

CF RFID Reader-Scan Card™ Series 6

*Dual-Function RFID Reader and
Bar Code Scanner for Pocket PCs*

User's Guide



socket[™]
Increasing Mobile
Productivity

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Other than the above, Socket Communications can assume no responsibility for anything resulting from the application of information contained in this manual.

Please refrain from any applications of the Socket CF RFID Reader Card that are not described in this manual. Please refrain from disassembling the CF RFID Reader Card. Disassembly of this device will void the product warranty.

You can track new product releases, software updates and technical bulletins by visiting Socket's web page at: www.socketcom.com.

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1 | Introduction

As RFID begins to supplement bar codes in many applications, both technologies will co-exist for many years. Now you can add high frequency RFID read/write and laser bar code scanning capabilities to your Pocket PC-based data collection application with the Socket CF RFID Reader-Scan Card. This dual-function device reads and writes to all ISO 15693 and many proprietary 13.56 MHz RFID tags and also scans all common linear bar codes.

The CF RFID Reader-Scan Card is sleekly designed with no cables or batteries – it draws minimal power from the Pocket PC. Plus, the card is designed to withstand repeated three-foot drops to concrete – even when inserted into the Pocket PC.



About the Software



SocketScan™ enters the RFID tag ID or bar coded data directly into any open Windows program, as if the data were manually typed. You can configure Prefix/Suffixes, enable/disable bar code symbologies, and assign a beep tone to signify good data reads.



The RFID Setup utility allows you configure what kinds of data are returned after reading RFID tags, including tag ID, tag memory, tag types, tag type prefix, etc. You can also enter a string used to indicate read errors and enable/disable inventory mode.



Socket RFid Demo allows you to read memory blocks of selected RFID tags in range in either Inventory Mode or a continuous Loop Mode. For advanced users, there is also the capability to write data to the RFID memory.



SocketScan Trigger places a software trigger on your screen that you can tap to trigger the reader or scanner. Installation is optional.



Trigger Select

The Trigger Select program allows you to press a button to quickly switch between the RFID and laser scanning modes of the RFID Reader-Scan Card.



Trigger ISC

The Trigger ISC program allows you to assign a button on your Pocket PC exclusively for triggering the bar code laser scanner.



Trigger RFID

The Trigger RFID program allows you to assign a button on your Pocket PC exclusively for triggering the RFID reader.

Software updates: www.socketcom.com/support/support_bar.asp

System Requirements

Your device should meet these minimum requirements:

- Pocket PC running Windows Mobile 2003/2003SE
- Available CompactFlash or PC Card slot
(Operation in a PC Card slot requires a PC Card adapter, available separately, SKU# AC4000-978.)

Package Contents

The CF RFID Reader-Scan Card package includes the following:

- Socket CF RFID Reader-Scan Card
- *SocketScan Installation CD*
- Booklet with copyright and warranty information

Product Registration

Socket highly recommends that all customers register their products.

Registered users receive priority for technical support, product updates, and special offers. Register online at: www.socketcom.com/prodreg. Product registration is not required to ensure your warranty rights.

Resellers and Integrators

For information about Socket's Strategic Vertical Integrator (SVI) Program, please visit: www.socketcom.com/solutions/default.asp?Type=SVI

Vertical Solutions

For information about third party vertical application solutions, please visit: www.socketcom.com/solutions/

2 | Setup for Windows Mobile

This chapter shows how to install, configure, and use the CF RFID Reader-Scan Card on a Pocket PC running any of the following versions of Windows Mobile:

- Windows Mobile 2003
- Windows Mobile 2003SE (Second Edition)

The product includes support for square screens and landscape mode for Windows Mobile.



Setup Summary

STEP 1: Uninstall other bar code scanning software.

STEP 2: Install the software.

STEP 3: Insert the CF RFID Reader-Scan Card.

STEP 4: Start SocketScan.

STEP 5: Assign a trigger button.

STEP 6: Read tag IDs into a Windows program.

OPTIONAL:

- Configure RFID
- Configure prefix/suffixes.
- Configure sounds to confirm a successful read.
- Configure bar code symbologies.
- Use SocketScan Trigger.
- View version information.

STEP 1: Uninstall Other Scanning Software

Delete any bar code scanning software you may already have installed on your Pocket PC. You can either uninstall the software directly from your Pocket PC, or indirectly via ActiveSync.

OPTION 1: Uninstall Directly from the Pocket PC

1. Make sure the bar code scanning software is closed, and remove the CF RFID Reader Card from your Pocket PC.
2. Tap **Start | Settings**. Tap on the **System** tab or **Control Panel**.
3. Tap on the **Remove Programs** icon.
4. Select the bar code scanning software, then tap **Remove**.
5. Tap **Yes** to confirm removal of the program.

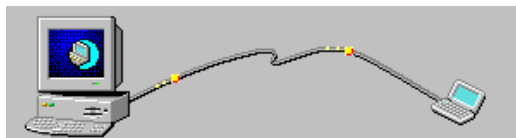
OPTION 2: Uninstall via ActiveSync

1. Make sure the bar code scanning software is closed, and remove the CF RFID Reader Card from your Pocket PC.
2. Use ActiveSync and a serial/Ethernet/USB cable or cradle to make an active connection between your Pocket PC and a host PC.
3. On the host PC, open Microsoft ActiveSync.
4. Click **Tools | Add/Remove Programs**.
5. Select the bar code scanning software and click **Remove**.
6. In the confirmation screen, click **OK**.
7. The next dialog will ask if you want to remove the software from your host PC as well.
 - Click **NO** to keep a copy of the software on the host PC that can later be re-installed onto a Pocket PC.
 - Click **YES** to remove the software from the host PC.

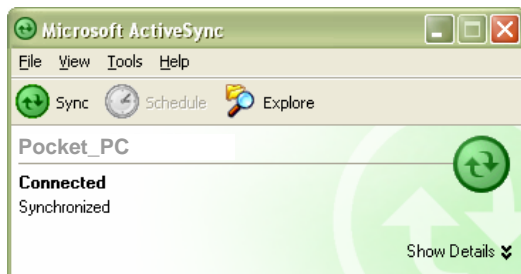
STEP 2: Install the Software

Follow these instructions to install SocketScan into your Pocket PC. Afterwards, you may choose to repeat the same process to install the RFID Demo and/or Floating Trigger software, if desired.

1. Use ActiveSync and a serial/Ethernet/USB cable or cradle to make an active connection between the Pocket PC and a host PC.



ActiveSync should report that you have Connected, and the ActiveSync logo should turn green.



2. Insert the installation CD into your host PC.
3. Use My Computer or Windows Explorer to access your CD-ROM drive. In the CD, click on SETUP.EXE.

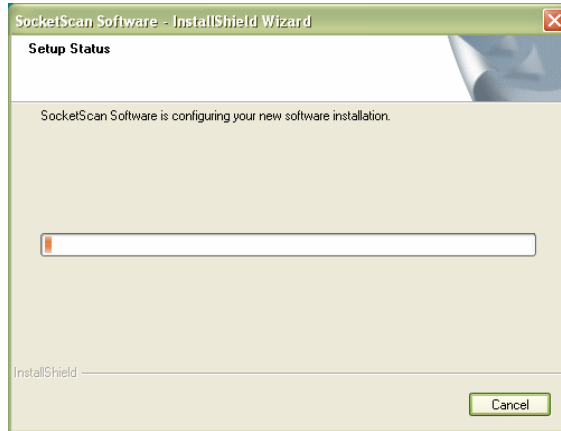


CD Drive



setup
Setup.exe
InstallShield Software Corpora...

4. SocketScan will begin to automatically install on your Pocket PC. Follow the screens on your host PC and Pocket PC.



5. If your Pocket PC warns that the software comes from an unknown publisher, tap Yes to continue installation.
6. When software installation is complete, remove the Pocket PC from the cradle. Soft reset the Pocket PC by pressing the reset button.





Note: After software installation, several new icons will appear in the Programs screen.

STEP 3: Insert the CF RFID Reader-Scan Card



STEP 4: Assign Trigger Button(s)

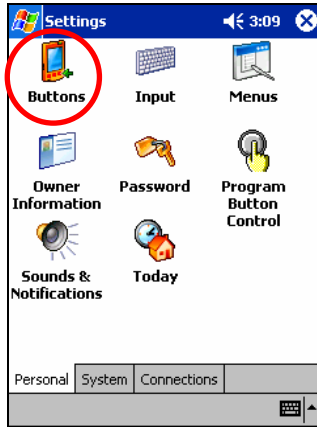
You must set up a mechanism for triggering the CF RFID Reader-Scan Card. Hardware button(s) are the best triggering method from a Pocket PC. To make the dual functionality of the CF RFID Reader-Scan Card easy to use, SocketScan allows you to configure up to four buttons for launching SocketScan and/or triggering the RFID reader or bar code scanner. Please refer to the chart below to determine which SocketScan functions you would like to assign to buttons on your Pocket PC.

| Program | What happens when you press a button assigned to this program? |
|--|---|
|  SocketScan | SocketScan will launch. If SocketScan is already running, pressing this button will trigger either the RFID reader or laser scanner, depending on which mode the card is in. If you assign only one hardware button for use with the CF RFID Reader-Scan Card, this is the program that should be assigned. If you do not assign a button to this, you will have to manually start SocketScan by tapping Start Programs SocketScan. |
|  Trigger Select | Your Pocket PC will switch from RFID mode to bar code scanning mode, or vice versa. This is designed to be used in conjunction with a trigger button assigned to SocketScan. You can also use Trigger Select to toggle to other Socket bar code scanners that use a software trigger. |
|  Trigger ISC | The laser bar code scanner will be triggered. SocketScan must be running. |
|  Trigger RFID | The RFID reader will be triggered. SocketScan must be running. |

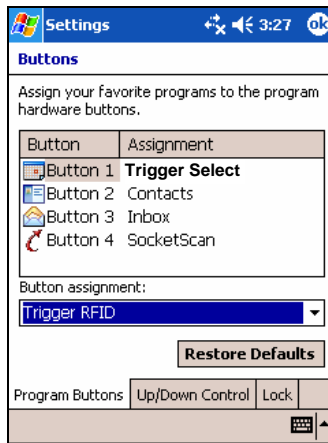
Note:

- *If it is inconvenient or impossible for you to assign a hardware button on your Pocket PC, you can install SocketScan Trigger from the installation CD, which allows you to tap on the icon to trigger SocketScan and the RFID reader/bar code scanner.*
- *Refer to your Pocket PC manual for specific instructions on assigning buttons.*

1. Tap Start | Settings | Personal | Buttons.



2. In the Button list, tap to highlight a button you would like to assign a new program to. In the drop-down menu, select the program. If desired, repeat to assign additional trigger buttons. When done, tap OK.



