

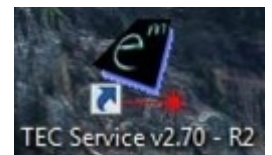
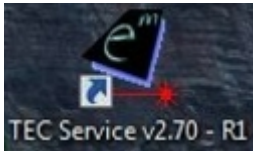
TEC Service XY

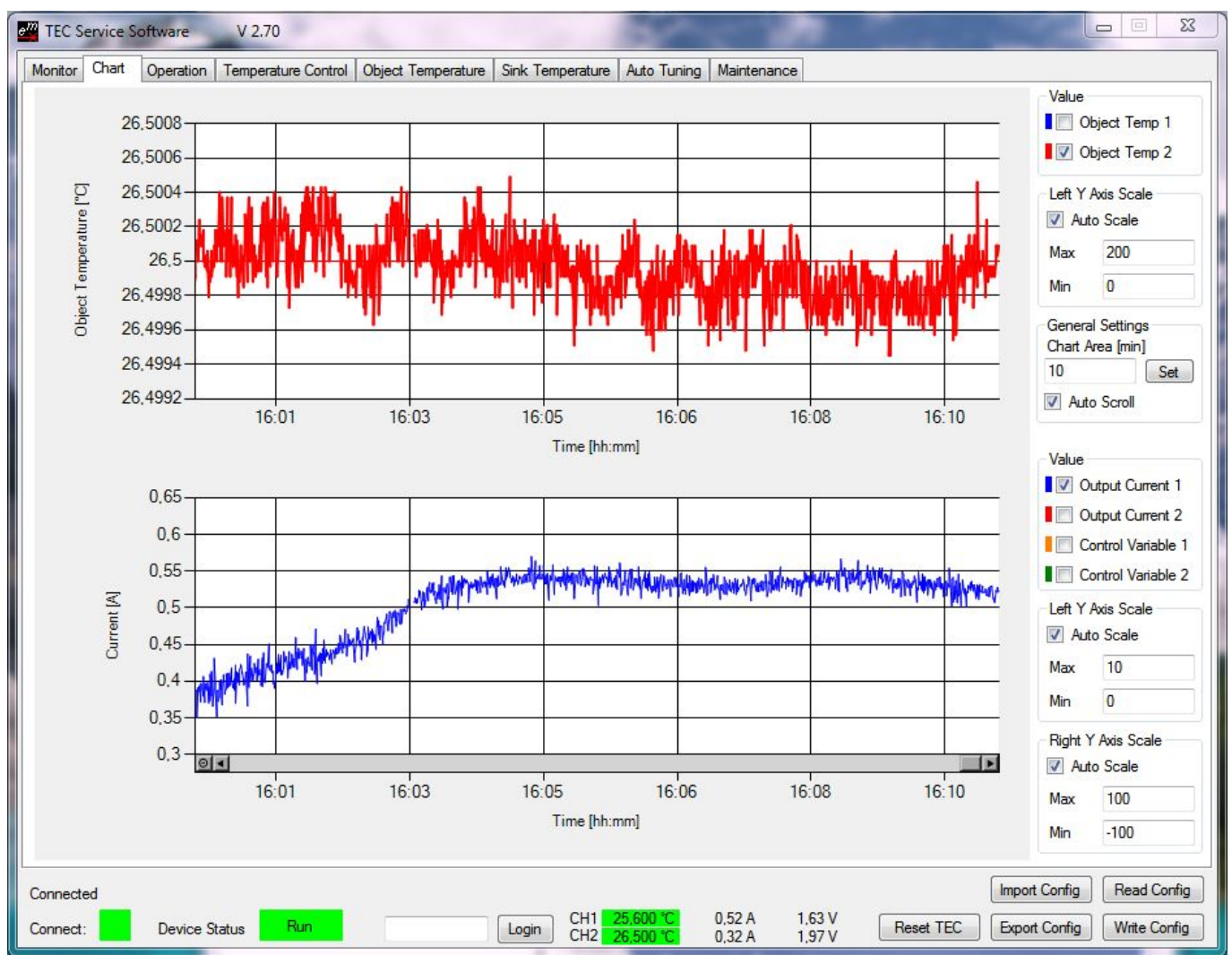
Version: v3.00

Application: Meerstetter Control Software for ECDL baseplate, active shieldings of resonators R1 and R2.

