

Manual for
TC 649 C
Version 1



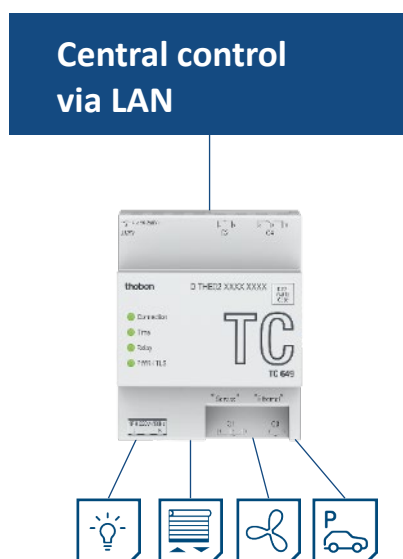
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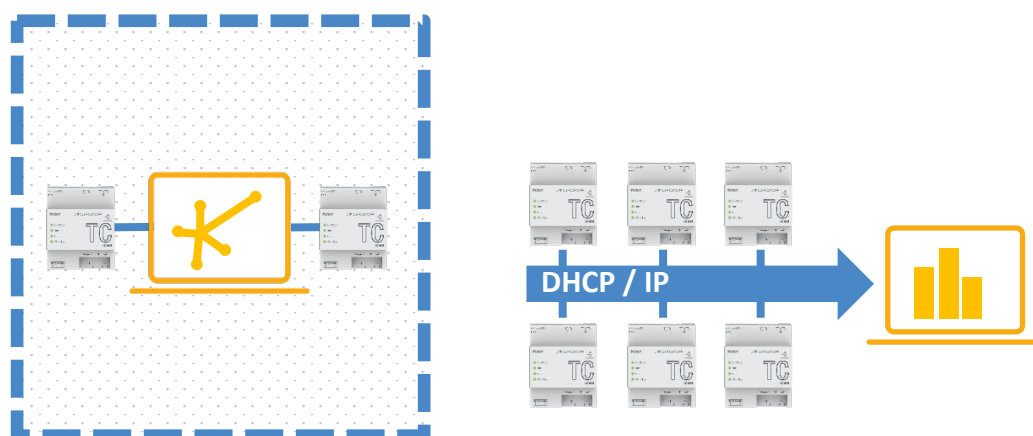
1 Introduction

1.1 TC 649 C control box

The TC 649 C control box is operated using an administration and configuration tool (web interface). The control box can be used to send time switch and astro programs via LAN or WAN. It is installed in the network via an integrated web server.



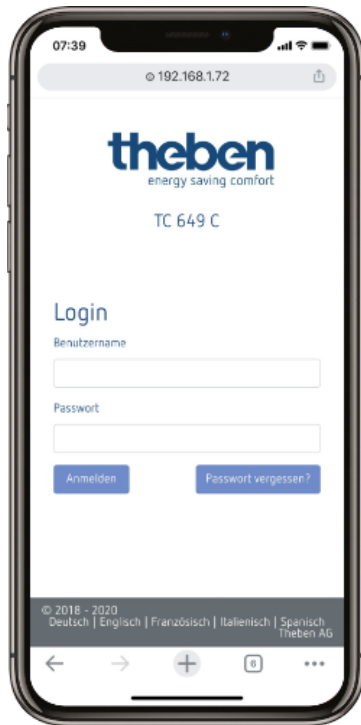
The control box is integrated into the company network. The control box must have an Internet connection so that it can be addressed via the Theben cloud.



You can use simple functions with the control box, such as astronomically controlled lighting, time-controlled access points and temperature reduction for heating units during the day and at night.

1.2 Information about the web interface

The web interface for the TC 649 C control box can be called up on a desktop PC or a mobile end device such as a tablet or smartphone.



The following browsers / operating systems are supported:

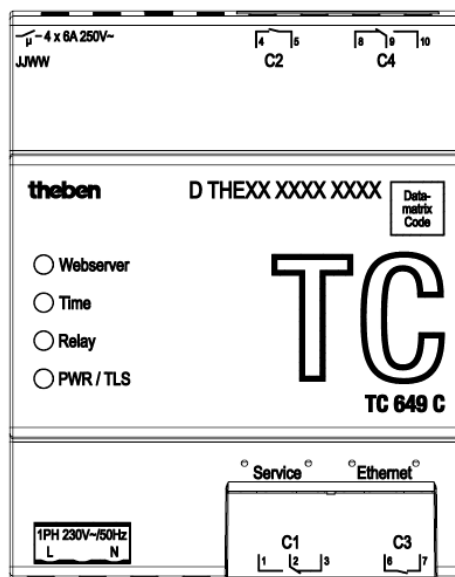
- Browsers:
 - Google Chrome from version 69 onwards
- Operating systems:
 - Microsoft Windows
 - Apple iOS from version 10 onwards
 - Google Android from version 7 onwards

1.3 Main functions

Feature	Meaning
NTP server	Using the NTP server with the TC 649 C ensures switching accuracy to the second across the globe.
Standalone operation	The TC 649 C is operated as a single device without any external software.
Administration via web interface	The TC 649 C can be easily configured via the web.
Updating firmware	Firmware can be easily updated via the web interface.

1.4 Housing

1.4.1 Top

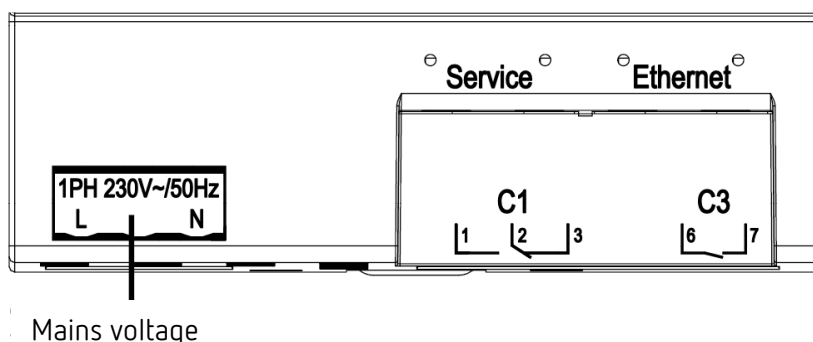


Name	Status	Meaning
Web server	Off	The web server for the web interface is switched off.
	On	The web server for the web interface is switched on.
	Flashing	The web server for the web interface is starting up.

