

FX RFID READER SERIES

**Embedded SDK
Sample Application**



ZEBRA

User Guide

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FX RFID READER SERIES EMBEDDED SDK SAMPLE APPLICATIONS USER GUIDE

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Revision A

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Revision History

Changes to the original manual are listed below:

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

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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.

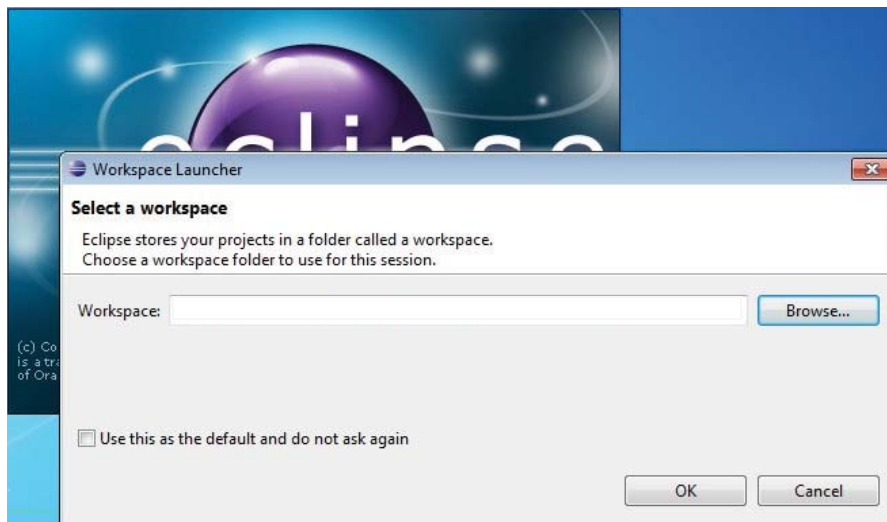


NOTE: Screen captures are for example use only. Actual screens may vary upon product and software release.

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.

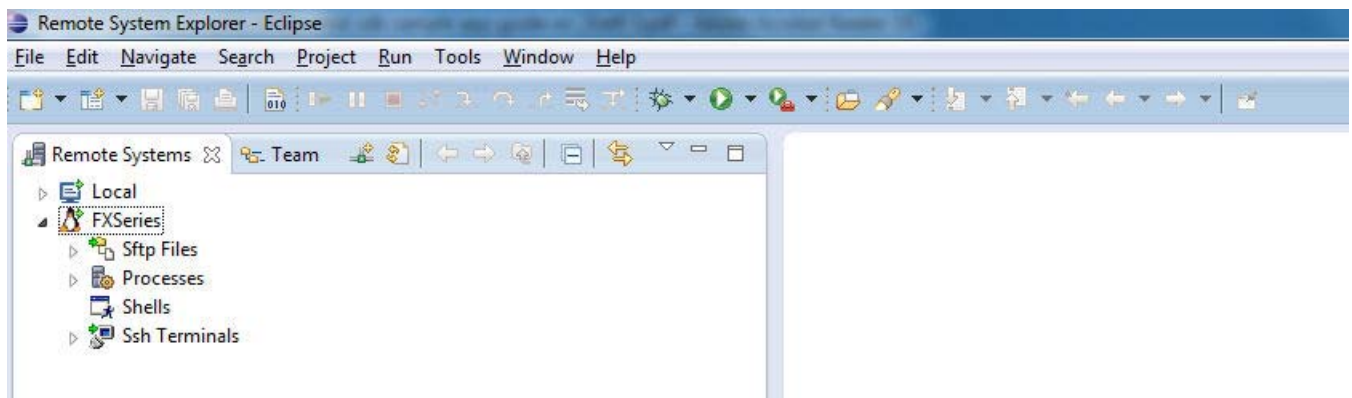


NOTE: The install path of the FX Series Embedded SDK in this example is C:\Zebra-FXSeries -Embedded-SDK. The sample applications are in the following workspace folders:

- C sample application: [INSTALL PATH]\samples\C\CodeSourcery
- C++ sample application: [INSTALL PATH]\samples\C++\CodeSourcery
- Java sample application: [INSTALL PATH]\samples\Java.

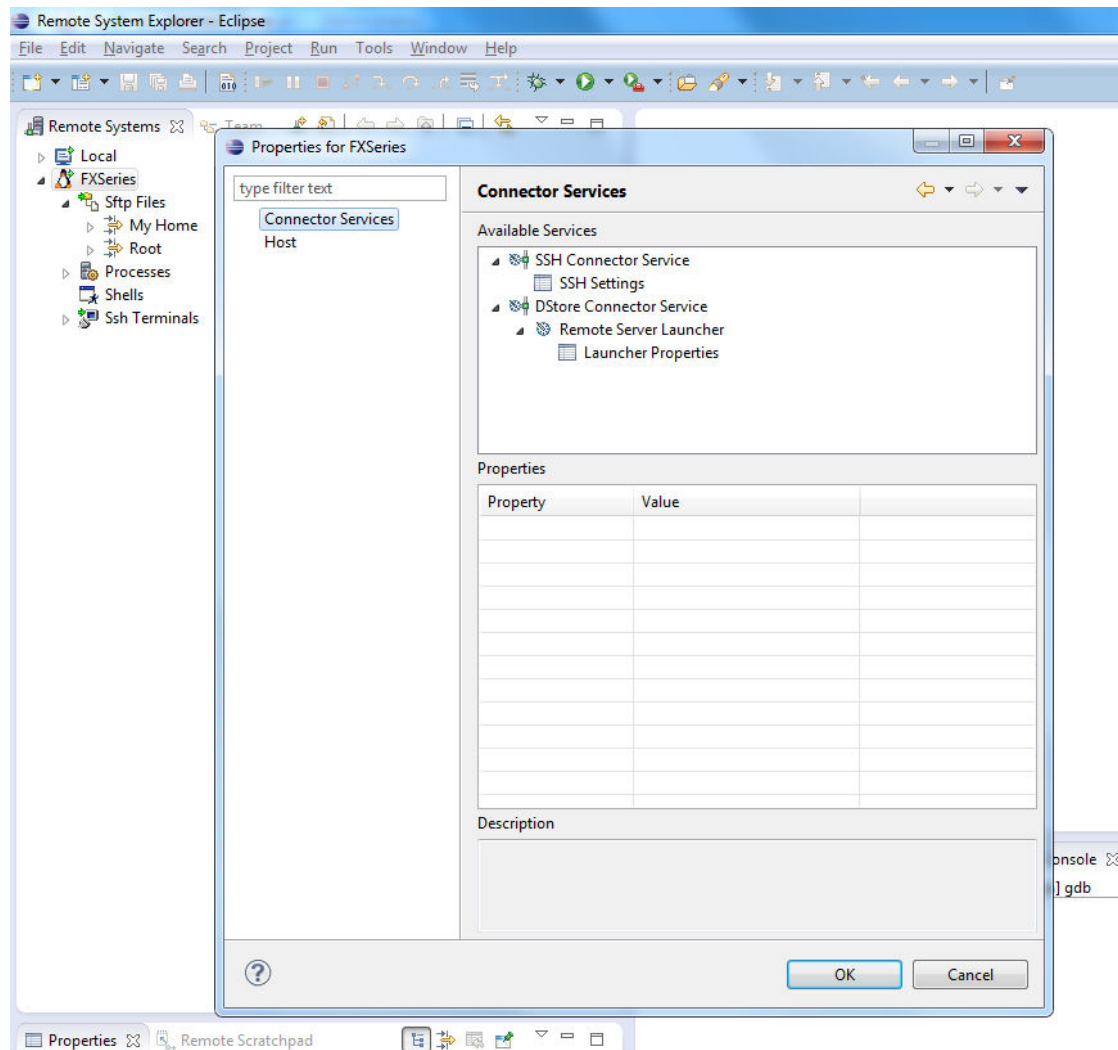
3. Select OK.
4. Select the Remote System Explorer button in the top-right corner of the main window, or select **Windows > Open Perspective > Other....**

Figure 2 Selecting Remote System Explorer



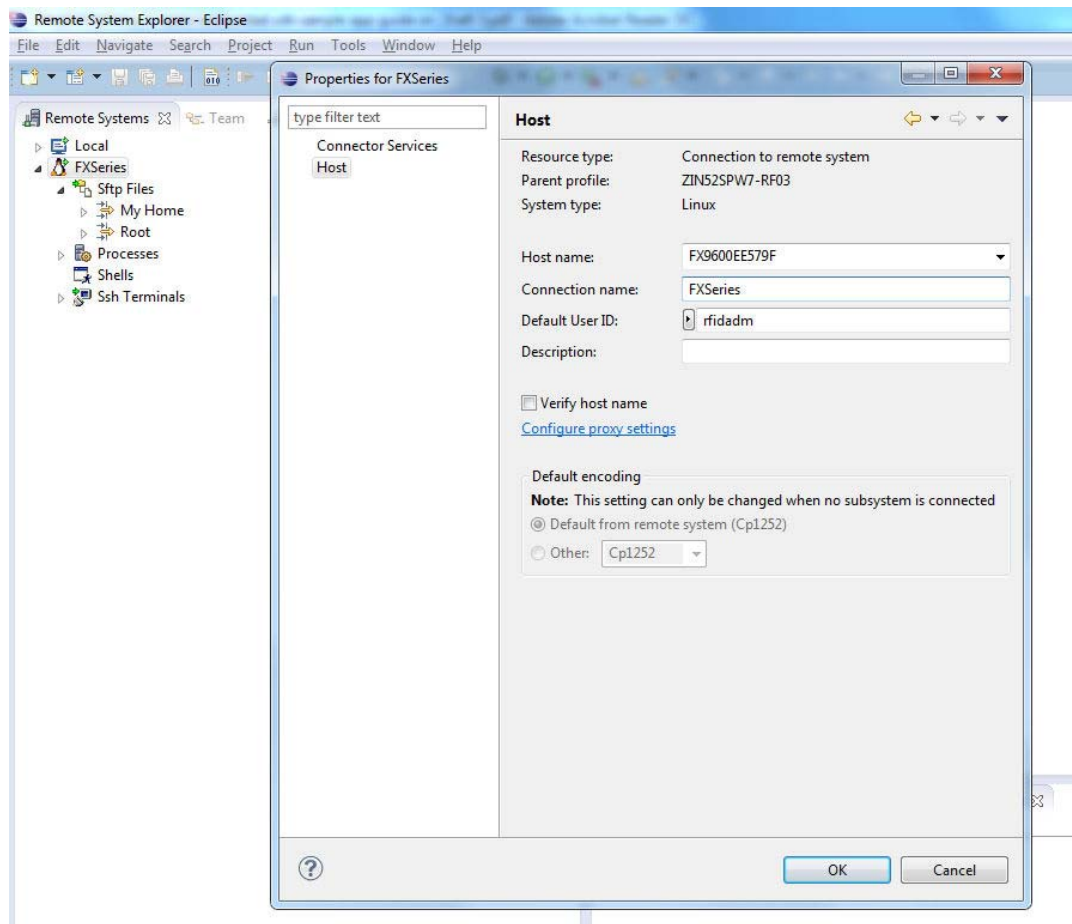
5. Right-click on FX Series in the left window and select **Properties**.

