
E5080B ENA Series RF Network Analyzers

Notices

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Manual Part Number

E5080-90010

Edition

Edition 2, May 2022

Printed in Malaysia

Published by:

Keysight Technologies International
Japan G.K,
1-3-3 Higashikawasaki-cho
Chuo-ku
Kobe-shi, Hyogo, Japan

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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.

NOTE

This **NOTE** sign denotes important information. It calls attention to a procedure, practice, or condition that is essential for the user to understand.

Installation Guide

Caution



Do not exceed the operating input power, voltage, and current level and signal type appropriate for the instrument being used, refer to your instrument's Function Reference.



Electrostatic discharge (ESD) can damage the highly sensitive microcircuits in your instrument. ESD damage is most likely to occur as the test fixtures are being connected or disconnected. Protect them from ESD damage by wearing a grounding strap that provides a high resistance path to ground. Alternatively, ground yourself to discharge any static charge built-up by touching the outer shell of any grounded instrument chassis before touching the test port connectors.

Safety Summary

When you notice any of the unusual conditions listed below, immediately terminate operation and disconnect the power cable.

Contact your local Keysight Technologies sales representative or authorized service company for repair of the instrument. If you continue to operate without repairing the instrument, there is a potential fire or shock hazard to the operator.

- Instrument operates abnormally.
- Instrument emits abnormal noise, smell, smoke or a spark-like light during operation.
- Instrument generates high temperature or electrical shock during operation.
- Power cable, plug, or receptacle on instrument is damaged.
- Foreign substance or liquid has fallen into the instrument.

Manufacturer's Declaration

Herstellerbescheinigung

GERA- USCHEMISSION

LpA < 70 dB

am Arbeitsplatz

normaler Betrieb

nach DIN 45635 T. 19

Manufacturer's Declaration

ACOUSTIC NOISE EMISSION

LpA < 70 dB

operator position

normal operation

per ISO 7779

Regulatory Compliance Information

This product complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

- The Low Voltage Directive 2014/35/EU
- The EMC Directive 2014/30/EU

To obtain Declaration of Conformity, please contact your local Keysight Technologies sales office, agent or distributor.

Safety Notice Supplement

- This equipment complies with EN/IEC61010-1:2010.
- This equipment is of MEASUREMENT CATEGORY NONE per IEC Standard.
- Do not connect the measuring terminals to mains.
- This equipment is a POLLUTION DEGREE 2, INDOOR USE product.
- This equipment is tested in stand-alone condition and in combination with the accessories supplied by Keysight Technologies against the requirement of the standards described in the Declaration of Conformity. If it is used as a system component, compliance of related regulations and safety requirements are to be confirmed by the builder of the system.
- Do not connect the measuring terminals to mains.

General Safety Precautions

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific WARNINGS elsewhere in this manual may impair the protection provided by the equipment. Such noncompliance would also violate safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these precautions.

NOTE

The E5080B complies with INSTALLATION CATEGORY II as well as POLLUTION DEGREE 2 in IEC61010-1. The E5080B is an INDOOR USE product.

NOTE

The LEDs in the E5080B are Class 1 in accordance with IEC60825-1, CLASS 1 LED PRODUCT.

- Ground the Instrument
To avoid electric shock, the instrument chassis and cabinet must be grounded with the supplied power cable's grounding prong.
- Do NOT Operate in an Explosive Atmosphere
Do not operate the instrument in the presence of inflammable gases or fumes. Operation of any electrical instrument in such an environment clearly constitutes a safety hazard.
- Keep Away from Live Circuits
Operators must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltage levels may remain even after the power cable has been disconnected. To avoid injuries, always disconnect the power and discharge circuits before touching them.
- DO NOT Service or Adjust the Instrument Alone
Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
- Do NOT Substitute Parts or Modify the Instrument
To avoid the danger of introducing additional hazards, do not install substitute parts or perform unauthorized modifications to the instrument. Return the instrument to a Keysight Technologies Sales and Service Office for service and repair to ensure that safety features are maintained in operational condition.

- Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltage levels, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting this instrument.

Safety Symbols

General definitions of safety symbols used on the instrument or in manuals are listed below.



Instruction Manual symbol: the product is marked with this symbol when it is necessary for the user to refer to the instrument manual.



Alternating current.



Direct current.



On (Supply).



Off (Supply).



A chassis terminal; a connection to the instrument's chassis, which includes all exposed metal structure.



Standby.

Certification

Keysight Technologies certifies that this product met its published specifications at the time of shipment from the factory. Keysight Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institution's calibration facility or by the calibration facilities of other International Standards Organization members.

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Assistance

Product maintenance agreements and other customer assistance agreements are available for Keysight Technologies products.

For any assistance, contact your nearest Keysight Technologies Sales and Service Office. Addresses are provided at the back of this manual.

Manuals for E5080B

Keysight provides the following three manuals for E5080B. The latest version of all documentations can be downloaded from <http://www.keysight.com/manual/e5080b>.

Installation Guide

The installation guide (this manual) provides start up setup information when you use the E5080B for the first time and troubleshooting information when the Windows cannot be boot up. See this manual first when you use the E5080B for the first time.

Online Help

The online help provides the information about the quick start, measurement operation, programming, built-in VBA, I/O interface. This is pre-installed in the E5080B. Press **[Help]** hard key on the front panel to open. Quick Start helps in understanding the E5080B operation quickly.

The latest version of online help is available at:
<http://www.keysight.com/manuals/e5080b>

The online help has context sensitive help, which is a great feature of the E5080B help. It allows you to get information about the selected softkey by pressing the Help key in the E5080B or by pressing F1 in a keyboard attached to the E5080B or by clicking the help button in a dialog box. With context sensitive help, users can receive information quickly about the area the user is working in the firmware of the E5080B. It provides information relevant to the task that needs to be accomplished and reduces the time to search relevant information required to complete a task.

Service Guide

The service manual provides information about the parts, troubleshooting, performance test, adjustment and service menu.

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1 Installation

This chapter provides information about how to set up the Keysight E5080B.

Checking the Shipment

After you receive the analyzer, carry out checks during unpacking according to the following procedure.

WARNING

When unpacking the analyzer, if the exterior of the analyzer (such as the cover, front/rear panel, LCD screen, power switch, and port connectors) appear to be damaged during transport, do not turn on the power switch. Otherwise, you may get an electric shock.

- Step 1.** Check that the packing box or shock-absorbing material used to package the analyzer has not been damaged.

NOTE

If the packing box or shock-absorbing material has been damaged, leave the packing box and shock-absorbing material as is until other inspection items are checked as follows.

- Step 2.** Check the packaged items supplied with the analyzer for any damage or defects.
- Step 3.** By referring to the furnished contents list, check that all packaged items supplied with the analyzer have been received as per the specified options.
- Step 4.** After checking, if one of the following applies, contact your nearest Keysight Technologies sales and service office.
1. The packing box or shock-absorbing material used to package the analyzer has been damaged or the shock-absorbing material has traces where extreme force has been applied.
 2. A packaged item supplied with the analyzer has mechanical damage or defects.

3. A packaged item supplied with the analyzer is missing.
4. A fault has been detected in the subsequent operation check of the analyzer.

If an abnormality is detected in step 1, contact the company that transported the analyzer as well as your nearest Keysight Technologies sales and service office.

Environmental Requirements

Set up the E5080B where the following environmental requirements are met.

Operating Environments

Ensure that the operating environment meets the following requirements.

Temperature	0°C to 40°C
Temperature range at the error-correction	23°C ± 3°C (< 1°C deviation from the temperature when performing the error-correction)
Humidity	20% to 80% at wet bulb temperature < +29°C (non-condensation)
Altitude	0 to 2,000 m (0 to 6,561 feet)
Vibration	0.21 G maximum, 5 Hz to 500 Hz

NOTE

Above environmental requirements are NOT for the specifications and measurement accuracy of the analyzer, but for the operating environment of the analyzer.

