HAAKE MARS 60 and HAAKE MARS 40 Firmware

This document describes the Thermo Scientific™ HAAKE™ MARS™ 60 and HAAKE MARS 40 firmware version release history in chronological order.

The MARS 40 firmware version numbers are identical to those of the MARS 60 unless listed differently.

The latest firmware version can be found at the end of the list.

Release date: 14 july 2015

	MARS 60 firmware version	MARS 40 firmware version
Box	50.17.000	
DSP	50.17.000	
Stand	60.01.000	

These are the first release versions.

Release date: 22 september 2015

	MARS 60 firmware version	MARS 40 firmware version
Box	50.18.000	
DSP	50.17.000	
Stand	60.02.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box & DSP firmware

1. The buttons on the MARS front panel (apart from the menu button) are now locked when a RheoWin Job is running to prevent accidental lift movement and rotor release. When a locked button is pressed when a RheoWin Job is running, the message `M: Key disabled` will appear on the MARS front panel for a short time.
2. The AutoTension function has been modfied. RheoWin version 4.60.0000 or newer is needed for being able to use the new functionality. See the RheoWin What's new information.

Stand firmware

1. Several modifications for compatibility with certain accessories (RheoScope module etc.) were made.

Release date: 28 october 2015

	MARS 60 firmware version	MARS 40 firmware version
Box	50.18.000	
DSP	50.17.000	
Stand	60.03.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. The normal-force re-zero function has been improved and is more accurate now.
2. The lift-control routines are now compatible with the CTC oven.
   (Previous firmware versions were NOT compatible with the CTC oven.)

Release date: 08 december 2015

	MARS 60 firmware version	MARS 40 firmware version
Box	50.19.000	
DSP	50.17.000	
Stand	60.04.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box & DSP firmware

1. Under certain circumstances modified Connect Assist adapter rotor properties were not correctly saved into the adapter rotor tag. This has been solved.
   (This applies to the Connect Assist adapter rotors U1, U2, U3, P1, P2 and ISO only.)

Stand firmware

1. The name of a Connect Assist rotor is now displayed on the MARS control panel with a maximum length of 16 (instead of 14) characters, longer names are truncated.

Release date: 11 april 2016

	MARS 60 firmware version	MARS 40 firmware version
Box	50.19.000	
DSP	50.17.000	
Stand	61.01.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. Some modifications were made for compatibility with modified electronics hardware.
   Firmware version 61.01.000 **must** be used for all newer MARS 60 (delivered starting from2016), using any older firmware in these instrument will make the instrument inoperative. Firmware version 61.01.000 is compatible with any MARS 60, that is also with older instruments.

Release date: 03 june 2016

	MARS 60 firmware version	MARS 40 firmware version
Box	50.20.000	
DSP	50.18.000	
Stand	61.01.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Note This version is only compatible with RheoWin 4.62.0000 or newer.

Box firmware

1. Improved OSC CD Mode
   The general performance of the deformation (strain) control in oscillation mode (CD-OSC) has been (substantially) improved regarding stability, accuracy, etc.

2. *New* OSC CD mode with active compliance correction
   Active compliance correction consists of an active compensation of the compliance of the drive motor + rotor shaft, so that the set deformation value is always achieved. In all previous firmware versions the compliance correction was passive. As long as the deformation is within the linear visco-elastic range, the G' and G" values resulting from measurements with active and passive compliance correction should be identical.
3. *New* OSC CS mode with active inertia correction
   Active inertia correction consists of an active compensation of the inertia of the drive motor + rotor shaft, so that the set stress value is always achieved. In all previous firmware versions the inertia correction was passive. As long as the resulting deformation is within the linear visco-elastic range, the G' and G" values resulting from measurements with active and passive inertia correction should be identical.

Release date: 20 july 2016

	MARS 60 firmware version	MARS 40 firmware version
Box	50.21.000	
DSP	50.19.000	
Stand	61.02.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Note This version is only compatible with RheoWin 4.63.0000 or newer.