Figure 3 FX Series Properties



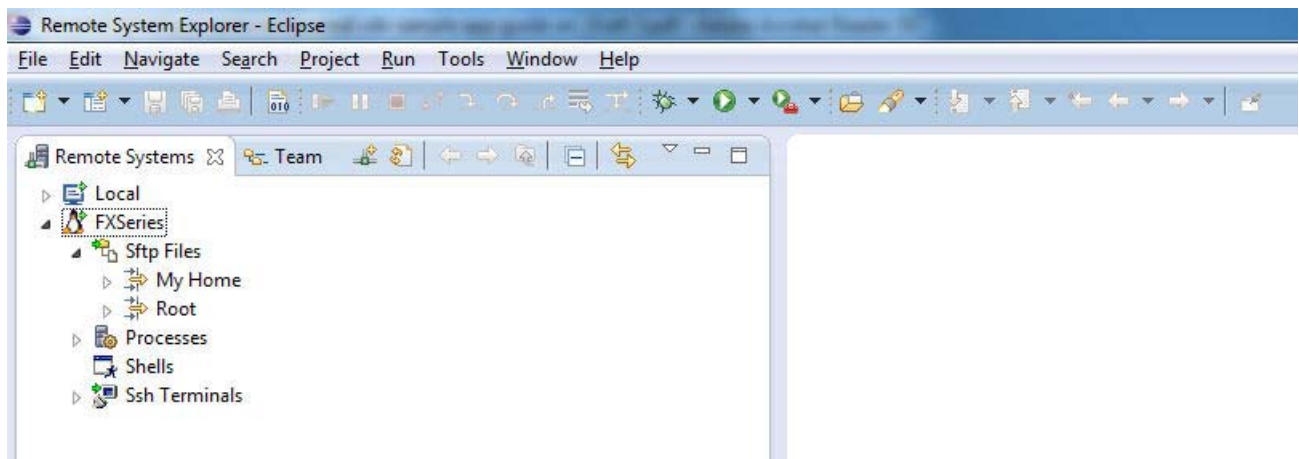
6. Select Host.

Figure 4 Host Properties



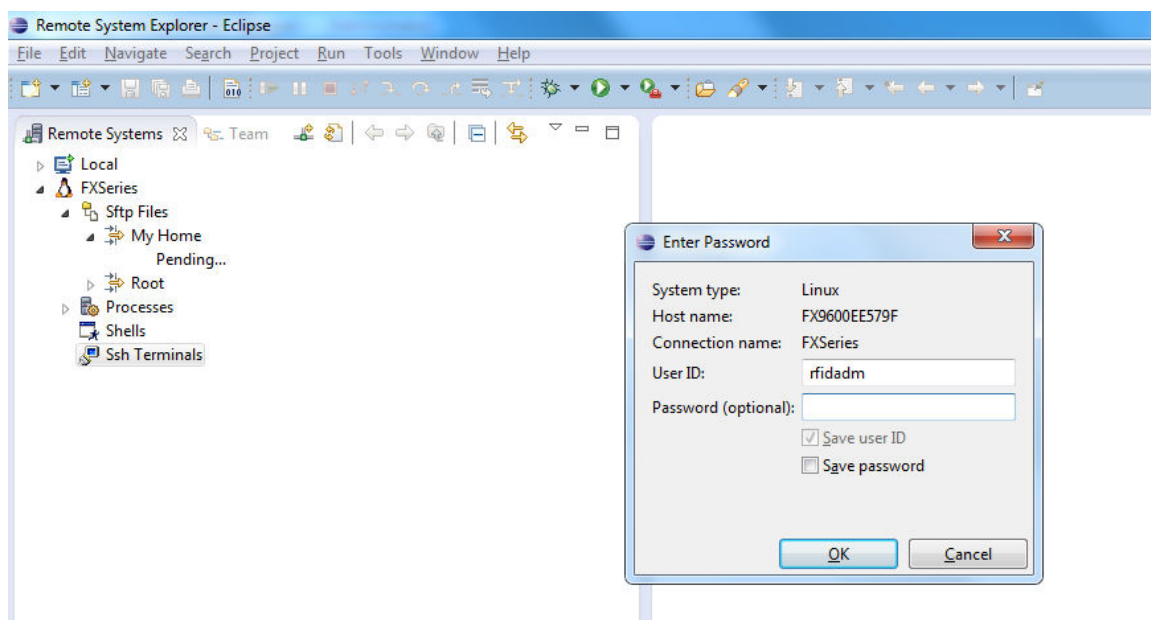
7. Enter the Host name of the FX Series RFID Reader (example: FX7500 + last 6 digits of the mac address or IP address).
8. In the Default User ID field, enter rfidadm.
9. Select OK.
10. Expand the FX Series entry.

Figure 5 FX Series Expanded Selection



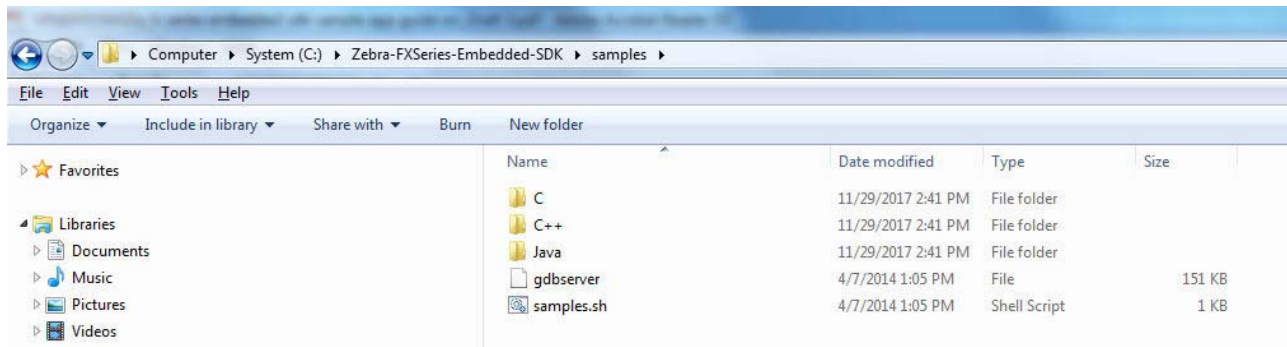
11. Expand My Home. If the Enter Password window appears, leave the Password field blank and check Save password.

