Important User Information

Liability

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There are many applications of this product. Those responsible for the use of this device must ensure that all the necessary steps have been taken to verify that the applications meet all performance and safety requirements including any applicable laws, regulations, codes, and standards.

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The examples and illustrations in this document are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular implementation, HMS Industrial Networks cannot assume responsibility for actual use based on these examples and illustrations.

Intellectual Property Rights

HMS Industrial Networks has intellectual property rights relating to technology embodied in the product described in this document. These intellectual property rights may include patents and pending patent applications in the USA and other countries.
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1 User Guide

Please read the manual carefully. Make sure you fully understand the manual before using the product.

1.1 Target Audience

This manual addresses trained personnel who are familiar with CAN, CAN FD and the applicable national standards. The contents of the manual must be made available to any person authorized to use or operate the product.

1.2 Related Documents

<table>
<thead>
<tr>
<th>Document</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Guide</td>
<td>HMS</td>
</tr>
<tr>
<td>VCI Driver</td>
<td>HMS</td>
</tr>
<tr>
<td>Software Design Guide CAN@net NT 200/420 Generic Protocol for Gateway Mode</td>
<td>HMS</td>
</tr>
<tr>
<td>User Manual CAN-Gateway Configurator</td>
<td>HMS</td>
</tr>
</tbody>
</table>

1.3 Document History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>July 2016</td>
<td>First release</td>
</tr>
<tr>
<td>1.1</td>
<td>October 2016</td>
<td>Adjusted to new Ixxat CAN-Gateway Configurator</td>
</tr>
<tr>
<td>1.2</td>
<td>July 2017</td>
<td>Changes in configuration tool, added CAN@net NT 420</td>
</tr>
<tr>
<td>1.3</td>
<td>November 2017</td>
<td>Minor corrections</td>
</tr>
<tr>
<td>1.4</td>
<td>April 2018</td>
<td>Moved parts of the configuration to user manual of CAN-Gateway Configurator</td>
</tr>
<tr>
<td>1.5</td>
<td>January 2019</td>
<td>New CAN-Gateway-Configurator version</td>
</tr>
<tr>
<td>1.6</td>
<td>March 2019</td>
<td>Layout changes</td>
</tr>
</tbody>
</table>

1.4 Trademark Information

Ixxat® is a registered trademark of HMS Industrial Networks. All other trademarks mentioned in this document are the property of their respective holders.
1.5 **Conventions**

Instructions and results are structured as follows:

- instruction 1
- instruction 2
  - result 1
  - result 2

Lists are structured as follows:

- item 1
- item 2

**Bold typeface** indicates interactive parts such as connectors and switches on the hardware, or menus and buttons in a graphical user interface.

This font is used to indicate program code and other kinds of data input/output such as configuration scripts.

This is a cross-reference within this document: *Conventions, p. 4*

This is an external link (URL): [www.hms-networks.com](http://www.hms-networks.com)

Safety advice is structured as follows:

<table>
<thead>
<tr>
<th>!</th>
<th>Cause of the hazard!</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consequences of not taking remediate action.</td>
</tr>
<tr>
<td></td>
<td>How to avoid the hazard.</td>
</tr>
</tbody>
</table>

Safety signs and signalwords are used dependent on the level of the hazard.

- This is additional information which may facilitate installation and/or operation.

- This instruction must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

- **Caution**
  This instruction must be followed to avoid a risk of personal injury.

- **WARNING**
  This instruction must be followed to avoid a risk of death or serious injury.
2 Safety Instructions

! Risk of interference to radio and television if used in office or home environment!
Use exclusively included accessories. Use exclusively shielded cables.
Make sure that the shield of the interface is connected with the device plug and the plug
on the other side.

! Malfunction caused by extension cable!
According to the USB specification connect the interface directly or via an active USB hub
to the computer. Do not use an extension cable.

2.1 General Safety Instructions

► Protect product from moisture and humidity.
► Protect product from too high or too low temperature (see Technical Data, p. 24).
► Protect product from fire.
► Do not paint the product.
► Do not modify or disassemble the product. Service must be carried out by HMS Industrial
Networks.
► Store products in dry and dust-free place.

