Keysight Wireless Test Platform

E7515W UXM Wireless Test Platform

KEYSIGHT

Getting Started Guide

Notices

Copyright Notice

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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.

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, browse to one of the following URLs, according to the name of your product:

www.keysight.com/find/UXM-W

To receive the latest updates by email, subscribe to Keysight Email Updates at the following URL:

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

Information on preventing instrument damage can be found at:

www.keysight.com/find/PreventingInstrumentRepair

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

CONTENTS

SAFETY AND ENVIRONMENTAL INFORMATION

The following topics can be found in this section:

Warning Statement and Symbols

Caution and Warning notices are used in this document as described below.

CAUTION	A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not performed correctly 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 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.

See also: "Front and Rear Panel Symbols".

Safety

This product has been designed and tested in accordance with accepted industry standards and has been supplied in a safe condition. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Safety Compliance

This product complies with the essential requirements of the European Low Voltage Directive as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61010-1
- Canada: CSA C22.2 No. 61010-1
- USA: UL std no. 61010-1

Acoustic Statement (European Machinery Directive)

Acoustic noise emission LpA <70 dB

Operator position

Normal operation mode per ISO 7779

General Safety Notice

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.

WARNING

All external inputs connected to ports shall provide reinforced or double insulation for protection against electric shock and shall have voltages below 30 V_{rms} and 42.4 V_{peak} or 60 V_{DC}.

WARNING

No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.

Electrical Safety

See also: "AC power safety".

NOTE

Measurement Category: None (not intended for Measurement Category II, III or IV.) (That is, the E7515W input ports are not designed to measure hazardous voltages, or to be connected to equipment that is not protected from hazardous transient voltages.)

WARNING

This is a Safety Class 1 Product (provided with a protective earth ground incorporated in the power cords). The mains plug shall only be inserted in socket outlets provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the instrument is likely to make the instrument dangerous. Intentional interruption is prohibited.

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. Install the instrument so that both detachable power cords are readily identifiable and easily reached by the operator. The detachable power cords are the instrument disconnecting device. They disconnect the mains circuits from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

CAUTION

This instrument has an auto-ranging line voltage input. Ensure the supply voltage is within the specified range and voltage fluctuations do not exceed 10 percent of the nominal supply voltage.

CAUTION

When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4°C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used. It is your responsibility to ensure the ambient temperature does not exceed the rated ambient temperature stated in the specification.

WARNING

The Mains wiring and connectors shall be compatible with the connector used in the premise electrical system. Failure, to ensure adequate earth grounding by not using the correct components may cause product damage, and serious injury.

CAUTION

Use the Keysight supplied power cords with the same or better electrical rating.

Environmental Conditions (Operating)

CAUTION

This product is designed for use in OVERVOLTAGE CATEGORY II and POLLUTION DEGREE 2.

This product is designed for use in the following conditions:

- For indoor use only
- Altitude up to 2000m (10,000 feet)
- Temperature 10°C to 40°C
- Maximum Relative Humidity: 5% to 85% non-condensing
- OVERVOLTAGE CATEGORY II and POLLUTION DEGREE 2

NOTE

From 40°C to 45°C, the maximum % Relative Humidity follows the line of constant dew point.

Environmental Information

Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of Storage, Transportation and End-use; those stresses include but are not limited to temperature, humidity, shock, vibration, altitude, and power line conditions.

Test Methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.

EMC (Electromagnetic Compatibility)

This product complies with the essential requirements of the European Directive as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61326-1
- CISPR Pub 11 Group 1, class A
- AS/NZS CISPR 11
- ICES/NMB-001

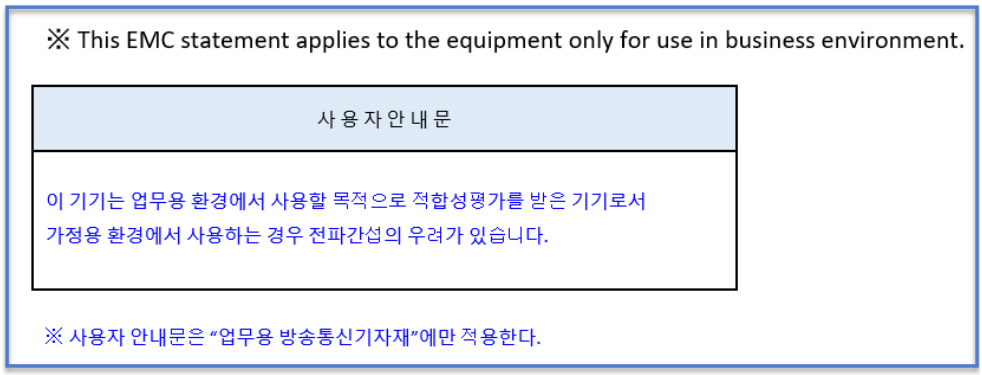
  This device complies with Canadian ICES-001.

  Cet appareil ISM est conforme a la norme NMB-001 du Canada.

CAUTION This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

South Korean Class A EMC Declaration

This equipment has been conformity assessed for use in business environments. In a residential environment this equipment may cause radio interference.



Declaration of Conformity

The Declaration of Conformity for any Keysight product can be found on the website:

http://www.keysight.com/go/conformity

Instrument Location and Rack Mounting Requirements

Locating the Test Platform

Make sure that the left-side panel fan inlet and right-side panel exhaust vent areas are not obstructed. The minimal required clearance is 2.75 inches (7 cm).

NOTE Install the instrument so that the detachable power cords are readily identifiable and is easily reached by the operator. The detachable power cords are the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. The front-panel switch is only a standby switch and does not act as a LINE switch. If needed, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

Tabletop Ambient Temperature

CAUTION

Do not exceed an ambient temperature of 40° C when operating the instrument on a tabletop.

Rack Mounting: Hardware and Temperature

If you choose to locate your test platform in a rack, follow the guidelines provided in this section.

Based on the type of equipment rack, you must determine what rack rails you need. If you are using a Keysight System Test Rack, you can find information on what to order by referring to the Rack Mounting Flange Kit (Option E7515W-1CM) Installation Note.

CAUTION

When mounting instrument in a rack, do not exceed the level of:

- Internal rack air temperature of 40°C

Ventilation

Do not rack mount the test platform side-by-side with any other instrument with side ventilation. Make sure the exhaust air from the first instrument is directed away from the inlet of the second unit. If the pre-heated air from the first instrument is directed into the second instrument, it can cause excessive operating temperatures in the second unit and can cause instrument failures. The test platform draws air in from the left side and exhausts air from the right side. Do not mount other equipment immediately above the instrument. The minimal required clearance is 2.75 inches (7 cm).

CAUTION

VENTILATION REQUIREMENTS: When installing the instrument(s) into a cabinet, consideration shall be given to the convection flow into and out of the

cabinet. Consideration shall also be given to the individual instruments to avoid having the heated discharge of one instrument, now becoming the cooling intake air for another instrument.

Do not place the test set against any surface in such a way as to block its ventilation openings. Interfering with ventilation airflow can cause the test set to overheat.

Another area of concern is verification that the maximum ambient operating temperature of the instrument(s) is not exceeded by cabinet installation.

Keysight recommends forced air convection whenever an instrument(s) is installed in a cabinet and further recommends that the maximum operating temperature of the cabinet be reduced 10°C from the lowest, of the maximum operating temperature of a single instrument.