Ventilation Requirements

To ensure safety requirements, the specifications and measurement accuracy of the analyzer, you must keep environmental temperature within the specified range by providing appropriate cooling clearance around the analyzer or, for the rack-mount type, by forcefully air-cooling inside the rack housing. For more information on environmental temperature to satisfy the specifications and measurement accuracy of the analyzer, see the specification in the E5080B Online Help.

When the environmental temperature around the analyzer is kept within the temperature range of the operating environment specification (See Section **“Operating Environments” on page 14**), the analyzer conforms to the

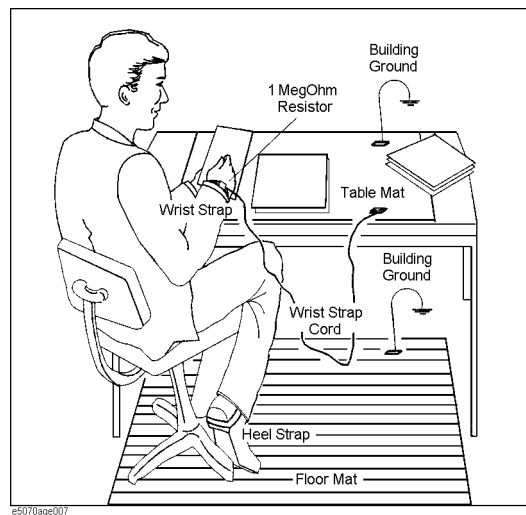
requirements of the safety standard. Furthermore, under that temperature requirement, the analyzer still conforms to the requirements of the safety standard even when placing the analyzer with cooling clearance as follows:

	Requirements
Back	≥ 180 mm
Sides	≥ 60 mm (both right and left)

Protection Against Electrostatic Discharge (ESD)

Set up a static-safe work-station to protect the electronic components from the damage by the electrostatic discharge (ESD) as shown in **Figure 1-1**.

Figure 1-1 Example of the static-safe work station



Ensuring Adequate Free Space around Analyzer for Immediate Disconnection of Power Cable in Case of Emergency

As described in **“Disconnection from Supply Source” on page 20**, the power supply is disconnected by removing the power cable’s connector plug from either the AC outlet or the E5080B unit. When installing the E5080B, ensure that there is sufficient free space around the unit to permit quick disconnection of the plug (from AC outlet or E5080B unit) in case of emergency.

Power Supply

Before turning on the E5080B power, check the following.

Verification of the Power Supply

Confirm that the power supplied to the E5080B meets the following requirements:

	Requirements
Voltage	100 to 240 VAC
Frequency	50/60 Hz
Maximum power consumption	350 W

Verification and Connection of Power Cable

The three-wire power cable attached to the E5080B has one wire serving as a ground. Using this power cable allows the E5080B to be grounded, thereby protecting you against electrical shock from the power outlet.

Step 1. Confirm that the power cable is not damaged.

WARNING

NEVER use a power cable showing any sign of damage. Faulty cables can cause electrical shock.

Step 2. Use the supplied cable to connect between the power cable receptacle (**Figure 1-2 on page 20**) on the rear panel of the E5080B and a three-wire power outlet with the grounding prong firmly connected in the ground slot.

WARNING

Use the supplied power cable with grounding wire to securely ground the E5080B.

For power cord list and options, refer to www.keysight.com/find/powercords.

Blown Fuses

If the fuse appears to have blown during operation, this instrument may be subject to failure and must be repaired. For any assistance, contact Keysight Technologies Customer contact center listed at the end of this guide.

The E5080B uses the following fuse types:

UL/CSA Type, Slow-Blo, 8 A-250 Vac.

WARNING

DO NOT replace the fuse yourself; doing this may expose you to electrical shock.

