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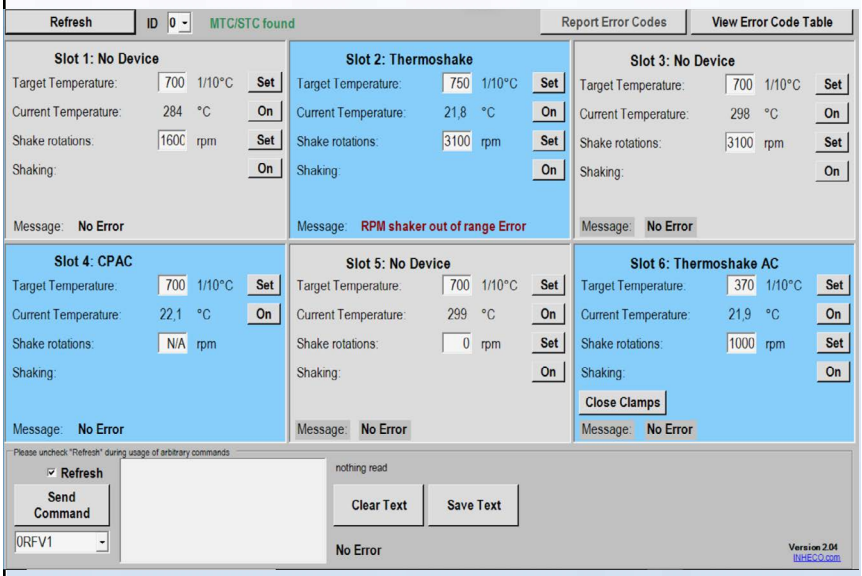

INHECO Demo Tool for MTC / STC

For Demo Tool Version: 2.0.4 and higher

► **User´s Manual**

Doc ID: 900093-001
June 2019

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 us.

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1 IMPORTANT NOTES

1.1. General Information

Read the user instructions completely. The instructions for use explain the intended use of the Demo Tool Software for all MTC/STC connected devices, e.g. Thermoshake, Thermoshake AC, CPAC UltraFlat / CPAC Microplate, CPAC UltraFlat / CPAC Microplate HT 2-Tec, HeatPAC, Teleshake 95, Teleshake MTC / STC, Heated Lid. In case the instructions of this manual are disregarded, injury or product damage cannot be excluded.

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

The content of this manual is also part of the TEC Control Unit Manual which is delivered together with the Multi TEC Control Unit (MTC) and the Single TEC Control Unit (STC) and can also be downloaded from our webpage.

The Demo Tool meets the acknowledged rules of software development and comply with today‘s standards.

- The signal word NOTE stands for the general precautionary measures that are to be observed to avoid damaging the device when using it.

Please contact the manufacturer in case there is anything you do not understand within this manual.

Your opinion about this manual provides us with valuable insights on how we can serve you better. Please do not hesitate to direct your comments to us:

1.2. How to contact Tek-Matic

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1.3. Explanation of symbols

Symbol	Explanation
	Potential danger of injury or death. → signal words WARNING and CAUTION indicate the severity
	Note: Device will get damaged, if you do not follow instructions
·	Bullet points indicate steps of instructions.
-	Hyphens are used for enumerations.
→	Arrows indicate: “refer to” and are mostly an active link
blue writing	indicates a software button

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2 PRODUCT DESCRIPTION

2.1. Intended Use

The INHECO Demo Tool software is mainly designed to check the main functions of the MTC/STC connected devices. It also allows to send single commands.

The following devices are controlled via the TEC Control Unit (MTC/STC):

Product	INHECO Part#	Function
CPAC UltraFlat / CPAC Microplate	7000190 / 7000179	heat and cool
CPAC UltraFlat / CPAC Microplate HT 2-TEC	7000166 / 7000163	heat and cool
HeatPAC	7900046	heat
Teleshake 95	7100136	heat and shake
Teleshake MTC / STC	7100137	shake
Thermoshake / Thermoshake RM	7100146 / 7100144	heat / shake and cool
Heated Lid	8900033	heat
Thermoshake AC	7100160	heat / shake and cool with clamp mechanism

Usually the INHECO devices are integrated in workstations and are controlled by their software. Therefore the Demo Tool only provides very basic functions and the possibility to send firmware commands to the devices.

