

# Installation Guide

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## N5101A Baseband Studio PCI Card

### Overview

This guide provides instructions on how to install the N5101A Baseband Studio PCI card in a PC. The PCI card is installed in a PC and is used with a signal source (or an N5515C wireless communications test set) to run Agilent software applications. This process comprises the following steps:

1. Verify that the hardware you received is correct, and note the license and serial number of each Baseband Studio PCI card (see [page 2](#)).
2. Ensure that your PC and signal source meet the basic installation requirements (see [page 4](#) and [page 5](#)).
3. Install the PCI card hardware (for the internal PCI card hardware, see [page 6](#); for external cabling, see [page 8](#)).
4. Install the Baseband Studio PCI card driver (see [page 9](#)).

After the PCI card installation is complete, the procedure directs you to the software installation guide for instructions on installing application software used with the PCI card (see [page 9](#)).

This document also provides troubleshooting tips (see [page 10](#)), application-specific cabling information (see [page 11](#)), Agilent assistance information (see [page 12](#)), safety and regulatory information (see [page 13](#)), and a list of additional PCI card-related documentation (see [page 14](#)).

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**NOTE** The Baseband Studio PCI card shown in this document reflects the current PCI card that is being shipped. Older versions of the PCI card appear considerably different. However, all connectors are located in the same location as the board shown in this document.

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**NOTE** An older version of this installation guide (N5101-90001) documents installing the PCI card using the Baseband Studio CD-ROM (N5101-90002). This CD-ROM **is no longer** available. However, if you have the CD-ROM, the installation guide may be downloaded at the following web page:

<http://www.agilent.com/find/basebandstudio>

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**Agilent Technologies**



N5101-90005

**Agilent Part Number: N5101-90005**

**Printed in USA May 2005**

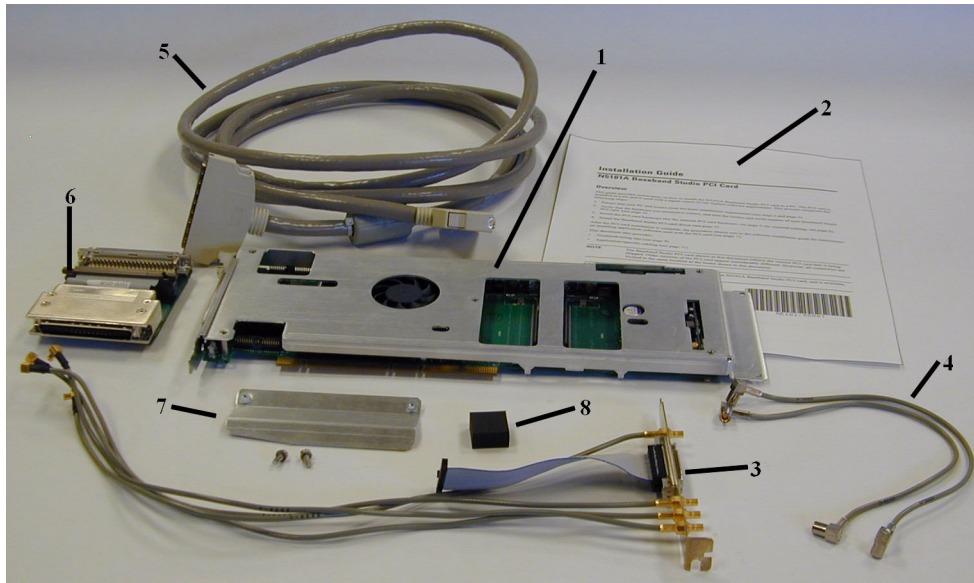
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# Checking the Shipment

## Hardware

For each N5101A Baseband Studio PCI card purchased, you should receive the following items:

