

INSTRUCTION MANUAL

ControlPlex[®] CPC12 bus controller – Webserver



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1. GENERAL INFORMATION

Safety instruction

This manual points out possible danger for your personal safety and gives instruction how to avoid property damage. The following safety symbols are used to draw the reader's attention to the safety instructions included in this manual.



Danger!

Danger to life and limb unless the following safety precautions are taken.



Warning!

Danger to machinery, materials or the environment unless the following safety precautions are taken.



Note

Information is provided to allow a better understanding.



Caution!

Electrostatically sensitive devices (ESD). Devices must exclusively be opened by the manufacturer.



Disposal guidelines

Packaging can be recycled and should generally be brought to reuse.

Qualified personnel

This user manual must exclusively be used by qualified personnel, who are able – based on their training and experience – to realise arising problems when handling the product and to avoid related hazards. These persons have to ensure that the use of the product described here meets the safety requirements as well as the requirements of the presently valid directives, standards and laws.

Use

The product is part of a continuous enhancement process. Therefore, there might be deviations between the product in hand and this documentation. These deviations will be remedied by a regular review and resulting corrections in future editions. The right to make changes without notice is reserved. Errors and omissions excepted.

Delivery state

The product is supplied with a defined hardware and software configuration. Any changes in excess of the documented options are not permitted and lead to liability exclusion.

2. GENERAL DESCRIPTION

CPC12 - transparency through webserver and fieldbus connection

The requirements of machine and plant construction regarding machine uptime and a consistently high production quality are increasing. Stable processes are based on a reliable and transparent DC24V protection and power distribution system.

E-T-A's CPC12 bus controller has a separate DC24V power supply and allows independent supply of the circuit protectors. It records all status information and measuring values. These data are visualised with the internal webserver. Via the field bus interface, the data are also made available to the superordinate control systems.

E-T-A's REX12D system in combination with the CPC12 bus controller was designed specifically for the requirements of the machine construction and process control industry. The REX12D modular power distribution system combined with the CPC12 bus controller meets all requirements.

- **Maximises plant and machine uptime** through clear failure detection, high transparency and remote diagnosis
- **Saves space** through a slim design of the circuit protectors and the potential modules
- **Increases flexibility of system planning** through many different modules meeting the demands of DC24V power distribution

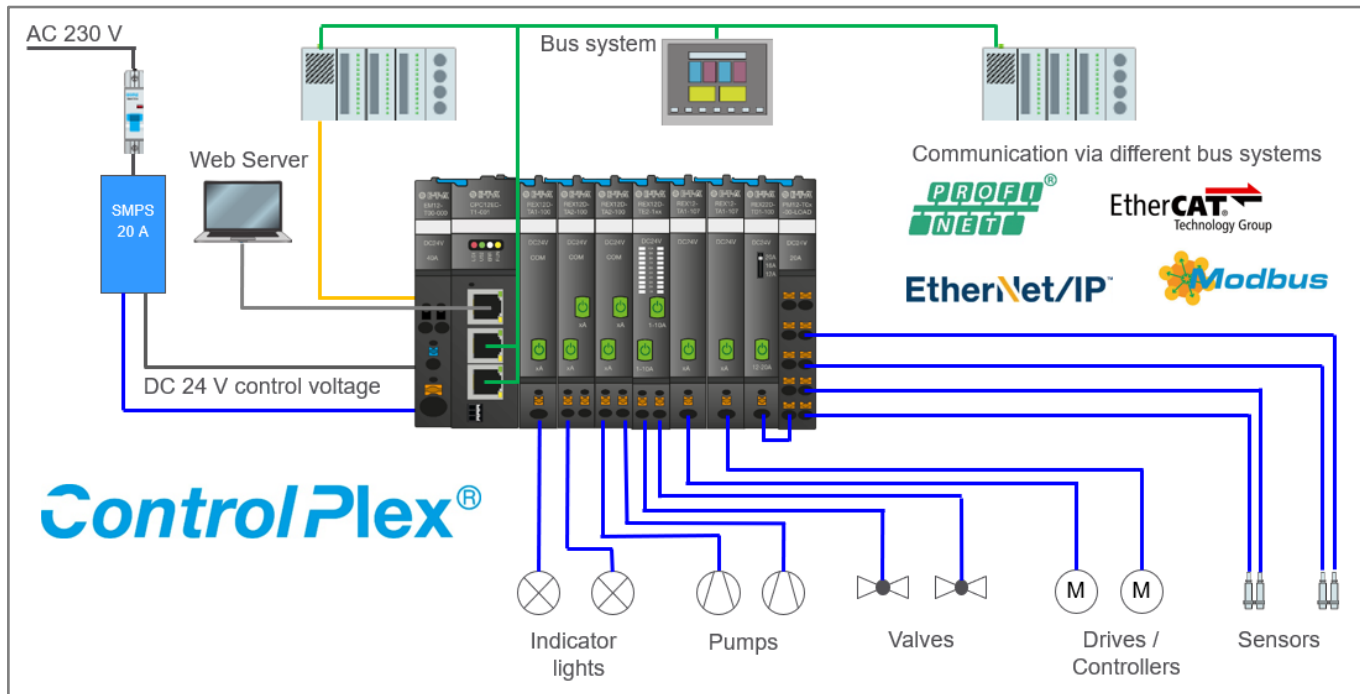


Image 1: CPC12 bus controller as intelligent power distribution system



Image 2: Setup of the REX12D system in combination with the CPC12 bus controller

3. CONNECTION WITH THE WEBSERVER

As soon as the electrical installation of the **ControlPlex®** system is completed, an Ethernet connection can be established via X1 interface on the CPC12 bus controller.