3 SOFTWARE INSTALLATION

This section describes the installation of the INHECO Demo Tool MTC/STC software.

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

3.1. System Requirement

- Operating system: Windows XP, Windows Vista, Windows 7 or Windows 10
- Free USB port (USB 1.1 or 2.0)
- Minimal display resolution: 800 x 600 pixel

NOTE
The USB is not optimized for secure real time data transfer. Therefore all communication is secured by a cyclic redundancy checksum (crc). If the communication between the PC and the connected devices fail the PC might be the cause for the communication failure. For a stable communication we recommend the following:
- Other devices connected to the USB-Port of your PC might have an influence on the communication stability of the connected devices
- Check the stability of communicaiton with a different PC
- Windows updates might cause comunication failures.

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3.2. Start Software

3.2.1. Operate the connected Devices via TEC Control Unit & Demo Tool

The Demo Tool (file name INHECO MTC/STC Demotool) and the DLL are stored on the USB stick which comes with each TEC Control Unit or can be downloaded from our login section on the webpage www.inheco.com.

- Copy the demotool MTC file and the DLL into same folder on your PC.

NOTE
The software will only start if software and DLL are in the same folder. Otherwise the Demo Tool will not work. You will receive a message: "MTC/STC test has stopped working". In some operating systems this message disappears very fast.

- Make sure that the device is connected to the TEC Control Unit and that the TEC Control Unit is connected to the PC.
- Switch TEC Control Unit power on.
- Open the software by double-clicking on data file INHECOsMTC.exe.

4 DAILY USAGE

4.1. Get Started

- Switch TEC Control Unit power on.
- Open the software by double-clicking on the data file INHECOsMTC.exe.

In case the following message pops up please check whether the Demo Tool is already running.

Fig.1: Error message if software is already running

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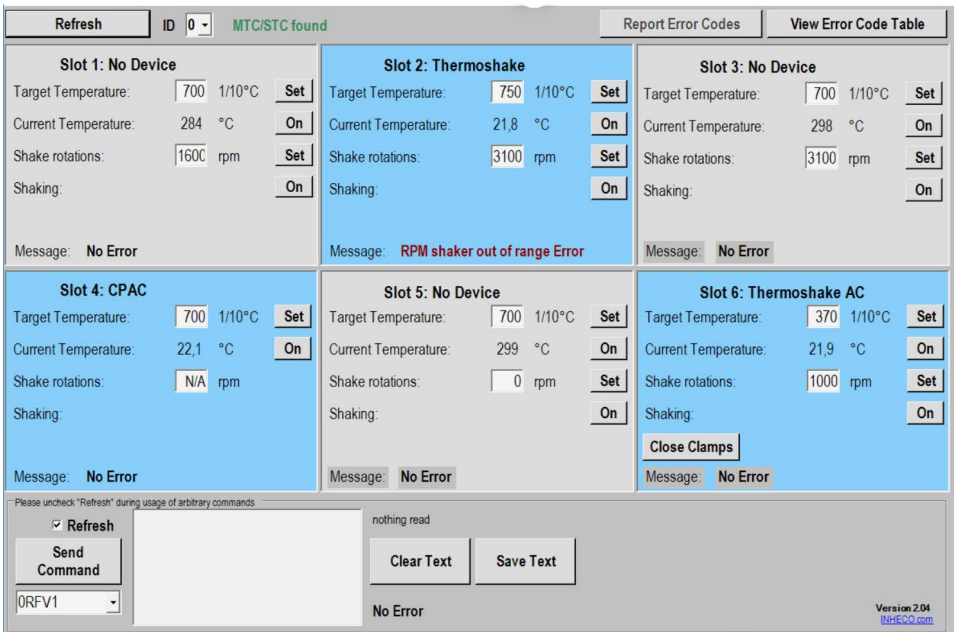

Fig.2: Demo Tool Interface before MTC or STC is found

- Select Find MTC.