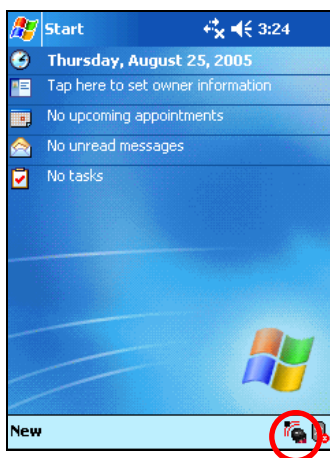
Note: For maximum ergonomic placement, choose a button located directly beneath your thumb or forefinger when you hold the Pocket PC. The Voice Record button is a good choice for many Pocket PCs, if available.




STEP 5: Read Data into a Windows Program

1. Start SocketScan. If you assigned a hardware button to SocketScan, you can press the button to quickly launch the program. Otherwise, tap **Start | Programs | SocketScan**.



2. Whenever SocketScan is running, any of three icons may appear at the bottom of the *Today* screen. Make sure an icon appears indicating that the SocketScan detects the reader-scan card, either in RFID or scanning mode.



| Icon | Meaning. |
|---|---|
|  | Card detected, RFID mode. SocketScan detects the reader-scan card and is ready to read RFID tags. |
|  | Card detected, scanning mode. SocketScan detects the reader-scan card and is ready to read bar codes. |
|  | No RFID Reader Card detected. The reader card is either missing or improperly inserted. |

Note:

- *If the card is inserted, but SocketScan does not detect it, push the card gently but firmly all the way into the slot.*
- *By default, the RFID Reader Card will return the tag ID. The RFID Setup utility can be used so that the RFID Reader Card returns only the tag data, or the tag ID plus the tag data.*

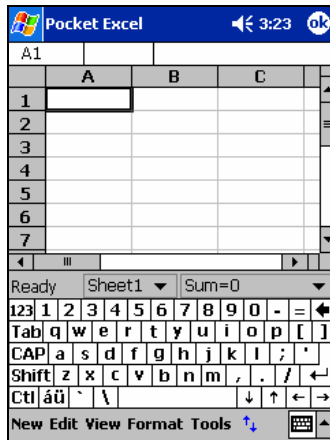
3. If you did not assign buttons to Trigger ISC or Trigger RFID, make sure the CF RFID Reader-Scan Card is in the correct mode for the function you wish to use. The SocketScan icon at the bottom of the Today screen indicates your current mode.

To switch modes, do either of the following:

- If you assigned a button to Trigger Select, press the button.
- Tap on the SocketScan icon. In the pop-up menu, tap to select the card mode you want.



4. Start the Windows application that you want to receive the data (e.g., Excel, Notepad, etc.). Make sure a document or spreadsheet is open. Place the cursor where you want to enter data.



Note: If reading RFID tags into Excel, you may want to increase the cell width to fit the entire length of a tag ID, which may have more than 20 characters.

5. Hold the Pocket PC so the CF RFID Reader-Scan Card is in the correct reading/scanning position (see next page) and press the trigger button.


Please note that the correct positions for RFID reading and bar code scanning are very different!

CORRECT BAR CODE SCANNING POSITION:



Hold the RFID Reader-Scan Card so that the lens is angled about 45° to the bar code and at least 2.0 inches away from the bar code. The red laser line should cover the entire width of the bar code.



 2.0 inches MIN.

Note: The proper scanning distance and angle vary depending on the size, type and quality of the bar code, and the quality of the printing material.

CORRECT RFID POSITION:



Hold the RFID Reader Card parallel to and directly above the tag, at most 2.0 inches above the tag.



Note: The LED will turn amber to indicate that the RFID Reader Card is reading tag IDs. It does not indicate a successful read, nor does it indicate bar code scanning.



WRONG RFID POSITION:

DO NOT direct the RFID Reader-Scan Card at an angle towards the tag.

No



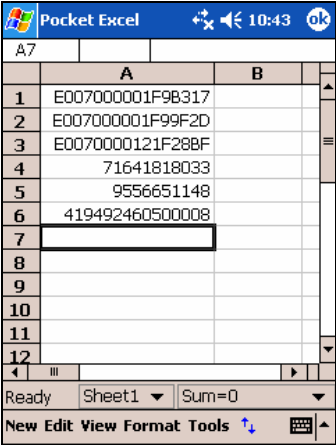
WRONG RFID POSITION:

DO NOT hold the RFID Reader-ScanCard perpendicular to the tag.

No



6. When data is read, a beep should sound indicating a good read, and data should appear in your application. For example, in an Excel spreadsheet, data should appear in the cell you highlighted. The next cell should now be highlighted, ready for the next scan/read.



The screenshot shows a Pocket Excel application window with a spreadsheet. The spreadsheet has columns A and B, and rows 1 through 12. The data in column A is as follows:

| | A | B |
|----|-------------------|---|
| 1 | E007000001F9B317 | |
| 2 | E007000001F99F2D | |
| 3 | E00700000121F28BF | |
| 4 | 71641818033 | |
| 5 | 9556651148 | |
| 6 | 419492460500008 | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |

The status bar at the bottom shows 'Ready', 'Sheet1', and 'Sum=0'. The menu bar includes 'New Edit View Format Tools'.

If the CF RFID Reader-Scan Card fails to read data within a few seconds, you must try again.

Note:

- *If your Pocket PC enters sleep mode when SocketScan is running, press the ON button to restart SocketScan and initialize the reader.*
- *By default, the RFID Reader Card will return the tag ID. The RFID Setup utility can be used so that the RFID Reader Card returns only the tag data, or the tag ID plus the tag data. (See the next page for instructions.)*

OPTIONAL: Configure RFID

This utility allows you to configure what kinds of data are returned after reading RFID tags.

Note: These settings are only used with the SocketScan keyboard wedge programs and Scan Demo.

1. Tap Start | Settings | System tab | RFID Setup.



2. Enter your desired settings, then tap ok.

A screenshot of the RFID Setup utility interface. The title bar shows 'RFID Setup' and system icons for volume, battery, and time (3:17). The main content area has a blue header with 'RFID Setup' and a sub-header 'Set the trigger options below to modify the data returned when the RFID Scanner is triggered.' Below this are several settings: 'Trigger mode' is a dropdown menu set to 'Tag ID Only'; 'Starting block' is a text input field with '0'; 'Number of blocks' is a text input field with '4'; 'Read error string' is a text input field with '<<<READ FAILED>>>'; 'Tag type' is a dropdown menu set to 'AUTO DETECT (00)'; and two checkboxes at the bottom: 'Inventory mode' (checked) and 'Display tag ID prefix' (unchecked).

Trigger mode:

- **Tag ID only:** Select to read only the tag ID.
- **Read Data Only:** Select to read only data from the tag memory.
- **Tag ID & Read Data:** Select to read both the tag ID and tag memory.

Starting block: If you selected a **Read Data** option in the drop-down menu, enter the number of the first block you want to begin reading.

Number of blocks: If you selected a **Read Data** option in the drop-down menu, enter the number of blocks you want to read.

Read error string: Enter what string you want your application to display in case the CF RFID Reader-Scan Card has problems reading the tag data.

Tag type: Select the type of RFID tag you would like to read. The Auto Detect setting enables all tag types to be read.

Note: Selecting a specific tag may result in a longer read range and faster read.

Inventory mode: Check to enable inventory mode. The CF RFID Reader-Scan Card will read all of the tags present in an RFID field, if supported by the tag type.

Display tag ID prefix: Check to display the RFID tag ID prefix with each tag ID. The prefix indicates the tag type.

OPTIONAL: Configure Prefix/Suffixes

The SocketScan applet lets you specify prefix and/or suffix characters to be added automatically to the data you read. This helps to further eliminate manual data entry.

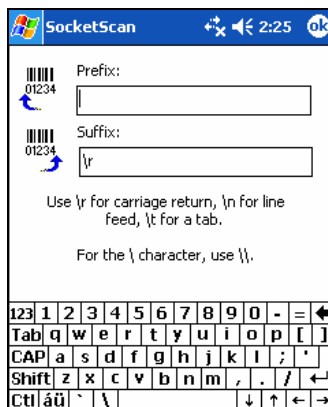
1. Tap on the SocketScan icon. In the pop-up menu, tap Prefix/Suffix.

Note: You can configure prefix/suffixes whether or not the CF RFID Reader-Scan Card is inserted into your Pocket PC.

2. In the pop-up menu, select Prefix/Suffix...



3. In the screen that appears, enter the characters you want to be appended to each tag read (128 character maximum). Tap ok.



Note: Only printable ASCII characters can be used as prefixes or suffixes.

