PCAN-Ethernet Gateway DR

User Manual

Relevant Product

Product name	Software version	Part number
PCAN-Ethernet Gateway DR	2.11.0	IPEH-004010

Imprint

PEAK-System Technik GmbH
Leydheckerstraße 10
64293 Darmstadt
Germany

Phone: +49 6151 8173-20
Fax: +49 6151 8173-29

www.peak-system.com
info@peak-system.com

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Contents

1 Introduction

The PCAN-Ethernet Gateway DR allows the connection of different CAN buses over IP networks. CAN frames are wrapped in TCP or UDP message packets and then forwarded via the IP network from one device to another. The PCAN-Ethernet Gateway DR provides one LAN connection and two High-speed CAN interfaces. With its DIN rail casing and the support of the extended temperature range, the module is suitable for use in an industrial environment.

The PCAN Gateway product family is configured via a convenient web interface. Alternatively, the JSON interface allows access via software. Both options provide status information and settings of the devices, the various communication interfaces, message forwarding, and filters.

1.1 Properties at a Glance

- Two High-speed CAN channels (ISO 11898-2)
  - Comply with CAN specifications 2.0 A/B
  - Bit rates from 5 kbit/s up to 1 Mbit/s
  - NXP PCA82C251 CAN transceiver
- Galvanic isolation of the CAN channels up to 500 V against each other, against RS-232 and the power supply
- Connections for CAN, RS-232, and power supply via 4-pole screw-terminal strips (Phoenix)
- LAN interface
  - Data transmission using TCP or UDP
  - 10/100 Mbit/s bit rates
  - RJ-45 connector with status LEDs
- Monitoring and configuration of the devices via the web interface or JSON interface
- Software update via the web interface
- Reboot and reset of the device to factory defaults with a reset button
- Plastic casing (width: 22.5 mm) for mounting on a DIN rail (DIN EN 60715 TH35)
- LEDs for device status and power supply
- RS-232 connector for serial data transfer (reserved for future use)
- Voltage supply from 8 to 30 V
- Extended operating temperature range from -40 to +85 °C (-40 to +185 °F)

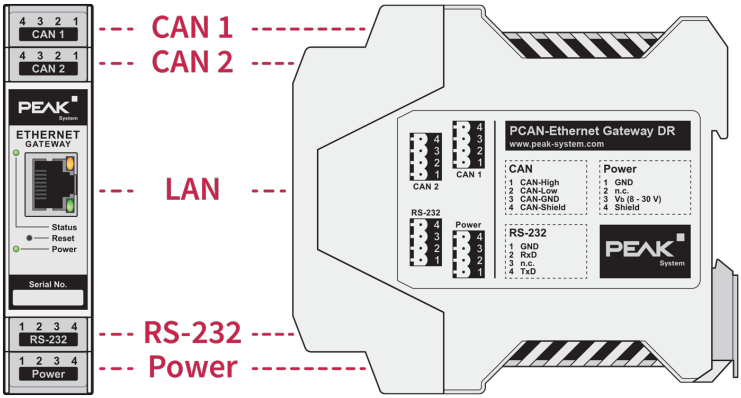
1.2 Scope of Supply

- PCAN-Ethernet Gateway DR in DIN rail plastic casing
- Mating connectors for both CAN channels, RS-232, and power supply (Phoenix Contact MSTB 2,5/4-ST BK - 1756298)
- RJ-45 network patch cord (2 m)
- Manual in PDF format
- Printed quick start guide

1.3 Prerequisites

- Voltage supply in the range of 8 to 30 V

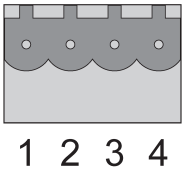
2 Connectors and Control Elements



Position of the connectors and control elements

2.1 CAN1/CAN2

The CAN connectors are located on the upper side of the casing.



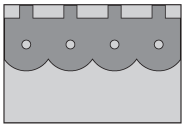
Pin assignment
CAN connector 1 and 2

Pin	Function
1	CAN-High
2	CAN-Low
3	CAN-GND
4	CAN-Shield

The mating connectors (Phoenix Contact MSTB 2,5 / 4-ST BK - 1756298) are included in the scope of supply.

2.2 RS-232

The RS-232 connector is located on the lower side of the casing.



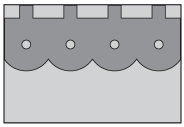
Pin assignment
RS-232 connector

Pin	Function
1	GND
2	RxD
3	not connected
4	TxD

The mating connector (Phoenix Contact MSTB 2,5 / 4-ST BK - 1756298) is included in the scope of supply.

2.3 Power

The connection for the power supply is located on the lower side of the casing.



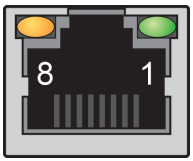
Pin assignment
Power connector

Pin	Function
1	GND
2	not connected
3	Vbat (8 - 30 V)
4	Shield (top hat rail potential)

The mating connector (Phoenix Contact MSTB 2,5 / 4-ST BK - 1756298) is included in the scope of supply.

2.4 LAN

The RJ-45 connector for connecting to a LAN network is centered on the front of the casing.



Pin assignment
RJ-45 connector

Pin	Function
1	TxD
2	TxD
3	RxD
4	not connected
5	not connected
6	RxD
7	not connected
8	not connected

2.5 Reset Button

The PCAN-Ethernet Gateway DR can be restarted or reset with the Reset button. You can find more information in section 4.2 *Reset Button*.

2.6 LEDs

The PCAN-Ethernet Gateway DR has LEDs for device status and power supply as well as two LAN LEDs. For more information, see section 4.1 *Status LEDs*.

3 Commissioning

The PCAN-Ethernet Gateway DR is configured via a web interface. Therefore, the gateway must be connected via LAN to a computer, located in the same logical network as your gateway (192.168.1.xxx).

3.1 Establish First Connection

During initial operation or after resetting to factory defaults, you must preconfigure the PCAN-Gateway for your LAN. The default login data is written on the label on the left side of the PCAN-Gateway. Proceed as described in the following subsections.

3.1.1 Preparing the Computer

Your computer must be configured with an appropriate IP address to connect to the device via LAN.

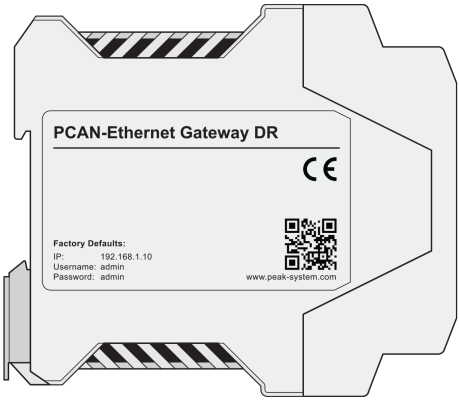
Do the following to determine and change your IP address:

1. Open the Windows Start menu.
2. Type `ncpa.cpl` and confirm with Enter.
   The overview of the network adapters appears.
3. Do a right-click on the adapter that will be used for the connection to the PCAN-Gateway and select *Properties*.
4. Open the properties of *Internet Protocol Version 4 (TCP/IPv4)*.
5. Make a note of the current settings in order to reset the computer later on.
6. Select *Use the following IP address*.
7. Enter an *IP address* in the range from 192.168.1.1 to 192.168.1.254 (but not the PCAN-Gateway's own address which is written on the left casing side).

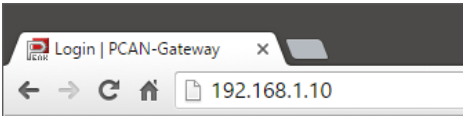
8. Click on *Subnet mask*. 255.255.255.0 is shown. Leave this entry unchanged.
9. Confirm the entries with OK.

3.1.2 Establishing the Connection

1. Connect the RJ-45 connector of the PCAN-Gateway via a LAN cable (included in the scope of supply) directly to the computer.
2. Connect the device to a suitable power supply (8 - 30 V).
3. Wait until the PCAN-Gateway is ready (Status LED is blinking green).
4. Open a web browser on the computer.
5. In the browser's address bar, enter the address of the PCAN-Gateway (see the label on the left side of the device).



IP and access information on the left side of the device



Address bar of the web browser

This opens the configuration website.

6. In the upper right area of the configuration website you can find the login. Enter `admin` for each the username and the password and confirm with Enter.

The restricted area appears and you can start setting up the PCAN-Ethernet Gateway DR. You can find a description of the basic configurations in the following section 3.2 *Basic Configuration*.

