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Quick Start Guide *REX100*

Version
3 en

www.helmholz.com

Content

1. Introduction

Before getting started:
For commissioning please use the latest version (as of v3) of the dial-up software "shDIALUP".

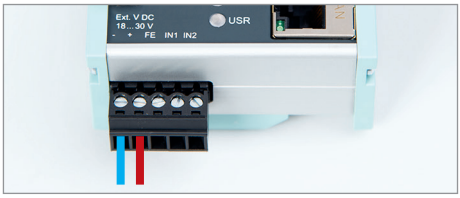
Write down the serial number and MAC address of your REX 100 router before installing the router in your system. You will need the serial number in order to configure the device!

The REX 100 is an industrial router designed to be installed on DIN rails and is suitable for worldwide remote access to IP-enabled devices (PLCs, HMIs, IP cameras, etc.)
This Quick Start Guide goes over the basic settings in the myREX24 portal and shows how to use the portal to create a configuration and transfer it to your REX 100 unit.

2. Preparing the REX 100 unit

2.1 REX 100 3G/LAN

Connect the antenna and insert your SIM card.
Connect a supply voltage of 10–30 V DC to the provided connector.



2.2 REX 100 WAN/LAN

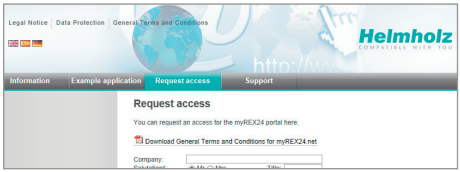
Connect the REX 100 router's WAN port (port 1) to the network or DSL modem being used to establish an Internet connection.
Connect a supply voltage of 10–30 V DC to the provided connector.

3. Creating a REX 100 configuration in the myREX24 portal

REX 100 routers are fully configured using the myREX24 portal. Once the corresponding configuration file is ready, it can be transferred to the actual REX 100 unit in a variety of ways.

3.1 Register

If you do not yet have a myREX24 account, you will first have to visit www.myREX24.net and register under "Request access." Make sure to fill out all mandatory fields. Once you submit the form, you will receive an e-mail containing your login data.
You can download the software necessary for establishing a connection with myREX24-Portal (shDIALUP and shCHECK), as well as other documents with supplementary example applications anytime from the download area under www.myREX24.net and www.helmholz.com.



3.2 Log in to the myREX24 portal

Once you install and open the shDIALUP program, you can use your login data to log in to the myREX24 portal.

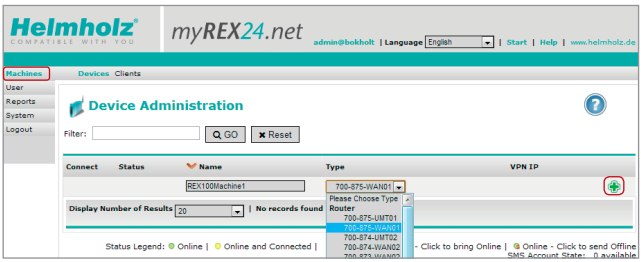
Note: *Your login name is composed of a user name preceding the @ character and the name of your company.*
Example: admin@helmholz
Other users can be created and managed after you log onto the myREX24 portal.

3.3 Create a router configuration

The configuration points necessary to realize a VPN portal connection are described in the following. For a more detailed description of the advanced functions and configuration options available, please use the portal's online help.

Note: *You should always individualize your access data (user names/passwords).*
For more information, make sure to consult the portal's online help ( ).

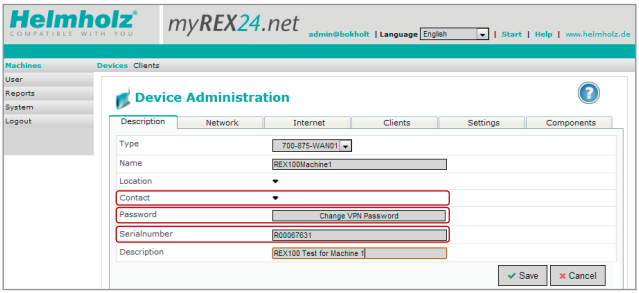
Once a connection to the myREX24 portal is successfully established, a new browser window with your myREX24 online account will open. Create a new device in the „Machines" menu.



