

BulleT MagneSafe Swipe Reader

TECHNICAL REFERENCE MANUAL

PART NUMBER 99875523

APRIL 2012

MAGTEK[®]

REGISTERED TO ISO 9001:2008

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REVISIONS

Rev Number	Date	Notes
1.01	2/24/2011	Initial release
2.01	4/4/2011	Updated feature list; added information about battery characteristics
2.02	5/31/2011	Changed name of Centurion to Dynamag
3.01	4/25/2012	Added BulleT Keyboard (KB) interface; expanded description of LED Indicator to include rapid flashing red; added LED Status Table

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This equipment has been tested and was found to comply with the limits for a Class B digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation.

FCC COMPLIANCE STATEMENT

This device complies with Part 15 of the FCC Rules. Operation of this device 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.

CANADIAN DOC STATEMENT

This digital apparatus does not exceed the Class B limits for radio noise from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

CE STANDARDS

Testing for compliance with CE requirements was performed by an independent laboratory. The unit under test was found compliant with standards established for Class B devices.

UL/CSA

This product is recognized per Underwriter Laboratories and Canadian Underwriter Laboratories 1950.

RoHS STATEMENT

When ordered as RoHS compliant, this product meets the Electrical and Electronic Equipment (EEE) Reduction of Hazardous Substances (RoHS) European Directive 2002/95/EC. The marking is clearly recognizable, either as written words like "Pb-free", "lead-free", or as another clear symbol (Ⓟ).

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Figure 1-1. BulleT MagneSafe Reader

SECTION 1. FEATURES AND SPECIFICATIONS

The BulleT MagneSafe V5 Swipe Reader is a compact, handheld magnetic stripe card reader that conforms to ISO standards. In addition to reading multiple tracks of data from a card, this Reader also includes MagnePrint technology and data encryption. The MagnePrint data will be included with the track data on each transaction. In order to maximize card security, this Reader incorporates data encryption to protect the card contents and the MagnePrint information. The Reader is compatible with any device having a host Bluetooth interface. A card is read by sliding it, stripe down and facing toward the LED side, through the slot either forward or backward.

An LED (Light Emitting Diode) indicator on the Reader panel provides the operator with continuous status of the Reader operations.

When a card is swiped through the Reader, the track data and MagnePrint information will be TDEA (Triple Data Encryption Algorithm, aka Triple DES) encrypted using DUKPT (Derived Unique Key Per Transaction) key management. This method of key management uses a base derivation key to encrypt a key serial number that produces an initial encryption key which is injected into the Reader prior to deployment. After each transaction, the encryption key is modified per the DUKPT algorithm so that each transaction uses a unique key. Thus, the data will be encrypted with a different encryption key for each transaction.

FEATURES

Major features of the MagneSafe V5 BulleT Swipe Reader are as follows:

- Powered by a rechargeable battery; recharging can be provided via a standard USB cable
- The SPP version is compatible with any device that supports Bluetooth virtual serial port profile (SPP)
- The keyboard (KB) version emulates a Bluetooth HID profile keyboard.
- Can be used as a conventional MagneSafe USB reader in HID interface type mode
- Bi-directional card reading
- Reads encoded data that meets ANSI/ISO/AAMVA standards and some custom formats such as ISO track 1 format on track 2 or 3
- Reads up to three tracks of card data
- Red/Green/Amber LED for status
- Non-volatile memory for property storage
- Hundreds of transactions can be processed on a single charge
- Industry standard USB micro-B connector
- Compatible with USB specification Revision 1.1
- Compatible with HID specification Version 1.1
- Can use standard Windows HID driver for communications; no third party device driver is required
- Programmable USB Interrupt In Endpoint polling interval
- Supplies 54 byte MagnePrint™ value
- Contains a unique, non-changeable device serial number which allows tracking each reader
- Encrypts all track data and the MagnePrint value
- Provides clear text confirmation data including card holder's name, expiration date, and a selectable portion of the PAN as part of the Masked Track Data
- Mutual Authentication Mode for use with Magensa.net
- Provides MagneSafe 2.0 format

HARDWARE CONFIGURATION

The hardware configuration is as follows:

Part Number	Tracks	Style	Interface	Cable
21073082	1, 2, 3	Portable	Bluetooth SPP	N/R*
21073098	1, 2, 3	Portable	Bluetooth KB HID	N/R*

* No cable is required to operate the reader but one of the cables listed below can be used to charge the battery.

ACCESSORIES

The optional accessories are as follows:

Part Number	Description	Notes
21051543	USB-A TO USB-Micro-B Black, 700mm Retractable Cable	Optional Cable
21051548	USB-A TO USB-Micro-B Black, 6' Cable	Supplied with reader
51300010	Bluetooth USB 2.0 Adapter	For interface to PC

REFERENCE DOCUMENTS

MagTek Communication Reference Manual for USB MagneSafe V5 Readers (99875475)
MagTek Technical Reference Manual for Dynamag MagneSafe Swipe Reader (99875482)

ANS X9.24-2004 Retail Financial Services Symmetric Key Management Part 1: Using Symmetric Techniques

USB Human Interface Device (HID) Class Specification Version 1.1.

Universal Serial Bus (USB): HID Usage Tables Version 1.12 (1/21/2005)

USB (Universal Serial Bus) Specification, Version 1.1, Copyright© 1998 by Compaq Computer Corporation, Intel Corporation, Microsoft Corporation, NEC Corporation.

USB Implementers Forum, Inc., www.usb.org.

SPECIFICATIONS

Table 1-1 lists the specifications for the BulleT MagneSafe Reader. Figure 1-2 shows the dimensions of the Reader.