Installation:

1. Copy folders with TEC Software
2. Set a software shortcut on the desktop
3. right click on each shortcut to change the "Ziel" and "Ausführen in"
 1. R1 → DevAddr 1
 2. R2 → DevAddr 2
 3. ECDL Baseplate → DevAddr 0 → "C:\Program Files\TEC Meerstetter\TEC Software v3.00\TEC Service v3.00.exe" **/DevAddr 0**



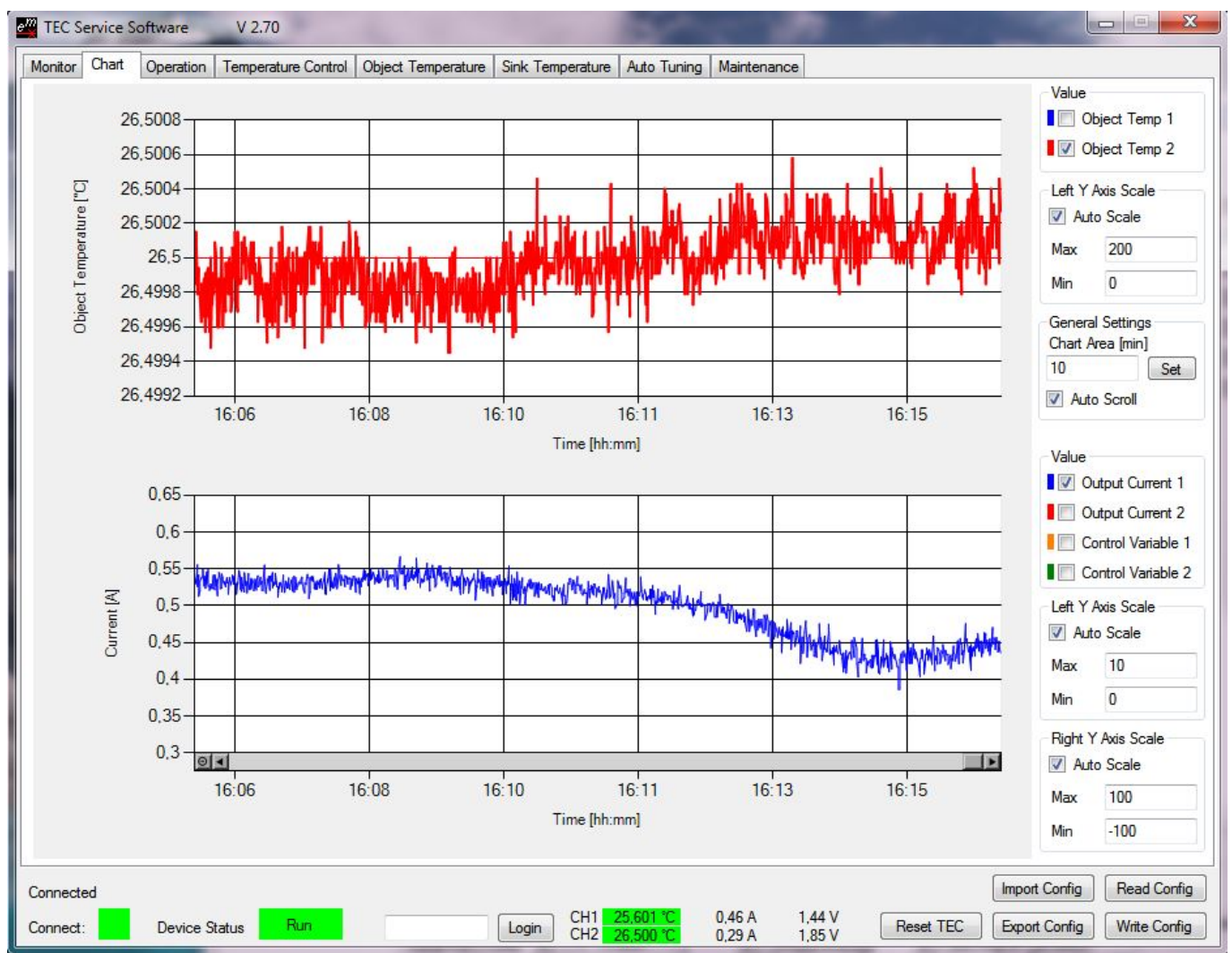


TEC Service Software V 2.70

Monitor	Chart	Operation	Temperature Control	Object Temperature	Sink Temperature	Auto Tuning	Maintenance
CH1 Temperature Measurement				Object Temperature [°C]	25,601	CH2 Temperature Measurement	
				Sink Temperature [°C]	25,000	Object Temperature [°C]	
						Sink Temperature [°C]	
CH1 Temperature Control				Target Object Temperature [°C]	25,600	CH2 Temperature Control	
				(Ramp) Nominal Object Temperature [°C]	25,600	Target Object Temperature [°C]	
				Thermal Power Model Current [A]	0,45	(Ramp) Nominal Temperature [°C]	
						Thermal Power Model Current [A]	
CH1 Output Stage Monitoring				Actual Output Current [A]	0,44	CH2 Output Stage Monitoring	
				Actual Output Voltage [V]	1,38	Actual Output Current [A]	
						Actual Output Voltage [V]	
CH1 FAN Controller				Relative Cooling Power [%]	0	CH2 FAN Controller	
				Actual FAN Speed [rpm]	0	Relative Cooling Power [%]	
						Actual FAN Speed [rpm]	
CH1 Temperature Controller PID Status				PID Lower Limitation [%]	0,0	CH2 Temperature Controller PID Status	
				PID Upper Limitation [%]	100,0	PID Lower Limitation [%]	
				PID Control Variable [%]	5,0	PID Upper Limitation [%]	
						PID Control Variable [%]	
CH1 Temperature Measurement				Object Sensor Raw ADC Value [..]	2095944	CH2 Temperature Measurement	