Connecting the BNC Adaptor (Option 1E5)

When the E5080B is equipped with Option 1E5 (high-stability frequency standard), connect the BNC adapter between the 10 MHz REF OVEN and the 10 MHz REF IN connectors on the rear panel. The BNC adapter is included in Option 1E5. When Option 1E5 is installed, the frequency accuracy and stability of the E5080B will further improve.

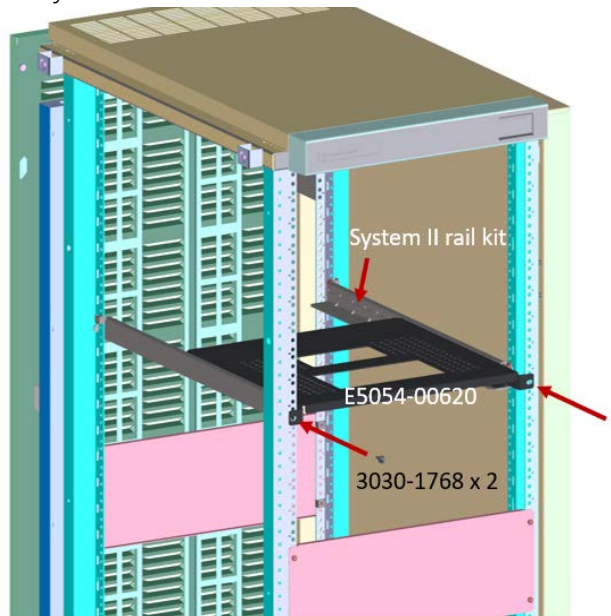
Installing Rack mount

There are two options of E5080B Rack mount kit:

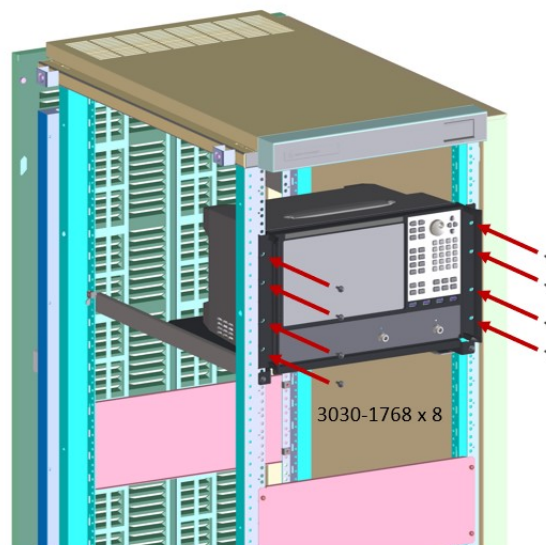
- Option 1CP: Rack mount kit for installation with handles
- Option 1CM: Rack mount kit for installation without handles

Steps to install the rack mount:

1. Install tray on the rails. Fasten front screws.



2. Remove bottom feet of the instrument.
3. Attach front flanges and set the instrument on tray. Then fasten front screws.



Starting the E5080B

This section describes how to turn ON/OFF the E5080B power and how to cut off the power supply in the case of emergency.

Turning the Power ON and OFF

The standby switch can turn ON/OFF the E5080B. The color on the button shows the status, as indicated below:

Indicator Color	Description
Green	Normal power on status
Orange	Standby status
Orange + Green	Illegal power on status

Perform the following steps to turn the power ON or OFF.

Turning the Power ON

Step 1. Press the standby switch once. It changes to green color.

This operation turns ON the power, and the E5080B starts the self-test.

Step 2. Confirm that the self-test indicates normal operation.

Normal operation is confirmed by the self-test if no error message appears.

Turning the Power OFF

Step 1. To turn OFF the power of the E5080B, first, press this standby switch or send a shutdown command from the external controller to activate the shutdown process (the process of software and hardware necessary to turn OFF the power supply). This puts the E5080B into the standby state and the button changes to orange color.

