Imprint

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## 1 Introduction

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1.1 About This User Manual

To Find information quickly

This user manual provides you with the following access help:

> At the beginning of each chapter you will find a summary of the contents
> The header shows in which chapter of the manual you are
> The footer shows the version of the manual
> At the end of the user manual you will find a glossary to look-up used technical terms

Conventions

In the two tables below you will find the notation and icon conventions used throughout the manual.

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<td><strong>bold</strong></td>
<td>Fields/blocks, user/surface interface elements, window- and dialog names of the software, special emphasis of terms.</td>
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<td><strong>[OK]</strong></td>
<td>Push buttons in square brackets</td>
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<td><strong>MICROSAR</strong></td>
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<td><strong>Source Code</strong></td>
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<td>![!]</td>
<td>This icon warns of dangers that could lead to damage.</td>
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<td>![📝]</td>
<td>This icon indicates text areas where changes of the currently described file are allowed or necessary.</td>
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<tr>
<td>![✗]</td>
<td>This icon indicates files you must not change.</td>
</tr>
<tr>
<td>![🎥]</td>
<td>This icon indicates multimedia files like e.g. video clips.</td>
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<td>![🎵]</td>
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1.1.1 Certification

Quality Management System

Vector Informatik GmbH has ISO 9001:2010 certification. The ISO standard is a globally recognized standard.

1.1.2 Warranty

Restriction of warranty

We reserve the right to modify the contents of the documentation or the software without notice. Vector disclaims all liabilities for the completeness or correctness of the contents and for damages which may result from the use of this documentation.

1.1.3 Support

Need support?

You can get through to our hotline by calling +49 (0)711 80670-200 or you can send a problem report to support@vector.com

1.1.4 Trademarks

Protected trademarks

All brand names in this documentation are either registered or non-registered trademarks of their respective owners.

1.2 Important Notes

1.2.1 Proper Use and Intended Purpose

Caution!

The interface is designed for analyzing, controlling and otherwise influencing control systems and electric control units (ECU). This includes, inter alia, bus systems like CAN, LIN, K-Line, MOST, FlexRay, Ethernet, BroadR-Reach and/or ARINC-429.

The interface may only be operated in a closed state. In particular, printed circuits must not be visible. The interface may only be operated (i) according to the instructions and descriptions of this manual; (ii) with the electric power supply; and (iii) with accessories manufactured or approved by Vector.
The interface is exclusively designed for use by skilled personnel as its operation may result in serious personal injuries and damage to property. Therefore, only those persons may operate the interface who (i) have understood the possible effects of the actions which may be caused by the interface; (ii) are specifically trained in the handling with the interface, bus systems and the system intended to be influenced; and (iii) have sufficient experience in using the interface safely.

The knowledge necessary for the operation of the interface can be acquired in workshops and internal or external seminars offered by Vector. Additional and interface specific information, such as Known Issues, are available in the Vector KnowledgeBase for updated information prior to the operation of the interface.

1.2.2 Safety Instructions and Hazard Warnings

Caution!
In order to avoid personal injuries and damage to property, you have to read and understand the following safety instructions and hazard warnings prior to installation and use of this interface. Keep this documentation (manual) always near the interface.

> Install or remove only when de-energized.
> Installation, initial operation and use have to be done by qualified personal.
> Approved only for the connection values given on the rating plate and in the technical data.
> Use the included power cord to connect to the AC line. Do not use the dedicated power cord with other instruments.
> The module must be connected to a socket outlet with earthing contact.
> The power switch must be accessible at any time.
> During operation, do not store flammable substances near the module.
> Manipulations in the device are not permitted.

1.2.3 Disclaimer

Caution!
Claims based on defects and liability claims against Vector are excluded to the extent damages or errors are caused by improper use of the interface or use not according to its intended purpose. The same applies to damages or errors arising from insufficient training or lack of experience of personnel using the interface.

1.3 CANoe RT Rack

General notes

The CANoe RT Rack is an industrial computer running Windows 10 IoT, which is preconfigured by Vector to run the real-time relevant simulation parts of CANoe (RT server). The simulation and test modules access network interfaces for network and I/O, which are built into the CANoe RT Rack. The CANoe RT Rack must be
connected to the user computer running the graphical interface of CANoe by Ethernet/TCP/IP.

Variants of the CANoe RT Rack are also available without RT server:
- Hardware with Windows 10 IoT included, similar to a regular user computer.
- Hardware only, without operating system.

**Note:** The following description refers to the CANoe RT Rack. When using the variant without RT server, the operation is the same as for a regular user computer.

**Reference:** Before starting your CANoe RT Rack for the first time, it is recommended to first read the relevant help sections of CANoe (CANoe|Setup and Extensions|RT Setup). The help will provide a general overview of CANoe in a real-time setup.
2 First Steps

In this chapter you will find the following information:

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2.1 Licenses

When running CANoe in real-time mode, no additional licenses are necessary; hence with every CANoe license you automatically have the right to use CANoe Real-Time. The following scenarios for licensed hardware are possible to run CANoe Real-Time:

- Licensed hardware built into RT server
- Licenses on USB dongle or keyman plugged into the user computer.

