LIGHT BLUE OPTICS

User Guide

Light Touch
Virtual Touch-Screen Computer
LT1221 Series

For models: LT1221FC/MG/RG-10/11

Contents

Package Contents

The following items should be included in the package

- 1 x Light Touch (LT1221FC/MG/RG-10/11)
- 1 x International Power Adaptor (220/110V AC to 5V DC)
- 1 x USB Cable (Full-size Type A to Micro Type B)
- 1 x CD containing:
    - Light Touch LT1221 Series Quick Start Guide
    - Links to further documentation on http://lightblueoptics.com

Product Accessories

There are a number of accessory items that are available for purchase to accompany the LT1221 Series product.

For details, contact a LBO sales representative

Introducing Light Touch™

Light Touch™ is an interactive projector that instantly transforms any flat surface into a touch screen. It projects a full-colour image down onto any flat surface and turns it into a virtual touch-screen.

Light Touch™ is an application platform with onboard processor, running Microsoft WinCE 6 R3 operating system. It supports applications written in Adobe Flash Lite 3.1 or Microsoft .NET CF 3.5. Light Touch has wireless networking capability and is ideally suited to running applications that connect to the internet or cloud-based servers.

Light Touch models from the LT1221 series, are supplied in a plastic outer shell, designed for standalone operation.

Figure 1 – Light Touch LT1221 Series

Light Touch LT1221 Series Product Range

The Light Touch LT1221 Series product range includes the following models:

Product code	Description
LT1221FC-10	Light Touch Virtual Touch Screen Computer Full-colour projection O/S: MS Win CE6R3 Core
LT1221FC-11	Light Touch Virtual Touch Screen Computer Full-colour projection O/S: MS Win CE6R3 Pro
LT1221MG-10	Light Touch Virtual Touch Screen Computer Monochrome green projection O/S: MS Win CE6R3 Core
LT1221MG-11	Light Touch Virtual Touch Screen Computer Monochrome green projection O/S: MS Win CE6R3 Pro
LT1221RG-10	Light Touch Virtual Touch Screen Computer Bi-chrome (red/green) projection O/S: MS Win CE6R3 Core
LT1221RG-11	Light Touch Virtual Touch Screen Computer Bi-chrome (red/green) projection O/S: MS Win CE6R3 Pro

Safety Notice

Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure

This laser product is certified as a CLASS 2 laser product to the requirements of the US Federal Product Performance Standard for Laser Products contained in the regulations in 21 CFR Subchapter J except for specific deviations described in FDA Laser Notice #50.

This machine incorporates embedded, Class 3B and 4 lasers which are capable of producing hazardous levels of laser radiation. However, this product incorporates a protective housing and controls in its design such that there is no exposure or human access to levels of laser radiation above Class 2.

Tested to IEC 60825-1:2007

447nm wavelength, 0.16mW maximum power, 200uSec pulse duration

532nm wavelength, 0.26mW maximum power, 200uSec pulse duration

637nm wavelength, 0.26mW maximum power, 200uSec pulse duration

780nm wavelength, 0.14mW maximum power, 16.6mSec (Class 1)

CLASS 2 – DO NOT STARE INTO THE BEAM

AS WITH ANY PRODUCT CONTAINING LASERS, DO NOT DISASSEMBLE THE PROJECTOR FOR ANY REASON. DISSASSEMBLING THE PROJECTOR MAY RESULT IN HAZARDOUS LASER RADIATION EXPOSURE.

UNDER NO CIRCUMSTANCE SHALL ATTEMPTS BE MADE TO OPERATE THIS DEVICE WHEN IT IS DAMAGED OR DISASSEMBLED.

Return it to the manufacturer for repair or replacement. All service to the product shall be performed by Light Blue Optics Ltd., their authorised agents, or personnel trained by Light Blue Optics Ltd.

Product Classification

DECLARATION OF CONFORMITY according to FCC part 15

Responsible party: Light Blue Optics Ltd
Address: Platinum Building, St. John's Innovation Park,
                                Cowley Road, Cambridge. CB4 0WS U.K.
Telephone: +44 (0)1223 428500
Declares that product: Models LT1221FC, LT1221MG & LT1221RG
                                Comply with part 15 of the FCC rules

FCC warning statement:
- This device complies 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 complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

Light Blue Optics declares that the equipment described in this document is in conformance with the Requirements of the European Council Directive listed below:

2006/95/EC Low Voltage Directive
2004/108/EC EMC Directive

This product follows the provisions of the European Directive 1999/5/EC.
Dette produkt er i overensstemmelse med det europæiske direktiv 1999/5/EC.
Dit product is in navolging van de bepalingen van Europees Directief 1999/5/EC.
Tämä tuote noudattaa EU-direktiivin 1999/5/EC määräyksiä.
Ce produit est conforme aux exigences de la Directive Européenne 1999/5/EC.
Dieses Produkt entspricht den Bestimmungen der Europäischen Richtlinie 1999/5/EC.
Þessi vara stenst reglugerð Evrópska Efnahags Bandalagsins númer 1999/5/EC.
Questo prodotto è conforme alla Direttiva Europea 1999/5/EC.
Dette produktet er i henhold til bestemmelsene i det europeiske direktivet 1999/5/EC.
Este produto cumpre com as normas da Diretiva Européia 1999/5/EC.
Este producto cumple con las normas del Directivo Europeo 1999/5/EC.
Denna produkt har tillverkats i enlighet med EG-direktiv 1999/5/EC.
This declaration is based upon compliance of the product to the following standards:
EN 55022:2006 (CISPR 22 Class B) RF Emissions Control.
EN 55024:1998 +A1:2001 +A2:2003 Immunity to Electromagnetic Disturbance.
EN 60950-1 Second Edition Information Technology Equipment- Safety-Part 1: General Requirements.

VCCI Class B Statement (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。
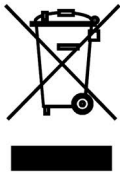
BSMI Class A Notice (Taiwan)

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，
可能會造成射頻干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

This product uses RoHS compliant components

Light Blue Optics products with the Waste Electrical and Electronic Equipment Directive (WEEE) label, shown below, can be shipped back to Light Blue Optics for proper disposal of hazardous components. Please contact Light Blue Optics Technical Support for the proper procedure.

WLAN Declaration

The Light Touch unit has a WLAN capability.
The unit supports 802.11 b/g (Channels 1-11).

FCC ID: YVE-LM

European Union Regulatory Conformance

The equipment complies with the RF Exposure Requirement 1999/519/EC, Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0–300 GHz). This equipment meets the following conformance standards:

EN 300 328, EN 301 489-17, EN 301 511, EN 301 908, EN 50385

This wireless device complies with the R&TTE Directive.

Japan Wireless Certification obtained

Canada

IC ID: 9291A-LM

English

"Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication."

"This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

"This device complies with Industry Canada's RF radiation exposure limits for general population. It must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operated in conjunction with any other antenna or transmitter."

French

"Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante."

"Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

"Cet appareil est conforme aux limites d'Industrie Canada concernant l'exposition de la population générale aux radiofréquences. Il doit être installé de façon à laisser une distance de séparation d'au moins 20 cm de toute personne et ne doit pas être colocalisés ou exploité en conjonction avec toute autre antenne ou transmetteur."

The Basics

Getting Started

1. **Remove from packaging**
Check package contents against list on page 3.

2. **Place unit upright on flat surface**
Place the unit on a flat, level surface. For uniform results, a matte white surface is recommended.

3. **Press the ▷ button on top of the unit**
This will turn on the unit. A blue logo will be projected for a few seconds whilst the software loads. Light Touch™ will display a carousel menu which provides access to a selection of preloaded demonstration applications.

4. **Touch the projected image to interact**
The menu can be navigated by touching the projected image with a finger and using standard actions such as swipe and click. A touch is registered when the finger lifts up from the projection surface, and not when the finger is pressed down.

