

R&S® MXO5 Oscilloscopes

Release Notes

Firmware Version 2.6.2.4

These Release Notes are for following models of R&S® MXO5:

R&S® MXO54 Oscilloscope 4 channels, order no. 1802.1008K04

R&S® MXO58 Oscilloscope 8 channels, order no. 1802.1008K08

R&S® MXO54C Oscilloscope 4 channels, order no. 1802.3000K04

R&S® MXO58C Oscilloscope 8 channels, order no. 1802.3000K08

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The software makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" provided with the product.

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Contents

1	Information on the current version and history	3
1.1	Version.....	3
2	Modifications to the documentation	8
3	Firmware update	9
3.1	Preparing the Update	10
3.2	Performing the Firmware Update on the Instrument	10
3.3	Performing the Firmware Update without a running oscilloscope application ..	11
3.4	Firmware downgrade.....	11
3.5	Installing Firmware Options	12
4	Customer support.....	13

1 Information on the current version and history

1.1 Version

New functionality

Version	Functions
2.6.2.4	Mount to network drive functionality added
2.6.2.4	ScopeSync functionality added to synchronize multiple scope
2.6.2.4	Basic Jitter analysis added by option MXO5-K12
2.6.2.4	User selection to see measurement result lines
2.6.2.4	Image viewer allows to view screenshots on the device.
2.6.2.4	Recall of session files on MXO oscilloscopes (includes ref channels and saveset, but not data of analog/digital channels)
2.6.2.4	Multi-channel export supports CSV file format
2.6.2.4	Switching Loss and Turn On/Off added to Power Analysis option MXO5-K31
2.6.2.4	Custom NRZ (unclocked / clocked) now included in option MXO5-K510
2.6.2.4	SpaceWire decoding now included in option MXO5-K530
2.6.2.4	Generators can be switched on and off conveniently via toolbar buttons
2.6.2.4	Reference curve supports opening .bin files from RTO/RTP
2.6.2.4	Track signals available as XY source
2.6.2.4	Acquisition timestamp available as ISO 8601 format by ACQ:HIST:ISODate?
2.5.2.2	Configurable result table for power analysis (option MXO5-K31) measurement quality. SCPI commands for statistics available.
2.5.2.2	Math traces can be selected as a source for power analysis (option MXO5-K31).
2.5.2.2	Screenshot added as a Trigger and Mask action
2.5.2.2	Bus Measurements added by option MXO5-K500
2.5.2.2	I3C decoding now included in option MXO5-K550
2.5.2.2	HDF5 file (.h5) export for single and multi-channel added
2.5.2.2	Added HCOPI:DATA? to retrieve screenshot via SCPI

Version	Functions
2.4.2.0	Introduction of Mask Test
2.4.2.0	Introduction of XY
2.4.2.0	SENT decoding now included in MXO5-K520
2.4.2.0	RFEE decoding now included in MXO5-K550
2.4.2.0	Probe RT-ZP1X available as predefined probe
2.4.2.0	Trigger action Beep and Stop added.
2.3.2.2	Addition of device Selftest to Settings->Maintenance menu.
2.2.2.1	Option R&S®MXO5-K510 low speed serial buses: Added support for Quad SPI decoding
2.2.2.1	New option R&S®MXO5-K530 aerospace protocols
2.2.2.1	SCPI commands for screen annotations
2.2.2.1	Support of R&S®RT-Z2T probe interface adapter to connect TekProbe-BNC level II probes
2.2.2.1	Zone trigger in time and frequency domain
2.1.4.0	Full HW support of MXO5C
2.1.2.0	Support for exFAT file system on external memory devices
2.1.2.0	Autoset for spectrum signals
2.1.2.0	New control element for text size annotation
2.1.2.0	Support for R&S®RT-ZM modular probes
2.1.2.0	Advanced math formulas using text editor
2.1.2.0	Sequence trigger for analog channels
2.1.2.0	New trigger type Pattern for analog channels
2.1.2.0	New trigger type State for analog channels
2.1.2.0	New trigger type Setup & Hold for analog channels
2.1.2.0	New option R&S®MXO5-K560 automotive Ethernet protocols
2.1.2.0	New option R&S®MXO5-K550 MIPI low speed protocols
2.1.2.0	Extended de-skew on analog channels up to 20ms
2.1.2.0	Support of new devices MXO54C and MXO58C
2.0.2.0	New Feature Digital Voltage Meter (DVM)
2.0.2.0	New Option R&S®MXO5-K31 power analysis