**Note:** Licenses residing on network interfaces plugged into the user computer will not be evaluated in real-time operation. If you experience missing licenses or if CANoe does not start correctly due to licensing issues in real-time operation, you may need to transfer licenses between network interfaces or from network interface to a USB dongle or keyman. In this case please contact the Vector support team to assist you with the license transfer (email address at the end of this document).

**Reference:** An overview of used third party software in RT server can be viewed here: Vector Platform Manager|Help|Copyright/Contact/License.

2.2 Powering Up the CANoe RT Rack for the First Time

To power up the CANoe RT Rack, follow the steps below.

1. Connect the Ethernet port to your user computer or corporate network respectively (see chapter 3.1 for details).
2. Connect the power supply cord / AC adapter.

CANoe RT Rack will now boot into Windows 10 IoT.

**Note:** Once powered up, the CANoe RT Rack will automatically start all necessary RT server processes. For administrative purposes the CANoe RT Rack provides a Remote Desktop connection. Configuration tasks can be done remotely (see chapter 3.3 for details). If required, mouse, keyboard and monitor can also be connected to configure the CANoe RT Rack.
# 3 Connecting

In this chapter you will find the following information:

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3.1 Connecting the CANoe RT Rack to the Ethernet Network

Overview

The IP address of the CANoe RT Rack is preconfigured to a static local network IP address as seen on the test report, which came with the hardware (typically: 192.168.0.2 or 192.168.0.3). In order to access the CANoe RT Rack from another user computer, both must reside on the same subnetwork.

Please see also chapter 3.2 for preparation steps on the user computer.

Note: The CANoe RT Rack is configured to always use static IP addresses, as a running DHCP Client service would negatively influence the real-time performance.
3.1.1 Physical Connection

Overview

The CANoe RT Rack must be connected to the user computer or Ethernet network using

- a crossover Ethernet patch cable or
- a standard Ethernet patch cable

with RJ45 connectors.

Direct connection

Recommended

The recommended way to connect your CANoe RT Rack to the user computer is by connecting the network interfaces of both computers using a crossover network cable.

In this case only the IP settings on the network interface of the user computer need to be adjusted.

<i>Note:</i> Both the CANoe RT Rack and the user computer must reside on the same subnetwork (e.g. by setting the IP address of the user computer statically to 192.168.0.1 / netmask 255.255.255.0).

If you cannot use the 192.168.0.xxx subnet, you also need to change the IP settings of the CANoe RT Rack. Please see chapter 3.1.2 for necessary technical steps.

Connection via switch

The CANoe RT Rack can also be connected to the user computer by plugging both computers into an Ethernet switch. In this scenario the IP address of the CANoe RT Rack most likely needs to be changed. Please see chapter 3.1.2 for a description of necessary technical steps.

<i>Note:</i> It is not recommended to operate the CANoe RT Rack in a corporate network/switch. However, if it is done nevertheless the following notes apply: If the switch is attached to the corporate network, the IP address chosen for the CANoe RT Rack must be provided from a static IP address pool of your corporate network. This address can typically be provided by your local IT organization.

3.1.2 Adjusting the Used IP Address on CANoe RT Rack

On the CANoe RT Rack the IP address can be modified using the following steps:

1. Connect to the CANoe RT Rack using Remote Desktop (See chapter 3.3) or plug in Monitor, Mouse and Keyboard. Be aware, that the usage of Remote Desktop requires an established network connection between the user computer and the CANoe RT Rack.

2. Open the Windows system control panel (click the button [SystemControl Panel] on the Control Service Console).

3. Start the Network and Sharing Center.

4. Click on the active network adapter and open its Properties dialog.

5. In the Properties dialog adjust the IP settings according to standard Windows procedures.
3.2 Connecting CANoe RT Rack to User Computer with CANoe running

This chapter explains how to connect from the user computer running CANoe to your CANoe RT Rack. In the example it is assumed that a direct connection by crossover Ethernet cable is used.

1. Install CANoe on the user computer from the CD.
2. Change the network properties on your user computer.

![Internet Protocol Version 4 (TCP/IPv4) Properties](image)

3. Start CANoe and select the number of channels used under File | Options | Measurement | General.

The example screenshot below shows a setup where 4 CAN-channels are used for the CANoe RT Rack.
Note: If multiple channels on different interface cards are used, it is recommended to activate the Hardware Synchronization: Under Hardware|Network Hardware|Hardware Sync enable Active and activate the manual configuration. Please choose the first channel of the fastest bus (FlexRay > CAN > LIN). If hardware synchronization is used, the synchronization connectors on the used network interfaces must be connected with a synchronization cable from Vector.

