Installation Manual

NEN® Model 4300 DNA Analyzer
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Chapter 1: Unpacking and Installation

**Placement in the Laboratory**

A Model 4300S weighs approximately 29 kg (64 lb) and a Model 4300L weighs 36 kg (80 lb). The system should be placed on a level laboratory bench that is sufficiently sturdy to bear its weight and rigid enough to prevent swaying during scanning.

Place the Model 4300 away from external heat sources (furnaces, radiators, distillation devices, etc.). Additional heating can cause high temperatures within the enclosure, resulting in instrument shutdown. Place the instrument away from sinks or other sources of water that pose a shock hazard. Recommended operating conditions are 15-35 °C and a dew point not greater than 20 °C. For proper ventilation, do not place the instrument in a location where the fans on the exterior of the instrument are blocked. Leave enough room so the fans can be accessed for periodic cleaning.

The Model 4300S and 4300L are both 47 cm (18.5”) deep and 51 cm (20”) wide. When the front door is fully open, 102 cm (40”) of width is required. The Model 4300S is approximately 59 cm (23”) tall and the Model 4300L is 84 cm (33”) tall.

The Model 4300 draws approximately 3 amperes current at 120V. If an extension cord is used, make sure the total of the ampere ratings on the instruments plugged into the extension cord does not exceed the extension cord ampere rating. Also make sure the total amperage of instruments plugged into the wall outlet does not exceed the amperage capacity for the outlet. In the United States, this is usually
15 or 20 amperes. Do not locate the Model 4300 where the power cord will be walked on or exposed to water or chemical spills.

**Leveling the Instrument**

The instrument should be leveled after it is initially placed in the laboratory or moved. The instrument must be level to prevent buffer solution from overflowing the tanks, and to ensure that the buffer levels can be gauged accurately.

A small bubble level is included in the accessories kit. Center the level on the platform below the heater plate. Each of the four plastic feet on the bottom of the instrument has a threaded insert that can be turned up or down to adjust its height. Adjust the feet as necessary, until the instrument is level. After the instrument is level, make sure all four feet contact the bench top to prevent the instrument from rocking.

**Installation Overview**

The Model 4300 is a server device that can be connected via TCP/IP to the system computer or to your network. The basic installation procedure in Chapter 2 describes how to connect the Model 4300 directly to the system computer and establish communication. For users who do not want to connect to a network, the installation procedure is complete after following the instructions in Chapter 2.
Users who want to connect to a network should perform the basic installation in Chapter 2, confirm proper operation, and then follow the network installation procedure in Chapter 3 to complete the installation. Connection to a network allows image data, sequence files, run parameters, and user access to be viewed or changed using any computer on the network.

**Firewall Recommendations**

For networks connected to the Internet, the safest way to protect your research and data is to put the Model 4300 and computer on a subnet that is behind a firewall. Inexpensive firewall appliances can perform this function. Contact your local IT department for help in selection and configuration if your organization does not already provide you with firewall protection. Legitimate, safe, remote access can still be achieved when the Model 4300 is protected by a firewall. Failure to adequately protect the Model 4300 instrument or its computer from attack via the Internet can have very serious consequences that are not covered by LI-COR's express or implied warranty.
Chapter 2: Basic Installation Procedure

**Introduction**

The installation procedure in this chapter configures both the Model 4300 and its computer. Communication is established by connecting the Model 4300 to the computer without using your network. Using this direct connection, you can verify that the instrument is working correctly and install any application software. After software installation, the computer can be used to start runs and analyze images. If you want to extend this basic configuration so files can be transferred over your network, the Model 4300 and computer can be connected to your network as described in Chapter 3.

The Ethernet switch and two Cat. 5 RJ-45 cables included with the system are required for the basic installation described in this chapter.

**Hardware Configuration**

1) Unpack the computer. Connect the monitor, keyboard, mouse and power cords as described in the computer manufacturer’s documentation. Connect the power cords, but don’t turn the computer on (Windows® setup is described later in this chapter).

