

# Handscanner User Guide

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## Overview

This document provides general usage instructions for the Handscanner and is applicable for both the 1D laser scanner and 2D imager versions.

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## History

Version	Date	Modifications
1.0	15/02/07	Document Creation
1.1	13/06/07	Updates to Regulatory section.
1.2	6/07/07	Added new FCC ID information

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# 1 Main parts of the Handscanner

## 1.1 Handscanner



The status LEDs on the top of the Handscanner provide an indication of the operating status of the unit.

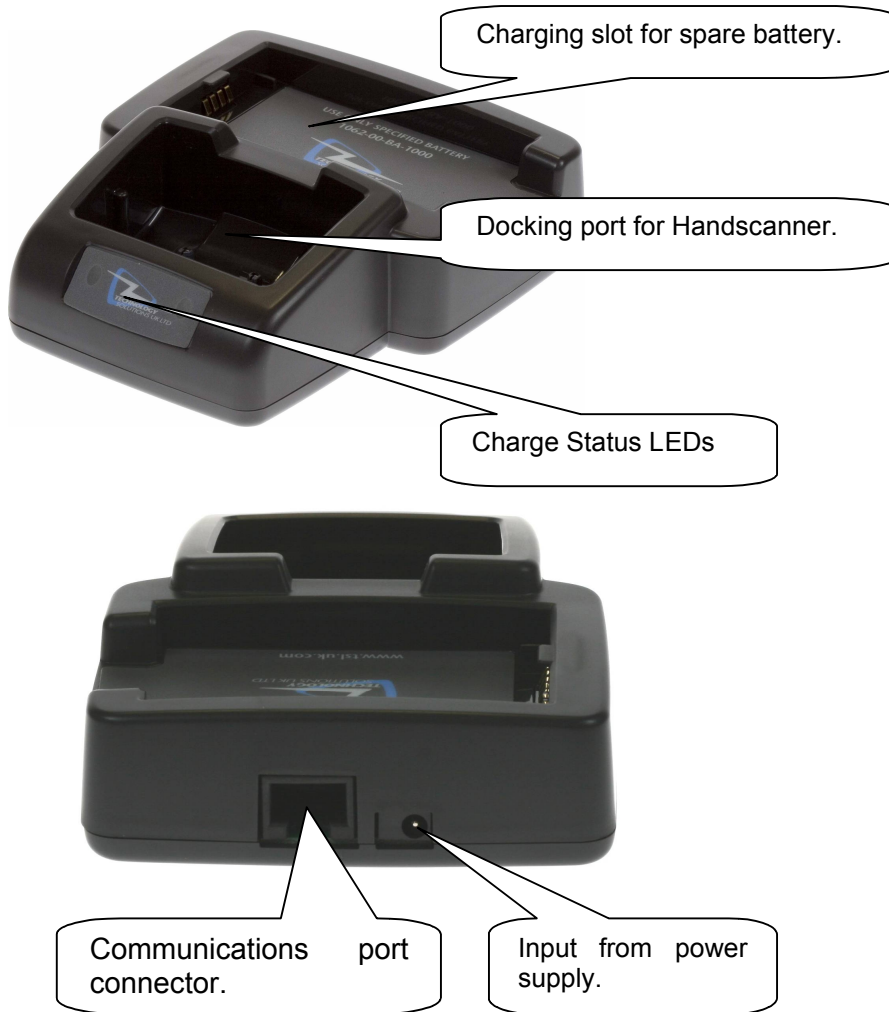
LED colour	Status
Off	The Handscanner is off.
Blue flashing	The Handscanner is powered on and waiting for a Bluetooth connection.
Continuous Blue	The Handscanner is powered on and connected via Bluetooth.

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Red	The Handscanner is charging.
Green	The Handscanner is fully charged.
Red and Green	The battery in the Handscanner has a fault, or it is being charged outside the recommended temperature range (0°C to 45°C).

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## 1.2 Cradle



The Charge Status LEDs indicate the state of the spare battery. The spare battery charge feature is independent of the charging of the battery inside the Handscanner.

LED	Charge Status
Red on	The spare battery is charging.
Green on	The spare battery is fully charged.
Both red and green on.	No spare battery is present, the spare battery has a fault, or the spare battery is being charged outside the recommended temperature range (0°C to 45°C).

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## 2 Using the Handscanner

### 2.1 Charging the Handscanner

The Handscanner is charged by docking it in the cradle. Plug the power supply provided with the cradle in to the power in socket on the back of the cradle. The charge time will depend on how discharged the Handscanner battery is. Typically a fully discharged battery will take 3-4 hours to fully charge. The LEDs on the top of the Handscanner indicate the charge status; Red for charge in progress, Green for charge complete. Both LEDs on simultaneously indicates a fault condition. This will happen if the battery is outside the recommended charging temperature (0°C to 45°C), or if the battery has a fault.

The cradle is also capable of charging a spare battery at the same time as a Handscanner. The spare battery drops into the holder at the back of the cradle. The charge time in the cradle is the same as the Handscanner. Charge status is indicated by the LEDs on the cradle. Red indicates charge in progress, Green charge complete and Red and Green for fault (or battery not present). Note that the charge status of the spare battery is independent of the Handscanner.

## 2.2 Removing the Handscanner battery

1. Press in the yellow button



2. Slide the battery cover down and lift it off.

The battery can then be lifted out and replaced. Refit the cover by sliding it back up until the button clicks in place.

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## 2.3 Handscanner Readzones



Both transponders and barcodes are read in front of the Handscanner as shown above. The barcode is read when the red laser line completely scans over it (1D) or it is enclosed in the projected red outline (2D). RFID transponders are read in the same plane as barcodes. The RFID read range is far less than the barcode. Typically an RFID device will be read at less than 10cm (dependent on the size and type of the RFID device). A barcode may be read between 5cm and 1m depending on the scanner type, barcode symbology, size and condition.

The Handscanner functionality depends on the software running on the host device. Generally pressing the button on the Handscanner triggers a barcode and/or RFID read. The RFID read zone is in front of the window on the Handscanner.

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## 2.4 Operating modes

The Handscanner has two fundamental operating modes; Host Command Mode and Button Press mode. Both modes may be combined in an actual deployed application.

Host Command Mode requires custom software to be developed and deployed to the host. All of the functionality and features of the Handscanner can be remotely controlled in Host Command Mode. The full command set is documented in the 'Handscanner Programming Guide'. To simplify custom application development an API is available; this is documented in the 'Handscanner API' document. Both documents are available from the Technology Solutions' website ([www.tsl.uk.com/downloads](http://www.tsl.uk.com/downloads)). Source code examples are provided in the Software Development Kit available from Technology Solutions (1062-0x-BT-HSCAN-KIT).

In Button Press Mode the Handscanner is initially configured to operate in a particular way each time the button is pressed. A PC application; Desktop Configuration is provided by Technology Solutions for configuring Handscanners. An overview of the configurable features is given in Section 2.5.

Host Command Mode requires that the Handscanner has a Bluetooth link to the host. Button Press Mode usually operates with a Bluetooth link, but it is possible to configure the Handscanner to store scan data locally and download it later. This is Batch Mode and is described in Section 2.5.8.

The method of establishing the Bluetooth link varies between different host platforms. The Handscanner appears as a serial device (Bluetooth Serial Port Profile) and so in some cases will be accessed over a virtual comm. port. The Handscanner establishes a secure Bluetooth connection and therefore a PIN will be required during the pairing process. The default PIN is '0000', but this can be changed using the Desktop Configuration software. When discovering devices the Bluetooth Friendly Name of the Handscanner is set to be the same as the serial number printed on the side of the Handscanner. Again, this may be changed. Refer to the operating instructions of the host platform for further information on establishing a Bluetooth link.