Figure 6 Enter Password Window



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

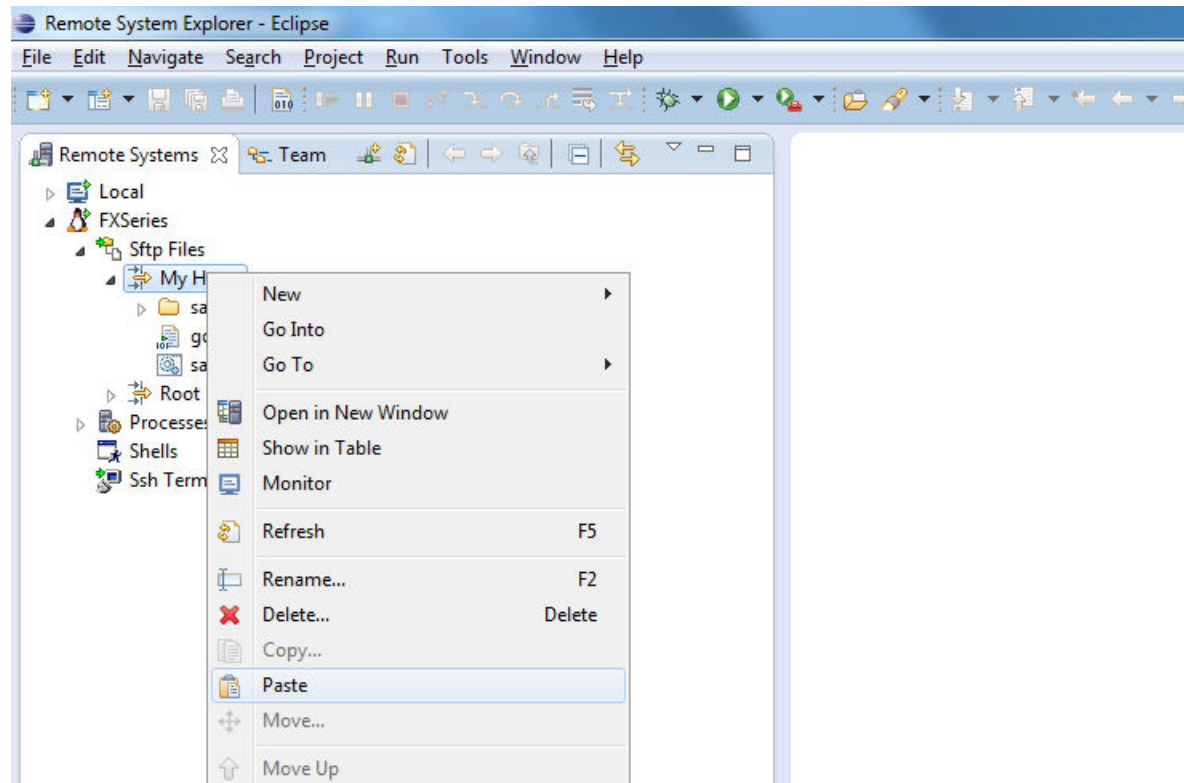


16. Return to the Remote System Explorer, right-click My Home, and select Paste.



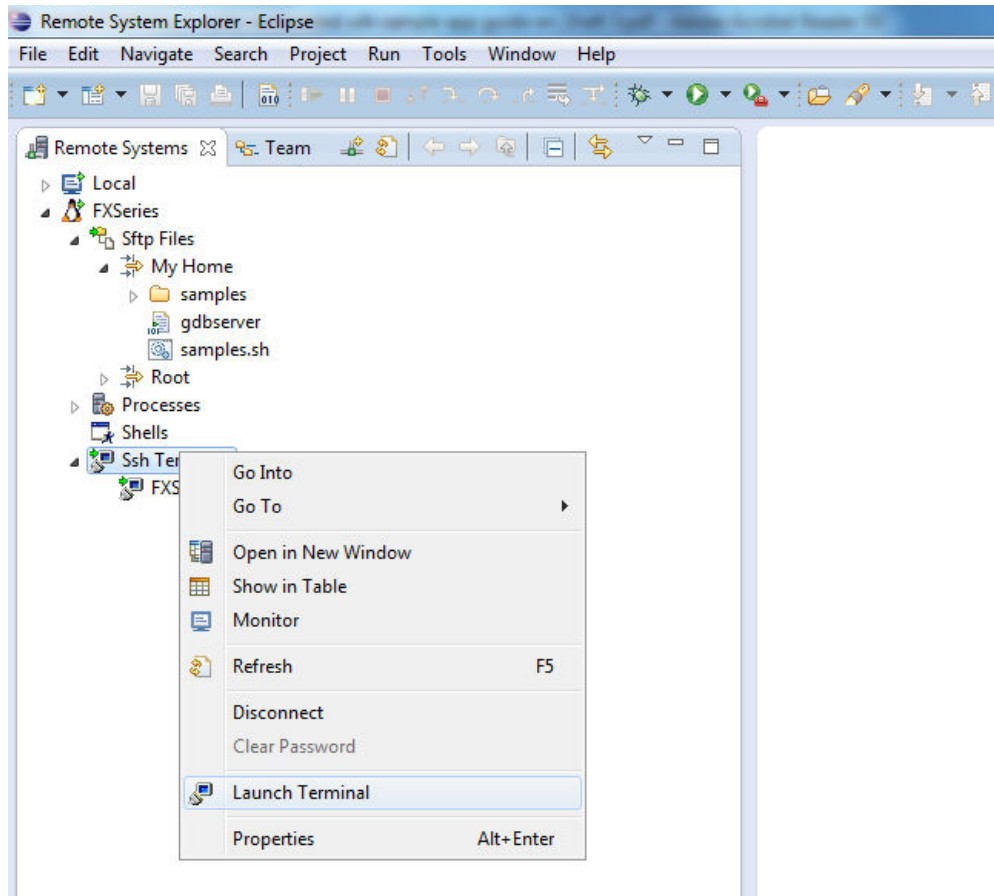
NOTE: Copying gdbserver and samples.sh is only required the first time you are using a new FX Series RFID reader for remote debugging of the sample applications.

Figure 8 Pasting Sample Files



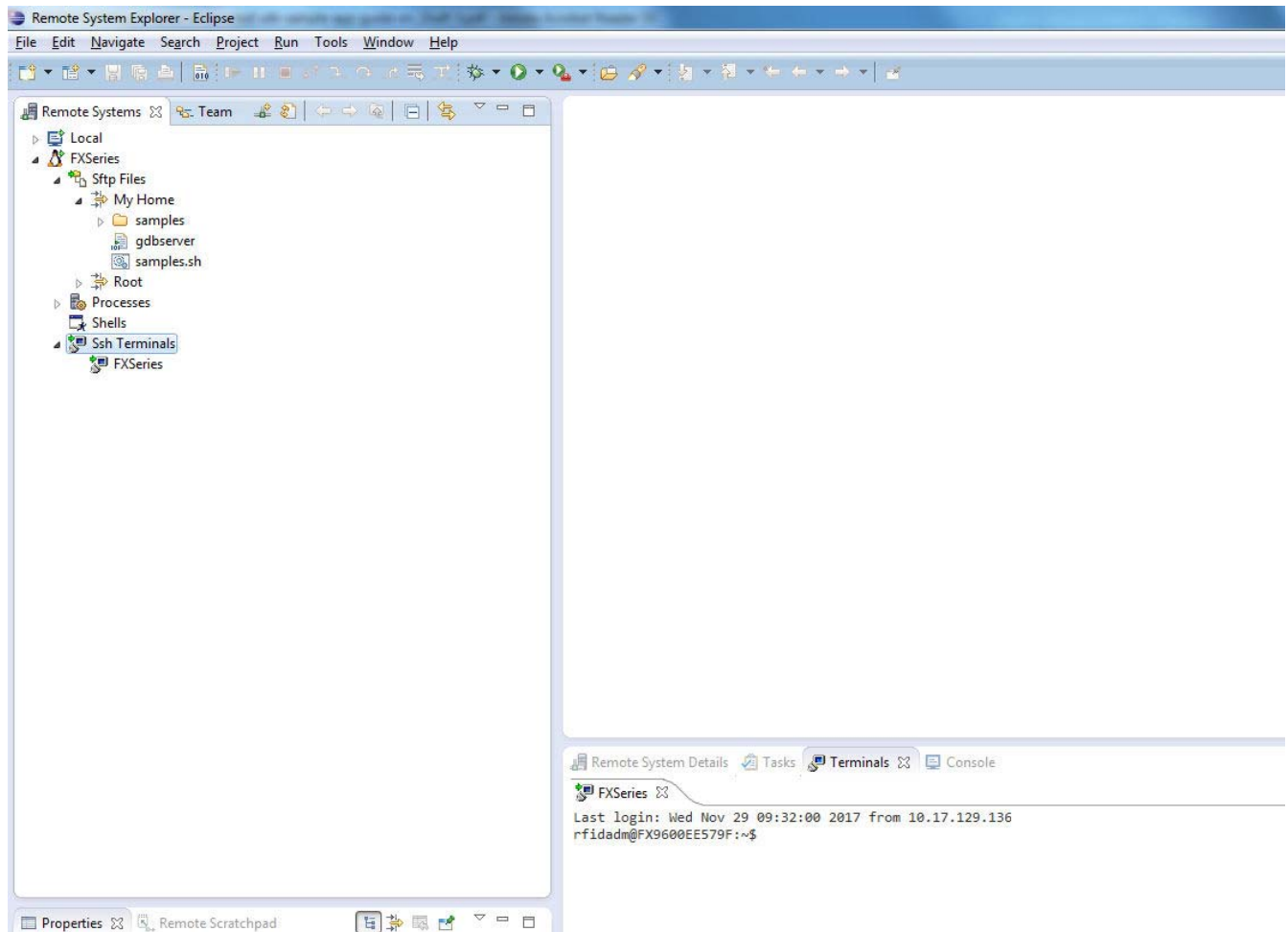
17. Right-click on Ssh Terminals and select Launch Terminal.

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.



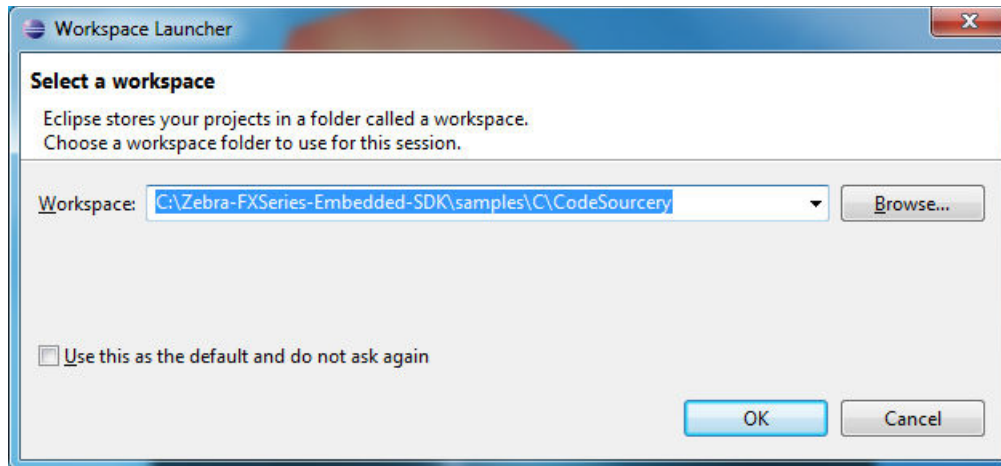
NOTE: Screen captures are for example use only. Actual screens may vary upon product and software release.

