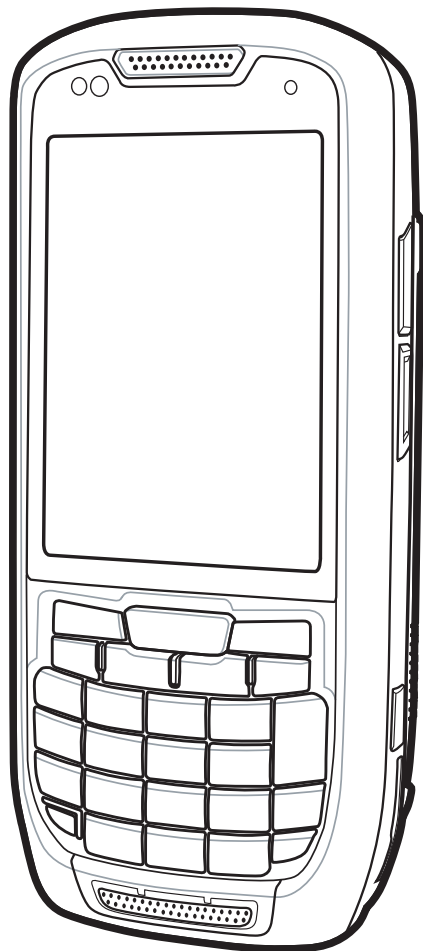


MC45 USER GUIDE ADDENDUM



MC45
User Guide Addendum

MN000133A02

Rev. A

March 2015

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Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev. A	10/03/13	Initial release.
-02 Rev. A	3/2015	Zebra rebranding

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Appendix A: Technical Specifications

MC45N7 Technical Specifications A-1

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About This Guide

Introduction

This guide is an addendum to the *MC45 User Guide* and provides information about using the MC45N7 configuration.

✓ **NOTE** Screens and windows pictured in this guide are samples and can differ from actual screens.

Documentation Set

The documentation set for the MC45 provides information for specific user needs, and includes:

- **MC45 Quick Start Guide** - describes how to get the MC45 up and running.
- **MC45 User Guide** - describes how to use the MC45.
- **MC45 User Guide Addendum** - describes the additions to the User Guide for the MC45N7 configuration.
- **MC45 Integrator Guide** - describes how to set up the MC45 and accessories.
- **MC45 Regulatory Guide** - provides all regulatory, service and EULA information for the MC45.
- **Enterprise Mobility Developer Kit (EMDK) Help File** - provides API information for writing applications.

Configurations

This guide covers the following configurations:

Configuration	Radios	Display	Memory	Data Capture	Operating System	Keypads
MC4587	WWAN: GSM/HSDPA WPAN: Bluetooth v2.1 with EDR	3.2" QVGA 16 Bit Color	256 MB RAM/ 1 GB Flash	Camera	Microsoft Windows Embedded Handheld 6.5.3, Professional Edition	Numeric
MC4597	WWAN: GSM/HSDPA WLAN: 802.11 a/b/g WPAN: Bluetooth v2.1 with EDR	3.2" QVGA 16 Bit Color	256 MB RAM/ 1 GB Flash	1-D laser scanner or camera	Microsoft Windows Embedded Handheld 6.5.3, Professional Edition	Numeric
MC45N7	WWAN: GSM/HSDPA WPAN: Bluetooth v2.1 with EDR	3.2" QVGA 16 Bit Color	512 MB RAM/ 1 GB Flash	Camera, NFC	Microsoft Windows Embedded Handheld 6.5.3, Professional Edition	Numeric

Chapter Descriptions

Topics covered in this guide are as follows:

- [Chapter 1, MC45N7 Configuration](#) provides information on getting the MC45 up and running for the first time.
- [Chapter 1, MC45N7 Configuration](#) provides information on using the NFC Demo application.
- [Appendix A, Technical Specifications](#) provides the technical specifications for the MC45.

Notational Conventions

The following conventions are used in this document:

- “Mobile Computer” refers to the Zebra MC45 series of handheld computers.
- *Italics* are used to highlight the following:
 - Chapters and sections in this and related documents
 - Icons on a screen.
- **Bold** text is used to highlight the following:
 - Dialog box, window, and screen names
 - Drop-down list and list box names
 - Check box and radio button names
 - Key names on a keypad
 - Button names on a screen.
- Bullets (•) indicate:
 - Action items
 - Lists of alternatives
 - Lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Documents

- *MC45 Quick Start Guide*, p/n 72-164157-xx.
- *MC45 Regulatory Guide*, p/n 72-164158-xx.
- *MC45 User Guide*, p/n 72E-164159-xx.
- *MC45 Integrator Guide*, p/n 72E-164160-xx.
- *Enterprise Mobility Developer Kits (EMDKs)*, available at: <http://www.zebra.com/support>.
- Latest ActiveSync software, available at: <http://www.microsoft.com>.