Box and stand firmware

1. The actual lift speed did not correspond to the lift speed values selected in the RheoWin Lift element. This has been changed, the actual lift speed now corresponds to the selected value. Because the existing selectable lift speed values were relatively low, four new lift speed values (5, 10, 20 and 50 mm/s) have been added.
2. The automatic locking of the buttons (apart from the menu button) on the MARS front panel during a Job run, which is useful for preventing accidental lift movement and rotor release when a Job is running, can be now de-activated/activated at any time (i.e. also during a Job run) by using the **Menu > Lift (Job) locked / Menu > Lift(Job) free** command from the MARS front panel menu. The menu setting is saved when the instrument is switched off and restored when the instrument is switched on.
3. A modification for the torque calibration has been implemented, this is for production and service personel only.

Release date: 10 august 2016

	MARS 60 firmware version	MARS 40 firmware version
Box	50.22.000	
DSP	50.19.000	
Stand	61.02.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box firmware

1. Some modifications for production and service personel only have been implemented.

Release date: 11 november 2016

	MARS 60 firmware version	MARS 40 firmware version
Box	50.23.000	
DSP	50.19.000	
Stand	61.03.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. The control of axial ramps has been optimized and is now more accurate.
2. The temperature control of the TM-EL-P has been optimized. In the temperature range of 0 °C to 40 ° the set temperature is reached quicker and the stationary temperature value is more stable.
3. The temperature of the Peltier heatsink (of the TM-PE-P and TM-PE-C) is now continuously monitored. When the heatsink temperature reaches an unexpected value (due to insufficient cooling), the Peltier temperature control will be halted and a message will be displayed on the instruments control panel.

Release date: 11 january 2017

	MARS 60 firmware version	MARS 40 firmware version
Box	50.23.000	
DSP	50.19.000	
Stand	61.04.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. On some MARS 60 instrument there was a problem with the front display.
   This has been solved.

Release date: 24 march 2017

	MARS 60 firmware version	MARS 40 firmware version
Box	50.23.000	
DSP	50.19.000	
Stand	61.05.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box and stand firmware

1. The rotor eject function for the situation where the rotor is in measurement position.
   This has been improved.
2. The safety mechanism in the lift control for the quick downward movement has been optimised.
3. When the lift is stopped for safety reasons a message is displayed on the MARS front panel.

Release date: 25 september 2017

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.000	
DSP	50.22.000	
Stand	61.05.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Note This version is only compatible with RheoWin 4.75.0000 or newer.

Box firmware

1. The CD oscillation mode for higher frequencies has been improved.
2. The recognition of a Connect Assist rotor did not work when the RheoWin Monitor (Manual control) window was open when the rotor was mounted. This has been solved.
3. The last set gap value was not always used correctly. This has been solved.

Release date: 14 november 2017

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.000	
DSP	50.22.000	
Stand	61.06.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. The intrinsic safety of the lift control has been improved. This does not influence the instrument operation.

Release date: 19 february 2018

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.001	
DSP	50.22.000	
Stand	61.06.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box and stand firmware

1. A bug caused spurious results during the transition between two CR-ROT elements. This has been solved.

Release date: 27 july 2018

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.001	
DSP	50.22.000	
Stand	61.07.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. The maximum lift speed that can be used in measurement elements, mainly in the axial ramp element, is now 20 mm/s.

Release date: 25 february 2019

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.001	
DSP	50.22.000	
Stand	61.08.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. Under certain circumstances the lift motor control did not work as intended.
   This has been solved.

Release date: 09 december 2019

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.001	
DSP	50.22.000	
Stand	61.09.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box and stand firmware

1. The ejection/release of concentric cylinder geometry rotors has been improved.

Release date: 13 august 2020

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.003	
DSP	50.23.000	
Stand	65.00.012	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Note The use of RheoWin 4.86.0002 or newer is recommended.