Demonstration Applications
The Light Touch LT1221 unit comes preloaded with a number of demonstration applications, which can be accessed via the carousel. A category can be selected by a single "click" on any visible icon.

Figure 2 – Screenshot of carousel menu

The pre-loaded applications are provided for demonstration purposes only. Please contact Light Blue Optics for further information if required, including enquiries about obtaining permission to use part or all of one of these applications in a commercial product.

For information on creating applications for Light Touch, see the separate document entitled: 'Light Touch Application Guide'.

![Light Blue Optics logo]

Light Touch Settings

The user can configure Light Touch via the 'Settings' section of the menu carousel.
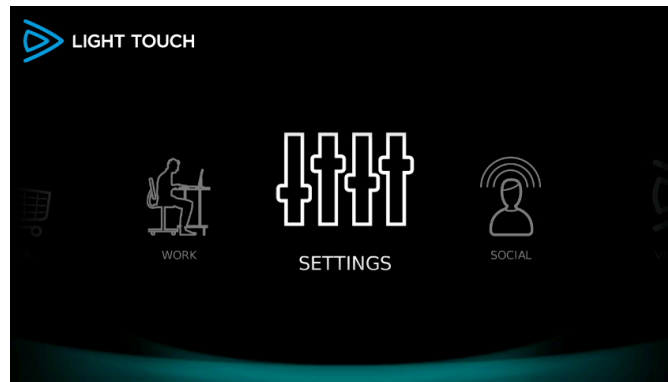

Figure 3 – Screenshot of 'Settings' icon in menu

Within the 'Settings' menu, the following categories are accessible:

- System Information ('About')
- Power Management
- Wireless Networking
- USB Mode

Each category is described in the following section.

System Information

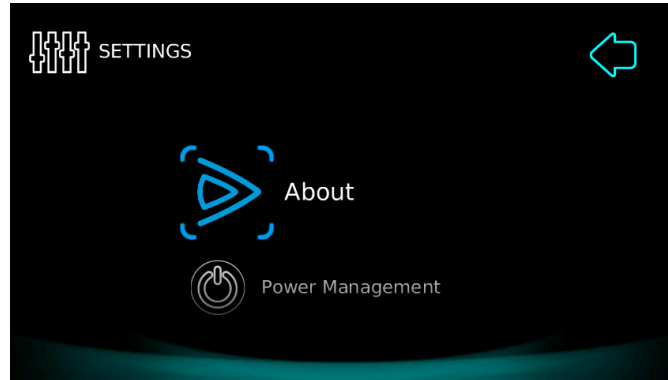The 'About' screen can be accessed from within the 'Settings' category:

Figure 4 – Screenshot of 'About' icon within 'Settings' menu

The 'About' screen contains information about the hardware and software versions. The serial number is the unique identifier for the unit.

Light Touch
Software Version: 3.5.0
Image Timestamp: 11/4/2010 6:06 PM
Serial Number: LT010001477 (01.0005)

Content Version: CUSTOMER_2_5_1
Content Timestamp: 11/22/2010 5:53 PM

OK
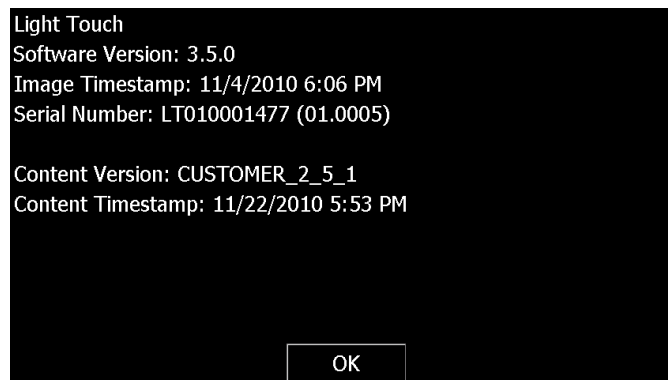
Figure 5 – Screenshot of 'About' screen

Power Management

The 'Power Management' control panel can be accessed from within the 'Settings' category:

Figure 6 – Screenshot of 'Power Management' icon within 'Settings' menu

The 'Power Management' control panel allows the user to put Light Touch into a 'display-off' mode after a period of inactivity. To activate this mode, the 'Display Off Time' needs to be set to a value greater than 0. There are separate settings for when the unit is running from the power adaptor (called 'AC mode') and from the internal battery. Use the arrows to access the other power management settings.
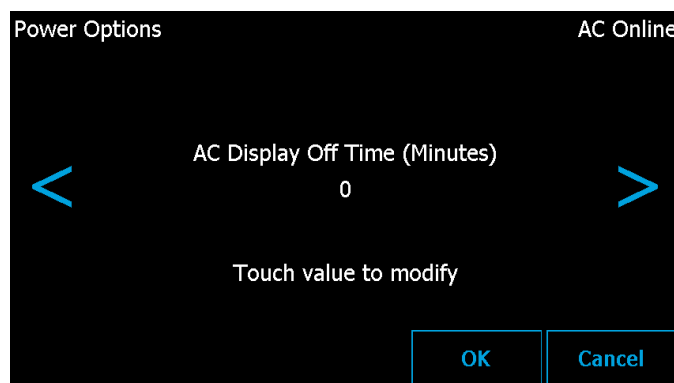
Figure 7 – Screenshot of power management control panel

In the top right corner of the screen, the power source status is displayed; either 'AC Online' or 'Battery' with the current battery charge level. Touching the value (shown here as '0') brings up a virtual keyboard so that the value can be changed.

The virtual keyboard can switch between three screens by pressing the mode key (marked as *%123) in the image below

Figure 8 – Screenshot of selecting a value in power management control panel

When the desired value has been entered, press the enter key to return (the right-hand button on the second line up)

Wireless Networking

Light Touch has inbuilt wireless networking support for 802.11 b/g. The following encryption standards are supported:

- WEP
- WPA
- WPA2 – TKIP
- WPA2 – AES

The wireless networking control panel can be accessed from within the 'Settings' category:

Figure 9 – Screenshot of 'Wireless Networking' icon within 'Settings' menu

The main screen within the wireless networking control panel is shown below:
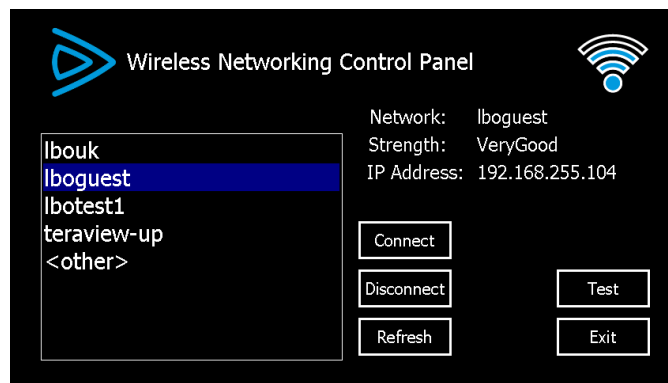
Figure 10 – Screenshot of wireless networking control panel

To connect to one of the networks displayed in the list, select the network by touching the name, then press 'Connect'. If the network requires a security code then this will cause a virtual keyboard to be displayed and the code should be entered.

