Security Guide

Keysight M9393A PXIe Vector Signal Analyzer

Notice: This document contains references to Agilent. Please note that Agilent's Test and Measurement business has become Keysight Technologies. For more information, go to www.keysight.com.

KEYSIGHT TECHNOLOGIES

Notices

Trademark Acknowledgements

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Warranty

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Warranty

This Keysight technologies instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, Keysight Technologies will, at its option, either repair or replace products that prove to be defective. For warranty service or repair, this product must be returned to a service facility designated by Keysight Technologies. Buyer shall prepay shipping charges to Keysight Technologies, and Keysight Technologies shall pay shipping charges to return the product to Buyer. For products returned to Keysight Technologies from another country, Buyer shall pay all shipping charges, duties, and taxes.

Where to Find the Latest Information

Documentation is updated periodically. For the latest information about these products, including instrument software upgrades, application information, and product information, see the following URLs:

http://www.keysight.com/find/pxa

http://www.keysight.com/find/mxa

http://www.keysight.com/find/exa

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Information on preventing instrument damage can be found at:

Is your product software up-to-date?

Periodically, Keysight releases software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Keysight Technical Support website at:

http://www.keysight.com/find/techsupport

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Product Memory Sanitization

Sanitization processes for the following Keysight product models are covered by this document:

- Multi-module instrument:
    - M9381A PXIe Vector Signal Analyzer drivers
- PXIe modules:
    - M9300A PXIe Frequency Reference
    - M9308A PXIe Synthesizer
    - M9365A PXIe Downconverter
    - M9214A PXIe IF Digitizer

M9393A PXIe Vector Signal Analyzer Drivers

This product uses the same AgM9393 driver. The driver installs the IVI-C, IVI-COM, and MATLAB driver components, as well as the soft front panel and kernel device driver on your controller.

Memory Type: Controller Hard Drive	**Memory Size**: unknown
Memory Function: Stores device drivers, example programs, example waveforms, help system, user documentation, and customer-specific frequency alignment data.	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: To uninstall the AgM9393 instrument driver from the controller, perform the relevant procedure below. Windows 7: 1. Select **Start > Control Panel > Programs and Features** 2. Select **Keysight M9393** 3. Select **Uninstall** **To remove customer-specific frequency alignment data**: Navigate to C:\ProgramData\Keysight\<Model#>\FieldAlignment and delete the contents. Where <Model#> is: M9393A M9308A M9214A M9365A To clear all information from the controller used with the M9393A PXIe Vector Signal Analyzer, follow the memory erase procedure for the controller as recommended by the manufacturer.	

M9300A PXIe Frequency Reference

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores module model number, serial number, manufacturing number, PCB part and version numbers, cal verify date, max module temperature, and calibration data.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Device firmware. Images can be changed using the Keysight Soft Front Panel firmware update utility.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores calibration preferences: due date subject to periodic cal, module cal warnings, cal due reminder, module cal reminder and passphrase	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: You can clear the passphrase by using the relevant IVI driver code: • If the module is used in an M9393A instrument, see "M9393A Memory Clear Code" (page 13).	

Memory Type: FPGA	**Memory Size**:
Memory Function: Reference output selections, external reference and frequency selections, time shift and self test results	
User Modifiable? Yes	**Volatile?** Yes
Memory Erase Processes: Cycle power	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores User Customizable Asset Number and System Identification	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: You can clear the asset number and system identification values by using the relevant IVI driver code: • If the module is used in an M9393A instrument, see "M9393A Memory Clear Code" (page 13).	

M9308A PXIe Synthesizer: 187.5 MHz to 3 GHz or 6 GHz

(NOTE: The M9308A PXIe Synthesizer is only used with M9393A PXIe Vector Signal Analyzer.)

Memory Type: Flash Memory	**Memory Size:** 128 M Bit
Memory Function: Stores Module Model Number, Serial Number, Manufacturing Number, Options, PCB Part and Version Numbers, Cal Verify Date, Max Module Temperature, and Calibration and Alignment Data.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size:** 128 M Bit
Memory Function: Device firmware. Images can be changed using the Keysight soft front panel firmware update utility.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size:** 128 M Bit
Memory Function: Stores calibration preferences: due date subject to periodic cal, module cal warnings, cal due reminder, module cal reminder and passphrase	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: You can clear the passphrase by using the relevant IVI driver code: • If the module is used in an M9393A instrument, see "M9393A Memory Clear Code" (page 13).	

