TEC Controller Software

1 Current Release Notes, Version 5.01

29 October 2021; TEC Service Software v5.01; TEC STM32 v5.01

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.10
- TEC-1090: Hardware Version Range 1.00 – 1.90
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 2.00
- TEC-1091 Hardware Version Range 0.80 – 3.40
- TEC-1092 Hardware Version Range 1.00 – 1.01
- TEC-1161 Hardware Version Range 1.00 – 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:

- Steinhart-Hart Coefficients now calculated using double precision values, resulting in improved precision when using NTC sensors. Measured temperature can change slightly compared to old firmware.
- Bootloader updated, no effect for users.

Resolved Issues

- Error 37 (Internal 3.3V power net > Hard Limit) could appear sporadically when using the TEC-1091. Frequency of internal supply voltage measurements modified to avoid aliasing effects.

Known Issues

- The Service Software may lose the connection to the device if the graph is zoomed out too much because of CPU overload.
- It is not possible to handle .ini files from a path that contains non-ASCII characters.

2 Old Release Notes, Version 5.00

27 July 2020; TEC Service Software v5.00; TEC STM32 v5.00

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.10
- TEC-1090: Hardware Version Range 1.00 – 1.90
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 2.00
- TEC-1091 Hardware Version Range 0.80 – 3.30
- TEC-1092 Hardware Version 1.00
- TEC-1161 Hardware Version 1.00 – 1.10

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 encrypted bootloader:
  - The firmware file is now encrypted and will be decrypted during installation on the device
  - The JTAG interfaces is fully disabled
  - It is not possible to update from a firmware < v5.00 to a firmware >= v5.00 and it is not possible to downgrade from firmware >= v5.00 to a firmware < 5.00, without sending the device back to Meerstetter Engineering GmbH
  - The Service Software does now preload the path to the accurate .hex file, contained in the .msi installation package, otherwise the browse function can be used.
- STM32 command to jump to the internal bootloader removed.
- GPIO Start Lookup Table debounce time reduced from 1s to 100ms.
- Add customer specific command: “?TT”.

Resolved Issues

- The Service Software Device Boot Loader can now handle any windows compatible file path.
- CHx Object Temperature Measurement Limits, Lowest Voltage was wrong in case of VIN1.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini files from a path that contains non-ASCII characters.

3 Old Release Notes, Version 4.20

11 March 2020
TEC Service Software v4.20; TEC STM32 v4.20

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.10
- TEC-1090: Hardware Version Range 1.00 – 1.90
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 2.00
- TEC-1091 Hardware Version Range 0.80 – 3.30
- TEC-1092 Hardware Version 1.00
- TEC-1161 Hardware Version 1.00 – 1.10

New and Improved Features

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

- Support for the TEC-1161 added
- Pump Control Feature:
    - Channel 2 temperatures can now be used for channel 1 fan and vice versa. The Device Temperature can also be used for pump control.
- Mod: The Service Software has been updated to Visual Studio 2019. The Software has not been tested with Windows 7 or older.

Resolved Issues

- GPIO Function Update reset was needed for the PWM Function.
- “Write Config” command took too long.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

4 Old Release Notes, Version 4.11

11 October 2019
TEC Service Software v4.11; TEC STM32 v4.10

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.10
- TEC-1090: Hardware Version Range 1.00 – 1.90
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 2.00
- TEC-1091 Hardware Version Range 0.80 – 3.30
- TEC-1092 Hardware Version 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 TEC Service Software itself contains now the TEC Controller Firmware. It is possible to just click the “Update Device” button to update.

Resolved Issues

- None

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

5 Old Release Notes, Version 4.10

2 October 2019
TEC Service Software v4.10; TEC STM32 v4.10

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.10
- TEC-1090: Hardware Version Range 1.00 – 1.90
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 2.00
- TEC-1091 Hardware Version Range 0.80 – 3.30
- TEC-1092 Hardware Version 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:

- Features from v3.20 imported
- Sink temperature measurement range is now bigger for new hardware versions. Check datasheet.
- New OLED displays supported. Some display configurations may not be converted from older firmware versions. Please make sure you check the display configuration after the firmware update.
  Supported displays:
  - NHD-0216KZW-AY5 is a OLED display 2x16 Char
  - NHD-0420DZW-AY5 is a OLED display 4x20 Char
  - NHD-0216AW-SB3 is a small OLED display 2x16 Char
- Service Software new monitor value added: Actual Output Power [W]
- Service Software sends now the Change Speed command always to the address 255 without waiting for an answer.