2.2 Intended Use

The components are used to connect computer systems to CAN and CAN FD networks and to
connect the networks with each other. They are intended for installation on standard DIN rail.

3 Scope of Delivery

Included in scope of delivery:
• CAN@net NT
• 1 x power connector
• 2 x CAN connector (with CAN@net NT 200)
  4 x CAN connector (with CAN@net NT 420)
• User Manual CAN@net NT
• Installation Guide VCI Driver
• Mini USB cable
4 Product Description

The CAN@net NT hardware provides connectivity to Ethernet and CAN networks with various operational modes. The CAN@net NT 420 additionally is capable of CAN FD. The application firmware provides functions to access a CAN bus from virtually every Ethernet TCP/IP host. The CAN@net NT provides message filtering, based on CAN identifiers, for Bridge and Gateway mode in the direction from CAN system to TCP/IP network. In the Gateway mode the filter can be configured by ASCII commands. In the Bridge mode the configuration tool is used to configure the filter. With the VCI driver the CAN@net NT can be used as a PC interface.

4.1 Features

- CAN@net NT 200: 2 x CAN connections, ISO 11898-2 (terminal adapters)
- CAN@net NT 420: 4 x CAN connections, ISO 11898-2 (terminal adapters), via the CAN-Gateway Configurator two connections can be switched between Classic CAN and CAN FD
- 1 x RJ45 Ethernet port, 10/100 Mbit/s
- 1 x mini USB 2.0 port, high-speed
- configuration via USB or Ethernet
- With the CAN-Gateway Configurator a configuration can be created, modified, written to and read from the target device via USB or Ethernet connection.
- platform independent due to ASCII protocol
- Classic CAN/ CAN FD ID filtering
- Classic CAN to CAN FD mapping and CAN FD to Classic CAN mapping (with NT 420)
- cyclic transmission of CAN messages
- MQTT and syslog functionality
- command line program CANGWfile (available for Windows and Linux)
- action rules via if-this-action-then-that-event functionality

4.2 Operational Modes

4.2.1 ASCII Gateway Mode

In the Gateway mode, the CAN@net NT is hooked to the local intranet or internet (firewall needed). This allows a TCP/IP host within the reach of this intranet or internet to connect to the CAN@net NT and gain control of the CAN system. The Ethernet TCP/IP host can exchange commands and CAN messages using the ASCII protocol. The server relays the commands and messages to the CAN bus and vice versa.
For information about the communication in Gateway mode and commands that are used to exchange CAN messages see Software Design Guide CAN@net NT 200/420 Generic Protocol for Gateway Mode on www.ixxat.com.

4.2.2 Bridge Modes

With the CAN@net NT the Bridge mode allows to connect CAN systems over an Ethernet TCP/IP network, for example the local intranet or the internet (firewall needed). Minimum two devices are required for a CAN-Ethernet-CAN bridge. One must be configured as master and one as slave. A single device can be used as Local CAN bridge, which allows to map individual messages from and to each CAN port of the device.

Possible Bridge Modes with CAN@net NT 200:
- Local CAN Bridge
- CAN-Ethernet-CAN Bridge with 2 devices

Possible Bridge Modes with CAN@net NT 420:
- Local CAN Bridge
- CAN-Ethernet-CAN Bridge with 2 devices
- CAN-Ethernet-CAN Bridge with 3 devices
- CAN-Ethernet-CAN Bridge with 4 devices

![Fig. 2 CAN-Ethernet-CAN Bridge with 2 devices (NT 200)](image)

![Fig. 3 CAN-Ethernet-CAN Bridge with 4 devices (NT 420)](image)

4.2.3 VCI Interface Mode

With the VCI driver the CAN@net NT can be used as a PC interface. All VCI-based Ixxat tools as well as customer-specific applications based on the VCI driver can be used. The VCI driver offers the possibility to communicate with up to 128 CAN@net NT devices via LAN or internet.
5 Installation

5.1 Installing the Software

5.1.1 Installing the Driver

For the operation of the CAN-Gateway Configurator and the CAN@net VCI mode a driver is needed.

