

**5 Series MSO Low Profile
With Option 5-SEC Enhanced Security
Declassification and Security
Instructions**

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Preface

This document helps customers with data security concerns to clear or sanitize a 5 Series MSO Low Profile MSO58LP instrument that has factory option 5-SEC installed.

The instrument has data storage devices (memory and a removable mass storage drive) and data export interfaces (USB and Ethernet). These instructions describe how to clear or sanitize the memory devices and disable the data output interfaces. The instructions also describe how to sanitize an instrument that is not functioning.

Reference

The procedures in this document are written to meet the requirements specified in:

- National Industrial Security Program Operating Manual (NISPOM), DoD 5220.22–M, Chapter 8
- Defense Security Service Manual for the Certification and Accreditation of Classified Systems under the NISPOM

Supported products

These instructions cover the following instrument:

- MSO58LP with factory installed option 5-SEC

NOTE. *Option 5-SEC must be ordered at the same time that you order an instrument.*

About option 5-SEC

NOTE. *Option 5-SEC must be ordered at the same time you order an instrument.*

Option 5-SEC provides the highest level of instrument security for 5 Series MSO products. Option 5-SEC features include:

- Oscilloscope hardware is configured to easily declassify the oscilloscope:
 - The main system memory is easily removed without disassembling the instrument
 - Data can only be saved to or read from a USB port on the instrument, a mounted network drive, or through the programmatic interface
- Password protection to enable/disable external USB Host and Device ports
- Password protection to enable/disable firmware upgrades or downgrades
- Password protection to prevent BIOS modification and booting from USB flash devices.

Terms

The following terms may be used in this document:

- **Clear.** This eradicates data on media/memory before reusing it in a secured area. All reusable memory is cleared to deny access to previously stored information by standard means of access.
- **Erase.** This is equivalent to clear.
- **Media.** Storage/data export device. A device that stores or exports data from the instrument, such as a USB flash drive or USB port.
- **Sanitize.** This removes the data from media/memory so that the data cannot be recovered using any known technology. This is typically used when the device is moved (temporarily or permanently) from a secured area to a nonsecured area.
- **Scrub.** This is equivalent to sanitize.
- **Remove.** This is a physical means to clear the data by removing the memory device from the instrument. Instructions are available in the product service manual.
- **User-Accessible.** The user can directly retrieve the memory device contents.
- **User-Modifiable.** The memory device can be written to by the user during normal instrument operation, using the instrument user interface or remote control.
- **Volatile memory.** Memory that loses data when the instrument is powered off.
- **Nonvolatile memory.** Memory that retains data when the instrument is powered off.
- **Power off.** Some instruments have a “Standby” mode, in which power is still supplied to the instrument. For clearing data, putting the instrument in Standby mode does not qualify as powering off. For these products, you must either push a rear-panel OFF switch or remove the power source from the instrument.
- **Instrument Declassification.** A term that refers to procedures that must be undertaken before an instrument can be removed from a secure environment. Declassification procedures include memory sanitization, memory removal, and sometimes both.

Memory device clear and sanitize procedures

Nonvolatile, volatile memory device table terminology

The tables in this section use the following terms:

- **User data.** Describes the type of information stored in the device. Refers to waveforms or other measurement information representing signals connected to the instrument by users.
- **User settings.** Describes the type of information stored in the device. Refers to instrument settings that can be changed by the user.
- **Both.** Describes the type of information stored in the device. It means that both user data and user settings are stored in the device.
- **None.** Describes the type of information stored in the device. It means that neither user data or user settings are stored in the device.
- **Directly.** Describes how data is modified. It means that the user can modify the data.
- **Indirectly.** Describes how data is modified. It means that the instrument system resources modify the data and that the user cannot modify the data.

Memory devices

The following tables list the volatile and nonvolatile memory devices in the instrument.

