

How Does MultiTouch Work?

Your MultiTouch unit consists of two main components: a Hand Imaging Surface (the touch surface) and a Gesture Processor. The MultiTouch Gesture Processor watches the touch surface all the time. It's always looking to see which fingers are touching and what they are doing. The Gesture Processor ignores touching and movement that are not valid gestures, so you can rest your hand on the surface without causing spurious input.

Interacting with MultiTouch is a form of communication. You generate gestures and the Gesture Processor reads them and tries to interpret the meaning of your gestures. You can easily confuse the Gesture Processor if you don't communicate clearly - just like you can confuse a careful listener if you garble your speech. The MultiTouch unit will serve you well if you communicate with it clearly. There are five rules that must be followed to ensure clear communication with your MultiTouch device. These are described on the following section

Using MultiTouch - the Golden Rules

- 1 **Touch the surface with the correct number of fingertips** (Note that this applies to only the initial contact; after the initial contact has been made the remaining fingers may drop onto the surface, e.g. for 5-finger pointing)
- 2 **Keep the fingers slightly spread** - keep them relaxed not tightly bunched
- 3 **Maintain contact with the surface during movement** - relax and let gravity do its job
- 4 **Keep the thumb separated from the other fingers** - otherwise the system could mistake the thumb for a fingertip
- 5 **Finger taps should be light and crisp** - don't bang the keys, save your fingers

Additional information and guidance on each of these rules is given below.

Rule 1: Touch the surface with the correct number of fingertips. Clear communication involves touching the surface with the correct fingertips for the desired gesture. This is required because the system distinguishes gestures by the particular set of fingers that *initially* contact and move together across the surface. For example, the mouse operations of point, drag, and scroll are launched by initial contact of adjacent fingers: two finger tips initially touching means pointing, three mean drag, and four mean scroll. On iGesture products, pointing can also be initiated with five fingers if desired, but clicking must still be done with two.

Some of the gestures allow you to drop the non-involved fingers after initially touching the surface with the correct (involved) fingers. Practicing this helps to reduce hand fatigue. You can also lift all but one finger without interrupting the operation you started using more fingers. Here's an example of scrolling using all five fingers.

- 1 Touch four fingertips on the MultiTouch surface.
- 2 Begin sliding or rolling fingertips in desired direction.
- 3 Drop thumb onto surface and continue finger motions.

Rule 2: Keep the fingers slightly spread - keep them relaxed not tightly bunched. It's not easy to do, but it is possible to fool the Gesture Processor into thinking that one finger is touching the surface when in fact two are. This can occur if you have small fingers and you squeeze them so tightly together that they look like one large finger. Obviously, it isn't your intent to fool your system so relax your fingers and keep them slightly separated for all operations.

Rule 3: Maintain contact with the surface during movement. If all your fingers come off the surface during a gesture operation the Gesture Processor will interpret that as a signal from you that the operation in progress has concluded. Relax and let the weight of your hand keep your fingers on the surface as they slide across-s it.

Rule 4: Keep the thumb apart from the other fingers. The Gesture Processor might think that the thumb is just another finger if it "sees" it in a position where it should not be. For example, if you put your thumb right next to your index and middle fingers it may look to the MultiTouch software like you have touched down three fingers instead of two fingers and a thumb. Avoid confusing your MultiTouch unit by keeping the thumb comfortably away from the other fingers.

Rule 5: Finger taps should be light and crisp. Hitting the surface hard with you finger tips is not good for your fingers. For clicking, the Gesture Processor pretty much ignores how hard you hit the surface and really only cares if your finger tips touch and lift simultaneously and fairly quickly. If you stay too long the Gesture Processor will assume you are resting your fingers.

Using the Gesture Quick Guide

A separate Gesture Quick Guide that shows static images of all the active gestures for your particular MultiTouch interface should be included in the shipping box. Additional copies of the Gesture Quick Guide, and a diagram showing the hotkeys generated by each gesture, can be downloaded from our website under Customer Support/Downloads. While you are learning the gestures you may find it helpful to keep a copy of the Quick Guide near your computer.

Using the Animated Gesture Guide

A CD containing the animated Gesture Guide should be included in the shipping box. If the CD is missing you can run the guide from our web site. The guide runs on your Internet browser and provides animated videos of each gesture operation. We highly recommend that you take the time to run through the guide at least once so that you see the proper way to execute each gesture.

