rexroth
A Bosch Company

Application Manual

VPN Client App

Virtual Point-to-Point Connection Software for ctrlX CORE 02VRS

R911421596, Edition 01

Disclaimer

The data specified above only serve to describe the product. As our products are constantly being further developed, no statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Table of contents

1 About this documentation

Editions of this documentation

Edition	Release date	Note
01	2023-11	First edition VPN Client App Version VPN-V-0202

2 Important directions on use

2.1 Intended use

2.1.1 Introduction

Rexroth products are developed and manufactured to the state-of-the-art.

The products are tested prior to delivery to ensure operational safety and reliability.

⚠ WARNING	**Personal injury and damage to property due to incorrect use of products!** The products may only be used as intended. Failure to use the products as intended may cause situations resulting in property damage and personal injury.

NOTICE	**Damages resulting from unintended use** Rexroth As the manufacturer does not assume any warranty, liability or compensatory claims for damages resulting from unintended use of the products. The user alone shall bear the risks of an unintended use of the products. Before using Rexroth products, make sure that all the prerequisites for an intended use of the products are met: – Personnel that in any way, shape or form uses Rexroth products must first read and understand the relevant safety instructions and be familiar with their intended use – Leave hardware products in their original state, i.e., do not make any structural modifications. It its not permitted to decompile software products or alter source codes – Do not install damaged or defective products or commission them – It has to be ensured that the products have been installed as described in the relevant documentation

2.1.2 Areas of use and application

Products of the ctrlX series are suitable for Motion/Logic applications.

NOTICE	Products of the ctrlX series may only be used with the accessories, mounting parts, and other components specified in this documentation. Components that are not expressly mentioned must neither be attached nor connected. The same applies to cables and lines. Only to be operated with the hardware component configurations and combinations expressly specified and with the software and firmware specified in the corresponding documentations and functional descriptions.

Products of the ctrlX series are suitable for single-axis as well as for multi-axis drive and control tasks. Device types with different equipment and interfaces are available for using the system in specific applications.

Typical areas of application:

- Building automation
- IoT and Security Gateway or Device
- Handling & Robotic

Controls of the ctrlX CORE series may only be operated under the mounting and installation conditions, in the position of normal use and under the ambient conditions (temperature, degree of protection, humidity, EMC, etc.) specified in the related documentations.

2.2 Unintended use

"Unintended use" refers to using the ctrlX products outside of the above-mentioned areas of application or under operating conditions and technical data other than described and specified in the documentation.

ctrlX products must not be used if they are exposed to following conditions:

- Operating conditions that do not meet the specified ambient conditions. Operation under water, under extreme temperature fluctuations or under extreme maximum temperatures is prohibited
- Applications that have not been expressly authorized by Rexroth

3 Safety instructions

The Safety instructions contained in the available application documentation feature specific signal words (DANGER, WARNING, CAUTION or NOTICE) and, where required, a safety alert symbol (in accordance with ANSI Z535.6-2006).

The signal word is meant to draw the reader's attention to the safety instruction and identifies the hazard severity.

The safety alert symbol (a triangle with an exclamation point), which precedes the signal words DANGER, WARNING and CAUTION, is used to alert the reader to personal injury hazards.

The Safety instructions in this documentation are designed as follows:

⚠ DANGER	In case of non-compliance with this safety instruction, death or serious injury **will** occur.
⚠ WARNING	In case of non-compliance with this safety instruction, death or serious injury **could** occur.
⚠ CAUTION	In case of non-compliance with this safety instruction, minor or moderate injury could occur.
NOTICE	In case of non-compliance with this safety instruction, property damage could occur.

4 Introduction and overview

4.1 VPN Client App

Function:

The VPN client app allows easy and secure remote access to the production plant or to individual machines to configure them irrespective of the existing IT infrastructure. With this app, IPSec and OpenVPN connections can be created and configured. The basic license provides the remote access and the encryption of up to two connections.