The virtual keyboard can switch between three screens by pressing the mode key (marked as *%123) in the image below. When the code has been entered, press the green arrow button to connect.
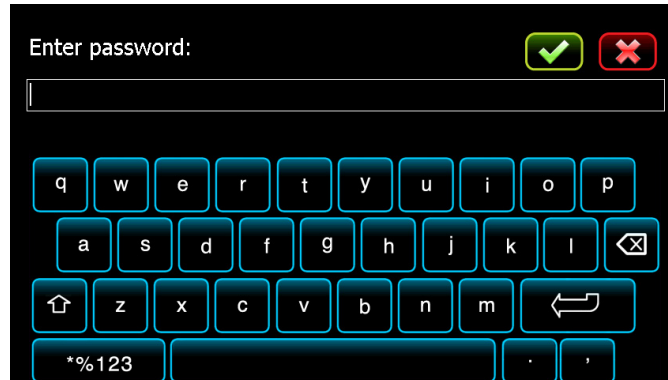

Figure 11 – Screenshot of entering network access code

At the main screen of the wireless networking control panel, the status of the connection will be displayed. Pressing the 'Test' button with cause the application to actively test the wireless network connection. If successful, the following screen will be shown. If unsuccessful, a similar screen will say that you are not connected to the internet.
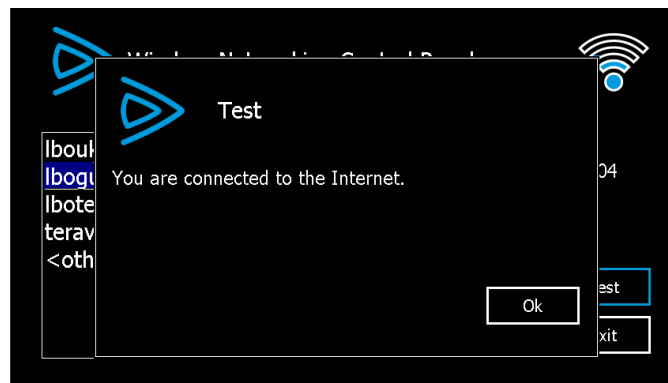
Figure 12 – Screenshot of networking control panel showing network test

Light Touch can also connect to wireless networks that don't broadcast their SSIDs. To connect to a network with a hidden SSID, select 'Other' from the list of available networks and press 'Connect'.

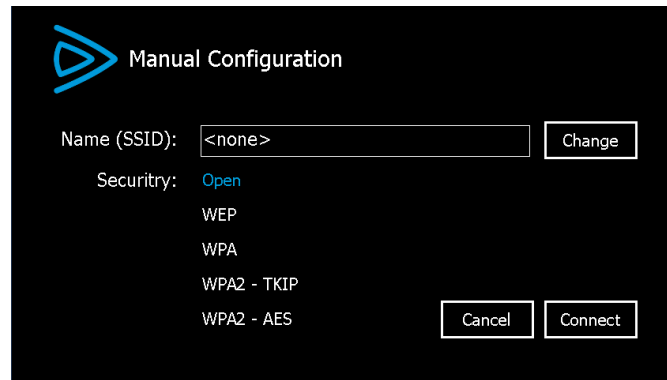The manual configuration screen, as shown below, allows network parameters to be set explicitly.

Figure 13 – Screenshot of manual configuration within wireless networking control panel

The virtual keyboard is used to enter the network name and security code.

USB Mode

Light Touch can be connected to a host machine via a USB cable that plugs into the USB Micro-B port. The USB Mode control panel can be accessed from the 'Settings' menu:
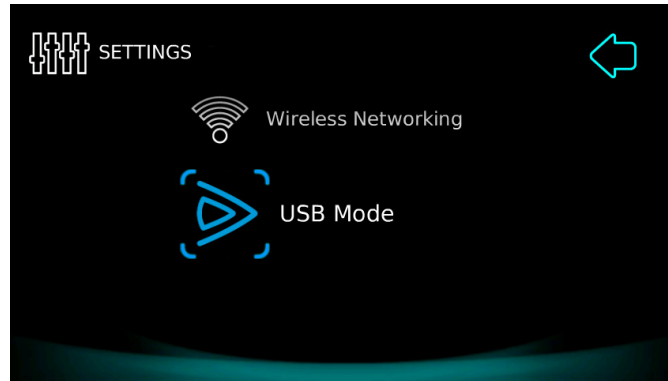

Figure 14 – Screenshot of 'USB Mode' icon within 'Settings' menu

The default USB mode is 'ActiveSync' mode, which allows Light Touch to be controlled from a Microsoft Windows PC. Further details are available in the separate 'Application Guide' document.

In order to connect using USB ActiveSync mode, a device driver is needed for the host PC. Instruction relating to the installation and use of these drivers is contained in the appendices of this document.

Light Touch also supports 'USB Mass Storage' mode, which allows Light Touch to appear as an external drive to a host PC or Mac.

Mass storage mode supports a higher transfer rate and the ability to connect without using a device driver. However, whilst Light Touch is connected as a mass storage device, it cannot access its own file system.

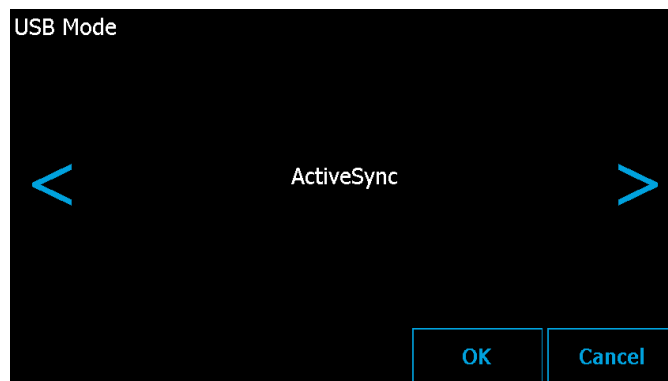The main screen of the USB Mode control panel allows the connection type to be selected as shown below.

Figure 15 – Screenshot of selecting USB mode

There are two different mass storage modes because Light Touch contains two separate memories that are accessible to the user. The 'internal' Flash memory has a capacity of 4GB and is present at all times. The 'micro-SD' Flash memory is an optional memory card that may be fitted into the device via the external micro-SD card slot.[1]

If mass-storage (micro-SD) mode is selected, the user will first be prompted to make sure that a micro-SD card is inserted.
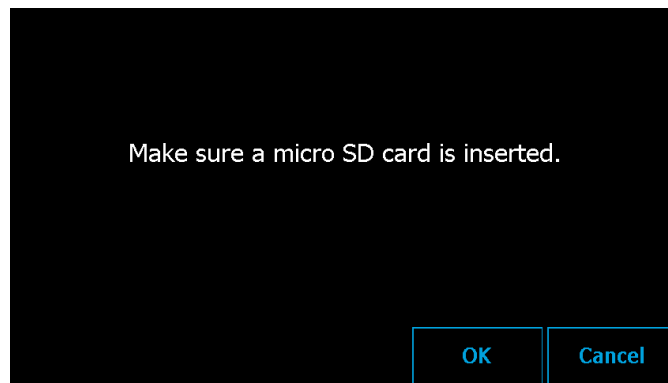

Figure 16 – Screenshot of prompt to check micro-SD card inserted

When Light Touch is put into mass storage mode, the following screen will be displayed for the duration of the transaction.
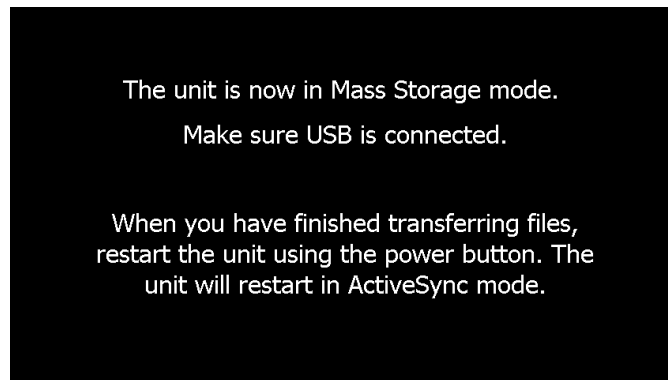

Figure 17 – Screenshot of mass storage mode message

When a USB cable is connected, the appropriate memory within Light Touch will appear as a network drive on the host machine. Once any file transfers have completed, Light Touch should be restarted using the power button. On power-up, Light Touch will return to 'ActiveSync' mode.

