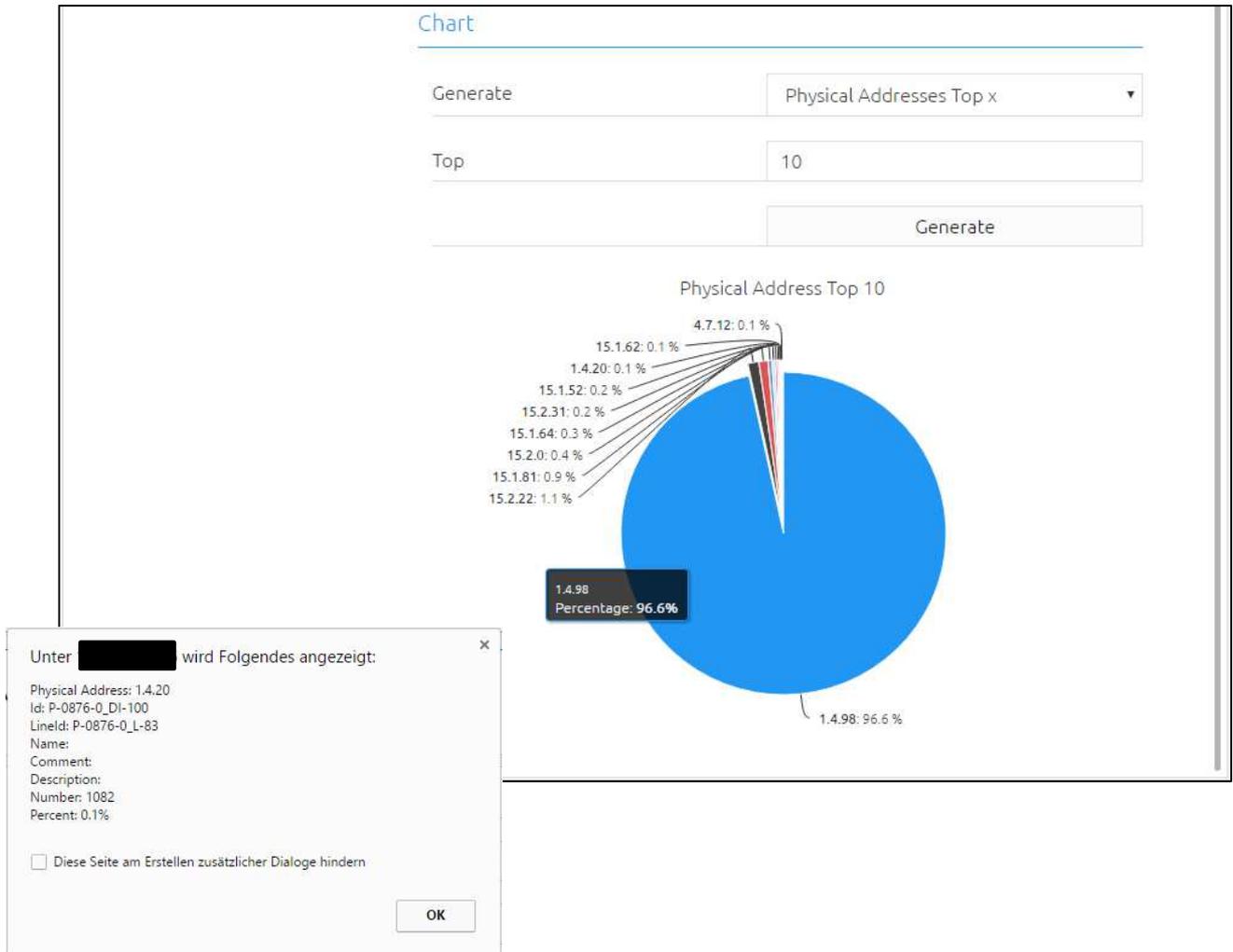
The “**Top**” field selects the number of top entries. In the figure, 10 is selected as an example. Thus, the first 10 physical addresses which have been sent most frequently are illustrated in the pie chart (see next figure). You can enter numbers from 1 to 30.

The “**Generate**” button generates the chart.

The figure on this page shows the pie chart with the 10 most frequently sent physical addresses from the specified period. The physical addresses are listed in descending order.

IF the physical address was parametrised in the ETS project, you can get additional information by clicking on the share of the pie chart. The following information text is provided in the information window:

- Physical address
- ID
- Line ID
- Name
- Comment
- Description
- Number
- Share (of the total number of telegrams) in percent



3.1.1.3 TELEGRAM RATE

In this chart, the telegram per hour/minute or second rate is illustrated.

Select “Telegram rate” in the “**Generate**” field.

“**Telegrams per**” The selection “Minute” and “Second” as a standard is only available if the period does not exceed one day.

For the telegram rate, you have the options of telegrams/hour, telegrams/minute and telegrams/second.

The “**Generate**” button generates the chart.

This chart shows the minimum, maximum and average telegram rate. Using the mouse, it is possible to zoom in on certain sections of the chart for further details. Press “Reset zoom” to restore the normal view of the chart (see next figure).

Click on the caption of the graph to hide it, and click again to show it (see next figure).





3.1.1.4 OWN CHART

If you select Own chart, you can create your own chart. A maximum of 4 group addresses can be specified.

Select “Own chart” in the “**Generate**” field. Your own chart is only available for the internal database.

Enter the name of the chart under “**Chart title**”. In the example, you can see a temperature chart with the title “DATALOGGER TEST”.

In the “**Group address list**” field, the group addresses for the chart are shown. A maximum of 4 group addresses is allowed. The collected values of these group addresses from the defined period form the chart. The group addresses are created, edited or deleted using the “**Add**”, “**Edit**” and “**Delete**” buttons. If you press the “Add” button, a selection window opens up where you can select the group address (see next figure).

The new selection window only shows group addresses which are also parametrised in the ETS project with a data point type. The DATALOGGER requires this information so that the values can be correctly converted for the chart.

Once the desired group address is selected by a mouse click, “OK” will acknowledge your selection adding the group address to the list.

All selected group addresses should have the same file type. In this example, it is possible e.g. to add a lux value to the (temperature) chart. However, the DATALOGGER issues an error message.

Press “**Generate**” to generate the chart (see figure on the next page).

Illustrated according to the specified group address from the “Group address list”. Thus, you can, for example, directly compare both group addresses.

In this chart, too, you can zoom in on a section of the chart, or show and hide individual graphs.