For the latest version of this guide and all guides, go to: <http://www.zebra.com/support>.

Service Information

If you have a problem with your equipment, contact Zebra Global Customer Support for your region. Contact information is available at: <http://www.zebra.com/support>.

When contacting Zebra Global Customer Support, please have the following information available:

- Serial number of the unit
- Model number or product name
- Software type and version number

Zebra responds to calls by email, telephone or fax within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Global Customer Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your Zebra business product from a Zebra business partner, contact that business partner for support.

Chapter 1 MC45N7 Configuration

Introduction

The MC45N7 configuration operates in the same manner as the MC4587 and MC4597 except for:

- only a camera for data capture
- does not contain Wi-Fi
- has an NFC antenna
- contains an NFC sample application.

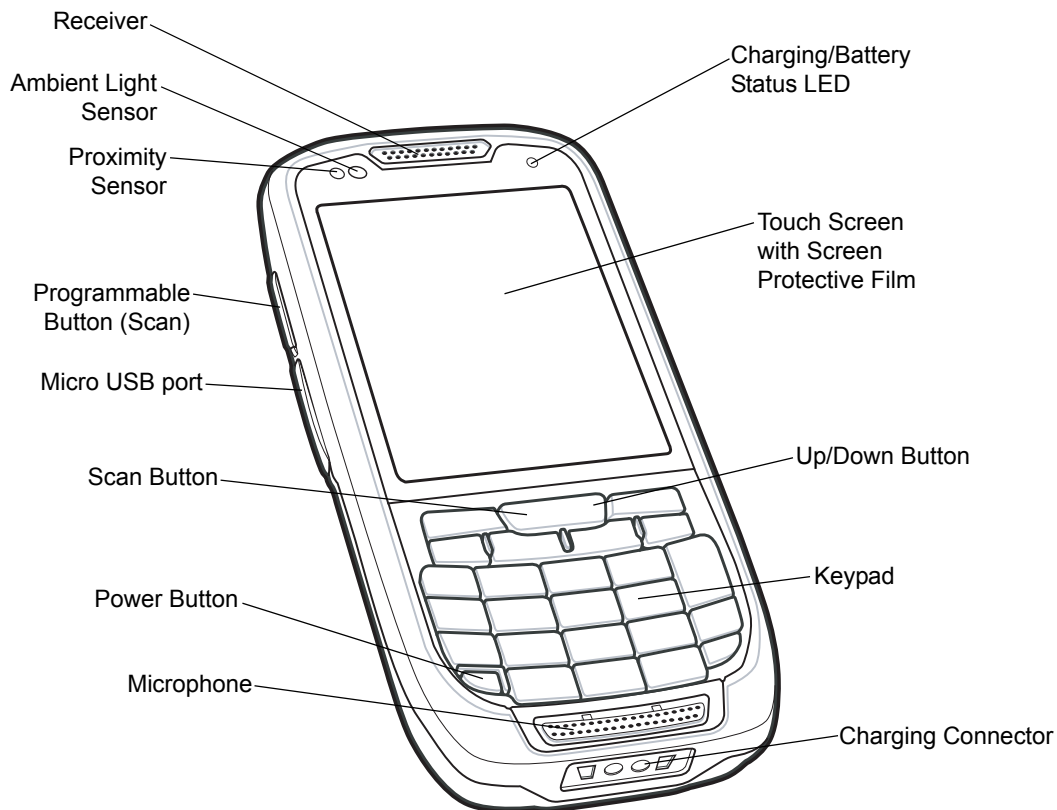


Figure 1-1 MC45N7 Front View

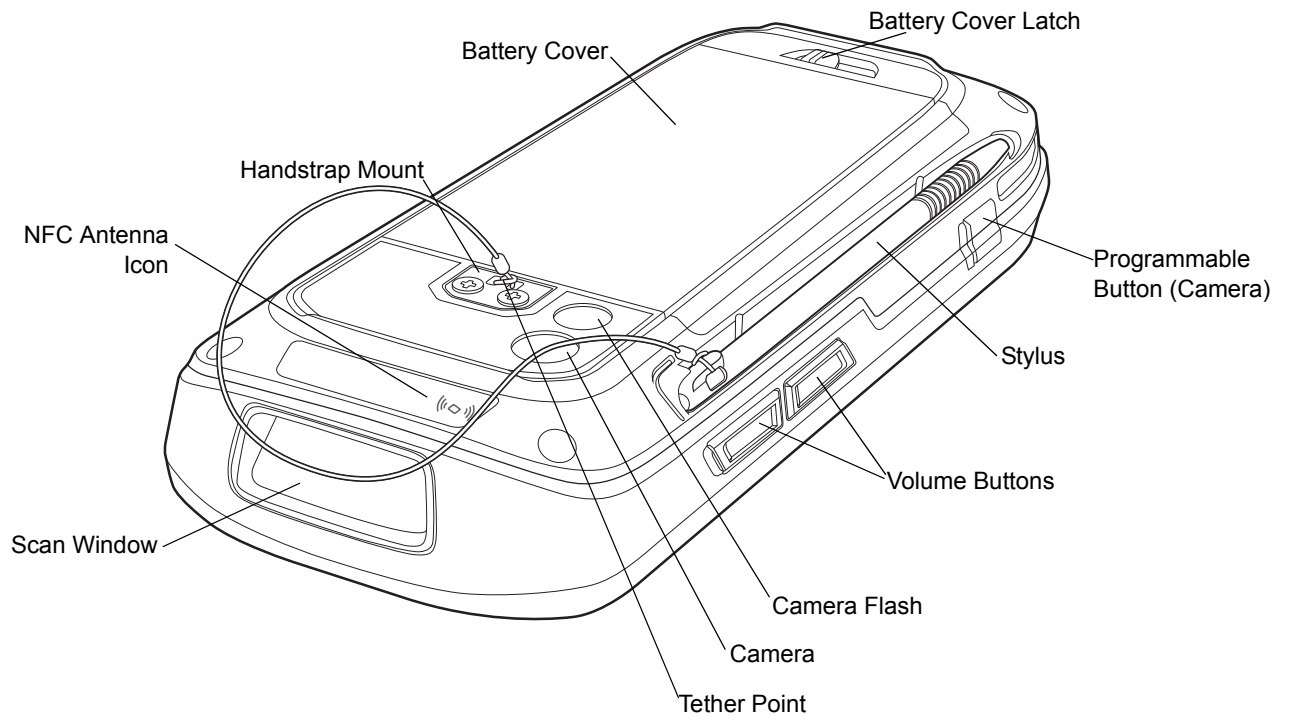


Figure 1-2 MC45N7 Rear View

NFC Operation

For detailed information on operating the MC45N7, see the *MC45 User Guide*.

