APPENDIX C FTP FIRMWARE UPGRADE

Introduction

This appendix provides reader firmware update information on using the web-based **Administrator Console**. The following methods are available to update the firmware on the FX7500 reader.

- Update using a USB drive.
- File-based update that allows uploading the firmware files from the PC (or a network location) to the reader and running the update.
- FTP / FTPS / SCP server-based update.

Use this procedure to update the following software components:

- uboot
- OS
- Reader Server Application (includes Radio API and Radio firmware)

Prerequisites

The following items are required to perform the update:

- · Reader with power supply or POE connection
- · Laptop (or other host computer)
- An Ethernet cable
- An FTP server
- · Current firmware file examples:
 - OSUpdate.elf
 - response.txt
 - u-boot_X.X.X.X.bin (uBoot, X.X.X.X is a filename version)
 - ulmage_ X.X.X.X (OS, X.X.X.X is a filename variable)

- rootfs_X.X.X.X.jffs2 (Root FileSystem, X.X.X.X is a filename variable)
- platform_X.X.X.X.tar.gz (Platform partition, X.X.X.X is a filename variable)

Refer to the release notes to determine which files were updated; not all of the files are updated in every release.

Failsafe Update

FX7500 provides true failsafe firmware update. Each partition (such as OS and platform) has an active and backup partition.

The firmware update process always writes the new images to the backup partition. This ensures that any power or network outages in the middle of firmware update does not prevent the reader from being operational. In the case of a firmware update failure, the power LED on the reader lights red.

Update Phases

The firmware update takes place in three phases:

- Phase 1 The reader application retrieves the response.txt and OSUpdate.elf files from the ftp server.
- Phase 2 The reader application shuts down and the OSUpdate starts. The files referenced in the response.txt file are retrieved from the FTP server and written to flash.
- Phase 3 The reader resets after all partitions update successfully. It may also update the RFID firmware if it detects a different version in the platform partition.

A typical entry in the Response.txt is:

;platform partition

-t5 -fplatform_1.1.15.0.tar.gz -s8004561 -u8130879

 \checkmark

NOTE The Application Server, Radio API, and Radio firmware code all reside in the **Platform** partition.

The **-t** parameter is the file type, **-f** is the name of the file, and **-s** the size. Ensure the file size is correct. ";" comments out the rest of the line.

Updating FX7500 Reader Software

Verifying Firmware Version

To verify that the FX7500 reader firmware is outdated:

1. Log into the reader. In the User Login window, enter admin in the User Name: field and enter change in the Password: field.

MOTOROLA		FX7500
	Reader Administration Co	nsole
	User Login	
	User Name: admin	
	Password:	
	Login	
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Figure C-1 User Login Window

2. Select Firmware on the left side panel to verify that the current version of reader software is outdated, e.g., 1.1.43.

> 🔥 мо	TOROLA	````	FX7500
Home Status > Operation Statustics > Configure Reader Read Tags > Communication Date Time IP Sec Change Password GPIO Applications Profiles • Firmware Update Commit/Discard > System Log Diagnostics Shutdown Logout	Current Version: Version Infor Boot Loader OS File System Reader Application LLRP Radio Firmware Radio Firmware Radio Firmware Radio Firmware Radio Firmware Radio Firmware Revert back F Boot Loader OS File System Reader Application Revert Bac	/ersion mation 1.1.11 1.1.23 1.1.42 1.1.42 1.1.45 1.3.17 1.3.14 Firmware 1.1.11 1.1.23 1.1.42 1.1.42 1.1.42 1.1.43 Solutions Inc. All Rights Reserved	 Firmware Version The Firmware page shows the current software and firmware versions and provides a facility to upgrade the software. Current version indicates the versions of the binaries that are currently running in the reader and 'last known version' indicates versions of binary images stored in the backup partition. Pressing revert back shall switch the reader to use the firmware binary images which are stored in the backup partition. The version section of the page currently has the following fields: Boot loader - The current version of the system bool loader. Os - The current version of the Operating System build. File System - The current version of the file system build. Reader Application - The current version of the Radio Firmware. LLRP - The current version of the Radio Firmware. Radio Firmware. Radio Firmware. Reverthack The Revertback option is provided to revert back the reader to last known firmware version Up on pressing this button, reader will revertback the

Figure C-2 Firmware Version Window

Updating Methods

Download the reader update files from http://www.motorolasolutions.com/support, then use one of three methods to update the reader software to a later version, e.g., 1.1.45.0 or higher:

- Update Using a USB Drive (Recommended)
- File-Based Update on page C-6
- FTP-Based Update on page C-8

Update Using a USB Drive (Recommended)

1. Copy all reader update files into the root folder of the USB drive.



Figure C-3 USB Drive Root Folder

2. Insert the USB drive into the USB host port of the FX7500 RFID reader.



New Pic with USB Host Port to Come

Figure C-4 USB Host Port Window

The reader starts the update process in 5-7 seconds, and indicates progress as follows:

- The reader continuously blinks the Power LED red.
- The reader blinks all 4 LEDs orange once.
- The reader Power LED remains steady orange.
- The reader Power LED settles to a steady green to indicate that the update is complete.



