# **CHAPTER 4 ADMINISTRATOR CONSOLE**

# Introduction



**NOTE** The screens and windows in this chapter may differ from actual screens and windows. The applications described may not be available on (or applicable to) all devices. Procedures are not device-specific and are intended to provide a functional overview.

This chapter describes the FX7500 **Reader Administrator Console** functions and procedures. Access the **Administrator Console** using a web browser from a host computer, and use this to manage and configure the readers. The **Administrator Console** main window and support windows have four areas, each containing unique information about the reader.

- Selection Menu selects the function for the primary information window.
- Primary Information Window provides the primary function information.
- Product Identification Header identifies the product.
- USB Port Status provides details on the USB device connected to the USB host port. Hover the mouse
  pointer over the blue link, available only when a device is detected.
- Help Information Window:
  - · provides detailed information to support the primary information window
  - includes a scroll bar to scroll through information
  - · includes a toggle button to turn on/off the help information window

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Figure 4-1 Reader Administrator Console Main Menu

#### Profiles

Use profiles for multiple reader deployments to save configuration time, as only a few APIs are needed to completely configure a reader. See *Reader Profiles on page 4-37*.

#### **Resetting the Reader**

To reset the reader, press and hold the reset button for not more than 2 seconds. See *Figure 2-4 on page 2-5* for the reset button location. The reader reboots but retains the user ID and password. See *System Start-up/Boot LED Sequence on page 3-11*.



**NOTE** Hard rebooting the reader (disconnecting power) is not recommended as this discards all the tag events and system log information.

# **Connecting to the Reader**



NOTE This section describes procedures in a Windows environment.

To use the Administrator Console to manage the reader, first power up the reader and connect it to an accessible network. See *Powering the Reader on page 3-10* and *Ethernet Connection on page 3-5*. The green power LED indicates that the reader is ready. If the green power LED is not lit, reset the reader. See *Resetting the Reader on page 4-2*.

Connect to the reader in one of two ways:

- 1. Connecting via Host Name on page 4-3
- 2. Connecting via IP Address on page 4-4

There are three ways to assign an IP address to the reader:

- 1. Using DHCP on the network
- 2. Using Zero-Configuration Networking when DHCP Server is Not Available on page 4-5
- 3. Statically assigning an IP

Any method of assigning the IP supports connection using host name or IP address. Alternatively, connect the reader directly to a local computer using zero-configuration networking. See Using Zero-Configuration Networking when DHCP Server is Not Available on page 4-5.

**NOTE** When using zero-configuration networking, the FX7500 reader cannot communicate with computers on different subnets, or with computers that do not use automatic private IP addressing.

#### **Connecting via Host Name**

To connect to the reader using the host name:



**CAUTION** Reader host name is not guaranteed to work at all times. Its recommended use is only in networks where the probability for IP collisions is low, such as a network in which a DNS server is configured to work together with DHCP to register host names. Host name usage is not recommended in a network where there is no strict control to prevent IP collisions, such as informal networks that use IP static configuration without strict control.

- 1. Open a browser. Recommended browsers are IE10 (disabling Compatibility View is recommended), Chrome v29, and FireFox 24.
- Enter the host name provided on the reader label in the browser (e.g., http://fx7500cd3b0d) and press Enter. The Console Login window appears and the reader is ready.

- 3. Proceed to Administrator Console Login on page 4-6 to log in to the reader.
  - **NOTE** Connect the reader to a network that supports host name registration and lookup to ensure the network can access the reader using the host name. For instance, some networks can register host names through DHCP. When first connecting to the reader, it is recommended to keep DHCP enabled in both the PC and the reader, although it is not guaranteed that the host name will work all the time. Use the host name printed on the reader label, or construct it using the reader MAC address on the reader back label. The host name is a string with prefix FX7500, followed by the last three MAC address octets. For example, for a MAC address of 00:15:70:CD:3B:0D, use the prefix FX7500, followed by the last three MAC address octets (CD, 3B, and 0D), for the host name FX7500CD3B0D. Type http://FX7500CD3B0D in the browser address bar to access the reader.

For a network that does not support host name registration and lookup, use the Power Session auto discovery feature to obtain the IP address, and use the IP address connect method.

#### **Auto Discovery**

The FX7500 can automatically belong to a network. The reader implements WS-Discovery conforming to RFID Reader Management Profile (RDMP) specification in ISO 24791-3. RDMP is based on an extension for Device Profile for Web Services (DPWS). The discovery mechanism is limited to subnets and does not work across subnets. The Power Session application supports this feature, and it lists the discovered reader using reader hostnames. Because this feature is based on WS-Discovery, the readers can also be discovered in Windows Vista and Windows 7 computers by clicking on the **Network** icon in a file browser.

## **Connecting via IP Address**

To use the IP address to connect to the reader:

- 1. Open a browser. Recommended browsers are IE10 (disabling Compatibility View is recommended), Chrome v29, and FireFox 24.
- 2. Enter the IP address in the browser (e.g., http://157.235.88.99) and press Enter. The Console Login window appears and the reader is ready.
- 3. Proceed to Administrator Console Login on page 4-6 to login to the reader.

### Using Zero-Configuration Networking when DHCP Server is Not Available

If a DHCP server is not available, the FX7500 reader can use zero-configuration networking to automatically provide a unique network IP address. The reader can then use TCP/IP to communicate with other computers also using a zero-configuration networking-generated IP address.



**NOTE** When using zero-configuration networking, the FX7500 reader cannot communicate with computers on different subnets, or that do not use automatic private IP addressing. Automatic private IP addressing is enabled by default.

The zero-configuration networking procedure is recommended when the reader is connected directly to a PC. It reduces the overhead needed to configure the reader to a static IP address.

When zero-configuration networking executes after failing to detect a DHCP server, the reader automatically assigns an IPv4 IP address to the Ethernet interface in the form **169.254.xxx.xxx**. This IP address is predictable because it uses the last 2 bytes of the MAC address, usually represented as HEX values, to complete the IPv4 address. These values are converted to decimal format (e.g., if the MAC address ends with **55:9A**, the IPv4 address assigned by the zero-configuration algorithm is **169.254.85.148**.

Windows-based computers support APIPA [or zero-configuration networking???] by default when DHCP fails. To enable APIPA for a Windows PC, visit http://support.microsoft.com/ and search for APIPA.

#### **Obtaining the IP Address via Command Prompt**

The Administrator Console provides the reader IP address. See *Figure 4-1 on page 4-2*. To obtain the reader IP address without logging into the reader, open a command window and ping the reader host name. See *Connecting via Host Name on page 4-3*.

| 📾 Command Prompt   |       | ×  |
|--|-------|----|
| C:\>ping fx7400cd3b13  |       |    |
| Pinging fx7400cd3b13.Symbol.com [157.235.88.87] with 32 bytes of   | data: |    |
| Reply from 157.235.88.87: bytes=32 time=19ms TTL=121<br>Reply from 157.235.88.87: bytes=32 time=20ms TTL=121<br>Reply from 157.235.88.87: bytes=32 time=20ms TTL=121<br>Reply from 157.235.88.87: bytes=32 time=20ms TTL=121 |       |    |
| Ping statistics for 157.235.88.87:<br>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),<br>Approximate round trip times in milli-seconds:<br>Minimum = 19ms, Maximum = 20ms, Average = 19ms                               |       |    |
| C: \>_   |       | -  |
|  | Þ     | // |

Figure 4-2 IP Ping Window

# **Administrator Console Login**

The reader has a unique first time startup sequence that requires setting a unique user ID and password and as well as the region (regulatory requirement).



**NOTE** The recommended browsers are IE10 (disabling Compatibility View is recommended), Chrome v29, and FireFox 24. These browsers were tested and validated to work properly. Other browsers may or may not work properly.

## First Time / Start-Up Login

When starting the reader for the first time, set a unique user ID and password and set the region of reader operation. Setting the reader to a different region is illegal.

#### Logging In with Default User ID and Password

1. Upon connecting to the reader with a web browser, the User Login window appears.

| MOTOROLA    | <b>&gt;</b> , <b>&gt;</b> , <b>&gt;</b>   | FX7500   |
|-------------|---|----------|
|             | Reader Administration Co                  | onsole   |
|             | User Login                                |          |
|             | User Name: admin -                        |          |
|             | Login                                     |          |
|             |   |          |
|             |   |          |
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Figure 4-3 User Login Window

2. Enter admin in the User Name: field and change in the Password: field and click Login.

For global reader configurations, the **Region Configuration** window appears. For US reader configurations, the **Administrator Console** main window appears.

### **Setting the Region**

For global reader configurations, set the region of operation. Setting the unit to a different region is illegal.

**NOTE** Region configuration is not available for readers configured to operate in the United States region (under FCC rules). In this case, skip this step.

1. In the **Configure Region Settings** window, select the region from the drop-down menu.

| > 🔥 мо                              | TOROLA                            | , <b>`</b> ,`,                          | >               | FX7500   |
|-------------------------------------|-----------------------------------|---|-----------------|--|
| Home                                | Region C                          | onfiguration                            |                 | RF Region  |
| Status<br>▶ Operation<br>Statistics | Configure F                       | Region Settings                         |                 | The <b>RF Region</b> page provides an interface to set<br>the region (country) in which the reader is to be<br>used. Different countries have different regulatory<br>requirements on <u>RF</u> cadition and it is necessary |
| ➡ Configure<br>Reader               | Region of operation:              | European Union 🔻                        |                 | to correctly set the country in which the reader is being used, to assure regulatory compliance.   |
| P Read<br>points<br>Advance¢        | Communication Standard:           | Argentina                               |                 | Because of the differing frequency requirements, there are several versions of the hardware. The   |
| Region<br>Read Tags                 | Selected Channels:                | Brazil<br>Canada                        | .90 867.50      | ist of choices on this page is immed by the<br>software to those selections compatible with the<br>hardware in use. Note that if only one option is  |
| ►<br>Communication                  | Warning - Selecting a Region<br>i | Chile<br>China                          | intry of use is | selected automatically.  |
| Date Time<br>IP Sec                 | Please confirm:                   | Colombia<br>European Union<br>Hong Kong |                 | As with most of these pages, setting selections<br>first affects only the display. Selections must be<br>committed, in this case using the <b>Commit</b>   |
| Change<br>Password                  |                                   | India<br>Korea                          | roperties       | Change button on the Commit / Revert page,<br>before they take effect.<br>• Region of Operation - Allows choosing  |
| GPIO<br>Applications                |                                   | Malaysia<br>Mexico                      |                 | the region for the country of operation.<br>This must be selected from the drop down   |
| Profiles  Firmware                  |                                   | New Zealand<br>Peru                     |                 | list that presents the regions which have<br>given regulatory approval to be used with<br>the current board.<br>• Communication Standard - Allows  |
| 157.235.88.2/region.html#           | © Copyright 2013 Motor            | rola Solutions Inc. Al                  | Rights Reserved |  |

Figure 4-4 Selecting the Region

- 2. Select the Communication Standard if applicable.
- 3. Select Frequency Hopping, if applicable.
- **4.** Select the appropriate channel(s), if applicable.
- 5. Click the I understand check box.
- 6. Click Set Properties to complete the region selection. The Operation Successful window appears.
- 7. Select Commit/Discard from the selection menu.



**NOTE** Most changes to the reader require a commit to save them.

 $<sup>\</sup>checkmark$ 



Figure 4-5 Commit/Discard Window

8. Click **Commit** to apply the changes to the reader configuration file, or **Discard** to discard the new region configuration changes.

When the commit completes, the **Commit Successful** window appears. The region is now set and stored in the reader.

# **Reader Administrator Console**

The Reader Administrator Console main window appears after successfully logging into the reader.

| > мот   | TOROLA   | FX7500   |
|---|--|--|
| Home  | Reader Administration Console                                    | - Help   |
| <ul> <li>Operation</li> <li>Statistics</li> </ul> | Welcome to the FX Series (4 port) Reader Administration Console. | Check Status<br>Check Statistics   |
| ▶ Configure<br>Reader                             | Reader Software Version: 1.1.45                                  | <u>Gen2 Optional Operation</u><br><u>Statistics</u><br><u>NXP Custom Operation</u>   |
| Read Tags Communication                           | Reader Host Name : FX75000656FE                                  | Statistics<br>Events Statistics<br>Other Custom Operation                            |
| Date Time<br>IP Sec                               | Reader Network IP Address 157.235.88.2                           | <u>Statistics</u><br><u>General Reader Configuration</u><br>Read Point Configuration |
| Change Password<br>GPIO                           | Reader Serial Number: 13245010500752                             | Advanced Antenna<br>Configuration<br>Region Configuration                            |
| Applications<br>Profiles<br>▶ Firmware            | USB Port Status : No Device<br>Found                             | Certificates<br>Certificates<br>Inventory and Read Tags<br>Communication Settings    |
| Commit/Discard<br>▶ System Log                    |  | SNMP<br>Wireless<br>Services   |
| Diagnostics<br>Shutdown<br>Logout                 |  | Date and Time Settings<br>IPSec Settings<br>Change Password<br><u>GPIO Settings</u>  |
|   | © Copyright 2013 Motorola Solutions Inc. All Rights Reserved     | User Application Deployment  |

Figure 4-6 Reader Administrator Console Main Window

#### Administrator Console Option Selections

Click an item from the selection menu on the left to select:

- Status see Status on page 4-10
- Operation Statistics see Reader Statistics on page 4-11
  - Gen2 Optional see Reader Gen2 Optional Operation Statistics on page 4-12
  - NXP
  - Events
  - Other Custom see NXP Custom Command Operation Statistics on page 4-13
- Configure Reader see Configure Reader on page 4-16
  - Read Points see Read Points on page 4-17
    - Advanced see Read Points Advanced on page 4-19
  - Region see Configure Region on page 4-20
- Read Tags see Read Tags on page 4-21
- Communication see Communication Settings on page 4-23
  - LLRP see Configure LLRP Settings on page 4-27
  - SNMP see SNMP Settings on page 4-28
  - Wireless see
  - Services see
- Date/Time see System Time Management on page 4-31
- IP Sec see

- Change Password see
- GPIO see
- Applications see
- Profiles see Reader Profiles on page 4-37
- Firmware see Firmware Version/Update on page 4-39
  - Update see Firmware Update on page 4-40
- Commit/Discard see Commit/Discard on page 4-41
- System Log see System Log on page 4-42
  - Configure see
- Diagnostics see
- Shutdown see Shutdown on page 4-45
- Logout click Logout to immediately log out of the Administrator Console.

## Status

Click Status on the selection menu to view the Reader Status window. This window displays information about the reader and read points (antennas).



Figure 4-7 Reader Status Window

The Reader Status window provides consolidated reader status information:

- System Clock: The current system clock value, in the format of [Year] [Month] [Day] [Hour: Minute: Second] [Time Difference with UTC]. Click the link to adjust the reader date and time settings.
- Up Time Displays how long the reader has been running, in the format [Number of Days] [Number of Hours] [Number of Minutes] [Number of Seconds].