Table 1-1. Specifications

Reference Standards	ISO 7810 and ISO 7811; AAMVA*
Power Input	USB port or 5 VDC for battery charging
Recording Method	Two-frequency coherent phase (F2F)
Message Format	ASCII
Card Speed	4 to 60 ips (10.1 to 152.4 cm/s)
Battery Characteristics	3.7V, 120 mAh Li-ion Polymer Battery
Time to Charge Battery	About 2.5 hours (from a fully discharged state)
Card Swipes per Full Charge	Over 100 swipes
ELECTRICAL	
Current	100mA maximum during charge
MECHANICAL	
Dimensions	Length 2.68" (68.07mm) Width 0.65" (16.51mm) Height 1.35" (34.29mm)
Weight	1.4 oz. (39.7 gr)
Cable length	6'
Connector	USB Micro B
ENVIRONMENTAL	
Temperature	
Operating	32 °F to 113 °F (0 °C to 45 °C)
Storage	-4 °F to 140 °F (-20 °C to 60 °C)
Humidity	
Operating	10% to 90% noncondensing
Storage	10% to 90% noncondensing

* ISO (International Standards Organization) and AAMVA (American Association of Motor Vehicle Administrators).

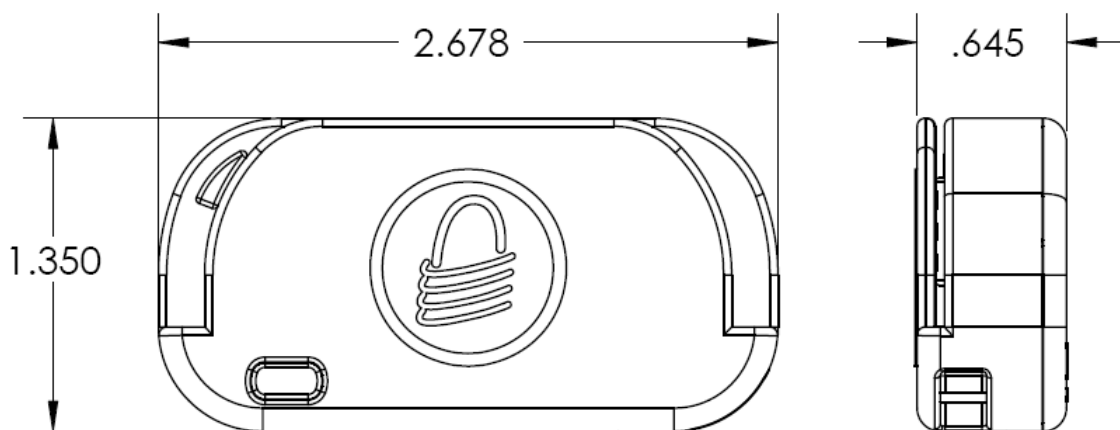


Figure 1-2. Dimensions for BulleT

SECTION 2. INSTALLATION

This section describes the Windows setup.

BULLET CONNECTION

On hosts with the Windows operating system, the SPP version BulleT reader appears as a virtual COM port and the KB HID version BulleT appears as a Bluetooth keyboard. Use the Windows Bluetooth installation utility or, if using another Bluetooth adapter, follow the directions for that device. (See [Appendix A](#) or [Appendix B](#))

SECTION 3. OPERATION

ACTIVE INTERFACE

This reader communicates either via the Bluetooth interface or via the USB interface. When it first powers up, if the USB cable is attached, it is receptive to commands on both interfaces. Once it receives a command on one interface, that interface becomes the Active Interface and the other interface is disabled. The Active Interface stays active until the reader is disconnected from the USB cable or a ***Relinquish Interface*** command is received. A ***Relinquish Interface*** command allows both interfaces to be receptive to commands again. Only the SPP version of the BulleT can receive commands over Bluetooth. The keyboard version can't receive commands over Bluetooth. The keyboard version can only send card data over Bluetooth.

If the reader is connected to a USB cable and the Active Interface is Bluetooth, any event that would cause the reader to power down if it were not connected to the USB cable will have the same effect as a ***Relinquish Interface*** command.

The intention here is to allow the user to communicate with the reader using whichever interface is convenient while giving the user a method to enable the other interface at any time. For a more detailed description of the USB interface, refer to the *MagTek Technical Reference Manual for Dynamag MagneSafe Swipe Reader* (99875482). The full USB communication command set can be found in the *MagTek Communication Reference Manual for USB MagneSafe V5 Readers* (99875475)

USER SWITCH

The User Switch, or Power Switch, is located on the side of the reader. Pressing the User Switch when the reader is off will turn the reader on. The reader will stay on for a predetermined amount of time (the default is 120 seconds) or until the completion of a card read transaction. Pressing the User Switch and holding for approximately one second when the reader is on will extend the Activity Timer to its full period, avoiding having the reader turn off due to inactivity.

If the power is already on, pressing the User Switch and holding it for three seconds will turn the reader off.

LED INDICATOR

The LED indicator will be either off, red, green, or amber (see table below). When the reader is not powered and not connected to USB/power supply, the LED will be off.

When the BulleT reader is first turned on, the LED will flash amber, turn momentarily red and then go to rapidly flashing green unless the battery power is too low, in which case it will be red for two seconds then turn solid green. The LED will continue rapidly flashing green until either a valid host connection is made or the reader times out. When the LED shows a solid green, the reader is either awaiting Authentication (if configured to require Authentication) or armed to read (if configured NOT to require Authentication).

When the BulleT reader is attached to a USB cable or other 5 volt power source, the battery will begin charging. The LED will *slowly* blink amber while the battery is charging and then turn solid amber when the battery is fully charged. If the battery voltage is too low, the LED will

rapidly flash red until the battery voltage is high enough for normal operation (this may take a few minutes).

If enabled to operate with authentication (Security Level 4) and when the host completes Authentication successfully, the LED will blink green; the reader is now armed to read a card. If the host fails an Authentication sequence, the LED will turn solid red and stay red until either the host completes Authentication successfully or the reader is powered down.

When a card is being swiped, the LED will turn off temporarily until the swipe is completed. If there are no errors after decoding the card data, then the LED will turn green for approximately two seconds to indicate a successful read and flash green once as the reader powers down. If there are any errors after decoding the card data, the LED will turn red for approximately two seconds to indicate that an error occurred and then turn solid green to indicate that the card can be swiped again for another try; the retries can go on indefinitely until a good read or until power goes off.