Chart

Generate Own chart

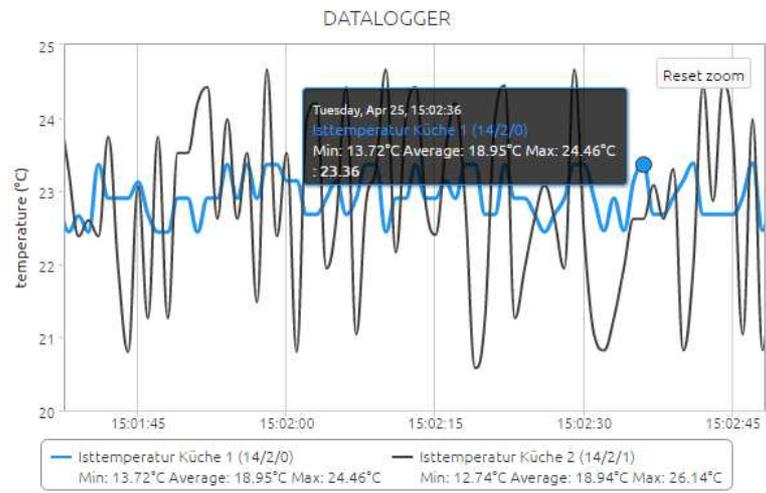
Chart title: DATALOGGER

Group address list

Isttemperatur Küche 1 (14/2/0)
Isttemperatur Küche 2 (14/2/1)

Add Edit Delete

Generate

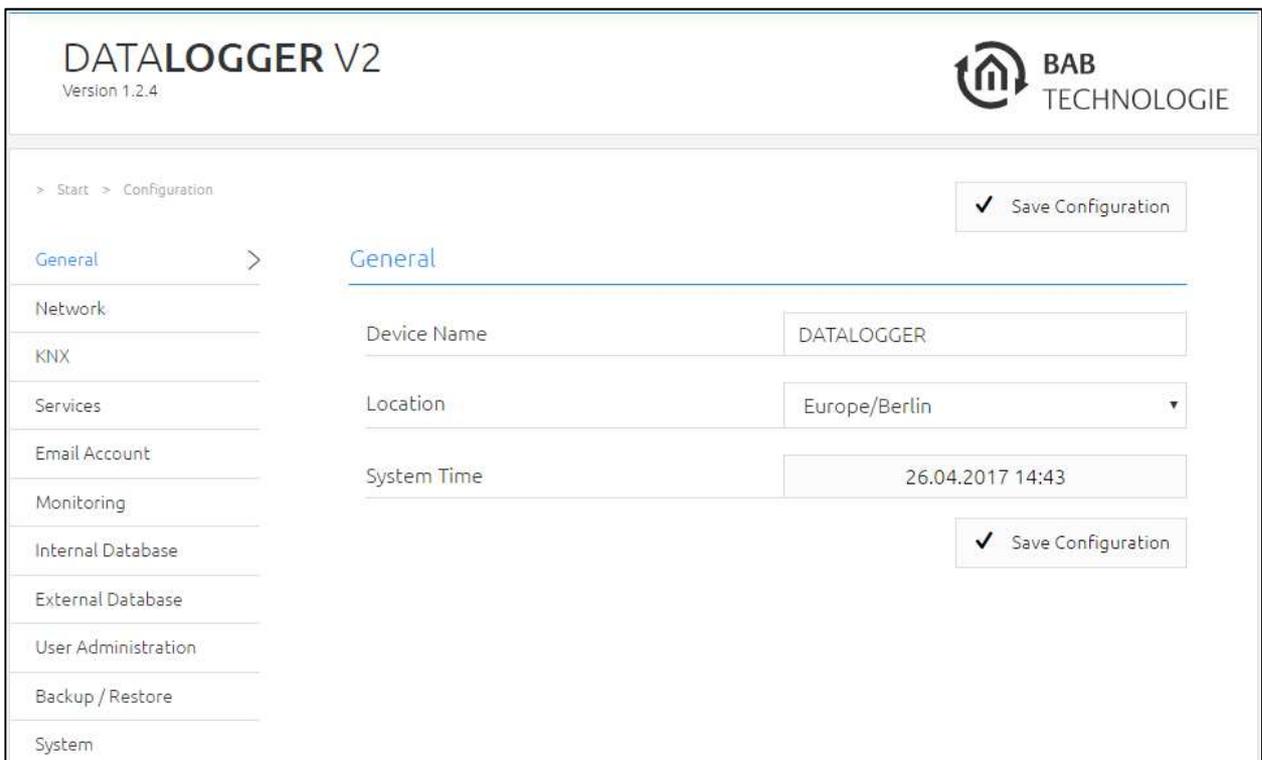


3.2 “CONFIGURATION” ITEM

The following configuration areas are provided in this item:

- General
- Network
- KNX
- Services
- Email
- Monitoring
- Internal database
- External database
- User administration
- Save settings
- System

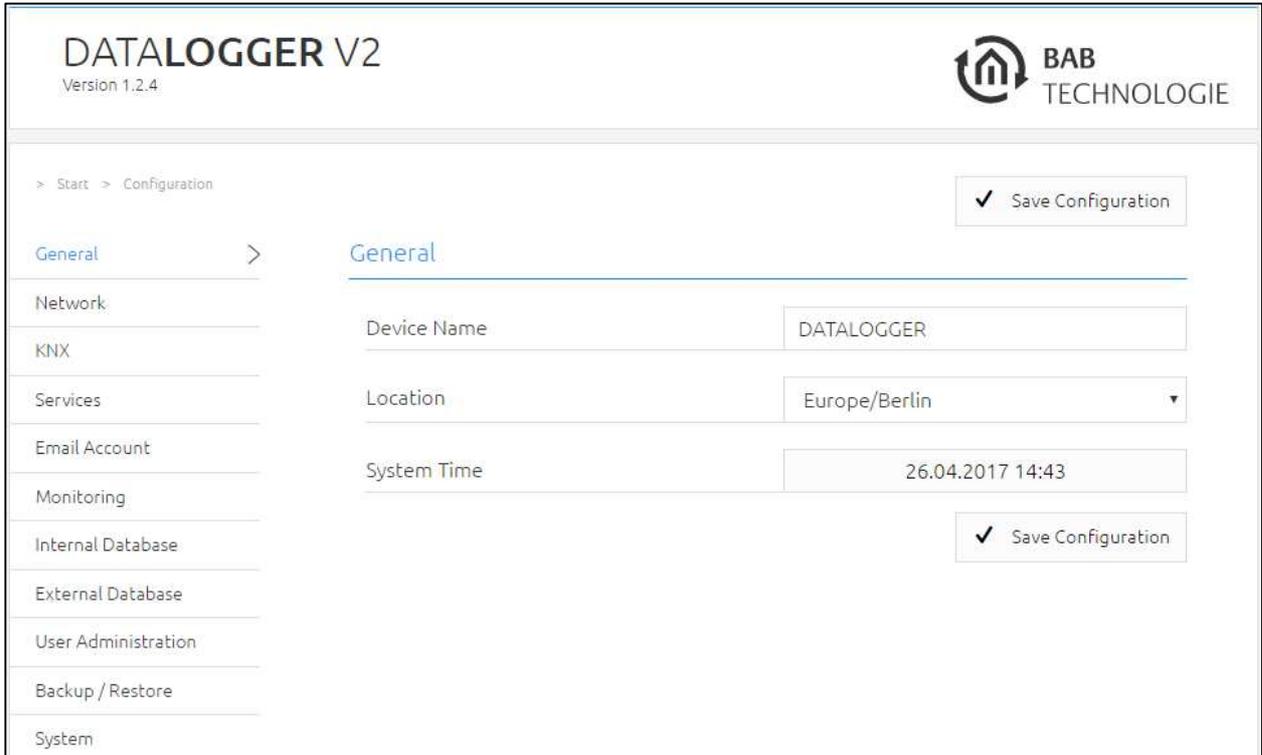
Changed settings are not saved until you press the “Save configuration” button in the DATA LOGGER



The screenshot shows the 'DATALOGGER V2' web interface, Version 1.2.4, with the 'BAB TECHNOLOGIE' logo. The breadcrumb path is '> Start > Configuration'. A 'Save Configuration' button with a checkmark is visible in the top right. On the left, a sidebar menu lists configuration categories: General (selected), Network, KNX, Services, Email Account, Monitoring, Internal Database, External Database, User Administration, Backup / Restore, and System. The main content area is titled 'General' and contains three settings: 'Device Name' (text input with value 'DATALOGGER'), 'Location' (dropdown menu with value 'Europe/Berlin'), and 'System Time' (text input with value '26.04.2017 14:43'). A second 'Save Configuration' button with a checkmark is located at the bottom right of the settings area.