				Object Sensor Resistance [Ω]	9740,432	Object Sensor Raw ADC Value [..]	
				Object Sensor Temperature [°C]	25,601	Object Sensor Resistance [Ω]	
				Sink Sensor Raw ADC Value [..]	4095	Object Sensor Temperature [°C]	
				Sink Sensor Resistance [Ω]	60753	Sink Sensor Raw ADC Value [..]	
				Sink Sensor Temperature [°C]	-11,717	Sink Sensor Resistance [Ω]	
						Sink Sensor Temperature [°C]	
Firmware and Hardware Versions							
Device Type [..]							
Firmware Version [..]							
Firmware Build Number [..]							
Hardware Version [..]							
Serial Number [..]							
Power Supplies and Temperature							
Driver Input Voltage [V]							
Medium Internal Supply [V]							
3.3V Internal Supply [V]							
Device Temperature [°C]							
Device Temperature Mode (Standard or Extended)							
Maximum Device Temperature [°C]							
Maximum Output Current [A]							
Output Stage Monitoring							
Actual Output Current (CH1 + CH2) [A]							
Error Status							
Error Number [..]							
Error Instance [..]							
Error Parameter [..]							
Error Description							
No Error							
meerstetter engineering							

Connected

Connect: Run Device Status Run Login CH1 25,601 °C 0,44 A 1,38 V CH2 26,500 °C 0,31 A 1,91 V Reset TEC Export Config Write Config



TEC Service SoftwareV 2.70

MonitorChartOperationTemperature ControlObject TemperatureSink TemperatureAuto TuningMaintenance

CH1 Output Stage Control Input Selection

ActualTemperature Controller

New

CH2 Output Stage Control Input Selection

ActualTemperature Controller

New

General Operating Mode

ActualSingle (Independent)