> **NOTE**
> When the TEC Control Unit is connected via USB to a PC, the TEC Control Unit will log on as human interface device (HID).

- Approximately two seconds later the software scans all com ports and displays the connected TEC Control Unit and the connected devices. The standard ID of the TEC Control Unit is 0. However it can be changed with the help of the dip switch on the TEC Control Unit back side. When TEC Control Unit is not found please check dip switch position and change the ID in the software accordingly.

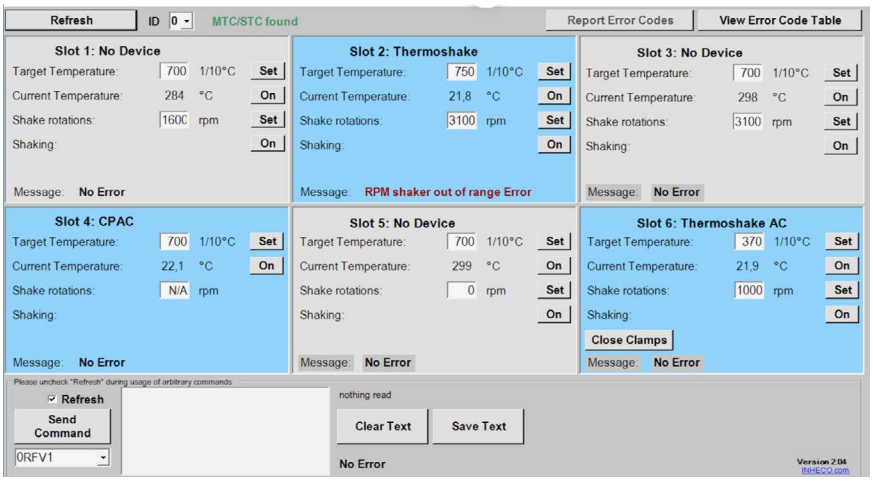

Fig.3: Interface when TEC Control Unit & connected device have been found

Each connected device is now assigned to the appropriate slot, the background changes to blue. Devices will not heat/cool or shake without activating the button On. During heating/cooling/shaking the button shows Off.