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## **2.5 Configurable features**

### **2.5.1 Introduction**

The Desktop Configuration application supplied by Technology Solutions is required for configuring Button Press Mode on a Handscanner. This application is available for download from the Technology Solutions website ([www.tsl.uk.com/downloads](http://www.tsl.uk.com/downloads)) along with a full user guide. Configuration of the Handscanner is only possible over the wired serial connection. A cradle and serial data lead are therefore required. If the host PC does not have a serial port it is possible to use a USB to serial converter lead.

The following sections provide an overview of the configuration options.

### **2.5.2 Bluetooth settings**

The Bluetooth Friendly Name, the PIN and the Bluetooth RF power can be modified.

### **2.5.3 Functionality**

The RFID functionality can be enabled and disabled for each transponder type. Barcode scanning, and the various symbologies included in a barcode scan can be enabled and disabled.

### **2.5.4 Prefix**

A prefix can be added to the scanned data to indicate whether it came from a barcode, or from a particular RFID transponder type. A prefix can also be added to all scanned data to indicate which Handscanner the data came from.

### **2.5.5 Buzzer**

The buzz on successful read function can be enabled or disabled.

### **2.5.6 Vibrator**

Vibrate on successful read can be enabled or disabled.

### **2.5.7 RFID multiblock read**

An RFID transponder may contain multiple blocks of data in addition to the unique serial number. The start block and number of subsequent blocks to read when a transponder is present can be configured.

### **2.5.8 Batch mode**

Batch mode allows the Handscanner to store all scanned data locally if there is not a Bluetooth link to the host. With Batch mode enabled the Handscanner continues to operate as normal, but stores scan data locally. This data can then be downloaded from the Handscanner memory subsequently. If Batch mode is not enabled the Handscanner will not respond to button presses when a Bluetooth link is not established.

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Batch mode is a useful feature in help to avoid data loss if the Bluetooth link drops because the Handscanner has moved out of range of the host. There is a risk of a short period of data loss because the Bluetooth link failure indication is not immediate. Scan data obtained during the period between moving out of range and the Bluetooth link indicating failure may not be preserved.

### **2.5.9 Scan time**

The maximum duration in seconds of a scan can be configured. The barcode reader has an independent maximum scan duration (4s for 1D, 10s for 2D). Setting the Scan Time to shorter than these times results in barcode and RFID scanning stopping at the specified time, setting the Scan Time to longer times results in the barcode scanning stopping before the RFID

### **2.5.10 Power down time**

The time in seconds that the Handscanner stays powered on after the Bluetooth link has dropped or the button has been pressed can be changed from the default value of 120 seconds.

### **2.5.11 Firmware update**

The Desktop Configuration application includes a firmware loader for updating the Handscanner firmware.

## 3 Application Examples – PC

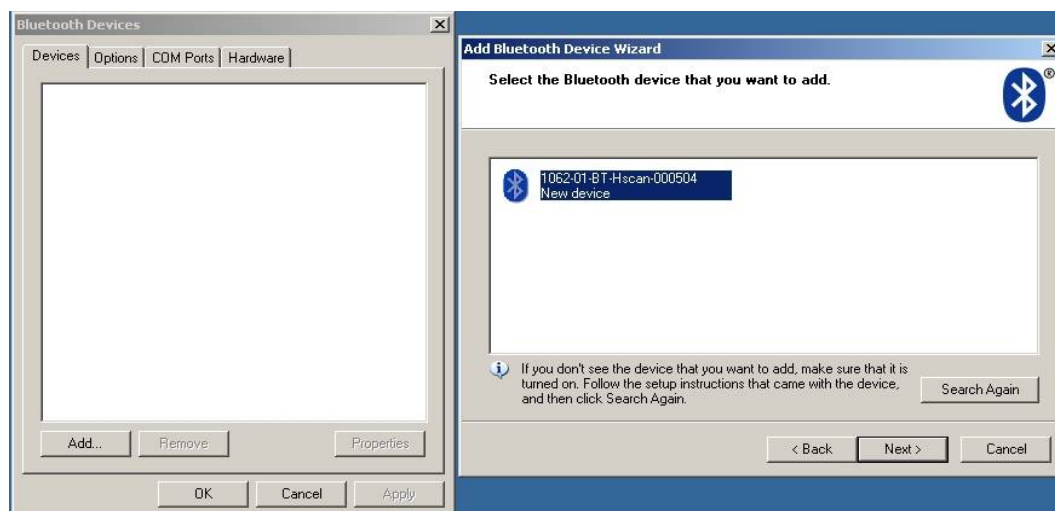
### 3.1 Introduction

These examples assume that the Handscanner is in its factory default state and that it is being used on a PC running Windows XP. The same approach can be taken with any other platform.

### 3.2 Setting up the Bluetooth connection

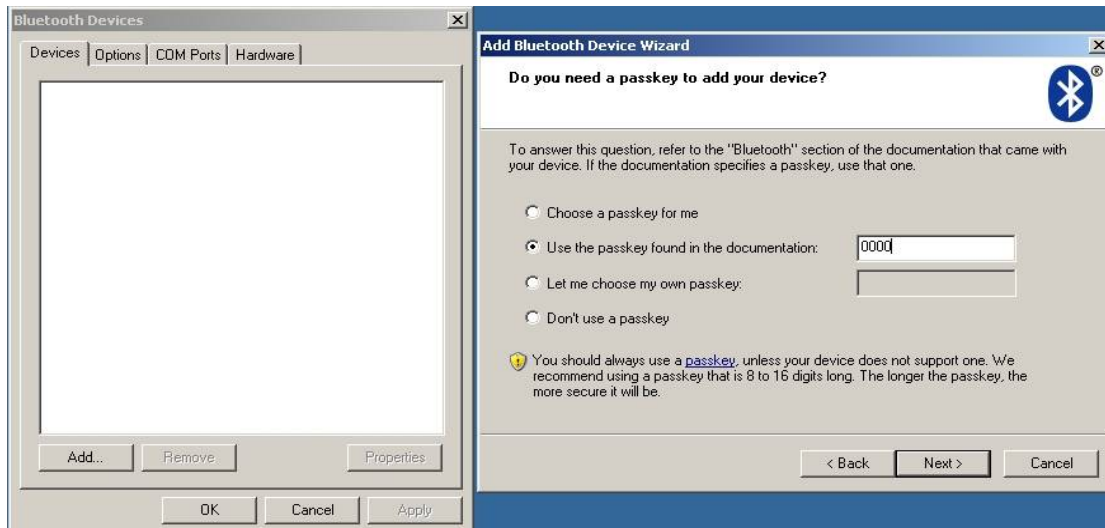
Establishing a Bluetooth connection requires the stages of Discovery and Pairing. The Handscanner conforms to the Bluetooth Serial Port Profile and therefore a Virtual Comm port will be created as part of the Bluetooth setup process.

