

Appliance Manual

Release 1.34

PAT-Tester

Management and setup instructions

The information in this manual has been carefully checked and believed to be accurate; however, no responsibility is assumed for inaccuracies.

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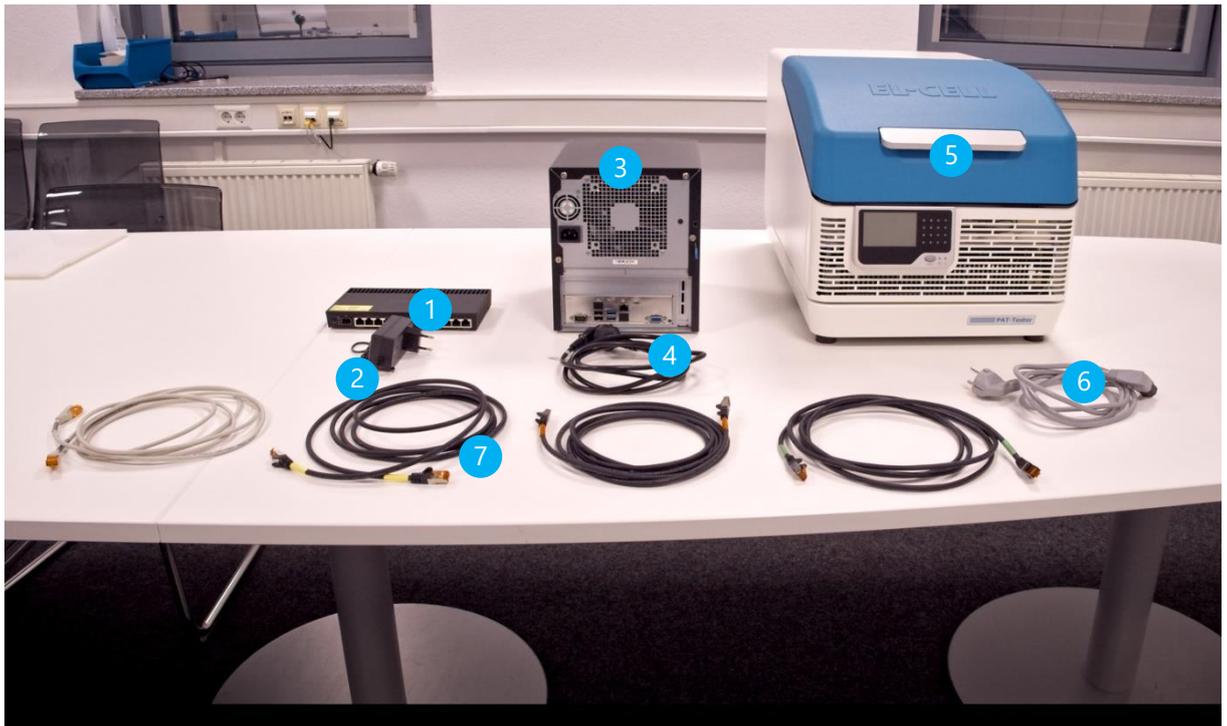
web: <https://el-cell.com>

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1 Appliance Setup Overview:

1.1 Scope of Delivery:



1. Router
2. Power supply with cable for router
3. Server PC
4. Power cable Server PC
5. PAT tester i-16
6. Power cable PAT-Tester
7. LAN cable (4 pcs.)

1.2 Explanation of Terms

Hardware components

Client PC: Physical or virtual PC on which the EL-Software Client is executed.

Server PC or EL-Server: Physical PC on which the EL-Software Server is running

EL-Router: Network router that manages the PAT-Tester network and provides the interface to the customer's network (Client Network)

Client Network: The customer's existing network infrastructure

PAT-Tester Network or Tester Network: Network of the appliance setup delivered by EL-Cell. The PAT-Testers are operated in this network.

Software components:

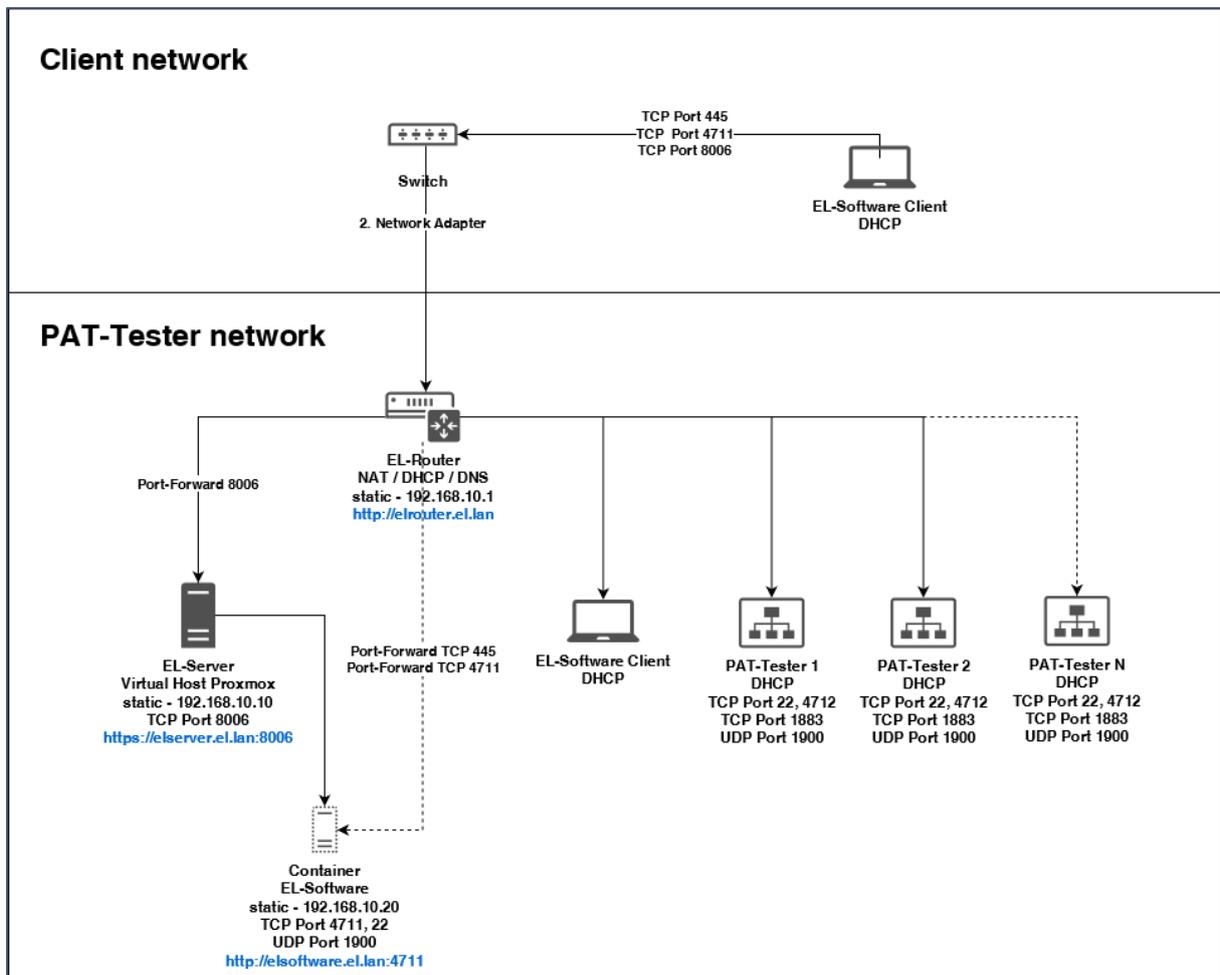
EL-Software Client: Client component of EL-Software that provides the graphical user interface (GUI).

EL-Software Server: server component of EL-Software that manages the PAT-Testers and contains the databases.

EL-Software Controller: Software component of EL-Software, which is installed directly on each PAT-Tester to control it.

Proxmox: Open source virtualization software used on the EL-Server to create and manage virtual PCs (containers).

1.3 Network Structure and Settings



EL-Router (supplied router hardware):

Access: <http://elrouter.el.lan>

User name: admin
Password: changeit

Port settings

Port 1: Client Network (DHCP)

Note: Do not connect a PAT-Tester, Server, or EL-Software Client PC directly to port 1.

Port 2-10: Internal PAT-Tester network.

- *Server:* Connect the EL-Server to Port 2.
- *PAT-Tester:* Connect all PAT-Testers from port 3 upwards.

- *EL-Software Client*: Connect the PC's running the EL-Software Client from Port 10 downwards.

Note: PCs running the EL-Software Client can access the EL-Server from both the client and the PAT-Tester network.

EL-Server (supplied server hardware):

Access:<https://elserver.el.lan:8006>

Username: root

Password: changeit

SMB share for Microsoft Windows: \\elsoftware.el.lan\experiments

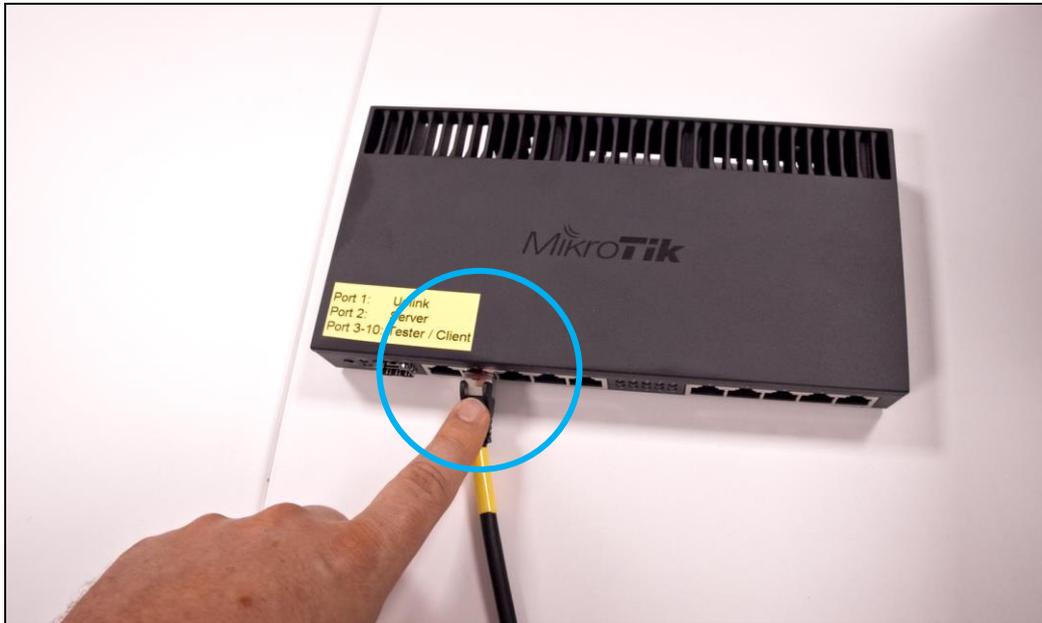
A community edition of Proxmox virtualization software is installed on the server. The server can be reached at <https://elserver.el.lan:8006> when using the supplied EL-Router.

The EL-Server hosts a virtual Linux Ubuntu 18.04 container (elserver) running the EL-Software Server. As a default, the elserver container has the static IP: 192.168.10.20

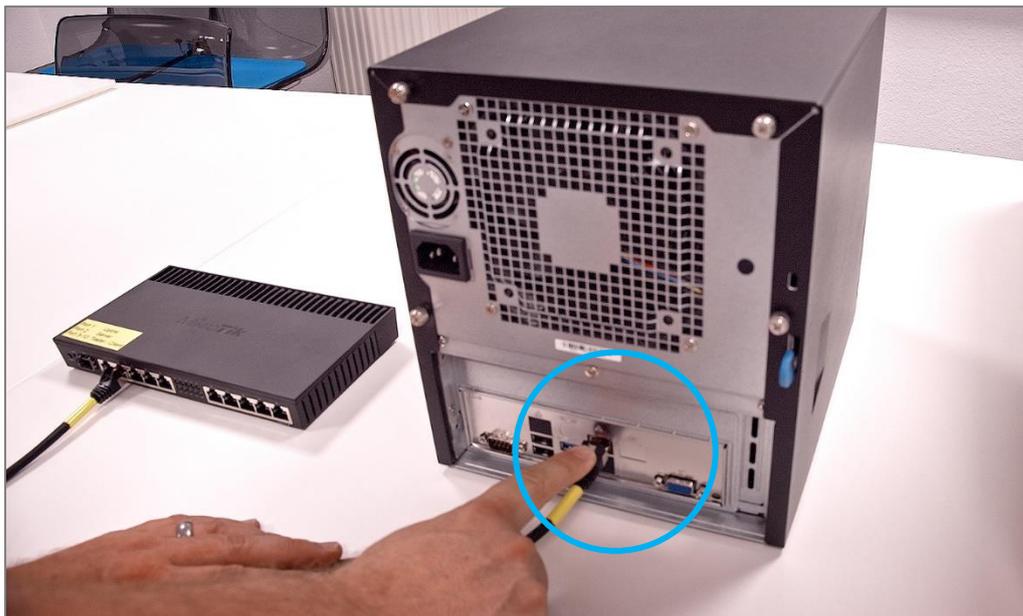
2 Setting up the Appliance Hardware

Connecting the router to the server PC

1. Connect the yellow LAN cable to LAN port 2 of the router.



2. Connect the cable to the LAN port of the server PC.



Connecting the router to the PAT-Tester-i-16

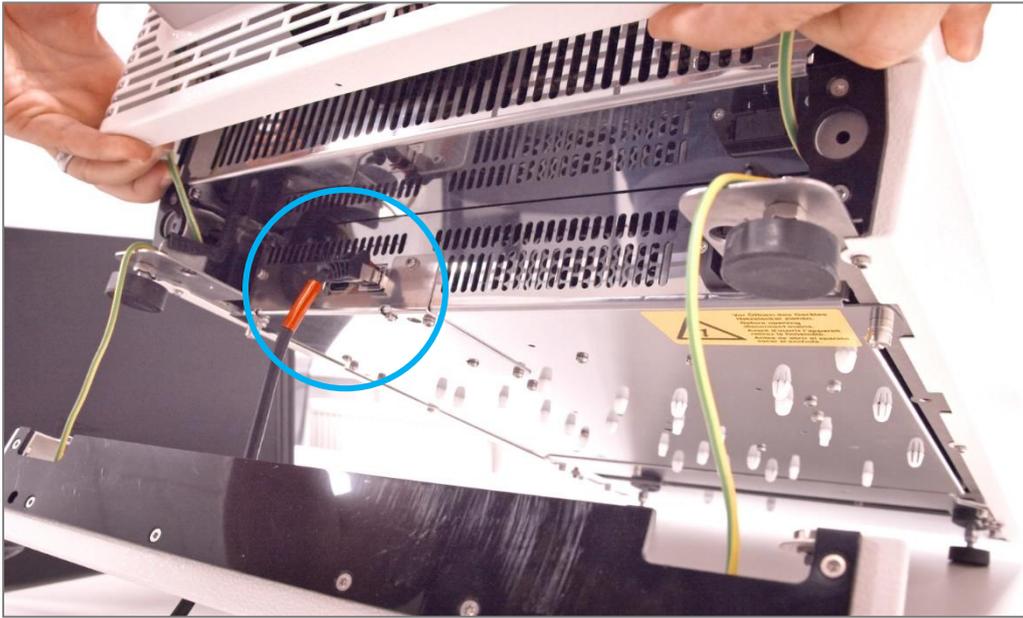
3. Schließen sie nun das rote LAN-Kabel an den LAN-Port 3 des Routers an.



4. Entfernen sie die Frontblende des PAT-Tester-i-16, um den LAN-Port freizulegen.



5. Schließen sie dann das LAN-Kabel an den LAN-Port des Gerätes an.

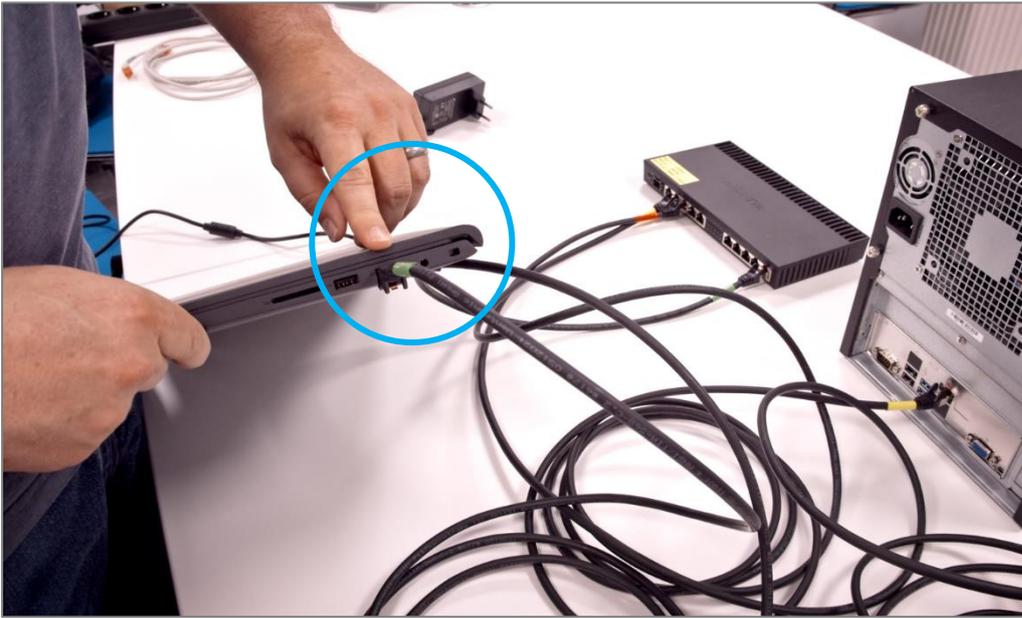


Connecting the router to the Client PC (connected to the tester network)

6. Connect the green LAN cable to the router. Use ports 4 to 10 of the router for this purpose.

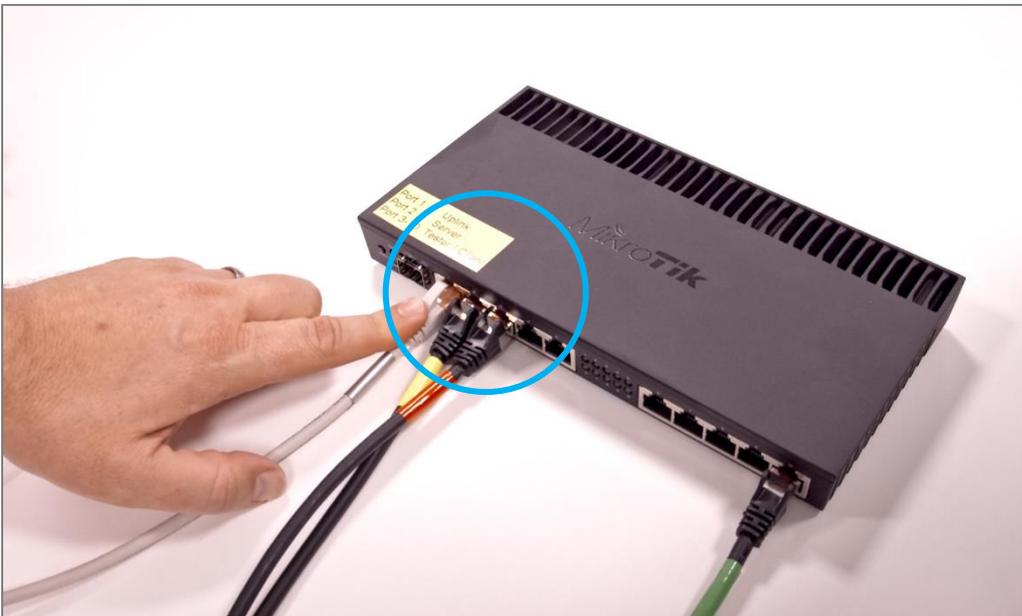


7. Connect the cable to the LAN port of the Client PC.



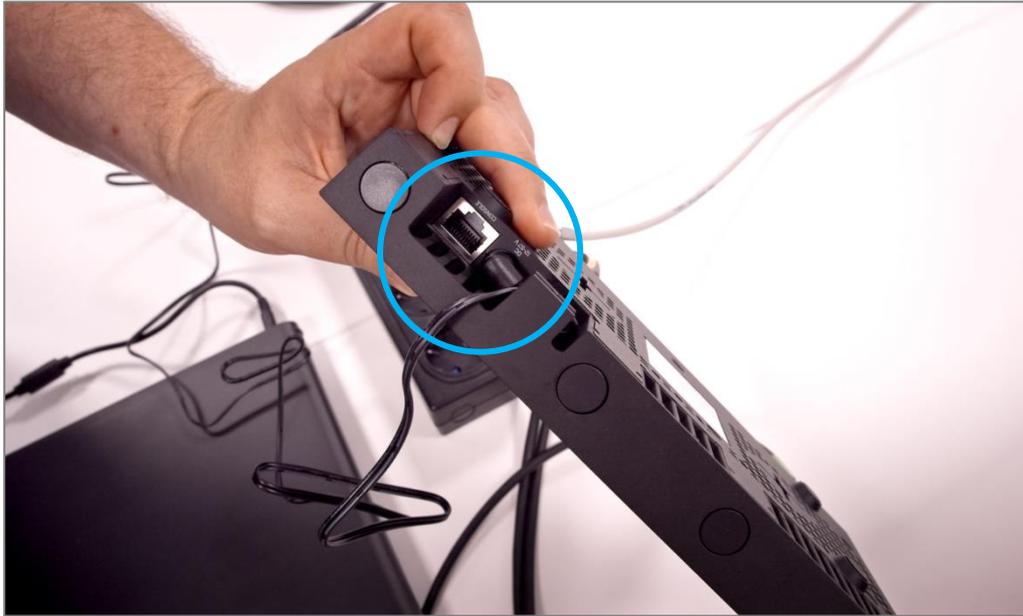
Connecting the router to the Client Network (recommended)

8. Connect the white LAN cable (White) to port 1 of the router. Connect the other end to the Client Network.



Connecting the devices to the mains and commissioning

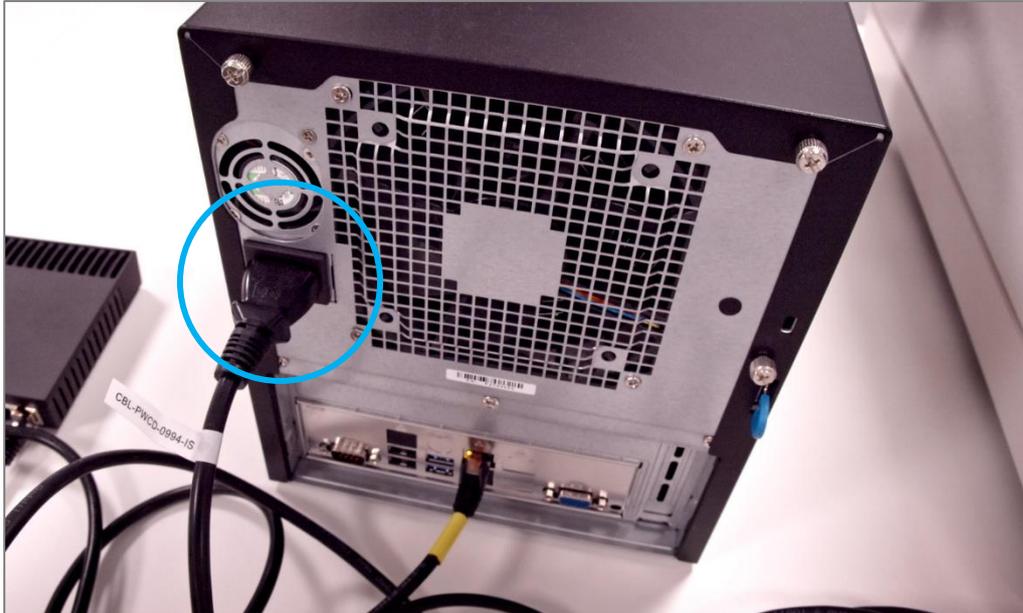
9. Connect the router to the power supply using the supplied power adapter.