2) Find the supplied Cat. 5 RJ-45 cable with a large black EMI filter attached to one end. Connect the end of the cable with the EMI filter to the network port on the Model 4300 back panel (Figure 2-1).
Basic Installation Procedure

3) Connect the other end of the Cat. 5 RJ-45 cable to any port numbered 1 - 4 on the switch (do not use the Uplink port).

4) Use a second Cat. 5 RJ-45 cable to connect the network port on the computer to any port numbered 1 - 4 on the switch (not the Uplink port).

**Figure 2-1.** Basic configuration using a switch.

If you need to install more than one instrument, connect each Model 4300 to one of the unused numbered ports (1-4) on the switch using the Cat. 5 RJ-45 cable with black EMI filter included with the instrument. Make sure to plug the end with the EMI filter into the Model 4300. (Note that port 5 on the switch is also available if you do not plan to connect to a network after basic installation.)
Power Connections

1) Use the tip of a pen or small screwdriver to move the shipping lock switch (located on the Model 4300 back panel) to the Operate (left) position.

2) If your system includes an uninterruptible power supply (UPS), connect the battery according to the manufacturers instructions. Connect the UPS to a supply outlet and turn on the UPS.

3) Plug the female end of the power cord into the power receptacle on the Model 4300 back panel and then plug the power cord into a receptacle on the UPS.

4) Connect the power cord to the Power port on the Ethernet switch and then apply power to the switch by plugging the power cord into the UPS or a supply outlet (there is no ON/OFF switch).

5) Make sure the door is closed and press the Power key on the instrument keypad.
CHAPTER 2
Basic Installation Procedure

The front panel power light turns on immediately. The display will remain blank for several minutes while the server software is loaded.

**Entering the Model 4300 IP Address**

When the Model 4300 is initially powered on, there is no IP address, so the Model 4300 requests the IP address as shown below.

![IP Type: Static](image)

The first task is to set the **IP TYPE** to **Static** and then enter 172.024.041.180 as the IP address.

1) If the **IP Type** is not **Static**, press the **Next** key to toggle the choices until **Static** is displayed.

2) Press **Start (Y)** to choose **Static**. Notice that the diamond shape next to **OK** on the display matches the diamond in the center of the **Start (Y)** key.

3) Enter the first number of the IP address by repeatedly pressing **Start (Y)** to increment the first digit until “1” is displayed.

4) With “1” displayed in first digit, press **Next** to move the cursor to the second digit. Use the **Start (Y)** key to increment the second digit until “7” is displayed and press **Next**.
5) Continue to enter each digit of the IP address (172.024.041.180) in this fashion.

6) When you have finished entering the last digit, press Next and you will be prompted to accept the IP address changes.

7) Press Start (Y) to confirm the address change.

Important: If you make a mistake, you cannot back up to make changes. Instead, press Stop (N) to cancel address entry. You can then restart the IP address entry routine by simultaneously pressing both the Stop (N) and Next keys.
CHAPTER 2
Basic Installation Procedure

Windows® Setup

When you start the computer for the first time, the Setup Wizard automatically guides you through the setup procedure. You will need to provide some information when the computer is started for the first time, including your name, organization, computer name, and administrator password.

1) Turn on the computer and complete the Windows setup procedure.

When entering account names and passwords, use names you will remember.

Important: LI-COR is not responsible for lost account names or passwords.

After finishing the setup procedure, follow the steps below to finish setup for operation with the Model 4300.

2) Choose Start > Control Panel on the Windows task bar.

3) Double click the Network Connections control panel.

4) Double click Local Area Connection.
5) In the Local Area Connection Status window, click **Properties**.

6) In the list of checked components, scroll down and select **Internet Protocol (TCP/IP)**.

7) Select **Show icon in notification area when connected** and click **Properties**.
8) Select **Use the following IP address**: and enter the IP address and Subnet mask as shown.

![Internet Protocol (TCP/IP) Properties](image)

9) Click **OK** to save the computer IP address.