Launch the Bluetooth Device window (Start>Control Panel>Bluetooth Devices). Click the 'Add' button, switch on the Handscanner by pressing the yellow button. The Blue LED will start to flash slowly. Tick the 'My device is set up and ready to be found.' box and click the 'Next' button. This starts the Discovery process. When this is complete a list of devices will be shown, including the Handscanner as shown below:

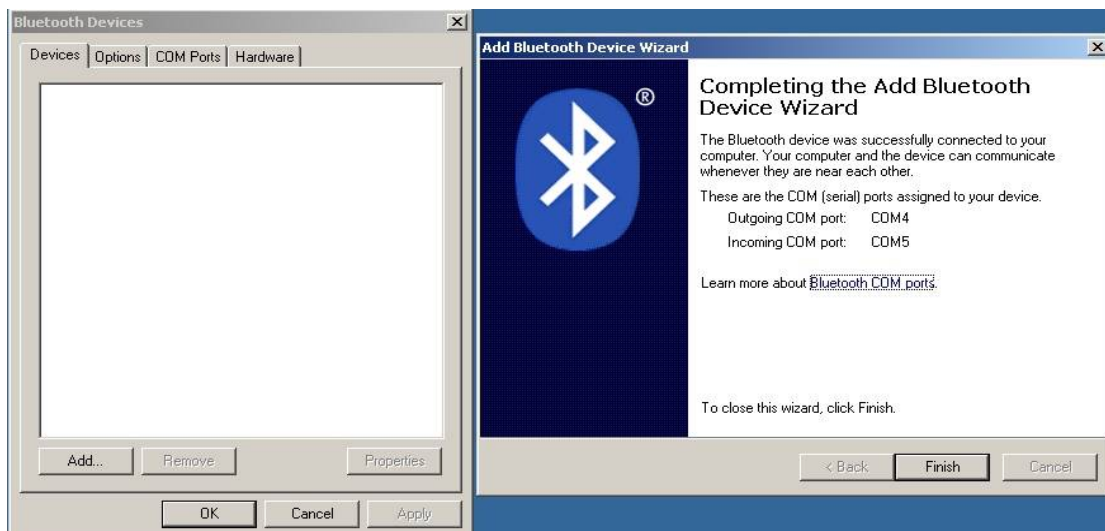


The Handscanner will be identified by its Bluetooth Friendly name which by default is the serial number printed on the side of the Handscanner. Click on the Handscanner and then on 'Next' to start Pairing. Enter the default PIN of '0000' as shown below and then click 'Next'.

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The installation of the Handscanner will then continue. At this point the Virtual COM port will be created. When this has successfully completed the window shown below will be displayed.



Record the 'Outgoing COM port' number. This is the Virtual COM port that will be used by any application that needs to connect to the Handscanner.

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## 3.3 Using SmartWedge Basic

### 3.3.1 Introduction

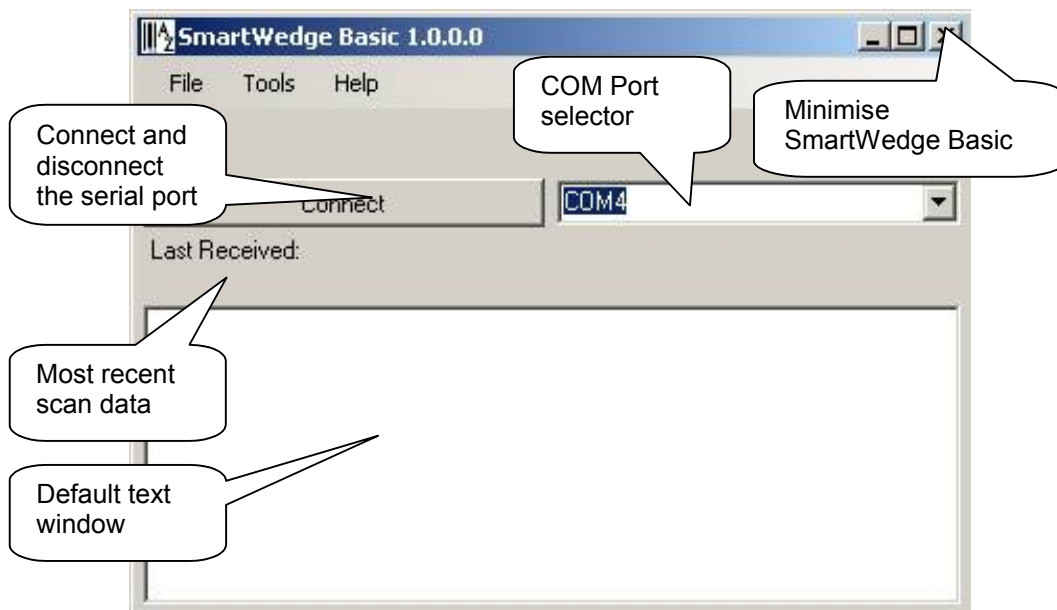
SmartWedge Basic is an application for Windows XP which allows scanned data to be directly entered into another Application as though it had been typed on the keyboard. The data is inserted at the cursor of whichever window has focus. This allows the Handscanner to be immediately used in existing systems with no software development. The Handscanner can be configured (see Section 2.5) to provide a certain set of actions on button press so that the correct data is read and prefixed ready for use by the existing software. A more advanced version of the SmartWedge software is available from Technology Solutions which includes additional functionality such as data filtering and formatting.

### 3.3.2 Installation

SmartWedge Basic for the PC is provided in a standard Windows Installer (.msi) package. Double click to install the application.

### 3.3.3 Operation

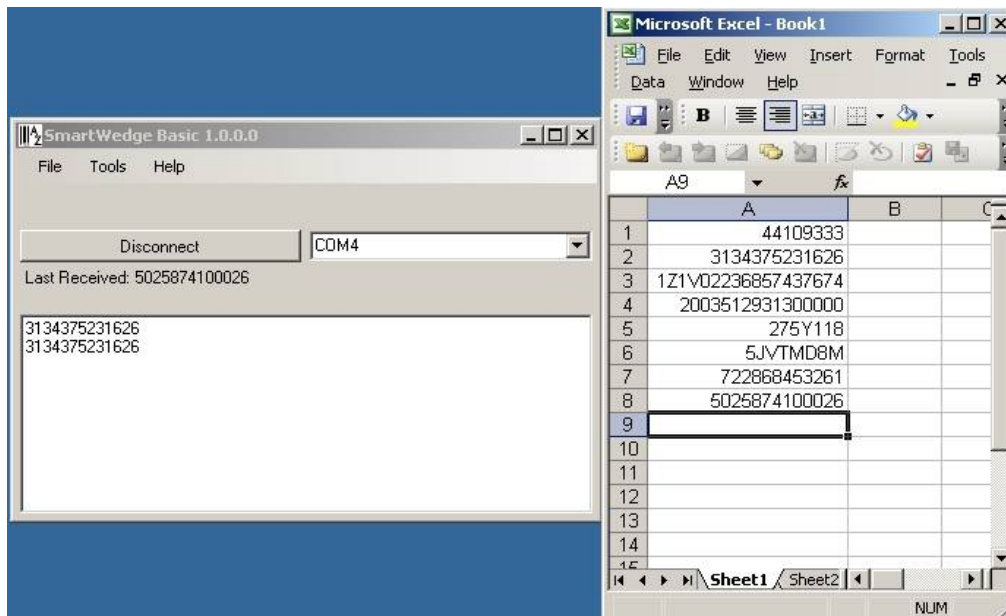
Start SmartWedge from 'Start > All Programs > Technology Solutions > SmartWedge Basic'. When the application starts it shows the configuration window as below:



Before using SmartWedge Basic the Handscanner must be associated with a virtual comm. port (see Section 3.2). Select the appropriate port number from the 'COM Port selector', ensure the Handscanner is powered on and tap the 'Connect' button. If the correct virtual comm. port is not shown in the 'COM Port selector' then it is possible to directly type in the port number.

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Any RFID or barcode data scanned by the Handscanner will then appear at the top of the window and also in the 'Default text window' whilst SmartWedge Basic has focus (the cursor is flashing in the 'Default text window'). Launch the application that is to receive the data, for example Excel, and position the cursor at the data entry point. Scan data will then be entered into the target application. By default all scanned data is terminated with CR LF characters to automate data entry. A typical screenshot is shown below:



Note that if CAPS lock is selected on the PC keyboard all of the alphabetical characters will have their case reversed so a lower case character from a barcode will appear as an upper case character in the receiving application and vice versa.