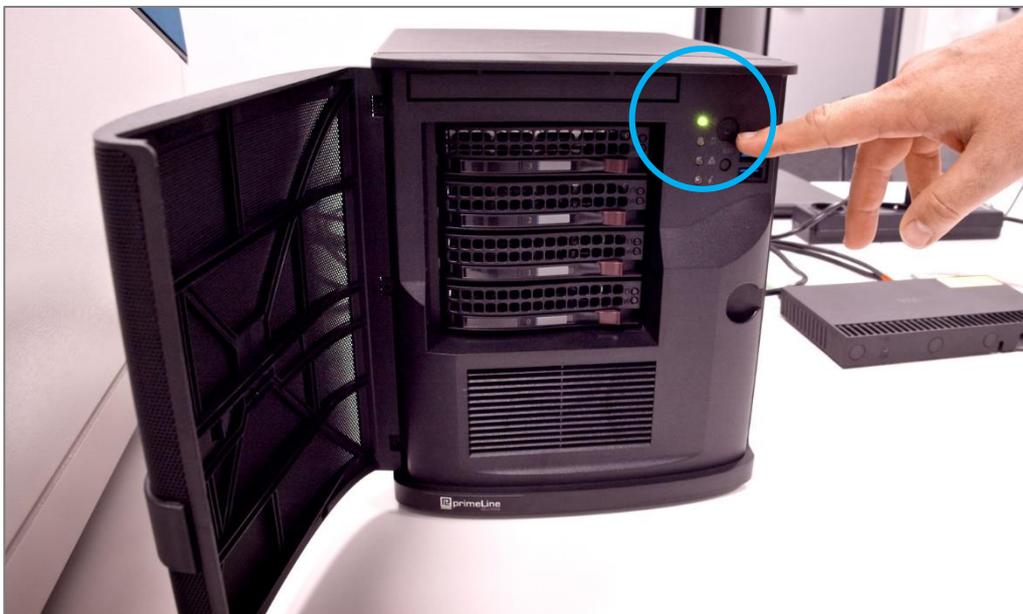
10. The router now starts. It is ready for operation after approx—1 minute. A green LED will light up continuously if connected to the Client Network.



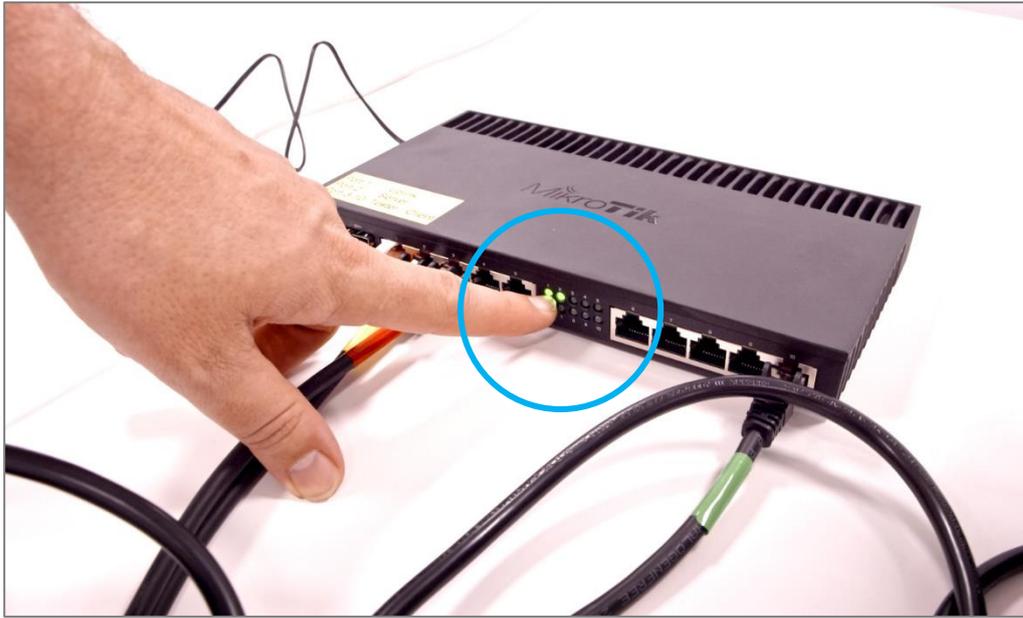
11. Connect the server PC to the power supply via the cable.



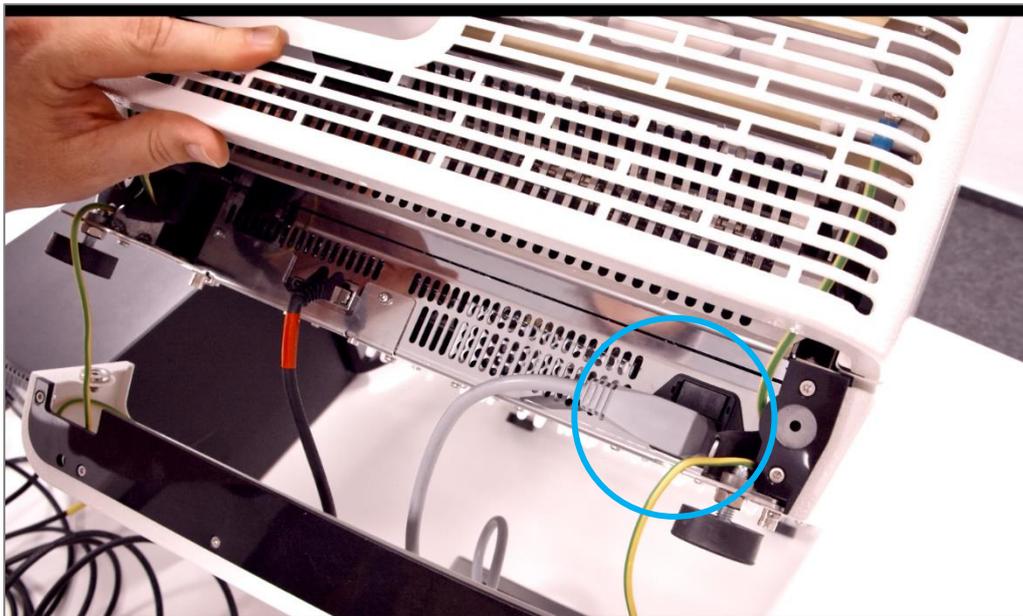
12. Switch it on. The green power LED now lights up green. The server boots and is ready for operation after approx—1 minute.



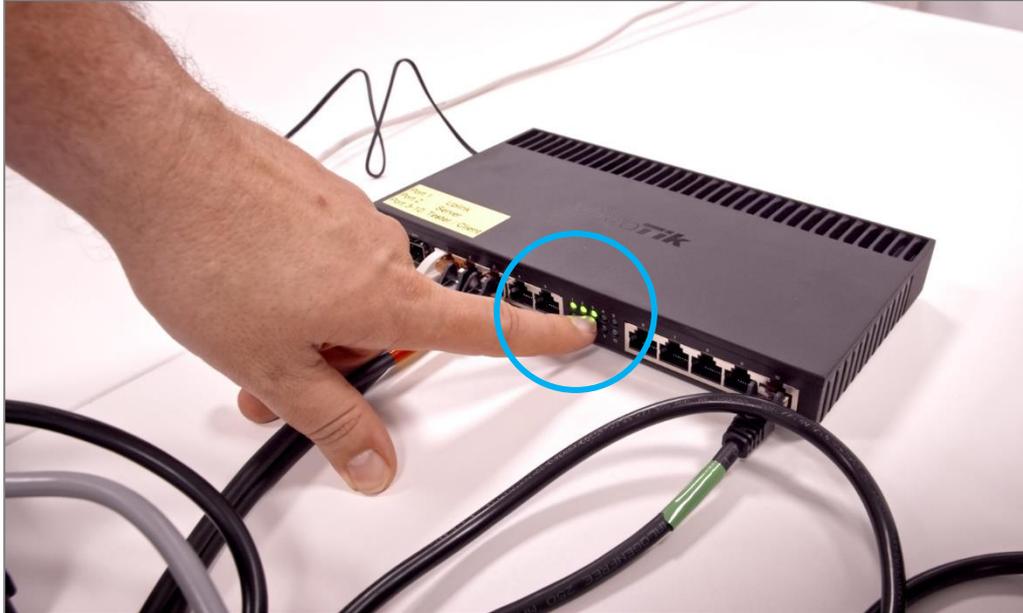
13. A green LED will now light up on the router on the port connected to the server PC.



14. Now, connect the PAT-Tester-i-16 to the power supply. Here, too, the front panel must be removed beforehand.



15. A green LED will now light up on the router on the port that is connected to the PAT-Tester-i-16.



16. „booting“ is now shown on the display of the PAT-Tester-i-16.

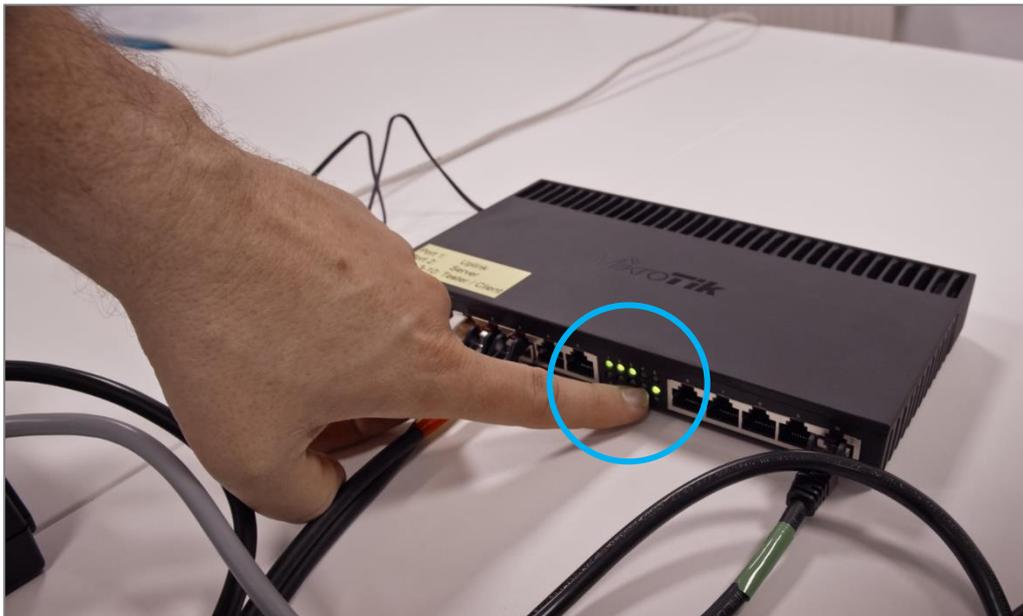


The boot process is completed as soon as the PAT-Tester has received an IP address from the router. This is now shown on the display



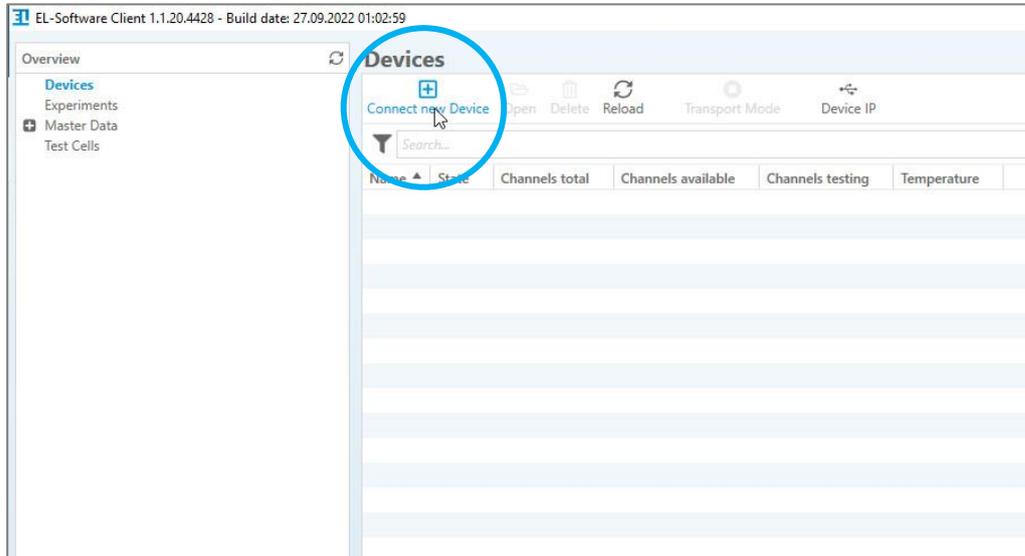
Optional: If the Client PC is connected to the tester network

17. Turn on the Client PC. Make sure that it is registered in the network and that the green LED on the router lights up.

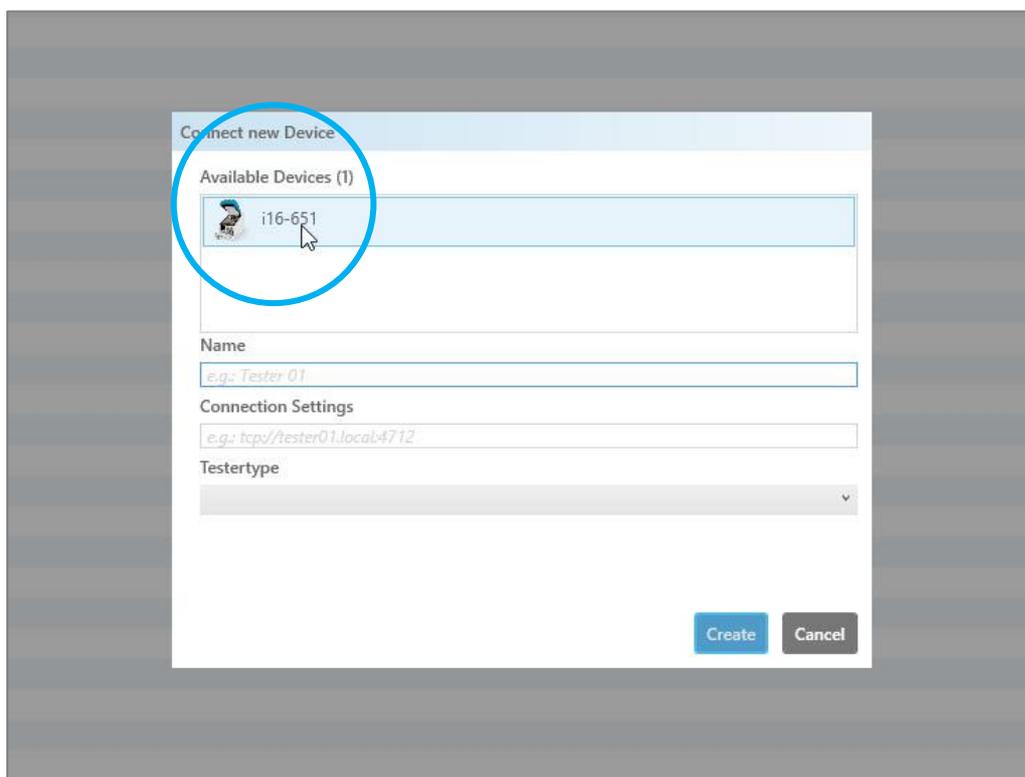


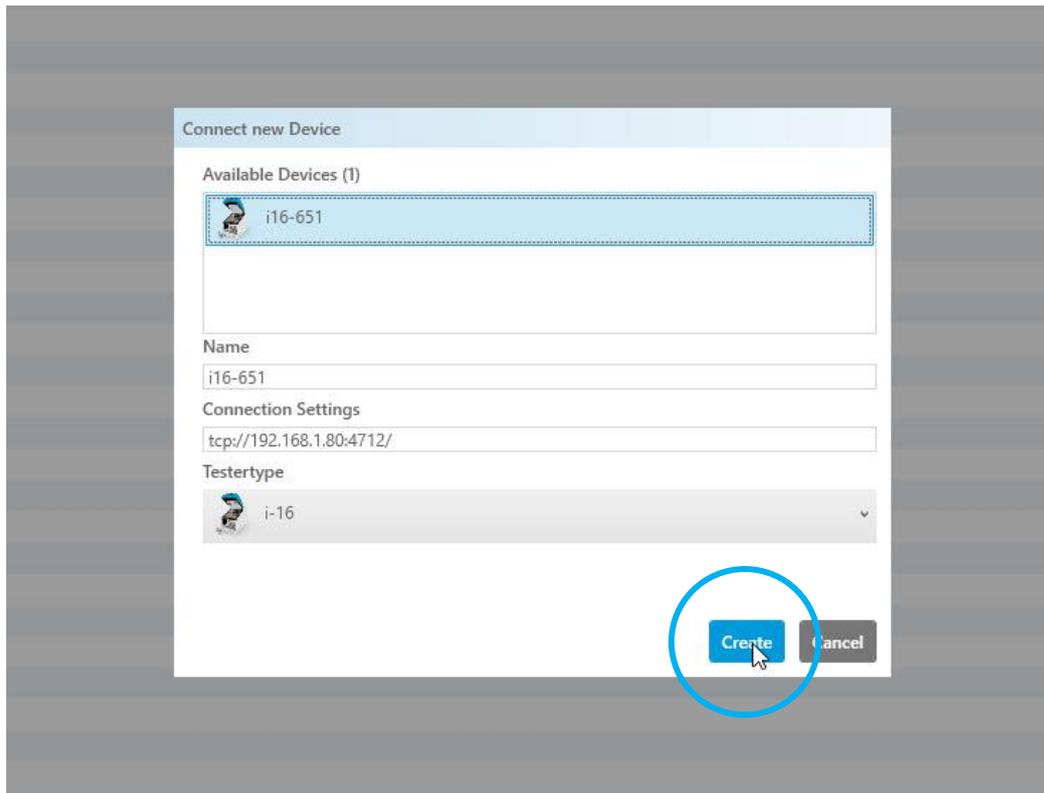
2.1 Connecting the EL-Software Server to the PAT-Tester

1. Start the EL-Software Client and select the "Devices" item in the tree structure. Click on "Connect new Device."

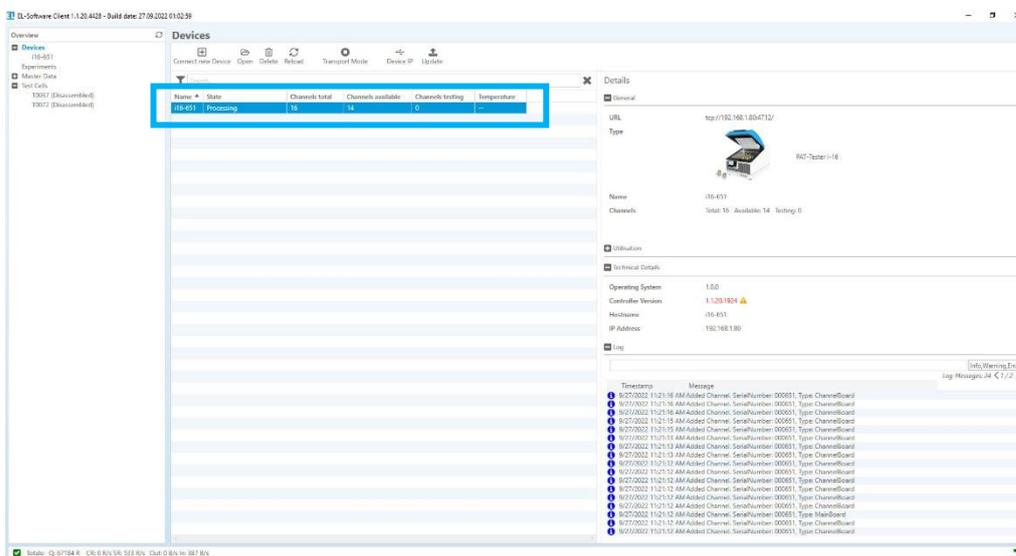


2. A popup shows the available PAT-Testers, in this example, a PAT-Tester-i-16. Select it and then click on "Create." This will connect the tester to the EL-Software Server.





3. The PAT-Tester-i-16 appears as an entry in the Devices list. It is now connected to the EL-Software Server and ready for use.



3 EL-Software Setup and Management

3.1 Installing the EL-Software Client

3.1.1 Obtaining via the EL-Software Server

The EL-Software Server contains an installation version of the EL-Software Client, which can be used for setup on any number of Client PCs.

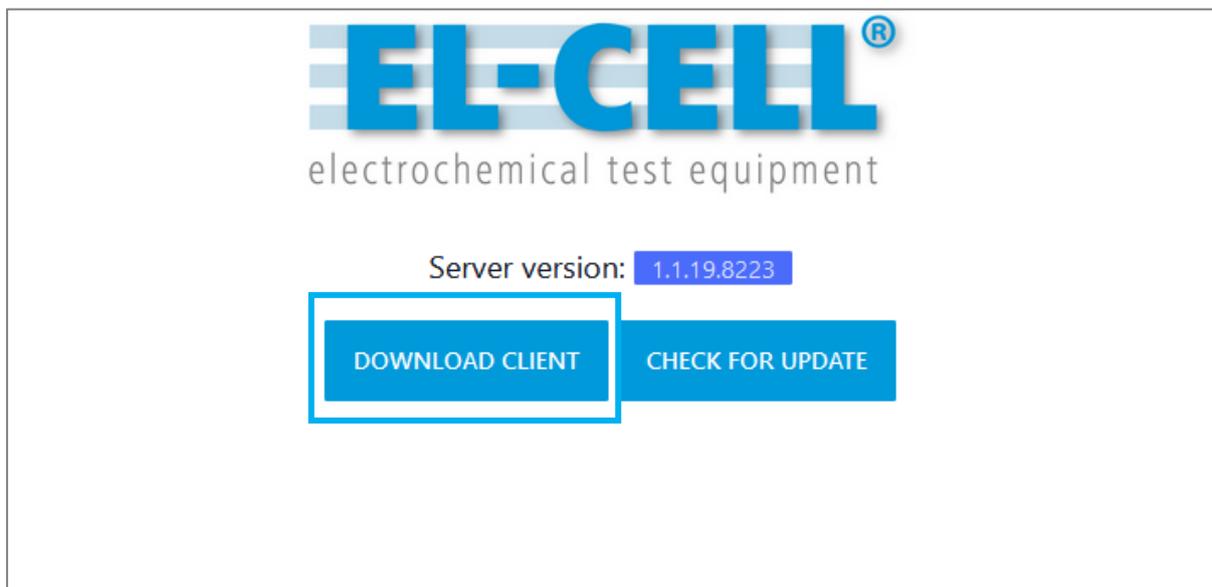
Please note: Only the EL-Software Client can be installed via this file. For installing the EL-Software Server, you need the installation package, which can be downloaded from the EL-Cell website.