Time	Off	The NTP service is deactivated.
	On	The NTP service is activated and a connection has been established to an NTP server.
	Flashing	The NTP service is activated and the device is searching for a connection to the NTP server.
Relay	Off	All relays are switched off.
	On	One <u>or</u> more relays are switched on.
PWR/TLS	Off	The TC 649 C is switched off.
	Flashing	The TC 649 C is switched on.

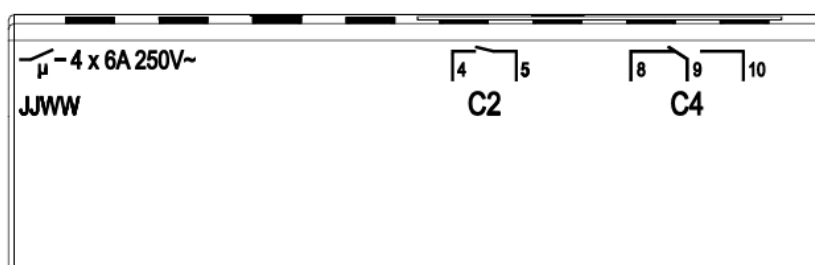
1.4.2 Front

The socket for the power supply, both network interfaces (Service, Ethernet) and the socket for relays C1 and C3 are located on the front of the device.



1.4.3 Back

The socket for relays C2 and C4 is located on the back of the device.



2 Start-up

Please refer to the enclosed installation and operating instructions for information on how to connect the device and carry out initial operation.

3 Connecting TC 649 C to the network

Depending on which method you use, you will need one or two network cables (RJ45) to connect the TC 649 C control box to the network.



Make sure the cabling is correct.

- Connect the cables in accordance with the following sections.

There are three ways of carrying out the start-up process for the TC 649 C.

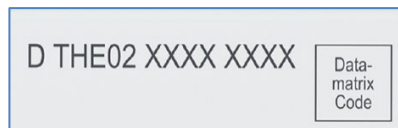
1. Start-up via the hostname (serial number)
2. Start-up via the service interface in order to read out the IP address
3. Start-up via the service interface in order to assign the IP address statically



Two network cables are required for options 2 and 3.

3.1 Start-up via the hostname

1. Plug the network cable (RJ45 connector) into the router.
2. Plug the other end of the network cable (RJ45 connector) into the (right-hand) **Ethernet** socket on the TC 649 C.
3. Open the web browser (Google Chrome).
4. In the address field in the browser, enter the serial number in the following format: <http://serial-number>. You will find the serial number on the device. The serial number will always start with DTHE.



5. If accessing the device via the serial number does not work, you can also access it directly using the IP address. In the address field in the browser, enter the IP address (if known) in the following format: <http://IPaddress>.
6. The login screen will appear.

7. Enter **admin** as the user name.
Enter **admin** as the password.
Click on "Log in".

Your TC 649 C is connected to your network. The start-up process is now complete.

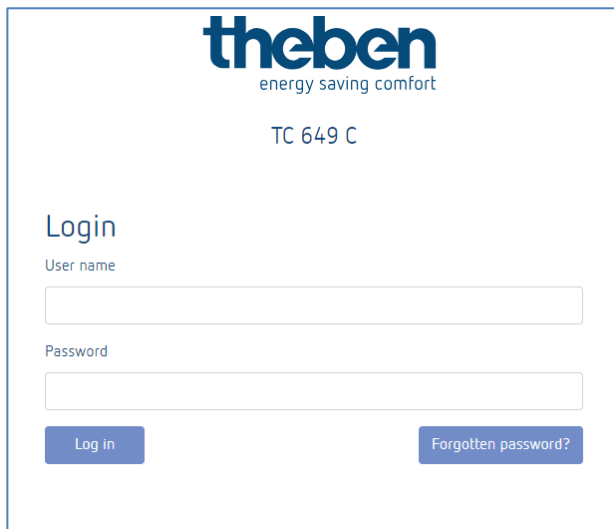
❗ If you cannot reach the device via the serial number, it is probably because your router is unable to resolve the serial number. You can use the user interface of your router to display all connected devices and their IP addresses. Please refer to your router manual to see exactly how to do this.

❗ If accessing the device via the serial number does not work, you do not know the IP address or you cannot find out the address via your router, please continue with Section 3.2 in order to find out the IP address of your TC 649 C.

3.2 Start-up via the service interface in order to read out the IP address

You will need two network cables (RJ45 connector) for this type of start-up.

1. Disconnect the TC 649 C from the power supply.
2. Plug network cable 1 into the router.
3. Plug the other end of network cable 1 into the (right-hand) **Ethernet** socket on the TC 649 C.
4. Plug network cable 2 into the network socket on your PC.
5. Plug the other end of network cable 2 into the (left-hand) **Service** socket on the TC 649 C.
6. Connect the TC 649 C to the power supply.
7. Open the web browser (Google Chrome).
8. Open the web browser and open the following page in the address field:
9. <http://192.168.138.3>
10. The login screen will appear.



