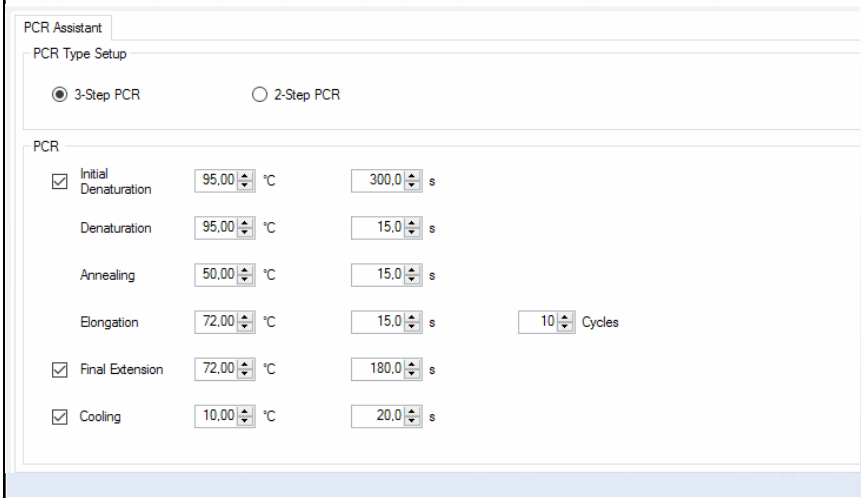
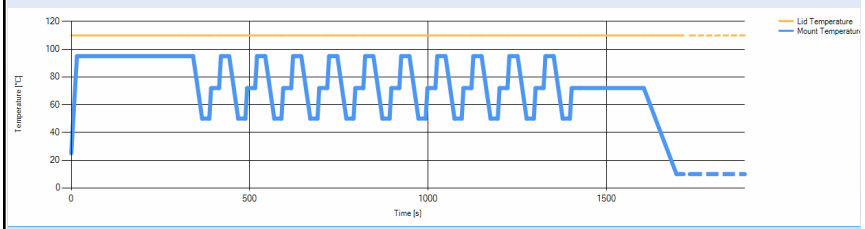
inheco
industrial heating & cooling





ODTC® Script Editor

For ODTC® Script Editor 3.0.0

► **User´s Manual**

Doc ID: 900738-002
January 2017

INHECO Industrial Heating and Cooling GmbH reserves the right to modify their products for quality improvement. Please note that such modifications may not be documented in this manual.

This manual and the information herein have been assembled with due diligence. **INHECO GmbH** does not assume liability for any misprints or cases of damage resulting from misprints in this manual. If there are any uncertainties, please feel free to contact **sales@inheco.com.** → How to contact INHECO, page 4.

TABLE OF CONTENTS

1 IMPORTANT NOTES

1.1. General Information

Read the user instructions completely. The manual explains how to use the INHECO ODTC® Script Editor (in the following Script Editor) to edit temperature profiles for the ODTC® (all versions of ODTC®96 and ODTC®384). INHECO recommends to use the Script Editor 3. The combination of Script Editor 3 with ODTC® firmware version 225 and SiLA version 6046 or higher provide the maximum of performance.

To transfer the temperature profiles into the ODTC® it is necessary to use a SiLA Process Management Software (PMS) provided by a robotic system provider. In case of ODTC® testing in stand alone condition (without integration) INHECO can assist you with a SiLA PMS test tool. Please contact **techhotline@inheco.com** if you need further information.

Missing or insufficient knowledge of the manual leads to loss of liability against INHECO GmbH.

This manual is part of the ODTC® and must be retained until the unit is disposed of and must be passed on with the device when the unit is taken over by a new user.

Manual instructions must be followed in order to ensure safe handling of the unit.

Security-related warnings in this manual are classified as following:

- The signal word NOTE stands for general precautionary measures that have to be taken to avoid issues with the software or your methods. There is no health risk or risk of damaging the device due to the use of this software.

Contact INHECO in case there are any uncertainties of how to operate or how to handle the ODTC® Script Editor.

Your opinion about this manual provides us with valuable insights on how we can improve this document. Please do not hesitate to direct your comments to **sales@inheco.com**, → How to contact INHECO, chapter 1.3 below.

1.2. Explanation of symbols

Symbol	Explanation
·	Bullet points indicate steps of instructions.
-	Hyphens refer to enumeration.
→	Arrows indicate: “refer to” and are mostly active links

1.3. How to contact INHECO

INHECO GmbH	
Address	Fraunhoferstr. 11 82152 Martinsried Germany
Telephone - Sales	+49 89 899593 120
Telephone - Techhotline	+49 89 899593 121
Fax	+49 89 899593 149
E-Mail - Sales	sales@inheco.com
E-Mail - Technical - Hotline	techhotline@inheco.com
Website	www.inheco.com

Technical Support & Trouble Shooting Instructions:

http://www.inheco.com/service/technical-support.html

1.4. Abbreviations and Glossary

Symbol	Explanation
SiLA	Standard in Laboratory Automation
PMS	Process Management Software
ODTC®	On Deck Thermal Cycler
FWCS	Firmware Command Set
Temp init step	Temperature initialization step
.exe	executable file
°C	Degree Celsius
LAN	Local Area Network
Gbit/s	GigaBit per second
MB	MegaByte

DEFINITION

Project:	Comprises all edited temperature initialization steps, standard and PCR methods in one project file
Temp init step:	Is mandatory to set the ODTC® mount and lid to a defined start temperature.
Method	Set of temperature steps (programming of simple temperature profiles, no PCR profiles)
PCR	Programming of PCR temperature profiles

2 PRODUCT DESCRIPTION

2.1. Intended Use

The Script Editor allows to create temperature profiles for the ODTC® only. The temperature profiles have to be programmed in xml format and then transferred/loaded to the ODTC® via the Ethernet connector. The xml files must be created by using the ODTC® Script Editor as the ODTC® Script Editor automatically compiles a xml file with the correct control parameters for the ODTC®.

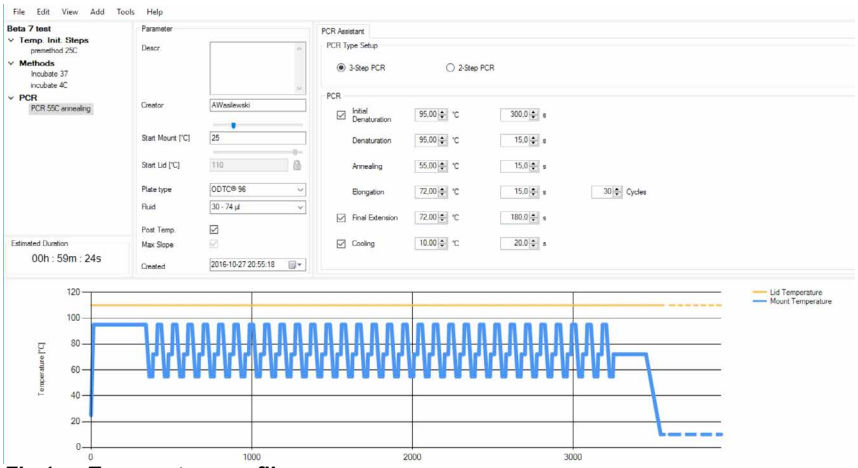


Fig.1: Temperature profile

After editing the desired temperature profiles, the xml files must be transferred to the ODTC® via the PMS of the liquid handling workstation.

The ODTC® needs to be addressed by a SiLA PMS (Process Management System) for operation. For the integration into SiLA based liquid handling workstations the already existing workstation SiLA protocol can be used to operate the ODTC®.

For non SiLA based workstations an additional driver must be written which translates the workstation protocol into a SiLA based protocol. The description of the command set and the SiLA communication protocol are part of the scope of delivery of the ODTC®. Please contact your workstation provider for the integration.

Script Editor Version 3 offers some additional features (release 12/2016). For creating new methods INHECO strongly recommends to use the latest version of the Script Editor in combination with the firmware 225 and higher. In case you need further information contact **techhotline@inheco.com**. Scripts created with Script Editor version 2 or lower cannot be imported or edited in Script Editor Version 3.0 or higher.

2.2. Changes to older Script Editor Versions

- easier editing of PCR profiles (PCR Editor)
- adjustable lid temperature for each method
- optimized setting for slopes (heating and cooling speed) by choosing max slopes
- shorter heat up times for Temperature initialization steps
- advanced export function for ODTC® compatible files

3 SOFTWARE INSTALLATION

Please follow the instructions in the given order. Ignoring the correct order may cause complications during installation.

3.1. Hardware and System Requirements

- Windows compatible x86 based CPU (32 and 64 bit are supported)
- Operating system: Windows XP, Windows Vista, Windows 7, Windows 8 or Windows 8.1, Windows 10
- The Script Editor Setup (installer) comprises all necessary prerequisites / software packages for the above mentioned operating systems, e.g. .net Framework 4.0
- Administrator rights are necessary for executing the Script Editor installer. For using the Script Editor administrator rights are not necessary.
- Network Adapter: IEEE 802.3 Ethernet Network Interface (10/100/1000 BASE-T)
- Processor: 1GHz or faster (recommended dual core or better)
- Ram Minimum 512 MB
- Disk space minimum for Script Editor: 200MB with .net framework 4.0 already installed

3.2. Installation of ODTC® Script Editor

3.2.1. Content of USB flash drive

The required file to install the Script Editor can be found on the USB flash drive which is part of the scope of supply of the ODTC®.

