CONNECTING YOUR NXT TO A COMPUTER

Before you try to set up a wireless Bluetooth connection, make sure that your computer has Bluetooth capability.

If your computer does not have built-in Bluetooth capability, you must use a Bluetooth USB dongle. Make sure that you use the right type of Bluetooth USB dongle. Read more about the different types of Bluetooth USB dongles to use at www.MINDSTORMS.com/bluetooth
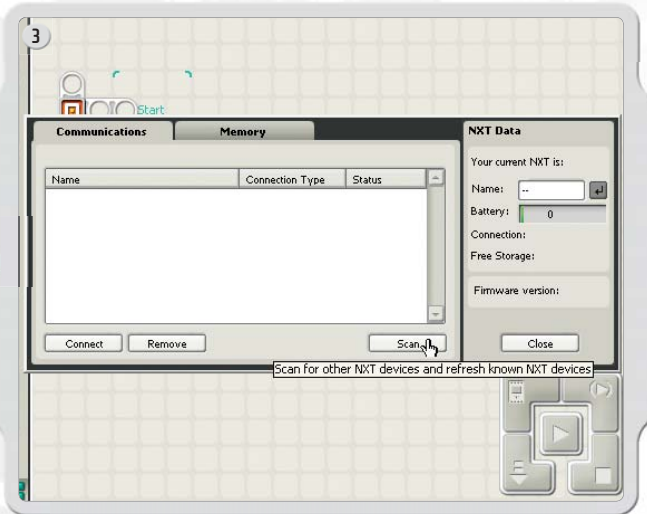
MAKING THE CONNECTION TO A PC

1

Make sure that your NXT is turned on. Also make sure that you have Bluetooth set to On and that your NXT is set to be Visible (read how in the Bluetooth submenu on the NXT on page 34). Also make sure that Bluetooth is installed and enabled on your computer. See your computer's and Bluetooth USB dongle's instruction manuals for details.
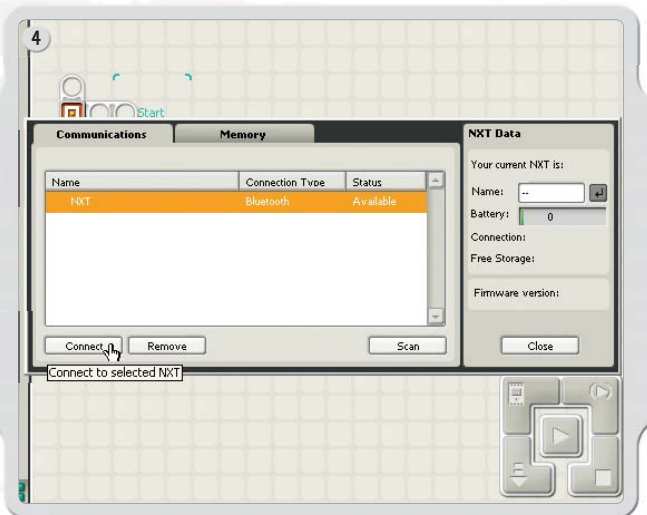
2

NXT window

Find the Controller at the lower right corner of the work area in the software. Click on the NXT window button (the one at the upper left) and the NXT window will open.
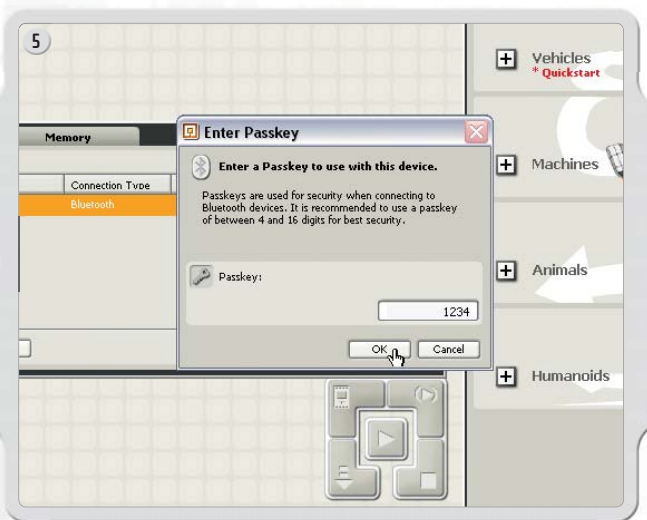
3

Communications | Memory

NXT Data

Your current NXT is:

| Name | Connection Type | Status |

Name: --
Battery: 0
Connection:
Free Storage:

Firmware version:

Connect | Remove | Scan

Close

Scan for other NXT devices and refresh known NXT devices

Click Scan. Your computer will automatically search for Bluetooth devices.

4

Communications | Memory

NXT Data

Your current NXT is:

| Name | Connection Type | Status |
| NXT | Bluetooth | Available |

Name: --
Battery: 0
Connection:
Free Storage:

Firmware version:

Connect | Remove | Scan

Close

Connect to selected NXT

After a short interval, a list of available Bluetooth devices will appear in the window on the computer screen. Select the device you want to connect to and click the Connect button.

5

Vehicles
* Quickstart

Memory

| Connection Type |
| Bluetooth |

Enter Passkey

Enter a Passkey to use with this device.

Passkeys are used for security when connecting to Bluetooth devices. It is recommended to use a passkey of between 4 and 16 digits for best security.

