Gefen Wireless Hub and PC USB Dongle

User Guide

FCC Statement

This device complied with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious legal penalties.

Changes or modifications not expressly approved by Gefen could void the user's authority to operate the equipment.

About Wisair

Wisair is a leading provider of WiMedia ultra-wideband (UWB) chipset solutions for consumer electronics, PC peripherals, and mobile devices. Leveraging the management teams' decades of wireless communications product development expertise, Wisair is the first company to deliver fully-functional WiMedia-based UWB chipsets and small form-factor reference designs.
Today, the fabless semiconductor company continues to focus on delivering low-cost, low-power, and high bit-rate wireless connectivity solutions.

For more information, visit www.wisair.com.

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1 Introduction

Gefen USB Cable Replacement kit enables you to set up an ad hoc, Wireless network instantly, for USB cable replacement or extending USB range without the need for a network infrastructure, thus providing the right balance between functionality and aesthetics. It allows remote content browsing, sharing, control, multi channel streaming, hotsync, printing, fast copy and very fast information exchange between PC and USB 2.0/1.1 PC peripherals. The types of content supported are data, applications, pictures, and compressed video and audio files (asynchronous transfer).

The kit is comprised of two major components: USB Dongle and Wireless Hub which form a point to point Wireless link. The components are:

§ USB Dongle—A USB PC dongle, shown below in

§

§ **Figure** 1: USB Dongle .
The dongle is plugged directly to a PC USB port or to a USB hub host port. The dongle is powered by the USB port and contains an on-board omni-directional antenna.

§ Wireless Hub—A Wireless Hub, shown below in **Figure 2: Wireless Hub**.
The 4 port USB 2.0/1.1 wireless hub is a stand alone unit with external power and two internal omni-directional antennas. Up to four USB legacy devices can be directly attached to the hub.

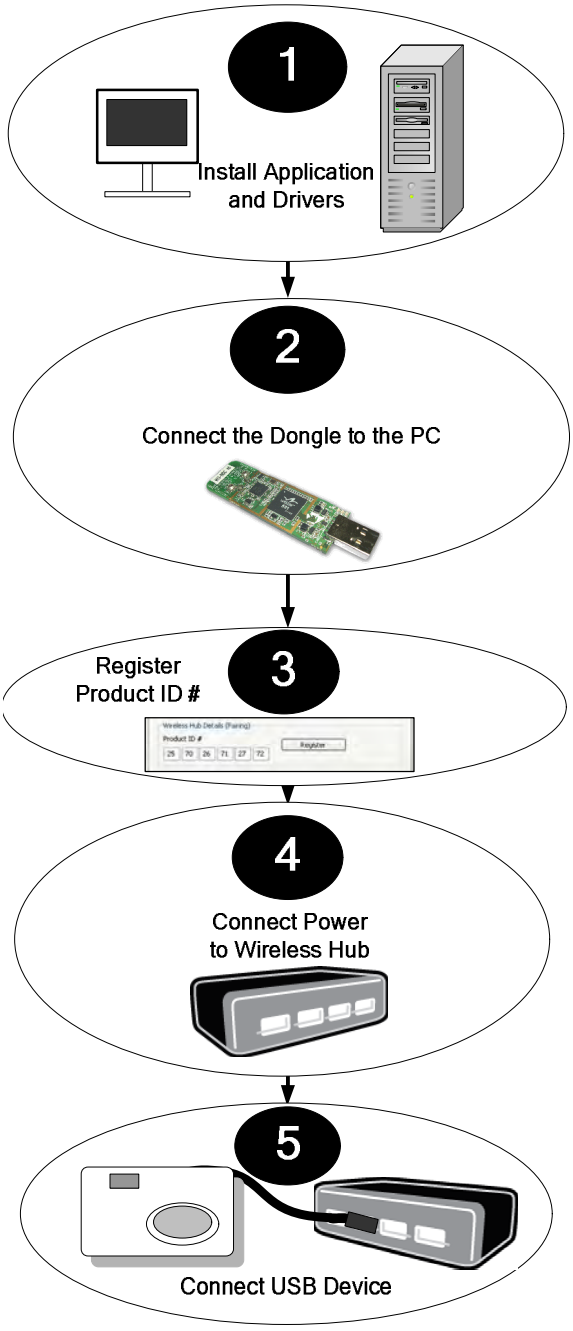
Figure 1: USB Dongle

Figure 2: Wireless Hub

Figure 3: Wireless Hub block diagram

2 Quick Start

The following diagram illustrates the basic steps in connecting and getting started with the USB Dongle and Wireless Hub:



3 Installation

3.1 System Requirements

The minimum requirements for running the Gefen Wireless Hub connection software on a PC are as follows:

- No previous Gefen Wireless Hub software version installed. If you need to uninstall a previous version of the software, use the uninstall utility under **Start>Programs>Wireless Hub**
- One or more available high speed (EHCI controller) USB 2.0 ports
- Windows XP with SP2
- 4 MB of free disk space

3.2 PC Software Installation

Note: Do not attach the USB Dongle before the GUI application is installed

The software and driver installation is performed in three stages:

1. The GUI application and USB drivers are installed on the PC, **no hardware is connected yet.**
2. The **USB dongle is connected** to the high speed USB 2.0 port in the PC and Windows must recognize the dongle and each of the drivers that it uses.
3. The **Wireless Hub is powered**, associated with the USB Dongle, and its corresponding driver is recognized by Windows.

3.2.1 Install the USB Drivers and GUI Application

1. Ensure that the **Wireless Hub is switched off** and the **USB Dongle is detached** from the PC.
2. Run the **Setup_ver_XX_XX.exe** Gefen Setup Launcher program.

3.2.2 Connecting the USB Dongle and Registering the Drivers

1. Connect the Gefen USB Dongle to the high speed PC USB port. The system will install the drivers for the connected dongle automatically.
2. Hardware device recognition notifications are displayed in bubble help messages above the system tray. Wait for the final message – "your hardware is installed and ready for use" before continuing.

3.2.3 Connecting the Wireless Hub

1. Ensure that the Wireless Hub is switched **off**.
2. Open the **Wireless Hub Connection Status** screen (double-click the Connection Manager tray icon).

3. In the **Wireless Hub Details (Pairing)** section, enter the **Product ID #** provided on a sticker on the bottom of the Wireless Hub. (There are six pairs of character/digit combinations in the product ID).

4. Place the Wireless Hub within 1 meter distance of the USB dongle. Ensure the two units have clear line-of-sight.
5. Turn the Wireless Hub unit on. Ensure the LEDs are on.
6. A bubble help message is displayed in the System Tray area showing the Product ID # and a message that the Wireless Hub is connected with the PC as shown in the screen shot below.

7. The system will automatically detect and install the device driver for the Wireless Hub. Windows hardware device recognition notifications are displayed in bubble help messages above the system tray.
   Wait for the final message – "your hardware is installed and ready for use".

4 Operation

To begin operation, please review the steps outlined in **Sec. 2 Quick Start.**

Please Note: In** compliance with 47 CFR 15.519(a)(1) **the wireless dongle and /or hub will cease transmission within 10 seconds unless it receives an acknowledgement from the other that its transmission is being received. An acknowledgment of reception must continue to be received by the wireless dongle and / or hub at least every 10 seconds or the UWB device will cease transmitting until it receives acknowledgement. This may cause some additional delay in operation when first associating the dongle and hub if hub is out of range of dongle or power is applied to hub after 10 seconds of dongle connection.

4.1 Status Indication

When the Gefen Connection Manager is up, the Gefen icon displays in the Windows System Tray. The color of the icon indicates the current activity state, as follows:

Icon Color	Status
	**Connected (green icon)** A wireless connection is established with a Wireless Hub module
	Enabled (yellow icon) USB dongle is connected to the PC **(**dongle is enabled, no wireless connection is detected)
	Disabled (gray icon) USB Dongle is disabled (and no connection available)

4.2 Optimizing Hub Performance

The following recommendations for connecting and positioning the USB dongle and Wireless USB hub can help optimize Wireless USB performance.