USB flash drive content:

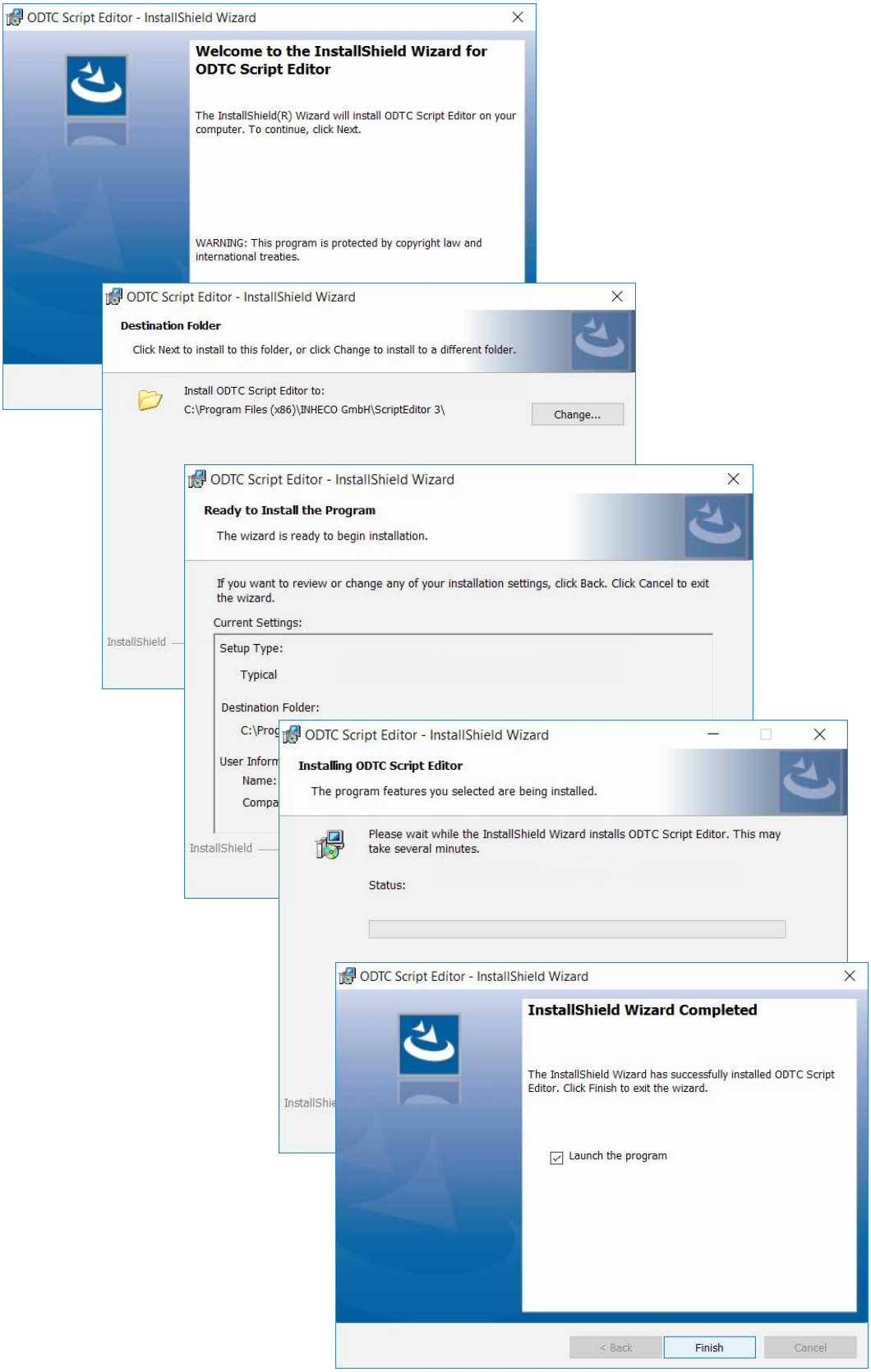
- ScriptEditor3.0.0_Setup

3.2.2. Installation of ODTC® Script Editor

- INHECO offers the Script Editor installer called ScriptEditor3.X.X._setup. This installer provides all necessary items for a successful usage of the Script Editor.

Fig.2: Installer file in explorer

- Follow the instructions in the dialogues given below.
  Additional dialogues could appear, depending on Windows configuration, user rights and firewall. For questions about these, please contact your administrator.



- After click on "Finish" the ODTC® Script Editor will open:

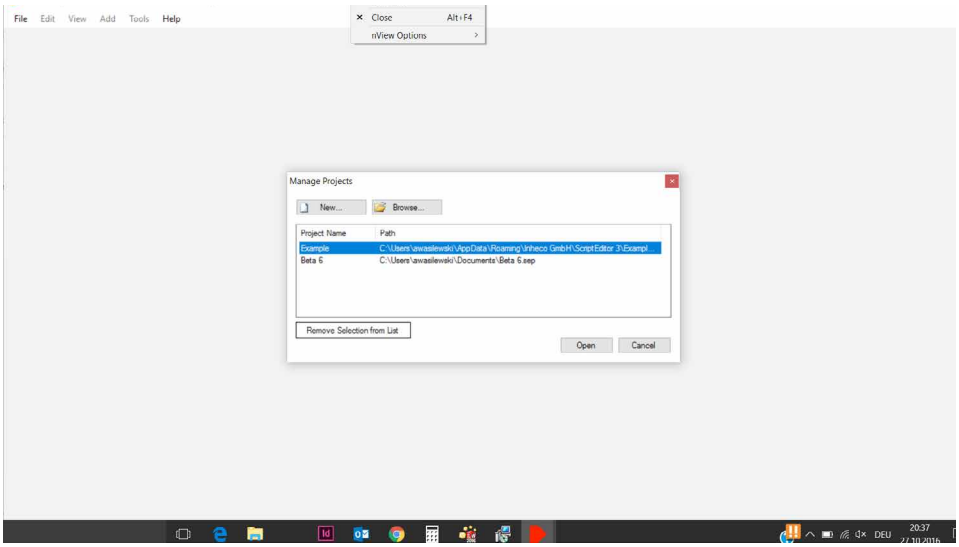


Fig.3: Start Window

3.2.3. Start Script Editor from workstation software

- Some workstation provider may include the ***Script Editor.exe*** in the workstation software, please visit the workstation provider documentation for further information.

4 DAILY USAGE

4.1. Operation of the ODTC®

Temperature profiles have to be programmed in xml format and then transferred/loaded to the ODTC® via the Ethernet connector. The xml files must be created by using the ODTC® Script Editor as the ODTC® Script Editor automatically compiles a xml file with the correct control parameters for the ODTC®. The ODTC® Script Editor allows an easy editing of the temperature profiles and the translation into ODTC® compatible xml files. After editing the desired temperature profiles, the xml files must be transferred to ODTC® via a PMS of the liquid handling workstation.

The ODTC® needs to be addressed by a SiLA PMS (Process Management Software) for operation. For the integration into SiLA based liquid handling workstations the already existing workstation SiLA protocol (SiLA standard 1.2) can be used to operate the ODTC®.

For the operation of the ODTC® with your liquid handling workstation software please contact your platform provider.

NOTE
The Script Editor provides the possibility to edit temperature profiles only. Other process steps, like "open door" (to allow pipetting or gripping of the disposable) or "close door" must be executed via the PMS. For translation of your application into an ODTC® compatible process/sequence please divide your process in temperature and non temperature methods.

4.2. User Interface

- open Script Editor

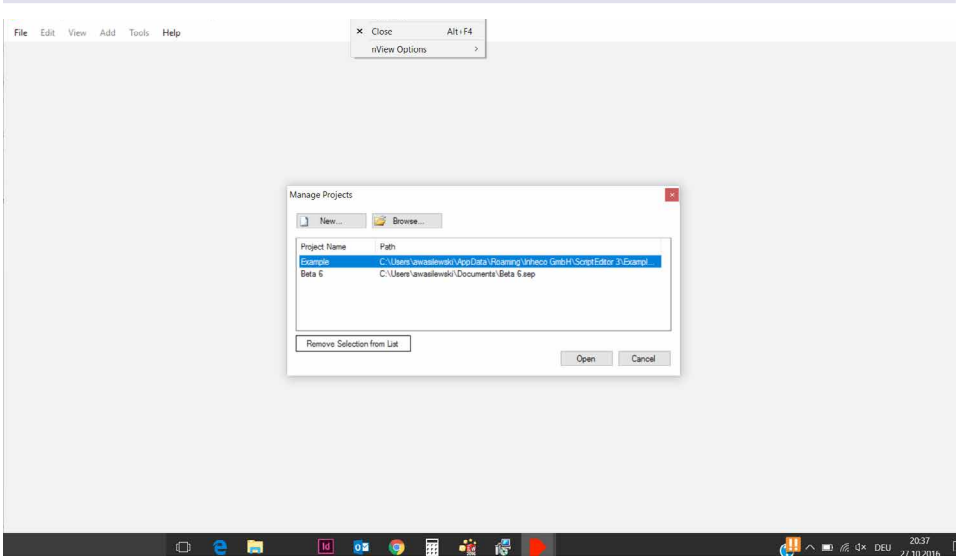


Fig.4: Start Window

- For existing project, you can either use the selection list or the browse function. To create a new project use button NEW.