With the button you go to the next submenu.

Note: *The device name must start with a letter. Umlauts, special characters and spaces are generally not permitted. In addition, every device name must be unique.*

The description page for the device you just created will appear now. Please note that the location and contact information fields are optional.



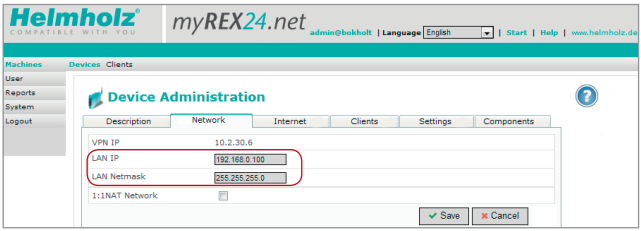
A field for entering a phone number for the SIM card will be shown for GSM devices only. If you do enter a number, the myREX24 portal will be able to control the REX 100 router using SMS text messages.

No entry needs to be made in the „Change VPN password field". The password is generated automatically.

In order that the configuration is sent to the correct end device, the serial number of the REX 100 must be entered for purposes of recognition. The purpose of the additional description field is to make it possible to distinguish between several remote servicing units internally.

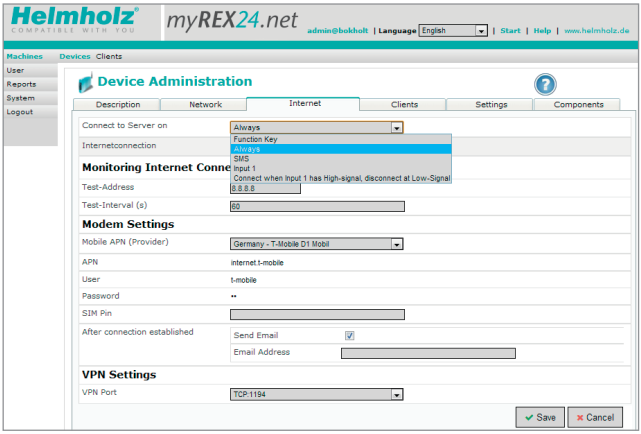
Go to the „Network" tab without Save.

Enter the IP address and the appropriate subnet mask for your equipment network into the LAN parameter fields. All REX 100 routers come with a default IP address of 192.168.0.100/24. If you don‘t have to/don‘t wish to change this address, it should be noted that this address area on the REX 100 WAN side may not be used.



If you would like to connect additional TCP/IP components for purposes of remote maintenance at the LAN interface of the REX 100, this IP address is also the standard gateway for these devices (see page 14, point 6).

Open the „Internet“ tab without clicking on Save.



Under „Connect to server on“, select the actions with which this device should connect to your myREX24 account. Depending upon the device version, you must carry out corresponding adjustments for establishing a connection:

- In the case of devices with a radio modem, all information concerning the access point (Access Point Name) of the card provider must be provided and the SIM PIN entered.
- In the case of wired devices and when using static IP addresses, the customer specifications for the subsequent router start must be used for the gateway, DNS server and VPN port.

Prior to defining a pre-selectable VPN port, clarify whether this is also open on the system side at the customer location (also see the chapter 5.2 „Tips and Tricks“, page 13).

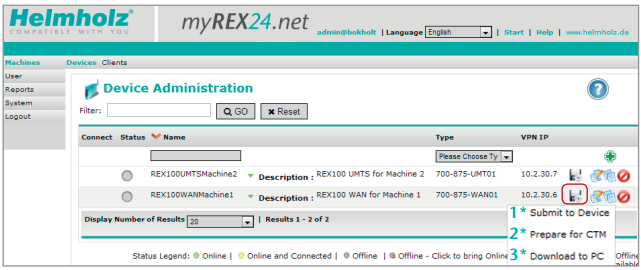
The basic settings have thus been completed and the configuration can be transferred to the REX 100 with the Save button via the channels available in the menu (see page 6, point 4).

In the event that the dialog for „Submit to Device“ appears automatically, you can cancel this dialog and call it up later when needed.