GENERAL

General settings are configured under “Configuration” and “General”.



The screenshot displays the DATALOGGER V2 configuration interface. At the top left, it shows 'DATALOGGER V2' and 'Version 1.2.4'. At the top right is the 'BAB TECHNOLOGIE' logo. Below the header, there is a breadcrumb trail '> Start > Configuration'. A 'Save Configuration' button with a checkmark is located in the top right corner. On the left side, there is a vertical menu with options: General, Network, KNX, Services, Email Account, Monitoring, Internal Database, External Database, User Administration, Backup / Restore, and System. The 'General' option is selected and highlighted. The main content area is titled 'General' and contains three configuration fields: 'Device Name' with the value 'DATALOGGER', 'Location' with a dropdown menu set to 'Europe/Berlin', and 'System Time' with the value '26.04.2017 14:43'. A second 'Save Configuration' button with a checkmark is located at the bottom right of the configuration area.

Device name

Specify a unique device name so that you can distinguish the DATALOGGER from other BAB TECHNOLOGIE devices, if any. The device name is shown in the DiscoveryTool and in the BAB STARTER.

Installation location

The installation location primarily determines the local system time of the device. Adjust it to the correct time zone.

System time

The current system time of the device is shown. By clicking the button, the system time of the device is synchronised with that of the PC. For automatic time synchronisation, up to three NTP time servers can be entered at the “Network” configuration section.



NETWORK

In the "Network" menu item, several changes can be made, for example changes to the IP address, DNS server or the NTP server. In addition, the DHCP function can be switched on / off.

DATALOGGER V2

Version 1.2.4

> Start > Configuration

✓ Save Configuration

General

Network >

KNX

Services

Email Account

Monitoring

Internal Database

External Database

User Administration

Backup / Restore

System

Network

DHCP

IP Address

Netmask

Gateway

DNS Server

DNS Server #1

DNS Server #2

DNS Server #3

NTP Server

NTP Server #1

NTP Server #2

NTP Server #3

Check IP address

IP address / Hostname:

✓ Save Configuration

DHCP

If the DHCP function is active, the **DATALOGGER** automatically obtains the network settings. A DHCP server must be available in the local network.



IP address / network mask / gateway

If DHCP is not active, the network settings must be carried out statically. In case of doubt, contact your network administrator as to which settings are to be carried out. Please note that an IP address may never be assigned twice in a local network.

DNS server 1-3

DNS is the abbreviation for Domain Name System. The DNS server converts Internet addresses (e.g. www.bab-tec.de) into the IP address (e.g. 99.199.99.199) and vice versa. Neither NTP service nor mail traffic can be carried out without a valid DNS entry.

NTP server 1-3

NTP is a free service for synchronising the system time of Internet-compatible devices. If time synchronisation is not possible, please check the system time of the **DATALOGGER** on a regular basis. See chapter "General"!

NTP server list: e.g. <http://www.pool.ntp.org/zone/europe>

CHECKING THE IP ADDRESS

The **DATALOGGER** is in the position to check whether IP addresses and host names can be accessed in the network and in the Internet or not. Enter the IP addresses or host names to be checked in the "IP address / host name" text field. Press the "Ping" button to start the check. Any entered address which is available is indicated by a green rectangle with the message "Found". Any address which cannot be accessed is indicated by a red rectangle with the message "Not found".



KNX

The KNX-specific settings of the DATALOGGER are made in the "KNX" menu.

DATALOGGER V2

Version 1.2.4

> Start > Configuration ✓ Save Configuration

- General
- Network
- KNX >
- Services
- Email Account
- Monitoring
- Internal Database
- External Database
- User Administration
- Backup / Restore
- System

ETS-Project

Current Project

DATALOGGER Test 🗑️

Latest Change

10/7/2016, 5:25:41 PM

📄 Select Project File

Upload selected project

KNX Date / Time

Group Address Date

0/5/1

Group Address Time

0/5/2

KNX

Physical Address

4.7.23

KNXnet/IP Tunneling Address

4.7.123

4.7.223

Add
Edit
Delete

Group Address format

3 Level (xx/y/zzz) ▼

Check KNX physical address

Physical address:

4.7.11

Check



KNX DATE / TIME

The **DATALOGGER** can also synchronise its time settings via the KNX bus. The group addresses for the date and time of a KNX time transmitter are entered here.

Physical address

Enter the physical address which is to be used by the **DATALOGGER** in KNX. Please make sure that the physical address corresponds to the line and does not occur twice.

KNXnet/IP tunnelling address

This address is used by the internal KNXnet/IP server for a KNXnet/IP tunnelling connection established to the device (e.g. for using the **DATALOGGER** as a programming interface). Please note that this address must not be the same as the physical address (see above) and that it must not be used by any other participant in the line either.

Uploading the ETS project

ETS4 and ETS5 can export files with the ending “.knxproj”. These files include information on the KNX project. In ETS, you have the option to precisely define the data type.

NOTE: For switch actuators, you can thus enter e.g. “on” / “off” instead of the values “0” / “1”. The function for exporting these data is in the ETS menu under “Projects” > “Export”.

Via the web interface, the project file is directly imported to the database of the **DATALOGGER** so that any information is directly available.

By clicking on “Select project file”, a file dialogue opens up where the path to the .knxproj file is indicated. Complete the upload by clicking on “Upload selected project”.

