



# INSTRUCTION MANUAL

## *ControlPlex*<sup>®</sup> 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

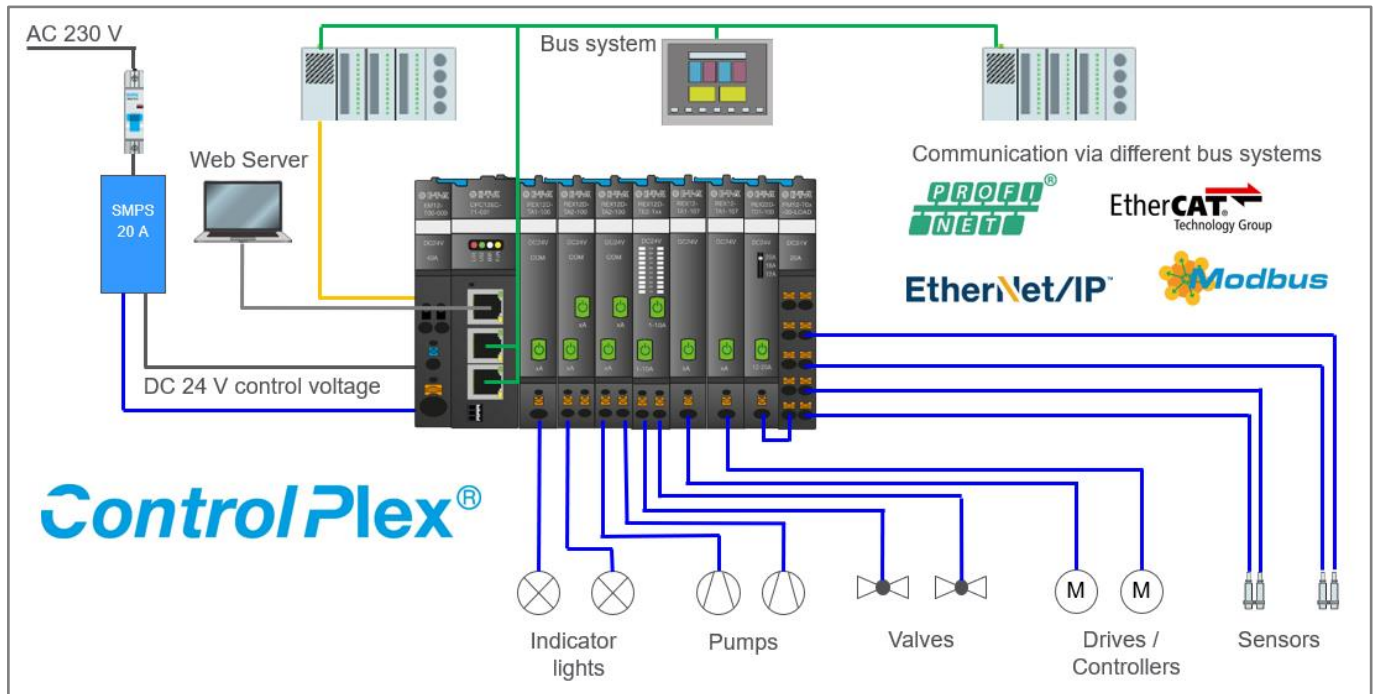


Image 1: CPC12 bus controller as intelligent power distribution system



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.

