TEC Controller Software

1 Current Release Notes, Version 2.20

2 February 2015
TEC Service Software Version 2.20; TEC STM32 Version 2.20

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.50)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.31)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- Mod: Parameter Save to flash delay reduced from 2s to 0.5s. The save to flash process is running faster. This results in a much shorter time between “Write Config” and an possible “Reset TEC” event.
- Add: ?TT Command (customized command, see Communication Protocol Document for more information)
- Add: Configurable Error 108 delay (Output Stage Controller Limitation Error Delay to solve the problem of temporarily too low Driver input voltages in compare to the output voltage.

Resolved Issues

- The OLED Display shows the wrong error text for the “Output Overvoltage” error.
  →Fixed

Known Issues

- IBC functionality currently not available

2 Old Release Notes, Version 2.10

24 November 2014
TEC Service Software Version 2.10; TEC STM32 Version 2.10

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.50)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.31)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- Add: Communication Watchdog. A timeout error is thrown if no package has been received during the specified timeout.
- Mod: Object and Sink Temperature Measurement Limits precautions enhanced and harmonized

Resolved Issues

- CSV Export CH1 current shows CH1 + CH2 current
  → Fixed
- "Create *.mepar File (for Settings Dump)" does not convert the firmware version correctly. Therefore it will probably not be possible to download the generated strings.
  → Version conversion function fixed

Known Issues

- IBC functionality currently not available

3 Old Release Notes, Version 2.00

7 August 2014
TEC Service Software Version 2.00; TEC STM32 Version 2.00

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.40)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.30)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- The Auto Tuning feature has been enhanced for slow thermal models.
- The Temperature PID Controller has been supplemented with a “D Part Damping PT1” filter. This is very useful for slow thermal models with big Td values.
- Added more instructions to the Lookup Table feature:
    - SET_FLOAT, SET_INT: Can be used to set every parameter to a new value. Opens a wide variety of options to use the Lookup Table. For example generating a current curve shape without temperature control.
    - TILL_TEMP_STABLE: Waits at this point till the Object Temperature of the corresponding channel is stable.
- Add: Clear Button for clearing “Monitor Data Logger” (CSV Export)

Resolved Issues

- Opening more than one Service Software instance simultaneously may result in USB connecting problems.
  → Solved: The connecting delays are now initialized by a random number.
  (Do also FTDI driver update to 2.10.00)
- Connecting over Ethernet is not possible if the FTDI USB driver is not installed.
  → Solved
- The Service Software shows the wrong Error Message for Base Plate over Temperature.
  → Temperature in Error Message removed, because TEC-1091 has a higher switch off Temperature.
- The Service Software shows some wrong Error Information values for Input Voltage Errors.
  → Solved: Absolute Voltages removed in Error Text
- The TEC PBC RESx Pin switches not back to high impedance if the PBC function “---“ is selected.
  → Solved.
- Auto Tuning works not if the thermal model is very slow (Timeout)
  → Solved: Option for Slow Thermal Model added
- Auto Tuning may output not optimal PID Parameters if the thermal model is very slow. (The resulting D Time (Differential Time) becomes very big and adds a noise to the current output, because the temperature measurement noise is being amplified very strong)
  → Solved: Option for Slow Thermal Model added and PID D Part Damping Value added (see PID Parameters new value: “D Part Damping PT1”.

- Using only heating or only cooling thermal models, the PID controller does not use the P Part if the current temperature is above or under the target temperature.
  → Solved: The PID controller internal Limits have been enhanced.
- Error 139 may occur at some fast thermal models because the setting “Max Temp Change [°C/s] is set too low by default.
  → Solved: Set to 200°C/s as default.
- CSV Export: The Integer Values like Error Numbers were not exported.
  → Solved
- High TEC Service Software RAM consumption after a few days due to data logging
  → 1 Log entry takes about 700 Bytes. The Graph has a limited history of 6h – 7h.

Known Issues

- IBC functionality currently not available

4 Old Release Notes, Version 1.91

6 February 2014
TEC Service Software Version 1.90; TEC STM32 Version 1.91

Supported Devices

- TEC-1089(HV) / TEC-1090(HV) (Hardware Versions 1.00 – 1.40)
- TEC-1122(HV) / TEC-1123(HV) (Hardware Versions 1.01 – 1.30)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- Output voltage Limitations changed:
  - 19V Version can now output up to 22V if primary supply is high enough.
  - High Voltage Version added. TEC-XXXXHV with output voltage limit of 31V.
- Option to export all Monitor values to .CSV File added.