Note:

- *The default suffix is a carriage return.*
- *If in the RFID Setup utility you selected Tag ID & Read Data, the prefix/suffix is added to both the tag ID and the read data fields.*

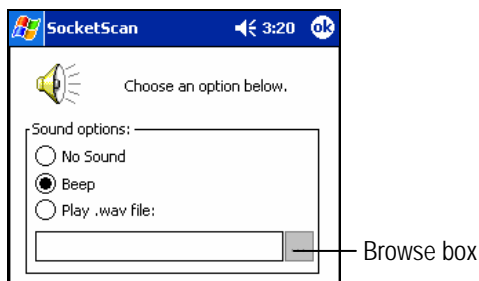
OPTIONAL: Configure Sounds

The SocketScan Sounds applet lets you choose any WAV sound file to be played to indicate a successful read.

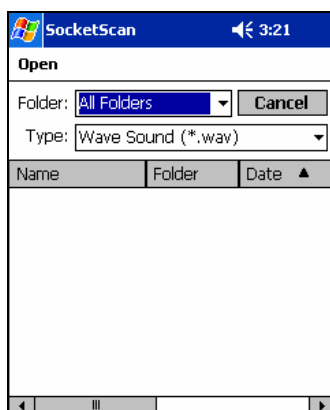
1. Tap on the SocketScan icon at the bottom of the Today screen.
2. In the pop-up menu, select **Sounds...**



3. In the screen that appears, select a sound for indicating successful reads. Tap **ok**.



To you want to play a .WAV file, after selecting **Play .wav file**, you can search through files by tapping the browse box. In the **Open** screen, tap on the file you want:

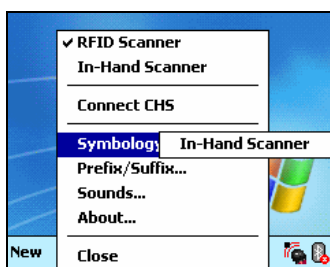


Note: You can only select a WAV file from the My Documents folder. If needed, copy the file you need to this folder.

OPTIONAL: Configure Bar Code Symbologies

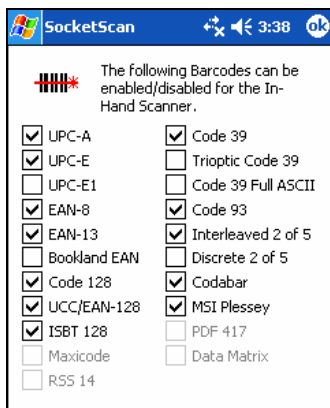
SocketScan provides an applet that makes it easy to modify which bar code symbologies you want the scanner to recognize and attempt to decode. By default, the scanner is set to recognize several of the most common symbologies.

1. Tap on the SocketScan icon at the bottom of the Today screen.
2. In the pop-up menu, tap **Symbology Selector**. If SocketScan is currently configured for more than one scanner, then tap **In-Hand Scanner** in the submenu that appears.



Note: The Connect CHS option will only appear if you have enabled SocketScan for the Cordless Hand Scanner in the Socket CHS configuration utility.

3. In the screen that appears, use the checkboxes to enable/disable symbologies. Tap ok.



Note:

- Symbologies not supported by the CF RFID Reader-Scan Card will be grayed out.
- Enabling all possible symbologies will make the decode process slightly longer.

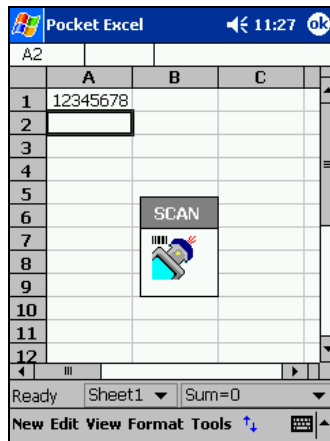
OPTIONAL: Use SocketScan Trigger

If you find it inconvenient or impossible to assign or use a hardware button to trigger the reader, you can install this virtual trigger button that “floats” on top of the active application.

1. Make sure to do all of the following before using SocketScan Trigger:
 - Install SocketScan Trigger from the installation CD. The software must be installed separately from SocketScan.
 - Start SocketScan. Tap **Start | Programs | SocketScan**.
 - Insert the CF RFID Reader-Scan Card into your Pocket PC.
 - Open the application that you want to read the tag ID into.
2. Start SocketScan Trigger. Tap **Start | Programs | SocketScan Trigger**.



3. The floating trigger button will appear on your screen on top of the active application.

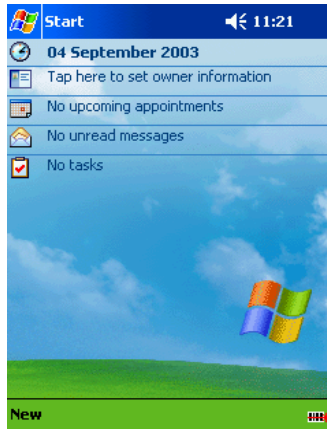


Drag from the title bar to move the trigger button to a convenient place on the screen.

Tap the trigger button to activate the RFID Reader-Scan Card.

(The trigger will activate the selected function (either the RFID reader or the laser scanner), as indicated by the SocketScan icon at the bottom of the Today screen.)

4. A SocketScan Trigger icon will also appear in the menu bar of the Today screen. Tap on this icon to reveal a pop-up menu with the following options:



- Tap **Scan Now** to activate the scanner as if you had tapped the trigger button.
- Tap **Remove Floating Trigger** to remove the trigger button from the screen but keep the icon handy on the task bar. To restore the trigger button, tap on the menu bar icon. In the pop-up menu, tap **Launch Floating Trigger**.
- Tap **About** to view SocketScan Trigger version information.
- Tap **Close SocketScan Trigger** to close the application completely. From this state, the SocketScan trigger can only be launched from the Programs page.

OPTIONAL: View Version Information

SocketScan includes an About screen which displays the SocketScan version, as well as the firmware/scan engine version for the selected device.

1. In the Today screen, check the SocketScan icon at the bottom of the screen to verify that the correct device is selected. If required, select the correct device by tapping on the icon and in the pop-up menu, selecting the device you want.



2. Tap on the SocketScan icon at the bottom of the screen. In the pop-up menu, tap **About**. The screen reports the SocketScan version.

If the RFID Reader is currently selected, the RFID firmware version will also appear.



If the bar code scanner is currently selected, the scanning engine/firmware version will appear.



Note: If you need technical support for your device, please include these firmware versions with your request.

3 | RFID Demo

This chapter shows how to use the Socket RFID Demo application with the Socket CF RFID Reader-Scan Card to perform the following:



- Read an RFID Tag.
- Enable Loop Mode.
- Select Tag Type.
- *Advanced* – Write to Tag.

Before you begin using the Socket RFID Demo application, make sure you have done the following:

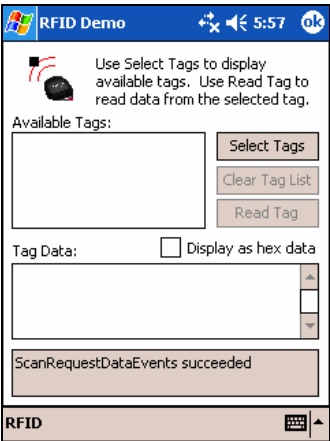
- Installed the RFID Demo application onto your Pocket PC, following the same software installation procedure described in Chapter 2.
- Inserted the CF RFID Reader-Scan Card into your Pocket PC.
- When you use this application, you should only trigger the RFID Reader Card by tapping on the **Select Tags** or **Read Tag** button on the RFID Demo screen.

Read an RFID Tag

1. Start RFID Demo. Tap Start | Programs | RFID Demo.



2. The main screen of RFID Demo will appear with blank fields.

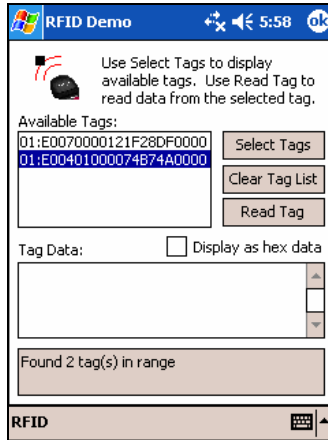


3. Hold the Pocket PC in the correct position to read an RFID tag, as described in Chapter 2. Hold the Pocket PC so the RFID Reader Card is parallel to and directly above the tag, at most 2.0 inches above the tag.

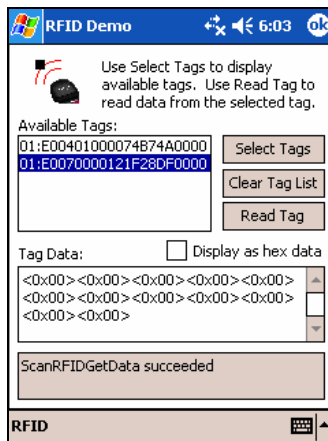


4. Tap Select Tags.

5. Tag ID(s) should appear in the Available Tags field. Additionally, the bottom of the screen will report the number of RFID tags found in range.



6. In the Available Tags field, tap to highlight the RFID tag you wish to read, then tap Read Tag.
7. After the Socket RFID Reader Card reads the tag, Tag Data will appear. If desired, check Display as hex data to view the data in hexadecimal format.