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[1] Note that the external micro-SD card slot is only accessible by removing the back panel of the outer plastic cover. To remove the cover, first remove the screw at the bottom of the back panel and then lift off the panel, starting from the bottom.

Developing Custom Applications

Introduction
The Light Touch LT1221 Series is designed to be an application platform that users can create their own content for. The system is designed to enable users to create applications using either one of two popular software platforms:

• **Adobe Flash Lite 3.1** – the Adobe Flash development toolset is currently used by over 1,000,000 developers. A wide range of visually-rich, interactive applications can be developed quickly and easily without the need for complex coding. As such, this method of creating applications is accessible to a wider range of content developers such as graphic designers and artists. Flash Lite 3.1 can also be used for the development of complex applications due to its support for ActionScript 2.0 code.

• **Microsoft .NET Compact Framework 3.5** – this powerful development environment gives developers maximum control over the system at the expense of more complex code development. Standard tools such as Microsoft Visual Studio can be used to create applications and the developer can get low-level access to system peripherals which would not be accessible via Flash Lite 3.1

The Light Touch LT1221 Series runs Microsoft WinCE 6.0 R3 as the operating system and includes all of the files needed to run applications written in both Flash Lite 3.1 and .NET Compact Framework 3.5.

Connecting to the Unit
Light Touch can be connected to a host computer via USB. The USB connection can be run in two modes: USB mass storage mode (i.e. providing drag-and-drop file transfer support, or ActiveSync mode (i.e. providing file transfer and debug capabilities for Windows PCs). Information on how to set the USB mode is provided in the 'Light Touch Settings -> USB Mode' section of this document.

For USB ActiveSync mode, the recommended method of connecting to the Light Touch from a PC is slightly different depending on which operating system the PC is running:

For Windows XP:

• Ensure that the host PC has Microsoft ActiveSync software installed http://www.microsoft.com/windowsmobile/en-us/downloads/microsoft/activesync-download.mspx . With the Windows XP operating system, it is recommended to use ActiveSync version 4.5
• Plug in the power to the Light Touch and turn the unit on
• Connect the Light Touch unit to a PC via the USB cable. The required USB cable is: Micro-USB (Type B) to Full Size USB (Type A).

- Follow the step-by-step instructions as shown in Appendix A.

For Windows 7 or Vista:

- Plug in the power to the Light Touch and turn the unit on
- Connect the Light Touch unit to a PC via the USB cable. The required USB cable is: Micro-USB (Type B) to Full Size USB (Type A).
- Follow the step-by-step instructions as shown in Appendix B.

Internal File Structure

The internal file structure of the Light Touch LT1221 Series is shown in Figure 18. The file 'Menu.swf' is the application that is run on start-up unless user generated applications are present. This launches the 'Application Launcher Carousel', which is effectively a dynamic, data-driven menu system. The contents of the menu system is defined using a number of XML files, with 'main.xml' being the principal one, which references other category-specific files such as 'videos.xml'.
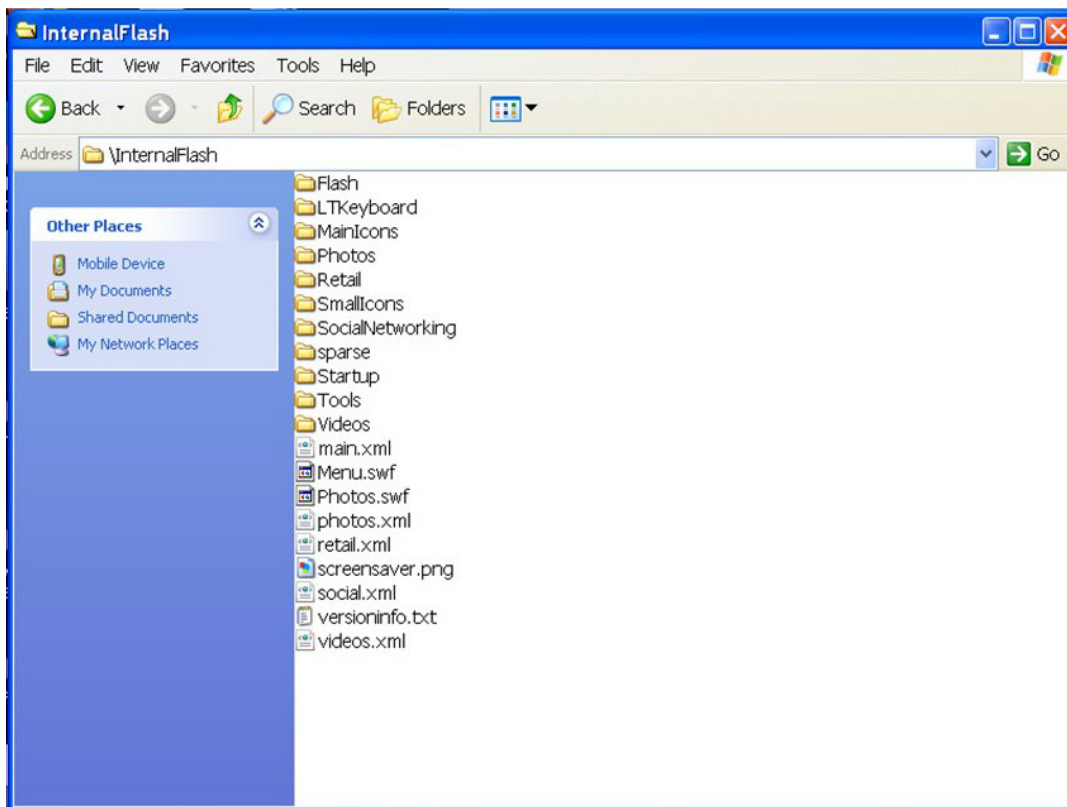

Figure 18 – File Structure of the LT1221 Series

The contents of this directory are supplied on the CD that comes with the Light Touch so that the user has a backup. They are located in:

<CD Drive Letter>:\Software\InternalFlash\

Configuring Application Use on Start-Up

The Light Touch can be configured to use different applications on start-up. On power-up, the system will load the operating system and then automatically search for a number of pre-defined applications in memory. The following list shows the name, location and priority order of files that are searched for by the system on start-up:

1. "\\storage card\\startup.exe"
2. "\\storage card\\startup.swf" (*See Note A)
3. "\\internalflash\\startup\\startup.exe"
4. "\\internalflash\\startup\\startup.swf"
5. "\\internalflash\\menu.swf"

Notes
   A. The '\\storage card\\startup.swf' path is only supported by Light Touch software versions 3.8.0 and higher (from May 2011)
   B. The 'storage card' location refers to the microSD card, which is located on the rear side of the Light Touch device. For the LT1221 Series, access to the card slot requires removal of the rear plastic cover, by removing two screws.

Therefore, if all of these files are present in the file system, the first one in the list is the application that will be run. If none of these files exists, the system will pause and wait until one does exist.

This system means that it is straightforward to reconfigure the system to load a user-generated application rather than the pre-loaded Flash Lite demonstration applications. When the unit is delivered, the 'startup' sub-directory will be present within the 'InternalFlash' directory, but it will not contain any files. Therefore, the system will load 'menu.swf' on power-up until the user uploads either 'startup.exe' or 'startup.swf' into the 'startup' sub-directory or onto the microSD card.

Tip:

When developing and testing new applications on a Light Touch unit, the following procedure is recommended:

1. Place the new application in one of the following two locations whilst testing:
   a. In a new directory in the InternalFlash folder and edit one of the .xml files (e.g. work.xml) to create a launch icon for the application in one of the menus or sub-menus, or
   b. Put the application on a microSD card and insert it into the Light Touch
2. Once the application has been fully tested and is known to work correctly, it can be run from the startup folder.