► Install the VCI driver (see Installation Guide VCI Driver).

5.1.2 Installing the CAN-Gateway Configurator

► Download the CAN-Gateway Configurator CANbridge NT & CAN@net NT 200/420 package from www.ixxat.com.

► Run cangwconfig.exe.
   → Installation wizard starts automatically.

► Follow instructions in installation program.

5.2 Installing the Hardware

Fig. 4 Connectors

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAN 1</td>
</tr>
<tr>
<td>2</td>
<td>CAN 2</td>
</tr>
<tr>
<td>3</td>
<td>Power connector</td>
</tr>
<tr>
<td>4</td>
<td>CAN 3 (only with CAN@net NT 420)</td>
</tr>
<tr>
<td>5</td>
<td>CAN 4 (only with CAN@net NT 420)</td>
</tr>
</tbody>
</table>

► Make sure that the cross-sectional area of the cable is larger than or equal to 0.14 mm² resp. 25 AWG.

► To remove the connector, use screwdriver or similar tool.

► Connect the cables.

► Plug the connector into the housing.
The shield of the CAN connector is connected to the device ground and the PE on the back of the device (DIN rail) via a 1 MΩ resistor and a 10 nF capacitor. To achieve highest interference immunity, ground the shield of the CAN cable.

5.2.1 Power Connector

![Power connector diagram](image)

**Fig. 5 Power connector**

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V+ (+9 V to +36 V DC)</td>
</tr>
<tr>
<td>2</td>
<td>V-</td>
</tr>
<tr>
<td>3</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
</tr>
</tbody>
</table>

5.2.2 CAN and CAN FD Connectors

![CAN/CAN FD connector diagram](image)

**Fig. 6 CAN/CAN FD connector**

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAN high</td>
</tr>
<tr>
<td>2</td>
<td>CAN low</td>
</tr>
<tr>
<td>3</td>
<td>CAN GND</td>
</tr>
<tr>
<td>4</td>
<td>Shield</td>
</tr>
</tbody>
</table>

If a D-Sub 9 connector is used, observe the following pin allocation of the D-Sub 9 connector:

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>CAN low</td>
</tr>
<tr>
<td>3</td>
<td>CAN GND</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Shield</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>CAN high</td>
</tr>
<tr>
<td>8</td>
<td>—</td>
</tr>
<tr>
<td>9</td>
<td>—</td>
</tr>
</tbody>
</table>
5.3 Checking and Updating the Firmware

5.3.1 Checking the Device Firmware

► Make sure, that the latest VCI driver is installed.
► Make sure, that the device is correctly connected to the host computer and to power supply.
► Make sure that the latest CAN-Gateway Configurator is installed (check within support area on www.ixxat.com).
► Start the Ixxat CAN-Gateway Configurator.
► Open menu Scan and select All Ixxat devices.
  → Connected devices and firmware version of the devices are shown.

5.3.2 Updating the Device Firmware

Whether updating is permitted via Ethernet or a password is needed, is defined in the security settings of the CAN-Gateway Configurator. The default password is IXXAT. For more information see user manual CAN-Gateway Configurator.

The firmware is constantly improved and expanded! Check if a newer firmware version is available within the support area on www.ixxat.com.

To use all features the latest firmware versions of the CAN-Gateway Configurator and of the CAN@net NT must be installed.

If the current firmware of the CAN@net NT in use is V4 or older:
► See update package on www.ixxat.com for information about updating to V5 or contact Ixxat support.

