# FX RFID READER SERIES

Embedded SDK Sample Application



# **User Guide**

MN000539A01

# FX RFID READER SERIES EMBEDDED SDK SAMPLE APPLICATIONS USER GUIDE

MN000539A01 Revision A December 2017

## Copyright

© 2017 ZIH Corp. and/or its affiliates. All rights reserved. ZEBRA and the stylized Zebra head are trademarks of ZIH Corp., registered in many jurisdictions worldwide. All other trademarks are the property of their respective owners.

COPYRIGHTS & TRADEMARKS: For complete copyright and trademark information, go to www.zebra.com/copyright.

WARRANTY: For complete warranty information, go to www.zebra.com/warranty.

END USER LICENSE AGREEMENT: For complete EULA information, go to www.zebra.com/eula.

#### For Australia Only

For Australia Only. This warranty is given by Zebra Technologies Asia Pacific Pte. Ltd., 71 Robinson Road, #05-02/03, Singapore 068895, Singapore. Our goods come with guarantees that cannot be excluded under the Australia Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Zebra Technologies Corporation Australia's limited warranty above is in addition to any rights and remedies you may have under the Australian Consumer Law. If you have any queries, please call Zebra Technologies Corporation at +65 6858 0722. You may also visit our website: www.zebra.com for the most updated warranty terms.

### **Terms of Use**

Proprietary Statement

This manual contains proprietary information of Zebra Technologies Corporation and its subsidiaries ("Zebra Technologies"). It is intended solely for the information and use of parties operating and maintaining the equipment described herein. Such proprietary information may not be used, reproduced, or disclosed to any other parties for any other purpose without the express, written permission of Zebra Technologies.

Product Improvements

Continuous improvement of products is a policy of Zebra Technologies. All specifications and designs are subject to change without notice.

Liability Disclaimer

Zebra Technologies takes steps to ensure that its published Engineering specifications and manuals are correct; however, errors do occur. Zebra Technologies reserves the right to correct any such errors and disclaims liability resulting therefrom.

Limitation of Liability

In no event shall Zebra Technologies or anyone else involved in the creation, production, or delivery of the accompanying product (including hardware and software) be liable for any damages whatsoever (including, without limitation, consequential damages including loss of business profits, business interruption, or loss of business information) arising out of the use of, the results of use of, or inability to use such product, even if Zebra Technologies has been advised of the possibility of such damages. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

# **Revision History**

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev A	12/2017	Initial release

# **Table of Contents**

Copyright	3
For Australia Only	3
Terms of Use	3
Revision History	4

#### 

#### 

C and C++ Sample Application	
Introduction	16
Connecting to the FX Series RFID Reader	17
Compiling the C and C++ Sample Application	20
Debugging the C and C++ Sample Application	23

#### **Embedded Java Application**

	9
Connecting to the FX Series RFID Reader	0
Building the Java Sample Application	6
Debugging the Java Sample Application	9

# **ABOUT THIS GUIDE**

### Introduction

This guide describes how to use the sample applications of the FX Series RFID Reader Embedded SDK.

# **Chapter Descriptions**

Topics covered in this guide are as follows:

- Setting Up SDK for Debugging describes how to set up the SDK to enable remote application debugging.
- C and C++ Sample Application describes how to compile and debug the C and C++ sample applications.
- Embedded Java Application describes how to compile and debug the Java sample application.

### **Notational Conventions**

The following conventions are used in this document:

- FX Series RFID reader refers to the FX7500 and FX9600 RFID readers.
- Bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential.
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

### **Related Documents and Software**

The following documents provide more information about the reader.

- FX Series RFID Reader Integrator Guide, p/n MN000026Axx
- FX7500 RFID Reader Quick Start Guide, p/n MN000070A01
- FX7500 RFID Reader Regulatory Information, p/n MN000027Axx
- FX9600 RFID Reader Quick Start Guide, p/n MN-003087-xx
- FX Series Reader Software Interface Control Guide, p/n 72E-131718-xx
- RFID Demo Applications User Guide, p/n 72E-160038-xx
- FX Series Embedded SDK Installation Guide, p/n MN000537Axx
- FX Series Embedded SDK Programmer's Guide, p/n MN000540Axx
- Application Guide for Zebra Enterprise Mobility Devices, p/n 72E-68902-xx
- RFID 3 API
- EPCglobal Low Level Reader Protocol (LLRP) Standard

For the latest version of these guides and software, visit: www.zebra.com/support.

### **Service Information**

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

When contacting support, please have the following information available:

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

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

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

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

# Setting Up SDK for Debugging

## Introduction

This chapter describes how to set up the SDK to enable remote application debugging. This is required only once to prepare the FX Series RFID Reader for remote debugging of the sample applications.



NOTE: The instructions in this chapter show Microsoft Windows 7 screens. This procedure was not tested on Microsoft Windows 8. The installation was reported as working on Microsoft Windows 8, but is currently not officially supported.



NOTE: Screen captures are for example use only. Actual screens may vary upon product and software release.

To set up the SDK for remote debugging of the sample applications:

1. Execute the shortcut FX Series RFID Reader (the FX7500 is used as an example only) Embedded SDK from the desktop to start the SDK.