Version	Functions
1.4.3.0	Initial version for MXO5

Modified functionality

Version	Functions
2.6.2.4	Self-test can be run remotely by *TST? command only. SELFtests.* commands are deprecated.
2.4.2.0	If DHCP is active and the device doesn't receive a DHCP address within ten seconds, it will use an Automatic Private IP Address. DHCP will be disabled until the LAN cable is reconnected or a LXI LAN reset is done.
2.4.2.0	Cursor Track waveform is off by default. In previous versions it was on by default.
2.3.2.2	Installing a different firmware version requires a new alignment. On first boot an alignment failed message will be shown and a full alignment needs to be performed via Menu->Settings->Maintenance->Alignment or *CAL? remote command.
2.3.2.2	Source "Scope waveform" of the generator was not functioning and has been removed. Workaround: Store .ref file and load file into the generator.
2.3.2.2	Remove Acquisition, Horizontal, Zoom and Roll menu from frequency analysis option menu.
2.2.2.1	MXO5C: improved readability of electronic ink display
2.2.2.1	Optimized user interface and language support
2.2.2.1	Select value step size (coarse / fine) by pressing multiuse wheel
2.2.2.1	Option R&S®MXO5-K31 power analysis: support of standard IEC61000-3-2 revision 2019
2.2.2.1	Option R&S®MXO5-K31 power analysis: magnitude in unit % and A in result table
2.2.2.1	Simplified signal color selection
2.2.2.1	Active math doesn't restrict acquisition memory
2.1.2.0	Signal flow diagram in analog channel dialog
1.4.3.0	Initial version for MXO5

Improvements

Version	Improvements
2.6.2.4	192.168.0.x is allowed as device IP-Address.
2.6.2.4	Loading of ARB files supports .CSV files with an uppercase file extension.
2.6.2.4	Enhanced visualization resolution of signals

Version	Improvements
2.6.2.4	Fixed an issue where the device might be in an incorrect state after a self-test.
2.5.2.2	Channel and frequency response analysis (MXO5-K36) parameters are not reset when the frequency response analysis application is opened and closed.
2.5.2.2	Faster SCPI export of multiple channels at once by using EXPORT:WAVEform:DATA
2.5.2.2	XY performance improved by hardware acceleration
2.4.2.0	Fixed signal artifacts in some situations where multiple channels are active and ZoneTrigger is used.
2.4.2.0	Slew Rate Unit is displayed as V/s instead of V*Hz.
2.4.2.0	If a FAT formatted USB drive is unplugged without eject, the file system is not reported as defective anymore.
2.3.2.2	Fixed I1 and Q1 cannot be computed in frequency analysis when the device bandwidth is less or equal to 200MHz.
2.3.2.2	Fixed slow boot time when K520, K530 and K560 options are installed without K510.
2.2.2.1	Fixed boot issues with Option R&S®MXO5-K550 MIPI low speed protocols installed
2.2.2.1	Improved waveform data update rate after a certain time in roll mode
2.2.2.1	Restore user settings after executing auto zero on probes
2.2.2.1	MXO5: Fixed random reboot issues
2.2.2.1	Fixed electronic ink display update issues on power down
2.1.4.0	Trigger type Pattern available for all patterns
2.1.2.0	Option R&S®MXO5-K31 power analysis: THD value accuracy improvements
2.1.2.0	Hot plug support for external monitor
2.0.4.0	Improved stability of vertical self-alignment
2.0.2.0	MXO5: Fixed scope startup issues if device uses IP address 192.168.0.2
2.0.2.0	Resolved FW crash with more than 16 analog waveforms in on diagram (i.e. analog channels, references, math, track waveforms)
1.4.3.0	Initial version for MXO5

Known issues

Version	Known Issues
2.6.2.4	In some cases, an empty screen with the message "Invalid item Reset layout" might appear. Clicking the recycle bin above the message will restore the default layout of the screen.
2.6.2.4	In case of a slow response of the DHCP server, the device will be in link local mode. To obtain a DHCP IP address, enable DHCP again in the network settings menu.
2.6.2.4	Changing the time zone of the device via the menu is not possible.
2.6.2.4	Active probes: In rare conditions the channel coupling will remain on 50 Ohm when the probe is unplugged. Set it to 1 MOhm manually to prevent input channel damage due to overload.
2.6.2.4	ScopeSync: "Auto remote skew" skew configuration is valid for the current HD mode settings only. Changing the HD mode state or the bandwidth requires a to perform "Auto remote skew" with the new settings.
2.6.2.4	Inserting a hard drive with a version 2.6 or later with a fixed IP address of the range 192.168.0.x into a device hardware that was running a version lower than 2.6 might result in boot failure. To prevent this perform a LXI LAN reset in Settings->System->Network before hard drive removal.
2.3.2.2	Upgrading from a version lower than 2.2 requires an upgrade to 2.2 before the upgrade to 2.3.
2.3.2.2	Trigger reset event (R-Event) might not work as expected on MXO54 and MXO54C.
2.3.2.2	Device stops processing in some cases where eight waveforms, zoom on all eight of them and spectrum. Workaround: Preset and switch off the display or zoom of some of the channels or add a reference waveform.
2.2.2.1	Toolbar functions for mask test without function
2.2.2.1	Boot screen message "Current system time is further ahead 15y after build time"
2.1.2.0	MXO54 & MXO54C: No trigger with trigger on sequence if reset event is enabled

2 Modifications to the documentation

The current documentation is up-to-date.