> **Note:** Afterwards set back the computers IP address to the previously noted address.

3.2 Basic Configuration

Change your login data first and then set up the PCAN-Gateway connection to CAN and the LAN network.

3.2.1 Change Login Data

1. Open the page *Device* > *User Management*.
2. Change the login data on this page. Create a new username and a new password. To ensure a minimum level of security, the password should have at least 8 characters. If possible, use letters, numbers, and special characters.

> **Important notice: Login data is confidential!**
> Do not act carelessly and leave your system open to attack. Never deposit the login data in any form on the Internet or make it easily accessible. Do not give the new login data carelessly to third parties nor send it by e-mail.

3.2.2 Setting up CAN Channels

Enter the following settings to configure the CAN channels:

1. Open the page *Network* > *CAN*.
2. **Listen-Only-Mode:** If the PCAN-Gateway should act as a pure observer, not affecting the data traffic, Listen-Only-Mode must be enabled. Activate Listen-Only-Mode with a click on the checkbox.
3. **Nominal Bit Rate:** For setting the nominal bit rate, click the drop-down menu and select the value that is used on the CAN bus to be connected.

Save your configuration for each CAN channel with Save Settings.

3.2.3 Connecting to a LAN Network

There are two options for configuring the IP address data of the PCAN-Gateway for the LAN to be connected:

Manual Address Assignment (Recommended)

1. Open the page *Network* > *LAN*.
2. If automatic address assignment via DHCP is not used, enter the IP address and Subnet mask that the PCAN-Gateway should use in the LAN at the bottom of the page. The gateway address can optionally be set.
3. Confirm the entered data with Save Settings.

You are automatically forwarded to the new IP address. The basic setup of the device is completed.

Automatic Address Assignment via DHCP

Note: DHCP is not recommended, because it is necessary to know the IP address of the device to access the configuration website. Furthermore, the IP address may change after a restart of the gateway or the DHCP server. In this case the existing routes won't work.

1. Open the page *Network* > *LAN*.
2. If the LAN network to be connected uses DHCP (Dynamic Host Configuration Protocol), the PCAN-Gateway IP address and Subnet mask are assigned automatically. Enable DHCP to use this feature.
3. Confirm the entered data with Save Settings.

You are automatically logged out and the basic setup of the device is completed. When the PCAN-Gateway is installed in the LAN, it automatically receives its new address data via DHCP.

3.3 Installation

Proceed as follows to install and connect the PCAN-Ethernet Gateway DR at its place of use:

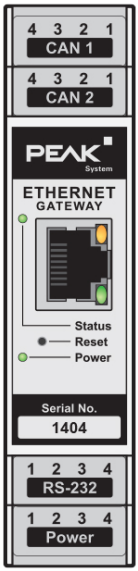
1. Mount the PCAN-Ethernet Gateway DR at the appropriate position on the DIN rail by placing it at the top of the rail and snapping it to the bottom.
2. Connect each of the two CAN ports with the affiliated CAN network.
3. Connect the RJ-45 connector using a LAN cable to the IP network.
4. Connect the PCAN-Ethernet Gateway DR to a suitable power supply (8 - 30 V).

The PCAN-Ethernet Gateway DR starts automatically. When the status LED is blinking green the device is ready and the current configuration is executed.

Note: A High-speed CAN bus needs to be electrically terminated on both ends using resistors of 120 Ω. The device does not have an internal termination.

Note: In case of a dynamic address assignment via DHCP, the new IP address must first be determined. Commercial routers list all connected devices with their current IP address.

4 Operation



Front side with LEDs and Reset button

4.1 Status LEDs

The PCAN-Ethernet Gateway DR has LEDs for device status and power supply as well as two LAN LEDs, which indicate the following conditions:

LED	Status	Condition
Status	Green on	System start
	Green blinking	Ready for operation
LAN	Yellow on	Data is transmitted
	Green on	Connection is established
Power	Green on	Power supply is applied

4.2 Reset Button

If the PCAN-Ethernet Gateway DR is no longer available due to an incorrect configuration, the device can be reset to factory defaults using the Reset button.

To perform a reset, press with a paper clip for example into the small hole on the front side of the casing. Press for 1 second to restart the device. Press for more than 5 seconds to reset the PCAN-Gateway to factory defaults.

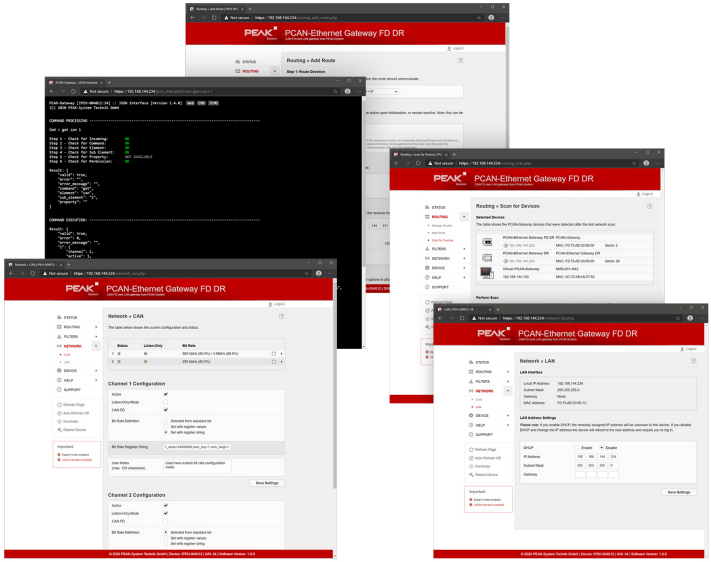
With a reset to the factory defaults, the IP address and the login data are reset to the initial value (see the label on the left side of the PCAN-Gateway). Afterwards you can perform a reconfiguration of the PCAN-Gateway, see section 3 *Commissioning*.

4.3 Signal Delay

The signal delay between the CAN connection and LAN may vary.

The transmit time of the signal in the IP network depends on the expansion and structure of the network as well as the configuration of the message forwarding. Therefore, a fixed value cannot be specified.

5 Configuration



The configuration of the PCAN-Ethernet Gateway DR is done via a comfortable web interface. Enter the IP address of your PCAN-Gateway into the address bar of your browser.

Afterwards, the configuration website opens. Besides providing a variety of status information, the website can be used to manage settings for the PCAN-Gateway, communication interfaces, message routing, and filters.

The information that is visible to non logged in users (Public Dashboard) can be set on the page *Device* > *User Management*, see section 5.6.2 *User Management*. The login area can be found at the upper right of the website.

Enter your username and password, then press Enter . After logging in, you will have access to the 7 main areas of the website: Status, Routing, Filters, Network, Device, Help, and Support.

Note: For full functionality and an optimal representation of the website, we recommend one of the following Internet browsers: Google Chrome, Mozilla Firefox, Microsoft Edge, Internet Explorer 11, Safari, or Opera.

The storing of cookies by the browser is required to access the website.

Some features of this website require JavaScript. Please enable support for this scripting language if a prompt appears on the website.

5.1 Structure of the Website

5.1.1 Header

The header area of the website displays the product name, as well as a user defined name and description that can be set on the *Device* > *Configuration* page. This information is used to identify the device.

5.1.2 Navigation

On the left side is the main navigation menu:

- The main pages (Status, Routing, Filters, Network, Device, Help, and Support) display general information
- The subpages of Network and Device provide configuration options for the communication interfaces and the PCAN-Gateway itself
- The subpages of Routing can be used to add, manage, edit, or delete routes, as well as to search for other devices in the network
- The subpages of Filters can be used to add, edit, or delete filters

The links in the control box (below the menu) perform additional website and device functions.

- **Refresh:** Clicking Refresh will perform a page reload, for example to update the current route status

  > **Note:** The information displayed on the website is not updated automatically by default.

- **Auto Refresh On / Off:** When you activate this function by left clicking the link, the website will begin to automatically update the information on the page every 10 seconds. You can manually turn this function off by left clicking the link again. Navigating away from the current page will automatically deactivate this function too
- **Illuminate:** LEDs on the device will light up for approximately 10 seconds. This function can be used to identify the PCAN-Gateway
- **Reboot Device:** Use this link to restart the device. During this process, the PCAN-Gateway will be unreachable for a short time

The red framed Info box at the end of the navigation lists important information about the current configuration.

5.1.3 General Symbols

The configuration website uses a variety of different symbols and icons to convey general information that is valid for many situations.

In some cases, additional information is displayed as a tooltip when you hover the mouse cursor over the icon.