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TC 649 C

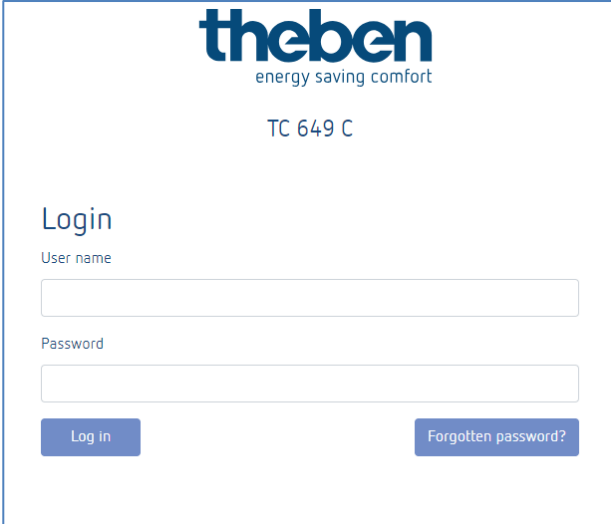
Login

User name

Password

11. Enter **admin** as the user name.
Enter **admin** as the password.
Click on "**Log in**"
12. Read out the IP address of your TC 649 C via Settings → Network settings → IP address.
13. Remove the network cable from the service interface of the TC 649 C.
14. Now connect your PC to your home network again via WiFi or LAN.

15. Open the web browser (Google Chrome).
16. In the address field in the browser, enter the IP address that you read out in point 12 in the following format: <http://IPaddress>.
17. The login screen will appear.

The image shows a web browser window displaying the login interface for a Theben TC 649 C device. At the top, the 'theben' logo is displayed in blue, with the tagline 'energy saving comfort' underneath it. Below the logo, the device model 'TC 649 C' is shown. The main heading is 'Login'. There are two input fields: 'User name' and 'Password'. Below the 'User name' field is a blue 'Log in' button. To the right of the 'Log in' button is a blue button labeled 'Forgotten password?'.

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TC 649 C

Login

User name

Password

Log in

Forgotten password?

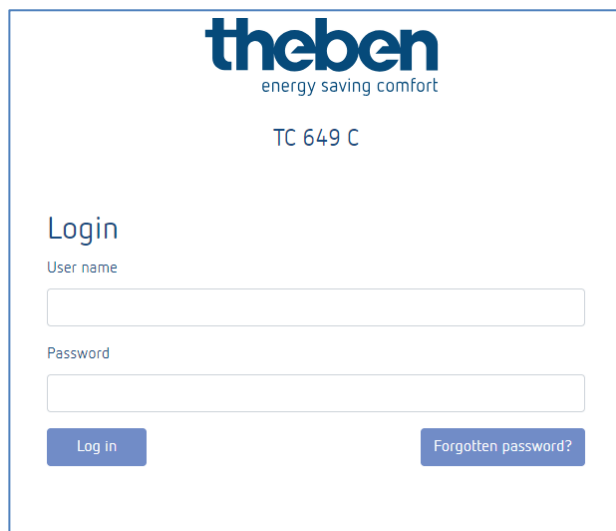
Your TC 649 C is connected to your network. The start-up process is now complete.

i If you still cannot access the TC 649 C device, check the proxy settings and contact the system administrator if necessary.

3.3 Start-up via the service interface in order to assign the IP address statically

You will need two network cables (RJ45 connector) for this type of start-up.

1. Disconnect the TC 649 C from the power supply.
2. Plug network cable 1 into the router.
3. Plug the other end of network cable 1 into the (right-hand) **Ethernet** socket on the TC 649 C.
4. Plug network cable 2 into the network socket on your PC.
5. Plug the other end of network cable 2 into the (left-hand) **Service** socket on the TC 649 C.
6. Connect the TC 649 C to the power supply.
7. Open the web browser (Google Chrome).
8. Open the web browser and open the following page in the address field:
9. <http://192.168.138.3>
10. The login screen will appear.



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TC 649 C

Login

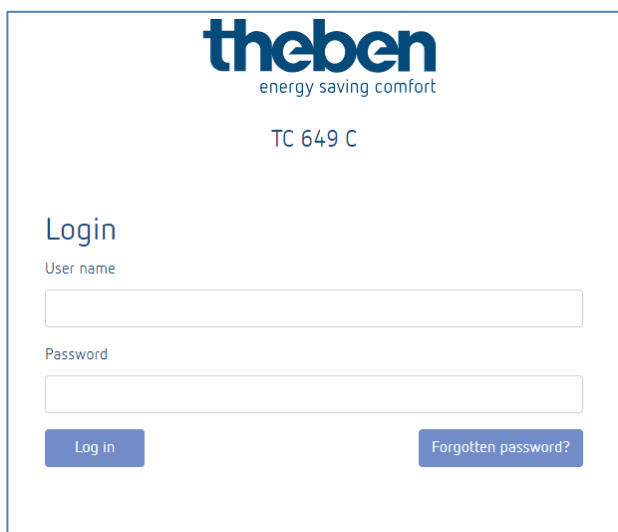
User name

Password

11. Enter **admin** as the user name.
Enter **admin** as the password.
Click on "**Log in**".
12. Display the IP address of your TC 649 C via Settings → Network settings → IP address.
13. Untick "Use DHCP", use the pre-filled IP address or enter an IP address of your choice.

Note: Only use an IP address that is not being used by another device in the network and that corresponds to your network.

14. Click on **"Save"** and wait until the settings have been saved.
15. Remove the network cable from the service interface of the TC 649 C.
16. Now connect your PC to your home network again via WiFi or LAN.
17. Open the web browser (Google Chrome).
18. In the address field in the browser, enter the IP address that you assigned in point 15 in the following format: <http://IPAddress>.
19. The login screen will appear.



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TC 649 C

Login

User name

Password

[Log in](#) [Forgotten password?](#)

Your TC 649 C is connected to your network. The start-up process is now complete.

i If you still cannot access the TC 649 C device, check the proxy settings and contact the system administrator if necessary.

4 Theben cloud (TC 649 C remote control)

4.1 Setting up a Theben cloud account

If you would like to connect your TC 649 C to the Theben cloud, you will need a Theben cloud account.