New Pic with LED Labels to Come

Figure C-5 Reader LEDs

File-Based Update

1. Copy all reader update files into any folder on a host computer.



Figure C-6 Host Computer Folder

2. Log into the reader and navigate to the Firmware Update page.

💛 мот	TOROLA	FX7500 🚛
Home	Firmware Update	Firmware Update
▶ Operation Statistics	Install New Software Via: (*) FTP/FTPS Server (*) File based Upload	Motorola RFID reader supports three different methods of updating the firmware.
Configure Reader Reade	FTP/FTPS/SCP Server Name or IP Address: User Name: Password: Update All Partitions: Start Update NOTE: Clicking on "Start Update" shuts down the reader application while the new files are uploaded in the background. The firmware update process could take up to 15 minutes.	 FTP/FTPS/SCP Server - This tells the reader where to get the Current Updates for the Reader software and the response file containing the names of the partitions themsetves. Note: the IP address (not domain name) must be used in this link, beginning with ftp/i (or ftps://or scp.//). User Name User Name must be provided for appropriate access to the FTP/FTPS/SCP server. User Password The password for the passvord for the above FTP/FTPS/SCP User Name. After the "Start Update" button is
Commit/Discard System Log Diagnostics Shutdown	PLEASE ENSURE THAT THE READER IS NOT POWERED OFF OR REBOOTED UNTIL GREEN LED IS ON CONTINUOUSLY!	unkee, the reader will rect all required files to start imware update. The firmware update process is then started, the files mentioned in the Response to file are downloaded, validated, and then programmed into flash. The

Figure C-7 Firmware Update Window

3. Select File based Upload.

4. Click on Browse and navigate to the folder that contains the firmware update files.

🍰 Open	X
Look In:	1.1.45.0
response.	txt
File Name:	response tit
Files of <u>Type</u> :	text files (.txt)
	Open Cancel
	Open selected file

Figure C-8 Browsing Update Files

- 5. Select response.txt and click Open.
- 6. Click Start Update. The reader starts the update process and displays the update status as follows:
 - The reader continuously blinks the Power LED red.
 - The reader blinks all 4 LEDs orange once.
 - The reader Power LED remains steady orange.
 - The reader Power LED settles to a steady green to indicate that the update is complete.



Figure C-9 Reader LEDs

When the update completes, the reader reboots and returns to the FX7500 login screen.

FTP-Based Update

Copy all the update files into an appropriate FTP location.

1. Log into the reader and navigate to the Firmware Update page.

> 🔥 мот		=X7500
Home	Firmware Update	Firmware Update
Status ▶ Operation Statistics ▶ Configure	Install New Software Via: FTP/FTPS Server File based Upload	Motorola RFID reader supports three different methods of updating the firmware. FTP / FTPS / SCP Server Based.
Reader Read Tags Communication	FTP/FTPS/SCP Server Name or IP Address:	. FTP/FTPS/SCP Server - This tells the reader where to get the Current Updates for the Reader software and the response file containing the names of the
Date Time IP Sec Change	User Name: Password: Update All	mutions to be updated, as well as the partitions themselves. Note: the IP address (not domain name) must be used in this link, beginning with first // for fice // or sen //
Password GPIO Applications	Partitions: Start Update	User Name User Name must be provided for appropriate access to the FTP/FTPS/SCP server. User Password The password
Profiles ▼ Firmware Update	NOTE: Clicking on "Start Update" shuts down the reader application while the new files are uploaded in the background. The firmware update process could take up to 15 minutes.	for the above FTP/FTPS/SCP User Name. After the "Start Update" button is clicked, the reader will fetch all
Commit/Discard ▶ System Log Diagnostics	PLEASE ENSURE THAT THE READER IS NOT POWERED OFF OR REBOOTED UNTIL GREEN LED IS ON CONTINUOUSLY!	required files to start firmware update. The firmware update process is then started; the files mentioned in the Response.tut file
Shutdown		are downloaded, validated, and then programmed into flash. The

Figure C-10 Firmware Update Window

- 2. Select FTP/FTPS Server.
- 3. Enter the FTP location where the files are located.
- 4. Enter the User Name and Password for the FTP server login.
- 5. Click Start Update. The reader starts the update process and displays the update status as follows:
 - The reader continuously blinks the Power LED red.
 - The reader blinks all 4 LEDs orange once.
 - The reader Power LED remains steady orange.
 - The reader Power LED settles to a steady green to indicate that the update is complete.



Figure C-11 Reader LEDs

When the update completes, the reader reboots and returns to the FX7500 login screen.

Verifying Firmware Version

To verify reader update success:

1. Log into the reader. In the User Login window, enter admin in the User Name: field and enter change in the Password: field.

MOTOROLA	`````````````````````````````````````	FX7500	11// O
	Reader Administration Co	onsole	
	User Login		
	User Name: admin		
	Login		
© Copyright 2	2013 Motorola Solutions Inc. All Rights I	Reserved	

Figure C-12 User Login Window

2. Select **Firmware** on the left side panel to verify that the current version of reader software is the new version number, e.g., 1.1.45, which indicates that the update was successful.