- CPU Usage: Displays the CPU usage of the reader application and customer applications (if any), and the operating system CPU usage.
- RAM Usage: Displays the total allocated RAM for the reader application and customer applications (if any), the memory used, and the free memory.
- Flash Usage: Displays the flash memory usage by partition.
- **Refresh Interval** Sets the refresh interval (in seconds) for the window. The status information refreshes every **N** seconds (where **N** is the user configured value for the refresh interval). The minimum refresh interval value is 10 seconds; the maximum allowed is 86,400 seconds.

# **Reader Statistics**

Select **Operation Statistics** to view the **Reader Operation Statistics** window. This window provides options to view the statistics of individual read points or combined statistics for all read points, including the success and failure values of statistics for each read point. The statistic count is cumulative once the reader starts or the **Reset Statistics** button is selected.

| 💛 мо  | 27 | roro                     | LA                      | <b>&gt;</b> ,> ,     | <b>&gt;</b>          | FX75  | 500  | 0   |         |
|---|----|--------------------------|-------------------------|----------------------|----------------------|---|--|---|---------|
| Home  | ì  |                          | Reader G                | Sen2 Operation       | Statistics           | Reade   | r Statistic  | s   | ?       |
| Status<br>▶ Operation<br>Statistics<br>▶ Configure<br>Reader<br>Read Tags |    | Choose Re<br>Operation S | adPoint:<br>Statistics: | Read Point 1 -       |                      | The Read<br>options to<br>read point<br>point optic<br>for all the<br>failure val | er Statistics p<br>view the stati<br>s. The user ca<br>on to view the<br>read points. T<br>ues of followir | age provides<br>stics of individual<br>an choose "All" rea<br>combined statistic<br>he success and<br>g statistics can be | id<br>s |
| Communication   |    |                          | OperationName           | Success (# of Times) | Failure (# of Times) | viewed for  | each read po   | pint.   | or      |
| Date Time   |    |                          | IdentificationCount     | 0                    | 0                    | ofs   | uccessful (and   | failed) tag inventory.  |         |
| IP Sec  |    |                          | ReadCount               | 0                    | 0                    | Rei   | ad count - Shov<br>cessful (and fai  | ws the number of<br>led) tags reads   |         |
| Change  |    |                          | WriteCount              | 0                    | 0                    | • Wri   | te count - Show  | vs the number of  |         |
| Password  |    |                          | LockCount               | 0                    | 0                    | suc<br>• Loc  | cessful (and fai<br>k count - Shov   | led) tags written to.<br>vs the number of   |         |
| GPIO  |    |                          | KillCount               | 0                    | 0                    | suc   | cessful (and fai   | led) lock operation or  |         |
| Profiles<br>Firmware<br>Update  |    |                          |                         | Reset Statistics     |                      | tag<br>● Kill<br>suc<br>tag:<br>● Ch  | s.<br>count - Shows<br>cessful (and fai<br>s.<br>cose Read poi   | the number of<br>led) kill operation on<br>nt - Allows choosing   | а       |
| Commit/Discard<br>▶ System Log<br>Configure                               |    |                          | Refresh li              | nterval (secs): 10   | Change               | spe<br>stat<br>• Re-<br>and<br>Ger  | cific (or "all") re-<br>istics are displa<br>set Statistics -<br>failure counts (<br>12 and Custom         | adpoint whose<br>yed.<br>Resets all the succe<br>including the optional<br>statistics) for all the                        | ss      |
| Shutdown<br>Logout  |    |                          |                         |                      |                      | • Rei<br>the<br>pag   | resh Interval -<br>refresh interval<br>e. The statistics   | Allows the user to so<br>(in seconds) for this<br>a information for the   | et      |

Figure 4-8 Reader Operation Statistics Window

- Choose ReadPoint Select a specific read point or select All from the drop-down list to display the statistics.
- IdentificationCount Displays the number of successful (and failed) tag inventories.
- ReadCount Displays the number of successful (and failed) tag reads.
- WriteCount Displays the number of successful (and failed) tag writes.
- Lockcount Displays the number of successful (and failed) lock operations on tags.
- KillCount Displays the number of successful (and failed) kill operations on tags.
- Reset Statistics Resets all success and failure counts (including the optional Gen2 and Custom statistics) for all read points.

• **Refresh Interval** - Sets the refresh interval (in seconds) for this window. The statistics information for the chosen read point is refreshed every **N** seconds (where **N** is the set refresh interval). The minimum value is 10 seconds and the maximum value allowed is 86,400 seconds. Input a new value and click **Change** to set a new interval.

## **Reader Gen2 Optional Operation Statistics**

Select **Gen2 Optional** to view the **Reader Gen2 Operation Statistics** window. This window provides options to view the statistics of read points for the optional Gen2 operations the reader supports.

| > 🔥 ма   | 0 | TOROI                      | LA                    | <b>&gt;</b> ,> ;       | >>>                    |       | FX7500  | 1117<br>O  |   |
|--|---|----------------------------|-----------------------|------------------------|------------------------|-------|---|--|---|
| Home   | Î |                            | Reader                | Gen2 Operation         | Statistics             |       | Reader Gen2 O   | ptional  | ) |
| Status<br>Operation<br>Statistics<br>Gen2<br>Optional<br>NXP |   | Choose Rea<br>Operation st | dPoint:<br>tatistics: | Read Point 1 V         |                        |       | operation Statis<br>The Reader Gen2 Bloc<br>provides options to view<br>individual read points fo<br>Operations supported to<br>user can choose "All" m   | k Statistics page<br>withe statistics of<br>prithe optional Gen2<br>by the reader. The<br>ead point option to  |   |
| Events   |   |                            | OperationName         | Success (# of Times)   | Failure (# of Times)   |       | view the combined stat  | istics for all the read  |   |
| Other  | Ξ |                            | BlockErase            | 0                      | 0                      | -     | following statistics can  | be viewed for each   |   |
| Configure  |   |                            | BlockWrite            | 0                      | 0                      |       | read point.   |  |   |
| Reader<br>Read Tags<br>▶<br>Communication                    |   |                            | BlockPermalock        | 0<br>Reset Statistics  | 0                      | ]     | <ul> <li>Block Erase cour<br/>of successful (and<br/>operations.</li> <li>Block Write coun<br/>of successful (and</li> </ul>  | nt - Shows the number<br>failed) Block Erase<br>t - Shows the number<br>failed) Block Write  |   |
| Date Time<br>IP Sec<br>Change                                |   |                            | Refresh               | Interval (secs): 10    | Change                 |       | operations.<br>Block Permalock<br>number of succes<br>Permalock operati<br>Choose Read per  | count - Shows the<br>sful (and failed) Block<br>ons.   |   |
| Password<br>GPIO<br>Applications<br>Profiles<br>Firmware     |   |                            |                       |                        |                        |       | <ul> <li>Choose Read po<br/>specific (or "all") re<br/>statistics are displi</li> <li>Reset Statistics -<br/>and failure counts<br/>Gen2 and Custom<br/>read points.</li> <li>Refresh Interval</li> </ul> | Int - Allows choosing a<br>sadpoint whose<br>ayed.<br>Resets all the succes<br>(including the standard<br>statistics) for all the<br>- Allows the user to se |   |
| Commit/Discard   | Ŧ |                            | © Copyright           | 2013 Motorola Solution | s Inc. All Rights Rese | erved | the refresh interval<br>page. The statistic   | (in seconds) for this<br>s information for the   |   |

Figure 4-9 Reader Gen2 Operation Statistics Window

- Choose ReadPoint Select a specific read point from the drop-down list to display the statistics, or select All to view the combined statistics for all read points.
- BlockErase Displays the number of successful (and failed) block erase operations.
- BlockWrite Displays the number of successful (and failed) block write operations.
- BlockPermalock Displays the number of successful (and failed) block permalock operations.
- Reset Statistics Resets all success and failure counts (including the standard Gen2 and custom statistics) for all read points.
- **Refresh Interval** Sets the refresh interval (in seconds) for this window. The statistics information for the chosen read point is refreshed every **N** seconds (where **N** is the set refresh interval). The minimum value is 10 seconds and the maximum value allowed is 86,400 seconds. Input a new value and click **Change** to set a new interval.

#### **NXP Custom Command Operation Statistics**

Select **NXP** to view the **NXP Custom Command Operation Statistics** window. This window provides options to view the statistics of read points for the custom NXP operations the reader supports.

| Home   | Â | N           | IXP Custom           | Command Ope          | ration Statistic     | s Reader Statistics for NXP  |
|--|---|-------------|----------------------|----------------------|----------------------|--|
| Status<br>Operation<br>Statistics<br>Gen2<br>Optional<br>NXP |   | Choose Read | dPoint:<br>atistics: | Read Point 1 -       |                      | Custom Operations<br>The Reader NXP Custom Statistics page<br>provides options to view the statistics of<br>individual read points for the Custom NXF<br>Operations supported by the reader. The<br>user can choose "All" read point option to |
| Events   |   |             | OperationName        | Success (# of Times) | Failure (# of Times) | view the combined statistics for all the real  |
| Other  | Ξ |             | ChangeEAS            | 0                    | 0                    | following statistics can be viewed for each  |
| Configure  |   |             | EASAlarm             | 0                    | 0                    | read point.  |
| Reader   |   |             | SetQuiet             | 0                    | 0                    | Change EAS count - Shows the numb  |
| Read Tags  |   |             | ResetQuiet           | 0                    | 0                    | of successful (and failed) Change EAS<br>operations performed on NXP tags.   |
| )<br>Communication   |   |             | ChangeConfig         | 0                    | 0                    | <ul> <li>EAS Alarm count - Shows the number<br/>successful (and failed) EAS Alarms</li> </ul>  |
| Date Time<br>P Sec<br>Change<br>Password                     |   |             |                      | Reset Statistics     |                      | received from tags<br>• Set Quiet count - Shows the number of<br>successful (and failed) Set Quiet<br>operations performed on NVP tags.<br>• Reset Quiet count - Shows the number  |
| SPIO   |   |             | Refresh              | Interval (secs): 10  | Change               | of successful (and failed) Reset Quiet   |
| pplications  |   |             |                      |                      |                      | Change Config count - Shows the  |
| Profiles   |   |             |                      |                      |                      | number of successful (and failed) Chan<br>Config operations performed on NXP ta  |
| Firmware   |   |             |                      |                      |                      | Choose Read point - Allows choosing  |

Figure 4-10 NXP Custom Command Operation Statistics Window

- Choose ReadPoint Select a specific read point from the drop-down list to display the statistics, or select All to view the combined statistics for all read points.
- ChangeEAS Displays the number of successful (and failed) change EAS operations performed on NXP tags.
- EASAlarm Displays the number of successful (and failed) EAS alarms received from tags.
- SetQuiet Displays the number of successful (and failed) set quiet operations performed on NXP tags.
- ResetQuiet Displays the number of successful (and failed) reset quiet operations performed on NXP tags.
- ChangeConfig Displays the number of successful (and failed) change configuration operations performed on NXP tags.
- **Reset Statistics** Resets all the success and failure counts (including the standard and optional Gen2 operation statistics) for all the read points.
- **Refresh Interval** Sets the refresh interval (in seconds) for this window. The statistics information for the chosen read point is refreshed every **N** seconds (where **N** is the set refresh interval). The minimum value is 10 seconds and the maximum value allowed is 86,400 seconds. Input a new value and click **Change** to set a new interval.

#### **Event Statistics**

Select **Events** to view the **Events Statistics** window. This window provides options to view the statistics of events.

| > 🔥 ма             | 0' | TOROLA            | <b>, &gt;</b> , >               | <b>, &gt;</b>      | F | X7500   | 1117<br>Queene                                    |
|--------------------|----|-------------------|---------------------------------|--------------------|---|---|---|
| Home<br>Status     | Î  |                   | Event Statist                   | lics               |   | Event Statistics  | (?)   |
| ▶ Operation        |    | Event Statistics: |                                 |                    |   | to view the statistics of                                       | ge provides options<br>events.                    |
| Statistics<br>Gen2 |    |                   | EventName                       | Count (# of Times) |   | <ul> <li>Ambient Tempera</li> </ul>                             | ture High Alarm -                                 |
| Optional           |    |                   | AmbientTemperatureHighAlarm     |                    |   | Shows the number  | of events raised for                              |
| NXP                |    |                   | AmbientTemperatureCriticalAlarm |                    |   | <ul> <li>Ambient Temperatu</li> </ul>                           | iture Critical Alarm -                            |
| Events             |    |                   | PATemperatureHighAlarm          |                    |   | Shows the number  | of events raised for                              |
| Other<br>Custom    | Ξ  |                   | PATemperatureCriticalAlarm      |                    |   | PA Temperature I  | High Alarm - Shows the                            |
| ▶ Configure        |    |                   | ForwardPowerHighAlarm           |                    |   | temperature high a  | aised for PA<br>Iarm.                             |
| Reader             |    |                   | ForwardPowerLowAlarm            |                    |   | PATemperatureCi   | riticalAlarm - Shows                              |
| Read Tags          |    |                   | ReversePowerHighAlarm           |                    |   | temperature critica   | l alarm.  |
| Communication      |    |                   | EchoThresholdAlarm              |                    |   | <ul> <li>Forward Power H</li> <li>number of events r</li> </ul> | igh Alarm - Shows the                             |
| Date Time          |    |                   | DatabaseWarning                 |                    |   | high alarm.   | aised for forward power                           |
| IP Sec             |    |                   | DatabaseError                   |                    |   | <ul> <li>Forward Power Le<br/>number of events r</li> </ul>     | ow Alarm - Shows the<br>aised for forward power   |
| Change             |    |                   | GPIInformation                  |                    |   | low alarm.  |   |
| Password           |    |                   |                                 |                    |   | <ul> <li>Reverse Power H<br/>number of events r</li> </ul>      | ligh Alarm - Shows the<br>aised for reverse power |
| GPIO               |    |                   | Reset Statistics                |                    |   | high alarm.   |   |
| Applications       |    |                   |                                 |                    |   | <ul> <li>Echo Threshold A<br/>number of events r</li> </ul>     | Alarm - Shows the<br>raised for echo              |
| Profiles           |    |                   |                                 |                    |   | threshold alarm.  |   |
| ▼ Firmware         |    |                   | Refresh Interval (secs): 10     | Change             |   | <ul> <li>Database Warning<br/>of events raised for</li> </ul>   | g - Shows the number<br>r database warning.       |
| Update             |    |                   |                                 |                    |   | Database Error -  | Shows the number of                               |
| Commit/Discard     | Ŧ  |                   |                                 |                    |   | events raised for d   | atabase error.                                    |

Figure 4-11 Event Statistics Window

- AmbientTemperatureHighAlarm Displays the number of events raised for ambient temperature high alarm.
- AmbientTemperatureCriticalAlarm Displays the number of events raised for ambient temperature critical alarm.
- PATemperatureHighAlarm Displays the number of events raised for PA temperature high alarm.
- PATemperatureCriticalAlarm Displays the number of events raised for PA temperature critical alarm.
- ForwardPowerHighAlarm Displays the number of events raised for forward power high alarm.
- ForwardPowerLowAlarm Displays the number of events raised for forward power low alarm.
- ReversePowerHighAlarm Displays the number of events raised for reverse power high alarm.
- EchoThresholdAlarm Displays the number of events raised for echo threshold alarm.
- DatabaseWarning Displays the number of events raised for database warning.
- DatabaseError Shows the number of events raised for database error.
- GPIInformation Shows the number of events raised for GPI events.
- Reset Statistics Resets all the success and failure counts for all the read points.
- **Refresh Interval** Sets the refresh interval (in seconds) for this window. The statistics information for the chosen read point is refreshed every **N** seconds (where **N** is the set refresh interval). The minimum value is 10 seconds and the maximum value allowed is 86,400 seconds. Input a new value and click **Change** to set a new interval.