New

CH1 Output Stage Enable

ActualNew

Output EnableStatic ON

CH2 Output Stage Enable

ActualNew

Output EnableStatic ON

Device Address

ActualNew

Device Address [.]2

CH1 Output Stage 'Static Current/Voltage' Control Values

ActualNew

Set Current** [A]1

Set Voltage [V]10

CH2 Output Stage 'Static Current/Voltage' Control Values

ActualNew

Set Current** [A]1

Set Voltage [V]5

RS485 Channel 1 Settings

ActualNew

Baud Rate* [.]57600

Response Delay [us]0

CH1 Output Stage Limits

ActualNew

Current Limitation [A]2

Voltage Limitation [V]15

Current Error Threshold [A]5

Voltage Error Threshold [V]17

CH2 Output Stage Limits

ActualNew

Current Limitation [A]1

Voltage Limitation [V]15

Current Error Threshold [A]4

Voltage Error Threshold [V]17

Communication Watchdog

ActualNew

Timeout [s]0

*Reset required **Defines the Polarity

Connected

Connect:Device StatusRun

Login

CH125.601 °C0.45 A1.42 V

CH226.500 °C0.31 A1.97 V

Reset TEC

Import ConfigRead ConfigExport ConfigWrite Config

TEC Service Software V 2.70

Monitor

Chart

Operation

Temperature Control

Object Temperature

Sink Temperature

Auto Tuning

Maintenance

CH1 Nominal Temperature

	Actual	New
Target Object Temp [°C]	25,6	
Coarse Temp Ramp [°C/s]	0,0001	
Proximity Width [°C]	0,1	

CH2 Nominal Temperature

	Actual	New
Target Object Temp [°C]	26,5	
Coarse Temp Ramp [°C/s]	0,1	
Proximity Width [°C]	0,1	

CH1 Temperature Controller PID Values

	Actual	New
Kp [%/°C]	2000	
Ti [s]	2000	
Td [s]	0	
D Part Damping PT1 [.]	0,3	

CH2 Temperature Controller PID Values

	Actual	New
Kp [%/°C]	3000	
Ti [s]	5000	
Td [s]	0	
D Part Damping PT1 [.]	0,3	

CH1 Modelization for Thermal Power Regulation

Actual Resistor, Heat Only

New

CH2 Modelization for Thermal Power Regulation

Actual Resistor, Heat Only

New

CH1 Peltier Characteristics

	Actual	New
Maximal Current Imax [A]	15	
Maximal Voltage Umax [V]	15,4	
Cooling Capacity Qmax [W]	130	
Delta Temp dTmax [°C]	68	
Positive Current is	Heating	

CH2 Peltier Characteristics

	Actual	New
Maximal Current Imax [A]	15	
Maximal Voltage Umax [V]	15,4	
Cooling Capacity Qmax [W]	130	
Delta Temp dTmax [°C]	68	
Positive Current is	Heating	

CH1 Resistor Characteristics

	Actual	New
Resistance [Ω]	1,9	
Maximal Current [A]	2	

CH2 Resistor Characteristics

	Actual	New
Resistance [Ω]	2	
Maximal Current [A]	1	

Connected

Connect:

Device Status

Run

Login

CH1 25,601 °C

CH2 26,500 °C

0,48 A

0,31 A

1,50 V

1,93 V

Reset TEC

Import Config

Export Config

Read Config

Write Config

TEC Service SoftwareV 2.70

MonitorChartOperationTemperature ControlObject TemperatureSink TemperatureAuto TuningMaintenance

CH1 Object Measurement Settings

	Actual	New
Temperature Offset [°C]	0	
Temperature Gain [°C/°C]	1	

CH1 Actual Object Temperature Error Limits

	Actual	New
Lower Error Threshold [°C]	-10	
Upper Error Threshold [°C]	65	
Max Temp Change [°C/s]	200	

CH1 Object NTC Sensor Characteristics

	Actual	New
Lower Point	Temperature [°C]	0
	Resistance [Ω]	32650
Middle Point	Temperature [°C]	25
	Resistance [Ω]	10000
Upper Point	Temperature [°C]	60
	Resistance [Ω]	2488

CH1 Object Temperature Stability Indicator Settings

	Actual	New
Temperature Deviation [°C]	1	
Min Time in Window [s]	10	
Max Stabilization Time [s]	0	

CH2 Object Measurement Settings

	Actual	New
Temperature Offset [°C]	0	
Temperature Gain [°C/°C]	1	

CH2 Actual Object Temperature Error Limits

	Actual	New
Lower Error Threshold [°C]	-10	
Upper Error Threshold [°C]	65	
Max Temp Change [°C/s]	200	