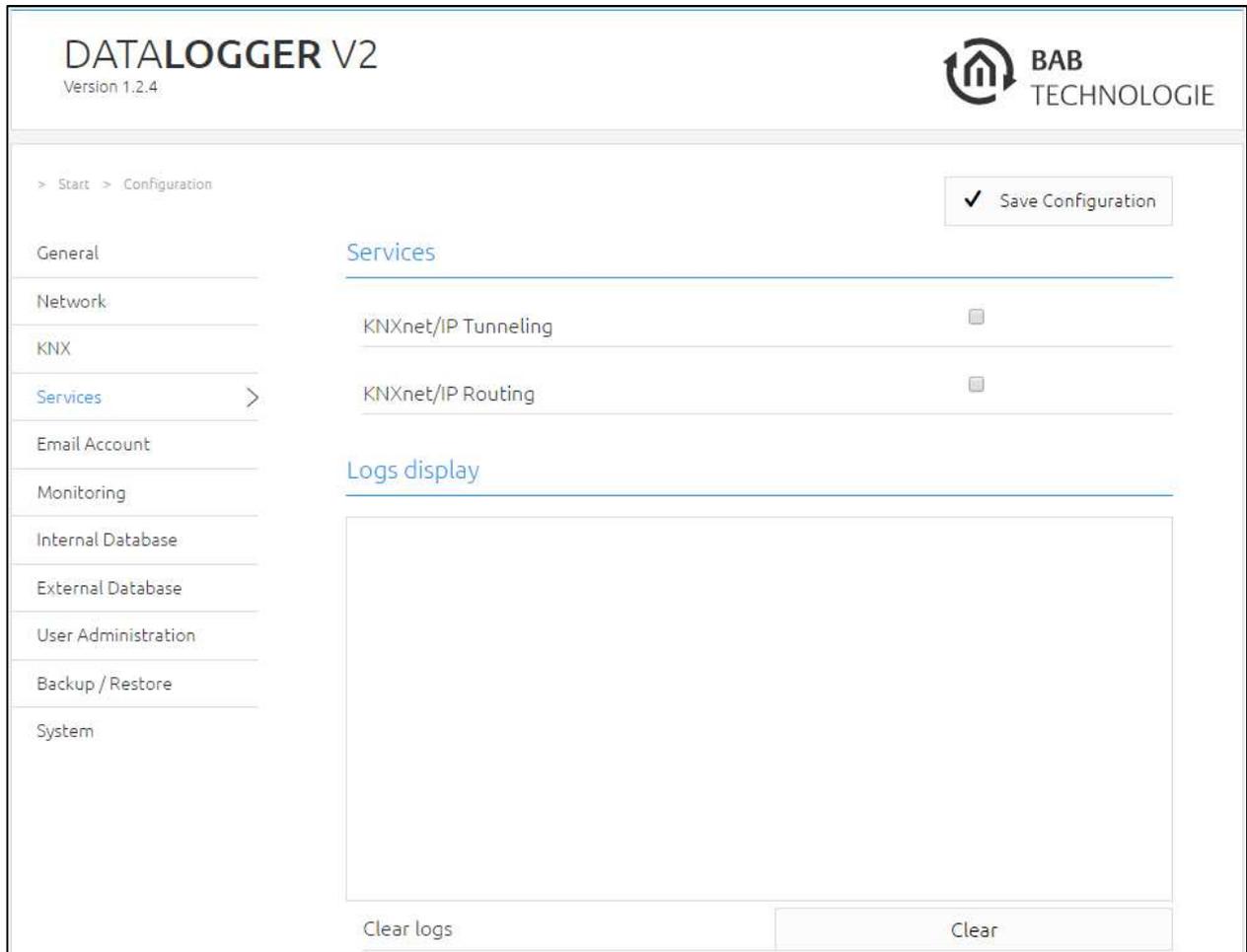
By uploading the .knxproj file, you also import the KNX topology to the database. This includes the data point types of the group addresses. In addition, the tables “dw_knx_groupaddress” and “dw_knx_grouprange” (see “Database overview”) include the KNX topology.

CHECKING THE PHYSICAL ADDRESS

The **DATALOGGER** is in the position to check whether physical addresses are available in the KNX bus or not (according to the same principle as ETS). Enter the physical address to be checked in the text field. Press the “Check” button to start the function. Any entered KNX participant which is available is indicated by a green rectangle with the message “Found”. Otherwise, a red rectangle with the message “Not found” appears.

SERVICES

The KNXnet/IP routing and tunnelling logs can be activated/deactivated in the web interface under “Configuration” > “Services”



KNXnet/IP Routing

Activates KNXnet/IP routing for coupling lines and areas via IP. Can only be activated if the physical address corresponds to that of a line or area coupler. KNXnet/IP routing is based on multicast, and all participants send to a multicast group 224.0.23.12. Since multicast packages are usually not transferred by routers, "routing" only works within a subnet.

KNXnet/IP tunnelling

Activates the KNXnet/IP tunnelling access to the device. This connection can be used to program KNX devices or to exchange data. In this context, the **DATALOGGER** is the server. The above-mentioned address is used as the physical address for the connection. For each address, only one connection can be established at any one time. On the TCP/IP layer, the connection is made by means of unicast to UDP port 3671.

Logs

The log messages are issued at the bottom section of this view. The messages include errors, warnings or information text. A maximum of hundred entries are logged with a time stamp. These entries are removed with the “Delete” button.

EMAIL ACCOUNT

The configurations for the mail traffic can be made on the web interface under “Configuration” > “Email”. An SMTP server must be configured for the DATALOGGER to be able to send mails.

The screenshot shows the DATALOGGER V2 web interface. The top left corner displays "DATALOGGER V2" and "Version 1.2.4". The top right corner features the "BAB TECHNOLOGIE" logo. A breadcrumb trail indicates the current location: "> Start > Configuration". A "Save Configuration" button with a checkmark is visible in the top right. On the left side, a navigation menu lists various settings categories: General, Network, KNX, Services, Email Account (highlighted with a right-pointing arrow), Monitoring, Internal Database, External Database, User Administration, Backup / Restore, and System. The main content area is titled "Email: Account Settings" and contains the following fields:

- SMTP Server: [Empty text input field]
- SMTP Port: [Text input field containing "25"]
- TLS: [Dropdown menu showing "DISABLED"]
- From Name: [Empty text input field]
- From Address: [Empty text input field]
- Use Authentication: [Toggle switch, currently off]
- Username: [Masked text input field]
- Password: [Masked text input field]
- Repeat Password: [Masked text input field]
- Realm: [Empty text input field]
- Max. Attachment Size: [Dropdown menu showing "500KB"]

Below the account settings, there is a section titled "Email: Send test Email" with a "Test recipient" text input field and a "Send test Email" button.

SMTP server

Here, the name of the SMTP server (outbox server) must be entered, e.g. mail.gmx.net

SMTP Port

Here, the port used by the SMTP server must be entered.



TLS

With this entry you can select whether the SMTP server requires an encoded connection.

Name of sender

The email is sent under this name.

Address of sender

The email is sent under this email address. This email address (“From Address”) is the same time the address to which the DATALOGGER will send monitoring notifications and information.

Authentication used

Depending on the SMTP server, authentication is required. If authentication is required, the entry must be activated.

User name

With this user name (SMTP server. name of the email account), the DATALOGGER logs in to the SMTP (outbox server).

Password

Here, the password for the user login (SMTP server) is entered. To avoid typing errors, the password must be entered twice.

Realm

Some providers require the “Realm” entry. It is used for authentication in order to allocate the user to a defined area. Contact your outbox server provider or administrator for further information.

Maximum attachment size

It is possible to define the maximum size of the attachment. If this size is reached when sending the email, the DATALOGGER will split the attachment and send it with a new mail until all data are sent. This is to ensure that the attachment is not larger than the maximum permissible size. A sequential number and the total number of mails (i.e. the number of mails generated by the DATALOGGER after having split the attachment) is added in the subject line.

Test recipient and sending test mail

Before saving the mail configuration, you can send a test email. The recipient of the test email is entered in the “Test recipient” field. Press the “Send test email” button to start sending the test email. If the email arrives, it can be assumed that the SMTP configuration and network settings are correct.

Note: A connection to an email server can only be established with valid DNS entries. Emails can only be sent if the DATALOGGER can convert names.

The network configuration is under “Configuration” > “Network”.



MONITORING (AS OF VERSION 1.2.4)

This menu item is under “Configuration” > “Monitoring”. The following figure shows the complete configuration menu.

The screenshot displays the DATALOGGER V2 configuration interface. At the top left, it says "DATALOGGER V2" and "Version 1.2.4". At the top right is the "BAB TECHNOLOGIE" logo. A navigation menu on the left lists various configuration options: General, Network, KNX, Services, Email Account, Monitoring (highlighted with a right arrow), Internal Database, External Database, User Administration, Backup / Restore, and System. The main content area is titled "> Start > Configuration" and includes a "Save Configuration" button with a checkmark. The interface is divided into three sections for monitoring:

- Monitoring of group addresses:** Features a "Monitored Addresses:" label, an empty text input box, and "Add", "Edit", and "Delete" buttons.
- State of the monitored group addresses:** Features an empty text input box.
- Monitoring of physical addresses:** Features a "Monitored Addresses:" label, an empty text input box, and "Add", "Edit", and "Delete" buttons.
- State of the monitored physical addresses:** Features an empty text input box.
- Monitoring of IP addresses:** Features a "Monitored Addresses:" label, an empty text input box, and "Add", "Edit", and "Delete" buttons.
- State of the monitored IP addresses:** Features an empty text input box.