Resolved Issues

- It may be difficult to use several TEC or LDD Service Software Applications simultaneously on one PC (Connecting to the right device is difficult)
  → Solved. The Service Software tries now to connect to every TEC connected to the computer. The first compatible and free device is taken. Please refer to the User Manual for details:
  6.9 Remote Control / Service Communication by TEC Service Software
- Service Software freezes if the USB connection has a problem. (Sometimes caused by EMC Problems)
  → Solved. The Service Software disconnects and reconnects to the device.
- FAN Control Feature problems solved:
  - Some FAN need a relatively high PWM Level to start (or not to Stop). This may be detected as Error by the TEC (FAN blocked).
    →Solved: Error Level has been increased from 10% to 35% PWM Level combined with the no rotation criteria.
  - The PWM Level goes not to 0% if 0 rpm is required. Some FANs do then detect the rotor blocked condition and stop working.
    → Solved: PWM level goes to 0% if no rotation is required.
  - Bypassing FAN speed controller option added, because some FAN do have already a built in speed controller.
- The lock feature of the PBC updown buttons was always activated if no buttons have been selected.
  → Solved

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging
- Auto Tuning works not if the thermal model is very slow (Timeout)

- Auto Tuning my output not optimal PID Parameters if the thermal model is very slow.
  → The resulting D Time (Differential Time) becomes very big and adds a noise to the current output, because the temperature measurement noise is being amplified very strong.
  → Workaround: Send a screenshot of the Tuning Tab on a succeeded Auto Tuning to Meerstetter Engineering and we will send you PID Parameters which are leaving de D Part to 0. (Using only PI controller)

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.90
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.91.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- All new parameters are automatically initialized to a sensible value.

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

5 Old Release Notes, Version 1.83

17 January 2014
TEC Service Software Version 1.80; TEC STM32 Version 1.83

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.40)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.30)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- PBC RESx (General purpose) Interface functions modified:
    - CHx Temp Up / Down: Can be used to increase or decrease the target temperature by using external buttons. (Pushing both buttons for more than 6s, the function is locked or unlocked)

Resolved Issues

- None

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging
- Auto Tuning works not if the thermal model is very slow (Timeout)
- Auto Tuning my output not optimal PID Parameters if the thermal model is very slow.
  → The resulting D Time (Differential Time) becomes very big and adds a noise to the current output, because the temperature measurement noise is being amplified very strong.
  → Workaround: Send a screenshot of the Tuning Tab on a succeeded Auto Tuning to Meerstetter Engineering and we will send you PID Parameters which are leaving de D Part to 0. (Using only PI controller)
- It may be difficult to use several TEC or LDD Service Software Applications simultaneously on one PC (Connecting to the right device is difficult)

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.80
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.83.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- All new parameters are automatically initialized to a sensible value.

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

6 Old Release Notes, Version 1.80

13 December 2013
TEC Service Software Version 1.80; TEC STM32 Version 1.80

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.40)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.30)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- PBC RESx (General purpose) Interface functions added:
  - TEC Run: Goes to high level if the TEC is in Run State
  - CHx Not Stable: Goes to high if an error is occurred or the temperature is not stable
  - CHx Temp Up / Down: Can be used to increase or decrease the target temperature by using external buttons.
- Display output options added:
  - CHx Actual 4: Actual Object Temperature with one decimal place.
  - CHx Nominal 2: Target Temperature with two decimal places
- CSV Data Export enhancements:
  - The Timestamp used in the CSV export function has now a international format: YYYY-MM-DD HH:MM:SS
  - The stored values have now the fully 32 bit float resolution.
- The Service Software can now handle comma or point separated decimals, depending on the regional computer settings.
- The graph is now feed with the fully 32 bit float values.
- The Input Voltage limitation error is set to 29V in case of TEC-1089/1090/1122/1123. (The Input Voltage limitation of the Datasheet is still mandatory, expect for specially modified types)

Resolved Issues

- The Service Software Graph was not displaying any values on Windows 8.1.
  → Data Input and Output handling revised (comma or point used as decimal separator)
- Service Software: All buttons in the Lookup Table have no function.
  → Button event added again.