LED symbol	Meaning
	ON / active
	OFF / inactive
	Warning! The execution / function is prevented. The problem is well known and can be eliminated.
	Attention! An error prevents the execution / function.

5.2 Status

On the *Status* page the current device configuration is displayed.

Device Information:

In this box the product name, the order number, the serial number, and the device ID of the PCAN-Gateway are displayed. This information can be used to uniquely identify the device.

- On the *Device* page you will find detailed information about the device

CAN Interfaces:

For each CAN channel the status, bit rate, and the setting of the Listen-Only-Mode are displayed.

- The CAN interfaces can be configured on the *Network* > *CAN* page. In addition, this page provides detailed information about the interfaces

LAN Interface:

This box displays the LAN interface settings. IP address, Subnet mask, and gateway are adjustable. The MAC address cannot be changed. Each device receives a unique MAC address during the manufacturing process, which can be used for identification.

- The LAN interface can be configured on the *Network* > *LAN* page

Defined Routes:

This box contains an overview of all defined message forwardings with basic information. Each is specified with its index, status, used transmission protocol, source and destination, used filters, and user notes.

- On the *Routing* > *Manage Routes* page, existing routes can be managed, edited, and deleted
- On the *Routing* > *Add Route* page, new routes can be created

Defined Filters:

This box contains an overview of all defined filters with basic information. Each is specified with its index, usage, user notes, name, type, and mode.

- On the *Filters* > *Manage Filters* page, existing filters can be managed, edited, and deleted
- On the *Filters* > *Add Filter* page, new filters can be created

5.3 Routing

Routing displays basic information about the created routes and PCAN-Gateways detected on the network.

Defined Routes:

This box contains an overview of all defined message forwardings with basic information. Each is specified with its index, status, used transmission protocol, source and destination, used filters, and user notes.

- On the *Routing* > *Manage Routes* page, existing routes can be managed, edited, and deleted
- On the *Routing* > *Add Route* page, new routes can be created

Detected Devices:

This table shows all PEAK-System gateways that were detected during the last network broadcast scan. If no other devices are currently in the network or no scan has been performed, this table will not be shown.

Each PCAN-Gateway is displayed with its product name, the custom device name, MAC address, and serial number. This information can be used to identify the device. In addition, the IP address and a small icon of the device are displayed. With a left-click the configuration website of this device can be opened in a new tab.

- On the *Routing* > *Scan for Devices* page, a search for available devices on the network can be performed

> **Note:** When changing the network topology, the list is not updated automatically. If a device is removed from the network, it will remain visible in the list of detected devices until the scan is performed again and the list is updated.

5.3.1 Manage Routes

On the page *Routing* > *Manage Routes* the message forwardings are listed with basic information and control options. Each is specified with its index, status, used transmission protocol, source and destination, used filters, and user notes.

Index: For saving routes, the PCAN-Gateway uses a table with 16 rows that are addressed with a unique index.

Status: The LED indicates the status of a route.

LED symbol	Meaning
	The route is inactive.
	For send routes: The route is active.
	For receive routes: The route is active and connected with the remote site.
	Warning! The route is active but not connected with the remote site.
	Warning! The route has been successfully established but the data connection is closed. Please check if the remote route is still active.
	Warning! More than one remote site tries to connect to this route.
	The PCAN-Gateway handshake is inactive. No status information are gathered for this route.

Filter: Hover the filter icon  with the mouse cursor to display a list of the attached filters. The list refers to the indices of the filters. Perform a left-click on the icon to open the page *Filters* > *Manage Filters* with the corresponding filters highlighted. The icon is not visible if no filter was defined.

Notes: Hover this icon  with the mouse cursor to display the user notes of this route. The icon is not visible if no user notes are available.

Source / Destination: The source and the destination depend on the direction of the message forwarding.

- With a Receive route the PCAN-Gateway receives data via the IP interface and forwards it to a CAN channel. In this case, the IP address is displayed as *Local IP*

- With a Send route the data of a CAN channel is forwarded over the IP interface. By left-clicking the IP address of the receiver, its configuration website can be opened

In Expert mode the *Loopback* IP address 127.0.0.1 can be set for Send and Receive routes to connect the CAN channels of the PCAN-Gateway.

Protocol: Routes can use TCP or UDP as the transmission protocol in the IP network.

- TCP (Transmission Control Protocol) establishes a connection between two participants and monitors their communication. If data packets are lost for example, they are retransmitted
- UDP (User Datagram Protocol) sends the data packets directly into the network without establishing a connection. With this protocol, error free transmission is not guaranteed. The advantage UDP has over TCP is the lower demand on performance

Control Elements:

Symbol	Meaning
	Switch ON / Switch OFF (depending on the current state)
	Delete
	Edit

ON/OFF: Use the "ON / OFF" switch to activate or deactivate a route.

Delete: Click on the trash can icon to remove the route.

Edit: Click on the pencil icon to edit the route. The route is loaded into the forms of the page *Routing* > *Add Route*. The same input and configuration options are available there. Detailed information can be found in section 5.3.2 *Add / Edit Route*.

Add Route : This button opens the *Routing* > *Add Route* page on which you can set up a new message forwarding instance.

Additional Information:

Each route is provided with additional information about its connection and data transfer status. This additional information can be viewed by clicking on the triangle icon located on the right edge of the route.

In Expert mode (see section 5.6.2 *User Management*) detailed connection status information are displayed. With the Reset button you can reset the values of the route to 0.

5.3.2 Add / Edit Route

On the *Routing* > *Add Route* page you can set up a new route. Similarly, an existing route can be edited via the form displayed. For this, the current settings are loaded into the form fields. Editing a route is done via the page *Routing* > *Manage Routes*.

For saving routes, the PCAN-Gateway uses a table with 16 rows that are addressed with a unique index. If a new route is to be set up, the lowest free index will be assigned. Because of that, only up to 16 routes can be created regardless of the status. Then the *Add Route* function is no longer available.

Route Direction:

When you create a route, you should start with the selection of direction since the following input and output fields are determined by this.

- **Receive IP > CAN:** With a Receive route the PCAN-Gateway receives data via the IP interface and forwards it to a CAN channel. The IP address shown in this case is "Local IP". The configuration of the local IP interface is done on the *Network* > *LAN* page.
- **Send CAN > IP:** With a Send route the data of a CAN channel is forwarded over the IP interface. If other PCAN-Gateways were discovered during a broadcast scan, they can be selected for the destination of the route. On the page *Routing* > *Scan for Devices* you can search for other PCAN-Gateways in the network.

Status:

Use this setting to determine the state of the route after it is created. Ticking the checkbox will have the effect of immediately activating the route after the completed form is saved. Port 45321 is required for the transmission of status information.

PCAN-Gateway handshake off: (Expert mode only) If this checkbox is active, no handshake will be performed and therefore no status information will be gathered for this route. Use this option for communication with your own application.

Information about the data protocol can be found in the PCAN-Gateway developer documentation.

CAN Interface:

Choose one of the available CAN channels. The configuration of the CAN interfaces is done on the page *Network* > *CAN*.

IP Interface:

IP Address Source: This field only appears when PCAN-Gateways were detected during a network broadcast scan and the direction *Send CAN* > *IP* is selected.

Select the desired device from this drop-down menu. The following IP address is automatically set to the appropriate value. If you prefer to enter the IP address yourself, select *Manual Input*.

IP Address: Enter the IP address (IPv4) of the destination device. It should be noted that only values from 0 to 255 may be used and certain address ranges are reserved.

- In the first field, enter a value less than 224, since addresses starting from this value are reserved for Multicast messages
- Depending on the Subnet mask, the highest device address is reserved for broadcast messages. For the Subnet mask 255.255.255.0 and the network address 192.168.1.xxx, the reserved address would be: 192.168.1.255
- Depending on the Subnet mask, the lowest device address is reserved for messages that are addressed to the entire network. For the Subnet mask 255.255.255.0 and the network address 192.168.1.xxx, the reserved address would be: 192.168.1.0

A special case is the *Loopback* IP address 127.0.0.1 which can be set for Send and Receive routes to connect the CAN channels of the PCAN-Gateway. Selecting the *Loopback* IP address for Receive routes is only possible in Expert mode.

Port: Enter a port between 1024 and 65535. Values below 1024 are reserved for various system services and must therefore not be used. Port 45321 is reserved for the transmission of status information and to perform a handshake between PCAN-Gateways. Port 52957 is reserved for device scans.

Protocol: Select which transmission protocol should be used by the route in the IP network.