IPSec refers to a number of protocols for the key management and for authentication purposes and encryption. OpenVPN is an open source software to create Virtual Private Networks (VPN) using encrypted TLS connections.

The functionality depends on the purchased license. For example, the number of parallel connections can be limited or only connections to certain VPN end point providers can be established.

VPN service provider

Together with ctrlX WORLD partners, Bosch provides services for VPN connections.

Our customer service provides information about our ctrlX WORLD partners, see ➥ Chapter 7 Service and support on page 25.

Connections can be started and stopped manually via the web interface, via REST commands or e.g. via a key switch connected to an existing Data Layer node. The connection can also be started automatically after the device is switched on. The start options are set in the “Options” tab in the connection editor.

Start option “DataLayer controlled”

If the option “DataLayer controlled” is enabled, starting and stopping via the web interface or REST command is not possible

The status of a connection can be transmitted via an existing Data Layer node, e.g. to a connected signal lamp

The connection configurations loaded to the ctrlX device are automatically stored in the “vpn-manager” folder of the ctrlX device configuration.

The "vpn-manager" folder on the “Manage App data” page is only shown in the file view.

Login files of the OpenVPN connection configurations which are configured with user/password authentication and uploaded to the ctrlX device, see ➥ Elements of the “Configuration” tab on page 14, are stored in subfolders of the “vpn-manager” folder.

Further information

- ➥ Chapter 5.1.1 Window – VPN on page 11
- ➥ Chapter 5.3.1 Editor – VPN <Name> on page 17
- ➥ Chapter 5.2.1 Tab – “Configuration” on page 13
- ➥ Chapter 5.2.2 Tab – “Options” on page 15
- window “Data Layer”, see documentation about the ctrlX CORE Runtime ➥ Web Documentation

5 ctrlX UI – Elements

5.1 Windows

5.1.1 Window – VPN

The VPN client app allows easy and secure remote access to the production plant or to individual machines to configure them irrespective of the existing IT infrastructure.

The functionality depends on the purchased license. For example, the number of parallel connections can be limited or only connections to certain VPN end point providers can be established.

Call:

ctrlX CORE side navigation *“Settings → VPN”*

If no VPN connection was created on the control, only the ↥ Upload VPN configuration file and + Add VPN connection interfaces are displayed in the window. After uploading or adding a connection, the command bar and the table including the entry of the connection are displayed on the page.

Elements of the “VPN” window

GUI element	Description
Command bar	“[x] item(s)” Number of listed connections
	↥ Upload the configuration file to ctrlX CORE. To create an OpenVPN/IPSec connection, upload a configuration file to the device. The provider of the VPN server service usually provides the configuration file. The service provider creates the configuration. The configuration is based on information provided by the user of the VPN service. Select the configuration file in the Explorer window. The IPSec connection configuration consists of the configuration file (.conf) and the container file (.p12) with certificate and key. **The IPSec configuration file (.conf) has to be created in Swanctl format.** According to the configuration type, during the upload the VPN type, IPSec or OpenVPN is set automatically. However, you can also change this setting manually if it is not entered in the configuration file. **If the set VPN type does not correspond to the actual type upon upload, the connection cannot be created.**

GUI element	Description
	 Creating an unconfigured connection. The “Add connection” dialog opens. While creating a connection, assign a unique name and the VPN type: • IPsec • OpenVPN Add or discard the connection with  or  . Click on  “Edit” in the Actions column of the connection list to open the configurator used to configure or rename the connection. **The IPSec configuration file (.conf) has to be created in Swanctl format**
Table	“Connection”: Connection name
	“Type” VPN type
	“Start” Start type of the connection entered in the “Options” tab. • Manual The connection can be started and stopped via the interfaces in the “Actions” column of the respective connection or via REST commands • Automatic The connection is established automatically after the start of the control • DataLayer controlled The connection is exclusively controlled by a Data Layer node. Manual starting and stopping of the connection via the web interface or REST commands is not possible
	“Status” Current connection status When establishing the connection “Establish connection” is displayed. After the connection has been set up, but there has not yet been any response from the remote host, the status remains on “pending”. After the connection has been set up, the connection status changes to “connected”