Passkey:

1234

OK | Cancel

Machines

Animals

Humanoids

When you connect to a device for the first time, the Enter Passkey window will pop up. Enter the passkey to use with this device (the default passkey is 1234) and click OK.
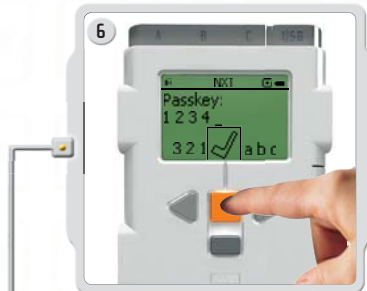
Enter the passkey on your NXT and confirm the connection by pushing the orange (Enter) button. If you have chosen the default passkey, just click the orange (Enter) button.
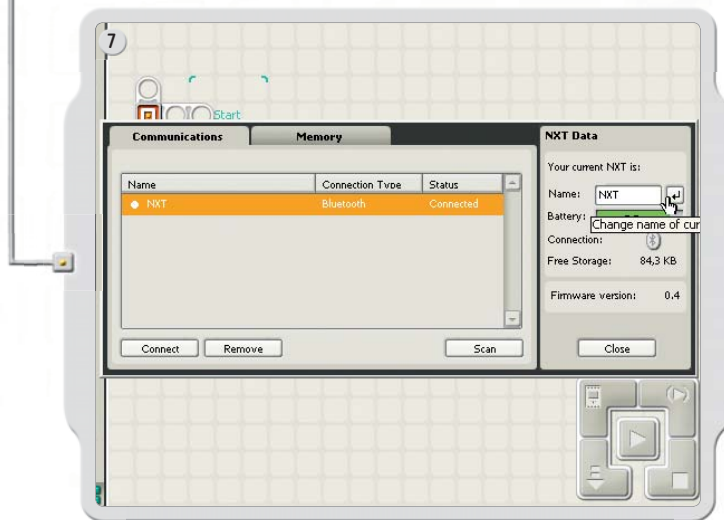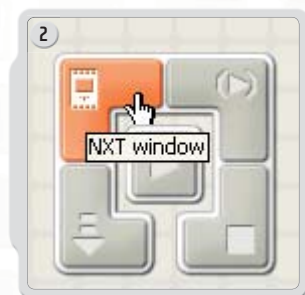
In the NXT window, the status of your NXT has now changed from Available to Connected. Your NXT and computer are now connected and can share data.
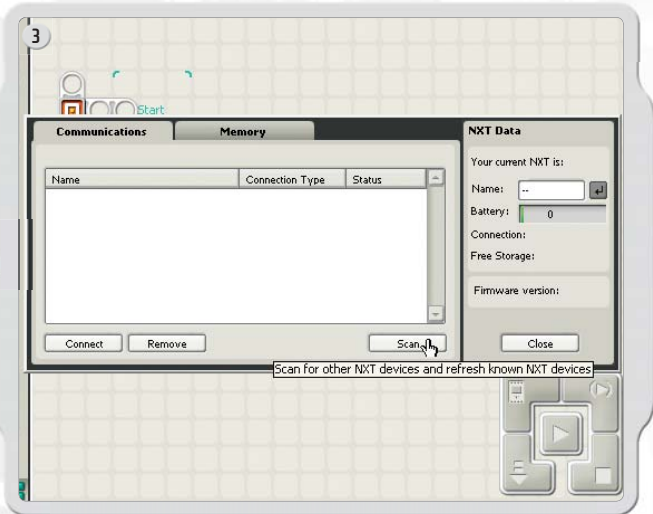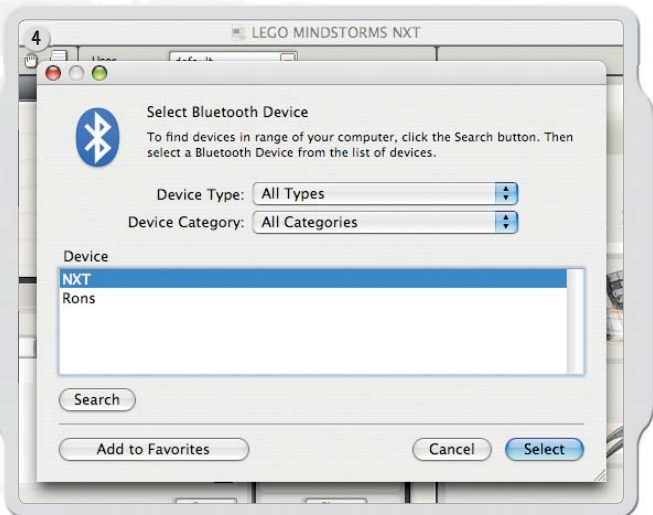

MAKING THE CONNECTION TO A MACINTOSH

Make sure that your NXT is turned on. Also make sure that you have Bluetooth set to On and that your NXT is set to be Visible (read how in the Bluetooth submenu on the NXT on page 34). Also make sure that Bluetooth is installed and enabled on your computer. See your computer's and Bluetooth USB dongle's instruction manuals for details.
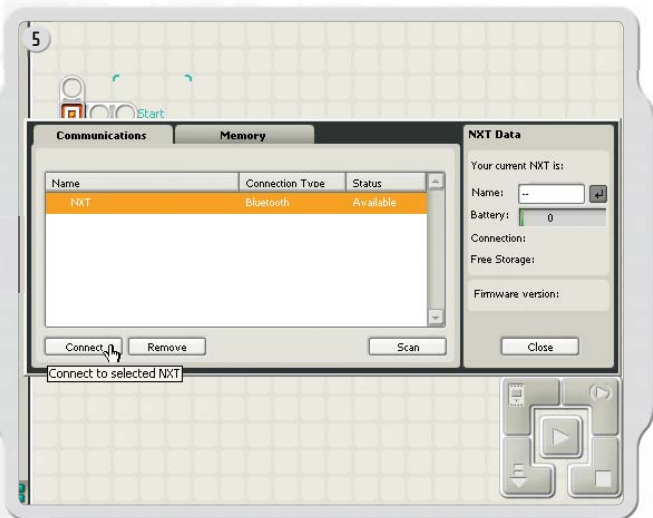

Find the Controller at the lower right corner of the work area in the software. Click on the NXT window button (the one at the upper left) and the NXT window will open.