3.2.1.1 MONITORING OF GROUP ADDRESSES (AS OF VERSION 1.2.4)

This type of monitoring can be used to trigger a message if a rule is no longer fulfilled. Rules can receive (telegram) values of group addresses and compare them with entered limit values. Once the rule is no longer fulfilled, a message is triggered in the form of an email. Another email is sent as soon as the value drops back below the limit.

MONITORED ADDRESSES

This list shows all created addresses which are monitored. Up to 50 addresses can be monitored.

A new monitoring can be created by pressing the “Add” button. If you press the “Edit” button, the selected address is opened and changes can be made. Pressing the “Delete” button will remove the selected address.

For a new rule (by adding), the **group address** (for the telegram value), a **limit value** and a **comparative operation** (" \leq " or " $>$ ") are required.

The last input is a **group address for reset**. The group address for manually resetting the message. The DATALOGGER does not send any further emails as long as the alarm condition remains the same, i.e. until the message is reset.

The message is not automatically reset until there is a value which does not fulfil the condition (example: “Alarm value ≥ 1 ” does only send exactly one email, no matter how often a 1 is received in a row. Only a 0 followed by a 1 would trigger further emails.).

Important:

It is necessary to import the ETS project file including the group addresses to be monitored. It is also necessary to allocate the correct data point type to the devices, communication objects and group addresses in the ETS project.

Without these data, the correct interpretation of the raw data is not possible. THUS, it is not possible for the DATA LOGGER to check the conditions whether they are true or false.

Press “OK” to save and activate the configuration. Once the DATALOGGER **has received** a KNX telegram on the indicated group address and thus no longer fulfils the rule, a message is triggered. The rules are listed in the window “Condition of the monitored group addresses”.

NOTE: The monitored items are not shown in the list until the DATALOGGER has received the group address for the first time (after having created the monitoring).

CONDITION OF THE MONITORED GROUP ADDRESSES

The conditions including the current status are shown as an entry (line). Each entry includes the following information on the message:

- allocated name (of the group address in the ETS project) and group address
- value
- limit value
- data point type
- unit

All messages with time stamp and telegramvalues are listed in the list (pull-down menu). This list can be deleted for each entry by pressing the “Delete date” button.



Each time a telegram has been received by an entered group address, the **DATALOGGER** updates the monitoring conditions. If the condition is fulfilled (comparison is not fulfilled), the entry remains green. If, however, the indicated condition is fulfilled, the colour changes from green to red.

NOTIFICATION

Example: The limit value indicated for the address 5/1/2 is 30°C. The **DATALOGGER** receives the temperature value 32.5°C on this group address, which exceeds the limit value. Thus the condition is fulfilled and a message is triggered.

Once the message has been triggered, the corresponding entry changes its colour from green to red. At the same time, the **DATALOGGER** generates an entry in the list, thus saving the time when the message has been triggered.

Then, if the appropriate function is configured, the **DATALOGGER** sends an email including any corresponding information.

A further email is sent as soon as this message is no longer available, i.e. once the condition is fulfilled again.



3.2.1.2 MONITORING OF PHYSICAL ADDRESSES (AS OF VERSION 1.2.4)

This function cyclically monitors whether physical addresses whether are available or not.

MONITORED ADDRESSES

This list (of physical addresses) shows all created monitored addresses. Up to 50 physical addresses can be monitored.

A new monitoring can be created by pressing the “Add” button. If you press the “Edit” button, the selected address is opened and changes can be made. Pressing the “Delete” button will remove the selected physical address.

For a new rule, the physical address which is to be checked and which triggers a message if not available is entered in the field “Monitored physical address”. The cycle is defined by the next two fields. The following is possible:

- Every X minutes (“Check all”). This means that every X minutes a check is carried out (possible from 15 to 59 minutes).
- Every X hours. This means that every X hours a check is carried out (possible from 1 to 23 hours).
- Daily (“Check at”) at X o’clock. X is the time (in hours and minutes) at which the physical address is to be checked each day.

Press “OK” to save and activate the configuration.

Condition of the monitored physical addresses

The field “Condition of the monitored physical addresses” shows the list of all created monitoring addresses. The colours “green” and “red” indicate whether the physical address is available or not. Each line includes the following information:

- physical address
- time stamp of the message

The time stamp (in the pull-down menu) shows the date and the time when the message has occurred. If the time stamp field is empty, there has not yet been any message. The “Clear date” button will delete all entries.

Notification

If a message has been triggered, the corresponding entry changes its colour from green to red. At the same time, the DATALOGGER generates an entry in the list thus saving the time when the message has been triggered.

Then, if the appropriate function is configured, the DATALOGGER sends an email including any corresponding information.

A further email is sent as soon as this message is no longer available, i.e. once the condition is fulfilled again.

Note: The entered physical address is checked immediately when saving the configuration. This can also trigger a message.



3.2.1.3 MONITORING OF IP ADDRESSES (AS OF VERSION 1.2.4)

This function cyclically monitors IP addresses whether they are available or not.

MONITORED ADDRESSES

This field shows a list (IP addresses) of all created monitoring addresses. Up to 50 IP addresses can be monitored.

A new monitoring can be created by pressing the “Add” button. If you press the “Edit” button, the selected address is opened and changes can be made. Pressing the “Delete” button will remove the selected IP address.

For a new rule, the IP address which is to be checked and which triggers a message if not available is entered in the field “Monitored IP addresses”. The cycle is defined by the next two fields. The following is available:

- Every X minutes (“Check all”). This means that every X minutes a check is carried out (possible from 15 to 59 minutes).
- Every X hours. This means that every X hours a check is carried out (possible from 1 to 23 hours).
- Daily (“Check at”) at X o’clock. X is the time (in hours and minutes) at which the IP address is to be checked each day.

Condition of the monitored IP addresses

The field “Condition of the monitored IP addresses” shows a list of all created addresses which are monitored. The colours “green” and “red” indicate whether the physical address is available or not. Each line includes the following information:

- IP address
- time stamp of the message

The time stamp shows the date and the time when the message has occurred. If there is no time stamp, the message has not yet been triggered. The “Clear date” button will delete all entries.

Notification

Any occurring message will be updated in the list “Condition of the monitored IP addresses”. The affected network address turns red, and an entry in the pull-down menu with time stamp is generated.

Finally, the DATALOGGER sends an email (if this function is configured). This email also includes any information on the message.

Another email is sent as soon as the IP address is available again.

Important: The entered IP address is checked immediately upon saving the configuration. Please note that another message is triggered upon saving the address.



INTERNAL DATABASE

The database is configured via the web interface. The internal database is pre-configured (only the port can be changed) and has a capacity of more than 18 million KNX telegrams. However, there are some parameters which can be adapted. These parameters are provided in the “Internal database”.

