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CycleManager X50

Software manual

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1 Operating instructions

1.1 Using this manual

Two manuals are supplied with the CycleManager X50 software:

- Software manual: The software manual describes how to operate the CycleManager X50 software.
- Hardware manual: The hardware manual describes how to operate the Mastercycler X50 in conjunction with the CycleManager X50 software.

The current versions can be found on our webpage www.eppendorf.com/manuals.

Information on installing the device and possible system configurations can be found in the Mastercycler X50 hardware manual.

Information on installing the software can be found as a PDF file on the supplied data carrier.

1.2 Symbols used

Depiction	Meaning
1. 2.	Actions in the specified order
▸	Actions without a specified order
•	List
Text	Display or software texts
ⓘ	Additional information

1.3 Abbreviations used

PCR
Polymerase Chain Reaction

PDF
Portable Document Format

USB
Universal Serial Bus

2 Safety

2.1 Intended use

The CycleManager X50 is a PC software that allows control and monitoring of the Eppendorf Mastercycler X50 without control unit. The CycleManager X50 is permitted for use in training, routine and research laboratories in the fields of life sciences, industry or chemistry. The product is intended for research purpose only, but not intended for use in diagnostic and therapeutic procedures.

The CycleManager X50 software is to be used only by operators trained in laboratory techniques and procedures.

2.2 Antivirus protection

You can install antivirus software to protect the software against viruses and malware. Each user is responsible for ensuring that the software is not infected with viruses.

- If you have any questions about anti-virus software, contact your administrator or the manufacturer of the antivirus software.

2.3 PC interfaces

To prevent unauthorized access, data loss, sample loss and data misuse, secure the CycleManager X50 against undesired access from the Internet.

- Observe the basic security instructions when working with IT systems.
- Contact your network administrator.
- Use a VPN client if you access the internal network from an external source.

This software uses various network interfaces.

- Do not rename network interfaces during operation.

3 Installation

Information on installing the software can be found as a PDF file on the supplied data carrier.

3.1 System requirements

3.1.1 CycleManager server

- Windows 7 Pro/Enterprise, Windows 10 Pro/Enterprise
- 4 GB RAM
- 2 TB of free hard disk space
- Intel Core i5, 2.8 GHz clock frequency (or higher)
- 1 Ethernet port

3.1.2 Cycler Bridge

A separate computer for the *Cycler Bridge* component is required if the Mastercycler X50 are not in the same subnet as the server with the CycleManager X50 software.

- Windows 7 Pro/Enterprise, Windows 10 Pro/Enterprise
- 1 GB RAM
- 500 GB of free hard disk space
- Intel Core i5, 2.8 GHz clock frequency (or higher)
- 2 Ethernet ports

3.1.3 Client

- Internet browser *Chrome*
- Screen resolution 1366 × 768 pixels (or higher)

4 Operation
4.1 Operating the user interface
4.1.1 Logging in and out as a user

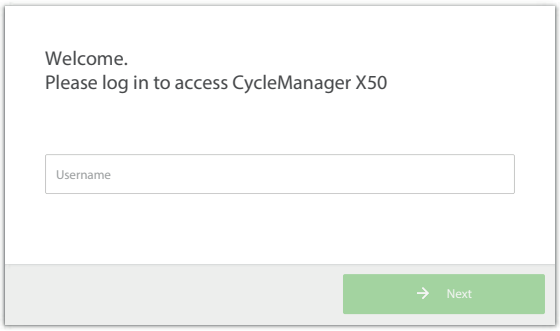
To protect your login data, note the following points:
- Use a secure password.
- Change your password regularly.
- Do not write down passwords.
- Disable the autofill feature in your Internet browser.

1. Start the CycleManager X50 in the *Chrome* Internet browser.

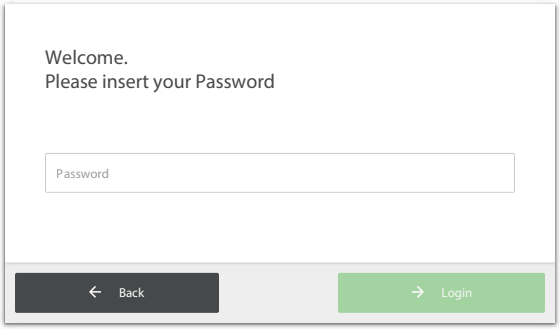
Logging in as a user

2. Call up the login window via the installed client application.

   The login window appears.



3. Enter your user name and confirm with *Next*.



4. Enter your password and confirm with *Login*.

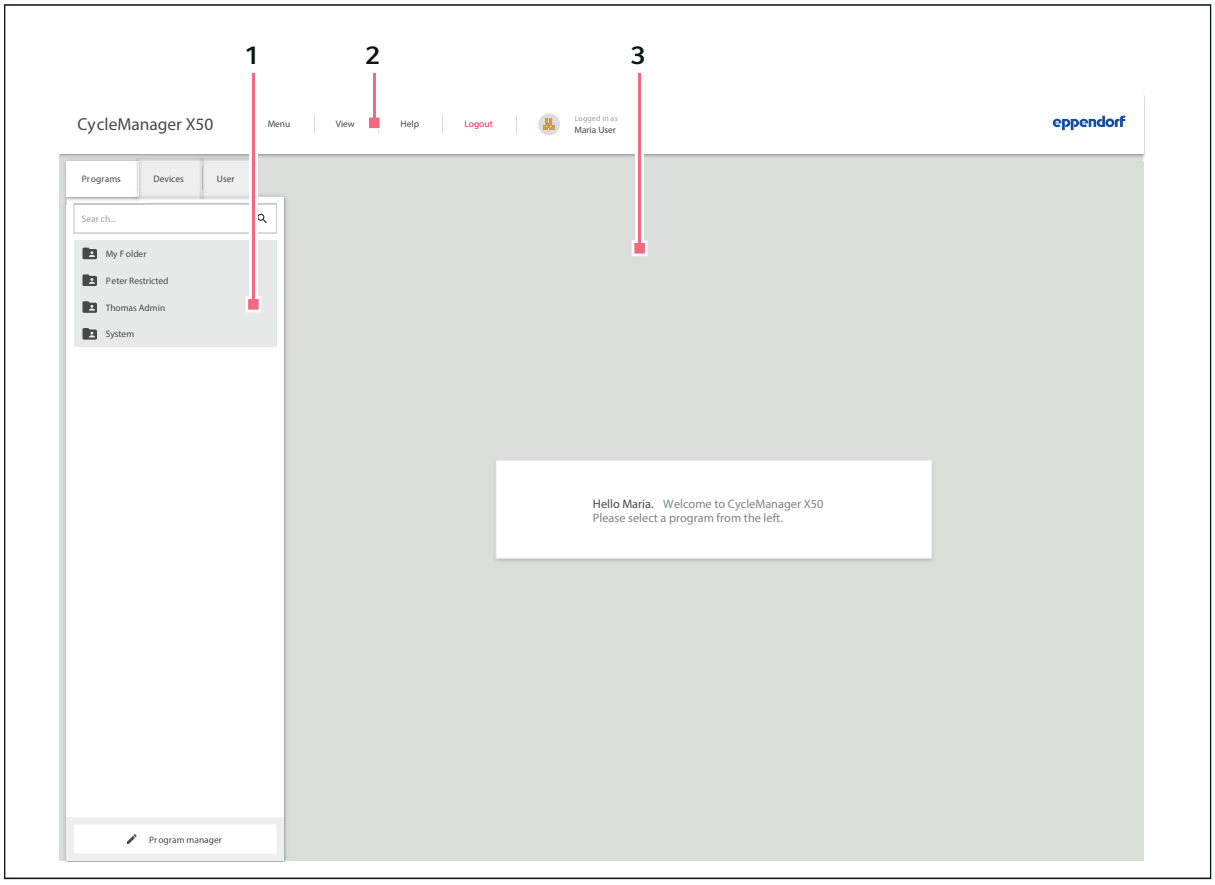
   The user is automatically logged in once the correct password has been entered.
   The start window appears.

Logging out as a user

1. Click on *Logout* in the menu bar.

   The user is logged off and the login window appears again.

4.1.2 Start window

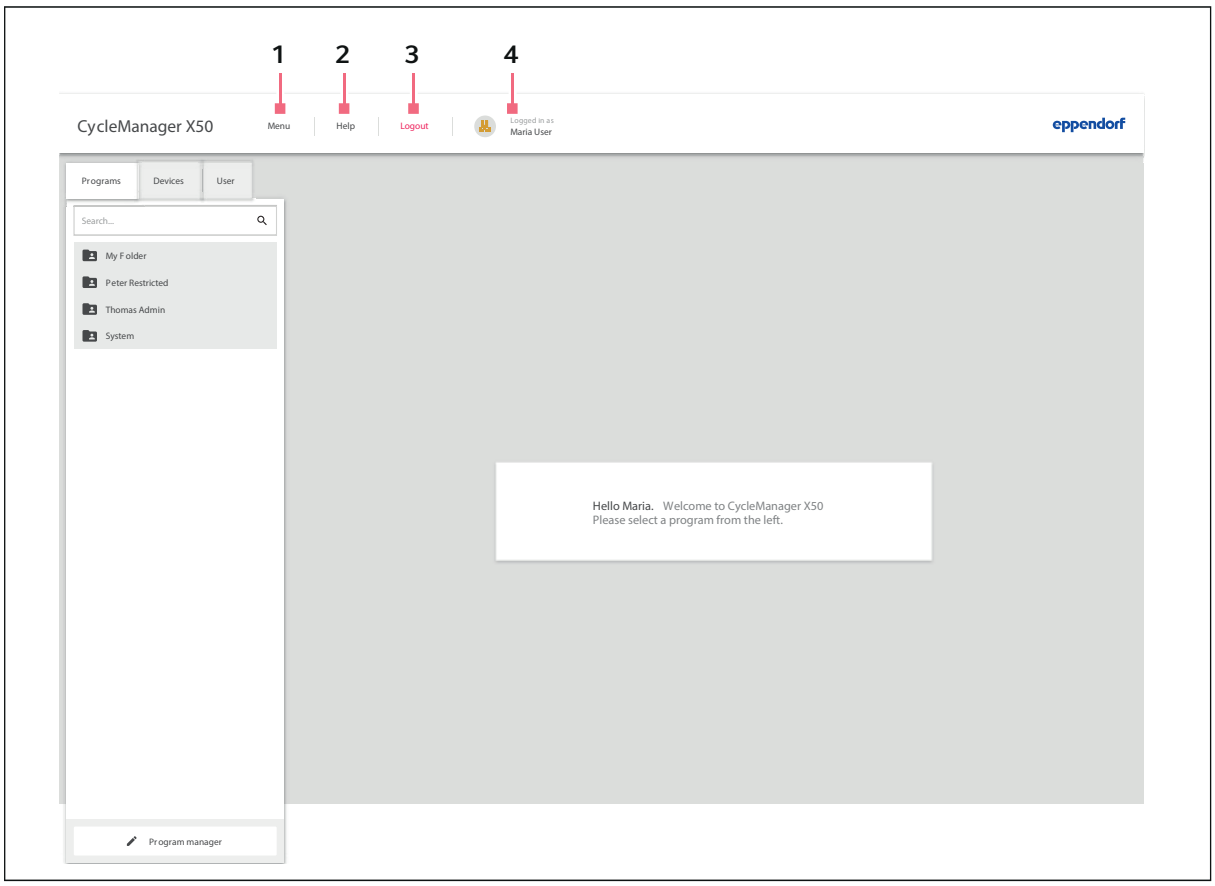


1 Navigation area
The navigation area is used for the management of programs, devices and users. Users with standard rights and administrators can directly access the *Program manager* in the navigation area.