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



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

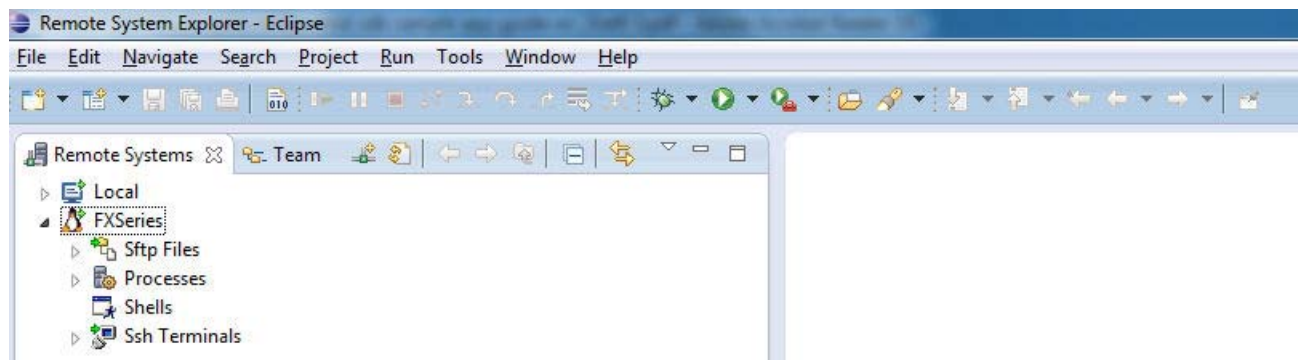


NOTE: The install path of the FX7500 Embedded SDK in this example is C:\Zebra-FXSeries-Embedded-SDK. The sample applications are in the following workspace folders:

- C sample application: [INSTALL PATH]\samples\C\CodeSourcery
- C++ sample application: [INSTALL PATH]\samples\C++\CodeSourcery

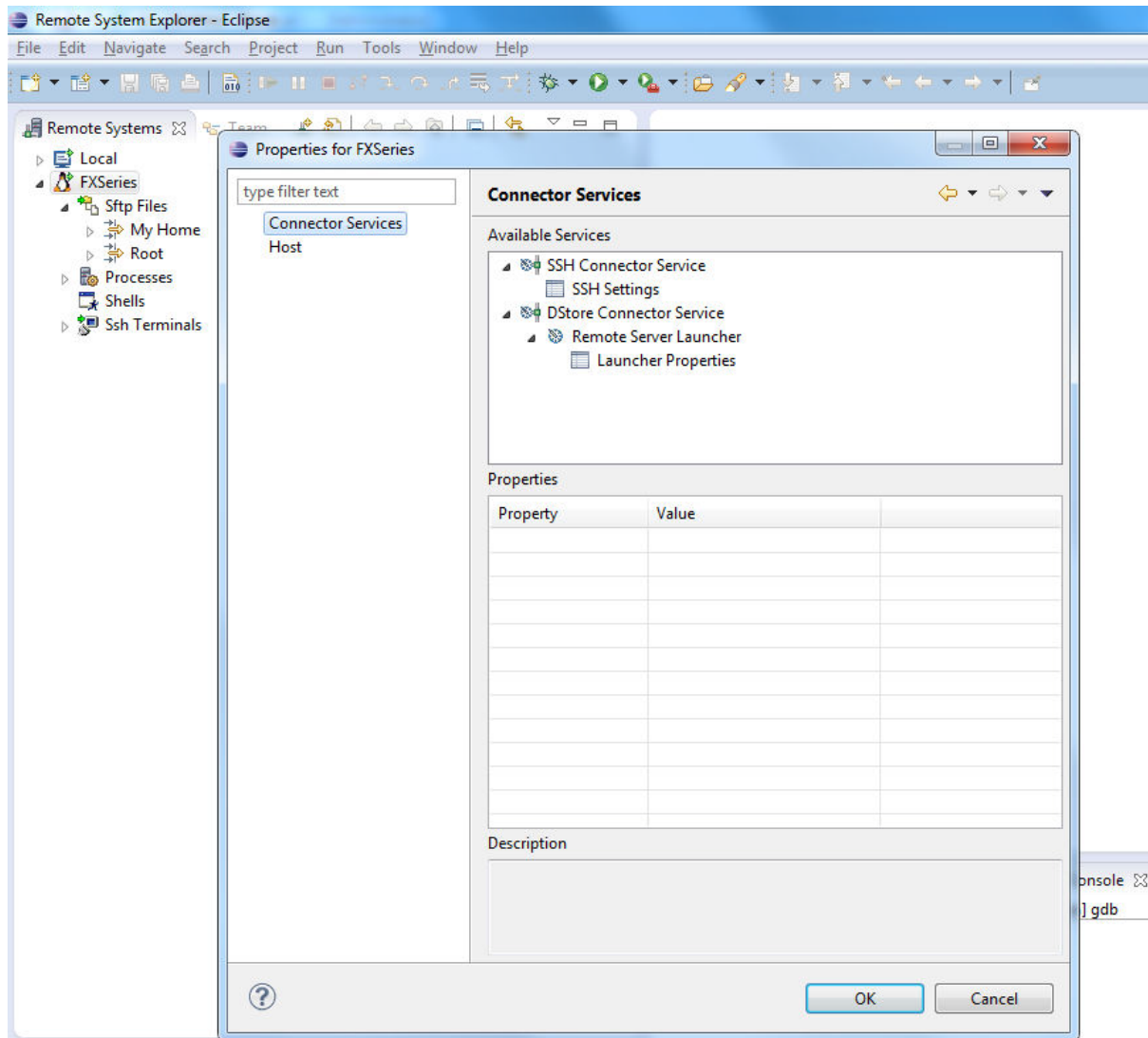
3. Select OK.
4. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other....

Figure 13 Selecting Remote System Explorer



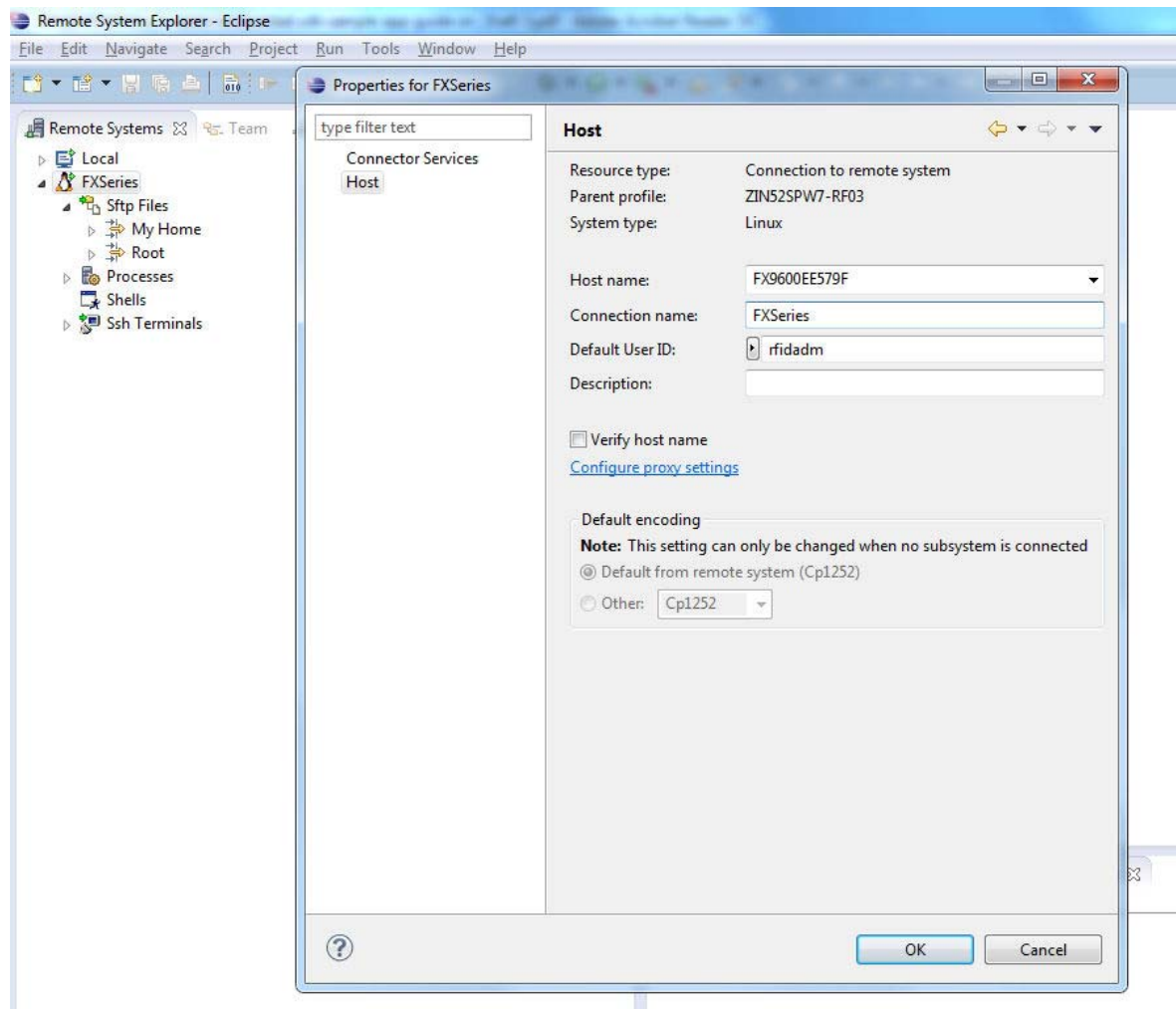
5. Right-click on FX Series in the left window and select Properties.

Figure 14 FX7500 Properties



6. **Select Host.**

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... .

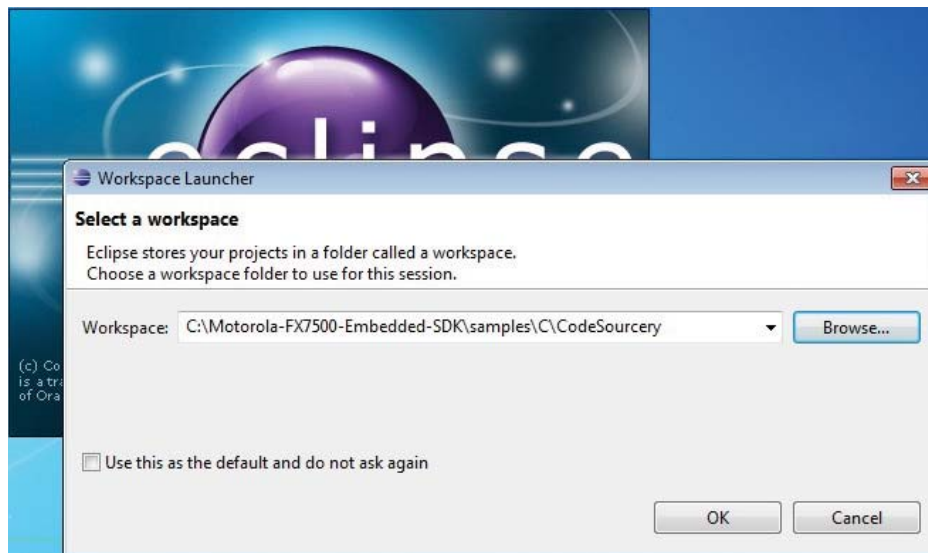
Compiling the C and C++ Sample Application

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



from the desktop to start the SDK.