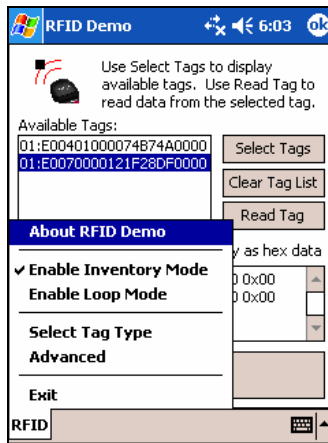
Enable Inventory and Loop Modes

The Socket RFID Reader Card has four types of reading modes that result from different combinations of inventory mode and loop mode. The chart below describes the results of enabling or disabling the modes.

| Tag Select Mode | Loop Mode | Inventory Mode | Description |
|-----------------------|-----------|----------------|---|
| One tag | Disabled | Disabled | Selects the first tag in RF field |
| One tag continuously | Enabled | Disabled | Selects the first tag continuously (the same tag ID will be returned as long as the tag remains in the RF field). |
| All tags present | Disabled | Enabled | Inventory mode: returns the tag IDs of all tags in the RF field and then reports when there are no more tags. |
| All tags continuously | Enabled | Enabled | Returns the tag IDs of all tags in the RF field. It does not repeat a tag ID unless the tag goes out and then re-enters the RF field. |

Note: Not all tag types are readable when Inventory Mode is enabled.

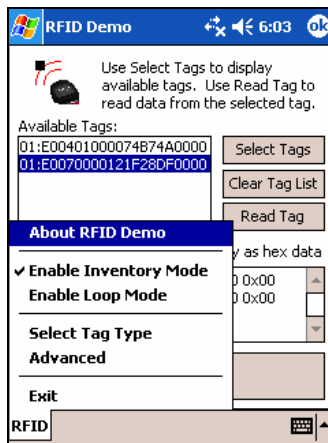
1. In the main screen of RFID Demo, tap RFID at the bottom of the screen. In the pop-up menu, select adjust the Inventory Mode and/or Loop Mode settings as desired.



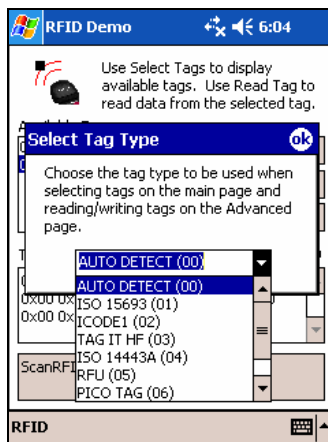
2. After selecting the desired settings, tap Select Tags. The RFID Reader Card will begin searching for tags in range, according to the settings you enabled.

Select Tag Type

1. In the main screen of Socket RFID Demo, tap RFID at the bottom of the screen. In the pop-up menu, tap Select Tag Type.



2. In the Select Tag Type dialog box, use the drop-down menu to select the tag type. Tap ok.

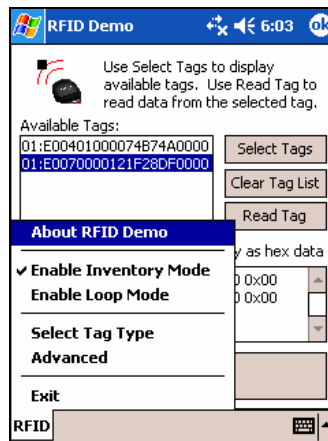


Note:

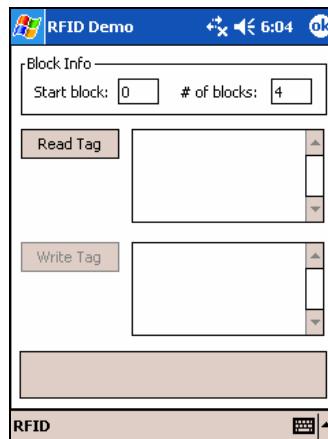
- Tag selection response time is longer with Auto Detect than for specific tag types. If Auto Detect is not selected, only the type of tags selected can be read or written to.
- Auto Detect will search for tag types 01 to 04. Pico Tag (06) must be selected in order to read tag ID.

ADVANCED: Write to Tag

1. In the main screen of Socket RFID Demo, tap RFID at the bottom of the screen. In the pop-up menu, tap Advanced.

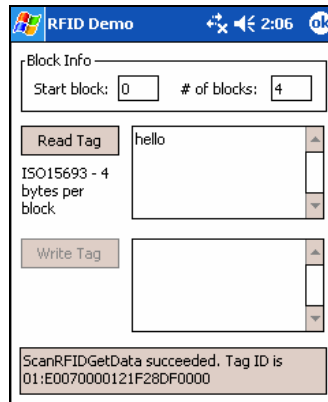


2. Use the next screen to read and write data in specific blocks of an RFID tag. Enter the number of the starting block and number of blocks you would like to read.

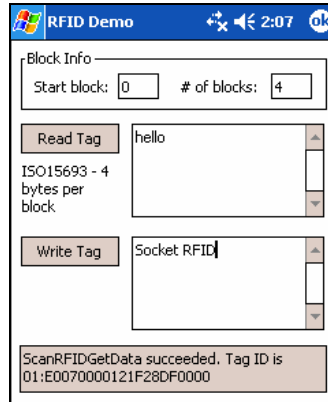


3. Hold the Pocket PC in the correct position to read RFID tags — parallel to the tag and directly above it, at most 2.0 inches above. Tap Read Tag.

- RFID Demo will report any data saved to the RFID tag, as well as the type of tag and number of bytes per block. The bottom of the screen will report the read status and tag ID.



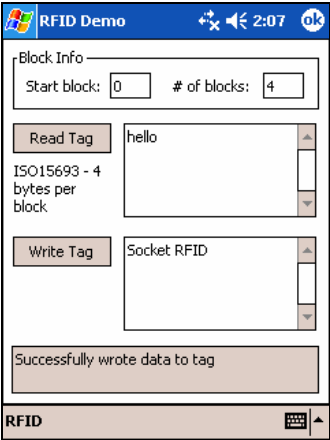
- To write data to the tag, enter text into the bottom field. The type and amount of text that can be written varies depending on your tag type. After entering text, hold the Pocket PC in the correct reading/writing position and tap Write Tag.



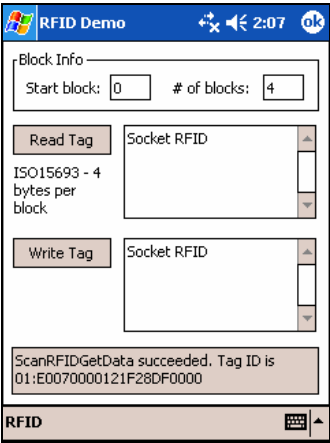
Note:

- The number of characters in the Write Tag field must match the number of bytes per block multiplied by the number of blocks, or an error will occur.*
- See Appendix B to find out the type and amount of text that can be written to your tag.*
- The most common cause of write failures is either an incorrect “start block” or number of blocks.*

6. After writing data to the tag, the bottom of the screen will report the write status.



7. To verify that the data was written successfully to the tag, hold the Pocket PC in the correct reading/writing position, and tap Read Tag.



8. To close the advanced screen, tap **OK**.

Appendix A

Product Specifications

Physical Characteristics

CompactFlash Card Size: 1.43 x 1.68 x 0.20 inches (36 x 42.7 x 5.0 mm)

Weight: 1.6 oz. (45 g)

Scanner Head Size: 1.76 x 1.93 x 0.82 inches (45 x 49 x 21 mm)

Power Consumption (3.3 V):

Idle: 11 mA

RFID Reading/Writing: 52 mA

Bar Code Scanning: 72 mA

Also operates at 5 V

Environmental:

Operating Temperature: 10 to +50°C (-4 to +122°F)

Storage Temperature: -40 to +70°C (-40 to +158°F)

Humidity: 5-95% RH non-condensing

Compatibility: Windows COM port

Operating System Support: Windows CE.NET v4.2 (Windows Mobile)

Certification: FCC: Part 15, Class B, CE: EN55024:1998, C-TICK: s.182

RFID Characteristics:

Frequency: 13.56 MHz (HF)

Maximum Read Range: 2.0 inches, depending on tag antenna size

HF RFID Tags Supported

ISO15693: ICode SL2, LRI512, my-d, Tag-It HF-I

Proprietary: ICode 1, PicoTag (tag ID only), Tag-It HF, GemWave (tag ID only)

Scanner Characteristics: *Laser Classes Available:*

Version 6M: Laser Class 1

Version 6P: Laser Class 2

Appendix B

HF RFID Standards and Tag Descriptions

ISO15693

The ISO/IEC 15693 standard was developed for “Contactless Vicinity Cards”. Adopted in 1998, ISO15693 has significantly enabled global acceptance of 13.56MHz RFID technology. Based on contributions by Texas Instruments and Philips, ISO/IEC 15693 is largely a superset of the features and specifications of the Tag-it HF and I-Code1 products, respectively.

- **ISO15693-1:** Defines the physical characteristics of a credit card transponder.
- **ISO15693-2:** Specifies the 13.56MHz air interface and modulation methods that accommodate regulatory bodies worldwide.
- **ISO15693-3:** Specifies the command protocol and anti-collision method for data exchange between tags and readers.

The ISO15693 “standard” permits tags to be manufactured that support optional and custom commands, and that have custom memory structures, sizes and architectures. The SkyeRead family of RFID readers fully supports all four (4) IC manufacturers that offer ISO/IEC 15693 compatible tags.

Tag-It HF-I ISO15693 (Texas Instruments)

The complete Tag-It HF-I specification can be found in the Texas Instruments publication titled “Tag-It HF-I Transponder Inlays Reference Guide”.

Figure 1 - Memory Structure of the Tag-It HF-I

2K bits (256 bytes) of user memory is available for read/write.

| Block # | 32 bits (4 bytes per block) | | | |
|-----------|--------------------------------|---|---|---|
| 0 (0x00) | | | | |
| 1 (0x01) | | | | |
| 2 (0x02) | | | | |
| . | . | . | . | . |
| . | . | . | . | . |
| . | . | . | . | . |
| 62 (0x3E) | | | | |
| 63 (0x3F) | | | | |

The user can permanently lock any block.

Once a block is locked it can not be unlocked.