2 Menu bar

3 Editing window
The editing window is used, for example, for editing PCR programs or controlling the connected devices.

4.2 Menu bar



1 *Menu*

2 *Help*

3 *Logout*

4 **Logged-in user**

4.2.1 Calling up the menu

1. Click on the *Menu* button.
   The menu items are displayed.
2. Select the menu item.

4.2.2 Menu > System

- **Info**
  - Software:
    Current software version
  - Server resources:
    Free hard disk space
  - Copyright
  - User:
    Logged-in user

- **Service Contact**
  - Service partner contact details
- **Network**
  - Configure notifications on a mail server. Prerequisite: An e-mail address is entered in the user profile.
    Notifications can be sent in the following cases:
  - The PCR program is in the final hold step.
  - The set service function for a device will soon become necessary.
  - The device is in an error state.
  - Configure the IP address of the bridge server.
    The IP address of the server is entered by default. You will need to enter additional IP addresses manually.

    Note: The interfaces used on the computer with the bridge server must not be renamed during operation.

- **Backup/Restore**
  Backup and restore the complete database (login data, programs, etc.).
- **Logs**
  Server-side notifications or messages

4.2.3 Menu > Settings

Only the administrator can make settings in the *Settings* menu item.

- **Firmware**
  - Firmware status:
    Current firmware version for all the connected devices.
  - Upload date:
    Date when the firmware was last changed.
  - Upload firmware:
    You can search for and select the file with the firmware via the input line. If the update is performed, the new firmware is installed on all the connected devices.

- **Restart**
  - If the *Auto restart* function is active, the currently running program is automatically resumed after a mains/power outage. The *Max interrupt time* parameter defines how long a mains/power outage may last. The current program is not resumed if the device is supplied with power again after this time has elapsed.
- **Service**
  - Reminder functions for self test, verification and assay validation. After the defined limits have been exceeded (intervals and number of program runs), the device can be tested with the corresponding test function. An appropriate test must be carried out depending on the disqualification setting.
  - *Disqualification:*
    Specify conditions when the device is no longer qualified.

  - *Disqualification on software changes* (Mastercycler X50 firmware)
  - *Disqualification on hardware changes*
  - *Disqualification on failed self-test*
  - *Disqualification when verification expires*
- **Assignment**
  - *Assigned to this cyclemanager*:
    All the devices that are assigned to the CycleManager are displayed.
  - *Not assigned to this cyclemanager*:
    All the devices that are recognized by the CycleManager via the network and that are not assigned to this CycleManager are displayed.

4.2.4 Menu > Program manager

Program manager (see *Programming on p. 21)*

4.2.5 Menu > Events

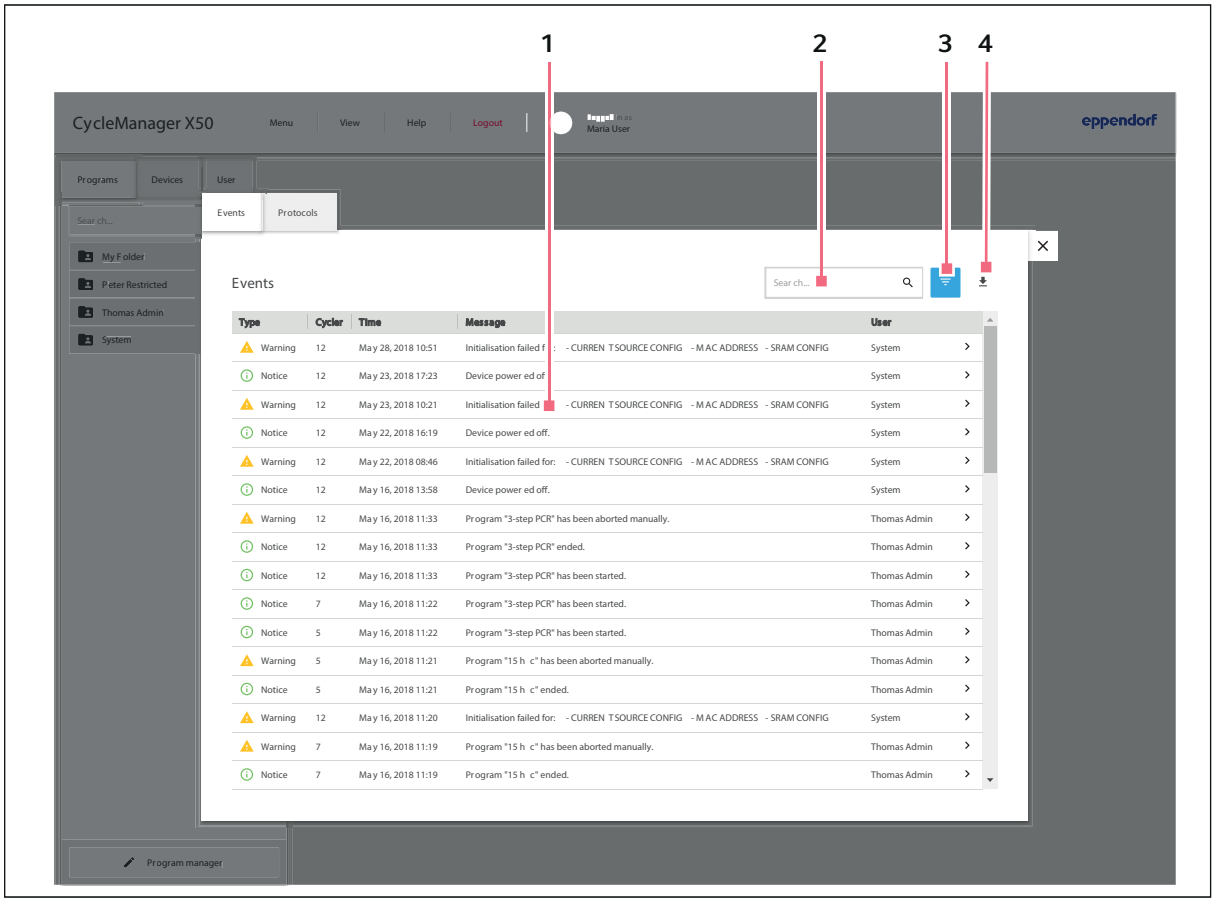


Fig. 4-1: Events

1 Notification or message

2 Search field

3 Filter options

4 Export of the displayed event list to the download folder

Accessing *Events*

1. Access *Menu*.
2. Select the *Events* menu item.

Filtering the event list

3. Click on the button for the filter options.

   The selection with the filter options opens.
   - *Device number*: The number on the device display
   - *Serial number*
   - *Priority*
   - *Time span*
   - *Acknowledgement status*

4. Select the filter option.

   An input mask appears or a selection with further filter options.
5. Complete the input mask or select the filter option.
6. Confirm your entry with *Add Filter* or cancel with *Cancel*.

   The filtered notifications and messages are displayed.

If a filter is enabled, an icon appears next to the filter option.

To disable a filter, click on the icon next to the filter.

Calling more information

- Select a notification or message from the event list.

  The window with the information about the selected notification or message appears.
  The window is closed with *Close*.

Exporting the event list

- Click on the Export button.

  The event list is saved as a CSV file in the download folder.

4.2.6 Menu > Protocols

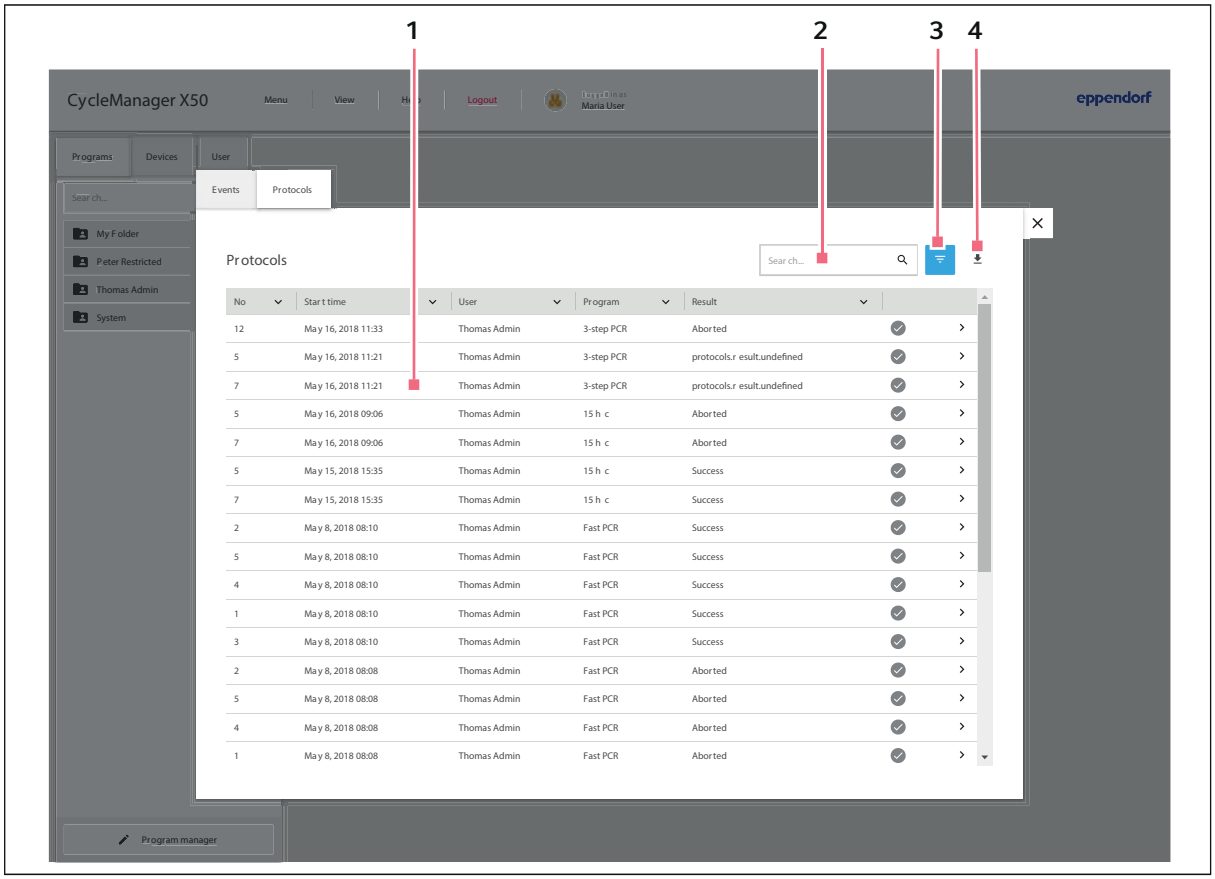


Fig. 4-2: Protocols

1 Protocol entry

2 Search field

3 Filter options

4 Export

Accessing the protocol

1. Call *Menu*.
2. Select the *Protocols* menu item.
   The list of logged program runs appears.

Filtering the protocol entries

3. Click on the button for the filter options.
   The selection with the filter options opens.
   - *Device number*: The number on the device display
   - *Serial number*
   - *Time span*
4. Select the filter option.
   An input mask appears.
5. Complete the input mask.
6. Confirm your entry with *Add Filter* or cancel with *Cancel*.
   The filtered protocol entries are displayed.