**Table 1** PCI Card Parts List



<b>1</b>	N5101A Baseband Studio PCI Card	<b>5</b>	Digital Bus Cable (P/N N5101-60003)
<b>2</b>	Installation Guide (P/N N5101-90005)	<b>6</b>	Loopback Fixture (P/N E4400-63583) (For troubleshooting)
<b>3</b>	GPIO Bracket (P/N N5101-60006) (Replaceable Parts of GPIO Bracket: - SMB-to-MCX Cable: P/N 8121-0655 - Ribbon Cable Assembly: P/N N5101-60004)	<b>7</b>	PCI card ISA Retainer & Screws Retainer: P/N 1400-3295 Screws: P/N 0624-0858 (2 each)
<b>4</b>	SMB to SMB Cables (P/N 8120-5020) (2 each) (For installation of two PCI cards)	<b>8</b>	Foam Pad (P/N N5101-20005) (For installation of two PCI cards)

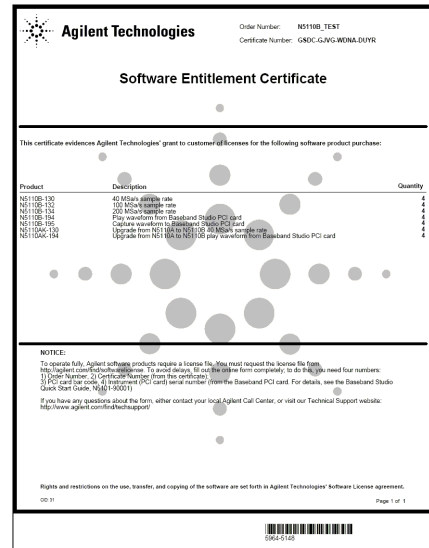
# Entitlement Certificate

Each software application purchase includes one entitlement certificate. Software applications require a license file to be fully functional. The entitlement certificate shipped with your application purchase lists the products purchased, and has two of the four numbers required to obtain the license file.

Applications are licensed to a specific PCI card; you may license more than one application to a single PCI card. The N5101A Baseband Studio PCI card has the other two numbers needed to obtain the license file.

The license redemption process is described later in the installation procedure.

From the PCI card, you will need the following numbers. It is important to record and save these numbers now to avoid the need to remove your PCI card from the computer later in the installation procedure.



- PCI Card Bar Code License Number**

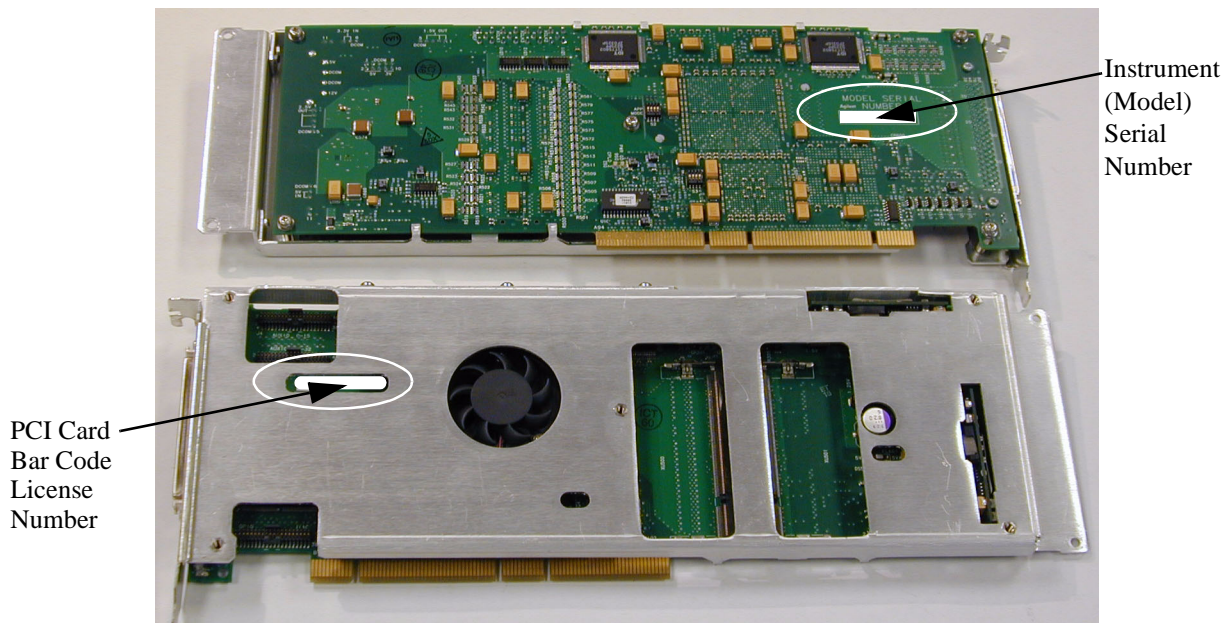
A bar code label that displays this license number is affixed to the PCI card as shown below.