Figure 1 Workspace Launcher

2. Select the workspace path of one of the sample applications. For example, to select the C sample application, browse the Workspace Launcher window.



NOTE: The install path of the FX Series Embedded SDK in this example is C:\Zebra-FXSeries -Embedded-SDK. The sample applications are in the following workspace folders:

- C sample application: [INSTALL PATH]\samples\C\CodeSourcery
- C++ sample application: [INSTALL PATH] \samples \C++ \CodeSourcery
- Java sample application: [INSTALL PATH]\samples\Java.
- 3. Select OK.
- 4. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other....

#### Figure 2 Selecting Remote System Explorer



5. Right-click on FX Series in the left window and select Properties.

		.e≡	• 💁 • 🗁 🛷 • 👔 •	§ • ← ← • → •   ≥
emote Systems 🔀 🔧	م <u>ل ک اڑھ اور س</u> م		- Y	
📑 Local	Properties for FXSeries			
👌 FXSeries 🔺 📆 Sftp Files	type filter text	Connector Serv	vices	⇔ • ⇔ • •
⊳ 計 My Home	Connector Services	Available Service	5	
> ⇒ spr Koot ► Processes ► Shells ► Ssh Terminals		▲ ⊗∳ SSH Con	nector Service Settings onnector Service ote Server Launcher auncher Properties	
		Properties		
		Property	Value	
		Description		
			_	

#### Figure 3 FX Series Properties

6. Select Host.



3 - 12 - 13 6 2   6 ! - (	Properties for FXSeries	BRG+S+C		
🖥 Remote Systems 🔀 😽 Team ,	type filter text	Host		↓ ↓ ↓ ↓
<ul> <li>Local</li> <li>KSeries</li> <li>Stp Files</li> <li>Ny Home</li> <li>Root</li> <li>Root</li> <li>Root</li> <li>Root</li> <li>Shells</li> <li>Ssh Terminals</li> </ul>	Connector Services Host	Resource type: Parent profile: System type: Host name: Connection name: Default User ID: Description: Verify host name Configure proxy settin Default encoding Note: This setting co © Default from rem © Other: Cp1252	Connection to remote system ZIN525PW7-RF03 Linux FX9600EE579F FXSeries an only be changed when no subs ote system (Cp1252)	/stem is connected
	0		OK	Cancel

- 7. Enter the Host name of the FX Series RFID Reader (example: FX7500 + last 6 digits of the mac address or IP address).
- 8. In the Default User ID field, enter rfidadm.
- 9. Select OK.
- 10. Expand the FX Series entry.



Figure 5 FX Series Expanded Selection

11. Expand My Home. If the Enter Password window appears, leave the Password field blank and check Save password.

Figure 6 Enter Password Window

Edit Navigate Search Project Run Tools Window Help ★ 🗟 ★ 🗒 🗟 🗟 🕞 🛛 📾 अपने के अपने में अपने 🖉	• % • [@ % • ] !	2 × 31 × ← + + + +   2
<ul> <li>Remote Systems ☆ ★ Team</li></ul>	Enter Password          System type:         Host name:         Connection name:         User ID:         Password (optional):	Linux FX9600EE579F FXSeries rfidadm Save user ID Save password

- 12. Select OK.
- 13. Select Yes or OK on any warning message windows regarding authentication and missing folders for SSH handling.
- 14. In File Explorer, navigate to the samples folder in the SDK installation folder ([INSTALL PATH]\samples).
- 15. Right-click the files gdbserver and samples.sh and select Copy.

#### Figure 7 Copying Sample Files

	of the same hour last			
🔾 🗸 🖌 Computer 🔸 System (C:) 🔸 Zebra-FXSeries-Em	bedded-SDK 🕨 samples 🕨			
<u>File Edit View Tools H</u> elp				
Organize  Include in library  Share with  Burn	New folder			
> 🔆 Favorites	Name	Date modified	Туре	Size
	📕 c	11/29/2017 2:41 PM	File folder	
4 🥽 Libraries	📕 C++	11/29/2017 2:41 PM	File folder	
Documents	퉬 Java	11/29/2017 2;41 PM	File folder	
🖻 🎝 Music	gdbserver	4/7/2014 1:05 PM	File	151 KB
<ul> <li>Pictures</li> <li>Videos</li> </ul>	🚳 samples.sh	4/7/2014 1:05 PM	Shell Script	1 KB

16. Return to the Remote System Explorer, right-click My Home, and select Paste.



NOTE: Copying gdbserver and samples.sh is only required the first time you are using a new FX Series RFID reader for remote debugging of the sample applications.