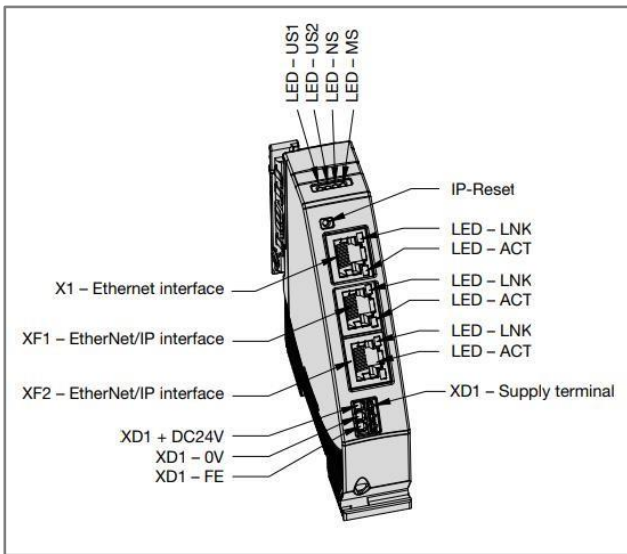
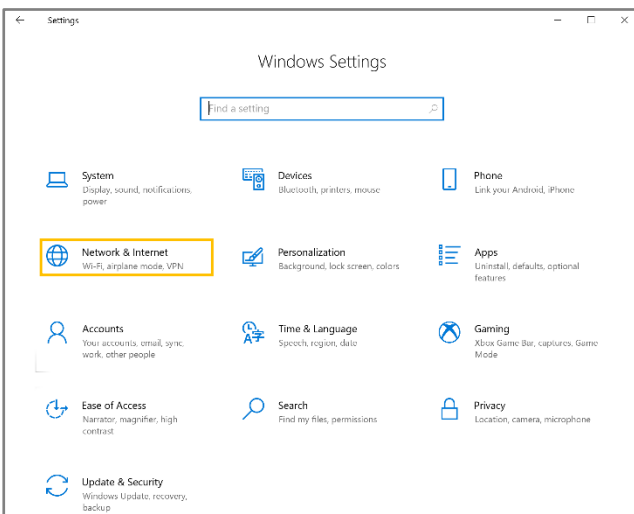


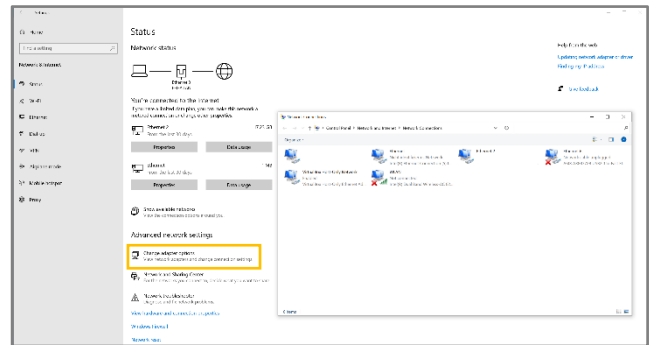
Image 3: Connections of the CPC12 bus controller

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).

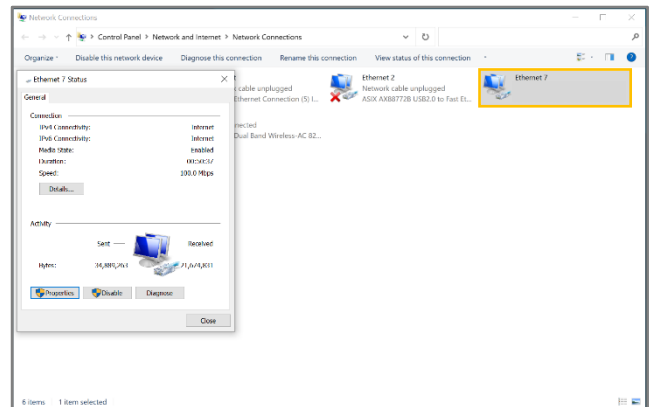
1. Under Windows Settings the submenu "Network and Internet" is selected



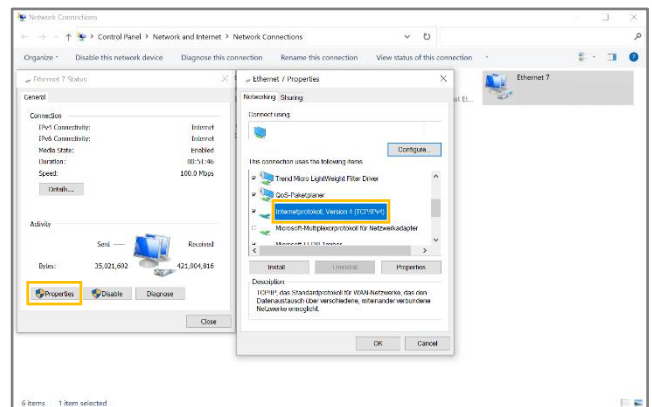
2. Clicking on "Change adapter options" opens the "Network connections" window



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"