After a card swipe, when data should be transmitted on the Bluetooth connection, if the connection is not available, the green LED will blink rapidly (10 times a second) until the connection becomes available (when data is transmitted), the user holds the user switch down for three seconds, the reader times out, or the battery power is too low. If the connection is established, the data will be transmitted and the LED goes green or red to indicate transmission of good or bad data.

Table 3-1. LED Status

LED Color	LED Condition	USB Connection	Meaning
Off		n/a	No power
Green	Steady On	--	Ready to read a card—after power button pushed
Green	Rapid Flashing	No	Searching for Bluetooth connection
Green	Slow Blinking	--	Authentication has been established; ready to read a card
Green	On 2 seconds	--	Good Read
Amber	Steady On	Yes	Battery fully charged
Amber	Short Flash	No	After power button is pushed
Amber	Slow Blinking	Yes	Battery charging
Red	Steady On	--	Authentication failed
Red	Short Flash	--	Following amber after power button is pushed
Red	Rapid Flashing	Yes	Battery voltage too low to operate normally
Red	On 2 seconds	--	Bad card swipe

CARD READ

A card may be swiped through the Reader slot when the LED is solid green or flashing green. The magnetic stripe must face toward the LED and may be swiped in either direction. If there is data encoded on the card, the reader will attempt to read the data, encrypt it, and then send the encrypted results to the host. After the results are sent to the host, the reader will automatically turn off. This is the default setting of the reader and is configurable to allow the reader to remain on, thus eliminating the requirement to *pair* the reader after each valid card swipe.

CHARGING THE BULLET READER BATTERY

As mentioned above (LED Indicator), the BulleT reader may indicate low battery at power up. The first time this happens there will probably be sufficient battery available for several more card swipes, but the battery should be charged soon. If the low battery warning is ignored and the battery gets too low, the reader will refuse to power up until it has been charged.

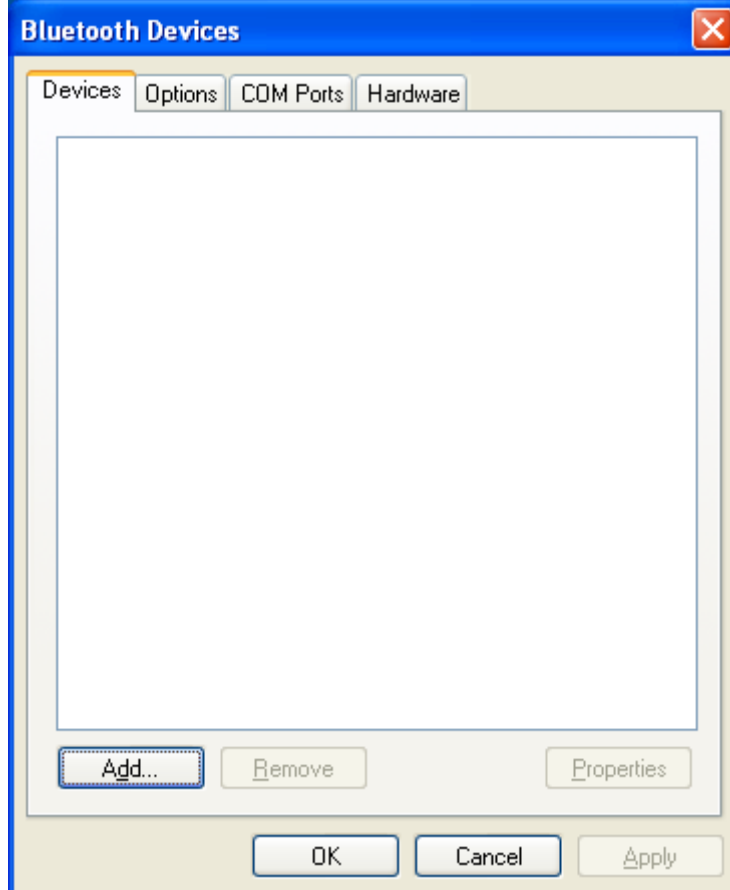
Charge the reader by connecting it to any USB port on a running system or a compatible 5VDC source. For best results, allow the battery to charge fully (until the LED goes to steady amber) before using the reader again.

APPENDIX A: INSTALLING WITH WINDOWS DRIVER

This section demonstrates how to install the SPP version. The keyboard version is installed similarly. If prompted for a passkey use 1234.

Attach a Bluetooth adapter to the PC. (NOTE: If using a Kensington Adapter, see Appendix B.)

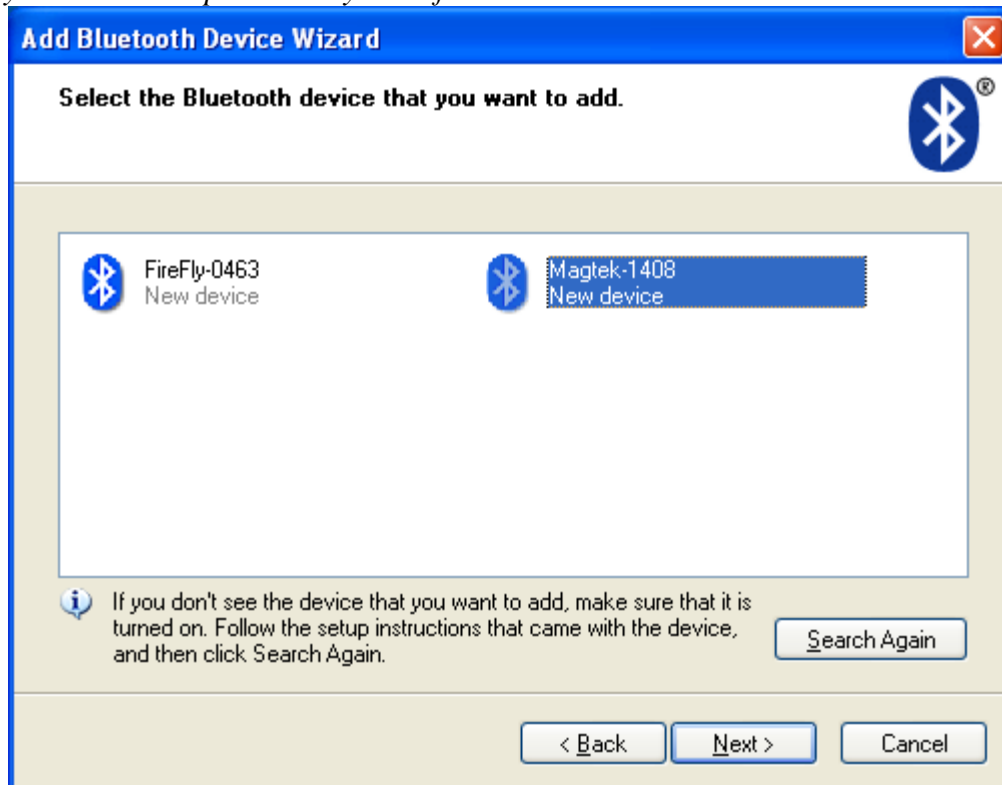
Select Bluetooth icon  in Control Panel. The following will be shown.