мот		`,``	FX7500
Home Status ▶ Operation Statistics ▶ Configure Read Tags ▶ Communication Date Time IP Sec Change Password GPIO Applications Profiles ➡ Firmware Update Commit/Discard ▶ System Log Diagnostics Shutdown Logout	Current Version: Boot Loader OS File System Reader Application LLRP Radio Firmware Radio API Last Known Version: Revert back F Boot Loader OS File System Reader Application Revert Bac	remation 1.1.11 1.1.23 1.1.42 1.1.45 1.1.45 1.3.17 1.3.14 Immware 1.1.11 1.1.23 1.1.42 I.1.43 I.1.45 I.1.45 I.1.4	 Firmware Version The Firmware page shows the current software and firmware versions and provides a facility to upgrade the software. Current version indicates the versions of the binaries that are currently running in the reader and "last known version" indicates versions of binary images stored in the backup partition. Pressing revert back shall switch the reader to use the firmware binary images which are stored in the backup partition. Pressing revert back shall switch the reader to use the firmware binary images which are stored in the backup partition. Pressing revert back shall switch the reader to use the firmware binary images which are stored in the backup partition. Pressing revert back shall switch the reader to use the firmware binary images which are stored in the system boot loader. OS - The current version of the Operating System buid. Reader Application - The current version of the Reader Application of LLRP stack. Radio API - The current version of the RRD Radio Firmware - The current version of the Reader Application of the Reader to last known firmware the reader to last known firmware version. Up on pressing this but this reducting the firmware the the theorem.
	© Copyright 2013 Motorola S	Solutions Inc. All Rights Reserved	

Figure C-13 Firmware Version Window

APPENDIX D STATIC IP CONFIGURATION

Introduction

This appendix describes three methods of setting the static IP address on an FX7500 RFID Reader.

Reader IP Address or Host Name is Known - Set the Static IP Using the Web Console

- 1. Browse the device using the host name, e.g., FX7500CD3B1E.
- 2. Log onto the device.

MOTOROLA	> , > , >	FX7500
	Reader Administration Co	onsole
	User Login	
	User Name: admin	
	Login	
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Figure D-1 Reader Administration Console Login Window

3. Click Communication.

4. Set Obtain IP Address via DHCP to Off and enter all required information.

> 💛 мот	FOROLA F	X7500
Home	Reader Communication Parameters	Communication Settings
Status ▶ Operation Statistics	Configure Network Settings	Ethernet
 ♦ Configure Reader Read Tags ▼ Communication 	Ethernet Wi-Fi Bluetooth IPv4 Obtain IPV4 IPv6 Address via Off • DHCP:	IPV4
LLRP SNMP Wireless Services	Current IPV4 address 157 235.88.2 IPV4 Subnet Mask 255 255.0 IPV4 Gateway: 157 235 88.246	off, depending on current state. If DHCP is turned on, actual current values of the reader's IP address, subnet mask, default gateway, and DNS server are displayed on this page. Since these have been obtaiged from the
IP Sec Change Password GPIO	IPV4 DNS 10.176.0.3 Server: 10.176.0.3 MAC 84:24:8D:06:56:FE Address: 84:24:8D:06:56:FE	buce server, they cannot be changed manually. If DHCP is turned off, you can set values for these fields:
Applications Profiles ▶ Firmware Commit/Discard ▼	Set Properties	 IP Address (in dotted notation) at which the reader is assigned. Subnet Mask (in dotted notation) appropriate for the network the reader resides in.

Figure D-2 Reader Communication Parameters Window

- 5. Click Set Properties. You can set a static IP that doesn't belong to this DHCP network.
- 6. Click Commit/Discard, then click the Commit button.

мотор		FX7500
Home Status	Configuration Commit/Discard	Save Changes (or Revert to Backup)
 > Operation Statistics > Configure Reader Read Tags ≡ > Communication 	Commit the Configuration Changes	When you add or make modifications the logical view of your Reader Network using the Motorola RFID reader Administrator Consoles, the changes are not immediately applied your underfying physical Reader and network connections
Date Time IP Sec Change Password GPIO	Discard Reset reader to factory defaults	You must click the Commit button on the Commit/Revert page to save the changes to the Motorola RFID reader configuration file, and to update the running physical Reader Network.
Applications Profiles ▼ Firmware Update	Factory Reset	While a successful update may take u to a minute to complete, your system will continue to operate with only a bri one- or two-second period pause.
Commit/Discar 🗸		If you decide NOT to commit the changes to the Server's configuration file that you've made to the Reader

Figure D-3 Commit/Discard Window

7. The message Reader IP Address config has changed. Needs reader reboot to take effect appears. Reset the device and use the reader with the static IP network.

Reader IP is Not Known (DHCP Network Not Available) - Set the Static IP Using the Web Console

- 1. Connect the device and a PC running Windows XP to the same network that doesn't have a DHCP server, or connect the device directly to the PC.
- 2. Ensure both the device and PC Ethernet jack use at least one LED to indicate network connection detect.
- 3. If the PC uses an assigned static IP, update it to use DHCP. The PC obtains an IP that starts with 169.



Figure D-4 Obtain IP Address

4. When possible, ping the host name of the device.



Figure D-5 Ping the Host Name

- 5. Use a browser to connect to the device with the host name, e.g., FX7500CD3B1E, or use the IP address obtained from ping replies (e.g. 169.254.62.74).
- 6. Log onto the device.
- 7. Click Communication.