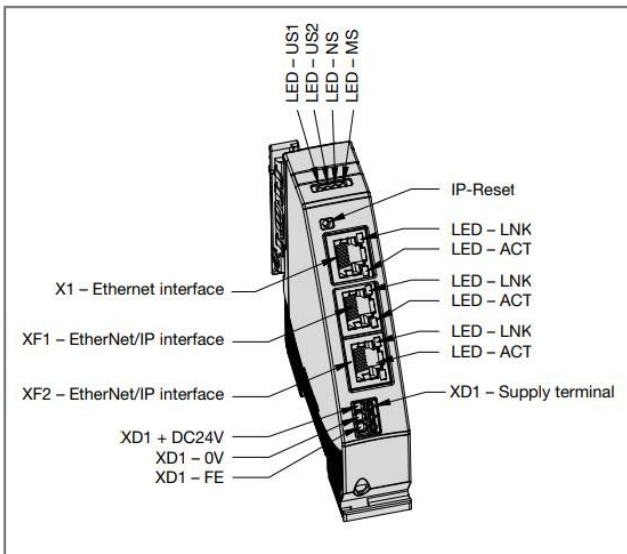
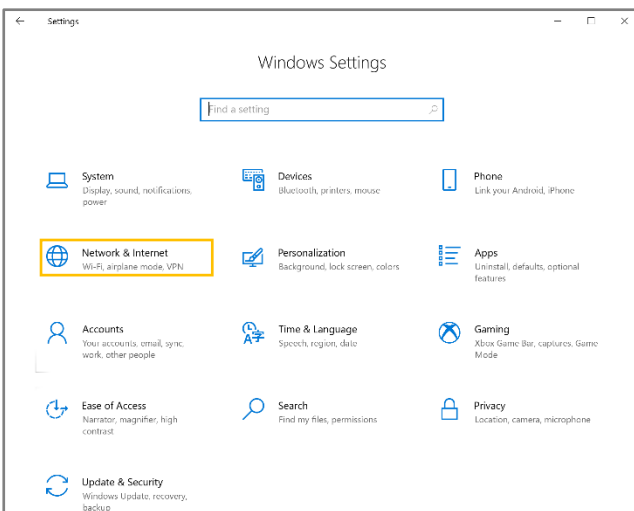


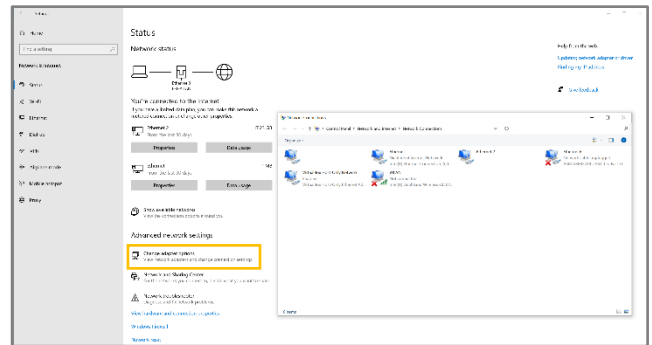
Image 3: Connections of the CPC12 bus controller

To do this, the adapter options must first be set to the standard IP range 192.168.1.XXX (for example 192.168.1.254).

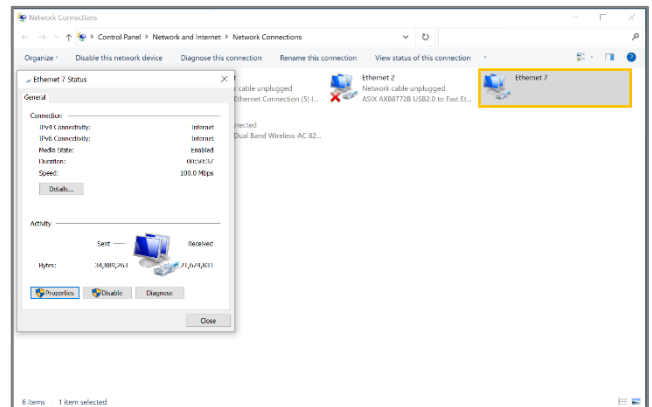
1. Under Windows Settings the submenu "Network and Internet" is selected