If a filter is enabled, an icon appears next to the filter option.

To disable a filter, click on the icon next to the filter.

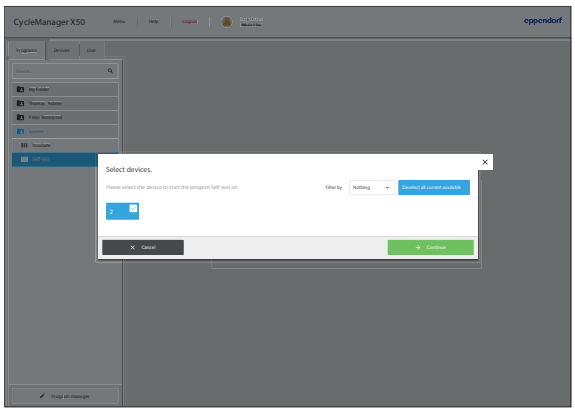
Exporting protocol entries

1. Select the protocol entries for the export.
2. Click on the Export button.
   All the selected protocols are saved in a PDF file in the download folder.
3. To complete the process, confirm the message.

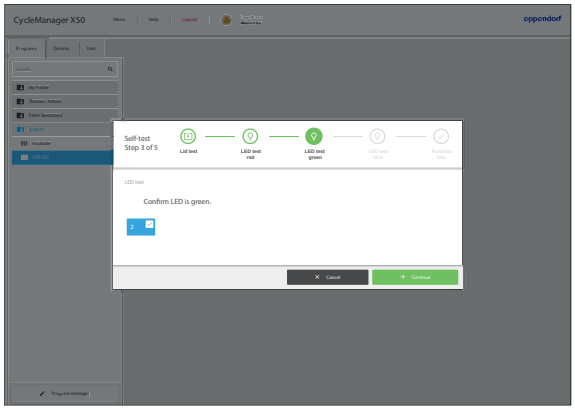
4.3 Self test

Any user can perform a self test.

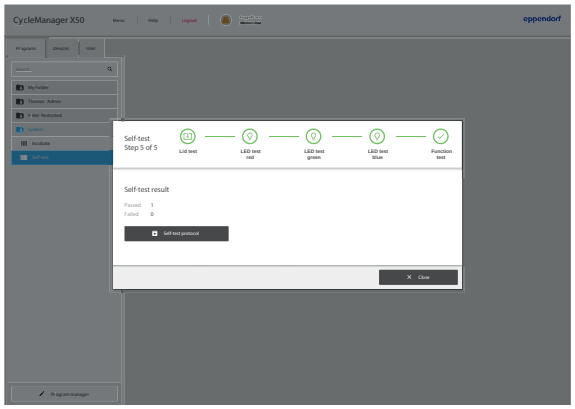
The self test function provides a simple way of testing the correct function of the thermal cycler without any further tools.



1. Call *Self test* under *Programs* > *System*.
2. Select the device.
3. Continue by selecting *Continue*.



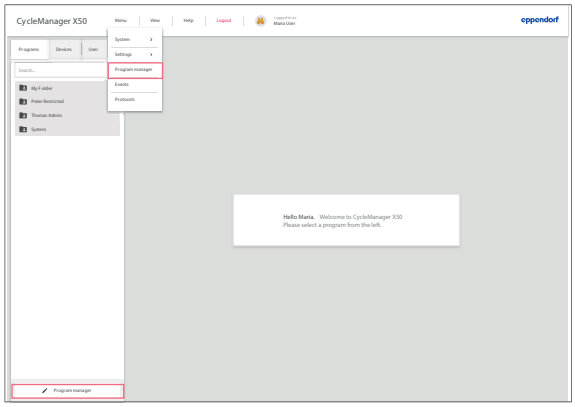
4. Follow the self test instructions.



5. You can save the results of the self test as a PDF file in the download directory with *Self-test protocol*.
6. End the self test with *Close*.

Self test performed by the service technician: A hardware change log is output in addition to the results of the self test.

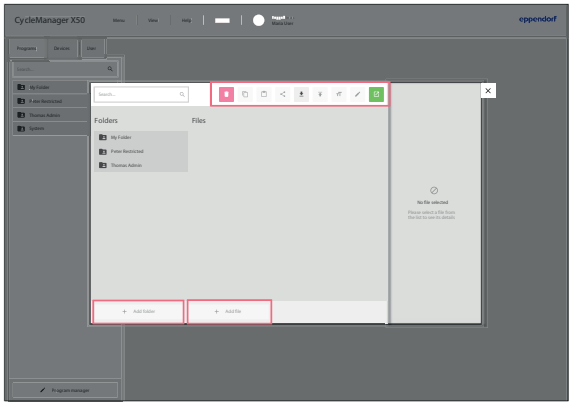
5 Programming
5.1 Overview of the *Program Manager*
5.1.1 Accessing the *Program Manager*



- On the home screen, call the *Program Manager*.
  The window with the *Program Manager* is displayed.

The *Program Manager* can also be called in the *Menu*.

The available folders and programs are displayed depending on the user rights.
A separate folder is predefined for the service technician's user account. This folder is only visible to the service technician.



Toolbar with editing functions

- *Delete* button: Folders or your own programs can be deleted depending on the user rights.
- *Copy* button: Copy programs
- *Paste* button: Paste programs
- *Share* button: Share programs with other users
- *Export* button: Copy programs to the download folder
- *Import* button: Import programs. Programs cannot be imported if the program name contains special characters or umlauts.
- *Rename* button: Rename folders or programs
- *Set as template* button: Save programs as a template
- *Edit* button: Open and edit programs
- *Open* button: Open programs

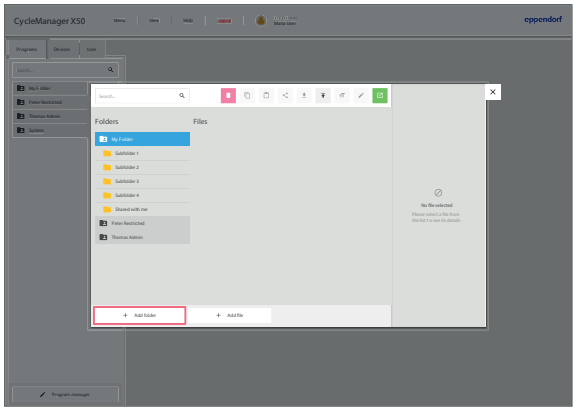
Folders

- *My folder* folder: Folders for your own subfolders and programs
- *Shared with me* folder: Subfolders and programs can be opened by other users depending on the user rights.

Adding folders and programs

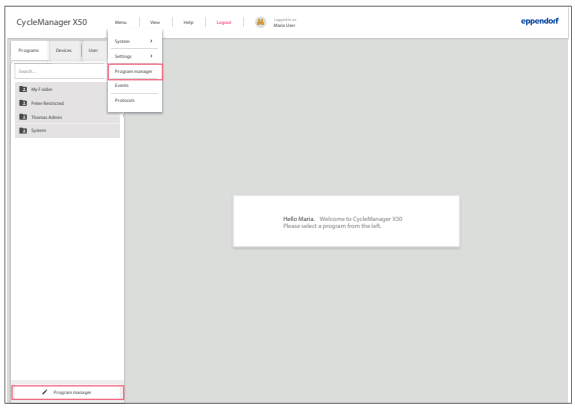
- + *Add folder*: Create a new folder
- + *Add file*: Create a new program

5.2 Creating a new folder

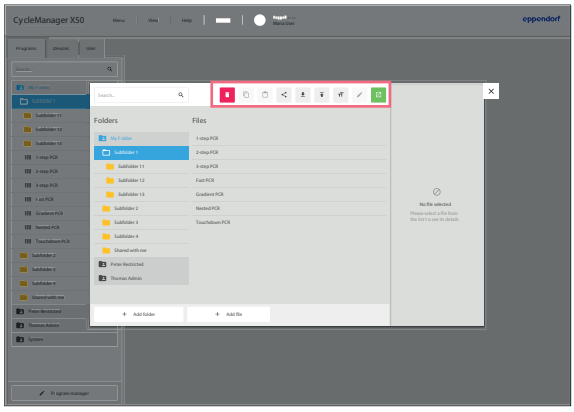


1. Select the folder, e.g., *My folder* in the folder structure.
2. Click on the + *Add folder* button.
   An input mask appears.
3. Enter a name for the folder.
4. Confirm your entry.
   The new folder is displayed under *My folder*.

5.3 Administration of folders



1. On the home screen, tap on the *Program Manager*.
   The options for editing the folders are displayed. Functions that cannot be selected are displayed in a light font.



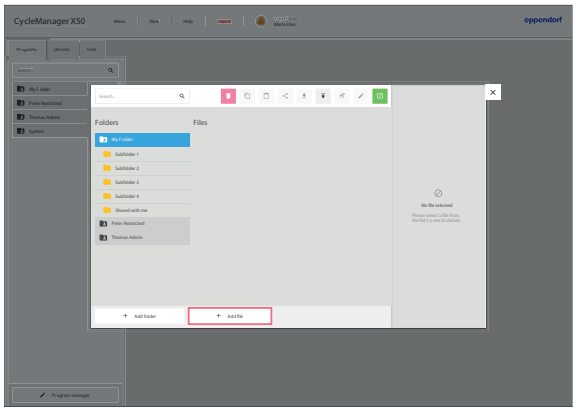
2. Select a folder from the folder structure.
3. Click on the editing function.
   The window with the selected editing function opens.

The following editing functions for folders are available:

- *Delete* button: Folders can be deleted depending on the user rights
- *Share* button: Share your own folders with other users
- *Import* button: Import folders from the download directory
- *Rename* button: Rename your own folders
- *Open* button: Open the selected folder

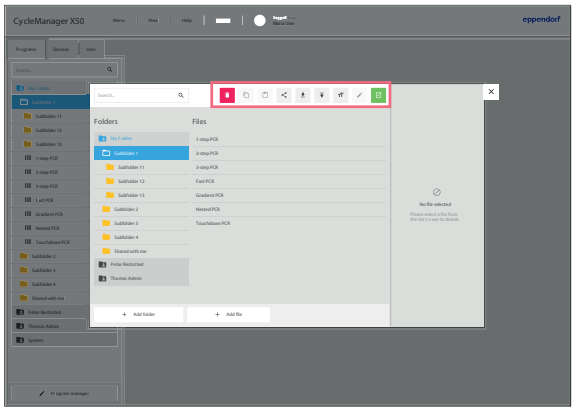
5.4 Creating a new program

You can create and save up to 1000 programs.



1. Select the storage location for the new program in the folder structure.
2. Click on the + *Add file* button.
   An input mask appears.
3. Select the template.
4. Enter a name for the program.
5. Confirm the entry with *Add*.
   The new program is saved in the selected folder.