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4.2. Interface Description

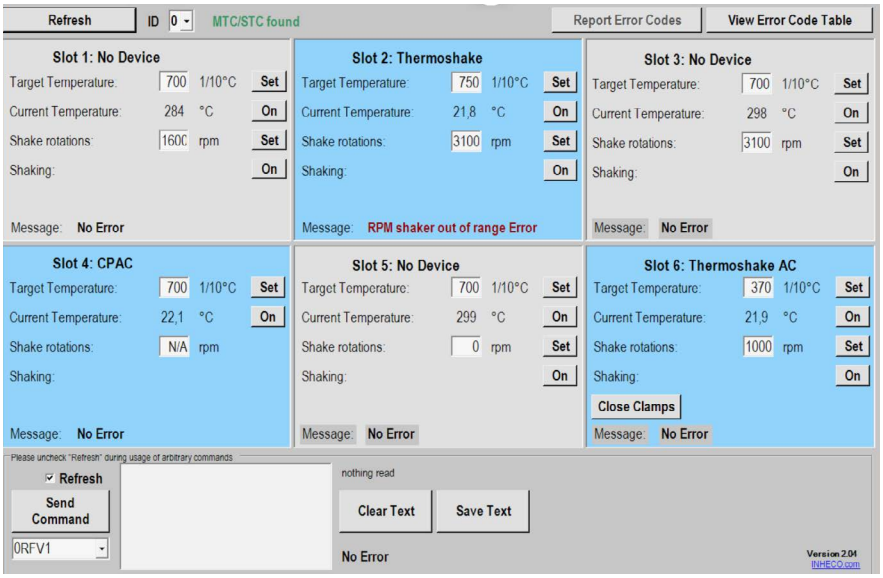

Fig.4: User Interface

Find MTC	Searches for connteced TEC Control Unit
Report Error Codes	Opens additional window listing the incidences (& history) of error codes
View Error Code Table	Opens an additional window in which all possible error codes are displayed
Set **Target Temperature** for device	Example: enter 370 and click on Set for 37°C
Current temperature **On**	Device starts heating or cooling after clicking the button On. While heating the button shows Off
Set **Shake Rotations**	Enter the target rotation in rpm
Shaking **On**	Device starts shaking after clicking on the button On. While shaking the button shows Off
Close Clamps	Allows to close the clamps for transporation without starting the shaking routine. If this button was used to close the clamps start shaking button does not work. The clamping mechnism needs to be opened with this button first.
Refresh	When this box is activated, the values of the current temperature for all connected devices is updated in intervals. Please deactivate the checkbox if you send commands to the TEC Control Unit (see below).
Send Command	You can also send single commands to the TEC Control Unit with the Demo Tool by using the Send Command button. Enter your command (Consult the Firmware Command Set MTC) into the command field and send command
Reply Window	Displays command answer
Clear Text	Erases text from reply window
Save Text	Allows to save the answers from the replay window as a .txt file.

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4.3. Benefits & Examples of Device Control

The INHECO Demo Tool software allows to operate devices with basic temperature and shaking settings. You can also generate error code reports for the evaluation of malfunctions. If you have a Thermoshake connected to your controller, you can also check the cooling liquid level and refill requirements with the Demo Tool.

4.3.1. Temperature setting

- Enter your desired temperature, e.g. enter 700 if your target temperature is 70°C → table below.
- Select Current Temperature On. The button will change to status Off.

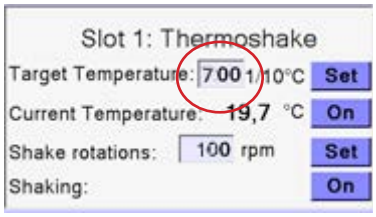

Fig.5: Temperature setting

Device	Minimum temperature	Maximum temperature
CPAC UltraFlat / Mírcoplate	40 (= 4°C)	700 (= 70°C)
CPAC UltraFlat /Microplate HT 2TEC	40 (= 4° C)	1100 (= 110°C)
HeatPAC	N/A	1350 (= 135°C)
Teleshake 95	N/A	1250 (= 125°C)
Thermoshake & Thermoshake AC	20 (= 2°C)	700(= 70°C)
Heated Lid	N/A	1350 (= 135°C)

- To stop heating/cooling select Off.

4.3.2. Shaking setting

- Enter your desired amplitude in rpm → table below.
- Select Shaking On. The button will change to status Off.

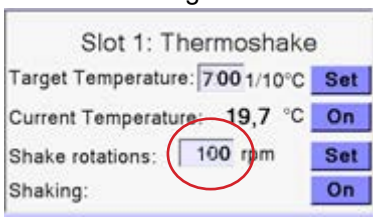

Fig.6: Shaking setting

Device	Minimum rotation	Maximum rotation
Thermoshake	60	2000
Teleshake 95	60	2000
Teleshake MTC / STC	60	2000
Thermoshake AC	200	3000

- To stop shaking select Off.

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4.3.3. Mainboard and Slot Message

The interface displays messages for each Slot Module or connected device related to error bytes. An example is the message regarding the Thermoshake in Fig. 7 below. The Shaker needs a refill of the cooling liquid and must not be used until its reservoir is refilled.

Furthermore the interface displays related messages below the the button Clear Text which are related to error bytes generated by a command.