Note: *The myREX24 portal’s online help provides information on the function of the advanced settings. If you enable DHCP, make sure that the DHCP server does not assign the WAN port an IP address that is already in use on the LAN side. Each router must be assigned to the LAN and WAN interface IP addresses from 2 different sub-networks.*

4. Router configuration transfer options

After you have created a configuration, you can select one of three transmission methods via the diskette symbol:

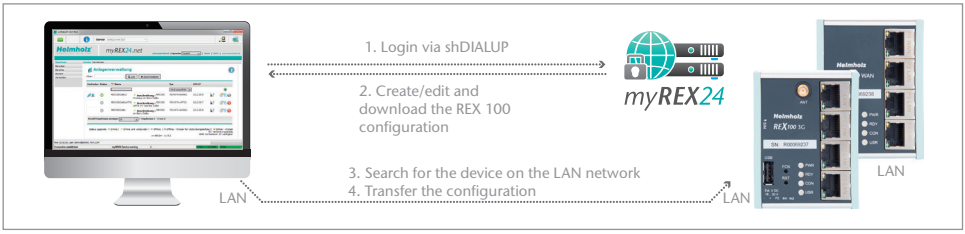


1 Submit to device:*
Used to transfer the configuration via the local LAN connection of the computer on which shDIALUP is running (see point 4.2 below).
You can use this option if the REX 100 router can be reached directly through the local network (LAN).

2 Prepare for CTM:*
The configuration is downloaded via an Internet connection of the REX 100 from the myREX24-Portal (CTM = Configuration Transfer Manager, see chapter 4.2, page 8).
Internet transfer is the standard configuration channel as soon as the REX 100 has established a connection to the myREX24 portal. When the REX 100 has a connection to the myREX24 portal, the CTM is automatically used for all subsequent configuration changes.

3 Download to PC:*
The configuration file is saved and subsequently transferred to the REX 100 using a USB stick
(see point 4.3, page 12).
Choose this option if the REX 100 router cannot be reached through the local network (LAN) or through the Internet when it is first being set up.

4.1 Transfer configuration via a local LAN connection

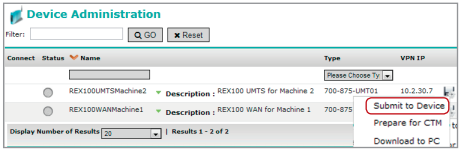


In order to be able to transfer the configuration through the LAN network, it must be possible to reach the REX 100 unit (the one being configured) on the same network on which the computer with the shDIALUP program is found.

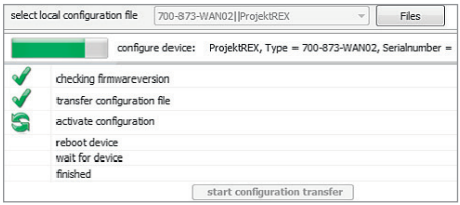
4.1.1

Connect the LAN socket of your PC (LAN card) with a LAN socket of the REX 100.
Make sure to use a standard Cat5 patch cable to establish the direct connection between your computer and the router.

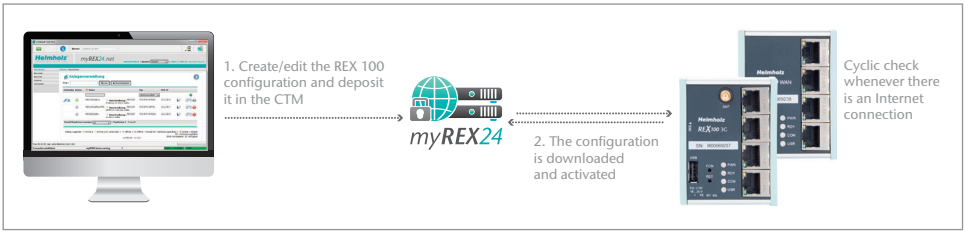
4.1.2
In the myREX24 portal (shDIALUP) in Device Administration, select the option “Submit to Device”.



4.1.3
After you have selected the corresponding PC-LAN network card in the device search menu, the search for locally connected REX routers is carried out automatically in the following dialogue.
The transfer will start if a device with the right serial number is found. Once the transfer is complete, the REX 100 router will start using the new configuration after being restarted.