5.5 Administration of programs

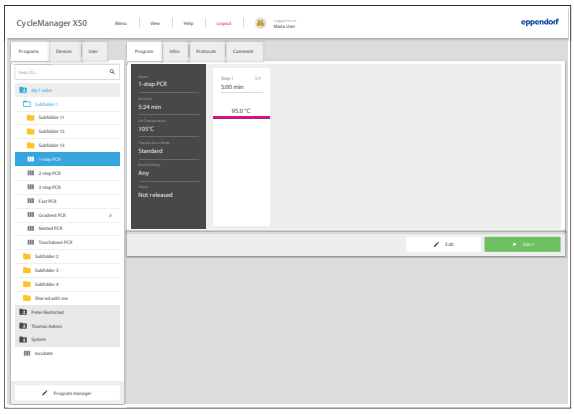


1. Select a program.
   The options for editing the programs are displayed. Functions that cannot be selected are displayed in a light font.
2. Click on the editing function.
   The window with the selected editing function opens.
3. Confirm the changes.
   The changes are saved.

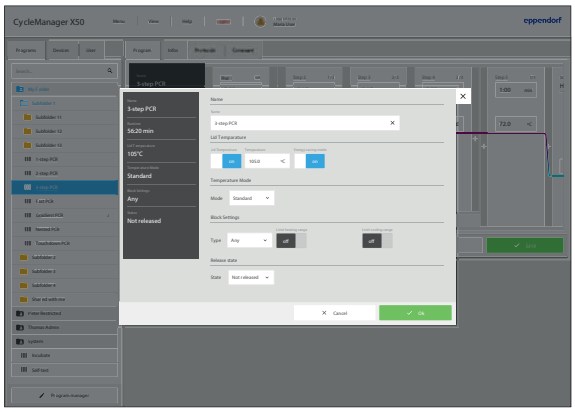
The following editing functions for programs are available:

- *Delete* button: Delete the program
- *Copy* button: Duplicate the program
- *Share* button: Share your own programs with other users
- *Export* button: Copy the program to the download directory
- *Import* button: Import the program
- *Rename* button: Rename the program
- *Edit* button: Edit the selected program
- *Open* button: Open the selected program

5.6 Adjusting program settings



1. Select a program.
2. Click on *Edit* .
   The window with the header settings and the program steps is displayed.
3. Click with the left mouse button in the header settings.
   The editing window for the header settings is displayed.



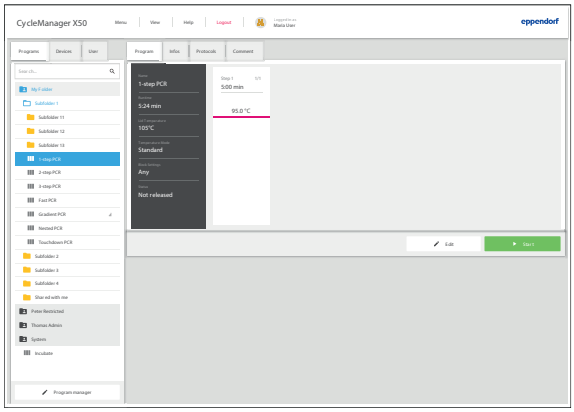
- *Name*: Program name
- *Lid Temperature*: Lid temperature settings
  - *Lid Temperature*: Activate or deactivate the heated lid
  - *Temperature*: Set the lid temperature (37 °C to 110 °C)
  - *Energy-saving mode*: If the function is enabled, the heated lid switches off when the block temperature falls below 15 °C.
- *Temperature Mode*: Block temperature control mode
  - Fast (≤ 10 µL)
  - Intermediate (10 µL–20 µL)
  - Standard (20 µL–50 µL)
  - Safe (> 50 µL)
- *Block Settings*: Set the block type and limit the heating and cooling rates. The block type must be set for the correct gradient temperatures to be displayed.
- *Release State*: Select the program status.

Programs with the status "released" cannot be changed and can also be used by users with restricted user rights.
The status "released" can be withdrawn.

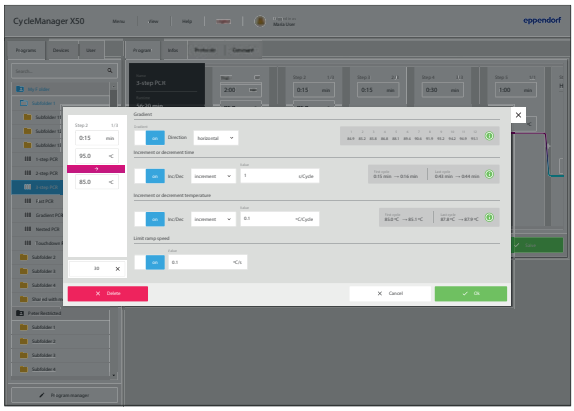
▸ Release programs after detailed examination only.

5.7 Editing a program

5.7.1 Selecting the program step



1. Select a program.
2. Click on *Edit* .
   The window with the header settings and the program steps is displayed.

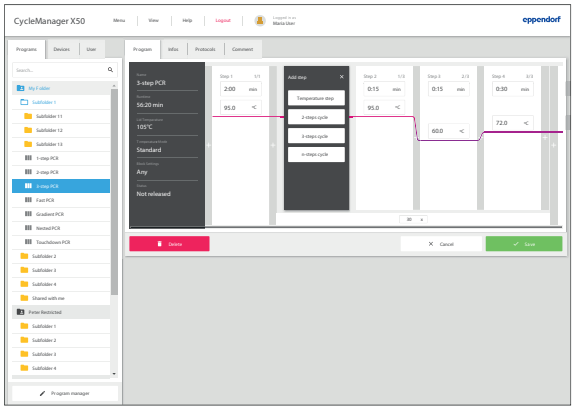


3. Select the column with the program step to be edited.
   The window with the editing options appears.

- *Gradient*: Set the gradients. Prerequisite: The block type has been correctly selected.
- *Increment or decrement time*: Incremental change of the holding time to the next cycle
- *Increment or decrement temperature*: Incremental change of the temperature to the next cycle
- *Limit ramp speed*: Set the temperature control speed of the thermoblock

5.7.2 Inserting a program step

To the right and left of a program step there is a button with the plus sign (+). This button can be used to add further program steps.



1. Click on the + button to the left or right of a program step.

   A selection menu appears. You can select the following program steps depending on the previous or subsequent program step:
   - *Temperature*: Individual temperature step with adjustable block temperature and holding time.
   - *2-Steps Cycle*: Cycle program step with 2 temperature steps and an adjustable number of repetitions (1 to 99).
   - *3-Steps Cycle*: Cycle program step with 3 temperature steps and an adjustable number of repetitions (1 to 99).
   - *n-Steps Cycle*: Cycle program step with up to 40 temperature steps and an adjustable number of repetitions (1 to 99).
   - *Hold*: Temperature step with adjustable block temperature and indefinite holding time. The set temperature is maintained until the program is manually resumed or ended.

2. Select a new program step.

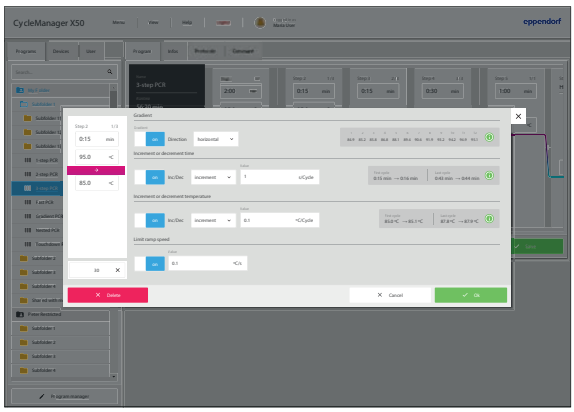
   The new program step is inserted.

3. Set all the parameters for the program step such as block temperature, holding time or number of repetitions.
4. Insert further program steps if required.
5. Save the finished program with *Save*.

5.7.3 Setting gradients

You can use a gradient step to optimize the specificity and yield in PCR reactions. A vertical or horizontal increasing temperature gradient is generated during the holding time. The temperature control rates before and after the gradient step are constant over the entire thermoblock.

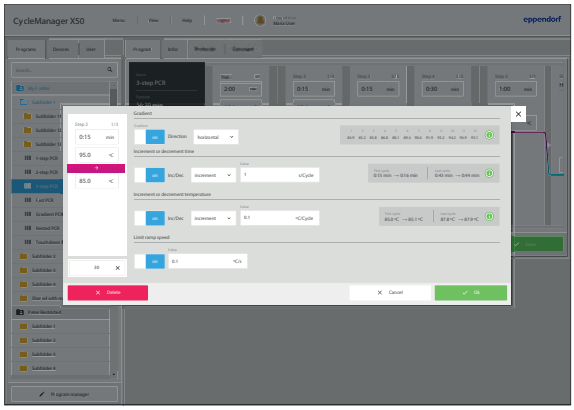
The gradient function is only available if the *Block Settings* in the header settings for the device have been correctly selected. If *Any* is set, the gradient temperatures for the aluminum block 96 are displayed.
The gradient temperature can be set between 30 °C and 99 °C. If a gradient temperature below 30 °C was defined, an error message appears. The gradient spread is max. 30 °C



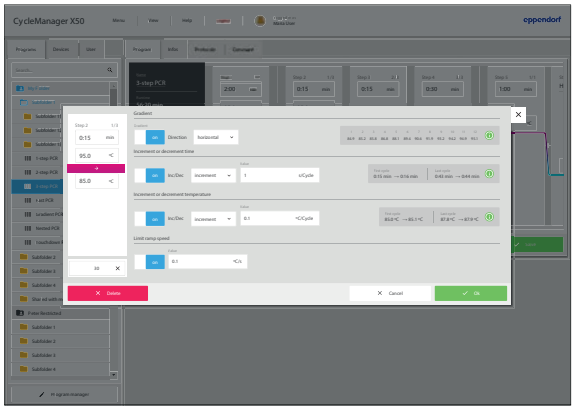
1. Select the column with the program step to be edited.
2. Switch on the function with *Gradient*.
3. Select a horizontal or vertical gradient function.
4. Define the lower and upper temperature in the left column.
5. Confirm the changes with *Ok*.

5.7.4 Defining increments and decrements

You can only define increments and decrements for program steps with several cycles.



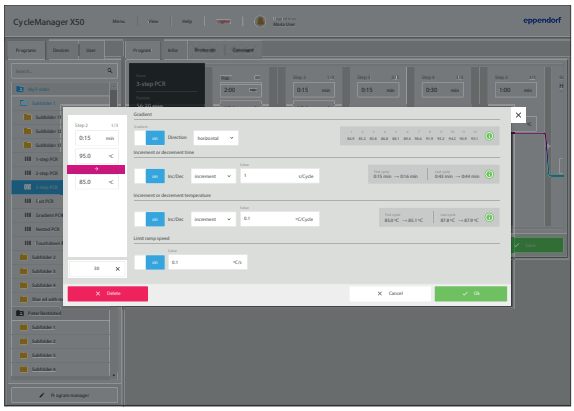
1. Select the column with the program step to be edited.
2. Switch on the function with *Increment or decrement time*.
3. Select the increment or decrement for the cycle time.
4. Enter the cycle time under *Value*.
   The duration of the next cycle will be increased or reduced by the set value.
   Adjustable from 00:01 min to 01:00 min in 1 s increments.



5. Switch on the function with *Increment or decrement temperature*.
6. Select the increment or decrement for the block temperature.
7. Enter the block temperature under *Value*.
   Adjustable within the block limits of 4 °C and 99 °C in 0.1 °C increments.
8. Close the window.
9. Confirm the changes with *Ok*.