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging
- Auto Tuning works not if the thermal model is very slow (Timeout)
- Auto Tuning my output not optimal PID Parameters if the thermal model is very slow.
  → The resulting D Time (Differential Time) becomes very big and adds a noise to the current output,

because the temperature measurement noise is being amplified very strong.
→ Workaround: Send a screenshot of the Tuning Tab on a succeeded Auto Tuning to Meerstetter Engineering and we will send you PID Parameters which are leaving de D Part to 0. (Using only PI controller)

- It may be difficult to use several TEC or LDD Service Software Applications simultaneously on one PC (Connecting to the right device is difficult)

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.80
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.80.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- All new parameters are automatically initialized to a sensible value.

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

7 Old Release Notes, Version 1.70

17 October 2013
TEC Service Software Version 1.70; TEC STM32 Version 1.70

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)
- TEC-1091 (Hardware Versions 0.80 - 1.00)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- TEC-1091 compatible
- The default values for the expert temperature settings can now be loaded directly form the expert tab. This brings the advantage to have only one default file for all TECs.
- Additional PBC RESx functions:
    - "TEC OK" → Pin is high Level when the TEC is in "Ready" or "Run" Mode.
    - "CHx Rmp/Stable" → Pin is alternating with 1Hz when the Temperature control is active. Pin is high Level when the temperature is stable.
- Stability Indicator: Parameter "Max Stabilization Time" added. Can be used to generate an error if the temperature is not being stabilized within de specified time.
- Auto Reset: Parameter "Error State Auto Reset Timeout" added. If the TEC goes into the error state. It will be reseted after the specified time.

Resolved Issues

- If more than one error condition is present. The error number may change on leaving the error State. → Fiexed (Just the first occurred error is shown)

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.70
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.70.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- All new parameters are automatically initialized to a sensible value.

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

8 Old Release Notes, Version 1.60

14 August 2013
TEC Service Software Version 1.60; TEC STM32 Version 1.60

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- OLED Display Functionality. A Alphanumeric Display can now be connected directly to the TEC on the Connector X11. Some different Values and Messages can be shown on the display.
- FAN Control: A ventilator control function is now available. It is intended to cool down the Peltier heat sink to a desired temperature. It is also possible to use the Object Temperature to control the FAN. The correct function of the FAN is monitored by the TEC Firmware. Only 4 wire ventilators can be connected.
- The PBC Connector has got some new functions. The Signals RES1 … RES8 can be used for the following functions:
    - Data Interface: The Signals can be set or read back over the Data Interface
    - TEC OK: Output is high when the TEC is in Run or Ready status
    - CHx Stable: Output is high when the object temperature is stable.
    - CHx HW Enable: If this function is selected, the TEC is only running if this Signal is high.
    - CHx FAN PWM: Speed control Signal for a ventilator.
    - CHx FAN Tacho: Speed sense Signal for a ventilator.
- The Parameter System Save to Flash function can be disabled now. This is useful when the TEC is being controlled over a Data Interface and some values are periodically changed. Prevents early Flash failure.
- The Actual Object Temperature Source can be changed from the onboard sensor to a external Data Interface Register. Can be used to feed the Actual Object Temperature from external to the TEC.
- The Address of the connected Device is shown in the Service Software title.

Resolved Issues

- The Service Software can not connect to the Rack over Ethernet if just a IP Address is being typed in the Address field under OS Win 7 (DNS Name is OK). → Problem Solved
- The Service Software Graph is using a lot of CPU power if a very small temperature range is displayed. → Dotted nominal temperature line changed to solid line. CPU usage reduced to about 1%.
- If a Parameter is being changed while the TEC is Boot loading, the reset after boot loading is not being executed and the new Parameter will not be saved. → The Parameter is now being saved after boot loading and after this the reset is executed.

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.60
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.60.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- All new parameters are automatically initialized to a sensible value.

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

9 Old Release Notes, Version 1.51

17 July 2013
TEC Service Software Version 1.50; TEC STM32 Version 1.51

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

- None

Resolved Issues

- Sink Temperature: If Mode “Fixed Value” is selected and the Sink Temperature hardware measurement is in error state, the Sink Temperature is displayed as “NA”.
  → Fixed

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.50'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.51.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

10 Old Release Notes, Version 1.50

17 June 2013
TEC Service Software Version 1.50; TEC STM32 Version 1.50

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

- If the TEC is used in a LTR-1200, the Device Address is an important setting to be able to communicate with the TEC. If the user imports a Config File, the Service Software asks the user now before the Address is being changed.