8. Set Obtain IP Address via DHCP to Off and enter all required information.

F	X7500
Reader Communication Parameters	Communication Settings
Configure Network Settings	Ethernet
Ethernet Wi-Fi Bluetooth	IPV4
IPv4 Obtain IPV4 Address via Off ▼ DHCP:	The reader supports both automatic TCP/IP configuration via DHCP, and manual configuration. The first button turns DHCP on or
Current IPV4 address 157.235.88.2 IPV4 Subnet 255.255.255.0	off, depending on current state. If DHCP is turned on, actual current values of
Mask: IPV4 Gateway: 157.235.88.246 IPV4 DNS 10.72.0.0	the reader's IP address, subnet mask, default gateway, and DNS server are displayed on this page. Since these have been obtained from the DHCP server they cannot be changed
Server: 10.176.0.3 MAC 84:24:8D:06:56:FE Address: 84:24:8D:06:56:FE	manually. If DHCP is turned off, you can set values for
Set	these fields: IP Address (in dotted notation) at which the reader is assigned
Properties	Subnet Mask (in dotted notation) appropriate for the network the reader resides in.
	Reader Communication Parameters Configure Network Settings Ethernet Wr-Fi Bluetooth Obtain IPV4 PV6 Obtain IPV4 Current IPV4 Off • DHCP: Otf • Current IPV4 157 235 88 .2 IPV4 Subnet 255 255 255 .0 Mask: IPV4 Gateway: IPV4 DNS 10.176 .0.3 MAC 84:24:8D.06:56:FE Address: Set Properties Set

Figure D-6 Reader Communication Parameters Window

- 9. Click Set Properties.
- 10. Click Commit/Discard, then click the Commit button.

	* * /	O services
Home Status	Configuration Commit/Discard	Save Changes (or Revert to Backup)
 > Operation Statistics > Configure Reader Read Tags > Communicatio Date Time IP Sec Change Password GPIO Applications > Profiles > Firmware Update 	Commit the Configuration Changes Commit Discard the Configuration Changes Discard Reset reader to factory defaults Factory Reset	 When you add or make modifications in the logical view of your Reader Network using the Motorola RFID reader Administrator Consoles, the changes are not immediately applied the your underlying physical Reader and network connections. You must click the Commit button on the Commit/Revert page to save the changes to the Motorola RFID reader configuration file, and to update the running physical Reader Network. While a successful update may take u to a minute to complete, your system will continue to operate with only a brid one- or two-second period pause.

Figure D-7 Commit/Discard Window

11. The message Reader IP Address config has changed. Needs reader reboot to take effect appears. Reset the device and use the reader with the static IP network.

APPENDIX E RF AIR LINK CONFIGURATION

Introduction

This appendix lists the different air link configurations supported. The air link configuration is available through LLRP and RFID3 API interfaces.

Radio Modes

The supported modes are exposed as a list of individual UHFC1G2RfModeTableEntry parameters in regulatory capabilities as shown in *Table E-1* and *Table E-2*. The Mode Index column refers to the index used to walk the C1G2UHFRFModeTable. Refer to the EPCglobal *Low Level Reader Protocol (LLRP) Standard*.

RF Mode Index	Divide Ratio	BDR Value	M Value M2=2, FM0=1, M4=4, M8=8	FLM Value	PIE Value	Min Tari	Max Tari	Step Tari	Spectral Mask Indicator	EPC HAG T&C Conform- ance
1	64/3	640000	1	PR_ASK	1500	6250	6250	0	Single	false
2	64/3	640000	1	PR_ASK	2000	6250	6250	0	Single	false
3	64/3	120000	2	PR_ASK	1500	25000	25000	0	Single	false
4	64/3	120000	2	PR_ASK	1500	12500	23000	2100	Single	false
5	64/3	120000	2	PR_ASK	2000	25000	25000	0	Single	false
6	64/3	120000	2	PR_ASK	2000	12500	23000	2100	Single	false
7	64/3	128000	2	PR_ASK	1500	25000	25000	0	Single	false
8	64/3	128000	2	PR_ASK	1500	12500	23000	2100	Single	false
9	64/3	128000	2	PR_ASK	2000	25000	25000	0	Single	false

 Table E-1
 Radio Modes for FCC Readers

*RF Mode 13 is the default air link profile. **RF Mode 23 is the automac air link profile.

RF Mode Index	Divide Ratio	BDR Value	M Value M2=2, FM0=1, M4=4, M8=8	FLM Value	PIE Value	Min Tari	Max Tari	Step Tari	Spectral Mask Indicator	EPC HAG T&C Conform- ance
10	64/3	128000	2	PR_ASK	2000	12500	23000	2100	Single	false
11	64/3	160000	2	PR_ASK	1500	12500	18800	2100	Single	false
12	64/3	160000	2	PR_ASK	2000	12500	18800	2100	Single	false
*13	64/3	60000	4	PR_ASK	1500	25000	25000	0	Dense	false
14	64/3	60000	4	PR_ASK	1500	12500	23000	2100	Dense	false
15	64/3	60000	4	PR_ASK	2000	25000	25000	0	Dense	false
16	64/3	60000	4	PR_ASK	2000	12500	23000	2100	Dense	false
17	64/3	64000	4	PR_ASK	1500	25000	25000	0	Dense	false
18	64/3	64000	4	PR_ASK	1500	12500	23000	2100	Dense	false
19	64/3	64000	4	PR_ASK	2000	25000	25000	0	Dense	false
20	64/3	64000	4	PR_ASK	2000	12500	23000	2100	Dense	false
21	64/3	80000	4	PR_ASK	1500	12500	18800	2100	Dense	false
22	64/3	80000	4	PR_ASK	2000	12500	18800	2100	Dense	false
**23	64/3	variable	variable	PR_ASK	variable	6250	25000	variable	variable	false
24	64/3	320000	1	PR_ASK	1500	12500	18800	2100	Single	false
25	64/3	320000	1	PR_ASK	2000	12500	18800	2100	Single	false
26	64/3	30000	8	PR_ASK	1500	25000	25000	0	Dense	false
27	64/3	30000	8	PR_ASK	1500	12500	23000	2100	Dense	false
28	64/3	30000	8	PR_ASK	2000	25000	25000	0	Dense	false
29	64/3	30000	8	PR_ASK	2000	12500	23000	2100	Dense	false
30	64/3	32000	8	PR_ASK	1500	25000	25000	0	Dense	false
31	64/3	32000	8	PR_ASK	1500	12500	23000	2100	Dense	false
32	64/3	32000	8	PR_ASK	2000	25000	25000	0	Dense	false
33	64/3	32000	8	PR_ASK	2000	12500	23000	2100	Dense	false
34	64/3	40000	8	PR_ASK	1500	12500	18800	2100	Dense	false
35	64/3	40000	8	PR_ASK	2000	12500	18800	2100	Dense	false