If there are any concerns or special requirements, a Keysight Field Engineer should be consulted to assure instrument(s) temperature compliance and performance.

Power Requirements

The E7515W has two AC power inputs, as illustrated below. The AC inputs must be connected and powered to operate the instrument. Both power cords are provided with the E7515W. See "AC power safety" for more information.

Figure 1: AC Inputs

Voltage & frequency: 100-240V~, 50-60 Hz, nominal Power consumption: 2 x 900 W Max

NOTE

Mains supply voltage fluctuates up to +/- 10% of the nominal voltage.

Transient over-voltages are typically present on the mains supply.

CAUTION

Be sure to comply with all recommendations included in "AC power safety"

AC Power Safety

It is important to know the power capacity of the building's wiring facilities.

– For voltages below 200 V, two entirely separate power cords (provided with the E7515W) must be used. Make sure the plugs for each power cord are protected with independent and properly sized circuit breakers, with margin to provide the required power. Power strips are not allowed.

– For facilities with voltages above 200 V, a single power cord with a Y-adapter may be used to connect both instrument's AC inputs to a single wall plug. Make sure the circuit breaker for the line is properly sized, with margin to provide the required power.

WARNING

If a Y-adapter is used, a ground cable (not provided by Keysight) must be connected from the ground stud (at the lower left corner of the E7515W rear panel) to a proper ground socket of the building. Install the cable as illustrated below. The minimum required cross-section of the cable is 14AWG and O-ring size is M4.

Figure 2: Grounding Cable (needed if a Y-adapter power input is used)

WARNING The power cords are connected to internal capacitors which may remain live for 5 seconds after disconnecting the plugs from their power supply.

Using Accessories

Only Keysight approved accessories shall be used.

NOTE Proper ergonomics should be considered when using accessories such as a keyboard or a mouse.

Weight and Dimensions

The weight and dimensions of the E7515W are as follows:

- Weight:
    - E7515W-00A: 45.0 Kg
- Height: 309 mm (323 mm with feet)
- Width: 436 mm (452.5 mm with lateral handles)
- Depth: 554 mm

Lifting

As indicated by the "TWO PERSON LIFT" label, safety precautions must be taken in lifting or carrying the instrument.

WARNING

More than one person is required to safely lift or carry this instrument. Alternately a mechanical lift can be used to eliminate the risk of personal injury.

Figure 3: Lift Warning Label

Protecting against Electrostatic Discharge

Electrostatic discharge (ESD) can damage or destroy electronic components (the possibility of unseen damage caused by ESD is present whenever components are transported, stored, or used).

Test equipment and ESD

To help reduce ESD damage that can occur while using test equipment:

WARNING

Do not use these first three techniques when working on circuitry with a voltage potential greater than 500 V.

- Before connecting any coaxial cable to a test set connector for the first time each day, momentarily short the center and outer conductors of the cable together.
- Personnel should be grounded with a 1MΩ resistor-isolated wrist-strap before touching the center pin of any connector and before removing any assembly from the test set.
- Be sure that all instruments are properly earth-grounded to prevent build-up of static charge.
- Perform work on all components or assemblies at a static-safe workstation.
- Keep static-generating materials at least one meter away from all components.
- Store or transport components in static-shielding containers.
- Always handle printed circuit board assemblies by the edges. This reduces the possibility of ESD damage to components and prevent contamination of exposed plating.

Additional information about ESD

For more information about ESD and how to prevent ESD damage, contact the Electrostatic Discharge Association (http://www.esda.org). The ESD standards developed by this agency are sanctioned by the American National Standards Institute (ANSI).

Protecting against Excessive Input Power

The E7515W supports Power Class 2 devices while keeping its warranted specs. However, if the user wants to operate the E7515W against Power Class 1.5 devices, special care is needed. During UE testing in Power Class 1.5, the DUT may generate power levels high enough to exceed maximum RF input power at ports RF1 through RF8. To protect the E7515W receiver, a 4 dB attenuator should be connected in line with each UXM RF port, when testing in Power Class 1.5. Recommended attenuators: BW-S4W5+ (SMA, 4dB) or BW-N4W5+ (N, 4dB).

CAUTION If the attenuators described above are not used during testing at high power levels, the receiver section of the E7515W could be damaged.

After connecting the attenuators to the UXM ports, please remember to refresh the system calibration factors by running Cal Utility included in HCCU (Hardware Configuration Utility) software. This will update system to include the extra power loss in paths with added attenuators. (These attenuators are not supplied with the UXM.).

Instrument Maintenance

Cleaning the Instrument

WARNING To prevent electrical shock, disconnect the instrument from mains before cleaning. Use a dry cloth slightly dampened with water to clean the external case.

Cleaning the Connectors

NOTE Cleaning connectors with alcohol shall only be done with the instrument's power cords removed, and in a well-ventilated area. Allow all residual liquid alcohol to evaporate and the fumes to dissipate prior to energizing the instrument.

QUICK START

This section describes how to set up your UXM install product licenses and provide test platform maintenance. You can also contact your Keysight representative to obtain on-site start-up assistance to help you with all steps outlined in this section, which is included with your UXM purchase.

The following topics can be found in this section:

Overview

The purpose of this guide is to provide you with the basic steps for getting started with the E7515W UXM Wireless Connectivity Test Platform, and to tell you where you can go to get additional information. It also provides first-time power on instructions, licensing information, operating system information, and general hardware information.

Figure 4: Keysight E7515W UXM Wireless Connectivity Test Platform

Purpose and Function

The E7515W UXM Wireless Connectivity Test Platform provides the signalling and measurement core for Keysight's network emulation solution portfolio.

Initial Inspection

Inspect the shipping container and the cushioning material for signs of stress. Retain undamaged shipping materials for future use, as you may wish to ship the test platform to another location or to Keysight Technologies for service. Verify the contents of the container against the table below.

WARNING This instrument is heavy. Two people are required to lift this instrument.

WARNING Please consult ergonomic guidelines regarding placement of the external keyboard when using it with the instrument. Using the keyboard in an uncomfortable or awkward environment could result in personal injury.

Item	Deliverable	Description
E7515W UXM Wireless Connectivity Test Platform		
License entitlement certificate(s)		You must register your instrument purchase using the included entitlement certificate. Follow the instructions on the certificate. If this is your first visit to the license management website, you will be required to register. Refer to "Licensing" for more information.
Keysight Base SIM, 5G (E7515-10911)	See www.keysight.com/find/usim for details.	
AC Power Cable (2)		Connection for Instrument Power

Shipping Problems?

If the shipping materials are damaged or the contents of the container are incomplete:

– Contact the nearest Keysight Technologies office.

– Keep the shipping materials for the carrier's inspection.

– If you must return a test platform to Keysight Technologies, use the undamaged original or comparable shipping materials. See "Returning Your Test Set for Service".

UXM Applications

The UXM operates within the C8714000A RF Application Framework. Different capabilities of this framework are licensed separately.

NOTE You must purchase a RF Application license to use its features in the UXM.

About the Test Applications

The applications run on the embedded Windows controller present in the UXM (or on an external test PC connected to the UXM). The applications use the provided touchscreen-based interface, integrated fading, network emulation and measurement capabilities present in the test platform to provide you with a simple to use, bench-top design verification tool.

