

Nx Head Tracker



User Guide



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Introduction

The Waves Nx Head Tracker is a small Bluetooth device that attaches to your headphones. It tracks your head movements in 360 degrees to enhance the realistic and immersive 3D audio experience created by Waves Nx technology.

The Nx Head Tracker can be used together with several types of Waves Nx software. Use the Nx Head Tracker along with the [Nx desktop and mobile apps for 3D audio on headphones](#) to experience the music, movies, and games you love, in 3D audio— on your desktop, laptop, tablet or mobile device.

Audio professionals can use the Nx Head Tracker, along with the [Nx Virtual Mix Room Over Headphones plugin](#) or Abbey Road Studio 3, to recreate on headphones the ideal spatial acoustics of a high-end studio, thus improving your headphone mixing and recording experience.

Why Head Tracking Matters

When you hear sounds in the real world, your head movements help your brain create a sense of three-dimensional audio depth. As your head moves, your brain remembers where the sound used to be and where it is now, combines this with its knowledge that the head (and not the external source) has moved, and uses this information to locate the external source and construct a three-dimensional “audio scene.”

However, when you listen to sound on headphones, the audio scene constantly shifts with your head, so your experience of three-dimensional auditory space is gone.

By tracking your head movements and adjusting the audio to the orientation of your head, the Nx Head Tracker (combined with Nx software) helps reconstruct the realistic three-dimensional audio experience of sounds coming at you from external sources in the realworld.

There are several ways you can track your head movements to enhance the Nx experience:

- Use the Nx Head Tracker device.
- Use your computer’s camera.
- If you are using the Nx Virtual Mix Room or the Abbey Road Studio 3 plugin, you can use both methods simultaneously (“Sensor Fusion” mode) to achieve a faster tracking rate.

For a detailed comparison between these options, see the Overview tab of the [Nx Head Tracker webpage](#).

Functions and Features

Battery

The Nx Head Tracker device works with any standard AAA battery, which provides approximately 40 hours of use. Replace the battery through the bottom hatch. The device will go to sleep automatically after a few minutes if it's not connected or not moving. In sleep mode, the battery life can last for months.



Attaching the Nx Head Tracker to Your Headphones

After you insert a AAA battery into the Nx Head Tracker, position the device at the top-center of the headphone arc, with the Nx logo facing forward (i.e., the battery in the back). The Nx Head Tracker will not track your head movements properly if you place it off-center or facing backward.



Wrap the strap around the headphone's headband and attach it to the hook on the other side. The strap can be disconnected at both ends for replacement and any standard rubber band can be used if needed.

Button Functions

A short press (under two seconds) in any state will place the unit in advertising mode. In this mode, the device can be detected and paired with your computer.



LED Indications

Sleep	LED off
Advertising	Blinks blue
Connecting	Solid blue
Connected	Blinks blue every 15 seconds
Low Battery	Red instead of blue
Identifying	Blinks white
Updating	Blinks green



Pairing Nx Head Tracker with Waves Nx 3D Audio Apps

For detailed instructions about how to pair the Nx Head Tracker device with the [Waves Nx desktop and mobile apps for 3D audio](#) on headphones, refer to the apps' user guides:

- [Waves Nx for Windows and Mac – User Guide](#)
- [Waves Nx for Mobile \(iOS and Android\) – User Guide](#)

Pairing Nx Head Tracker with the Nx Virtual Mix Room or Abbey Road Studio 3 Plugin

To use the Nx Head Tracker device with the Nx Virtual Mix Room plugin, you must first pair them. This is done from a dedicated **head tracking application** that opens and closes automatically when you open and close the plugin. For head tracking to be enabled, the application must remain open. If the application is closed, head tracking will stop. This will not affect the plugin itself or your DAW in any way; you can simply restart the head tracking application using the Settings button (Abbey Road Studio 3) or Restart button (Nx Virtual Mix Room). This reestablishes tracking.

Head Tracking Application—Bluetooth Tracker Tab



Device List – This list will show all available Nx Head Tracker devices. Up to six devices can be connected simultaneously.

Connect (check box) – Check or uncheck this box in order to connect or disconnect an Nx Head Tracker device that appears in the device list.

Refresh Device List – This control will erase the list and rescan for Nx Head Tracker devices.

Automatic Connect –When On, the application automatically connects with any Nx Head Tracker device it detects. When Off, the application detects Nx Head Tracker devices, but the user must initiate the connection,

Open Bluetooth Settings (Windows only) – This opens the system Bluetooth settings window. You must first pair the Nx Head Tracker in your system's Bluetooth settings before the head tracking application can detect it.

Rename – This control lets you rename your Nx Head Tracker device. The name is permanent, and the device will advertise itself by the given name.

Identify – This control will make the Nx Head Tracker device blink white. This is helpful to identify a certain device among several.

Update – This control will initiate FW updates to the Nx Head Tracker's firmware. A message will appear when a firmware update is available for your Nx Head Tracker device.