GUI element	Description
	“Actions” Includes buttons to edit or delete a connection. This is only possible in stopped state.  Editing a connection. The VPN connection editor opens, see ➦Chapter 5.3.1 Editor – VPN <Name> on page 17.  Deleting a connection.  Load the VPN configuration file from the device to the local PC. In the opening dialog, select whether to save the file in the “Download” folder or to open it in the (text) editor. Starting the connection. The connection is set up as required for the respective configuration. The OpenVPN configuration file usually includes the certificates and the keys. If this is not the case, a corresponding message is reported when the connection is started. If the OpenVPN connection is configured with a user/password authentication and if the “<filename>.auth” file has not yet been loaded to the ctrlX device, see ➦Chapter 5.3.1 Editor – VPN <Name> on page 17, a message is output when trying to start the connection. If the certificates and keys belonging to the IPSec configuration were not uploaded to the control using “Certificates & Keys”, refer to the ctrlX CORE Runtime Application Manual →, chapter Managing certificates and key ➦web documentation, a message is output when the connection is started: "The connection cannot be started due to missing access data (certificates, keys, etc.)."  Closing the connection

Further information

- ➦Chapter 4.1 VPN Client App on page 9
- ➦Chapter 5.3.1 Editor – VPN <Name> on page 17
- ➦Chapter 5.2.1 Tab – “Configuration” on page 13
- ➦Chapter 5.2.2 Tab – “Options” on page 15

5.2 Tabs

5.2.1 Tab – “Configuration”

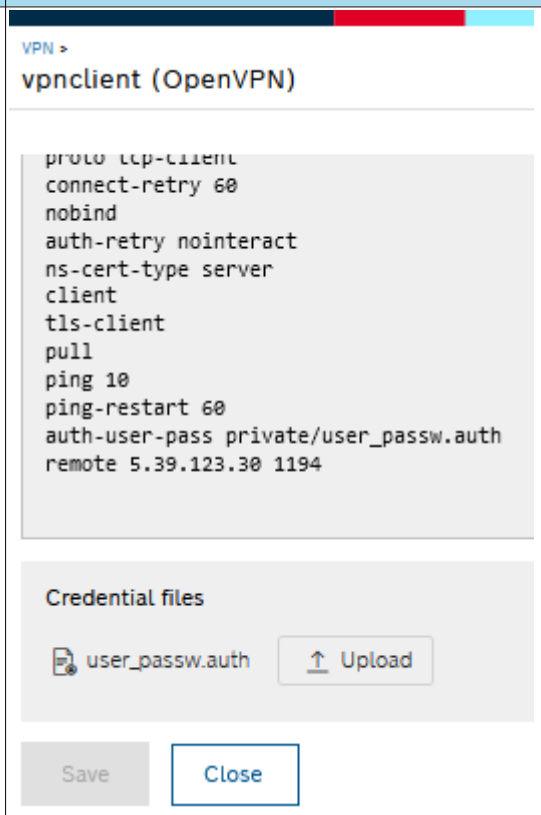
In the “Configuration” tab you can edit the configuration of the connection to the respective VPN server in the “Connection configuration” edit field

Call:

ctrlX CORE side navigation *“Settings → VPN” “Button”* *“Tab → Configuration ”*

Elements of the “Configuration” **tab**

GUI element	Description
Edit field	“Connection configuration” Editing the connection. In case changes are implemented, a prompt is displayed when closing the editor and by clicking on ×, prompting the user to save or discard the changes. Click on Save or Discard and the editor either saves or does not save the changes before closing. Click on Cancel and the editor remains open. The changes are not saved. Click on Save to save the changes and the editor is closed. **An IPSec configuration file (.conf) has to be created in Swanctl format.** An OpenVPN configuration file usually includes the certificates and keys as well. If this is not the case, a corresponding message is reported when the connection is started. The required certificates and keys have to loaded to the ctrlX device via *“Settings → Certficates & Keys → VPN”*. If the OpenVPN connection is configured with user/password authentication and the associated "<filename>.auth" file has not yet been loaded onto the ctrlX device, a corresponding message is displayed when trying to start the connection. If the certificates and keys of the IPSec configuration were not uploaded to the control using the “Certificates & Keys” app, refer to the ctrlX CORE Runtime Application Manual →, chapter Managing certificates and key ➦web documentation, a message is output when the connection is started: "The connection cannot be started due to missing access data (certificates, keys, etc.)"
	“Login files” This dialog is only available in the OpenVPN connection editor if the connections are configured for user/password authentication. Use ↥ “Upload” to load the “<filename>.auth” file to the ctrlX device.

GUI element	Description
	 If a file has already been uploaded to the ctrlX device, the file is displayed next to the “Upload” button. By clicking on the file name, a dialog to delete the file from the ctrlX device is shown. When clicking on the “Delete” button, the file is directly deleted from the device without prompt

Further information

- Chapter 4.1 VPN Client App on page 9
- Chapter 5.1.1 Window – VPN on page 11
- Chapter 5.2.2 Tab – “Options” on page 15

5.2.2 Tab – “Options”

The start type of the connection can be selected in the “Options” tab and whether the status of the connection is passed on via a Data Layer node.

Call:

ctrlX CORE side navigation *“Settings → VPN” “Button” “Tab → Options”*

Elements of the “Options” tab

GUI element	Description
“Connection start”	The following connection start options can be selected: • “Manual” The connection can be started and stopped via the interfaces in the “Actions” column of the respective connection in the “VPN” window or started and stopped via REST commands • “Automatic” The connection is started automatically, after automatic startup has been activated, upon the next status update, at the latest after 2 minutes, as well as upon device startup. Manual stop and start or via a REST command is also still possible • “DataLayer controlled” The connection is exclusively controlled by a Data Layer node. Manual starting and stopping of the connection via the web interface or REST commands is not possible In the field below the option, the address of the Data Layer node that controls the connection state has to be specified. The Test button can be used to check if the address is correct. If the address is invalid or if the Data Layer node is not of type bool, a corresponding message box is displayed. If the address and type are correct, the message window displays the current status of the Data Layer node
“Connection status propagation”	“Propagate connection status to DataLayer node” The status is transferred via an existing Data Layer node In the field below the option, the address of the Data Layer node has to be specified, via which the connection status is transferred. The Test button can be used to check whether the address is correct. If the address is invalid or if the Data Layer node is not of type bool or is not writable, a corresponding message box is displayed. If the address and type are correct, the value "true" is set in the Data Layer node as long as the Test button is pressed

Further information

- ➦Chapter 4.1 VPN Client App on page 9
- ➦Chapter 5.1.1 Window – VPN on page 11
- ➦Chapter 5.2.1 Tab – “Configuration” on page 13
- window “Data Layer”, see documentation about the ctrlX CORE Runtime ➦Web Documentation

5.3 Editors

5.3.1 Editor – VPN <Name>

Editing a connection

The connection editor is opened via the button in the “Actions” column of the table in the window “VPN”. The properties of a connection can be edited in stopped state. If the connection is active, the connection properties are opened as read-only.

Elements of the editor “VPN <Name>”

The header contains the name of the connection opened in the editor with the connection type in brackets. Below it is the edit field “Name* ” for entering and changing the individual name of the connection, as well as the two tabs “Configuration” and “Options”.

In the “Configuration” tab, you can edit the parameters for establishing the connection to the VPN server. In the “Options” tab, you can set the connection startup type and the connection status transfer.