To create a Theben cloud account, please go to:

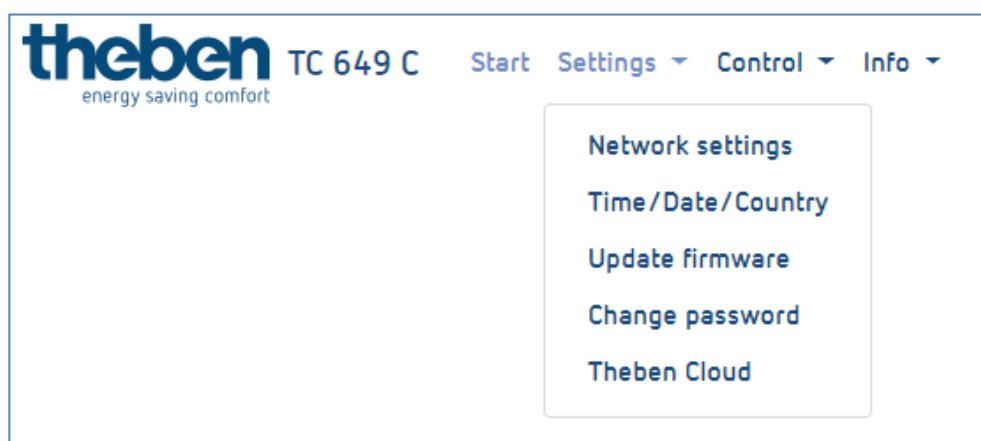
<https://cloud.theben.de>

4.2 Connecting the TC 649 C to the Theben cloud

i If the TC 649 C has not been connected to the Theben cloud, it will not appear online under <https://cloud.theben.de>.

i To connect your TC 649 C to the Theben cloud, first make sure that your TC 649 C is connected to the Internet.

Open the user interface of your TC 649 C. Go to Settings -> Theben cloud.



Enter the login details for your Theben cloud account and click on "Connect to Theben cloud". The process can take up to 90 seconds.

Theben Cloud Setting

You can connect your TC 649 C with the Theben Cloud here. Insert you login data of the Theben Cloud login, please.

email address

Password

Disconnect from Theben Cloud
Connect to Theben Cloud

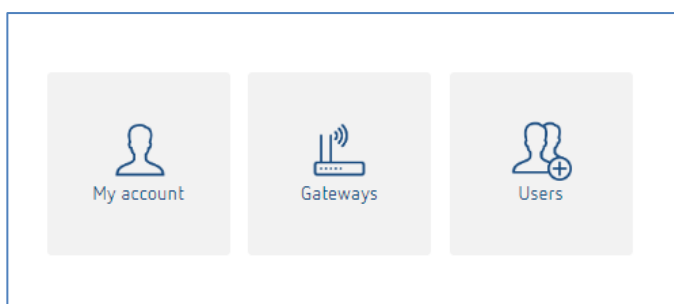
Your TC 649 C is now connected to the Theben cloud.

You can now manage your device via <https://cloud.theben.de>.

4.3 Managing the TC 649 C via the Theben cloud

Open <https://cloud.theben.de> and log in.

Via the "Gateways" menu item, open the list of devices that are linked to your account (TC 649 C).



4.3.1 Management and remote control

- Select the TC 649 C that you want to manage and go to "Manage".
- The connection to the TC 649 C will be established. The **Navigation** and **Control and Menu** sections explain how to control the TC 649 C.

4.3.2 Renaming

- Select the TC 649 C that you want to rename and go to "Edit".
- Change the name of your TC 649 C.
- Click on "Save".

4.3.3 Transferring

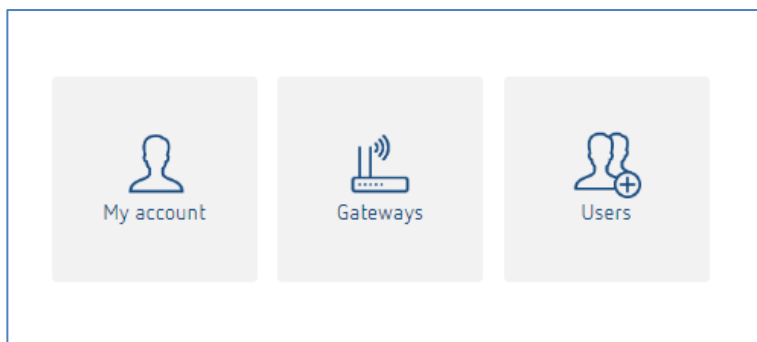
- Select the TC 649 C that you want to transfer to a different owner and go to "Transfer".
- Select the user to whom you wish to transfer the ownership rights.
- Click on "OK".

i If there are no users in the list, you will need to invite a user first. Further information can be found below.

4.4 User administration in the Theben cloud

Open <https://cloud.theben.de> and log in.


Via the "Users" menu item, open the list of devices that are linked to your account and the available installations and their users and owners.



4.4.1 Adding users

- Under "Installations", select the TC 649 C to which you wish to add a new user.
- Under "Invitation", enter the e-mail address of the new user.
- Click on "Send".
- The user will receive an invitation via e-mail.
- As soon as they accept the invitation, they will also be able to manage the selected TC 649 C.

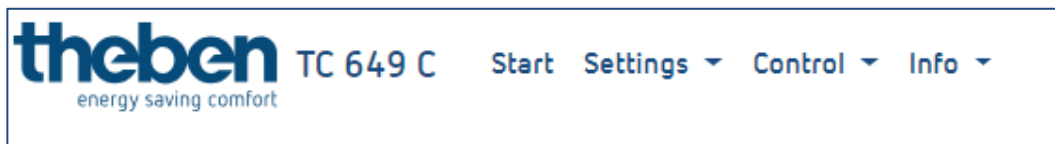
4.4.2 Deleting users


 You can only delete users if you are registered as the owner.