3

Communications | Memory

NXT Data

Your current NXT is:

Name	Connection Type	Status

Name: --
Battery: 0
Connection:
Free Storage:
Firmware version:

Connect | Remove | Scan | Close

Scan for other NXT devices and refresh known NXT devices

Click Scan. The Bluetooth device window will pop up on the screen.

4

LEGO MINDSTORMS NXT

Select Bluetooth Device

To find devices in range of your computer, click the Search button. Then select a Bluetooth Device from the list of devices.

Device Type: All Types
Device Category: All Categories

Device
NXT
Rons

Search
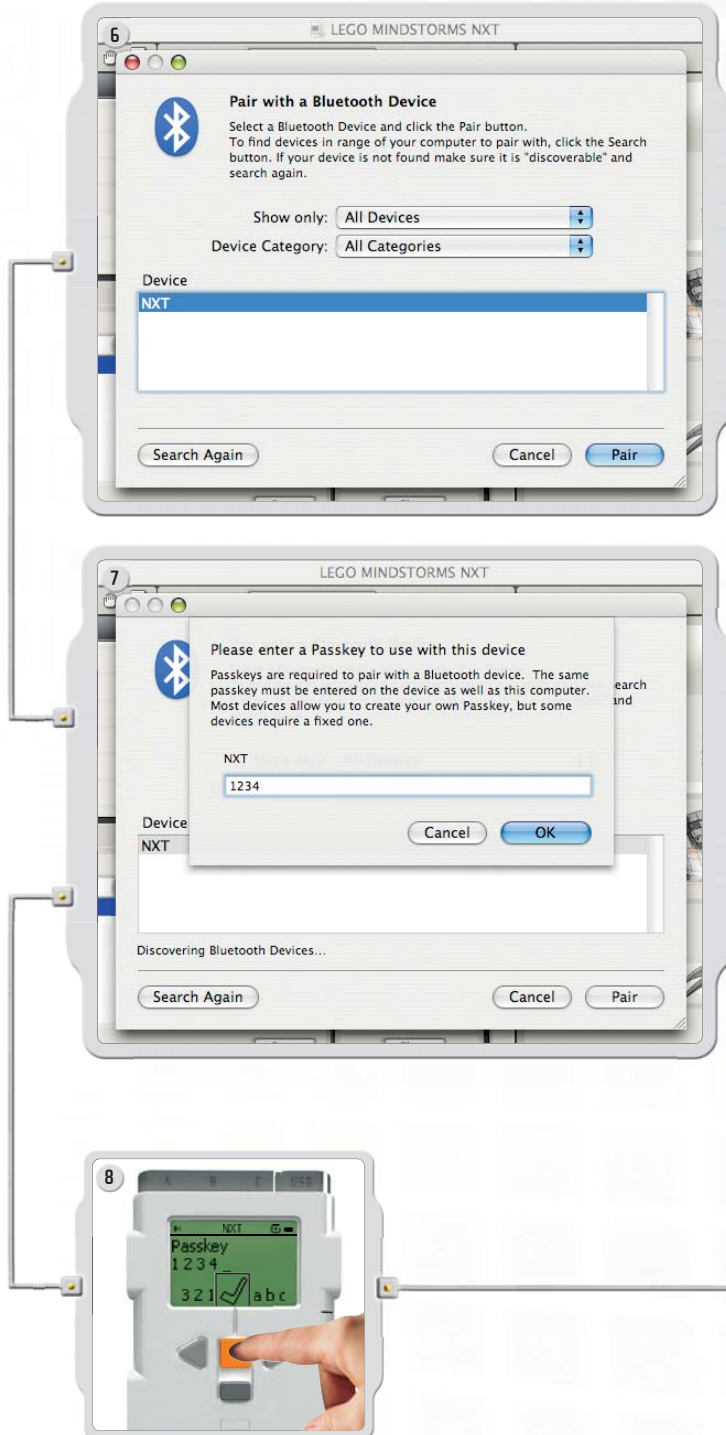
Add to Favorites | Cancel | Select

A list of Bluetooth devices will appear in the Select Bluetooth Device window on the screen. Select the device you want to connect to and click the Select button.

5

Communications | Memory

NXT Data

Your current NXT is:

Name	Connection Type	Status
NXT	Bluetooth	Available

Name: --
Battery: 0
Connection:
Free Storage:
Firmware version:

Connect | Remove | Scan | Close

Connect to selected NXT

The NXT that you want to connect to appears in the NXT window as available. Click the Connect button.

The Pair with a Bluetooth Device window pops up. Select the NXT. Click Pair.

When you connect to a device for the first time, a Passkey window will pop up. Enter the passkey to use with this device (the default passkey is 1234) and click OK.
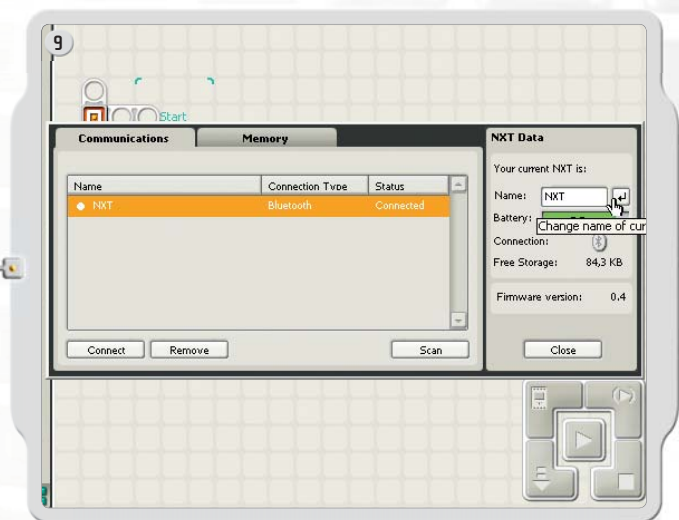

Enter the passkey on your NXT and confirm the connection by pushing the orange (Enter) button. If you have chosen the default passkey, just click the orange (Enter) button.