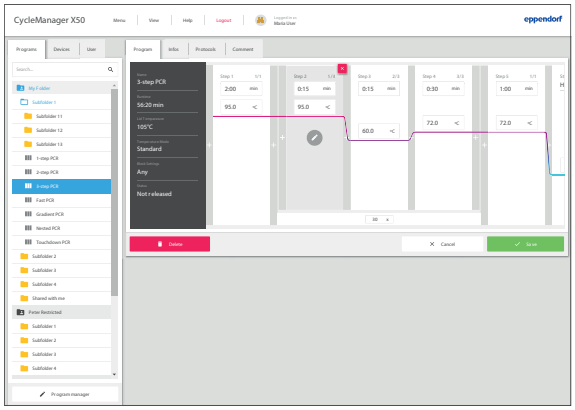
5.7.5 Defining the ramp

The ramp can be used to set the temperature control speed of the thermoblock.



1. Select the column with the program step to be edited.
2. Switch on the function with *Limit ramp speed*.
   The ramp that leads to the selected step is limited.
3. Enter the value for the ramp rate (cooling) under *Value*.
   The maximum ramp rate depends on the cooling rate.
4. Confirm the changes with *Ok*.
5. Save the finished program with *Save*.

5.7.6 Deleting a program step

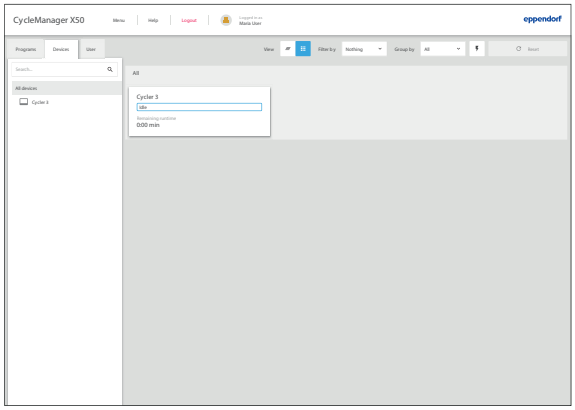


1. Select the column with the program step to be deleted.
2. Delete the program step with the **x** button.

6 Device management

6.1 Devices in the navigation area

6.1.1 Devices in the overview

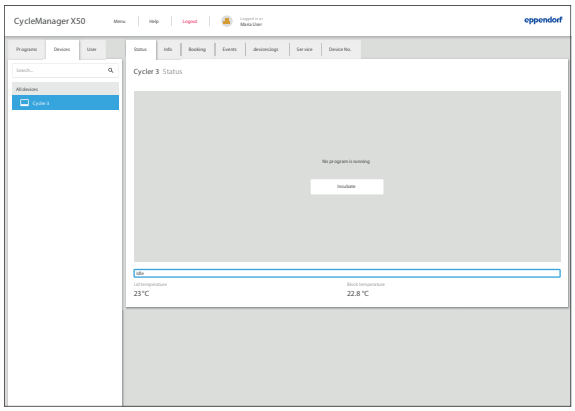


- In the navigation area, select the *Devices* tab.

  All the devices that are assigned to the CycleManager X50 are displayed under *All devices*. You can adjust the view. Filter options:

  - *View:*
    - Booking overview
    - Device overview
  - *Filter by:*
    Filter the device selection
  - *Group by:*
    Group the devices in the view
  - Save the filter settings
  - Reset the filter settings

6.1.2 Devices in the single view



1. Select the device in the selection list.

   A window with information about the selected device appears.

6.1.3 Device Information

Status
- Information about the current status of the selected device.

Info
- Device information
  - Name
  - Block
  - Lid type
  - Serial number
  - Firmware
  - Last calibration
  - Last verification
  - Last self test
  - Last assay validation
  - Last user
  - Last program

Booking
- Booking system. The selected device can be booked with the **+** icon in the upper right corner:
  - Select the date in the calendar sheet and enter the start time.
  - Enter the duration of the booking.
  - Confirm the booking with *Save*.

  No further bookings can be created by other users for the booked period.
  In the calendar, in addition to the booking for the device, another booking is generated for the program which the user starts on the device on the booked date.

Events
- Notifications or messages that relate to the selected device are displayed.
  Filtering the event list (see p. 16)

devices.log
- A list with all the activities of the device or the server that affect the selected device.

Hardware (only as a service technician)
- Device information for the authorized service technician
- Reset the run time counter and cycle counter of the thermoblock
- Reset the run time counter of the heated lid

Service
- Conduct a self test
- Sensor values (only as a service technician)
- *Hardware changelog* (only as a service technician)

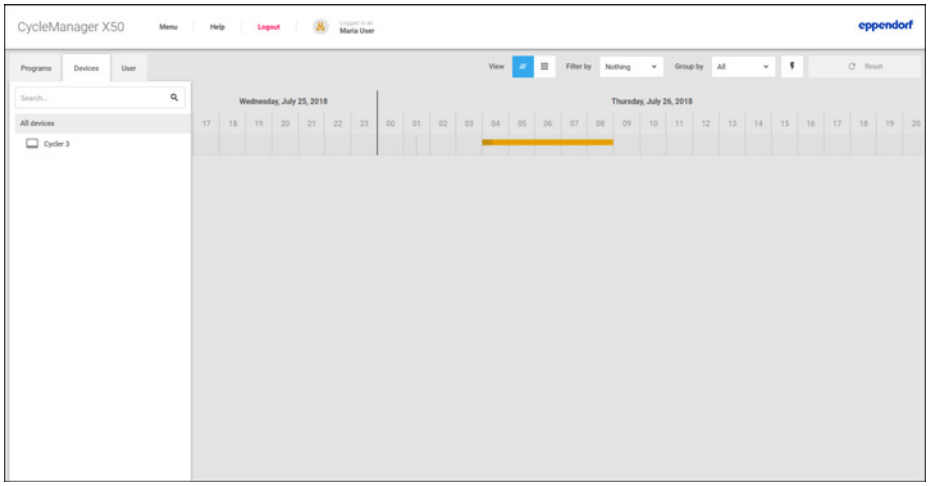
Assignment
- Number on the device display
- *Blink* button: The status lamp on the device flashes white. This allows the user to identify the device more quickly.

6.2 Booking of devices

Booking of programs (see *Starting a program at a scheduled time on p. 47)*

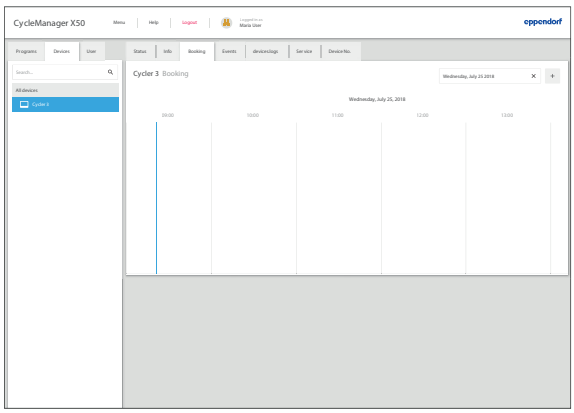
6.2.1 Displaying the bookings for all devices

The booking overview displays the bookings for all devices.
You cannot create any bookings in the overview.
You can open, edit and delete existing bookings via the overview.



1. In the navigation area, select the *Devices* > *All devices* tab.
2. Go to the booking overview by using the *View* button.

6.2.2 Opening the booking page for devices



1. In the navigation area, select the *Devices* tab.
2. Select the device in the selection list.
   The booking window for the selected device appears.
3. Select the *Booking* tab.
   The booking view appears.

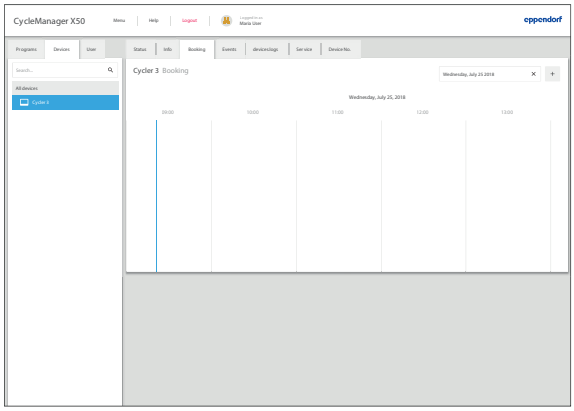
6.2.3 Navigating in the booking view

Bookings are displayed in yellow in the booking view.

Currently running programs are displayed in blue.

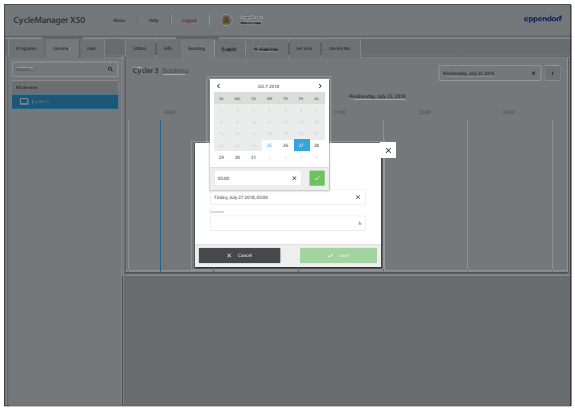
The booking view provides the following time views:

- Yearly view with months
- Monthly view with days
- Daily view with hours



- Click on the top line in the booking view.
  The view changes to a more detailed time representation, e.g., from the monthly view to the yearly view.
- Click on an entry (month, day) in the header of the timeline.
  The view changes to a less detailed time representation, e.g., from the monthly view to the daily view.
- Move the timeline to the left or right using the arrow keys or with the left mouse button held down.
- Double-click on a booking.
  The booking is opened and can be edited or deleted.

6.2.4 Creating a new booking

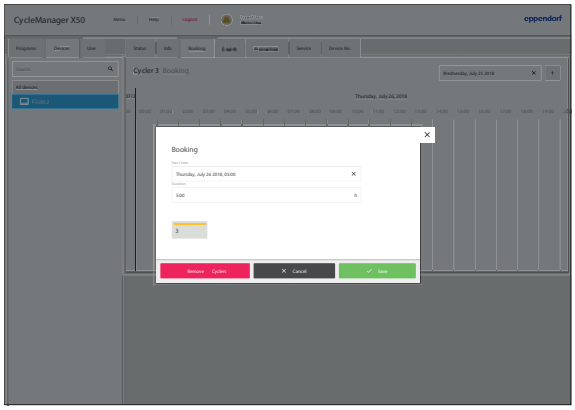


1. Click on the **+** icon in the upper right corner of the booking view.
   The input window for bookings appears.
2. Click in the *Start time* input line.
   The calendar sheet for the current month appears.
3. Select the date in the calendar sheet and enter the start time.
4. Enter the duration of the booking in the *Duration* input line.
5. Confirm and save the booking with *Save*.
   No other user can book or start the booked device during the booking period.
   Programs cannot continue to run when a new booking starts.

The booking expires if the device is not started within 15 minutes from the time of booking. If a program with *Start after lid movement* is started on the booked device during the booking period, the booking is extended until the lid is closed. Both users will be notified if there is a scheduling conflict with a subsequent booking.