Figure 8 Pasting Sample Files

😂 Remote System Exp	lorer	r - Eclipse					
<u>File Edit N</u> avigate	Sea	arch <u>P</u> roject <u>R</u> un Tools	: <u>W</u> indow <u>H</u> elp	)			
1 <b>11 - 11 - 1</b> 1 G		₿  ⊨ Ⅱ = 27 Э.	. ⊙e ≒ ,¤'	参 • • • •	<b>&amp;</b> •   🗁 /	🔗 🕶 🛛 🔄 👻 🦂	1
Remote Systems	2	🗞 Team 🛛 🔹 શ   🗇 🕬	⇒ @   ⊡   ঽ				
a 🔁 Sftp Files							
▲ 🔆 My H ▷ 🗀 sa ເଛ଼ା gc ເઢୁ sa ▷ 🛟 Root		New Go Into Go To	•				
⊳ 🐻 Processes 🕞 Shells 🔊 Ssh Term		Open in New Window Show in Table Monitor					
	8	Refresh	F5				
	1 ×	Rename Delete Copy	F2 Delete				
	Ê	Paste					
	+ + +	Move					
	Ŷ	Move Up					

17. Right-click on Ssh Terminals and select Launch Terminal.



#### Figure 9 Selecting Launch Terminal

18. A terminal window opens at the bottom of the main window with a prompt in the Home directory.



Figure 10 Remote System Details

19. Execute sh samples.sh in the terminal window. This creates debug folders for the sample applications, the debug script for the Java sample application, and prepares the gdbserver application.

Figure 11 Debug Information



- 20. Return to previous perspective by selecting the C/C++ button or Java button in the top-right corner of the main window, or by selecting the perspective through Windows > Open Perspective > Other....
- 21. Select File > Exit to close the SDK.

# C and C++ Sample Application

# Introduction

This chapter describes how to compile and debug the C and C++ sample applications.



NOTE: The instructions in this chapter show Microsoft Windows 7 screens. This procedure was not tested on Microsoft Windows 8. The installation was reported as working on Microsoft Windows 8, but is currently not officially supported.

The procedures for both sample applications are identical except for the workspace selected.



NOTE: If using a new FX Series RFID Reader, follow the instructions in Setting Up SDK for Debugging before performing the procedures in this chapter.



NOTE: Screen captures are for example use only. Actual screens may vary upon product and software release.

# **Connecting to the FX Series RFID Reader**

Perform this only if the connection (FX7500 reference only) was not changed or if using a different FX Series RFID Reader. If the connection reference is correct, skip this section.

1. Execute the shortcut FX Series RFID Reader Embedded SDK from the desktop to start the SDK.

Figure 12 Workspace Launcher

Workspace Launcher	
Select a workspace	
Choose a workspace folder to use for this session.	
Workspace: C:\Zebra-FXSeries-Embedded-SDK\samples\C\CodeSou	rcery
Use this as the default and do not ask again	
	OK Cancel
	OK Cancer

2. Select the workspace path of the C or C++ sample application by clicking Browse... in the Workspace Launcher window.



NOTE: The install path of the FX7500 Embedded SDK in this example is

C:\Zebra-FXSeries-Embedded-SDK. The sample applications are in the following workspace folders: - C sample application: [INSTALL PATH]\samples\C\CodeSourcery

- C++ sample application: [INSTALL PATH]\samples\C++\CodeSourcery
- 3. Select OK.
- 4. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other....

Figure 13 Selecting Remote System Explorer



5. Right-click on FX Series in the left window and select Properties.



onsole ⊠ ]gdb

OK

Cancel



6. Select Host.

?

Connector Services   FXSeries   System Files   My Home   Resource type:   Resource type:   Connection to remote system   Parent profile:   ZIN525PW7-RF03   System type:   Linux   Host Host name: FXSeries Default User ID: Infidadm Description: Outing to make the control of the	Remote Systems 52 95 Team	type filter text	Hort	
	<ul> <li>Local</li> <li>FSSeries</li> <li>Sftp Files</li> <li>Root</li> <li>Processes</li> <li>Shells</li> <li>Ssh Terminals</li> </ul>	Connector Services Host	Resource type: Parent profile: System type: Host name: Connection name: Default User ID: Description: Verify host name Configure proxy settin Default encoding Note: This setting cc @ Default from rem O Other: Cp1252	Connection to remote system ZIN52SPW7-RF03 Linux FX9600EE579F FXSeries Infidadm Igs an only be changed when no subsystem is connected iote system (Cp1252)

#### Figure 15 Host Properties

- 7. Enter the Host name of the FX7500 (FX7500 + last 6 digits of the mac address or IP address).
- 8. In the Default User ID field, enter rfidadm.
- 9. Select OK.
- 10. Return to previous perspective by selecting the C/C++ button in the top-right corner of the main window, or by selecting Windows > Open Perspective > Other....

# **Compiling the C and C++ Sample Application**

1. Execute the shortcut FX Series RFID Reader (the FX7500 is used as an example only) Embedded SDK





	C			
	Workspace	Launcher		×
	Select a wor Eclipse store Choose a wo	<b>kspace</b> s your projects in a folder called a workspace. orkspace folder to use for this session.		
(c) Co is a tra of Ora	Workspace:	C:\Motorola-FX7500-Embedded-SDK\samples\C\CodeSourcery	- (	Browse
	🔲 Use this a	s the default and do not ask again		Cancel

2. Select the workspace path of the C or C++ sample application by clicking Browse... in the Workspace Launcher window.



NOTE: The install path of the FX7500 Embedded SDK in this example is

- C:\Zebra-FXSeries-Embedded-SDK. The sample applications are in the following workspace folders: - C sample application: [INSTALL PATH]\samples\C\CodeSourcery
- C sample application: [INSTALL PATH]samples(C)CodeSourcery - C++ sample application: [INSTALL PATH]samples(C++)CodeSourcery
- 3. Select OK.
- 4. To compile the application select Build All or Build Project from the Project menu, or right-click the project name RFIDSample4App in the Project Explorer on the left side of the main window and select Build Project.