Resolved Issues

- Exoprt Config: No file extension is being added if the Filename does contain some dots.
  → Fixed
- Bootloader: If a wrong hex file is being downloaded by the user, the Service Software generates the correct error Message, but the Bootloader is hanging in a unknown state.
  → The Bootloader state machine is now being set back to reset state if the user restarts the download process.

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.50'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.50.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

11 Old Release Notes, Version 1.43

29 May 2013
TEC Service Software Version 1.42; TEC STM32 Version 1.43

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

None

Resolved Issues

- The Output Stage Controller produces more current ripple close to the zero current point. This can result in higher temperature variations than normal.
  → Output Stage Controller switching between current and voltage mode enhanced again.

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.42'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.43.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

12 Old Release Notes, Version 1.42

23 May 2013
TEC Service Software Version 1.42; TEC STM32 Version 1.42

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

None

Resolved Issues

- The Output Stage Controller produces more current ripple close to the zero current point. This can result in higher temperature variations than normal.
  → Output Stage Controller switching between current and voltage mode enhanced.
- Parameter Save System does not detect when new parameters not have been saved.
  → The parameter sequence Number is now being checked after saving.
- The Service Software crashes on negative Auto Tuning process
  → Negative Process is now limited to 0

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.42'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.42.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

13 Old Release Notes, Version 1.41

10 April 2013
TEC Service Software Version 1.41; TEC STM32 Version 1.41

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- Interaction with LTR-1200 improved:
  - The Service Software is now able to connect over Ethernet to the LTR-1200
  - Communication watchdog between HMI and TEC added
- New Parameter ID added:
  - ID 106: Error Instance
  - ID 107: Error Parameter
- The RES1 … RES8 signals on the PBC Connector can now being used as Digital IO. The user can control them over some Parameter IDs.

Resolved Issues

- Data loss on RS485 Interface at very high data Rates
  →Driver is now enabled 4us before the first byte is being sent.
- Channel 2 of the “dual Channel TEC” took the “Object Measurement Setting – Current Source” from the Channel 1.
  →Parameter Instance set to 2 for Channel 2.
- Firmware update reading the HEX file directly from CD was not possible
  →Service Software is now able to handle read only files.

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version > 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.41'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.41.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

14 Old Release Notes, Version 1.40

08 March 2013
TEC Service Software Version 1.40; TEC STM32 Version 1.40

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- Operation modes of dual channel TECs improved:
  'General Operating Mode' can be set to:
  - 'Single (Independent)' → each channel is used totally independently
  - 'Parallel (CH1 → CH2); Individual Loads' → one temperature controller (CH1) is active and two Peltier elements are used (one on CH1, one on CH2), both acting on the same object
  - 'Parallel (CH1 → CH2); Common Load' → one temperature controller (CH1) is active and the two output stages are connected in parallel to drive one bigger (high current) Peltier element
- Actual Voltage values added to the Service Software status bar
- Command SA added: is used to set the device address based on the device type and serial number
- Command ?SD added: is used to download the mepar strings. These strings can be exported by the Service Software. This feature is used to easily change a configuration set by third-party software

Resolved Issues

- ini file import failure: if an ini file is imported in offline mode, all 'New' fields are filled up with 'Type Err' →Type is now ignored in offline mode

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version 1.31 / 1.30 / 1.20 / 1.11 / 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini file.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.40'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.40.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

15 Previous Release Notes, Version 1.31

15 February 2013
TEC Service Software Version 1.30; TEC STM32 Version 1.31

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- New Parameter ID added:
  - ID 104: Device Status
  - ID 105: Error Number

Resolved Issues

- Communication failure: The ?IF command has returned 24 chars instead of 20 chars
  → Package size fixed to 20 chars (as it is defined in the communication protocol)

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version 1.30 / 1.20 / 1.11 / 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini File.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.30'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.31.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

16 Previous Release Notes, Version 1.30

31 January 2013
TEC Service Software Version 1.30; TEC STM32 Version 1.30

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual or the communication protocol specification for further information:

- Operation tab parameter changed from “Mode” to “CHx Output Stage Input Selection”. One of several input sources defining the parameters of the output stage can be selected. Options:
  - “Static Current/Voltage” is used to operate the TEC as a standalone device with fixed values
  - “Live Current/Voltage” is used to operate the TEC as BUS-device with live (RAM) values
  - “Temperature Controller” is used to operate the TEC as temperature controller
- Operation tab parameter changed from "CHx TEC Output Enable" to “CHx Output Stage Enable”. New definitions, new live option added:
  - “Static OFF” is used to have the TEC output stage always OFF
  - “Static ON” is used to have the TEC output stage always ON
  - “Live OFF/ON” is used to follow the Enable status taken from another live (RAM) parameter. This mode is recommended while in BUS-operation over communication protocol
- New “Parameter System Flash Status” parameter added
- Reset is delayed if Flash write progress is running
- New “Emergency Stop” command added