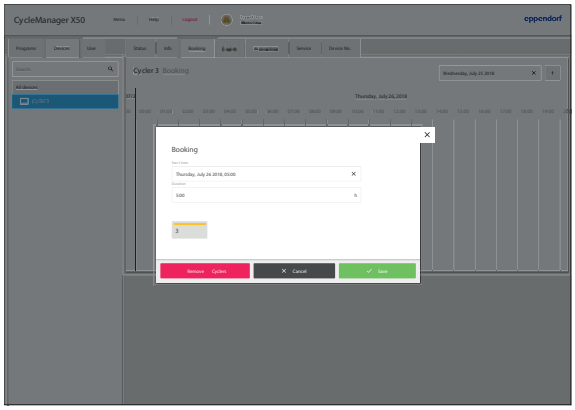
In the calendar, in addition to the booking for the device, another booking is generated for the program which the user starts on the device on the booked date.

6.2.5 Editing a booking



1. In the booking view for a device, open a booking by double-clicking on it.
   The window for editing the booking appears.
   Alternatively, the booking can also be opened in the overview of all bookings.
2. Change the booking.
3. Select the devices.
4. Confirm your changes with *Save*.
   The booking is changed for the selected devices.

6.2.6 Deleting a booking



1. In the booking view for a device, open a booking by double-clicking on it.
   The window for editing the booking appears.
   Alternatively, the booking can also be opened in the overview of all bookings.
2. Select the devices.
3. Click on the *Remove Cyclers* button.
   The booking is deleted for the selected devices.

7 User administration

7.1 The user administration concept

User administration can be used to organize accesses to PCR programs. There are three user roles:

- Administrator
- User with standard rights
- User with restricted rights

There is a separate user role for service technicians.

7.1.1 Administrator

The administrator has additional rights:

- Access to network functions and device management.
- Access to user administration

7.1.2 User with standard rights

A user with standard rights is allowed to use the CycleManager X50 without restrictions, create, rename, move and delete programs and folders.

7.1.3 User with restricted rights

A user with restricted rights is allowed to use the CycleManager X50 with restrictions, e.g., select, start and stop a program that has been shared with him and that is released.

7.1.4 Service technician

The authorized service technician has access to special service functions.

7.2 Editing user accounts

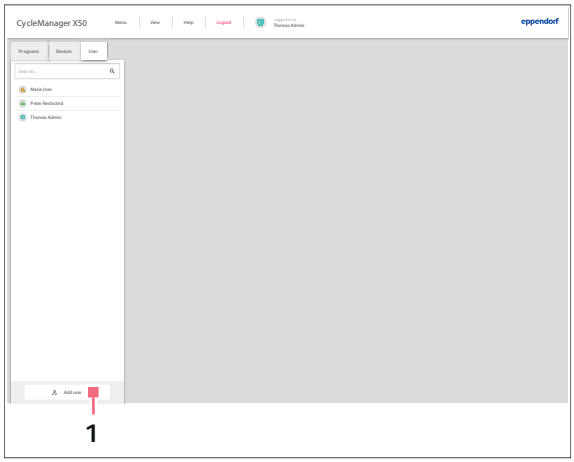
NOTICE! Data loss due to loss of the administrator password
The administrator is only able to change his password using his access data. If the administrator's access data is lost, changes are no longer possible in the user administration or the system settings.
In this case, the administrator password will have to be reset by an authorized service technician.

- ▸ Create a second user account with administrator rights.
- ▸ Keep the administrator password secure.

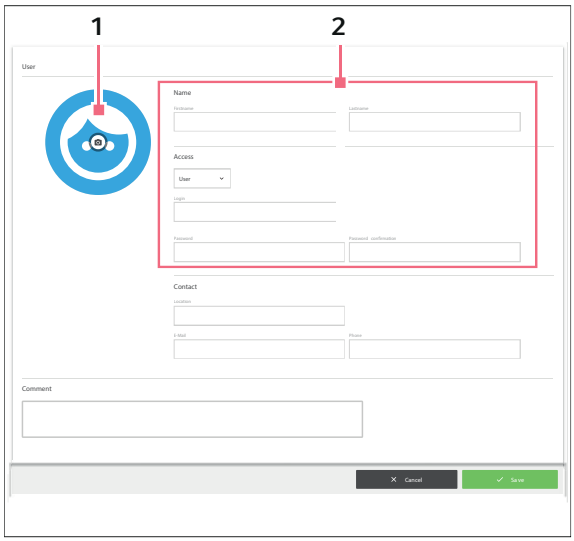
7.2.1 Creating a user account

A user account can only be created as an administrator.

The user account for the service technician is pre-installed and does not need to be created. This special user account cannot be deleted or changed.



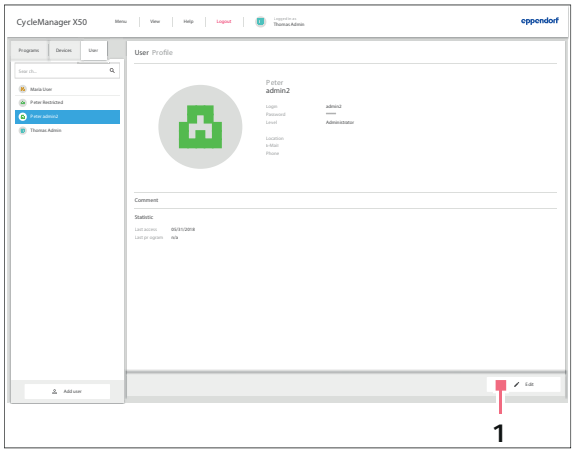
1. On the *User* tab, click on the *Add user* (**1**) button.
   An input mask appears.



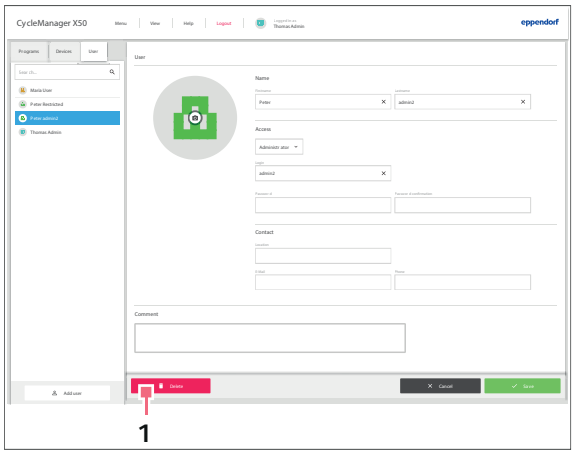
2. Complete the mandatory fields (**2**) and assign access rights.
3. Import an optional photo (**1**).
4. Optional: Complete the contact details and comments.
5. Confirm your entries with *Save* or cancel with *Cancel*.
   The user account has been created.

7.2.2 Editing user accounts

Users with restricted rights or standard rights can only edit their own entries. They can also change their own password.
Administrators can change the access rights for each user account, reset the password or delete user accounts.
Authorized service technicians can reset the password for each user account.



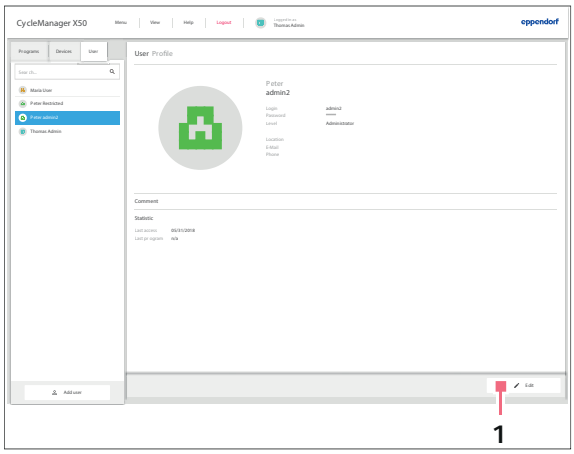
1. On the *User* tab, select a user.
2. Click on the *Edit* (**1**) button.
   An input mask appears.



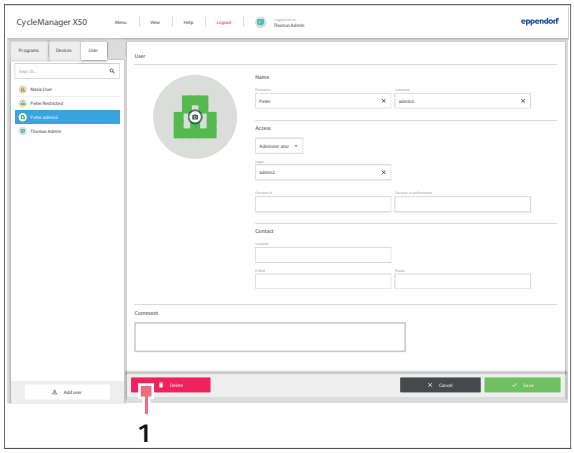
3. Enter the changes in the user profile.
4. Assign the access rights.
   - Administrator
   - User
   - Restricted User
5. Confirm the changes with *Save*.
   The changes are saved.

7.2.3 Deleting a user account

User accounts can only be deleted by the administrator.



1. On the *User* tab, select a user account to be deleted.
2. Click on the *Edit* (**1**) button.
   An input mask appears.



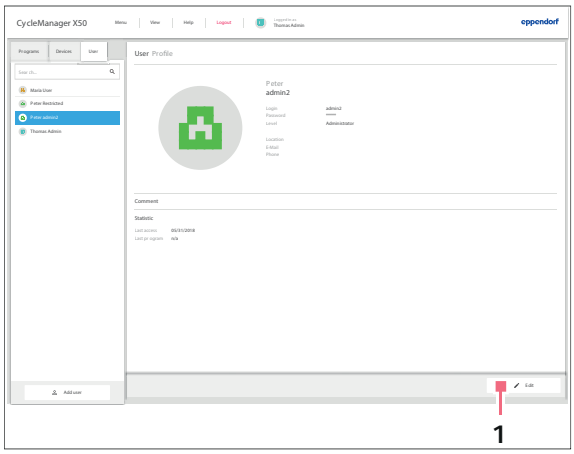
3. Click on the *Delete* (**1**) button.
4. Confirm the deletion of the user account with *Delete*.
   The user account is deleted.

7.2.4 Resetting the password for a user account

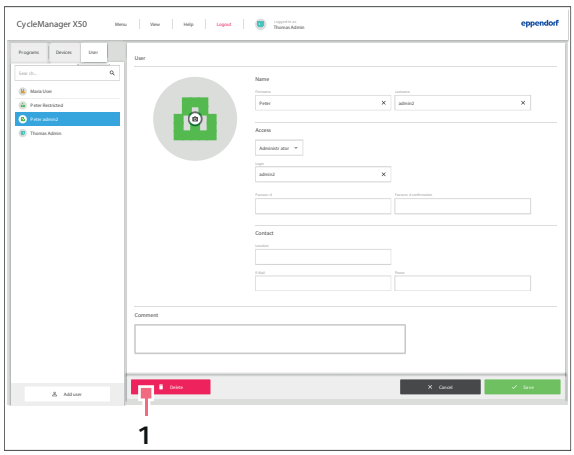
If the user has forgotten his password, the administrator can create a new password.

The administrator is only able to change his password using his access data. If the administrator's access data is lost, changes are no longer possible in the user administration. In this case, the administrator password will have to be reset by an authorized service technician.

▶ Create a second user account with administrator rights.



1. On the *User* tab, select a user account.
2. Click on the *Edit* (**1**) button.
   An input mask appears.



3. Re-enter the password.
   The new password will be requested the next time the user logs in.
4. Confirm the entries with *Save*.

8 PCR run
8.1 Loading the thermoblock
8.1.1 Selecting the sample tubes

WARNING! Biohazard due to unsuitable reaction vessels, plates and lids.
Unsuitable reaction vessels, plates and lids will get damaged in the Cycler. This will release sample material.