 Table E-1
 Radio Modes for FCC Readers (Continued)

*RF Mode 13 is the default air link profile. **RF Mode 23 is the automac air link profile.

										-
RF Mode Index	Divide Ratio	BDR Value	M Value M2=2, FM0=1, M4=4, M8=8	FLM Value	PIE Value	Min Tari	Max Tari	Step Tari	Spectral Mask Indicator	EPC HAG T&C Conform- ance
1	64/3	120000	2	PR_ASK	1500	25000	25000	0	Single	false
2	64/3	120000	2	PR_ASK	1500	12500	23000	2100	Single	false
3	64/3	120000	2	PR_ASK	2000	25000	25000	0	Single	false
4	64/3	120000	2	PR_ASK	2000	12500	23000	2100	Single	false
5	64/3	128000	2	PR_ASK	1500	25000	25000	0	Single	false
6	64/3	128000	2	PR_ASK	1500	12500	23000	2100	Single	false
7	64/3	128000	2	PR_ASK	2000	25000	25000	0	Single	false
8	64/3	128000	2	PR_ASK	2000	12500	23000	2100	Single	false
9	64/3	160000	2	PR_ASK	1500	12500	18800	2100	Single	false
10	64/3	160000	2	PR_ASK	2000	12500	18800	2100	Single	false
*11	64/3	60000	4	PR_ASK	1500	25000	25000	0	Dense	false
12	64/3	60000	4	PR_ASK	1500	12500	23000	2100	Dense	false
13	64/3	60000	4	PR_ASK	2000	25000	25000	0	Dense	false
14	64/3	60000	4	PR_ASK	2000	12500	23000	2100	Dense	false
15	64/3	64000	4	PR_ASK	1500	25000	25000	0	Dense	false
16	64/3	64000	4	PR_ASK	1500	12500	23000	2100	Dense	false
17	64/3	64000	4	PR_ASK	2000	25000	25000	0	Dense	false
18	64/3	64000	4	PR_ASK	2000	12500	23000	2100	Dense	false
19	64/3	80000	4	PR_ASK	1500	12500	18800	2100	Dense	false
20	64/3	80000	4	PR_ASK	2000	12500	18800	2100	Dense	false
**21	64/3	variable	variable	PR_ASK	variable	12500	25000	variable	variable	false
22	64/3	320000	1	PR_ASK	1500	12500	18800	2100	Single	false
23	64/3	320000	1	PR_ASK	2000	12500	18800	2100	Single	false
24	64/3	30000	8	PR_ASK	1500	25000	25000	0	Dense	false
25	64/3	30000	8	PR_ASK	1500	12500	23000	2100	Dense	false
26	64/3	30000	8	PR_ASK	2000	25000	25000	0	Dense	false
27	64/3	30000	8	PR_ASK	2000	12500	23000	2100	Dense	false
*DE Mor							1			1

 Table E-2
 Radio Modes for ETSI Readers

*RF Mode 11 is the default air link profile. **RF Mode 21 is the automac air link profile.

RF Mode Index	Divide Ratio	BDR Value	M Value M2=2, FM0=1, M4=4, M8=8	FLM Value	PIE Value	Min Tari	Max Tari	Step Tari	Spectral Mask Indicator	EPC HAG T&C Conform- ance
28	64/3	32000	8	PR_ASK	1500	25000	25000	0	Dense	false
29	64/3	32000	8	PR_ASK	1500	12500	23000	2100	Dense	false
30	64/3	32000	8	PR_ASK	2000	25000	25000	0	Dense	false
31	64/3	32000	8	PR_ASK	2000	12500	23000	2100	Dense	false
32	64/3	40000	8	PR_ASK	1500	12500	18800	2100	Dense	false
33	64/3	40000	8	PR_ASK	2000	12500	18800	2100	Dense	false
*RF Mod	*RF Mode 11 is the default air link profile.									

Table E-2 Radio Modes for ETSI Readers (Continued)

RF Mode 21 is the automac air link profile.

APPENDIX F CONNECTING WI-FI AND BLUETOOTH DONGLES

Introduction

This appendix describes how to connect to a wireless network using a USB Wi-Fi dongle on the FX7500, and how to connect to a peer device over Bluetooth using a USB Bluetooth dongle.