Box and stand firmware

1. The temperature offset tables (in the MTMC driver) can now contain upto 20 values.
2. The temperature offset tables are now also available for the TM-LI-C, TM-LI-C48, TM-LI-C32 and TM-LI-P modules.
3. The new TM-PE-P Air (air-cooled Peltier plate module) can now be used with the MARS 60.
4. The CD-OSC control loop has been further improved.

Note For 1) and 2) a new RheoWin MTMC driver (file name MTMC.dll) for RheoWin 4.86.0002 or newer is needed.

Note For 3) a hardware update is needed for all MARS 60 build before mid May 2020.

IMPORTANT Before updating the firmware save any existing temperature offest table! Updating the firmware will delete any existing temperature offset table! Either take note of existing offset tables, or export the tables to a *.tot file first. After the firmware update manually enter the table values again, or import the previously exported *.tot file.

Release date: 15 september 2022

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.003	
DSP	50.23.000	
Stand	65.00.017	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Stand firmware

1. The firmware is now compatible with the TM-LI-C28 temperature module.

Release date: 01 june 2023

	MARS 60 firmware version	MARS 40 firmware version
Box	50.25.003	
DSP	50.23.000	
Stand	65.00.039	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Note For the TM-PE-C32 Air and TM-LI-C28 to be recognized by RheoWin, **RheoWin 4.91.0011** or newer is needed.

Box and stand firmware

1. The firmware is now compatible with the TM-PE-C32 Air temperature module.
2. The temperature control of the TM-EL-C has been improved.
3. The temperature control of the TM-PE-P has been improved.
4. The temperature limits for the TM-LI-C28 have been modified.

Release date: 27 november 2023

	MARS 60 firmware version	MARS 40 firmware version
Box	50.26.008	
DSP	50.24.006	
Stand	65.00.041	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box and stand firmware

1. The rotation CR-Mode control has been improved and now adapts better to the properties of the sample to be measured.
2. The firmware internal calculation of the rheological properties G', G", etc. now checks the plausibility of the measured G' values, and corrects them if considered useful. This feature is only active when performing measurement at the limits of the possible measuremen range and can be switched on/off by (de)activating the new **G' limiter** option in the RheoWin device manager.

   Note For this RheoWin 4.92.0007 or newer is needed.
3. Under certain circumstances the lift motor control did not work correctly when moving the measuring head upward from the measurement position. This has been solved.

Release date: 27 march 2024

	MARS 60 firmware version	MARS 40 firmware version
Box	50.26.009	
DSP	50.24.009	
Stand	65.01.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware version.

Box and stand firmware

1. The new tribology measuring geometries have been added to the list of compatible accessories.
2. The new solid clamps for cylindrical samples have been added to the list of compatible accessories.
3. The new D170/300 pressure cell has been added to the list of compatible accessories.
4. An initialisation error could occur when a Rheonaut module and a TM-EL-H were connected. This has been solved.
5. The absolute angle value during oscillation was not correct for values above 2π. This has been solved.
6. Under certain circumstances the lift motor control did not work correctly when moving the measuring head upward from the measurement position. This has been solved.
7. When a TM-LI-x module is connected to the device the corresponding valve in the valve block is automatically opened.
8. Under certain circumstances the instruments display became unreadable after a firmware update. This has been solved.
9. The Set Element options for Oscillation “Rapid data acquisition Mode” and “Data acquisition during control loop startup phase” now work as intended.

Release date: 15 july 2024

	MARS 60 firmware version	MARS 40 firmware version
Box	50.27.006	
DSP	50.24.009	
Stand	65.02.001	

Below is a list of things that are new and/or changed in this version compared with the previous firmware versions.