Creating Applications in Adobe Flash Lite 3.1

The recommended tool for Application development is Flash Creative Studio 4 or later. It should be set to ActionScript 2 only, as Flash Lite 3.1 is not compatible with ActionScript 3. The screen size should be set to 848 x 480 and touch interactions are equivalent to mouse clicks.

Applications created using Flash Lite 3.1 can communicate to system-level components via API calls. Examples of such components include the LBO virtual keyboard and audio volume levels. A document describing the API components and how to use them is available on request from LBO.

For further information and suggestions of good design practice, please refer to the Light Touch Design Guidelines document, which is available on request from LBO.

Creating Applications in Microsoft .NET Compact Framework 3.5

Microsoft's .NET Compact Framework is a version of the .NET framework designed to run on mobile devices. Included on the Light Touch unit is .NET compact Framework 3.5. The framework uses some of the same libraries available in the full .NET framework and also includes some specifically designed for mobile devices.

MSDN has further details on the Compact Framework:

http://msdn.microsoft.com/en-us/library/f44bbwa1.aspx

The recommended tool for application development is Microsoft Visual Studio 2008. The screen size should be set to 848 x 480 and touch interactions are equivalent to mouse clicks.

For further information and suggestions of good design practice, please refer to the Light Touch Design Guidelines document, which is available on request from LBO.

Support

Troubleshooting

Symptom	Solution
Unit will not turn on	1) The internal battery may need to be recharged. 2) Ensure the power is connected before pressing the on button. 3) If a USB cable is connected, remove it and retry.
Touch does not function	1) Check that the clear plastic shipping labels have been removed from the front surfaces of the projector 2) Check the projector is absolutely level on the projection surface. If the surface is uneven, or contains obstacles, this can interfere with the touch system. 3) Check that no lighting source with a high infra-red content is near the projector. 4) Ensure Light Touch is not too close to another Light Touch unit, as this can cause interference with the touch system. 5) Lift the unit and check that the micro-switch is free on the bottom and can be depressed. Replace the unit and recheck. 6) If touch is still not functioning, turn the unit off and restart.
ActiveSync will not connect to the unit	1) Reconnect the USB cable. Wait for ActiveSync to attempt connection before trying again. 2) Turn off and then restart the unit and attempt to reconnect 3) If this does not work, restart the PC.
A white screen is displayed or a message box appears and the unit becomes unresponsive	Turn off and restart the unit.
Colours are not aligned	Light Touch includes an automatic colour-plane alignment facility. If the unit is very cold on start-up, colours may be misaligned. Allow the unit to run and warm up for 5 minutes, then turn-off and restart.

Table 1 – List of potential problems and respective solutions

Support Desk

If you should require support with your Light Touch product, please contact the support desk at Light Blue Optics at: support@lightblueoptics.com

The LBO support team will endeavour to respond to your enquiry within 2 working days

Appendix A – ActiveSync USB Setup for Windows XP

1) Connect Light Touch™ to mains power, turn it on and connect to a host PC via a USB cable. The PC will auto-detect the presence of the unit and launch the following dialogue window as shown in Figure 19.

Figure 19 - Hardware Update Wizard (Step 1)

2) Select the option 'No, not this time' and click 'Next'. A second dialogue window will appear, as shown in Figure 20.
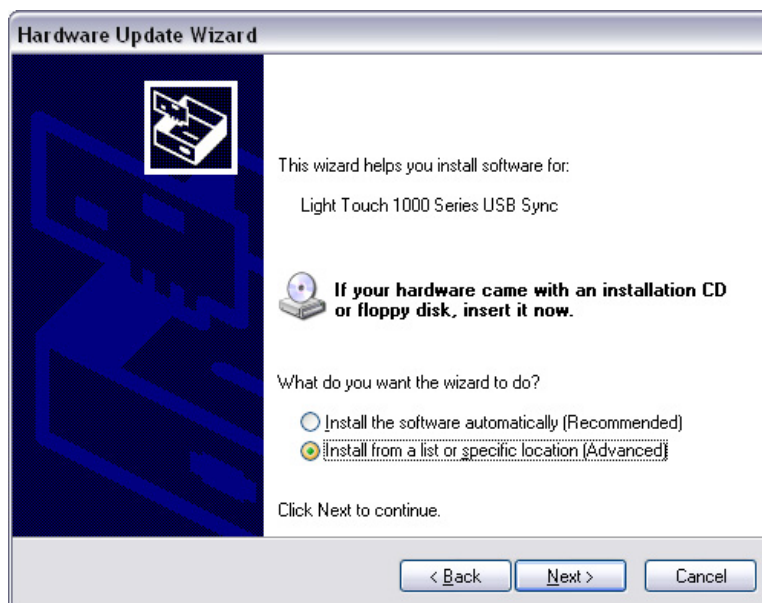

Figure 20 - Hardware Update Wizard (Step 2)

![LIGHT BLUE OPTICS logo]

3) Select the option 'Install from a list or specific location (Advanced). The window as shown in Figure 21 will appear.
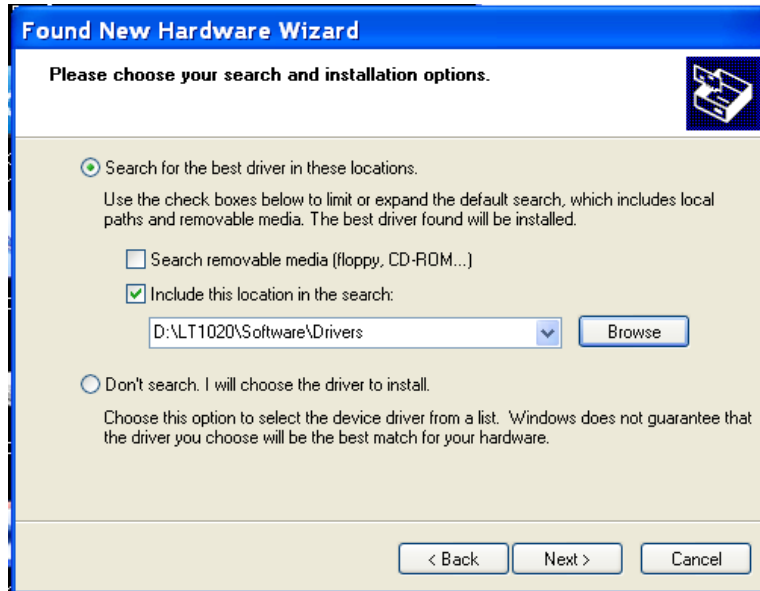
Figure 21 - Hardware Update Wizard (Step 3)

4) Insert the Start-up CD in the Light Touch™ pack. Browse and select the directory as shown in Figure 22. (Note : the drive letter will vary from PC to PC).
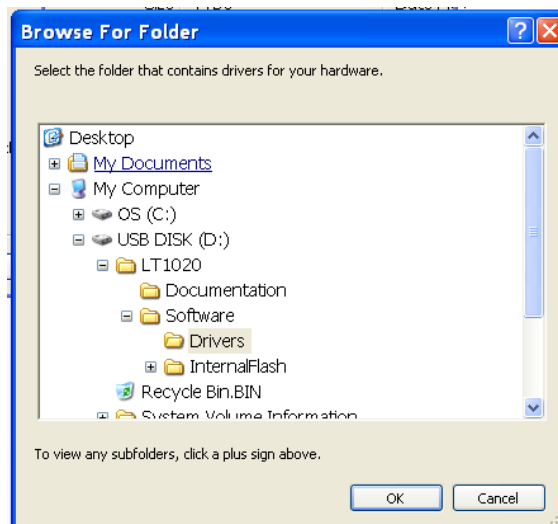
Figure 22 - Hardware Update Wizard (Step 4)

5) Once the folder has been selected, the PC will locate the relevant driver files and complete installation.