Memory Type: FPGA	**Memory Size:**
Memory Function: Frequency start/stop/step, power, waveform, and impairments.	
User Modifiable? Yes	**Volatile?** Yes
Memory Erase Processes: Cycle power	

Memory Type: Flash Memory	**Memory Size:** 128 M Bit
Memory Function: Stores user customizable asset number and system identification	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: You can clear the asset number and system identification values by using the relevant IVI driver code: • If the module is used in an M9393A instrument, see "M9393A Memory Clear Code" (page 13).	

M9365A PXIe Downconverter

(NOTE: The M9365A PXIe Downconverter is only used with M9393A PXIe Vector Signal Analyzer.)

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores module model number, serial number, manufacturing number, options, PCB part and version numbers, cal verify date, max module temperature, and calibration and alignment data.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Device firmware. Images can be changed using the Keysight Soft Front Panel firmware update utility.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores calibration preferences: due date subject to periodic cal, module cal warnings, cal due reminder, module cal reminder and passphrase	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: To clear the passphrase, use the IVI driver code provided in "M9393A Memory Clear Code" (page 13).	

Memory Type: FPGA	**Memory Size**:
Memory Function: Stores: IQ, spectrum and power settings; advanced options; dither; alignments.	
User Modifiable? Yes	**Volatile?** Yes
Memory Erase Processes: Cycle power	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores User Customizable Asset Number and System Identification	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: To clear the asset number and system identification values, use the IVI driver code provided in "M9393A Memory Clear Code" (page 13).	

M9214A PXIe IF Digitizer

(NOTE: The M9214A PXIe IF Digitizer is only used with M9393A and M9391A PXIe Vector Signal Analyzers.)

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores module model number, serial number, manufacturing number, options, PCB part and version numbers, cal verify date, max module temperature, and calibration and alignment data.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Device firmware. Images can be changed using the Keysight Soft Front Panel firmware update utility.	
User Modifiable? No	**Volatile?** No
Memory Erase Processes: None, this is not user accessible	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores calibration preferences: due date subject to periodic cal, module cal warnings, cal due reminder, module cal reminder and passphrase	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: To clear the passphrase, use the IVI driver code provided in "M9393A Memory Clear Code" (page 13).	

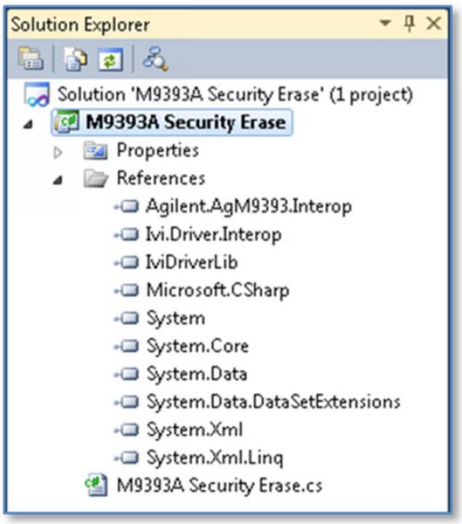
Memory Type: FPGA	**Memory Size**:
Memory Function: Stores: IQ, spectrum and power settings; advanced options; dither; alignments.	
User Modifiable? Yes	**Volatile?** Yes
Memory Erase Processes: Cycle power	

Memory Type: Flash Memory	**Memory Size**: 128 M Bit
Memory Function: Stores User Customizable Asset Number and System Identification	
User Modifiable? Yes	**Volatile?** No
Memory Erase Processes: To clear the asset number and system identification values, use the IVI driver code provided in "M9393A Memory Clear Code" (page 13).	

M9393A Memory Clear Code

Below is the IVI code to clear the memory from the M9393A PXIe Vector Signal Analyzer and its modular components (M9300A Reference, M9308A Synthesizer, M9365A Downconverter, and M9214A Digitizer). The procedures in this code sample clear the Asset Number, System ID, and Cal passphrase from the flash memory.