### **Other Custom Command Operation Statistics**

Select **Other Custom** to view the **Other Custom Command Operation Statistics** window. This window provides options to view the statistics of read points for the custom operations the reader supports.

| TORO       | LA                     | <b>&gt;</b> ,> ;  | > <b>&gt;</b>  | FX7500  |
|------------|------------------------|---|--|---|
| Ċ          | Other Custom           | Command Ope   | eration Statistics   | Reader Statistics for Other   |
| Choose Rea | adPoint:<br>tatistics: | Read Point 1 •  |  | Custom Operations<br>The Reader Other Custom Statistics page<br>provides options to view the statistics of<br>individual read points for the Custom<br>Operations supported by the reader. The<br>user can choose "All" read point option to  |
|            | OperationName          | Success (# of Times)  | Failure (# of Times)   | view the combined statistics for all the read   |
|            | QTOperation            |   | 0  | following statistics can be viewed for each   |
|            | Refresh                | Reset Statistics  | Change   | OT Operation - Shows the number of<br>successful (and failed) QT operations<br>performed on Monza4 QT tags.     Choose Read point - Allows choosing a<br>specific (or "all") readpoint whose<br>statistics are displayed.     Reset Statistics - Resets all the succes  |
|            |                        |   |  | and failure counts (including the<br>standard optional Gen2 and Custom<br>operation statistics) for all the read points<br>• Refresh Interval - Allows the user to se<br>the refresh interval (in seconds) for this<br>page. The statistics information for the<br>chosen read point is refreshed every 'N'<br>seconds (where N is the user configured<br>value for the refresh interval). The<br>minimum value of the refresh interval). |
|            | Choose Rei             | Choose ReadPoint:<br>Operation statistics:<br>OperationName<br>QTOperation<br>Refresh | Choose ReadPoint:<br>Read Point 1 •<br>Operation statistics:<br>OperationName Success (# of Times)<br>QTOperation<br>Reset Statistics<br>Refresh Interval (secs): 10 | Other Custom Command Operation Statistics         Choose ReadPoint:         @readPoint1 @         Operation statistics:         @operationName Success (# of Times) Failure (# of Times)         @dTOperation         @reset Statistics         Refresh Interval (secs): 10   |

Figure 4-12 NXP Custom Command Operation Statistics Window

- Choose ReadPoint Select a specific read point from the drop-down list to display the statistics, or select All to view the combined statistics for all read points.
- QTOperation Displays the number of successful (and failed) QT operations performed on Monza4 QT tags.
- Reset Statistics Resets all the success and failure counts for all the read points.
- **Refresh Interval** Sets the refresh interval (in seconds) for this window. The statistics information for the chosen read point is refreshed every **N** seconds (where **N** is the set refresh interval). The minimum value is 10 seconds and the maximum value allowed is 86,400 seconds. Input a new value and click **Change** to set a new interval.

## **Configure Reader**

Use the **Configure Reader** submenus to access the following functions.

#### **Reader Parameters (General)**

Select Configure Reader in the selection menu to configure reader settings using this window.

| Operation<br>Statistics | Motorola - FX7500            | 42045040500750               | The reader settings can be configured using this  |
|-------------------------|------------------------------|------------------------------|---|
| Statistics              |                              | 13245010500752               | page.   |
| - Configure<br>Reader   | Co                           | nfigure Reader               | name - Anows seeiing the user configured<br>name of the reader. Accepts alpha<br>numeric characters with a maximum size |
| ▶ Read                  | Nama                         |                              | Description - User specified description     of the reader Accente alpha numeric  |
| Region                  | Name.                        |                              | characters with a maximum size of 32  |
| Read Tags               | Location:                    | FX75000050FE Advanced Reader | <ul> <li>characters.</li> <li>Location - User specified information<br/>reporting the location of the reader</li> </ul> |
| Communication           | Contact:                     | Motorola Inc                 | Accepts alpha numeric characters with a   |
| ate Time                | Operation Status:            | Enabled                      | maximum size of 32 characters.  Contact - Name of the contact who   |
| P Sec                   | Antenna Check:               | Disabled •                   | manages the reader. Accepts alpha   |
| hange<br>assword        | Idle Mode Timeout<br>(secs): | 0                            | numeric characters with a maximum size<br>of 32 characters.<br>• Operation status - Displays the current                |
| PIO                     | Radio Power State:           | On                           | operation status of the reader. Can be  |
| pplications             |                              | Set                          | <ul> <li>Antenna check - Option to control the</li> </ul>   |
| rofiles                 |                              | Properties                   | antenna sensing feature on the reader. If   |
|                         |                              |                              | TABLE DASHED AND THE STANDARD THAT DASH MAL DASH  |
| Firmware                |                              |                              | not attempt to check if any antenna is  |

#### Figure 4-13 Reader Parameters

- Name Sets the user-configured reader name. Accepts up to 32 alphanumeric characters.
- Description Sets a user-configured reader description. Accepts up to 32 alphanumeric characters.
- Location Enter information on the reader location. Accepts up to 32 alphanumeric characters.
- Contact Enter the name of the reader manager contact. Accepts up to 32 alphanumeric characters.
- **GPI Debounce Time** Delays input events up to this time, and delivers these events only if the PIN states remains on the same level.
- Operation Status Displays the current operation status of the reader (Enabled, Disabled, or Unknown).
- Antenna Check Controls the antenna sensing feature on the reader. Disabled indicates that the reader does not attempt to check if an antenna is connected on the ports. When Enabled, the reader monitors the presence of an antenna on the port and only transmits RF if an antenna is connected.
- Idle Mode Timeout (secs) Turns off the radio when the reader is idle for the specified time interval. A value of 0 disables this feature. Enabling this also turns off the antenna check feature when idle mode is entered after time out.
- Radio Power State Displays the current state (On or Off) of the radio. The radio can be turned off if the Idle Mode Timeout is set to a non-zero value and the radio is not performing RF operations for a time period greater than the time specified by this timeout. The radio turns on automatically when RF operation starts.
- Set Properties Click to send the changes to the reader.

These settings only affect the display. Use Commit/Discard on page 4-41 to save the changes.

#### **Read Points**

Click **Read points** in the selection menu to configure the read point settings and view the current read points state.

| 💛 мотоі  | ROLA                                  | FX7500  |
|--|---------------------------------------|---|
| Home   | Reader Parameters                     | Read point  |
| Status<br>▶ Operation<br>Statistics<br>▼ Configure | Antenna Status                        | The read point settings can be configured using<br>this page. The current state of the read points can<br>also be vewed in this page.<br>• Antenna Status - Shows the status of the |
| Reader<br>▶Read<br>points                          | Antenna #: 1 2 3 4<br>Antenna Status: | read points on this reader. I here can be<br>three possible state of a specific read point.<br>Connected - Read point is<br>enabled and an antenna is                               |
| Region<br>Read Tags                                | Refresh Interval (secs):              | connected to the port.<br>(Shown using the green<br>button).<br>Not Connected - Read point<br>is enabled however no   |
| Date Time<br>IP Sec                                | Antenna Configuration                 | antenna is connected to the port. (Shown using the red button).   |
| Change<br>Password                                 | Choose Read Point 1 -                 | User Disabled - Kead point<br>is disabled by the user.<br>(Shown using the yellow   |
| GPIO   | Description:                          | button).  |
| Applications<br>Profiles                           | User Enabled -                        | read point will allow the user to see /<br>change the selected antenna's  |
| <b>▼</b> Firmware                                  | Air Protocol: GEN2                    | configuration.  |
| Update<br>Commit/Discard                           | Cable 0<br>Loss(dB/100 ft):           | <ul> <li>Refresh interval - Allows the user to set<br/>the refresh interval (in seconds) to update<br/>the readpoint status on this page. The</li> </ul>                            |
| ▶ System Log                                       | Cable Length(ft): 0                   | minimum value of the refresh interval is 10<br>seconds while the maximum value allowed<br>is 84400 seconds  |
| Diagnostics  |                                       | <ul> <li>Maintenance mode - Places the reader in<br/>maintenance mode in order to intermittently<br/>drive PWR_ACT and STAT LEDs to enable</li> </ul>                               |
| Logout -   |                                       | easily locating the reader. Also enables<br>quick reporting of Antenna status by setting  |

Figure 4-14 Configure Read Points

#### Antenna Status

- Status buttons indicate the status of the reader read points:
  - Green: Connected Read point is enabled and an antenna is connected to the port.
  - Red: Not connected Read point is enabled, but no antenna is connected to the port.
  - Yellow: User disabled The user disabled the read point.

Click a read point's status button to view and/or change the selected antenna configuration.

- **Refresh Interval** Sets the refresh interval (in seconds) to update the readpoint status. The minimum value is 10 seconds and the maximum value allowed is 86,400 seconds. Input a new value and click **Change** to set a new interval.
- Maintenance mode Places the reader in maintenance mode which intermittently drives PWR, ACT, and STAT LEDs to easily locate the reader. Also enables quick reporting of antenna status by setting the refresh interval to 2 seconds. Note that you can not modify the refresh interval in this mode.

#### **Antenna Configuration**

- Choose Read Point Select a read point to display the configuration.
- Description Enter a read point description of up to 32 alphanumeric characters.
- User Configuration Enable or disable the read point. Disabling a read point blocks RF operation using the port/antenna.
- Air Protocol Displays the air protocols the read point supports. The reader currently supports only EPC Class1 GEN2 air protocol.
- **Cable loss (dB/100 ft)** Specifies the cable loss in terms of dB per 100 feet length for the antenna cable that is used to connect this read point port to the antenna. Refer to the specification of the antenna cable for this information. The default value is **0**. Setting this and the cable length to non-zero values allows the compensating for the RF signal loss in the cable due to attenuation by specifying an appropriate increase in the transmit power for this read point. The reader uses this and the cable length value to internally calculate the cable loss. The calculated cable loss is internally added to the power level configured on the read point.
- Cable length (ft) Sets the cable length in feet of the physical cable that connects the read point port to the antenna.
- Set Properties Select Set Properties to apply the changes. Select Commit/Discard on page 4-41 to save the changes to the reader.

### **Read Points - Advanced**

Click Advanced under Read points in the selection menu to view the Advanced Antenna Configuration window. Use this window to modify the transmission power and frequency configuration elements of the antenna.

**NOTE** This page is not supported when LLRP is configured in secure mode.

| ᄊ мото  |   | FX7500   |
|---|---|--|
| Iome<br>Status<br>Operation<br>Statistics<br>- Configure Reader<br>- Read points<br>- Advanced<br>- Region<br>Region<br>Region<br>Read Tags<br>- Communication<br>Jate Time<br>P Sec<br>- Communication<br>Jate Time<br>P Sec<br>- Pointes<br>- Firmware<br>- Commit/Discard<br>- System Log<br>Diagnostics<br>- Shutdown<br>.ogout | Advanced Antenna Configuration          Antenna Configuration         Select Antenna         Antenna 1         Get Configuration         Transmit Power(dBm)         30.0         Transmit Frequency(MHz)         865.7         Antenna 1         Antenna 2         Intenna 3         Antenna 4         Save Settings Permanently         Apply | <ul> <li>Advanced Antenna Configuration</li> <li>The advanced enterna configuration can be done using this tage The current configuration of an antenna has to be inspected to one or more selected antennas.</li> <li>Of Configuration for a selected antenna to get the current configuration for a selected antenna to get the advanced configuration settings are used.</li> <li>Face Configuration for a selected antenna to get the current configuration age will retain the retrieved settings after login, the page sin or televed a using prover retrest.</li> <li>Transmt Power - Displays the current transmit using for onfiguration the sele anten to due using or owner retrest.</li> <li>Transmt Frequency - Displays the current y advert transmit prover, readpoint whose configuration is selected antenna to a due to any period regulator regions. It hopping is enabled.</li> <li>Save Settings Permanently. The settings for selected antennas. The settings bergings retrody.</li> <li>Apply - Click on this to apply the settings for selected antennas. The settings will be applied to anten selected antennas. The settings will be applied to anten selected antennas. The settings will be applied to anten selected antennas. The settings will be applied to antennas the setting settings are setting affect on the settings are setting affect on the settings will be applied to antennas. The settings will be applied to antennas the selected antennas. The settings will be applied t</li></ul> |

Figure 4-15 Advanced Antenna Configuration

Retrieve the current configuration of an antenna before applying the advanced configuration settings.

- Get Configuration Select an antenna to get the current configuration for that antenna. After login, you must get the antenna configuration for an antenna before settings can be applied. The antenna configuration page retains the retrieved settings after login if you do not refresh the page using browser refresh.
- Transmit Power Displays the current transmit power setting after selecting Get Configuration, and allows changing the transmit power for that antenna. This transmit power level does not include cable loss compensation.
- Transmit Frequency Displays the active frequency configuration on the reader, and allows changing the frequency for non-frequency hopping enabled regulatory regions. If hopping is enabled, the combo box displays the hop table ID.
- Save Settings Permanently Check this to save the settings permanently and persist them across reboots.
- Apply Click to apply the settings for the selected antennas. This applies the selected transmit power and frequency/hop table configuration to all selected antennas. The settings are applied immediately and have immediate effect on Inventory/Access operations. Also check Save Setting Permanently to persist these settings across reboots unless modified by another client.

#### **Configure Region**

Different countries have different RF regulatory requirements. To assure regulatory compliance, select **Region** to set the reader for specific regulatory requirements in the country of reader operation using the **Configure Region Settings** window.



**NOTE** Region configuration is not required for readers configured to operate in the United States region (under FCC rules).