A 64-bit ID (factory programmed) uniquely identifies each Tag-It HF-I chip.

| | | | |
|-----|------|------|-----------------------------------|
| TID | 0xE0 | 0x07 | Unique Tag ID - 48 bits (6 bytes) |
|-----|------|------|-----------------------------------|

I-Code SLI ISO15693 (Philips)

The complete I-Code SLI specification can be found in the Philips publication titled “I-Code SLI Smart Label IC SL2 ICS20 Functional Specification”.

Figure 1 - Memory Structure of the I-Code SLI (version SL2 ICS20)

896 bits (112 bytes) of user memory is available for read/write.

| | | | | | |
|----------------|--|---|---|---|--|
| Block # | 32 bits (4 bytes per block) | | | | |
| 0 (0x00) | | | | | |
| 1 (0x01) | | | | | |
| 2 (0x02) | | | | | The user can permanently lock any block. |
| . | . | . | . | . | |
| . | . | . | . | . | Once a block is locked it can not be unlocked. |
| . | . | . | . | . | |
| 26 (0x1A) | | | | | |
| 27 (0x1B) | | | | | |

A 64-bit ID (factory programmed) uniquely identifies each I-Code SLI chip (SL2 ICS20).

| | | | | |
|------------|-------------|-------------|-------------|--|
| TID | 0xE0 | 0x04 | 0x01 | Unique Tag ID 40 bits (5 bytes) |
|------------|-------------|-------------|-------------|--|

my-d SRF55VxxP ISO15693 (Infineon)

The complete my-d SRF55VxxP specification can be obtained from Infineon.

Figure 2 - Memory Structure of the my-d SRF55V02P

29 blocks of 8 bytes = 232 bytes (1856 bits) of user memory is available for read/write.

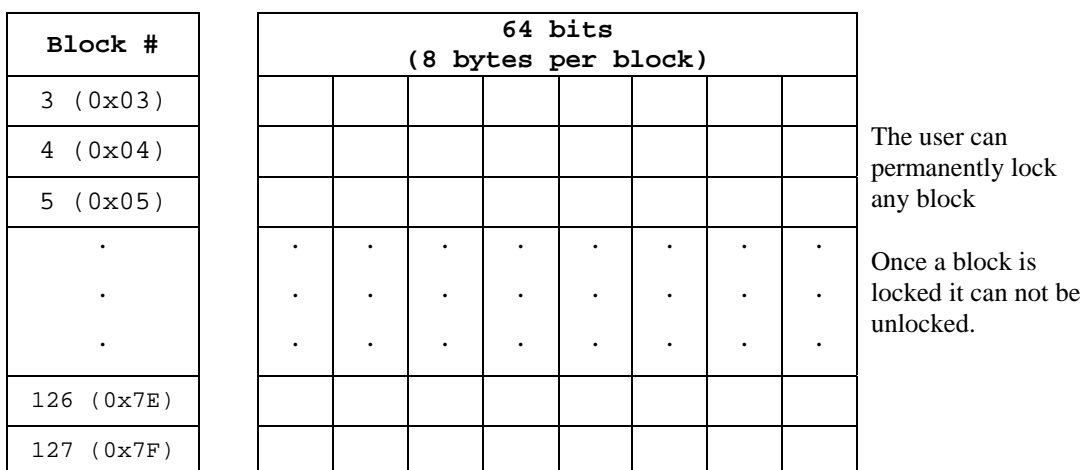
| | | | | | | | | | |
|----------------|--|---|---|---|---|---|---|---|--|
| Block # | 64 bits (8 bytes per block) | | | | | | | | |
| 3 (0x03) | | | | | | | | | |
| 4 (0x04) | | | | | | | | | |
| 5 (0x05) | | | | | | | | | The user can permanently lock any block |
| . | . | . | . | . | . | . | . | . | |
| . | . | . | . | . | . | . | . | . | Once a block is locked it can not be unlocked. |
| . | . | . | . | . | . | . | . | . | |
| 30 (0x1E) | | | | | | | | | |
| 31 (0x1F) | | | | | | | | | |

A 64-bit ID (factory programmed) uniquely identifies each my-d SRF55V02P chip.

| | | | | |
|------------|-------------|-------------|-------------|--|
| TID | 0x60 | 0x05 | 0x02 | Unique Tag ID - 40 bits (5 bytes) |
|------------|-------------|-------------|-------------|--|

Figure 4 - Memory Structure of the my-d SRF55V10P

125 blocks of 8 bytes = 1000 bytes (8000 bits) of user memory is available for read/write.



A 64-bit ID (factory programmed) uniquely identifies each my-d SRF55V10P chip.

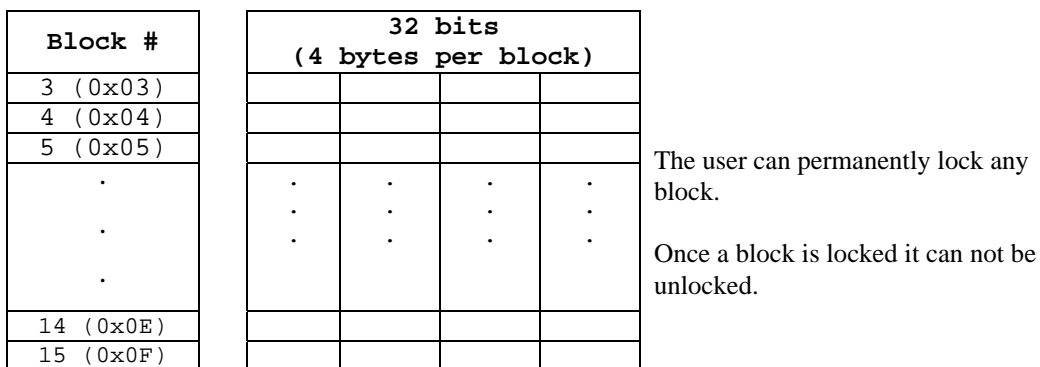
| | | | | |
|------------|-------------|-------------|-------------|--|
| TID | 0x60 | 0x05 | 0x00 | Unique Tag ID - 40 bits (5 bytes) |
|------------|-------------|-------------|-------------|--|

LRI512 ISO15693 (ST Microelectronics)

The complete LRI512 specification can be found in ST Microelectronics’ publication titled “LRI512 Memory TAG IC 512 bit High Endurance EEPROM 13.56MHz, ISO 15693 Standard Compliant with E.A.S.”.

Figure 5 - Memory Structure of the STM LRI512

512 bits (64 bytes) of user memory is available for read/write.



A 64-bit ID (factory programmed) uniquely identifies each STM LRI512 chip.

| | | | |
|------------|-------------|-------------|--|
| TID | 0xE0 | 0x02 | Unique Tag ID 48 bits (6 bytes) |
|------------|-------------|-------------|--|

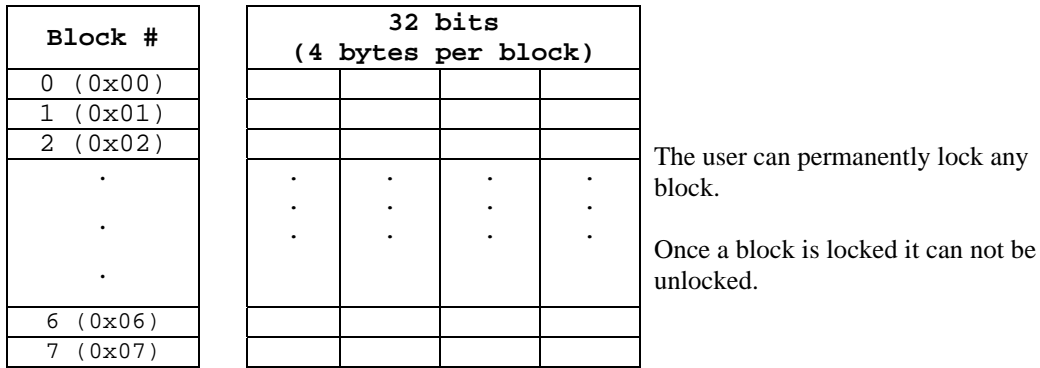
Tag-it HF

The first 13.56MHz RFID IC that Texas Instruments developed was the Tag-it HF. Still in high volume production, Tag-it HF is widely used in applications globally and has an existing installed base of millions of tags. The Tag-it HF uses a protocol air interface that is proprietary to Texas Instruments.

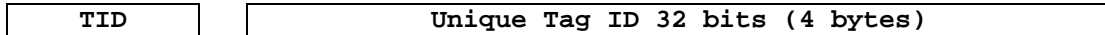
By contrast, the Tag-it HF-I was released by Texas Instruments in 2001 is compatible with ISO/IEC 15693 parts -2 and -3. The host application developer should be aware of the distinction between the Tag-it HF and the Tag-it HF-I.

Figure 6 - Memory Structure of the Tag-it HF

256 bits (32 bytes) of user memory is available for read/write.



A 32-bit ID (factory programmed) uniquely identifies each Tag-it HF chip.



The complete Tag-it HF specification can be obtained from Texas Instruments.

I-Code1

The first long range 13.56MHz RFID IC that Philips released was the I-Code1 (SL1). Still in high volume production, I-Code1 (SL1) is still widely used in applications globally and has an existing installed base of millions of tags. The I-Code1 (SL1) uses a protocol and air interface that is proprietary to Philips.

By contrast, the I-Code SLI (SL2), released by Philips in 2002, is fully compatible with ISO/IEC 15693 parts -2 and -3. The host application developer should be explicitly aware of the distinction between the I-Code1 (SL1) and the I-Code SLI (SL2).

Figure 7 - Memory Structure of the I-Code1 (version SL1 ICS30 01)

512 bits (64 bytes) of user memory is available for read/write.

| Block # | 32 bits (4 bytes per block) | | | |
|-----------|--------------------------------|---|---|---|
| 3 (0x03) | | | | |
| 4 (0x04) | | | | |
| 5 (0x05) | | | | |
| . | . | . | . | . |
| . | . | . | . | . |
| . | . | . | . | . |
| 14 (0x0E) | | | | |
| 15 (0x0F) | | | | |

The user can permanently lock any block.
Once a block is locked it cannot be unlocked.