Connecting to a Wireless Network Using a Wi-Fi Dongle

To connect to a wireless network using a USB Wi-Fi dongle on the FX7500:

- 1. Plug the supported wireless dongle into the USB host port on the FX7500. Supported dongles are:
 - · Wi-Fi over USB adapters with Realtek chipset RTL 8187
 - · The following devices were tested:
 - Alfa AWUS036H, visit http://www.alfa.com.tw/in/front/bin/ptlist.phtml?Category=10541
 - CCrane Versa Wifi USB Adapter II, visit http://www.ccrane.com/antennas/wifi-antennas/versa-wifi-usb-adapter-II.aspx



USB Host Port

Figure F-1 USB Host Port Location for Dongle

F - 2 FX7500 RFID Reader Integrator Guide

2. To confirm that the Wi-Fi dongle is detected properly, log in to the reader Administrator Console. On the Home page ensure the USB Port Status displays Device Connected. Hover the mouse pointer over this link to display the WiFi dongle information shown in *Figure F-2*.

💛 мотого				FX7500	
Home		Reader Administ	ration Console	Help	0
Status Operation Statistics Configure Reader	Welcome to the FX Series (2 port) Re-	ader Administration Console.		Check Status Check Statistics	
Read Tags ▶ Communication	Read	er Software Version :	1.1.42	Gen2 Optional Operat NXP Custom Operat Events Statistics	on Statistics
Date Time IP Sec	Read	er Host Name :	FX7500060C17	<u>Other Custom Opera</u> <u>General Reader Configuration</u> Read Point Configur	tion Statistics 1 ation
Change Password	Read	er Network IP Address :	157.235.208.232	Advanced Antenna C Region Configuration	onfiguration 1
Applications	Read	er Serial Number :	13219010500509	Inventory and Read Tags Communication Settings	
Profiles ▶ Firmware	USB F	Port Status :	Device Connected	LLRP SNMP Wireless	
Commit/Discard ▶ System Log	Connected USB Devices Information			Services Date and Time Settings	
Diagnostics Shutdown	Wireless LAN Adapter			Change Password GPIO Settings	
Logout	Model : Vendor :	RTL8187_Wireless_LAN_/ Manufacturer_Realtek_RTL	Adapter 18187_	User Application Deployment Manage Profiles on the reade Firmware Version Information	
	SerialNumber :	Manufacturer_Realitek_RTI	.8187RTL8187_Wireless_LAN_Adapter_000A5224C441	Errmwäre Undate Commitkeven Sistem Loa Sistem Loa Contou Diagnostics Sthul Doon Error Messaose Third Part: Software	ration
157.235.208.232/intropage.html#		© Copyright 2013 Motoro	la Solutions Inc. All Rights Reserved		
×					Proxy: www.gate0.mot.com

Figure F-2 Wi-Fi Dongle Connected

3. Select Communication > Wireless.

Home	Reader Wireless Settings Parameters	Wireless Settings
Status Operation Statistics Configure Reader Read Tags Configure Reader LLRP SMMP Wireless Services Date Time IP Sec Change Password GPIO Applications Profiles	Existing Connection: Connection Status Get Details ESSID: Signal Strength: 0% Status: Failed IP Address: Disconnect	This page supports setting the writeless configuration on the reader. Motors1 grounder statile support for USB WiFi adapters with the Realtek chipsel RTL 1917. The following adapters have been tested by Motorola: + Alfa AWUS039H + CCrane Versa Wifi USB Adapter II • Get Details - Get the details of connected network. The essid, signal strength and connection status are provided. • Disconnect - Disconnect from a connected network. • Scan - Scan the available networks: = SSID shall be listed in the drop down menu upon pressing the button. If the ESSID is hidden(not broadcasted), then the same can be hepd in the tot box provided • Passkey - Pre shared key for the VPSWPA2 network. • Connect automatically - Pressi Interviox setting across tebods and automatically retain association with configured AP • Note: The scan function may take several seconds. All buttons in the pr schall be disabled while scan is in progress and enabled back once scan completed.
+ Firmware Commil/Decard - System Log Diagnostics Shutdown Logout	Connect to wireless Network: Connect to wireless network © Enter ESSID © Scan and Choose network ESSID: Passkey: Connect Automatically: Connect	

Figure F-3 Wireless Settings

The WiFi dongle can connect to the wireless network in one of two ways:

- Manually entering the ESSID (if known).
- Scanning the current list of APs and choosing the correct one to connect to.

4. Once the APs are scanned, enter the appropriate passkey and enable **Connect Automatically** (if required to connect to the AP automatically if the connection is lost).

> ᄊ мотово		FX7500 💭
Home Status > Operation Statistics > Configure Reader Read Tags - Communication LLRP SHIP Wireless Services Date Time IP Sec Change Password GPIO Applications Profiles > Immare	Existing Connection: Connection Status Get Details ESSID: Signal Strength: 0% Status: Failed IP Address: Disconnect	 Wireless Settings This page supports setting the wireless configuration on the reader Notorola rootes and the support for USB Wirel daghters with the Realack cripped RTL and the other and the USB daghters. The tollowing adapters have been tested by Motorola: - Afa AWUS036H - Corane Versa Wir USB daghters Description connected in tables are produced. Description connected in the builts of the Cost in Modernic of the day of the built on the Cost in Modernic of the other with the same can be typed in the test box provided. Desased-root the VENWAPC Activation. Desased-root table of the VENWAPC Activation. Desased-root tables. Desased-table of the VENWAPC Activation. Desased-table of the VENWAPC Act
▶ System Log Diagnostics Shutdown Logout	Connect to wireless network Center ESSID Connect Owneet of the second o	
×	© Copyright 2013 Motorola Solutions Inc. All Rights Reserved	Proxy: www.gate0.mot.com