Because of the differing frequency requirements, there are several versions of the hardware. The list of choices on this page is limited by the software to those selections compatible with the hardware in use. Note that if only one option is compatible with the hardware, that option is selected automatically.

|                                     | OLA                         | , <b>`,`,`</b>                          | FX7500  |
|-------------------------------------|-----------------------------|---|---|
| Home                                | Region                      | Configuration                           | RF Region   |
| Status<br>▶ Operation<br>Statistics | Configur                    | e Region Settings                       | The <b>RF Region</b> page provides an interface to set<br>the region (country) in which the reader is to be<br>used. Different countres have different regulatory<br>requirements on RF radiation, and it is necessary<br>to correctly set the country in which the reader is |
| Reader                              | Region of operation:        | European Union 👻                        | being used, to assure regulatory compliance.  |
| P Read<br>points                    | Communication Standard:     | EU 302.208 💌                            | Because of the differing frequency requirements,  |
| Advance                             | Frequency Hopping:          |   | there are several versions of the hardware. The<br>list of choices on this page is limited by the   |
| Region 😑                            |                             | V V V                                   | software to those selections compatible with the  |
| Read Tags                           | Selected Channels:          | 865.70 866.30 866.90 867.50             | hardware in use. Note that if only one option is<br>compatible with the hardware that option is   |
| Communication                       | Warning - Selecting a Regio | on different from the country of use is | selected automatically.   |
| Date Time<br>IP Sec                 | Please confirm:             | I understand                            | As with most of these pages, setting selections first affects only the display. Selections must be committed, in this case using the <b>Commit</b>  |
| Change<br>Password                  |                             |   | Change button on the Commit / Revert page,<br>before they take effect.  |
| GPIO                                |                             | Flopenies                               | Region of Operation - Allows choosing   |
| Applications                        |                             |   | the region for the country of operation.<br>This must be selected from th <u>e drop down</u>  |
| Profiles                            |                             |   | list that presents the regions which have   |
| ▶ Firmware                          |                             |   | the current board.  |
| Commit/Discard                      |                             |   | Communication Standard - Allows     shooping the communication standard   |
| ▶ System Log                        |                             |   | from the list of standards supported by the   |
| Diagnostics                         |                             |   | chosen region. If a region supports only<br>one standard the same is chosen   |

Figure 4-16 Configure Region Settings Window

- **Region of Operation** Select the region for the country of operation from the drop-down list. This list includes regions which have regulatory approval to use with the current board.
- **Communication Standard** Select the communication standard from the list of standards that the chosen region supports. If a region supports only one standard, it is automatically selected.
- Frequency Hopping Check to select frequency hopping. This option appears only if the chosen region of
  operation supports this.
- Selected Channels Select a subset of channels on which to operate (from the list of supported channels). This option appears only if the chosen region of operation supports this.
- Please confirm Check the I understand check box to confirm your understanding that the choices are in compliance with local regulatory requirements.
- Set Properties Click to apply the changes. Select Commit/Discard on page 4-41 to save the changes to the reader.

# **Read Tags**

Select **Read Tags** to view the **Reader Operation** window. Use this window to perform inventory on the connected antennas and view the list of inventoried tags.



**NOTE** Enable Java JRE support on the browser in order for this window to function properly.



**NOTE** This page is not supported when LLRP is configured in secure mode.

| ome   | Reader Operation  | Read Tags   |
|---|---|---|
| atus peration<br>atistics<br>configure Reader<br>ad Tags<br>communication<br>tet Time<br>Sec<br>ange Password<br>plo<br>colles<br>firmware<br>mmit/biscard<br>System Log<br>agnostics<br>utdown<br>gout | Inventory Tags           Start Inventory         StopInventory         Clear Tag List         Auto Config           Total Unique Tags         8           EPC Id         TagSeen Count         RSSI         Antenna Id         FirstSeen         LastSeen           b227b22b22b22b2         269         -38         1         1381225409642         1381225492512           a27b322b22b22b2         268         -38         1         1381225409542         1381225425125           100df00d00d000_2         267         -42         1         1381225409542         13812254252175           111122223334         268         -38         1         1381225409565         1381225425175           Lidddead11223         268         -33         1         1381225409566         1381225425175           Lidddead11223         268         -37         1         1381225409566         1381225425175           e2009000260c0_         268         -46         1         1381225409569         1381225452175 | <ul> <li>This page facilitates the user to perform inventory on the connected antennas and view the list of fags that are inventored.</li> <li>Since the read tags page uses applet to connect to the reader. Will support must be enabled on the browser for page to function properly.</li> <li>Start Inventory - Click this button to start inventory operation on the connected antennas. If the there no connected antennas in the support of the start and the support of the start inventory operation on the set disabled, then ReadTags page will show that inventor has started successfully to no tags will be displayed.</li> <li>Stop Inventory - Click this button to stop the ongo inventory operation.</li> <li>Clear Tag List - Check this button to set the reader riag list.</li> <li>Auto Config - Check this button to set the reader will see the environment and will adjust the F characteristics to be optimized as per the environment.</li> <li>Note: Start Inventory will fail if there is already a connected LLRP clearts to the communication - LLRP case a</li> </ul> |
|   |   |   |

Figure 4-17 Read Tags Window

- Start Inventory Click to starts inventory operation on the connected antennas. If the there are no
  connected antennas, no tags in the field of view, or all the antennas are user-disabled, the Read Tags
  window indicates that inventory successfully started but no tags display.
- Stop Inventory Stops the ongoing inventory operation.
- Clear Tag List Clears the current tag list.
- Auto Config Check this to set the reader to auto-optimized mode. In this mode the reader senses the environment and adjusts its RF characteristics to be optimized as per the environment.
- Total Unique Tags Indicates the number of unique tags read.

#### 4 - 22 FX7500 RFID Reader Integrator Guide

The list of tags appears in a table with the following attributes for each tag:

- EPC Id Unique tag EPC ID.
- TagSeen Count Number of times the tag was identified on the specific antenna.
- **RSSI** Received Signal Strength Indication.
- Antenna Id Antenna ID on which the tag is seen.
- FirstSeen time stamp UTC time (in microseconds) when the tag was first seen.
- LastSeen time stamp UTC time (in microseconds) when the tag was last seen.

# **Communication Settings**

Select **Communication** to view the **Configure Network Settings** window. This window has tabs for Ethernet, WiFi, and Bluetooth. Each tab has options for IPV4 and IPV6.

## **Configure Network Settings - Ethernet Tab**

| > 🙌 мот   | FOROLA  | X7500  |
|---|---|--|
| Status  Operation<br>Statistics   | Reader Communication Parameters   | Communication Settings   |
| ♥ Configure<br>Reader ▶ Read<br>points  | Configure Network Settings  | Ethernet   |
| Region<br>Read Tags<br>Communication<br>Date Time<br>IP Sec<br>Change<br>Password<br>GPIO<br>Applications<br>Profiles           | Ethernet         Wi-H         Bluetooth           IPv6         Obtain IPV4         On •           DHCP:         Current IPV4         157 235.88.2           IPv6         IPv4 Subnet         255 255.255.0           Mask:         IPV4 Gateway:         157 235.88.246           IPV4 ONS Server:         107 6.0.3           MAC Address:         84.24.8D.06.56.FE | IPV4<br>The reader supports both automatic TCP/IP<br>configuration via DHCP, and manual configuration.<br>The first button turns DHCP on or off, depending<br>on current state.<br>If DHCP is turned on, actual current values of the<br>reader's IP address, subnet mask, default<br>gateway, and DNS server are displayed on this<br>page. Since these have been obtained from the<br>DHCP server, they cannot be changed manually.<br>If DHCP is turned off, you can set values for these |
| <ul> <li>Firmware</li> <li>Commit/Discard</li> <li>System Log</li> <li>Diagnostics</li> <li>Shutdown</li> <li>Logout</li> </ul> | © Convicible 2013 Indexed & Solutions Inc. All Bighte Becomed   | <ul> <li>ields:</li> <li>IP Address (in dotted notation) at which the reader is assigned.</li> <li>Subnet Mask (in dotted notation) appropriate for the network the reader resides in.</li> <li>Default Gateway (in dotted notation) appropriate for the network the reader resides in.</li> <li>DK Server (in dotted notation) conserved to fact the server (in the total not preserved to the server (in the total not preserved to the server).</li> </ul>                                |

Figure 4-18 Configure Network Settings - Ethernet Tab

#### IPV4

• **Obtain IPV4 Address via DHCP** - The reader supports both automatic TCP/IP configuration via DHCP and manual configuration. The DHCP button turns DHCP on and off.

If DHCP is turned on, this window displays actual current values of the reader's IP address, subnet mask, default gateway, and DNS server. Because these are obtained from the DHCP server, they cannot be changed manually.

If DHCP is turned off, you can set the following values for these fields.

- Current IPV4 Address IP address (in dotted notation) at which the reader is assigned.
- **IPV4 Subnet Mask** Subnet mask (in dotted notation) appropriate for the network in which the reader resides.
- **IPV4 Default Gateway** Default gateway (in dotted notation) appropriate for the network in which the reader resides.
- IPV4 DNS Server DNS server (in dotted notation) appropriate for the network in which the reader resides.
- MAC Address The MAC address of the reader.
- $\checkmark$
- **NOTE** You must click **Commit** to update the network configuration (see Save Changes.) If the Commit is not successful, the system indicates the problem and allows correcting it by repeating the operation. DHCP and IP address updates do apply until the reader is rebooted.

#### IPV6

• Obtain IPV6 Address via DHCP - The reader supports both automatic TCP/IPV6 configuration via DHCP and manual configuration. The DHCP button turns DHCP on and off.

If DHCP is turned on, this window displays actual current values of the reader's IPV6 address, prefix length, default gateway, and DNS server. Because these are obtained from the DHCP server, they cannot be changed manually.

If DHCP is turned off, you can set the following values for these fields.

- Current IPV6 Address IP address (in dotted notation) at which the reader is assigned.
- Prefix Length Prefix length appropriate for the network in which the reader resides.
- **IPV6 Default Gateway** Default gateway (in dotted notation) appropriate for the network in which the reader resides.
- IPV6 DNS Server DNS server (in dotted notation) appropriate for the network in which the reader resides.
- MAC Address The MAC address of the reader.



**NOTE** You must click **Commit** to update the network configuration (see Save Changes.) If the Commit is not successful, the system indicates the problem and allows correcting it by repeating the operation. DHCP and IP address updates do apply until the reader is rebooted.



**NOTE** Also enable automatic configuration for IPV6 through RA packets configuration. To enable or disable RA packet configuration go to the Services window (see Services).

## **Configure Network Settings - Wi-Fi Tab**

| > мот   |   | -X7500 📕   |
|---|---|--|
| Status ▲<br>▶ Operation<br>Statistics   | Reader Communication Parameters   | Communication Settings   |
| ♥ Configure<br>Reader▶ Read<br>points<br>Region   | Configure Network Settings Ethernet WI-Fi Bluetooth   | WI-FI  |
| Read Tags<br>Communication<br>Date Time<br>IP Sec<br>Change<br>Password<br>GPIO<br>Applications<br>Profiles<br>Firmware<br>Commit/Discard<br>N System Lon | IPv4       Current IPV4 address       0.0.0.0         IPv6       IPV4 Subnet Mask:       0.0.0.0         IPV4 Gateway:       IPV4 ONS Server:         MAC Address:       0.0.0.0         Set       Properties | IFV4<br>The reader supports only DHCP based<br>configuration for WiFL<br>The current values of the reader's IP address,<br>subnet mask, default gateway, and DNS server<br>are displayed on this page. Since these have been<br>obtained from the DHCP server, they cannot be<br>changed manually. |
| Diagnostics<br>Shutdown<br>Logout   | © Convright 2013 Motorolo Solutions Inc. All Pickte Preserved   |  |

Figure 4-19 Configure Network Settings - Wi-Fi Tab

#### IPV4

The reader supports only DHCP-based configuration for WIFI. This window displays the current values of the reader's IP address, subnet mask, default gateway, and DNS server. Since these are obtained from the DHCP server, they cannot be changed manually.

#### IPV6

The reader supports only DHCP based configuration for WIFI. This window displays the current values of the reader's IPV6 address, prefix length, default gateway, and DNS server. Since these are obtained from the DHCP server, they cannot be changed manually.

## **Configure Network Settings - Bluetooth Tab**

| Status   | Reader Communication Parameters  | FX7500   |
|--|--|--|
| Configure<br>Reader  | Error: Adapter not found.  | Communication Settings   |
| ▶ Read<br>points<br>Region   | Configure Network Settings   | The reader supports only automatic IP configuration of Bluetooth interface.  |
| Read Tags<br>Communication<br>Date Time<br>IP Sec                        | Ethernet Wi-Fi Bluetooth  IPv4 Current IPV4 address: IPV6 IPV4 Subnet Mask: MAC Address: | If a bluetooth client is connected to the reader then<br>the actual current values of the reader's IPV4<br>address, Subher thask and IPV6 address and<br>Prefix Length are diplayed on this page in the<br>appropriate tables. Since these are automatically<br>configured and fixed for a reader, they cannot be<br>changed manually. |
| Change<br>Password<br>GPIO<br>Applications                               | Discoverable:  | If a bluetooth USB dongle is connected to the<br>reader then the following bluetooth properties can<br>be set in this page   |
| <ul> <li>Firmware</li> <li>Commit/Discard</li> <li>System Log</li> </ul> | PassKey:<br>PassKey:<br>DHCP start<br>address:   | <ul> <li>Discoverable Whether the reader will be<br/>seen by other bluecohn enabled devces<br/>on a discovery.</li> <li>Pairable Whether any bluetooth enabled<br/>device will allowed to pair with reader</li> <li>Use Device To the continuous enabled</li> </ul>  |
| Diagnostics<br>Shutdown<br>Logout  | DHCP end<br>address:   | <ul> <li>Ose Passkey This opion when establed<br/>mandates the connecting device to supply<br/>a predetermined passkey which will be<br/>used for authentication while pairing.</li> <li>Passkey Passkey that will be used for</li> </ul>  |

Figure 4-20 Configure Network Settings - Bluetooth Tab

The reader supports only automatic IP configuration of the Bluetooth interface.

If a Bluetooth client is connected to the reader, this window displays the current values of the reader's IPV4 address, Subnet mask, IPV6 address, and prefix length in the appropriate tabs. Because these are automatically configured for a reader, they cannot be changed manually.

If a Bluetooth USB dongle is connected to the reader, you can set the following Bluetooth properties in this window:

- Discoverable Select whether the reader is seen by other Bluetooth-enabled devices on discovery.
- Pairable Select whether any Bluetooth-enabled device can pair with reader.
- **Use Passkey** Enable this option to mandate the connecting device to supply a pre-determined passkey to use for authentication while pairing.
- Passkey The passkey to use for authentication.
- **DHCP start address** The starting address of the DHCP IP range out of which an IP is assigned to the connecting device.
- **DHCP end address** The end address of the DHCP IP range out of which an IP is assigned to the connecting device.



**NOTE** The DHCP IP range specified using the DHCP start address and DHCP end address options also determine the IP of the Bluetooth interface of the reader. The first two octets of the IP address of the reader Bluetooth interface are taken from the IP range specified and the last two octets use the reader BD address.

### **Configure LLRP Settings**

Select **LLRP** to view and set the LLRP settings. By default, LLRP activates in server mode, where LLRP clients can connect to the reader using the port number specified in the **Client** port field. You can also configure the reader in LLRP client mode. In this case, configure the LLRP server address in this web page as well. LLRP cannot be disabled since it is the primary native protocol for RFID for the reader.

| Home                    | Reader Communication                             | Parameters       | LLRP Settings  |
|-------------------------|--|------------------|--|
| Operation<br>Statistics | Configure LLRP Se                                | ttings           | This page supports setting the LLRP configuration the reader.  |
| Configure<br>Reader     | LLRP Status:                                     | LLRP is running. | the LLRP server on the reader. Indicates   |
| Read Tags               | Operation Mode:                                  | Server -         | <ul> <li>whether LLRP is running or not.</li> <li>Operation Mode - Allows the user to</li> </ul>         |
| Communication           | Client IP:                                       | 0.0.0.0          | choose the LLPR mode in the reader. C<br>be set to either "Server" or "Client".                          |
|                         | Enable Secure mode:                              |                  | Configuration options when LLRP in the reader i  |
| SNMP                    | Validate peer:                                   |                  | in "Server" mode.  |
| Wireless                | Client Port:                                     | 5084             | <ul> <li>Client IP - Displays the currently</li> </ul>   |
| Services<br>Date Time   | Allow LLRP Connection Override (From<br>USB IF): |                  | connected LLRP client's IP address. If<br>there is no LLRP client connection this v                      |
| P Sec                   |  | Disconnect       | <ul> <li>Client Port - Allows configuring the LLF</li> </ul>   |
| Change                  | Connect Status:                                  | LLRP             | listening port on the reader. Default is<br>5084.  |
| SPIO                    |  | Set              | <ul> <li>Connect Status - Indicates whether the<br/>client is connected or not. This button w</li> </ul> |
| pplications             |  | Properties       | be grayed out if there is not client   |
| Profiles                |  |                  | connected. If an LLRP client is connected to the reader, this button will be enabled                     |
|                         |  |                  | and effeties on the enter will discovere   |

Figure 4-21 Configure LLRP Settings Window

This window offers the following fields:

- LLRP Status Displays the current state of the LLRP server on the reader. Indicates whether LLRP is running.
- Operation Mode Sets the LLPR mode in the reader to either Server or Client.