4.2 Configuration Transfer Manager (CTM)



The Configuration Transfer Manager enables the transfer of the configuration to the REX 100 when the router has established an Internet connection with the myREX24 portal.
If the REX 100 unit has a connection to the myREX24 portal, it will check whether there is a newer configuration available for its serial number. If there is one, it will load it automatically.
This method is ideal for retroactive changes to the configuration.

Note: *Only with version 3 and up of the dial-up software “shDIALUP” is the CTM function supported.*
In order to be able to transfer the configuration, the Configuration Transfer Manager needs an Internet connection established using a WAN network or SIM card.
If you are using your REX 100 router for the first time, you can establish this connection directly on the router by using the First Start webpage.

4.2.1 Establishing an Internet connection through the First Start webpage

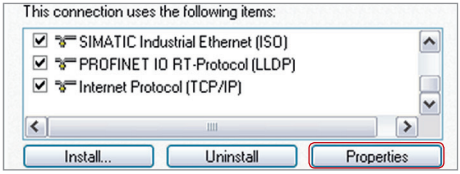
If you have not yet configured your REX 100 router using one of the other two configuration methods (directly on the computer or using a USB flash drive), you can establish an Internet connection directly with the REX 100 router’s web interface by using the First Start webpage so that you can set the router up.
If the REX 100 unit is already able to establish an Internet connection, please skip ahead to page 10, point 4.2.5 “Automatic download of the configuration.”

Commissioning via the “First Start” website presumes that the REX 100 can be addressed in the local network under its default IP address. REX 100 routers come with a default IP address of 192.168.0.100 (subnet mask: 255.255.255.0).

In order to be able to reach the REX 300 router, the PC network adapter must also be set to the IP address space and subnet of the router.

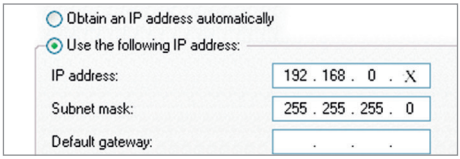
Start by opening the properties for your LAN connection.
Windows[1)] XP: Start -> Settings -> Control panel -> Network connections.
Windows[1)] 7: Start -> Control panel -> Network and sharing center -> Change adapter settings

Open the Properties dialog box for the network connection that you want to use in order to establish a connection to your REX 100 unit. To change your computer's IP address, select "Internet Protocol (TCP/IP)" and click on the "Properties" button.



Your IP address must lie within the address range "192.168.0.x". The subnet mask must match the subnet mask used by the REX 100 unit (default: 255.255.255.0).

Note: *Make sure that there are no address space conflicts with any other network ports (do not assign the same IP address more than once). If there are, you will not be able to communicate with your REX 100 unit properly.*



When your PC network card has accepted the new settings, start a browser (Firefox, Chrome, Opera) and enter the IP address of the router in the address line (URL) as follows: http://192.168.0.100.

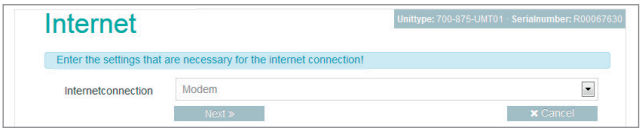
Enter the standard login data now required for logging into the REX 100:
Username: helmholz
Password: router

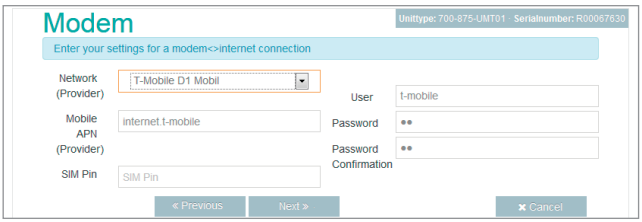
Note: *Please note that the login data must be changed for your security after the router is set up. To change them, go to the configuration menu on the myREX24 portal.*

The Internet connection path of the REX 100 is now defined uniquely at the "First Start" website.