If the current firmware of the CAN@net NT in use is V5:
► Check if newer firmware is available on www.ixxat.com.
► Download and unzip the update package.
► Make sure, that the device is connected to power supply.
► Connect the device to the computer via USB.
► Make sure that the latest CAN-Gateway Configurator is installed (check within support area on www.ixxat.com).
► Start the CAN-Gateway Configurator.
► In drop down list Select device type select the device in use.
► In drop down list Select device version select V5.
► Scan for devices with button Scan and select the device in use in the combo box Target Device.
► Click button Connect.
► Open menu Target and select Read configuration from target.
► Save the configuration on the computer.
► Open menu Target and select Update Firmware.
► Select the update file.
  → Firmware of the connected device is updated.
► In the status window check if the update is completed successfully.
► Write the saved configuration to the device.
6 Configuration

The security settings set via the CAN-Gateway Configurator define if changing the configuration via Ethernet is possible and if a password is needed to change to configuration. The default password is IXXAT. For more information see user manual CAN-Gateway Configurator.

6.1 Connecting Possibilities

There are different possibilities to connect the CAN@net NT. Depending on the type of connection different ways of configuring the IP address and the device are necessary.

The following ways of connecting the devices for the configuration are possible:

- **(1)** via USB (recommended for the first configuration of the device)
- **(2)** via Ethernet in a local network
- **(3)** via Ethernet in a local network with an unknown or invalid IP address
- **(4)** via Router (IP address of device has to be known)

Malfunction caused by extension cable!

According to the USB specification connect the interface directly or via an active USB hub to the computer. Do not use an extension cable.
6.2 Basic Configuration

CAN@net NT 200 and CAN@net NT 420 can not be combined. For CAN-Ethernet-CAN Bridges use either NT 200 devices or NT 420 devices.

**Fig. 8 CAN-Gateway Configurator**

1. Information about target device (STS reflects Power LED of device)
2. Drop-down list Select device type
3. Drop-down list Select device version
4. Drop-down list Select operational mode
5. Button New
6. Button Open
7. Button Save
8. Button Save as
9. Button Verify
10. Button Scan
11. Combo box Target device
12. Button Connect
13. Button Write to
14. Button Read from
15. Terminal window

6.2.1 Prerequisites and Initial Settings

To use all features the latest firmware versions of the CAN-Gateway Configurator and the CAN@net NT must be installed.

- Make sure, that the latest VCI driver is installed.
- Make sure, that the device is installed correctly (see Installing the Hardware, p. 8).
- Connect a device to the host computer (see Connecting Possibilities, p. 12).
- Make sure, that the latest firmware is on the device (see Checking and Updating the Firmware, p. 10).
- Make sure, that the latest CAN-Gateway Configurator is installed (check within support area on www.ixxat.com).
- Start the CAN-Gateway Configurator.
- To identify the connected devices and the firmware version open menu scan Scan and select All Ixxat devices.
  - Connected devices and firmware version of the devices are shown.
  - Devices that are connected via a router are not found. IP address and device firmware version must be known.
  - Devices with an unknown or invalid IP address are not found (for more information see Scanning for Devices with Unknown IP Addresses, p. 14).
► If the connected device is not found, see Scanning for Devices with Unknown IP Addresses, p. 14 for more information.
► Select the type of CAN@net NT in use in drop-down list Select device type (2).
► Select the firmware version of the device in drop-down list Select device version (3).
► Select the desired operational mode for the device in use in drop-down list Select operational mode (4).
► Connect the device in the CAN-Gateway Configurator (see Connecting the Device in CAN-Gateway Configurator, p. 15).

### 6.2.2 Scanning for Devices with Unknown IP Addresses

If the IP address of a device that is connected via Ethernet is unknown or invalid in the local network, the device can be found via menu Scan — IP configuration.

| ! | Device is only found by scanning, if correct device type and firmware version are selected. Make sure, that device type and firmware version are selected according to the connected device. |

**HMS Industrial Networks recommends to use a static IP address.**

► Select the type of CAN@net NT in use in drop-down list Select device type (2).
► Select the firmware version of the device in drop-down list Select device version (3).
► Open menu Scan and select IP configuration.
  → CAN-Gateway Configurator scans automatically for connected devices of predefined type and firmware version.
  → Connected devices of the selected type and firmware version are shown.

![IP Configuration](image)

Fig. 9 IP configuration
Select the desired device in the drop-down list **Target device**.