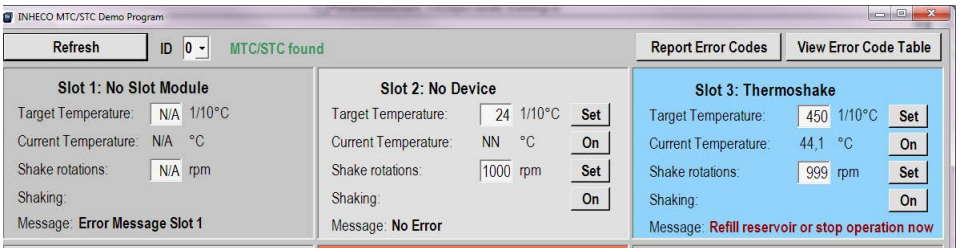

Fig.7: Slot message

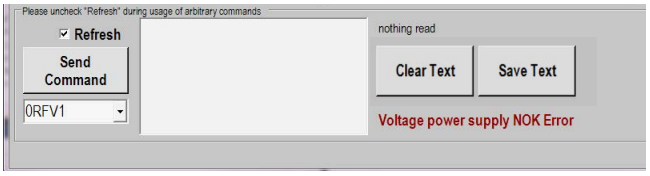

Fig.8: Error byte related message

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4.3.4. Send Firmware Commands to devices

Consult the firmware command set of the TEC Control Unit for the description of the commands.

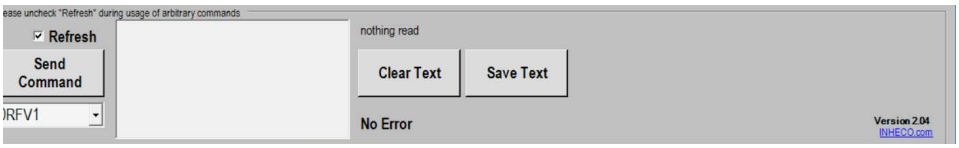

Fig.9: Command section of User Interface

- Uncheck the Refresh Box.
- Enter your command into the command field.

NOTE
The command field below the Send Command button shows either the the default command 0RFV1 or the last command you have entered.

Example of a command: 3rrs (3 = Number of Slot)

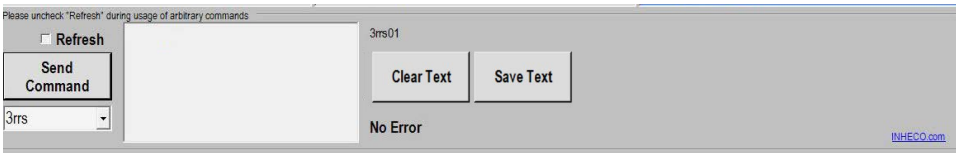

Fig.10: Command section after overwrite

- Select Send Command.

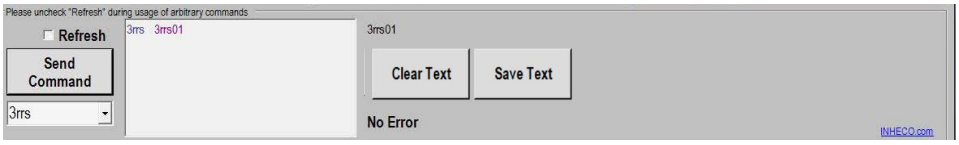

Fig.11: Command section after sending a command with reply (in our example: 3rrs01)

NOTE
Never use a space within a command!

The answer is displayed in the reply message window next to the Send Command (refer to Fig 11. above).

possible Answer (x = slotID)	Description
xrrsYS	x = Slot ID or Mainboard number depending on what you have send digit 2-4 = command digit 5 (here Y) = reply message byte from the error code table digit 6 = the requested parameter
xrrsA..._..._...	correct command but I am busy with an action command or startup. **Refresh** MTC and resend command

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In our example the answer is 3rrs01

digit 1 = Slot ID number = 3

digit 2-4 = command = rrs

digit 5 = reply message byte from the error code table = 0

digit 6 = the requested parameter = 1

Position 6 is the requested parameter which ist describedd in the device´s manual or in the Firmware Command Set:

RRS		
Response	Range	Description
	0	Reservoir is below 1/3 (please refill reservoir)
	1	Reservoir is at least 1/3 full
Error	(5) Invalid operand	

Fig.12: Section RRS within the FWCS: Range is in this case the requested parameter