- Only use reaction vessels, plates and lids that meet the requirements specified in the operating manual.

Approved sample tubes for devices with a 96-well thermoblock

The thermoblock can be loaded with the following sample tubes:

- 0.1 mL PCR strips
- 0.2 mL PCR tubes and PCR strips
- 96-well PCR plates

Approved sample tubes for devices with a 384-well thermoblock

The thermoblock can be loaded with the following sample tubes:

- 384-well PCR plates

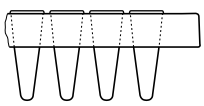
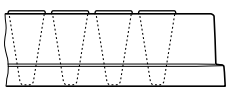
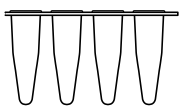
Approved sample tubes for devices with High Pressure Lid

Devices with a High Pressure Lid can be loaded with the following sample tubes:

- 96-well PCR plates

Compatible PCR plate types

The following PCR plate types are compatible.

Semi-skirted PCR plate	Skirted PCR plate	Non-skirted/unskirted PCR plate
		
PCR plate with surrounding half-edge.	PCR plate with a surrounding edge.	PCR plate without any surrounding edge.

Requirements for sample tubes

The sample tubes must meet the following requirements:

- Temperature resistance at least 120°C
- Exact fit in the thermoblock

Maximum volumes

The possible sample volumes can vary depending on the tubes used.

For devices with a 96-well thermoblock
- PCR plates: max. 100 µL
- 0.1 mL PCR strips: max. 100 µL
- 0.2 mL PCR tubes and PCR strips: max. 100 µL

For devices with a 384-well thermoblock
- PCR plates: max. 25 µL

8.1.2 Inserting the sample tubes

WARNING! Biohazard due to sample material directly in the thermoblock.

- Do not fill sample material directly into the thermoblock.
- Only use reaction vessels, plates and lids that meet the requirements specified in the operating manual.

WARNING! Biohazard when tempering with the heated lid open.

Observe the following notes:

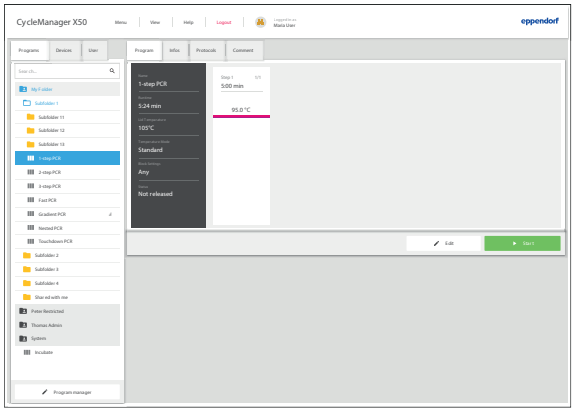
- Never run a program with an empty thermoblock. Always equip the thermoblock with PCR plates or PCR tubes when running a program.
- Place the tubes or strips into the center of the thermoblock and ensure that they are symmetrically positioned.
- Load the thermoblock with at least 5 tubes. If you have fewer reaction batches, also add empty tubes so the thermoblock is loaded with at least 5 tubes.

Very soft PCR tubes may become deformed at high temperatures. To prevent deformations:
- Increase the number of empty sample tubes in the thermoblock.
- Reduce the temperature of the heated lid .
- Use original Eppendorf PCR consumables. Eppendorf PCR consumables are optimally suited for the device.

8.2 Selecting a program

8.2.1 Selecting a program

Restricted user: The programs that can be used by users with restricted rights are displayed in the *Shared with me* folder.



1. In the navigation area, select the *Programs* tab.
   The available folders with programs are displayed depending on the user rights.
2. Open the *My folders* folder.
   Your own folders are displayed.
3. Open one of your own folders.
   Your own available programs are displayed.
4. Select a program.
   The editing window displays information about the selected program.

8.2.2 Information about programs

Further information can be called via the tabs in the editing window of a selected program.

Program

A display of the set parameters and the current program release status. The individual program steps of the selected program are displayed next to the parameters.

- *Edit*: Adjust the program
- *Start*: Start the program

Infos

Organizational information about the selected program.

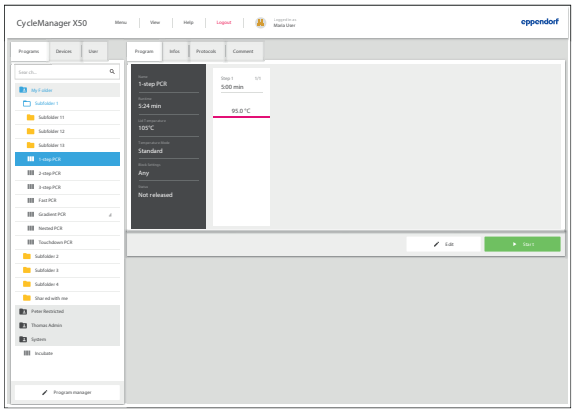
Protocols

All the recorded protocols for the selected program.

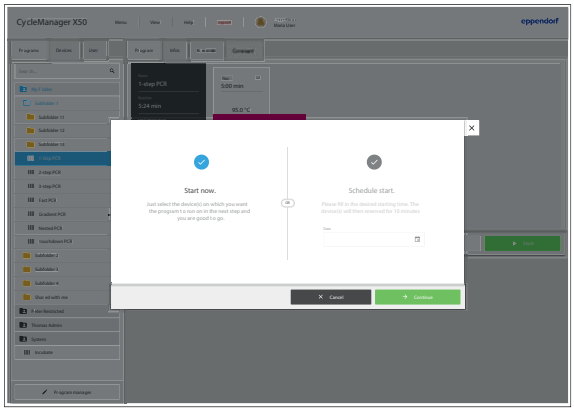
Comment

Your own comments that are edited via the *Edit* button.

8.3 Starting a program

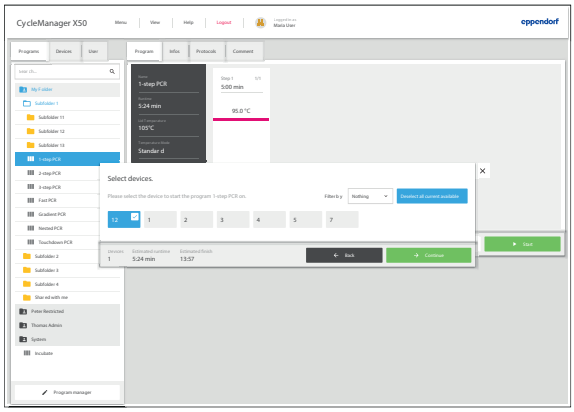


1. Select the program on the *Programs* tab.
   The editing window displays information about the selected program.
2. Click on the *Start* button.

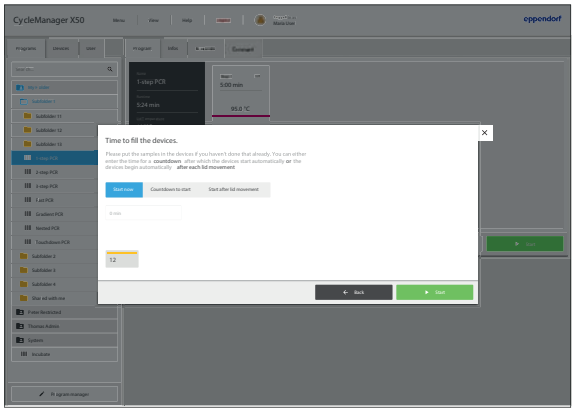


3. Select *Start now*.
4. Continue by selecting *Continue*.
   All the devices that are currently connected to the CycleManager X50 are displayed.

With *Schedule start* the program start can be scheduled at a later time and the devices can be booked depending on the program.



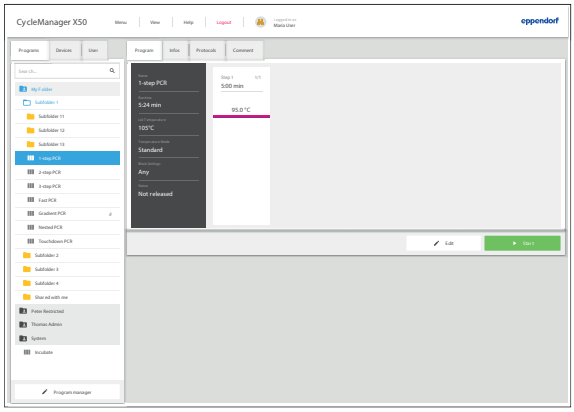
5. Select the device.
   You can select the devices manually. It is possible to select several devices.
   You can use the *Select all current available/ Deselect all current available* button to select or deselect all the available devices.
   The selection can be restricted via a drop-down list using the filter function.
6. Continue by selecting *Continue*.



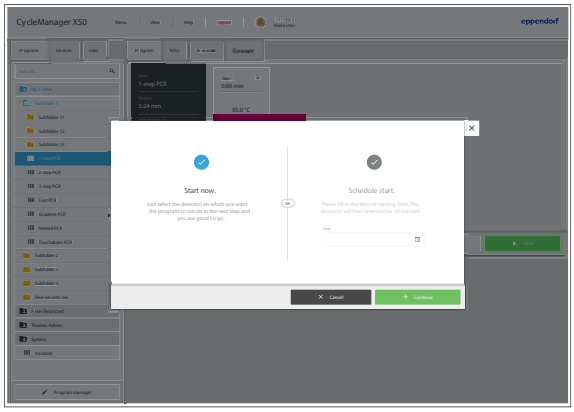
7. Define the start time.
   The following options are possible:
   - *Start now*: The program starts immediately.
   - *Countdown to start*: The program starts after a defined period of time (1 min - 120 min).
   - *Start after lid movement*: The program starts after the device lid is closed.
8. Start the program.

8.4 Starting a program at a scheduled time

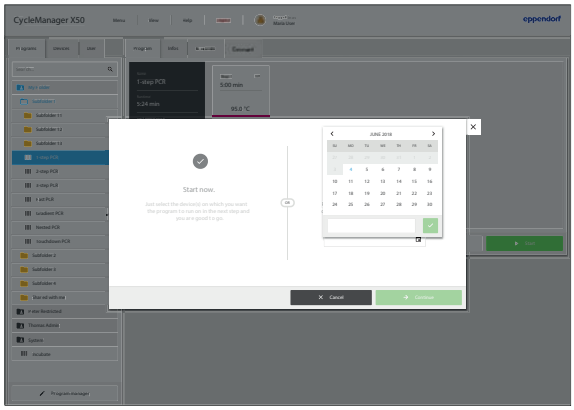
8.4.1 Reserving a device



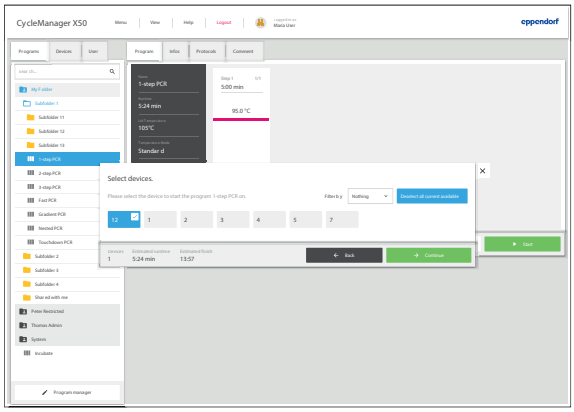
1. Select the program on the *Programs* tab.
   The editing window displays information about the selected program.
2. Click on the *Start* button.