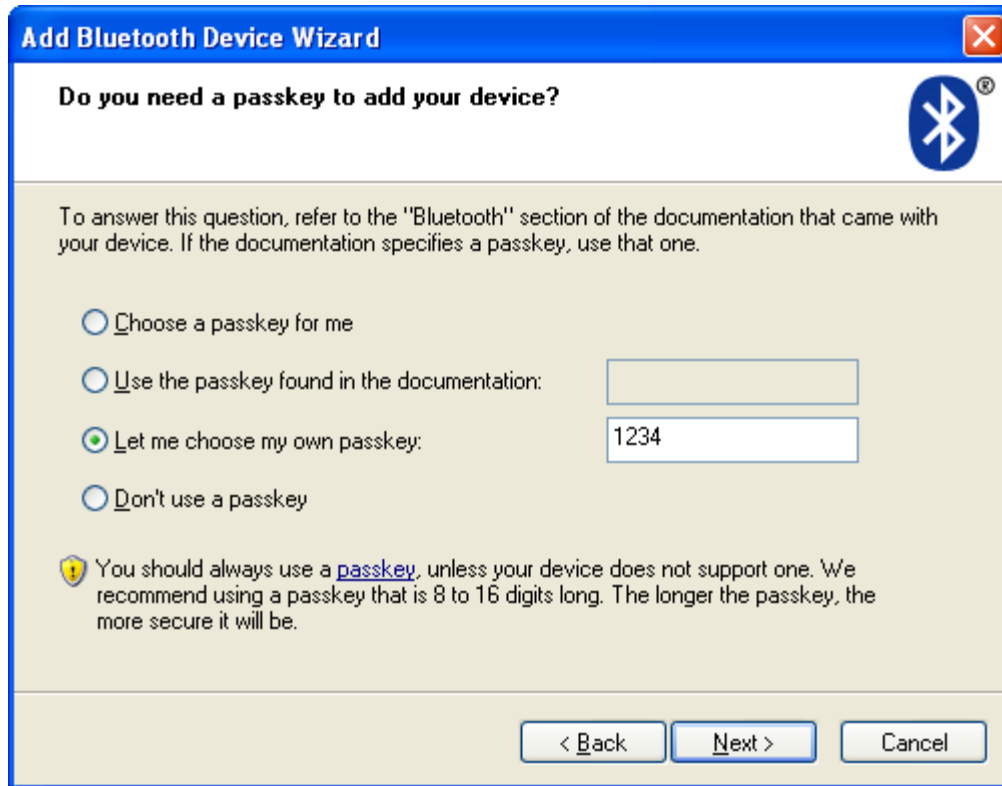
Click *Add...*



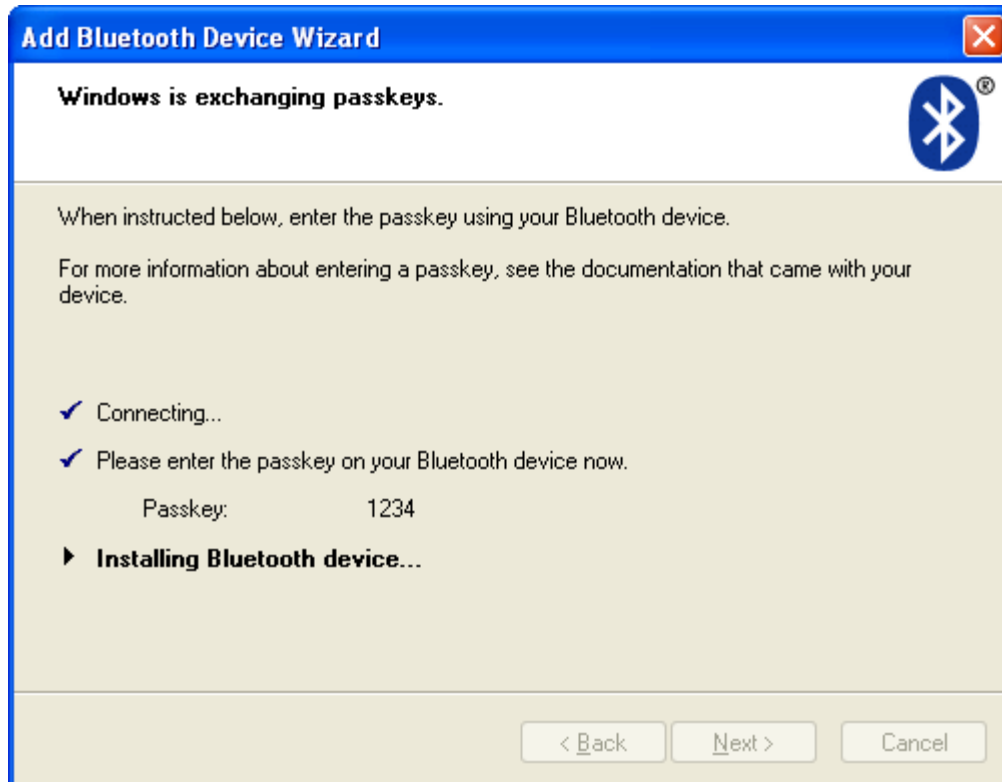
Check *My device is set up and ready to be found.* Then click *Next.*