To save the answer of several command please use Save Text

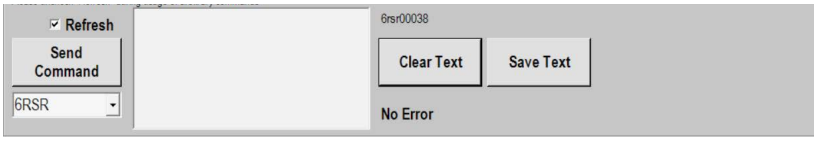

Fig.13: Save answers from the reply message window as txt file

The following window will open:

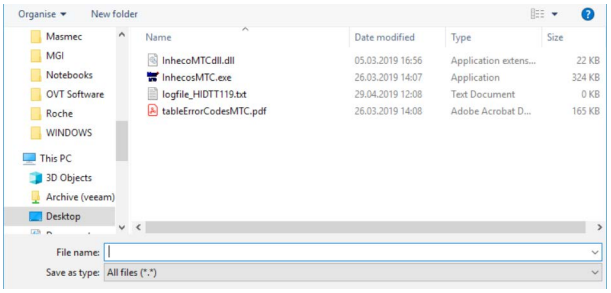

Fig.14: Save answers from the reply message window as txt file

- Enter file name and save, e.g. to send the answers to techhotline.
- Open the xxxx.txt file (xxx = your own chosen file name).

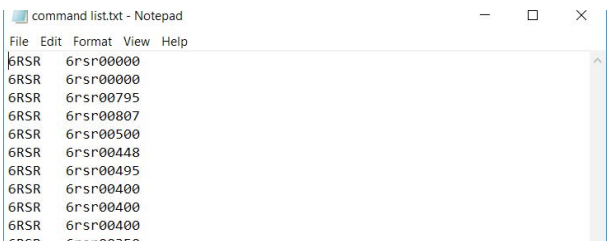

Fig.15: Answer file

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4.3.5. Evaluation of Malfunctions

The Demo Tool allows you to generate the Error Code Report which helps you or INHECO for the first evaluation of malfunctions.

- Select button Report Error Codes

The following window will open to save the error codes:

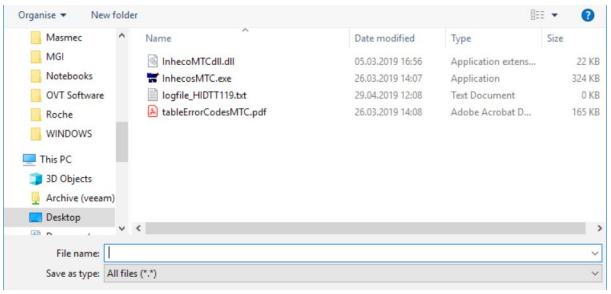

Fig.16: Save the error code report txt file

The file will be saved and in parrallel the Error Codes will be displayed

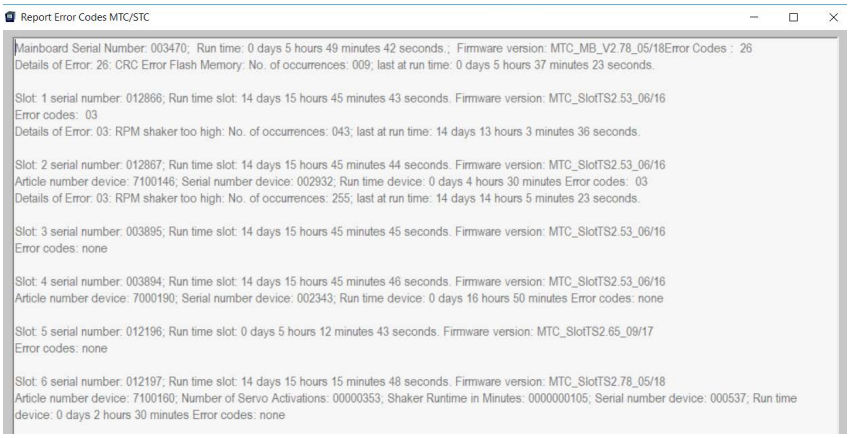

Fig.17: Error code report window

Mainboard errors are TEC Control Unit errors or slot installation errors.