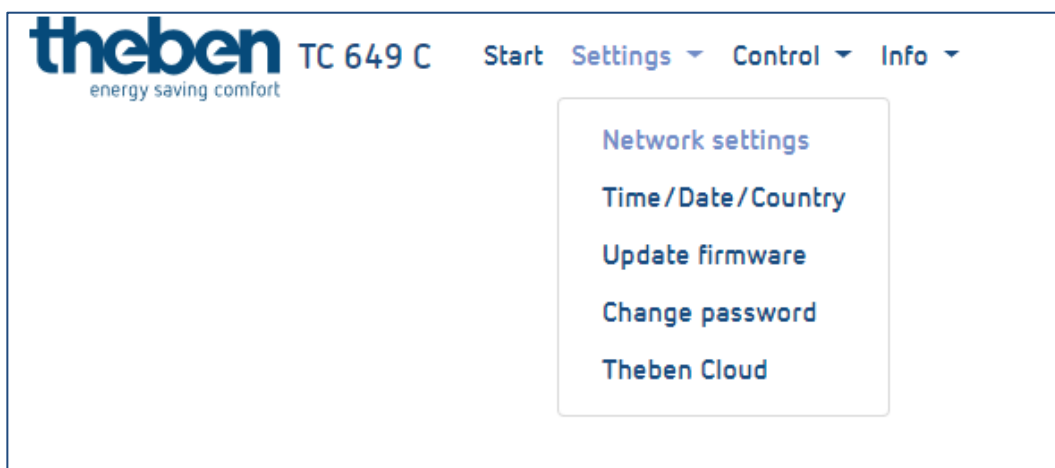
- Under "Installations", select the TC 649 C whose user you wish to delete.
- Under "Users", you will see all users of your TC 649 C.
- Select the user and click on "Revoke".
- The user will no longer have access to your TC 649 C.

5 Navigation

The main way to navigate around the user interface is via the menu bar at the top of the screen. You can access all the TC 649 C settings via this navigation bar.



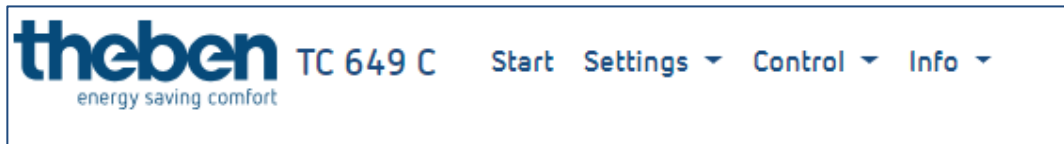
Menu items marked with a  contain sub-menu items which can be called up with a single click.



6 Controls and menu

To navigate around the main menu, click on the required main menu item.

If the main menu item contains sub-menu items, a drop-down menu will open. You can then click on the sub-menu item you want.



6.1 Start

Detailed device information is displayed on the start page.

i This information cannot be changed here. To change the settings, use the corresponding menu items under Settings or Control.

Device information

Serial number:	DTHE0200000454
Date/Time (local):	06.08.2020 13:48:48
Current ot2 file:	TC649Leer.OT2
Interface type:	STATIC
IP address:	192.168.138.10
Subnet mask:	255.255.255.0
Gateway:	192.168.66.1
NTP active	Yes
Device name	<input type="text"/>

Save

6.2 Settings

6.2.1 Network settings

You can change the network settings for the TC 649 C in this menu.

Network settings

You can manage the network settings for your device here.

IPv4 address

Subnet mask

Standard gateway

☐ Use DHCP

CAUTION! Changes to the network settings may result in loss of contact with the TC649 C.

☒ Use NTP server

NTP server address

i Please note that all changes only affect the right network interface (Ethernet).

6.2.1.1 DHCP → static

To change the network interface from DHCP to **static** ...

- Untick the Use DHCP field.
- Enter a valid IPv4 address, the corresponding subnet mask and a standard gateway if applicable.
- Click on **Save** to confirm changes.

To configure and use the NTP server, proceed as follows ...

- Tick the box next to **Use NTP server**.
- Enter the relevant NTP server address.
- Click on **Save** to confirm changes.

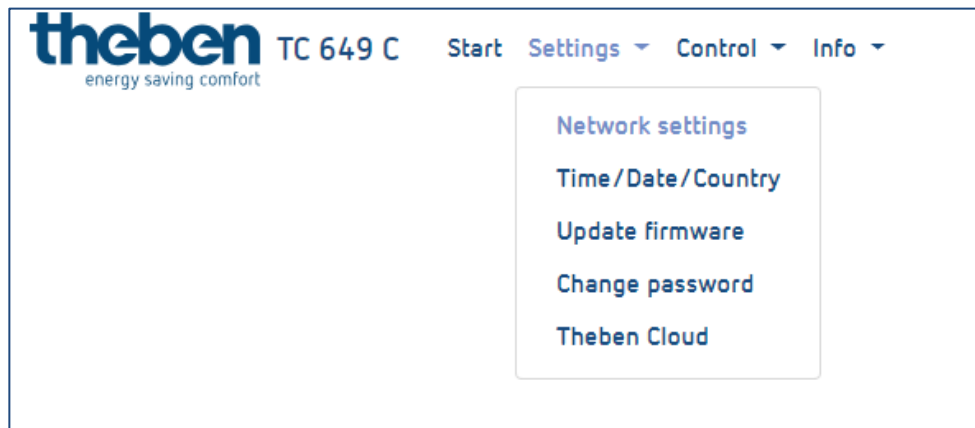
i If you have ticked the box next to **Use NTP server**, you cannot change the time. If you untick the box, you can change the time again.

i The control box is briefly unavailable after settings have been saved.

i Changes to the network settings may result in loss of contact with the control box.