3.1.1.1 Preparing for installation

If the Client PC is connected directly to the tester network: Open the web browser on the Client PC. Enter the address **192.168.10.20:4711**.

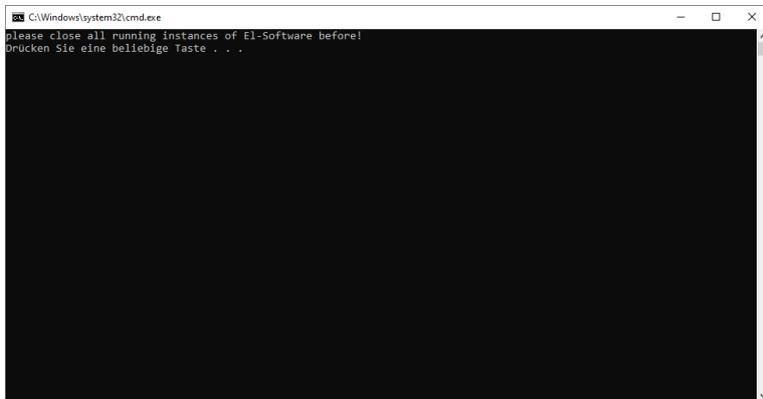
If the Client PC is connected to the Client Network, the IP address must be known, which the EL-Router has received in the customer network. The system administrator can determine this. Open the web browser on the Client PC. Enter the address **XXX.XXX.XX.XX:4711** (replace X with the determined IP address of the EL-Router)

Now click the "Download Client" button to download the .bat file.



3.1.1.2 Performing the Installation

Run the .bat file on the Client PC you downloaded in step 3.1.1. A system window will open. Press any key to run the installation process.



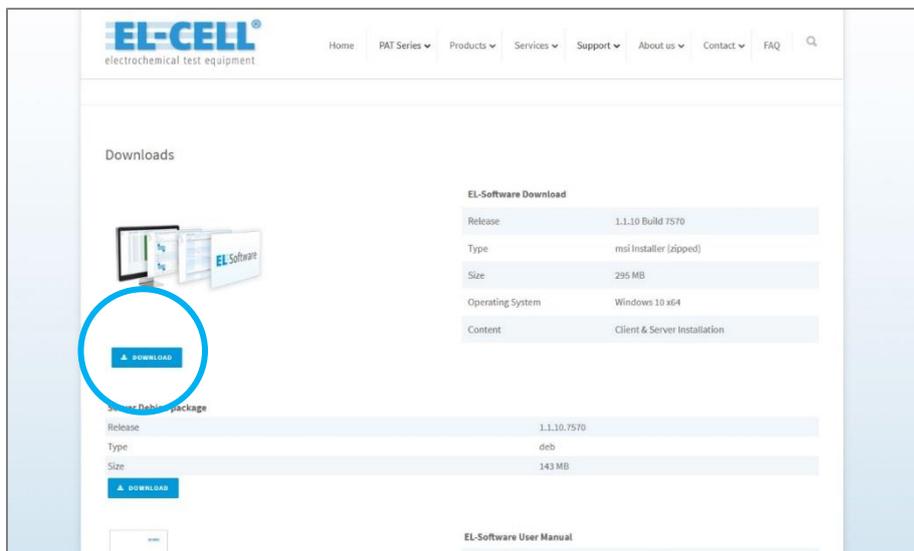
The EL-Software Client will be started automatically after successful installation.

3.1.2 Obtaining via the EL-Cell website (.msi installation file)

An installation file in .msi format can be downloaded from the EL-CELL website, which can be used to install both the EL-Software Server and the EL-Software Client.

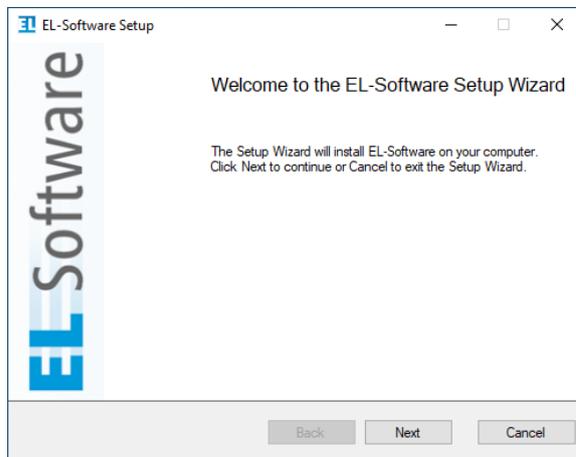
3.1.2.1 Preparing for installation

Download the EL-Software Installer from the EL-Cell website. Extract the zip file and execute the included Windows Installer file "Setup-EL-Software-win10...".

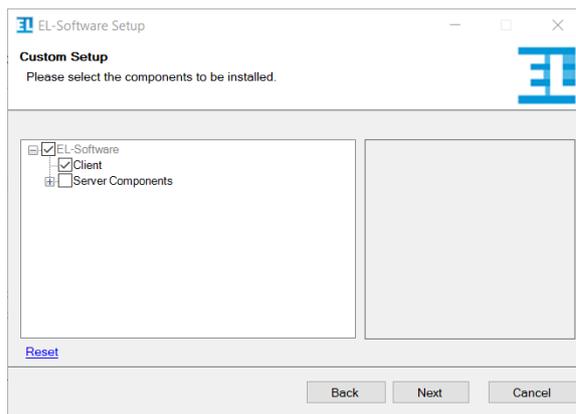


3.1.2.2 Performing the installation

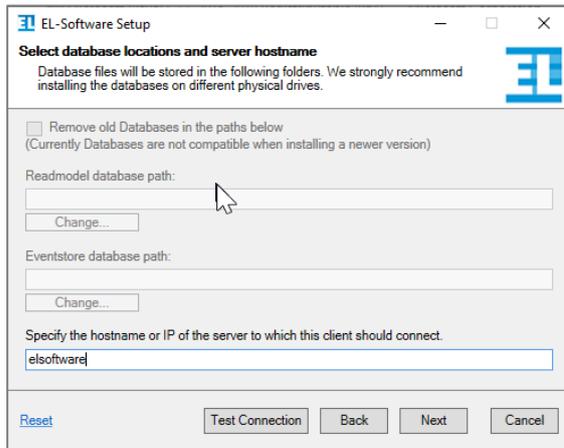
1. Double-click the provided installer file. The installation wizard will open, guiding you through the installation process. Click "Next" to continue.



2. Select the client component. Click "Next" to continue.

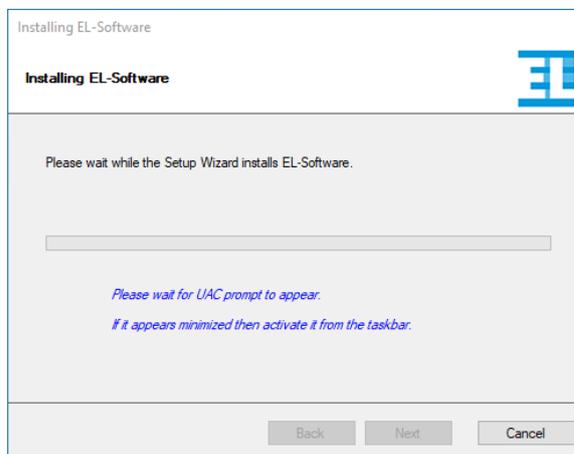


- If the Client PC is directly connected to the Tester Network:** Enter the hostname of the server you want the client to connect to. The default server name is *elsoftware*. Use the Button "Test Connection" to check the connection to the server. Click "Next" to continue.

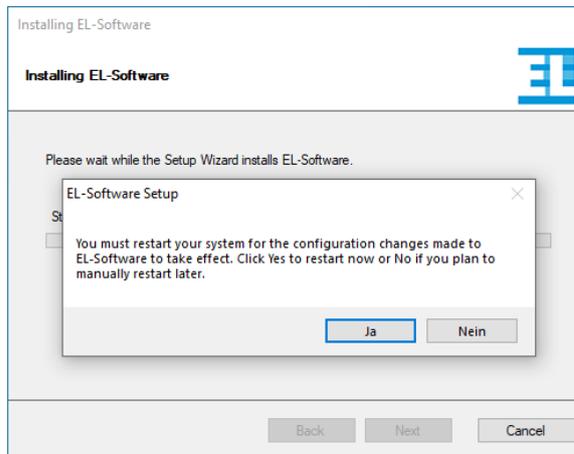


If the Client PC is connected to the Client Network: In this case, the IP address must be entered, which the EL-Router has received in the customer network. The system administrator can determine this. Via the "Test Connection" button, you can check the connection to the server. Then select "Next" to continue.

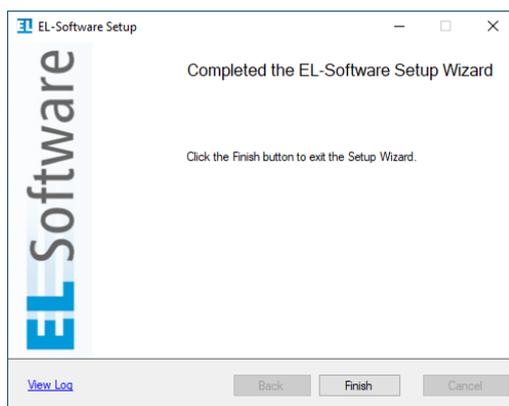
- The software components are now installed. When the Microsoft Windows User Account Control (UAC) window appears, press "Yes" to allow the installation.



- Once the installation is complete, you must restart the computer before you can use EL-Software. The restart is executed only after the wizard is finished.



- Press "Finish" to exit the wizard.



3.2 Updating the EL-Software Client

Once the EL-Software Server has been updated, the client is automatically updated at the next start. The update is obtained directly from the EL-Software Server.

3.3 Removing the EL-Software Client

The EL-Software Client is uninstalled differently depending on the source it was obtained from (EL-Cell website or EL-Software Server).

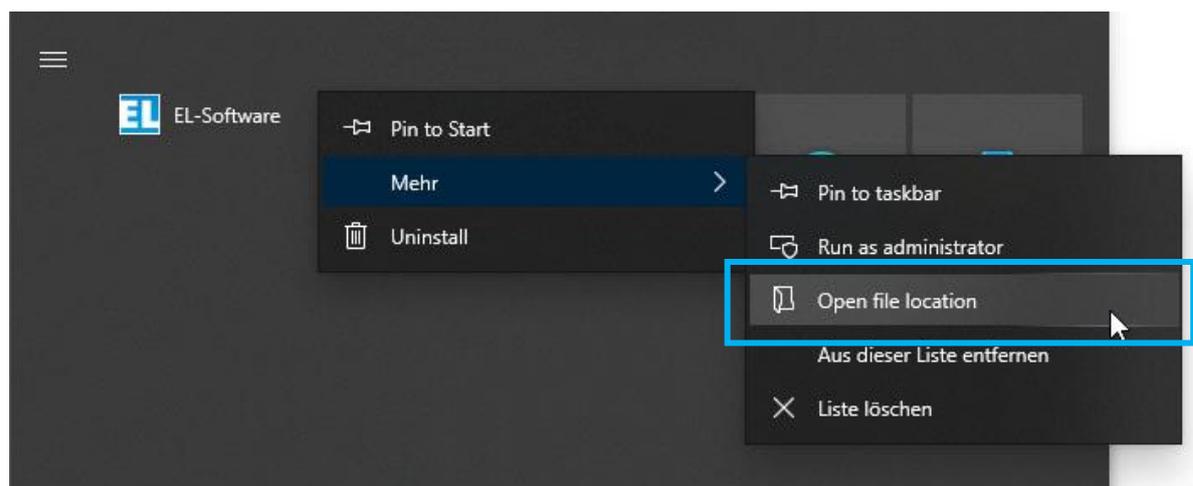
3.3.1 If Installation has been performed via the EL-Software Server

If the EL-Software Client was obtained and installed via the EL-Software Server, it has to be removed by deleting the installation folders. To determine the location of these folders, follow these steps. 1:

1. Open the Windows Start menu via the taskbar or the Windows key.
2. Right-click on the entry of the installed EL-Software Client. 3.

Please note: It is possible to install the EL-Software Client multiple times. Each installation is connected to a different server. The name of the connected server is mentioned in the entry behind "EL-Software."

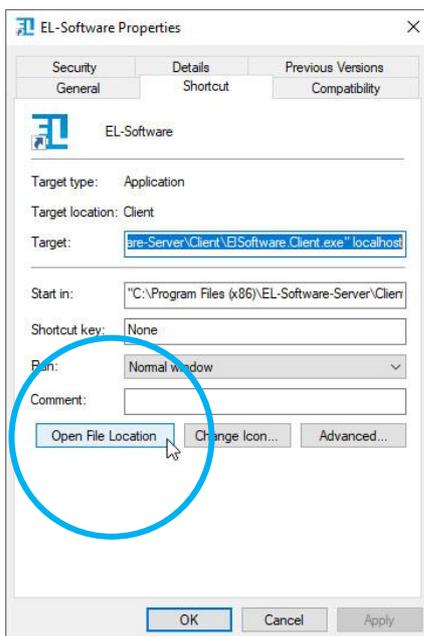
3. In the context menu, go to „more“ and select "Open file location."



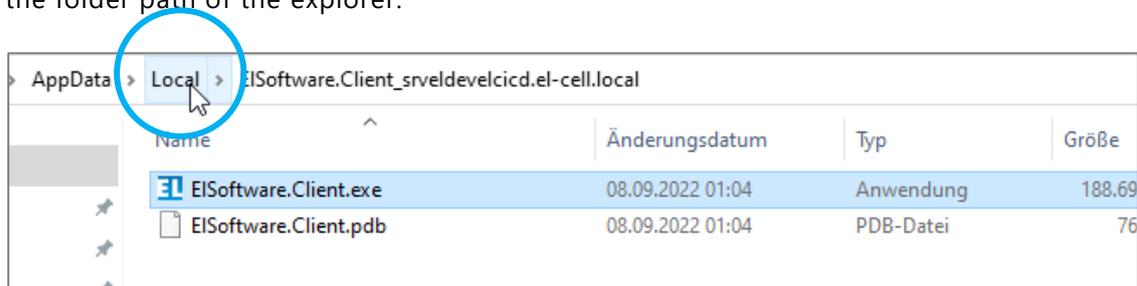
- A file explorer window opens with the EL-Software Client shortcut. Select it with the right mouse button and click on "Properties" in the context menu.



- Now select "Open file path."



- A new file explorer window will open. Navigate one level higher by clicking on "Local" in the folder path of the explorer.



- Now, delete the whole folder. It has the same name as the entry in the Windows start menu. Now the EL-Software Client is uninstalled.

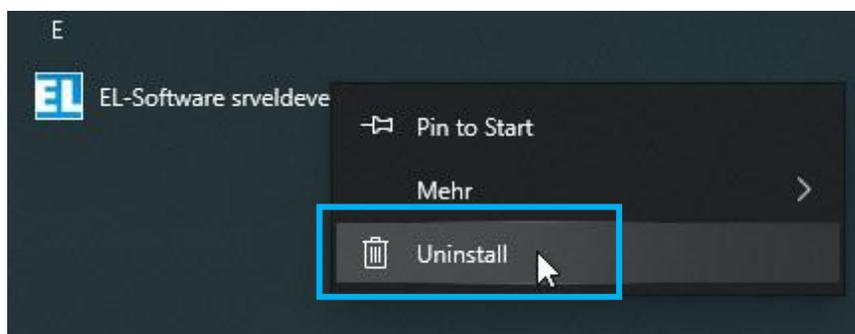
3.3.2 If the Installation was performed using the .msi Installer

If you have installed the EL-Software Client via the .msi installation file, offered as a download on the EL-Cell website, you have to uninstall it via the system control panel. Follow the steps below. 1:

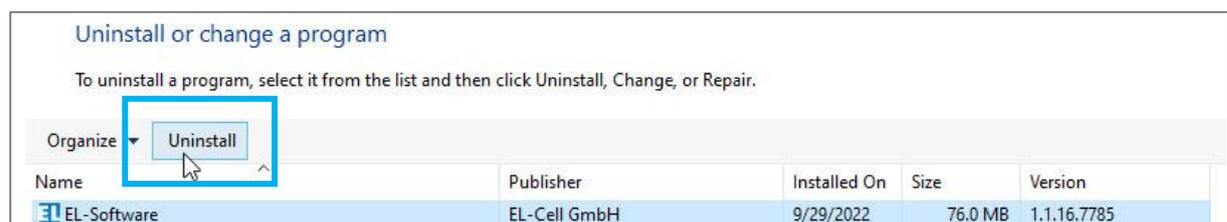
1. Open the Windows start menu via the taskbar or the Windows key.
2. Right-click on the entry of the installed EL-Software Client.

Please note: It is possible to install the EL-Software Client multiple times. Each installation is connected to a different server. The name of the connected server is shown in the entry behind "EL-Software" (example: "EL-Software example-server").

2. Now select the "Uninstall" option.



3. The Windows system dialog opens with a list of the installed programs on the Client PC. Select the entry of the EL-Software Client and click on Uninstall. This will remove the program from the Client PC.



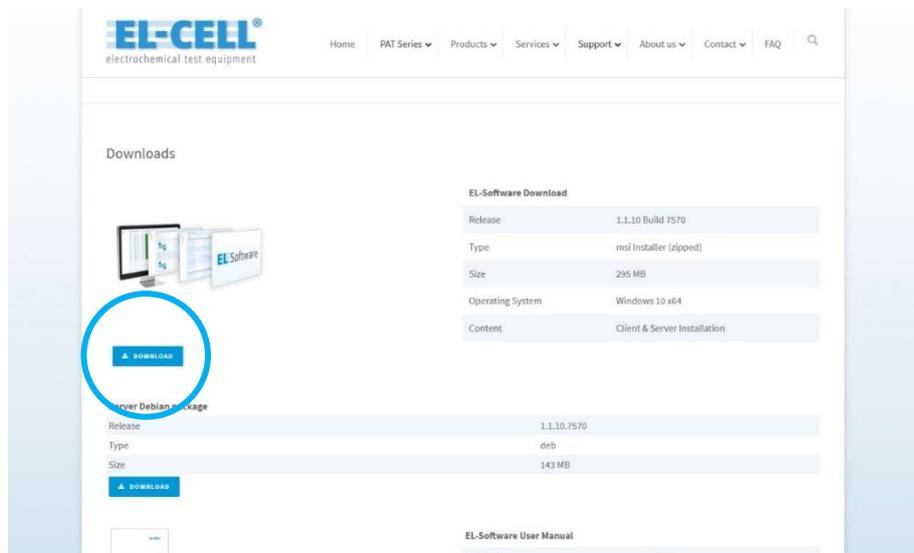
3.4 Installing the EL-Software Server

3.4.1 Installation on Microsoft Windows

The EL-Software Server installation file can be downloaded from the EL-Cell website.

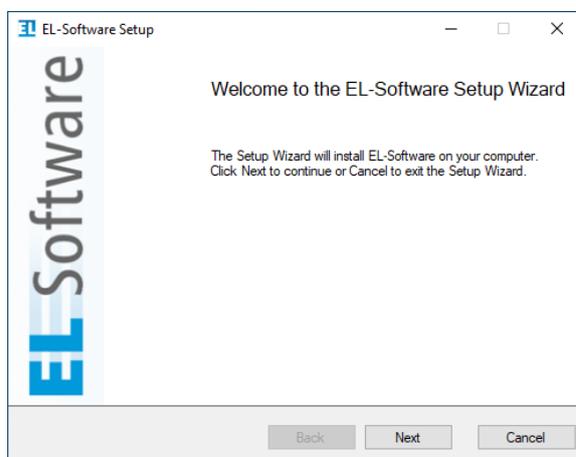
3.4.1.1 Preparing for Installation

Download the EL-Software installation file from the EL-Cell website. Extract the zip file and execute the included Windows Installer file (.msi) "Setup-EL-Software-win10...".



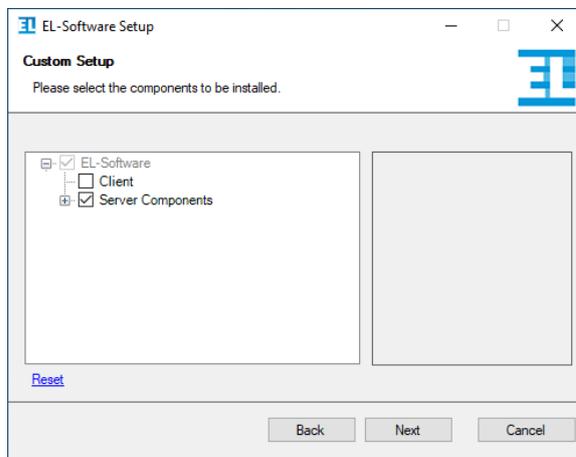
3.4.1.2 Installing the EL-Software Server

1. Double-click the provided installer file. The installation wizard will open and guide you through the installation process. Click "Next" to continue.



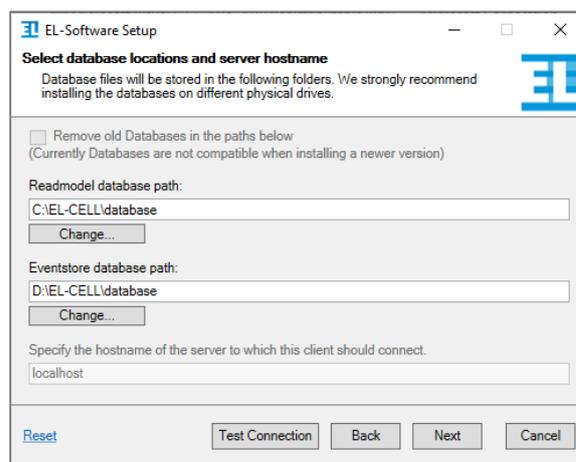
2. Select the server components. If you want to use the EL-Software Client on this system at the same time, select it as well.

Click "Next" to continue.

