

**Getting Started**  
with the  
**Agilent N4880A**  
**Reference Clock Multiplier**

You only need a few minutes to get started with the N4880A.

This Getting Started Brochure helps you to quickly install and operate the instrument.

If you need more detailed information on the N4880A, refer to the Online Help of your Reference Clock Multiplier N4880A.

For more information, visit  
[www.agilent.com/find/n4880](http://www.agilent.com/find/n4880)

The Help also offers printable versions of the User Guide.



**Agilent Technologies**

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## General Safety Precautions

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument.

Agilent Technologies Inc. assumes no liability for the customer's failure to comply with these requirements.

Before operation, review the instrument and manual for safety markings and instructions. You must follow these to ensure safe operation and to maintain the instrument in safe condition.

## General

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

All Light Emitting Diodes (LEDs) used in this product are Class 1 LEDs as per IEC 60825-1.

## Instrument Markings

This product is marked with a warning symbol when it is necessary for the user to refer the instructions in the manual.



## Environmental Conditions

This instrument is intended for indoor use in an installation category II, pollution degree 2 environment. It is designed to operate within a temperature range of 5 – 40 °C (40 – 105 °F) at a maximum relative humidity of 95% and at altitudes of up to 2000 meters.

Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

## Before Applying Power

Verify that all safety precautions are taken. The power cable inlet of the instrument serves as a device to disconnect from the mains in case of hazard. The instrument must be positioned so that the operator can easily access the power cable inlet. When the instrument is rack-mounted the rack must be provided with an easily accessible mains switch.

## Ground the Instrument

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

## Do Not Operate in an Explosive Atmosphere

Do not operate the instrument in the presence of flammable gases or fumes.

## Do Not Remove the Instrument Cover

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified personnel. Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

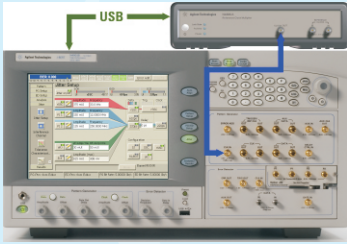
## Services and Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local Agilent Technologies Service Center. You can find a list of local service representatives on the Web at: <http://www.agilent.com/find/techsupport>

# Installing the Agilent N4880A

## Inspect Shipment

Check if the Agilent N4880A shipping container contains the following standard deliverables:



Agilent N4880A Reference Clock Multiplier connected to J-BERT N4903B

If the contents are incomplete, if there is mechanical damage, or if the instrument does not work within its specifications, notify the nearest Agilent office. The Agilent office will arrange for repair or replacement without awaiting settlement.

For the complete content of your delivery please refer to the Box Contents List.

In addition, the box will contain the USB flash drive, with N4880A installer and documentation.



Box Contents List



USB Flash Drive



Power Cable



USB Cable

## Power Requirements

The instrument can operate from any single-phase AC power source supplying 100 – 240 V in the frequency range from 50 – 60 Hz. The maximum power consumption is 80 VA. The power supply automatically adapts to the applied AC power (Auto Selection) and monitors the AC power range.

The mains plug can only be inserted in a socket outlet that provides protective earth contact. Any interruption of the protective earth contact inside or outside the instrument makes any operation of the instrument dangerous. Intentional interruption is prohibited.

### Abbreviations used in this guide:

- DUT Device Under Test
- BERT Bit Error Ratio Tester
- ED Error Detector
- PG Pattern Generator
- RCM Reference Clock Multiplier
- USB Universal Serial Bus

## Connections of the N4880A

The N4880A is controlled by the J-BERT N4903B or a PC via USB. Using a J-BERT be certain to connect it to a USB port on its rear side otherwise operation is not guaranteed and install the included software package before connecting the N4880A to your J-BERT or PC.

The N4880A is a reference clock multiplier. It provides a multiplying phase locked loop (PLL) which enables users to lock the pattern generators of J-BERT or ParBERT to a lower rate reference clock. The N4880A supports reference clock rates for PCI Express 1 to 3, MIPI M-PHY and UHS-II standards.

There are three connectors on the front panel. All of them are 3.5 mm SMA female. Two of them are the input channel which can also be used single ended. One is the output channel.

For clock multiplication, its Reference Clock Input has to be connected to the Clock Out of the DUT. Its Clock Output has to be connected to the Clock In of J-BERTs PG or clock module of ParBERT. The respective ports are at the front side of the instruments.

**All data and clock input and output connectors of the BERT PG and RCM that are not used in your test setup must be terminated with 50 Ohm.**

## Ventilation Requirements

Make sure that there is adequate clearance of 50 mm (2 in) at the rear and one side of the instrument to ensure adequate air flow. If the air flow is restricted, the internal operating temperature will be higher, reducing the instrument's reliability.

Do not cover the ventilation holes.