6) Power cycle Light Touch™ and then run ActiveSync software on the host PC. The PC will automatically detect Light Touch and to the following window appear, as shown in Figure 23.

Figure 23 – Opening ActiveSync Connection (Step 1)

7) Select the option 'No' and press 'Next'. A confirmation window is then displayed as shown in Figure 24.
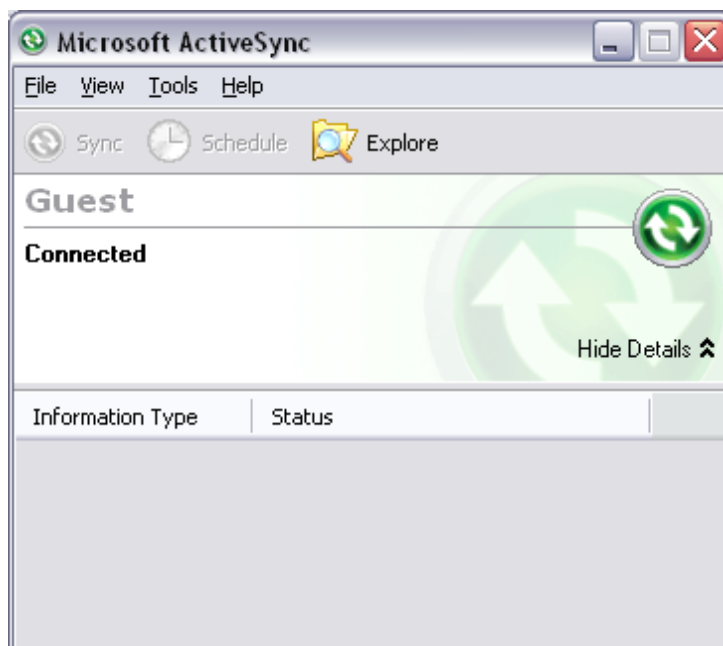
Figure 24 - Opening ActiveSync Connection (Step 2)

8) Browse the InternalFlash directory on Light Touch ™ as shown in Figure 25.
Files can then be modified, uploaded or downloaded as required.
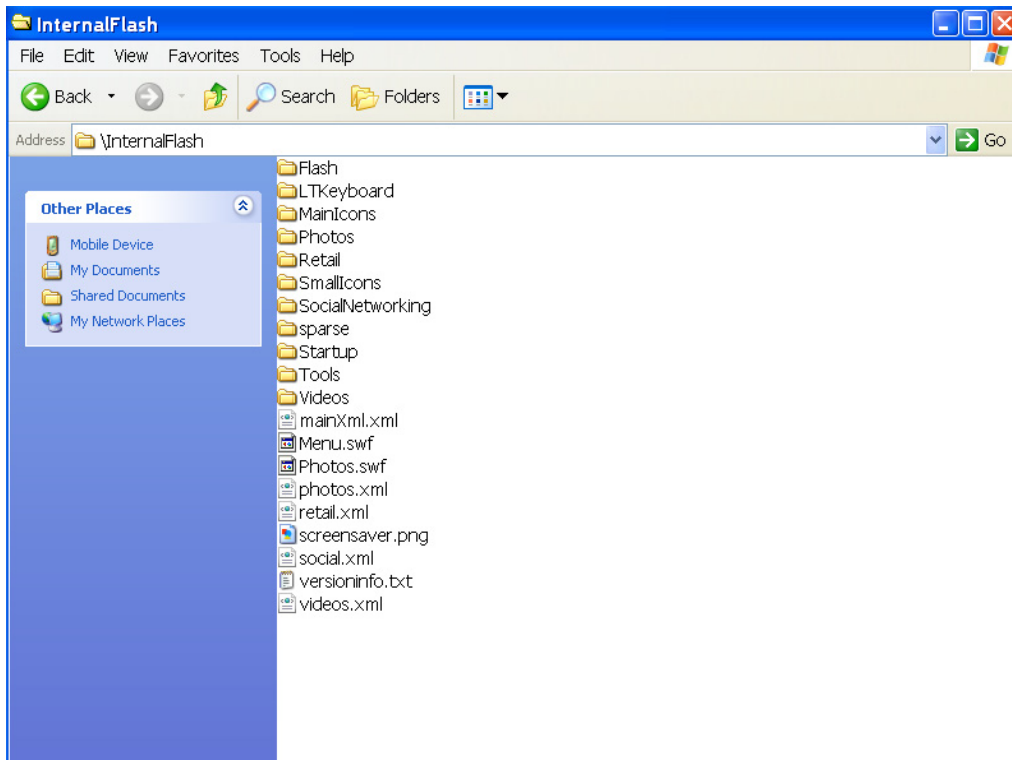
Figure 25 - Opening ActiveSync Connection (Step 3)

Appendix B – ActiveSync USB Setup for Windows Vista/7

To install the Light Touch on Windows 7 or Vista perform the following steps.