Resolved Issues

- Parameter loss because of an erroneous load process, due to a transmission error
  → Flash communication failure tolerance added
- Error message caused by an erroneous parameter load process was automatically cleared after the next device reset

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version 1.20 / 1.11 / 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini File.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.30'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.30.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

17 Previous Release Notes, Version 1.20

03 December 2012
TEC Service Software Version 1.20; TEC STM32 Version 1.20

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual for further information:

- Sink Temperature Measurement: Reference Voltage parameter added

Resolved Issues

- none

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version 1.11 / 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration as an ini File.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.20'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.20.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

18 Previous Release Notes, Version 1.11

28 November 2012
TEC Service Software Version 1.10; TEC STM32 Version 1.11

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual for further information:

- New 'Lookup Table' functionality added. Use the Lookup Table example Excel files to generate the CSV file. The new Tag in Service Software is only visible with the expert login.
- New Parameters to control the TEC Controller in BUS Mode. See Document 5136J

Resolved Issues

- none

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version 1.01

Attention:

- The device configuration will not be erased during the update process, it is although recommended to export the current TEC configuration to a ini File.

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.10'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.11.hex’
3. Press ‘Update Device’ and wait for the process to complete

Set the new available parameters:

- <No new parameters available in Service Software>

How to Update from Versions older than 1.01

Use the previous Release Notes Version 1.01

19 Previous Release Notes, Version 1.01

01 October 2012
TEC Service Software Version 1.01; TEC STM32 Version 1.01

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.20)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.20)

New and Improved Features

The current release features the following enhancements. Refer to the user manual for further information:

- New 'PID Auto Tuning' of the digital temperature controller
- New 'Monitor Data Logger' built into TEC Service Software (incl. export to .csv file)
- New RS485 channel 2 connection to TEC Service Software (alternative to USB)
- New 'Object Temperature Stability Indicator' (user configurable)
- New comprehensive 'Error Status' description in 'Monitor' tab
- New residual/leakage current detection
- Improved output ripple (reduced by a factor 2)
- Improved nominal temperature ramping from starting value to 'Target Object Temp' (sine-shaped curve)

Resolved Issues

- TEC Service Software decimal separator incompatible with some regional settings
- Error 10 after firmware updates using the 'Device Bootloader'
- Two channels 'Parallel' operating mode unreliable

Known Issues

- IBC functionality currently not available
- High TEC Service Software RAM consumption after a few days due to data logging

How to Update from Version 0.70

Attention:

- Due to an error in a previous bootloader version, Error 10 may be displayed after firmware update. Please follow the update instructions below to resolve this problem
- The device configuration will not be erased during the update process

Update Instructions:

1. Connect the TEC controller to the 'TEC Service Software V 1.00'
2. Select tab ‘Maintenance’, press 'Load Hex File' and chose ‘TEC STM32 v1.00.hex’
3. Press ‘Update Device’ and wait for the process to complete
4. Error 10 may occur. Please do a power cycle now
5. Press the ‘Update Device’ button again and wait until the process has completed
   (The bootloader will now be updated and the problem will be resolved)

Set the new available parameters:

- Set the ‘CHx Object Temperature Stability Indicator Settings’ in tab ‘Object Temperature’

How to Update from Versions older than 0.70

Due to profound changes in software, the update and re-configuration process is not straightforward and thus cannot be carried out by the customer alone. Send the current .ini file to contact@meerstetter.ch and wait for more instruction.

20 Legacy TEC Controller Software Releases

Version 0.7x

06 July 2012

TEC Service Software Version 0.70; TEC STM32 Version 0.70

Software Changes

- New access to all TEC-Family Communication Protocol RS485 commands also over USB
- New 'Expert' tab (hardware settings)
- New display of hardware-given 'Temperature Measurement Limits' in TEC Service Software
- New auto gain setting for the ADC (extended object temperature measurement range)
- Improved NTC temperature accuracy (Steinhart-Hart model)
- Improved digital temperature controller (PID regulator parameter Td fixed)
- Changed Firmware Identification String (?IF Command) to "8065-TEC SW G01 "