Your Macintosh and NXT are now connected and can share data.

BLUETOOTH SUBMENU ON NXT

Bluetooth
Select the Bluetooth submenu on the NXT display.

Search
Search for other Bluetooth devices. After you have chosen the Search icon, your NXT will automatically start to search for other Bluetooth devices that it can connect to.

My Contacts
You can see all of your trusted Bluetooth contacts in My Contacts. These contacts can automatically connect and send data to your NXT without using a passkey. To add a new contact to the list, you must have been connected to the contact before. Devices which you have been connected to, will automatically be added to the list in My Contacts.

Connections
This item displays your current connections. You can connect your NXT to three devices at the same time (on Line 1, 2 and 3), while one device can connect to you (on Line 0). Note, however, that while you can be "connected" to up to three devices, you can only "communicate" with one device at a time.
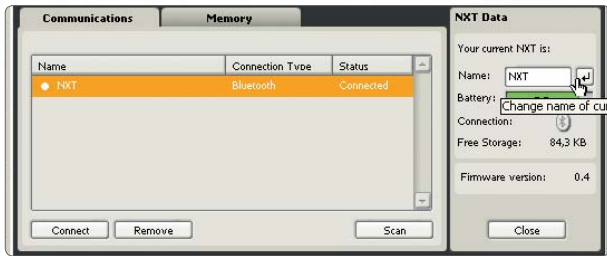
You can also view the connection status in the NXT window in the software. There you can change the name of your NXT, check battery and memory levels, and delete programs on your NXT.

Check the connection status in the icon bar at the top of the NXT's display.
If there is no Bluetooth icon shown, Bluetooth is OFF.

Bluetooth is ON but your NXT is not visible to other Bluetooth devices.

Bluetooth is ON and your NXT is visible to other Bluetooth devices.

Bluetooth is ON and your NXT is connected to a Bluetooth device.

Visibility
Use the Visible option to make your NXT visible or invisible to other Bluetooth devices when they do a Bluetooth search.

Passkey
The Passkey ensures that only Bluetooth devices approved by you can connect to your NXT. Whenever you connect to a Bluetooth device for the first time using your NXT, you will be asked for a passkey. Select the preset passkey 1234 or make up your own code. Other Bluetooth devices must know your passkey in order to confirm a connection with your NXT.
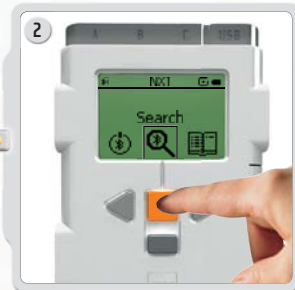
On/Off
You can turn Bluetooth functionality on or off. If you turn Bluetooth off, you will not be able to send or receive data over Bluetooth. To save battery power, turn off the Bluetooth function when it is not in use.
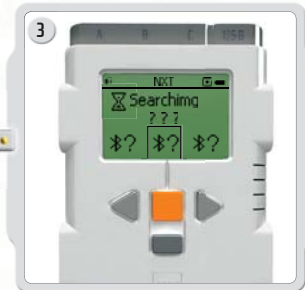
Note! Bluetooth is turned off by default.
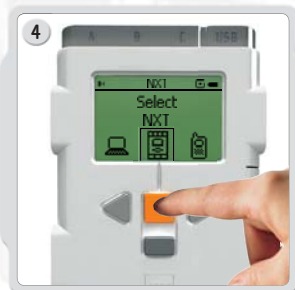
CONNECTING YOUR NXT TO ANOTHER NXT


Select the Bluetooth submenu on the NXT's display.

Select the Search icon to search for other Bluetooth devices. Your NXT will automatically search for Bluetooth devices.

Depending on how many devices are detected in the area, a list will pop up on the NXT's display after a few seconds.

Select the device you want to connect to. Remember that you can give each NXT a unique name
– see Naming the NXT on page 11.
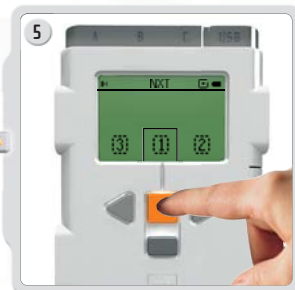
Select which of the three lines of communication you want the connection to be on (1, 2 or 3). You can connect your NXT to three different devices at the same time.
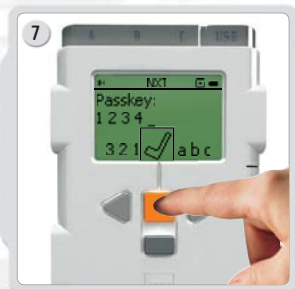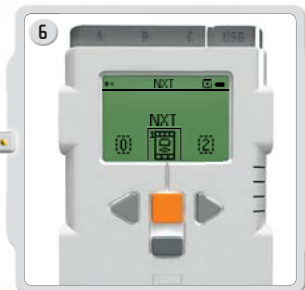
If you connect to a device for the first time, your NXT will ask for a passkey. Just press enter to use the default passkey 1234 or make up your own code. The other Bluetooth device must know your passkey in order to confirm the connection. This means that the two NXTs need to to enter the same passkey in order to connect.

If you want to connect your NXT to more than one Bluetooth device, go to the My Contacts submenu to select a trusted contact or start a new search.
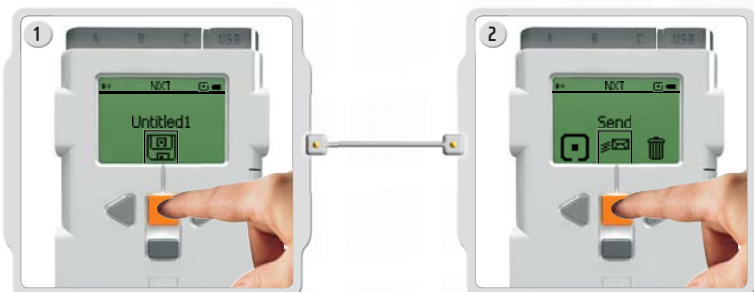
Connecting to more than one NXT

You can connect up to three NXTs or other Bluetooth devices to your NXT at the same time. However, you can only communicate with one device at a time.