After the successful compilation, the Console window at the bottom of the main window displays the compile and linking commands and information.

C/C++ - Eclipse		- • •
<u>File Edit Source Refactor Navigate Sea</u>	arch <u>P</u> roject <u>R</u> un <u>W</u> indow <u>H</u> elp	
	X = 3 2   .e	<i>A</i> •
· · · · · · · · · · · · · · · · · · ·	Quick Access	System Explorer
Project Explorer 23 RFIDSampleApp	□ B: O ⊠ <sup>w</sup> 2 An outline is no	u □ U U U U U U U U U U U U U U U U U U U
	Problems	kall r/lib" /lib -o l



# **Debugging the C and C++ Sample Application**

To debug the sample application:

- 1. Click the debug symbol down arrow **\***, located at the top of the window near the menus.
- 2. Select 1 RFIDSample4App.

Figure 19 Selecting Sample Application



3. If the Enter Password window appears, leave the Password field blank and check Save password.

#### Figure 20 Enter Password Window

철 ▼ 챔 ▼ ☆ ★ ▼ ⇒ ▼   골		Quick Access
Project Explorer 😢 🖳 🗖 🔄 🤹 ╞ 🌣 🗸 Þ 🎏 RFIDSampleApp		
	Enter Password	×
	System type: Host name: Connection name:	Linux FX750099874F FX7500
	Password (optional):	
		☑ Save user ID ☑ Save password
	C	OK Cancel

- 4. Select OK.
- 5. Select Yes or OK on any warning message windows regarding authentication and missing folders for SSH handling.

The Console window at the bottom of the main window indicates that remote debugging is in progress. The Confirm Perspective Switch window may open.







NOTE: Ensure port 2345 is not blocked by the firewall.

6. Select Yes to open the Debug perspective.



Debug - RFIDSampleApp/src/RFIDSampleApp.c - Eclipse			
File Edit Source Refactor Navigate Search Project Run Window Help		8-0 0 1 F	
	Quick Access	🗄 🖻 🔤 C/C++ 📓	Remote System Explorer 🎋 Debug
🐞 Debug 🛿 🙀 😵 🗖 🗖 🗖	🗱 Variables 🔀 💁 Brea	kpoints 👭 Registers 🔳	Modules 🗖 🗖
RFIDSampleApp [C/C++ Remote Application]		ж-	# □ # * * * □ = = -
RFIDSampleApp.elf	Name	Type	Value
Thread [1] 7310 (Suspended : Breakpoint)	(x)= argc	int	1
main() at RFIDSampleApp.c:24 0xcf52	b ➡ argy	char **	0xbeeebc94
Remote Shell	(×)= readerHandle	RFID_HANDLE32	0x0
p⊡ gdb	(×)= rfidStatus	RFID_STATUS	RFID_API_SUCCESS
	-		
RFIDSampleApp.c 🔀			Dutline 🖾 📃 🗆
RFID HANDLE32 readerHandle=NULL;			50 🖻 🔍 🔊 🖉 🖉 🗸 🗸
RFID_STATUS rfidStatus;			
if(argc == 1    argc == 3)			g bUseWin32EventHandling :
if(argc == 1)			S hostName : wchar tíl
{			S readerPort : int
wcscpy(hostName, L"localhost");			S singulationControl : SINGULA
readerPort = 0;			g_antennaInfo : ANTENNA_IN
ر else			+ InventoryFilterOption(RFID_H/
{			+ Createmenu(RFID_HANDLE32)
#ifdef linux			+ ConfigurationMenu(RFID_HAI
g_bUsewin32EventHandling = false; // in lunux, just t	ne <u>callback</u> mechanism	Ls suppor <del>v</del>	H InventoryMenu(RFID_HANDLE ▼
۲ ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (			H
E Console 22 @ Tasks I Problems D Everytables I Memory			
PERCENSION AND INCOMENSION AND INCOMENSION		• •• ·%   • <b>8 0</b> 0 🔛	
KFIDSampleApp [C/C++ Remote Application] gab			
			<u></u>
			*
			Þ

NOTE: To switch between the compile perspective and the debug perspective, select the appropriate button at the top right section of the main window, or select Windows > Open Perspective > Other.



ZA

NOTE: If the following error condition occurs, select the Go button is at the top of the main window to continue. This issue should not impact the debugging and is believed to be an issue with the gdbserver on the device which needs further investigation. Report if the execution of the program is not possible as explained in this procedure.

Figure 23 Debug ErrorContinue debugging by selecting Go 🏴 at the top of the main window.





NOTE: Debugging stops at the main function by default. Change the debug settings to alter this if desired.

The Console window at the bottom of the main window shows the application output, which is a menu offering various functions.