Record the license number here: \_\_\_\_\_

- Instrument (Model) Serial Number**

A label that displays the serial number is affixed to the reverse side of the PCI card as shown below. The serial number is also displayed on a sticker affixed to the end of the box in which the card is packaged.

Record the serial number here: \_\_\_\_\_



PCI Card Bar Code License Number

Instrument (Model) Serial Number

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# System Requirements

## PC Requirements

### Requirements for all applications:

- You must be able to log on to your PC using an account with administrative privileges.
- The PC and all signal sources *must* be connected via LAN or GPIB.
- Available PCI slot(s) must meet the 2.2 PCI/ISA (or later) specifications (see the bottom of [page 10](#)).
- Not all computer cases are PCI or ISA compliant. PCI compliant computer cases accommodate the N5101A PCI card with the metal extender, thus enabling both ends to be restrained. For ISA compliant computer cases, an ISA retainer (included) must be attached to the N5101A PCI card metal extender to enable the card to fit into the ISA slots. To avoid reliability issues, the N5101A PCI card must be restrained on both ends. Refer to [page 6](#) for installation instructions.

### Application-specific requirements:

The N5110B Baseband Studio for Waveform Capture and Playback hard disk drive (HDD) playback rate and duration are not guaranteed. Factory tests at Agilent achieved a HDD playback rate of 40 MSa/s over an 8 hour duration using the following PC configuration: HP XW 8200 PC workstation, Adaptec 2230 SLP RAID controller, 74-GB SATA 150 HDD (10000 RPM), and four 73-GB U320 SCSI HDD (15000 RPM, RAID 0 required, 64KB block size). The recommended PC configuration requirements listed below are for the convenience of customers who want to assemble their own high-performance PC workstation.

**Table 2 Recommended PC Configuration for N5110B HDD Playback**

<b>Processor</b>	Pentium® 4, 2 GHz or greater (dual processors are recommended)
<b>Front Side Bus</b>	533 MHz
<b>Memory (Size, Type)</b>	1 GB, PC2700
<b>Available PCI Slots</b>	64 bit/66 MHz or 64 bit/133 MHz and one additional PCI slot opening
<b>HDD Controller</b>	Ultra 320 SCSI RAID Controller (capable of RAID 0 configuration)
<b>Hard Disks</b>	One SATA 150 (10000 RPM) Four Ultra 320 SCSI (15000 RPM, RAID 0, 64 KB block size) RAID 0 required
<b>HDD Configuration</b>	Dedicated OS Drive, Data on RAID 0
<b>Operating System</b>	Windows® XP Professional

The table below lists the minimum PC requirements to capture or playback waveforms using the DRAM of the N5110B Baseband Studio for Waveform Capture and Playback software.

**Table 3 Minimum N5110B PC Requirements for DRAM Capture and Playback**

<b>Processor</b>	Pentium III, 800 MHz or greater
<b>Operating System</b>	Windows XP Professional, SP 1 or greater -or- Windows 2000 Professional, SP 3 or greater
<b>Memory (RAM)</b>	256 MB minimum (512 MB recommended)
<b>Free Disk Space</b>	200 MB minimum
<b>Display</b>	1024 × 768 minimum screen resolution with normal font size
<b>Available PCI Slots</b>	One 32 bit/33 MHz and one additional PCI slot opening

The table below lists the minimum PC requirements for the N5115A Baseband Studio for Fading software application.