Table 1: Volatile memory devices

Type and minimum size	Function	Type of user info stored	Backed-up by battery	Method of modification	Data input method	Location	User accessible	To clear	To sanitize
SDRAM ≥16 GB (All models)	Host processor memory	User data or user setting	No	Indirectly	Written by processor system	Module socket (SODIMM) on the carrier interface assembly	No	Unplug the instrument for at least 30 seconds	Unplug the instrument for at least 30 seconds
SDRAM ≥4 GB	Holds active acquisition data	User data	No	Indirectly	Application software operations	Module socket (SODIMM) on the carrier interface assembly	No	Unplug the instrument for at least 30 seconds	Unplug the instrument for at least 30 seconds
SDRAM ≥512 MB	Holds video graphics data	User data	No	Indirectly	Application software operations	Acquisition board	No	Unplug the instrument for at least 30 seconds	Unplug the instrument for at least 30 seconds
CMOS RAM ≥256 Bytes	Holds clock and BIOS configuration data	None	Yes	Indirectly	BIOS operations	Carrier interface assembly	Yes	Push the CMOS clear button on the bottom of the instrument for a minimum of 30 seconds. (See page 7, <i>Resetting the instrument CMOS.</i>)	Push the CMOS clear button on the bottom of the instrument for a minimum of 30 seconds. (See page 7, <i>Resetting the instrument CMOS.</i>)

Table 2: Nonvolatile memory devices

Type and minimum size	Function	Type of user info stored	Method of modification	Data input method	Location	User accessible	To clear	To sanitize
Linux Solid State Drive Card ≥80 GB	Host instrument Linux operating system, application software, and user settings, Ethernet IP and related settings	User settings	Indirect	Written by processor system, software operations	Socket (m.2) on the carrier interface assembly	Yes	(See page 10, <i>How to clear or sanitize a working instrument.</i>)	(See page 10, <i>How to clear or sanitize a working instrument.</i>)
EEPROM ≥2 Kbit	Stores factory data, maintenance data, user password	User password	Directly settable from UI or by using PI commands	UI, Factory operations and programmatic commands	Acquisition board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM ≥2 Kbit	Holds AFG calibration data, USB port access password	USB Port access password Ethernet IP and related settings	Indirect	Factory operations	AFG riser board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM ≥64 Kbit	Holds the front panel USB configuration	None	None	Factory operations	Front panel LED board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM ≥1 Kb Four to six pieces depending on model	Holds the SODIMM memory configuration data (SPD)	None	None	Factory operations	Module socket (SODIMM) on the carrier interface assembly and module socket (SODIMM) on acquisition board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.

Memory device clear and sanitize procedures

Type and minimum size	Function	Type of user info stored	Method of modification	Data input method	Location	User accessible	To clear	To sanitize
Flash Memory ≥16 Mbit Two pieces	Holds a part of the Acquisition FPGA configuration	None	Indirect	Application software operations	Acquisition board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
Flash Memory ≥128 Mbit	Stores processor BIOS firmware, BIOS configuration, and embedded controller firmware. The Ethernet MAC address is stored in this device.	None	Indirect	BIOS operations, operating system operations and factory operations	Processor module board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
Flash Memory Unspecified size, three pieces	Stores power supply configuration data	None	Indirect	Application software operations	Internal to the UCD9248 power supply controller on the acquisition board and carrier interface assembly	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
Flash Memory ≥32 KB	Stores power management controller firmware	None	Indirect	Application software operations	Internal to the MC9S08 micro controller on the acquisition board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.

Type and minimum size	Function	Type of user info stored	Method of modification	Data input method	Location	User accessible	To clear	To sanitize
Flash Memory ≥64 KB Two to four pieces depending on model	Stores analog board microcontroller firmware	None	Indirect	Application software operations	Internal to the MKL14 micro controller on the analog board	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.
Flash Memory ≥0.33 Mbit	Stores the processor carrier FPGA configuration	None	None	Factory operations	Internal to the LCMXO2 FPGA on the carrier interface assembly	No	Not applicable, does not contain user data or settings. Clearing would disable instrument functionality.	Not applicable, does not contain user data or settings. Sanitizing would disable instrument functionality.

Media and data export devices

The following table lists the data export devices in the instrument.