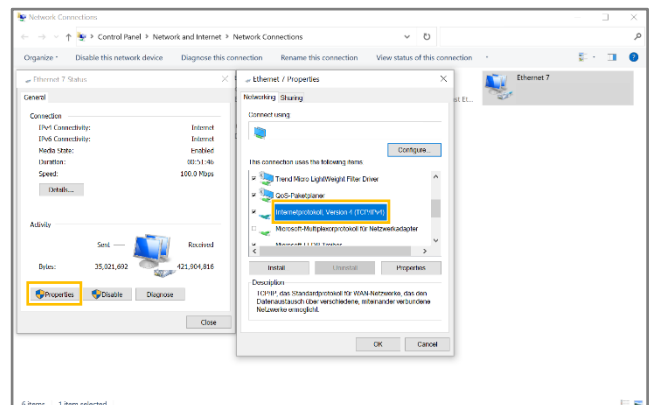
2. Clicking on "Change adapter options" opens the "Network connections" window



3. Double-click on the current Ethernet connection to open the "Status of WLAN" window



4. Clicking on "Properties" opens another window in which the "Internet Protocol, Version 4" is selected



5. Clicking on "Properties" opens a new window in which the item "Use the following IP address" is selected, the corresponding address is entered and confirmed with "OK"

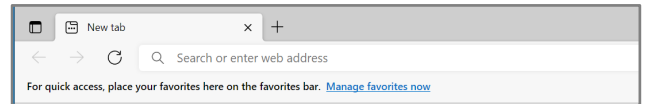
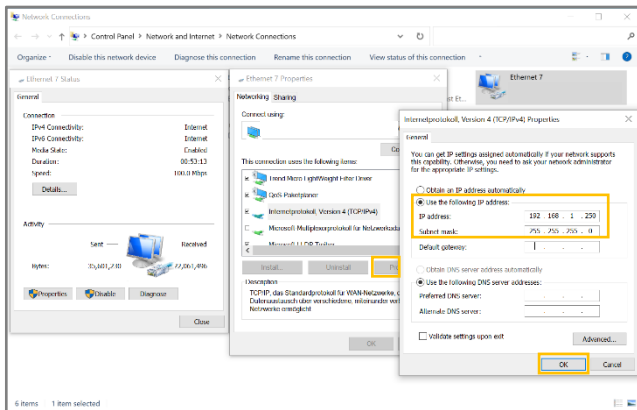


Image 4: Search field of the web browser

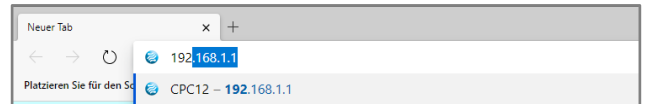


Image 6: Typing the default IP address of the CPC12 webserver in the search field

After the network settings have been adjusted, the webserver of the CPC12 can now be accessed via a standard web browser. In the following example, the Microsoft Edge browser was used. In addition, the browser variants Chrome and Mozilla Firefox in the latest versions are possible. Only these variants are checked and available for the webserver. All other browsers are not supported.

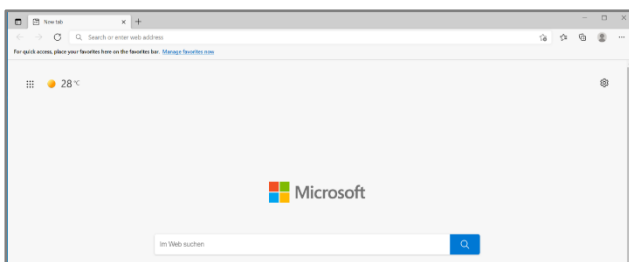


Image 5: Open Microsoft Edge browser

To call the webserver of the CPC12, the default IP address 192.168.1.1 must be typed in the upper search field of the web browser and then confirmed.

After a successful connection, the following overview page of the **ControlPlex®** system is displayed.

The screenshot displays the ControlPlex web interface. At the top, the browser shows the URL 192.168.1.1/#/. The interface header includes 'Control Plex', 'CPC12EN-T1', navigation menus for 'Configure' and 'Commands', and system status: 'Status: Webservice Connected', 'Supply 24.3 V', and 'Total Current 0.0 A'. A device status bar shows 12 active channels (green) and 12 inactive channels (grey).