Sending files from NXT to NXT

It's easy to send programs from your NXT to another NXT:

Make sure that your NXT is connected to the NXT to which you want to send the program (see page 36, Connecting your NXT to another NXT).
Select the My Files submenu in the NXT's display and select the program you want to send.

Select Send.
Select which of the connected devices you want the program to be sent to (Line 1, 2 or 3).

Your NXT will now send the file.
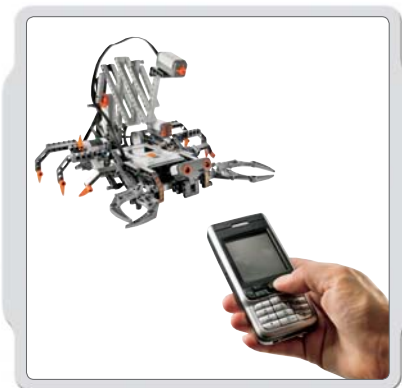
Connecting your NXT to a mobile phone

If you have a mobile phone with Bluetooth capability, you can use it with your LEGO® MINDSTORMS® NXT set. Go to www.MINDSTORMS.com/bluetooth for more information on mobile phone requirements. Here you can also download the MINDSTORMS NXT Bluetooth connection program for your mobile phone and get additional information on how to connect your NXT to mobile phones.

SYSTEM REQUIREMENTS

POWERED BY
NATIONAL INSTRUMENTS
LabVIEW
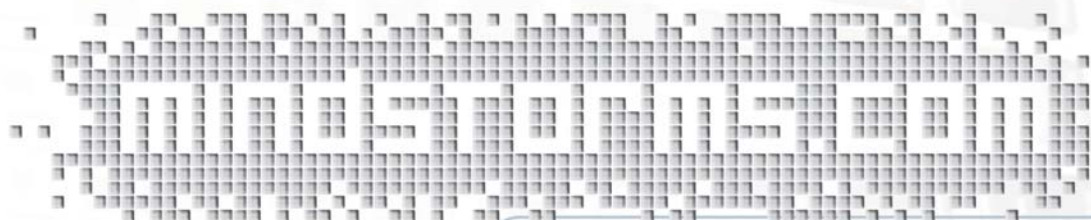
Before installing the LEGO® MINDSTORMS® NXT Software, you must make sure that your computer meets the following minimum system requirements:
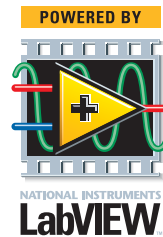
Windows
- Intel® Pentium® processor or compatible, 800 MHz minimum
- Windows XP Professional or Home Edition with Service Pack 2
- 256MB of RAM minimum
- Up to 300MB of available hard disk space
- XGA display (1024x768)
- 1 available USB port
- CD-ROM drive
- Compatible Bluetooth adapter (optional)*

Macintosh
- PowerPC® G3, G4, G5 processor, 600 MHz minimum
- Apple MacOS X v. 10.3.9 or 10.4
- 256MB of RAM minimum
- Up to 300MB of available hard disk space
- XGA display (1024x768)
- 1 available USB port
- CD-ROM drive
- Compatible Bluetooth adapter (optional)*

*Supported Bluetooth software include Widcomm® Bluetooth for Windows (newer than v. 1.4.2.10 SP5), and the Bluetooth stacks included in Microsoft Windows XP (with Service Pack 2) and Apple MacOS X (10.3.9 and 10.4). For more details on compatible Bluetooth adapters, see www.MINDSTORMS.com/bluetooth.

INSTALLING THE SOFTWARE

Microsoft Windows
Exit all open programs.
Insert the CD-ROM.
If the CD-ROM does not run automatically:
- click the Start button (at the bottom left-hand corner of your screen)
- click Run
- type d:\autorun.exe (where d: is your CD drive)

Select your preferred language.
Follow the on-screen instructions.

LEGO® MINDSTORMS® NXT
Software v1.0

Nederlands
English
Français
Deutsch
日本語
Exit

LEGO mindstorms

Apple Macintosh
Exit all open programs.
Insert the CD-ROM.

Open the "LEGO MINDSTORMS NXT" CD-ROM and double-click Install.
Select your preferred language.
Follow the on-screen instructions.

When the installation procedure is complete, click Finish. You are now ready to use the
LEGO MINDSTORMS NXT Software and create programs for cool robotic inventions.
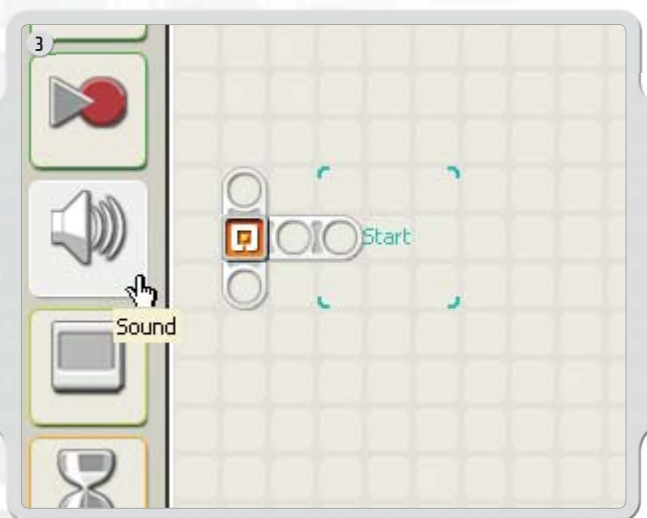
YOUR FIRST PROGRAM

This simple program will make the NXT play a sound file. It will help you understand how to connect your computer to the NXT.