Need Picture	When connecting the dongle to a laptop or desktop PC, use the supplied USB elbow adaptor. Position the dongle on the desk, perpendicular to the ground, so that its wide side faces the hub.
Need Picture	Best performance will be achieved when there is a direct line of sight between the dongle and the hub. If possible, place the hub at the end of the surface facing the dongle, so that no large objects are in the way.

4.3 Configuration Properties

The USB Dongle hardware **properties** screen provides direct access to the dongle hardware configuration.
To open the **properties** screen, right click on the Gefen icon and select **properties** from the context menu.
The following table explains the properties that can be configured or viewed:

Property	Description
Connection Status	
Operating State	Disabled/Disconnected/Connected
Signal Strength	0-100%
Transmit Rate Select	Auto/480/400/320/200/160/106.7/80/53.3 Mbps
Channel Select	Auto Detect /A/B/C/D/E (see Table 1: Wireless channel selection)
Current Channel	A/B/C/D/E (see Table 1: Wireless channel selection)
Wireless Hub Details (Pairing)	
Product ID #	Enables the registration of the Wireless Hub Product ID# in order to allow association/connection with that hub.
Register/Un-Register	Registers (associates) or Un-Registers (disassociates) the Wireless Hub of the given Product ID #.
USB Dongle Status	
Reset	Resets the connection/disassociates Wireless Hub from Host and restarts scanning
Disable/Enable	Turns USB dongle off to save PHY power
Packets Sent/Packets Received	Packets Sent (by USB Dongle) Packets Received (from Wireless Hub)
USB Dongle Details	
Description	USB Dongle
Product ID	Unique hardware identification number
Firmware Version	Host firmware version
Driver Version	Wireless Hub PC driver version

Table 1: Wireless channel selection

Gefen Channel Name	TFC Channel	Band Search Pattern
A	TFC1	$F_1\ F_2\ F_3\ F_1\ F_2\ F_3$
B	TFC2	$F_1\ F_3\ F_2\ F_1\ F_3\ F_2$
C	TFC5	$F_1\ F_1\ F_1\ F_1\ F_1\ F_1$
D	TFC6	$F_2\ F_2\ F_2\ F_2\ F_2\ F_2$
E	TFC7	$F_3\ F_3\ F_3\ F_3\ F_3\ F_3$