Further information

- Chapter 4.1 VPN Client App on page 9
- Chapter 5.1.1 Window – VPN on page 11
- Chapter 5.2.1 Tab – “Configuration” on page 13
- Chapter 5.2.2 Tab – “Options” on page 15

6 Related documentation

6.1 Overview

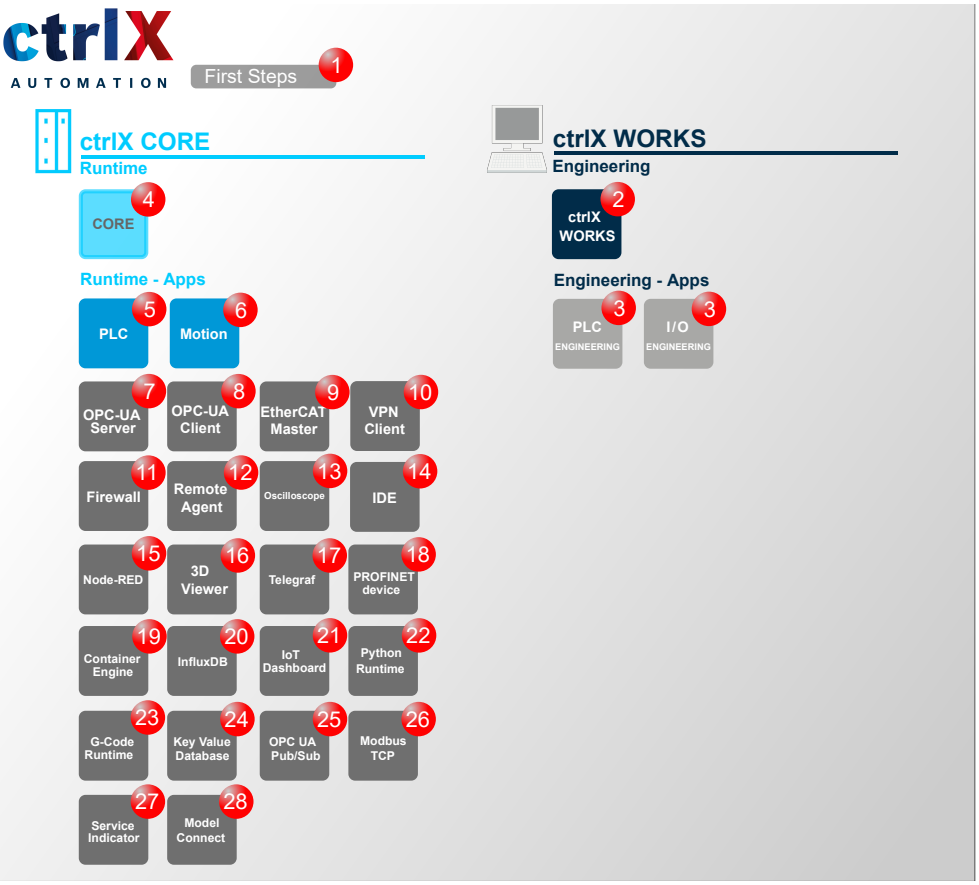


Fig. 1: Overview on further documentations

6.2 ctrlX AUTOMATION

No.	Documentation
1	**ctrlX WORKS First Steps 02VRS** Quick Start Guide ➦ Web documentation link Ordering information: • DOK-XWORKS-F*STEP**V02-QURS-EN-P • R911421574

6.3 ctrlX WORKS

No.	Documentation
2	**ctrlX WORKS Basic System 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XWORKS-WRK***V02**-APRS-EN-P • R911421576
3	**ctrlX PLC Engineering - PLC Programming System 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XPLC**-ENG*****V02-APRS-EN-P • R911421578
3	**ctrlX PLC Engineering - PLC Libraries 02VRS** Reference ➦ Web documentation link Ordering information: • DOK-XPLC**-LIBRARY*V02-RERS-EN-P • R911421580

6.4 ctrlX CORE

No.	Documentation
4	**ctrlX CORE - Runtime 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-XCR***V02**-APRS-EN-P • R911421590
	ctrlX CORE - Nodes of the Data Layer 02VRS Reference ➦ Web documentation link Bestellinformationen: • DOK-XCORE*-BASE*DL*V02-RERS-EN-P • R911421592
	ctrlX CORE - Diagnostics 02VRS Reference ➦ Web documentation link Ordering information: • DOK-XCORE*-DIAG****V02-RERS-EN-P • R911421594