LLRP configuration options when the reader is in Server mode:

- **Client IP** Displays the currently connected LLRP client's IP address. If there is no LLRP client connection, this is 0.0.0.0.
- Client Port Configures the LLRP listening port on the reader. The default is 5084.
- **Connect Status** Indicates whether the client is connected. This button is grayed out if there is no client connected. If an LLRP client is connected to the reader, this button is enabled; click this button to disconnect the client.

LLRP configuration options when the reader is in **Client** mode:

- Server IP Configures the IP address of the server to connect to.
- Client Port Configures the LLRP host port to connect to. The default is 5084.
- Allow LLRP Connection Override (From USB IF) This allows the reader to listen on an alternate port (49152) on the virtual network (over USB) interface. When an LLRP client is connected over the primary interface (Ethernet and primary LLRP port), a different client can override this connection on the alternate interface (Virtual Network and alternate port 49152) if this option is enabled. This also permits overriding a connection from a primary interface over an existing connection on an alternate interface. This option is off by default. Changing this option restarts the LLRP service on the reader.

 Connect Status - Indicates whether the reader is connected to the LLRP host. This button toggles between ConnectLLRP and DisconnectLLRP. Clicking ConnectLLRP initiates an LLRP connection to the host server.

LLRP configuration options when the reader is in Secure mode:

- Security Mode Specifies whether LLRP communicates in secure or unsecure mode. Checking Enable Secure Mode switches the LLRP port to 5085 by default. You can override the port value. LLRP in secure mode supports ciphers that are compliant with TLS1.2.
- Validate Peer Specifies whether the validation of peer against the same certification authority issued certificate is required. If you select the validate peer option, the secure LLRP service on the reader allows connection for valid secure peer entities only if the certificate of the peer is issued from the same certification authority that issued the certificate for the reader. By default the reader uses self-signed certificates, and peer certificate based validation is disabled.

#### **SNMP Settings**

Select SNMP to view the Configure SNMP Settings window.

| Home   | Reader Communication Parameters  | SNMP Settings  |
|--|--|--|
| Configure<br>Reader<br>Read Tags<br>Communication<br>LLRP  | Configure SNMP Settings<br>Send SNMP Trap To:<br>SMMP Community<br>String:<br>SNMP Version: V1 •<br>Send Server Heartbeat: V | This page supports setting the SIMIP<br>configuration on the reader (if the SIMP host is<br>not set (or is not valid), no Network Status Events<br>will be sert. If you want to receive Network Status<br>Event notifications, you must supply a valid link in<br>the<br>• Send SIMIP Trap to - Supports<br>configuring the host IP address to which<br>the SIMIP trap should be sent to. If this is<br>left blank, traps will not be sent to any<br>host. |
| Wireless Services Date Time Services Se | Set<br>Properties  | <ul> <li>SMMP Community string - SMMP community string to be used for SNMP set and get.</li> <li>SMMP Version - SNMP version to be used in the reader. Supported versions an "V1" and "V2C".</li> <li>Send Server Heartbeat - Send heartbeat message periodically to the configured SNMP host.</li> </ul>  |
| Applications<br>Profiles<br>P Firmware<br>Commit/Discard<br>9 System Log   |  | Note: Send SNMP Trap to and Send Serve<br>Heartbeat take effect immediately after<br>doing "Set Properties". However Commit<br>changes needs to be performed to save the<br>same persistently. The modified SNMP<br>Community string and SNMP Version do no  |

Figure 4-22 Configure SNMP Settings Window

Use this window to configure the SNMP host settings to allow sending network status events and receiving network status event notifications:

- Send SNMP Trap To Configures the host IP address to which the SNMP trap is sent. Leave this blank to send no traps to any host.
- SNMP Community String SNMP community string to use for SNMP set and get.
- SNMP Version SNMP version to use in the reader. Supported versions are V1 and V2c.
- Send Server Heartbeat Sends a heartbeat message periodically to the configured SNMP host.



*NOTE* Send SNMP Trap To and Send Server Heartbeat take effect immediately after clicking Set Properties. However, perform a Commit to persist the changes. The modified SNMP Community String and SNMP Version are not affected until the reader reboots.

## **Wireless Settings**

| 💛 мот  | OROLA  | FX7500  |
|--|--|---|
| Home<br>Status<br>) Operation<br>Statistics<br>Norman<br>Reader<br>Reader<br>Read Tags<br>Communication<br>LLRP<br>SNMP<br>Wireless<br>Services<br>Date Time<br>IP Sec<br>Change Password<br>GPIO<br>Applications<br>Profiles<br>Firniware | Existing Connection:         Existing Connection:         Connection Status         Get Details         ESSID:         Signal         Strength:         0%         Status:         Disconnected         IP         Address:  | <ul> <li>Wireless Settings</li> <li>Wireless Settings</li> <li>This page supports setting the wireless configuration on the reader. Motorolar provides native support for USB WFi adapters with the Reatek chapset RTL 1817.</li> <li>The following adapters have been tested by Motorola - Ala AWUS308th - Charae Versa Wfu USB Adapter II</li> <li>Get Details - Get the details of connected network. The essad, signal strength and connection status are provided.</li> <li>Disconnect - Disconnect From a.</li> <li>Starl Scan the available networks. ESSID shall be lated in the drop down memu upon pressing the button. If the ESSID is hidden(not broadcasted), then the same can be typed in the late baro in the USD with WEWWAR detaily - Persist network setting alross releval and automatically retain association with configured AP</li> </ul> |
| Commit/Discard<br>▶ System Log<br>Diagnostics<br>Shutdown<br>Logout  | Connect to wireless network  Call Connect  Automatically:  Connect  Call | Note: The scan function may take several<br>seconds. All buttons in the page shall be<br>disabled while scan is in progress and<br>enabled back once scan is completed.   |
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Select Wireless to view the Reader Wireless Settings Parameters window.

Figure 4-23 Wireless Settings Window

Use this window to set the wireless configuration on the reader. Motorola provides native support for USB WiFi adapters with the Realtek chipset RTL 8187, and tested the following adapters:

- Alfa AWUS036H
- CCrane Versa Wifi USB Adapter II

The Wireless Settings window offers the following options:

- **Get Details** Click to get details of the connected network, including the ESSID, signal strength, and connection status.
- **Disconnect** Click to disconnect from a connected network.
- Scan and Choose Network Scan the available networks. Clicking this lists the ESSID in the drop-down menu. If the ESSID is hidden (not broadcasted), enter the ESSID in the text box provided.
- Passkey Pre-shared key for the WPA/WPA2 network.
- Connect Automatically Persist network setting across reboots and automatically retain association with the configured AP.



**NOTE** The scan function can take several seconds. All buttons on the page are disabled while the scan is in progress, and re-enabled when the scan completes.

## **Network Services Settings**

Select Services to view the Configure Network Service Settings window.

| Home                           | Reader Communication Parameters | Service Settings  |
|--------------------------------|---------------------------------|---|
| Operation Statistics Configure | Configure Network Settings      | Network Services  |
| Reader<br>Read Tags            | Web Server: HTTP  Shell: SSH    | services.   |
| Communication                  | File Server: FTPS -             | <ul> <li>Web Server - This allows configuring the<br/>web server in either HTTP (Unsecure) or</li> </ul>  |
| SNMP<br>Wireless               | Receive RA packets:             | HTPS (Secure) mode.     Shell - This allows configuring the Shell t     SH (Secure) mode or disabled state.     Elle Server. This allows configuring the          |
| Services<br>Date Time          | Set<br>Properties               | File server to either FTP (Unsecure) or<br>FTPS (Secure) mode.<br>Disable IPVS Stack - This allows the use  |
| Change<br>Password             |                                 | to enable or disable the reader's IPV6<br>stack.<br>• Receive RA packets - This option is onl   |
| GPIO<br>Applications           |                                 | valid when IPV6 stack is enabled. If<br>enabled this allows for IPV6 IP<br>configuration through RA packets else th<br>IP will have to be obtained via DHCP in th |
| ▶ Firmware<br>Commit/Discard   |                                 | communications page or assigned<br>statically.  |
| System Log                     |                                 | Note: The service configuration is not<br>updated until you click Commit (see Save  |

Figure 4-24 Configure Network Service Settings Window

The reader supports the following network services.

- Web Server Configures the web server in either HTTP (unsecure) (default) or HTTPS (secure) mode.
- Shell Sets the shell to SSH (secure) mode (default) or a disabled state.
- File Server Sets the file server to either FTP (unsecure) or FTPS (secure) (default) mode.
- Disable IPV6 Stack Select this to disable the reader's IPV6 stack. IPV6 stack is enabled by default.
- Receive RA packets This option is only valid when the IPV6 stack is enabled. Enable this to allow IPV6 IP configuration through RA packets; otherwise obtain the IP via DHCP in the Communication window or assign statically. This is disabled by default.



**NOTE** You must click **Commit** to update the service configuration (see Save Changes.) If the Commit is not successful, the system indicates the problem and allows correcting it by repeating the operation.

# **System Time Management**

Select **Date Time** to view the **System Time Management** window. Use this window to set the date and time value of the reader, or to specify an NTP server for the reader to synchronize with.

| > 🙌 мо                              | то                            | 70     | )L,  | A    |       |       |            | >          | <b>)</b> | ><br>>>    | >   |                    |   | F   | X7500  | 1117<br>0  |          |
|-------------------------------------|-------------------------------|--------|------|------|-------|-------|------------|------------|----------|------------|---|--------------------|---|---|--|--|----------|
| Home                                | System Time Management        |        |      |      |       |       |            |            |          | Î          | Set Date and <sup>•</sup>   | Гime               | ?   |   |  |  |          |
| Status<br>▶ Operation<br>Statistics | SNTP Configuration            |        |      |      |       |       |            |            |          |            |   |                    | The Date/Time page pro<br>user to adjust the date a<br>reader, or to specify an | wides the interface for<br>ind time value of this<br>NTP server for the rea | der  |  |          |
| ▶ Configure<br>Reader               | SNTP Server Name or IP        |        |      |      |       |       |            |            |          |            |   |                    |   |   |  |  |          |
| Read Tags                           |                               |        |      |      |       |       |            | Ad         | dress    |            |   |                    |   |   | To specify a SNTP server's IP address or i   | <i>er,</i> enter your SNTP<br>ame in the <b>SNTP Ser</b> | ver      |
| ▶ Communication                     |                               |        | N    | OTE  | Chai  | nging | g the      | SNTP Ser   | ver Ac   | ldress req | uires a   | Commi              | t!  |   | Name or Address box,<br>Server Address, Your | and then click Set SN<br>pust do a Commit for t          | TP<br>he |
| Date Time                           |                               |        |      |      |       |       |            | Set SNTP   | Param    | eters      |   |                    |   |   | change to take effect.                       |  | E        |
| IP Sec<br>Change Password<br>GPIO   | Set Date & Time on the reader |        |      |      |       |       |            |            |          |            | ally, select the approp<br>Il <b>time</b> , and click the "S<br>The reader's clock will | riate<br>Set<br>be |   |   |  |  |          |
| Applications                        | <                             | s      | epte | mbe  | r 201 | 3     | >          | Month      | Day      | Year       | Hour  | Minute             | Second  |   | adjusted to the exact va                     | lue provided if the                                      | riato    |
| Profiles                            | Su                            | Mo     | Ти   | We   | Th    | Fr    | <b>S</b> a | 09 🗸       | 30 🗸     | 2013 🗸     | 14 🔻  | 46 🔻               | 07 👻  |   | message will tell the rea                    | ison for the failure.                                    | liale    |
| ▶ Firmware                          | 1                             | 2      | 3    | 4    | 5     | 6     | 7          |            |          | Set Date   | and Tim   | e                  |   |   | The time zone (includin                      | g use of Daylight Savin                                  | iqs)     |
| Commit/Discard                      | 8                             | 2<br>Q | 10   | 11   | 12    | 13    | 14         |            |          | Set Date   | and min   |                    |   |   | can also be set from thi                     | s page.  | <i>,</i> |
| System Log                          | 15                            | 16     | 17   | 18   | 10    | 20 4  | 21         |            |          |            |   |                    |   |   | Note: The date/time an                       | l time zone changes ta                                   | ake      |
| Diagnostics                         | 22                            | 23     | 24   | 25   | 26    | 20 1  | 21         |            |          |            |   |                    |   |   | effect immediately, and                      | do not require a Comn                                    | nit. 💻   |
| Shutdown                            | 22                            | 30     | 1    | 23   | 3     | Δ .   | 5          |            |          |            |   |                    |   |   |  |  |          |
| Logout                              | 6                             | 7      |      |      |       |       |            |            |          |            |   |                    |   |   |  |  |          |
|                                     |                               |        | Tim  | e Zo | ne:   |       |            |            |          |            |   |                    |   | Ŧ   |  |  | -        |
|                                     |                               |        |      | (    |       | ovrig | ht 20      | 013 Motoro | ola Sol  | utions Inc | All Rig   | hts Res            | served  |   |  |  |          |

Figure 4-25 System Time Management Window

To specify an SNTP server, enter the SNTP server's IP address or name in the **SNTP Server Name or IP** Address box, and then click **Set SNTP Parameters**. You must select Commit for the change to take effect.

To adjust the time manually, select the appropriate value for the user's local time, and click the **Set Date and Time** button. This adjusts the reader's clock to the value provided if the operation is successful. Otherwise, an appropriate message indicates the reason for the failure.

You can also set the **Time Zone** (including use of Daylight Savings) using the drop-down menu.