Figure 16 Workspace Launcher



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

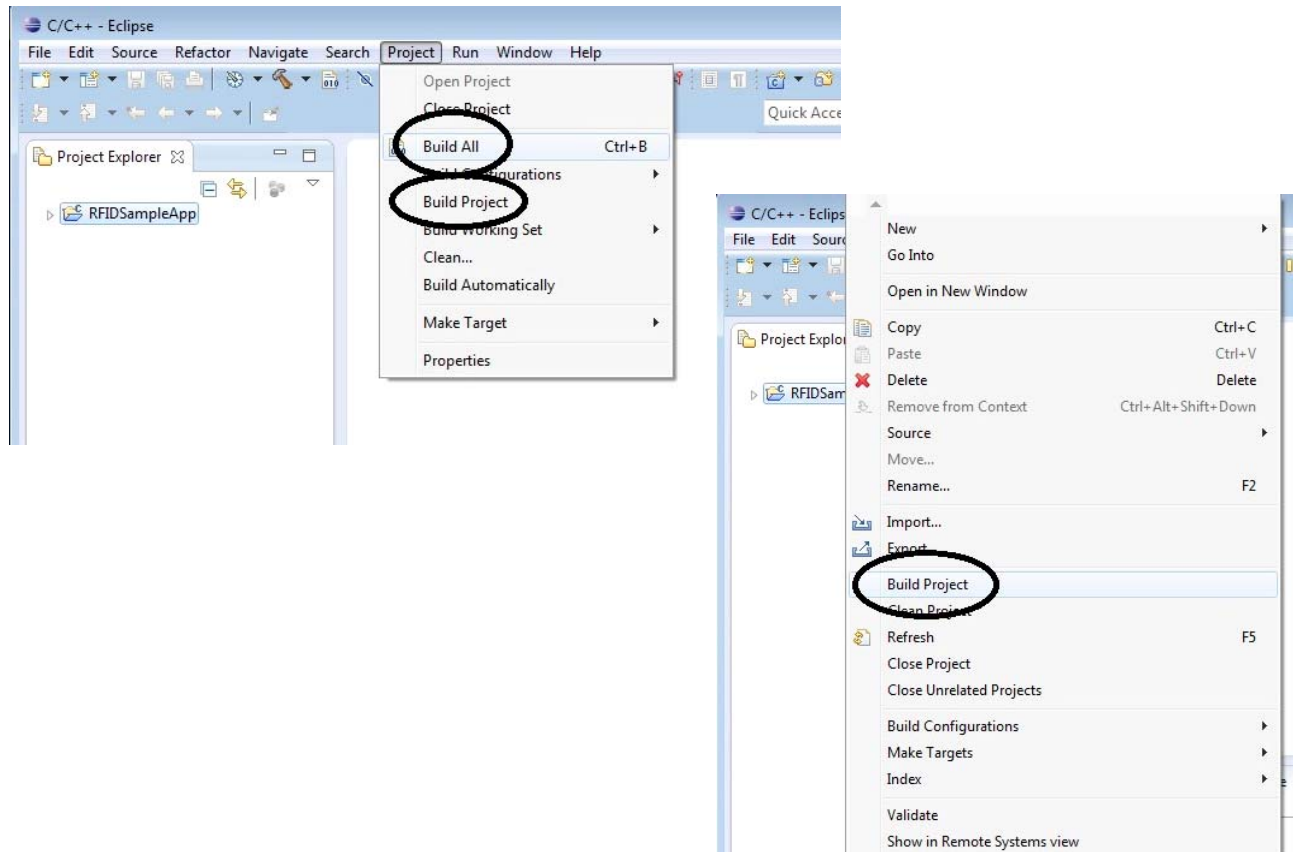


NOTE: The install path of the FX7500 Embedded SDK in this example is C:\Zebra-FXSeries-Embedded-SDK. The sample applications are in the following workspace folders:

- C sample application: [INSTALL PATH]\samples\C\CodeSourcery
- C++ sample application: [INSTALL PATH]\samples\C++\CodeSourcery

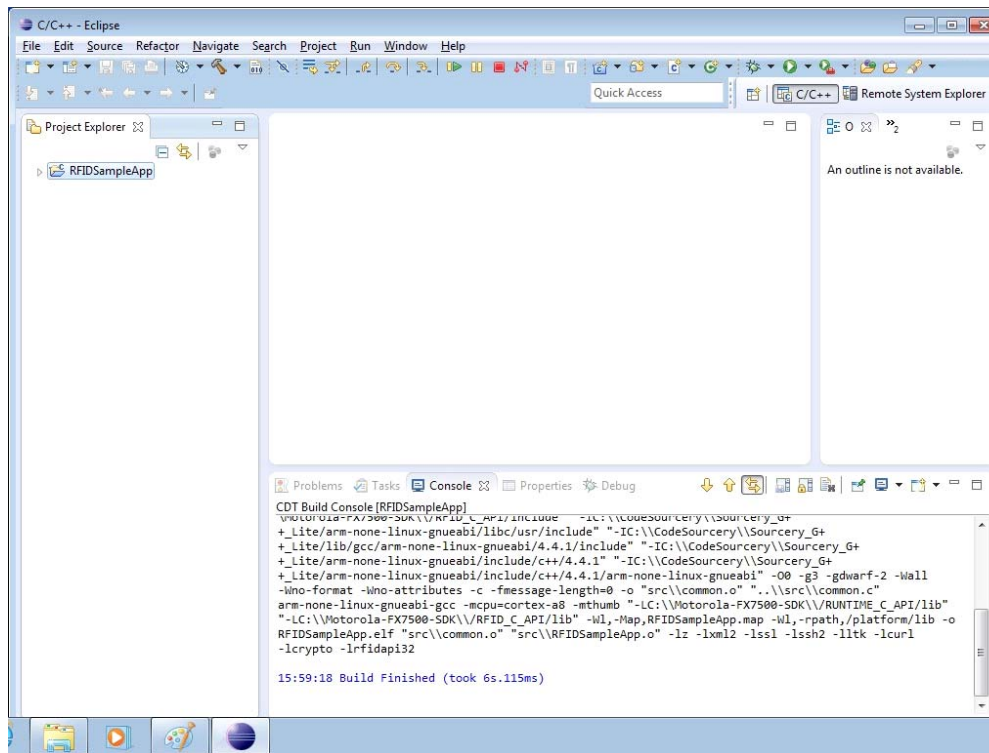
3. Select OK.
4. To compile the application select Build All or Build Project from the Project menu, or right-click the project name RFIDSample4App in the Project Explorer on the left side of the main window and select Build Project.

Figure 17 Building the Project



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

Figure 18 Compile and Linking Commands and Information

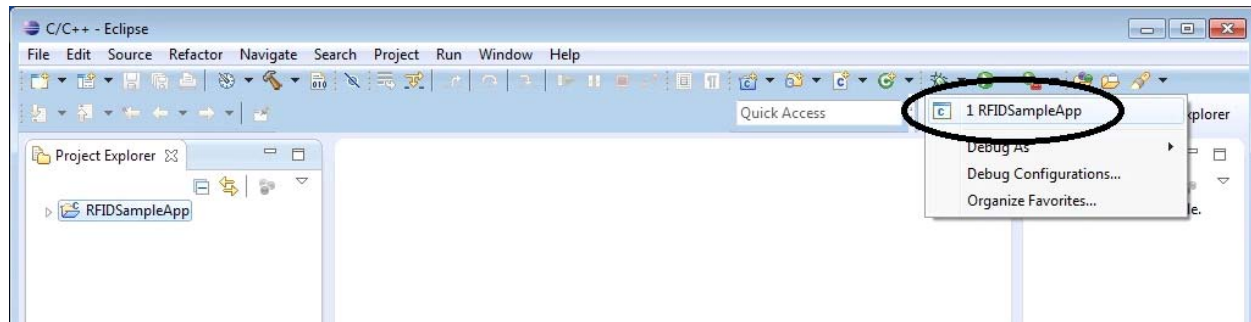


Debugging the C and C++ Sample Application

To debug the sample application:

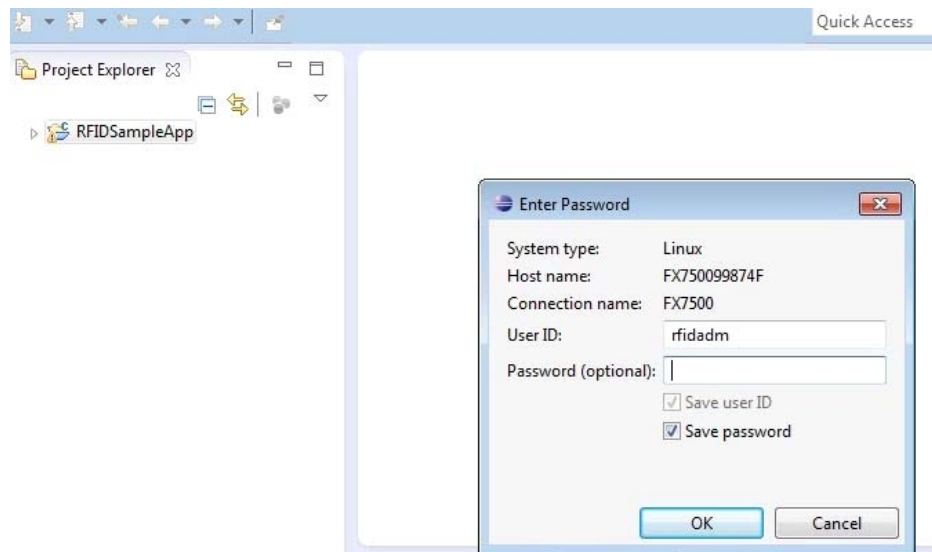
1. Click the debug symbol down arrow  , located at the top of the window near the menus.
2. Select 1 RFIDSample4App.