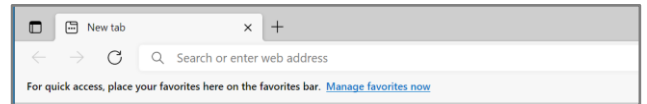
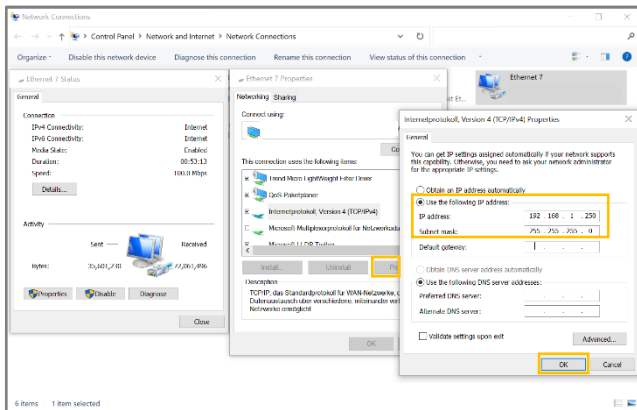


Image 4: Search field of the web browser



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.

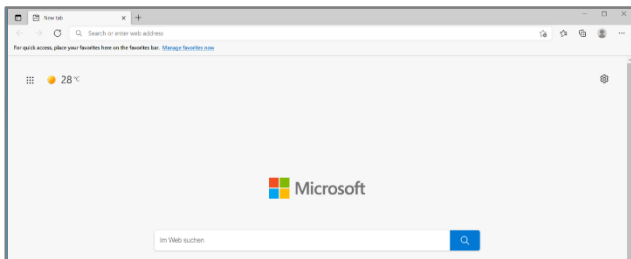


Image 5: Open Microsoft Edge browser

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 system overview page. At the top, the browser address bar shows '192.168.1.1/#/'. The page header includes 'ControlPlex', 'CPC12PN-T1', 'Configure', 'Commands', and 'Status: Webserver Connected'. The supply voltage is 24.1 V and the total current is 0.0 A. The E-T-A logo is visible in the top right corner.

F	1.1	1.2	2.1	2.2	3	4.1	4.2	5.1	5.2	6.1	6.2	7.1	7.2	8.1	8.2
Status	10 A	9 A	8 A	7 A	16 A	4 A	4 A	1 A	1 A	6 A	5 A	4 A	3 A	2 A	1 A
Load Voltage	23.8 V	23.8 V	23.8 V	23.8 V	23.9 V	23.9 V	23.9 V	23.9 V	23.9 V	24.0 V	24.0 V	24.0 V	24.0 V	23.9 V	23.9 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 view for channel F1.1 REX12D-TE2-100 shows the following parameters:

- Serial No.: 4294967295
- Hardware: 1.4
- Software: 2.0.0
- Error Memory: None
- Event: None
- Trip Counter: 0 (Set Zero button)
- Last Trip: None (Reset Load, Turn off Load buttons)
- Device Type: REX12D-TE2-100
- Rated Current: 10 A
- Load Current Threshold: 53 % of Rated Current
- Lock: OFF (ON button)
- Restore Factory Settings button
- Write Parameter button

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**<sup>®</sup> system. In addition, an overview of the supply voltage and the total current of the **ControlPlex**<sup>®</sup> 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.