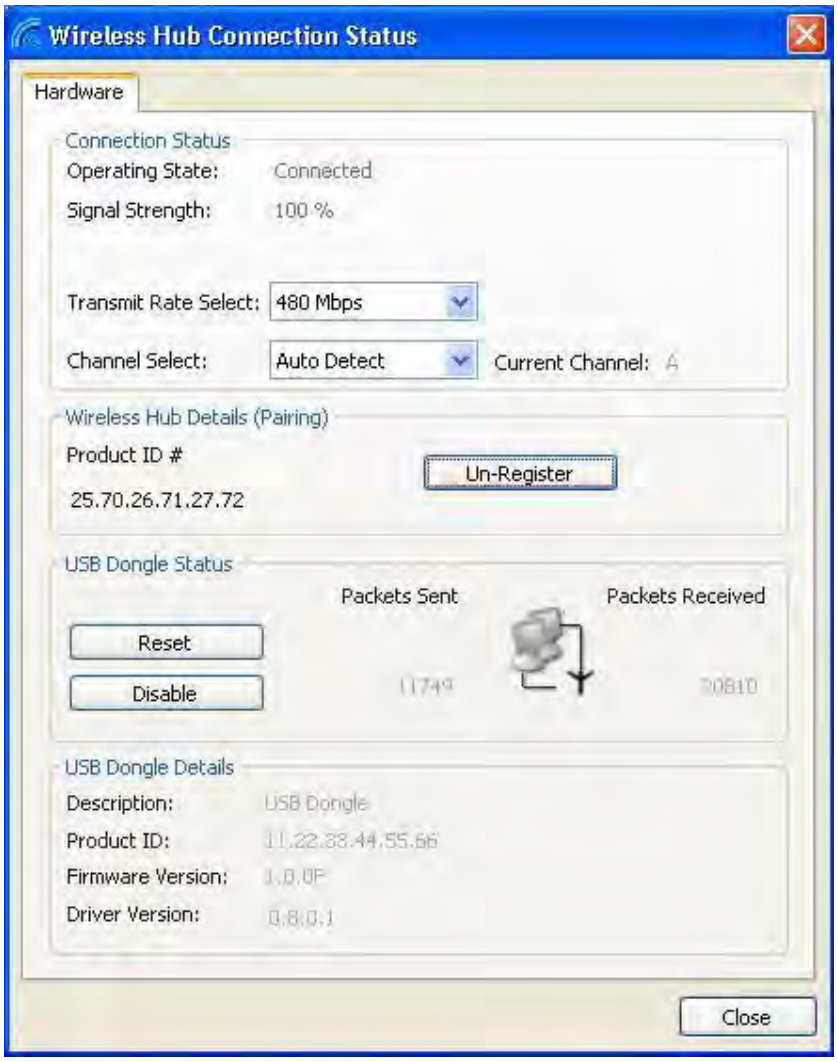


Figure 4: Connection Manager Properties - Wireless Hub Connection Status screen

4.4 USB Dongle LED Indications

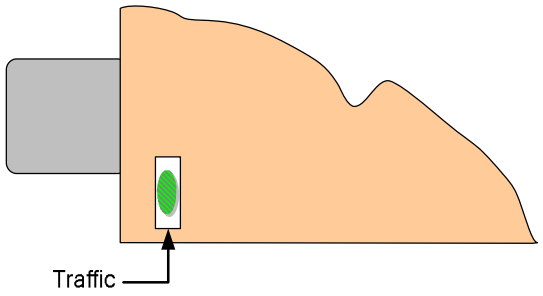


Figure 5: USB Dongle LED indications

A single LED is provided on the USB Dongle for the following visual status indications:

- **Power** – Constant green when 5V DC is applied from the PC USB port.
- **USB Association** – Slow flashing green when dongle associates with the PC.
- **Rx Traffic** – Flashes green when packets are received.

4.5 Wireless Hub LED Indications

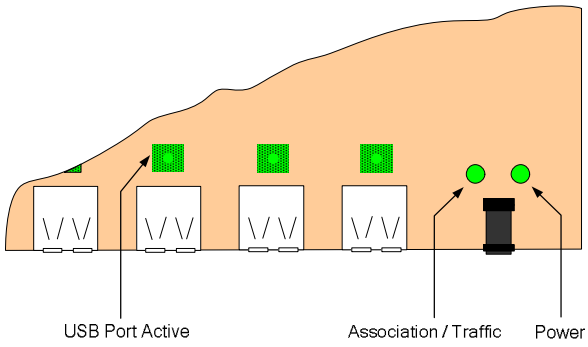


Figure 6: Wireless Hub LED indications

- **LED#1: Power** —Constant ON green when 5V DC is applied
- **LED#2: Association with USB Dongle/Traffic Indication**—Slow flashing when the connection/association is established. Rapid flashing to indicate Rx/Tx traffic.
- **LED#3 to #6: USB Port Active Indication**— OFF when no USB device is attached or when attached USB device is not yet recognized by the PC. Constant ON green when a device is connected to the USB port and is recognized by the host (PC) side. Orange if port was overloaded by more than the maximum USB rating power.

4.6 Pairing and Association/Connection

Once the Wireless Hub is powered up and completes initialization, it is ready for association. First time association occurs after manually **Registering** the Product ID# of the Wireless Hub with the PC, this is also called **Pairing** the two entities.

4.6.1 Automatic Association

After the first time connection/association, future association with the same hub is handled automatically whenever the Wireless Hub operates within range. No additional user intervention is necessary.

4.6.2 Changing Association/Registration (Pairing)

To associate to a different Wireless Hub, you must manually **Un-Register** the previous Wireless Hub by pressing **Un-Register,** causing the Wireless Hub to dis-associate from the PC.

To change the association/registration from one Wireless Hub to another:

1. In the Wireless Hub Connection Status screen, click **Un-Register**.

2. Enter the **Product ID #** of the Wireless Hub that you want to associate and press **Register**.

3. A tool tip is displayed in the System Tray area, containing the Product ID and a message that the Wireless Hub is now connected with the PC.