UXM Hardware Modules

The UXM is a modular hardware platform. It is composed by:

- a set of base HW, present in all product options and configurations. These are:
  - ICM: management of the present HW
  - AUXM: synchronization of the present HW
  - EPC: Embedded PC that hosts the user applications with GUI.
  - PSM: Power supply module
  - Infrastructure HW: Chassis, touch screen, cooling subsystem and backplane.

- a set of HW modules that confer to each commercial configuration their specific features. Each hardware module offers extended capabilities to the UXM in terms of computing power, signal processing power, interface with external modules, etc. They are conceived to meet different usage scenarios. These are the different types of HW modules the UXM can host:
  - RF module. It is required to host one module of this type. It gives to the UXM their most essential features. This table summarizes the capabilities of each RF module choice:

RF Module	Tx/Rx Channels	Max Operating Frequency	Channel BW	Duplex Modes	Tx Power Dynamic Range	Rx Power Dynamix Range
RFM	8/4	7.125 GHz	400 MHz	TDD/FDD	-110 dBm up to +7 dBm	-60 dBm up to +29 dBm

1. *Maximum Tx Power depends on frequency.*
2. *Maximum Rx power must not exceed the maximum absolute rating: +42 dBm peak power.*
   - DSP module: SFM, an enhanced signal processing module, is used in the UXM.
   - DSP extensions: These modules increase the signal processing capabilities of the UXM.

- CPU modules: These computing modules host different applications for the variety of software solutions and licenses offered by the UXM.
- LO modules: These modules provide a set of local oscillators that enable easy interface with RRHs, which allow increasing the operating frequency of the UXM.

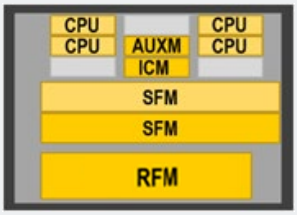
UXM Product Configuration Details

Each product configuration is formed by hardware and software. The below tables list the hardware codes and software license codes for each product configuration series. These tables show:

a) The base configuration of the series, that is, the minimum hardware and software items that compose the most basic product configuration of the series, and

b) The options that can be added to the base configuration, expressed in terms of additional hardware and/or software codes.

These codes are very important to check the correct collection of the hardware and software items of your E7515W purchase. Refer to next subsection for details on upgrade options and upgrade kits to expand in the future the capabilities of your E7515W.

E7515W-00A series			
Base configuration	**Hardware**	**Software Licenses**	**Picture/comments**
8 DL/4 UL Supports frequency range from 6 GHz to 7.125 GHz	E7515W-**00A**		
Embedded PC	E7515W-**PEB**	Not required	
Extended storage	E7515W-**PS1**	Not required	
Extended memory	E7515W-**PM2**	Not required	
Configuration options to add	**Additional Hardware**	**Software Licenses**	**Picture/comments**
100 MHz aggregated BW	No additional HW required	E7515W-**B01**	
200 MHz aggregated BW	No additional HW required	E7515W-**B02**	
400 MHz aggregated BW	No additional HW required	E7515W-**B04**	
Dynamic Antenna Mapping	No additional HW required	E7515**D01B**	
Baseband IQ	No additional HW required	E7515**Q01B**	
IQ Protocol capture tool	No additional HW required	E7515**QP1B**	
Flexible band combinations	No additional HW required	E7515W-**5A2**	

UXM Wireless Connectivity Test Platform Upgrade Option

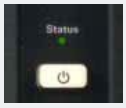
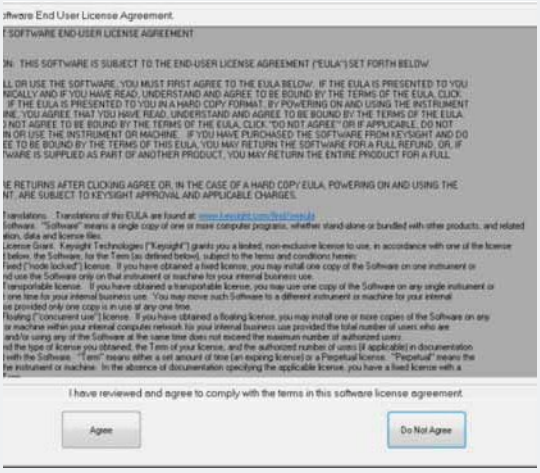
The following table shows the possible product upgrades to expand the capabilities of the E7515W.

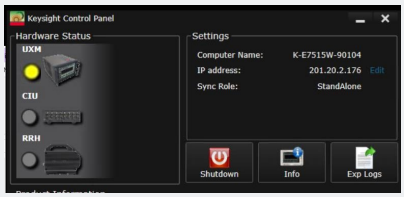
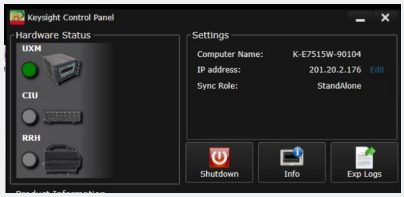
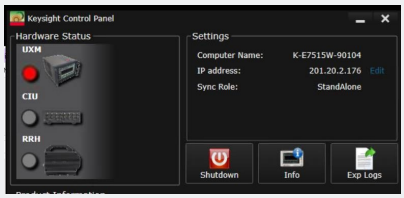
Original Configuration	Transforms to...	Order Code	HW Module included	Notes
E7515W-**B01**	E7515W-**B02**	E7515WK-**B12**	-	Upgrades aggregated bandwidth from 100 MHz to 200 MHz
	E7515W-**B04**	E7515WK-**B14**	-	Upgrades aggregated bandwidth from 100 MHz to 400 MHz
E7515W-**B02**	E7515W-**B04**	E7515WK-**B24**	-	Upgrades aggregated bandwidth from 200 MHz to 400 MHz

Turning On the Test Platform for the First Time

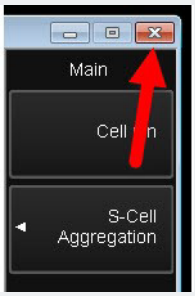
CAUTION DO NOT remove the AC power during boot-up/shutdown of the operating system or during the process of initializing the software. This can cause damage to the system files and prevent proper operation of the instrument.

CAUTION Before switching on this instrument, make sure the supply voltage is in the specified range.

Step	Instruction	Action	Notes
1	Connect power cable.	Install the instrument so that the detachable power cords are easily reached by the operator.	Ensure power outlet is provided with a protective ground as specified.
2	Connect the mouse, keyboard, and a display.	Connect the mouse and keyboard to the test platform's USB ports at the front panel. It is optional to connect a display to the front panel DisplayPort connector.	
3	Power on the test platform.	Position the test platform so you have easy access to the power cords and plug them in. Press the power button (bottom right of instrument front panel) when it is in red color. (It is best to wait at least 5 seconds after the power button is in red before pressing it.)	See "Instrument Location and Rack Mounting Requirements" and "Power Requirements". Front-panel power button: 
4	On the display, you will be prompted to accept the End User License Agreement (EULA)	Select the **Agree** button to indicate that you accept the license agreement.	 After you agree to the EULA, the operating system boots-up and you see a black background with Keysight Technologies logo displayed on the screen. The E7515W

Step	Instruction	Action	Notes
			Control Panel (shown below) is overlaid on top of this Keysight screen and remains visible while the internal hardware boards of the UXM are booted-up. 
5	Wait until you see the green or red color displayed in the UXM pictorial graphic, located in the upper left corner of the E7515W Control Panel.	The changing colors of the E7515W Control Panel pictorial graphic indicate the "ready-state" of the UXM.   	Yellow indicates the UXM is in the process of becoming ready for operation. Green indicates the UXM is ready for operation. Red indicates an error has occurred in the system and the unit is not ready for operation. (This requires troubleshooting, as the problem is not expected to resolve on its own.)
6	Make sure all required Windows updates are made.	Windows must be configured properly on your instrument to ensure this.	Windows updates are necessary to protect your E7515W instrument against the latest malware and viruses.