10) Click **OK** to dismiss the Properties window, click **Close** to close the Local Area Connection Status window, and close the Network and Dialup Connections window. You are finished entering the computer IP address.

**Setting Date and Time**

1) In the Control Panel window, double-click the **Date and Time** control panel.
2) Update the date and time as needed and click OK to close the control panel.

![Date and Time Properties](image)

**Changing Power Management Settings**

During a run, the computer may be idle for a period of time. The default power management options for the computer will put the computer in standby mode after 20 minutes of idle operation. This can interfere with ongoing processes, so the power conservation features of the computer should be turned off.

1) In the Control Panel window, double-click **Power Options**.
2) Set **Turn Off Hard Disks, System Standby** and **System Hibernates** to **Never**.

3) Click **OK** to close the **Power Options** control panel, then close the Control Panels window.

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**Logging On to the Model 4300**

After entering the IP Address in the Model 4300 and setting up the computer, you should log on to the Model 4300 server and add a user account.

1) Open Internet Explorer.

*Note:* When the browser opens, you may get an error message that implies a connection failure or that the browser cannot find a certain server. This message is not related to the Model 4300 and can be dismissed. The message is displayed because the browser is configured to automatically load a “home” page from the Internet. If the computer is not connected to the Internet, the browser preferences can be used to disable automatic loading of a home page, if you so desire.
2) In the location (URL) field of the browser, enter http://172.24.41.180 and press **Enter** on the keyboard.

![Image of browser window with URL field filled with the IP address](image1)

**Note:** The address entered in the URL field is an abbreviated form of the Model 4300 IP address, not the address that was entered during setup (172.024.041.180). Leading zeros within each group of three digits should not be entered. Thus 024 becomes 24 and 041 becomes 41 when the IP address is entered in a browser.

3) If you have logged on correctly, a “home” page with four buttons will be displayed.

![Image of the 4300 DNA Analyzer home page](image2)

Adding User Accounts

4) Click **Utilities** on the home page. When prompted for a user name and password, enter admin in both fields and click **OK**.
“admin” is the default administrator account entered by LI-COR. You must be logged on using an account with administrator rights to add new user accounts. For everyday operation, user accounts with control rights should be used. Additional information about creating accounts can be found in the Model 4300 Operator’s Manual.

5) Click the **Manage User Accounts** link on the Utilities page.

6) Click **Add Account**.
7) Enter a new user account name and password. Confirm the password by typing it again in the **Confirm** field.

8) Select the **Control** button under **Set Account Rights**.

   *Control rights should be assigned to typical users. With Control rights a user can operate the DNA analyzer, perform new runs, and download image data. Administrator rights should not be used for daily operations.*

9) Click **Create User Account**. The list of user accounts is updated to include your new account. Repeat steps 6-9 for any additional user accounts you may wish to add.

10) Close the browser to log off of the server software.

   Setup of the server software is complete. The next step is to configure your browser for use with the Model 4300 and install e-Seq™ or Saga™ application software (if any) on the computer.
Installing Application Software

If you purchased e-Seq or Saga application software, you must also install those programs as recommended in their individual manuals. Installation of e-Seq is described in Chapter 1 of the e-Seq User Guide. e-Seq version 3.0 or above is required for operation with the Model 4300. Installation of Saga is described in Chapter 3 of the Saga Administrator’s Guide. Saga version 3.1 or above is required for operation with the Model 4300.

After installing e-Seq or Saga, the Model 4300 needs to be added to the list of available scanners before it can be used to start a run. Consult Chapter 9 of the e-Seq User Guide or Chapter 3 of the Saga Administrator’s Guide for instructions on adding scanners.

What’s Next?

Basic installation is now complete. If you purchased e-Seq or Saga, a good way to learn how to operate the Model 4300 is to complete the tutorial exercises in the e-Seq or Saga Tutorial Manual. If you did not purchase application software, the Model 4300 Operator’s Manual has detailed instructions on how to operate the Model 4300 using browser software.