4. Connect the user computer with the CANoe RT Rack: open Home|Vector Tool Platform|Connection|Selected Device CANoe RT
5. Once the connection succeeded, the text in the status column will change to **Connected: CANoe RT Rack - ....**

6. Select the **CANoe/CANalyzer** plug in which is now loaded and select **Configure selected device as RT server**.
7. After successfully connecting the CANoe RT Rack to the user computer continue using CANoe in the usual way.
3.3 Remote Desktop Connection

Remote connection To simplify the configuration, the CANoe RT Rack can be accessed via the Microsoft Windows Remote Desktop.

To open a remote desktop connection, follow the next steps.

1. Start CANoe and open ribbon Home|Vector Tool Platform.
2. Select the Connection plug in and click Connect in the Remote Desktop section.

Note: If the Control Service is not running on the CANoe RT Rack, you can also start the Remote Desktop client by typing mstsc in the Run... box (Start menu | Run...) of the user computer. In this case enter the IP address of the CANoe RT Rack manually. Note that depending on the operating system installed on the user computer you may have to install the Remote Desktop client first to use the Remote Desktop connection. If you are unsure ask your local IT organization or the Vector support for help.

3. A Remote Desktop connection to the CANoe RT Rack is established.
4. A login prompt is shown. Use Administrator as the user name and leave the password field empty.

After you have successfully logged in, you see the Desktop of the CANoe RT Rack. Using the Remote Desktop connection you can administrate the CANoe RT Rack similar to usual Windows 10.
# 4 Start-up & Power-down of CANoe RT Rack

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4.1 Starting Up the CANoe RT Rack

The CANoe RT Rack can be started up by shortly pressing the **Power** button on the front side of the CANoe RT Rack.

4.2 Shutting Down the CANoe RT Rack

The CANoe RT Rack can be shut down by shortly pressing the **Power** button on the front side of the CANoe RT Rack.

By clicking on **Start**|**Shutdown** on the CANoe RT Rack you can shut down the CANoe RT Rack or you can shut down the CANoe RT Rack via the Control Service Console:
## 5 Software

In this chapter you will find the following information:

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5.1 Installation of Third Party Software

**Note:** It is not suggested to install and run other applications than the RT server components on the CANoe RT Rack. The installation of third party software could negatively influence the simulation performance.

5.2 Driver Configuration and Driver Update

**Configuration**

The driver for Vector interface hardware on the CANoe RT Rack is preconfigured according to your product order. When CANoe is operated in a real-time setup, only the hardware residing in the CANoe RT Rack will be used for accessing the CAN/LIN/MOST/FlexRay networks or other I/O.

The actual configuration of the driver on the CANoe RT Rack can be viewed or changed using the following steps:

1. On the Control Service Console click **Vector Hardware Configuration**.

   ![Control Service Console](image)

2. View & change the configuration settings as described in the respective driver manual.

**Note:** On the CANoe RT Rack the application channels used by RT server are also referred to as belonging to the CANoe application. No additional application needs to be defined in the Driver Configuration dialog.

**Update**

To update the driver on the CANoe RT Rack you can use CANoe. At first please download the latest driver package from www.vector.com/driver-setup and unzip all files on your local machine. After that you can update the driver via CANoe.
5.3 Updating the Installed CANoe Version

If you need to update the installed version of RT server components on the CANoe RT Rack, please start the CANoe version you want to run on the CANoe RT Rack. Start Home|Vector Platform Manager|CANoe/CANalyzer|Execution environment. Update the execution environment to the current CANoe version.
5.4 Backup of the Installed Disk Contents

**Backup**

If a backup of the hard disk contents is needed e.g. to bring back the system into an operational state quite fast after a misconfiguration / other data loss, such backups can be made using commercially available disk imaging software like Acronis True Image or Norton Ghost (only to name a few).

Since no software components must be installed under the Windows 10 IoT image, the only prerequisite is that the imaging software must not install directly into the host system, but e.g. can boot from some kind of rescue medium (Emergency CD) and generate the image from this rescue environment.
6  Common Tasks on the CANoe RT Rack

In this chapter you will find the following information:

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## 6.1 Tasks

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<td>To toggle between open windows on the CANoe RT Rack, press ALT+TAB on an attached keyboard.</td>
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<td>File operations - Windows Explorer</td>
<td>To start a Windows Explorer, click on the Explorer button on the Control Service Console.</td>
</tr>
<tr>
<td>Driver configuration</td>
<td>To reconfigure Vector interface drivers, click on the Vector Hardware Configuration on the Control Service Console.</td>
</tr>
<tr>
<td>Internal HW synchronization</td>
<td>For HW synchronization of multiple boards an internal sync cable is pre-assembled in the CANoe RT Rack. Please connect additional boards with this cable.</td>
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7 Glossary

**RT Hardware**  CANoe Real-Time Rack is referred to as **RT Hardware**.