If necessary define a new IP address.

Make sure that the IP address is in the range of the network in which the device is integrated.

Define the network settings.

Enter password (default: IXXAT) in field **Device password**.

To write the new IP configuration to the target device click button **Save**.

Connect the device in CAN-Gateway Configurator (see **Connecting the Device in CAN-Gateway Configurator**, p. 15).

### 6.2.3 Connecting the Device in CAN-Gateway Configurator

![CAN-Gateway Configurator](image)

**Fig. 10** CAN-Gateway Configurator

Connect a device to the host computer (see **Connecting Possibilities**, p. 12).

Make sure, that the initial settings are configured (see **Prerequisites and Initial Settings**, p. 13).

If the device is connected via a router, enter the IP address (see **Default Network Settings**, p. 24) in combo box **Target Device** (3).

or

If the device is connected via USB or Ethernet in a local network, click button **Scan** (2) and select the device in use in combo box **Target Device** (3).

Click button **Connect** (4) to connect the selected device.

For ASCII Gateway and VCI Interface mode make sure that the IP address is in the range of the network in which the device is integrated (see **Changing the IP Address**, p. 16).

For CAN-Ethernet-CAN bridge make sure that the IP addresses of all devices of the bridge are in the same IP range (see **Changing the IP Address**, p. 16).

To create a new project file, click button **New** (1).

or

To change an existing configuration, click button **Read from** (5) and save the configuration.

Configure the device in the selected mode (see **ASCII Gateway Configuration**, p. 17, **Bridge Configuration**, p. 18 or **VCI Interface Configuration**, p. 19).
6.2.4 Changing the IP Address

HMS Industrial Networks recommends to use a static IP address.

- Make sure that the device is connected in the CAN-Gateway Configurator (see Connecting the Device in CAN-Gateway Configurator, p. 15).
- Open menu Target and select Change IP configuration.
  → Window IP Configuration is opened.
- Make sure that the serial number in drop-down list Target device points to the connected device.
- Define the network settings.
- Enter password (default: IXXAT) in field Device password.
- To write the new IP configuration to the target device click button Save.
- Connect the device again in CAN-Gateway Configurator (see Connecting the Device in CAN-Gateway Configurator, p. 15).

HMS Industrial Networks recommends to change the default password. See User Manual CAN-Gateway Configurator for more information.
6.3 ASCII Gateway Configuration

► Make sure, that the device is connected (see Connecting Possibilities, p. 12) and that the basic configurations are set (see Basic Configuration, p. 13).

► Make sure, that ASCII Gateway Mode is selected in drop-down list (2).

► In configuration tree (1) select CAN@net — General.

► Select the desired protocol line ending (4).

► Define the IP port (5) to be used.

► To write the configuration to the device, click button Write to (3).

► To exchange messages in the Gateway mode, use ASCII commands (for more information see Software Design Guide CAN@net NT 200/420 Generic Protocol for Gateway Mode on www.ixxat.com).

It is possible to add information about the configuration in fields Author, Configuration Name and Additional Info.
6.4 Bridge Configuration

In the Bridge configuration each device can be configured differently, but all devices must be configured in one configuration file. The configuration can be set for one device and then downloaded to the other devices (Master, Slave 1 to 3). In the Local CAN Bridge mode only one device is connected and has to be configured.

Configuration fails, if the individual devices of a CAN-Ethernet-CAN Bridge are configured from different configuration files! Observe that for the configuration of a CAN-Ethernet-CAN Bridge each device must be configured with the same configuration file. If the configuration is changed, the new configuration file has to be downloaded again to all devices.

Exclusively one master device is allowed in the Bridge mode.