Shutting Down the Test Platform

Step	Instruction	Action	Notes
1	Close the test application by clicking on the "X" button at the upper right.		
2	It is recommended that you press the front-panel power button, or select **Shutdown** from the MS Windows Start menu, or select the **Shutdown** icon on the E7515W Control Panel (as illustrated here).	The display will show the windows shut-down screen.	
3	To force power off: press and hold the front-panel power button for at least 60 seconds.	**CAUTION**	Do not force power off in this way unless the normal procedure fails (a forced shutdown carries a risk of corrupting hard-drive data). If the last power shutdown was done in that way, the message shown below will be displayed on power-up as a reminder.
			

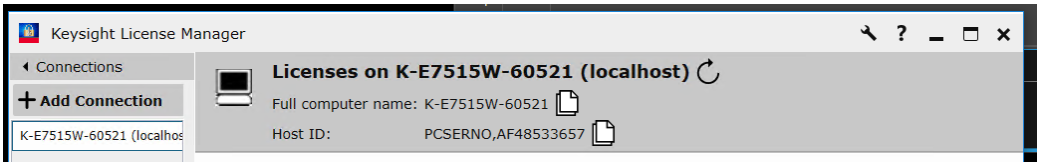
Licensing

All licenses required to operate your UXM have been installed at the factory (except transportable licenses – see below). Complete these steps if you need to add licensing to your UXM:

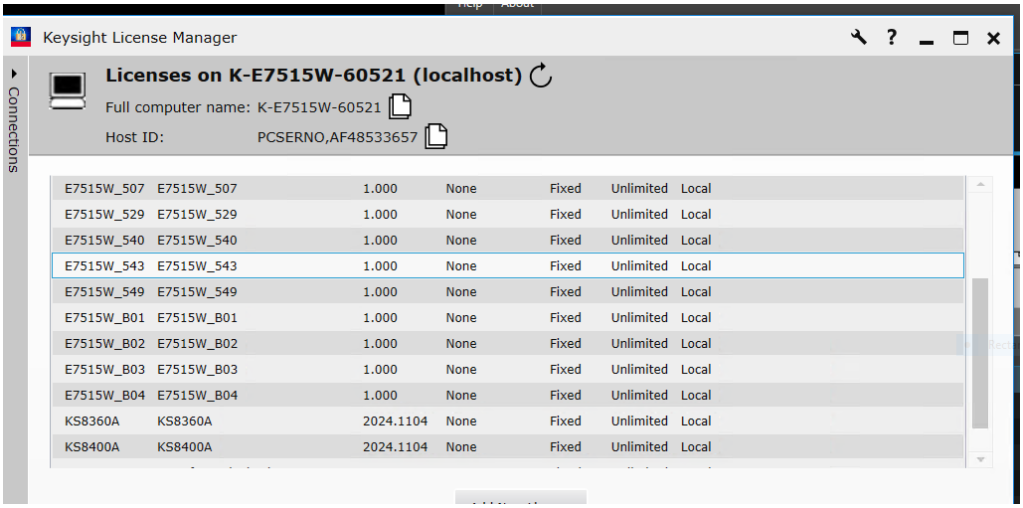
1. Follow the directions located on the license entitlement certificate that you received with the delivery of your UXM.

NOTE You may register or sign in with your profile at: www.keysight.com/find/softwaremanager to obtain any software updates and/or new licenses using your entitlement details.

2. To redeem a license unique to your UXM, you will need to enter the "Host ID". To determine the Host ID of your UXM, select the License Manager icon located on the E7515W Control Panel (see "Control Panel Icons") The Keysight License Manager (KLM) window opens and displays your Host ID:



3. After the registration/sign-in/filling in information, an e-mail with the generated license file will be sent to you. You need to copy the license file to the root directory of a USB memory stick and then insert the USB memory stick into the E7515W. It will automatically install any licenses that it finds on the USB memory stick for the test platform.



Transportable Licenses

Transportable licenses are identifiable by the “T” included in their license numbers (for example: C8702000A-1TP). This type of license enables you to move the license from one host instrument or PC to another, without the need to contact Keysight. Follow the steps above to install the transportable license for the first time.

To transport a license after that installation, run Keysight License Manager on the host that currently has the license, and transport the license. (Select **Help > Keysight License Manager Help** and search for “transport” to find detailed instructions.)

NOTE Transportable licenses for the E7515W UXM allow you to transport licenses up to 30 times within the previous 10 days.

You can also save a transportable license to Keysight Software Manager (KSM) for later assignment to a host. To do so, review the Transporting Licenses section (found as described above) in the Keysight License Manager Help.

When you are asked to choose a destination for the license, select **Save the license to Keysight Software Manager**.

When you are ready to assign the license to a host, come back to KSM and look for the action bubble entitled **You can request new licenses**. Click the bubble and follow the instructions given.

Other related topics for managing your software and licenses can be found by reviewing the Keysight License Manager Help available from the Help drop-down menu of the KSM software.

LAN Connectivity

The UXM has two network interface cards (NICs) that connect the instrument Host PC (embedded PC module) to external LAN outputs.

If your site network supports Dynamic Host Configuration Protocol (DHCP), these front and rear LAN ports are assigned IP addresses automatically when they are connected to the LAN.

Connect the LAN lines as shown below. (You need only one connection from the UXM Host PC: either the front-panel LAN or the Rear-Panel LAN.)

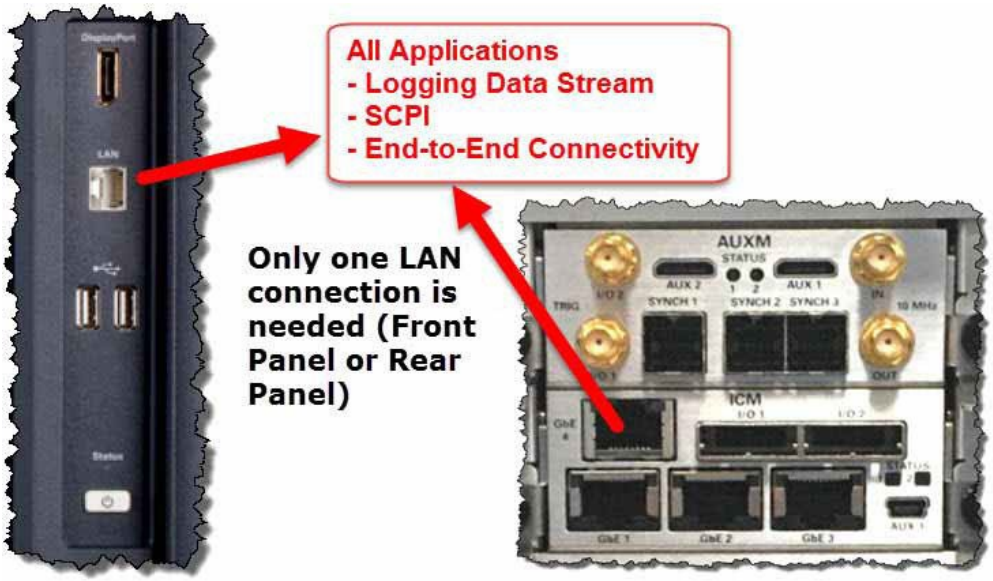


Figure 5: LAN Configuration

Corporate Domains

CAUTION It is strongly recommended that the UXM Host PC should not be added to any corporate domain. Doing so may result in undesirable operation procedures, or first-time test application software launch failures.