F	1.1	1.2	2.1	2.2	3.1	3.2	4	5.1	5.2	6.1	6.2	7.1	7.2	8.1	8.2
Status	4 A	10 A	10 A	10 A	6 A	6 A	10 A	4 A	4 A	10 A	10 A	2 A	2 A	10 A	10 A
Load Voltage	24.2 V	24.2 V	24.2 V	24.2 V	24.3 V	24.3 V	24.3 V	24.2 V	24.2 V	24.2 V	24.2 V	24.3 V	24.3 V	24.2 V	24.2 V
Load Current	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A
Short Circuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Overload	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Undervoltage	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Current Threshold	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Event	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

The detailed configuration section for 'F1.1 REX12D-TE2-100' includes:

- Serial No.: 720900256
- Hardware: 0.3
- Software: 1.1.0
- Error Memory: None
- Event: None
- Trip Counter: 0 (with 'Set Zero' button)
- Last Trip: None (with 'Reset Load' and 'Turn off Load' buttons)
- Device Type: REX12D-TE2-100
- Rated Current: 4 A
- Load Current Threshold: 80 %
- Lock: OFF (with 'ON' button)
- Buttons: 'Restore Factory Settings' and 'Write Parameter'

Image 7: Overview page of the **ControlPlex®** system

4. WEBSERVER FUNCTIONALITY

4.1 Menu Bar

A menu bar is integrated in the upper part of the user interface. In this line various information and functions can be called and controlled. These are, for example, the tabs Configure, Commands, as well as the connection status and general information about

the **ControlPlex**[®] system. In addition, an overview of the supply voltage and the total current of the **ControlPlex**[®] system is inserted on the right side.



Image 8: Menu bar of the webserver

4.1.1 User Management

Most of the further functionalities are controlled by the user management. Depending on the selection of a function, a pop-up window appears with the request to enter the username and password.

The default username is *admin*
The default password is *admin*
The user management is described in the further text.

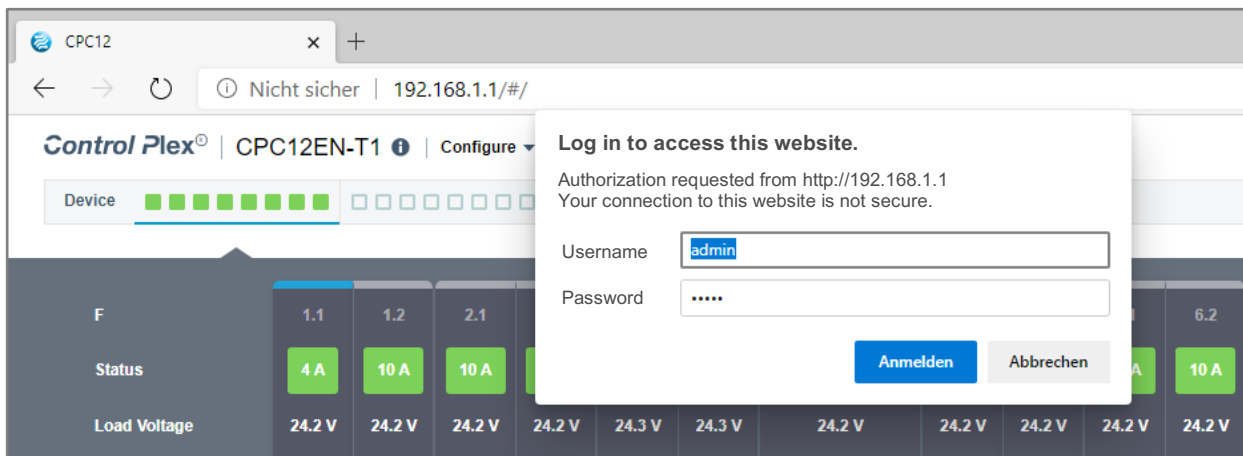


Image 9: Login process

4.1.2 CPC-Info

To get general information of the CPC12 bus controller, you have to navigate with the mouse pointer over the round information sign.

The product ID, the serial number as well as the hardware and software version are displayed.

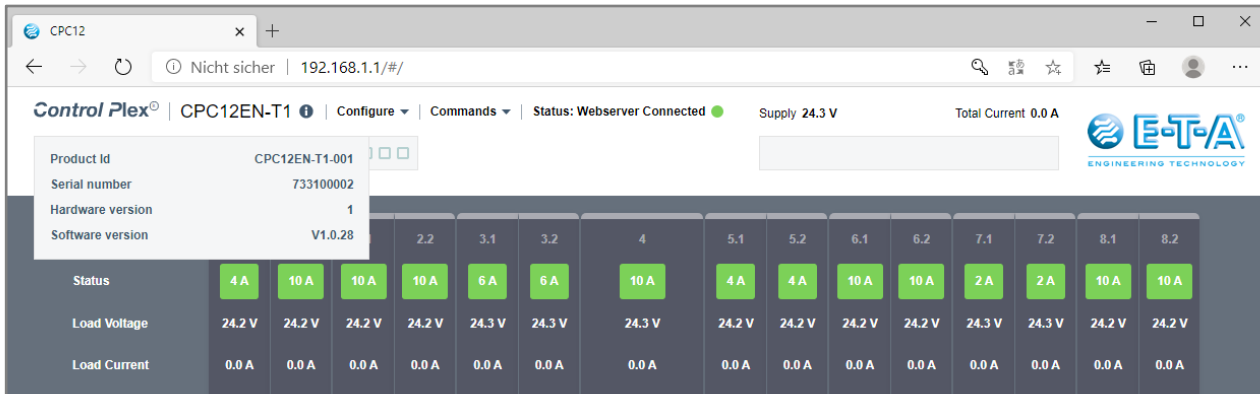


Image 10: General information about the CPC12 bus controller

4.1.3 Configure

By pressing the Configure button a drop-down menu opens.