- TCP (Transmission Control Protocol) establishes a connection between two participants and monitors their communication. If data packets are lost for example, they are retransmitted.
- UDP (User Datagram Protocol) sends the data packets directly into the network without establishing a connection. With this protocol, error free transmission is not guaranteed. The advantage UDP has over TCP is the lower demand on performance.

> **Note:** Any combination of the IP address, port, and protocol can only be used once.

Frames per Packet: This value specifies how many CAN frames are transmitted per IP packet. The higher the value, the greater the delay in the transmission of CAN messages. However, the demand on performance is lower in this case. This selection is only available for Send routes when using the UDP protocol.

TCP Delay: (Expert mode only) If this checkbox is active, TCP delay is enabled. In this case, the transmission of data packets via TCP might be delayed to lower the demand on performance. If this option is disabled, every CAN frame is transmitted as fast as possible.

Filter:

The defined filters are listed in this form. A single one can be attached or detached to Send routes via the radio buttons. If Expert mode is active, the radio buttons will be replaced by checkboxes and multiple filters can be selected.

Filters are joined with: This property specifies how multiple filters are linked. If you use several Whitelist filters, you should choose Logical OR. If you attach multiple Blacklist filters to a single route, the selection Logical AND is recommended.

> **Note:** A single Range filter is realized with a composition of multiple Mask filters. The Joined Filters property will also affect this.

User Notes:

Additional information with a length of 125 characters can be entered for each route. This text is available on the page *Routing* > *Manage Routes*.

Finally you can create the new route with the Add Route button or save the changes after editing with the Save Settings button.

> **Note:** Transferring data between 2 PCAN-Gateways always consists of a Send and a Receive route. Note that both should use the same transmission protocol (TCP or UDP) and the same port.

5.3.3 Scan for Devices

Using the *Routing* > *Scan for Devices* page a broadcast message can be sent to the IP network, to which all PCAN-Gateway products report. From the obtained information, a list of available devices is created. The detected devices can then be used as target destinations while creating or editing routes.

> **Note:** When changing the network topology, the list is not updated automatically. If a device is removed from the network, it will remain visible in the list of detected devices until the scan is performed again and the list is updated.

Detected Devices:

This table shows all PEAK-System gateways that were detected during the last network broadcast scan. If no other devices are currently in the network or no scan has been performed, this table will not be shown.

Each PCAN-Gateway is displayed with its product name, the custom device name, MAC address, and serial number. This information can be used to identify the device. In addition, the IP address and a small icon of the device are displayed. With a left-click the configuration website of this device can be opened in a new tab.

Perform Scan: By clicking on the Perform Scan button, the list of available devices is updated. The scan takes a short time. Please wait until you are forwarded.

5.4 Filters

Filters are used to filter CAN messages by their ID. It is possible to create up to 32 of them. Each filter can be attached to multiple Send routes via the page *Add Route* or *Edit Route*.

The page *Filters* displays basic information about the created filters.

Defined Filters:

This box contains an overview of all defined filters with basic information. Each is specified with its index, usage, user notes, name, type, and mode.

- On the *Filters* > *Manage Filters* page, existing filters can be managed, edited, and deleted
- On the *Filters* > *Add Filter* page, new filters can be created

5.4.1 Manage Filters

On the page *Filters* > *Manage Filters* the existing filters are listed with basic information and control options. Each of them is specified with its index, usage, user notes, name, type, and mode.

Index: For saving filters, the PCAN-Gateway uses a table with 32 rows that are addressed with this unique index.

Usage: The badge on the left shows how many times the filter is used. The information to which routes it is attached to, is displayed as a tooltip when hovering with the mouse cursor. The list refers to the indices of the routes. If you click on the badge, the page Manage Routes will be opened with the corresponding routes highlighted.

Notes: Hover this icon with the mouse cursor to display the user notes of this filter. The icon is not visible if no user notes are available.

Name: While creation a name can be assign to a filter. It can be used for identification while managing the filters or attaching them to routes.

Type: This column displays the filter type (Range or Mask) and the used CAN ID mode (11- or 29 Bit). Detailed information can be found in section 5.4.2 *Add / Edit Filter*.

Mode: The filter mode (Blacklist or Whitelist) indicates if the defined filter is inverted or not.

Control Elements:

Symbol	Meaning
	Delete: Click the trash icon to remove the filter. If it is attached to one or more routes, it will be automatically detached
	Edit: Click on the pencil icon to edit the filter. The filter is loaded into the forms of the page Filters > Add Filter. The same input and configuration options are available there. Detailed information can be found in section 5.4.2 *Add / Edit Filter*

Add Filter : The button below the information table opens the *Filters* > *Add Filter* page on which you can set up a new filter. It is not available if the limit of 32 filters is reached.

Detailed Information:

The filters are provided with detailed information. This additional information can be viewed by clicking on the triangle icon located on the right edge of the filter.

5.4.2 Add / Edit Filter

On this page you can set up a new filter. Similarly, an existing one can be edited via the form displayed. For this, the current settings are loaded into the form fields. Editing a filter is done via the page *Filters* > *Manage Filters*.

For saving filters, the PCAN-Gateway uses a table with 32 rows that are addressed with a unique index. If a new filter is to be set up, the lowest free index will be assigned. Because of that, only up to 32 filters can be created regardless of their status. If the limit is reached, the *Add Filter* function is no longer available.

Type and ID Mode:

When you create a filter, you should start with the selection of the type and ID mode since the following input and output fields are determined by this. The filter types *Range* and *Mask* specify how the CAN IDs, to be filtered, are defined.

The ID modes specify if the CAN message will be a Standard frame with an 11 Bit identifier or an Extended frame with a 29 Bit identifier. This changes the ID value range that can be entered in the following forms.

Mode:

The mode indicates how the defined filter is interpreted.

- **Whitelist:** A filter using this mode will transmit every CAN message whose ID matches the filter specifications
- **Blacklist:** If this mode is selected, the filter will be inverted. That means every message with a CAN ID that matches the filter specifications will not be transmitted

Type Range:

If the filter type *Range* was chosen, a lower and an upper limit have to be specified to set the range. This can be done via the slider (JavaScript support required) or with the input forms.

- **From:** This value marks the lower limit of the filter range
- **To:** This value marks the upper limit of the filter range

While entering the values the following should be considered:

- The values are entered in hexadecimal format.
- The From value has to be lower than the To value.

Type Mask:

The working principle of this acceptance filtering is based on the SJA1000 CAN controller. Detailed information can be found in the NXP Application Note *AN97076 - SJA1000 Stand-alone CAN controller* chapter 4.1.2.

The ID of the CAN message to be transmitted is compared bitwise with the *Acceptance Code* value. The *Acceptance Mask* specifies which bit positions are relevant.

- 0 = relevant. The CAN ID at the corresponding bit position has to match the value of the Acceptance Code
- 1 = not relevant. The CAN ID at the corresponding bit position does not matter

In contrast to the original implementation, the PCAN-Gateway *Mask* filter only looks at the CAN ID. It cannot process any data bytes or the RTR flag.

The size of the *Acceptance Mask* and *Acceptance Code* depends on the ID mode selection above and can be 11 Bit for Standard with a range of 0 to 7FF or 29 Bit for Extended with a range of 0 to 1FFFFFFF.

Example for 11 Bit identifiers:

IDs											**Meaning**
0	1	1	1	1	0	1	1	1	1	1	Acceptance Code
1	1	1	0	0	0	0	1	1	0	1	Acceptance Mask
X	X	X	**1**	**1**	**0**	**1**	X	X	**1**	X	CAN messages with an ID matching this binary value, are accepted. X means that this bit position does not matter.
MSB										LSB	

Name:

A name with up to 50 characters can be assign to a filter. It can be used for identification while managing filters or attaching them to routes.

User Notes:

Additional information with a length of 200 characters can be entered for each filter. Besides the pages *Status*, *Filters*, *Filters* > *Add / Edit Filter*, and *Filters* > *Manage Filters* this text is available while adding or editing routes.

Finally you can create the new filter with the Add Filter button or save the changes after editing with the Save Settings button.

5.5 Network

The *Network* page provides information about the current configuration of available communication interfaces.

CAN Interfaces:

For each CAN channel the status, bit rate, and the setting of the Listen-Only-Mode are displayed.

- The CAN interfaces can be configured on the *Network* > *CAN* page. In addition, this page provides detailed information about the interfaces

LAN Interface:

This box displays the LAN interface settings. IP address, Subnet mask, and gateway are adjustable. The MAC address cannot be changed. Each device receives a unique MAC address during the manufacturing process, which can be used for identification.