CAUTION Adding the Host PC to a domain may force installation of conflicting software (for example: firewalls or anti-virus software). In such cases adding to a domain must be avoided.

Once the UXM Host PC has been added to a domain, the domain may enforce certain Windows security or user policies. If this occurs, it is not sufficient to remove the PC from the domain – a system recovery is required, to fully restore the settings to a known working condition.

Reference Documents

More detailed information about the test platform is available on the Document Library tab of this web page:

www.keysight.com/find/UXM-W

CONTROL PANEL FUNCTIONS

The following topics can be found in this section:

The Control Panel

Figure 6: The UXM Control Panel

The E7515W Control Panel enables you to interact with and manage the hardware components of the UXM. It is always running if the test platform is turned on. If it is not displayed on the screen, it is minimized in either the lower left or right area of the Windows task bar.

NOTE

The control panel lists "Sync Role" information under Settings as shown above, but the current version of the control panel is no longer used to place the UXM in an array, or to remove it from an array and return it to StandAlone mode.

Viewing the Control Panel

Right-click on the E7515W Control Panel icon  from the task bar and select **Open Control Panel**.

NOTE

To access the Windows task bar from inside the test application, you can use the Application Switch tool to switch to the desktop and find the task bar, or you can connect the USB keyboard to the UXM using one of the USB ports located on the front and rear panels of the UXM.

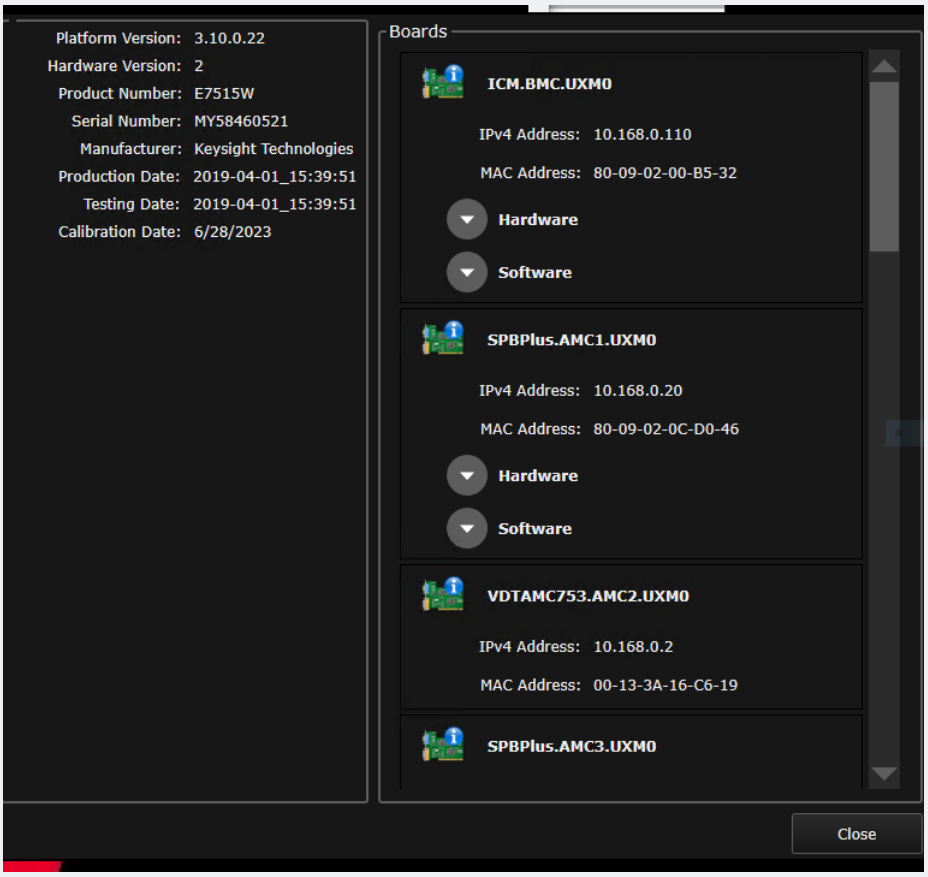
Press the key showing the Windows icon  , which is usually located in the lower-left corner of the keyboard.

NOTE

If the E7515W Control Panel icon is not present in the task bar or on the desktop, it can be opened by selecting the Windows **Start** Menu, **All Programs**, **Keysight E7515W Platform**, **E7515W Control Panel**.

Control Panel Icons

The functions listed in the table below are available by selecting the various E7515W Control Panel icons.

Icon	Description
	Shuts down the UXM hardware and software. It is recommended that you close all application software before selecting this E7515W Control Panel option. As a shutdown is a "destructive" operation, you will be asked to click "Ok" in a confirmation window ("This action will shut down Windows. Do you want to continue?".)
	Opens window with two options for obtaining instrument traceability information. Use this information when you need to discuss your test platform with an authorized Keysight representative. Below is a partial example of what you might see displayed. 
	Opens a file window at C:\Users\Administrator\Desktop\ngp\fr1_celloff_2cc_error which enables you to browse to a different location or to designate this location to save a zipped set of encrypted log files from the instrument. These files can be used to assist Keysight with remote diagnosis of instrument problems. The .zip file is password-protected; the password is: Keysight4u!

FRONT AND REAR PANEL FUNCTIONS

The following topics can be found in this section:

Front Panel Features

Begin using the UXM by becoming familiar with the layout of the Front Panel and the displayed user interface.

Figure 7: UXM Front Panel

Number	Item Name	Description
1	Touchscreen	LCD Flat-Panel Display with single touch 15” capactive touchscreen.
2	DisplayPort	This is a DisplayPort output, which transfers uncompressed video and audio data to an external display, such as a PC monitor or projector.
	NOTE	If a monitor is going to be connected to the DisplayPort, it is preferable to make this connection while instrument power is off. The monitor is normally detected by the E7515W’s power-on routine; it can sometimes go undetected if the connection is made after power is on (if that happens, it will be necessary to cycle power on the E7515W so that the power-on routine is repeated).
3	Front LAN Connection	This RJ-45 connector provides front-panel access from the UXM Host PC enabling a maximum Ethernet data rate of 1 Gigabit. This connector is used for downloading firmware upgrades, new test platform applications, saving data to an external memory drive and other reasons for which you may wish to connect to a local area network and/or to the internet. See “LAN Connectivity”. The IP address for this input is labeled “Front”.
4	2-USB Inputs	Universal Serial Bus inputs for peripheral devices (mouse, keyboard, flash drives). These are USB version 2.0. (See the rear panel for USB 3.0 ports.)