A 64-bit ID (factory programmed) uniquely identifies each I-Code1 chip.

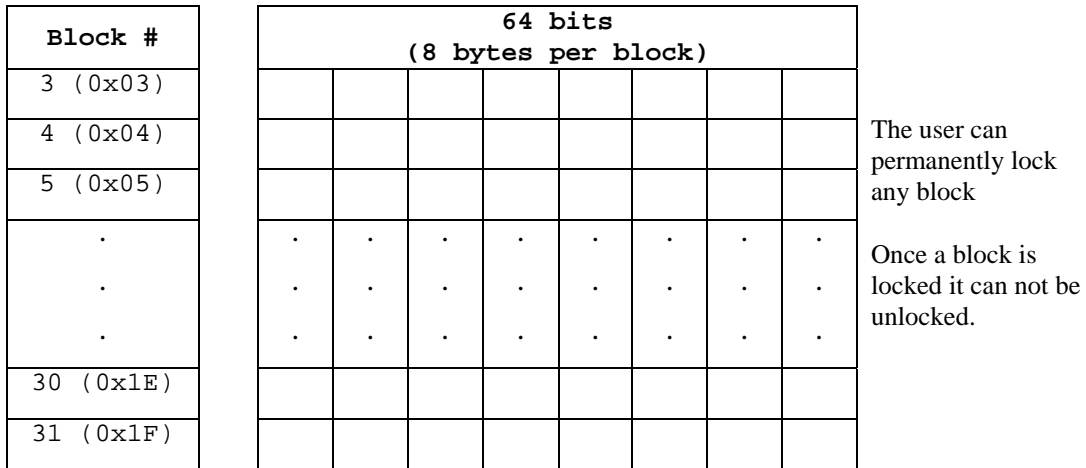
| | |
|------------|--|
| TID | Unique Tag ID 64 bits (8 bytes) |
|------------|--|

PicoTag

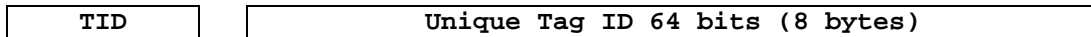
Inside Contactless (formerly Inside Technologies) makes a contactless RFID product series called the PicoTag. There are two different sizes of PicoTag memories, 2K and 16K. There are two different modes of operation, plain and secure.

Figure 8 - Memory Structure of the PicoTag 2K

29 blocks of 8 bytes = 232 bytes (1856 bits) of user memory is available for read/write.



A 64-bit ID (factory programmed) uniquely identifies each PicoTag chip.



Note: Only the tag ID can be read by the CF RFID Reader-Scan Card.

ISO14443

ISO/IEC 14443 is a 4-part RFID standard for short-range “Contactless Proximity Cards”. Adopted in 1999 and 2000, ISO14443 has become the worldwide standard for cashless payment and contactless stored value applications.

- ISO14443-1 defines the physical characteristics of an RFID card.
- ISO14443-2 specifies two types (A and B) of 13.56MHz air interface and modulation methods used for communication between tags and readers.
- ISO14443-3 specifies the anti-collision method for selecting one tag among many.
- ISO14443-4 defines the high-level protocol and method for data exchange between tags and readers.

14443-A Mifare Standard 4K (Philips)

The Mifare chip from Philips is used in millions of secure contactless applications since it was introduced in 1995.

Figure 9 - Memory Structure of the Mifare Standard 4K (MF1 IC S70)

| BLOCK | SECTOR | BYTE | | | | | | | | | | | | | | |
|-------|--------|---------------|----|----|----|------------|-------------------|----|----|----|----|-------|----|----|----|----|
| | | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 |
| 0 | 0 | Serial Number | | | | Check Byte | Manufacturer Data | | | | | | | | | |
| 1 | | Data | | | | | | | | | | | | | | |
| 2 | | Data | | | | | | | | | | | | | | |
| 3 | | Key A | | | | | Lock Bits | | | | | Key B | | | | |
| 4 | 1 | Data | | | | | | | | | | | | | | |
| 5 | | Data | | | | | | | | | | | | | | |
| 6 | | Data | | | | | | | | | | | | | | |
| 7 | | Key A | | | | | Lock Bits | | | | | Key B | | | | |
| . | . | . | | | | | | | | | | | | | | |
| . | . | . | | | | | | | | | | | | | | |
| . | . | . | | | | | | | | | | | | | | |
| 60 | 15 | Data | | | | | | | | | | | | | | |
| 61 | | Data | | | | | | | | | | | | | | |
| 62 | | Data | | | | | | | | | | | | | | |
| 63 | | Key A | | | | | Lock Bits | | | | | Key B | | | | |

The complete Mifare specification can be obtained from the Philips publication “Mifare Standard 4 kByte Card IC MF1 IC S70” dated October 2002.

Note: Only the tag serial number can be read by the CF RFID Reader Card.

Mifare Ultralight (Philips)

The complete Mifare Ultralight specification can be obtained from the Philips publication “Mifare Ultralight Contactless Single-trip Ticket IC MF0 IC U1 Functional Specification” dated March 2003.

Figure 10 - Memory Structure of the Mifare Ultralight (MF0 IC U1)

| Block | Byte | | | |
|-------|---------|----------|---------|---------|
| | 00 | 01 | 02 | 03 |
| 0 | SN0 | SN1 | SN2 | BCC0 |
| 1 | SN3 | SN4 | SN5 | SN6 |
| 2 | BCC1 | Internal | Lock 0 | Lock 1 |
| 3 | OTP 0 | OTP 1 | OTP 2 | OTP 3 |
| 4 | Data 0 | Data 1 | Data 2 | Data 3 |
| . | . | . | . | . |
| 15 | Data 44 | Data 45 | Data 46 | Data 47 |

System Area

User Area

Note: Only the tag serial number can be read by the CF RFID Reader Card.

LTO CM 14443-A (LTO) The LTO-CM is compliant with ISO14443-A air interface.

Figure 12 - Memory Structure of the LTO CM

128 blocks of 32 bytes = 4096 bytes (32768 bits) of user memory is available for read/write.

| BLOCK | WORD (2 Bytes) | | | | | | | | | |
|-------|--|---|-----------------------|----------------------|-------------------|---|---|---|---------------------|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 08 ... 15 | |
| 0 | Serial Number | | Check Byte & LTO Size | Transponder Type | Manufacturer Data | | | | | |
| 1 | Last Write Inhibited Block & Block 1 Protection Flag | | Reserved | Protected Page Table | | | | | | |
| 2 | | | | | | | | | | |
| 3 | Cartridge Manufacturer's Information Page | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | Media Manufacturer's Information Page | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | Unprotected Page Table | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | Initialization Data Page | | | | | | | | | |
| 10 | Tape Write Pass Page | | | | | | | | | |
| 11 | Tape Write Pass Page Cont.. | | | | | | | | Tape Directory Page | |
| 12 | Tape Directory Page Cont | | | | | | | | | |
| ... | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | EOD Information Page | | | | | | | | | |
| 61 | Cartridge Status and Tape Alert Flags Page | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | Usage Information Page 1 | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | Usage Information Page 2 | | | | | | | | | |
| 66 | | | | | | | | | | |
| 67 | Usage Information Page 3 | | | | | | | | | |
| 68 | | | | | | | | | | |
| 69 | Usage Information Page 4 | | | | | | | | | |
| 70 | | | | | | | | | | |
| ... | | | | | | | | | | |
| 82 | | | | | | | | | | |
| ... | Applications Specific Page | | | | | | | | | |
| 115 | | | | | | | | | | |
| 116 | Suspended Append Writes page | | | | | | | | | |
| ... | | | | | | | | | | |
| 127 | | | | | | | | | | |

Note: Only the tag serial number can be read by the CF RFID Reader-Scan Card.

Appendix C

Bar Code Label Specifications

All bar code symbols/labels should satisfy the appropriate AIM Uniform Symbology Specification.

Background Substrate:

The bar code symbol should be printed on material (media) that is reflective and has a matte (not glossy) finish. A background diffuse reflectance of at least 70% to 80% is desirable for optimum contrast. Retro-reflective media should be used to obtain decode distances greater than 36 inches.

Ink Color and Type:

The inked bars should not exceed 25% reflectance at the wavelength that is being used for reading, whether printed with black ink or colored ink. The reflectance value should not vary more than 5% within the same character.

Voids and Specks:

The code should be printed clearly, free of voids, specks, blemishes and lines that could “fool” the scanner. Specks or blemishes in the white spaces, or false or missing bar sections could be interpreted by the reading equipment as part of the code. Generally, the width of such flaws is more serious than the height. Code symbols/ labels should be rejected if these defects are present.

Definition:

The bars in the bar code symbol should be well defined. Their edges should not be rough or fuzzy, so that the bars and spaces have the proper widths intended for the bar code symbology used.

Contrast:

Background reflectance (that of the substrate on which the codes are printed) should always provide a good contrast relative to the ink reflectance (that of the code bars). The difference between the two should be at least 37.5% at the wavelength used for reading.

Tolerance:

The ratio of the widths of bars and spaces in a bar code symbol must conform to the appropriate AIM bar code specifications and can cause problems if not correct throughout the bar code. Problems can occur when bar edges are smeared or rough, or when they exhibit voids.

Appendix D

Class 1 vs. Class 2 Laser Scanners

This is a paper on bar code laser scanners that Jack Brandon, Product Marketing Manager of Scanner Products for Socket Communications, published in 2001. You can download a copy of this paper from: www.socketcom.com/support/learn.asp

Introduction

Socket now offers the popular CF RFID Reader-Scan Card with either a CMOS, Class 1 or Class 2 laser engine. This document describes the differences between the Class 1 and Class 2 devices and the appropriate applications for each.