Fig. 12 CAN-Gateway Configurator CAN@net NT 420

- Connect the Master device to the host computer (see Connecting Possibilities, p. 12).
- Make sure, that the basic configurations are set (see Basic Configuration, p. 13).
- Make sure, that the desired operational mode is selected in drop-down list (2).
- In configuration tree (1) select CAN@net — General.
- If CAN-Ethernet-CAN Bridge is selected, enter the IP addresses of the Master device and of all connected Slave devices.
- Configure the baud rate settings for the CAN ports of the Master device and of all Slave devices and the mapping table (for more information see User Manual CAN-Gateway Configurator on www.ixxat.com).
- For descriptions of the further configuration possibilities see User Manual CAN-Gateway Configurator.
- After the configuration click button Write to (5) to write the configuration to device.
- Click button Save (3) or Save as (4) to save the configuration.
For the CAN-Ethernet-CAN Bridge connect the devices one after another and download the configuration to each device.

Observe that for the configuration of a CAN-Ethernet-CAN Bridge each device must be configured with the same configuration file. If the configuration is changed, the new configuration file has to be downloaded again to all devices.

It is possible to add information about the configuration in fields Author, Configuration Name and Additional Info.

### 6.5 VCI Interface Configuration

The VCI interface mode is only possible via Ethernet.

- Make sure that the device is connected (see Connecting Possibilities, p. 12) and the basic configurations are set (see Basic Configuration, p. 13).
- Make sure, that the desired operational mode is selected in drop-down list (2).
- In configuration tree (1) select CAN@net — General to add information about the configuration in fields Author, Configuration Name and Additional Info.
- To write the configuration to the device, click button Write to (3).
- Configure the Device Server (see Installation Guide VCI Driver).
6.6 Reset to Factory Settings

It is possible to reset a connected device to factory settings.

![Menu Reset to factory settings](image)

- Make sure that the device is connected via USB.
- Open menu Target and select Reset to Factory Settings.
- Click button Yes to confirm the reset.

6.7 Read and erase LOG File

In case of an error the device writes the error in a log file. The log file can be read from the device, saved as a txt file and send to the Ixxat support if needed.

- Open menu Target and select Read and erase LOG file.
  - Window Save Log File As is opened.
- Define a file name and save the file.
  - .txt-file is created.
7 Operation

![Ports and LEDs diagram]

<table>
<thead>
<tr>
<th>No.</th>
<th>LED/Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Status LED</td>
</tr>
<tr>
<td>2</td>
<td>Power LED</td>
</tr>
<tr>
<td>3</td>
<td>Mini USB port</td>
</tr>
<tr>
<td>4</td>
<td>CAN LEDs 1 to 4</td>
</tr>
<tr>
<td>5</td>
<td>User LED</td>
</tr>
<tr>
<td>6</td>
<td>Ethernet LED</td>
</tr>
<tr>
<td>7</td>
<td>Link speed LED</td>
</tr>
<tr>
<td>8</td>
<td>Link/Activity LED</td>
</tr>
<tr>
<td>9</td>
<td>Ethernet port</td>
</tr>
</tbody>
</table>

7.1 Ethernet Port

Designed as standard RJ45 port with pin allocation according to Ethernet standard. Because of the Ethernet PHY auto-crossover feature the device can be connected with a crossover cable or with a one-to-one network cable.

The shield of the port is connected to the ground of the printed board via a 1 nF capacitor.

<table>
<thead>
<tr>
<th>Pin Allocation Ethernet Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin no.</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

7.2 Mini USB Port

Provided to connect the device for configuration.
7.3 Indicators

7.3.1 Power LED

Indicates the status of the power supply.

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No power</td>
<td>Possible causes: device not connected to power supply, fuse of device damaged, internal power supply damaged, power supply not sufficient</td>
</tr>
<tr>
<td>Green</td>
<td>Power</td>
<td>Device fully functional</td>
</tr>
</tbody>
</table>

7.3.2 Status LED

Indicates the device status.