Select the *Magtek-xxxx* device using the number as indicated on the reader, then click *Next.*



Select *Let me choose my own passkey:* then type “1234” in the associated box. Click *Next* when ready. Wait for the device to be installed:

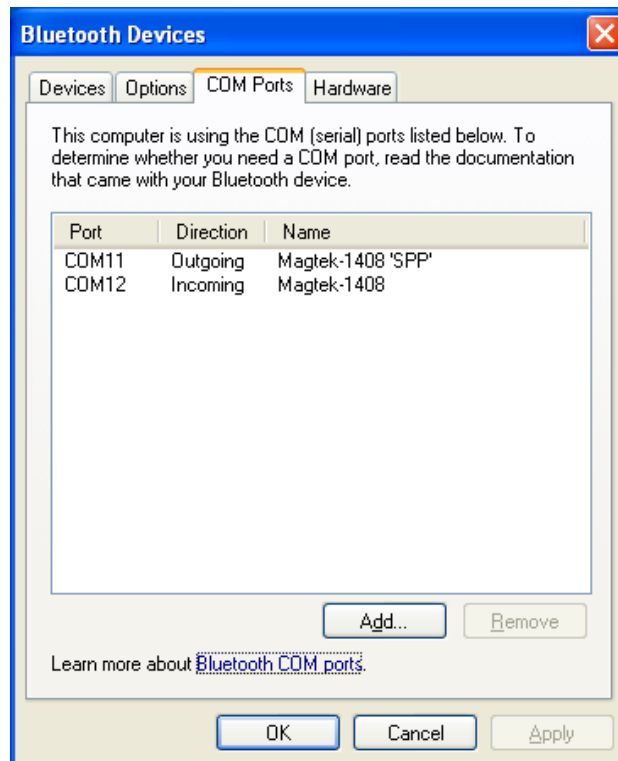


After the device is installed, note the *Outgoing COM port*: for communication purposes.



Click **Finish**. The Bluetooth reader is now ready to use.

If you need to discover the COM port values later on, open the Bluetooth utility and select the *COM Ports* tab:



APPENDIX B: INSTALLING WITH KENSINGTON DRIVER

(NOTE: Uninstall any existing Bluetooth software prior to beginning installation. DO NOT plug USB adapter in until instructed to do so.)

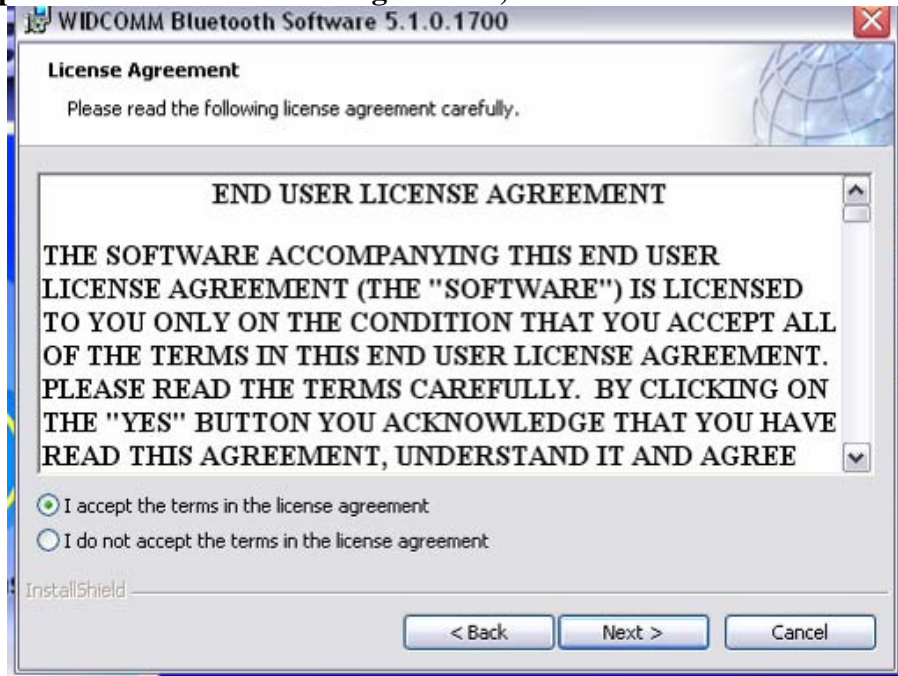
Put the installation CD in your CD drive. Click **Click! To Install** to begin. (If the CD does not autoplay, select Start>Run... and type: D:autorun.exe, where 'D' is the letter of your CD drive.)