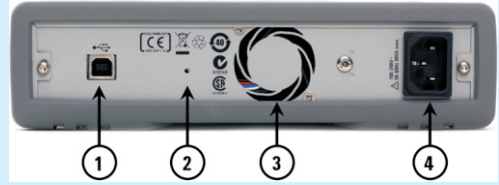
# Installing the Agilent N4880A

## Hardware Overview

### Front Panel



### Rear Panel



#### 1. Power Switch

#### 2. Status LEDs

- Lock State** Signals the lock state of the PLL  
Green when the PLL is locked  
Red when the PLL is unlocked
- Activity** Flashes green when the instrument is connected to the graphical user-interface  
Constantly green when device is up and running
- POWER** Red when there is a selftest error  
Constantly green when instrument is ON (powered)  
Red when instrument is OFF (in power standby mode)

#### 3. CLOCK OUT Clock Output

#### 4. REFERENCE CLOCK IN Non-Inverted data input /REFERENCE CLOCK IN Inverted data input

#### 1. USB Interface Connector (device type for remote access)

#### 2. Firmware update button

#### 3. FAN outlet

#### 4. Power Connector (100 – 240V~ 50/60Hz 80VA max.) Unused inputs and outputs have to be terminated with 50 Ohm.

## Software Requirements

Pre-requisites for installing the Agilent N4880A software:

The supported Operating System are:

- Windows XP SP3 English (32 bit)
- Windows Vista SP2 English (32 bit)
- Windows Vista SP2 English (64 bit)
- Windows 7 SP1 English (32 bit)
- Windows 7 SP1 English (64 bit)

Ensure that you have .NET 2.0 with Service Pack 2 installed on your system.

For using the J-BERT SCPI remote extension J-BERT firmware version 7.20 is necessary.

# Installing the Agilent N4880A

## Controlling the N4880A Remotely

In case, you want to use the N4880A with its J-BERT SCPI remote programming extension be sure to update your J-BERT firmware to revision 7.20.

**1** You may wish to connect a keyboard and mouse to your J-BERT N4903B. This is not mandatory but convenient and should be done when the instrument is switched off.

**2** Switch on the J-BERT N4903B.

**3** Open the *Help* menu and click *About*.

The software revision must be 7.20 or later. If it is lower, you need to update the software. For details refer to the User Guide.

[www.agilent.com/find/n4903](http://www.agilent.com/find/n4903)

**4** Open the *Utility* menu and click *Minimize GUI*.

**5** Look out for the *Agilent IO Control* icon in the Windows task bar.

If you see this icon, the revision of the Agilent IO Libraries Suite is 15.5 or later.



You can use the *Agilent Connection Expert* which makes it easy to configure USB instruments for SCPI.

# Installing the Agilent N4880A

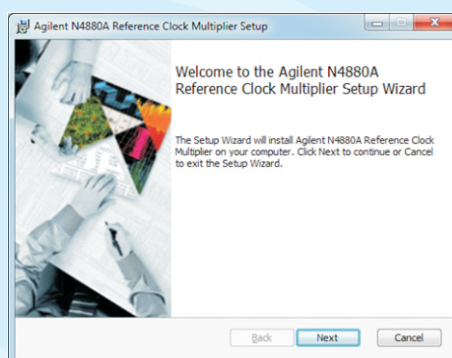
## Installing the Agilent N4880A Software

Install the N4880A software package before connecting the device with your computer otherwise there can be connection problems. The latest N4880A software can be found at [www.agilent.com/find/n4880](http://www.agilent.com/find/n4880).

Be certain that .NET 2.0 with Service Pack 2 is already installed on your system.

**1** Connect the USB stick shipped with your N4880A to your J-BERT or PC.

**2** Execute the N4880A software installer and follow the onscreen steps.



**3** Install the *Driver* when the dialog pops up.



**4** Once installation is finished depending on your system a reboot may be necessary. Otherwise, the *Reference Clock Multiplier* may not be found when plugged in.

**5** Connect the *Reference Clock Multiplier* via USB to the corresponding J-BERT or PC.

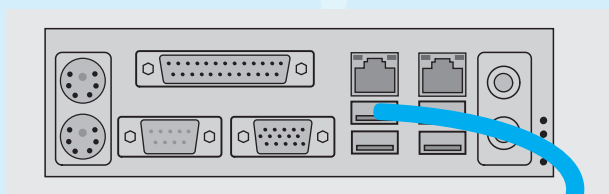
The device driver is installed via the installation program and can also be found in the "Driver" folder inside the installation directory.

# Installing the Agilent N4880A

## Establish the USB Connection

- 1 Keep the user interface of the Serial BERT N4903B minimized.
- 2 Connect the N4880A to mains and switch it on.
- 3 Connect the USB cable between the USB port of the N4880A and one of the rear USB ports of your N4903B.

Rear panel view of N4903B



- 4 Depending on your Windows version, when you connect the N4880A for the first time, the Windows *Found New Hardware Wizard* appears. . Select *Install the software automatically* and follow the onscreen steps.

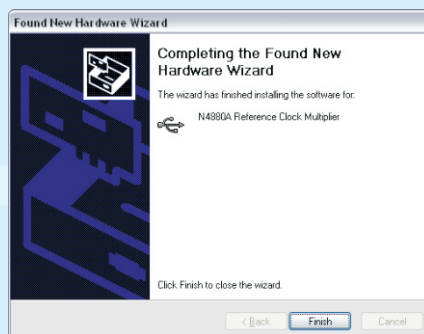


Rear panel view of N4880A

The installation is automatically done on the latest versions of Windows.