- After starting the ODTC® Script Editor, the menu bar will allow different functionalities:

Fig.5: Functional elements of Start Window

File	Comprises: new project, open project, close project, save, save as, rename project and exit.
Edit	Comprises: rename or delete existing methods.
View	Allows to select different display modes of temperature profiles/graphs.
Add	Selection for adding a Temperature initialization step, a method or a PCR to a project.
Tools	Export function for edited methods.
Help	Shows information about the software version and about INHECO (INHECO Website) .

General error handling information

The entry of invalid values in the Script Editor can be either indicated as pop up or marked with an exclamation mark.

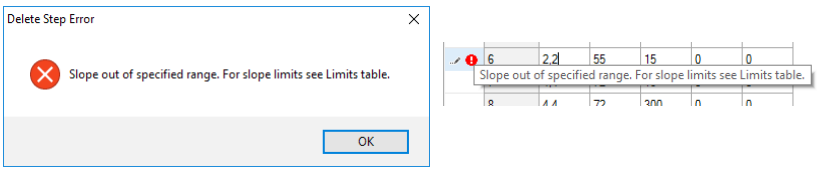


Fig.6: Pop up information and exclamation mark for incorrect or invalid value entries

4.2.1. File Menu

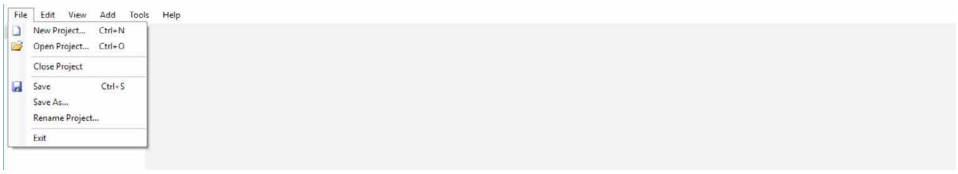


Fig.7: File Menu

New project	Creation of a new project file. A project comprises different methods to be used in the ODTC®.
Open project	Allows the user to search his computer for already existing projects. **Note:** Methods of the Script Editor Version below Version 2 or lower cannot be imported into the new Script Editor.
Close Project	Closes the project without closing the Script Editor.
Save	Saves the project with overwriting the opened project.
Save as	The project will be copied and saved with a new name.
Rename project	Opens File-Explorer where you can define a new Project File name.
Exit	Closes the Script Editor.

NOTE
The transfer of xml files to the ODTC® has to be performed by the PMS of the workstation → please see documentation of workstation provider

DEFINITION

Project:	Comprises all edited temperature initialization steps, standard and PCR methods in one project file
Temp init step:	Is mandatory to set the ODTC® mount and lid to a defined start temperature.
Method	Set of temperature steps (programming of simple temperature profiles, no PCR profiles)
PCR	Programming of PCR temperature profiles

4.2.2. Edit Menu

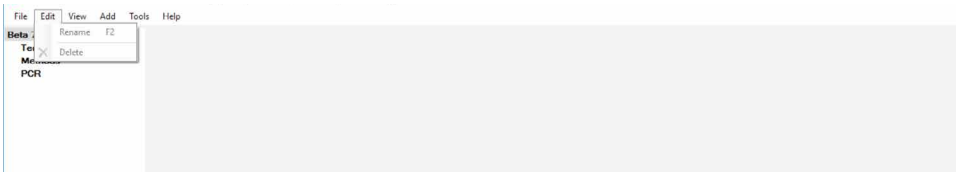


Fig.8: Edit Menu

Rename	Renames an existing method.
Delete	Deletes an existing method.

4.2.3. View Menu

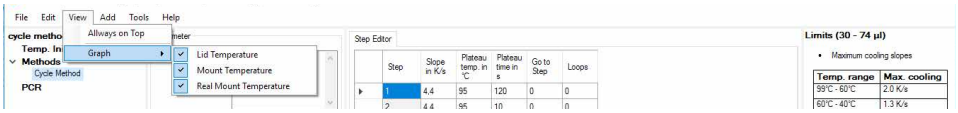


Fig.9: View menu

Allways on Top	When activated the Script Editor will always be on top of any other program window.	
Graph	Allows to select different display modes of the temperature graph.	
	Lid Temperature	yellow line shows programed Lid Temperature
	Mount Temperature	blue line shows programed Mount Temperature
	RealMount Temperature	red line shows Mount Temperature including over- and undershoots

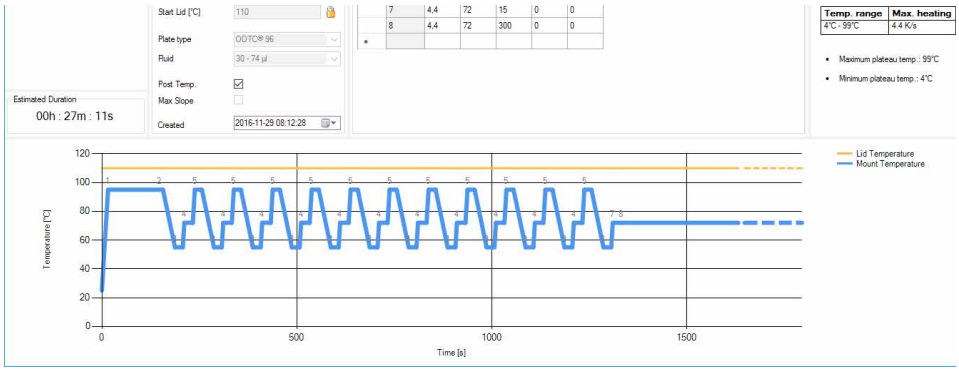


Fig.10: Graph showing Lid and Mount Temperature profile

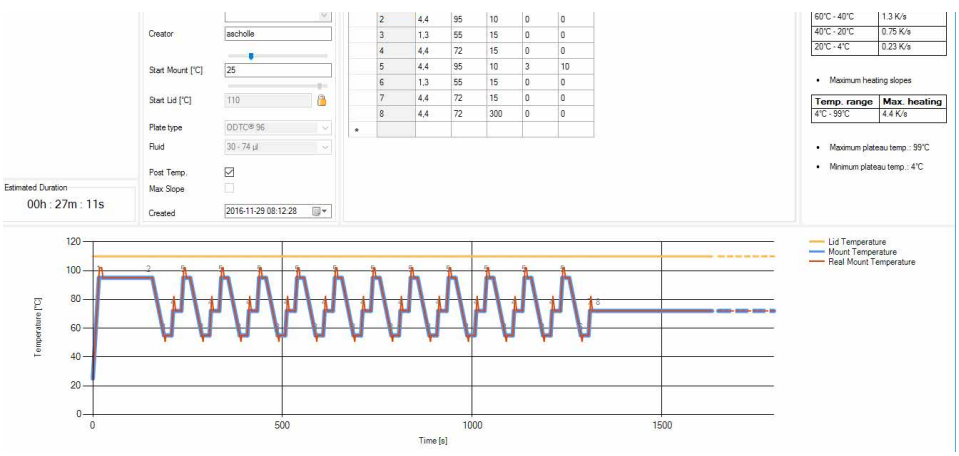


Fig.11: Graph additionally showing RealMount Temperature (over-/undershoots)

NOTE

The RealMount Temperature includes the over and under shoots which are necessary to achieve a correct temperature in the sample. When max cooling/heating slope is selected, a cooling step might also be subdivided into multiple cooling steps depending on the fluid quantity and target temperature. => refer to **Appendix.**

4.2.3.1 Zoom Function

The graphical section has a zoom in function. To zoom into the graph just click in the graph hold the left mouse button and drag the mouse or press Ctrl + mouse and use wheel up/down. This feature is only available in Methods and PCR but not in a Temperature initialization step. A right click with the mouse gives you the option to

- show the temperature graph on the full screen
- get back to the default zoom
- copy the graph

Fig.12: Pop up window after right mouse click

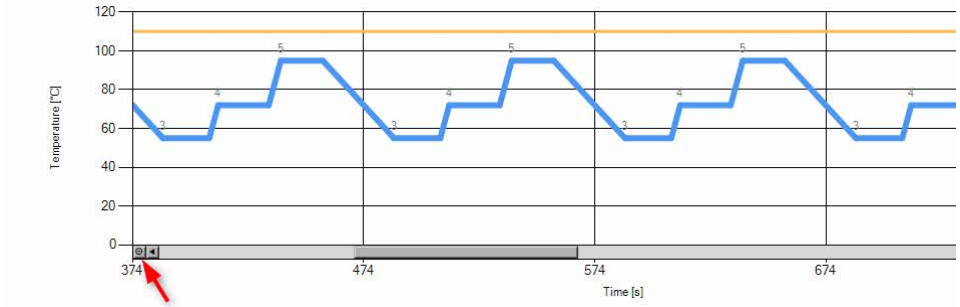


Fig.13: Zoomed graph with Restore Previous Zoom button (red arrow)

4.2.4. Add Menu

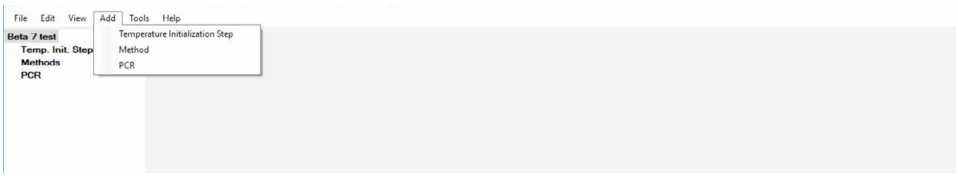


Fig.14: Add Menu

Temperature Initialization Step	Starts creating a new Temperature Initialization Step.
Method	Starts creating a new Method.
PCR	Starts creating a new PCR profile.