**Table 4 N5115A Baseband Studio for Fading Minimum PC Requirements**

<b>Processor</b>	Pentium III, 600 MHz or greater
<b>Memory (RAM)</b>	256 MB minimum
<b>Free Disk Space</b>	145 MB minimum
<b>Available PCI Slots</b>	Single-Channel Configuration: One 32 bit/33 MHz and one additional PCI slot opening Dual-Channel Configuration: Two 32 bit/33 MHz and two additional PCI slot openings
<b>Operating System</b>	Windows XP Professional, SP 1 or greater -or- Windows 2000 Professional, SP 3 or greater

## Signal Source Requirements

The PC and signal sources *must* be connected via LAN or GPIB.

**Table 5 Requirements for Signal Sources**

<b>Application</b>	<b>Source Model</b>	<b>Source Firmware Revision</b>	<b>Source Options</b>	<b>Interface</b>
<b>N5110B Baseband Studio for waveform capture and playback</b>	E8267D	C.04.04	601 or 602	LAN or GPIB
	E8767C	C.03.78 or later	602	LAN or GPIB
	E4438C	C.03.74 or later	601 or 602	LAN or GPIB
<b>N5115A Baseband Studio for fading</b>	E4438C	C.03.40 or later	601 or 602	LAN or GPIB
	E5515C	E6702B:B.03.00 or later, E6703C:C.01.00 or later, or E6785C: C.01.00 or later	003 E5515CU Option 504 E5515CU Option 187 <sup>a</sup>	GPIB only

a. E5515CU Option 187 required for W-CDMA usage only.

# Installing the Hardware

## PC Hardware and Internal Cables

### All Applications:

Power down the PC and disconnect the AC power cable.

Before you install the Baseband Studio PCI card, be sure to note the bar code license number and the model serial number on the card (described on [page 3](#)).

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**NOTE** The N5101A PCI card is a 64-bit card. If you are using the streaming application from a hard disk a 64-bit slot is required. Otherwise, a 32-bit slot may be used without loss of functionality.

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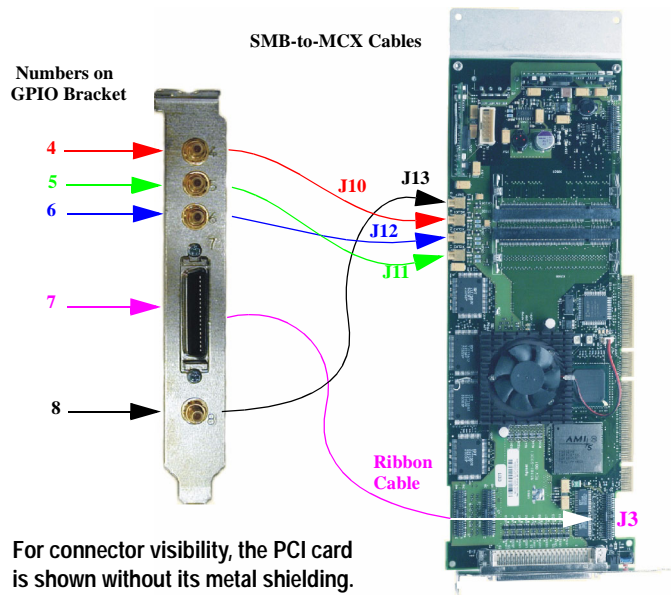
### Single-card Installation:

#### Internal cabling:

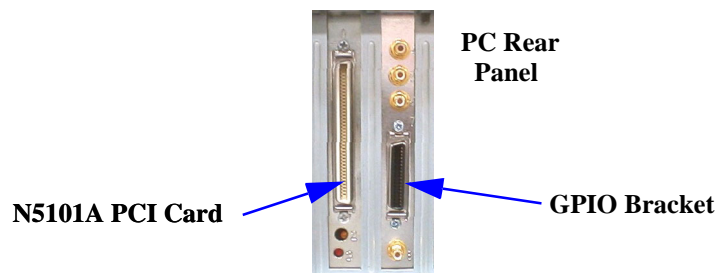
1. Connect the GPIO bracket ribbon cable to J3 on the PCI card. The remaining cables can be connected, as shown, either before or after you install the PCI card in the computer.

Number on GPIO Bracket	PCI Card Connector
4	J10
5	J11
6	J12
7	J3
8	J13

**Caution:** Use standard precautions to protect against electrostatic discharge when handling the PCI card. Refer to “[ESD Information](#)” on page 13.

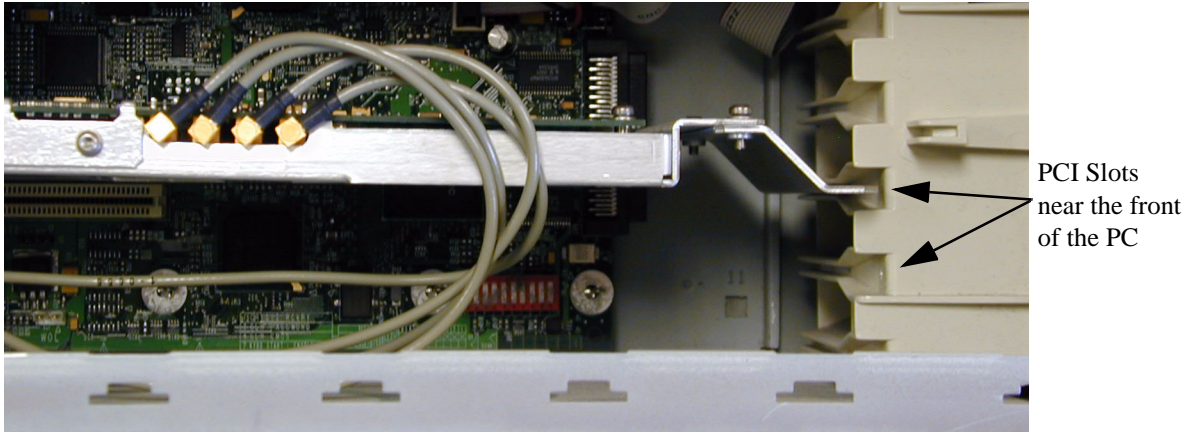


2. For PCI compliant computer cases, install the N5101A PCI card and GPIO bracket using two PCI slots in the PC. Refer to the PC’s documentation for specific installation instructions.

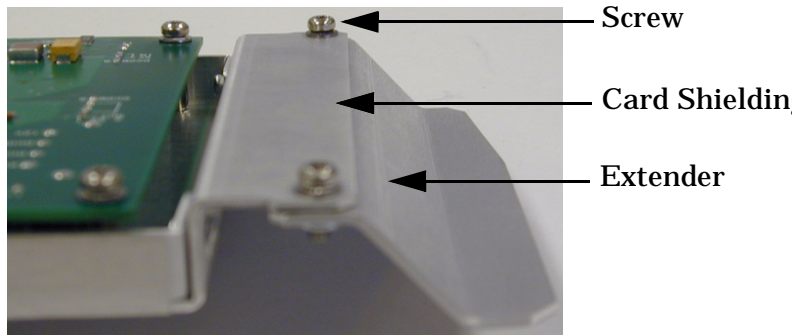




3. Ensure that the metal shielding bracket of the PCI card slips into the PCI slot at the front of the case. If it does not fit, refer to step 4.



4. For ISA-compliant computer cases, attach the metal extender bracket to the PCI card shielding using the two screws provided. See the illustration below. The extender will slip into the guides at the front of the ISA-compliant PC case as shown in the illustration above.