CH2 Object NTC Sensor Characteristics

	Actual	New
Lower Point	Temperature [°C]	0
	Resistance [Ω]	32650
Middle Point	Temperature [°C]	25
	Resistance [Ω]	10000
Upper Point	Temperature [°C]	60
	Resistance [Ω]	2488

CH2 Object Temperature Stability Indicator Settings

	Actual	New
Temperature Deviation [°C]	1	
Min Time in Window [s]	10	
Max Stabilization Time [s]	0	

CH1 Object Temperature Measurement Limits

Sensor Type:	Lowest Resistance [Ω]	290
NTC	Highest Resistance [Ω]	38810
	Temperature at Lowest Resistance [°C]	131.3
	Temperature at Highest Resistance [°C]	-3.3

CH2 Object Temperature Measurement Limits

Sensor Type:	Lowest Resistance [Ω]	290
NTC	Highest Resistance [Ω]	38810
	Temperature at Lowest Resistance [°C]	131.3
	Temperature at Highest Resistance [°C]	-3.3

Connected

Connect:Device StatusRun

Login

CH125.600 °C0.47 A1.47 V

CH226.500 °C0.31 A1.95 V

Reset TEC

Import ConfigRead ConfigExport ConfigWrite Config

IQwiki - <https://iqwiki.iqo.uni-hannover.de/>

TEC Service Software

V 2.70

Monitor

Chart

Operation

Temperature Control

Object Temperature

Sink Temperature

Auto Tuning

Maintenance

CH1 Sink Measurement Settings

Actual

New

Temperature Offset [°C]

0

Temperature Gain [°C/°C]

1

CH2 Sink Measurement Settings

Actual

New

Temperature Offset [°C]

0

Temperature Gain [°C/°C]

1

CH1 Actual Sink Temperature Error Limits

Actual

New

Lower Error Threshold [°C]

5

Upper Error Threshold [°C]

70

Max Temp Change [°C/s]

200

CH2 Actual Sink Temperature Error Limits

Actual

New

Lower Error Threshold [°C]

5

Upper Error Threshold [°C]

70

Max Temp Change [°C/s]

200

CH1 Sink NTC Sensor Characteristics

Actual

New

Lower Point

Temperature [°C]

0

Resistance [Ω]

32650

Middle Point

Temperature [°C]

25

Resistance [Ω]

10000

Upper Point

Temperature [°C]

60

Resistance [Ω]

2488

CH2 Sink NTC Sensor Characteristics

Actual

New

Lower Point

Temperature [°C]

0

Resistance [Ω]

32650

Middle Point

Temperature [°C]

25

Resistance [Ω]

10000

Upper Point

Temperature [°C]

60

Resistance [Ω]

2488

CH1 Sink Temperature Measurement Limits

Sensor Type:

Lowest Resistance [Ω]

37

NTC

Highest Resistance [Ω]

53668

Temperature at Lowest Resistance [°C]

232,6

Temperature at Highest Resistance [°C]

-9,4

CH2 Sink Temperature Measurement Limits

Sensor Type:

Lowest Resistance [Ω]

30

NTC

Highest Resistance [Ω]

55858

Temperature at Lowest Resistance [°C]

245,1

Temperature at Highest Resistance [°C]

-10,2

CH1 Sink Temperature General

Actual

New

Sink Temperature Selection

Fixed Value

Fixed Temperature [°C]

25

Upper ADC Limit Error

Enabled

CH2 Sink Temperature General

Actual

New

Sink Temperature Selection

Fixed Value

Fixed Temperature [°C]

25

Upper ADC Limit Error

Enabled

Connected

Connect:

Device Status

Run

Login

CH1

25.600 °C

0.46 A

1.46 V

CH2

26.500 °C

0.31 A

1.91 V

Reset TEC

Export Config

Write Config

Import Config

Read Config

TEC Service Software V 2.70

Monitor | Chart | Operation | Temperature Control | Object Temperature | Sink Temperature | Auto Tuning | Maintenance

PID Auto Tuning

Select the TEC Instance: CH 1

1. Presettings

Thermal Model Speed: Fast Model

2. Status

Start Cancel

Idle. Press Start to Tune!