Pairing Instructions

1. Open the Nx Virtual Mix Room or Abbey Road Studio 3 plugin. The head tracking application will launch automatically.
2. In the Head Tracking application, go to the Bluetooth Tracker tab.
3. Power on the Nx Head Tracker. Make sure your computer's Bluetooth is on and that it supports Bluetooth Low Energy (BLE).
4. Connect to the Head Tracker device(s):

Mac:

The Nx Head Tracker device will automatically be recognized and added to the list of devices showing in the Bluetooth Tracker tab. Mark the Connect check box and see the numbers under Tracking Data start to change as the Nx Head Tracker moves.

Windows:

Open your computer's Bluetooth settings and pair it with the Nx Head Tracker. Once paired, the Nx Head Tracker device will automatically be recognized and added to the list of devices showing in the Bluetooth Tracker tab. Mark the Connect check box and see the numbers under Tracking Data start to change as the Nx Head Tracker moves.

5. In the Nx Virtual Mix Room plugin, under the Tracking Device menu, select the Nx Head Tracker. The head in the plugin will start to move according to the Nx Head Tracker.
6. Attach the Nx Head Tracker device to the top-center to the headband of your headphones, with the Nx logo facing forward. The L and R icons at the sides of the Nx Head Tracker device should correspond to the L and R of your headphones. Inaccurate positioning of the Nx Head Tracker will result in inaccurate head tracking.

Updating the Firmware

The Nx Head Tracker can update its firmware over Bluetooth. The device leaves the factory with firmware version 1.17v1.13. As we continue to develop the Nx device, firmware updates will be released. When a firmware update is available, a message will appear in red in the Device Status window. Follow these instructions to update the firmware:



- 1) Turn on your Nx Head Tracker device. Find your device in the IMU Device Name column of the Waves Head Tracker application and check **Connect**.
- 2) Confirm that the firmware version on the Nx Head Tracker device is 1.17v1.13. You will see red text indicating that a Firmware update is available.
- 3) Click the **Update** button and follow the update dialog box:

Mac


- a) Press **Update**.
- b) Press **OK** to proceed to the firmware update.

- c) The Nx Head Tracker device will restart. A green light indicates that the device is in update mode. The Waves Head Tracker application will automatically connect to the device and start updating the firmware. The update will require a few minutes. A dialog box will indicate that the update has finished successfully.
- d) The Nx Head Tracker device will then automatically restart. Its LED will turn blue.
- e) You will now need to reconnect the device by repeating the same actions as in Step 1 (above). Once the device is reconnected, the firmware version number changes to 1.19v1.13.

Windows

- a) Press **Update**.
- b) Press **OK** to proceed to the firmware update.
- c) Press **OK** to open the Bluetooth Settings menu. The Nx Head Tracker device will restart automatically. Its light will be green, indicating that the device is in update mode. It will be advertising by the name “Nx Update.”
- d) Pair the “Nx Update” device through the Bluetooth Settings menu.
- e) Once the “Nx Update” device is paired, the Waves Head Tracker application will start updating the firmware. The update will require a few minutes to complete. A dialog box will indicate that the update has finished successfully.
- f) Return to the Bluetooth Settings menu and un-pair both the “Nx Update” and the “Nx Tracker” devices.
- g) Restart the Nx Head Tracker device by pressing the power button (using a long press to turn off, or a short press to power back on).
- h) Once again, pair the Nx Head Tracker device in the Bluetooth Settings menu. Once this is done, you will see the firmware version change to 1.19v1.13.

- 4) Once the Nx Head Tracker's firmware is updated to 1.19v1.13, turning off the device (long button press) will put the device in sleep mode (indicated by the LED flashing red). In this mode, the battery should last over six months.

 We advise that you start the firmware update with a full battery. If the battery is too low, there is a slight risk that the update process will fail in a way that will make the device unusable. The application has a safety threshold that will not let the update process start when the battery is too low, but using a full battery is still advised when updating. If your Nx Head Tracker becomes inoperable after a firmware update, please contact our technical support team at <http://www.waves.com/contact-us>.

During the update, try not to handle the device; leave it stationary on a flat surface. You can update only one Nx Head Tracker device at a time.

While the device is updating, make sure that **no other system is using the Waves HeadTracker application in close proximity**. Two nearby systems using the application at the same time can interfere with each other.