If you want to add the Model 4300 to your local network, contact your network administrator and follow the instructions in Chapter 3 of this manual. An alternate configuration for computers with two network cards is described in Chapter 4. If you are not planning to connect to a network, installation is complete and you don’t need any of the other instructions in this installation guide.
Chapter 3: Connecting the Model 4300 to a Network

Introduction

Before starting the network setup procedure described in this chapter, you should perform the basic installation described in Chapter 2 and verify that the Model 4300 is operating correctly. This chapter describes how to extend the basic installation configuration by connecting the Model 4300 and computer to your network using Internet Protocol (TCP/IP). Your network administrator can help with other types of networks (i.e., NetBIOS).

The Model 4300 is a network server device that can be connected to a network, and ultimately to a computer, via TCP/IP. This allows any computer on the network to access the Model 4300 using e-Seq or Saga application software, or an Internet browser. When connected to a network, image data, run parameters, and user accounts can be viewed or changed over the network. Finished runs are downloaded from the Model 4300’s hard disk to local drives for storage and analysis. For additional privacy, a computer with two network cards can be used to create two separate networks – one for the Model 4300 and one for a local area network (see Chapter 4).

Your network administrator will need to provide certain information before you begin. If your network administrator cannot be present during setup, you may want to have the administrator fill out the network address form in the Appendices (Chapter 4) so you can complete the installation.
CHAPTER 3
Connecting The Model 4300 To A Network

Configuring the Model 4300 for Network Operation

The Model 4300 can be quickly configured using an Internet browser to open the network setup page in the server software.

1) Start your Internet browser (Netscape 4.5 or above, or Internet Explorer 5.0 or above) and enter http://172.24.41.180 in the location/URL field.

2) On the Model 4300 “home” page, click Utilities.

When prompted for a user name and password, enter admin in both fields (or use some other administrator account, if you have already created one).
3) Click the **Networking Setup** link on the Utilities Page.
Network Addressing Schemes

The Model 4300 Networking Setup page gives you many choices for configuring the network addresses. The relative merits of several possible configurations are discussed below.

Static Addresses vs. DHCP: To log on to the Model 4300 server, you must use the IP address or host name (if a host name is assigned). A static IP address is easier to use with the Model 4300 because it never changes. Dynamic Host Configuration Protocol (DHCP) is often used by network administrators since DHCP servers automatically assign a unique IP address to each network device, making IP address management easier. These addresses automatically expire after a
period of time and a new IP address assigned. When the IP address automatically expires, you will not be able to use the Model 4300 until you determine the new IP address using the instrument keypad (described later in this chapter). For this reason, static IP addresses are generally more trouble-free, though a dynamically assigned address with a long expiration accomplishes the same goal.

**Using Host Names:** A host name (i.e., analyzer1) can be assigned by your network administrator to identify the Model 4300 by name, rather than IP address. In the location/URL field of the browser, the host and domain names are entered instead of the IP address (i.e., http://analyzer1.yourlocation.com). Since host names are usually easier to remember, they generally make it easier for users to log on.

**Using the Networking Setup Page**

Each of the fields on the Networking Setup page are described below. Enter only the addresses assigned by your network administrator.

1) Select the type of IP address by clicking either **Use DHCP** or **Static IP**.

2) If **Static IP** is selected, enter the **IP Address** and **Net Mask** assigned by your network administrator.

   If **Use DHCP** is selected, the IP address will be changed by your network (usually within a five minutes after hardware connection). The new address can be determined using the keypad as described later in this chapter.

3) To use a host name, enter the host name (if any) assigned by your network administrator in the **Host Name** field.

4) In the **Gateway** field, enter the address of the router that connects your subnet to the rest of the network.
5) Enter the domain name in the **Domain** field and enter the IP address of the domain name server(s) that will be used to resolve the host name in the **Domain Name Servers** field. If there is more than one domain name server, enter only one address per line in the field.

6) Click the **Configure** button to send the changes to Model 4300 and then close your Internet browser software.