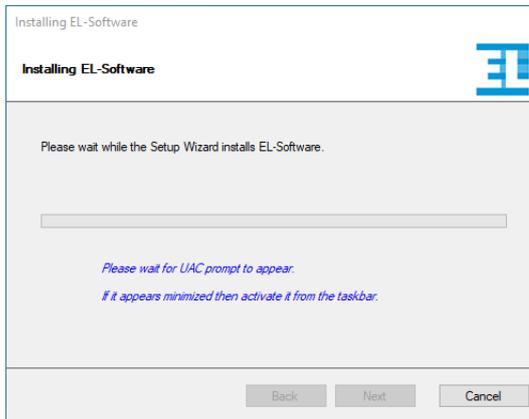


3. Select the storage locations for the databases. It is recommended to store each database on a separate physical hard drive.

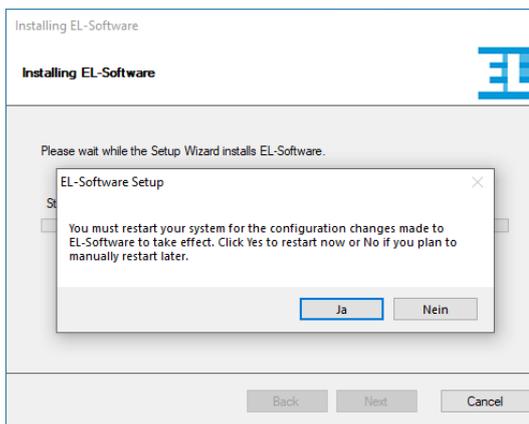
Click "Next" to continue.



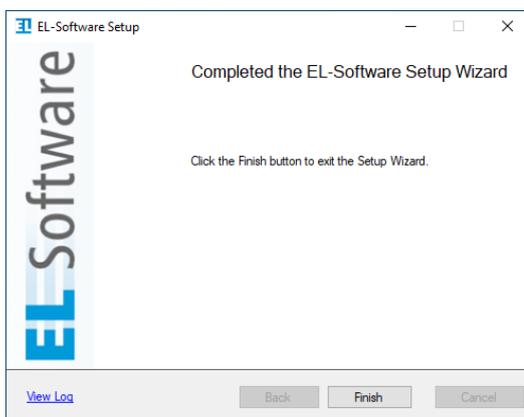
- The software components are now installed. When the Microsoft Windows User Account Control (UAC) window appears, press "Yes" to allow the installation.



- Once the installation is complete, you must restart the computer before you can use EL-Software. The restart is executed only after the wizard is finished.



- Press "Finish" to exit the wizard



- After restarting the computer and before the first use, the server's databases are set up. This process takes a few minutes, after which the software is ready to work.

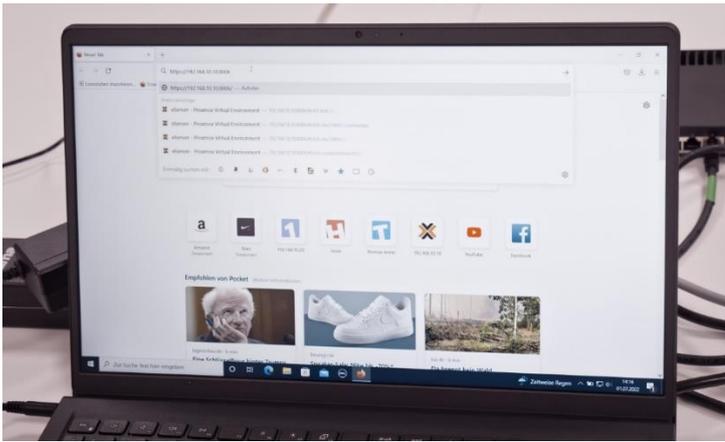
3.5 Updating the EL-Software Server

3.5.1 Update on Linux

In case the EL-Software Server is installed on a Linux system, please follow these steps:

1. First, all running instances of the EL-Software Client must be closed.

If the Client PC is connected directly to the tester network, open a web browser and call the address <https://192.168.10.10:4711>.



If the Client PC is connected to the Client Network, the IP address that the EL-Router has received from the customer network must be known. This can be requested from the system administrator.

Open a web browser on the Client PC and go to <https://XXX.XXX.XX.XX:4711> (replace X with the IP address of the EL-Router).

2. The browser now displays the currently installed version of the server. Click on "Check for Update."

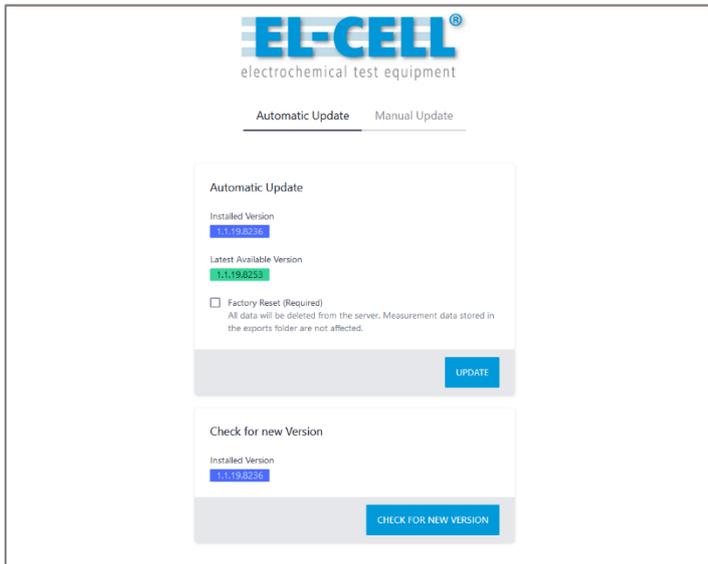


Two options are offered to start the update of the EL-Software Server, an automatic update and a manual one. The automatic update requires an existing Internet connection.

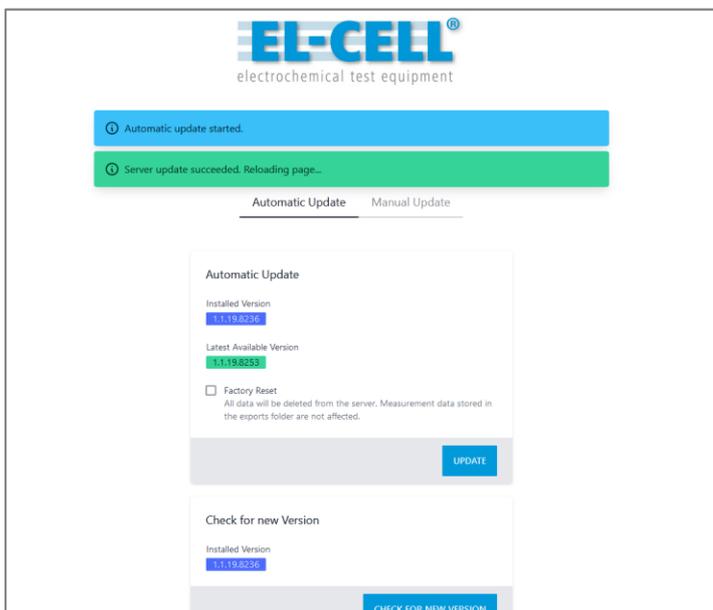
3.5.1.1 Performing the automatic update:

8. Select "Check for new version" on the EL-Software Server webpage to determine the latest version. Check "Factory Reset" and click on "Update" to start the update process.

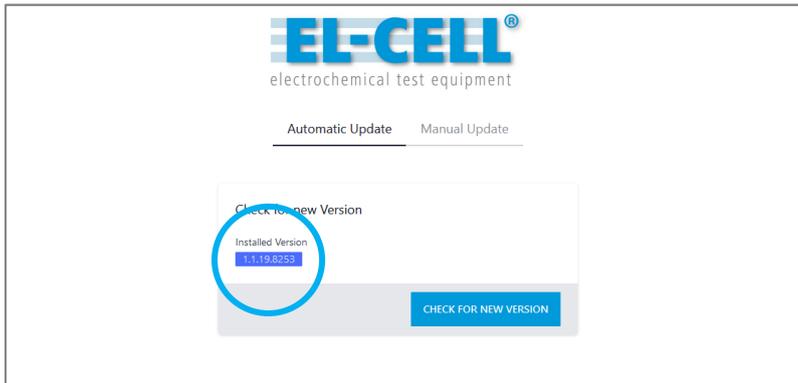
Please note: All settings will be reset to the factory settings during the update. Exported measurement data are not affected by this.



1. The update process is now started. You will be informed about the progress via the status bar.



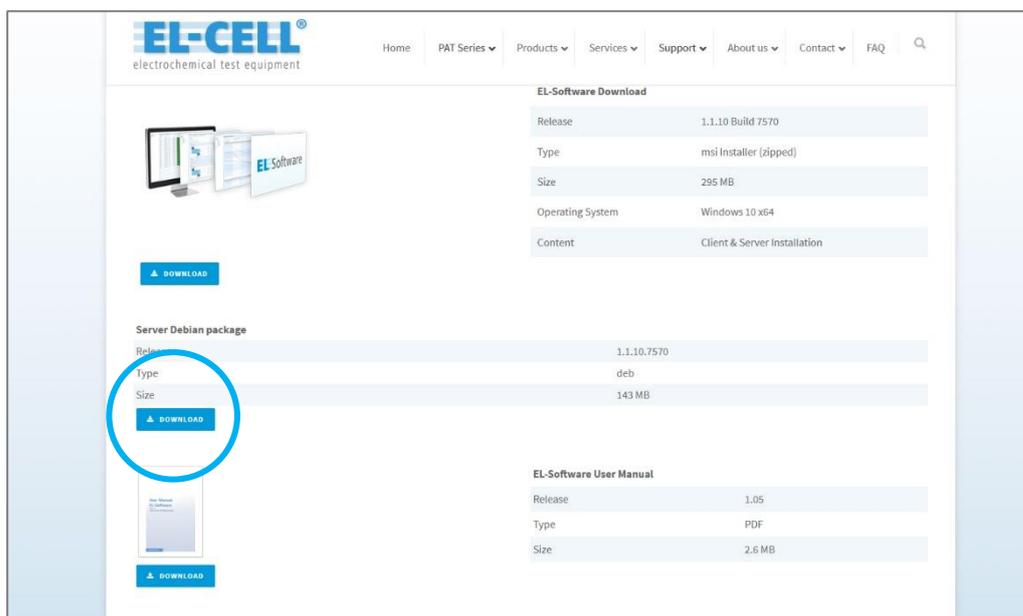
- After the successful update, the page is reloaded, and the newly installed version of the EL-Software Server is displayed.



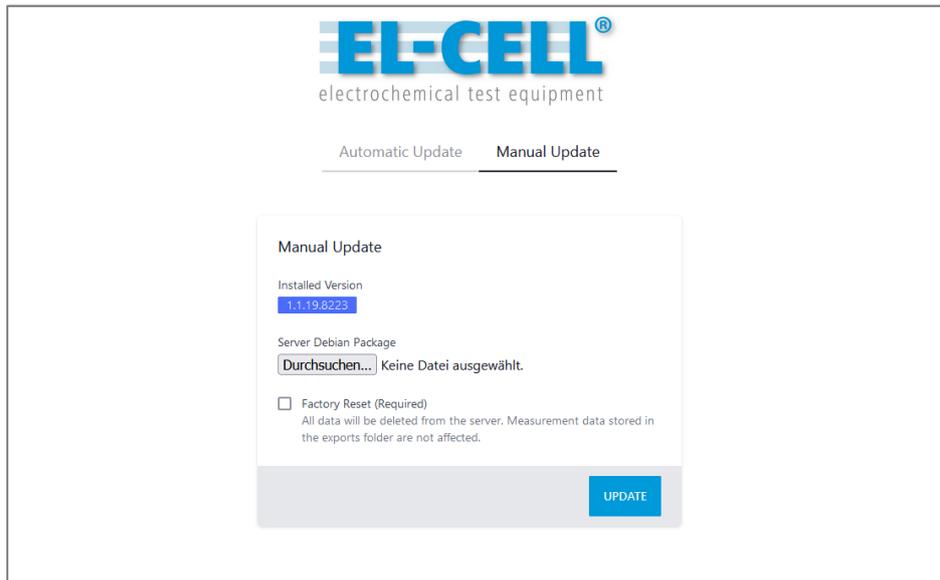
3.5.1.2 Performing the manual update:

It is possible to perform a manual update. This can be useful if there is no direct Internet connection

- Download the required server Debian package from the EL-Cell website and transfer it to the Client PC.

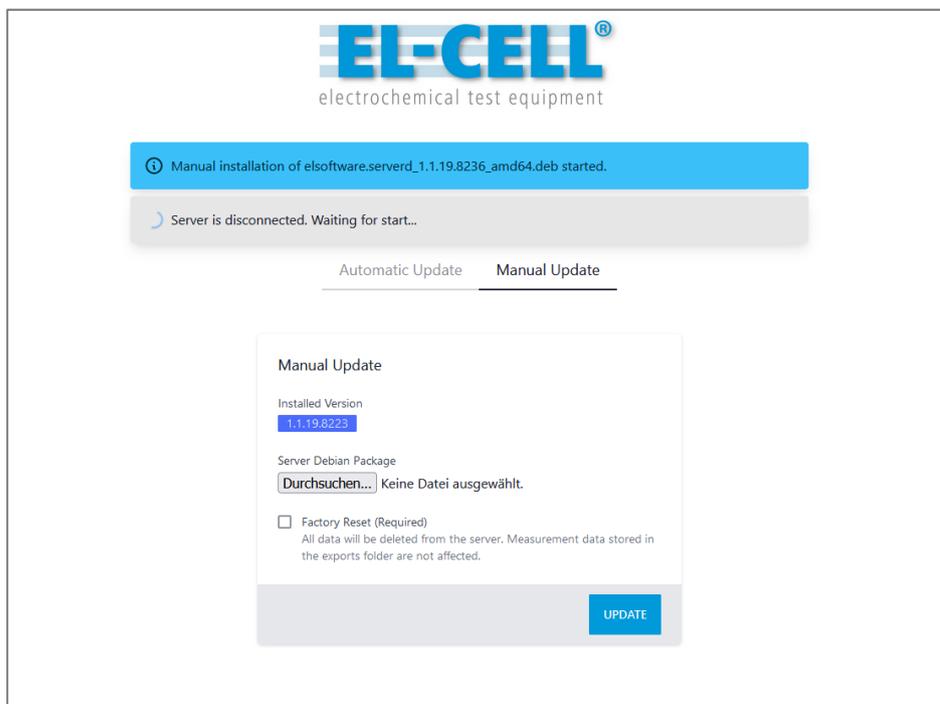


2. Click on the tab "Manual update" on the EL-Software Server webpage to change the view.

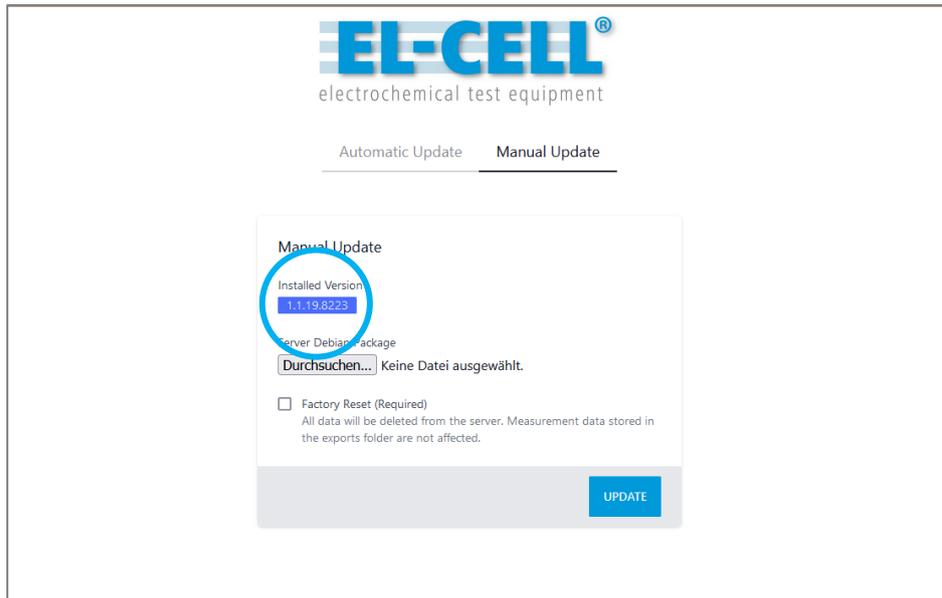


Select the previously downloaded Debian package in deb file format. Then check the "Factory Reset" box and click on "Update" to start the update process.

Please note: All settings will be reset to factory defaults during the update process. Exported measurement data is not affected by this.



3. After a successful update, the page is reloaded, and the installed version indicates the latest version.



3.5.2 Performing the update on Microsoft Windows

Please follow these steps if the EL-Software Server is installed on a Microsoft Windows system. For the update, you need the current installation file of EL-Software, which you can obtain from the EL-CELL website. Follow the standard installation instructions as shown in the corresponding chapter. The existing installation of the EL-Software Server does not have to be uninstalled before the update.

3.5.3 Removing the EL-Software Server from a Microsoft Windows system

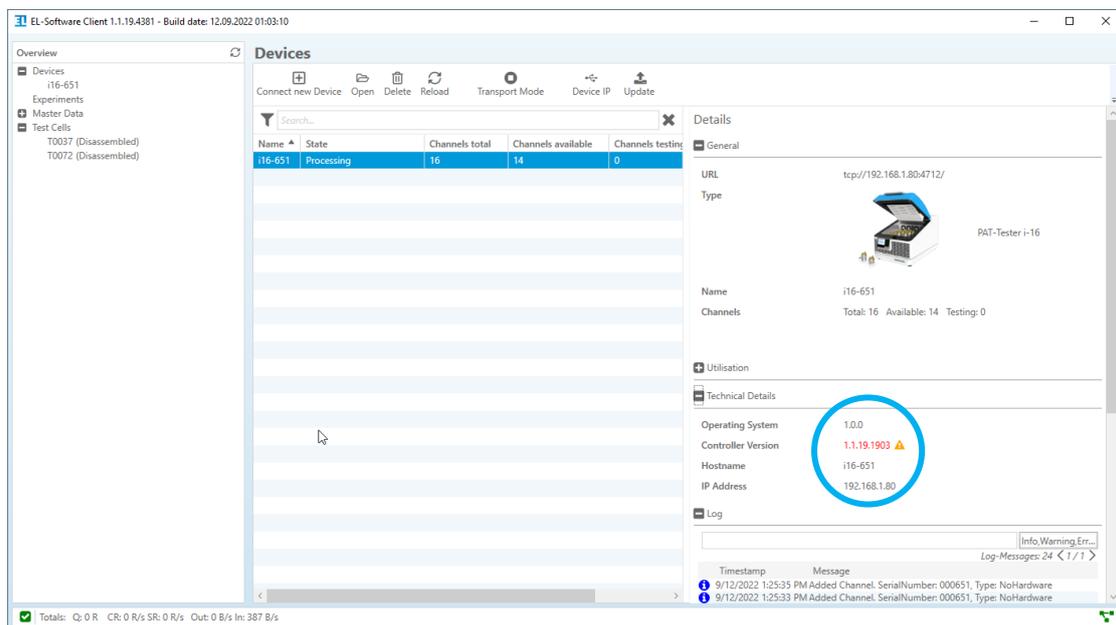
To remove EL-Software from your computer, uninstall it from the system control panel.

3.6 Performing the EL-Software Controller update

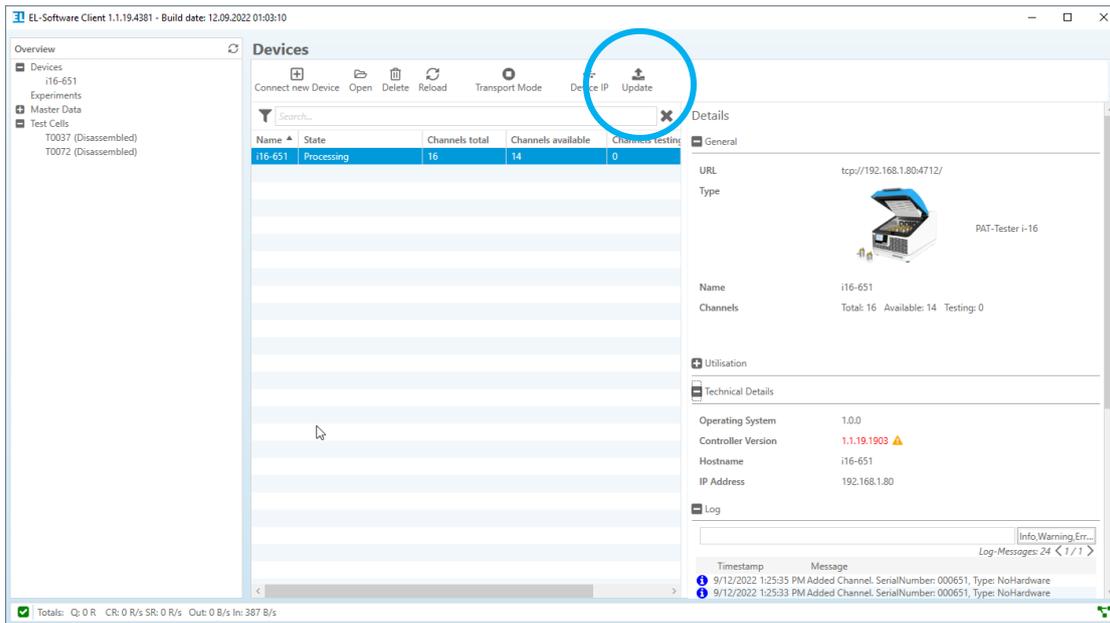
The EL-Software Controller component of a PAT-Tester can be updated via the EL-Software Client. To do this, the PAT-Tester must be connected to the EL-Software Server (see chapter 2.1). Then follow the steps below.

1. In the EL-Software Client, switch to the Device view and select the PAT-Tester whose controller you want to update.

If you expand the "Technical Details" area on the right, you will see the controller software version. If it appears in red font and is marked with a warning triangle, the software version is outdated and can be updated.

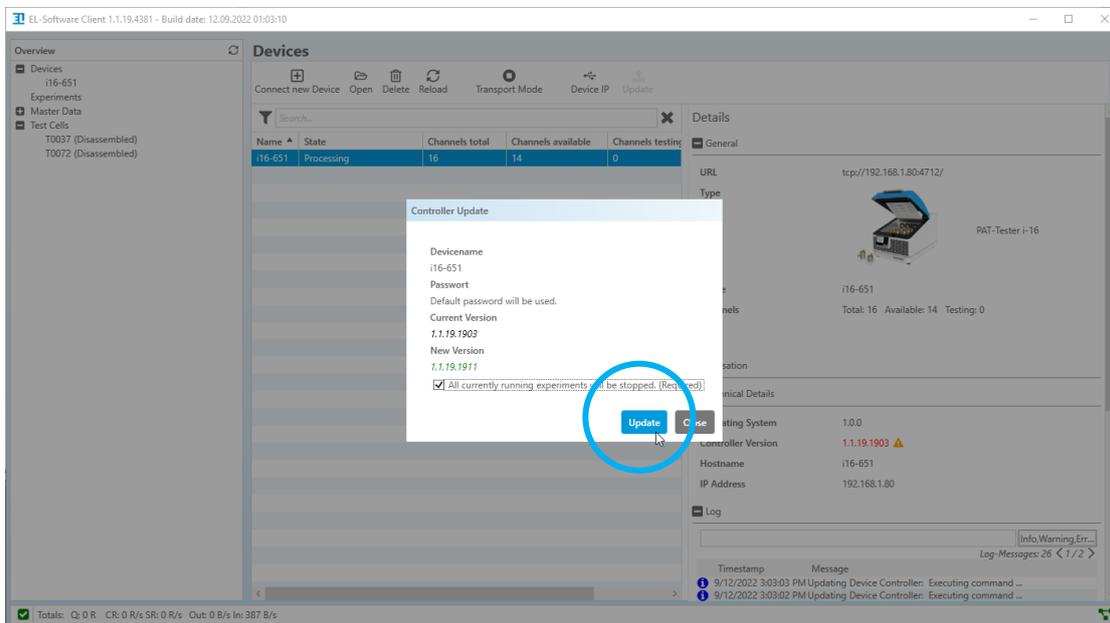


- Click on "Update" in the main menu bar.