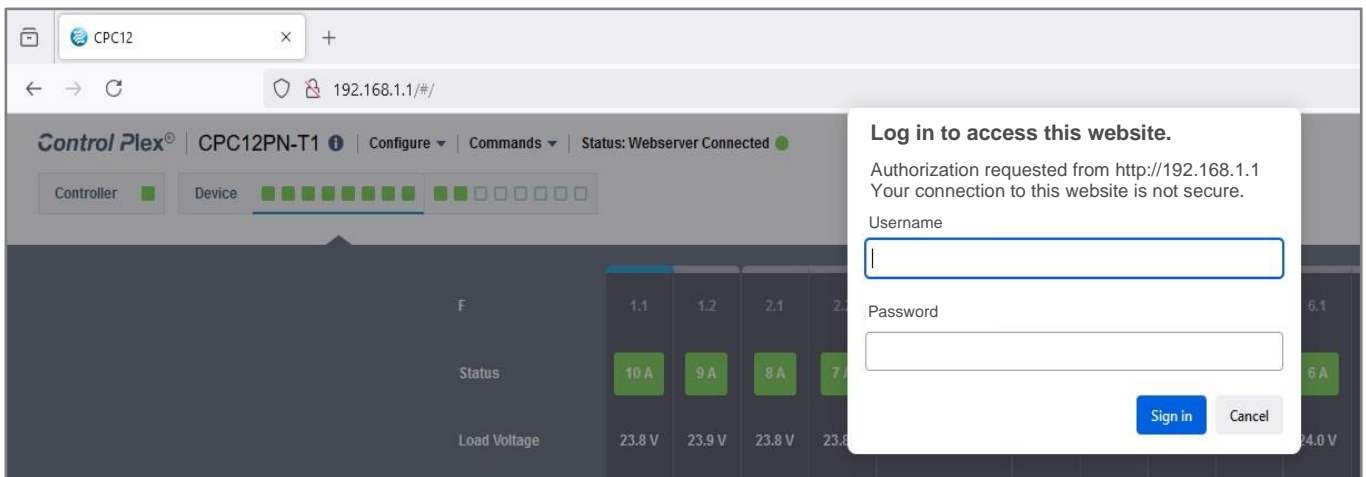


Image 9: Login process

### 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.

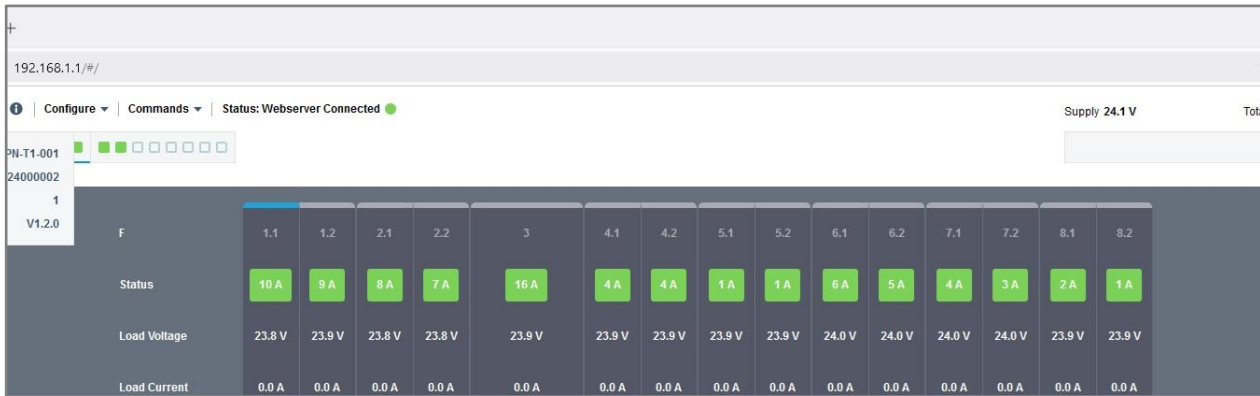


Image 10: General information about the CPC12 bus controller

### 4.1.3 Configure

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

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

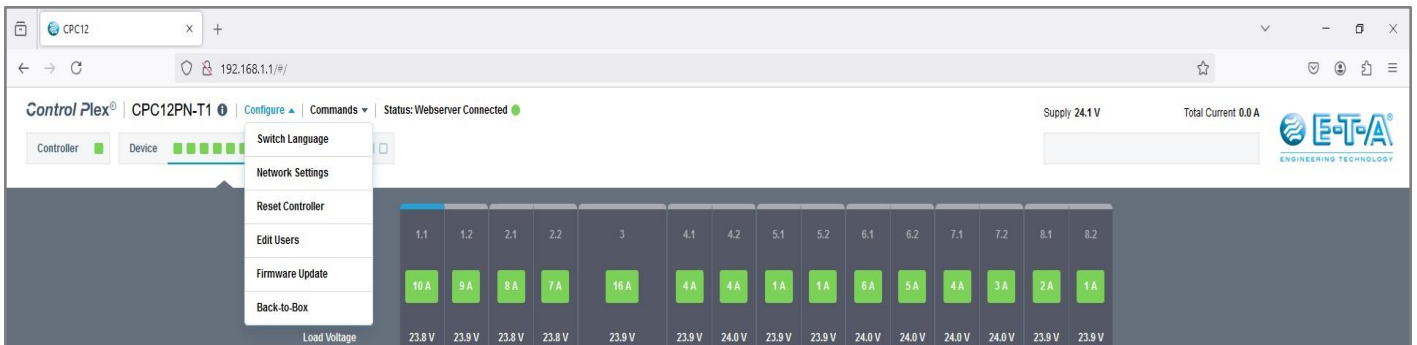


Image 11: Configure button

#### 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).

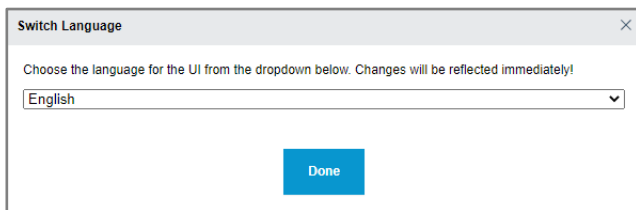


Image 12: Switching the language

#### 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. For this press "Submit" (The function is only possible in Admin mode).

Network Settings