4.2.2 Establish Internet connection via "First Start" with REX 100 3G

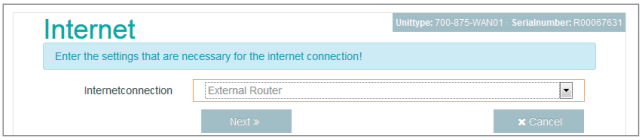
If you are using a REX 100 3G model, you will now need to provide the following for the modem:
The login data for the carrier (APN) and the SIM card ID number (SIM PIN).



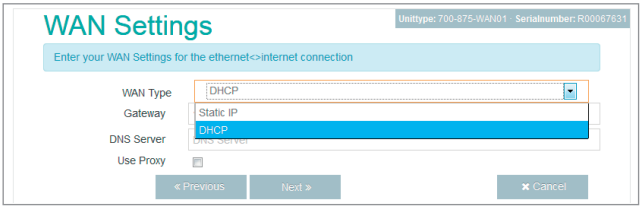


4.2.3 Establish Internet connection via “First Start” with REX 100 WAN

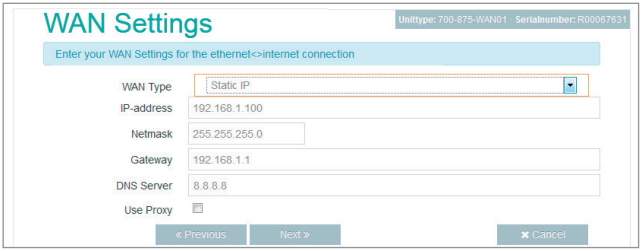
In the case of wired models, access to the Internet can only be established through the “external router” on the equipment side.
To this purpose, the WAN interface must be connected with the customer server/DSL modem.



No WAN settings need to be made when selecting “DHCP”.
Please note that either the MAC address filter at the DSL modem or in the external firewall is deactivated or the MAC address of the REX device has been activated there.



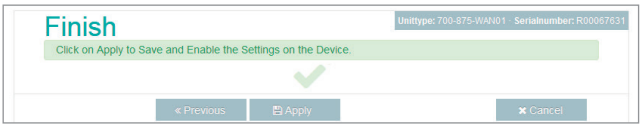
The values for the statically set WAN interface are defined by the responsible network administrator.
Settings for access via the proxy server are also stored in the WAN settings when needed.



4.2.4 Complete “First Start” steps with REX 100 3G and WAN

The cloudserver preset here doesn’t need to be changed. The code for the session key is optional and does not have to be entered when setting up the router.

As soon as all settings have been transferred and saved in the REX 100 router, the router will establish an Internet connection.

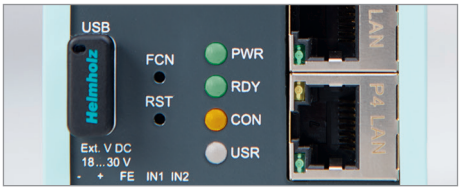


4.2.5 Automatic download of the configuration

If the REX 100 router is able to establish an Internet connection, it will connect to the myREX24 portal and verify itself using its serial number.

The successful establishing of a connection is displayed at the router by the blinking “CON” LED (see LED description, page 15).

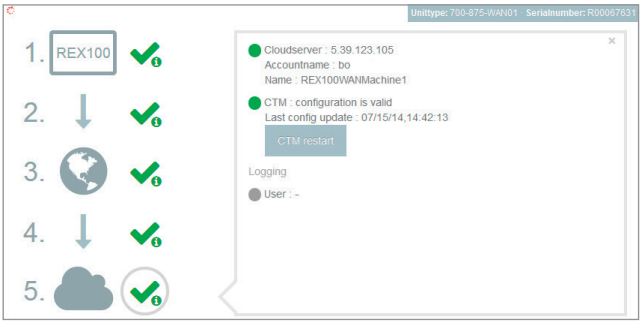
If a configuration file is available on the portal server, it will be automatically loaded onto the device and enabled.



4.2.26 REX 100 Quick Start status page

The status page on the REX 100 router’s web interface will show the router’s connection status and active configuration data.

To get more information on each step of the router connection, click on the Info icon in the various status fields.

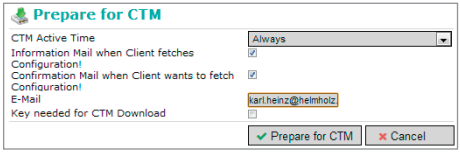


You can use the status page to trigger test functions or to manually make the router obtain its configuration using the CTM.