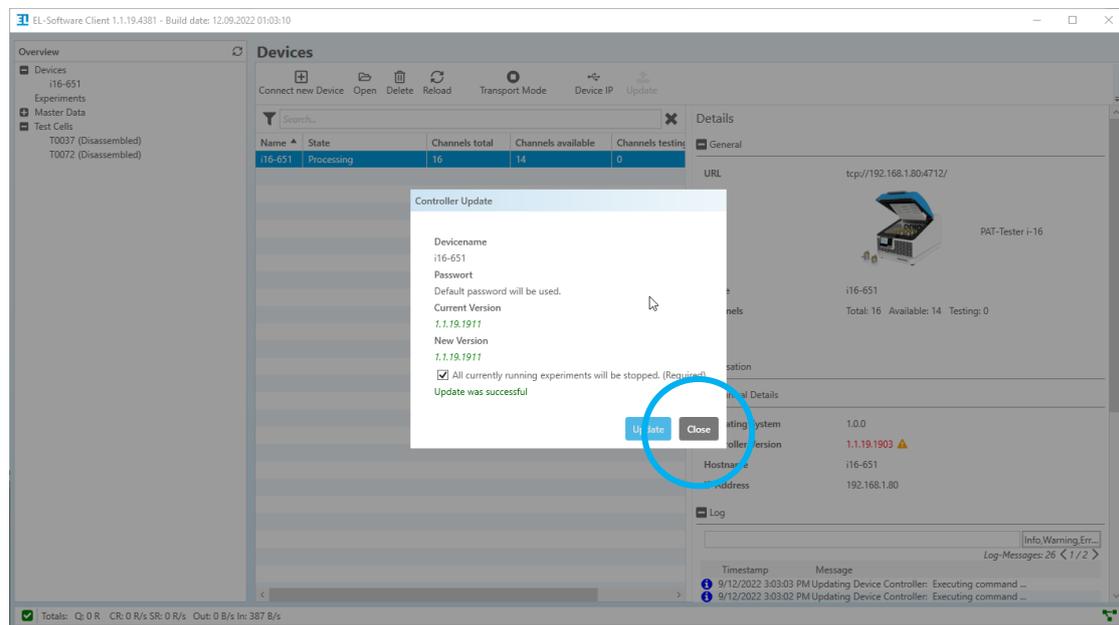


- A popup appears. If you have changed the default password for the controller software, you must enter it here. Otherwise, the default password will be used automatically.

During the update, all running experiments will be stopped. Check the box to continue. The button "Update" will be unlocked and can be selected to start the update.



- The update will now be performed. The new version of the EL-Software Controller is displayed as soon as it has been completed. You can now close the window via the „Close“ button.



4 For advanced users

The following chapters describe procedures and help for advanced users. They can be applied if problems cannot be solved via standard procedures.

4.1 Performing software updates via Linux (with an existing internet connection)

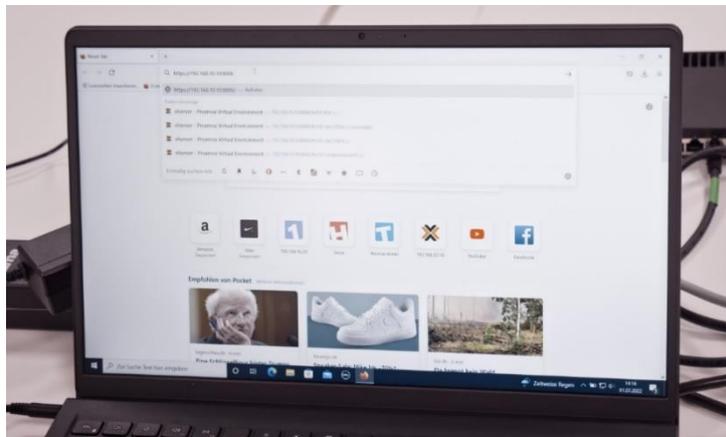
4.1.1 Updating the EL-Software Server

If the Client PC is connected to the tester network:

First, close all running instances of the EL-Software Client.

Open the web browser on the Client PC and call the address <https://192.168.10.10:8006>. This will take you to the user interface of the virtualization manager Proxmox. Login with username: `root` and password: `changeit`.

Continue with step 1.

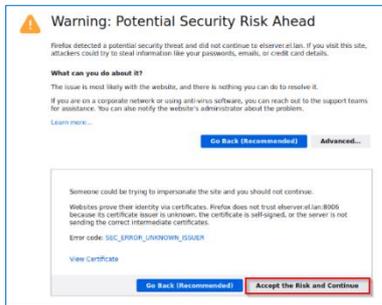


If the Client PC is connected to the Client Network:

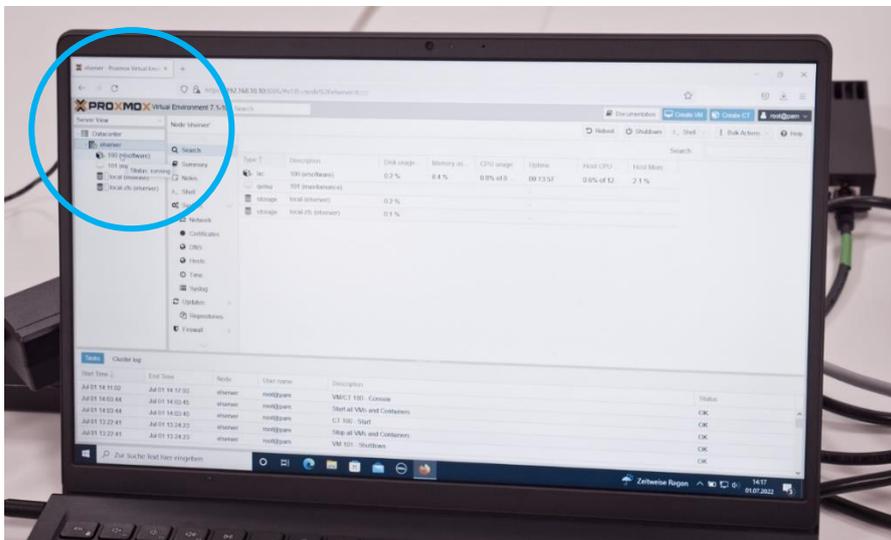
In this case, the IP address the EL-Router has received from the Client Network must be known. This can be requested from the system administrator.

Open the web browser on the Client PC and call up <https://XXX.XXX.XX.XX:8006> (replace X with the determined IP address). This will take you to the user interface of the Proxmox virtualization manager. Login with username: `root` and password: `changeit`. Continue with step 1.

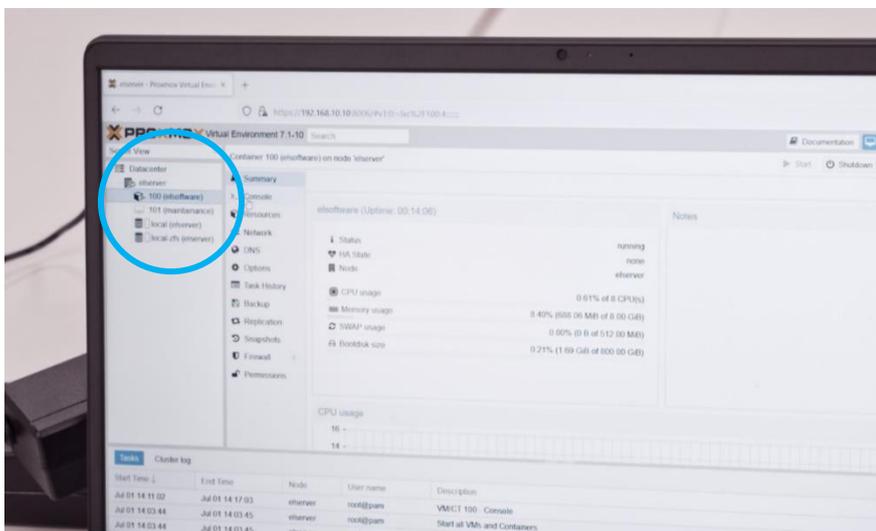
9. Accept the security risk



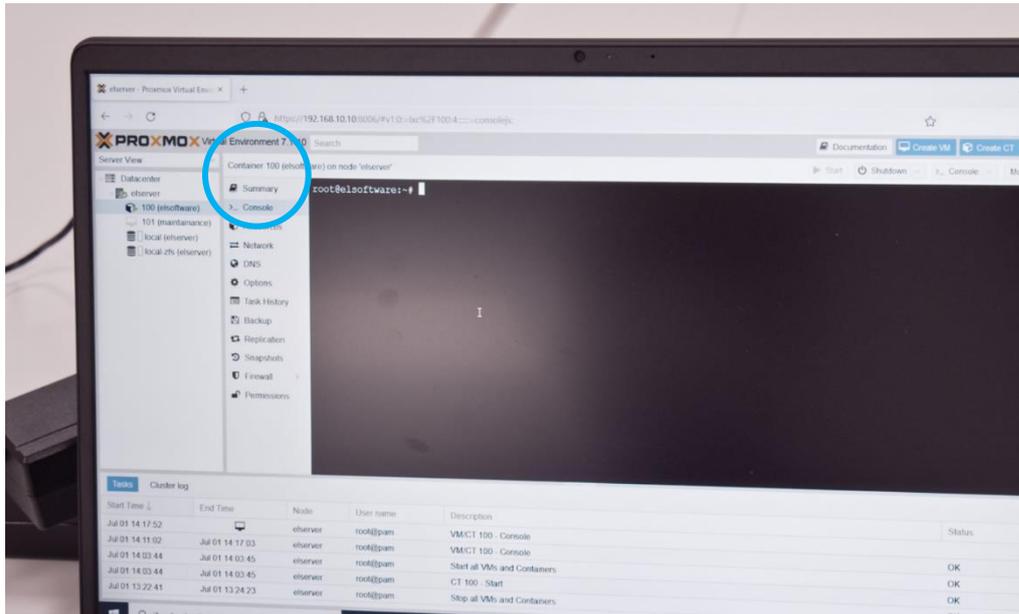
10. Choose **elserver** from the tree structure on the left side



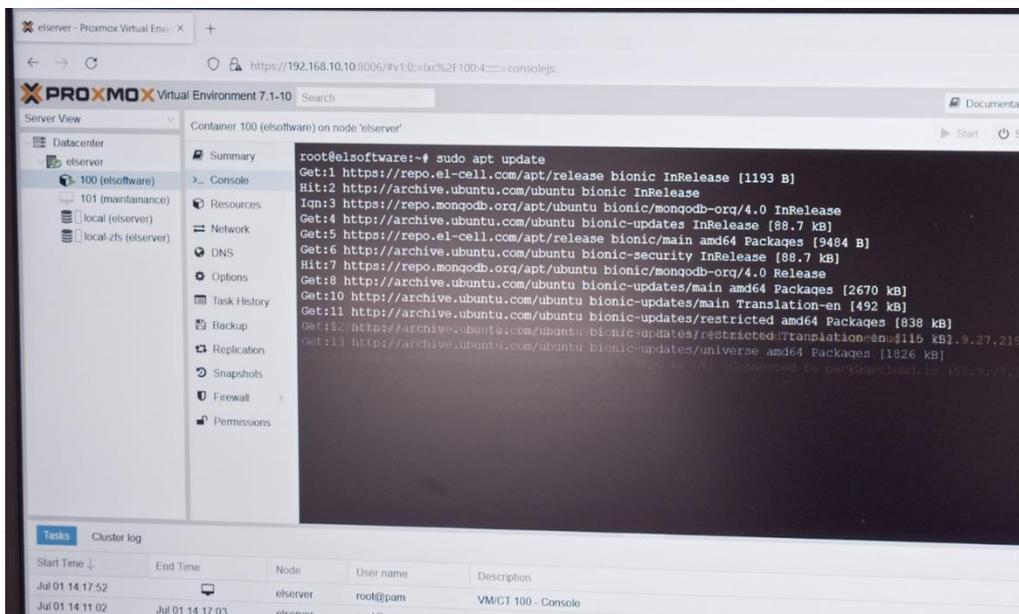
5. Select the entry „100 (elsoftware)“. This is the virtual container on which the EL-Software Server is installed ist.



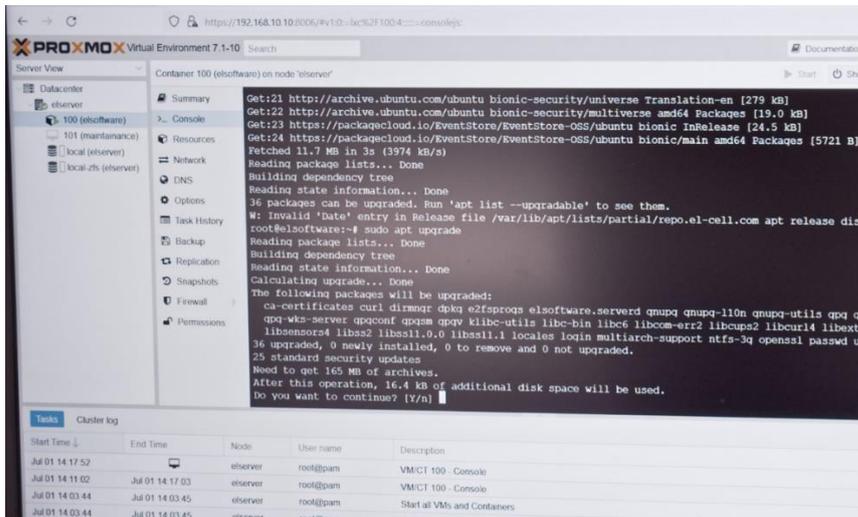
- Click on "Console" in the container menu to open the input window. Login with username: `eladmin` and password: `changeit`



- Now enter the command `sudo apt update` in the input window. This checks all software components for up-to-date and downloads new versions if an Internet connection is available.



8. Enter the command `sudo apt upgrade`. Confirm the prompt asking if you want to continue. Now the previously downloaded content will be installed.



```

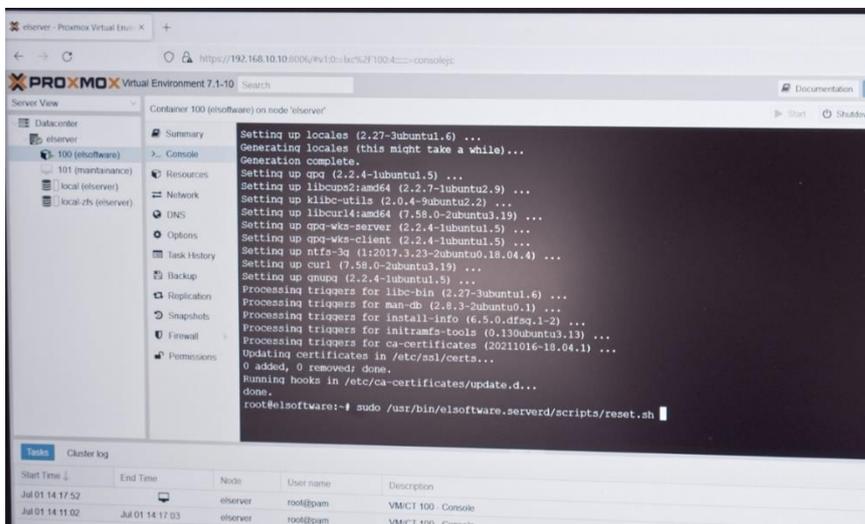
Get:21 https://archive.ubuntu.com/ubuntu bionic-security/universe Translation-en [279 kB]
Get:22 http://archive.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [19.0 kB]
Get:23 https://packagecloud.io/EventStore/EventStore-OSS/ubuntu bionic InRelease [24.5 kB]
Get:24 https://packagecloud.io/EventStore/EventStore-OSS/ubuntu bionic/main amd64 Packages [5721 B]
Fetched 11.7 MB in 3s (3974 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
36 packages can be upgraded. Run 'apt list --upgradable' to see them.
W: Invalid 'date' entry in Release file /var/lib/apt/lists/partial/repo.el-cell.com apt release dist
root@elsoftware:~# sudo apt upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  ca-certificates curl dirmngr dpkg e2fsprogs elsoftware.serverd gnupg gnupg-l10n gnupg-utils gnupg qd
gnupg-wks-server gpgconf gpgsm gpgv klibc-utils libc-bin libc6 libc6-err2 libcups2 libcurl4 libext2
libensors4 libfs2 libfsall.0 libssl1.1 locales login multiarch-support nftables openssl passwd ub
36 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
25 standard security updates
Need to get 165 MB of archives.
After this operation, 16.4 kB of additional disk space will be used.
Do you want to continue? [Y/n]

```

9. The database must be reset because the installed updates can potentially contain changes to the structure, which can endanger the stability. To do this, enter the following command in the input window:

```
sudo /usr/bin/elsoftware.serverd/scripts/reset.sh
```

10. The database will now be rebuilt; this process can take several minutes.



```

Setting up locales (2.27-3ubuntu1.6) ...
Generating locales (this might take a while)...
Generation complete.
Setting up gnupg (2.2.4-1ubuntu1.5) ...
Setting up libcups2:amd64 (2.2.7-1ubuntu2.9) ...
Setting up klibc-utils (2.0.4-9ubuntu2.1) ...
Setting up libcurl4:amd64 (7.58.0-2ubuntu3.19) ...
Setting up gnupg-wks-server (2.2.4-1ubuntu1.5) ...
Setting up gnupg-wks-client (2.2.4-1ubuntu1.5) ...
Setting up nftables (1:2017.3.23-2ubuntu0.18.04.4) ...
Setting up curl (7.58.0-2ubuntu3.19) ...
Setting up gnupg (2.2.4-1ubuntu1.5) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for install-info (6.5.0.dfsg.1-2) ...
Processing triggers for initramfs-tools (0.130ubuntu3.13) ...
Processing triggers for ca-certificates (20211016-10.04.1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
root@elsoftware:~# sudo /usr/bin/elsoftware.serverd/scripts/reset.sh

```

Please note: If you start the client software too soon, you will receive a warning or an error message.

Important note: The experiment data in the exports folder will be preserved.

Update of the EL-Software Client after update of the EL-Software Server

Start the EL-Software Client. It will automatically upgrade itself using the installer downloaded with the new EL-Software Server components.

4.1.2 Updating the EL-Software Controller via Linux console in the tester network

Please note: Your PC must be connected to the tester network to access the controller.

1. For this purpose, you need the IP address of the tester; it is shown on the display

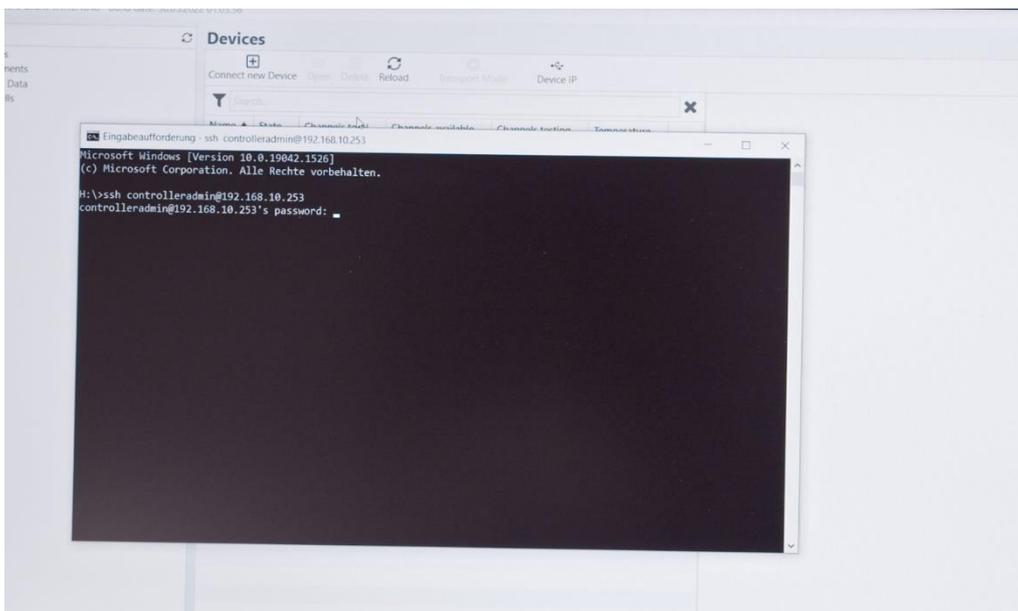


Open the command prompt on the Client PC (e.g., by pressing the Windows key, entering cmd, and clicking on the command prompt). Enter the following line there:

```
ssh controlleradmin@XXX.XXX.XX.XXX
```

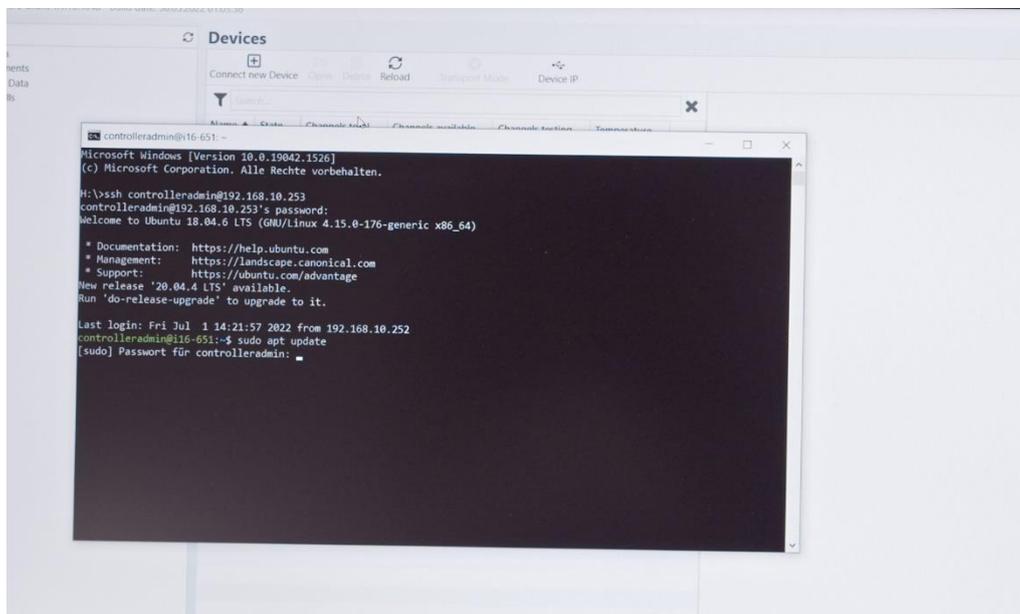
(Replace the X with the IP address of the respective PAT-Tester)