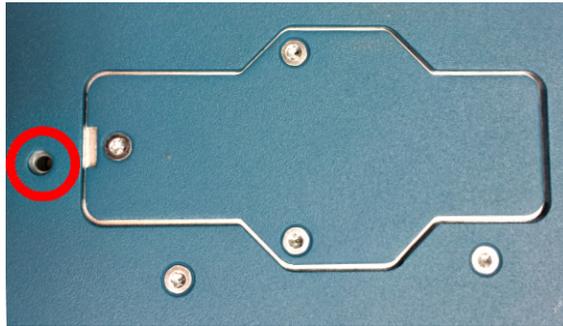
Table 3: Media and data export devices

Type	Function	Method of modification	Data input method	Location	User accessible	To disable
USB Host ports	User storage and recall of reference waveforms, screen images, and instrument setups, and installation of firmware updates using removable USB flash drives	Directly	User writeable	Three USB Host ports on front of the instrument; four USB Host ports on the back of the instrument	Yes	Use the Utility > Security menu to disable all USB ports (Host and Device). Requires a password (user-created when first disabled)
USB Device port	Remote control and data transfer to a PC	Directly	Remote control using USBTMC	USB Device port on back of the instrument	Yes	Use the Utility > Security menu to disable all USB ports (Host and Device). Requires a password (user-created when first disabled)
Ethernet	Transfer data and remote control of instrument.	Directly	Remote control using LXI, VISA, or Socket Server	Ethernet port on back of instrument	Yes	The Ethernet LAN port cannot be disabled.

Resetting the instrument CMOS

Do the following steps to reset the instrument CMOS device:

1. Disconnect the instrument power cord.
2. Disconnect all probes and cables.
3. Turn the instrument over so the bottom faces up.
4. Using a small, nonsharp tool, push and hold the indented CMOS reset button for 30 seconds.



5. Turn the instrument over.
6. Set the instrument clock. (See page 8, *Resetting the instrument clock.*)

Resetting the instrument clock

Do the following steps to reset the instrument clock in case the instrument date and time are incorrect, or after a CMOS reset:

1. Connect a keyboard and monitor to the instrument.
2. Power on the instrument.
3. While the instrument is powering on, continuously press the **F2** or **Delete** key until the **BIOS Login** screen appears.
4. Enter the password (yours or the default password). If you are logging in for the first time, the factory installed password is **Tektronix**. Once you have logged in using the factory default BIOS password, create and enter a new password in accordance with your organization's policies.



WARNING. *Make sure that you keep a record of the instrument BIOS password in your organization's records. There is no way for Tektronix to gain access to the instrument BIOS settings once the password is changed from the factory default value. If you need to return the instrument to Tektronix for service, you must reset the BIOS password back to the factory default value **Tektronix** before sending to the Tektronix Service Center.*

5. The **Please select a boot device** screen appears.
6. Use the down arrow key to select **Enter Setup** and press **Enter**.
7. In the Main tab (default), use the down arrow to select **System Date**. If the date is not current, use the keys as described on the screen to select and enter correct information in the date fields.
8. In the Main tab (default), use the down arrow to select **System Time**. If the time is not current, use the keys as described on the screen to select and enter correct Coordinated Universal Time (UTC) information in the date fields. Use the Web to determine the current UTC time. (note; Do not enter your local time.)
9. Once the time is set, press the **F4** key to save this value and exit the setup screen. The instrument powers on to the normal oscilloscope view.
10. Double-tap the **Date and Time** badge in the lower right of the screen.
11. Tap the Time Zone field and select the correct time zone for your instrument location.

12. Enable the **Automatically adjust clock for Daylight Savings Time** function if used in your time zone.
13. Tap outside the menu to close the time zone setting.

How to clear or sanitize a working instrument

Run all the following procedures, in order, to clear or sanitize the instrument. You typically clear or sanitize an instrument when you want to erase files to clear space or turn the instrument over to another person or department.

Clear the Network Configuration password

1. Connect the instrument to a network to which you have access.
2. Enter the instrument's IP address into a web browser on a PC that has network access to the instrument.
3. Click the **Security for Network Config** link on the left side of the screen.
4. Click **Submit**:
 - If a password was set for this function, you are requested to enter the password. If the password is accepted, the password is set to blank (the default setting of the access password fields).
 - If a password was not set for this function, the screen displays the message that the password was successfully changed (to a blank password).

Clear the network DNS Hostname and description

1. Connect the instrument to a network to which you have access.
2. Enter the instrument's IP address into a web browser on a PC that has network access to the instrument.
3. Click the **Network Configuration** link on the left side of the screen.
4. Delete all text in both of the **Host Settings** fields.
5. Click the Host Settings **Submit** button. A message appears stating that the field is empty, and will be configured to the original factory default value.
6. Click **OK**. The message closes and the fields are restored to their original factory settings.