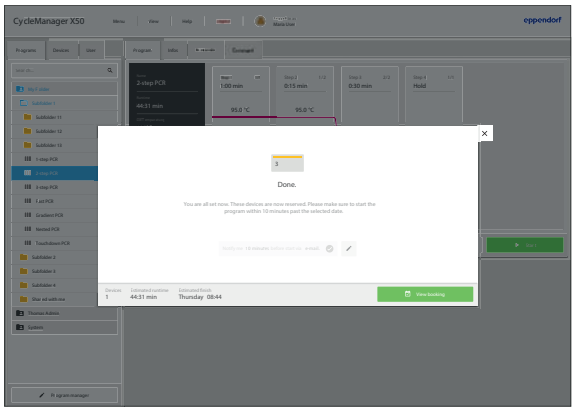
3. Select *Schedule start*.
4. Click in the *Date* input line.
   A calendar sheet for the current month appears.



5. Select the date in the calendar sheet and enter the start time.
6. Confirm the booking and continue with *Continue*.
   All the devices that are connected to the CycleManager are displayed.



7. Select the device.
   You can select the devices manually. It is possible to select several devices.
   If there is an overlap, the device cannot be selected and the message *Status: Device is booked* appears.
   You can use the *Select all current available/ Deselect all current available* button to select or deselect all the available devices.
   The selection can be restricted via a drop-down list using the filter function. The filter function can also be used to find and book devices that are offline.
8. Continue by selecting *Continue*.
   All the information about the reservation of the device is displayed.



9. Define the type and time of the notification.

Possible types of notification:

- E-mail
- Notification function from *Chrome*

10. Close the window.
    The reservation has been completed.

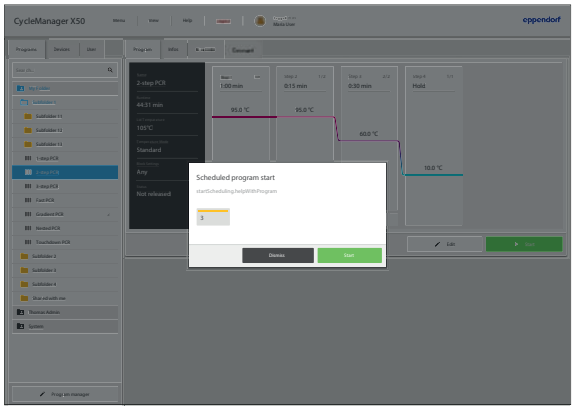
8.4.2 Starting the program at a scheduled time

Prerequisites

- The device has been reserved

A window appears at the scheduled time.

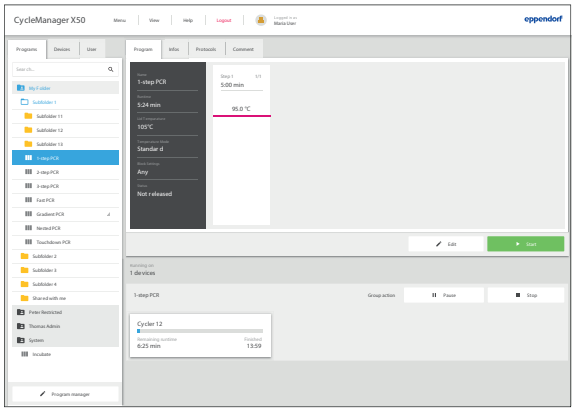
If the program is not executed within 15 min, the reservation will be deleted and the device released.



1. Load the thermoblock.
2. Close the heated lid.
3. Click on the *Start* button.
   The program is executed on the reserved device.
   You can cancel your reservation by selecting *Dismiss*.

8.5 Pausing and resuming a program

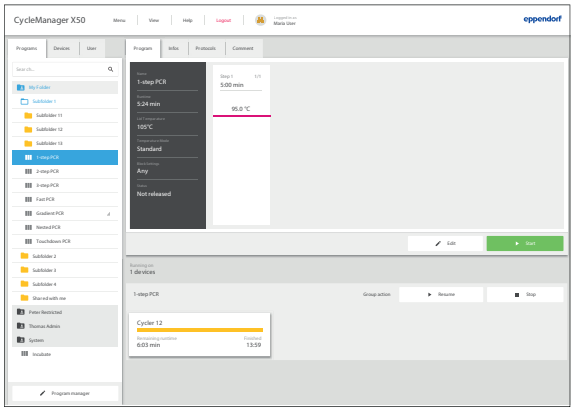
You can execute the *Pause*, *Stop* and *Resume* functions in the device overview and in the single view.



1. Select a program on the *Programs* tab.
   If the selected program is running on one or more devices, the current information about this program and the devices is displayed in the lower half of the screen.
   - Number of devices on which the program is executed.
   - Program name
   - Device number on which the program is executed.
   - Time remaining
   - Time at which the program is due to be finished.
2. Move the mouse pointer to the display of a device. An overlay appears with the *Pause* and *Stop* buttons.

Group actions: With the *Pause* and *Stop* buttons, these functions are executed for all devices on which the selected program is running.

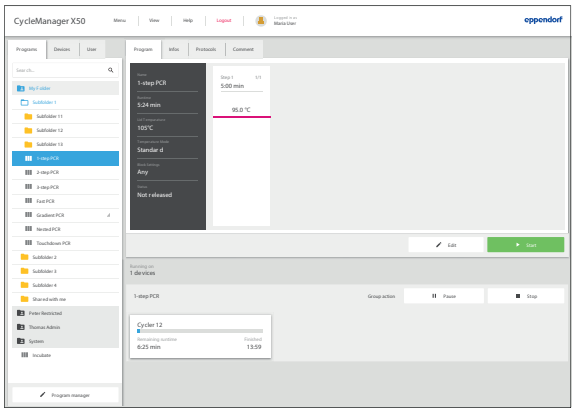
3. Click on the *Pause* button.
   The program is paused.



4. Click on the *Resume* button.
   The program is resumed.

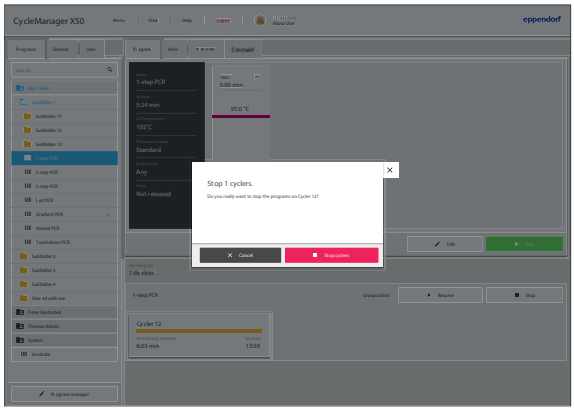
8.6 Aborting the program

You can execute the *Pause*, *Stop* and *Resume* functions in the device overview and in the single view.



1. Select a program on the *Programs* tab.
2. Move the mouse pointer to the display of a device. An overlay appears with the *Pause* and *Stop* buttons.
3. Click on the *Stop* button.
   A window with a confirmation prompt appears.

Group actions: With the *Pause* and *Stop* buttons, these functions are executed for all devices on which the selected program is running.



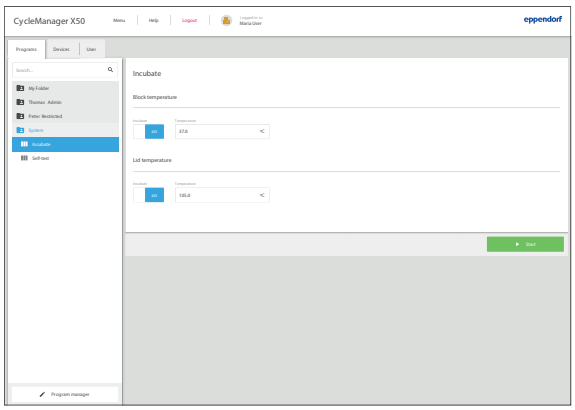
4. Confirm the program termination with *Stop cyclers*.
   The program is ended.

8.7 Incubate

The thermoblock and the lid can be temperature controlled independently of a PCR run.

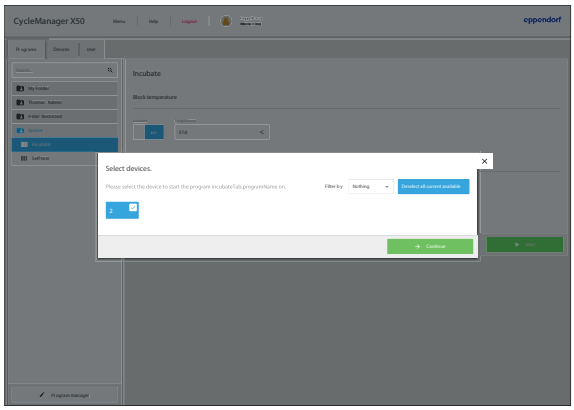
The *Incubate* function can be set separately for all the connected devices or for all the devices together.

Accessing the *Incubate* function



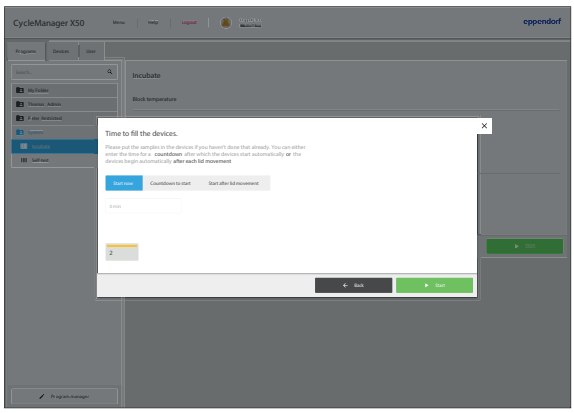
1. Access the *Incubate* function under *Programs* > *System*.
2. Set the temperature for the thermoblock.
3. Activate the *Incubate* function for the thermoblock.
4. Set the temperature for the lid.
5. Activate the *Incubate* function for the lid.
6. Confirm the settings with *Start*.

Assigning a device



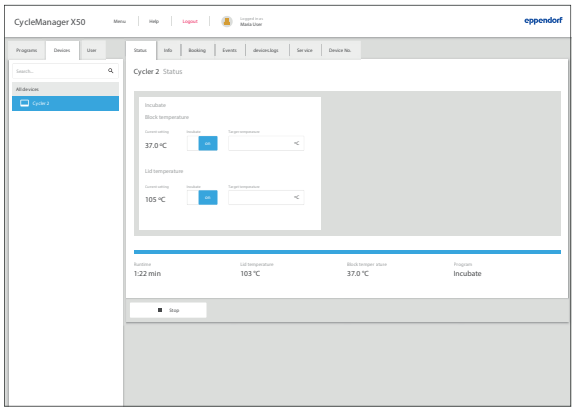
7. Select one or more devices.
8. Continue by selecting *Continue*.

Starting the *Incubate* function



9. Define the start time.
   The following options are possible:
   - *Start now*: The program starts immediately.
   - *Countdown to start*: The program starts after a defined period of time (1 min - 120 min).
   - *Start after lid movement*: The program starts after the device lid is closed.
10. Start the *Incubate* function.

Ending the *Incubate* function



11. Select one or more devices.
12. Use *Stop* to end the *Incubate* function.

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