Password: *changeit*

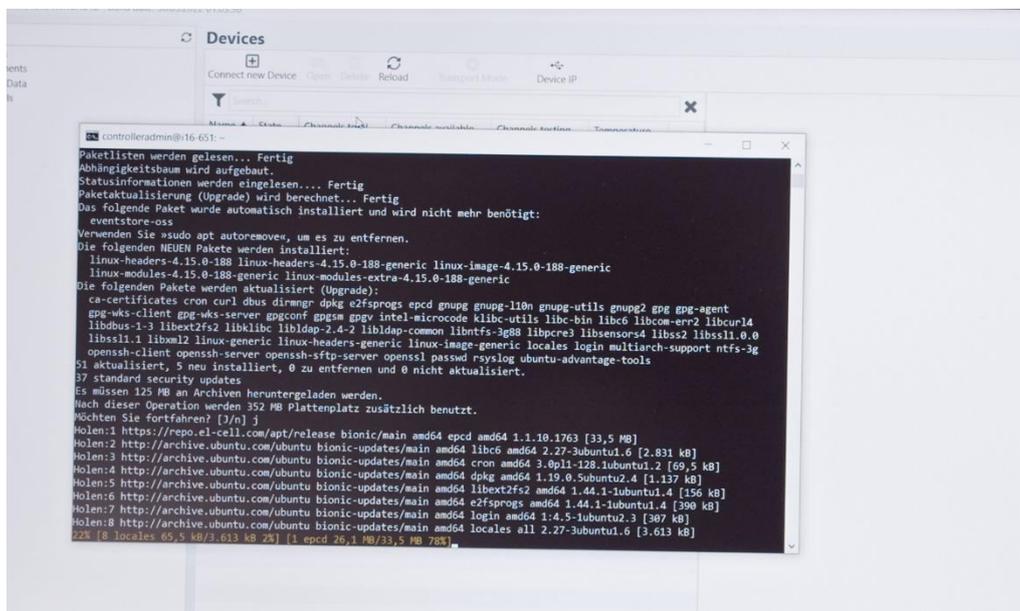


- Now enter the command `sudo apt update`. Password: `changeit`

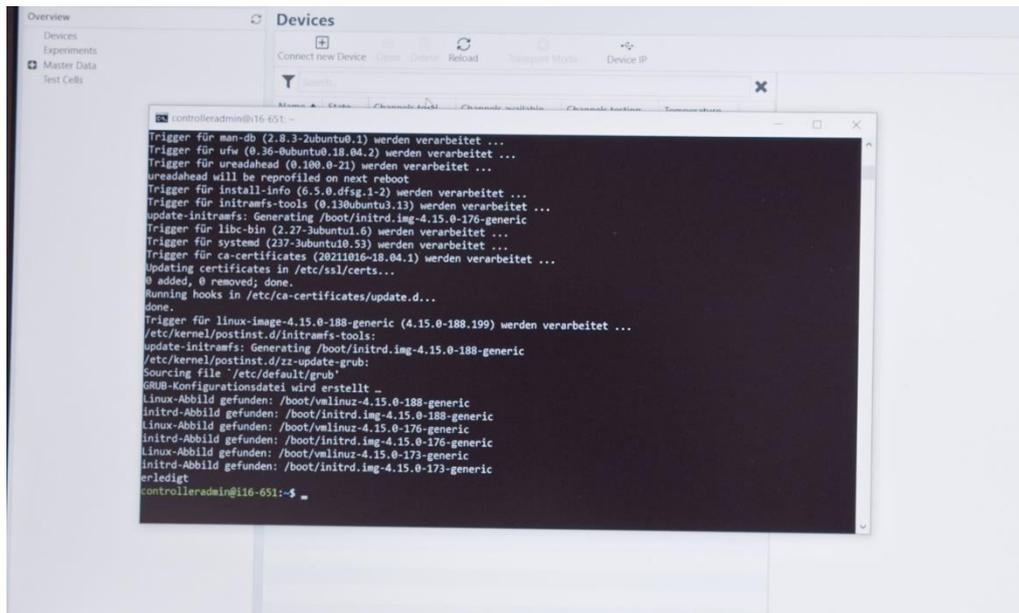
The software components of the controller are now checked, and new versions are downloaded.



- Start the update by entering the command `sudo apt upgrade`. The controller software will now be updated. The PAT-Tester will reboot and perform functional tests, such as confirming the ventilation flaps.

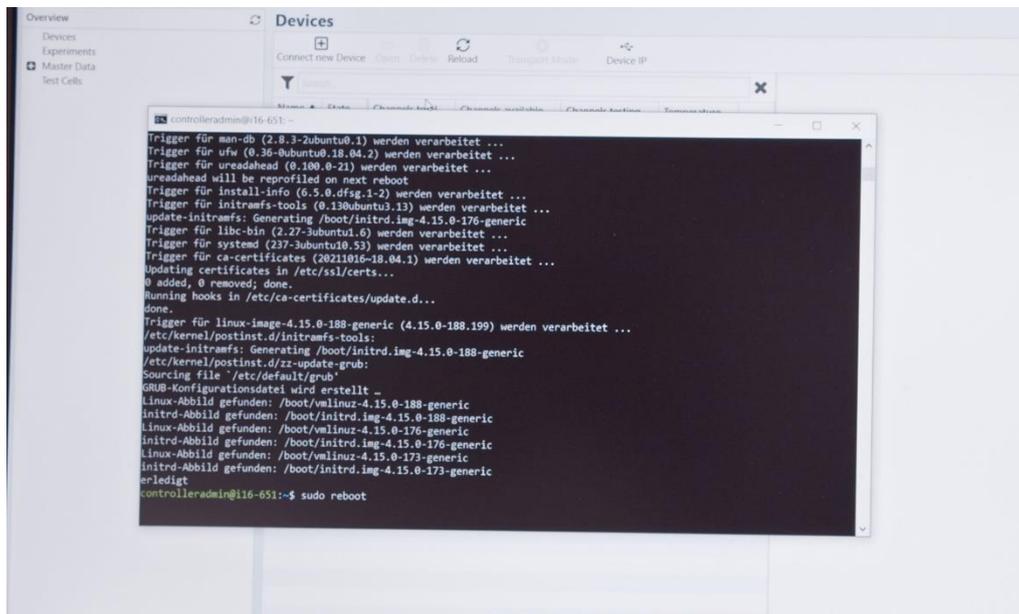


The process can take several minutes. It is completed as soon as the prompt appears again in the console.



```
controlleradm@i16-651:~$ sudo apt-get update
Trigger für man-db (2.8.3-2ubuntu0.1) werden verarbeitet ...
Trigger für ufw (0.36-0ubuntu0.18.04.2) werden verarbeitet ...
Trigger für ureadahead (0.100-0-21) werden verarbeitet ...
ureadahead will be reprofiled on next reboot
Trigger für install-info (6.5.0.dfsg.1-2) werden verarbeitet ...
Trigger für initscripts (0.130ubuntu3.13) werden verarbeitet ...
update-initscripts: Generating /boot/initrd.img-4.15.0-176-generic
Trigger für libc-bin (2.27-3ubuntu1.0) werden verarbeitet ...
Trigger für systemd (227-3ubuntu1.0.23) werden verarbeitet ...
Trigger für ca-certificates (20211016-18.04.1) werden verarbeitet ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
Trigger für linux-image-4.15.0-188-generic (4.15.0-188.199) werden verarbeitet ...
/etc/kernel/postinst.d/initscripts-tools:
update-initscripts: Generating /boot/initrd.img-4.15.0-188-generic
/etc/kernel/postinst.d/zz-update-grub:
Sourcing file /etc/default/grub
GRUB-Konfigurationsdatei wird erstellt -
Linux-Abbild gefunden: /boot/vmlinuz-4.15.0-188-generic
initrd-Abbild gefunden: /boot/initrd.img-4.15.0-188-generic
Linux-Abbild gefunden: /boot/vmlinuz-4.15.0-176-generic
initrd-Abbild gefunden: /boot/initrd.img-4.15.0-176-generic
Linux-Abbild gefunden: /boot/vmlinuz-4.15.0-173-generic
initrd-Abbild gefunden: /boot/initrd.img-4.15.0-173-generic
erledigt
controlleradm@i16-651:~$
```

- Restart the PAT-Tester. To do this, enter the command `sudo reboot`.



```
controlleradm@i16-651:~$ sudo reboot
Trigger für man-db (2.8.3-2ubuntu0.1) werden verarbeitet ...
Trigger für ufw (0.36-0ubuntu0.18.04.2) werden verarbeitet ...
Trigger für ureadahead (0.100-0-21) werden verarbeitet ...
ureadahead will be reprofiled on next reboot
Trigger für install-info (6.5.0.dfsg.1-2) werden verarbeitet ...
Trigger für initscripts (0.130ubuntu3.13) werden verarbeitet ...
update-initscripts: Generating /boot/initrd.img-4.15.0-176-generic
Trigger für libc-bin (2.27-3ubuntu1.0) werden verarbeitet ...
Trigger für systemd (227-3ubuntu1.0.23) werden verarbeitet ...
Trigger für ca-certificates (20211016-18.04.1) werden verarbeitet ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
Trigger für linux-image-4.15.0-188-generic (4.15.0-188.199) werden verarbeitet ...
/etc/kernel/postinst.d/initscripts-tools:
update-initscripts: Generating /boot/initrd.img-4.15.0-188-generic
/etc/kernel/postinst.d/zz-update-grub:
Sourcing file /etc/default/grub
GRUB-Konfigurationsdatei wird erstellt -
Linux-Abbild gefunden: /boot/vmlinuz-4.15.0-188-generic
initrd-Abbild gefunden: /boot/initrd.img-4.15.0-188-generic
Linux-Abbild gefunden: /boot/vmlinuz-4.15.0-176-generic
initrd-Abbild gefunden: /boot/initrd.img-4.15.0-176-generic
Linux-Abbild gefunden: /boot/vmlinuz-4.15.0-173-generic
initrd-Abbild gefunden: /boot/initrd.img-4.15.0-173-generic
erledigt
controlleradm@i16-651:~$ sudo reboot
```

- The controller pc inside the PAT-Tester will restart, update the test channels' firmware and re-establish the connection to the channels.

First, on display, all the LEDs of the channels will change from green to red and then turn off. This indicates that the connection to the PAT-Channelboards has been disconnected.

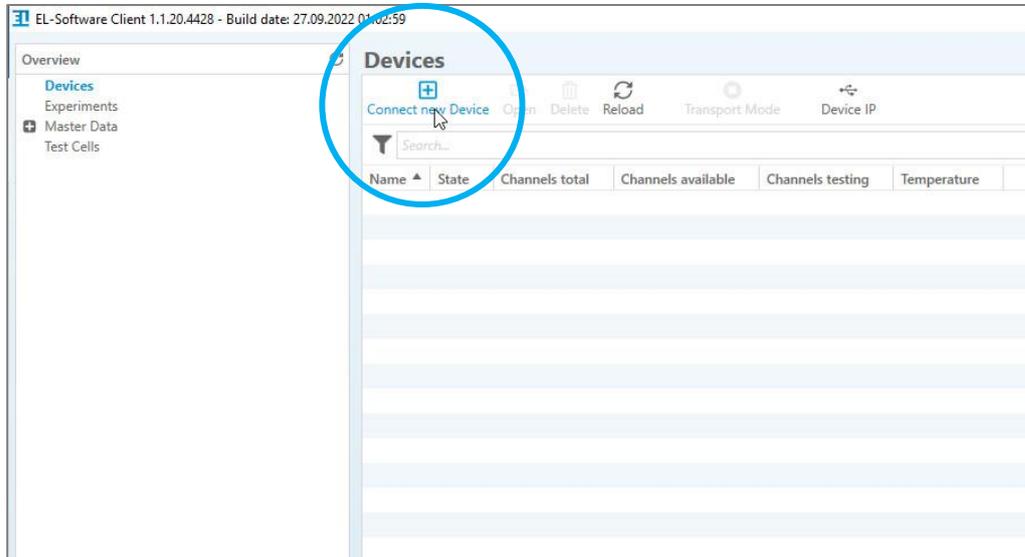


After that, the individual channels are restarted (red LED) and reconnected (green LED).

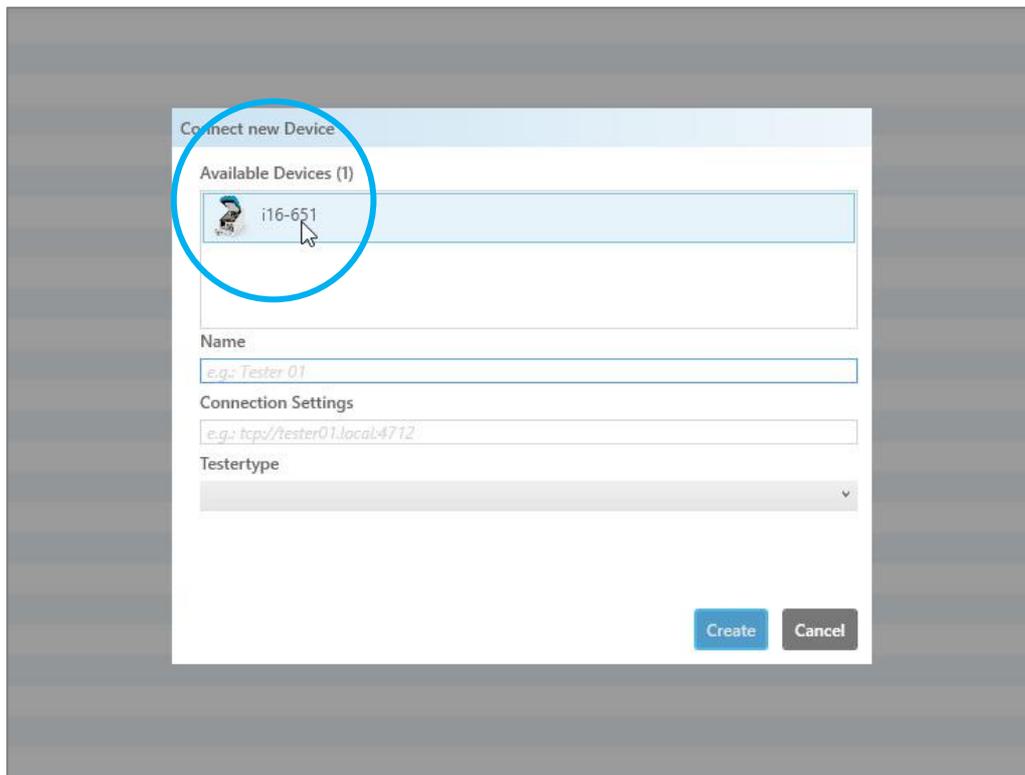


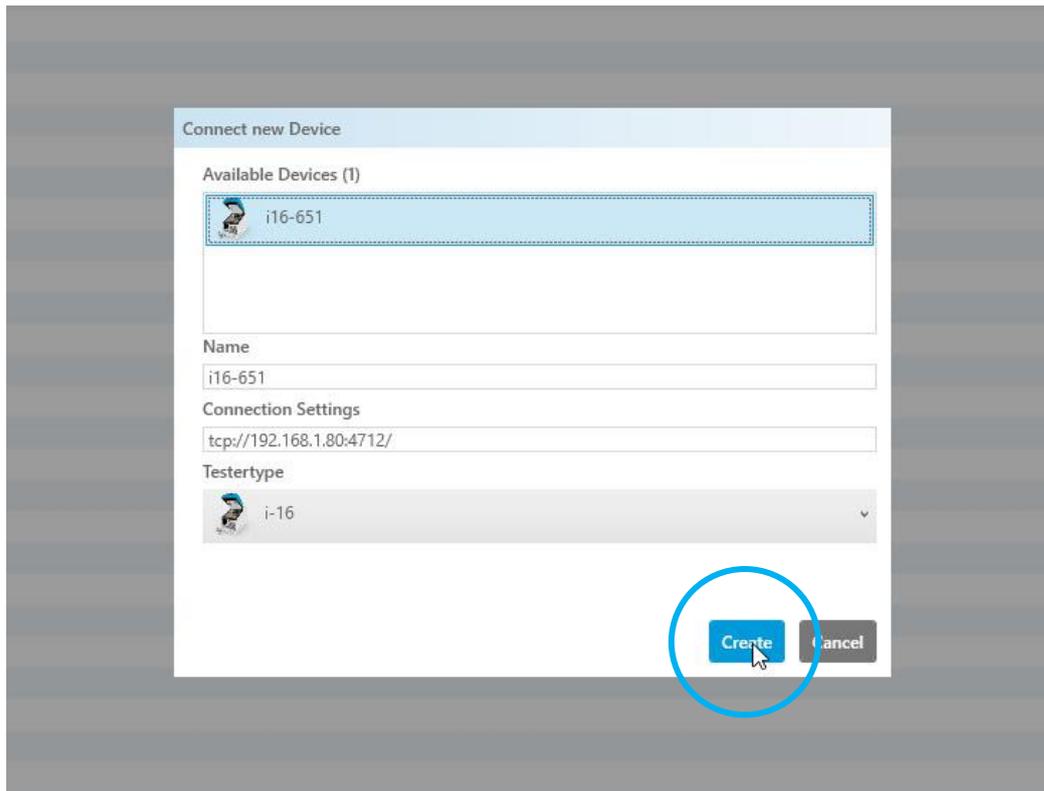
This process can take up to 15 min per channel. In the end, all channels should light up green again.

- After the update has been completed, the PAT-Tester must be reconnected to the EL-Software Server. To do this, start the EL-Software Client on the Client PC. Select the "Devices" item on the left-hand side of the tree structure. Then click on "Connect new Device."

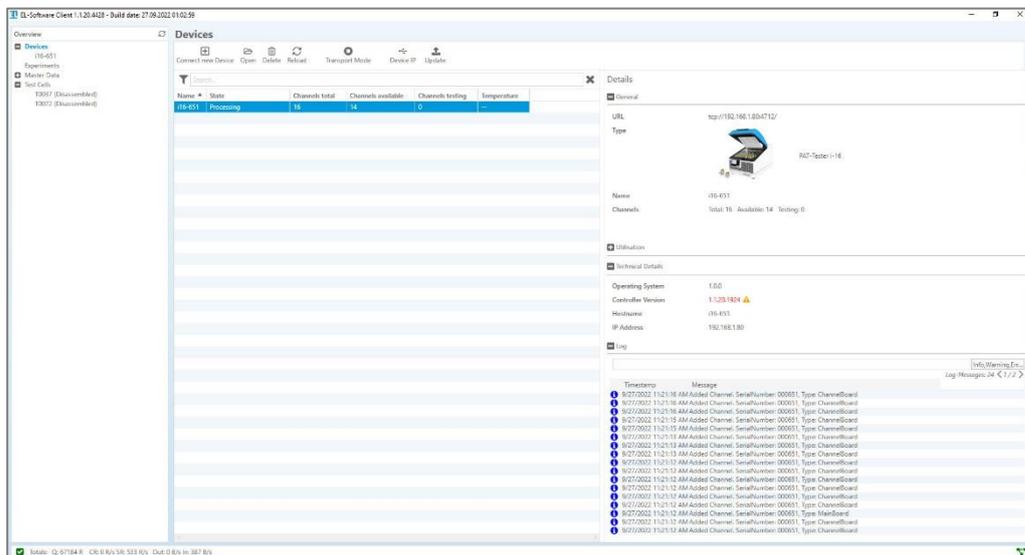


- A popup shows the available PAT-Testers, in this example, a PAT-Tester-i-16. Select it and then click on "Create." This will connect the tester to the EL-Software Server.





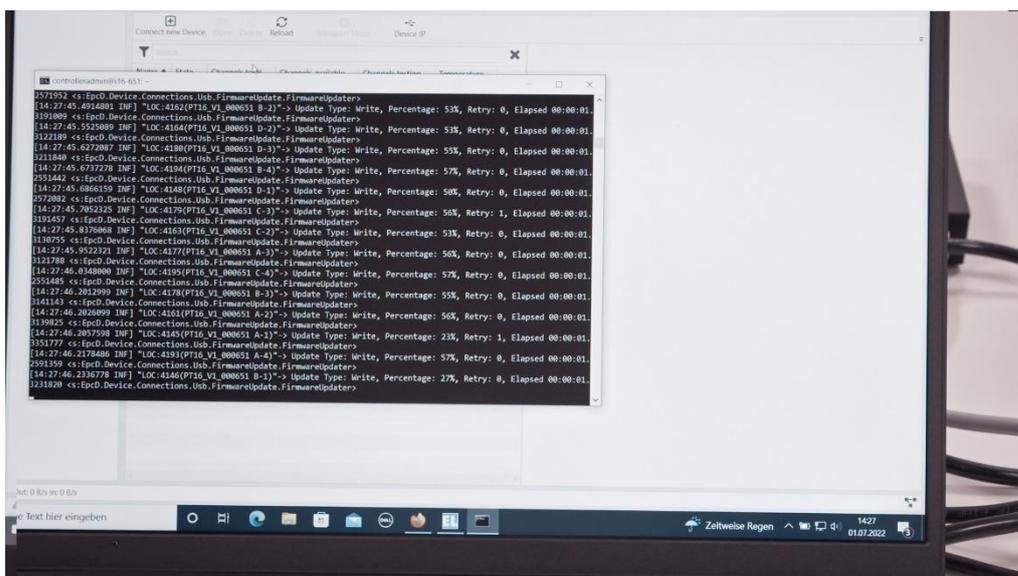
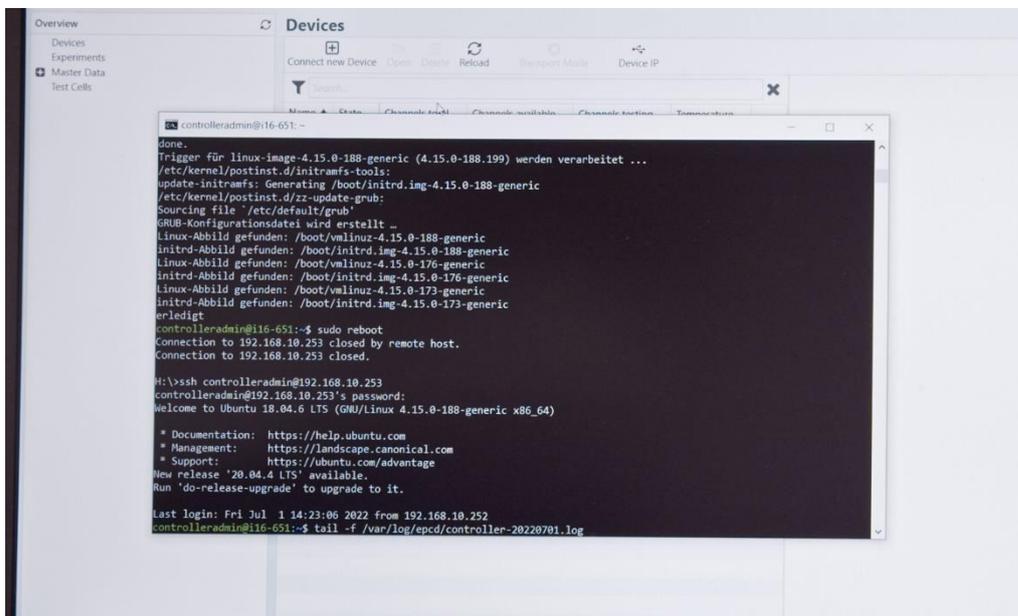
- The PAT-Tester-i-16 appears as an entry in the Devices list. It is now connected to the EL-Software Server and ready for use.