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**Configuring Windows XP for Network Operation**

In Chapter 2, you used the **Network Connections** control panel to enter an IP address for the basic installation. Before connecting the computer to your network, you must use the **Network Connections** again to enter the network addresses assigned by your network administrator. If your network administrator will not be present during installation, a network address form is given in Chapter 4 that your administrator can fill in with the necessary addresses. Use the steps below to change the network addresses for the computer.

1) In the Windows **Start** menu, choose control panel.

2) Double click the **Network Connections** control panel.
3) Double click **Local Area Connection**.

4) In the Local Area Connection Status window, click **Properties**.
5) In the list of connection items, scroll down and select **Internet Protocol (TCP/IP)**.

6) Click **Properties**.

The Internet Protocol (TCP/IP) Properties window is displayed.
7) To use a static IP address for the computer, select **Use the following IP address** and enter the **IP address**, **Subnet mask**, and **Default gateway** as assigned by your network administrator.

If you have a DHCP server that automatically assigns the IP addresses, select **Obtain an IP address automatically**.

8) Enter the fields for DNS server addresses according to the recommendations of your network administrator.

9) Click **OK** to enter the changes and dismiss the Internet Protocol Properties window.

10) Click **OK** to dismiss the Properties window, click **Close** to close the Local Area Connection Status window, and close the Network Connections window.

Now you are ready to make the hardware connections to the network and verify that you can communicate through the network.
Hardware Configuration

The basic hardware installation described in Chapter 2 results in the instrument and computer being connected to two of the numbered ports Ethernet switch as shown below.
To change this basic configuration into a network configuration, use a third Cat. 5 RJ-45 cable (not provided) to connect the Uplink port on the Ethernet switch to a network wall port as shown below.

The network cards in the computer and Model 4300 will automatically determine the connection speed (10 Mbps or 100 Mbps) available via the network and will switch accordingly.
If two network wall ports are available, you can also use an alternate cable configuration that eliminates the Ethernet switch. Both the Model 4300 and computer can be connected directly to a network wall port, rather than to the switch as shown below.

Verifying the Network Configuration

If your network administrator has made the necessary changes to your network and you are using a static IP address, you should be able to log back on to the Model 4300 by opening your Internet browser and entering http:// plus the new IP address in the URL/location field. Similarly, if you are using a host name, you should now be able to log on by entering http:// and the host name. (Your network administrator will supply the syntax.) If you log on correctly, you will see the Model 4300 home page.

If you chose to use DHCP to automatically assign an IP address, the IP address must be determined as described in the next section before you can log on to Model 4300.
When using Dynamic Host Configuration Protocol (DHCP), the Model 4300 is assigned a new IP address a few minutes after being connected to the network. The new IP address must be determined as described below.

**Determining a Dynamically Assigned IP Address**

1) Start the IP Address entry routine by simultaneously pressing both the **Stop (N)** and **Next** keys on the keypad. (If they are not pressed simultaneously, the **Next** or **Stop** function will be executed.)

2) Select **Static**, press **Start (Y)** and the current IP address will be displayed. Write this number down since this is the IP address you will need to log on.

3) Press **Stop (N)** to cancel IP address changes and leave the address unchanged.

The IP address determined by this method may periodically change. At some point in the future, you may try to log on and get an error
message. If so, the procedure above can be used to verify that the IP address before performing any other troubleshooting.

**Configuring Scanners in the Application Software**

If you are using e-Seq or Saga application software, the Model 4300 needs to be added to the list of available scanners before it can be used to start a run. Consult Chapter 9 of the e-Seq User Guide or Chapter 3 of the Saga Administrator’s Guide for instructions on adding scanners.

**What’s Next?**

Network installation is now complete. If you purchased e-Seq or Saga, a good way to learn how to operate the Model 4300 is to complete the tutorial exercises in the e-Seq or Saga Tutorial Manual. If you did not purchase application software, the Model 4300 Operator’s Manual has detailed instructions on how to operate the Model 4300 using Internet browser software.
Chapter 4: Appendices

Configuring Computers With Two Network Cards

Chapter 2 describes a basic stand-alone configuration with no local area network (LAN) connection and Chapter three describes connection of both the computer and the Model 4300 to a LAN. An alternate configuration is available for computers with two network interface cards (NICs), which is standard on computers from LI-COR (U.S.A. and Canada only) after September 2005.