Mainboard Report Section	Description
Mainboard serial no.	Mainboard´s serial no. equals TEC Control Unit´s serial no
Total Run time	Maninboard´s accumulated time of operation
Mainboard firmware version	Mainboards firmware version
Error Codes	Mainboards errors and / or slot module installation errors
Details of error	Detailed error description, Type of error (severness), NR (number of occurences), Maximum # of occurences = 255 Error happened last at run time

Slot errors are errors of the slot modules or of the connected devices.

Slot Module Report Section	Description
Slot Module serial no.	Slot module´s serial number
Run time	Device´s accumulated time of operation
Device type	
Slot Module firmware version	Slot module´s firmware version

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Slot Module Report Section	Description
Error Codes	Slot modules´errors and/or device´s errors*
Details of error	Detailed error description, Type of error (severness), NR (number of occurences), Maximum # of occurences = 255 Error happened last at run time

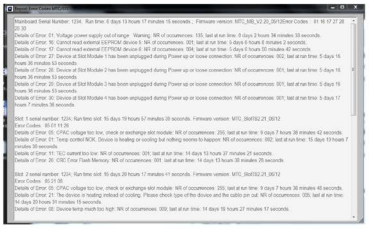
NOTE
The Slot Module Report shows the history of each error reported from all devices connected to this slot since its installation. Errors may be reported which are not related to the currently connected device.

You can receive more information on the error codes if you select Error Code Table

General descriptions of errors are displayed

The following Codes are shown in the MTC/STC Display and in the Error Code log files. These error codes can be read out with the Demotool using the button „report error codes" or with the command 0REC which reports the Error Code of the Mainboard (please refer to Firmware Command Set to learn more about using the commands). Up to 7 errors can be stored into the error memory.

When you use the button „report error codes" following window will open.



In the first line the information about the overall run time of mainboard, the firmware version of mainboard and the error codes are displayed.

In the following the error codes are explained in detail with:
- short description
- Warning or Error (tells something about the severness of an error code)
- NR (Number) of occurences
- Time when the error occured Last at run time

After the information about the Mainboard the infomation for each slot follows correspondingly to the mainboard.

If an error occured just a few times e.g. once and compared to the overall runtime long ago (e.g. error 01 of mainboard in this screenshot) it can be neglected. For all other error codes please refer to the following tables to get more recommendations.

Error	Error (E) / Warning (W)	Description of Error Codes	Impact	Additional Actions	Recommendation
1	W	Voltage power supply out of range	non, if the error code does not appear frequently	Send frequently 0RLO1to the Mainboard. If the reply is always 0rlo00250 the error entry happens accidently. If the reply is 0rloE0250 there seems to be a voltage problem and the Mainboard must be replaced	In addition you can send 0RHV0 to the Mainboard and check if the reply value is reasonable. E.g. if the Voltage is 0rhv00241
2	E	Digital housing temperature out of range	24 V Power supply is switched off, connected devices are no longer usable		Use the command 0RHV2 to watch the housing temperature. Check if ventilation slot is not covered and ensure

Fig.18: Screenshot of error code table

NOTE
If your Demo Tool version does not have the Error Code Table. You can download a new version from the login area at *www.inheco.com.*

- Evaluate the malfunction of your set-up on the basis of your individual Error Code Report and the general descriptions of errors in the Error Code Table.

NOTE
If the last occurence of an error happened clearly before the overall runtime the error has no meaning, e.g. in fig 16: Slot 1 had error 05 at runtime 9 days and the total Run time is 15 days. The error did not occur for the last 6 days of operation thus error 05 can be ignored.

In case you are unsecure about the meaning of particular errors or about the remedy of the malfunction you can send a screenshot of your error code report to *techhotline@inheco.com.* Please add a detailed description of the malfunction (i.e. why are you sending us the error report) in your own words.

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