Near field communication (NFC) is a set of standards for devices to establish radio communication with each other by touching them together or bringing them into close proximity, usually no more than a few centimeters. Present and anticipated applications include contactless transactions, data exchange, and simplified setup of more complex communications. Communication is also possible between an NFC device and an unpowered NFC tag.

Reading and Writing to NFC Tags

To read from or write to NFC tags, bring the MC45 close to the tag. Place the MC45 antenna icon on the back of the device over the center of the tag.

Depending upon the application, successful reading or writing is indicated using audio and or LED indications.

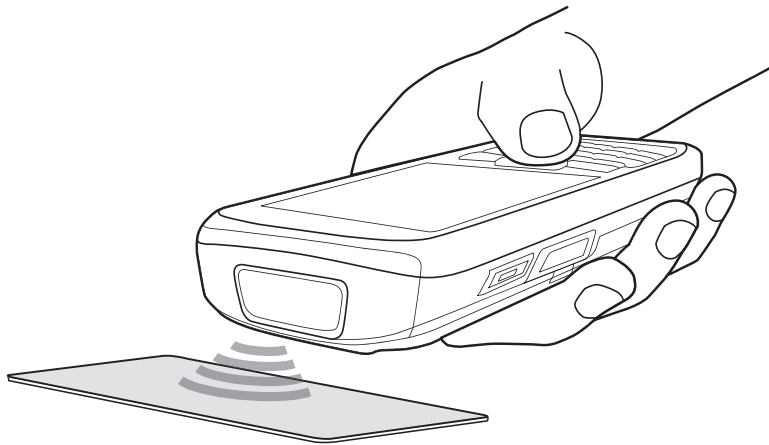


Figure 1-3 Reading/Writing NFC Tags

Bluetooth Pairing

The MC45N7 can use Bluetooth Pairing to connect to a Bluetooth device. Use the NFC Control Panel to enable and configure Bluetooth Pairing. See [Bluetooth Pairing on page 1-4](#).

1. Ensure that Bluetooth is enabled on both devices.
2. Bring the MC45N7 close to the NFC tag on the Bluetooth device.
3. The MC45N7 and the Bluetooth device communicate and pairing take place.