With two NICs, each card can be configured separately. The computer can have a stand-alone configuration with the Model 4300 using one NIC, and a connection to a LAN using the other NIC. This configuration has the following advantages:

- The Model 4300 is isolated from the LAN, preventing unwanted access to the Model 4300 hard disk or operating system. Note, however, that you will not be able to access the Model 4300 from remote computers such as your office computer.

- The Model 4300 is configured with static IP addresses on a separate network, preventing periodic communication loss if IP addresses expire and a DHCP server issues new ones.

- IT departments that use predominantly DHCP don't have to issue static IP addresses and the computer can be configured for the LAN in a routine way with no consequences to the Model 4300 installation.
Connections

1) Identify the two network cards (NIC-1 and NIC-2).

2) Connect NIC-1 to your LAN and configure NIC-1 with DHCP or a static IP address as directed by your network administrator.

3) Use the basic installation procedure described in Chapter 2 to connect NIC-2 and the Model 4300 to numbered ports on the provided network switch. Configure NIC-2 with a static IP address of 192.168.0.1 and the Model 4300 with a static IP address of 192.168.0.2. The subnet mask for both should be 255.255.0.0.

Configuring a Netscape Browser

During a run, the Model 4300 creates gel images in the form of TIFF files (*.tif). Most web browsers contain a preferences file that determines how external files are handled; for example, .pdf files can be downloaded or opened within the browser using Adobe Acrobat's
PDF file plug-in. Similarly, there are applications within some browsers that enable the user to view .tiff files. When you try to save a TIFF file, older versions of the Netscape browser may open a helper application to view the file rather than saving it.

Newer versions of the Netscape browser allow you to choose whether to view or save a file. Older versions, such as version 4.7, require a change to the preferences in order to save files rather than view them. To configure older Netscape browsers to save .tiff files created by the Model 4300, you may need to alter the preferences file as described below.

1) Open the browser and select Preferences from the Edit menu.
2) In the Category list, click Applications. Under Applications scroll the list and highlight TIFF Image.
3) Click **Edit** and select the **Save to Disk** radio button.

![Image of Edit Type dialog box]

4) Click **OK** to dismiss the windows.

---

**Connecting Multiple Instruments**

Where multiple network wall ports are available, additional instruments can be connected directly to network wall ports. When connecting each instrument, make sure to use the Cat. 5 RJ-45 cable (provided) that has the large black electromagnetic interference (EMI) filter. Connect the end with the EMI filter to the Model 4300.
If there are not enough network ports available for all instruments, an Ethernet switch (provided) can be used to make more ports available.

In this configuration, ports one through four on the switch are available for computers or instruments (do not use port five). If more network ports are needed, another switch can be added by connecting the Uplink port on a second switch to port 1, 2, 3, or 4 on the first switch.

The same connection scheme shown above can also be used to connect multiple DNA analyzers in a stand-alone configuration, except the uplink port is not connected to a network and port five on the switch is available for connection to an instrument or computer.

**Important:** When connecting multiple instruments and computers, make sure the IP addresses are unique for each device.
## Network Address Form

<table>
<thead>
<tr>
<th>Model 4300</th>
<th>Computer</th>
</tr>
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<tr>
<td><strong>Check One</strong></td>
<td><strong>Check One</strong></td>
</tr>
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<td>[ ] DHCP</td>
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<tr>
<td>[ ] Static IP Address</td>
<td>[ ] Static IP Address</td>
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### Model 4300

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</tr>
<tr>
<td>Net Mask</td>
<td></td>
</tr>
<tr>
<td>Host Name</td>
<td></td>
</tr>
<tr>
<td>Gateway</td>
<td></td>
</tr>
<tr>
<td>Domain</td>
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