4.2.5. Tools Menu

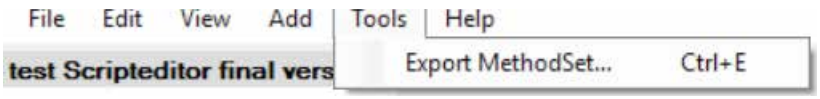


Fig.15: Tools Menu

Export MethodSet	Allows to select any desired Methods from the project to be exported to an ODTC® readable file (xml file). Also provides the possibility for "CopyparamsXML to Clipboard". "Copy-paramsXML to Clipboard" exports the methods to Windows Clipboard as xml file with additional information to allow method transfer to the ODTC® via the INHECO PMS.

4.2.6. Help Menu

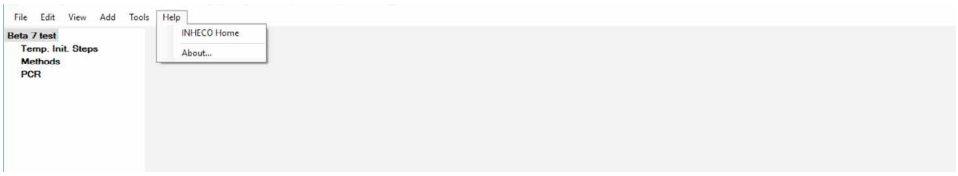


Fig.16: Help Menu

INHECO Home	Opens **www.inheco.com** .
About	Opens a window with Script Editor information such as version number and author.

4.3. Edit Methods

New Temperature Initialization Steps, Methods or PCRs you can be created by either using Add in the menu bar or right mouse click on the Temperature Initialization Step, Method or PCR (shown in the left part of the window) .

4.3.1. Creation of "Temperature Initialization Step"

- select Add => Temperature Initialization Step or by right mouse click

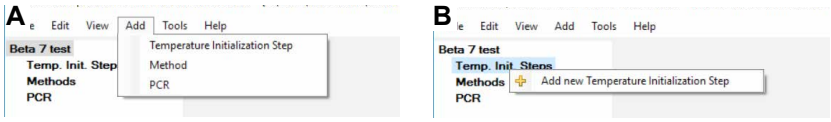


Fig.17: Add Method Set via menu bar (A) or right mouse click (B)

- the following window is displayed to configure the initial temperature conditions of the ODTC®.

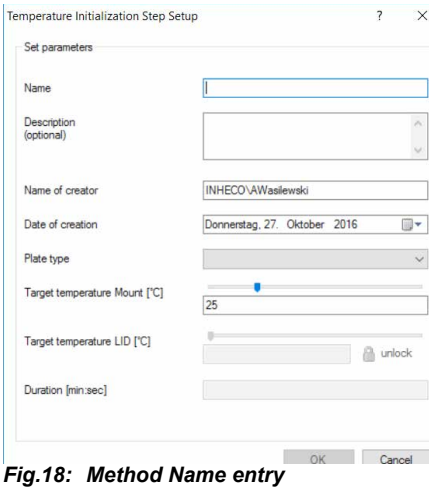


Fig.18: Method Name entry

Type: temperature initialization step	Temperature initialization step is mandatory to set the ODTC® mount and lid to a defined start temperature.
Name	Enter your method name.
Description	Enter a description for the method.
Name of creator	Enter name of the method creator.
Date of creation	Enter date of creation.
Plate type	Choose between 96 and 384 well type of ODTC®
Target temperature Mount	Enter initial start temperature of the Mount in °C (Min +4°C, Max +99°C).
Target temperature Lid	Enter initial start temperature of the Lid in °C (Min +30°C, Max +115°C).
Duration	Duration of method set (is calculated automatically).
Unlock	Unlocks the lid temperature and allows to edit lid temperature.

NOTE

The temperature initialization step sets the ODTC® mount and lid to a defined start condition and always needs to be executed first, when using the ODTC® (must be executed after switching on the ODTC® or each power cycle)
For unsealed plates INHECO recommends to set the target temperature of the mount in the temperature initialization step to +25°C (or as close as possible to room temperature) to minimize evaporation of the sample. The evaporation may cause reduced process quality.

- Enter name of method
- Enter description
- Enter name of creator
- Enter plate type
- Enter target temperature mount
- Enter target temperature LID

As soon as the plate type is selected the unlock button will be enabled.

Fig.19: Unlock button and its meaning

NOTE
The default lid temperature is set to +115°C for ODTC® 384 and +110°C for ODTC® 96 Please make sure that the lid temperature is always above the highest temperature in the method to avoid condensation.

NOTE
Lid does not have active cooling. Be aware that cooling down might take some time!

As soon as all mandatory entries are made OK will be enabled.

After acknowledging all information with clicking on the ok button the temperature initialization step will be displayed in a graph.

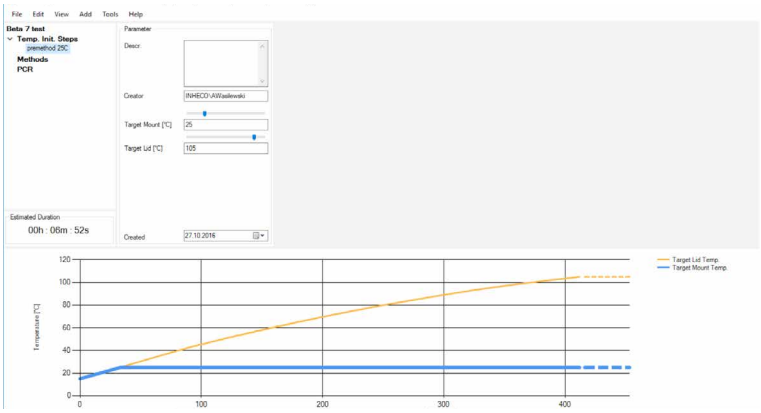


Fig.20: Temperature initialization step (after entry of all required information)

Name and type of Method Set	Is shown in the project directory.
Description of method	Shows entered method name.
Creator	Shows name of the method creator entered for this method.
Created	Shows date when the method was first created.
Target Mount	Shows target temperature of the Mount in °C.
Target Lid	Shows target temperature of the Lid in °C.
Estimated time	Duration of method set is calculated automatically and depends on the selected lid temperature. Minimum Lid Temperature: 30°C → estimated time approx. 1.5 min Maximum Lid Temperature: 115°C (ODTC® 384) → estimated time approx. 9 min

4.3.2. Create a "Method"

- select Add => Method or by right mouse click

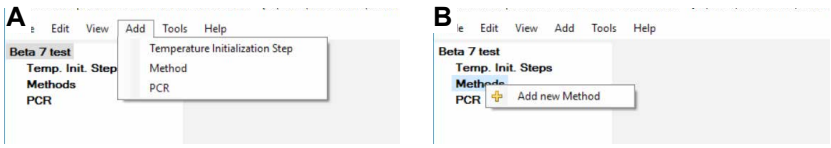


Fig.21: Add Method Set via menu bar (A) or right mouse click (B)

The following window will be shown to configure the initial temperature conditions of the ODTC® .

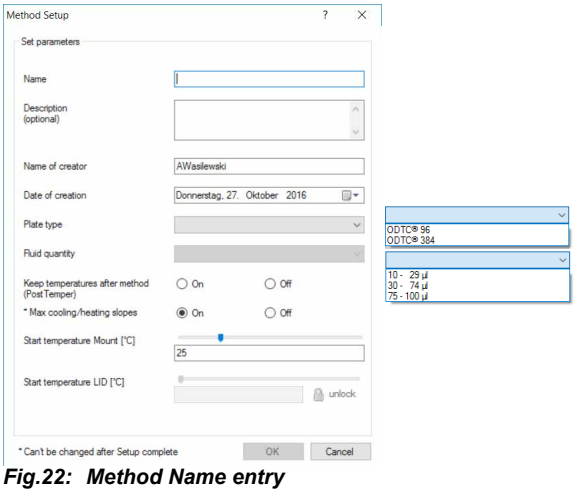


Fig.22: Method Name entry

Name of method	Enter method name.
Description of method	Enter a description for the method.
Name of Creator	Enter the name of the method creator.
Date of Creation	Enter date of creation (is automatically set to current date).
Plate Type	Choose between 96 and 384 well type of ODTC®.
Fluid quantity	Choose fluid quantity range of sample per well (only for ODTC® 96). For further information refer to the table 1 on the page 19.
Keep temperature after method	Select parameter "ON" or "OFF". If the ODTC® should keep its temperature after the method is finished (e.g. open door for pipetting step) set the selector to "ON". Set it to "OFF" to switch off the temperature control after method is finished. **Note:** If the selector is set to "OFF" no new method can be started within the ODTC® after this method. → Appendix Chapter 6.2, page 31
Max cooling/heating slopes	Select parameter "ON" or "OFF". In case the slopes should be programmed individually (according to specifications shown in table below) set the selector to "OFF". Set it to "ON" to allow the Script Editor to set the maximum cooling/heating slopes automatically. **Note:** This selection cannot be changed after the Set up is completed.
Start temperature Mount	Set temperature with which the method will start. **Note:** Make sure that the start temperature matches always the temperature that is set in the "temperature initialization step" or the temperature that is set at the end of the previous method.
Start Temperature Lid	Set temperature for the lid for the whole method. (Temperature can differ from temperature set in "temperature initialization step or previous method)

- Enter name of method
- Enter description
- Enter name of creator
- Enter well type with selector
- Enter plate type with selector
- Enter fluid quantity (only for ODTC® 96®)

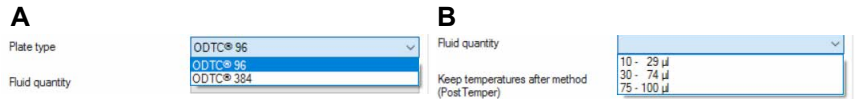


Fig.23: Selector Plate type (A) and Selector Fluid quantity (B)

NOTE
The fluid quantity is defined as a fluid quantity range. The control parameters of the ODTC® will be adjusted depending on the selected fluid quantity range. The control parameters work for the complete selected fluid range (see table 1 below for ODTC® 96).