- The LAN interface can be configured on the *Network* > *LAN* page

5.5.1 CAN

The *Network* > *CAN* page displays the current settings of the CAN interfaces as well as options to configure them. Information about the status, Listen-Only-Mode, and the bit rate is displayed for each CAN channel.

Channel: The channel number of the CAN interface. This number is used to select the intended interface while creating a route.

Status: The LED indicates the state of the CAN channel.

LED symbol	Status	Meaning
	Active	The CAN interface is active and the error counter is lower than 96 (Error Active).
	Inactive	The channel is inactive or sleeping.
	Error Warning	Errors were detected on the bus. The error counter reached the threshold of 96.
	Error Passive	Errors were detected on the bus. The error counter reached the threshold of 128. Please check the CAN connection and the configured bit rates. The values should match the bit rates of the connected CAN bus.
	Bus Off	The CAN controller was switched off. The error counter is higher than 255. A possible cause can be a short circuit on the bus.

Listen-Only: The state of the Listen-Only-Mode is represented by an LED.

LED symbol	Meaning
	Active. The CAN channel is not sending messages, nor is it answering incoming messages (Acknowledge).
	Inactive

Bit Rate: The nominal bit rate of this CAN channel. This value should match the bit rate of the connected CAN bus.

Additional Information: Furthermore, status information and user defined notes are available for each channel. Click the triangle icon on the right edge of the list item to view the information. With the **Reset** button ↻ you can reset the CAN channel.

In Expert mode, (see section 5.6.2 *User Management*) further detailed information is displayed.

CAN Channel Configuration:

Each channel is handled and configured by a separate form. Settings can be saved by clicking the Save Settings button located underneath the form.

Active: (Expert mode only) Use the checkbox to activate or deactivate the CAN channel.

Listen-Only-Mode: If the PCAN-Gateway should act as a pure observer, not affecting the data traffic, Listen-Only-Mode must be enabled. Activate Listen-Only-Mode with a click on the checkbox.

Bit Rate Definition: (Expert mode only) With this selection you can determine the mode to be used to set bit rates.

- **Selected from standard list:** This is the default mode which is used if the Expert mode is switched off. The bit rates can be selected from standard selection lists
- **Set with register values:** This is an option to set a custom bit rate. If selected, forms with input fields for the register values of the nominal bit rate appear. For details, see the following section *Configuring Custom Bit Rates with Register Values*
- **Set with register string:** This is an option to set custom bit rates. If selected, a single input form for a register string appears. For details, see the following section *Configuring Custom Bit Rates with a Register String*

Nominal Bit Rate: For setting the nominal bit rate, click the drop-down menu and select the value that is used on the connected CAN bus.

User Notes: Additional information with a length of 125 characters can be entered for each CAN channel. This text is available while adding and editing routes.

Configuring Custom Bit Rates with Register Values

In Expert mode, you can configure custom bit rates and sample points with the bit rate definition mode *Set with register values*.

If this mode is selected, input fields for the nominal bit rate are provided to enter the register values of the CAN controller.

Bit Rate Prescaler: With this input field, the radio of CPI clock and serial clock frequency is set. For a custom nominal bit rate, it accepts values from 1 to 256.

Propagation Segment: This time segment is used to compensate the signal delays over the network. For a custom nominal bit rate, it accepts values from 2 to 8.

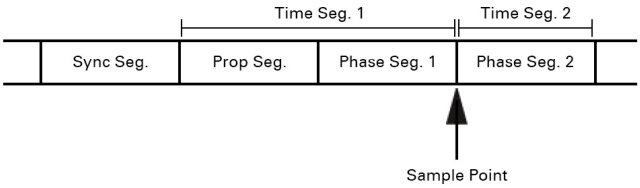
Phase Segment 1 & 2: The phase segments are used to compensate edge phase errors at the beginning and end of the bit. For a custom nominal bit rate, Phase Segment 1 accepts values from 2 to 8 and Phase Segment 2 accepts values from 2 to 8.

Re-Synch. Jump Width: The Resynchronization Jump Width defines the maximum extension or shortening of the Phase Segments for the signal resynchronization. This value has no impact on the bit rate and sample point calculation. For a custom nominal bit rate, it accepts values from 1 to 4.

Calculated bit rate: The form checks your entries and calculates the bit rates using the following formula:

$$\text{Bit Rate} = \frac{24\ \text{MHz} / \text{Bit Rate Prescaler}}{\text{Sync Seg.} + \text{Time Seg.1} + \text{Time Seg.2}}$$

The Synchronization segment is always 1 and is used for the synchronization of each bus node. The sampling time (sample point) is determined via Time Segments 1 and 2. Time Segment 1 consists of Phase Segment 1 and the Propagation Segment. Time Segment 2 is defined by Phase Segment 2.



Note: When entering values, the resulting bit rates are automatically calculated in real time. If the values are incorrect, or the calculated bit rates are beyond the limits of the CAN transceiver, the data cannot be saved. For the nominal bit rate, the limits are 5 kbit/s to 1 Mbit/s.

By clicking on the Save Settings button you can save your previously defined bit rate.

Configuring Custom Bit Rates with a Register String

In Expert mode, you can configure custom bit rates and sample points with the bit rate definition mode *Set with register string*.

If this mode is selected, a single input field is provided to enter the register string. This string specifies the clock frequency and the register values of the nominal bit rate. In contrast to configuring custom bit rates with register values, the register string indicates the Time segment values instead of the Phase and Propagation segment values.

The bit rate register string can be generated with the free applications **Bit Rate Calculation Tool** or **PCAN-View** from PEAK-System.

Examples:

500 kbit/s Nominal BR, 80% Sample Point =

```
f_clock=80000000, nom_brp=1, nom_tseg1=127, nom_tseg2=32, nom_sjw=32
```

500 kbit/s Nominal BR, 4 Mbit/s Data BR, 75% Sample Point =

```
f_clock=80000000, nom_brp=5, nom_tseg1=23, nom_tseg2=8, nom_sjw=8,
data_brp=5, data_tseg1=2, data_tseg2=1, data_sjw=1
```

1 Mbit/s Nominal BR, 4 Mbit/s Data BR, 80% Sample Point =

```
f_clock=80000000, nom_brp=1, nom_tseg1=63, nom_tseg2=16,
nom_sjw=16, data_brp=1, data_tseg1=15, data_tseg2=4, data_sjw=4
```

Note: The submitted values and the resulting bit rates are checked. If the values are incorrect, or the calculated bit rates are beyond the limits of the CAN transceiver, the data cannot be saved.

The limits of the register values and bit rates are documented in the previous section *Configuring Custom Bit Rates with Register Values*.

By clicking on the Save Settings button you can save your previously defined bit rate.

5.5.2 LAN

The *Network* > *LAN* page displays the current settings of the LAN interface and provides options for configuration.

LAN Interface

This box displays the LAN interface settings. IP address, Subnet mask, and gateway are adjustable. The MAC address cannot be changed. Each device receives a unique MAC address during the manufacturing process, which can be used for identification.

LAN Address Settings

The LAN interface can be configured by using the form underneath the general information overview. Settings can be saved by clicking the Save Settings button located below the form.

DHCP: If the IP network uses DHCP (Dynamic Host Configuration Protocol), the PCAN-Gateway IP address, Subnet mask, and gateway address are assigned automatically. Otherwise, you must manually enter the information. Switch DHCP on if required (Enable).

> **Note:** DHCP is not recommended, because it is necessary to know the IP address of the PCAN-Gateway to access the configuration website. Furthermore, the IP address may change after a restart of the device or the DHCP server. In this case the existing routes won't work.

IP Address: Enter the IP address (IPv4) of the LAN interface. It should be noted that only values from 0 to 255 may be used and certain address ranges are reserved.

- In the first field, enter a value less than 224, since addresses starting from this value are reserved for Multicast messages
- Depending on the Subnet mask, the highest device address is reserved for broadcast messages. For the Subnet mask 255.255.255.0 and the network address 192.168.1.xxx, the reserved address would be: 192.168.1.255
- Depending on the Subnet mask, the lowest device address is reserved for messages that are addressed to the entire network. For the Subnet mask 255.255.255.0 and the network address 192.168.1.xxx, the reserved address would be: 192.168.1.0

Subnet mask: The Subnet mask indicates which part of the IP address represents the network, and which part represents the device. This subdivision is achieved by filling in the (binary) Subnet mask from left to right with the number “1”. The resulting values for the individual fields are: 0, 128, 192, 224, 240, 248, 252, 254 and 255.