✕

Edit the ethernet configuration of the connected board below

Hostname	<input type="text" value="CPC12"/>
<b>Ethernet</b>	
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"/>	
<b>Fieldbus</b>	
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
<input type="button" value="Cancel"/> <input type="button" value="Submit"/>	

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).

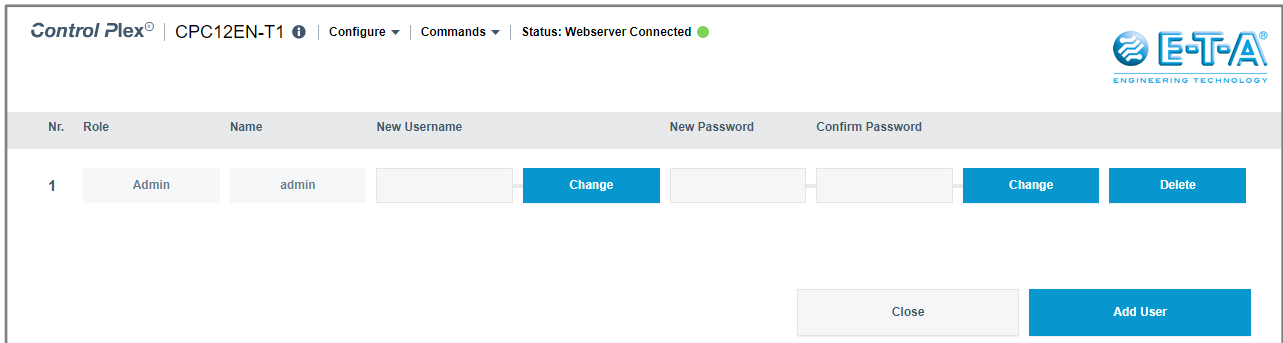


Image 14: Overview of the current administrators

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.

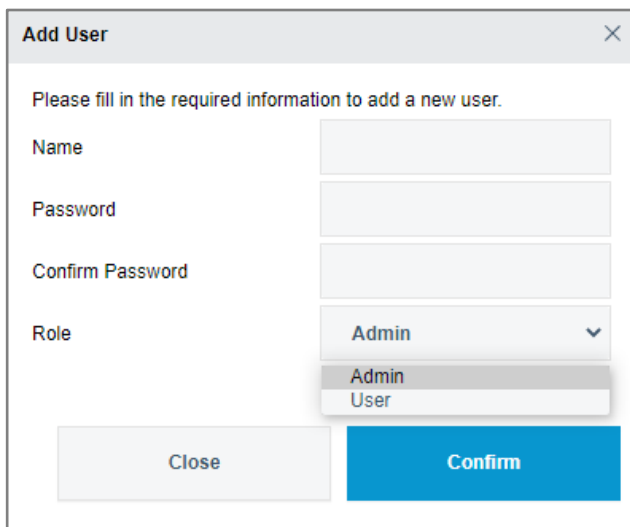


Image 15: Add a user

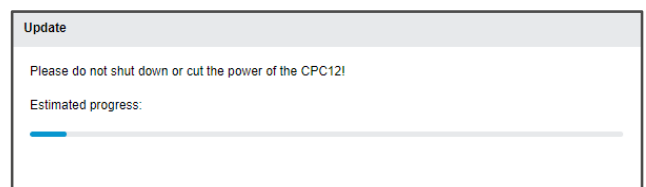
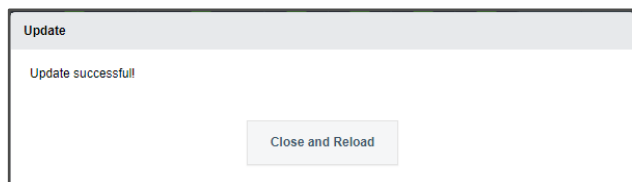