DATALOGGER V2
Version 1.2.4

> Start > Configuration ✓ Save Configuration

- General
- Network
- KNX
- Services
- Email Account
- Monitoring
- Internal Database >
- External Database
- User Administration
- Backup / Restore

Internal Database Server

Active

Port (default 3306)

Telegram-Filter

Exclude Sent Telegrams

Filter Type

Filter

Scheduled Export

Export Events

Upload and restore SQL Backup

Upload and restore SQL Backup

Check MySQL directory

Interval

Weekday

Day of Month

Time

Logs display

Refresh log file



3.2.1.4 TELEGRAM FILTER

Telegrams are recorded twice. One time when they are received and a second time when they are sent via one of the services (routing or tunnelling). For example, if a telegram is received via Twisted Pair, it is recorded together with the information that it was received from Twisted Pair, i.e. "SERVICE"="TWISTED_PAIR". If this telegram is now forwarded via routing, another telegram is recorded including the information "SERVICE"="ROUTING". If the **DATALOGGER** sends a KNX telegram, it is recorded with the IP address of the **DATALOGGER**. The IP address of the **DATALOGGER** is entered in the "IP ADDRESS" field.

If telegrams are recorded twice, they consume twice the memory and slow down the database queries. This behaviour is deactivated with the option "Ignore own telegrams". If this option is activated, the telegrams from the **DATALOGGER** are not written into the database.

Another alternative of selecting telegrams is the filter function. You can create **Inclusion** or **Exclusion** filters. Thus, group addresses can be selected which are written into the database. The Inclusion or Exclusion filters are created by pressing the "Add" button. An individual group address or group address ranges are selected for the filter.

3.2.1.5 EMAIL EXPORT

The collected data can be automatically sent by the **DATALOGGER** on a daily, weekly or monthly basis by email to one or several mail addresses according to the specifications.

If the option "Export to USB" is activated, the export is written on the connected USB stick (connected to one of the two USB ports of the **DATALOGGER**). In this case, the data are not sent by mail. In case that no USB stick is connected to the **DATALOGGER**, or if the USB stick does not have enough memory, the data are sent by mail instead.

NOTE: Possible formats for the mail export:

- CSV
- XLS
- XML
- SQL (database export in SQL format; completely or last month)
- BAK (saving the database; completely or last month; can be used to restore data)



3.2.1.6 UPLOADING AND RESTORING THE SQL BACKUP

In addition, the DATALOGGER exports a database backup by mail or download. The backup is either made for the last month or for the complete database. The backup file has the ending BAK and is encoded.

This BAK file can be imported and restored under this function. “Select file” opens up a dialogue for selecting the BAK file. With “Uploading and restoring the SQL backup”, the restoring process is started.

Important:

If the complete backup is restored, the whole database is replaced! Any available datasets are overwritten or deleted.

If a backup of the “last month” is restored, this will replace the data of the last month! Any available datasets are overwritten or deleted.

3.2.1.7 CHECKING THE MYSQL DIRECTORY

In case that files from the MySQL database are damaged, the DATALOGGER has this function which is used to solve this problem. All files in the MySQL database are checked and automatically repaired, if possible. The configuration of this function offers the option of defining the cycle of the check and repair process. Possible options for the cycle are daily, weekly or monthly.

A log is issued which records the data and results of the check and possible repair processes. This log is accessible via the web interface. Pressing the “Update” button will issue the log data from the DATALOGGER.

In addition to the defined cycle, a check is triggered if the DATALOGGER is no longer connected to the MySQL server. In this case, a mail is sent and the check is started. Once the check is completed, another mail is sent. This mail informs the user whether the DATALOGGER is reconnected to the MySQL database; it contains the log data of the check.

EXTERNAL DATABASE

3.2.1.8 CONFIGURING THE DATALOGGER FOR THE EXTERNAL DATABASE

Switch to “Configuration” > “External database” on the web interface.

The screenshot displays the DATALOGGER V2 web interface (Version 1.2.3) with the BAB TECHNOLOGIE logo. The navigation menu on the left includes: General, Network, KNX, Services, Email Account, Monitoring, Internal Database, External Database (selected), User Administration, Backup / Restore, and System. The main content area is titled "External Database Server" and features a "Save Configuration" button with a checkmark. The "Active" checkbox is checked. The "Hostname / IP Address" field is empty, and the "Port (default 3306)" field contains "3306". Below this is the "Login Data" section with fields for "Username", "Password", "Repeat Password", and "Database Name". The "Password" and "Repeat Password" fields are masked with dots. The "Telegram-Filter" section has an "Exclude Sent Telegrams" checkbox (unchecked), a "Filter Type" dropdown menu set to "Inclusion-Filter", and a large empty "Filter" text area. At the bottom of the filter section are "Add", "Edit", and "Delete" buttons.

First, activate or deactivate the use of the external database by selecting the “Active” option. The following two fields include information on the connection. The IP address or host name of the database server and the port to which the MySQL database is connected. The standard port for MySQL is 3306.



The following fields are for the registration in the database. The required entries include the user name [User name], the password [Password] and the name of the database [Database Name]. Press “Save” to save your entries. Now, the **DATALOGGER** tries to establish a connection with the database. The user name and the password were assigned when setting up the external database server.

In case that the **DATALOGGER** fails to register to the external database, an error message indicating the reason will be issued (Pop Up window). In this window an error message will be prompt by the SQL server. Please insert this error message in a search engine (e.g.Google) and follow the troubleshooting steps described here.

After several failed attempts, the **DATALOGGER** stops connecting with the database. To start another attempt, you must access the “External database” menu on the web interface. After having checked the entries and saving them again, another attempt to connect with the database is started.

USER ADMINISTRATION

Under "Configuration" > "User administration", new users are created and existing users are edited.