This in turn includes various functionalities, which are described below:

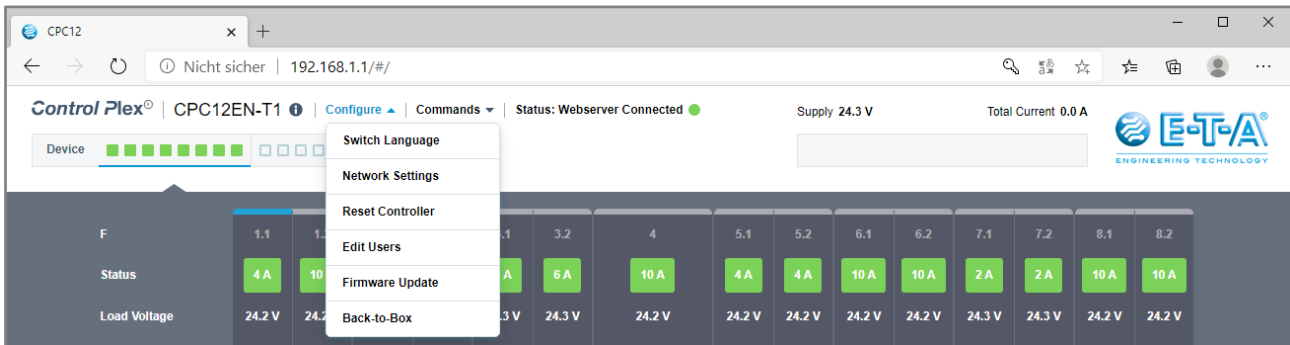


Image 11: Configure button

4.1.3.1 Switch Language

After selecting the function, a pop-up window with a drop-down menu appears. Different languages are available and can be confirmed with the blue "Done" button. (No admin rights needed).

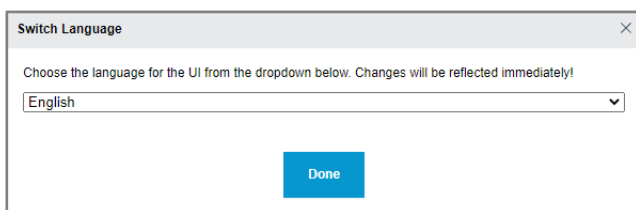


Image 12: Switching the language

4.1.3.2 Network Settings

After selecting the function, a pop-up window appears with various information about the Ethernet interface and the fieldbus interface. The network settings of the Ethernet interface can be adjusted. Additionally, with the two versions CPC12EN and CPC12MB with connection to EtherNet/IP or Modbus TCP, it is also possible to change the IP address via the "Network settings" window of the web server. Click on "Submit" to apply the settings you have made (this function is only available in Admin mode).

Network Settings
✕

Edit the ethernet configuration of the connected board below

Hostname	<input type="text" value="CPC12"/>
Ethernet	
Address	<input type="text" value="192.168.1.1"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.254"/>
DHCP	<input checked="" type="checkbox"/> OFF <input type="checkbox"/> ON
<input type="submit" value="Submit"/>	
Fieldbus	
Address	<input type="text" value="192.168.0.10"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.0.7"/>
DHCP	<input type="checkbox"/> OFF <input checked="" type="checkbox"/> ON

Image 13: Network settings

4.1.3.3 Reset Controller

After selecting the function, the CPC12 bus controller is reset and restarted. This resets the IP address of the webserver on port X1 to the default address 192.168.1.1. The language setting is also reset to English and the user management is reset. (The function is only possible in Admin mode).

4.1.3.4 Edit Users

After selecting the function, a new window opens with the overview of the current administrators and users of the system. New users can be created and existing ones can be edited and deleted (The function is only possible in Admin mode).