Resolved Issues

- GPIO “Hardware Configuration” “OUT OD NoPull” activated a pull-down resistor.
- The Service Software did sometimes round down values from example 4.10 to 4.09.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

6 Old Release Notes, Version 4.01

17 January 2019
TEC Service Software Version 4.00; TEC STM32 Version 4.01

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.00
- TEC-1090: Hardware Version Range 1.00 – 1.80
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 1.90
- TEC-1091 Hardware Version Range 0.80 - 1.80
- TEC-1092 Hardware Version 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:

- None

Resolved Issues

- Error 109 might have occurred when using TEC-1123-HV in common load mode
  → Delay of 100ms for error 109 implemented
  → 4 Times slower output change in common load mode.
  (A change from fully negative output to fully positive output takes now up to 800ms)

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

7 Old Release Notes, Version 4.00

18 September 2018
TEC Service Software Version 4.00; TEC STM32 Version 4.00

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.00
- TEC-1090: Hardware Version Range 1.00 – 1.80
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 1.90
- TEC-1091 Hardware Version Range 0.80 - 1.80
- TEC-1092 Hardware Version 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:

- Release without the features from firmware v3.20. This firmware is based on firmware v3.11.
- Power Stage efficiency has been enhanced.
    - Up to 42% for the HV models and up to 28% for the SV models. Check the datasheets.
    - As a consequence, the temperature limits are much higher now.
    - At some switching points, much lower switching frequencies are used. All multiple frequencies of 18.75kHz may appear at the output.
    - Add Error 111, which is thrown when the load resistance is too low.

Resolved Issues

- none

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

8 Old Release Notes, Version 3.20

15 January 2019
TEC Service Software Version 3.20; TEC STM32 Version 3.20

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.10
- TEC-1090: Hardware Version Range 1.00 – 1.90
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 2.00
- TEC-1091 Hardware Version Range 0.80 – 3.00
- TEC-1092 Hardware Version 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:

- Object Temperature ADC self-check (Called ADS Self Check)
  The reference voltage and the current through the reference resistor can be checked in order to verify if the converter is working properly.
- The Proximity Width can now be set to 0 to achieve a linear temp ramp.
- Sink temperature measurement filtering increased to reduce noise.
- Display now shows the TEC-Controller status when {ERRMSG} is used and there is no error present.
- Object Temperature VIN1 mode: Negative voltage limitation extended: New Range: -2.039V … 2.039V

Resolved Issues

- Display: 2 Errors were not displayed in {ERRMSG}
- FAN text replaced to Fan (GPIO drop down text also changed, old Fan GPIO ini file configurations are not being imported anymore, but usually the configuration is not lost during firmware update).
- The TEC Service Software did not close the old TCP connection, when a new one was opened. This caused problems using the MOXA NPort Ethernet to RS485 converter → Solved.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

9 Old Release Notes, Version 3.11

27 June 2018
TEC Service Software Version 3.10; TEC STM32 Version 3.11

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 2.00
- TEC-1090: Hardware Version Range 1.00 – 1.80
- TEC-1122 Hardware Version Range 1.01 – 2.00
- TEC-1123 Hardware Version Range 1.01 – 1.90
- TEC-1091 Hardware Version Range 0.80 - 1.80
- TEC-1092 Hardware Version 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:

- Temperature Measurement: New -VIN1 Feature: The TEC Controllers can now measure a voltage as object temperature input.
- The PBC RESx Pins have been renamed to GPIOx Pins
- GPIOx Features:
    - Old GPIO (RESx) Settings no longer supported. GPIOs must be reconfigured.
    - The Service Software now shows the current input state of each GPIOx pin.
    - New feature: “PowerSt 0A”. This feature can be used to set the output current to 0A for a short time. May be helpful during measurement cycles.
    - Encoder: A rotary encoder can now be used to change the CHx Target Temperature
    - New feature: The Level Assignment (positive or negative logic) and the Hardware Configuration can now be individually set for each GPIO.
    - New Channel setting: the TEC Controller channel for which the chosen GPIO Function is active can now be selected separately. The Function is set independently from the Channel.
- OLED Display Features
    - Old Display Settings no longer supported. Display Settings must be reconfigured.
    - Display can now show fully user-configurable text.
- Fan Features:
    - Added new fan start and stop speed parameters which can be used to implement a hysteresis for the fan
    - Channel 2 temperatures can now be used for channel 1 fan and vice versa. The Device Temperature can also be used for fan control.

Resolved Issues

- Lookup Table
    - The PBC RESx function “CH1 Lookup Start” does not work properly if the table ends before the signal itself goes back to low. It is then not possible to re-start a table, because the clear signal is not being cleared. This is important if a switch instead of a button is used.
      → Fixed by clearing the clear signal if the table has already stopped.

    - The LIN_RAMP_TIME does not work properly if the Enable mode is set to “Static ON”. The ramp already starts when the lookup table is being started instead when this command is being reached. → Fixed by adjusting the interaction between the table executer and the ramp generation.
    - If the table execution is being cancelled during LIN_RAMP_TIME, then the switchback to the flash target temperature is not done. → Fixed by changing back to the flash target temperature at table stop.
    - The minimum time for LIN_RAMP_TIME is 100ms. → Changed to 10ms, because of the new 80/90Hz mode.
    - Between two commands is always an empty cycle, because the old command has finished and the new one is not yet loaded. → Fixed by executing the table interpreter again if the previous command has already finished. A side effect of this is that commands which do not have a duration to execute, are now executed much faster. For example, several SET_INT in a row, are now being executed with full processor speed (not just every temperature control cycle).
- Nominal Object Temperature Ramp: beginning from firmware v3.00 the temperature control algorithm is executed at the speed of the external object temperature ADC to not lose any samples. Therefore, the execution speed can vary up to 5% over the whole device temperature range. This causes ramp speed [°C/s] inaccuracies. → The effective execution speed is now being measured and considered in the ramp generation module.
- FAN Control: If the FAN is being disabled using the “FAN Control Enable” in the Service Software, then the Fan started at 100% speed, instead of 0% Speed. → Fixed by re-initialization of the speed controller.
- Communication Interface:
    - Parameter ID 110 removed, because it conflicts with LTC-1141
    - The Read Meta Data Command (?VM) did not contain the NumberOfElements field
    - The commands Value Set (VS), Value Read (?VR) and Read Limits (?VL) did not send back Server error in case of a problem
- The DPY-1113 did not update the current target temperature if the TEC Controller was in Ready state.
- Service Software: the application crashes if the Real Time Data Logger tries writing to an open log file. → Fixed by adding error handling
- Service Software: In very rare cases, the TEC Service Software could not connect to the FTDI chip, because the driver did not provide an FTDI S/N. → Now the index is used to connect.
- Bootloader: the firmware upgrade can fail if there is packet loss on the serial interface. The bootloader writes wrong data to the update memory, this is being detected and is no danger for the target, the firmware upgrade process is cancelled (because of the intel HEX extended linear address record). → Solved by ignoring double received packages (packages with the same sequence number)
- Default setting changed. Peltier Characteristics setting “Positive current is” set to Cooling instead of Heating.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

10 Old Release Notes, Version 3.00

2 February 2017
TEC Service Software Version 3.00; TEC STM32 Version 3.00

Supported Devices

- TEC-1089: Hardware Version Range 1.00 – 1.70
- TEC-1090: Hardware Version Range 1.00 – 1.60
- TEC-1122 / TEC-1123 Hardware Version Range 1.01 – 1.50
- TEC-1091 Hardware Version Range 0.80 - 1.10
- TEC-1092 Hardware Version 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:

- Support for the new TEC-1092 temperature controller.
- Power stage supply all-new with floating-point current / voltage control and PWM dithering. This results in a faster and more precise current and voltage control.
- Faster temperature-control is configurable: 1Hz,10Hz or 80/90Hz option available. Previously only 10Hz was available. 1Hz is suitable for very slow and noisy environments. 80/90Hz is suitable for very small and fast Peltier elements present in optical detectors or light sources.
- Peltier linearization functions optimized for higher operation temperatures and multistage Peltier elements.
- Peltier characteristics simplified: Qmax and Umax settings removed.
- Object Temperature Observe Mode Yes, No or Automatic configurable.
- General “Heat Only – Cool Only” mode added. Old Cool or Heat Only modes need to be reconfigured manually after the firmware update!
    - Heat only is possible by setting the upper boundary to 1000°C
    - Cool only is possible by setting the lower boundary to -273°C
    - Heat and Cool only with a dead window is possible by setting both values to the desired upper and lower temperature. The controller will not heat or cool in the range in-between.
- New PBC RESx pin functions added / optimized:
    - Lookup Table Start / Stop.
    - A device address offset can be added by pulling REXx pins to GND.
    - The fans can get stopped by releasing the RESx pin from GND. (E.g. opening the fridge door.)
    - Up to 4 pre-configurable target temperatures can be selected by pulling RESx pins to GND.
    - The lowest detectable fan speed has been lowered and is now 30 RPMs or 1Hz.
- Sink Temperature measurement improved. Less noise, higher resolution.

- Service Software improvements:
    - Fast Chart added, that shows the object temperature and Peltier current in the full speed resolution even when 80/90 Hz control is chosen.
    - Export of the Fast Chart Data to an CSV file with the full time resolution.
    - Communication overhead reduced.
    - Reset and reconnect enhanced.
- Communication related changes:
    - For details, please have a look at the Communication Protocol spec history log at the end of the document.
    - No more answer to the device address 255, but the command will be recognized anyway. This may be suitable for the Change Speed command in RS485 bus situations.
    - Communication settings added, please refer to the table in the Communication Protocol spec document. Not all settings are valid for all devices. The TEC-1092 has more options available.
    - Change Speed fall back behavior changed. The serial speed will not fall back as long as valid packages are present on the interface. The address is ignored for this detection.
    - The RS485 baud rate of the TEC-1091 can be changed now.

Resolved Issues

- In very rare situations it happened that the object temperature measurement ADC stopped reading correct values or read always the same value.
  → A watchdog and periodical ADC configuration check has been added.
- If the Peltier efficiency is specified with 100%, the temperature controller is not working anymore.
  → Solved by replacing the Peltier linearization model.
- If the Object Temperature changes very fast (>15°C/s) from a high temperature to a lower temperature, then the gain switch may fail. This results in Error 134. This only applies to the NTC temperature type.
  → Solved by replacing the whole object temperature ADC control code by a faster acting system.
- The “Max Temp Change [°C/s]” did react too fast in ramping situations.
  → Surveillance optimized. The maximum change in °C/s is now observed very accurate. A spike that is bigger than the configured maximal change will be limited in the certain direction with the configured maximal change. After 20 (@10Hz = 2s) succeeding limitations in to the same direction an error is thrown.
- Using an Ethernet Service Software Connection, then it was necessary that the whole answer from a Query or Set command was returned within 1 IP Package.
  → An answer can now be divided into several IP packages. The Service Software will collect the data till a complete answer has been received.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

11 Old Release Notes, Version 2.72

5 September 2016
TEC Service Software Version 2.70; TEC STM32 Version 2.72

Supported Devices

- TEC-1089: Hardware Versions 1.00 – 1.70
- TEC-1090: Hardware Versions 1.00 – 1.60
- TEC-1122 / TEC-1123 Hardware Versions 1.01 – 1.50
- TEC-1091 Hardware Versions 0.80 - 1.10

New and Improved Features

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

- Parameter ID 4034 (Object Sensor Type) added.