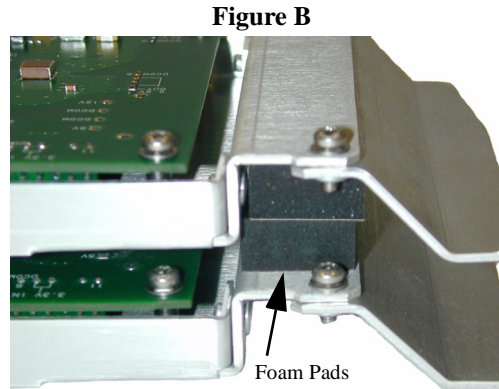
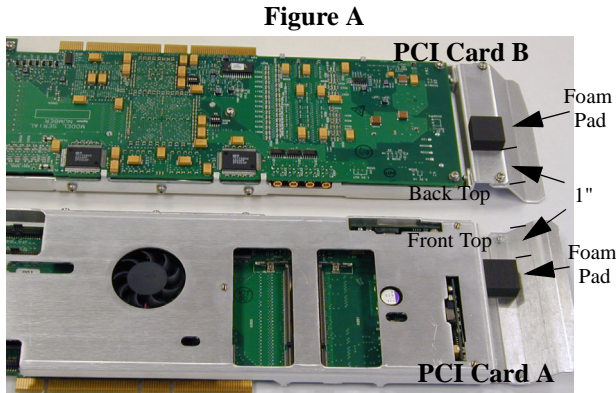


5. Secure the rear of the PCI board (the end with the digital bus connector) to the PC chassis with a mounting screw.
6. Reconnect the AC power cable.
7. If the LAN/GPIB was disconnected, reconnect it.

## Two-card Installation:

Before you install the PCI cards in the PC for the dual-channel fading application, attach the foam pads approximately 1 inch from the top of the PCI card as shown in Figure A of the following illustration.

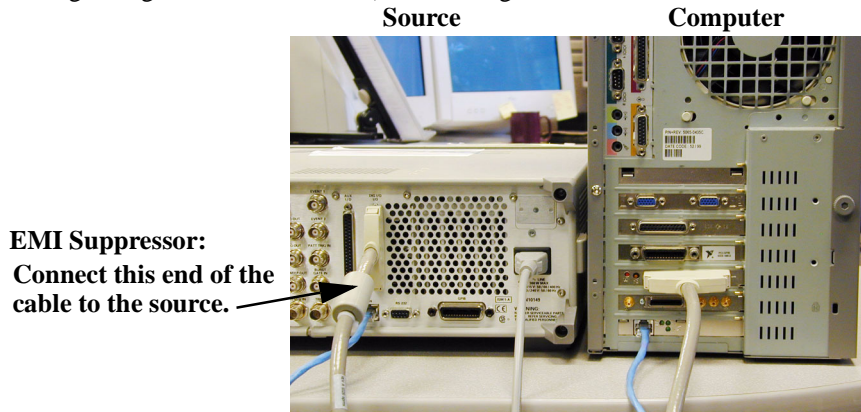
If the PCI/ISA slots are such that the two cards must be installed side-by-side (as in Figure B), you may need to route one or both of the ribbon cables under the PCI cards to connect them. This does not damage the cables.



## External Cables

Install the digital bus cable for all applications.

1. Inspect the digital bus cable and connectors to ensure that they are clean.
2. Connect a digital bus cable between each N5101A Baseband Studio PCI card and a source (or N5102A Baseband Studio digital signal interface module), connecting the end of the cable with the EMI suppressor to the source.



**NOTE** The digital bus cable connector has a release latch on each side. As you make a connection, you must simultaneously squeeze these release latches (see the illustration below); the connector should snap into place. A securely connected cable does not come loose when gently pulled.



To disconnect the cable, squeeze the release latches as you remove the connector.