4.2.7 Change configuration with Configuration Transfer Manager (CTM)

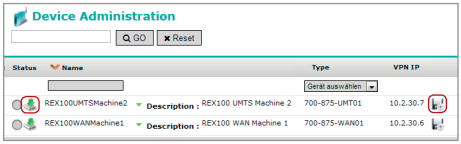
If the REX 100 router has already gotten a configuration file, you will be able to transfer any new configuration changes to the router using the CTM.

If the router has already been configured using the CTM and you click on “Save” in the “Device Administration” page after making changes to a configuration, the “Prepare for CTM” dialog box will appear.



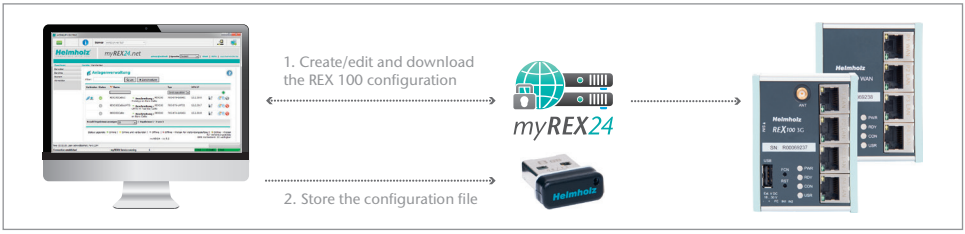
Alternatively, the transfer of the configuration to the Device Administration of the myREX24 portal can also be triggered manually via the diskette symbol.

A configuration prepared for CTM transfer is displayed in the Device Administration with the symbol .



Note: In order to establish a VPN connection with the REX 100, please read Chapter 5, page 12.

4.3 Transfer of the configuration using an USB stick



The parameterization method via USB should be used when the REX 100 isn’t accessible either through the local network (LAN) or via the Internet. In the myREX24 portal in Device Administration, select the option “Download configuration to the PC”.

- Don’t change the name of the configuration file and save this in the root directory of a standard FAT-formatted USB stick
- The REX 100 must be in standby mode (that is, at least the PWR and RDY LED should be lit)
- Insert the USB stick into the USB interface of the REX 100
- Once the USR LED starts flashing, you will have ten seconds to press the FCN button.
- Once the USR LED lights up with a solid light, you can release the FCN button, at which point the data will be loaded from the USB flash drive

Following successful transfer of the configuration file, the file is automatically renamed “Xmyrex24” and can thus not be used a second time by mistake.

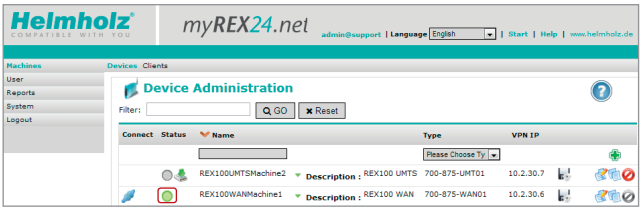
Note: The configuration file must be stored in the root directory of your USB flash drive.
In addition, no valid firmware file may be found for this action in the root directory, and an interruption of the supply voltage during the transfer can result in the router changing to an undefined status.

5. Establishing a VPN connection to your REX 100

***Note:** In order for the following steps to work, the REX router must have already been configured.*

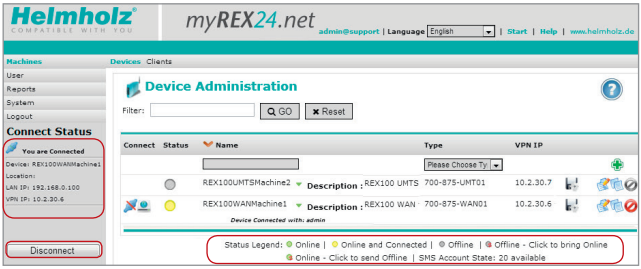
5.1 Establishing a VPN connection and transferring IP packages

After you log in successfully with shDIALUP, your online account will be opened. Logged-in REX routers will be indicated with a green circle.