Image 16: Firmware update in progress

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*

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

#### **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).

#### 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 protectors 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 protector is set to the "OFF" status (the function is only possible in Admin mode and without connection to the fieldbus).

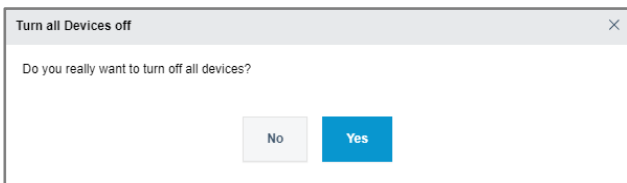


Image 19: Function turn all devices off

##### 4.1.4.2 Reset Devices

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

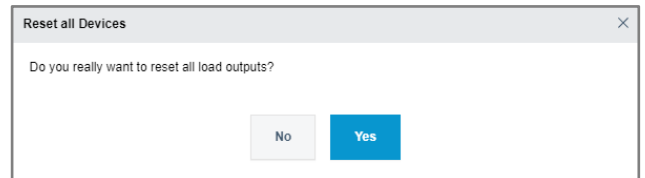


Image 20: Function reset devices after a short circuit or overload trip

#### 4.1.4.3 Enable Power Save

By selecting this function, the LED indicators on the electronic circuit protector 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).

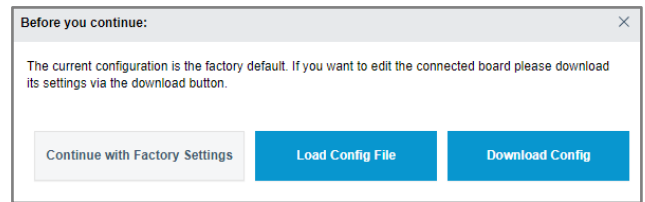


Image 21: Select a configuration

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.

<b>Name</b>	<b>Description</b>	<b>Adjustable</b>
<b>Slot Nr.</b>	Number of the circuit breaker	No
<b>Device Type</b>	Type of circuit breaker that is connected in the system	Yes
<b>Nominal Current</b>	Current rating of the circuit breaker	Yes
<b>Device Lock</b>	Editing lock bit of the circuit breaker	Yes
<b>Load Current Threshold</b>	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 protectors must therefore no longer be configured manually. (The function is only possible in Admin mode).



#### 4.2 Status Bar

Below the menu bar, a grey box is displayed with an overview of the status of the controller and a second box with the status of the various electronic circuit protectors.

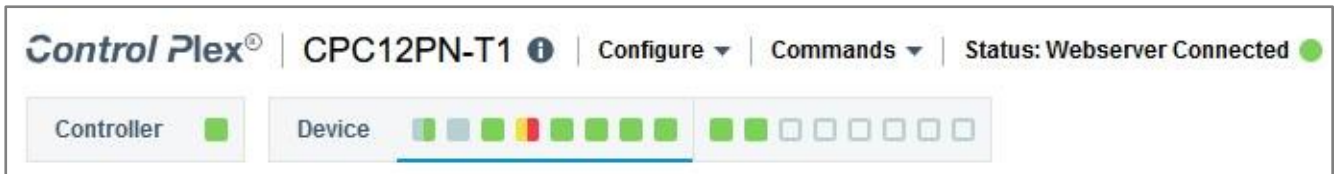


Image 23: Status of the electronic circuit protectors in menu bar

Click on the 'Controller' box on the left to navigate to the detailed view of the controller status.

The 'Device' box is divided into two areas. This is due to the detailed presentation of the circuit protectors. For reasons of clarity, a maximum of eight circuit protectors are shown on each page. This means that two boxes with eight circuit protectors each are shown.

This results in a maximum total of 16 possible circuit protectors. The currently displayed range is highlighted with a blue line.