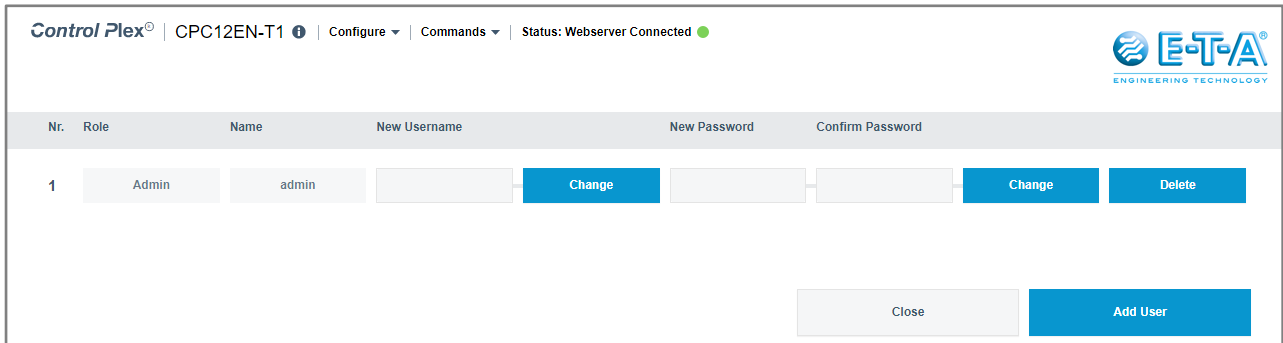


Image 14: Overview of the current administrators

After pressing the "Add User" button, a window with possible settings for the new account will open. Please note the role of the account! In the admin mode all functions are available. In the user mode it is only possible to switch the channel on or off with an already deactivated lock command. Furthermore, the statistics data and the error counter can be reset.

4.1.3.5 Firmware-Update

After selecting the "Firmware Update" function, an Explorer window opens to access the location of the firmware file. The latest firmware updates are available in the download portal of the **ControlPlex**® systems via the E-T-A homepage.

[You can find the portal under the following link:](#)



After the file has been selected, the firmware update begins. Attention: The file can only be loaded into the controller in Admin mode. Otherwise, the file will be declared as not valid.

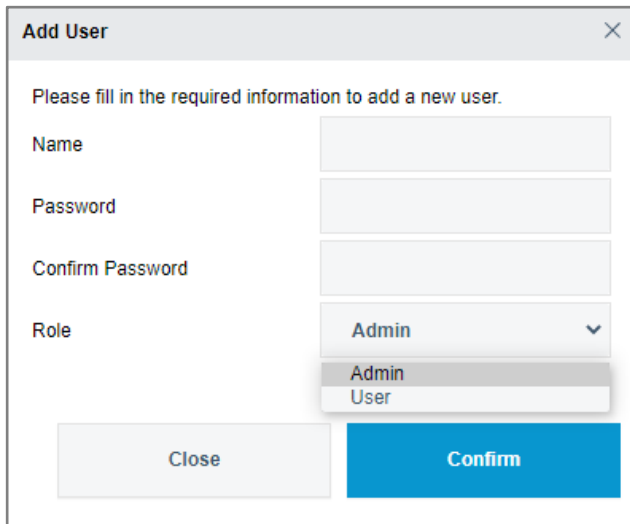


Image 15: Add a user

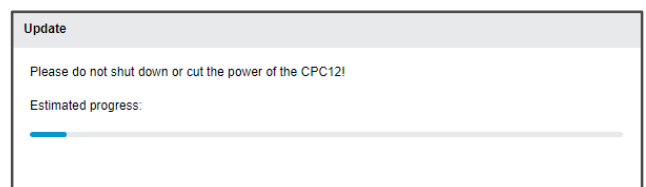


Image 16: Firmware update in progress

After the update is complete, a window appears with a request to reload the browser.

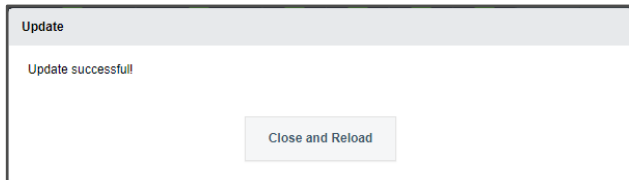


Image 17: Reload of the browser after a successful update

4.1.3.6 Back-to-Box

The function "Back-to-Box" resets the CPC12 to the factory settings. All configurations are set to default. (The function is only possible in Admin mode).

Without a reload, the changes will not take effect (The function is only possible in Admin mode).

4.1.4 Commands

By pressing the Commands button a drop-down menu opens. This includes various functionalities, which are described below:

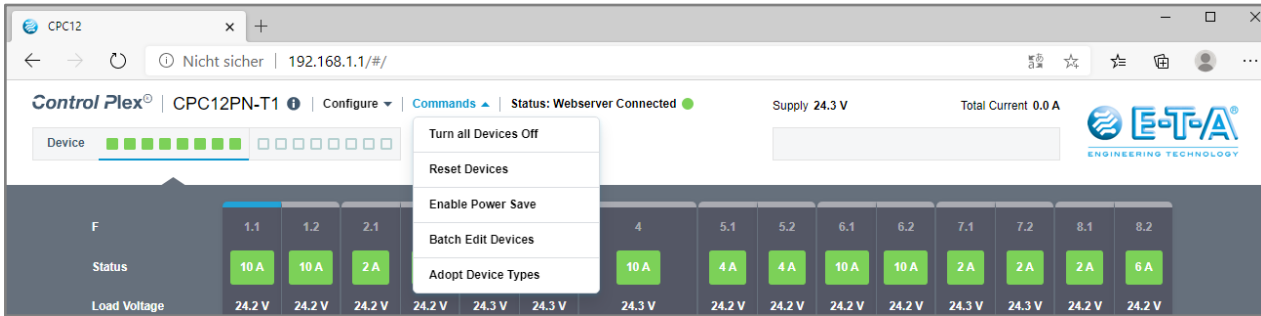


Image 18: Drop-down menu Commands

4.1.4.1 Turn all Devices off

By selecting this function, all electronic circuit breakers can be turned off. This function is only possible if there is only one connection to the webserver and the "Lock" function of the circuit breaker is set to the "OFF" status (the function is only possible in Admin mode and without connection to the fieldbus).