Extras

Appendix A: Troubleshooter

Problem	Possible Solutions
Head does not move in GUI – no tracking	<ol style="list-style-type: none">1. Verify head tracking is 'on' in plugin GUI.2. Check if tracker app is running.3. Play audio through the plugin (plugin on CPU).4. Check tracking rate box in plugin GUI.
Head tracking application is not running	<ol style="list-style-type: none">1. Restart head tracking through the plugin (Abbey Road Studio 3 "Settings") or Nx Virtual Mix Room "Restart").2. Inactivate/reactivate plugin.
Nx Head Tracker will not connect	<ol style="list-style-type: none">1. Make sure your computer's Bluetooth is turned on.2. Make sure your computer's Bluetooth is at least BT4.0 and supports BLE.3. Make sure the head tracking application is running.4. Make sure the Nx Head Tracker device is on and with a good battery.5. Windows only: Make sure the Nx Head Tracker is paired to your computer in the system Bluetooth settings menu.
Nx Head Tracker loses connection and doesn't move smoothly	<ol style="list-style-type: none">1. Try using a new battery.2. Try to have the Nx Head Tracker and the Bluetooth receiver closer together.3. If you are using a BT-USB dongle on a desktop, connect the dongle on the front panel or on an extension for better BT reception.
Nx Head Tracker is tracking my movements but in wrong directions	<ol style="list-style-type: none">1. Make sure the Nx Head Tracker is mounted on the top of the headphone arc with the logo side facing forward. L & R on the Nx Head Tracker should correspond to L & R on your headphones. Inaccurate positioning of the Nx Head Tracker will result in inaccurate head tracking.
Head tracking shows some latency	<ol style="list-style-type: none">1. Try to increase the tracking rate (optimally up to 30 fps).2. Try to lower the buffer size.3. In some DAWs, to run in the user-set buffer size, Nx need to be on the master buss or on a live input AUX path.

Appendix B: Setting up a Session with Multiple Nx Tracker Users

Up to six Nx Head Tracker devices can be used simultaneously. This lets engineers and artists work collaboratively in the same Nx mixing environment—each participant will have a an individual Nx mix and personal head tracking.

The two examples below are applicable to the Nx Virtual Mix Room and Abbey Road Studio 3 plugins.

Example 1: Mixing session with three mix engineers monitoring through Nx with three Nx Head Trackers

1. Route the mix to a master aux bus.
2. Send the master aux bus to the main output bus and to three other auxes for Nx monitoring. We will call these auxes “Nx aux 1, 2, and 3.”
3. Route each of the Nx auxes to separate headphone outputs (i.e., Nx aux 1 to headphone out 1 /2, Nx aux 2 to headphone out 3/ 4, and so on).
4. Open plugin on each of the Nx auxes.
5. If the Waves HeadTracker application is not open, open it now. Power up the three Nx Head Trackers.
6. Connect the Nx Head Trackers.

Mac: The Nx Head trackers are detected automatically and added to the list of devices in the Waves Head Tracker application. Check the Connect checkbox.

Windows: Click the “Open Bluetooth Settings” button and pair the three Nx Head Trackers. The Nx Head Trackers will be detected automatically and added to the list of devices in the Waves Head Tracker application. Check the Connect checkbox.

7. Use the Waves HeadTracker application to assign each Nx Head Tracker a unique name. This helps to identify the devices.
8. For each Nx plugin, select one of the Nx Head Trackers from the Tracking Device menu. **Make sure that each Nx aux channel is assigned to the correct headphones.** Incorrect selection will result in the movements of one Nx Head Tracker listener affecting the sound orientation of another listener.

Once all the Nx Head Trackers are assigned to the correct plugin instances and are routed separately to the listeners’ headphones, all three mix engineers will experience Nx spatial imaging: each with individual head tracking and their own aux mix.

Example 2: Recording session with one engineer and two musicians

1. Create a master track bus and two auxiliary buses for the musicians' headphone monitor mix. We will call these buses "Nx Master" and "Nx Monitor 1 and 2."
2. Route the Nx Master bus to the engineer's headphones, and the Nx Monitor buses 1 and 2 to two separate headphone outputs (one for each musician).
3. Open a plugin instance on each of the Nx buses.
4. If the Waves Head Tracker application is not open, open it now. Power up the three Nx Head Trackers.
5. Connect the Nx Head Tracker.

Mac: The Nx Head trackers are detected automatically and added to the list of devices in the Waves Head Tracker application. Check the Connect checkbox.

Windows: Click the "Open Bluetooth Settings" button and pair the three Nx Head Trackers. The Nx Head Trackers will be detected automatically and added to the list of devices in the Waves Head Tracker application. Check the Connect checkbox.

6. Use the Waves Head Tracker application to assign each Nx Head tracker a unique name. This helps to identify the devices.
7. For each plugin instance, select one of the Nx Head Trackers from the Tracking Device menu. **Make sure that on the "Nx Master," you select the engineer's head tracker, and on "Nx Monitor 1 and 2," you select the Nx Head Tracker that is used by the musician receiving this monitor bus.** Incorrect selection will result in the movements of one Nx Head Tracker listener affecting the sound orientation of another listener.

Once all the Nx Head Trackers are assigned to the correct Nx or Abbey Road Studio 3 instances and are routed separately to the listeners' headphones, each musician will hear his own monitor mix with Nx and head tracking, and the mix engineer will hear the master mix with head tracking through headphones

Appendix C: Pairing Nx Head Tracker with Waves Nx 3D Audio Apps

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[Waves Nx for Windows and Mac User Guide](#)

[For Mobile \(IOS and Android\) Waves Nx User Guide](#)