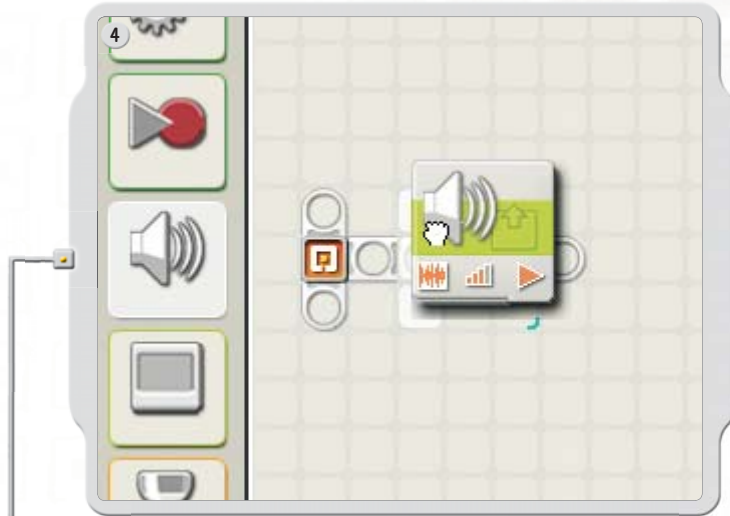Start the software on your PC or Macintosh by double-clicking the program icon.
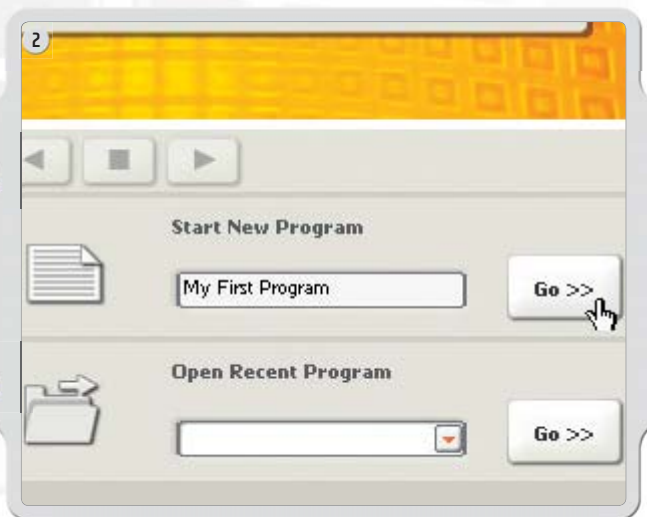
Type in the name of your first program, or just click on Go!

First, click on the Sound block icon in the programming palette.

Drag a Sound block and drop it to the right of the
Starting point in the work area.
Your program is now ready to download and run.

Make sure you turn on your NXT and connect the USB
cable to both your computer and the NXT (see page 8,
Connecting the NXT technology).

Locate the Controller in the lower right corner of the
work area. Click Download and run (the central but-
ton) and listen to what happens.

Congratulations, you have completed your first
program!

Download and run

SOFTWARE USER INTERFACE

A quick overview

1. Robo Center
2. My Portal
3. Tool bar
4. Work area
5. Little help window
6. Work area map
7. Programming palette
8. Configuration panel
9. Controller
10. NXT window
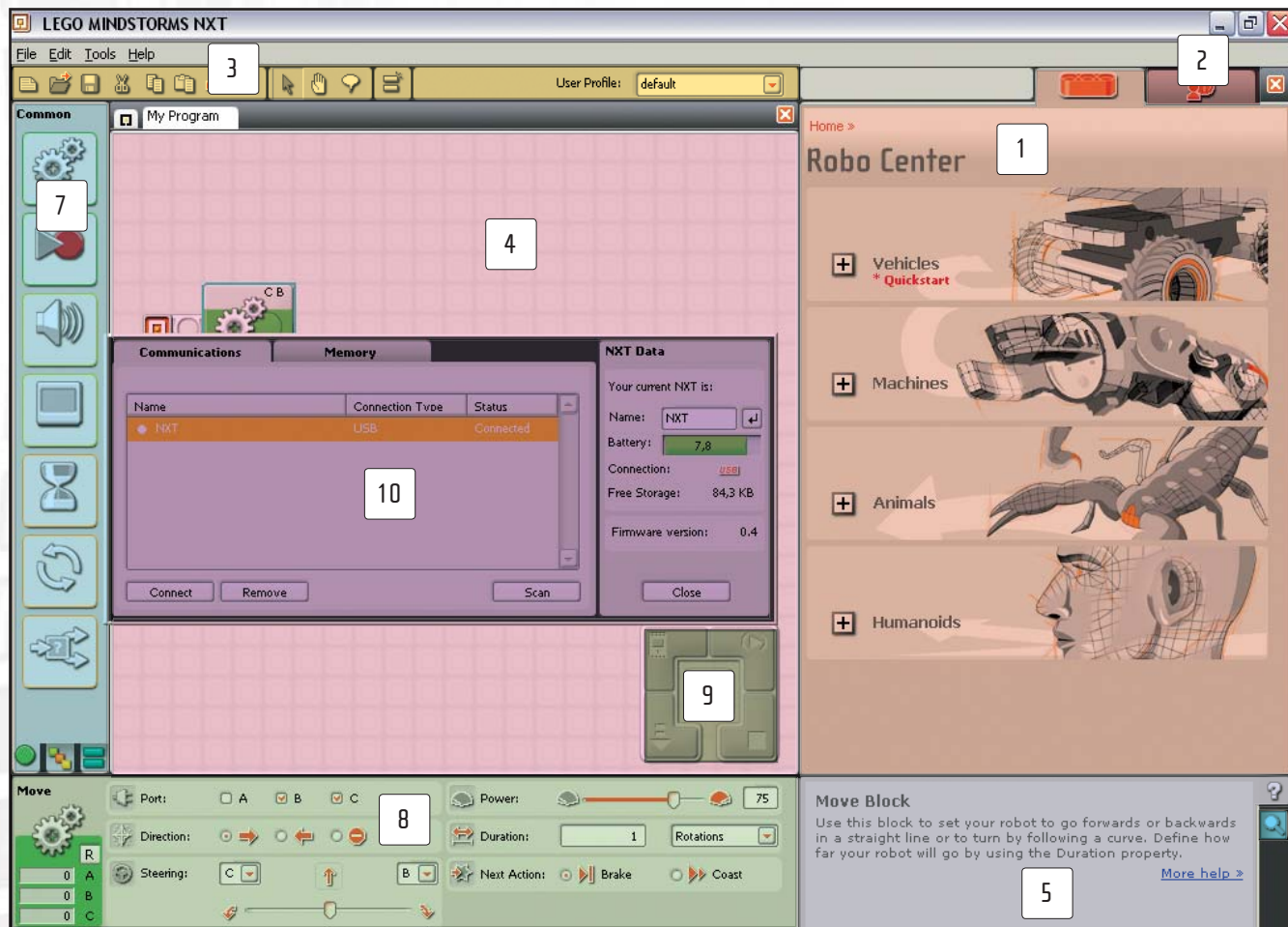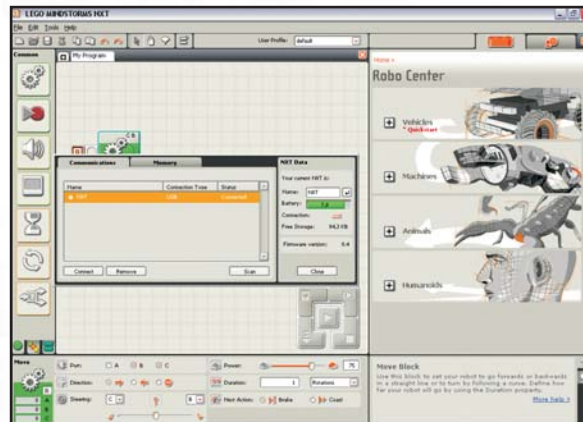
1 **Robo Center window**
Here you can find building and programming instructions for four cool models.