NOTE

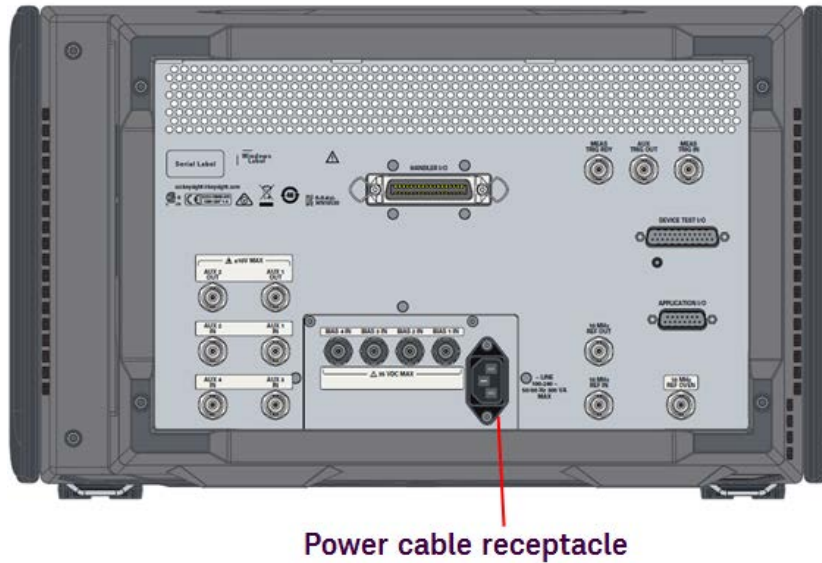
Under normal use, never directly interrupt the power supply to the power cable receptacle on the rear panel when the power supply is turned ON.

If you directly interrupt the power supply to the power cable receptacle when the power supply is turned ON, the shutdown process will not work. This could damage the software and hardware of the E5080B and lead to device failure.

Turning ON the power supply after a faulty shutdown may cause the system to start up in a condition called "safe mode." If this occurs, first shut down the system to set it to the standby state and then turn ON the power supply again to start up the system in normal mode.

Figure 1-2

Power cable receptacle



Disconnection from Supply Source

The power supply of the E5080B is cut off by disconnecting the plug of the power cable (on either AC outlet side or E5080B side). When it is necessary to disconnect the power supply in order to avoid shock hazards, etc., pull out the power cable plug from either the AC outlet side or the E5080B side.

NOTE

To allow this operation to be performed smoothly, be sure to follow the guidelines in **“Ensuring Adequate Free Space around Analyzer for Immediate Disconnection of Power Cable in Case of Emergency”** on page 15.

When turning the power OFF under normal circumstances, always follow the methods described in **“Turning the Power OFF”** on page 19.

Initial Registration of E5080B

When you start up the E5080B for the first time, you need to perform the initial registration of the Windows operating system of the E5080B.

When the Windows agreement message box appears, click Agree. The rest of the procedure runs automatically.

NOTE

The Touch Screen does not require any calibration and it works from the very first time you use the E5080B.

2 Troubleshooting

This chapter describes the troubleshooting during start up and the procedure of the operating system (OS) recovery when the Windows OS has been damaged.

Troubleshooting during Startup

When you encounter the problem during start up, see **Table 2-1**. System recovery saves most of problems.

Table 2-1

Troubleshooting during startup

Symptom	Solution
Turning on the standby switch does not start up the system.	Confirm that the power cable is properly plugged in.
The system starts up, but it automatically shuts down immediately.	Execute the system recovery.
The system starts up, but it enters the service mode (The instrument status bar in the lower right part of the screen displays SVC in red).	
The measurement screen appears after startup, but the power-on test is failed, with Error Message 241 appearing against a red background in the instrument message/warning area in the lower left part of the screen.	

System Recovery

By executing system recovery, you can return the system of the E5080B (the Windows operating system and the firmware) to the factory state (at the time of purchase¹).

CAUTION

Strictly follow the steps described below. If you do any operation other than the following steps, the system may not be recovered.