Clear Ethernet port settings

1. Disconnect the Ethernet cable from the instrument.
2. Connect a keyboard and monitor to the instrument.
3. Open the **Utility > I/O** menu.
4. In the LAN panel, clear all information from the **Host Name**, **Domain Name**, and **Service Name** fields.
5. Click the **LAN Reset** button.
6. Click **OK**.
7. Tap **Apply Changes**. It may take a few moments for the changes to take effect.
8. Tap outside the menu to close it.

NOTE. You can also clear the instrument IP Address settings from the instrument's web-based interface. Connect the instrument to your network, enter the instrument's IP address into a web browser on a PC that is connected to a network that has access to the instrument, click the **Network Configuration** link on the left side of the screen, select the **Manual TCP/IP Mode** box, clear all information from all fields, and click the **Address Settings Submit** button.

Delete USB port and software update password

If you have entered a password to enable/disable USB ports and software updates, do the following:

1. Connect a keyboard and monitor to the instrument.
2. Open the **Utility > Security > Change Password** menu.
3. Enter in the current password in the **Current Password** field.
4. Tap **Delete Password**.

Run TekSecure and Default Setup

1. Connect a keyboard and monitor to the instrument.
2. Tap **Utility > Security** on the oscilloscope Menu bar.
3. Tap **Run TekSecure** to start the process. The TekSecure process takes up to about 10 minutes to run.
4. Push the **Default Setup** button.
5. Power off the instrument.

NOTE. *As the TekSecure function overwrites data in the user-data partition of the SSD, and the old data cannot be recovered by standard means of access, then running TekSecure may meet your organizations needs for sanitizing and retaining a working instrument. Your organization must make this decision based on the fact that the other partitions on the SSD retain some user-related data and files after running TekSecure.*

NOTE. *You can continue using the oscilloscope after running TekSecure, as TekSecure does not erase or change the operating system, factory calibration constants, Ethernet settings, or Demo setups.*

The Clear/Sanitize process is done

You can now remove the instrument from the secured environment.

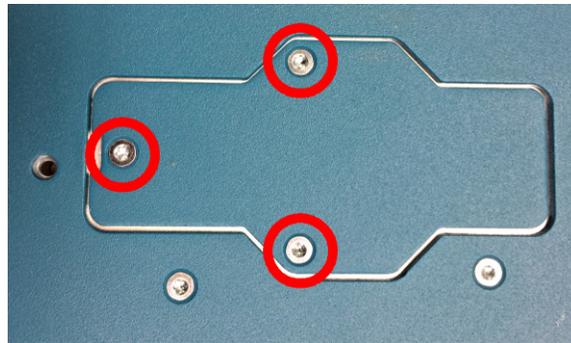
How to sanitize a nonfunctional instrument

Do the following to clear or sanitize your instrument if it is not functioning and must be returned to Tektronix for repair:



CAUTION. To avoid damaging other circuits in the instrument, perform the following procedure in a static-safe environment with proper electrostatic discharge controls in place (such as a grounded antistatic wrist strap).

1. Disconnect the instrument power cord.
2. Disconnect all probes and cables.
3. Remove all external USB memory devices. Store or destroy the USB memory devices in accordance with your organization's guidelines.
4. Turn the instrument over so that the bottom is facing up.
5. Use a T-10 Torx screw driver to remove the three screws on the Sold State Drive cover.



6. Use a T-10 Torx screw driver to remove the screw from the end of the memory card.



The end of the memory card lifts upward as you remove the screw.



7. Grasp the edges of the raised end of the card and pull to remove the memory card. Store or destroy the memory card in accordance with your organization's guidelines.
8. Reattach the drive cover.
9. Package the instrument for shipping. Contact Tektronix for guidelines on correct packaging to best protect your instrument during shipping.
10. Send the instrument to a Tektronix Service Center. The instrument will then be repaired, calibrated as necessary, and returned to you.

In North America, contact the Tektronix Customer Care Center (1-800-833-9200) for assistance with returning the instrument to a service center. Worldwide, visit www.tektronix.com to find contacts in your area.

Repair charges

Replacement of damaged and missing hardware is charged according to the rate at the time of replacement.