NFC Control Panel

The NFC Control Panel provides NFC configurations and settings. To open the NFC Control Panel, tap **Start > Setting > System > NFC**.

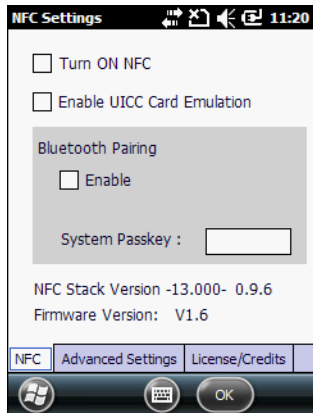


Figure 1-4 NFC Control Panel - NFC Tab

Turning On NFC

To turn on NFC, tap the **Turn ON NFC** check box. Once the NFC is on, other Control Panel options are available.

Enable UICC Card Emulation

Tap **Enable UICC Card Emulation** check box to turn on Universal Integrated Circuit Cards (UICC) card emulation.

Bluetooth Pairing

The MC45N7 can use Bluetooth Pairing to connect to a Bluetooth device. Tap the **Enable** check box to enable Bluetooth pairing.

If the Bluetooth device uses a Passkey other than 0000 or 1234, enter the Passkey in the **System Passkey** text box.

Tap **OK** to save the Bluetooth pairing information.

NFC Stack Version and PN544 Firmware Version

The NFC tab displays the current NFC stack version and firmware version.

Advanced Settings

The **Advance Settings** tab provide the configuration for Card Detection Mode and the NFC Transaction Timeout.

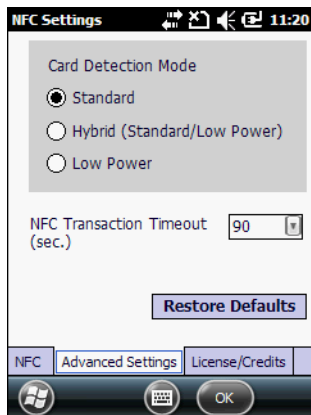


Figure 1-5 NFC Control Panel - Advanced Settings Tab

Card Detection Mode

The user can configure the following Card Detection modes:

- Standard (default)
- Hybrid
- Low Power.

Tap **OK** to enable the Card Detection mode.

NFC Transaction Timeout

User can select and configure the NFC Transaction Timeout interval. Available timeout options:

- 90 sec (default)
- 60 sec
- 30 sec.

This configures the NFC system to prevent the NFC Active Transaction Mode from taking more time than the set transaction timeout interval. The Active Transaction Mode is when an NFC transaction read, write or card emulation is in process.

After the timeout interval is reached, the NFC transaction will be stopped and the NFC stack will allow the MC45N7 to restart a new NFC transaction.

Restore Default

To return the MC45N7 to the default NFC configuration, tap **Restore Defaults**.

License / Credits

The **License/Credits** tab displays the information about apache license for the open source code that has been used in the NFC solution.

Chapter 1 NFC Demo Application

Introduction

The **NFC Demo** application demonstrates various Near Field Communication (NFC) operations. The application supports following tag types:

- Jewel / Topaz (NFC Type 1)
- Mifare Ultralight (NFC Type 2)
- FeliCa (NFC Type 3)
- MIFARE DESFire (NFC Type 4)
- Mifare Ultralight C
- Mifare Classic
- Mifare Plus
- NXP I-Code (ISO 15693)
- Calypso
- TI Tag-it (ISO 15693).

Installation

To install the NFC Demo application:

1. Tap **Start > Windows Explorer**.
2. Navigate to the **Application** folder.
3. Tap the file: **NFCDemoInstaller.CAB**.
4. Following the on-screen directions to install the application.
5. The icon will appear on the **Start** menu.

Reading a Tag

The Demo application demonstrates the MC45N7 reading a tag. When the tag is read, the information is populated into the application fields.

1. Tap **Start > NFC Demo > Read Tag**.
2. Wait for the MC45N7 to chime.
3. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
4. The MC45 beeps when it reads the data from a card.
5. The MC45N7 populates the fields with the information from the card.