Resolved Issues

- None

Known Issues

- If the Peltier efficiency is specified with 100%, the temperature controller is not working anymore.
- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.
- If the Object Temperature changes very fast (>15°C/s) from a high temperature to a lower temperature, then the Gain switch may fail. This results in Error 134. This only applies to the NTC temperature type.

12 Old Release Notes, Version 2.71

22 August 2016
TEC Service Software Version 2.70; TEC STM32 Version 2.71

Supported Devices

- TEC-1089: Hardware Versions 1.00 – 1.70
- TEC-1090: Hardware Versions 1.00 – 1.60
- TEC-1122 / TEC-1123 Hardware Versions 1.01 – 1.50
- TEC-1091 Hardware Versions 0.80 - 1.10

New and Improved Features

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

- None

Resolved Issues

- Lookup Table: The function “TILL_TEMP_STABLE” does not work on CH2. → Fixed
- Object Temperature Measurement: The Gain switch causes problems with the new NTC1M version. → Fixed
- Bootloader: It is possible to download a firmware from a different device family. → Fixed
- Resistive Heater: PID integral part windup is possible when the Power Stage current limitation is smaller than the maximum specified resistor current.
  → Fixed: If the Power Stage current limitation is smaller than the maximum specified resistor current, the PID maximum limitation is automatically set to a smaller value than 100%.

Known Issues

- If the Peltier efficiency is specified with 100%, the temperature controller is not working anymore.
- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.
- If the Object Temperature changes very fast (>15°C/s) from a high temperature to a lower temperature, then the Gain switch may fail. This results in Error 134. This only applies to the NTC temperature type.

13 Old Release Notes, Version 2.70

3 June 2016
TEC Service Software Version 2.70; TEC STM32 Version 2.70

Supported Devices

- TEC-1089: Hardware Versions 1.00 – 1.70
- TEC-1090: Hardware Versions 1.00 – 1.60
- TEC-1122 / TEC-1123 Hardware Versions 1.01 – 1.50
- TEC-1091 Hardware Versions 0.80 - 1.10

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: Object Temperature Type NTC1M (wide negative temperature range)
- Add: Sink Temperature: Upper ADC Limitation error can be disabled. This enables the usage of the Sink Temperature measurement input with ignoring too low temperatures.
- Mod: The Service Software has been updated to Visual Studio 2015. The Service Software now needs the following component to be installed: **Microsoft Visual C++ 2015 Redistributable (x86)** otherwise it will not open. It has been tested with Windows 7, 8 and 10. X64 Versions.

Resolved Issues

- CSV File header name is wrong → Changed to Device Temperature

Known Issues

- If the Peltier efficiency is specified with 100%, the temperature controller is not working anymore.
- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

14 Old Release Notes, Version 2.60

21 April 2016
TEC Service Software Version 2.60; TEC STM32 Version 2.60

Supported Devices

- TEC-1089: Hardware Versions 1.00 – 1.70
- TEC-1090: Hardware Versions 1.00 – 1.60
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.50)
- TEC-1091 (Hardware Versions 0.80 - 1.10)

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: FAN Surveillance Disable option
- Mod: The temperature limitation of the TEC-1123-HV has been changed. Check 5144M.
- Mod: Service Software should connect faster after reset.

Resolved Issues

-

Known Issues

- If the peltier efficiency is specified with 100%, the temperature controller is not working anymore.
- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

15 Old Release Notes, Version 2.50

29 December 2015
TEC Service Software Version 2.50; TEC STM32 Version 2.50

Supported Devices

- TEC-1089: Hardware Versions 1.00 – 1.70
- TEC-1090: Hardware Versions 1.00 – 1.60
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.50)
- TEC-1091 (Hardware Versions 0.80 - 1.10)

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: Standard and Extended Device Temperature modes. This option enables you the possibility to run the device at higher ambient temperatures if you do not need the full output power.
- Add: The Service Software shows additional the effective measured Object Sensor Temperature, even if another source has been set for temperature control.
- Add: Option to select the effective measured Object Temperature of CH2 for temperature control of CH1.
- Mod: Maximum Output Voltage changed:
    - For Standard Voltage (-SV) types: from 22V to 21V)
    - For High Voltage (-HV) types: from 31V to 30V

Resolved Issues

- The Error 107 error threshold is too low for 16A Standard Voltage types.
  → Limitation set to 22A.
- The Actual FAN Speed showed random values if no Tacho pin was selected.
  → Fixed.