Number	Item Name	Description
5	Power button	The power button is the On/Off button for AC power. Pressing this button when the instrument is powered off turns it on. Pressing this button briefly will shut down the UXM and Windows Operating System safely. (Pressing and holding this button down for 60 seconds forces a complete instrument shutdown, but this is not recommended, as it triggers an uncontrolled Windows shutdown).
	Status light	The Status light indicates the power status of the instrument (see "Power Status Indicator"). The line power must be connected for this light to illuminate.
6 - 13	RF1 – RF8 Tx/Rx	These ports transmit and receive using the base station emulator of the UXM.
	ports In/Out lights	For each port, two indicators are provided; they are lit when the port is configured to receive (In), to transmit (Out), or to operate in duplex mode (both).

CAUTION

For ports RF1 through RF8, the maximum RF power input levels are:

+34 dBm MAX CW, +42 dBm MAX Peak, ±20 VDC MAX

Excessive input power can damage the receiver.

See "Protecting against Excessive Input Power".

Power Status Indicator

UXM Power Status is shown in the table below:

Indicator	Status
Off	The power cords are unplugged.
Yellow	The power cords are plugged in, but the UXM is powered down (its front-panel power button is off). The first time that the line power is provided (with the power switch off), the indicator may display as green when the Micro-Controller Unit is loading (~3 seconds), after which it remains yellow.
Green blinking	The UXM is booting up.
Green	UXM is available for use or in use.
Green/Yellow blinking	Instrument Control Module (ICM) for the Micro-Controller Unit is downloading firmware. (Not the FPGA ICM.) When the FPGA ICM is downloading firmware, the LED is green.
Yellow blinking	UXM is shutting down and the boards shutdown process has begun.
Yellow/Orange blinking	UXM is off after an abnormal shutdown.

Rear Panel Features

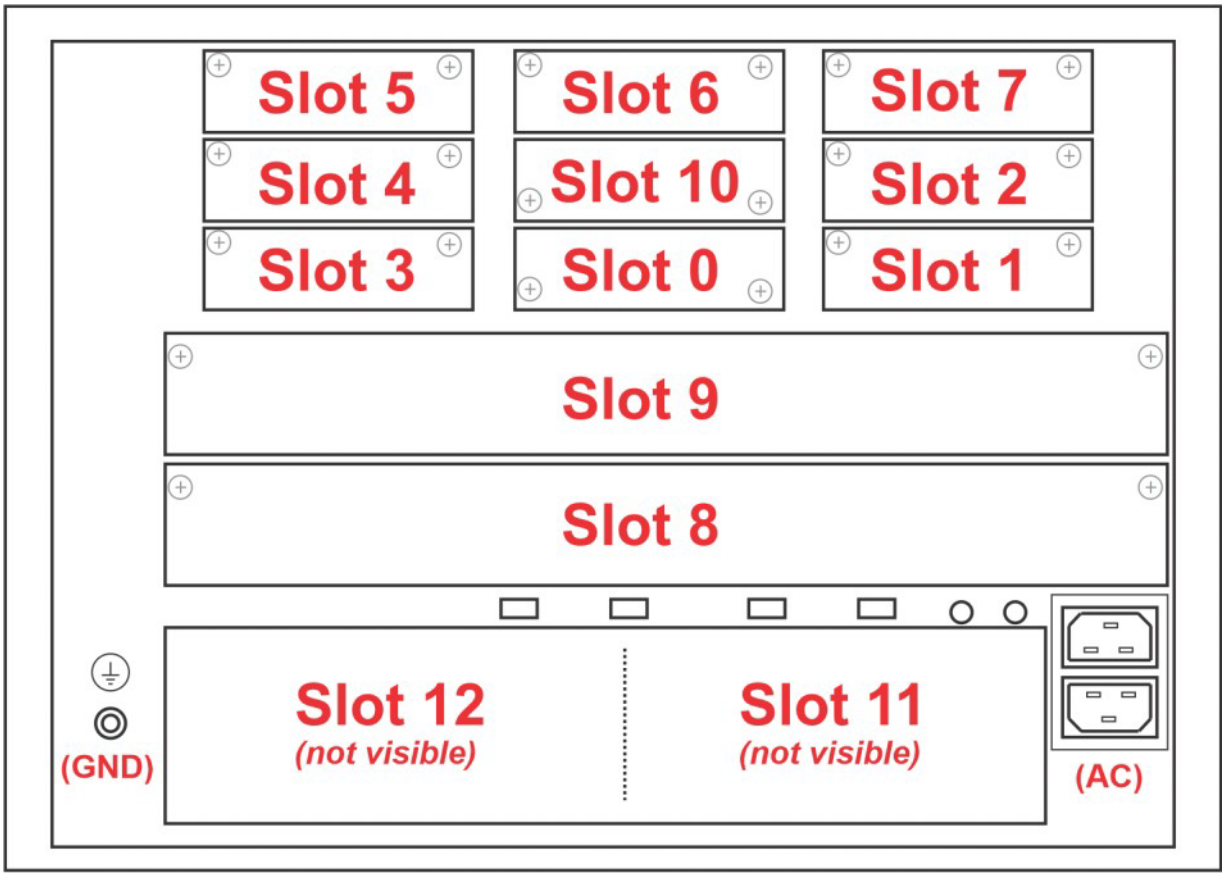


Figure 8: Slot Numbers

The slot numbers for the different sections of the rear panel that are marked in the illustration above; they are described in the following sections.

CAUTION

Mains supply voltage fluctuates up to +/- 10% of the nominal voltage.

Transient over-voltages are typically present on the mains supply.

NOTE

Be sure to comply with all recommendations included in "AC power safety".

Slot 0: ICM Connectors

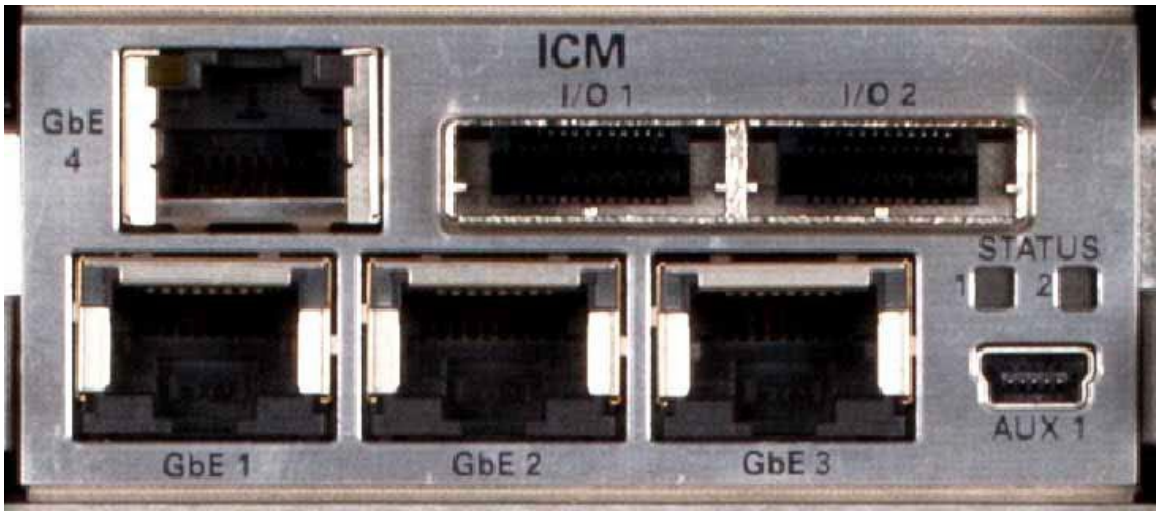


Figure 9: UXM Rear Panel - ICM Connectors

These connectors relate to the AUXM circuit board within the UXM.