6.5 ctrlX CORE Apps

No.	Documentation
5	**PLC App - PLC Runtime Environment for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-PLC*****V02-APRS-EN-P • R911421584
6	**Motion App - Motion Runtime Environment for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-MOT***V02**-APRS-EN-P • R911421610
7	**OPC UA Server App - OPC UA Server for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-OPCSERV*V02-APRS-EN-P • R911421598
8	**OPC UA Client App - OPC UA Client for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-OPCCLIENV02-APRS-EN-P • R911421600
9	**EtherCAT Master App - EtherCAT Master for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-ECM***V02**-APRS-EN-P • R911421604
10	**VPN Client App - Remote Support Software for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-VPN***V02**-APRS-EN-P • R911421596
11	**Firewall App - Security Functions for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-FRW***V02**-APRS-EN-P • R911421606

No.	Documentation
12	**Remote Agent App - ctrlX Device Portal Connection for ctrlX Devices 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-RMA***V02**-APRS-EN-P • R911421608
13	**Oscilloscope App - Oscilloscope Function for ctrlX Devices 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-OSCI****V02-APRS-EN-P • R911421587
14	**IDE App - Integrated Development Environment 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-IDE***V02**-APRS-EN-P • R911421612
15	**Node RED App - Graphic Programming for ctrlX CORE 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-NODERED*V02-APRS-EN-P • R911421582
16	**3D Viewer App - Browser-based 3D Kinematic Simulation for ctrlX CORE 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-3D*VIEW*V02-APRS-EN-P • R911421615
17	**Telegraf App - Server Agent for Collecting Data in the Data Layer 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-TSA***V02**-APRS-EN-P • R911421623
18	**PROFINET Device App - PROFINET Device for ctrlX CORE 02VRS** Application Manual ➥ Web documentation link Ordering information: • DOK-XCORE*-PROFINETV02-APRS-EN-P • R911421617

No.	Documentation
19	**Container Engine App - Use of Docker® Images on ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-DOE***V02**-APRS-EN-P • R911421619
20	**InfluxDB App - Influx Database Connection for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-IDB***V02**-APRS-EN-P • R911421625
21	**IoT Dashboard App - Data Visualization in Dynamic, Interactive Dashboards 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-GDB***V02**-APRS-EN-P • R911421633
22	**Python Runtime App - Python Runtime Environment for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-PYR***V02**-APRS-EN-P • R911421629
23	**G-Code Runtime App - G-Code Interpreter for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-GCO***V02**-APRS-EN-P • R911421631
24	**Key Value Database App - Managing Data in the Data Layer 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-KVD*****V02-APRS-EN-P • R911421635
25	**OPC UA Pub/Sub App - OPC UA Pub/Sub for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-PUBSUB**V02-APRS-EN-P • R911421602

No.	Documentation
26	**Modbus TCP App - Modbus TCP Communication for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-MOD*TCP*V02-APRS-EN-P • R911421621
27	**Service Indicator App - Service Indicator for ctrlX CORE 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-SIN*****V02-APRS-EN-P • R911421627
28	**Model Connect App Target for Model-Based Development and Simulation for ctrlX OS 02VRS** Application Manual ➦ Web documentation link Ordering information: • DOK-XCORE*-MOC*****V02-APRS-EN-P • R911421710

7 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts provide you with advice and assistance. You can contact us **24/7**.

Service Germany

Our technology-oriented Competence Center in Lohr, Germany, is responsible for all your service-related queries for electric drive and controls.

Contact the **Service Hotline** and **Service Helpdesk** under:

Phone:	**+49 9352 40 5060**
Fax:	**+49 9352 18 4941**
Email:	➦service.svc@boschrexroth.de
Internet:	➦http://www.boschrexroth.com

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

Service worldwide

Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

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