All you need to do is copy and paste the code into a console application and include the correct driver references – see inset picture (right).




```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using Ivi.Driver.Interop;
using Agilent.AgM9393.Interop;

namespace M9393A_Security_Erase
{
    class Program
    {
        static void Main(string[] args)
        {

            //Running this program will clear the flash memory of the M9393A Vector Signal Analyzer multi-module
            instrument.
            //The flash memory cleared is the Asset Number, System ID, and the passphrase protecting the calibration preferences.
            //ONLY run this program if you are sure you want to clear this information.

            //initialize the driver
            IAgM9393 m9393a = new AgM9393();
            string resource = "";   //enter in the VISA resource between the quotes for the instrument getting cleared
            string options = "QueryInstrStatus=true, Simulate=false, DriverSetup=Trace=false";
            bool idquery = true;
            bool reset = true;
            m9393a.Initialize(resource, idquery, reset, options);
            Console.WriteLine("Driver Initialized.\n Press enter to continue\n");
            Console.ReadLine();

            //Test to write to modules. It is commented out because it does not need to be run to clear the memory.
            //m9393aWrite(m9393a.Modules.get_Item("M9300A"));
            //m9393aWrite(m9393a.Modules.get_Item("M9308A"));
            //m9393aWrite(m9393a.Modules.get_Item("M9365A"));
            //m9393aWrite(m9393a.Modules.get_Item("M9214A"));

            //Read back asset numbers and system ID from each module
            string refAsset = m9393a.Modules.get_Item("M9300A").Nonvolatile.AssetNumber;
            string refID = m9393a.Modules.get_Item("M9300A").Nonvolatile.SystemIdentification;
            string synthAsset = m9393a.Modules.get_Item("M9308A").Nonvolatile.AssetNumber;
            string synthID = m9393a.Modules.get_Item("M9308A").Nonvolatile.SystemIdentification;
            string DCAsset = m9393a.Modules.get_Item("M9365A").Nonvolatile.AssetNumber;
            string DCID = m9393a.Modules.get_Item("M9365A").Nonvolatile.SystemIdentification;
            string digAsset = m9393a.Modules.get_Item("M9214A").Nonvolatile.AssetNumber;
            string digID = m9393a.Modules.get_Item("M9214A").Nonvolatile.SystemIdentification;
            Console.WriteLine("Reference Asset is:" + refAsset + "\n");
            Console.WriteLine("Reference System ID is:" + refID + "\n");
            Console.WriteLine("Synthesizer Asset is:" + synthAsset + "\n");
            Console.WriteLine("Synthesizer System ID is:" + synthID + "\n");
            Console.WriteLine("DownConverter Asset is:" + DCAsset + "\n");
            Console.WriteLine("DownConverter System ID is:" + DCID + "\n");
            Console.WriteLine("Digitizer Asset is:" + digAsset + "\n");
            Console.WriteLine("Digitzer System ID is:" + digID + "\n\n");

            //Begin clear
            Console.WriteLine("Press Enter to Clear asset number and system ID");
            Console.ReadLine();
```

```
            //Clear asset number and system ID and Calibration Preferences passphrase.
            m9393aClear(m9393a.Modules.get_Item("M9300A"));
            m9393aClear(m9393a.Modules.get_Item("M9308A"));
            m9393aClear(m9393a.Modules.get_Item("M9365A"));
            m9393aClear(m9393a.Modules.get_Item("M9214A"));

            //Read back module asset numbers and ID to verify memory clear.
            Console.WriteLine("press enter to verify clear");
            Console.ReadLine();
            refAsset = m9393a.Modules.get_Item("M9300A").Nonvolatile.AssetNumber;
            refID = m9393a.Modules.get_Item("M9300A").Nonvolatile.SystemIdentification;
            synthAsset = m9393a.Modules.get_Item("M9308A").Nonvolatile.AssetNumber;
            synthID = m9393a.Modules.get_Item("M9308A").Nonvolatile.SystemIdentification;
            DCAsset = m9393a.Modules.get_Item("M9365A").Nonvolatile.AssetNumber;
            DCID = m9393a.Modules.get_Item("M9365A").Nonvolatile.SystemIdentification;
            digAsset = m9393a.Modules.get_Item("M9214A").Nonvolatile.AssetNumber;
            digID = m9393a.Modules.get_Item("M9214A").Nonvolatile.SystemIdentification;
            Console.WriteLine("Reference Asset No is:" + refAsset + "\n");
            Console.WriteLine("Reference System ID is:" + refID + "\n");
            Console.WriteLine("Synthesizer Asset No is:" + synthAsset + "\n");
            Console.WriteLine("Synthesizer System ID is:" + synthID + "\n");
            Console.WriteLine("DownConverter Asset No is:" + DCAsset + "\n");
            Console.WriteLine("DownConverter System ID is:" + DCID + "\n");
            Console.WriteLine("Digitizer Asset is:" + digAsset + "\n");
            Console.WriteLine("Digitzer System ID is:" + digID + "\n\n");
            Console.WriteLine("\n Memory clear complete, press enter to exit program");
            Console.ReadLine();

            //Close the driver session.
            m9393a.Close();
        }

        //Test method to write to the modules. It is commented out because it does not need to be run to clear the memory.
        //static void m9393aWrite(IAgM9393Module module)
        //{
        //   module.Nonvolatile.Clear();
        //   module.Nonvolatile.SystemIdentification = "system ID";
        //   module.Nonvolatile.AssetNumber = "123456789";
        //   string oldPassphrase = module.Nonvolatile.Passphrase;
        //   module.Nonvolatile.Write(oldPassphrase);
        //}

        //Method to clear the Passphrase and Asset Number/System ID of each module.
        static void m9393aClear(IAgM9393Module module)
        {
                 module.Nonvolatile.Clear();
                 module.Nonvolatile.SystemIdentification = "";
                 module.Nonvolatile.AssetNumber = "";
                 string newPassphrase = "";
                 string oldPassphrase = module.Nonvolatile.Passphrase;
                 module.Nonvolatile.Passphrase = newPassphrase;
                 module.Nonvolatile.Write(oldPassphrase);
        }
    }
}
```