2 **My Portal**
Here you can access www.MINDSTORMS.com while programming your robots.
You can get more robotic challenges and download programs, sound effects and other cool stuff.

3 **The tool bar**
The tool bar includes the most frequently used commands from the menu bar in an easy-to-reach location.

4 **The work area**
This is the space on the screen where programming takes place. Drag programming blocks from the programming palette to the work area and attach the blocks to the sequence beam.

5 **Little help window**
Here you can always get help if needed.

6 **The work area map**
Use the pan tool on the tool bar to move around the work area – and use the work area map (tab in the lower right corner) to get an overview.

7 **The programming palette**
The programming palette contains all of the programming blocks you will need to create your programs. The tabs at the bottom of the palette let you switch between the common palette (containing the most frequently used blocks), the complete palette (containing all of the blocks), and the custom palette (containing blocks that you download or create yourself).

8 **The configuration panel**
Each programming block has a configuration panel that lets you customize the block for the specific input and output that you want.

9 **The Controller**
The five buttons on the Controller let you download programs (or parts of programs) from your computer to the NXT. With the Controller you can also change the settings of your NXT.

10 **The NXT window**
This pop-up window will give you information about your NXT's memory and communications settings.

THE ROBO CENTER
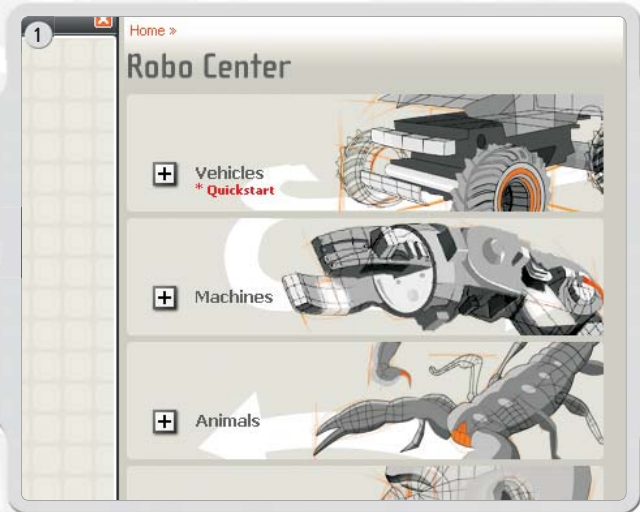
In the Robo Center you will find different robot models that you can build and program to do what you want.
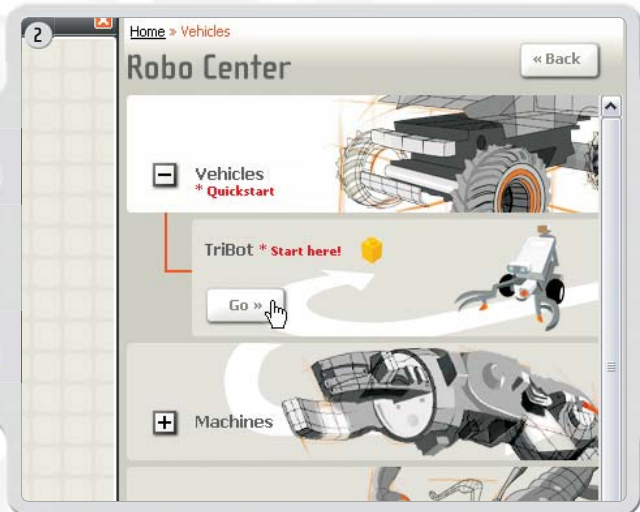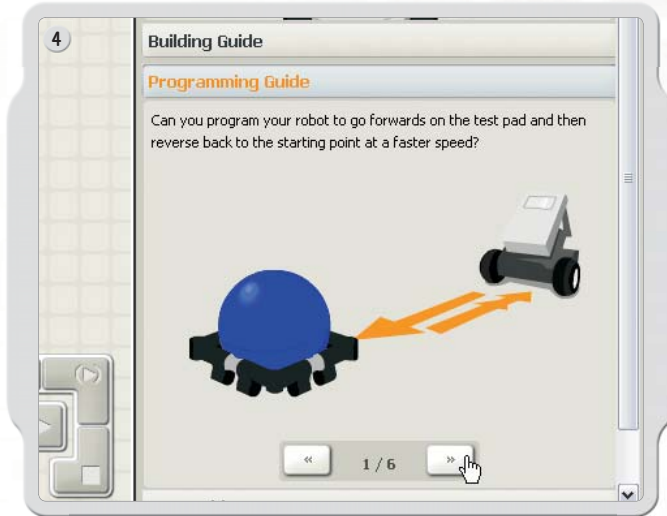
Start by selecting a robot model to build and program. We recommend that you start with the TriBot as it is a continuation of the Quick Start model included in the box.
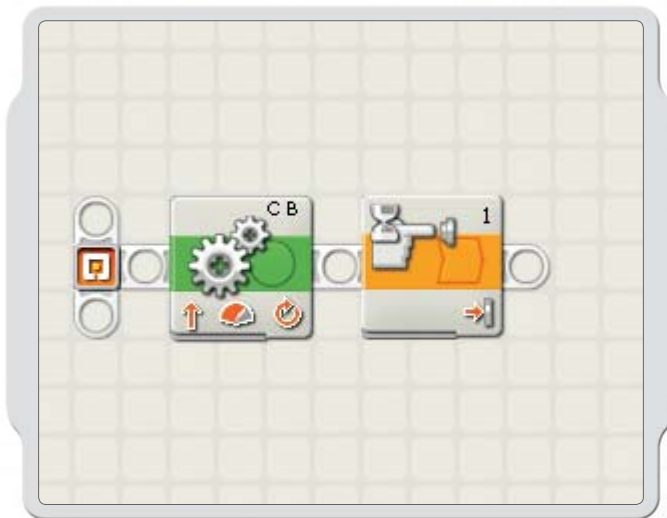
Follow the on-screen building and programming instructions – or solve the challenge on your own.

