Revision History

Keysight M90XA X-Series Measurement Applications for Modular Instruments

KEYSIGHT TECHNOLOGIES

Notices

Copyright Notices

Manual Part Number

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Published By

Keysight Technologies Ground Floor and Second Floor, CP-11 Sector-8, IMT Manesar – 122051 Gurgaon, Haryana, India

Edition

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Regulatory Compliance

This product has been designed and tested in accordance with accepted industry standards, and has been supplied in a safe condition. To review the Declaration of Conformity, go to http://www.keysight.com/go/conformity

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Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

The following safety precautions should be observed before using this product and any associated instrumentation. This product is intended for use by qualified personnel who recognize

shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product.

WARNING

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

The types of product users are:

- Responsible body is the individual or group responsible for the use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring operators are adequately trained.
- Operators use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument.They must be protected from electric shock and contact with hazardous live circuits.
- Maintenance personnel perform routine procedures on the product to keep it operating properly (for example, setting the line voltage or replacing consumable materials). Maintenance procedures are described in the user documentation.The procedures explicitly state if the operator may perform them. Otherwise,they should be performed only by service personnel.
- Service personnel are trained to work on live circuits, perform safe installations, and repair products.Only properly trained service personnel may perform installation and service procedures.

WARNING

Operator is responsible to maintain safe operating conditions. To ensure safe operating conditions, modules should not be operated beyond the full temperature range specified in the Environmental and physical specification. Exceeding safe operating conditions can result in shorter lifespans, improper module performance and user safety issues. When the modules are in use and operation within the specified full temperature range is not maintained, module surface temperatures may exceed safe handling conditions which can cause discomfort or burns if touched. In the event of a module exceeding the full temperature range, always allow the module to cool before touching or removing modules from chassis.

Keysight products are designed for use with electrical signals that are rated Measurement Category I and Measurement Category II, as described in the International Electro-technical Commission (IEC) Standard IEC 60664. Most measurement, control, and data I/O signals are Measurement Category I and must not be directly connected to mains voltage or to voltage sources with high transient over-voltages. Measurement Category II connections require protection for high transient over-voltages often associated with local AC mains connections.Assume all measurement, control, and data I/O connections are for connection to Category I sources unless otherwise marked or described in the user documentation.

Exercise extreme caution when a shock hazard is present. Lethal voltage may be present on cable connector jacks or test fixtures. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30V RMS, 42.4V peak, or 60VDC are present. A good safety practice is to expect that hazardous voltage is present in any unknown circuit before measuring.

Operators of this product must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000V, no conductive part of the circuit may be exposed.

Do not connect switching cards directly to unlimited power circuits. They are intended to be used with impedance-limited sources. NEVER connect switching cards directly to AC mains. When connecting sources to switching cards, install protective devices to limit fault current and voltage to the card.

Before operating an instrument, ensure that the line cord is connected to a properly grounded power receptacle. Inspect the connecting cables, test leads, and jumpers for possible wear, cracks, or breaks before each use.

When installing equipment where access to the main power cord is restricted, such as rack mounting, a separate main input power disconnect device must be provided in close proximity to the equipment and within easy reach of the operator.

For maximum safety, do not touch the product, test cables, or any other instruments while power is applied to the circuit under test. ALWAYS remove power from the entire test system and discharge any capacitors before: connecting or disconnecting cables or jumpers, installing or removing switching cards, or making internal changes, such as installing or removing jumpers.

Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

The instrument and accessories must be used in accordance with its specifications and operating instructions, or the safety of the equipment may be impaired.

Do not exceed the maximum signal levels of the instruments and accessories, as defined in the specifications and operating information,and as shown on the instrument or test fixture panels, or switching card.

When fuses are used in a product, replace with the same type and rating for continued protection against fire hazard.

Chassis connections must only be used as shield connections for measuring circuits, NOT as safety earth ground connections.

If you are using a test fixture, keep the lid closed while power is applied to the device under test. Safe operation requires the use of a lid interlock.

Instrumentation and accessories shall not be connected to humans.

Before performing any maintenance, disconnect the line cord and all test cables.

To maintain protection from electric shock and fire, replacement components in mains circuits - including the power transformer, test leads, and input jacks - must be purchased from Keysight. Standard fuses with applicable national safety approvals may be used if the rating and type are the same. Other components that are not safety related may be purchased from other suppliers as long as they are equivalent to the original component (note that selected parts should be purchased only through Keysight to maintain accuracy and functionality of the product). If you are unsure about the applicability of a replacement component, call an Keysight office for information.