Minimise SmartWedge Basic using the cross in the top right hand corner of the window. SmartWedge Basic minimises to the System Tray. Hover the mouse over the icon to see the current status, double click to restore the main window or right click to restore, disconnect or exit the application. Even when SmartWedge Basic is minimised the 'Most recent scan data' entry is always updated with the most recently received text.

When SmartWedge Basic is no longer required, click 'Disconnect' to close the link to the Handscanner and exit SmartWedge Basic from 'File > Exit'.

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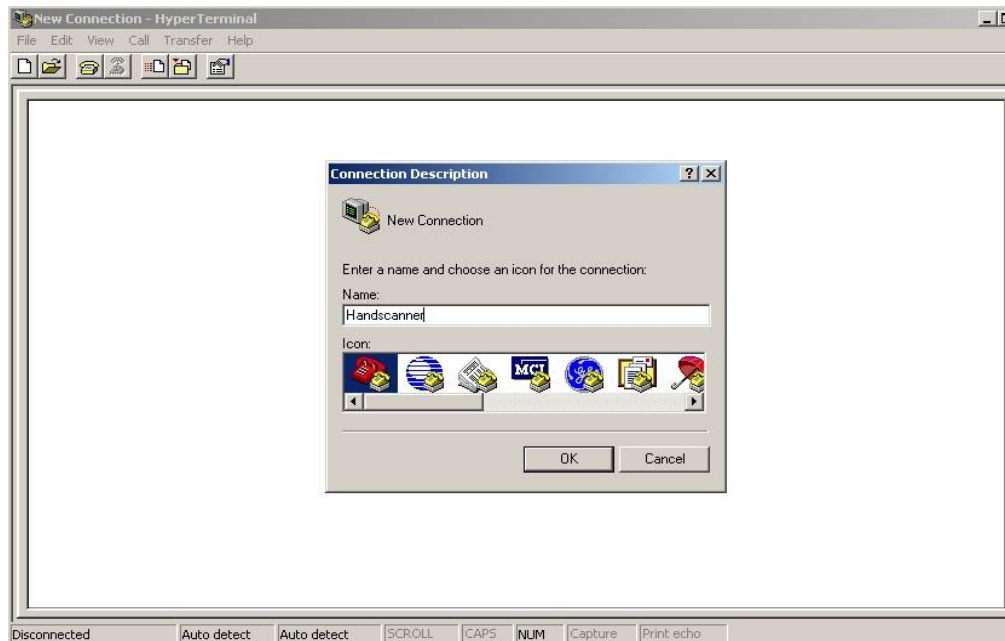
## 3.4 HyperTerminal

### 3.4.1 Introduction

HyperTerminal provides a simple way to display the data received from a Handscanner for demonstration or test purposes.

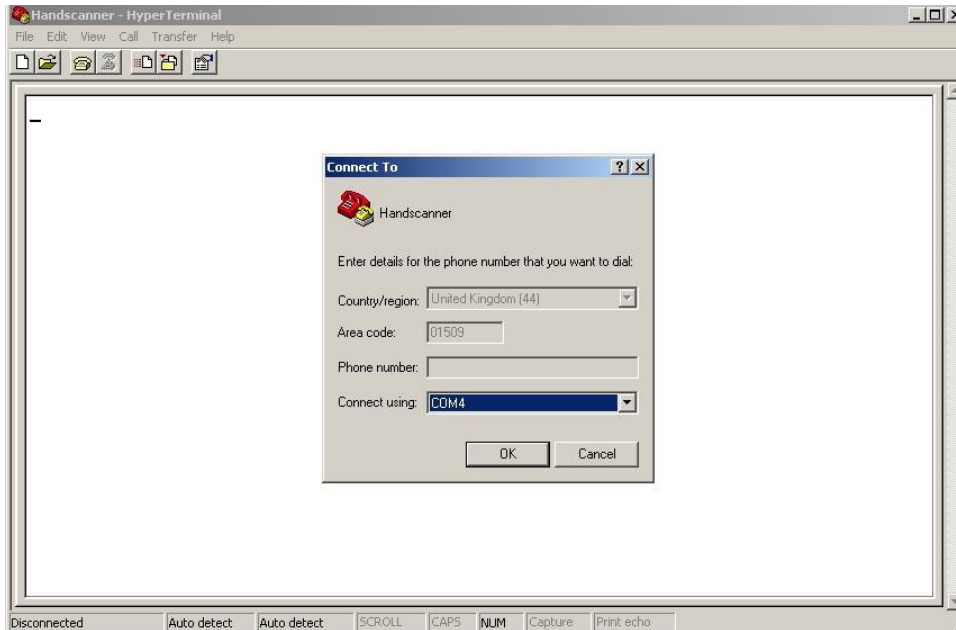
### 3.4.2 Configuring HyperTerminal

Launch HyperTerminal from 'Start > All Programs > Accessories > Communications > Hyperterminal.' Name the new connection 'Handscanner' or something similar:

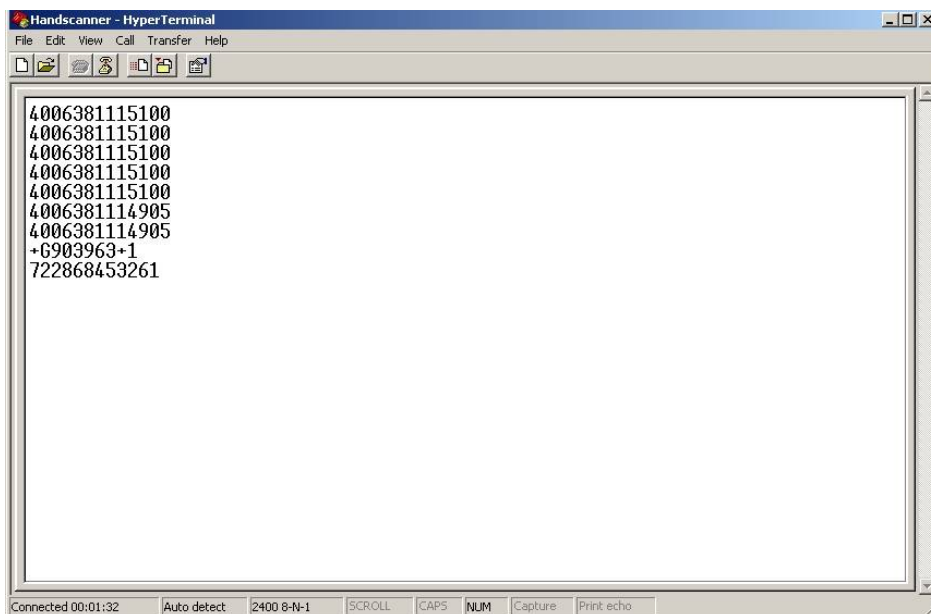


Click 'OK' and then chose the COM port that was displayed during the Bluetooth setup (Section 3.2):

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Check that the Handscanner is switched on, click 'OK' and the Bluetooth connection will be established. Any barcodes or transponders read by the Handscanner will be displayed by HyperTerminal. Note that the virtual comm. port is opened at the default setting of 2400 baud. This does not affect performance because only small amounts of data are being transferred. It is possible to modify the baud rate and other connection settings by closing the connection and using 'File>Properties'.



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## 4 Application Examples – Pocket PC

### 4.1 Introduction

These examples assume that the Handscanner is in its default state. Pocket PC devices have a range of different Bluetooth Managers. The two examples provided should cover the majority of devices. The fundamental approach will be the same on all devices; discover the Handscanner and then pair to it. In most cases it will also be necessary to define a virtual comm. port for use with the Handscanner.