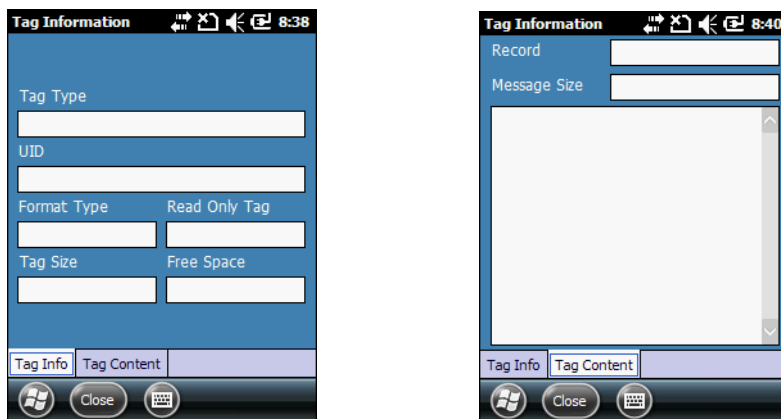


Figure 1-1 Read Tag Window

6. Tap the **Tag Content** tab to view the information on the tag.
7. Tap **Close** to return to the **NFC Demo** window.

Creating a Tag

The **Create Tag** window allows the user to write to an NFC tag with the following records:

- Text record
- Uniform Resource Identifiers (URI) record
- Smart poster record
- RAW
- Bluetooth address.

Tap **Start > NFC Demo > Create Tag**.

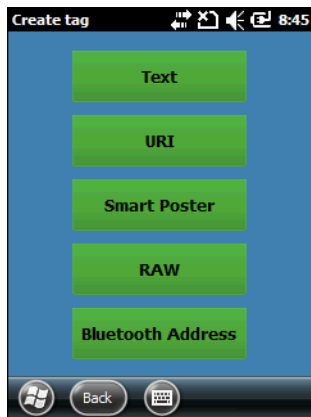


Figure 1-2 Create Tag Window

Create Text

- ✓ **NOTE** All NFC Data Exchange Format (NDEF) formatted tag types are supported.

Use the **Create Text** window to create a text record by entering the data.

To create text, **NFC Demo** window, tap the **Text** button.

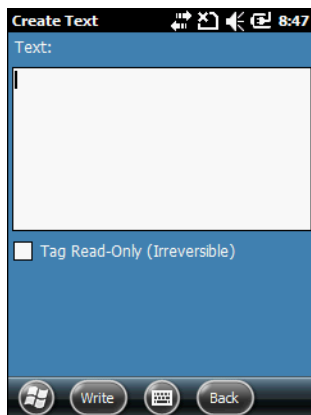


Figure 1-3 Create Text Window

1. In the **Text** field, enter the text.
2. To permanently make the tag read-only, tap the **Tag Read-Only** checkbox. A dialog box appears indicating that the process is irreversible. Tap **OK** to confirm.
3. Tap **Write** to initiate the tag discovery. A progress bar appears.
4. Wait for the MC45N7 to chime.
5. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
6. The MC45N7 beeps when the data is written to the tag. **Tag written successfully** appears above the progress bar.
7. Tap **Back** to close the **Create Text** window.

Create URI

✓ **NOTE** All NDEF formatted tag types are supported.

To create URI record, tap the **URI** button.

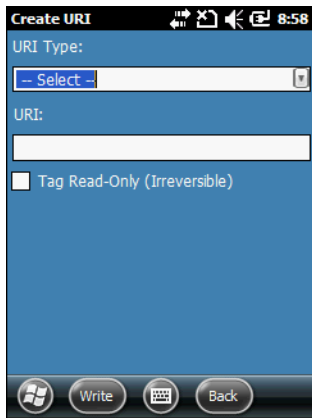


Figure 1-4 Create URI Window

1. Tap **Start** > **NFC Demo** > **Create Tag** > **URI**.
2. From the **URI Type** drop-down list, select the URI type.
3. In the **URI** text box, enter the web address or other address.
4. To permanently make the tag read-only, tap the **Tag Read-Only** checkbox. A dialog box appears indicating that the process is irreversible. Tap **OK** to confirm.
5. Tap **Write** to initiate the tag discovery. A progress bar appears.
6. Wait for the MC45 to chime.
7. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
8. The MC45N7 beeps when the data is written to the tag. **Tag written successfully** appears above the progress bar.
9. Tap **Back** to close the **Create URI** window.

Create Smart Poster

✓ **NOTE** All NDEF formatted tag types are supported.

To create Smart Poster record, tap the **Smart Poster** button.