The primary difference is the power output of the laser. The Class 1 laser has a nominal power output of 0.5 milliwatts, while the output of the Class 2 laser is 1.2 milliwatts. This difference impacts the scanning performance of the device in three ways:

1. Distance — For scanning distances of up to 10 inches, there is very little difference in the ability of either the Class 1 or the Class 2 laser to scan a given bar code. Beyond 10 inches, the Class 2 laser will scan a standard, high quality bar code about 20% - 25% farther than the Class 1 laser.

Scanning a standard bar code of any size at a distance greater than 25 inches becomes difficult with the Class 1 laser, while the Class 2 laser will easily scan very large bar codes at 60 inches and beyond. There are many variables involved in determining the distance at which a bar code can be scanned, including:

- a. The size of the bar code — The width of the narrowest bar in thousandths of an inch (or ‘mils’) is referred to as the “X dimension” or “size” of a bar code. Standard retail UPC or EAN bar codes are 10 mils (0.010 inches). Larger bar codes, such as warehouse location bar codes, can be 200 mils or larger. The larger a bar code, the greater the distance from which it can be scanned.

Please refer to the *Decode Zone* charts in Appendix F for more detailed information on the relationship between the size of a bar code and the distance at which it can be scanned.

- b. The label media — The media is the material a bar code is printed on. This is usually some type of paper but can also be a plastic or even metallic material. Because the reading mechanism in a bar code scanner is based on contrast, the whiter and more reflecting a media is, the farther away it can be scanned. Retro-reflective media (like a stop sign) is used for scanning very large bar code labels at distances of 20 feet and more.
 - c. The bar code symbology — There are many different bar code symbologies (or ‘languages’), such as UPC, EAN, Code 39, Code 128, Code 93 and more. Some symbologies are easier to decode than others and can, therefore, be scanned at greater distances.
- 2. Packaging or covering materials — The Class 2 laser can more effectively scan through difficult packaging materials such as Mylar (used for electronic components) or thick plastic or glass such as automobile windshields.
 - 3. Ambient light — The Class 2 laser can more effectively scan in high ambient light conditions such as high intensity lighting or even daylight (indirect sunlight). Scanning bar codes in direct sunlight is extremely difficult because sunlight contains enough energy in the red spectrum used by the laser to ‘blind’ the scanner’s decode system.

The second difference between the Class 1 and Class 2 lasers in the Socket CF RFID Reader-Scan Card is the wavelength frequency of the laser beam. The Class 1 laser has a 670 nanometer (nm) beam common in most laser bar code scanners, while the Class 2 features a 650 nm beam. There is no difference in the scanning capability of the two frequencies, but the 650 nm beam is more visible to the human eye, making it appear brighter than the Class 1 laser.

The user must see the oscillating laser beam in order to aim it effectively at the bar code to be scanned. The Class 2, 650 nm laser is easier to see and aim than the Class 1 laser, especially when scanning at greater distances, through difficult materials or in high ambient light.

A third difference between the Class 1 and Class 2 lasers is the current demand during scanning. At 3.3 Volt power (standard for CompactFlash card slots) the Class 1 laser draws about 67 milliamps (mA) and the Class 2 laser draws about 75 mA. Both lasers draw about 3 – 4 mA when idle. Therefore, for a given level of scanning activity, using the Class 1 laser should result in a slightly longer battery life.

A final consideration in the selection of either a Class 1 or Class 2 laser is safety. Staring directly into any laser beam for an extended period of time

will cause damage to the eyes of humans and animals. The normal use of a bar code scanner is inherently very safe because (a) the laser is typically aimed away from the person using the scanner, and (b) the beam oscillates 39 times per second over a 53° arc, making it impossible to stare into the beam. Additionally, using the lower powered Class 1 laser makes it even less likely that eye damage will occur. There are certain organizations in Europe, in fact, that require a Class 1 laser in bar code scanners to meet more stringent safety standards. The Socket CF RFID Reader-Scan Card with Class 1 laser meets these European safety standards. Please refer to the Regulatory Compliance section at the end of this *User's Guide* for more detailed safety information.

Conclusion

The Class 1 laser is suitable for most applications with expected scanning distances of less than 20 inches and normal ambient light conditions. The Class 1 laser may be required by certain European organizations to meet more stringent safety standards. When an application is likely to require more demanding scanning capabilities, the Class 2 laser provides the assurance of maximum scanning performance.

Note: People who use portable computers to gather and manage data at the point of activity are typically very quick to learn how to use a laser bar code scanner and realize the resulting gains in productivity. They are easily discouraged, however, if time and effort are required to obtain a successful scan – thus the decline in popularity of the much less expensive bar code contact wands seen at most retail checkout counters during the 1980's. The higher cost of the Class 2 version of the CF RFID Reader-Scan Card is easily justified if the application requires higher scanning performance.

Appendix E

Enabling or Disabling Symbologies

All Socket bar code scanning products are pre-set to automatically detect and decode (autodiscriminate) the most common bar code symbologies. Refer to the table on the next page to determine which symbologies and parameters are set as default. If you would like to change your symbology settings, you can choose from either of two options, depending on what device you are using and what settings you want to change.

Note: With more symbologies enabled, the scanner must work harder to search through all the possible combinations. This may make the decoding process slightly longer.

OPTION 1: Symbology Selector for Windows Mobile

If you are using a Windows Mobile-based device, you can quickly enable and disable any of the seventeen most popular symbologies by using the SocketScan Symbology Selector. Refer to Chapter 2 for instructions.

Note: The length of some symbologies will change after Symbology Selector is used. Refer to the table on the next page.

OPTION 2: Scan Programming Bar Codes

If you want to modify an option not included in Symbology Selector, you can scan programming bar codes to configure your CF RFID Reader-Scan Card. There are a variety of programming bar codes available that let you enable/disable symbologies as well as configure special features (e.g., specify bar code lengths, transmit check digits, recognize supplementals, etc.).

To obtain the programming bar codes, download the Programming Guide online from www.socketcom.com/support/support_bar.asp.



WARNING!

When scanning programming bar codes with the CF RFID Reader-Scan Card, do not scan any bar codes that set communication protocols, as the CF RFID Reader-Scan Card will be disabled and must be returned to Socket for reprogramming.

Table 1. Default Symbologies and Settings of the CF RFID Reader-Scan Card

| Symbology | Default | Length | Length with Symbology Selector |
|------------------------|----------|---------|--------------------------------|
| UPC-A | Enabled | N/A | N/A |
| UPC-E | Enabled | N/A | N/A |
| UPC-E1 | Disabled | N/A | N/A |
| EAN-8 | Enabled | N/A | N/A |
| EAN-13 | Enabled | N/A | N/A |
| • Supplementals | Disabled | N/A | N/A |
| • Transmit Check Digit | Enabled | N/A | N/A |
| Bookland EAN | Disabled | N/A | N/A |
| Code 128 - All | Enabled | Any | Any |
| Code 39 | Enabled | 2 to 55 | 2 to 55 |
| Trioptic Code 39 | Disabled | 2 to 55 | 2 to 55 |
| Code 39 Full ASCII | Disabled | 2 to 55 | 2 to 55 |
| • Transmit Check Digit | Disabled | N/A | N/A |
| Code 93 | Disabled | 4 to 55 | 2 to 55 |
| Interleaved 2 of 5* | Enabled | 14 Only | 2 to 55 |
| • Transmit Check Digit | Disabled | N/A | N/A |
| Discrete 2 of 5* | Disabled | 12 Only | 2 to 55 |
| Codabar | Disabled | 5 to 55 | 2 to 55 |
| MSI Plessey* | Disabled | 6 to 55 | 2 to 55 |
| • Transmit Check Digit | Disabled | N/A | N/A |

*WARNING: Setting the length to “Any” may lead to inaccurate decodes in these symbologies

For more information on bar codes, symbologies, labels or other bar code related topics, visit any of the following web sites:

- a. www.aimglobal.org/technologies/barcode/
- b. www.aimglobal.org/aimstore/stackedsymbologies.htm
- c. www.adams1.com
- d. www.bizfonts.com
- e. www.barcode-us.com/info_center/upc.htm (UPC Codes)
- f. www.barcode-us.com/info_center/bookinfo.htm (Bookland EAN)
- g. www.dataid.com/bcsymbology.htm
- h. www.aaabarcodes.com
- i. www.snx.com/mechanics.html
- j. www.idautomation.com/barcoding4beginners.html

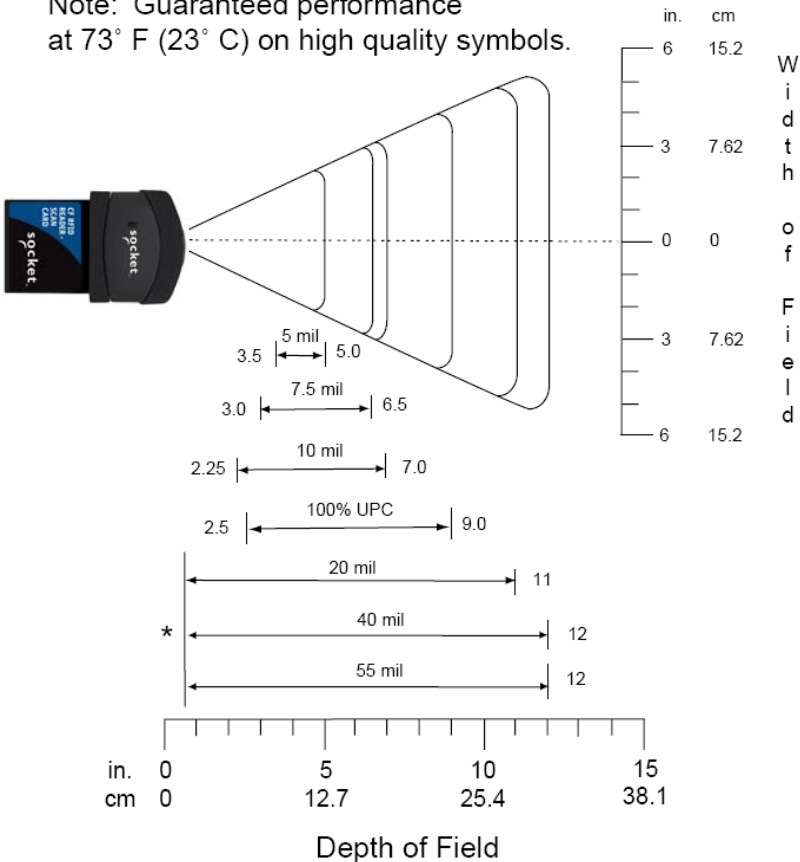
Appendix F

Laser Decode Zone

The decode zones for the Class 1 and Class 2 lasers in the CF RFID Reader-Scan Card are shown below. The minimum element width (“X Dimension” or bar code “size”) is the width in thousandths of an inch (mils) of the narrowest element (bar or space) in the symbol. The figures shown are the typical scanning distances (depths of field) for selected bar code sizes. The maximum usable length of a bar code symbol (Width of Field) at any given range is also shown below.