If you want to connect to a REX router, you can click on the “QuickConnect” button to establish a connection to your device.

In the “Connect Status” field, you are shown the REX “LAN IP” address on the system side (important, for example, for the “PG/PC interface”, see page chapter 6 page 14).



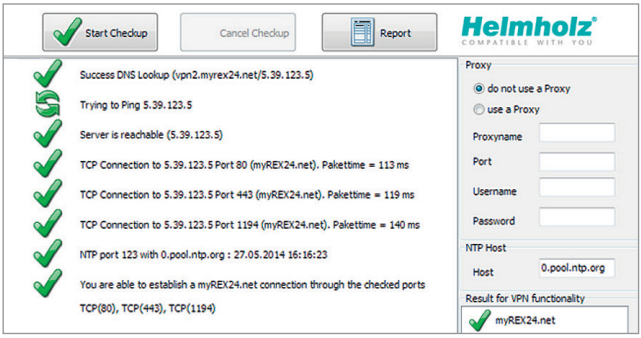
Once a connection to the REX 100 unit has been established, all the IP packets that are valid for the LAN network in the field will be sent.
To terminate the remote access connection, click on the “Disconnect” button.
The “Status Legend” provides more information on additional “statuses.”

5.2 Tips and tricks

- If logging in to the myREX24 portal does not work on the first try, please install our “shCHECK” testing tool on a PC. This free program will check whether the ports needed to successfully establish a connection to the myREX24 portal are open. Make sure to run the test on the network from which the REX router will also be establishing a connection to the Internet.

- In order to be able to establish a connection to myREX24, at least one of the TCP ports (80, 1194, or 443) required for the VPN tunnel must be open.

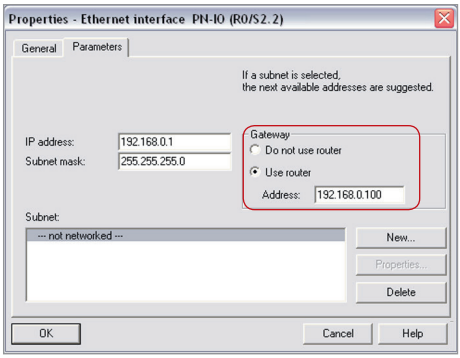
- If you would like to use the function for automatic sending of e-mails of the REX, the SMTP port 25 may not be blocked.



6. Remotely servicing an Ethernet PLC

6.1

In order to be able to access an Ethernet PLC through a VPN connection, the “Use router” option must be enabled and correctly filled out in the PLC for the Ethernet port being used for remote servicing purposes.
Enter the REX 100 unit’s LAN IP address into the “Address” field.

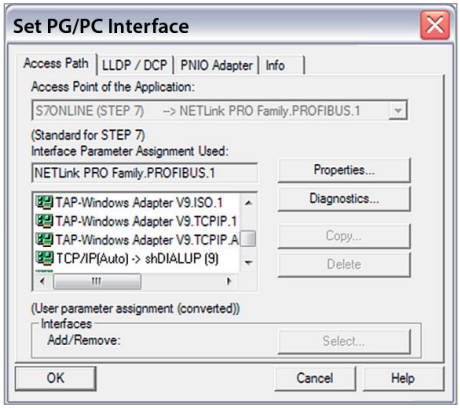


Note: *The IP address of the PLC must lie within the address range of the LAN interface of the REX 100.*

If it should not be possible to activate the “Use router” option in your project, or if you want to reach an Ethernet device for which you cannot enter a gateway IP, please check the security settings in Device Administration of the myREX24 portal in the “Settings” tab.
The SNAT function should be enabled under “General Firewall Settings” so that you will be able to reach devices in which a gateway IP has not been entered.
This function is always enabled in myREX24 configurations.

6.2

In order to be able to reach the PLC through the VPN tunnel, you will have to select the appropriate VPN adapter in the PG/PC interface.
The virtual network connection responsible for this is the TAPWindows[1)] Adapter V9



Note: *You can use either crossover or standard Ethernet cables in order to connect PLCs to the REX 100 unit.*

The “Available stations” function is not supported by the software when using VPN connections.