Test your robot using the challenges provided.

Building Guide

Programming Guide

Can you program your robot to go forwards on the test pad and then reverse back to the starting point at a faster speed?

1 / 6

THE PROGRAMMING PALETTE

The programming palette contains all of the programming blocks you will need to create your programs. Each programming block determines how your robot acts or reacts. By combining blocks in sequence, you can create programs that will make your robot come to life.

When you have finished creating your program, download it to the NXT and run it.

Remember to turn on and connect your NXT before downloading a program.

Download

Common palette

To simplify its use, the programming palette has been divided into three palette groupings: the common palette (containing the most used blocks), the complete palette (containing all of the programming blocks), and the custom palette (containing blocks you download or create yourself).

We recommend that you to start with the blocks in the common palette. You should be able to finish all of the starter challenges in the Robo Center with just these blocks. The software's help area has more information about the rest of the programming blocks when you are ready to move on.

Move block
This block controls the robot's motors and synchronizes its movements. Use this block to set your robot to go forwards or backwards in a straight line or to turn by following a curve.

Record/Play block
This block lets you record a physical movement with your robot and then play back the recorded movement elsewhere in the program.

Sound block
Use this block to play a sound file or a single tone. To compose a melody of tones, arrange several sound blocks in a row.

Display block
Use this block to display an image, write some text, or draw a shape on the NXT's display screen.

Wait block
This block lets your robot sense its environment for a specific condition before it continues with the program. For example, use the Wait block to make the robot wait for a specific sound, touch or time, before it moves on with the program.
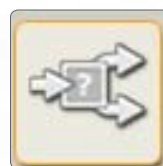
Loop block
Use this block if you want your robot to do the same thing again and again. For example, make your robot move forwards and backwards continuously until the Touch Sensor is pressed.

Switch block
This block lets your robot make its own decisions, such as going left when it hears a loud noise and going right when it hears a softer noise.

THE CONFIGURATION PANEL

Each programming block has a configuration panel that lets you adjust the settings of the block for the specific actions that you want. When a block is selected in the work area, its configuration panel will be visible at the bottom of the screen.

By changing the parameters on each configuration panel, you can change how a particular block will behave. For example, to make your robot move faster, you can change the Power property on the Move block's configuration panel.

THE CONTROLLER

The five buttons on the Controller communicate from your computer to the NXT:

The NXT window button gives you access to the NXT's memory and communications settings.

The Download button downloads the program to the NXT. You can then run the program from the NXT.

The Download and run button downloads a program to the NXT and then starts running the program.
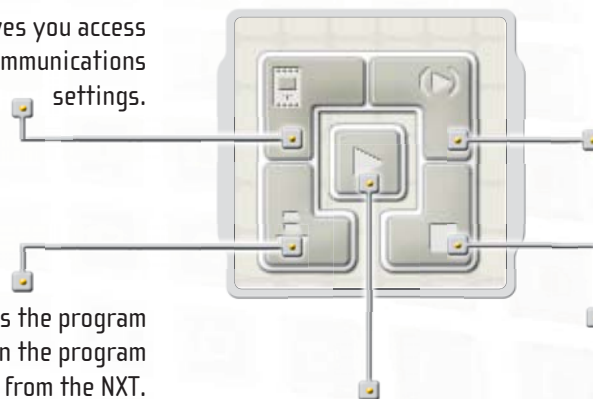
The Download and run selected button downloads and runs just a piece of your program's code (e.g. a single block or just a few blocks). Select the blocks you want to test and click on the Download and run selected button. You will then be able to see how the small sequence of your program performs on the NXT without having to download the whole program.

The Stop button stops a running program.

ELEMENT OVERVIEW

These are the LEGO® bricks in the MINDSTORMS® NXT set #8527.