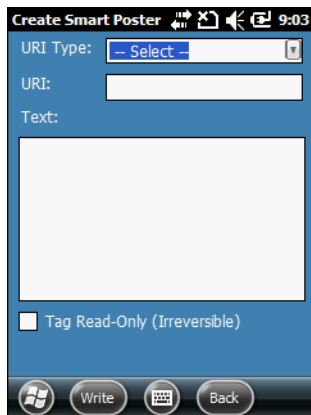


Figure 1-5 Create Smart Poster Window

1. Tap **Start** > **NFC Demo** > **Create Tag** > **Smart Poster**.
2. From the **URI Type** drop-down list, select the URI type.
3. In the **URI** text box, enter the web address or other address.
4. In the **Text** box, enter text to write to the tag.
5. To permanently make the tag read-only, tap the **Tag Read-Only** checkbox. A dialog box appears indicating that the process is irreversible. Tap **OK** to confirm.
6. Tap **Write** to initiate the tag discovery. A progress bar appears.
7. Wait for the MC45 to chime.
8. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
9. The MC45N7 beeps when the data is written to the tag. **Tag written successfully** appears above the progress bar.
10. Tap **Back** to close the **Create Smart Poster** window.

Create Raw Data Exchange

This window allows user to write RAW data to Non-NDEF tags.

- ✓ Supported tag types: Mifare Ultralight, Mifare Classic and Mifare Ultralight C.

To create RAW Data Exchange record, tap the **RAW** button.

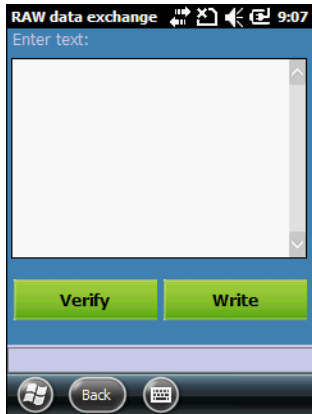


Figure 1-6 Create Raw Data Exchange Window

1. Tap **Start** > **NFC Demo** > **Create Tag** > **RAW**.
2. In the **Text** box, enter the RAW text.
3. Tap **Write** to initiate the tag discovery.
4. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
5. The MC45N7 beeps and **Write Successful** appears in the message area when the data is written successfully to the tag.
6. Tap **Verify** to read the raw data from to the tag to verify that it was written correctly.
7. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
8. The MC45N7 beeps and **Read Successful** appears in the message area when the data is read successfully from the tag.
9. Tap **Back** to close the **Create RAW data exchange** window.

Create Bluetooth Address

- ✓ Supported tag types: All NDEF formatted tag types except Mifare Ultralight.

To create a Bluetooth Address record, tap the **Bluetooth Address** button.

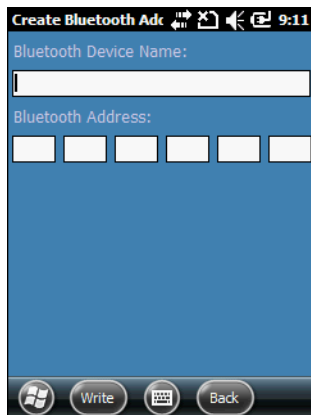


Figure 1-7 Create Raw Data Exchange Window

1. Tap **Start** > **NFC Demo** > **Create Tag** > **Bluetooth**.
2. In the **Bluetooth Device Name** text box, enter a name for the Bluetooth device.
3. In the **Bluetooth Address** boxes, enter the Bluetooth address of the Bluetooth device.
4. Tap **Write** to initiate the tag discovery. A progress bar appears.
5. Wait for the MC45 to chime.
6. Move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
7. The MC45N7 beeps when the data is written to the tag. **Tag written successfully** appears above the progress bar.
8. Tap **Back** to close the **Create Bluetooth Address** window.

Writing to a Card

When the user taps **Write** to write data to a card, a progress bar appears.

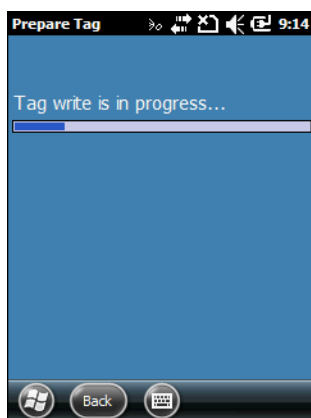


Figure 1-8 Write In Progress

When the data is written successfully to the tag, **Tag Written Successfully** appears.

If the amount of data is larger than the tag storage, **Message Buffer is large** appears.

If writing to the tag fails, **Tag Write is failed** appears.