Fluid quantity range	Optimized fluid quantity
10 - 29µl	25µl
30 - 74µl	50µl
75 - 100µl	100µl

Table 1: Fluid Quantity

- Select keep temperature after method

NOTE
If the ODTC® should keep its temperature after the method is finished (e.g. for a pipetting step) select keep temperature after method "ON".

- Enter start temperature

NOTE
Make sure that the start temperature matches always the temperature that is set in the "temperature initialization step" or the temperature that is set at the end of the previous method.

- Selection of lid temperature

You can now edit the lid temperature **used for the whole method**. The lid temperature is adjustable between 30°C and 115°C (for ODTC 96 Max. 110°)

As soon as the plate type is selected the unlock button will be enabled.

Fig.24: Unlock button and its meaning

NOTE
The default lid temperature is set to +115°C for ODTC® 384 and +110°C for ODTC® 96 Please make sure that the lid temperature is always above the highest temperature in the method to avoid condensation.

As soon as all mandatory entries were made OK will be enabled.

After acknowledging all information with clicking on the ok button the Method will be displayed:

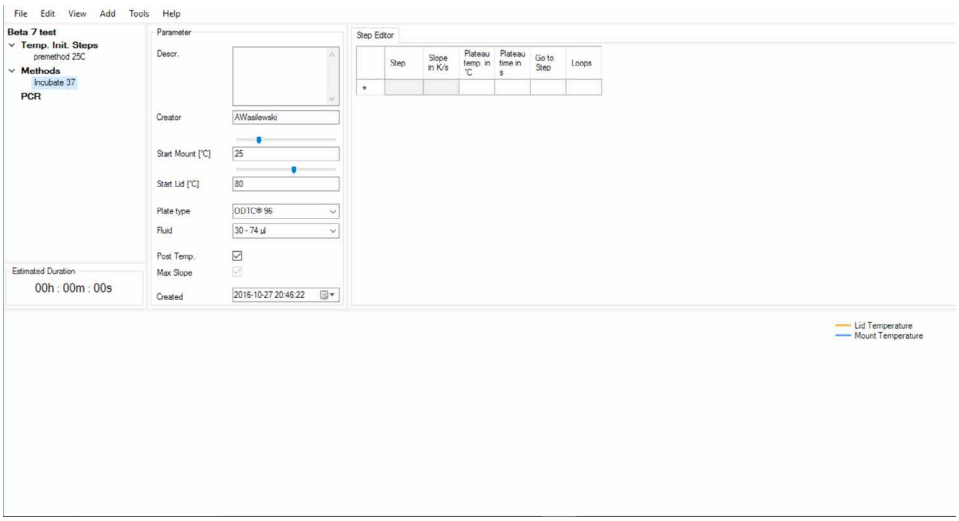


Fig.25: Configured method before entering the temperature profile

4.3.2.1 Edit temperature steps within a method

The temperature step of the temperature profile must be edited in the temperature profile editor.

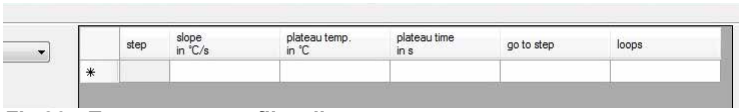


Fig.26: Temperature profile editor

NOTE
The maximum number of temperature steps within one method is 100.

- Enter slope (only possible when Maximum cooling/heating slope was set to OFF) The table displayed at the right informs you about the maximum possible average heating and cooling rates (slope) that can be entered depending on ODTC® type (96 or 384) fluid quantity and target temperature.

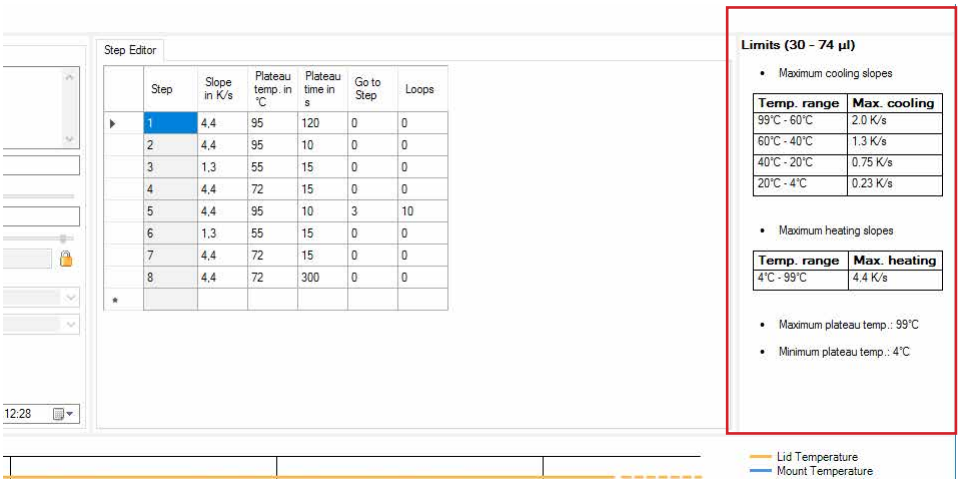


Fig.27: Table displayed on the right in the Script Editor for ODTC® 96 and ODTC® 384

NOTE
Depending on the language settings of your operating system you must either use "." or "," as decimal separator. If you use the wrong separator the field will be red for a short time and the separator is not accepted.

- Enter your target temperature.
  Minimum temperature: +4°C and maximum temperature: +99°C.
- Enter the plateau time.
- For PCR profiles please use the PCR Method Set. The programming of repeating steps in the Method Editor is quite complex (looping conditions). For further information please → **Appendix** or contact INHECO (**techhotline@inheco.com**).

NOTE
The maximum number of methods within one project is 255.

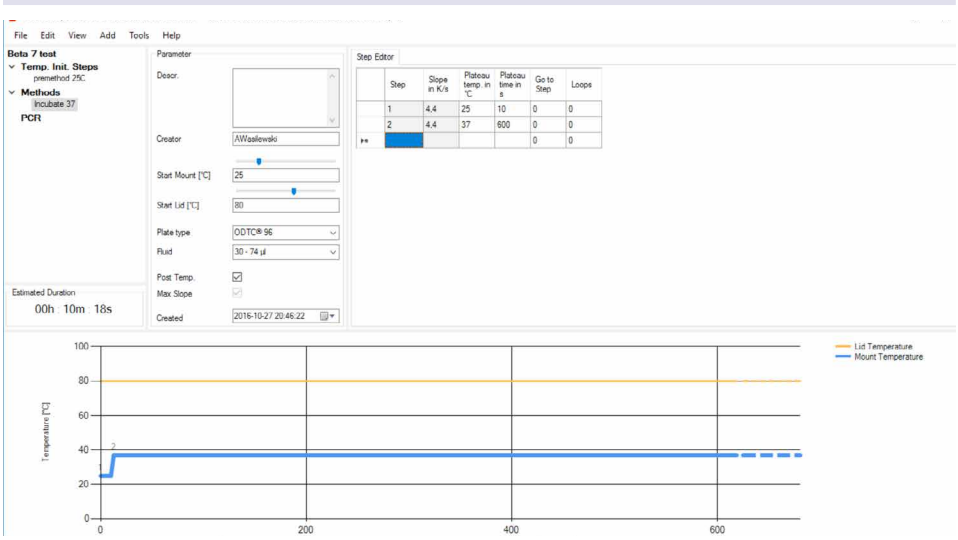


Fig.28: User Interface with edited data (last row needs to be empty to save method).

4.3.3. Edit a "PCR Method"

- select Add => PCR or by right mouse click

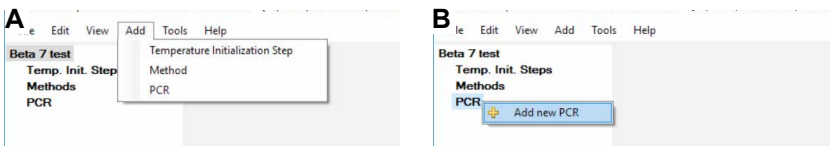


Fig.29: Add Method Set via menu bar (A) or right mouse click (B)

The following window will be shown to configure the initial temperature condition of the ODTC®.