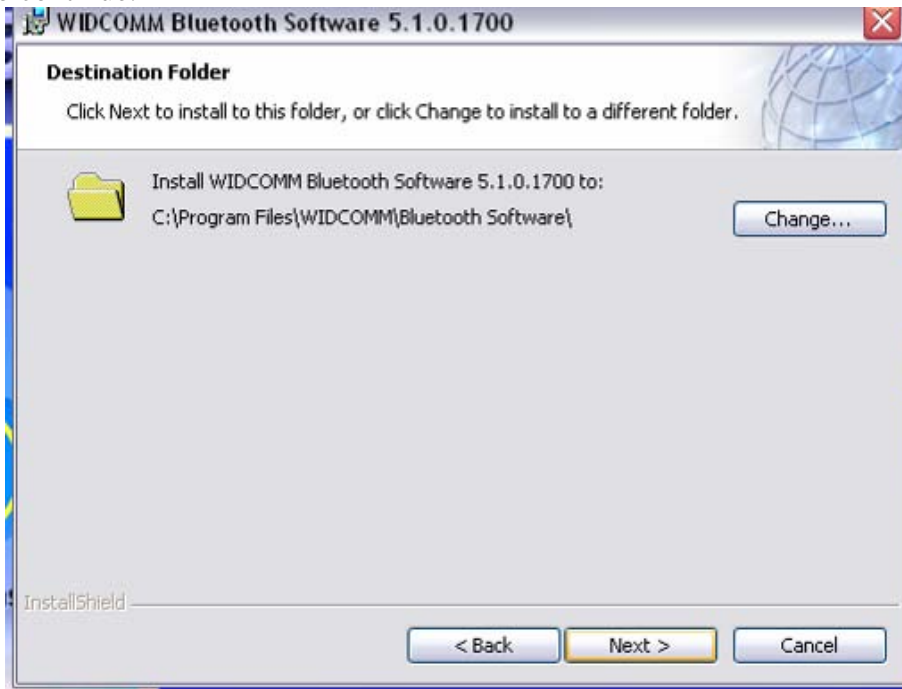
Click Next



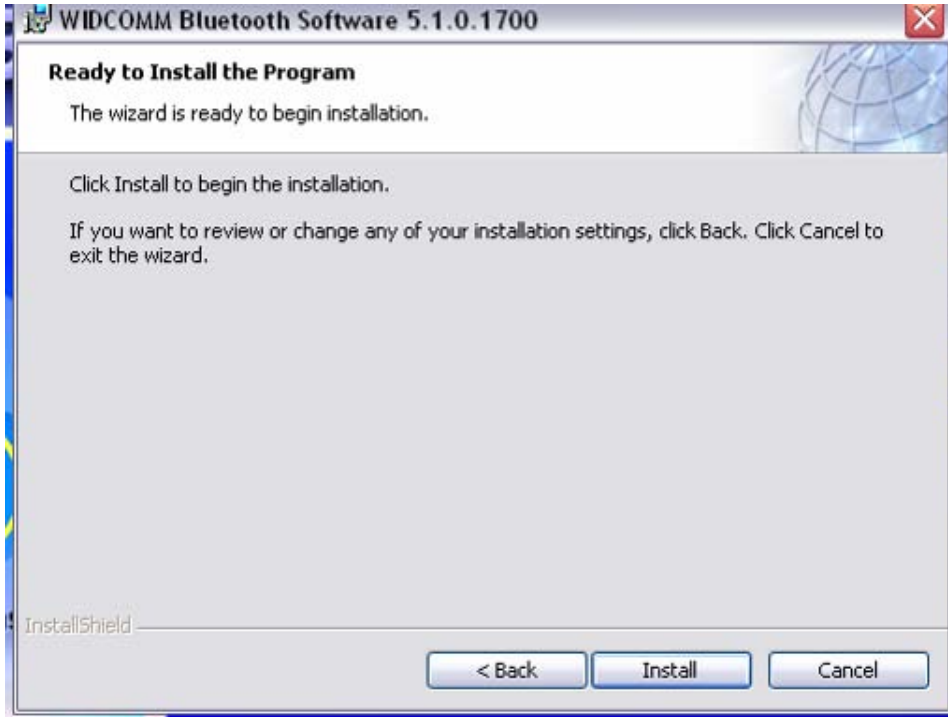
Select **I accept the terms in the license agreement**, and click **Next**



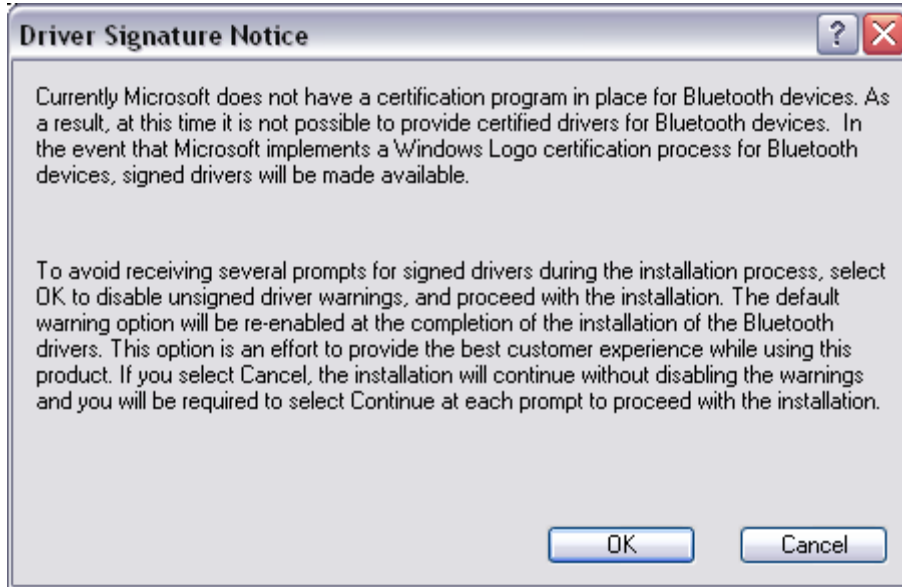
Click **Next** to continue.



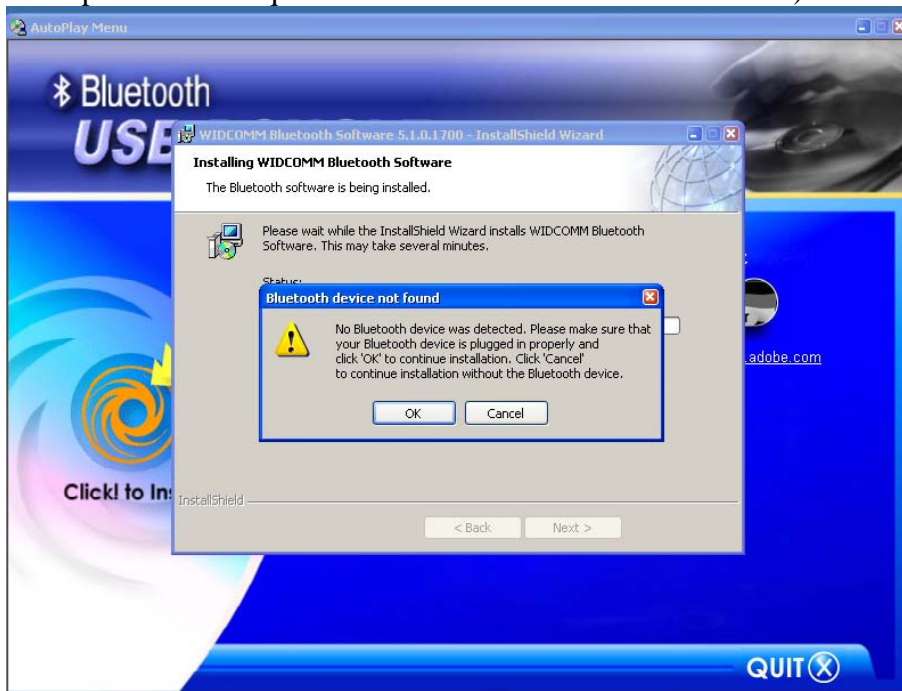
Click **Install** to begin installing the software. A status window shows the progress of the installation.