While entering values from left to right, as soon as a value smaller than “255” is entered, a “0” must follow. For example, 255.255.128.0 is valid, while 255.128.255.0 is false.

Gateway: Enter the IP address (IPv4) of the gateway that manages the IP network. Proceed with the same guidelines as outlined for local IP address entry. Entering a gateway address is optional.

Note: After modifying these settings, the device may not be reachable. Possible causes for this are:

- You have activated DHCP. The IP address of the device is not known, because it has been acquired dynamically from the gateway. The address can often be found on a list provided by the gateway.
- You have changed the part of the address assigned to the network (see Subnet mask information). In this case the device is now part of a different network than the one your computer is a part of. Connecting to the device is only possible by respectively adapting your computer's IP address to the different network that the device is in.

5.6 Device

The *Device* page displays detailed information about your PCAN-Gateway.

General Product Information: In this area, the product name, order number, and the serial number of the device are displayed. This information can be used to uniquely identify the device.

User defined Device Information: The information displayed here can be defined by the user.

- The Name and Description can be set on the *Device* > *Configuration* page.
- The Device ID can be set via the Windows software PCAN-View. It is not automatically updated on the website. Click the *Update* button to reload the ID or log in to the website again.

All of this information can be used to uniquely identify the device.

Interface Information: This area lists all available communication interfaces regardless of their state.

Hardware Information: This area lists the version of the circuit board and further hardware information if available.

Version Information: This area shows different information concerning versions:

- Software Version: This version number indicates the version of the installed software package. This, additionally to the software, includes the firmware, website, and JSON interface. The software package can be updated on the page *Device* > *Software Update*
- Website Version: This number indicates the version of the configuration website that you are currently using. The website is updated automatically when a software update is processed
- JSON Interface Version: This number indicates the version of the JSON interface, which is an alternative way to access the status information and configuration of the PCAN-Gateways. The JSON interface is updated automatically when a software update is processed

5.6.1 Device Configuration

On the *Device* > *Configuration* page it is possible to assign a custom name and description to the device. In addition to that, different import and export options are available.

Custom Device Name and Description:

Use this form to assign a name and description to the PCAN-Gateway. This will aid in identifying the device among other similar devices. The name and description will be shown in the header of the website and other areas.

Name: Enter a name for the device in this field. The maximum length allowed is 50 characters. Please note: This name is separate from the product name that is also displayed in the header area of the website.

Depending on the IP network, it is possible to access the website of the device by typing this name with a previous `http://` in the address bar of the browser.

Description: Enter a description for the device in this field. The maximum length allowed is 200 characters.

The entries can be saved by clicking the Save Settings button located beneath the form.

Import Configuration:

This form allows the importing of locally saved configuration files. After an import, all communication interfaces and device settings, as well as the routes and filters are restored. The current configuration is overwritten within that process.

Use the button on the left side to select a configuration file (*. ini). To start the restoration process, click the Import button located on the right.

Note: If you import a configuration file from another PCAN-Gateway device that is in the same network, its IP address will also be imported and loaded. Both devices would then have the same IP address. This would cause an address conflict and would result in both devices being non accessible.

In such a case, separate one device from the power supply. The other device will then become accessible again and its IP address can be changed manually. This will resolve the address conflict and both devices can be used again.

Export Configuration:

With the Export button, an ini file can be downloaded containing all device configurations as well as all route and filter settings.

The file can be freely renamed, the contents of the file however should not be altered. Importing altered configuration files can lead to failures during the import process. Only valid configuration files can be used for device restoration.

Reload Default Settings:

With the Reload button you can restore the device to its factory defaults. During this process the login settings, all device and communication interface settings along with existing routes will be restored to the states they were in at the time of product delivery. The current configuration is overwritten within that process. In addition, the access data will be reset to the default values (see the label on the left side of the device). The PCAN-Gateway is then reachable under the default IP address (192.168.1.10).

JSON Interface Configuration (Expert mode only):

The JSON interface is an alternative way to access the status information and configuration of the PCAN-Gateways.

A specific request is then transmitted as a GET parameter of a URL and the PCAN-Gateway returns a JSON-formatted response. Based on this, it is possible to monitor and configure the PCAN-Gateway product family via software.

The JSON interface is activated at delivery but cannot be used for configuration. It can be set up or deactivated via the configuration website.

Enable JSON Interface: If active, the JSON interface can be used.

Enable Configuration: If active, the device can be configured via the JSON interface. This includes the commands set, reset, reboot, and delete.

Enable Shell View: If active, the Shell view can be used. It is primarily intended for development and familiarization.

Respect Public Display: If active, access is only allowed to elements that have been activated on the page *Device* > *User Management* in the Public Dashboard form.

Save your settings with Save Settings.

> **Note:** In the current version there is no access protection for the JSON interface. Once you have activated the interface and Enable Configuration, the PCAN-Gateway can be configured without logging in.
>
> Detailed information about the JSON interface is included in the PCAN-Gateway developer documentation.

5.6.2 User Management

The *Device* > *User Management* page provides options for entering new login credentials, changing and defining the display mode, and determining what information should be visible on the login page.

Login Settings:

Enter your current login details in the upper part of the form. In the lower part you can enter a new username and a new password. The new password must be confirmed in order to exclude accidental input.

To ensure a minimum level of security, the password should have at least 8 characters. If possible, use letters, numbers, and special characters.

Save your inputs with the Save Settings button.

> **Important notice: Login data is confidential!**
> Do not act carelessly and leave your system open to attack. Never deposit the login data in any form on the Internet or make it easily accessible. Do not give the new login data carelessly to third parties nor send it by e-mail.

Display Mode Setting:

This form provides the opportunity to change the display mode. Expert mode enables access to more detailed information and professional settings. Interpreting this information and using these features requires advanced knowledge of TCP/IP, CAN, and the message forwarding of the PCAN-Gateways.

Click on the drop-down menu and choose one of the two modes. This setting only applies for the current session and will be reset with your next login.

Reset after Login: If you deactivate this checkbox, the display mode is not reset after a new login.

Save the settings by clicking the Save Settings button.

Public Dashboard:

This form is responsible for defining what information is visible on the website to non-logged in users. Only basic status information can be made visible, configuration options cannot be unlocked publicly. In addition, the Public Dashboard can be used to determine which elements can be accessed via the JSON interface.

Activate or deactivate the checkboxes to toggle the accessibility of their corresponding information.

Confirm your choices with the Save Settings button.

5.6.3 Software Update

Initiating a software update will update the firmware, software, configuration website, and JSON interface. The currently installed software package version is indicated by the software version number. This number can be found on the pages *Device* > *Software Update* and *Device* as well as in the footer of the website.

Current product updates can be downloaded on the PEAK-System website (www.peak-system.com). Please make sure to download the correct package for your device. Every version of the PCAN-Gateway product family has a separate download package.

It's recommended to backup the current configuration before performing a software update or downgrade. The current settings may get lost if they are not supported by the software package to be installed or if a failure like a power cut happens.

Performing a software update:

1. Please select the software update package (*.tar) with the button on the left.
2. Click the button on the right to upload the file and update your device.
   Please note: All routes and CAN interfaces will be switched to standby for that operation.
3. After a successful software update, the device will reboot. You will be forwarded to the login page and all routes and CAN interfaces are reactivated.

Note: If the update process was interrupted, you will have to restart the device in order to reactivate the routes and CAN channels. Use the **Reboot Device** link located near the bottom of the main navigation. Alternatively, you can use the physical **Reset** button located on the device itself.

Note: If you intend to downgrade to an older software package, export your current configuration. The settings, routes, and filters may get lost in the process.

5.7 Help

The *Help* page contains the complete help information available for your Gateway's Configuration web site. It is nearly identical to chapter 5 of the PDF documentation.

Question mark icons are located next to every page title, clicking on one will open a corresponding help page.

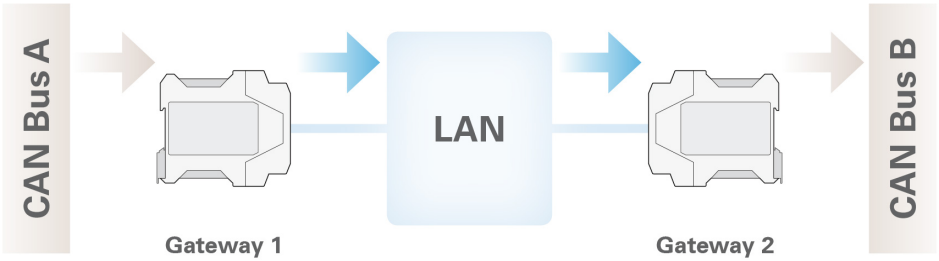
5.8 Support

On the *Support* page you will find useful links and contact information of PEAK-System Technik GmbH.