Name	Description	Notes
GbE4	This is the Ethernet port that is connected internally to the UXM Host PC. Use this port to connect the UXM to the LAN.	The IP address for this input is labelled “ICM GbE4”.
I/O 1 I/O 2	Mini-SAS 28AWG	Used to interconnect multiple UXM units.
STATUS 1 STATUS 2	LEDs	(Reserved for future use.)
AUX 1		(Reserved for future use.)
GbE1 GbE2 GbE3	Ethernet GbE1, GbE2, and GbE3	Used only by Keysight during production or maintenance.

Slot 1: Empty

Slot 2: CPU – AMC753 Module

Figure 10: UXM Rear Panel - VDTAMC Card Connectors

These connectors relate to the VDTAMC card within the UXM.

The VDTAMC card (also known as the Vadatech AMC 753) handles processing of the PHY and PDCP layers in the simulated stack.

Name	Description	Notes
10GBbE	SFP+ connector	Usage depends on the hardware configuration selected on the HCCU Setup tab.
U0, U1, U2, RUN	LEDs	(Reserved for future use)
X86 RS-232	Micro-USB connector	(Reserved for future use)
MGT RS-232	Micro-USB connector	(Reserved for future use)
ETH2	RJ-45 connector	Usage depends on the hardware configuration selected on the HCCU Setup tab.
USB	USB-C	(Reserved for future use)

Slot 3 and Slot 6: Empty

Slots 4: CPU – AMC705 Module

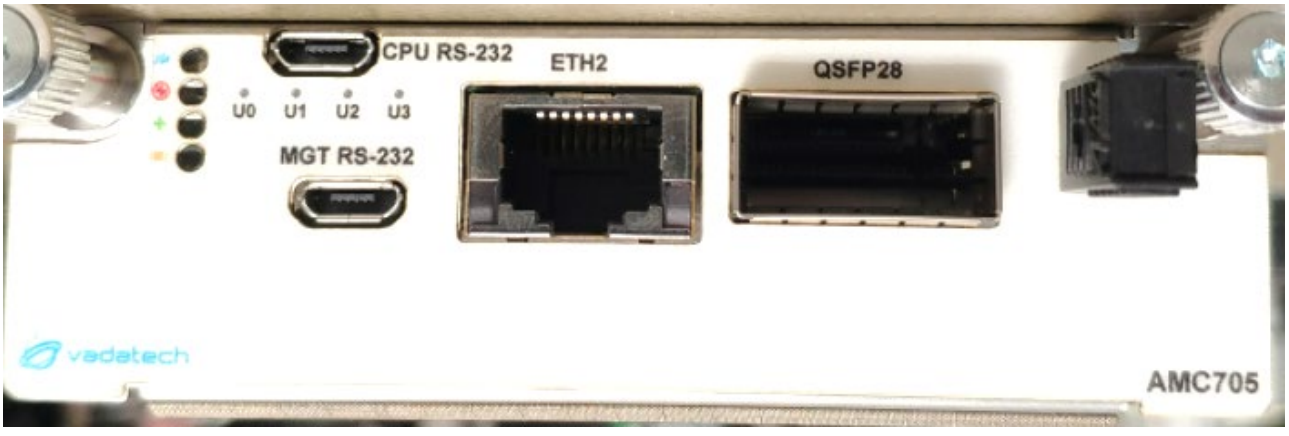


Figure 11: UXM Rear Panel - VDTAMC Card Connectors

These connectors relate to the VDTAMC card within the UXM.

The VDTAMC card (also known as the Vadatech AMC 705) handles processing of the PHY and PDCP layers in the simulated stack.

Name	Description	Notes
QSFP28	QSFP connector	Usage depends on the hardware configuration selected on the HCCU Setup tab.
U0, U1, U2, RUN	LEDs	(Reserved for future use)
CPU RS-232	Micro-USB connector	(Reserved for future use)
MGT RS-232	Micro-USB connector	(Reserved for future use)
ETH2	RJ-45 connector	Usage depends on the hardware configuration selected on the HCCU Setup tab.

Slot 5, Slot 7: CPU – CCTAMC Modules

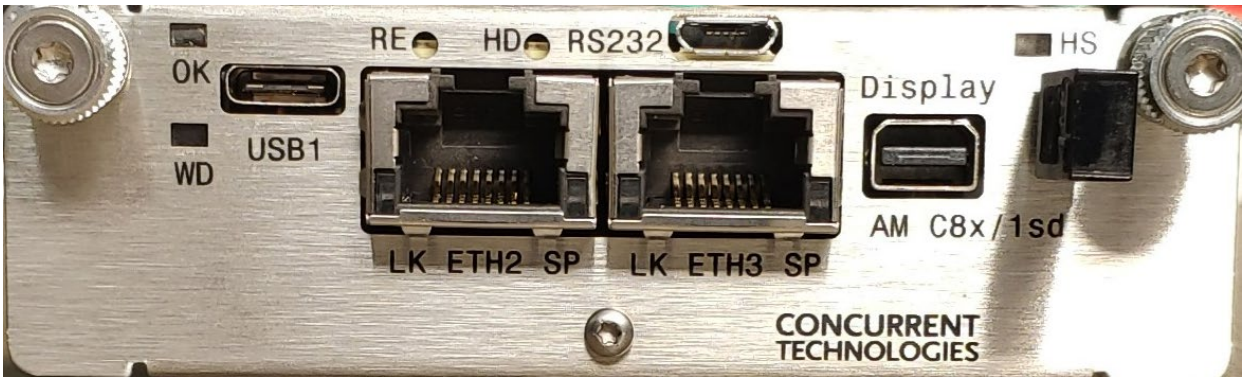


Figure 12: UXM Rear Panel - CCTAMC Card Connectors

These connectors relate to the CCTAMC card within the UXM.

The CCTAMC card (also known as the Concurrent Technologies AMC86) handles processing of the RLC and MAC layers in the simulated stack.

Name	Description	Notes
USB1	USB-C connector	(Reserved for future use.)
RS-232	Micro-USB	(Reserved for future use.)
ETH2	RJ-45 connector	Usage depends on the hardware configuration selected on the HCCU Setup tab.
ETH3	RJ-45 connector	Usage depends on the hardware configuration selected on the HCCU Setup tab.
Display	Mini Display Port	

Slot 8 and 9: SFM Connectors

Figure 13: UXM Rear Panel - SFM Panel Connectors

These connectors relate to the SFM panel control.