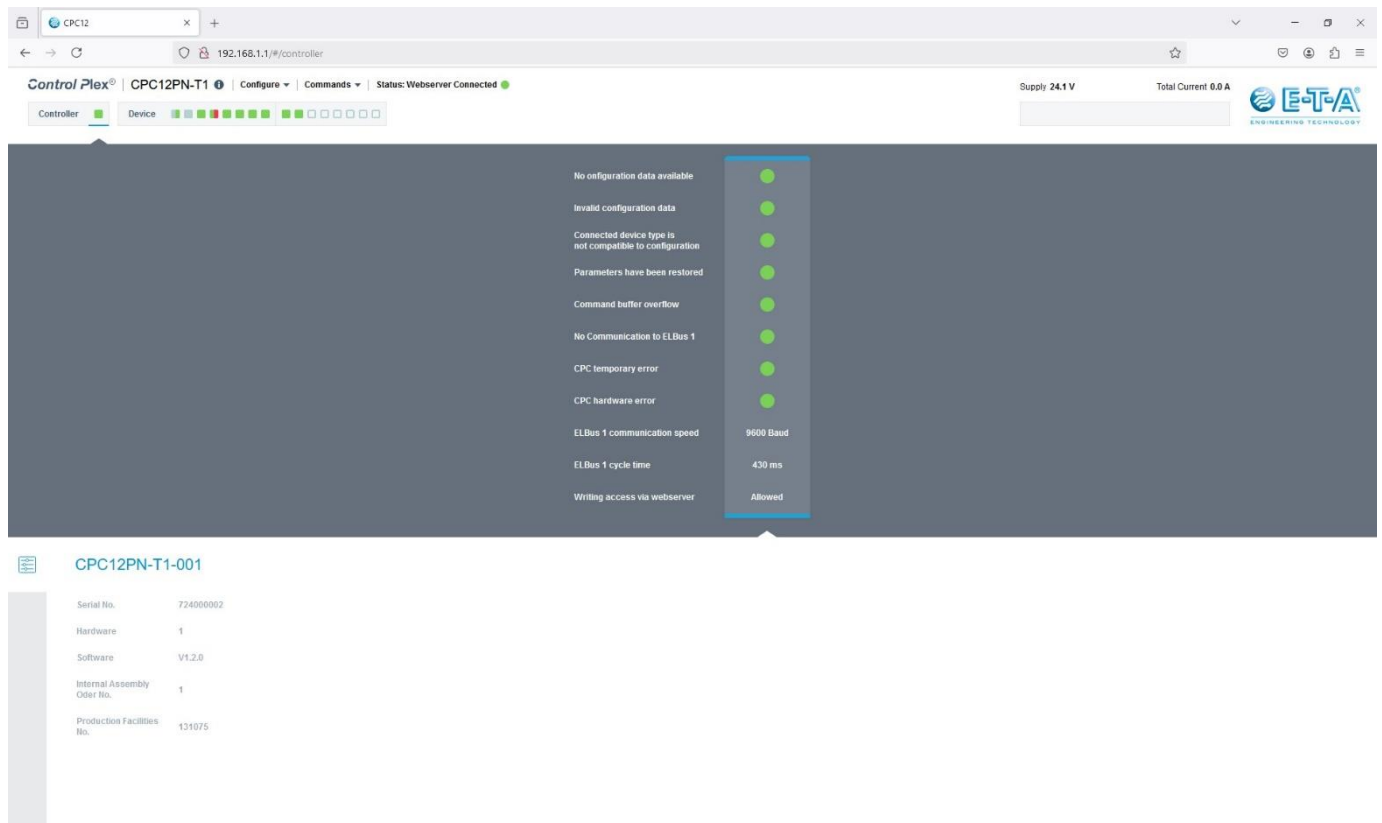
Fault-free operation of a circuit protector is shown with a green square. If there is a warning or an error, the square is displayed in orange or red. A square with a grey background means that the load output of the circuit protector has been switched off. If the square is only outlined and not filled in, no device is connected.

## 5. SYSTEM OVERVIEW

Following the functions described in the previous chapter, the area of the web server highlighted in dark grey is described here. The status of the ControlPlex® controller and the various electronic circuit protectors are shown.