### 4.2 Setting up a Bluetooth connection – Symbol MC70

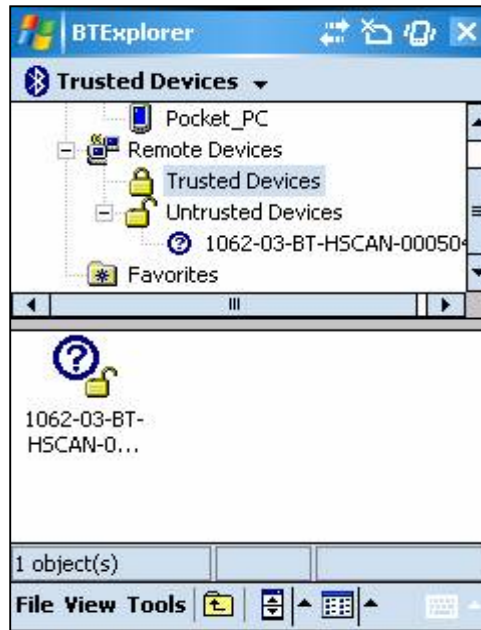
Ensure that Bluetooth is enabled and start BTE Explorer (Start>Programs>BTE Explorer). If necessary tap 'View>Explorer Mode' to exit the Wizard.

Tap 'Tools>Discover Devices' to start the Bluetooth Discovery. The screen will look similar to the one below:



Once the Bluetooth Discovery is complete the Handscanner will appear in the Untrusted Devices list. The Handscanner will be identified by its Bluetooth Friendly name which by default is the serial number printed on the side of the Handscanner:

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Tap and hold the Handscanner and then select 'Pair' from the menu. Enter the default PIN of '0000' and tap 'OK':

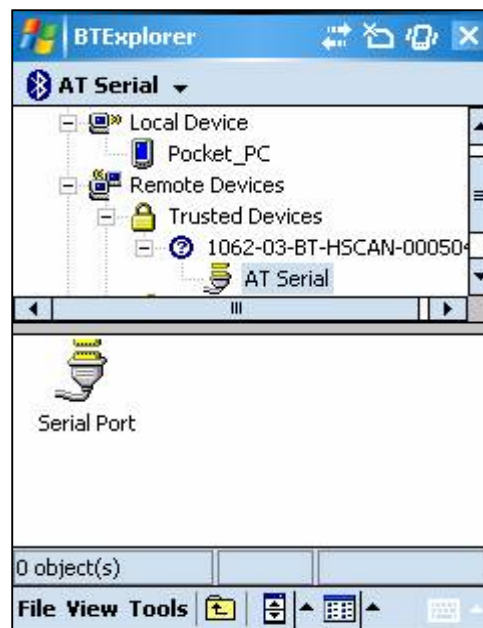


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The Pairing is then complete and the Handscanner will appear in the Trusted Devices list:



Tap and hold the Handscanner and select 'Explore' from the menu. An 'AT serial' port will be found:



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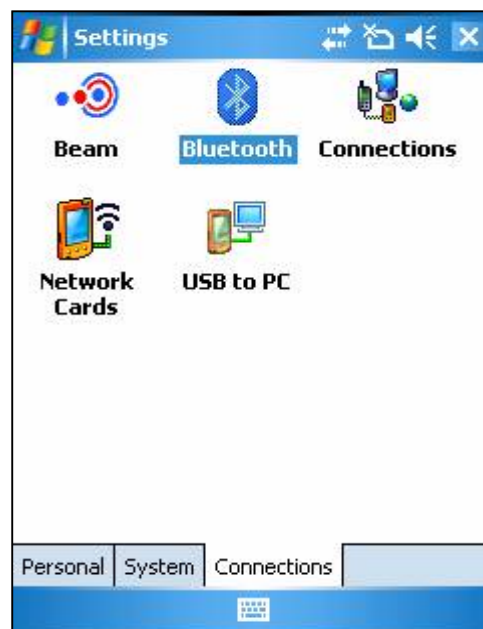
Finally, tap and hold the Serial Port and select 'Connect'. This will display the Connection Information as shown below. Note the Local COM Port. This is the port that an application will open to communicate with a Handscanner.



Tap 'Cancel' and confirm that the connection should be cancelled then close BTE Explorer.

### 4.3 Setting up a Bluetooth Connection – Intermec CN3

On the CN3 tap Start>Settings>Connections tab to get to the screen below:



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Tap the Bluetooth icon and then select the Devices tab:



Ensure that the Handscanner is powered up by pressing the yellow button. The blue LED will then be flashing.

Tap 'Add new device...' and the following screen will be shown:



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Once the Device discovery has completed a list similar to the one shown below will be shown:



By default the Handscanner name corresponds to the serial number printed on the side of the unit. In this case it is '1062-01-BT-Hscan-000504'. Tap on the Handscanner and then on 'Next'.

A Passcode will be requested, enter 0000.



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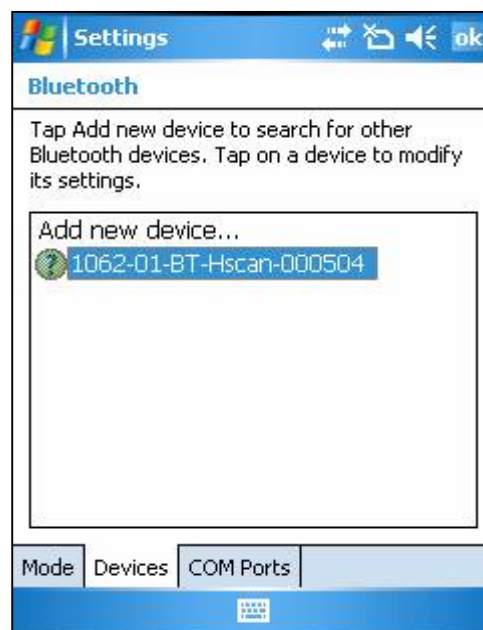


Once the authentication has completed successfully the following window will be shown, tap in the box next to serial port:



Finally tap on 'Finish' to complete the process.

Once the Handscanner is in the Known Devices List the display will be similar to the one below:

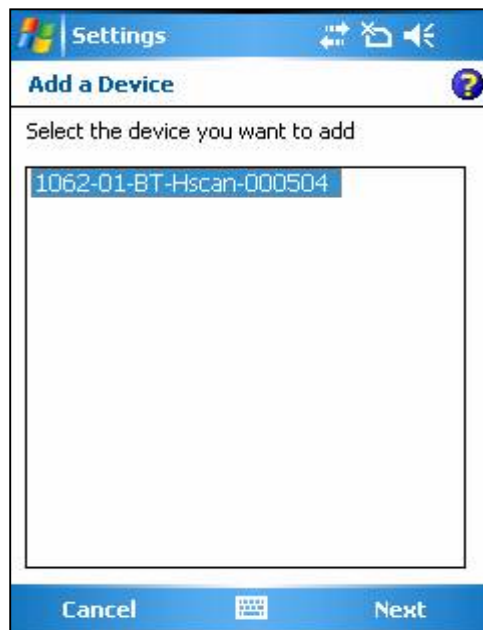


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If the application connecting to the Handscanner needs to use a Bluetooth virtual comm port then select the 'COM Ports' tab and tap 'New Outgoing Port':

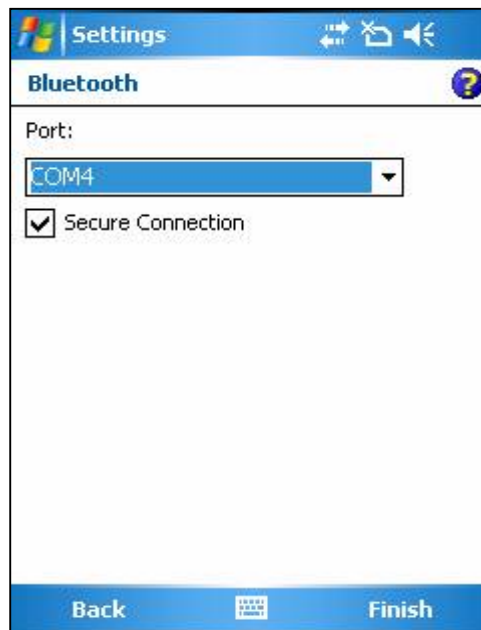


Tap on the Handscanner in the device list and tap 'Next':



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A list of the available ports will be displayed, select one and remember it. Tick the 'Secure Connection' box and tap 'Finish'.