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## Installing the Software

The following instructions describe how to install the Baseband Studio application:

### PCI Card Driver

1. Go to the Agilent Technologies web site: <http://www.agilent.com/find/basebandstudio>.
2. Click the **N5101A** product link.
3. On the N5101A Baseband Studio PCI Card page, click the **Baseband Studio PCI Card Driver** link and follow the download instructions.

### Application Software

To install the Baseband Studio application software, refer to the Agilent Technologies Software (for Baseband Studio and Signal Studio) Installation Guide (part number E4400-90559). This document leads you through installing the Baseband Studio software applications. To access this document:

1. Go to the Agilent Technologies web site: <http://www.agilent.com/find/basebandstudio>
2. Click the product link for the Baseband Studio application that you wish to download.
3. On the Baseband Studio application page, click the link for the software installation guide and follow the download instructions. Print this document.

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## Troubleshooting

### The Found New Hardware wizard is not displayed

If an N5101A Baseband Studio PCI card was previously installed, you may see a slightly different dialog from the New Hardware Detected wizard. If this happens, select the file *N5101A.sys* from the *driver* directory on the Baseband Studio CD, rather than the *N5101A.inf* file.

### No Prompt for the N5101A Baseband Studio PCI card driver

If you are not prompted for the N5101A Baseband Studio card driver, turn off the PC and ensure that the PCI card is securely seated in its slot. Reboot the PC, and log on using an account with administrative privileges.

### N5101A Baseband Studio PCI card does not appear in the IO Config utility Select an N5101A List

Ensure that all N5101A Baseband Studio PCI cards are installed correctly:

1. On the PC desktop, right-click the My Computer icon.
2. Select **Properties**.
3. Click the **Hardware** tab.
4. Click **Device Manager**.  
Under Agilent Technologies Test & Measurement Devices, you should see at least one Agilent N5101A listed.
5. Right-click an Agilent Technologies N5101A icon and select **Properties**.

In the Device status area, you should see the message, "This device is working properly." If not, the N5101A Baseband Studio PCI card is probably not seated properly in the PC.

### N5101A PCI Card-PC Installation Compatibility Issues

- **PCI Long Card**

Some PCs will have front card guides in the plane of the N5101A PCB which will support the front edge of the metal extension plate on the N5101A card. These front card guide slots will be about 305 mm (12 inches) from the rear card mounting surface and in line with the PCI connector. The N5101A PCB with the installed front metal plate is compliant with the PCI long card specification. The overall card length is 312 mm (12.283 inches).

- **ISA Long Card**

Some PCs will have ISA-compliant front card guides. These ISA front card guide slots will be about 335 mm (13 inches) from the rear card mounting surface and offset from the plane of the N5101A PCB and PCI connector by 14.27 mm (0.562 inches). An ISA retainer (an adaptor with two mounting screws) must be installed onto the N5101A metal extension plate to support the front of the card.

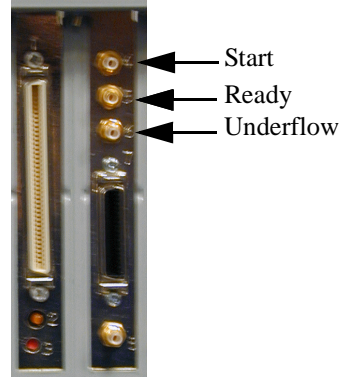
- **PC Slot Too Short for N5101A PCI Card**

The N5101A front metal extension plate may be removed. If the PC slots are still too short, a PC with PCI or ISA long card compliant slots is recommended.

## Application-Specific Cabling

### N5110B Baseband Studio for Waveform Capture and Playback, External Triggering

The GPIO bracket accepts an input trigger (Start), and provides two output markers (Ready and Underflow). For details, refer to the application's help.