Notes on executing factory recovery function

Executing the factory recovery function causes the following conditions:

- o In addition to the Windows operating system and the firmware, the following settings of the E5080B are returned to the factory state.
 - Network setting
 - GPIB setting
 - Printer setting
- o The driver for the supported printer installed after purchase is deleted.
- o You need to execute initial registration again.

Files that you have created using the save function (files in the D drive) are not affected, but we recommend backing them up before executing system recovery for precautionary purposes. For more information on backup, refer to “Backing Up the Data” as described in E5080B Online Help.

1. The default setting of the storage is recovered during the system recovery. For the storage that had failed earlier and had been replaced (after purchase), its default setting may not be the same as the factory state.

Procedure to execute the factory recovery

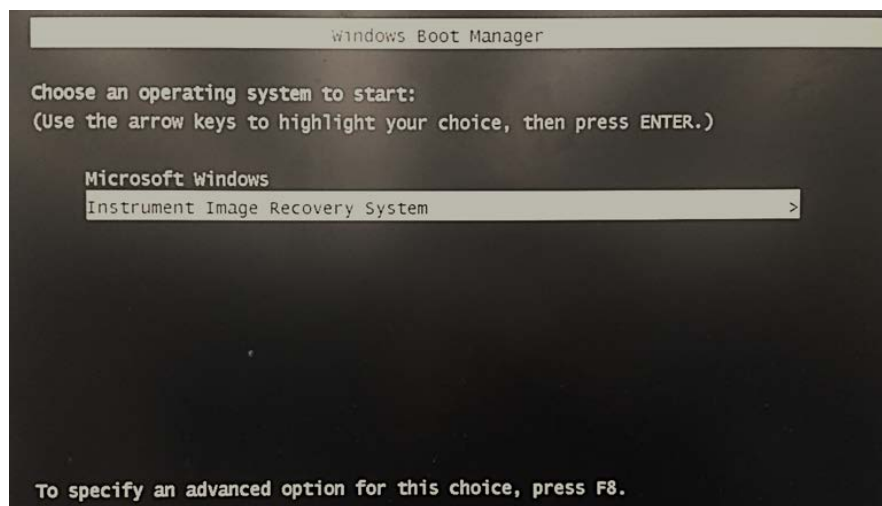
This section describes how to return the contents of the C drive to the factory state.

NOTE

You need a keyboard for this operation.

- Step 1.** Shut down the E5080B.
- Step 2.** Disconnect all of the USB device from the USB ports.
- Step 3.** Connect the keyboard to the E5080B.
- Step 4.** Press the standby switch of the E5080B to turn it ON.
- Step 5.** When the screen as shown in the figure below appears, select **Instrument Image Recovery System** and press [Enter].