Debug - RFIDSampleApp/src/RFIDSampleApp.c - Eclipse				x
File Edit Source Refactor Navigate Search Project Run Window Help				
	» · • • • • • • •		웹 * 원 * 두 수 * → *   권	
	Quick Access	🗄 🔛 🖬 🗠 C/C	🗘 👬 Remote System Explorer 🕸 De	ebug
🕸 Debug 🕱 👋 👘 🔽 🗖 🗖	🗱 Variables 🔀 💁 Brea	kpoints 1919 Regis	iters 🛋 Modules 🗖	
[C] RFIDSampleApp [C/C++ Remote Application]				$\bigtriangledown$
⊿ 🦓 RFIDSampleApp.elf	Name	Type	Value	
Thread [1] 7310 (Running : User Request)				
A Remote Shell				
P 345				
	-			1
	4			Þ
RFIDSampleApp.c 🔀			E Outline 🛛 📼	
RFID_HANDLE32 readerHandle=NULL;			> □ I <sup>4</sup> Ø % ● #	$\bigtriangledown$
RFID_STATUS rfidStatus;			common.h	
{			g_bUseWin32EventHandling	J:
if(argc == 1)			S hostName: wchar_t[]	III
wcscpy(hostName, L" <u>localhost</u> ");			S singulationControl : SINGUL	.A'
readerPort = 0;			g_antennaInfo : ANTENNA_I	IN
else			++ InventoryFilterOption(RFID_	H/
{ #ifdef linux		-	Createmenu(RFID_HANDLE3     ConfigurationMenu(RFID_H	32) • • •
( )		•	< <u> </u>	Þ.
Console 💥 🧟 Tasks 🛞 Problems 🕥 Executables 👖 Memory		■ × %		
RFIDSampleApp [C/C++ Remote Application] Remote Shell				
				^
Command Menu 1. Capability Displays the device capabilities				
2. Configuration				
<ol> <li>Inventory</li> <li>Access - Select Mode of Access</li> </ol>				=
5. Exit				
< III				F T

7. Select 5. Exit or the stop debug button

to complete the debug session.



NOTE: This debug procedure assumes that the GDB debugger executable arm-none-linux-gnueabi.exe resides in a directory path that the IDE (environment variables) can locate. If the IDE experiences problems finding the GDB debugger application, add full path information to the setting as shown in Figure 25.



Debug Configurations	Line .	×
Create, manage, and run config	gurations	Ť.
Ype filter text         C/C++ Application         C/C++ Application         C/C++ Postmortem Debugger         C/C++ Remote Application         C/C++ Remote Application         Java Applet         Java Application         Jr JUnit         Launch Group         Remote Java Application         Jr Task Context Test	Name:       RFIDSample4App         Main ↔ Arguments       ★ Debugger       Common         ✓       Stop on startup at:       main         Debugger Options       Main       Shared Libraries       Gdbserver Settings         GDB debugger:       C:\SGLite\bin\arm-none-linux-gnueabi-gdb       Browner         GDB command file:       .gdbinit       Browner         (Warning: Some commands in this file may interfere with the startup operation of the debugge example "run".)       Non-stop mode (Note: Requires non-stop GDB)         Enable Reverse Debugging at startup (Note: Requires Reverse GDB)       Force thread list update on suspend         Automatically debug forked processes (Note: Requires Multi Process GDB)       Tracepoint mode:	NSE NSE r, for
Filter matched 12 of 12 items	Using GDB (DSF) Automatic Remote Debugging Launcher - <u>Select other</u> Apply	Revert
?	Debug	Close

# Embedded Java Application

# Introduction

This chapter describes how to compile and debug the Java sample application.



NOTE: The instructions in this chapter show Microsoft Windows 7 screens. This procedure was not tested on Microsoft Windows 8. The installation was reported as working on Microsoft Windows 8, but is currently not officially supported.



NOTE: If using a new FX Series RFID Reader, follow the instructions in Setting Up SDK for Debugging before performing the procedures in this chapter.



NOTE: Screen captures are for example use only. Actual screens may vary upon product and software release.

# **Connecting to the FX Series RFID Reader**

Perform this only if the connection (FX7500 reference only) was not changed or if using a different FX Series RFID Reader. If the connection reference is correct, skip this section.

1. Execute the shortcut FX RFID Reader Embedded SDK from the desktop to start the SDK.

Figure 26 Workspace Launcher

😂 Workspace	Launcher		×		
Select a wo	Select a workspace				
Eclipse store Choose a we	s your projects in a folder called a workspace. orkspace folder to use for this session.				
<u>W</u> orkspace:	C:\Zebra-FXSeries-Embedded-SDK\samples\Java		Browse		
Use this a	s the default and do not ask again	ОК	Cancel		

2. Select the workspace path of the Java sample application by clicking Browse... in the Workspace Launcher window.



NOTE: The install path of the FX7500 Embedded SDK in this example is

C:\Zebra-FXSeries-Embedded-SDK\. The Java sample application is in the following workspace folder: [INSTALL PATH]\samples\Java

- 3. Select OK.
- 4. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other....