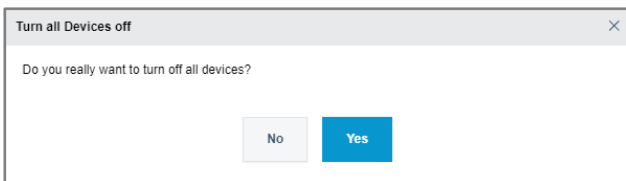


Image 19: Function turn all devices off

4.1.4.2 Reset Devices

By selecting this function, after a short circuit or overload trip, all circuit breakers will be reset after the fault has been solved (the function is only possible in Admin mode and without connection to the fieldbus).

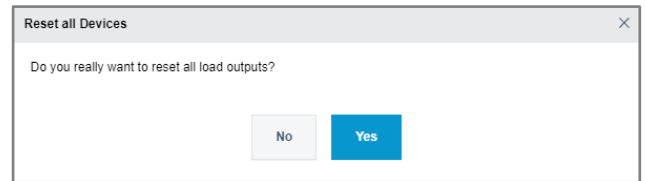


Image 20: Function reset devices after a short circuit or overload trip

4.1.4.3 Enable Power Save

By selecting this function, the LED indicators on the electronic circuit breaker are dimmed or brightened again (The function is only possible in Admin mode).

4.1.4.4 Batch Edit Devices

Selecting this function opens another window with an overview page of all configured parameters. First, a pop-up window asks whether the existing parameters of the current system should be loaded (Download Config), an already saved configuration file should be loaded (Load Config File) or a new standard configuration should be started (Continue with Factory Settings).

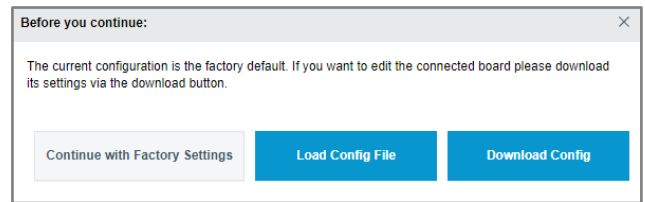


Image 21: Select a configuration

The table displayed in the window consists of the following parameters:

Slot Nr.	Device Type	Nominal Current	Device Lock	Load Current Threshold
F 1.1	REX12D-TA2-100	3 A	OFF ON	80 %
F 1.2		3 A	OFF ON	80 %
F 2.1	REX12D-TE2-100 (Class2)	4 A	OFF ON	80 %
F 2.2		4 A	OFF ON	80 %
F 3.1	REX12D-TA2-100	2 A	OFF ON	80 %
F 3.2		2 A	OFF ON	80 %
F 4.1	REX12D-TA2-100	4 A	OFF ON	80 %
F 4.2		4 A	OFF ON	80 %
F 5.1	REX12D-TA1-100	8 A	OFF ON	80 %
F 5.2		10 A	OFF ON	80 %
F 6.1	REX12D-TA1-100	10 A	OFF ON	80 %
F 6.2		10 A	OFF ON	80 %
F 7.1	REX12D-TA1-100	10 A	OFF ON	80 %
F 7.2		10 A	OFF ON	80 %
F 8.1		10 A	OFF ON	80 %

Image 22: Overview of system parameters

The upload of the configuration to the CPC controller is only possible with admin rights.

Name	Description	Adjustable
Slot Nr.	Number of the circuit breaker	No
Device Type	Type of circuit breaker that is connected in the system	Yes
Nominal Current	Current rating of the circuit breaker	Yes
Device Lock	Editing lock bit of the circuit breaker	Yes
Load Current Threshold	Warning limit for current in percent	Yes

4.1.4.5 Adopt Device Types

With the function "Adopt Device Types" selected, the currently used structure is automatically read out from the used hardware. The circuit breakers must therefore no longer be configured manually. (The function is only possible in Admin mode).

4.2 Status Bar

Below the menu bar, the status of the various electronic circuit breakers can be evaluated immediately using the boxes in the area "Device". This box is divided into two areas. By clicking on these areas, it is also possible to navigate the circuit breaker overview page to the different parts of the system. The currently displayed area is shown with a blue line below it.

If the system is operating, the colour is green. If there is a warning or an error, it will be highlighted with the colours orange or red. A gray filled rectangle means that the circuit breaker was switched off manually at the device. If the rectangle is only outlined, no device is connected.