Figure 2-1 Instrument Image Recovery System Selection Screen

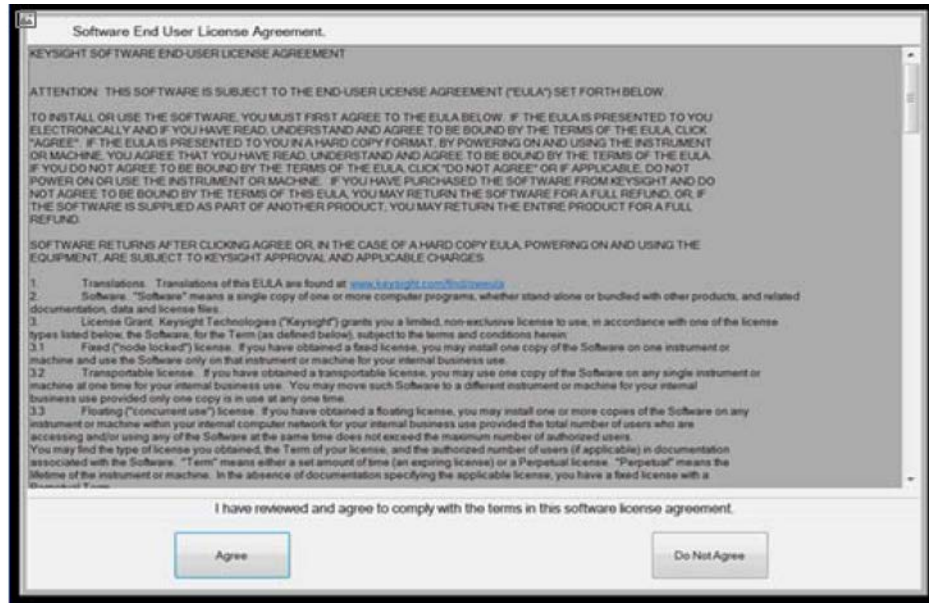


NOTE

After several seconds, the next screen appears automatically even if you do not press any key.

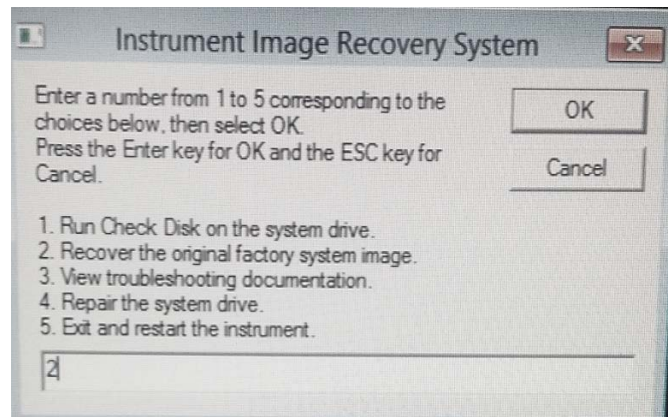
Step 6. Software End User License Agreement appears. Press [Agree].

Figure 2-2 Software End User License Agreement



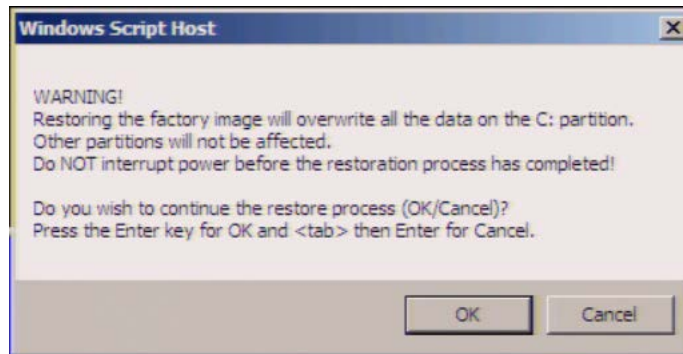
Step 7. Type 2 to select Recover the original factory system image option and press [Enter].

Figure 2-3 System recovery selection screen



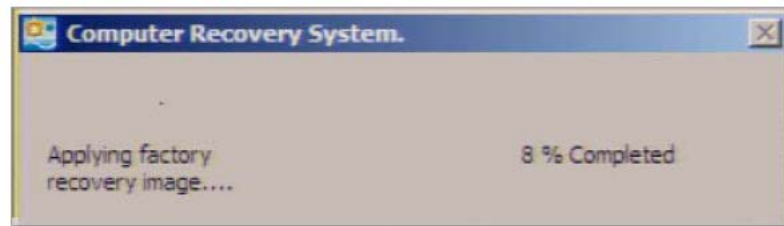
Step 8. A confirmation message appears. Click **OK** to continue the process.

Figure 2-4 System recovery confirmation screen



Step 9. The progress of the system configuration is displayed on the screen. The recovery takes a few minutes depending on the amount of data.

Figure 2-5 System configuration progress screen



Step 10. Once the recovery process is completed, completion message prompts. Click **OK**. The E5080B restarts automatically.

Step 11. **Software End User License Agreement** appears. Press [**Agree**]. Refer to [Figure 2-2](#).

Step 12. After the restart, execute initial registration. For information on the execution procedure, refer to [“Initial Registration of E5080B” on page 21](#)

CAUTION

Never turn OFF the power during the system recovery because doing so may cause serious damage to the E5080B.

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E5080-90010
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