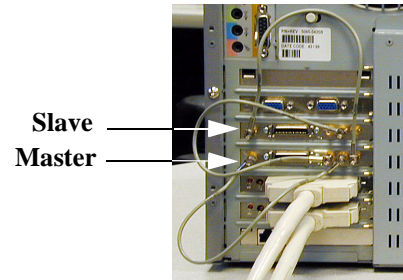


### N5115A Baseband Studio for Fading, Dual Channel

#### Recommended Setup:

Connect three SMB-to-SMB cables between the two GPIO brackets as shown. The cables are connected as follows:

Connector on Master GPIO Bracket	Connect to...	GPIO Bracket Connector
4		Slave 8
5		Master 8
6		Slave 5

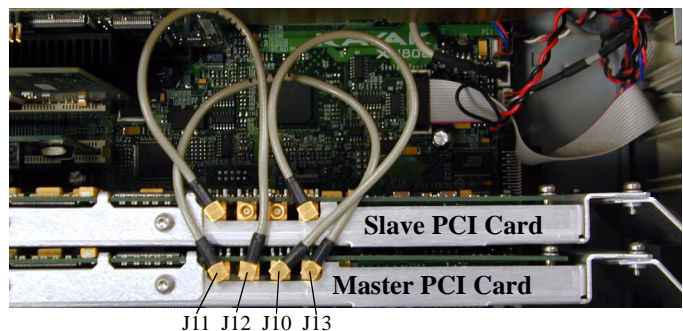


#### Alternate Setup:

If you are using two PCI cards for dual-channel fading and your PC has fewer than four open PCI slots, you can connect the PCI cards internally using three MCX-to-MCX cables (Agilent part number 8121-0620). These cables are not provided with the PCI card. The cables have MCX (male) connectors on both ends. They are connected as shown below:

From Master PCI Card	Connect to...	PCI Card
J13		Master J11
J10		Slave J13
J12		Slave J11

**Note:** Cabling is not connected to connectors J10 and J12 on the Slave PCI card.



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## Getting Assistance from Agilent

Your local Agilent office can help you with your test and measurement needs. The following Internet URL provides the information you need to contact your local Agilent office: <http://www.agilent.com/find/assist>

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

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

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## Safety and Regulatory Information

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**NOTE** A declaration of conformity is on file for the N5101A Baseband Studio PCI card and is available upon request.

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### ESD Information

#### Protection from Electrostatic Discharge

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation using two types of static-safe workstation protection:

- conductive table-mat and wrist-strap combination
- conductive floor-mat and heel-strap combination

Both types, when used together, provide a significant level of ESD protection. Of the two types, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 M $\Omega$  of isolation from ground.

#### Handling of Electronic Components and ESD

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**CAUTION** Many printed circuit (PC) boards are very susceptible to damage from electrostatic discharge (ESD). Always handle a PC board assembly by the edges at a static-safe workstation while wearing a grounding strap. Handling the PC board only by the edges will reduce the possibility of ESD damage to the components and prevent contamination of exposed plating.

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The possibility of unseen damage caused by ESD is present whenever components are transported, stored, or used. The risk of ESD damage can be greatly reduced by close attention to how all components are handled.

- Perform work on all components at a static-safe workstation.
- Keep static generating materials at least one meter away from all components.
- Store or transport components in static-shielded containers.



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## Additional PCI Card-Related Documentation

The following list of PCI card-related documentation is available from the Agilent web site (<http://www.agilent.com>).

The easiest method of finding this documentation is using the Agilent web site search tool to search for the document part number.

- Agilent N5101A Baseband Studio PCI Card Installation Note (*obsolete version of this document*)  
Agilent part number: N5101-90001
- Agilent N5101A Baseband Studio PCI Card Memory Upgrade Installation Note  
Agilent part number: N5101-90003
- Agilent Technologies Software Installation Guide for Baseband Studio and Signal Studio  
Agilent part number: E4400-90559
- Agilent Technologies E5515C Fading Solution Application Guide  
Agilent part number: 1000-1894  
<http://cp.literature.agilent.com/litweb/pdf/1000-1894.pdf>

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