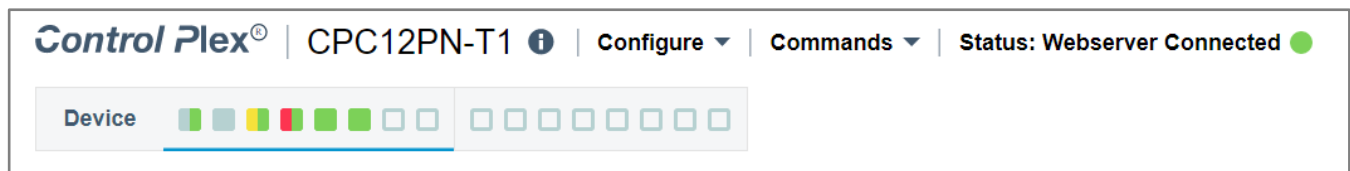


Image 23: Status of the electronic circuit breakers in menu bar

5. CIRCUIT BREAKER OVERVIEW

After the functionality of the system has been described in the previous chapter, the middle overview of the interface will be discussed now. This shows the various electronic circuit breakers lined up. Each channel shows the output voltage and current as well as different status messages.

The upper rectangle contains the currently set current rating. Depending on the recent switching state or message, the box changes its colour. Gray = Off, Green = On, Yellow = Warning, Red = Trip

Below that, different points clarify the status of the channel. These can also light up in the colours green, yellow, red.

The blue line above and below illustrates the selected circuit breaker.

F	1.1	1.2	2.1	2.2	3.1	3.2	4	5.1	5.2	6.1	6.2	7.1	7.2	8.1	8.2
Status	10 A	10 A	2 A	2 A	6 A	6 A	10 A	4 A	4 A	10 A	10 A	2 A	2 A	2 A	6 A
Load Voltage	24.2 V	24.2 V	24.2 V	24.2 V	24.3 V	24.3 V	24.3 V	24.2 V	24.2 V	24.2 V	24.2 V	24.3 V	24.3 V	24.2 V	24.2 V
Load Current	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A	0.0 A
Short Circuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Overload	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Undervoltage	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Current Threshold	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Event	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Image 24: Overview over parameters and status of each channel

6. CIRCUIT BREAKER FUNCTIONALITY

The last third of the overview page displays additional information and functions for the selected circuit breaker. Three different tabs can be selected on the left-hand side. These are explained below:

6.1 Parameter

The first tab displays general information about the circuit breaker, such as the serial number and the hardware and software version. Furthermore, the last error reason can be read out.

The possible parameters that can be set have already been explained in the "Batch Edit De-vice" function. The different input fields can be adjusted by the integrated arrow keys. If the required value is reached, the new setting can be loaded into the device via the "Write Parameter" button.

The "Restore Factory Settings" button resets all parameters to the factory settings.

The "Lock" selection option blocks switching the circuit breaker off or on from the software.

As soon as the function is set to status "OFF", the circuit breaker can be switched. As soon as the circuit breaker is switched off from the software, the hardware LED at the channel shows the colour orange.

Attention:

The role of the logged in account has to be checked. The differences between the Admin and the User mode are explained in chapter 4.1.3.4.

In addition, the function for resetting a circuit breaker and switching it on and off is not available with a connected fieldbus interface. The PLC software has a higher priority.

Furthermore, control and writing via the webservice can be deactivated via the PLC software (Configuration data of the CPC12 - Byte 0 Bit 0)!

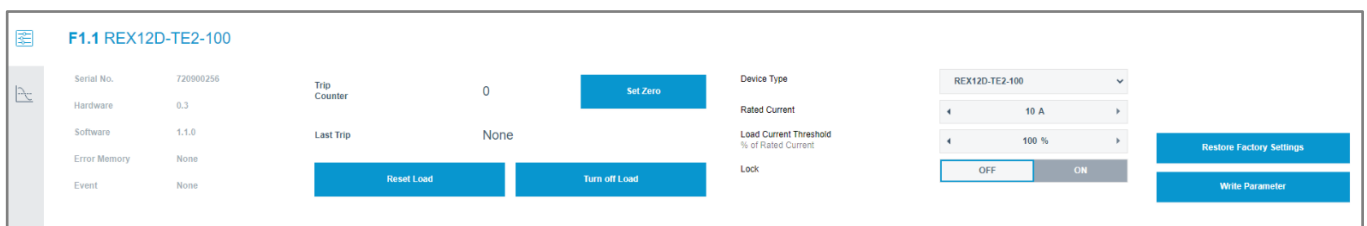


Image 25: General information and adjustable parameters of the circuit breaker

6.2 Statistic

In the second field the values of minimum and maximum current and voltage of the selected circuit breaker are listed.

In addition, calculated values for the average value in each case are listed. (No admin rights needed).

F1.1 REX12D-TE2-100					
Voltage		Current			
Minimum	18.9 V	Minimum	0 A	Reset Minimum	
Average	24.19 V	Average	0 A	Reset Average	
Maximum	25.1 V	Maximum	13.2 A	Reset Maximum	

Image 26: Overview of the current and voltage values of the circuit breaker



www.e-t-a.de/qrcpc12en

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