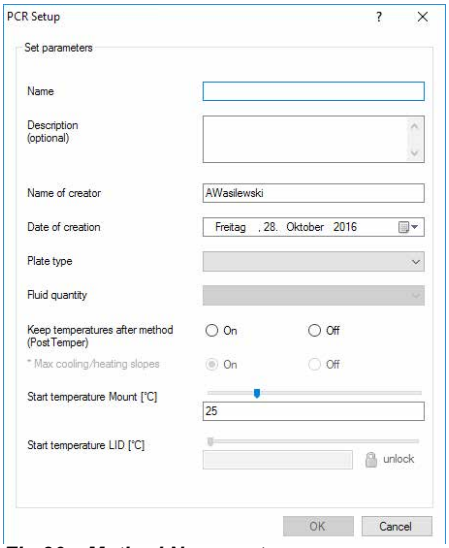


Fig.30: Method Name entry

Name of method	Enter method name.
Description of method	Enter a description for the method.
Name of Creator	Enter the name of the method creator.
Date of Creation	Enter date of creation (is automatically set to current date)
Plate Type	Choose between 96 and 384 well type of ODTC®.
Fluid quantity	Choose fluid quantity range of sample per well (only for ODTC® 96). For further information refer to the table 1 page 19
Keep temperature after method	Select parameter "ON" or "OFF". If the ODTC® should keep its temperature after the method is finished (e.g. open door for pipetting step) set the selector to "ON". Set it to "OFF" to switch off the temperature control after method is finished. **Note**: If the selector is set to "OFF" no new method can be started within the ODTC® after this method. → **Appendix, page 31**
Max cooling/heating slopes	Sets the maximum cooling/heating slopes automatically. **Note**: no parametrization possible in PCR method.
Start temperature Mount	Set temperature with which the method will start. **Note**: Make sure that the start temperature matches always the temperature that is set in the "temperature initialization step" or the temperature that is set at the end of the previous method.
Start Temperature Lid	Automatically set to 110°C for ODTC 96 and 115°C for ODTC 384.(not accessible).

- Enter name of method,
- Enter description,
- Enter name of creator,
- Enter well type with selector,
- Enter plate type with selector,
- Enter fluid quantity (only for ODTC® 96®)

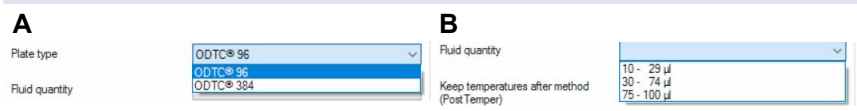


Fig.31: Selector Plate type (A) and Selector Fluid quantity (B)

NOTE
The fluid quantity is defined as a fluid quantity range. The control parameters of the ODTC® will be adjusted depending on the selected fluid quantity range. The control parameters work for the complete selected fluid range (see table 1 page 19).

- Select keep temperature after method

NOTE
If the ODTC® should keep its temperature after the method is finished (e.g. for a pipetting step) select keep temperature after method "ON".

- Enter start temperature lid and mount

NOTE
Make sure that the start temperature matches always the temperature that is set in the "temperature initialization step" or the temperature that is set at the end of the previous method.

As soon as all mandatory entries are made OK will be enabled

After acknowledging all information with clicking on the OK button the PCR Method will be displayed:

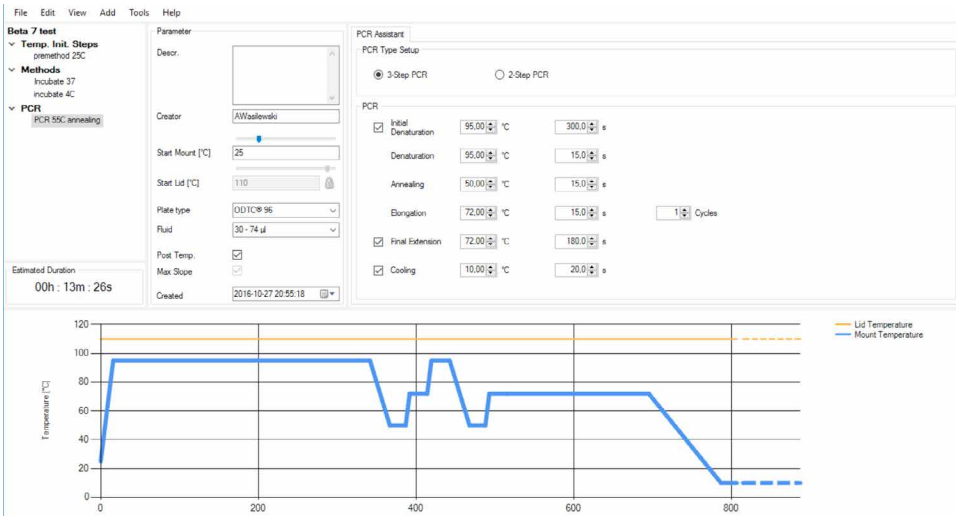


Fig.32: Configured PCR before entering the temperature profile

- select 3-Step PCR or 2-Step PCR

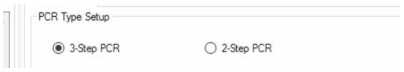


Fig.33: Selection of PCR profile

- select temperature for the different steps in °C

Fig.34: Change of temperature

- select duration for the different steps in sec

Fig.35: Change of duration

- select number of cycles

Fig.36: Change number of cycles

- uncheck steps if not needed

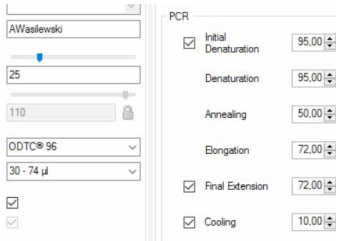


Fig.37: Uncheck unnecessary steps

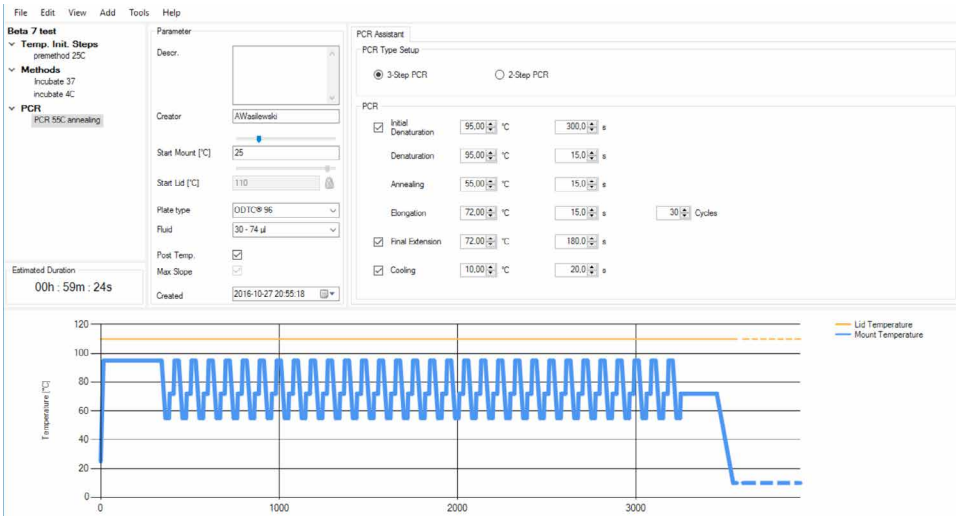


Fig.38: Configured 3-Step PCR after editing the temperature profile

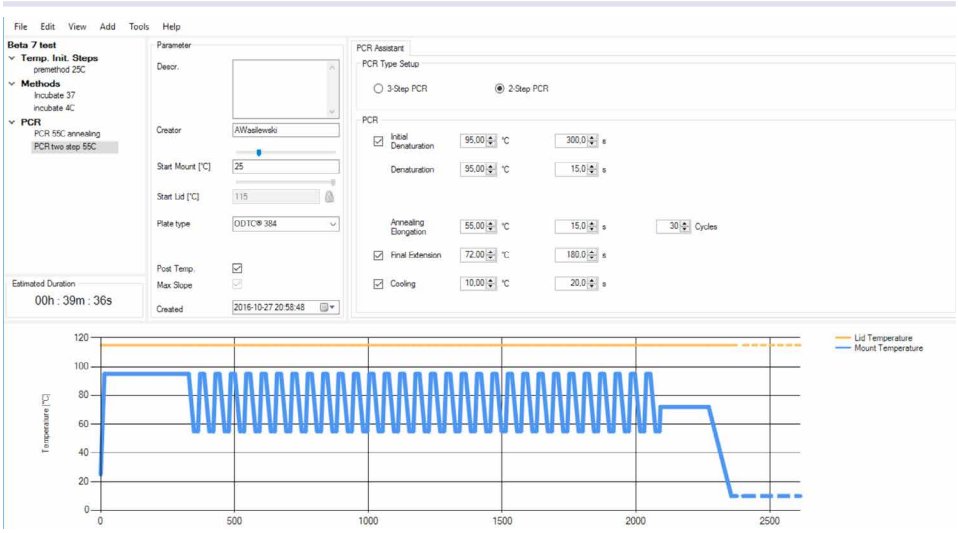


Fig.39: Configured 2-Step PCR after editing the temperature profile

4.3.4. Delete a Step

- right mouse click on the row then select Delete Step

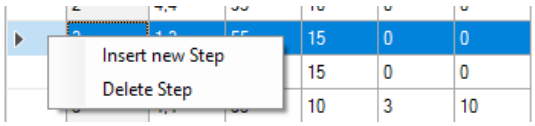


Fig.40: Delete Step

NOTE
A row can only be deleted when the slope of the following step will be according to the limit table. In case the value is out of the given limits you will receive an error message → figure 41 and 42 that the "cooling slope is higher than max. value".