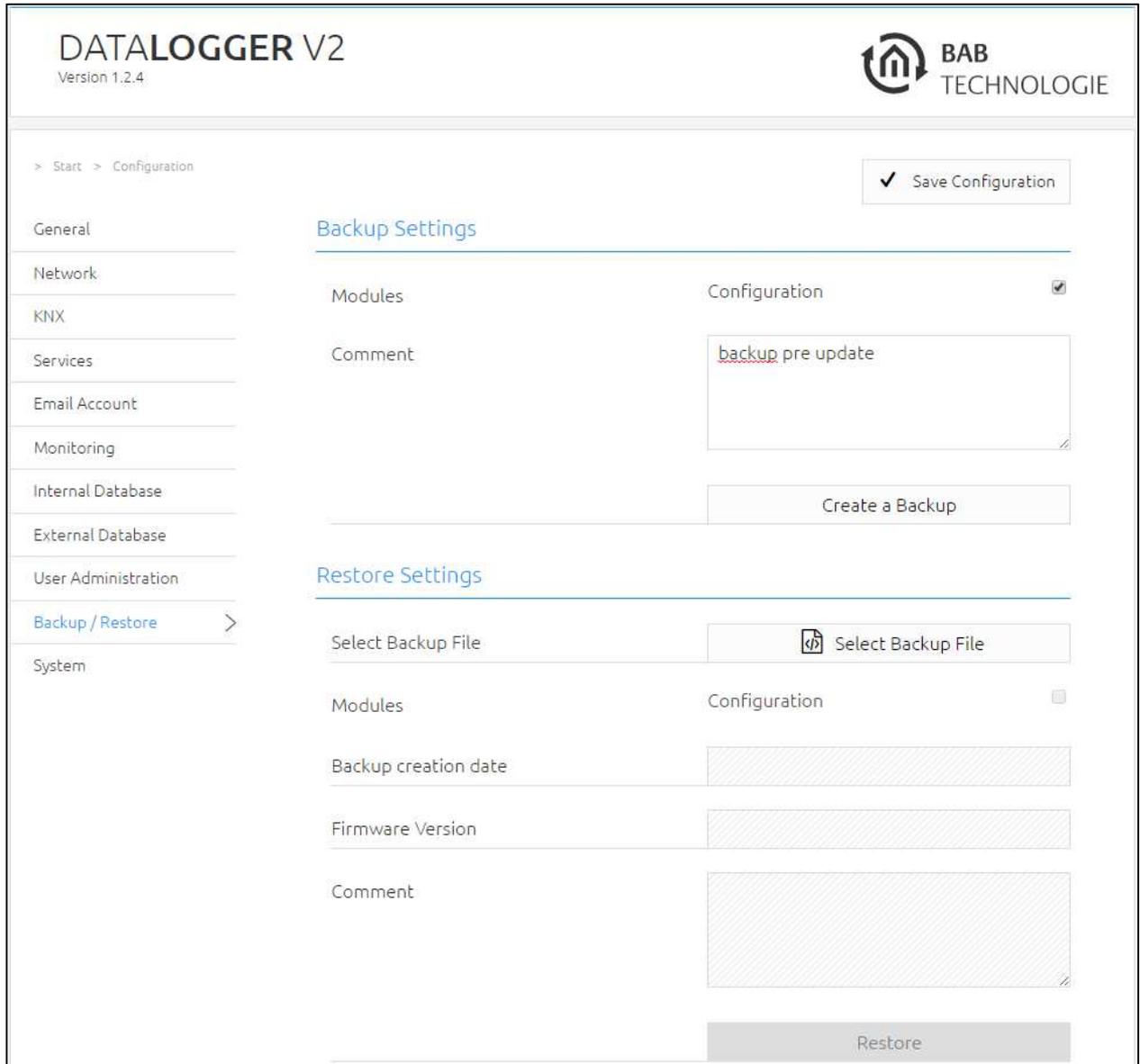
The screenshot displays the DATALOGGER V2 web interface. The top left shows the product name 'DATALOGGER V2' and version 'Version 1.2.4'. The top right features the 'BAB TECHNOLOGIE' logo. A breadcrumb trail indicates the current location: '> Start > Configuration'. A 'Save Configuration' button with a checkmark is visible in the top right. The left sidebar lists various configuration categories, with 'User Administration' highlighted and a right-pointing arrow. The main area is titled 'User Administration' and contains a 'List of Users' section. A table lists a single user named 'admin'. Below the table are three buttons: 'Add', 'Edit', and 'Delete'. A second 'Save Configuration' button with a checkmark is located at the bottom right of the main area.

Press the "Add" button to open up a new window where new users can be created. Enter the user name and the password (twice, for confirmation).

To change the name or the password of a user, you must select this user in the list and press the "Edit" button. A new window opens up where the name or the password can be changed.

SAVING THE SETTINGS

For safety reasons, the configuration data of the **DATALOGGER** should be backed up at regular intervals in order to ensure that the current configuration status can be restored at any time. A current backup is also required for firmware updates in order to restore the condition before the update.



The screenshot displays the 'DATALOGGER V2' web interface (Version 1.2.4) with the 'BAB TECHNOLOGIE' logo. The navigation menu on the left includes: General, Network, KNX, Services, Email Account, Monitoring, Internal Database, External Database, User Administration, Backup / Restore (selected), and System. The main content area is divided into two sections:

- Backup Settings:**
 - Modules: Configuration
 - Comment:
 - Button: Create a Backup
- Restore Settings:**
 - Select Backup File:
 - Modules: Configuration
 - Backup creation date:
 - Firmware Version:
 - Comment:
 - Button: Restore

A 'Save Configuration' button with a checkmark is located in the top right corner of the configuration area.



3.2.1.9 CREATING A BACKUP

Select the checkboxes under “Modules” to set which configuration data is to be backed up.

- *Configuration:* All configuration data except for archiving data (database).

Note: The network settings are not backed up; these are separate from the backup data.

Comments regarding the backup can be added in the “Comments” field.

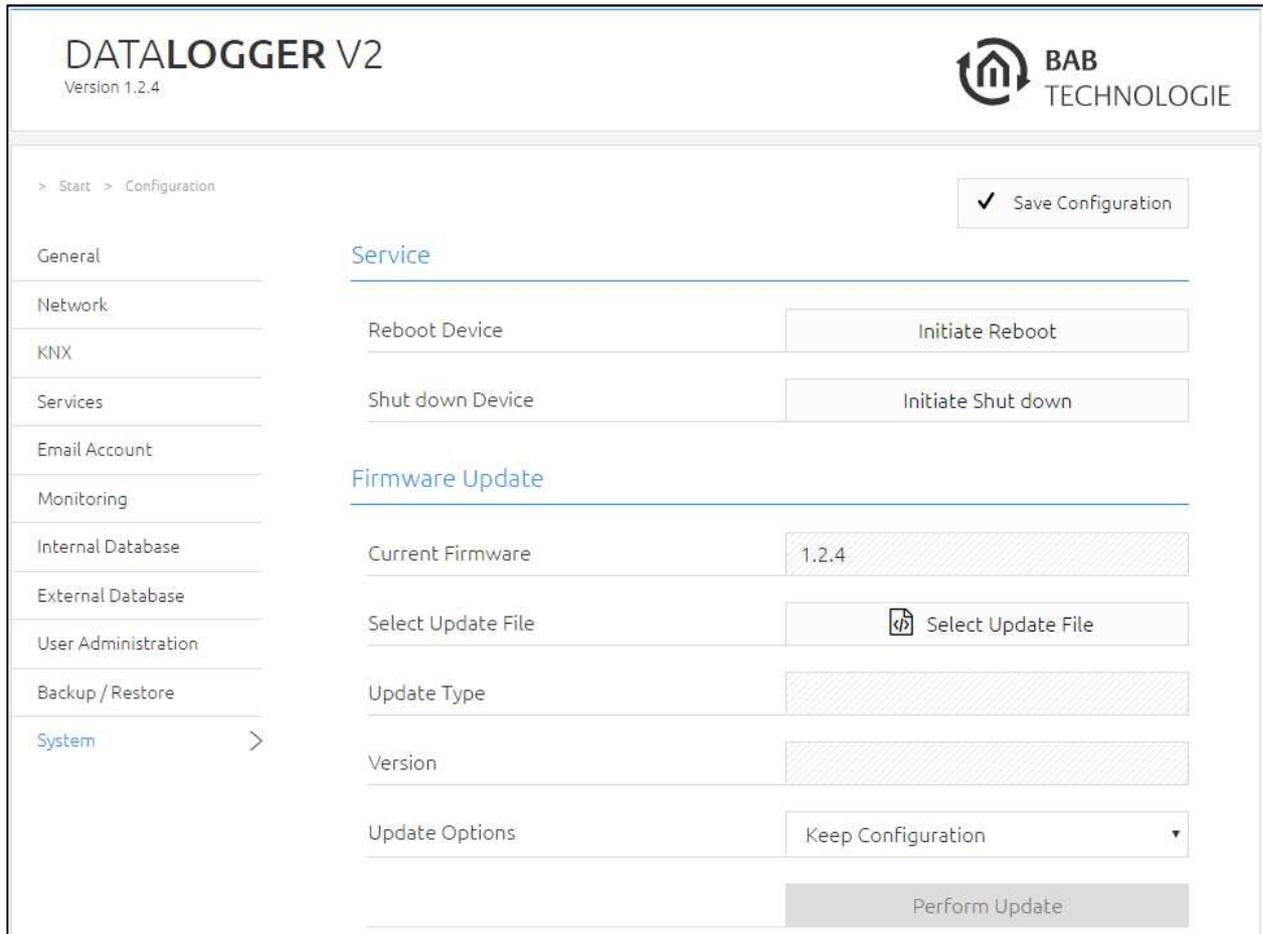
- Click on “Create backup” to launch the backup process.
- The backup file is generated by the system and provided automatically for download using the browser download dialogue.