Known Issues

- If the peltier efficiency is specified with 100%, the temperature controller is not working anymore.
- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

16 Old Release Notes, Version 2.41

16 September 2015
TEC Service Software Version 2.41; TEC STM32 Version 2.41

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.60)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.40)
- 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:

- None

Resolved Issues

- PBC RES3 and RES4 stay at low level under the following conditions:
  - RES3 or RES4 is configured as “Data Interface”.
  - The Data Interface function is not enabled after reset.

  → Solved: All as “Data Interface” configured RESx pins are set to Z if the Data interface is not enabled.
- Error 173 has no error text
  → Solved
- Power Stage: Negative power is limited to 3W also if the Power Stage is in non-common load operation. This caused problems if there is no load at the output, but a high output voltage.
  → Solved: Negative Power Limit has been set to 5W and is only active in common load operation.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.
- It is not possible to handle .ini and .hex files from a path that contains non-ASCII characters.

17 Old Release Notes, Version 2.40

15 July 2015
TEC Service Software Version 2.40; TEC STM32 Version 2.40

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.60)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.40)
- 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: Auto Tuning optimized for unilinear or high temperature systems.
- Mod: Auto Tuning error tolerance increased.
- Add: Configurable Pump Control Output for PBC RESx Pins.
- Mod: Peltier Characteristics Cooling Capacity Qmax lower limit changed from 1W to 0.01W.
- Add: Commands to query up to 50 parameter values within one command. This commands are not yet published, please ask if you need it.

Resolved Issues

- Lookup Table: Clicking 2x to Start did automatically restart the Lookup Table after the stop.
  → Solved
- Lookup Table : Write Config during a running lookup Table process, may the lookup table cause to execute twice the same command and skip one command.
  → Solved
- Data loss on serial interfaces: In some cases, the LDD devices have lost some bytes on the serial communication interfaces. This problem could not be reproduced or observed on the TEC devices, but the possible cause has anyway been solved.
- Losing the Configuration while downgrading: In some cases, the LDD devices have lost the Serial Number and other manufactory set values. This problem has not been appeared on the TEC devices, but the possible cause has anyway been solved.

Known Issues

- The Service Software may lose the connection to the device if the graph is too much zoomed, because of overloading the CPU.

18 Old Release Notes, Version 2.30

16 March 2015
TEC Service Software Version 2.30; TEC STM32 Version 2.30

Supported Devices

- TEC-1089 / TEC-1090 (Hardware Versions 1.00 – 1.51)
- TEC-1122 / TEC-1123 (Hardware Versions 1.01 – 1.32)
- 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: Supported Hardware Versions. The Medium Voltage has been changed from 10V to 8.5V for the following Devices:
    - TEC-1089/1090 beginning at Hardware Version 1.51
    - TEC-1122/1123 beginning at Hardware Version 1.32
    - TEC-1091 is not affected
- Add: Sink Sensor Temperature Value: Shows the Sink Temperature value, even if the Sink Temperature Source selection is set to “Fixed Temperature”.

Resolved Issues

- none

Known Issues

- none

19 Old 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

20 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

21 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

22 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

23 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

24 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

25 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

26 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

27 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

28 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

29 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

30 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

31 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

32 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

33 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

34 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

35 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

36 Change history

Template version: 1.0

Date of change	Doc/Version	Changed/ Approved	Change / Reason
30 July 2020	5147AK	ML/HS	• Add: Change history • Add: Software Version 5.00 • Mod: Software Version 4.20 renamed to old • Del: Versions < 1.20 removed
29 October 2021	5147AL	HS/RS	• Add: Software Version 5.01