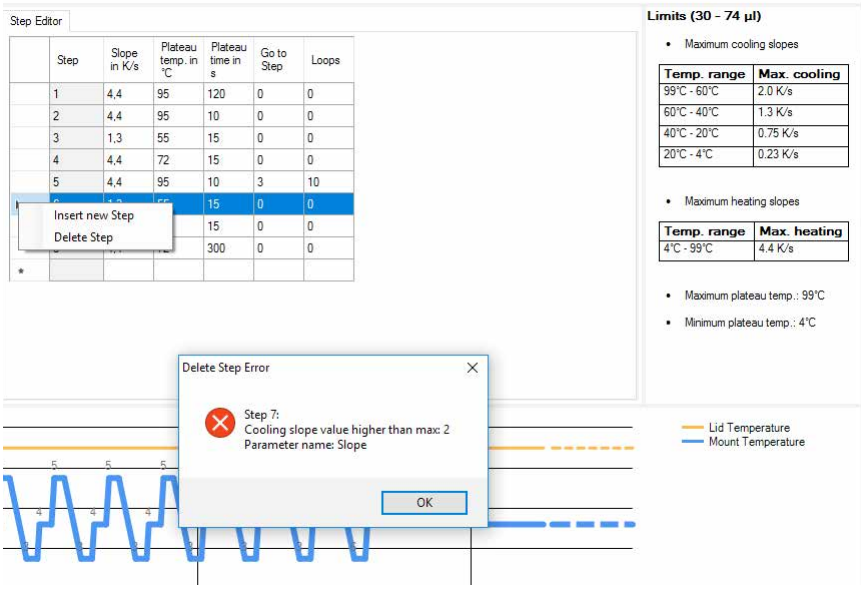


Fig.41: Example for error message when slope of following step is incorrect

Step 7 does have a slope of 4.4 in case step 6 is deleted this step will then be a cooling step and the max slope cannot be higher than 2.0.

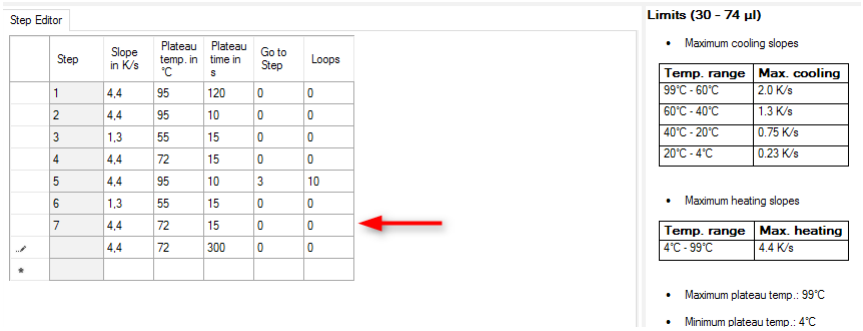


Fig.42: Step with wrong slope

In this case, you need to delete all steps after step 6 first and then delete step 6 or adjust the slope settings of the following step according to the slope conditions.

4.3.5. Insert a step

- right mouse click on the row then select Insert new Step

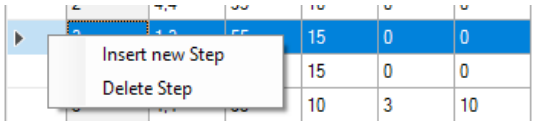


Fig.43: Insert new Step

NOTE
A row can only be inserted in looped steps when the loop parameter (→ **Appendix**) are correct. You will receive an error message → fig. 44 when the loop parameter does not match.

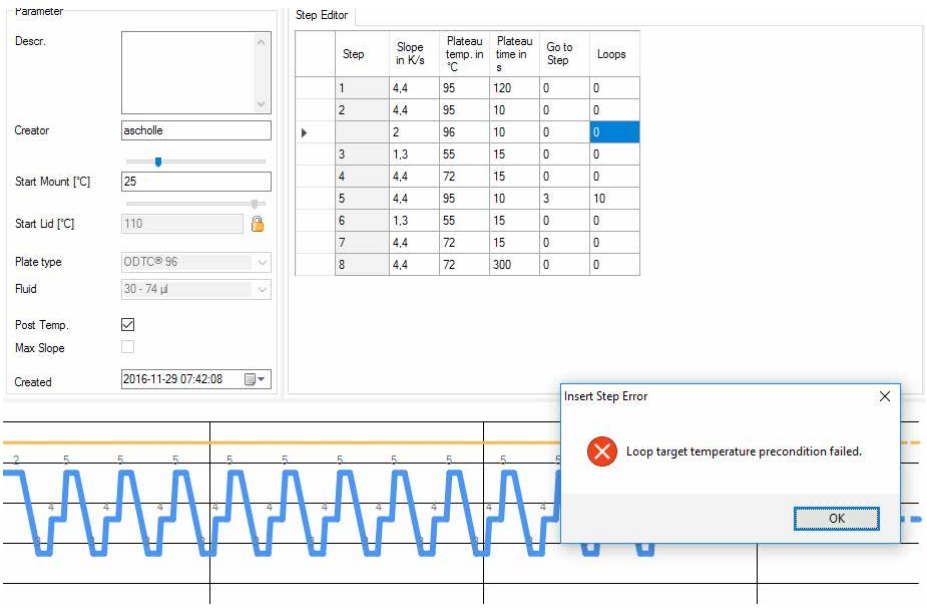


Fig.44: Example for error message when looping parameter is incorrect

The new Step 3 does not have the correct loop parameter (in this case temperature) to handle the looping from step 5 to 3. If you confirm with yes, the row will be deleted.

4.3.6. Save a Project

- Select file => Save as

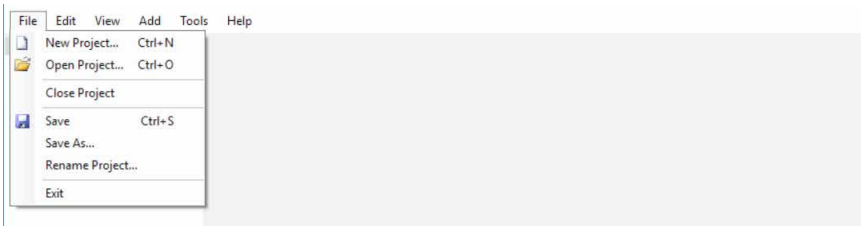


Fig.45: Selection Save as

- Enter file name and storage location and save project to PC or network

4.3.7. Export MethodSet

This function allows to select (with a check mark) all or any desired methods to be exported as ODTC® readable file.

Fig.46: Selection Tools Export MethodSET

NOTE
In case the Delete All function ON is selected all existing methods on the ODTC® will be deleted, as soon as the exported MethodSet is loaded onto the ODTC®. This functions is set to OFF as default. In this case the exported MethodSet is added to the already existing methods on the ODTC®. Methods with the same name will be overwritten on the ODTC®.

"CopyparamsXML to Clipboard" exports the methods to Windows Clipboard as xml file with additional information to allow method transfer to the ODTC® via the INHECO PMS.

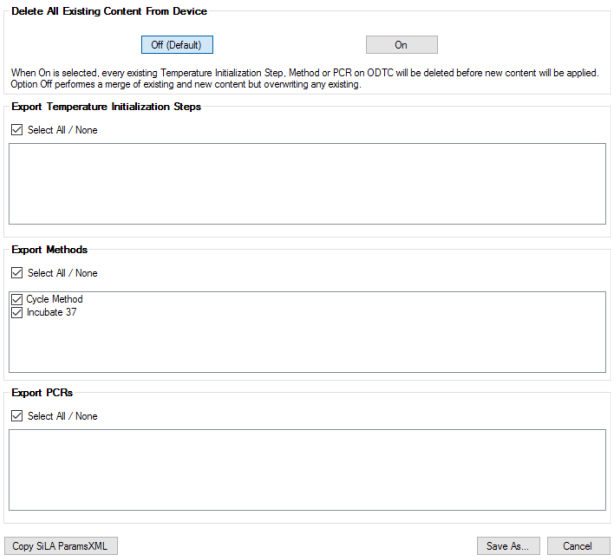


Fig.47: Method export

4.3.8. Current limitations of Script Editor

- Maximum temperature profile steps within one method are 100 steps.
- Maximum methods within one project are 255 methods / PCR and 255 temperature initialization steps.
- Maximum file size for a method set is 500kB (only of relevance for method sets with many methods or steps, e.g. 100 methods with 10 steps each). There will be a warning during export of the MethodSet. The project file can have a size larger than 500kB.

5 TROUBLE SHOOTING

5.1. Feasibility of .xml files

The ODTC® Script Editor will check all programmed steps of a method (definition → page 5) and will only allow steps which the ODTC® is capable of handling. However, in case you have issues with running a method on the ODTC® or if you need assistance with programming the xml files, please contact **techhotline@inheco.com.** Please send us your requirements and temperature profiles needed for testing your application on the ODTC® here at INHECO. If this information should contain proprietary information, please send us a NDA to cover this.

INHECO will evaluate if your temperature profiles are feasible.

6 APPENDIX

6.1. Example of correct method sequence

Following features have to be taken into account when defining a method set:

- If another method follows this method you should select keep temperature after method: ON
- The following method must start with the end temperature of the prior method, otherwise the ODTC® goes into error status.

Blue arrows indicate interaction phases with liquid handling instrument and allows commands like open door or close door.