3.2.1.10 RESTORING A BACKUP

- Choose a DATALOGGER backup file via the "Select Backup File" button. The files have the ending "backup_*.dl.bkp" (* is replacement character for the timestamp)
- In the "Backup creation date", "Firmware Version" and "Comment" sections, information about the currently chosen file is shown.
- In the "Modules" section, it is shown which modules are available in the chosen backup file. Using the check boxes, it is also possible to determine which modules are to be restored.
- Configuration: All configuration data except for the DATALOGGER configuration data.

Note: The network settings are not part of the backup file.

SYSTEM



The screenshot shows the 'DATALOGGER V2' web interface (Version 1.2.4) by BAB TECHNOLOGIE. The breadcrumb navigation is '> Start > Configuration'. A 'Save Configuration' button with a checkmark is visible in the top right. On the left is a sidebar menu with options: General, Network, KNX, Services, Email Account, Monitoring, Internal Database, External Database, User Administration, Backup / Restore, and System (selected with a right arrow). The main content area is divided into two sections: 'Service' and 'Firmware Update'. The 'Service' section contains two rows: 'Reboot Device' with an 'Initiate Reboot' button, and 'Shut down Device' with an 'Initiate Shut down' button. The 'Firmware Update' section contains several fields: 'Current Firmware' (1.2.4), 'Select Update File' (with a file upload icon and 'Select Update File' button), 'Update Type' (empty field), 'Version' (empty field), and 'Update Options' (dropdown menu set to 'Keep Configuration'). A 'Perform Update' button is at the bottom right of the Firmware Update section.

3.2.1.11 SERVICE

Under this section, the DATALOGGER can be rebooted (“Reboot device”) and shut down (“Shut down device”).

Important notice: Please shut down the DATA LOGGER via the web interface (under configuration / system) before disconnecting it from the power supply. Do not disconnect the DATA LOGGER until you have shut down the database service!



3.2.1.12 FIRMWARE UPDATE

Each DATALOGGER can be updated. The firmware update is free of charge. The current firmware files can be found on the BAB TECHNOLOGIE homepage. Proceed as follows to update the DATALOGGER:

- Download the current firmware image from the download area www.bab-tec.de.
- Unpack the file to any folder.

Note: Generate a new backup before you launch the update (see “CREATING A BACKUP”). The update process restores the factory settings.

- Open “Configuration” – “System”.
- Select the firmware image file (*.bin extension) using the “Select update file” dialogue. Update type and version are displayed.
- Decide how to perform the update. The following option can be selected:
 - “Keep Configuration” restores the configuration after the update. PLEASE CREATE FOR SECURE ALWAYS A BACKUP.
 - "Keep Network Settings" keep your current network settings after the update.
 - “Reset Configuration” set the DATALOGGER after the update to the factory settings.

Note: If the “Keep network settings” checkbox is not selected, the DATA LOGGER can be accessed at the default IP address after the update (For factory settings, see “2.4 INITIAL OPERATION”).

- Launch the update by clicking on “Perform Update”.
- Wait until the update is complete. The Web interface is updated automatically once the process has been successfully completed.
- The update restores the device factory settings. Individual settings are only loaded again when you restore a backup (see “3.2.1.10 RESTORING A BACKUP”). Except the option “Keep Network Settings” or “Keep Configuration” has been enabled.



3.3 “INFORMATION” ITEM

The last menu item (in the main menu) designated “Information” is on the web interface. It includes data such as the DATALOGGER name, firmware version, serial number, JAVA memory/processor utilisation and temperature. This item is accessible even without registration.

DATALOGGER V2

Version 1.2.4

> Start > Information

Product Information

Product	DATALOGGER V2
Manufacturer	BAB TECHNOLOGIE GmbH
Version	1.2.4
Serial Number	BT[REDACTED]
Temperature (System)	42.0 °C

Resource Monitor

CPU Usage

Java Memory Usage

Third-Party Software Information

[CometD](#) is used under [Apache License 2.0](#).

[CometD JQuery Plugin](#) is used under [MIT License](#).



4 APPENDIX

4.1 UPDATE

The software updates for the **DATALOGGER** are free, but they are defined for the hardware versions. If the software update is intended for a different hardware version, the hardware can be updated by an upgrade. Upgrades are not free; they are carried out at BAB TECHNOLOGIE GmbH.

Before carrying out an update on the **DATALOGGER**, a backup should be saved. Thus it is possible to restore the previous condition on the new firmware after the update (see chapter “Saving the settings”).

New firmware versions are published on our homepage.

CARRYING OUT AN UPDATE

The “Firmware update” function is to be found under “Configuration” > “System”.

The “Current firmware” field shows the currently installed firmware version.

Press “Select update file” to select the firmware file. The version number to which the **DATALOGGER** is to be updated must be at least the same or higher than the installed version.

The option

- “Keep configuration” prompts the configuration of the **DATALOGGER** to be restored after the update.
- “Keep network settings” prompts the network configuration to be kept after the configuration.
- “Reset configuration” resets the **DATALOGGER** to the factory default settings after the update.

“Start update” starts the update process.



4.2 DATABASE

INTRODUCTION

DATALOGGER logs data into a MySQL database. This database takes place in a 7 GB internal USB flash drive. **The DATALOGGER is able to log data up to ten telegrams per second.** The user is also able to log data into his own database.

DATABASE OVERVIEW

The database contains three table types:

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

4.2.1.1 TABLE „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

ID

This field represents the number of your group address.

PARENT_ID

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

TITLE

This field is the name of your group address.



F 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

ADDRESS

This field is the address of your group address.

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

UNIT

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

4.2.1.2 EXAMPLE: EXCERPT FROM THE TABLE “DW_KNX_GROUPADDRESS”

This is an example of the database table “DW_KNX_GROUPADDRESS”:

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

4.2.1.3 TABLE „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



ID

This field is the number of the current group range.

PARENT_ID

This field is the number of the parent group range.

TITLE

This field is the name of your group.

RANGE_END

This field is the end number of the group range.

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

4.2.1.4 TABLE „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

ID

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



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

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 Routing.

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.

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.

$Id = zone \times 2048 + line \times 256 + device$

Example:

$4.7.13 \Rightarrow 4 \times 2048 + 7 \times 256 + 13 = 9997$

DESTINATION_ID AND DESTINATION

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

APDU

APDU represent the whole Application layer of a KNX telegram.

APCI

APCI represent the type of telegram:

- GV_READ
- GV_WRITE
- GV_RESPONSE

RAW_DATA

This field is the pure data of the telegram.

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.

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 "NULL" or "\N".



PRIORITY

This is the priority of the telegram:

- low
- normal
- urgent

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



DATABASE CONFIGURATION

4.2.1.5 EXTERNAL DATABASE

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, execute 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.

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
```