4.1.3 Viewing the update progress via Linux console on the Client PC

The firmware update process can be monitored on the Client PC. To do this, log in to the controller and then call the log file.

1. First enter the following line in the command prompt:
`ssh controlleradmin@1XXX.XXX.XX.XXX`
 (Replace X with the IP address and the address of the respective tester).
2. Enter the password: `changeit`
3. Enter the line `tail -f /var/log/epcd/controller-20220701.log`.
 (Replace 20220701 with today's date in the format YYYYMMDD.)

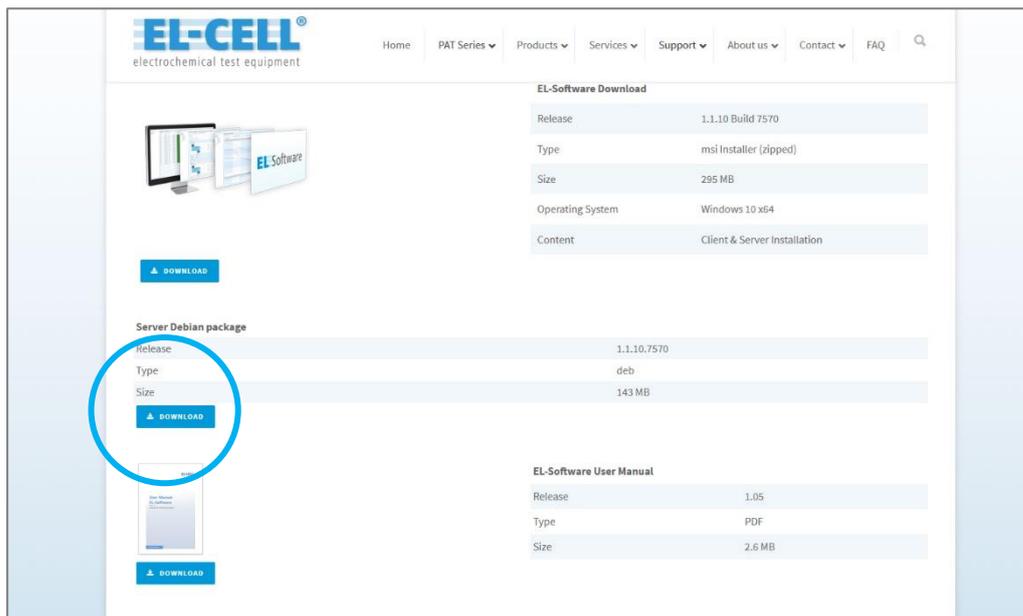


4.2 Software updates in the tester network via Linux (without internet connection)

Please note: Your PC must be connected to the tester network to access the controller.

4.2.1 Updating the EL-Software Server

1. Download the server Debian package (.deb file format) from the EL-Cell website. Transfer it to the Client PC.



2. Open the system command prompt on the Client PC (for example, by pressing the windows key, entering cmd, and clicking on the command prompt).
3. First, navigate to the folder with the downloaded file. This must now be transferred to the EL-Software Server. First, enter the following commands to switch to the download folder:

```
C:
```

```
cd users
```

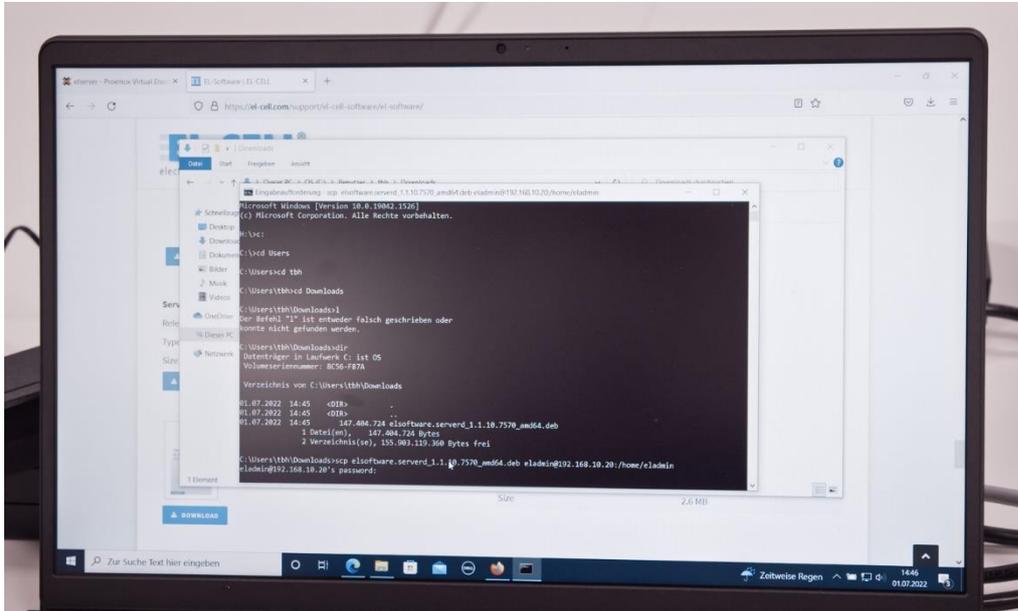
```
cd YOUR_WINDOWS_USER_NAME
```

```
cd downloads
```

4. Enter the following line to transfer the Debian package file:

```
scp YOUR_DEBIAN_PACKAGE.deb eladmin@192.168.10.20:/home/eladmin
```

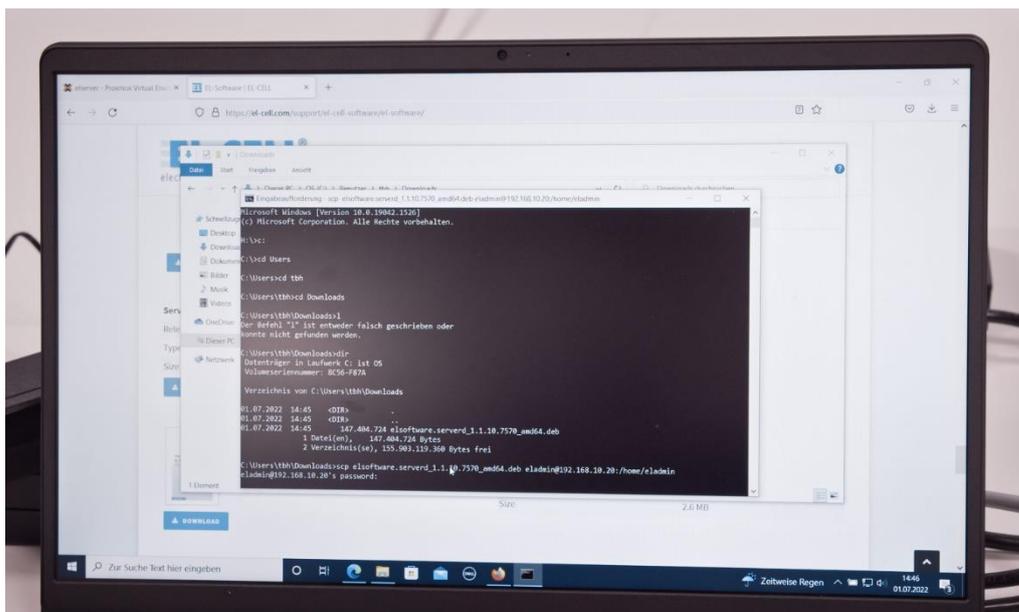
Enter the password: `changeit`



5. Now log in to the EL-Software Server with the following command:

```
ssh eladmin@192.168.10.20
```

Enter the password: `changeit`

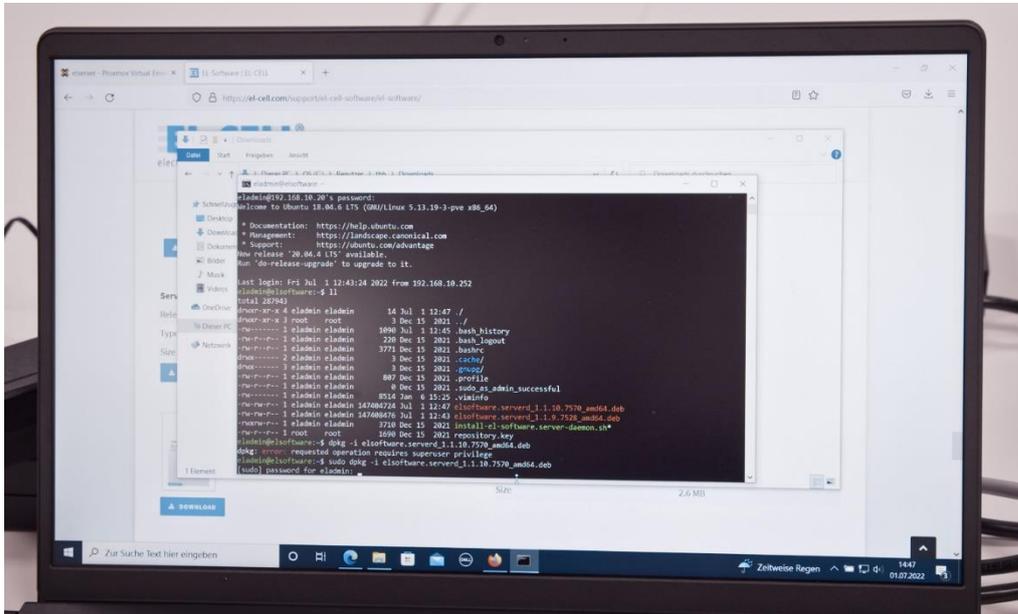


6. The Debian package can now be installed. Enter the following:

```
sudo dpkg -i elsoftware.XXXXXXX.deb
```

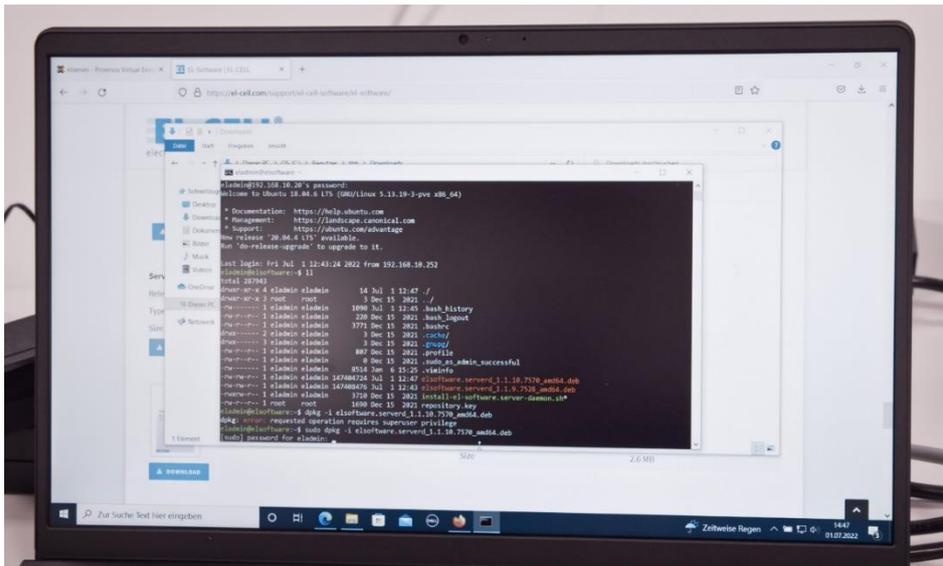
(Replace X with the filename of the transferred package)

Enter the password: `changeit`



7. After the Debian package installation, a database reset is needed. This is done by entering the following command:

```
sudo /usr/bin/elsoftware.serverd/scripts/reset.sh
```



8. The database is reinitialized now; it can take several minutes. If you start the client software too fast, you get a warning or an error message.

4.2.2 Updating the EL-Software Controllers via Linux console

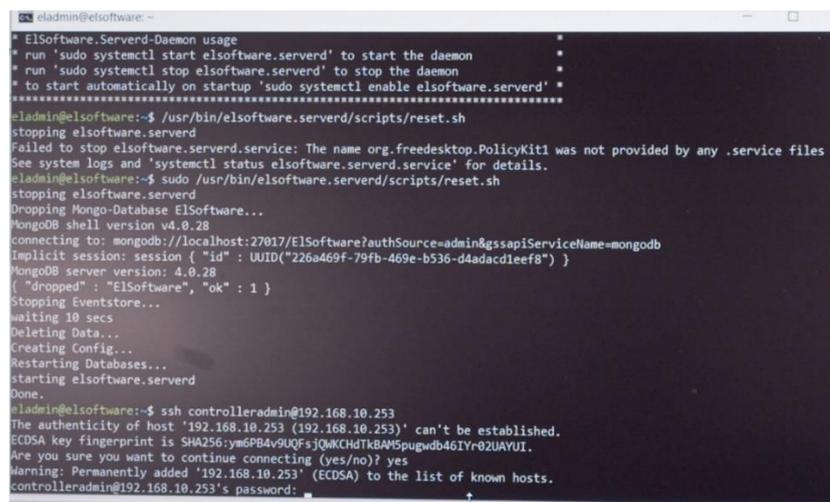
After an update of the EL-Software Server, the software of the EL-Software Controller must also be updated. To do so, you must log in to the controller to access it.

1. Enter the following in the command prompt of the Client PC:

```
ssh controlleradmin@XXX.XXX.XX.XXX
```

(Replace X with the IP address that appears on the PAT-Tester display).

Enter the password: `changeit`



```

eladmin@elsoftware:~$ ./usr/bin/elsoftware.serverd/scripts/reset.sh
stopping elsoftware.serverd
Failed to stop elsoftware.serverd.service: The name org.freedesktop.PolicyKit1 was not provided by any .service files
See system logs and 'systemctl status elsoftware.serverd.service' for details.
eladmin@elsoftware:~$ sudo ./usr/bin/elsoftware.serverd/scripts/reset.sh
stopping elsoftware.serverd
Dropping Mongo-Database ElSoftware...
MongoDB shell version v4.0.28
connecting to: mongod://localhost:27017/ElSoftware?authSource=admin&gssapiServiceName=mongod
Implicit session: session { "id" : UUID("226a469f-79fb-469e-b536-d4adac1eef8") }
MongoDB server version: 4.0.28
{ "dropped" : "ElSoftware", "ok" : 1 }
Stopping Eventstore...
waiting 10 secs
Deleting Data...
Creating Config...
Restarting Databases...
starting elsoftware.serverd
Done.
eladmin@elsoftware:~$ ssh controlleradmin@192.168.10.253
The authenticity of host '192.168.10.253 (192.168.10.253)' can't be established.
ECDSA key fingerprint is SHA256:ym6PB4v9UQFsjQwKChdTkbAM5pugwdb46IYr02UAYUI.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.10.253' (ECDSA) to the list of known hosts.
controlleradmin@192.168.10.253's password:

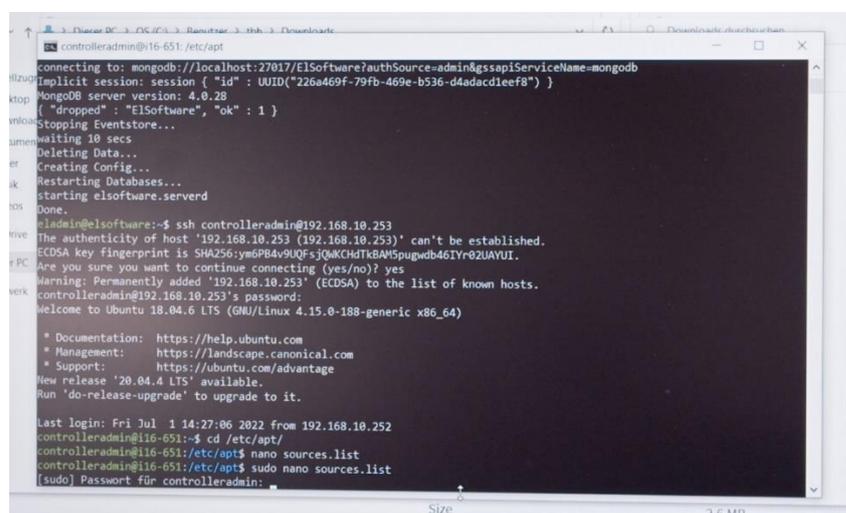
```

2. Since the controller wants to obtain software updates via the Internet by default, the search paths must be adapted. Use the following commands to do this::

```
cd /etc/apt
```

```
sudo nano sources.list
```

Enter the password: `changeit`



```

controlleradmin@116-651:~$ cd /etc/apt
controlleradmin@116-651:~/etc/apt$ nano sources.list
[sudo] Passwort für controlleradmin:

```

- A list with the search paths appears. All entries not marked blue must be marked inactive by inserting three # signs.

Please note: The list goes beyond the screen display. It must be edited completely.

```

controlleradmin@16-651: /etc/apt
GNU nano 2.9.3 sources.list
# deb http://archive.ubuntu.com/ubuntu bionic main restricted
## deb http://archive.ubuntu.com/ubuntu bionic-updates main restricted
## deb http://security.ubuntu.com/ubuntu bionic-security main restricted
# See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
# newer versions of the distribution.
deb http://archive.ubuntu.com/ubuntu bionic main restricted
# deb-src http://archive.ubuntu.com/ubuntu bionic main restricted

## Major bug fix updates produced after the final release of the
## distribution.
deb http://archive.ubuntu.com/ubuntu bionic-updates main restricted
# deb-src http://archive.ubuntu.com/ubuntu bionic-updates main restricted

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team. Also, please note that software in universe WILL NOT receive any
## review or updates from the Ubuntu security team.
deb http://archive.ubuntu.com/ubuntu bionic universe
# deb-src http://archive.ubuntu.com/ubuntu bionic universe
deb http://archive.ubuntu.com/ubuntu bionic-updates universe
# deb-src http://archive.ubuntu.com/ubuntu bionic-updates universe

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
Datei „sources.list“ ist schreibgeschützt
Hilfe Speichern Wo ist Ausschneiden Ausrichten Textmarke Rückgängig M-A Text markie
Beenden Datei öffnen Ersetzen Ausschn. r Rechtschr. Zu Zeile geh Wiederholen Kopieren
Size 2.6 MB

```

In the end, all entries must be marked in blue.

```

controlleradmin@16-651: /etc/apt
GNU nano 2.9.3 sources.list
## deb-src http://archive.ubuntu.com/ubuntu bionic-updates main restricted
## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team. Also, please note that software in universe WILL NOT receive any
## review or updates from the Ubuntu security team.
###deb http://archive.ubuntu.com/ubuntu bionic universe
# deb-src http://archive.ubuntu.com/ubuntu bionic universe
###deb http://archive.ubuntu.com/ubuntu bionic-updates universe
# deb-src http://archive.ubuntu.com/ubuntu bionic-updates universe

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
## your rights to use the software. Also, please note that software in
## multiverse WILL NOT receive any review or updates from the Ubuntu
## security team.
###deb http://archive.ubuntu.com/ubuntu bionic multiverse
# deb-src http://archive.ubuntu.com/ubuntu bionic multiverse
###deb http://archive.ubuntu.com/ubuntu bionic-updates multiverse
# deb-src http://archive.ubuntu.com/ubuntu bionic-updates multiverse

## N.B. software from this repository may not have been tested as
## extensively as that contained in the main release, although it includes
## newer versions of some applications which may provide useful features.
## Also, please note that software in backports WILL NOT receive any review
## or updates from the Ubuntu security team.
Dateiname zum Speichern: sources.list
Hilfe M-D DOS-Format M-A Anhängen M-B Sicherungsdatei
Abbrechen M-N Mac-Format M-P Vorw. anfügen M-I In Dateien
Size 2.6 MB

```

- After editing the list, save it by pressing **CTRL+O**. Close the list afterward with **CTRL+X**.