Figure F-4 Entering Connect Information

5. Select Connect. When the connection to the AP succeeds, an IP is assigned and appears in the IP Address field.

🔌 мотоко		FX7500 💭
Home Status) Operation Statistics) Configure Reader Read Tags communication LLRP SMIAP Wireless Services Date Time IP Soc Change Password GPIO Applications Profiles > Erriwayae	Reader Wireless Settings Parameters Existing Connection: Connection Status Get Details ESSID: DEV Signal Strength: 0% Status:: Completed IP Address: 157.235.207.24 Disconnect	Wireless Settings Wireless Auftrage The page supports sating the wireless configuration on the reader. Motoxia, start,
CommitDiscard > System Log Diagnostics Skutdown Logout	Connect to wireless network Connect SSID © Scan and Choose network ESSID: DEV (98 %) Passkey: Connect Automatically: Connect	
×	© Copyright 2013 Motorola Solutions Inc. All Rights Reserved	Proxy: www.gate0.mot.com

Figure F-5 Assigned IP Address

The reader is now accessible using the wireless IP shown in the **IP Address** field (157.235.207.24 in this case). The WiFi interface supports dynamic addressing mechanisms for both IPV4 and IPv6. There is no provision to set a static IP address.

For wireless IP address details, select Communication > Wi-Fi tab.

> Motorol		=X7500
Home Status ▶ Operation Statistics ▼ Configure Reader ▶ Read points	Configure Network Settings	Communication Settings ?
Region Read Tags ▶ Communication Dats Time IP Sec Change Password GPIO Applications Profiles ▶ Firmware CommUDiscard ▶ System Log Diagnostics Shutdown Logout	Current IPV4 address 157 235 207 24 IPV4 Subnet Mask: 255 255 25 0 IPV4 Gateway: 157 235 208 246 IPV4 ONIS Server: 157 235 208 246 IPV4 DNIS Server: 157 235 187.3 MAC Address: 00:0A:52 24:C4:41 Bet Properties	IPV4 The reader supports only DHCP based configuration for WIFI. The current values of the reader's IP address, subnet mask, default gateway, and DNS server are displayed on this page. Since these have been obtained from the DHCP server, they cannot be changed manually.
	© Copyright 2013 Motorola Solutions Inc. All Rights Reserved	· · · · · · · · · · · · · · · · · · ·
×		Proxy: www.gate0.mot.com

Figure F-6 Wi-Fi Tab - IPV4

The reader can also be accessed via Wi-Fi using an IPV6 address if supported by the network to which the API is connected.

MOTOROLA		FX7500
Home	Reader Communication Parameters	Communication Settings
status I operation Statistics I configure Reader Read Tags - Communication LLRP SMMP Wireless Services Date Time IP Sec Change Password GPIO Applications Profiles I Firmware Commit/Discard I System Log Diagnostics Shutdown Logout	Configure Network Settings	<section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><list-item><list-item><list-item></list-item></list-item></list-item></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header>
Ľ≚	© Copyright 2013 Motorola Solutions Inc. All Rights Reserved	Y

Figure F-7 Wi-Fi Tab - IPV6

Connecting to a Peer Device over Bluetooth Using a Bluetooth Dongle

To connect to a peer device over Bluetooth using a USB Bluetooth dongle on the FX7500:

- 1. Plug the supported Bluetooth dongle into the USB host port on the FX7500. The following Bluetooth dongles are supported on the FX7500:
 - Asus Mini Bluetooth Dongle USB-BT211.
 - MediaLink Bluetooth Dongle MUA-BA3.



Figure F-8 USB Host Port Location for Dongle

 To confirm that the Bluetooth dongle is detected properly, log in to the reader Administrator Console. On the Home page ensure the USB Port Status displays Device Connected. Hover the mouse pointer over this link to display the Bluetooth dongle information.

			FX7500
Home	Reader Administr	ation Console	2 Holp
Status ▶ Operation Statistics ▶ Configure Reader	Welcome to the FX Series (2 port) Reader Administration Console.		Check Status Check Status
Read Tags 	Reader Software Version :	1.1.46	Gen2 Optional Operation Statistics NXP Custom Operation Statistics Events Statistics
	Reader Host Name :	FX7500060C17	Other Custom Operation Statistics General Reader Configuration Read Point Configuration
Wireless	Reader Network IP Address :	157.235.208.232	Advanced Antenna Configuration Region Configuration
Date Time	Reader Serial Number :	13219010500509	Lennicates Inventory and Read Tags Communication Settings
IP Sec Change Password	USB Port Status :	Device Connected	LLRP SNMP Wireless
GPIO Applications	Connected USB Devices Information		Services Date and Time Settings
Profiles ▶ Firmware	Bluetooth Adapter		Change Password GPIO Settings
Commit/Discard ▶ System Log	Model : Vendor :	3002 0cf3	User Application Deployment Manage Profiles on the reader Firmware Version Information
Diagnostics Shutdown	SerialNumber :	0cf3_3002	Firmware Update CommitRevert System Lon
Logout			Sistem Log Configuration Diagnostica Shid Down Error Messakes Third Party Software
157.235.208.232/intropage.html#	© Copyright 2013 Motorol	a Solutions Inc. All Rights Reserved	