6.3

As soon as a VPN connection to the REX 100 unit has been established (see item 5), you can start working with the PLC from the project (e.g., transferring a hardware project, monitoring variables, etc.).

7. Description of LEDs and buttons

PWR	Indicator light for the power supply
RDY	Readiness indicator (this LED must show a solid light after a max. of 110 s)
CON	*Off:* There is no active Internet or VPN connection *Solid light:* Internet connection active or possible, but VPN connection inactive *Rapid flashing (3 Hz):* The router is attempting to establish a VPN connection *Flashing (1.5 Hz):* VPN connection active
USR	*Solid light:* When loading default settings, firmware files, or device configurations *Flashing (1.5 Hz):* A portal configuration has been detected on the USB flash drive* *Rapid flashing (3 Hz):* A firmware file has been detected on the USB flash drive*
FCN	1. Function button used to manually establish a connection to the portal server (see page 5) 2. * If the USR LED starts flashing, this means that you have ten seconds to press this button in order to load data from an inserted USB flash drive.
RST	Reset button for restarting the router

8. Restoring the REX 100 router to its default settings

In order to reset the REX 100 to the factory settings, the following steps are necessary:

- Apply a supply voltage (or press “RST”) until the “PWR” LED lights up
- Wait until the “RDY” LED flashes
- Hold down the FCN button for about10–15 sec. until the “USR” LED flashes orange
- After you release the “FCN” key, the REX reboots and once again has the factory settings

Important: *The IP address of the REX 100 LAN interface is reset to 192.168.0.100/24.*

9. Loading the configuration or firmware update from a USB flash drive

Note: *Ensure that either only the firmware file or only the configuration file is found in the root directory of the USB stick. If you wish to update both the firmware and the configuration, carry out the following steps for each file individually.*

To provide the REX 100 with a configuration or perform a firmware update from a USB flash drive, the following requirements must be met:

- The boot process of the device must be completed (PWR & RDY LEDs light up continuously)
- The file to be loaded must be saved in the root directory of the USB flash drive
- During the operation, the voltage supply should not be interrupted.
- After successful loading, it is not necessary to reboot the device

If these conditions are met, you can proceed with the following steps:

- Insert the USB flash drive into the REX
- Wait until the USR LED begins to flash
- Press and hold the FCN button until the USR LED lights up permanently
- Release the FCN button -> the device now loads the configuration or firmware file

Once the RDY & ON LEDs light up again permanently, the process is complete.

10. Technical specifications

Dimensions (D x W x H)	35 x 59 x 75 mm
Weight (approx.)	3G = 270 g | WAN = 250 g
GSM modem Antenna connection SIM card type GSM frequency bands (MHz) UMTS/HSPA frequency bands (MHz) Transmit power	Quad-band GPRS/EDGE data interface SMA connector (external thread) Standard Mini-SIM, 1.8 V/3 V GSM/GPRS/EDGE: 850, 900, 1800, 1900 UMTS/HSPA: 800/850, 900, AWS 1700, 1900, 2100, class 1 E2, 3, 4
Data transfer rates	HSPA+ (upload: 5.76 Mbps | download: 21.0 Mbps)
Number of inputs/switching point	2/24 V (DC), as per DIN EN 61131-2 Type 2
Router Features VPN	 Firewall, NAT/PAT, SMS wake-up OpenVPN
Interfaces	3x or 4x LAN 10/100 Mbps 1x WAN 10/100 Mbit/s USB 2.0 Type A port
Voltage	DC 18 V ... DC 30 V
Current draw	max. 250 mA with DC 24 V
Ambient temperature	0 ... +50 °C
Transport and storage temperature	-20 ... +60 °C
Humidity	0 ... 95 %, non-condensing
Location of use	Dry location
Protection rating	IP20
Certifications	CE, GCF, FCC, PTCRB, IC

Note:
The contents of this Quick Start Guide have been checked by us so as to ensure that they match the hardware and software described. However, we assume no liability for any existing differences, as these cannot be fully ruled out.
The information in this Quick Start Guide is, however, updated on a regular basis. When using your purchased products, please make sure to use the latest version of this Quick Start Guide, which can be viewed and downloaded on the Internet at www.helmholz.com.
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