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Device not ready</td>
<td>No firmware, application firmware not started</td>
</tr>
<tr>
<td>Green flashing (1 Hz)</td>
<td>Application firmware started</td>
<td>Device in Operational state</td>
</tr>
<tr>
<td>Red/green flashing</td>
<td>Configuration file error</td>
<td>Rewriting of configuration to device necessary</td>
</tr>
<tr>
<td>Green/orange flashing</td>
<td>Device in Configuring state</td>
<td>—</td>
</tr>
<tr>
<td>Orange flashing (1 Hz)</td>
<td>Automatic baud rate detection</td>
<td>Ongoing automatic baud rate detection</td>
</tr>
<tr>
<td>Red flashing</td>
<td>Device error</td>
<td>Application signals a device error, error in configuration or no configuration. Read log file for more information (see Read and erase LOG File, p. 20).</td>
</tr>
</tbody>
</table>

7.3.3 User LED

Indicates the primary application status and is different, depending on the operating mode.

Bridge

In the Bridge mode the User LED can be configured with user defined settings via Action Rules. See User Manual CAN-Gateway Configurator for more information.

VCI Interface

The User LED is not used.

ASCII Gateway

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange/Green flashing</td>
<td>No connection monitoring</td>
<td>—</td>
</tr>
<tr>
<td>Green flashing</td>
<td>Connection monitoring activated</td>
<td>Heartbeat mechanism to monitor the connection (PING REQUEST, PING RESPONSE)</td>
</tr>
</tbody>
</table>
### 7.3.4 Ethernet LED
Indicates the Ethernet communication status.

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No Ethernet communication</td>
<td>Possible causes: device unsuccessfully initialized, device not connected to Ethernet or no communication</td>
</tr>
<tr>
<td>Green flashing</td>
<td>TCP/IP packet transmitted successfully</td>
<td>Communication was successful</td>
</tr>
<tr>
<td>Orange flashing</td>
<td>TCP/IP packet not transmitted</td>
<td>Bad or slow TCP/IP connection, messages can not be transmitted to CAN and are jammed</td>
</tr>
<tr>
<td></td>
<td>TCP/IP congestion</td>
<td></td>
</tr>
</tbody>
</table>

### 7.3.5 Link Speed LED
The yellow LED indicates the link speed.

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>10 MBit/s</td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>100 MBit/s</td>
<td></td>
</tr>
</tbody>
</table>

### 7.3.6 Link/Activity LED
 Indicates connection status of the Ethernet interface.

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No link detected</td>
<td>No connection to Ethernet network, Network cable damaged</td>
</tr>
<tr>
<td>Green</td>
<td>Link</td>
<td>Ethernet connection established, no communication present</td>
</tr>
<tr>
<td>Green flashing</td>
<td>Activity</td>
<td>Ethernet connection established, communication present</td>
</tr>
</tbody>
</table>

### 7.3.7 CAN LED
CAN 1-4 LEDs indicate the status of the corresponding CAN interface.

<table>
<thead>
<tr>
<th>LED state</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No CAN communication</td>
<td>No connection to CAN</td>
</tr>
<tr>
<td>Orange flashing</td>
<td>Indicates a state of the automatic baud rate detection</td>
<td>See User Manual CAN Gateway Configurator</td>
</tr>
<tr>
<td>Green flashing</td>
<td>CAN communication</td>
<td>LED is triggered with each CAN message</td>
</tr>
<tr>
<td>Green</td>
<td>CAN communication</td>
<td>Device in Operational state, no messages on CAN bus</td>
</tr>
<tr>
<td>Red flashing</td>
<td>CAN communication, CAN controller in Error state</td>
<td>CAN controller in Error Warning or Error Passive state, reception/transmission of CAN messages possible</td>
</tr>
<tr>
<td>Red</td>
<td>Bus off</td>
<td>CAN controller is in Bus Off state, no CAN communication possible</td>
</tr>
</tbody>
</table>
8 Default Network Settings

<table>
<thead>
<tr>
<th>Network parameter</th>
<th>Default setting</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Mode</td>
<td>Static</td>
<td></td>
</tr>
<tr>
<td>IP Address</td>
<td>169.254.y.x</td>
<td>Like APIPA if no DHCP server is available. By scanning the network, all available devices can be found.</td>
</tr>
</tbody>
</table>

y = \((\text{device serial number} - 800000) \div 254\) MOD 256
x = \((\text{device serial number} - 800000) \mod 254\) +1

| Subnet Mask       | 255.255.0.0     |        |
| Standard Gateway  | 0.0.0.0         |        |
| Device Name       | CAN@net NT      |        |
| Device password   | IXXAT           | Transmitted MD5-encrypted |