Name	Description	Notes
DBG	Maintenance/Service	Micro-USB
TRIG_B1	General purpose I/O trigger	SMA
VB indicator	Internal FPGA processor status	
TRIG_B2	General purpose I/O trigger	SMA
ZQ indicator	Internal FPGA processor status	
TRIG_A2	General purpose I/O trigger	SMA
VA indicator	Internal FPGA processor status	
TRIG_A1	General purpose I/O trigger	SMA
MMC indicator	Internal microcontroller status	
LAN	Data interface	
SYNC 2	General purpose I/O trigger	SMA
SYNC 1	General purpose I/O trigger	SMA
QSFP1	Baseband IQ interface	QSFP interface
QSFP0	Baseband IQ interface	QSFP interface

Slot 10: AUXM Connectors

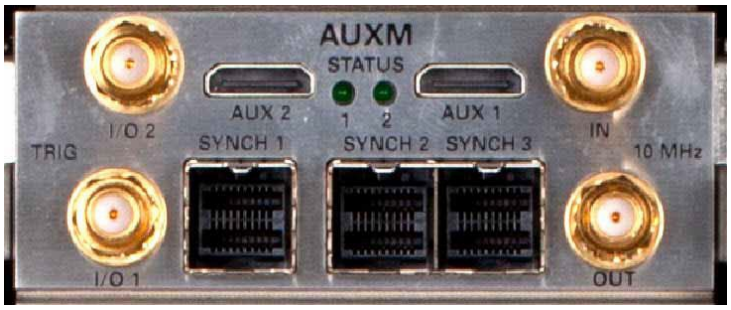


Figure 14: UXM Rear Panel - AUXM Connectors

These connectors relate to the AUXM circuit board within the UXM.

Name	Description	Notes
I/O 1 I/O 2	SMA connectors	(Reserved for future use.)
AUX 1 AUX 2	SMA connectors	(Reserved for future use.)
STATUS 1 STATUS 2	LEDs	(Reserved for future use.)
10 MHz IN 10 MHz OUT	SMA Input/Output 10 MHz clock reference	Do not modify connections to the internal and/or external references while this instrument is transmitting or receiving RF signals.
SYNCH 1 SYNCH 2 SYNCH 3	Mini-SAS HD 4x	Synchronizes the internal clocks between arrays of UXM units.

Slot 11 and 12: RFM Module

Figure 15: UXM Rear Panel - RFM Connectors

These connectors relate to the RFM circuit board within the UXM.

Name	Description	Notes
RX 8	SMA	(Reserved for future use.)
TX 8	SMA	(Reserved for future use.)
TX 7	SMA	(Reserved for future use.)
RX 7	SMA	(Reserved for future use.)
TX 6	SMA	(Reserved for future use.)
RX 6	SMA	(Reserved for future use.)
TX 5	SMA	(Reserved for future use.)
RX 5	SMA	(Reserved for future use.)
TX 4	SMA	(Reserved for future use.)
RX 4	SMA	(Reserved for future use.)
TX 3	SMA	(Reserved for future use.)
RX 3	SMA	(Reserved for future use.)
TX 2	SMA	(Reserved for future use.)
RX 2	SMA	(Reserved for future use.)
TX 1	SMA	(Reserved for future use.)
RX 1	SMA	(Reserved for future use.)

Slot 13: PCM

Figure 16: UXM Rear Panel - PCM Connectors

These connectors relate to the SFM circuit board within the UXM.

Name	Description	Notes
SS USB	Four USB 3.0 ports.	(The front-panel USB ports are USB 2.0.)
Audio In	3.5 mm stereo	Audio jack connector for input
Audio Out	3.5 mm stereo	Audio jack connector for output

AC Power

The E7515W requires two AC power inputs. Both AC inputs must be connected and powered to operate the instrument. If either of the two inputs are not present, the instrument will not boot (or will shut down, if already in operation). See “AC Power Safety” for more information.

Front and Rear Panel Symbols

Symbol	Description
	This symbol is used to indicate power ON.
	This symbol is used to indicate power OFF.
	This symbol mis used to indicate power STANDBY mode (yellow in standby, green when instrument is ON).
	This symbol indicates the input power required is AC.
	This symbol indicates earth ground.
	The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to instructions in the documentation
	The UK Conformity Assessed marking is a conformity mark used within Great Britain.
	The CE mark is a registered trademark of the European Community.
	The RCM Mark is a Compliance Mark according to the ACMA Labelling Requirement.
	South Korean Certification (KC) mark; includes the marking's identifier code which follows this format: MSIP-REM-YYY-ZZZZZZZZZZZZZZ
CAN ICES/ NMB-001(A) ISM GRP 1-A	ICES / NMB-001 Cet appareil ISM est conforme a la norme NMB du Canada. This is a marking to indicate product compliance with the Industry Canadian Interference-Causing Equipment Standard (ICES-001). This is also a symbol of an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).
	The CSA mark is a registered trademark of the CSA International.
	This symbol indicates separate collection for electrical and electronic equipment mandated under EU law as of August 13, 2005. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive 2002/96/EC).

Symbol	Description
	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.
	This symbol on all primary and secondary packaging indicates compliance to China standard GB 18455-2001.
ccr.keysight@keysight.com	The Keysight email address is required by EU directives applicable to our products.

TROUBLESHOOTING

The following topics can be found in this section:

Identifying Problems

WARNING No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.

1. Select the **Reboot** button on the System tab of the HCCU utility whenever the UXM hardware and/or software appear to be in a faulty state. Once the UXM image shows a green check mark, the UXM is in the ready state and you can proceed with your testing. Note that you may need to perform this reboot more than once to obtain the green display indicator condition. Note that the Restart and Shutdown affect the test set and Windows.

2. If you need to refer the problem to your Keysight representative, use the **Export Logs** feature on the **System** tab of the **HCCU**, and send the resulting file to Keysight for reference.

Figure 17: Using the HCCU Utility in Troubleshooting

Returning Your Test Set for Service

Calling Keysight Technologies

Keysight Technologies has offices around the world to provide you with complete support for your wireless test set. To obtain servicing information, or to order replacement parts, contact the nearest Keysight Technologies office listed under "Locations for Keysight Technologies". In any correspondence or telephone conversations, refer to your test set by its product number, full serial number, and software revision.

To access your product information, select the Info icon 

in the E7515W Control Panel view after switching to the E7515W Control Panel via the Application Switch tool or after performing both or only the second action described below:

1. To access the Windows task bar from inside the TA/LA software application, you can use the Application Switch tool to switch to the desktop and find the task bar, or you can connect the USB keyboard to the UXM using one of the USB ports located on the front and rear panels of

the UXM. Press the key showing the windows icon  , which is usually located in the lower-left corner of the keyboard.

2. Once you have access to the windows task bar, double-click the E7515W Control Panel icon  to maximize the E7515W Control Panel view.

Locations for Keysight Technologies

For online assistance: http://www.keysight.com/find/assist

To contact Keysight Technologies: http://www.keysight.com/find/contactus

Alternately, contact the nearest Keysight sales office:

Americas		
Canada (877) 894 4414	Brazil 55 11 3351 7010	Mexico 001 800 254 2440
United States (800) 829 4444		
Asia & Pacific		
Australia 1 800 629 485	China 800 810 0189	Hong Kong 800 938 693
India 1 800 112 929	Japan 0120 (421) 345	Korea 080 769 0800
Malaysia 1 800 888 848	Singapore 1 800 375 8100	Taiwan 0800 047 866
Other Asia-Pacific countries: (65) 6375 8100		
Europe & Middle East		
Austria 0800 001122	Belgium 0800 58580	Finland 0800 523252
France 0805 980333	Germany 0800 6270999	Ireland 1800 832700
Israel 1 809 343051	Italy 800 599100	Luxembourg +32 800 58580
Netherlands 0800 0233200	Russia 8800 5009286	Spain 0800 000154
Sweden 0200 882255	Switzerland 0800 805353 Opt. 1 (DE), Opt. 2 (FR), Opt. 3 (IT)	United Kingdom 0800 0260637

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