6 Application Examples

The PCAN-Ethernet Gateway DR allows the connection of different CAN buses over IP networks. CAN frames are wrapped in TCP or UDP message packets and then forwarded via the IP network from one device to the other. This makes it possible for CAN networks to connect to each other over large distances.

6.1 Unidirectional Data Transmission



For unidirectional data transmission, the message traffic from CAN bus A is to be forwarded to CAN bus B via a LAN network. Necessary for this are two PCAN-Ethernet Gateway DR and the creation of a route on each device.

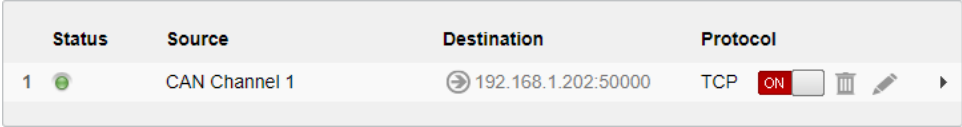
In this example Gateway 1's IP address is 192.168.1.201 and it is connected to CAN bus A via CAN channel 1. Gateway 2's IP address is 192.168.1.202 and it is connected to CAN bus B via CAN channel 2.

Creating a Send Route:

Incoming messages from Gateway 1 are to be transferred into the LAN network. For this, a Send route with the following values must be created.

Gateway 1 > Send Route		
Route Direction	Send: CAN > IP	
Status	Activate	
CAN	CAN Channel 1 (connected to CAN bus A)	
IP Interface	IP Address	192.168.1.202 (address of Gateway 2)
	Port	50000
	Protocol	TCP

After saving, the route on Gateway 1 will be displayed on the *Routing* > *Manage Routes* page as follows.



Creating a Receive Route:

Gateway 2 is to accept the data packets sent via the LAN network by Gateway 1, and pass the containing CAN messages through CAN channel 2 to CAN bus B. For this, a Receive route with the following values must be created.

Gateway 2 > Receive-Route		
Route Direction	Receive: IP > CAN	
Status	Activate	
IP Interface	Port	50000 (like the Send route)
	Protocol	TCP (like the Send route)
CAN	Channel 2 (connected to CAN bus B)	

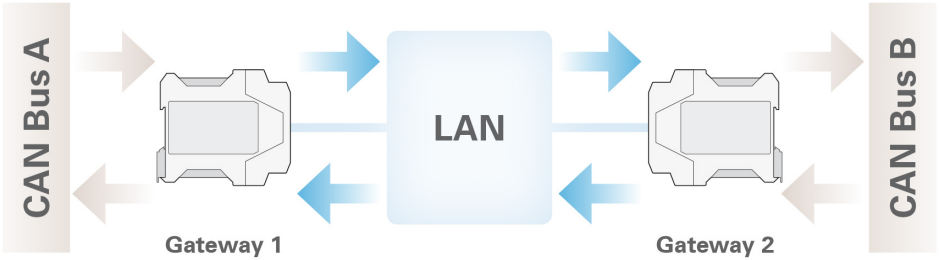
Transferring data between 2 PCAN-Gateways always consists of a Send and a Receive route. Note that both should use the same transfer protocol (TCP or UDP) and the same port.

After saving, the route on Gateway 2 will be displayed on the *Routing* > *Manage Routes* page as follows.

A short time after both routes have been created and activated, the connection will establish. You can interrupt the connection by deactivating or erasing one of the routes on the *Routing* > *Manages Routes* page.

Note: Detailed information concerning the creation of routes, as well as input and selection options, can be found in chapter 5.3.2 *Add / Edit Route*.

6.2 Bidirectional Data Transmission



For bidirectional data transmission the message traffic occurring between CAN buses A and B is to be forwarded via the LAN network. For this two PCAN-Ethernet Gateway DR are needed, where for each one, a Send and Receive route must be created.

In this example Gateway 1's IP address is 192.168.1.201 and it is connected via CAN channel 1 to CAN bus A. Gateway 2's IP address is 192.168.1.202 and it is connected via CAN channel 2 to CAN bus B.

The difference here, when compared with the example in section 6.1 , is solely that the opposite message forwarding from CAN bus B to CAN bus A must also be realized.

The Routes on Gateway 1:

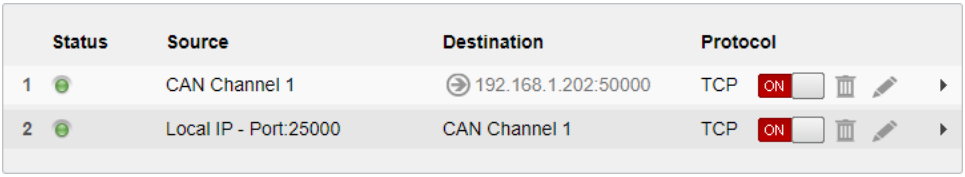
Incoming messages from Gateway 1 are to be transferred into the LAN network. For this, a Send route with the following values must be created.

Gateway 1 > Send Route A		
Route Direction	Send: CAN > IP	
Status	Activate	
CAN	CAN Channel 1 (connected to CAN bus A)	
IP Interface	IP Address	192.168.1.202 (address of Gateway 2)
	Port	50000
	Protocol	TCP

Gateway 1 is to accept the data packets sent via LAN network by Gateway 2, and pass the containing CAN messages through CAN channel 1 into CAN bus A. For this, a Receive route with the following values must be created.

Gateway 1 > Receive Route B		
Route Direction	Receive: IP > CAN	
Status	Activate	
IP Interface	Port	25000 (like the Send route B)
	Protocol	TCP (like the Send route B)
CAN	Channel 1 (connected to CAN bus A)	

After saving, the routes on Gateway 1 will be displayed on the *Routing* > *Manage Routes* page as follows.



The Routes on Gateway 2:

Gateway 2 is to accept the data packets sent via LAN network by Gateway 1, and pass the containing CAN messages through CAN channel 2 into CAN bus B. For this, a Receive route with the following values must be created.

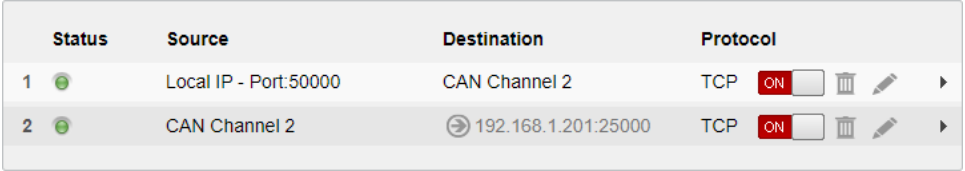
Gateway 2 > Receive Route A		
Route Direction	Receive: IP > CAN	
Status	Activate	
IP Interface	Port	50000 (like the Send route A)
	Protocol	TCP (like the Send route A)
CAN	Channel 2 (connected to CAN bus B)	

Gateway 2 should transmit incoming message traffic from CAN bus B into the LAN network. For this a Send route with the following values must be created.

Gateway 2 > Send Route B		
Route Direction	Send: CAN > IP	
Status	Activate	
CAN	Channel 2 (connected to CAN bus B)	
IP Interface	IP Address	192.168.1.201 (address of Gateway 1)
	Port	25000
	Protocol	TCP

Transferring data between 2 PCAN-Gateways always consists of a Send and a Receive route. Note that both should use the same transfer protocol (TCP or UDP) and the same port.

After saving, the routes on Gateway 2 will be displayed on the *Routing* > *Manage Routes* page as follows.



A short time after all routes have been created and activated, the bidirectional connection will establish. You can interrupt the connection by deactivating or erasing one of the routes on the *Routing* > *Manages Routes* page.

Note: Detailed information concerning the creation of routes, as well as input and selection options, can be found in chapter 5.3.2 *Add / Edit Route*.

6.3 Filtering Single CAN IDs

The outgoing CAN messages of a Send route can be filtered. Filters of the type Range cover a range of at least two CAN IDs. If a single message with a specific CAN ID is to be filtered, a Mask filter is used.

In this example a Send route has already been set up on the PCAN-Gateway. This Send route is to be configured with two filters that only allow messages with the 11-bit IDs 0x100 and 0x200 to pass.

Creating the Filters

Open the page *Filters* > *Add Filter* and create the filter for ID 0x100 with the following settings.