### 5.1 Overview bus controller

The status of the ControlPlex® controller is displayed in detail in this view. In addition to static information such as version numbers in the lower white area of the screen, the following information can be read here:



The screenshot displays the ControlPlex web interface for a CPC12PN-T1 controller. The browser address bar shows the URL 192.168.1.1/#/controller. The interface includes a navigation menu with 'Controller' and 'Device' options, and a status indicator 'Status: Webservice Connected'. The main content area shows a list of status items with corresponding green indicator lights:

- No configuration data available
- Invalid configuration data
- Connected device type is not compatible to configuration
- Parameters have been restored
- Command buffer overflow
- No Communication to ELBus 1
- CPC temporary error
- CPC hardware error
- ELBus 1 communication speed: 9600 Baud
- ELBus 1 cycle time: 430 ms
- Writing access via webservice: Allowed

Below the status list, the device information for CPC12PN-T1-001 is displayed:

Parameter	Value
Serial No.	72400002
Hardware	1
Software	V1.2.0
Internal Assembly Order No.	1
Production Facilities No.	131075

Image 24: Status information bus controller

- **No configuration data available**

The system could not save or read the system configuration. Error accessing the internal memory

- **Invalid configuration data**

The following possible errors:

- The parameterization has failed or the parameters are invalid
- The length of the data received by the automatic circuit protector does not match the expected data length

- **Connected device type is not compatible to configuration**

- **Parameter data has been restored**

The parameter data has been restored after a memory error.

- **Command buffer overflow**

The command memory for acyclic commands has overflowed, the last acyclic command is ignored.

- **No communication to ELBus® 1**

- **CPC temporary error**

A temporary fault has led to a restart of the CPC.

- **CPC hardware error**

A critical hardware error has occurred. The CPC should be replaced.

- **ELBus® 1 communication speed**

- **ELBus® 1 cycle time**

ELBus® Cycle time in milliseconds ms

- **Writing access via webserver**

Write commands may be executed via the web server despite active fieldbus communication.



Image 25: Status information bus controller

## 5.2 Overview circuit protectors

The various electronic circuit protectors are listed in this view. The output voltage and output current as well as the various status messages are displayed for each channel.

The upper rectangle contains the currently set nominal current. The box changes colour depending on the current switching status or the message present. Grey = off, green = on, yellow = warning, flashing yellow = load current limit exceeded, red = tripped.

Below this, various indicators provide information about the status of the channel. The circles also light up in green, yellow or red.

The blue line at the top and bottom indicates which circuit protector is currently selected.

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 26: Overview over parameters and status of each channel

## 6. CIRCUIT PROTECTOR FUNCTIONALITY

The last third of the overview page displays additional information and functions for the selected circuit protector. 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 protector, 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 protector off or on from the software.

As soon as the function is set to status "OFF", the circuit protector can be switched. As soon as the circuit protector 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 protector 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)!

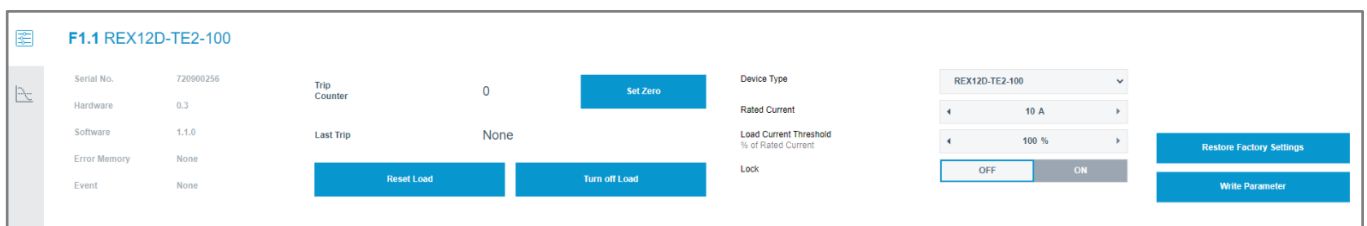


Image 27: General information and adjustable parameters of the circuit protector

## 6.2 Statistic

In the second field the values of minimum and maximum current and voltage of the selected circuit protector 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 28: Overview of the current and voltage values of the circuit protector



[www.e-t-a.de/qrcpc12en](http://www.e-t-a.de/qrcpc12en)

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