Figure 19 Selecting Sample Application



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

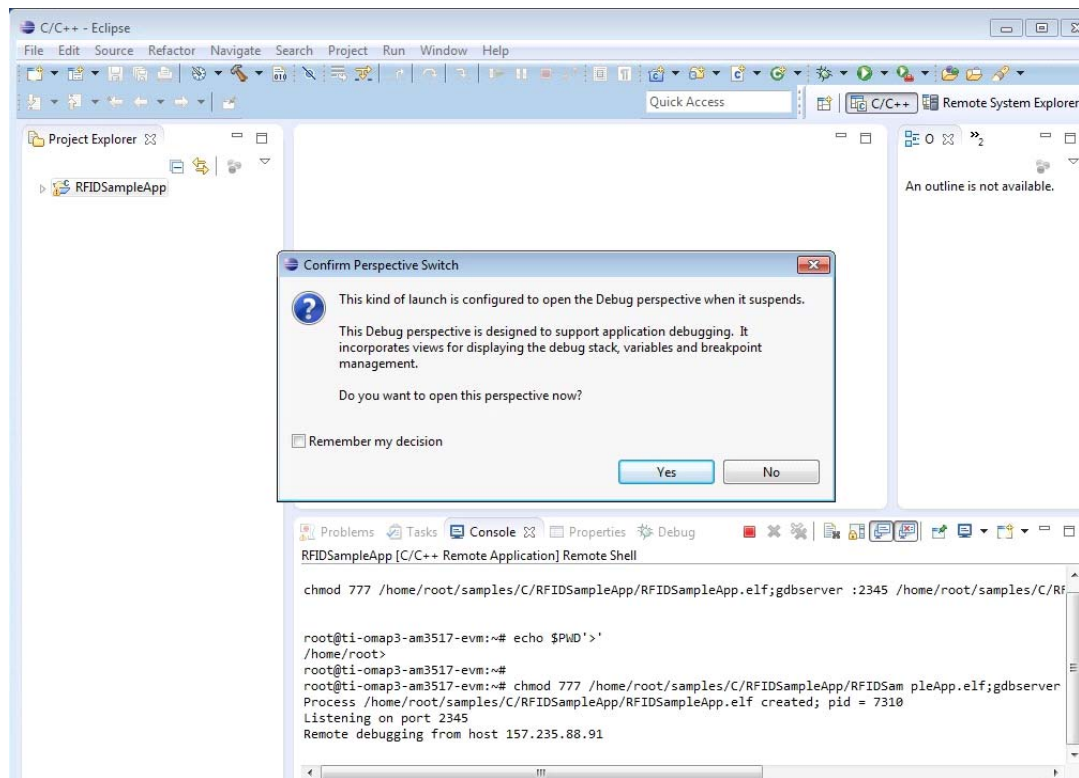
Figure 20 Enter Password Window



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.

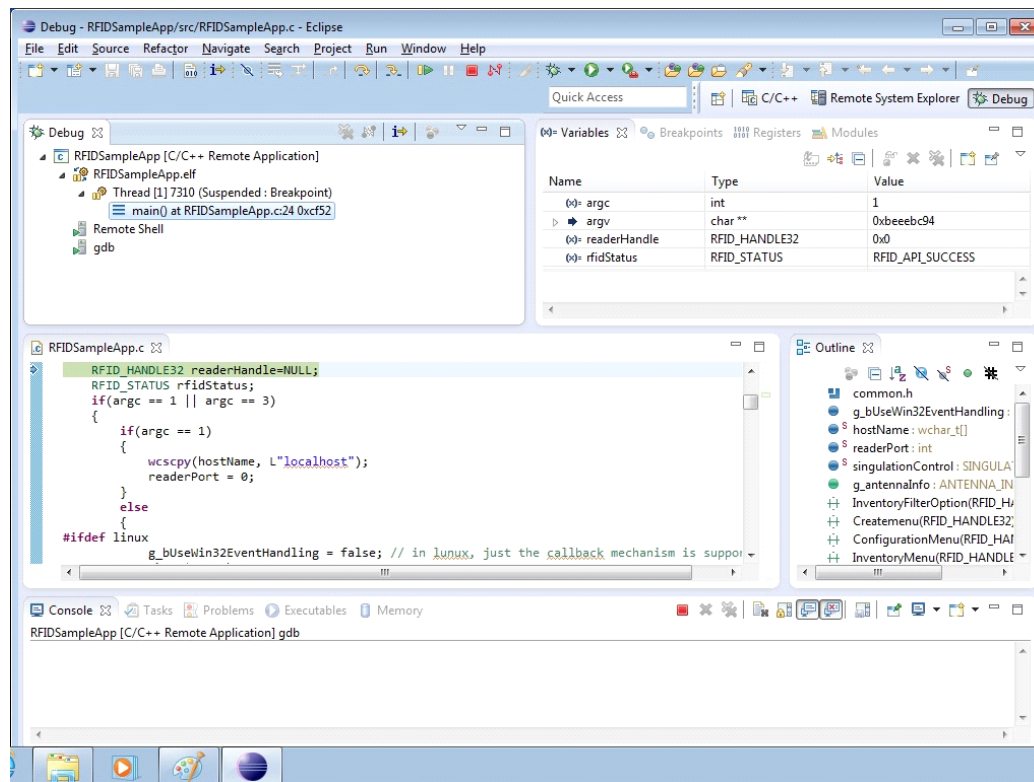
Figure 21 Confirm Perspective Switch Window



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

6. Select Yes to open the Debug perspective.

Figure 22 Debug Window



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**.




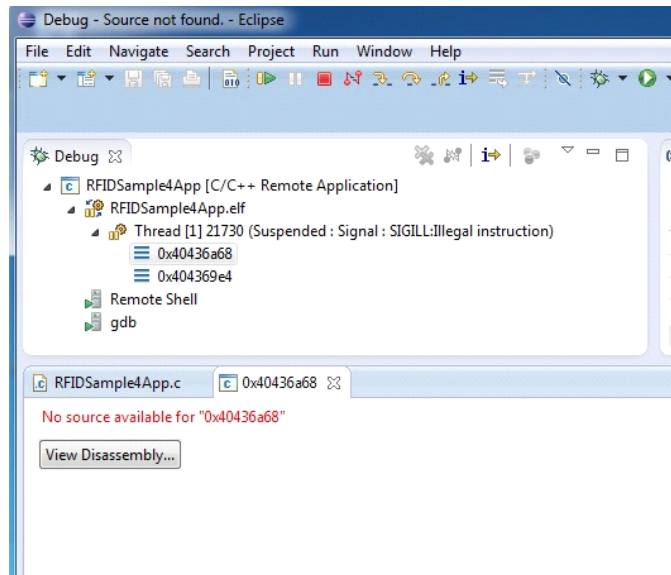
NOTE: If the following error condition occurs, select the Go button  at the top of the main window to continue. This issue should not impact the debugging and is believed to be an issue with the gdbserver on the device which needs further investigation. Report if the execution of the program is not possible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

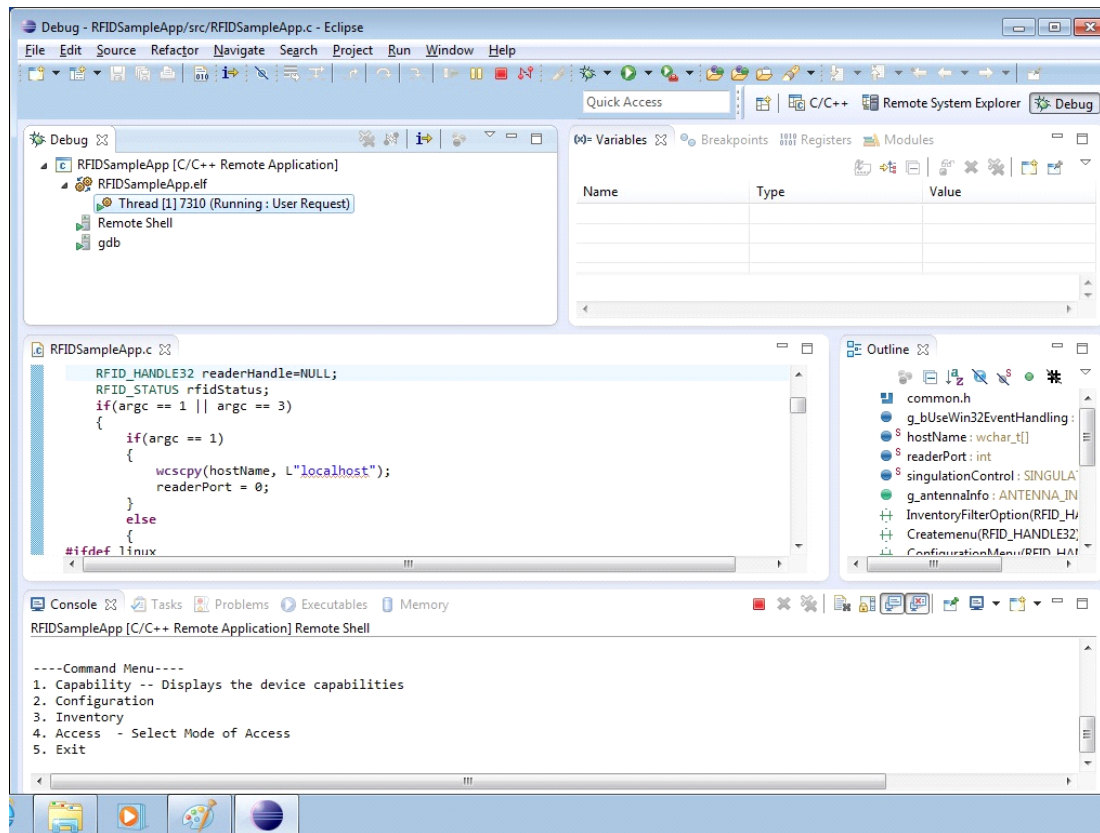
Figure 23 Debug ErrorContinue debugging by selecting Go  at the top of the main window.