The Handscanner will then be on the list of serial devices:



Any application which opens this virtual comm. port (COM 4 in this example) will be connected to the Handscanner.

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## 4.4 Using SmartWedge Basic

### 4.4.1 Introduction

SmartWedge Basic is a utility application for devices running Windows Mobile 5. It captures any text received over a serial port and sends it to the active application as though it had been directly entered on the keyboard. This allows the Handscanner to be immediately used with existing applications. The Desktop Configuration application can be used to modify the Handscanner operation, for example by adding prefixes, excluding transponder types.

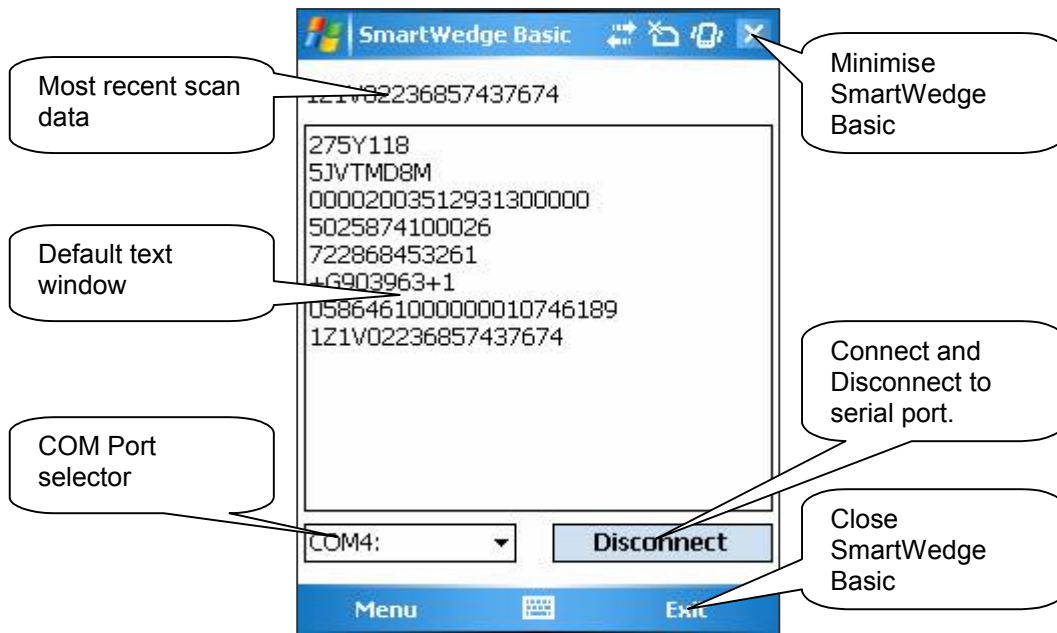
An advanced version of SmartWedge is available from Technology Solutions. This includes advanced data handling and filtering allowing rules to be constructed which modify the data processing based on the scanned data. It also integrates directly with the Bluetooth stack on certain devices which simplifies operation.

### 4.4.2 Installation

SmartWedge Basic is provided as a .cab file. ActiveSync to the target terminal and run the file to deploy SmartWedge Basic.

### 4.4.3 Operation

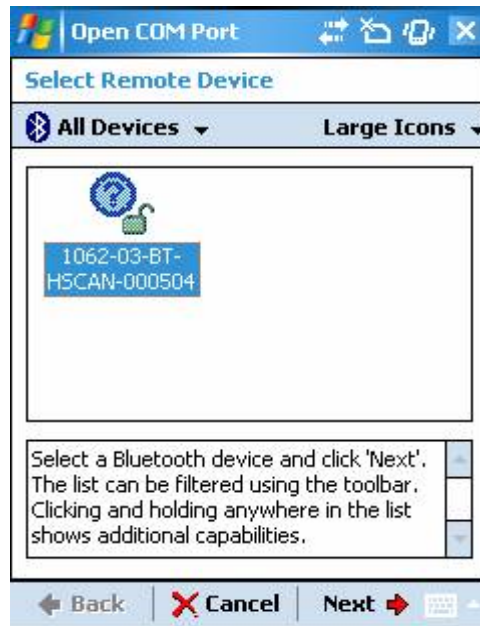
The SmartWedge Basic screen is shown below:



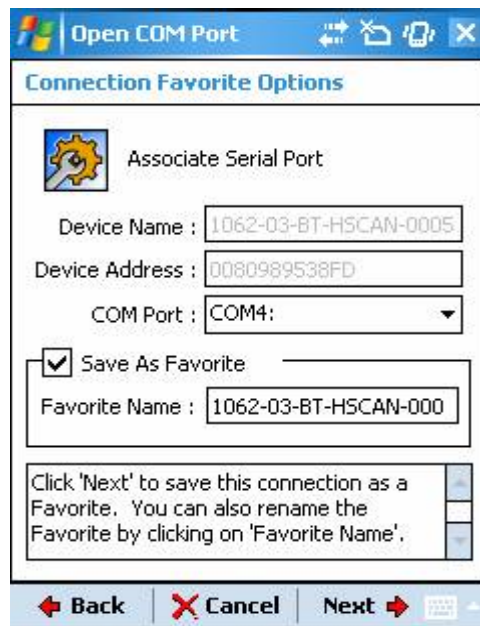
Before using SmartWedge Basic the Handscanner must be associated with a virtual comm. port (see Sections 4.2 and 4.3 for examples). Select the appropriate port number from the 'COM Port selector', ensure the Handscanner is powered on and tap the 'Connect' button.

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The behaviour then depends on which Bluetooth manager is used on the Pocket PC device. On the MC70 the following window appears the first time that the virtual comm. port is opened:

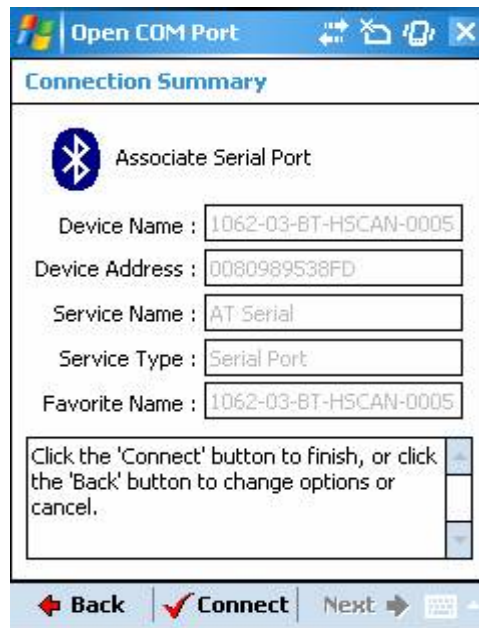


Select the Handscanner and tap 'Next'. The following window then opens:



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Tap 'Next' to see the following Connection Summary window:



Finally, tap 'Connect' to open the link with the Handscanner. For other devices these intermediate stages may not be required and the virtual comm. port will be opened immediately. Once connected the button will change to show 'Disconnect' as above, and the blue LED on the Handscanner will light continuously.