- Now you have to remove all files in the directory `etc/apt` that are not named "el-cell.list". To do this, enter `cd sources.list.d/`. Then display a list of the directory with the command `ll`.

```

controlleradmin@i16-651:~/etc/apt/sources.list.d$ ll
insgesamt 16
drwxr-xr-x 2 root root 4096 Mai 19 14:03 ./
drwxr-xr-x 7 root root 4096 Jul  1 14:50 ../
-rw-r--r-- 1 root root 162 Mai 19 14:03 el-cell.list
-rw-r--r-- 1 root root 428 Mär  8 09:04 EventStore_EventStore-OSS.list
controlleradmin@i16-651:/etc/apt/sources.list.d$ rm EventStore_EventStore-OSS.list
rm: Normale Datei (schreibgeschützt) 'EventStore_EventStore-OSS.list' entfernen? ^[[A^C
controlleradmin@i16-651:/etc/apt/sources.list.d$ sudo rm EventStore_EventStore-OSS.list
controlleradmin@i16-651:/etc/apt/sources.list.d$ ll

```

- All files, except the "el-cell.list", must be removed. Enter the following command:

```
sudo rm XXXXX.list
```

(Replace X with the file name)

- You have to edit the file "el-cell.list". Open it with the command:

```
sudo nano el-cell.list
```

```

Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.15.0-188-generic x86_64)

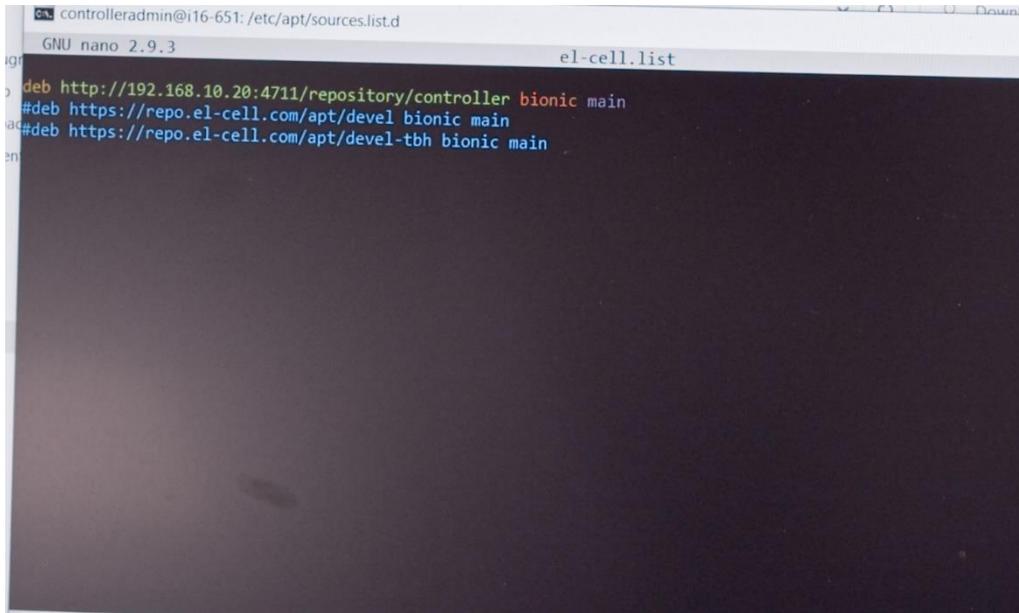
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage
New release '20.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Fri Jul  1 14:27:06 2022 from 192.168.10.252
controlleradmin@i16-651:~$ cd /etc/apt/
controlleradmin@i16-651:/etc/apt$ nano sources.list
controlleradmin@i16-651:/etc/apt$ sudo nano sources.list
[sudo] Passwort für controlleradmin:
controlleradmin@i16-651:/etc/apt$ cd sources.list.d/
controlleradmin@i16-651:/etc/apt/sources.list.d$ ll
insgesamt 16
drwxr-xr-x 2 root root 4096 Mai 19 14:03 ./
drwxr-xr-x 7 root root 4096 Jul  1 14:50 ../
-rw-r--r-- 1 root root 162 Mai 19 14:03 el-cell.list
-rw-r--r-- 1 root root 428 Mär  8 09:04 EventStore_EventStore-OSS.list
controlleradmin@i16-651:/etc/apt/sources.list.d$ rm EventStore_EventStore-OSS.list
rm: Normale Datei (schreibgeschützt) 'EventStore_EventStore-OSS.list' entfernen? ^[[A^C
controlleradmin@i16-651:/etc/apt/sources.list.d$ sudo rm EventStore_EventStore-OSS.list
controlleradmin@i16-651:/etc/apt/sources.list.d$ ll
insgesamt 12
drwxr-xr-x 2 root root 4096 Jul  1 14:51 ./
drwxr-xr-x 7 root root 4096 Jul  1 14:50 ../
-rw-r--r-- 1 root root 162 Mai 19 14:03 el-cell.list
controlleradmin@i16-651:/etc/apt/sources.list.d$ sudo nano el-cell.list

```

8. Change the entry in the first line as follows:

```
http://192.168.10.20:4711/repository/controller bionic main
```



```

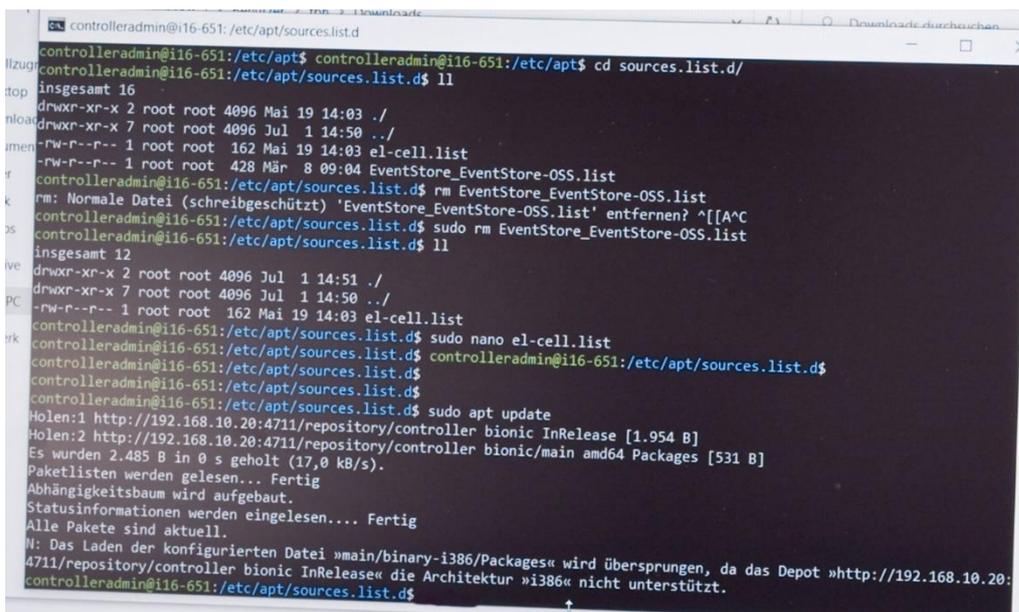
controlleradmin@i16-651: /etc/apt/sources.list.d
GNU nano 2.9.3 el-cell.list
deb http://192.168.10.20:4711/repository/controller bionic main
#deb https://repo.el-cell.com/apt/devel bionic main
#deb https://repo.el-cell.com/apt/devel-tbh bionic main

```

9. After editing the list, save it by pressing `CTRL+O`. Press `CTRL+X` to close the file afterward.

10. Now, you can start the update of the controller. To do this, type in:

```
sudo apt update.
```



```

controlleradmin@i16-651: /etc/apt/sources.list.d
controlleradmin@i16-651: /etc/apt$ controlleradmin@i16-651: /etc/apt$ cd sources.list.d/
controlleradmin@i16-651: /etc/apt/sources.list.d$ ll
insgesamt 16
drwxr-xr-x 2 root root 4096 Mai 19 14:03 ./
drwxr-xr-x 7 root root 4096 Jul 1 14:50 ../
-rw-r--r-- 1 root root 162 Mai 19 14:03 el-cell.list
-rw-r--r-- 1 root root 428 Mär 8 09:04 EventStore_EventStore-OSS.list
controlleradmin@i16-651: /etc/apt/sources.list.d$ rm EventStore_EventStore-OSS.list
rm: Normale Datei (schreibgeschützt) 'EventStore_EventStore-OSS.list' entfernen? ^[[A^C
controlleradmin@i16-651: /etc/apt/sources.list.d$ sudo rm EventStore_EventStore-OSS.list
controlleradmin@i16-651: /etc/apt/sources.list.d$ ll
insgesamt 12
drwxr-xr-x 2 root root 4096 Jul 1 14:51 ./
drwxr-xr-x 7 root root 4096 Jul 1 14:50 ../
-rw-r--r-- 1 root root 162 Mai 19 14:03 el-cell.list
controlleradmin@i16-651: /etc/apt/sources.list.d$ sudo nano el-cell.list
controlleradmin@i16-651: /etc/apt/sources.list.d$ controlleradmin@i16-651: /etc/apt/sources.list.d$
controlleradmin@i16-651: /etc/apt/sources.list.d$
controlleradmin@i16-651: /etc/apt/sources.list.d$
controlleradmin@i16-651: /etc/apt/sources.list.d$ sudo apt update
Holen:1 http://192.168.10.20:4711/repository/controller bionic InRelease [1.954 B]
Holen:2 http://192.168.10.20:4711/repository/controller bionic/main amd64 Packages [531 B]
Es wurden 2.485 B in 0 s geholt (17,0 kB/s).
Paketlisten werden gelesen... Fertig
Abhängigkeitsbaum wird aufgebaut.
Statusinformationen werden eingelesen... Fertig
Alle Pakete sind aktuell.
N: Das Laden der konfigurierten Datei »main/binary-i386/Packages« wird übersprungen, da das Depot »http://192.168.10.20:4711/repository/controller bionic InRelease« die Architektur »i386« nicht unterstützt.
controlleradmin@i16-651: /etc/apt/sources.list.d$

```

11. Enter the command `sudo apt upgrade` to perform the update.

```

controlleradmin@i16-651: /etc/apt/sources.list.d
controlleradmin@i16-651:/etc/apt/sources.list.d$ ll
insgesamt 12
drwxr-xr-x 2 root root 4096 Jul 1 14:51 ./
drwxr-xr-x 7 root root 4096 Jul 1 14:50 ../
-rw-r--r-- 1 root root 162 Mai 19 14:03 el-cell.list
controlleradmin@i16-651:/etc/apt/sources.list.d$ sudo nano el-cell.list
controlleradmin@i16-651:/etc/apt/sources.list.d$
controlleradmin@i16-651:/etc/apt/sources.list.d$
controlleradmin@i16-651:/etc/apt/sources.list.d$ sudo apt update
Holen:1 http://192.168.10.20:4711/repository/controller bionic InRelease [1.954 B]
Holen:2 http://192.168.10.20:4711/repository/controller bionic/main amd64 Packages [531 B]
Es wurden 2.485 B in 0 s geholt (17,0 kB/s).
Paketlisten werden gelesen... Fertig
Abhängigkeitsbaum wird aufgebaut.
Statusinformationen werden eingelesen.... Fertig
Alle Pakete sind aktuell.
N: Das Laden der konfigurierten Datei »main/binary-i386/Packages« wird übersprungen, da das Depot »http://192.168.10.20:4711/repository/controller bionic InRelease« die Architektur »i386« nicht unterstützt.
controlleradmin@i16-651:/etc/apt/sources.list.d$ sudo apt upgrade
Paketlisten werden gelesen... Fertig
Abhängigkeitsbaum wird aufgebaut.
Statusinformationen werden eingelesen.... Fertig
Paketaktualisierung (Upgrade) wird berechnet... Fertig
Die folgenden Pakete wurden automatisch installiert und werden nicht mehr benötigt:
  eventstore-oss linux-headers-4.15.0-173 linux-headers-4.15.0-173-generic linux-image-4.15.0-173-generic
  linux-modules-4.15.0-173-generic linux-modules-extra-4.15.0-173-generic
Verwenden Sie »sudo apt autoremove«, um sie zu entfernen.
0 aktualisiert, 0 neu installiert, 0 zu entfernen und 0 nicht aktualisiert.
controlleradmin@i16-651:/etc/apt/sources.list.d$

```

The controller PC in the PAT-Tester must then be rebooted. To do this, enter the following command: `sudo reboot`

After the restart, the firmware of the individual test channels is updated, and then the connection to the channels is re-established.

The LEDs of the channels will change from green to red and then turn off. This indicates that the connection to the channel boards has been disconnected.



Afterward, the individual channels are restarted (red LED) and connected (green LED).

Please note: This process can take up to 15 min per channel. In the end, all channels should light up green again.



12. After the update has been completed, the PAT-Tester must be reconnected to the EL-Software Server. Follow the instructions in chapter 2.1

4.3 Determining the IP address of the EL-Router

Once the Client PC is connected to the Client Network, it can only access the tester network via the IP address of the EL router assigned by the Client Network.

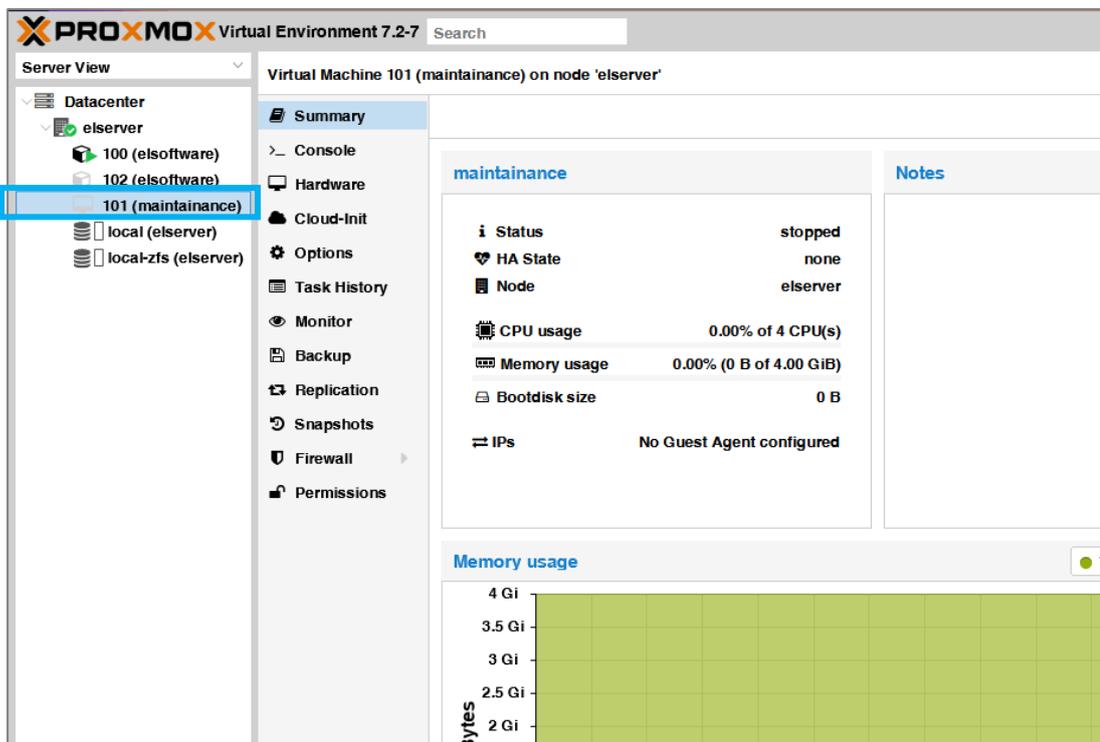
There are two ways to determine this address:

1. Ask your system administrator.
2. It is possible to determine the IP address via a virtualized machine (VM) installed on the EL-Server at delivery.

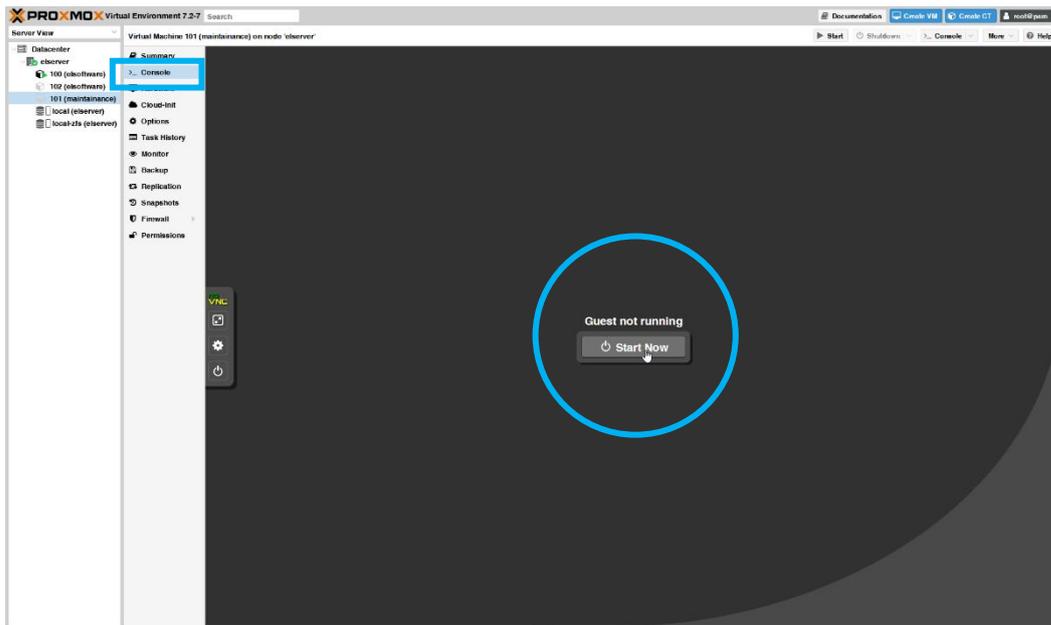
4.3.1 Determining the IP address via the Maintenance VM

Please note: Your PC must be connected to the tester network.

1. Open the web browser on the Client PC. Enter <https://192.168.10.10:8006>. The Proxmox environment opens. In the tree structure, click on the elserver entry to expand it. There, select 101(Maintenance).

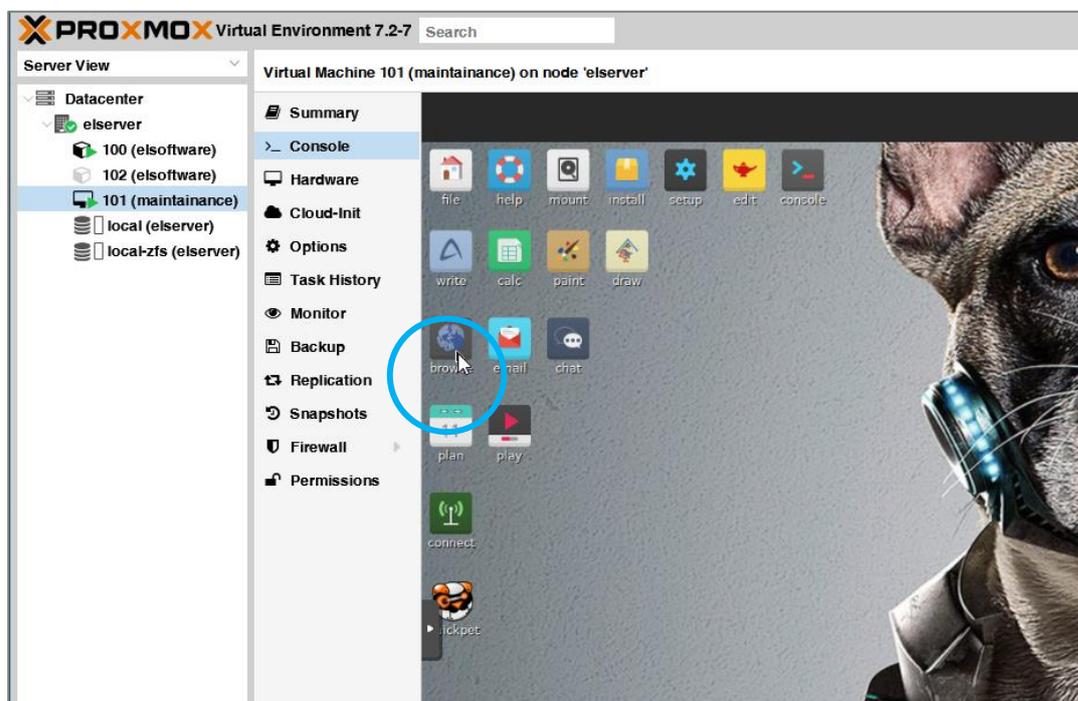


2. Select the item "Console" in the second navigation column and click on "Start now. "



3. The operating system of the Maintenance VM is now started. As soon as it is ready, the desktop environment will appear. All settings windows that appear can be closed. The VM is reset to the factory settings after it is closed, so any settings made here are not saved.

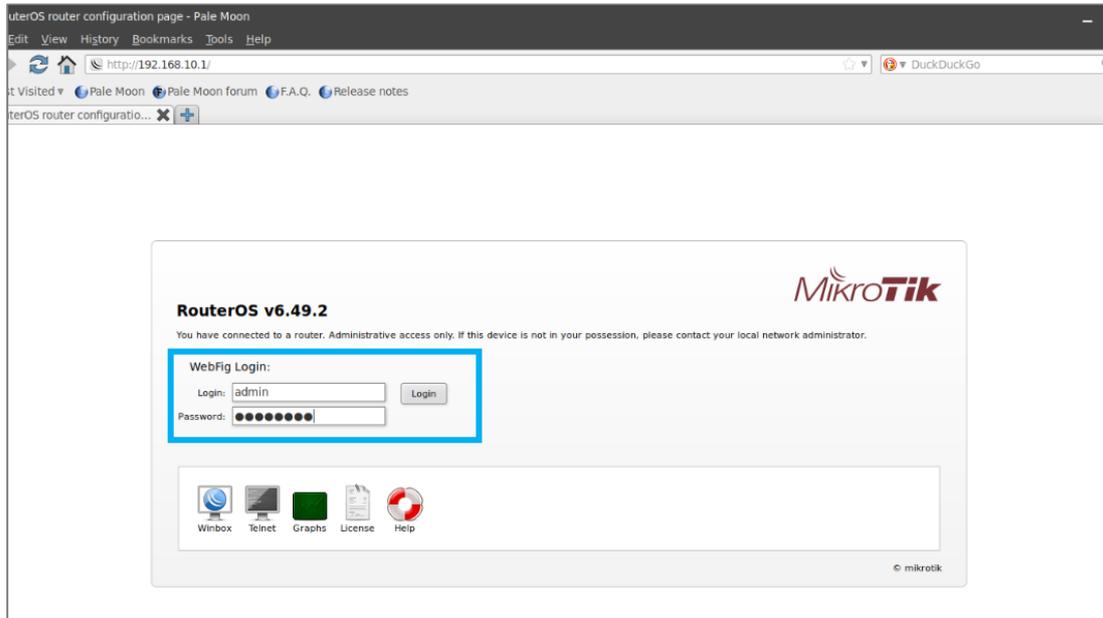
Click on the browser icon on the desktop.



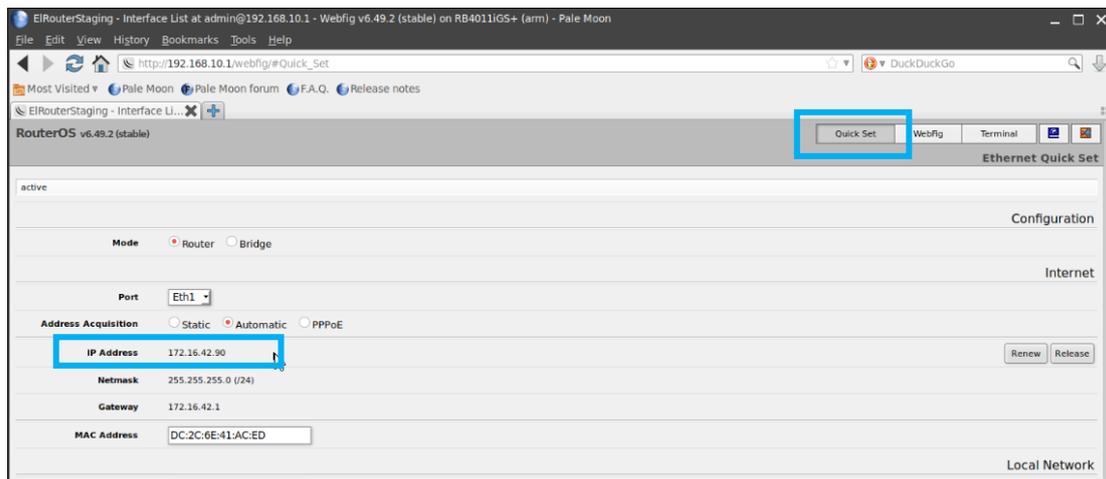
- Call up the target address <http://192.168.10.1> in the browser. This will take you to the user interface of the EL-Router. Log in with the following user data:

Login: `admin`

Password: `changeit`



- Switch to the "Quick Set" tab in the user interface. Under the item "IP Address," you can now view the IP address the EL-Router received in the customer network. You can now use this address to reach it via the customer network.



- You can close the Maintenance VM again via the "Shutdown" button.