Click **OK** to continue.



Insert USB adapter and click **OK**, if necessary, to continue. (Make note of the COM Port you use since the same port will be required for use of this device in the future.)



Installation will continue with several windows opening and closing automatically.



Click **Finish** and then click **Quit** on the main CD contents screen. (NOTE: You may need to minimize the main CD contents screen to see this window).



Double-click **My Bluetooth Places** on the desktop to begin the setup.



Click **Next** to continue.



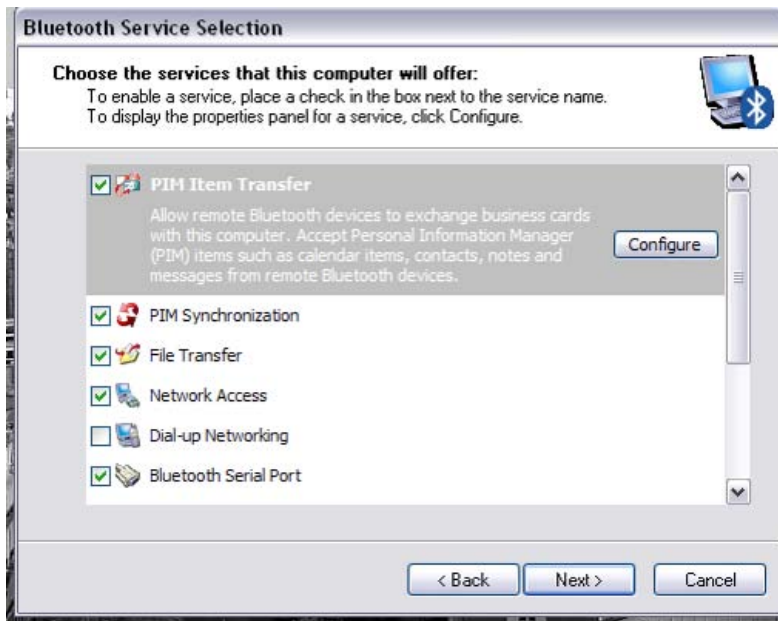
Click **Next** to continue.



Click **Next** to continue.



Click **Next** to continue.

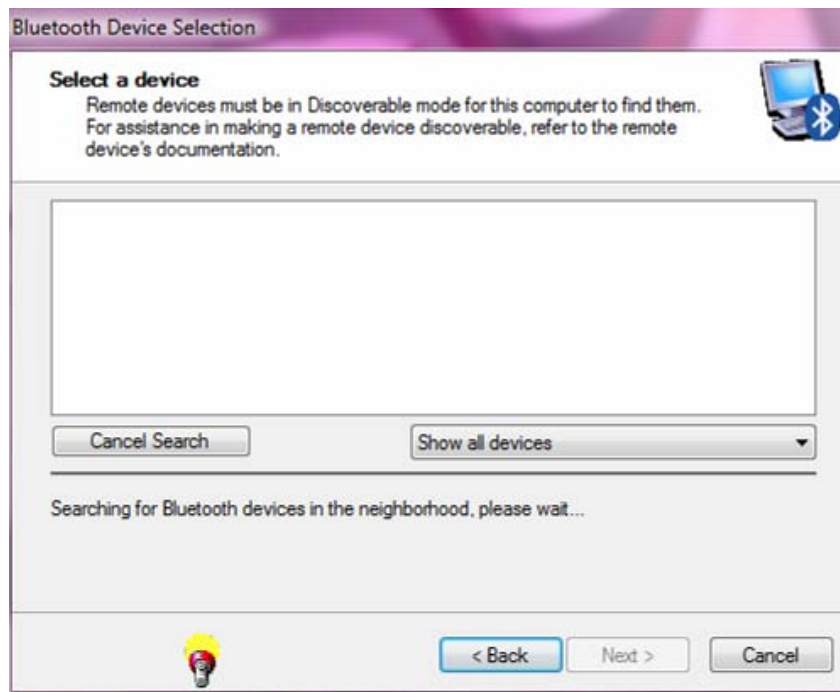


BulleT MagneSafe Swipe Reader

Power on the BulleT Reader and Click **Next**.



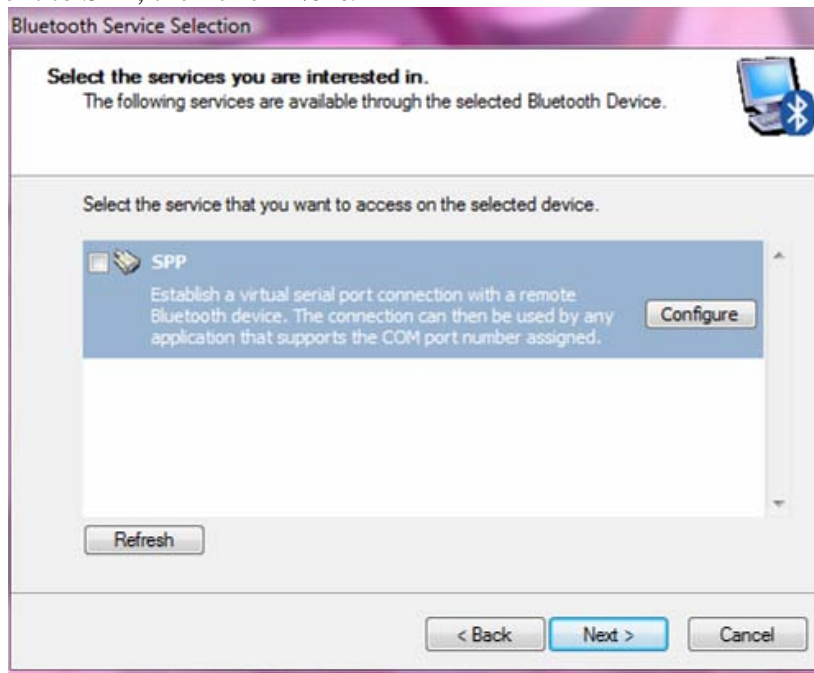
The program will begin searching. Once the device has been found, select the device and click **Next**.