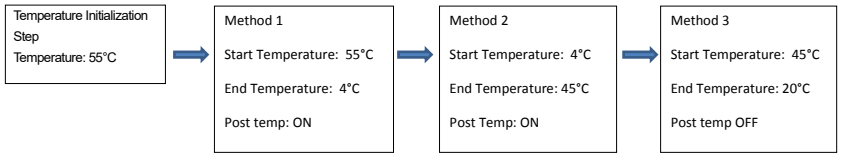


Fig.48: Example of correct method sequence

Different combinations of methods within a method set are possible:

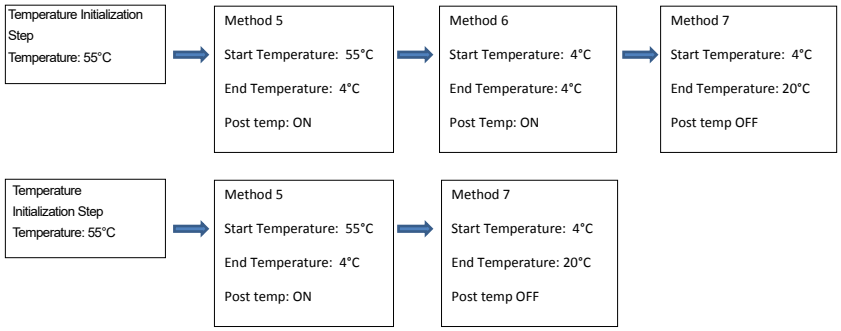


Fig.49: Example of correct Method Combination

6.2. Example of wrong method sequence

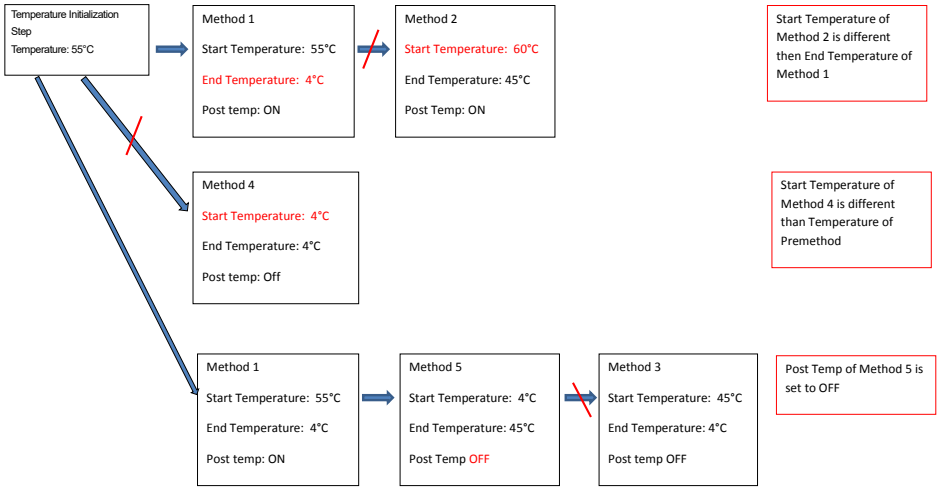


Fig.50: Example of wrong Method Combination

6.3. Example Method with correct loop parameter

When programming temperature profiles with loops with the “Methods” option, the looping conditions have to be considered in order to generate a valid method.

The programming of correct looping conditions is mandatory to make sure that the ODTC® will always be operated with the optimal over- / undershoots.

The calculations of the over-/undershoots is depending on

- Temperature difference between start temperature and end temperature in each temperature step
- Heating and cooling speed (slope)

The looping conditions are as follows:

A loop back is only possible if start temperature, end temperature and slope of the step are the same as in the previous step before the looping (see fig. 51. step 5 = step 2, start temperature 95°C, end temperature 55°C, slope 1.3 K/s)

The Script Editor will automatically evaluate the entries and only allow the programming of temperature profiles with correct looping conditions.

The following example shows how to program an amplification process in the method mode

6.3.1. Standard PCR Process (amplification) in the method mode

Step 1: Denaturation at 95°C for 120 seconds

Step 2: Denaturation at 95°C for 10 seconds

Step 3: Incubation at 55°C for 15 seconds

Step 4: Incubation at 72°C for 15 seconds

Step 5: Incubation at 95°C for 10 seconds

Got to Step 3 10 times

Step 6: Incubation at 55°C for 15 seconds

Step 7: Incubation at 72 for 15 seconds

Step 8: Incubation at 72 for 300 seconds

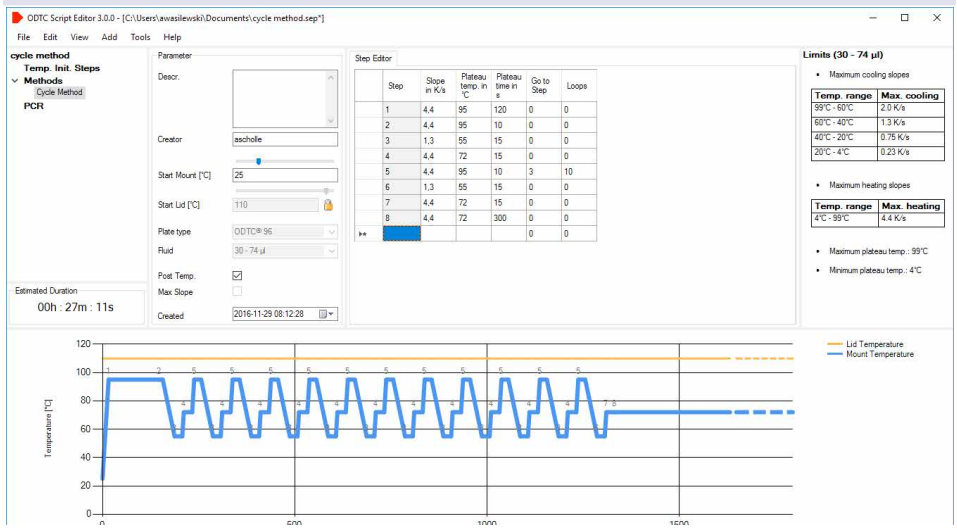


Fig.51: Example of correct looping parameter

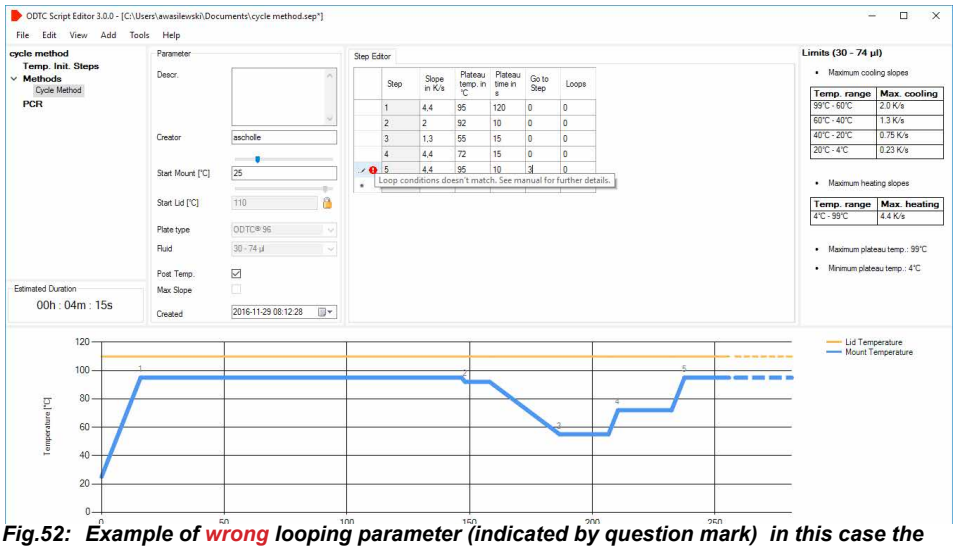


Fig.52: Example of wrong looping parameter (indicated by question mark) in this case the temperature of the "go to step" is incorrect.

NOTE
In case, you encounter difficulties with loops in a standard method contact **techhotline@inheco.com**

6.4. RealMount Temperature

The RealMount Temperature includes the over- / undershoots which are necessary to achieve a correct temperature in the sample. When max cooling/heating slope is selected, a cooling step might be also subdivided into multiple cooling steps depending on the fluid quantity and target temperature (refer to red area below).

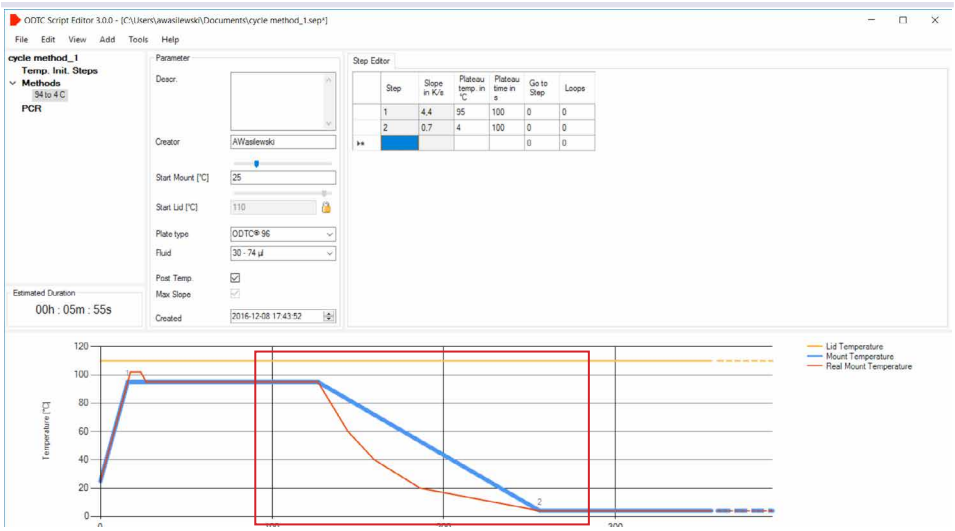


Fig.53: Example of RealMount Temperature when max cooling/heating slope is selected