Box and stand firmware

1. This firmware version is obligatory for the new version of the electronics hardware which is used in all instruments build after 15.07.2024. This firmware version is compatible with all older instruments.
2. The firmware is now compatible with the new CM-OP-P module.
3. There was a problem with the time value of the first data point in the Creep&Recovery and MultiStep elements. That has been solved.
4. The “low torque” option is now available in the Creep&Recovery and MultiStep elements.
5. When using CD-ROT mode in the MultiStep-element the values for the angle and the absolute angle were not correct. This has been solved.
6. In recent previous version of the firmware the temperature control for the TM-PE-C did not work correctly regarding reaching lower temperatures. This has been solved.
7. The firmware now includes two operation-hour counters. One for counting the power-on time and one for counting the actual measurement time. Starting from RheoWin 4.93.0020 these values are stored in every RheoWin *.rwd data file.
   NOTE: Of course both counters start with zero hours from the moment this new firmware is installed.

8. The implementation of the calculation of a temperature offset value from the temperature offset table has been improved.
9. Disconnecting a TM-xx-x would result in erronous informatin on the instruments display. This has been solved.

Release date: 10 december 2024

	MARS 60 firmware version	MARS 40 firmware version
Box	50.28.001	
DSP	50.24.009	
Stand	65.02.002	

Below is a list of things that are new and/or changed in this version compared with the previous firmware versions.

Box and stand firmware

1. The axial ramp control has been improved with respect to the delay at the end of a ramp.
2. The firmware part of the RheoWin reset time function (Set Element) has been improved.
3. Under certain circumstances the first step of a RheoWin multistep element was not working properly. This has been solved.
4. The firmware is now compatible with the new TM-PE-C48 module.
5. The firmware now reports the TM-PE-C module (for 32 mm cups) as TM-PE-C32.
6. The initialization procedure has been improved.

Release date: 27 april 2026 (this is the latest version)

	MARS 60 firmware version	MARS 40 firmware version
Box	50.30.000	
DSP	50.25.000	
Stand	65.04.000	

Below is a list of things that are new and/or changed in this version compared with the previous firmware versions.

Box and stand firmware

1. New functionality for Powder rheology has been implemented.
2. The handling of pressure cell measuring geometries, that is the magnetic coupling rotor, has been improved.
3. Safety rotational speed limits for pressure cell adapter geometries have been implemented.

   RheoWin 4.95.0003 or newer is needed for the functionality (1. to 3.) mentioned above.
4. A possible overheating of the TM-PE-x modules due to a lack of counter-cooling is now recognized and stopped earlier and more effective.
5. For measurements in OSC CS mode with oscillation frequencies f ≥ 1 Hz the rheometer firmware used a waiting time of 3 oscillation periods and for frequencies f ≥ 20 Hz a waiting time of 100 oscillation periods, before a data point was taken. This although the waiting time was set to 0 (or any other lower value) in RheoWin.
   This has been changed, the waiting time is now always as defined in RheoWin.

   IMPORTANT In order to get the same measurement results as with previous firmware versions, the waiting time must be set (modified) accordingly in all existing RheoWin Jobs in all measurement elements which use oscillation in CS mode.
6. Under certain circumstances the time value stored for a OSC data point was not correct. This has been solved.

7. Under certain circumstances CD OSC mode did not work correctly when using the RheoScope module. This has been solved.
8. The maximum number of repetitions per data point for OSC mode has been increased to 100.
9. Under certain circumstances the measured strain (angle) value did not start with zero for the first CD-Rot element in a Job. This has been solved.
10. The CS-Rot data of the first seconds of measurement has been improved.
11. High shear mode measurements (which include angular speeds > 1500 rpm) in CR continous ramp mode and CR stepped ramp mode now both behave in the same way.
12. When the communication between RheoWin and the MARS 40/60 is interrupted unintensionally, a running measurement is now stopped and after that the lift can be normally operated from the instruments control panel.
13. RheoRaman module produced starting from the year 2026 are recognized as RA-P on the display.

Updating the firmware

How to update the HAAKE MARS 40 or HAAKE MARS 60 firmware is described in Appendix A Firmware Update in the HAAKE MARS 40/60 Rheometer Reference Manual (part no. 006-4167). This manual is included in the RheoWin download ZIP file.

Contacting Thermo Fisher Scientific

If you have any questions and or suggestions regarding the MARS (firmware) please send an e-mail to:

support.mc.de@thermofisher.com