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.

Figure 24 Application Output

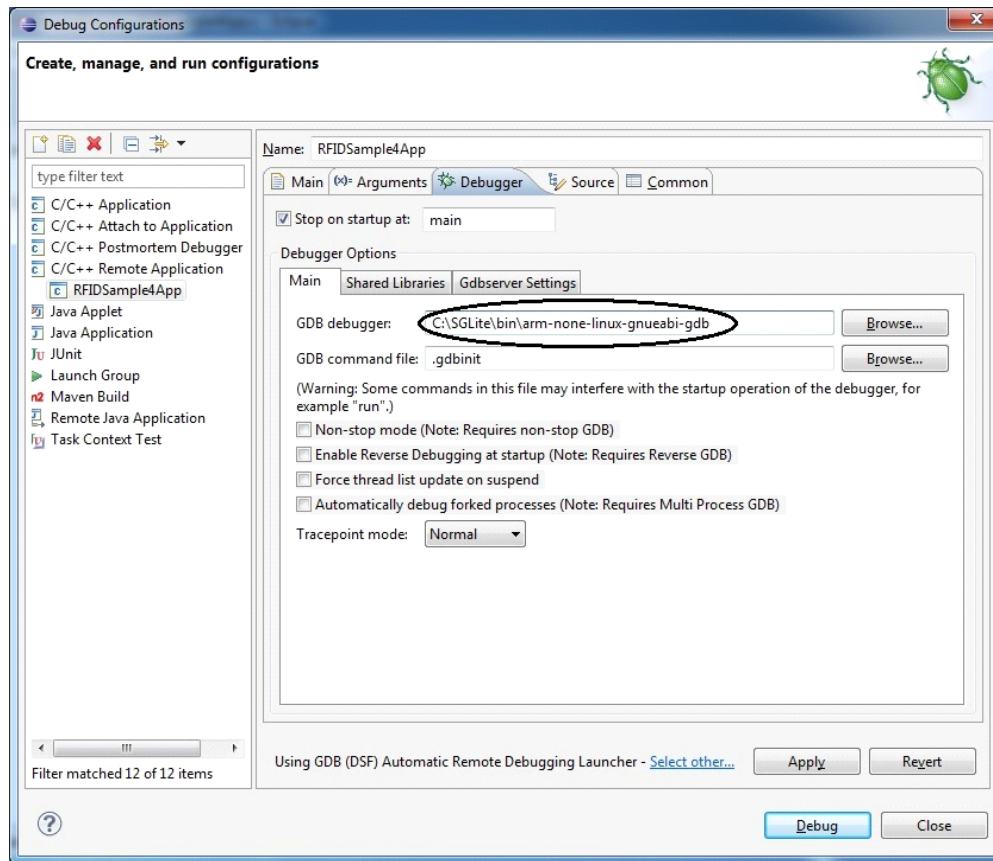


7. Select 5. Exit or the stop debug button  to complete the debug session.



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](#).

Figure 25 GDB Debugger Path Information



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.



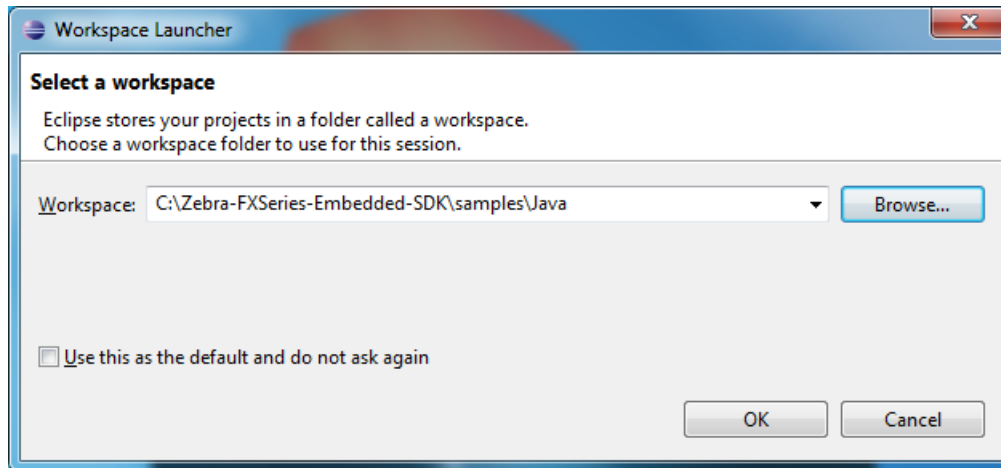
NOTE: Screen captures are for example use only. Actual screens may vary upon product and software release.

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



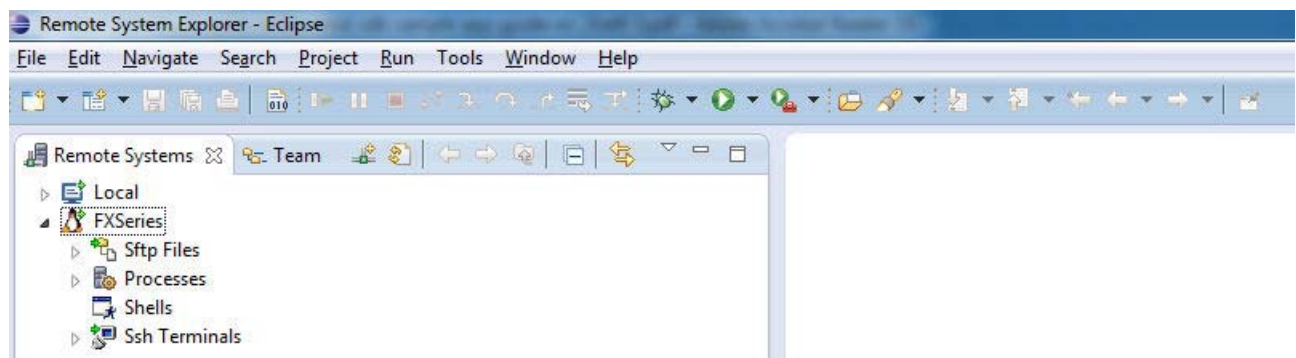
2. Select the workspace path of the Java sample application by clicking Browse... in the Workspace Launcher window.



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

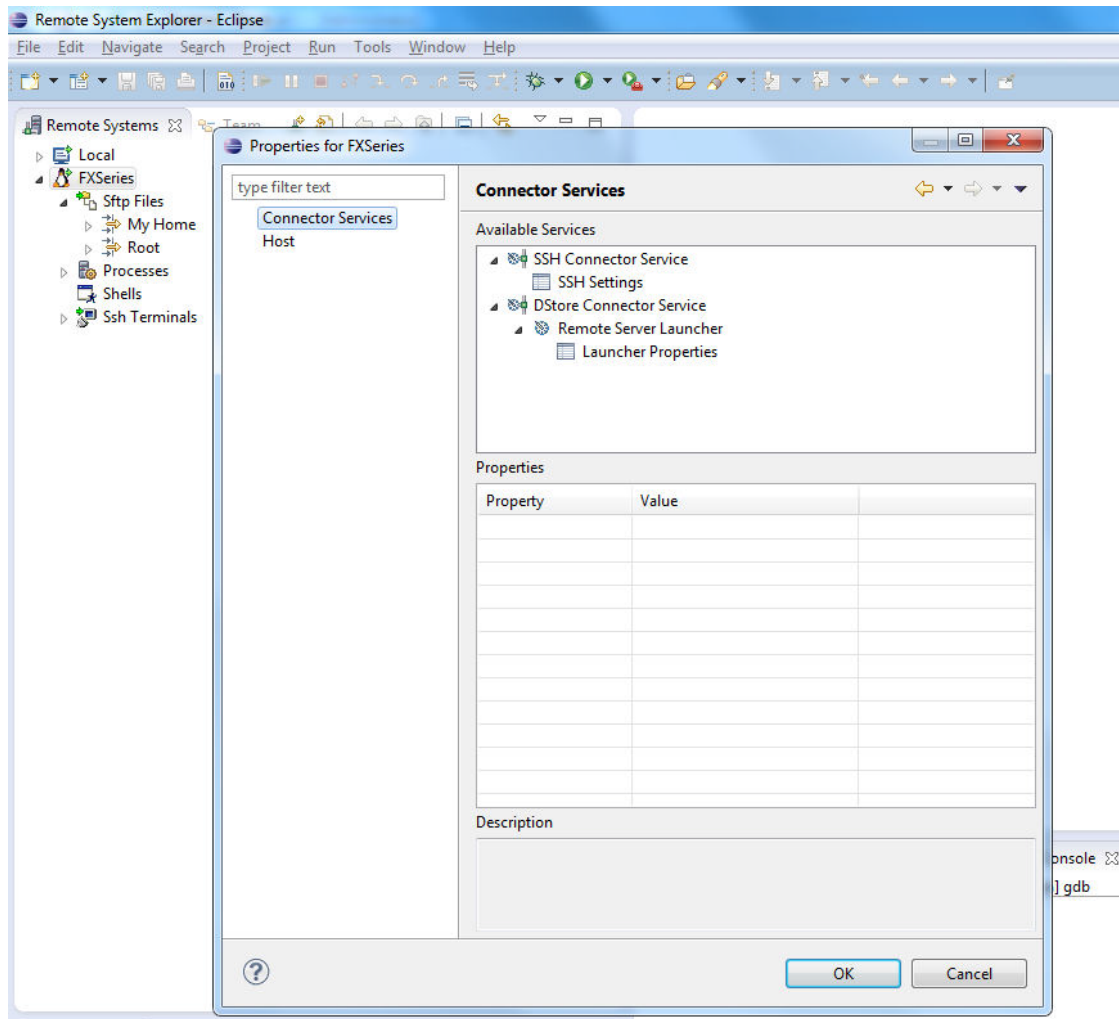
3. Select OK.
4. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other....