6.2.2 Setting time/date/country

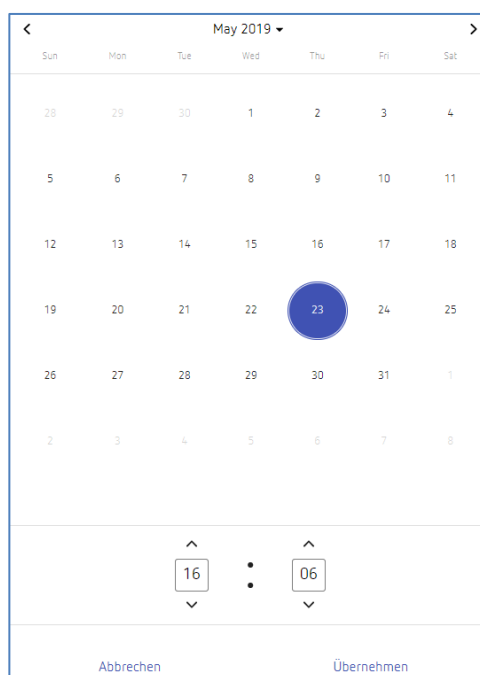
You can use the following menu to set the time and date and to store a location for the astro functionality.



Changing the time

i The date and time can only be changed if the NTP server is deactivated.

- Click the following field.
A pop-up window appears.




- Set the desired time.
- Click on **Apply**.
- Then click **Save**.

Changing the country and city

- Select a country from the (country) drop-down menu.
- Then select a city from the (city) drop-down menu.
- Click **Save**.

6.2.3 Update firmware


You can run a device update in this menu. You can run the device update either online (**Internet connection required**) or offline (**not on mobile devices**).

 A firmware update can only be carried out via the desktop application.

Online update

- Click on the **Check for updates** button.
- A message appears if an update is available.
- Then click on **Start firmware update**.
 - Press **Yes** to confirm and carry out the update.

The update is downloaded and installed automatically. Once the update has completed successfully, you will be redirected automatically to the login page.

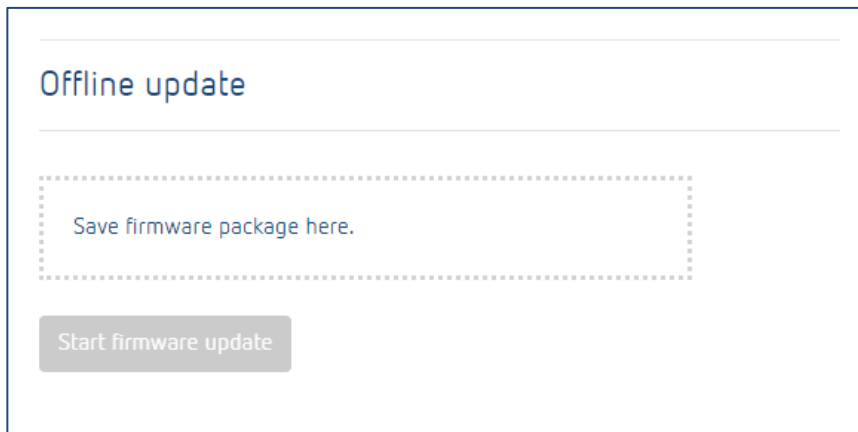
-
-  The update will take 3 to 5 minutes. The web interface will not be available during this time.
-




Do not disconnect the control box from the power supply during the firmware update, as this may cause irreparable damage to the device.

Offline update

- Drag and drop the firmware package provided by Theben AG into the dashed field.



- Then click on **Start firmware update**.
- Press **Yes** to confirm and carry out the update.
- The update is downloaded and installed automatically. Once the update has completed successfully, you will be redirected automatically to the login page.


-
-  The update will take 3 to 5 minutes. The web interface will not be available during this time.
-



Do not disconnect the control box from the power supply during the firmware update, as this may cause irreparable damage to the device.

6.2.4 Change password

In this menu, you can change the password.

 The new password must be between 5 and 20 characters in length.

- Enter your old password.
- Then enter the new password.
- Confirm the new password.
- Click on **Save**.


Once you have saved your password, you will be automatically logged out and redirected to the login page.

- Log in using your new password.

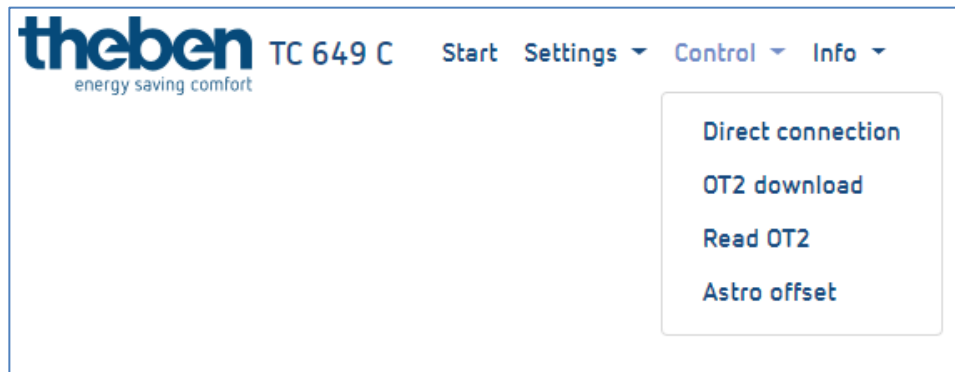
6.2.5 Theben cloud

In this menu, you can connect your TC 649 C to the Theben cloud.

See the **Connecting the TC 649 C with the Theben Cloud** section.

 In order to use the Theben cloud, you will need a Theben cloud account. This account is free for the TC 649 C. Don't have a Theben cloud account yet?
Further information can be found in the **Setting up a Theben Cloud Account** section.

6.3 Control



6.3.1 Direct switching

Direct switching is only possible with an active switching profile. Each channel can be switched individually.

Status	Function
PERM OFF	The channel is switched off and cannot be changed via the programmed switching times.
PERM ON	The channel is switched on and cannot be changed via the programmed switching times.
AUTO	The channel is switched according to the programmed switching times.

Changing the switching status

- Select the desired mode in the drop-down menu (PERM OFF, PERM ON, AUTO).