Enter the security code, which is set to 1234 for initial use, and click **Pair Now**

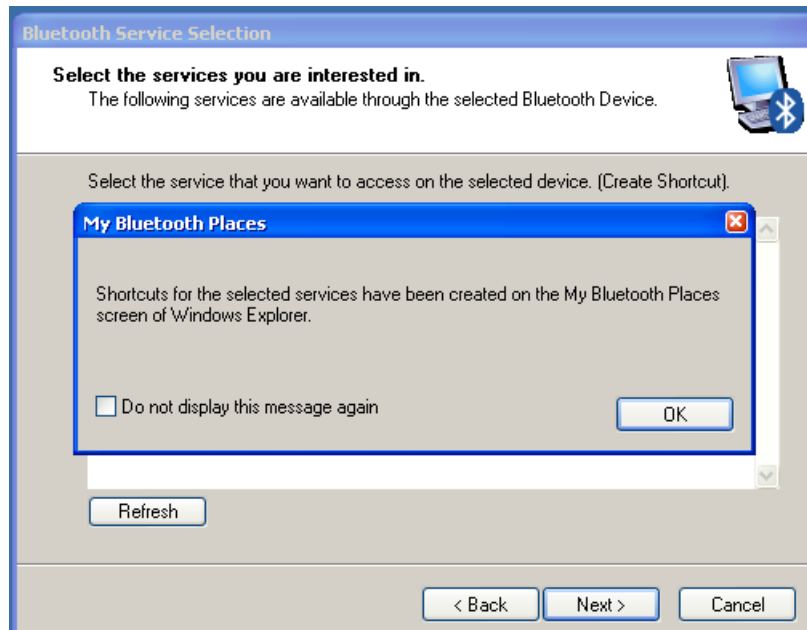


Check the box next to SPP, then click **Next**.



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Insure power to the BulleT Reader is still on (green LED flashing). If it is not, turn it back on. Click **OK**.



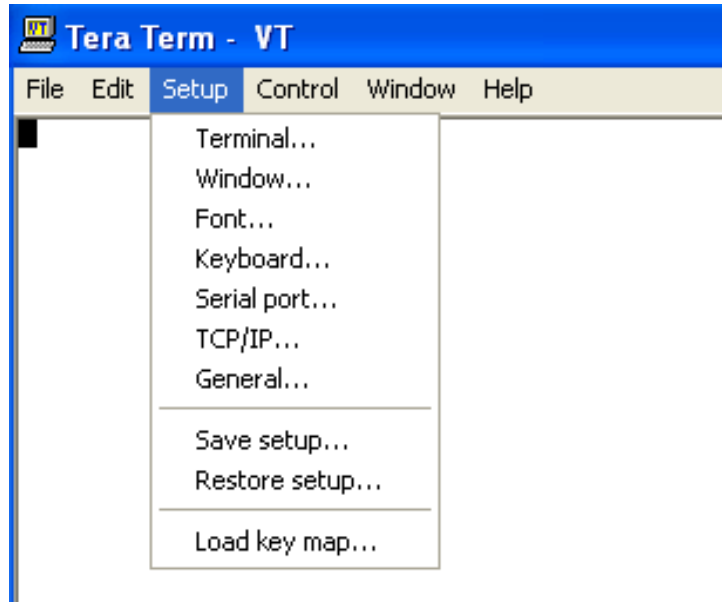
Click **Finish** to complete the process.



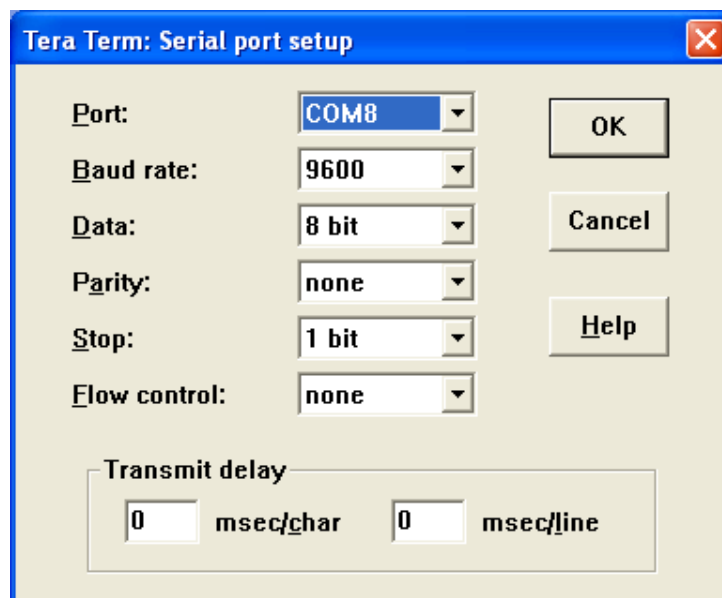
APPENDIX C: DEMONSTRATING THE SPP VERSION BULLET READER

Use any serial port program (NOTE: HyperTerminal does not work well with Bluetooth). You can download the TeraTerm utility from <http://www.rovingnetworks.com/support.html>.

Open TeraTerm and choose **Setup**



Select **Serial port...** then select the COM port that matches the port you plugged the USB adapter into during the installation process. Insure other selections match those pictured, then click **OK**.



BulleT MagneSafe Swipe Reader

Insure the BulleT Reader has a valid connection (LED is steady green) and swipe a card through the reader. Card data will appear in the TeraTerm screen.