WARNING

No operator serviceable parts inside.Refer servicing to qualified personnel. To prevent electrical shock do not remove covers. For continued protection against fire hazard, replace fuse with same type and rating.

PRODUCT MARKINGS:

The CE mark is a registered trademark of the European Community.

Australian Communication and Media Authority mark to indicate regulatory compliance as a registered supplier.

ICES/NMB-001
ISM GRP.1 CLASS A

This symbol indicates product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001). It also identifies the product is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).

KCC-REM-KST-BLMxxxxx

South Korean Class A EMC Declaration. This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용 (A 급) 전자파적합기
기로서 판 매자 또는 사용자는 이 점을 주
의하시기 바라 며 , 가정외의 지역에서
사용하는 것을 목적으 로 합니다.

This product complies with the WEEE Directive marketing requirement. The affixed product label (above) indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE directive Annex 1, this product is classified as “Monitoring and Control instrumentation” product. Do not dispose in domestic household waste. To return unwanted products, contact your local Keysight office, or for more information see http://about.keysight.com/en/companyinfo/environment/takeback.shtml

This symbol indicates the instrument is sensitive to electrostatic discharge (ESD). ESD can damage the highly sensitive components in your instrument. ESD damage is most likely to occur as the module is being installed or when cables are connected or disconnected. Protect the circuits from ESD damage by wearing a grounding strap that provides a high resistance path to ground. Alternatively, ground yourself to discharge any builtup static charge by touching the outer shell of any grounded instrument chassis before touching the port connectors.

This symbol on an instrument means caution, risk of danger. You should refer to the operating instructions located in the user documentation in all cases where the symbol is marked on the instrument.

This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.

Contents

M90XA Revision History

This revision history document is relevant for the following Keysight products:

Product/Feature	Description
M9063A	Analog Demodulation Measurement Application
M9064A	VXA Vector Signal Analysis Measurement Application
M9068A	Phase Noise Measurement Application
M9071A	GSM/EDGE/EVO Measurement Application
M9072A	CDMA2000/CDMAOne Measurement Application
M9073A	W-CDMA/HSPA+ Measurement Application
M9076A	1xEV-DO Measurement Application
M9077A	WLAN 802.11a/b/g/n/ac Measurement Application
M9079A	TD-SCDMA/HSPA Measurement Application
M9080A	LTE FDD Measurement Application
M9080B	LTE-Advanced FDD Measurement Application
M9081A	Bluetooth® Measurement Application
M9082A	LTE TDD Measurement Application
M9082B	LTE-Advanced TDD Measurement Application

Keysight recommends that you keep your system up to date by installing the most recent software version. Only the most current version, along with update instructions, is accessible via the web and can be downloaded from http://www.keysight.com/find/M90XA-SW.

The table below lists the release dates for each version of instrument software.

To see the version that is currently installed on your system, open Control Panel and find M90XA under installed programs. You can find versions of installed components as follows:

- M9391A and M9393A drivers: Control Panel, Installed Programs
- XSA: Run M90XA. Send the SCPI query *IDN? or from the GUI, select Utilities > System > Show > System and look for the Instrument S/W Revision entry on the display.

M90XA Software Version	Release Date
Version 3.0	October 2015
Version 2.1	March 2015
Version 2.0	July 2014
Version 1.1.500	December 2013
Version 1.0.9	October 2013

Version 3.0 (October 2015)