System Requirements

One free USB port on your computer or a free USB port on a hub that has an external (wall) power supply (**WARNING:** USB hubs that do not have external power cannot support MultiTouch products!). Also, an operating system that includes standard USB keyboard/mouse drivers such as:

- Windows 98, Windows 2000, Windows XP or ME
- Windows NT (with 'Legacy USB' BIOS option or BSquare third-party driver only!)
- Mac OS 9 or Mac OS X, BeOS, or OS/2
- Linux Kernel 2.4.3 or higher, or with the USB backport to the 2.2.x kernel series.

Installing the iGesture Pad on Your Computer

Windows XP should not require anything. Just plug the USB connector into the back of the computer and wait a second or two for the new hardware to be added.

Windows 98, Windows 2000, Windows ME:

Plug the USB connector into the back of the computer. Depending on what USB devices you've installed in the past, Windows may prompt you to approve installation of several USB drivers. All of the drivers can be obtained from your Windows CD, the Windows driver archive on your hard drive, or from Windows update over the Internet.

Windows (98 especially) may prompt you to install a USB Composite Interface Driver and ask you to reboot. Windows will then prompt you to install two Human Interface Device (HID) drivers, one for USB Keyboard emulation and one for USB Mouse emulation.

Your unit should begin functioning after these HID driver installs without another reboot. If you plug your unit into a different USB root or hub port in the future, Windows may prompt you to install the HID Drivers again, but this time Windows should find them on the hard drive (CD not needed again). If you suspect trouble, check that all drivers listed above show up in the Device Manager, as discussed at <http://www.fingerworks.com/troubleshooting.html>

Mac OS X should not require anything. Just plug in the USB connector into the back of the computer and wait a second or two for the new hardware to be added. To verify driver installation, expand the USB bus in the Apple System Profiler. An iGesture Pad should be listed.

Mac OS 9 should also not require anything. However, you may have to plug and unplug the MultiTouch device a few times before OS 9 picks up all the interfaces. After plugging in the USB connector, wait 30 seconds or so before unplugging it.

Linux: Recent distributions like RedHat 7.0 and Mandrake 8.0 should auto-detect both keyboard and mouse functionality of your unit. USB support and auto configuration has continued to improve in the 2.4.x kernel series, so success is most likely with the latest kernels.

Instructions for manual installation of the required USB kernel modules (usbcore, hid, usbmouse, uskbd) and modifying X11's XF86Config file to use /dev/input/mice as the pointer can be found at: <http://www.linux-usb.org>

See especially the USB User's Guide page on Human Interface Devices: <http://www.linux-usb.org/USB-guide/x194.html>

Configuring the iGesture Pad for your Operating System

All systems ship configured for Windows-style hotkeys and 2-Button wheel-mouse emulation. To enable Mac-style hotkeys for use with MacOS, hold the appropriate 3 corners for a second as shown below. The pad will acknowledge the new setting by emitting a key in the current text window:



Windows Mode (emits 'W' key)



MacOS Mode (emits 'M' key)

You may reconfigure your MultiTouch unit whenever you switch the unit to another operating system. Users of Linux, Unix, or CAD programs may also want to enable 3-Button wheel-mouse emulation, which splits the thumb & two-fingertip chord into Middle and Right click as shown:



2-Button Mouse Emulation (emits '2' key)



3-Button Mouse Emulation (emits '3' key)



Left Click



Middle Click



Right Click

Installing the MultiTouch Utilities

Installation of the MultiTouch Utilities (available for Mac OS X, Linux, Windows 2000 and Windows XP) is optional. They allow you to upgrade to the latest MultiTouch Firmware, run diagnostics on the sensing surface, and enable additional settings with a Feature Selector control panel (e.g. Linux/Adobe/Adobe hotkey mode, game mode, button swapping, and palm slides for flipping OS modes). The latest version of the utilities can always be found at <http://www.fingerworks.com/downloads.html> Or if your Internet is slow, you can install an (older?) copy from your FingerWorks CD.

Caring for your MultiTouch Surface

We recommend cleaning your surface with Lysol Disinfectant spray bottle or other non-abrasive household cleaner whenever it becomes grimy. Lysol in particular seems to leave the surface nice and slippery. NOTE: Unless you unplug while cleaning, spurious input (e.g. mouse clicks or gestures) could be generated while any liquid remains on the surface.