Figure 27 Selecting Remote System Explorer



5. Right-click on FX7500 in the left window and select Properties.



#### Figure 28 FX7500 Properties

6. Select Host.

le <u>E</u> dit <u>N</u> avigate Se <u>a</u> rch <u>P</u> roject ♀ ➡ ➡ ➡ ➡ ➡ ➡ = = (	Run Tools Window Help	BAGANA		
<ul> <li>Terret Version State</li> <li>Terret Version State</li> <li>Terret Version</li> <li>Terr</li></ul>	Properties for FXSeries           type filter text           Connector Services           Host	Host Resource type: Parent profile: System type:	Connection to remote system ZIN52SPW7-RF03 Linux	
▶ 🌇 Processes 🕞 Shells ▶ 🥲 Ssh Terminals		Host name: Connection name: Default User ID: Description: Verify host name <u>Configure proxy settin</u> Default encoding Note: This setting ca @ Default from rem	FX9600EE579F FXSeries if idadm gs an only be changed when no subsystem is on the system (Cn1252)	onnected
		O Other: Cp1252	*	
	0			

#### Figure 29 Host Properties

- 7. Enter the Host name of the FX7500 (FX7500 + last 6 digits of the mac address or IP address).
- 8. In the Default User ID field, enter rfidadm.
- 9. Select OK.
- 10. Return to previous perspective by selecting the Java button in the top-right corner of the main window, or by selecting Windows > Open Perspective > Other....
- 11. Right-click on RFIDSample4App in the Package Explorer window and select Debug As > Debug Configurations.

L E L C		New	•	1			
e Edit Sour		Go Into					
a · ua · la		Open in New Window		\$ . O . @ . @			
		Open Type Hierarchy	FA		Quick Access		Java 📲 Remote System Exp
Package Expl		Show In	Alt+Shift+W ▶				🗐 Task List 🐹 👘
	(FB)	Conv	Ctrl+C				💣 🕶 🛛 🐨 🖓
RFIDSan	臣	Copy Qualified Name	cure				$\bigtriangledown$
		Paste	Ctrl+V				
	×	Delete	Delete				Connect Mylyn
	2.	Remove from Context	Ctrl+Alt+Shift+Down				ALM tools or create
		Build Path	Carr Aler Siller Down				local task.
		Source	Alt+Shift+S 🕨				
		Refactor	Alt+Shift+T 🕨				E Outline 23
		Import					An outline is not available
	2	Export					
	-	Build Project					
	S	Refresh	F5				
	~	Close Project					
		Close Unrelated Projects		-			
		Assign Working Sets		claration 🕸 Debug 🖉 1	Terminals 🔀		-
		Run As	•	Terminal subsystem under	the target. Then selec	t 'Launch Terminal'	from the context menu.
		Debug As	•	🛐 1 Java Applet	Alt+Shift+D,	A	
		Profile As	•	2 Java Application	Alt+Shift+D	, J	
		Validate		Debug Configurations	5		
		Team	•		/		
		Compare With	•				
		Restore from Local History					
		Configure	•				
		Properties	Alt+Enter				

Figure 30 Selecting Debug Configurations

12. Select RFIDSample4App under Remote Java Application.

Debug Configurations Create, manage, and run cor Attach to a Java virtual machine	nfigurations e accepting debug connections
type filter text C C/C++ Application C C/C++ Application C C/C++ Remote Applic Java Applet Java Applet Java Applet Application Ju JUnit Launch Group Maven Build Remote Java Application Lask Context Test	Name:       RFIDSampleApp         Project:       RFIDSampleApp         RFIDSampleApp       Browse         Connection Type:       Standard (Socket Attach)         Standard (Socket Attach)       *         Conngction Properties:       Host:       FX750099874F         Port:       8998         Allow termination of remote VM
← Ⅲ ► Filter matched 12 of 12 items	Apply Reyert
?	Debug Close

Figure 31 Selecting RFIDSample4App

13. Enter the Host name of the FX7500 (FX7500 + last 6 digits of the mac address or IP address) and click Apply.

Image: Second state sta		
		Browse
Filter matched 12 of 12 items	Apply	Re <u>v</u> ert

#### Figure 32 Entering Host Name

14. Select Close.

# **Building the Java Sample Application**

15. Execute the shortcut FX Series RFID Reader Embedded SDK from the desktop to start the SDK.

Figure 33 Workspace Launcher

Workspace	e Launcher		X
Select a wor	r <b>kspace</b> ss your projects in a folder called a workspace. orkspace folder to use for this session.		
<u>W</u> orkspace:	C:\Zebra-FXSeries-Embedded-SDK\samples\Java	•	Browse
🕅 <u>U</u> se this a	s the default and do not ask again	ОК	Cancel

16. Select the workspace path of the Java sample application by clicking Browse... in the Workspace Launcher window.



NOTE: The install path of the FX7500 Embedded SDK in this example is C:\Zebra-FXSeries-Embedded-SDK. The Java sample application is in the following workspace folder: [INSTALL PATH]\samples\Java

- 17. Select OK.
- 18. To compile the application select Build All or Build Project from the Project menu, or right-click the project name RFIDSample4App in the Project Explorer on the left side of the main window and select Build Project.





After the successful compilation, the Problems window at the bottom of the main window does not show any errors.