1. Power on the Light Touch unit.

2. Access Windows Device Manager

    a. Right Click on **Computer ->** Select **Manage ->** Select **Device Manager**

3. Look for **Mobile devices** as shown below. There will likely be a yellow exclamation in front of the Light Touch. This is OK.
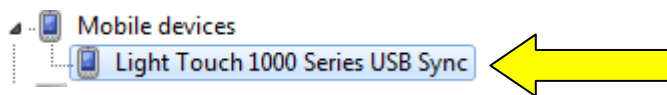
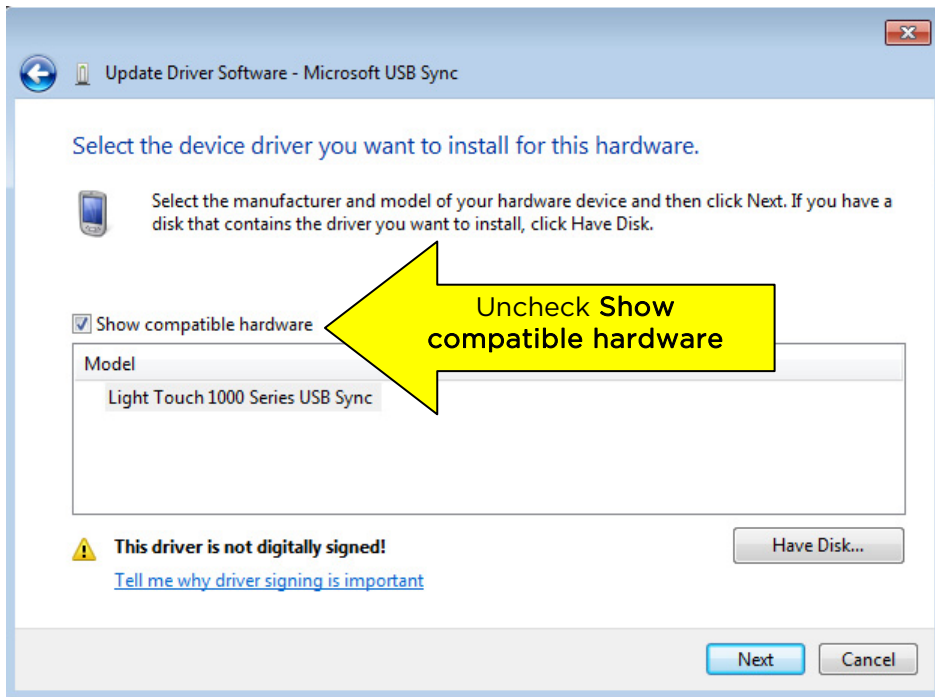4. Right Click on the Light Touch and Select Update Driver Software...
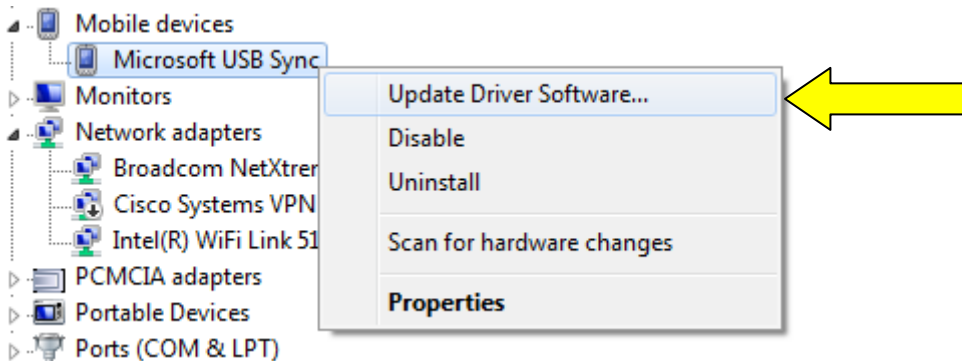
5. Select Browse my computer for driver software. Click **Next**.
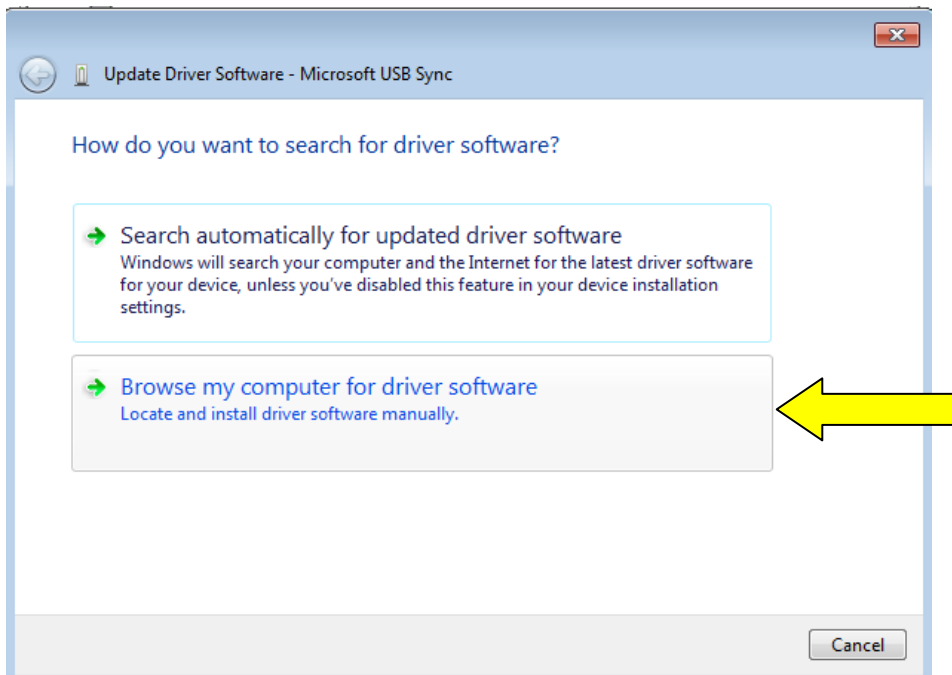
6. Select Let me pick from a list of device drivers on my computer. Click Next.


7. The **Update Driver Software – Microsoft USB Sync** window will appear. Unselect the **Show compatible hardware** check box.

8. Select **Microsoft** (1) in the Manufacturer column. The **Model** column will now populate. Select **Microsoft USB Sync (Microsoft Corporation)** (2). When the driver is loading a warning message will be displayed. Click **Yes**. The driver will now install and may take a few minutes to complete.
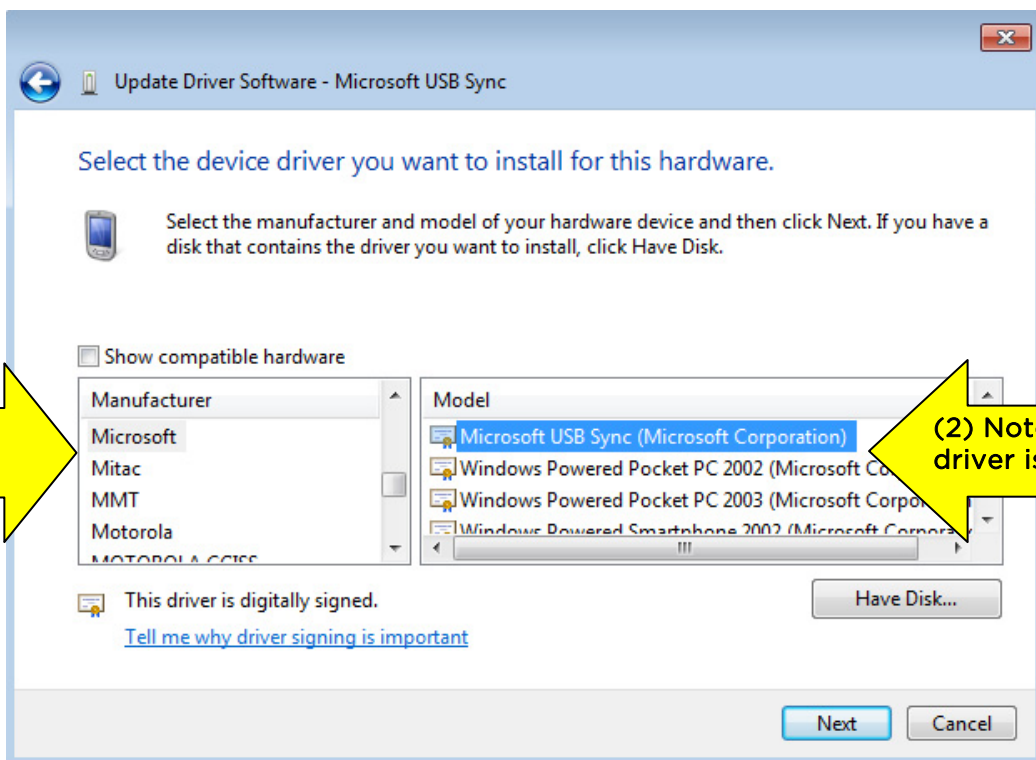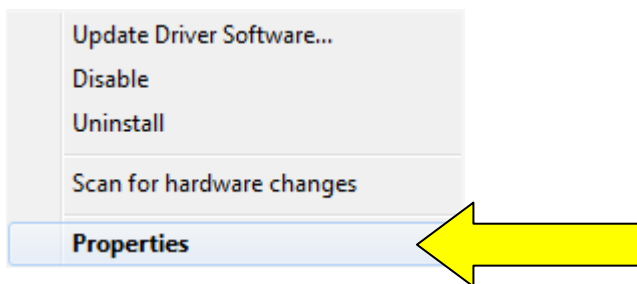
9. Once the driver installs it is very likely that a (code 10) error will be displayed. Click **Close**.
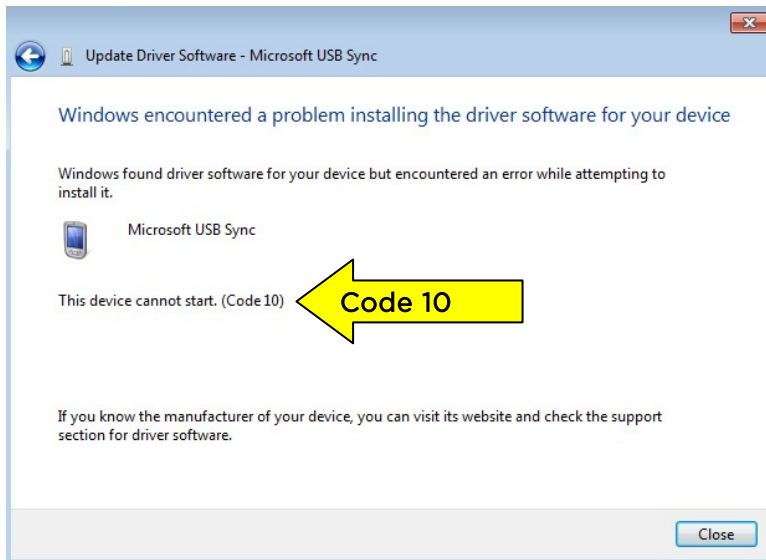
10. Once the correct driver is installed it will no longer show Light Touch 1000 Series USB Sync but Microsoft USB Sync as shown below.
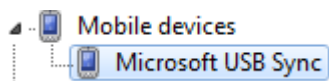
11. To verify the driver right click on Microsoft USB Sync and select properties.