Figure F-9 Bluetooth Dongle Connected

3. Select Communication > Bluetooth.

4. Change the Discoverable and Pairable properties to On.

> 🔥 мотоі	ROLA	FX7500
Home	Reader Communication Parameters	Communication Settings
Goration Statistics Configure Reader Read Tags Communication LLRP	Configure Network Settings	Network The reader supports both automatic TCPIIP configuration via DHCP, and manual configuration. The first button turns DHCP on or off, depending on current state.
SNMP Wireless Date Time IP Sec Change Password	Obtan IPV4 Address via DHCP: on Current IPV4 address IPV4 address IPV4 Subnet Mask: IPV4 Gateway: IPV4 DNS Server:	If DHCP is turned on, actual current values of the reader 4 s IP address, subnet mask, default gateway, and DNS server are displayed on this page. Since these have been obtained form the DHCP server, they cannot be changed manually. If DHCP is turned off, you can set values for these fields:
GPIO Applications Profiles Firmware	MAC Address: Discoverable: On ▼ Pairable: On ▼ Use PassKey: ☑	 IP Address (in dotted notation) at which the reader is assigned. Subnet Mask (in dotted notation) appropriate for the network the reader resides in. Default Cateway (in dotted notation) appropriate for the network the reader resides in. DM server (in dotted notation) appropriate for the
System Log Shutdown Logout	PassKey: •••• Set Properties	network the reader resides in. • MAC Address - Specifies the MAC dodress of the reader. • Web Server - This allows configuring the web server in either HTTP (Unsecure) or HTTPs (Secure) mode • Shell - This allows configuring the Shell be either Flent (Unsecure) or SSH (Secure) mode - The shell can also
		 File Server - This allows configuring the File server to either FTP (Unsecure) or FTPS (Secure) mode. The shell can also be set to disabled state. USB Operation Mode. This allows configuring the USB client port on the reader to either "Network" (Virtual Network Adapter) or "Active Sync" mode. The default mode is "Network". Changing the "USB Operation Mode" will restart the LLPP Service on the reader.
		Allow LLRP Connection Override (From USB B): This allows the reader to listen on an alternate port (49152) on the virtual Network (over USB) interface. When an LLPP client is connected over the primary interface (Ethernet and primary LLRP port) it is possible for a different client to override this connection on the alternate interface. (Virtual Network, and alternate prof 49152) if this option is enabled. The reverse overriding of connection from a primary interface over overding
	© Copyright 2013 Motorola Solutions Inc. All Rights Reserved	LLNP client is connected over the primary interface (Ehernet and primary LLNP port) its possible for a different client to override this connection on the alternate interface (virtual Network and alternate port 49152) (this option is enabled. The reverse overriding of connection from a primary interface over existing

Figure F-10 Changing Discoverable and Pairable Properties

- 5. Optionally select **Use Passkey** and enter a passkey to validate the Bluetooth connection. The default passkey for the FX7500 is **0000**.
- 6. Discover the reader from a Bluetooth-enabled device (such as a laptop). Use the host name to identify the reader among the discovered devices (e.g., FX7500060C17).
- After a successful connection, right-click the reader icon (e.g., FX7500060C17) in the list of Bluetooth devices and select Connect using > Ad hoc network. This establishes the network connection for later.



Figure F-11 Connecting to the Reader

8. The IP address assigned to the Bluetooth interface is 192.168.XX.XX. The last 2 octets are the last 2 octets of the Bluetooth MAC address (found in the Properties window on the PC once the Bluetooth connection is established). Also find this in the Communication > Bluetooth page. Both IPV4 and IPV6 based IP address are supported for adhoc Bluetooth connection between the reader and the client.

> 🕺 мотого	LA			FX7500 🚛
Home Status I Operation Statistics I Configure Reader Read Tags - Communication	Ethernet Wi-Fi Bluetcoth	Reader Communica	ation Parameters	Communication Settings Bluetooth The reader supports only automatic IP configuration of Bluetooth interface.
LLRP SMMP Writeless Services Date Time IP Sec Change Password GPIO Applications Profiles Profiles Profiles Firmware Committiblecard Explored Diagnostics Shutdown Logout		Current IPV4 address: IPV4 Subnet Mask: MAC Address: Discoverable: Pairable: Use PassKey: PassKey: DHCP start address: DHCP end address:	192.168.67.21 255.255.00 00:02.72.38.43.15 0n - 0n - 192.168.0.2 192.168.0.3 Set Properties	 If a directory interface contraction the reader then the actual current values of the reader's PV4 address. Subnet mask and IVV6 address and Prefix Length are diplayed on this page in the appropriate tabs. Since these are automatically configured and fixed for a reader. Here cannot be changed manually. If a bluehooth USB dongle is connected to the reader then the following bluehooth properties can be set in this page. Discoverable Vithether the reader will be seen by other bluehooth enabled devices on a discovery. Pairable Vithether any bluehooth enabled device will allowed to pair with reader. Use Passkey This option when enabled mandates the connecting device to supply a predetermined passkey which will be useford and the baseling of the connecting device. Discoverable Vithether the restartion address of the DHCP IP range out of which an IP will be assigned to the connecting device. DixEP and address The red address of the DHCP IP range out of which an IP will be assigned to the connecting devices. DHCP end address options will also determine the IP of the bluetooth interface will be taken from the IP range specified using the DHCP is an address of the reader bluetooth interface will be taken from the IP range specified and the last two octets formed using the reader BD address.
x		© Copyright 2013 Motoro	la Solutions Inc. All Rights Reserved	Direct Connection
^				Description of the second s

Figure F-12 Communication Bluetooth Tab

9. Open the web page or sample application to connect to the Bluetooth IP (192.168.67.21 in *Figure F-12*) and read tags.

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