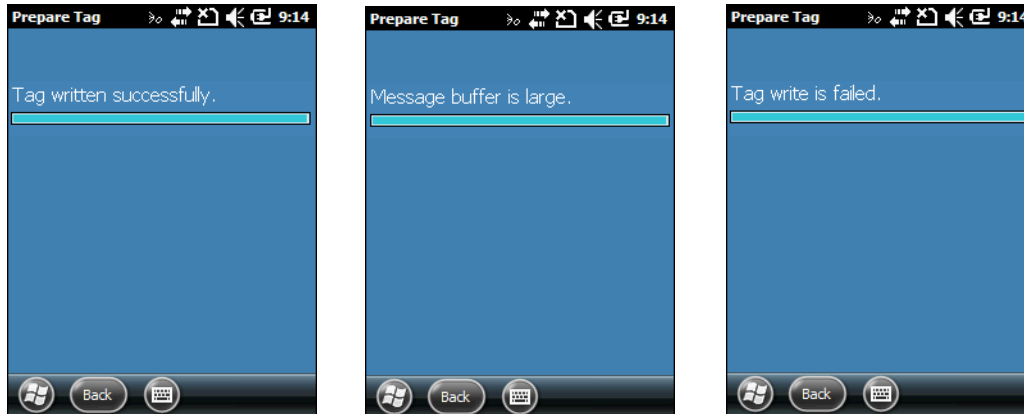


Figure 1-9 Tag Writing Messages

Host Card Emulation

The **Card Emulation** window allows the user to create vCard emulation. When the device enters vCard emulation mode, a different unique identifier (UID) is generated for each new card emulation session. The UID is auto-generated with each new session of card emulation.

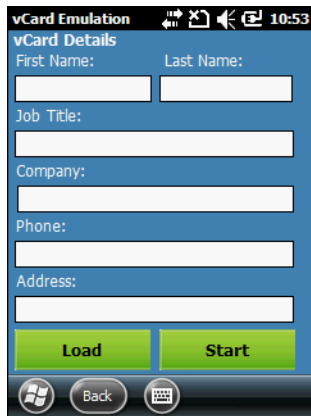


Figure 1-10 vCard Emulation Window

✓ **NOTE** The Demo Application contains a default vCard contact information data. Tap **Load** to populate the default data.

1. Tap **Start** > **NFC Demo** > **Card Emulation**.
2. In the **First Name** text box, enter the first name of the contact.
3. In the **Last Name** text box, enter the last name of the contact.
4. In the **Job Title** text box, enter the job title of the contact.
5. In the **Company** text box, enter the company of the contact.
6. In the **Phone** text box, enter the phone number of the contact.
7. In the **Address** text box, enter the address of the contact.

- ✓ **NOTE** If there is no data entered when the Start Button is clicked, card emulation begins with a blank tag. However, the blank vCard information is not saved as the default vCard file.

8. Tap **Start** to enter vCard Emulation.
9. Present the MC45N7 to an NFC reader to transfer the vCard information.
10. Tap **Stop** when transfer is complete.
11. Tap **Back** to close the **Create vCard emulation** window.

Tools

Use the **Tools** window to configure the application settings and allows formatting and erasing the tag.

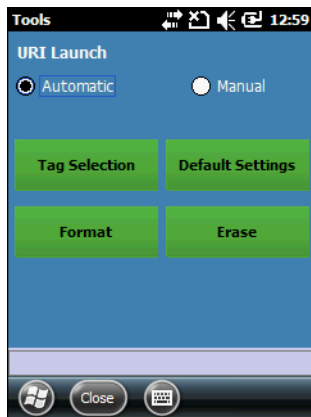


Figure 1-11 Tools Window

URI Launch:

- **Automatic:** the URI is launched automatically after detecting the URI tag.
- **Manual:** the URI content is shown in the tag read windows and URL is launched manually.

Buttons:

- **Tag Selection:** opens the **Tag Selection** window.
- **Default Settings:** Loads the default settings in the settings window.
- **Format:** opens the **Format** window.
- **Erase:** opens the **Erase** window.

Tap the **Close** button to return to the NFC Demo window. Tap **Yes** to save the settings or tap **No** to discard the new settings.

Tag Selection

By default, the Demo application is configured to read two tag type. Use **Tag Selection** window to select the tag type that the Demo application reads.

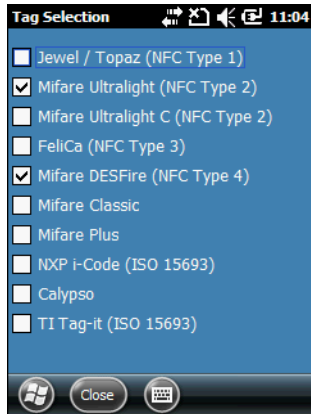


Figure 1-12 Tag Selection Window

Tap the check box next to the tag type and the tap **Close** to return to the **Tools** window.

Format



Supported tag types: non-NDEF formatted Mifare Ultralight and NXP i-Code tags.

Use the **Format** window to format one of these tag types.