12. Select the **Driver** tab. The window below will appear showing the driver version of 6.1.6965.0
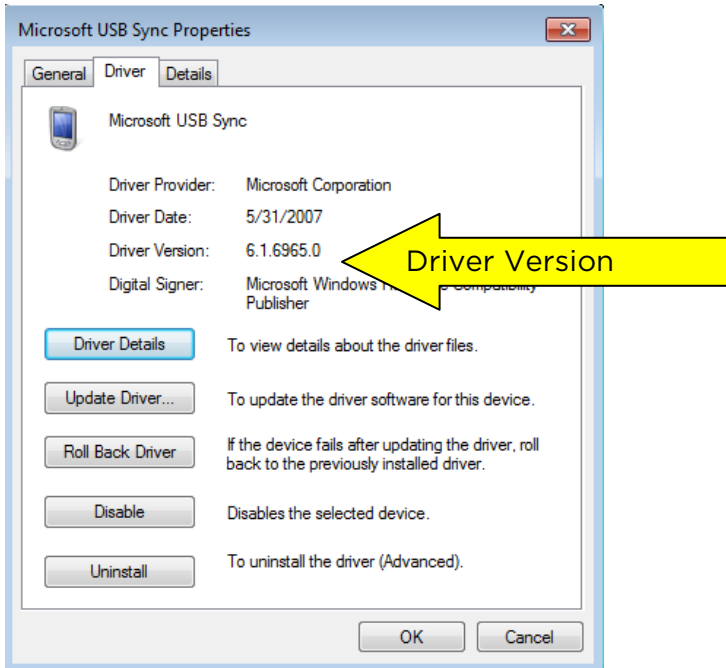

13. Power **off** the Light Touch. **Restart** your computer. Once your computer has rebooted power the Light Touch on. The Light Touch will begin to sync with Windows Mobile. Windows Mobile will display that the device has properly connected and can now be accessed.

14. To access the files on Light Touch select File **Management** and click on **Browse the contents of your device**.

15. The following directory structure will be displayed.
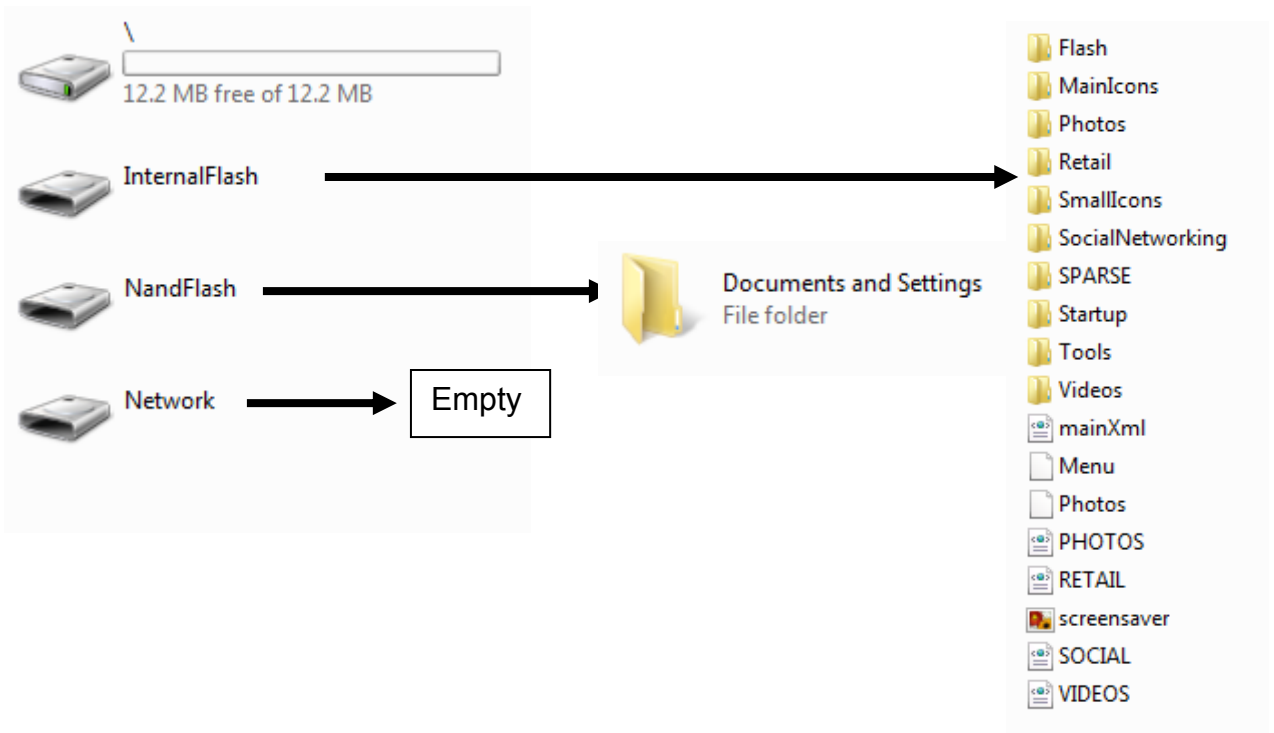
Appendix C - Light Touch™ Specifications

Resolution	848 x 480 pixels (WVGA)
Brightness	Dependent on content type: 18 Lumens for typical video content[1] 35 Lumens for typical user-interface content[1]
Projected Image Size	9.8" diagonal
Laser Safety Classification	Class 2 according to IEC 60825-1:2007
I/O Connectors	USB Device (Micro Type B Connector) Micro SDHC card (Push-push socket)[2]
Operating System	Microsoft WinCE 6 R3 (Core and Pro versions available)
Application Software	Adobe Flash Lite 3.1 Microsoft .NET Compact Framework 3.5
Memory	System memory: 128MB RAM, 256MB flash ROM Application/media memory: internal 4GB flash, external micro SDHC card (supports upto 32GB)
Wireless Networking	Integrated wireless networking chipset supporting 802.11 b/g with WEP, WPA, WPA2-TKIP and WPA2-AES Bluetooth v2.1 available for evaluation
Audio	Integrated mono speaker 3.5mm stereo headphone socket
Touch Sensor	Finger-activated touch sensor, providing single-touch detection over the full projected image.
Proximity Sensor	Detects the presence of a hand in area above the projected image. Can be used to trigger a 'system wake-up' event
Power Input	5V (+/- 0.5V) DC input socket (manufacturer CUI, part number PJ-028-03)
Battery Type	Internal Li-Ion rechargable
Battery Capacity	3600 mAh
Typical Operation Time	2 hours (from battery)
Battery Charging	5V DC Power Adaptor (Normal Charge and Continuous Operation) Micro-USB (Trickle Charge)
Weight	825g
Dimensions	137 x 41 x 193 mm
Operating Temperature	+5 to +35 °C
Storage Temperature	-20 to +60 °C
Lifetime (MTTF)	10,000 hrs[3]

1. Video content assumes 17% coverage. Symbology content assumes 6% coverage.

2. The micro-SD card slot is only accessible by removing the rear door in the outer cover

3. Figure subject to ongoing investigation

Table 2 – Specification of Light Touch LT1221 Series