**NOTE** The date/time and time zone changes take effect immediately, and do not require a Commit.

## **IPV6 IP Sec**

Select **IP Sec** to view the **IPV6 IP Sec** window. IP Sec settings allow adding IPSec pairing of the reader with a partner with a pre-shared key.

| MOTOROLA   |   | FX7500   |
|--|---|--|
| Home ^   | IPV6 IP Sec   | IPSEC  |
| ♥ Operation<br>Statistics<br>▶ Configure<br>Reader | Settings  | IPSEC settings allow the user to add IPSec pairing<br>of the reader with a partner with a pre-shared key.<br>Add IP Sec Entry  |
| Read Tags<br>▶ .<br>Communication <sub>≣</sub>     | Add IP Sec Entry      Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry     Delete IP Sec Entry | IP Address - Specify the IP Address of the<br>partner with whom the IP SEC<br>communication is intended  |
| Date Time<br>IP Sec<br>Change                      | IP Address:<br>Passkey:   | <ul> <li>Passkey - Enter the pre-shared passkey to<br/>be used with the partner IP<br/>Address Minimum allowed characters are<br/>6 and maximum is 15.</li> </ul>          |
| GPIO<br>Applications                               | Access<br>Level:  | <ul> <li>Access Level - Specify the IPSec access<br/>level. Can be either Transport or Tunnel<br/>mode. Currently the reader supports only<br/>Transport mode.</li> </ul>  |
| Profiles<br>▶ Firmware<br>Commit/Discard           | Add IP Sec Entry  | Delete IP Sec Entry  |
| ▶ System Log<br>Diagnostics<br>Sbirtdown           |   | <ul> <li>IP Address - Specify the IP Address of the<br/>partner with whom the IP SEC<br/>communication is already configured and<br/>which needs to be deleted.</li> </ul> |
| Logout   |   |  |
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Figure 4-26 IPV6 IP Sec Window

To add an IP Sec entry:

- 1. Click the Add IP Sec Entry radio button.
- 2. In the IP Address field, specify the IP address of the partner with whom the IP SEC communication is intended.
- 3. In the **Passkey** field, enter the pre-shared passkey (from 6 to 15 characters) to use with the partner IP address.
- 4. In the Access Level drop-down list, select the IPSec access level. Options are Transport and Tunnel mode. Currently the reader only supports Transport mode.
- 5. Click the Add IP Sec Entry button.

To delete an IP Sec entry:

- 1. Click Delete IP Sec Entry radio button.
- 2. In the IP Address field, specify the IP address of the partner with whom the IP SEC communication is configured and is to be deleted.
- 3. Click the Delete IP Sec Entry button.

# **Change Password**

To ensure the controlled and secured access to reader **Administrator Console** functions, designate which users and computers are authorized to have system access by setting up authorized user accounts. Only users logging in with a registered user name and password can successfully access **Administrator Console** functions.

## **FX7500 User Accounts**

The FX7500 supports the different user accounts:

- **admin** This user has web access but no shell access, with full privileges to make changes on the reader using the Administrator Console interface and to access to the reader using the FTP interface.
- **guest** This user has web access but no shell access, with read-only privileges in the Administrator Console and can not make configuration changes. The **guest** user does not need a password to log in to the Administrator Console.
- **rfidadm** This is the reader administrator, with shell access but no Administrator Console access. **rfidadm** has full access to the **/apps** directory and read-only access to most of the other directories, including the **/platform**, **/usr**, **/lib**, **/etc**, and **/bin** directories. The **rfidadm** user can use this account to install and uninstall RFID programs and upload user applications.

| Home       Status         Status       Operation         Statistics       Configure         Read Tags       User Name:         Old       Password:         Communication       Date Time         IP See       Change Password:         Password:       Re-enter   | MOTOROLA  | <b>&gt;</b> , <b>&gt;</b> , <b>&gt;</b>                          | FX7500  |
|---|---|--|---|
| Readr       Read Tags       User Name: admin ●       Should designate which users and computers areas. You set is by setting up authorized to have system areas. You set is by setting up authorized to have system rame and password (an success Stuly access the Password: Password: Re-enter Password | Home Status   | Change Password  | System Access     To ensure the controlled and secured access to     Reader Administrator Console functions, you  |
| Pression d       Change Password         GPIO       Applications         Profiles       Change Password         Firmware       Commit/Discard         Commit/Discard       System Log         Diagnostics       Diagnostics         Shutdown       Change Password  | P Communication<br>Read Tags<br>►<br>Communication<br>Date Time<br>IP Sec<br>Change<br>Posceverd                                  | User Name: admin  Old Password: New Password: Re-enter Password: | should designate which users and computers are<br>authorized to have system access. You do this by<br>setting up authorized user accounts. Only users<br>logging in with a registered user name and<br>password, can successfully access the<br>Administrator Console functions.<br><u>Change Password</u><br><u>Managing User Login and Logout</u>             |
| Logout Managing User Login and Logout   | Password<br>GPIO<br>Applications<br>Profiles<br>▶ Firmware<br>Commit/Discard<br>▶ System Log<br>Diagnostics<br>Shutdown<br>Logout | Change Password  | Change Password<br>• Select the user whose password is to be<br>changed from the drop dpwn menu. Type<br>the old password, and the new password<br>(twice) on the Change Password page,<br>and then click Change Password. This<br>option does not a commit operation,<br>password shall be changed with<br>immediate effect.<br>Managing User Login and Logout |

Select Change Password to view the Change Password window.

Figure 4-27 Change Password Window

To set a user password:

- 1. In the User Name drop-down list, select the user for whom to change the password.
- 2. In the Old Password field, enter the existing password for that user.
- 3. In the New Password field, enter the new password, and again in the Re-Enter Password field.

4. Click **Change Password**. The password changes immediately and does not require a Commit operation.

## **Managing User Login and Logout**

Users must log in and log out of the system to ensure that system access is granted only to authorized users, and that only one user is logged in at a time to ensure that multiple users do not make conflicting changes to the system.

If the user performs no action for a period of time, the system automatically logs him or her out. The user must log in again to use the Administrator Console.

# **GPIO**

Select GPIO to view the GPIO Control Page. This window allows viewing and setting the status for GPI pins.

| ᄊ мотоі                                      | ROLA                    |                  |            | FX7500   |
|--|-------------------------|------------------|------------|--|
| Home   | e e                     | SPIO Control Pa  | ge         | GPIO   |
| Status Operation Statistics Configure Reader | GPIO Pin #              | Settings         | Status     | GPIO settings page provides the status for GPI<br>pins and also helps the user to set the status of<br>GPO pins. To set a GPO pin HIGH/LOW click on<br>the image of the required pin number.   |
| Read Tags<br>Communication                   | GPI1:                   | Host GPI -       | •          | Indicates GPIO HIGH  |
| Date Time<br>P Sec                           | GFIZ.                   | HUSE GPT +       |            | Indicates GPIO Unknown state   |
| PIO<br>pplications                           | GPO1:                   | Host GPO 🔻       | •          | <ul> <li>GPI debounce time - Many of the devices<br/>connecting to GPIO port of the FX reader would<br/>create spikes during the connection. GPIO</li> </ul>   |
| rofiles                                      | GPO2:                   | Host GPO 🔻       | •          | GPIO debounce does not have impact on GPO  |
| Firmware<br>Update<br>commit/Discard         | GPO3:                   |                  | •          | operations and input operation when the debounc-<br>time is set to 0. Also, debounce time is applied in<br>all input pins and pins must work independently of<br>each other. The user can enter the debounce time<br>in milliseconder. The unser init of CPU debounce  |
| System Log<br>liagnostics<br>hutdown         | GPI Debounce T<br>(ms): | īme <sub>0</sub> |            | A remarked the set of the set |
| ogout  |                         |                  | Set        | pin state stays in the same level for the debounce time duration.  |
|  |                         |                  | Properties | GPIO Settings - GPIO Settings selection shall     hale to man the EX reader CPI as the CPO with  |

Figure 4-28 GPIO Control Page

- Settings Map the reader GPI and/or GPO with the radio GPIO. Select either Radio or Host for GPIx or GPOx where x = 0 or 1. An attempt to violate this condition changes the selection to either Host GPIx or Host GPOx automatically. These settings are valid for FX7500 four port readers and are disabled if not supported.
- Status To set a GPO pin high or low, click on the image next to the required pin number:
  - Green indicates GPIO HIGH
  - Red indicates GPIO LOW
  - Yellow indicates GPIO unknown
- **GPI Debounce Time** Enter a value of up to 1000 milliseconds to minimize spikes that can occur when a device connects to the GPIO port of the FX reader. The default is 50. Debounce time applies to all input pins, and pins must work independently of each other. Events and callback functions occur only after the debounce time expires, provided the pin state remains at the same level for the debounce time duration. GPIO debounce does not impact GPO and input operations when set to 0.
- Set Properties Click this when all selections are made.

# Applications

Select **Applications** to view the **User Application Page**. This window allows installing applications on the reader and provides details of the installed application.

| > 🙌 мото  | ROLA   | FX7500 💭   |
|---|--|--|
| Home  | User Application Page  | Applications   |
| Status<br>• Operation<br>Statistics<br>• Configure Reader<br>Read Tags<br>• Communication | Existing Packages:<br>List of Installed apps Start/Stop AutoStart Uninstall<br>T Meta Data | This page provides the details of installed application and<br>also to install applications in the reader.<br>• List of installed Apps - This drop down menu shall list the<br>current packages installed in the reader.<br>• Start/Stop - The image displays the running status as  |
| Date Time<br>IP Sec<br>Change Password<br>GPIO  | Install New Package:   | indicated below. Click the image to toggle the status.   |
| Applications<br>Profiles E<br>Firmware<br>Commit/Discard<br>> System Log<br>Diagnostics   | Current Status: Select package from the browse button package: Install                     | AutoStati - Serecting mis check box strait enange the<br>application to fun at starup.     Uninstali - Shall remove the package from reader.     How to create packages: Packages can be created using<br>any of standard debain package creation tools or manually.<br>The guidelines for package creation for FX7500 reader are<br>listed below.     The package static contain binary executable compatible of  |
| Shutdown<br>Logout  |  | ELF 32-bit S8 executable, ARM variant 1, GNU Linkows<br>2. The name of the binary executable must midch threat<br>package name is package-1.2.1. all (dockage-1 version<br>2. 1), then the name of binary executable must be package.<br>1. There can be more binary executable must be package-1.<br>There can be more binary executable must be safet nackage-<br>2.1. Then the name of sintin scient must be safet nackage- |
|   | © Convictor 2013 Materials Solutions Inc. All Diaber Descript                              | 1.sh     4. The package shall contain a stop script in the name of     Impackage shall contain a stop script in the name of     Impackage shall contain a stop script in the name of   |

Figure 4-29 User Application Page

The Existing Packages section includes the following options:

- List of Installed apps The drop-down menu lists the current packages installed in the reader.
- Start/Stop The image displays the running status as follows. Click the image to toggle the status.
  - Green U indicates application is running
  - Red indicates application is not running
- AutoStart Select this check box to run the application at startup.
- Uninstall Removes the package from the reader.

To create packages for the FX7500 reader, use any of the standard Debian package creation tools, or create them manually.

- The package must contain a binary executable compatible with ELF 32-bit LSB executable, ARM, version 1, GNU Linux.
- The name of the binary executable must match the name of the package, excluding the version name. For example, if the package name is **package-1\_2.1\_all** (package 1 version 2.1), the name of the binary executable must be **package-1**. There can be more than one binary in the package.
- The package must contain a startup script in the name of **start\_packageName.sh** to start the binary or binaries in the package. For example, if the package name is **package-1\_2.1\_all.deb** (package 1 version 2.1), the name of the startup script must be **start\_package-1.sh**.

 The package must contain a stop script in the name of stop\_packageName.sh to stop the binary or binaries in the package. For example, if the package name is package-1\_2.1\_all.deb (package 1 version 2.1), the name of stop script must be stop\_package-1.sh.



**NOTE** The reader executes the packages with the privileges of **rfidadm** user account. See the user accounts section for information on **rfidadm** user privileges.

# **Reader Profiles**

Select **Profiles** in the selection menu to view the **Reader Profiles** window, which shows the current profiles on the reader and allows performing profile-related operations.

**NOTE** Because the **Reader Profiles** window uses an applet to connect to the reader, enable JVM support on the browser in order for this window to function properly.

The window displays a set of provided configuration files, or profiles, that a user can re-use and/or modify depending on the reader application or use case. The profiles serve as configuration examples.



Figure 4-30 Reader Profiles Window

The Reader Profiles window functions are:

- Available Profiles in the Reader Displays the available reader profiles.
- Import Click to open a file dialog and pick a profile (XML file) from the local PC and import it into the reader.
- Export Select an available profile and click Export to export profile information and save an XML file onto the local drive.

 $<sup>\</sup>checkmark$ 

• Set Active - Activates a selected profile. Select an available profile and click Set Active to load the profile content in the reader.



**CAUTION** Swapping profiles between readers using static IP addresses is not recommended. Activating a profile with a static IP address changes the IP of the reader, and if not done properly can make the reader inaccessible.

• Delete - Select an available profile and click Delete to delete the profile.

**NOTE** Current Config is a special logical profile that can only be exported to the PC. This cannot be imported, activated, or deleted. Only the profile name indicates that it is the active profile.

Profiles can specify a number of reader parameters, including RF air link profiles. Air link profiles cannot be configured using LLRP or web page interface. See *Appendix E, RF Air Link Configuration* for more information about air link profile configuration.

## **FIPS Support on FX7500**

The FX7500 supports FIPS 140-2 Level 1 for the following interfaces:

- HTTPS
- FTPS
- SSH
- LLRP Server
- IPSec
- SNMP

To enable or disable FIPS support in the reader profile, export the profile XML (**CurrentConfig**) from the reader and set **FIPS\_MODE\_ENABLED** to **1** to enable FIPS, or **0** to disable FIPS. Then import the XML to the reader and activate. Changing the FIPS mode restarts the reader. By default, FIPS is disabled.

# **Firmware Version/Update**

The **Firmware Version** window displays the current software and firmware versions and allows upgrading to new firmware. From the selection menu, click **Firmware**.

| мот                     | TOROLA                 | , <b>``,`</b>                     | FX7500   |
|-------------------------|------------------------|-----------------------------------|--|
| Home                    | Firmware               | e Version                         | Firmware Version   |
| Status                  | ,                      |                                   | The Firmware page shows the current software   |
| Operation<br>Statistics | Current Version:       |                                   | and firmware versions and provides a facility to<br>upgrade the software.  |
| ▶ Configure<br>Reader   | Version Ir             | nformation                        | Current version indicates the versions of the  |
| Read Tags               | Boot Loader            | 1.1.11                            | and "last known version" indicates versions of   |
| ▶ Communication         | OS                     | 1.1.23                            | binary images stored in the backup partition.  |
| Date Time               | File System            | 1.1.42                            | Pressing revert back shall switch the reader to use  |
| IP Sec                  | Reader Application     | 1.1.45                            | backup partition. The version section of the page  |
| Change Password         | LLRP                   | 1.1.45                            | currently has the following fields:  |
|                         | Radio Firmware         | 1.3.17                            | Best leader. The surrort version of the  |
| GPIO                    | Radio API              | 1.3.14                            | system boot loader.  |
| Applications            |                        |                                   | OS - The current version of the Operating  |
| Profiles                | Last Known Version:    |                                   | System build.  |
| ▼ Firmware              |                        |                                   | file system build.   |
| Update                  | Revert bac             | k Firmware                        | Reader Application - The current version   |
| Commit/Discard          | Boot Loader            | 1 1 11                            | of the Reader Application software.  |
| System Log              | OS                     | 1123                              | Radio Firmware - The current version of  |
| Diagnostics             | File System            | 1.1.20                            | the RFID Radio Firmware .  |
| Shutdown                | Reader Application     | 1.1.43                            | Radio API - The current version of the<br>Radio API  |
| Logout                  | Reve                   | t Back                            | Revertback The Revertback option is<br>provided to revert back the reader to last<br>known firmware version. Up on pressing<br>this button, reader will revertback the |
|                         | © Copyright 2013 Motor | ola Solutions Inc. All Rights Res | served   |

Figure 4-31 Firmware Version

**Current Version** indicates the binary versions currently running in the reader. **Last Known Version** indicates binary image versions stored in the backup partition. This window provides version information on the following firmware:

- Boot Loader
- OS
- File System
- Reader Application
- LLRP
- Radio Firmware
- Radio API

Select **Revert Back** to revert the firmware to last known version. The reader automatically reboots. This option is not enabled if the reader detects an error in the previous firmware update.