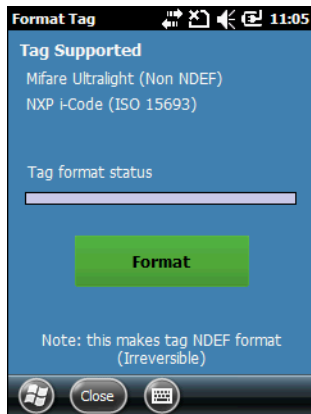


Figure 1-13 Format Window

1. Tap **Format** to format the tag.
2. Wait for the MC45N7 to chime.
3. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
4. The MC45N7 detects the tag and formats the tag. **Tag format success** appears above the progress bar.
5. Tap **Close** to return to the **Tools** window.

Erase

Use the **Erase Tag** window to erase the tag content.

The MC45N7 can erase the data from the following tag types:

- Jewel / Topaz (NFC Type 1)
- Mifare Ultralight (NFC Type 2)
- FeliCa (NFC Type 3)
- MIFARE DESFire (NFC Type 4)
- Mifare Ultralight C (NDEF Formatted)
- Mifare Classic (NDEF Formatted)
- NXP I-Code (ISO 15693).

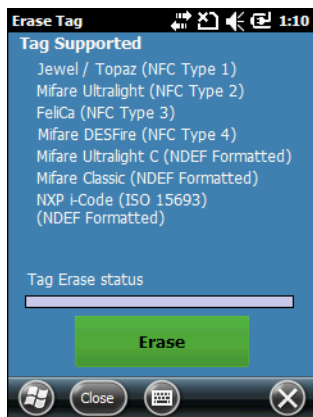


Figure 1-14 Erase Window

1. Tap **Erase** to erase the data on the tag.
2. Wait for the MC45N7 to chime.
3. The move MC45N7 close to the tag. See [Reading and Writing to NFC Tags on page 1-3](#).
4. The MC45N7 beeps when it erases the content on the tag. **Tag Erase success** appears above the progress bar.
5. Tap **Close** to return to the **Tools** window.

Appendix A Technical Specifications

MC45N7 Technical Specifications

The following tables summarize the MC45N7 intended operating environment and technical hardware specifications.

Table A-1 MC45N7 Technical Specifications

Item	Description
Physical Characteristics	
Dimensions	Length: 14.2 cm (5.6 in.) Width: 6.6 cm (2.6 in.) Depth: 2.5 cm (1.0 in.)
Weight	245 g (8.64 oz)
Display	16 bit color 3.2" QVGA with backlight, TFT-LCD, 65K colors, 240 W x 320 L (QVGA size)
Touch Panel	Polycarbonate analog resistive touch
Backlight	LED backlight
Battery	Rechargeable Lithium Ion 3.7V, 3080 mAh battery
Expansion Slot	User accessible microSD slot with UHS-I SDHC support up to 32GB
Network Connections	USB 2.0 High Speed (host and client), WWAN and Bluetooth
Notification	Vibrator and audible tone plus multi-color LED
Keypad Options	Numeric
Audio	VoWWAN: handset mode with active noise reduction, speaker phone mode, Bluetooth wireless headset mode
Performance Characteristics	
CPU	600 MHz, ARM 11 processor, MSM 7627

Table A-1 MC45N7 Technical Specifications (Continued)

Item	Description
Operating System	Microsoft® Windows Embedded Handheld™ 6.5.3 Professional Edition
Memory	512 MB RAM / 1GB Flash
Interface/Communications	USB 2.0
Output Power	USB: 5 VDC @ 300mA max.
User Environment	
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing
Drop Specification	Multiple 1.8 m (6 ft.) drop per MIL-STD 810G
Tumble	250, 0.5 m (1.5 ft.) tumbles with standard batteries installed; per applicable IEC tumble specifications
Electrostatic Discharge (ESD)	+/-15kVdc air discharge, +/-8kVdc direct discharge, +/-8kVdc indirect discharge
Sealing	IP64 per applicable IEC sealing specifications
Vibration	.04g2/Hz Random, Non-Operating, 1 hour duration per axis
Thermal Shock	-40°C to 70°C rapid transition
Wireless WAN Data and Voice Communications	
Radio	GSM and UMTS/HSDPA
Frequency Band	GSM – Quad Band: 850 / 900 / 1800 / 1900 MHz UMTS/HSDPA – MC45N7: 2100 MHz
GPS	Integrated, Autonomous and Assisted-GPS (A-GPS)
Wireless PAN Data and Voice Communications	
Bluetooth	Class II, V2.0 with EDR
NFC	PN504 NFC chip
Data Capture Specifications	
Options	Color camera
Camera Specifications	
Resolution	3.2 Mega pixel with auto focus and flash. Capable of enterprise-class decode of 1D/2D bar codes.

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