The channel switches to the desired status.

The current relay status is displayed.

Direct connection

Channel	Relay status	Mode
01	0	AUTO ▼
02	0	AUTO ▼
03	1	AUTO ▼
04	0	AUTO ▼

Update

6.3.2 ot2 download

You can transfer the ot2 file (from the OBELISK software) to the control box here.

i You can only download the ot2 file via the desktop browser.

Download ot2 file

You can transfer the Obelisk file (ot2) to the TC 649 C here.

You need the Theben OBELISK top2/3 software to create an Obelisk file. You can download the software via this link:

[Download Theben OBELISK top2/3 software](#)

Current ot2 file: TC649Leer.OT2

Selected ot2 file: No ot2 file selected

Select ot2 file Download ot2 file

To create an Obelisk file, you need the Theben OBELISK top2/3 software or the OBELISK top3 iOS/Android app. These can be downloaded via the following links:

Windows:

<https://www.theben.de/en/pc-set-obelisk-top2-3-9070409>

Under Downloads -> Software

Android:

<https://play.google.com/store/apps/details?id=de.theben.OBELISKtop3&hl=de>



iOS:

<https://apps.apple.com/de/app/obelisk-top3/id1273748982>



Loading ot2 file (switching times) on to device (with Windows)

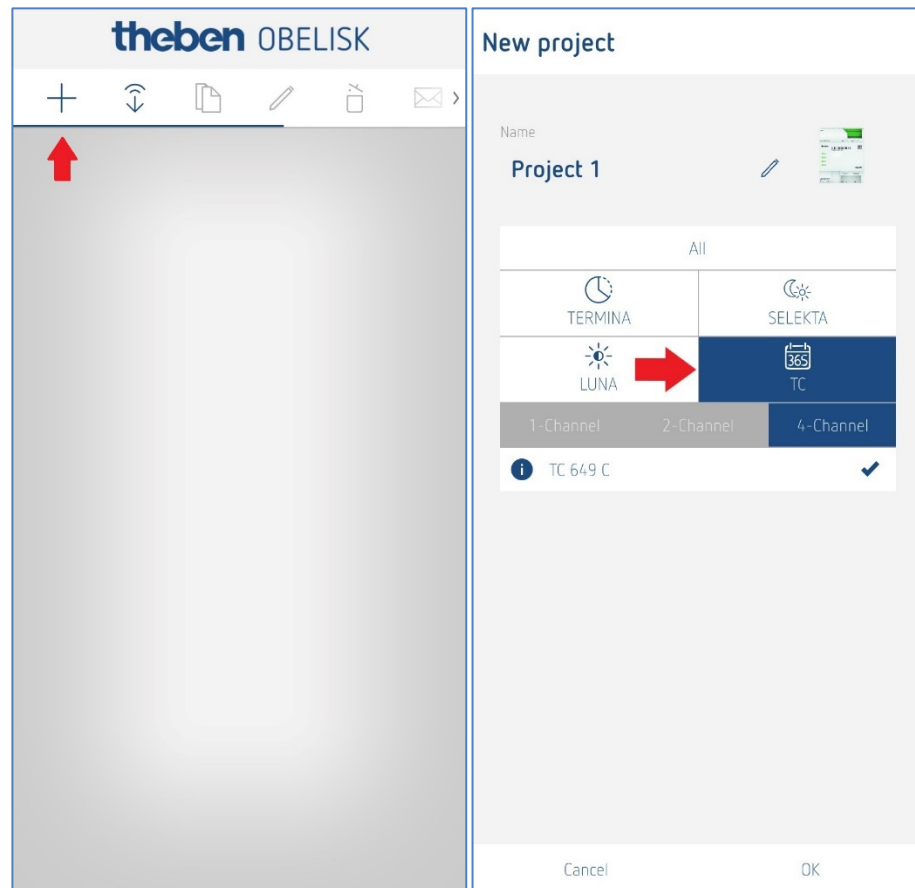
- Create an ot2 file using the Windows OBELISK software.
- Go to **Select ot2 file** in the TC 649 C user interface.
- Click on **Download ot2 file** in order to transfer the ot2 file to the TC 649 C.



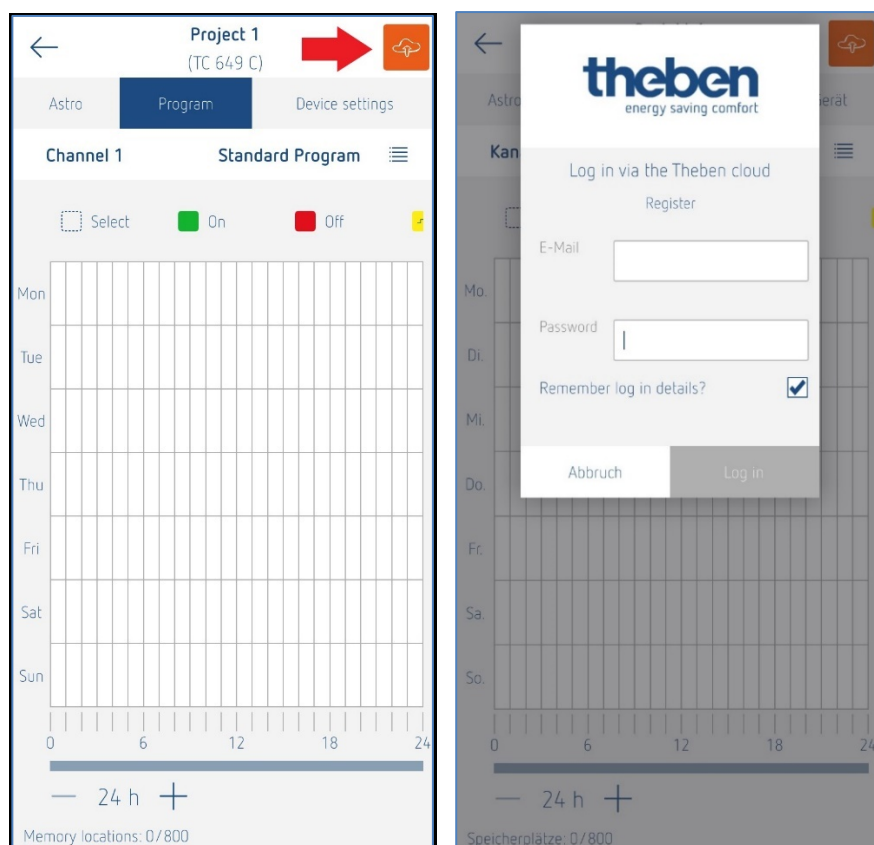
The ot2 file download can take a while. The time required for the download depends on the number of switching times.