- 5 Click *Next* until the wizard finishes.

Windows will automatically identify the N4880A as *N4880A Reference Clock Multiplier*.



In case of problems, please refer to the User Guide of your N4880A.

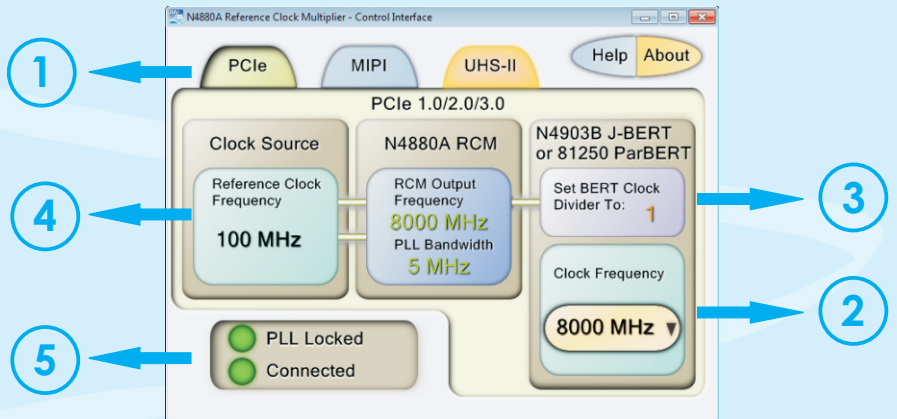
# Operating the Agilent N4880A

The N4880A Reference Clock Multiplier graphical user interface controls and monitors the connected Reference Clock Multiplier. For complete details, refer to the User Guide.

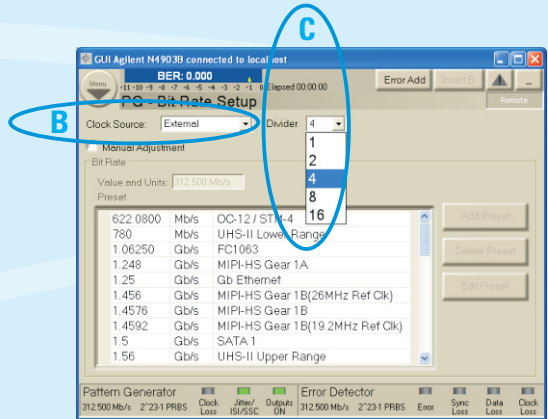
## Operation Example of PCIe with J-BERT

1 On the N4880A GUI, select *PCIe* tab.

2 Select BERT *Clock Frequency*.



- 3 Set BERT *Clock Divider* in the J-BERTs Pattern Generator. Follow the given instructions to set *Clock Divider* on J-BERT:
- Switch to *PG - Setup > Bit Rate Setup*.
  - Keep the *Clock Source* as *External*.
  - Select the *Divider* value as displayed on N4880As user interface.



4 Supply 100 MHz to the *Reference Clock In Port*

5 If the supplied *Reference Clock* is correct the *PLL Lock status* light shows green.



# Operating the Agilent N4880A

## Operation Example of MIPI with J-BERT

**1** On the N4880A GUI, select *MIPI* tab.

**2** Select *Reference Clock Frequency*.

**Changing the Reference Clock Frequency will adjust the BERT Clock Frequency to the nearest possible value if the originally selected is not possible for the chosen Reference Clock Frequency.**

**3** Select *BERT Clock Frequency*.

**4** Set *BERT Clock Divider* in the J-BERTs Pattern Generator.

**5** Supply the necessary *Reference Frequency* to the *Reference Clock In* Port.

## Operation Example of UHS-II with J-BERT

**1** On the N4880A GUI, select *UHS-II* tab.

**2** Set *BERT Clock Frequency* inside the allowed range.

**The Reference Clock Frequency and the BERT Clock Frequency are co-dependent in this mode, therefore the Reference Clock Frequency will adjust accordingly.**

**3** Set the *BERT Clock Divider* in the J-BERTs Pattern Generator.

**4** Supply the necessary *Reference Frequency* to the *Reference Clock In* Port.

**In case of problems, please refer to the User Guide of your N4880A.**

# Operating the Agilent N4880A

## Typical Connection Setup of Agilent N4880A

**1** Connect J-BERTs PG Data Out with the DUTs Data In.

**2** Connect J-BERTs PG CLK In with the N4880As CLK Out.

**3** Connect J-BERTs ED Data In with the DUTs Data Out.

**4** Connect J-BERTs ED CLK In with the J-BERTs Trigger Out.

**5** Connect N4880As CLK In with the DUTs CLK OUT.

**6** Set J-BERTs Data Out to the needed values for the DUT.

**7** Configure the N4880As user interface as explained on pages 7 and 8 of this guide.

**8** Set Clock Divider on J-BERT.

**9** Measure DUT with Error Detector.