Any RFID or barcode data scanned by the Handscanner will then appear at the top of the window and also in the 'Default text window' whilst SmartWedge Basic is shown. Even when SmartWedge Basic is minimised the Most recent scan data entry is always updated with the most recently received text. Minimise SmartWedge Basic using the cross in the top right hand corner of the screen.

Open the application that is to receive the scan data, for example Pocket Excel and position the cursor at the data entry point. Scan data will then be entered into the target application. By default all scanned data is terminated with CR LF characters to automate data entry.

Note that if CAPS lock is selected on the terminal all of the alphabetical characters will have their case reversed so a lower case character from a barcode will appear as an upper case character in the receiving application and vice versa.

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A typical screenshot is shown below:

	A	B
1	1Z1V02236857437674	
2	44109333	
3	5025874100026	
4	722868453261	
5	275Y118	
6	5JVTMD8M	
7	2003512931300000	
8		
9		
10		
11		
12		

When SmartWedge Basic is no longer required switch back to it (Tap on the icon in 'Programs' or 'Settings>System>Memory>Running Programs'), tap 'Disconnect' to close the link to the Handscanner and exit SmartWedge Basic by tapping 'Exit.'

If the terminal is put into Suspend state and then resumed the virtual comm. port is not reopened although SmartWedge Basic will still show 'Disconnect' as though the port was open. This is a limitation of Bluetooth Virtual comm. ports. Tap 'Disconnect' and then 'Connect' to re-establish the link. The direct Bluetooth Stack integration included in the advanced version of SmartWedge handles Bluetooth connection recovery.

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## 4.5 Using mToken

### 4.5.1 Introduction

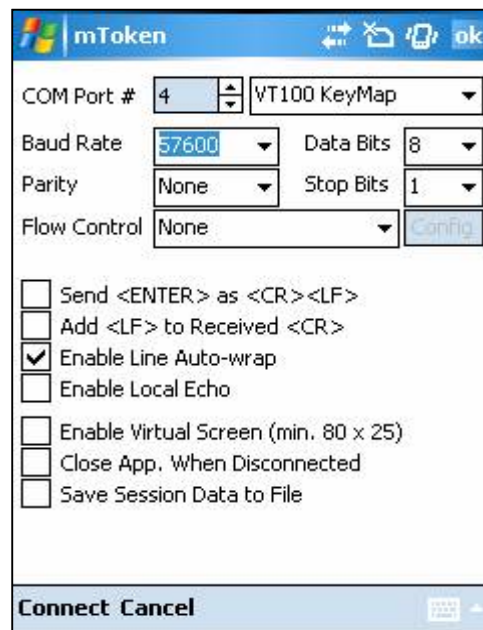
mToken is a Terminal Emulation application for Pocket PC devices. It is available for download from <http://www.choung.net/mToken>. A time limited evaluation version is also available.

### 4.5.2 Installation

Connect to the Pocket PC device using ActiveSync and then run the mToken install. This will deploy the application to the device.

### 4.5.3 Operation

Launch mToken and tap 'Session>Direct COM Port'. Select the COM port assigned during the Bluetooth connection setup and a baud rate of 57600 as shown below:

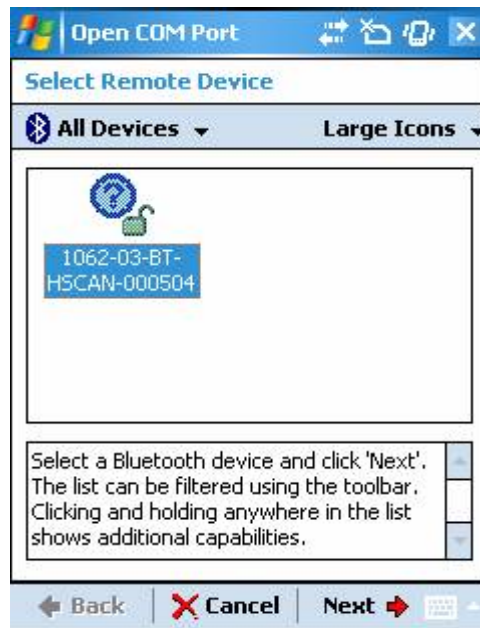


Ensure that the Handscanner is powered on by pressing the yellow button and tap 'Connect'. The behaviour then depends on which Bluetooth manager is used on the Pocket PC device.

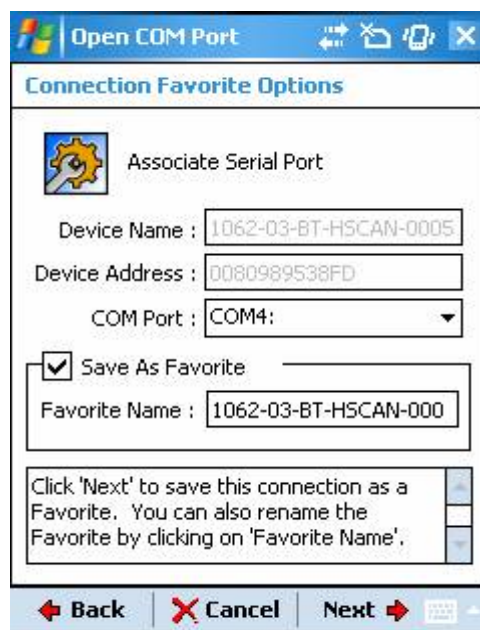
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On the MC70 the following window appears the first time that the virtual comm. port is opened:

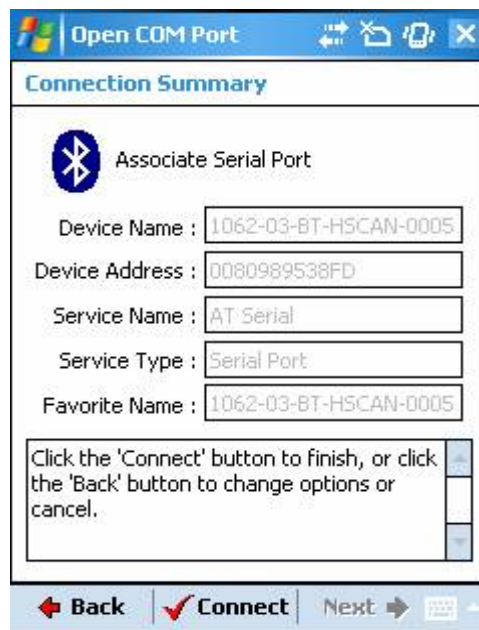


Select the Handscanner and tap 'Next'. The following window then opens:

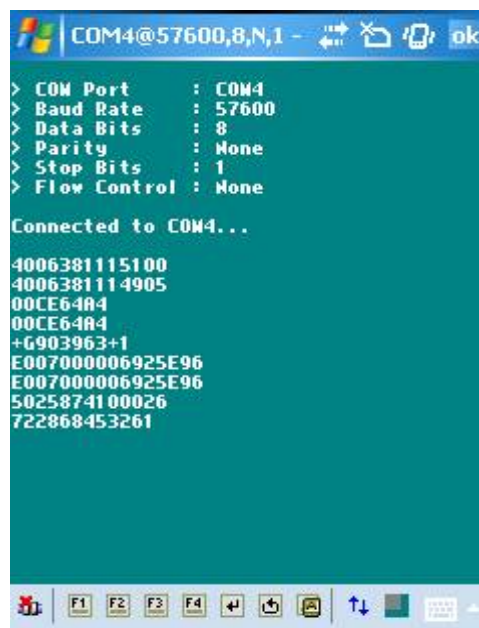


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Tap 'Next' to see the following Connection Summary window:



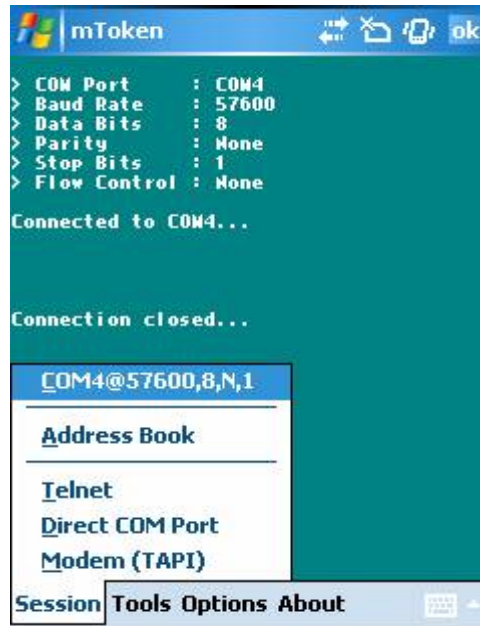
Finally, tap 'Connect' to open the link with the Handscanner. For other devices these intermediate stages may not be required and the virtual comm. port will be opened immediately. Barcode and RFID data read by the Handscanner will then appear in the mToken window as shown below:



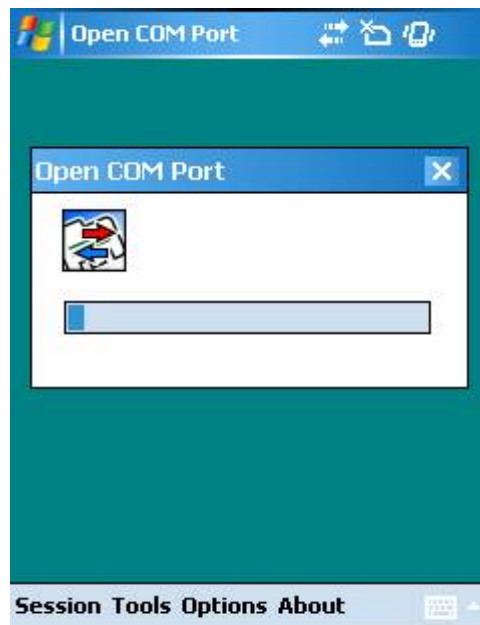
The Handscanner is disconnected by tapping the Disconnect symbol in the bottom left hand corner of the screen.

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Subsequent opens of the virtual comm. port are more straightforward on the MC70. Tap 'Session' and then the stored connection will be on the list:



Tap on the stored entry and after a short delay with the window below shown the port will be opened:



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## 5 Regulatory

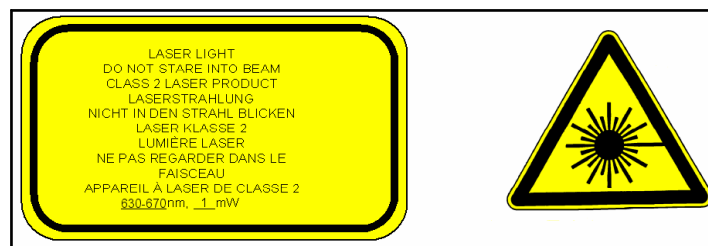
All Technology Solutions devices are designed to be compliant with appropriate regulations and standards and are CE marked. Any changes or modifications to Technology Solutions equipment, not expressly approved by Technology Solutions, could void the user's authority to operate the equipment.

### 5.1.1 Safety

The Handscanner complies with:

- 21CFR1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.
- EN60825-1:1994+ A1:2002 +A2:2001
- IEC60825-1:1993+A1:1997+A2:2001

This information is repeated inside the battery compartment. The following Laser Warning Label is printed on the side of the Handscanner:



Caution: Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Class 2 laser scanners use a low power, visible light diode. As with any very bright light source, such as the sun, the user should avoid staring directly into the light beam. Momentary exposure to a Class 2 laser is not known to be harmful.

The operation of wireless devices in an aircraft is forbidden or restricted in many cases. The Handscanner must not be operated in these situations.

The Handscanner transmits radio frequency energy and has the potential to interfere with inadequately protected medical devices. It is good practice to turn OFF the Handscanner within a hospital or other medical facility where sensitive medical equipment is in use. In some countries, this is a legal requirement applying to all mobile phones and related equipment.

You should not use Handscanner at a refueling point. You are reminded of the need to observe restrictions on the use of radio devices in fuel depots, chemical plants etc. and areas where the air contains chemicals or particles

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(such as grain, dust, or metal powders) and any other area where you would normally be advised to turn off your vehicle engine.

Use only Technology Solutions approved cradles, chargers and power supplies with the Handscanner. Use of an alternative power supply will invalidate any approval given to this device, void the warranty for the product and may be dangerous.

### **5.1.2 FCC 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.

The Handscanner contains Transmitter Module FCC ID: S6J01B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **5.1.3 Bluetooth**

The Handscanner contains an approved Bluetooth Product, the Ezurio BISM2 Bluetooth Serial Module.

### **5.1.4 Waste Electrical and Electronic Equipment (WEEE)**

For EU Customers: All products at the end of their life must be returned to TSL for recycling. For information on how to return product please contact TSL.

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## 6 Troubleshooting

Symptoms	Possible Cause	Action
Nothing happens when the yellow button is pressed.	If no LEDs are on the battery may be flat.	Fit a fully charged battery, or charge the Handscanner.
	The Handscanner may have been configured to exclude barcodes.	Check the Handscanner configuration using the Desktop Configuration software.
	If the Blue LED is not lit continuously the Handscanner will only operate in Batch Mode.	Connect the Bluetooth link to the Handscanner or use the Desktop Configuration software to enable Batch Mode.
The Handscanner scans but does not vibrate or beep.	The Handscanner may not be configured for the barcode symbology in use.	Check the Handscanner configuration using the Desktop Configuration software.
	The vibrate and beep functions may have been disabled.	Check the Handscanner configuration using the Desktop Configuration software.
	The barcode symbol may be damaged.	Try again with an undamaged barcode.
	The Handscanner may not be at the correct distance from the barcode or transponder.	Change the distance or angle between the Handscanner and the barcode or transponder.
	The battery may be low.	Fit a fully charged battery, or charge the Handscanner.
The red and green LEDs light during charging.	The battery pack has a fault.	Replace the battery pack.
	The battery pack temperature is outside recommended limits.	Ensure that charging only occurs between 0°C and 45°C.

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<b>Symptoms</b>	<b>Possible Cause</b>	<b>Action</b>
The host Bluetooth discovery does not find the Handscanner	The Handscanner has powered off.	Press the yellow button and ensure that the Blue LED is flashing.
	The Handscanner is out of range.	Move the Handscanner closer to the host.
	The Bluetooth Friendly name of the Handscanner has been changed.	Check the Bluetooth Friendly name using the Desktop Configuration software.
Opening the Bluetooth virtual comm. port does not connect to the Handscanner.	The host has paired to a different Handscanner.	Pair to the required Handscanner.
	The host Bluetooth function has an error.	Warm boot the host. If this does not help, delete the Handscanner from the paired devices list and re-pair.
Bluetooth pairing fails	The PIN on the Handscanner has been changed.	Set the Bluetooth PIN to a known value using the Desktop Configuration software.

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