Figure 35 Problems Window

## **Debugging the Java Sample Application**

1. In the Package Explorer, open RFIDSample4App.java under RFIDSample4App > src > org > zebra > RFIDSample4App.

Figure 36 Opening RFID Sample Application

Java - RFIDSampleApp/src/org/moto/RFIDS	mpleApp/RFIDSampleApp.java - Eclipse	- • •
<u>File Edit Source Refactor Navigate Se</u>	rch <u>P</u> roject <u>R</u> un <u>W</u> indow <u>H</u> elp	
📬 🕶 🔚 🐂 🖨   🗟 👎 🌽 💝	▣ • × == ≠   ∞   ∞   ∞   ∞   = ≠   ☆ • 0 • • • • • • • • • •	
	Quick Access 📰 🕅 🦉 Java 🛱 Re	mote System Explorer 🔅 Debug
Package Explorer  Package Exp	<pre>     RFIDSampleAppjava</pre>	Task List S       □         □       •         □       •         □       •         □       •         □       •         □       •         □       Connect Mylyn         Sconnect to your task and ALM tools or create a local task.         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       □         □       RemovePrefil
, (	Problems @ Javadoc @ Declaration 5/2 Debug @ Terminals 23	AccessMenu( getMyReader) updateTags(E + ( III )
	<pre>Command Menu 1. Capability 2. Configuration 3. Inventory 4. Access 5. Exit 5 root@ti-omap3-am3517-evm:~/samples/Java/RFIDSampleApp#</pre>	H
<b>D</b> 🧭		-

- 2. Set a breakpoint in the main window by double-clicking the location of the blue circle at the source code line (the blue circle indicates the breakpoint is active).
- 3. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other.

Figure 37 Selecting Remote System Explorer



4. Expand the FX7500 entry.



Ę	😂 Remote System Explorer - Eclipse																	
	<u>F</u> ile	<u>E</u> dit	<u>N</u> avigate	Se <u>a</u> rch	<u>P</u> roject	<u>R</u> un	Tools	<u>W</u> indow	<u>H</u> elp									
	€2	• 📫	- 8 6	<b>b</b>   <b>b</b>	<u> </u> 0⊳ 00		€ N	r e	\$ V	莽	• 🔾 •	Q.	• 0	1	1 2	- 12	• *	÷ • •
	- 4	Remot Lo A FX > C R S	e Systems (Series ) Sftp Files ) Processes 2 Shells ) Ssh Term	ाnals	am <sub>=</sub> ≝	2 2 2	¢ 4	> @   E		▽								

5. Right-click on Ssh Terminals and select Launch Terminal.

Figure 39 Launching Terminal



6. If the Enter Password window appears, leave the Password field blank and check Save password.

	Quick Acces
Project Explorer ☆ □     Project Explorer ☆     □     □     □     ↓      ↓     ↓     ↓     ↓     ↓     ↓     ↓     ↓     ↓     ↓     ↓     ↓ </th <th></th>	
	Enter Password
	System type: Linux Host name: FX750099874F Connection name: FX7500
	User ID: rfidadm
	Password (optional):
	<ul> <li>✓ Save user ID</li> <li>✓ Save password</li> </ul>
	OK Cancel

Figure 40 Enter Password Window

- 7. Select OK.
- 8. Select Yes or OK on any warning message windows regarding authentication and missing folders for SSH handling. A window opens at the bottom of the main window with a prompt in the Home directory.

Figure 41 FX7500 Window

Remote System Explorer - Eclipse	
<u>File Edit Navigate Search Project Run</u>	<u>Window</u> <u>H</u> elp
	-   ⊕   32,   DP 00 ■ M   ☆ ▼ () ▼ () ▼ () → () ⊕ A ▼   2 ▼ 7 = 7 = 4 + + + +   ≤
	Quick Access 📰 🗄 🛱 C/C++ 🔚 Remote System Explorer
Remote Sys X Sc. Team          Image: Start Start       Image: Start Start         Image: Start Start Start       Image: Start S	□ E Outl ∷ □ □ An outline is not available.
	🖉 Remote System Details 🖗 Tasks 🖉 Terminals 🛛 📃 🗖
	<b>ም</b> FX7500 窓
Properti ☆ Q. Remote □ Property Value Connected Yes Name Ssh Terminals ✓ m	rfidadm@ti-omap3-am3517-evm:~\$

- 9. Return to the Java perspective by selecting the Java button in the top-right corner of the main window or by selecting Windows > Open Perspective > Other....
- 10. Select Windows > Show View > Other... to open the Terminal window.
- 11. Select Remote Systems > Terminals.

- 12. Select OK.
- 13. In the Terminal window, enter cd samples/Java/RFIDSample4App and select Enter to open the folder ~/samples/Java/RFIDSample4App.
- 14. In the Terminal window, enter sh ../RFIDSample4App\_debug.sh and select Enter to start the debug session on the device. After few seconds the Terminal window indicates the remote debug session has started.



NOTE: RFIDSample4App\_debug.sh is created by the samples.sh as described in earlier, and configures the Java debug environment and starts the debug session on the device. To re-use RFIDSample4App\_debug.sh to debug a new Java application, replace the Zebra sample app name org.Zebra.RFIDSample4App.RFIDSampleApp with the new application Java class file name.