4. Check to see the **Operating State** field to see if the status changes from **Disconnected** to **Connected.**

4.7 Closing the Connection Manager Application

To shut down the Connection Manager:

1. Right click the tray icon and select **Exit**.

2. Click **Yes** to confirm that you want to shut down the application.

5 Maintenance

The following sections provide maintenance information and troubleshooting advice.

5.1 Troubleshooting

5.1.1 Channel Busy

When the user selected a specific channel (frequency range) and the USB Dongle (after scanning) found it cannot be the master on that channel, an information message window displays automatically. This is the result of more than one USB Dongle present in the same range.

Figure 7: Channel busy message

To resolve this conflict, select a different channel or **Auto Detect** in the Wireless Hub Connection Status screen of one of the USB Dongles.

5.1.2 Support for USB Classes

Audio devices (which is USB Audio class) and *some* Web cams (USB Video class) which have isochronous endpoints, are not supported by the Wireless Hub.

5.1.3 Wireless Link Out of Range

If you are experiencing frequent Wireless link breaks, the Wireless Hub may be out of range– the solution is to shorten the range between the USB Dongle and Wireless Hub.

5.1.4 Extended or External Wired USB Hub Connections

If you are connecting the USB Dongle to a PC via an external wired USB hub – we recommend:

- Apply external power to the wired USB hub.
- Do not use the external hub during initial connect and driver installation.

5.1.5 Manual Software Uninstall

To uninstall the software manually:

1. Ensure that the Connection Manager is stopped and the USB Dongle is disconnected.
2. Go to **C:\windows\system32\drivers** and locate the four driver files:
   - § FX2Control.sys
   - § SwMac.sys
   - § USBFX2.sys
   - § WirelessHub.sys

3. Delete the four files
4. If applicable, remove the shortcut for the ConnectionManager.exe from the **Start>Programs>Startup** menu.

5.1.6 Reading Software and Firmware Versions

In order to ensure that you are working with the latest version of software and hardware, you can check the versions of each component as follows:

Gefen application	In **Control Panel>Add or Remove Programs>Wireless Hub>Click here for support information** for the automatically installed application.
PC host drivers version	Right click the tray icon, select **Properties.** Read the **Driver Version** field **in the USB Dongle Details section**.
USB Dongle firmware version	Right click the tray icon, select **Properties.** Read the **Firmware version** field **in the USB Dongle Details section**. .
Wireless Hub firmware version	Use a serial connector to connect via HyperTerminal application and view the firmware version in the command prompt of the Wireless Hub.

6 Technical Specifications

Model number	HWA531 — USB Dongle DWA531 — 4 port Wireless Hub
UWB Chipset	Wisair 531 MAC/BB chip, Wisair 502 RF chip
Operational Range	Up to 10 to 20 meters (30 to 60 feet)
PHY data rate	Up to 480Mbps (Automatic or manually selected)
Frequency range	3.1GHz to 4.8GHz; supporting 3 sub-bands, 528MHz each
RF modulation type	Multiband OFDM
Max. output power	80µW (-41.25dBm/MHz maximum)
Max Power Consumption	HWA531 — 1.75W (350 mA maximum @5VDC from USB port) DWA531 — 3 W (600mA @5VDC from external power supply)
USB end points types	Bulk in/out, Interrupt, Control
Number of endpoints	32 endpoints
USB power drive	Powers up to 4 USB external devices (500mA@5VDC each)
USB association type	PC host GUI based association
LED indications	Power , Association, Traffic , USB Port active (on Wireless Hub)
PCB size	HWA531 — 25 by 69 mm DWA531 — 38 by 92 mm
Antenna	HWA531 — UWB on-board omni-directional antenna DWA531 — UWB two internal omni-directional antennas
Operating Temperature range	5°C to +50°C
Operational Humidity	10-95%
PHY compliance	Complies with WiMedia PHY spec. Rev. 1.0
FCC compliance	Complies with FCC CFR 47 Part 15 subpart F; UWB intentional radiation and subpart B.
USB hub compliance	Complies with USB 2.0/1.1
OS compliance	Microsoft® Windows XP SP2; Microsoft WHQL approved
Coexistence	Co-exists with standard WiMedia devices Coexistence with co-located additional USB dongles or UWB systems (FFI, TFI schemes)