Loading ot2 file (switching times) on to device (with iOS or Android)

- Create an ot2 file using the OBELISK top3 app.
 1. Create a new project.
 2. Select TC 649 C.



3. Create switch program.
4. Send switch program to your TC 649 C via the Theben cloud.



6.3.3 Astro offset

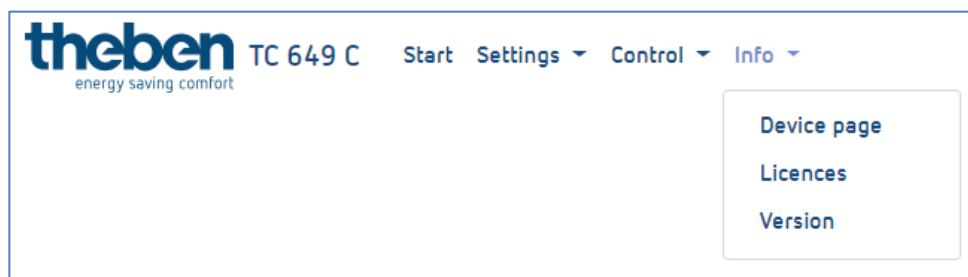
The offset for astro switching times can only be set for channels which use the astro functionality. The astro functionality for the individual channels must be stored in the OBELISK software.

The astro offset can be changed to values within the range -120 minutes to +120 minutes.

Changing the astro offset

- Set the desired offset value for the relevant channel using the slider or the input field.
- Click **Save** to transfer the offset settings to the TC 649 C.

6.4 Info



6.4.1 Home page

This menu takes you to our website. If you need assistance or have any questions, do not hesitate to contact us via the home page.

6.4.2 Licences

The licences for the programs and features used can be downloaded here as a ZIP package.

6.4.3 Version

This displays the software version currently installed on the TC 649 C.

6.5 Log out

To log out of the user interface, click on the **Log out** button in the top right-hand corner of the screen. You will then be redirected to the login page.

6.6 Password forgotten

If you have forgotten your password, click on **Forgotten password?** on the login page. This will redirect you to the page where you can reset your password.

To reset your password, proceed as follows:

- Enter your device's serial number in the serial number field. The serial number will always start with DTHE. Always enter the serial number **with** the letters at the beginning (DTHE).
- Contact Theben Support at **+49 7474 692-369**.
- Enter the Theben code you are given in the Theben code field.
- Then click on **Reset password**.

Once your password has been reset, you will be redirected to the login page.

You can now log in again using the user name **admin** and the password **admin**.

Reset password

You can reset your device password here

Please contact Theben Support to do this. You will find the service hotline number on our website here:

<https://www.theben.de/kontakt/hotline-faqs/>

Serial number: (DTHEXXXXXXXXXX)

DTHE0200000001

Automatically generated random number

30981547

Theben code

12345678|

Reset passwordBack

6.7 Switching language

You have the option of setting a different interface language on the TC 649 C.

- To do this, click on the language in the middle of the screen at the bottom and select your chosen language.

The interface language changes to the desired language.

7 Appendix

7.1 Default settings

Parameter	Default value
User name	admin
Password	admin
IP address	DHCP (assigned automatically)
NTP address	pool.ntp.org
NTP active?	yes

7.2 Troubleshooting

7.2.1 I cannot reach my TC 649 C via the browser.

- Check whether the TC 649 C is connected to the supply voltage.
- Check the network connection between the TC 649 C and the PC or router.
- Check the network configuration of your TC 649 C and/or your PC or router.

7.2.2 How can I tell if my TC 649 C is working properly?

Your TC 649 C is ready for operation if the PWR/TLS LED is flashing and the LED for the web server is lit up permanently.

7.2.3 What can I do if I forget my password?

Reset your password with the help of Theben Support (see the [Password forgotten](#) section for how to do this).

7.3 Specifications

General	
Standards and protocols	TCP/IP, DHCP, NTP
Safety and emissions	CE
Ports	2x 10/100M-RJ45-LAN connection
Physical and environmental	
Operating voltage	Extended operating range 230 V~, -20% +15%
Switching capacity	6 A/250 V AC, $\cos \varphi = 1$ Switching of any phase is permitted. Switching SELV is only permitted if both switching channels in each case, top or bottom, switch SELV.
Minimum load	5 V / 1 mA
Switch contact	μ -contact
Frequency	50 Hz
Power consumption	3 W
Set operating range	-10 °C to +45 °C
Threshold for operation	-25 °C to +55 °C
Threshold for storage and transport	-25 °C to +70 °C
Air humidity	95%, non-condensing
Protection class	II subject to designated installation
Protection rating	IP 30

7.4 Glossary

DNS (Domain Name System) – A service which converts the domain name into IP addresses

Domain name – The "descriptive" name for an Internet or network address

Gateway – Component which establishes a connection between two network systems

IP address – Addresses a device in the network so that it can be reached

DHCP (Dynamic Host Configuration Protocol) – Makes it possible to assign a network configuration to clients via a server

7.5 Use of open source software

This product uses open source software (OSS). A list of the OSS components used and their licence type and version can be found at

<https://www.theben.de/tc-649/>

8 Contact

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