Class 1 Laser Decode Zone

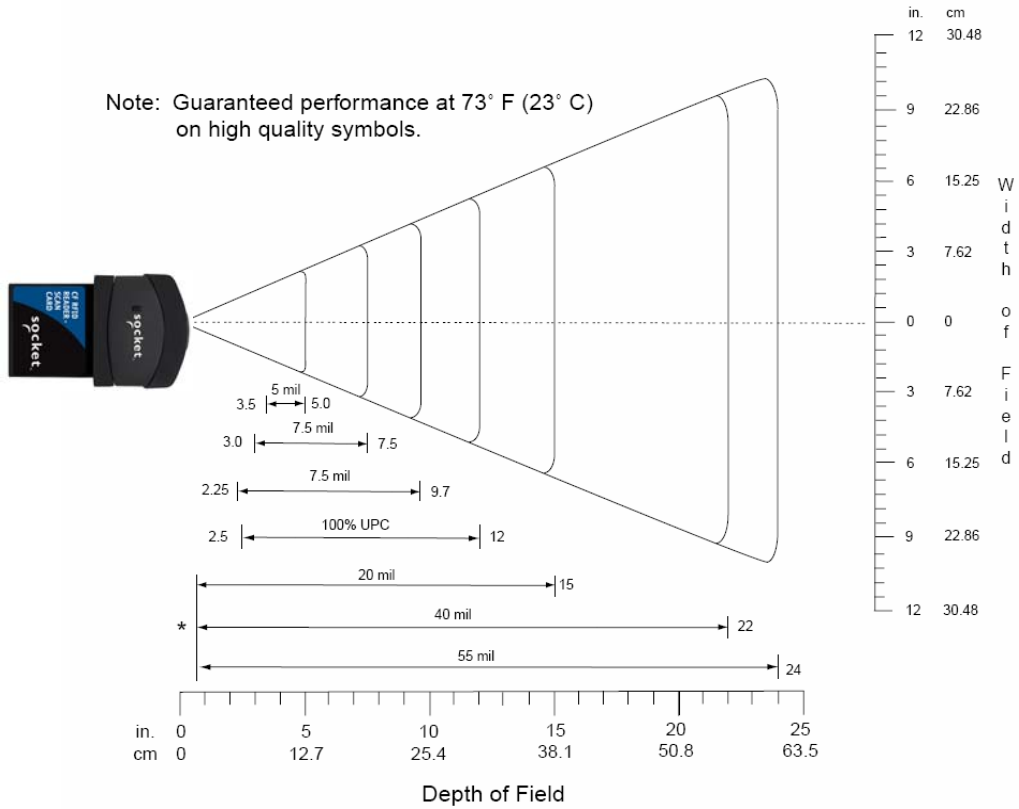
Note: Guaranteed performance at 73° F (23° C) on high quality symbols.



*Minimum distance determined by symbol length and scan angle

Class 2 Laser Decode Zone

Note: Guaranteed performance at 73° F (23° C)
on high quality symbols.




*Minimum distance determined by symbol length and scan angle

Appendix G

Troubleshooting

For help on SocketScan on a Windows Mobile-based device, tap **Start | Help**.

SYMPTOM:

I get the “No Card Detected”  icon in the task tray and can’t trigger the laser or scan any bar codes.

| POSSIBLE REASON | SOLUTION |
|--|--|
| Your mobile computer does not recognize the RFID Reader-Scan Card. | Make sure the RFID Reader Card is inserted properly. If necessary, remove and reinsert. If using battery power, be sure to tap Yes if asked if you want to use battery power. |

SYMPTOM:

When I try to read an RFID tag, no data appears on my screen.

| POSSIBLE REASON | SOLUTION |
|---|---|
| You are holding the Pocket PC and RFID Reader-Scan Card in the wrong position.. | Hold the Pocket PC so the RFID Reader-Scan Card is parallel to and directly above the RFID tag, at most 2.5 inches above the tag. |
| The RFID tag antenna is broken or incorrectly formatted. | Try reading another RFID tag that is correctly formatted. |
| The tag type may be disabled. | Use RFID Demo to determine the tag type. If needed, reconfigure the RFID Reader-Scan Card for the correct tag type. |

SYMPTOM:

When I press the trigger button, nothing happens.

| POSSIBLE REASON | SOLUTION |
|--|---|
| You programmed the trigger button incorrectly. | Test the button by assigning a different program to it and make sure it works properly. |

Appendix H

Technical Support

If you have trouble installing or using RFID Reader-Scan Card, Socket has two technical support resources to help you. Please note that technical support is available in English only.

1. **Socket On-Demand Support (SOS)**

Socket On-Demand Support is an interactive technical support program that focuses in on your specific problem to provide the answers you need. SOS provides immediate service and is the best place to start for technical support. To access SOS, visit: www.socketcom.com/support. Click on the SOS icon.

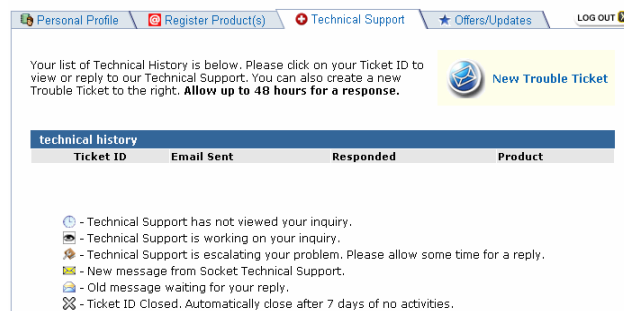


If SOS cannot solve your problem, end the session by submitting an email inquiry to a Socket technical support engineer as prompted. Your interactive session will be saved for reference.

2. **Live Technical Support**

IMPORTANT! To obtain technical support, you must first register your product online at www.socketcom.com/prodreg.

After you register your product, log in and click on the Technical Support tab. Click New Trouble Ticket.



If we are unable to resolve your support inquiry online, we can arrange for a technical support representative to call you at a specific time.

Please refrain from disassembling the Socket RFID Reader-Scan Card. Disassembly of this device will void the product warranty.

Limited Warranty

Socket Communications Incorporated (Socket) warrants this product against defects in material and workmanship, under normal use and service, for the following period from the date of purchase:

Socket CF RFID Reader-Scan Card: Two years

Incompatibility is not a defect covered by Socket's warranty. During the warranty period, Socket will, at its option, repair or replace the defective product at no charge when furnished with proof of retail purchase, provided that you deliver the product to Socket or to an authorized Socket Service Center.

The returned product must be accompanied by a return material authorization (RMA) number issued by Socket or by Socket's Authorized Service Center. If you ship the product, you must use the original container or equivalent and you must pay the shipping charges to Socket. Socket will pay shipping charges back to any location in the contiguous United States. This warranty applies only to the original retail purchaser and is not transferable.

Socket may, at its option, replace or repair the product with new or reconditioned parts and the returned product becomes Socket's property. Socket warrants the repaired or replaced products to be free from defects in material or workmanship for ninety (90) days after the return shipping date, or for the duration of the original warranty period, whichever is greater.

This warranty does not cover the replacement of products damaged by abuse, accident, misuse or misapplication, nor as a result of service or modification other than by Socket.

SOCKET IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, INCLUDING DAMAGE TO PROPERTY AND, TO THE EXTENT PERMITTED BY LAW, DAMAGES FOR PERSONAL INJURY. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Some states do not allow limitation of implied warranties, or the exclusion or limitation of incidental or consequential damages, so that the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

This product may contain fully tested, recycled parts, warranted as if new.

For warranty information, call (510) 744-2700.

Limited Software Warranty

LIMITED WARRANTY. SOCKET warrants that the original disk or CD ROM is free from defects for 90 days from the date of delivery of the SOFTWARE.

CUSTOMER REMEDIES. SOCKET'S entire liability and your exclusive remedy shall be, at SOCKET'S option, either (a) return of the price paid or (b) replacement of the SOFTWARE which does not meet SOCKET'S Limited Warranty and which is returned to SOCKET with a copy of your receipt. Any replacement SOFTWARE will be warranted for the remainder of the original warranty period or 30 days, whichever is longer. THESE REMEDIES ARE NOT AVAILABLE OUTSIDE OF THE UNITED STATES OF AMERICA.

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Regulatory Compliance

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

PRODUCT DISPOSAL: This product must not be disposed of with municipal waste. It is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment.