Minimum required M9391A driver: 1.2.417.1

Minimum required M9393A driver: 2.0.200.0

XSA version: M.16.00

Enhancements

- Updated all X-Series measurement applications to version 16.0.
- Tested support for M9393A version 2.0.
- Phase Noise application enhancements (require M9068A-B or M9068C-2):
    - Support for Gate functionality
    - Support for 4801 trace points per sweep (601 default)
- GSM/EDGE application enhancement (requires M9071A-B or M9071C-2):
    - Support for GSM multi-carrier ORFS test limit exception (non-contiguous)
- VXA Vector Signal Analysis application enhancement (requires M9064A-1):
    - Support for APCO 25
- WLAN application enhancements:
    - 802.11ac enhancements - support for 1024-QAM, Freq Sync (requires M9077A-4)
    - Support for 802.11p and 802.11j (requires M9077A-2)
    - Support for 802.11ah (requires M9077A-6)
- TD-SCDMA/HSPA application enhancements (requires M9079A-C):
    - Support for E-DCH Fixed reference channel configuration
- LTE-Advanced FDD and LTE-Advanced TDD applications enhancements (requires M9080*-2 and M9082*-2, respectively):
    - E-UTRA Test Config (ETC) preset
    - EVM Multi-CC simultaneous acquisition
    - EVM/CEVM and VSA v.19
    - ACP Inner-offset CACLR On/Off auto
    - Addition of OBW and ACP marker in modulation analysis
    - LTE-Advanced TDD application - Fix for ACP/SEM preset mask recall
- LTE TDD application enhancements (requires M9082*-1):
    - Alignment of frame timing to Ext. Trigger
    - “Transient Period” measurement aligned with 3GPP definition
    - 70us averaged power through entire OFF power period

- Bluetooth application enhancement (requires M9081A-B):
    - Support for Bluetooth v4.2 compliance

Issues Resolved

- Issues fixed in X-Series measurement applications are described in the X-Series Revision History at http://www.keysight.com/upload/cmc_upload/All/XSA_SWReleaseNotes-Win7.pdf

Version 2.1 (March 2015)

Minimum required M9391A driver: 1.2.417.1

Minimum required M9393A driver: 1.1.518.1

XSA version: M.14.50

NOTE **X-Series Measurement Applications for Modular Instruments are no longer supported in 32-bit mode.**

Enhancements

- Added support for the following measurement application:
  - M9068A - Phase Noise Measurement Application
- Updated all X-Series measurement applications to version 14.5. See X-Series Revision History at http://www.keysight.com/upload/cmc_upload/All/XSA_SWRev_History-Win7.pdf
- Reorganized the programming examples. Added new MATLAB and Visual Basic .NET programming examples.
- Measurement speed and performance enhancements in key areas.

Issues Resolved

- Issues fixed in X-Series measurement applications are described in the X-Series Revision History at http://www.keysight.com/upload/cmc_upload/All/XSA_SWRev_History-Win7.pdf

Version 2.0 (Release Date July 24, 2014)

Minimum required M9391A driver: 1.1.300.0

Minimum required M9393A driver: 1.0.70.0

XSA version: A.14.01

Enhancements

- Added support for M9393A PXIe Vector Signal Analyzer.
- Added support for the following measurement applications:
  - M9063A - Analog Demodulation Measurement Application
  - M9064A - VXA Vector Signal Analysis Measurement Application
  - M9080B - LTE-Advanced FDD Measurement Application
  - M9081A - Bluetooth_® Measurement Application
  - M9082B - LTE-Advanced TDD Measurement Application

    NOTE **The LTE-Advanced apps are not supported in 32-bit mode.**

- Updated all X-Series measurement applications to version 14. See X-Series Revision History at http://www.keysight.com/upload/cmc_upload/All/XSA_SWRev_History-Win7.pdf
- Added support for running in-process with 89600 VSA software and sharing hardware driver sessions.
- Measurement speed and performance enhancements in key areas.

Issues Resolved

- Issues fixed in X-Series measurement applications are described in the X-Series Revision History at http://www.keysight.com/upload/cmc_upload/All/XSA_SWRev_History-Win7.pdf

Version 1.1.500 (Release Date December 16, 2013)

Minimum required M9391A driver: 1.1.300
XSA version: A.13.33

Enhancements

None

Issues Resolved

- Fixed an issue where the result for Power Spectral Density (PSD) under the Channel Power (CHP) measurement was slightly less than the value measured with a swept analyzer.
- Fixed an issue where the Gate Length parameter was not being used to determine the data acquisition time for gated spectrum measurements.
- Fixed an issue where the TD-SCDMA Spectrum Emission Mask measurement did not account for External Gain for the first measurement.
- Fixed several issues that caused the M90XA to crash at exit.
- Fixed an issue where the M90XA virtual front panel was always the top-most window.

Version 1.0.9 (Release Date October 4, 2013)

Minimum required M9391A driver: 1.1.136
XSA version: A.13.32

Initial Release

Edition 3.0, October, 2015
M9000-90008
www.keysight.com