Date	Release Notes Revision	Changes
17.06.2024	2.2.2.1	Added functionality and improvements
25.04.2024	2.1.4.0	New manual for MXO5C
01.03.2024	2.1.2.0	Added functionality and improvements
29.09.2023	2.0.2.0	Added functionality and improvements
09.08.2023	1.4.3.0	Initial version for MXO5

3 Firmware update

Firmware updates for the R&S MXO5 are available as a single download from the Rohde&Schwarz web page <http://www.rohde-schwarz.com>.

The installation file for R&S MXO5 is named "**Setup_MXO5_V2.6.2.4.exe**".

After the update to this firmware version, the instrument will start with preset instrument settings. To check the installed firmware version, select "System" from the "Settings" menu and switch to the "About" tab or tab on the R&S icon on the upper right corner of the instrument screen.

3.1 Preparing the Update

There are several ways to update the device after downloading the firmware installation file.

Using a flash drive:

1. Copy the file to a directory of the flash drive and insert the flash drive into one of the USB sockets of the instrument.

3.2 Performing the Firmware Update on the Instrument

The firmware update process is performed with the following steps:

1. Switch the instrument on and wait until the Oscilloscope has resumed operation.
2. Ensure that the acquisition mode is not running. If the RUN CONT or the RUN Nx SINGLE key is shining green, press this key to stop the acquisition.
3. Select "Maintenance" from the "Settings" menu at the bottom right of the screen.
4. Select the "FW Update" tab.
5. The selected dialog box contains a part with the title "Select setup for firmware update". Press the Button "Install from file". A file selection dialog appears.
6. Change the path to the drive and directory which you prepared in the step 3.1 (flash drive directory) and close the dialog with the "Select" button.
7. The installation starts and an indicator appears. By default, all applications should be installed.
8. The installation continues and the firmware is stopped. After a few minutes the system restarts automatically.
Depending on the previously installed firmware version, a reconfiguration of the hardware may be required during the first start of the firmware. In this case, a message box is displayed and the update of the FPGA starts automatically. **Do not switch off the instrument during the update!** After the update of the FPGA the instrument restarts automatically.
If a special FPGA update is required the instrument must execute a cold boot. In such a case, a message appears on the screen asking to switch off the instrument. Press the "Ok" button and wait until the instrument is completely switched off. As a final step switch on the instrument. The instrument resumes operation.
9. After the firmware update a self-alignment is recommended. Select "Maintenance -> Alignment" from the "Settings" menu. Select "Start alignment" to start the self-alignment procedure.
A progress bar appears to indicate the running alignment procedure. This will take several minutes.

Now the instrument is ready for operation.

3.3 Performing the Firmware Update without a running oscilloscope application

A firmware update has to be executed from a remote PC.

1. Download the firmware installation file to a Windows PC in the same network as the oscilloscope.
2. Start the update by executing the firmware installation file.
3. Select "Remote Installation" and press "Next".
4. Select the packages to install (default is all) and press "Next".
5. The installer tries to find all oscilloscopes in your network. Once the device is found, select the checkbox next to the device name and press "Install".
Note: If the device is not found, check the network connection of the oscilloscope or press the "Options..." button to define additional information, i.e. the IP address.
Note: Multiple devices can be selected at once to execute the installation on all devices at the same time.
6. Wait until the installation is finished. The oscilloscope will reboot at the end of the installation.
7. Select "Finish" to close the installer.

3.4 Firmware downgrade

A firmware downgrade is handled like a firmware update.

3.5 Installing Firmware Options

The firmware update includes all currently available firmware options. No additional installation is required. A firmware update has no side effects to firmware options already installed.

The instructions in this chapter are only needed, if a firmware option is purchased and needs to be enabled on the instrument.

Enabling Options by Entering Option Key Codes

To activate firmware options, enter a license key for validation. The license key is in the device certificate or delivered as a part of the software package. The process is performed in the following steps:

1. Press the SETUP key. A dialog box appears. Select the “SW options” tab. The selected tab contains a box with the title “Install a new option”. There are two ways to install a firmware option:
 - a) If a file including the option key is provided, select “Open” in the box with the title “Install from file”. Navigate to the directory containing the option key file. Choose the file and click “Select”.
 - b) If an option key number is provided double click on the data entry field with the title “Enter new option key”. A key pad appears. Enter the option key number and press the “Enter” button.
2. After successful validation the message “option key valid” is displayed. If the validation failed, the firmware option is not installed.
3. If more than one firmware option shall be installed, step 1 and 2 needs to be repeated several times.

Reboot the device or restart the firmware.

4 Customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support or follow this QR code:



Bild 4-1: QR code to the Rohde & Schwarz support page