### **Firmware Update**

The Firmware Update window allows upgrading to new firmware. From the selection menu, click Update.



**NOTE** You must be logged in with Administrator privileges in order to access this window. See *Change* Password on page 4-33.

The reader supports three different methods of updating the firmware:

- 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.

For instructions on updating the firmware, see Appendix C, FTP Firmware Upgrade.

# **Commit/Discard**

Changes made to the logical view of the reader network using the Administrator Console do not immediately apply to the reader and network connections. To apply reader configuration modifications, select Commit/Discard, then click Commit to save the changes to the reader configuration file, and to update the running physical reader network. While a successful update can take up to a minute to complete, the system continues to operate with a brief one or two second pause.

| > 🔥 мо  | F)   | (7500 🚛   |
|---|--|---|
| Home  | Configuration Commit/Discard                                 | Save Changes (or Revert   |
| <ul> <li>▶ Operation<br/>Statistics</li> <li>▶ Configure<br/>Reader</li> <li>Read Tags ≡</li> </ul> | Commit the Configuration Changes                             | When you add or make modifications to<br>the logical view of your Reader<br>Network using the Motorola RFID<br>reader Administrator Consoles, the<br>changes are not immediately applied to |
| Communicatio<br>Date Time   | Discard the Configuration Changes                            | your underlying physical Reader and<br>network connections.<br>You must click the <b>Commit</b> button on   |
| Change<br>Password<br>GPIO  | Reset reader to factory defaults Factory Reset               | changes to the Motorola RFID reader<br>configuration file, and to update the<br>running physical Reader Network.  |
| Profiles<br>▼ Firmware<br>Update  |  | while a successinal appare may take up<br>to a minute to complete, your system<br>will continue to operate with only a brief<br>one- or two-second period pause.                            |
| Commit/Discar <del>▼</del>  | © Copyright 2013 Motorola Solutions Inc. All Rights Reserved | If you decide NOT to commit the changes to the Server's configuration file that you've made to the Reader   |

Figure 4-32 Configuration Commit/Discard Window

To discard changes to the server's configuration file made to the reader network during this session, click **Discard**.

Click **Factory Reset** to reset the reader to factory defaults. This clears all customized user settings, including configuration, and installed applications. The reader reboots automatically.

# System Log

The System Log window lists reader log information.

| > ᄊ мот   |  | FX7500  |
|---|--|---|
| Status   Operation Statistics   | System Log   | System Log  |
| Configure<br>Reader<br>Read Tags<br>Communication<br>Date Time<br>IP Sec<br>Change<br>Password<br>CPIC    | Apply<br>Fiter:<br>Minimum<br>Severity:<br>Process V RM V LLRP V SNMP V<br>Selection: RDMP<br>Other<br>Process:<br>Save  | The System Log page provides an interface to see the log information stored in the reader. There are two types of log information. One is the System Log, which includes the log information generated by the reader's internal instructions. The system log allows for storage of a maximum of 1 MB of log and overwrites the oldest logs first. The log information is saved and restored back on proper system reboot (using the web console)  |
| Applications<br>Profiles<br>Firmware<br>Commit/Discard<br>System Log<br>Diagnostics<br>Shutdown<br>Logout | System Log Access History     Oct 6 16:57:46 sshd[17130]: Did not receive identification string from 10.0.125.30     Oct 8 07:12:43 mserver.eff: I-admin logged out     Oct 8 07:12:43 mserver.eff: I-admin logged out     Oct 8 07:12:43 mserver.eff: I-sudminitologied in     Oct 8 07:12:43 mserver.eff: I-sudminitologied in     Oct 8 07:12:43 mserver.eff: I-sudminitologied in     Oct 8 07:12:43 mserver.eff: I-adminitologied out     Oct 8 07:29:57 mserver.eff: I-adminitologied out | The other one is the Access History. This provides a history log for the access to this reader. Every successful access to the reader through the web interface will be recorded in this log. User can select the filter option to see the logs for particular process and/or severity. If 'None' option is selected, no filter will be applied. If 'Minimum severity only' option is selected then severity level is considered to filter out the log. If 'Process only' option is selected to make the severity with a selected the severity are defined processes and process string with comma separated is considered to filter out the log. |
|   | © Copyright 2013 Motorola Solutions Inc. All Rights Reserved   |   |

Figure 4-33 System Log Window

This window offers the following options:

- **Apply Filter** Select a filter option from the drop-down menu to view logs for particular process and/or severity:
  - None Do not apply a filter.
  - Minimum Severity only The severity level filters the log.
  - **Process Selection only** Selected pre-defined processes and comma-separated process strings filters the logs.
  - Minimum Severity & Process Selection both severity and process selection are considered in the filter.

If you select **Process Selection only** or **Minimum Severity & Process Selection** and the process string is empty with no pre-defined process selection, then the pre-defined process list filters the logs.

- Minimum Severity Select the severity level on which to filter.
- Process Selection Select the types of processes to filter upon.
- Other process To filter for specific processes, enter the process in this text box using a comma-separated process list string with no spaces. If the log file is empty for the selected filter option, an error message appears in the log text area. Click **Save** to save the filter settings, which persist upon reader reboot.

- Log area Select a radio button for one of the two types of log information offered:
  - System Log Includes the log information generated by the reader internal instructions. This stores up to 1 MB of log information, and overwrites the oldest logs first. The log information is saved and restored on proper system reboot (via the Administrator Console).
  - Access History Provides a history log for reader access, including every successful access to the reader through the Administrator Console.
- Select the Refresh Log to refresh the information in the log, or Purge Logs to clear the information.
- To copy the log file to a specific location on the host select an option from the Export drop-down. Enter the location in the File Path field, then select the Export File button.

#### **Configure System Log**

This window configures system log settings. If the system log host is not set (or is not valid), log messages are not sent.

| 👌 ᄊ мотор   | ROLA  | FX7500   |
|---|---|--|
| Change<br>Password  | System Log Configuration Console  | Syslog Settings  |
| GPIO<br>Applications<br>Profiles  | Configure System Log  | This page supports setting the Syslog<br>configuration on the reader. If the Syslog host is<br>not set (or is not valid), no Log messages will be<br>not be sent.  |
| <ul> <li>▶ Firmware</li> <li>Commit/Discard</li> <li>▶ System Log</li> <li>Configure</li> </ul> | Remote Log Server IP:0.0.0.0Remote Log Server Port:514System Log Minimum Severity:Debug + | Remote Log Server IP - Supports<br>configuring the host IP address to which<br>Log Messages to be send. IP address<br>0.0.0 0 indicates no Host is configured<br>Remote Log Server Port - Remote Log             |
| Diagnostics<br>Shutdown<br>Logout   | Set<br>Properties   | server listening port, default port is 514<br>• System Log Minimum Severity - The<br>Minimum severity above which will be<br>stored in the systog file, this parameter<br>does not have any impact on the Remote |
| Ē   |   | Logging. This parameter does not affect<br>the logs which is already stored in the log<br>file   |
|   |   | atier the Commit   |
|   | © Copyright 2013 Motorola Solutions Inc. All Rights Reserve                               | ed   |

Figure 4-34 Configure System Log Window

This window offers the following options:

- **Remote Log Server IP** Configures the host IP address to which log messages are sent. IP address 0.0.0.0 indicates that no host is configured.
- **Remote Log Server Port** Remote log server listening port. The default port is 514.
- System Log Minimum Severity The minimum severity above which data is stored in the log file. This
  option does not impact remote logging or the logs already stored in the log file.

You must select **Commit** to activate these settings.

# **Reader Diagnostics**

Select **Diagnostics** to view the **Reader Diagnostics** window, which allows running diagnostics and viewing the diagnostics report.

| > ᄊ ма   | TOROLA FX7500  |  |
|--|--|--|
| Home<br>Status   | Reader Diagnostics Console   | ?  |
| ▶ Operation<br>Statistics  | The Reader Diagnostics page provides a   | an   |
| ▶ Configure<br>Reader  | Start Diagnostics interface to start the diagnostics and displating diagnostics report   | ay the   |
| Read Tags Communication Date Time IP Sec Change Password GPIO Applications Profiles Firmware Commit/Discard System Log Diagnostics Shutdown Logout | Oct 1 11:25:33       Nand Flash Running System Command nandtest /dev/mtd0 -I 0x0 -k         Oct 1 11:25:33       ECC corrections: 0         Oct 1 11:25:33       ECC Calitures : 0         Oct 1 11:25:33       Bad blocks : 0         Oct 1 11:25:33       Bad blocks : 0         Oct 1 11:25:33       BBT blocks : 0         Oct 1 11:25:33       Barb blocks : 0         Oct 1 11:25:33       Inadest /dev/mtd0 -I 0x0 -k         Oct 1 11:25:33       Nand Flash Running System Command completed with status St         Oct 1 11:25:33       Nand Flash Running System Command nandtest /dev/mtd1 -I 0x0 -k         Oct 1 11:25:33       ECC carrections: 0         Oct 1 11:25:33       ECC failures : 0         Oct 1 11:25:33       BBT blocks : 0         Oct 1 11:25:33       SeCC corrections: 0         Oct 1 11:25:33       BBT blocks : 0         Oct 1 11:25:33 | blayed<br>lics is<br>the<br>sed in<br>le<br>ss<br>other<br>D |
|  | © Copyright 2013 Motorola Solutions Inc. All Rights Reserved   |  |

Figure 4-35 Reader Diagnostics Window

Selecting **Start Diagnostics** clears the system log and displays the diagnostics report. The reader reboots when the diagnostics completes. Return to the **Diagnostics** window to view the diagnostics report.

To export the diagnostics report to a file, on the *System Log* window, select **Process Selection only** in **Apply Filter**, de-select all other processes, and in the **Other Process** text box enter: **rmserver.elf: N-D,IIrpserver.elf: N-D** 

# Shutdown

To protect the integrity of the reader data, gracefully reboot the reader via the Administrator Console when necessary.

| > 🔥 мо   | TOROLA   | X7500 🚛   |
|--|--|---|
| Password APIO  | System Shutdown/Restart  | Shut Down and/or Restart  |
| Profiles<br>▶ Firmware<br>Commit/Discard<br>▶ System Log | Warning: Shutting Down System May Interrupt Normal Operations Please confirm: I understand | In order to protect the integrity of the data in the<br>reader, it is strongly recommended to gracefully<br>reboot the reader through this interface when it<br>is necessary.   |
| Configure<br>Diagnostics<br>Shutdown<br>Logout           | What do you want to do: Restart Reader   | Click the <b>Shutdown</b> link to display the Shut<br>Down System page. Click and check the<br><b>Please confirm</b> checkbox to indicate that you<br>understand that you are about to shut down<br>and/or restart the system, which may interrupt<br>normal system operation |
| E  | System watchdog is currently: Enabled  | Select either <b>Restart</b> or <b>Shut Down</b> from the <b>What do you want to do</b> drop-down list, and then click <b>Go</b> .<br>The <b>Restart</b> option will let the reader save the used there and then content  |
|  |  | User data and then restart.<br>The <b>Shut Down</b> option will let the reader save<br>the user data, stop all reader functionalities and<br>then wait to be powered off.<br>This page also provides an option to   |
|  | © Copyright 2013 Motorola Solutions Inc. All Rights Reserved                               |   |

Figure 4-36 System Shutdown/Restart Window

To shut down or restart the reader:

- 1. Click the Shutdown link to display the System Shutdown/Restart window.
- 2. Check the Please Confirm check box to accept the system shut down and/or restart the system (this may interrupt normal system operation).
- 3. Select one of the following options from the What do you want to do drop-down list:
  - Restart Reader saves the user data and then restarts.
  - Shut down Reader server the reader saves the user data, stops all reader functions, and waits to be powered off.
- 4. Click Go.

This window also provides an option to enable or disable the reader watchdog.

# **CHAPTER 5 TROUBLESHOOTING**

Table 5-1 provides FX7500 troubleshooting information.

| Table 5-1 | Troubleshooting |
|-----------|-----------------|
|-----------|-----------------|

| Problem/Error   | Possible Causes  | Possible Solutions   |
|---|--|--|
| Reader error LED lights after the reader is in operation. | The CPU cannot communicate.  | Refer to the system log for error messages.  |
| Reader error LED stays lit on power up.                   | An error occurred during the power up sequence.  | Refer to the system log for error messages.  |
| Cannot connect to the reader.                             | User name and password is unknown.   | The default user name is <b>admin</b> and the default password is <b>change</b> . To change the user name and password, see <i>Communications Connections on page</i> 3-5.                 |
| Reader is not reading tags.                               | The tag is out of its read<br>range.<br>Antennas are not<br>connected.<br>Tags are damaged.<br>Tags are not EPCgen2.<br>If reading with the reader's<br>web page, Java JRE 1.6 or<br>later is not installed. | Move the tag into read range. See <i>Read</i><br><i>Tags on page 4-21</i> .<br>Connect antennas.<br>Confirm that tags are good.<br>Confirm that tags are EPCgen2.<br>Install Java JRE 1.6. |
| Cannot access the Administrator Console.                  | The IP address is unknown.   | See Communications Connections on page 3-5 to view the IP address, or use the host name to connect to the reader.  |

| Problem/Error  | Possible Causes  | Possible Solutions  |
|--|--|---|
| Certain real time applications are no longer functional. | The node address, IP<br>address, or other reader<br>configuration parameter(s)<br>were changed using the<br><b>Administrator Console</b> , and<br>the application expects the<br>previous configuration. | Update the settings within the application.<br>Refer to the application manual.   |
|  | The user closed the browser<br>without logging out of the<br><b>Administrator Console</b> , so<br>other applications cannot<br>connect to the reader.  | Log out of the <b>Administrator Console</b> . The applications can use the <b>Force Login</b> option to log in even when the user closes the browser without logging out. <b>Force Login</b> option is supported for the administrative user. |
| Cannot log into <b>Administrator</b><br><b>Console</b> . | The user forgot the password.  | Press and hold the reset button for more<br>than 8 seconds. This resets the reader<br>configuration to factory defaults, including<br>the password. This also removes the<br>contents of the <b>apps</b> partition.                           |
| Unable to add SNTP server, reader returning error.       | SNTP server is not reachable.  | Ensure the SNTP server is accessible.   |
|  | SNTP server name is not<br>resolvable via DNS server.<br>DNS server is not<br>reachable.   | Ensure the DNS server name is configured<br>in TCP/IP configuration.<br>Ensure the DNS server is accessible.  |
| Operation failed.  | A user operation did not<br>complete, typically due to<br>invalid input.   | Validate all inputs and retry the operation. If it is not successful, see <i>Service Information on page xi</i> .   |
| Invalid User Name and/or<br>Password - Try again.        | The user name and/or<br>password were not found in<br>the system, or do not match<br>the current user registry.  | Accurately retype login information. If this is not successful, see <i>Service Information on page xi</i> .   |
| Session has Timed-out - Log in again.                    | The current session was<br>inactive beyond the time-out<br>period (15 minutes), so the<br>system automatically logged<br>out.  | Log in again. As a security precaution to<br>protect against unauthorized system<br>access, always log out of the system when<br>finished.  |
| User name is not correct.                                | The user name does not<br>match the current user<br>registry (illegal characters,<br>too long, too short,<br>unknown, or duplicate.)<br>User forgot the user ID.   | Accurately retype the user name.<br>See Service Information on page xi.   |