9 Default TCP/UPD Ports

<table>
<thead>
<tr>
<th>CAN@net</th>
<th>PC</th>
</tr>
</thead>
</table>
| CAN Gateway Configurator | Device scan and IP configuration: 15000/udp
Device configuration (via TCP): 19229/tcp | Device scan and IP configuration: 15001/udp
Device configuration (via TCP): 1024-65535/tcp |
| VCI                      | 19229/tcp               | 1024-65535/tcp |
| Gateway (ASCII Interface) | 19228/tcp               | 1024-65535/tcp |
| Bridge (CAN-Ethernet-CAN) | Slave: 19239/tcp
Master: 1024-65535/tcp | — |

10 Technical Data

<table>
<thead>
<tr>
<th>Ethernet Interface</th>
<th>10/100 MBit/s, twisted pair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>114.5 x 99 x 22.5 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 150 g</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 °C to +85 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °C to +85 °C</td>
</tr>
<tr>
<td>Power supply</td>
<td>9 V to 36 V DC with overvoltage and polarity protection</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Typically 110 mA (at 24 V input voltage)</td>
</tr>
<tr>
<td>Housing material</td>
<td>Polyamide</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>1 kV DC for 1 sec</td>
</tr>
<tr>
<td>CAN transceiver (CAN 1/CAN2)</td>
<td>SN65HVD251</td>
</tr>
<tr>
<td>CAN FD transceiver (CAN3/CAN4 with CAN@net NT 420)</td>
<td>MCP2562FDT</td>
</tr>
<tr>
<td>Max. number of bus nodes</td>
<td>120</td>
</tr>
<tr>
<td>CAN bus termination resistor</td>
<td>None</td>
</tr>
</tbody>
</table>
| CAN baud rates         | Classic CAN: 5 to 1000 kBaud
CAN FD: 5 to 8000 kBaud |
| CAN pass through delay | Local CAN Bridge: 15-25 μs
CAN-Ethernet-CAN Bridge: 4-6 ms |
| Startup time after power on | < 1 s                      |
| Processing time in Bridge mode | 30000-40000 msg/s         |
| Protection class       | IP20                       |
11 Support/Return Hardware

Observe the following information in the support area on www.ixxat.com:

- information about products
- FAQ lists
- installation notes
- updated product versions
- updates

11.1 Support

► For problems or support with the product request support at www.ixxat.com/support.
► If required use support phone contacts on www.ixxat.com.

11.2 Return Hardware

► Print out the Product Return Number (PRN resp. RMA).
► Pack product in a physically- and ESD-safe way, use original packaging if possible.
► Enclose PRN number.
► Observe further notes on www.ixxat.com.
► Return hardware.

12 Disposal

► Dispose of product according to national laws and regulations.
► Observe further notes about disposal of products on www.ixxat.com.
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A Regulatory Compliance

A.1 EMC Compliance (CE)


A.2 FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAN@net NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>200/420</td>
</tr>
<tr>
<td>Responsible party</td>
<td>HMS Industrial Networks Inc</td>
</tr>
<tr>
<td>Address</td>
<td>35 E. Wacker Dr, Suite 1700 Chicago, IL 60601</td>
</tr>
<tr>
<td>Phone</td>
<td>+1 312 829 0601</td>
</tr>
</tbody>
</table>

Any changes or modifications not expressly approved by HMS Industrial Networks could void the user’s authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
A.3  Disposal and recycling

You must dispose of this product properly according to local laws and regulations. Because this product contains electronic components, it must be disposed of separately from household waste. When this product reaches its end of life, contact local authorities to learn about disposal and recycling options, or simply drop it off at your local HMS office or return it to HMS.

For more information, see www.hms-networks.com.
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