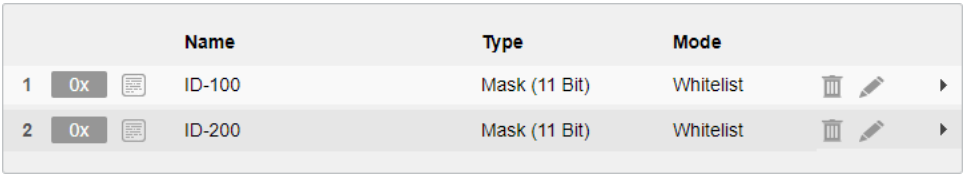
Filter 0x100	
Filter Type	Mask
CAN ID Mode	Standard (11 Bit)
Filter Mode	Whitelist
Acceptance Code	100
Acceptance Mask	000
Name	ID-100
User Notes	Only ID 0x100 can pass.

After saving, continue with the filter for ID **0x200**.

Filter 0x200	
Filter Type	Mask
CAN ID Mode	Standard (11 Bit)
Filter Mode	Whitelist
Acceptance Code	200
Acceptance Mask	000
Name	ID-200
User Notes	Only ID 0x200 can pass.

The Acceptance Code specifies the CAN ID that should pass the filter. The Acceptance Mask **000** causes every digit of the three-digit CAN ID to be checked.

After saving, the filters are displayed on the *Filters* > *Manage Filters* page as follows:



Assigning the Filters

The two filters must now be assigned to the Send route. However, in Normal display mode only a single filter can be used per Send route. In Expert mode several filters can be assigned.

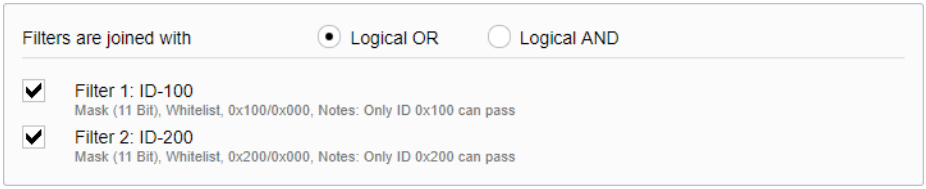
This is how you switch to Expert mode:

1. Open the page *Device* > *User Management*.
2. Choose in the form *Display Mode Setting* the display mode *Expert*.
3. Confirm your changes with Save Settings.

This is how you assign a filter to a Send route:

1. Open the page *Routing* > *Manage Routes*.
2. Open the desired Send route with the pencil symbol for editing.
3. Choose *Logical OR* for *Filters are joined with* in the filter form.

4. Activate the checkboxes of the filters **ID-100** and **ID-200**.



5. Confirm your changes with Save Settings.

Now the outgoing messages of the Send route are filtered as desired.

7 Technical Specifications

Connectors		
CAN	2 x	Phoenix connector 4-pin Mating connector: Phoenix Contact MSTB 2,5/4-ST BK - 1756298
RS-232	1 x	
Power	1 x	
LAN	RJ-45 socket	

CAN		
Protocols	CAN 2.0 A/B	
Physical transmission	ISO 11898-2 (High-speed CAN)	
Transceiver	NXP PCA82C251	
CAN bit rates	5 kbit/s to 1 Mbit/s	
Supported clock frequencies	24 MHz	
Supported bit timing values	Bit Rate Prescaler (BRP) Propagation Segment (PROPSEG) Phase Segment 1 (PSEG1) Phase Segment 2 (PSEG2) Synch. Jump Width (SJW)	1 to 256 2 to 8 2 to 8 2 to 8 1 to 4
Galvanic isolation	Isolation of the CAN channels up to 500 V against each other, against RS-232 and the power supply	
Internal termination	Not available	
Listen-only mode	Configurable separately for both CAN channels	

LAN	
Protocols	TCP, UDP
Standard	IEEE 802.3
Bit rates	10/100 Mbit/s Base-T

LAN	
Reserved ports	45321: Used for transferring status information and for executing the handshake between PCAN-Gateways 52957: Used for executing device scans
Additional features	Auto-Sensing with 10/100 Mbit/s Auto-Crossover

Power supply	
Supply voltage	8 to 30 V DC
Max. current consumption	360 mA at 8 V 240 mA at 12 V 100 mA at 30 V

Measures	
Size	22.5 x 99 x 114.5 mm (W x H x D) See also dimension drawing Appendix C
Weight	105 g

Environment	
Operating temperature	-40 to +85 °C (-40 to +185 °F)
Temperature for storage and transport	-55 to +125 °C (-67 to +257 °F)
Relative humidity	15 to 90 %, not condensing
Ingress protection (IEC 60529)	IP20

Conformity	
RoHS	EU Directive 2011/65/EU (RoHS 2) + 2015/863/EU (revised list of restricted substances) DIN EN IEC 63000:2019-05
EMC	EU Directive 2014/30/EU DIN EN 55032:2022-08 DIN EN 55035:2018-04

Appendix A CE Certificate

EU Declaration of Conformity

This declaration applies to the following product:

Product name:	**PCAN-Ethernet Gateway DR**
Item number(s):	**IPEH-004010**
Manufacturer:	PEAK-System Technik GmbH Leydheckerstraße 10 64293 Darmstadt Germany

CE We declare under our sole responsibility that the mentioned product is in conformity with the following directives and the affiliated harmonized standards:

EU Directive 2011/65/EU (RoHS 2) + 2015/863/EU (amended list of restricted substances)

DIN EN IEC 63000:2019-05
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016);
German version of EN IEC 63000:2018

EU Directive 2014/30/EU (Electromagnetic Compatibility)

DIN EN 55032:2022-08
Electromagnetic compatibility of multimedia equipment - Emission requirements (CISPR 32:2015);
German version of EN 55032:2015 + AC:2016 + A11:2020 + A1:2020

DIN EN 55035:2018-04
Electromagnetic compatibility of multimedia equipment - Immunity requirements (CISPR 35:2016, modified);
German version of EN 55035:2017

Darmstadt, 15 May 2024

Uwe Wilhelm, Managing Director

Appendix B UKCA Certificate

UK Declaration of Conformity

This declaration applies to the following product:

Product name: **PCAN-Ethernet Gateway DR**

Item number(s): **IPEH-004010**

Manufacturer:

PEAK-System Technik GmbH
Leydheckerstraße 10
64293 Darmstadt
Germany

UK authorized representative:

Control Technologies UK Ltd
Unit 1, Stoke Mill,
Mill Road, Sharnbrook,
Bedfordshire, MK44 1NN, UK

We declare under our sole responsibility that the mentioned product is in conformity with the following UK legislations and the affiliated harmonized standards:

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

DIN EN IEC 63000:2019-05
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016);
German version of EN IEC 63000:2018

Electromagnetic Compatibility Regulations 2016

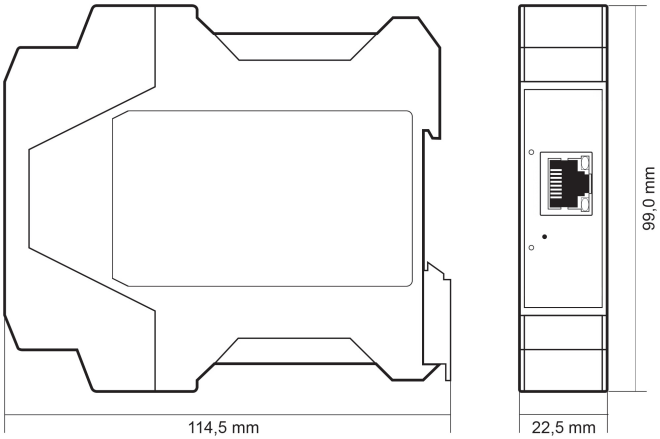
DIN EN 55032:2022-08
Electromagnetic compatibility of multimedia equipment - Emission requirements (CISPR 32:2015);
German version of EN 55032:2015 + AC:2016 + A11:2020 + A1:2020

DIN EN 55035:2018-04
Electromagnetic compatibility of multimedia equipment - Immunity requirements (CISPR 35:2016, modified);
German version of EN 55035:2017

Darmstadt, 15 May 2024

Uwe Wilhelm, Managing Director

Appendix C Dimension Drawing



The figure doesn't show the actual size of the product.

Appendix D Disposal

The PCAN-Ethernet Gateway DR must not be disposed of with household waste. Dispose of this electronic device in accordance with local regulations.

The PCAN-Ethernet Gateway DR does not contain a battery for separate disposal.