Contacting Keysight Sales and Service Offices

Assistance with test and measurement needs, and information on finding a local Keysight office, is available on the Internet at:

http://www.keysight.com/find/assist

If you do not have access to the Internet, please contact your field engineer.

NOTE In any correspondence or telephone conversation, refer to the instrument by its model number and full serial number. With this information, the Keysight representative can determine whether your unit is still within its warranty period.

Security Terms and Definitions

Term	Definition
Clearing	As defined in Section 8-301a **of** DoD **5220.22-M**, clearing is the process of eradicating the data on media before reusing the media so that the data can no longer be retrieved using the standard interfaces on the instrument. Clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.
Instrument Declassification	A term that refers to procedures that must be undertaken before an instrument can be removed from a secure environment, such as is the case when the instrument is returned for calibration. Declassification procedures include memory sanitization or memory removal, or both. Keysight declassification procedures are designed to meet the requirements specified in **DoD 5220.22-M**, Chapter 8.
Sanitization	As defined in Section 8-301b of **DoD 5220.22-M**, sanitization is the process of removing or eradicating stored data so that the data cannot be recovered using any known technology. Instrument sanitization is typically required when an instrument is moved from a secure to a non-secure environment, such as when it is returned to the factory for calibration. Keysight memory sanitization procedures are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS). These requirements are specified in the "Clearing and Sanitization Matrix" in Section 5.2.5.5.5 of the **ISFO Process Manual**.
Secure Erase	Secure Erase is a term that is used to refer to either the clearing or sanitization features of Keysight instruments.

References

Check references and hyperlinks whenever this document is revised!

1. **DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)"**

   United States Department of Defense. Revised February 28, 2006.

   May be downloaded in Acrobat (PDF) format from:

   http://www.dss.mil/isp/fac_clear/download_nispom.html

2. **ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NISPOM**

   Defense Security Service.

   DSS-cleared industries may request a copy of this document via email, by following the instructions at:

   http://www.dss.mil/isp/odaa/request.html

3. **Add further references here**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