Figure 42 Renaming Sample Application





NOTE: Ensure port 8998 is not blocked by the firewall.

15. Click the debug symbol down arrow <sup>\*</sup>, located at the top of the window near the menus.
16. Select 1 RFIDSample4App.





17. If the Enter Password window appears, leave the Password field blank and check Save password.

$  \bullet \forall \bullet \leftrightarrow \bullet \bullet \bullet   =$	Quick Acc
Project Explorer ☆ □ □ \$\$ 0 □ \$\$ 0 ○ \$\$ 0 ■ \$\$ 0 ■ \$\$ RFIDSampleApp	<u></u>
	Enter Password
	System type: Linux Host name: FX750099874F Connection name: FX7500
	User ID: rfidadm
	Password (optional):
	✓ Save user ID         ✓ Save password
	OK Cancel

Figure 44 Enter Password Window

- 18. Select OK.
- 19. Select Yes or OK on any warning message windows regarding authentication and missing folders for SSH handling.



Figure 45 Confirm Perspective Switch Message





R4

Debug - RFIDSampleApp/src/org/moto/RFIDSampleApp/RFIDSampleApp.java - Eclipse Eile Edit Source Refactor Navigate Search Project Run Window Help		
11 • 12 • 13 \$ \$   10   14   17 ≥ \$ 10 11   N   5 \$ \$   2   2   3   3.   17 • 31 • 15 \$ • • • • • • • • • • • • • • • • • •	0   1   ■ M ☆ ▼ O ▼ A ▼ B Ouick Access	C→ A <sup>2</sup> ▼ Java III Remote System Explorer III Debug
<ul> <li>✗ Debug ≅</li> <li>☑ RFIDSampleApp [Remote Java Application]</li> <li>☑ PrevIDK Zero VM[Fx7500090027:8998]</li> <li>☑ Thread [main] (Suspended (breakpoint at line 1523 in RFIDSampleApp))</li> <li>☑ RFIDSampleApp.main(String[]) line: 1523</li> </ul>	09- Variables (2) % Breakpoints (2) Name @ args	•t= □   * * *  Value String[0] (id=15) •
<pre>     RFIDSampleApp.java</pre>	otion {	Cuttine  Cu
Console S 2 Tasks Problems Executables		

NOTE: To switch between the build perspective and the debug perspective, select the appropriate button at the top right section of the main window, or select Windows > Open Perspective > Other.

21. Select Windows > Show View > Other... to open the Terminal window.

- 22. Select Remote Systems > Terminals.
- 23. Select OK.

KA

Figure 47 Terminals Window

Debug - RFIDSampleApp/src/org/moto/RFIDSampleApp/RFIDSampleApp.java - Eclipse File Edit Source Refactor Navigate Search Project Run Window Help							
│ 11 • 12 • 13 15 ▲│ ⋒   ≫   12 / 24 10 11   ≈   15 12   .2   10   24   10 − 11   10   12   10 • 12 − 12   10   10 / 12   10   10   10   10   10   10   10							
2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2	Quick Access 🔡 😫	Java 📳 Remote System Explorer 🔅 Debug					
🏇 Debug 🕄 🦉 🖓 👘 💱 🖓 🗖 🗖	🗱 = Variables 😫 💁 Breakpoints 🐇	= Variables 🛿 💁 Breakpoints 🛛 🍪 🏎 🔛 🗳 🔽 🗖 🗖					
RFIDSampleApp [Remote Java Application]	Name	Value					
ØpenJDK Zero VM[FX750009D027:8998] Inread [main] (Suspended (breakpoint at line 1523 in RFIDSampleApp))	() args	String[0] (id=15)					
RFIDSampleApp.main(String[]) line: 1523							
		\$					
		F					
🔊 RFIDSampleApp.java 🕴		🗄 Outline 😫 📃 🗖					
	^ <u> </u>	🗊 🖻 🛱 😿 😿 🔍 💆					
}		RemovePrefilter(): void AccessMenu(): void					
⊖ public static void main(String[] args) throws InterruptedExcep // TODO Auto-generated method stub	<ul> <li>getMyReader() : RFIDRead</li> </ul>						
RFIDSampleApp rfidBase;	updateTags(Boolean): vc						
}	-	▲ <sup>S</sup> postInfoMessage(String) ▼					
	•						
📮 Console 🧔 Tasks 🖹 Problems 🕡 Executables 🔎 Terminals 🕱							
₩ FX7500 🖾	)						
Welcome to RFID Java Standard Symple Application		*					
Command Menu							
1. Capability							
2. Configuration 3. Inventory							
4. Access 5. Exit							
5 root@ti-oman3-am3517-evm:v/samples/lava/REIDSampleApp# sh /REIDSampl	eAnn debug sh	E					
Listening for transport dt_socket at address: 8998	++						
		-					

24. Continue debugging by selecting the Go button 🏴 at the top of the main window.

NOTE: Debugging stops at the main function due to breakpoint.

The Terminals window at the bottom of the main window shows the application output, which is a menu offering various functions.





25. Select 5. Exit to stop the application or the suspend debug button 🛄 to interrupt the debug session.



www.zebra.com