| Problem/Error   | Possible Causes   | Possible Solutions  |
|---|---|---|
| Not a legal IP address<br>(1.0.0.0 - 255.255.255.255).<br>Cannot reach the specified IP<br>address.<br>The SNMP Host Link is not valid. | The IP address entered is<br>either formatted inaccurately<br>or cannot be accessed<br>(pinged).  | Accurately retype the IP address, and make<br>sure the host device is connected and<br>online. If this is not successful, see <i>Service</i><br><i>Information on page xi</i> . |
| Invalid network mask.   | The network mask entered is not formatted correctly.  | Confirm the correct network mask from the network administrator and enter it correctly.   |
| Invalid SNMP version number.  | The version number for<br>SNMP protocol is not a<br>supported version.  | Use version number 1 for SNMP version 1, and 2 for SNMP version 2c.   |
| Invalid description.  | The description contained invalid characters (<,>,or').   | Correct the description.  |
| Invalid password.   | The password does not<br>match the current user<br>registry (illegal characters,<br>too long, or too short.)<br>User forgot the password. | Accurately retype the password.<br>See Service Information on page xi.  |
| Name has already been used.<br>Serial number has already been<br>used.<br>IP address has already been<br>used.                          | The name, serial number, or<br>IP address entered already<br>exists in the system.  | Enter a unique value for the new name, serial number, or IP address.  |
| Select an item from the list.   | The system requires selecting an item from the list box before continuing.  | Select an item from the list box, and then continue.  |
| Last command is pending. Try again later.   | The system did not finish processing the previous command.  | Wait a few moments for the previous command to complete before sending another command.   |
| Another administrator is currently logged in. Try again later.  | The system does not allow<br>more than one administrator<br>to log in at a time.  | Wait until the other administrator logs out (or times out) before logging in.   |
| Backup configuration file does not exist.   | The system cannot revert to<br>a backup configuration<br>unless a backup file exists.   | Commit the new configuration to create a backup file.   |
| Failed to confirm the new password.   | The system requires<br>entering the password<br>identically two times.  | Accurately retype the password twice.   |
| Network configuration change(s) have not been saved.  | The user requested log out<br>prior to committing/<br>discarding the changes<br>made during the session.                                  | Select one of the <b>Commit/Discard</b> options.  |

| Problem/Error  | Possible Causes  | Possible Solutions  |
|--|--|---|
| New password is the same as the old one.   | The system requires<br>entering a new password<br>(different from the existing<br>password) during the<br><b>Change Password</b><br>operation. | Enter a password that is different from the existing password.  |
| Old password is not correct.   | The system requires<br>entering the existing<br>password during the <b>Change</b><br><b>Password</b> operation.                                | Accurately retype the existing password.  |
| Unspecified error occurred - code: ####  | A specific error message is missing for the given status code.   | Note the code number, and contact<br>Motorola Solutions support. See Service<br>Information on page xi. |
| The requested page was not found.<br>Internal Web Server Error.  | The system experienced an internal web server error.   | Contact Motorola Solutions support.<br>See Service Information on page xi                               |
| Request method was NULL.<br>No query string was provided.  | The system does not permit<br>executing a proxy program<br>from the command line<br>rather than the web server.                                | No action required. The system is reporting that this action is not permitted.                          |
| Content length is unknown.   | The system cannot accept<br>an incorrectly formatted<br>HTTP POST request (from<br>an unsupported browser<br>application).                     | Use a GET request instead, or update the software.  |
| Couldn't read complete post message.   | The system stopped a<br>POST operation before<br>completion.   | Retry the operation, and allow it to complete.  |
| Unhandled reply type.  | The system generated an unexpected value.  | Contact Motorola Solutions support.<br>See Service Information on page xi.                              |
| Failed to open port.<br>Failed to connect.<br>Failed to transmit.<br>Failed to receive.<br>Error during Receive of<br>Command. | Error during receive of command.   | Contact Motorola Solutions support.<br>See Service Information on page xi.                              |
| Invalid Device Address.  | The device address<br>information (parent) is<br>invalid, missing, or<br>formatted inaccurately.   | Contact Motorola Solutions support.<br>See Service Information on page xi.                              |

| Problem/Error  | Possible Causes   | Possible Solutions   |  |
|--|---|--|--|
| Command parsing state error.<br>Missing argument for the<br>command.<br>Command internal type cast<br>error.<br>Missing operator.<br>Unknown operator. | A command was formatted inaccurately.   | Contact Motorola Solutions support.<br>See Service Information on page xi. |  |
| The action must be confirmed.  | The user must confirm the requested action before it is executed.                 | Select the confirmation option when issuing this request.                  |  |
| Invalid network adapter when navigating to the Bluetooth configuration page.   | The Bluetooth dongle is not plugged in or not supported.                          | Plug in a supported Bluetooth dongle and refresh the browser.              |  |
| Wireless scan error.   | Wireless dongle is not plugged in or not supported.                               | Plug in a supported wireless dongle and repeat the wireless scan.          |  |
| OS update in progress.   | Firmware update on the reader is ongoing. The current operation is not permitted. | Wait for the firmware update to complete and then retry the operation.     |  |
| Cannot change password.  | Cannot change password for guest.   | Guest does not need a password to log in to the Administrator Console.     |  |



**NOTE** If problems still occur, contact the distributor or call the local contact. See page xi for contact information.

# **APPENDIX A TECHNICAL SPECIFICATIONS**

# FX7500 Kits

## KT-FX75004US-01 4-Port US Reader Kit

- FX7500-42310A30-US (4-port US reader)
- · AN480-CL66100WR (wide-band AN-480 antenna)
- BRKT-70661-01R (antenna mounting bracket)
- CBLRD-1B4001800R (15-foot RF cable)
- 50-14000-159R (power supply)
- 23844-00-00R (US power cord)

## KT-FX75002US-01 2-Port US Reader Kit

- FX7500-22310A30-US (2-port US reader)
- · AN480-CL66100WR (wide-band AN-480 antenna)
- · BRKT-70661-01R (antenna mounting bracket)
- CBLRD-1B4001800R (15-foot RF cable)
- 50-14000-159R (power supply)
- 23844-00-00R (US power cord)

## KT-FX75004WR-01 4-Port Global Reader Kit

- FX7500-42315A30-US (4-port global reader)
- AN480-CL66100WR (wide-band AN-480 antenna)
- · BRKT-70661-01R (antenna mounting bracket)
- CBLRD-1B4001800R (15-foot RF cable)
- 50-14000-159R (power supply)

# KT-FX75002WR-01 2-Port Global Reader Kit

- FX7500-22315A30-US (2-port global reader)
- AN480-CL66100WR (wide-band AN-480 antenna)
- BRKT-70661-01R (antenna mounting bracket)
- CBLRD-1B4001800R (15-foot RF cable)
- 50-14000-159R (power supply)

# **Technical Specifications**

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

#### Table A-1 Technical Specifications

| Item                                       | FX  |  |  |  |
|--|---|--|--|--|
| Physical and Environmental Characteristics |   |  |  |  |
| Dimensions                                 | 7.7 in. L x 5.9 in. W x 1.7 in. D                           |  |  |  |
|  | (19.56 cm L x 14.99 cm W x 4.32 cm D)                       |  |  |  |
| Weight                                     | 1.9 lbs ± 0.1 lbs (0.86 kg +/- 0.05 kg)                     |  |  |  |
| Base Material                              | Die cast aluminum, sheet metal and plastic                  |  |  |  |
| Visual Status Indicators                   | Multi-color LEDs: Power, Activity, Status, and Applications |  |  |  |
| Mounting                                   | Keyhole and standard VESA (75 mm x 75 mm)                   |  |  |  |
| FX Environmental Specifications            |   |  |  |  |
| Operational Temperature                    | -4° to +131° F / -20° to +55° C                             |  |  |  |
| Storage Temperature                        | -40° to +158° F / -40° to +70° C                            |  |  |  |
| Humidity                                   | 5 to 95% non-condensing                                     |  |  |  |
| Shock and Vibration                        | MIL-STD-810G  |  |  |  |
| Connectivity                               |   |  |  |  |
| Communications                             | 10/100 BaseT Ethernet (RJ45) w/ POE support                 |  |  |  |
|  | USB Client (Type B), USB Host (Type A)                      |  |  |  |
| General Purpose I/O                        | 2 inputs, 3 outputs, optically isolated (terminal block)    |  |  |  |
|  | External 12V ~ 48 VDC power available for GPIO              |  |  |  |
| Power                                      | POE or POE+   |  |  |  |
|  | 12 VDC to 48 VDC, or 24 VDC Universal Power Supply          |  |  |  |
| Antenna Ports                              | FX 7500-2: 2 mono-static ports (reverse polarity TNC)       |  |  |  |
|  | FX 7500-4: 4 mono-static ports (reverse polarity TNC)       |  |  |  |

| ltem                                | FX   |  |  |
|-------------------------------------|--|--|--|
| Hardware/OS and Firmware Management |  |  |  |
| Memory                              | Flash 512 MB; DRAM 256 MB  |  |  |
| Operating System                    | Linux  |  |  |
| Firmware Upgrade                    | Web-based and remote firmware upgrade capabilities   |  |  |
| Management Protocols                | RM 1.0.1 (with XML over HTTP/HTTPS and SNMP binding)   |  |  |
| Network Services                    | DHCP, HTTPS, FTPS, SFPT, SCP, SSH, HTTP, FTP, SNMP and NTP                                   |  |  |
| Network Stack                       | IPv4, IPv6   |  |  |
| Security                            | Transport Layer Security Ver. 1.2, FIPS 140-2 Level 1  |  |  |
| Air Protocols                       | EPCglobal UHF Class 1 Gen2, ISO 18000-6C   |  |  |
| Frequency (UHF Band)                | Global Reader: 902 MHz to 928 MHz (Maximum, supports countries that use a part of this band) |  |  |
|                                     | 865 MHz to 868 MHz   |  |  |
|                                     | US (only) Reader: 902 MHz to 928 MHz   |  |  |
| Transmit Power Output               | 10 dBm to +31.5 dBm (POE+, 12V ~ 48V External DC,  |  |  |
|                                     | Universal 24 VDC Power Supply;<br>+10 dBm to +30.0 dBm (POE)                                 |  |  |
| Max. Receive Sensitivity            | -82 dBm  |  |  |
| IP addressing                       | Static and Dynamic   |  |  |
| Host Interface Protocol             | LLRP v1.0.1  |  |  |
| API Support                         | Host Applications – .NET, C and Java EMDK;   |  |  |
|                                     | Embedded Applications – C & Java SDK   |  |  |

#### Table A-1 Technical Specifications (Continued)

#### Warranty

The FX7500-4 and FX7500-2 are warranted against defects in workmanship and materials for a period of one year (12 months) from date of shipment, provided the product remains unmodified and is operated under normal and proper conditions.

For the complete Motorola hardware product warranty statement, go to:

http://www.motorolasolutions.com/warranty

#### **Recommended Services**

| Support Services  | Service from the Start Advance Exchange On-Site System Support Support |
|-------------------|--|
| Advanced Services | RFID Design and Deployment Services                                    |

# **Cable Pinouts**

## 10/100bT Ethernet / POE Connector

The 10/100BT Ethernet / POE connector is an RJ45 receptacle. This port complies with the IEE 802.3af specification for Powered Devices.

12345678



Figure A-1 Ethernet Connections

 Table A-2
 10/100bT Ethernet / POE Connector Pinout

| Pin   | Pin Name | Direction | Description      | POE Mode A<br>Function | POE Mode B<br>Function |
|-------|----------|-----------|------------------|------------------------|------------------------|
| Pin 1 | TX-P     | 0         | TX Data Positive | Positive Vport         |                        |
| Pin 2 | TX-N     | 0         | TX Data Negative | Positive Vport         |                        |
| Pin 3 | RX-P     | I         | RX Data Positive | Negative Vport         |                        |
| Pin 4 | NC       | -         | No Connect       |                        | Positive Vport         |
| Pin 5 | NC       | -         | No Connect       |                        | Positive Vport         |
| Pin 6 | RX_N     | I         | RX Data Negative | Negative Vport         |                        |
| Pin 7 | NC       | -         | No Connect       |                        | Negative Vport         |
| Pin 8 | NC       | -         | No Connect       |                        | Negative Vport         |

## **USB Client Connector**

The USB Client port is supplied on a USB Type B connector.



Figure A-2 USB Client Connector

| Table A-3 USB Client Port Connector Pind |
|--|
|--|

| Pin   | Pin Name | Direction | Description         |
|-------|----------|-----------|---------------------|
| Pin 1 | 5.0V_USB | I         | 5.0V USB Power Rail |
| Pin 2 | USB_DN   | I/O       | Data Negative       |
| Pin 3 | USB_DP   | I/O       | Data Positive       |
| Pin 4 | GND      | -         | Ground              |

# **USB Host Connector**

The USB Host port is supplied on a USB Type A flag connector.



Figure A-3 USB Host Connector (J22)

| Pin   | Pin Name | Direction | Description         |
|-------|----------|-----------|---------------------|
| Pin 1 | V_USB    | I         | 5.0V USB Power Rail |
| Pin 2 | USBH_DN  | I/O       | Data Negative Rail  |
| Pin 3 | USBH_DP  | I/O       | Data Positive Rail  |
| Pin 4 | GND      | -         | Ground              |

 Table A-4
 USB Host Port Connector (J22) Pinout

## **GPIO Port Connections**

These plug terminal block types allow connecting and disconnecting individual wires independently. A single connector is used for both inputs and outputs. See *Table A-5* for pin descriptions.



Figure A-4 FX7500 RFID Reader GPIO Connection

| Pin # | Pin Name      | Direction | Description                     |
|-------|---------------|-----------|---------------------------------|
| 1     | +24V DC Power | 0         | Supplies +24V DC at up to 1 Amp |
| 2     | GP output #1  | 0         | Signal for GP output #1         |
| 3     | GP output #2  | 0         | Signal for GP output #2         |
| 4     | GP output #3  | 0         | Signal for GP output #3         |
| 5     | GND           | -         | Ground connection               |
| 6     | GP input #1   | I         | Signal for GP input #1          |
| 7     | GP input #2   | I         | Signal for GP input #2          |
| 8     | GND           | -         | Ground connection               |

#### Table A-5 GPIO Pin Outs

# APPENDIX B LLRP AND RM API EXTENSIONS

For information on Low Level Reader Protocol (LLRP) and Reader Management (RM) extensions for the FX7500 reader, refer to the FX Series Reader Software Interface Control Guide.