3. Tuning Results

Fast PID Values		Slow PI Values	
Kp	0,000 %/°C	Kp	0,000 %/°C
Ti	0,0 s	Ti	0,0 s
Td	0,0 s		

☐ Use Slow PI Values

PID D Part Damping PT1 Recommendation
Recommended Value: 0,000
☒ Use the Recommended Value

Nominal Temperature Ramping Recommendation
Coarse Temp Ramp: 0,000 °C/s
Proximity Width: 0,0 °C
☒ Use the Recommended Value

Write Auto Tuning Results to TEC

General Description:
The Auto Tuning function may help to find the best Temperature Controller settings. If the Auto Tuning process succeeds, it recommends you some settings. You will need to test these settings by yourself. The Auto Tuning process is based upon a Closed-Loop system. Please have look at the TEC-Family User Manual for more information.

Precautions:
The Auto Tuning process will only be successful if most of the TEC settings are set correctly. Please make sure you have set the right "Peltier Characteristics". Take this information directly from the peltier datasheet. If you want to limit the output current, please use the settings on the "Operation" tab. Please make sure that the Temperature Controller is running with its default PID settings before you use Auto Tuning. Most thermal models will be controllable with the default PID settings. Set under "Temperature Control" the "CHx Temperature Controller PID Values" to its default values: Kp = 10; Ti = 300; Td = 0.

1. Presettings
Fast Model: Use this setting if you have only a small thermal load and the target temperature is usually reached within a few seconds (Do always start first with this setting).
Slow Model: Use this setting if you have a huge thermal load and the target temperature is usually reached within some minutes.

2. Status
Set the System to "Static ON" and wait till the Target Temperature is reached and the Temperature has equalized.
Start the Auto Tuning process and observe the process on the Chart tab. If the process fails, try the fast or slow Model.

3. Tuning Results
Usually you only have to click on "Write Auto Tuning Results to TEC".
If you are unsatisfied with the resulting temperature control behavior, please have a look at the User Manual for further information and suggestions.

Raw Values

2a	0,000 °C
2d	0,0 %
Ku	0,0 %/°C
Tu	0,0 s

Connected

Connect: Run Device Status Run

Login CH1: 25,600 °C 0,49 A 1,52 V CH2: 26,500 °C 0,31 A 1,93 V

Reset TEC Import Config Read Config Export Config Write Config

TEC Service Software V 2.70

Monitor | Chart | Operation | Temperature Control | Object Temperature | Sink Temperature | Auto Tuning | Maintenance

Service Communication Settings

	Actual	New
Device to be Addressed [..]	0	0
Communication Interface	USB	USB
Ethernet Address [..] (IP Address or Hostname)		

Set and Reconnect

Application Arguments for starting the Service Software with the currently active Communication Settings.

TEC Service v2.70.exe

Set Device Address based on Serial Number and Type

☐ Enable (Disables all Service SW Functions)

Device Type to be Addressed [..]

Device S/N to be Addressed [..]

Option (0 is default) [..] 0

New Device Address [..]

Send Broadcast (255) Package

Monitor Data Logger

	Actual	New
Logging Interval [s]	1	
Number of Log Entries [..]	26604	

Set

Export all Monitor Values to CSV File (Debug) ☐

Clear Data | Export Logged Monitor Data to CSV File

Device Boot Loader

Load Hex File | Update Device

Create *.mepar File (for Settings Dump)

This Function is only available when a Device was connected to this software.

Only the 'New' Fields are exported to this file. Use 'Export Config' and 'Import Config' to move the values from 'Actual' to 'New'. Consider the Temperature Measurement Calibration Values!

Create File

Send *.mepar String (Single Setting Download)

Add only one Line:

Send String

STM32 Internal Boot Loader

Jump to Internal Bootloader

Please use the "STM32 and STM8 Flash Loader Demonstrator" Version 2.4.0 or Higher to Download the Program.

Connected

Connect: Run Device Status Run Login

CH1	25.600 °C	0.48 A	1.50 V
CH2	26.500 °C	0.31 A	1.94 V

Reset TEC | Import Config | Read Config | Export Config | Write Config

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