Figure 27 Selecting Remote System Explorer



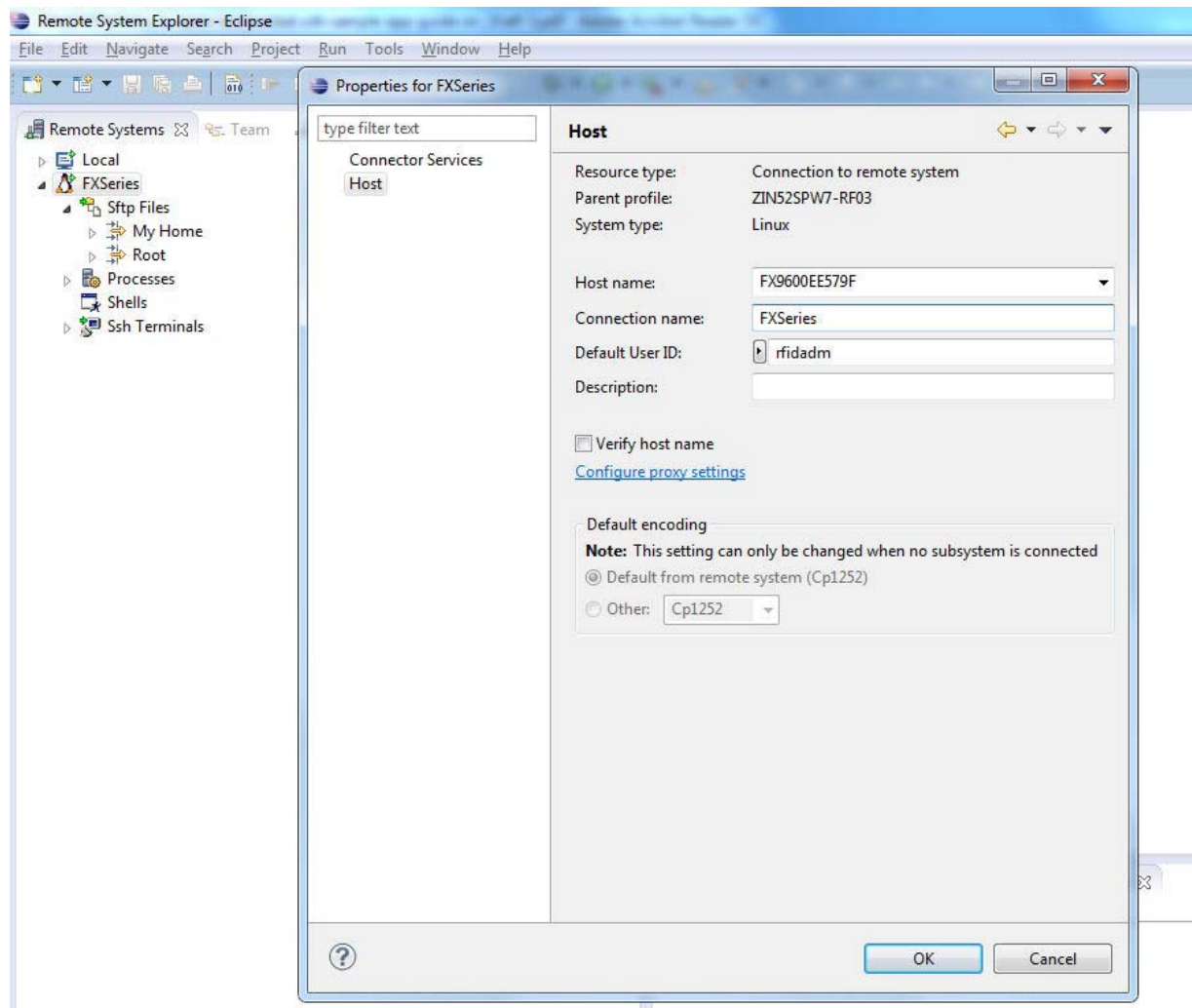
5. Right-click on FX7500 in the left window and select Properties.

Figure 28 FX7500 Properties



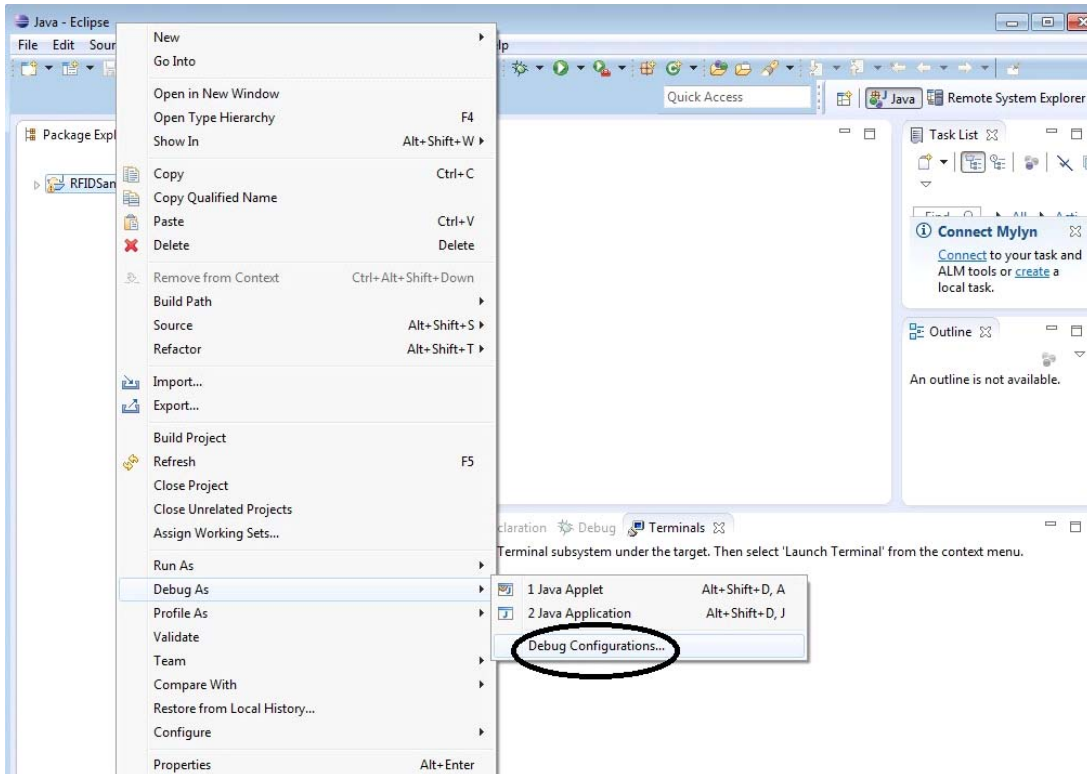
6. Select Host.

Figure 29 Host Properties



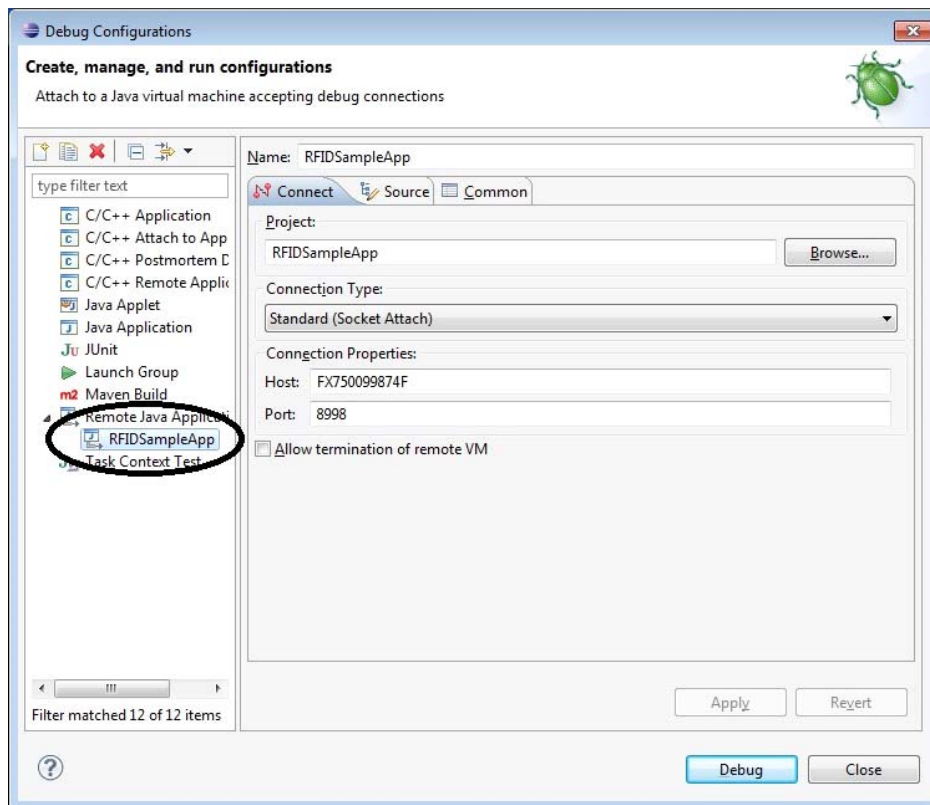
7. Enter the Host name of the FX7500 (FX7500 + last 6 digits of the mac address or IP address).
8. In the Default User ID field, enter rfidadm.
9. Select OK.
10. Return to previous perspective by selecting the Java button in the top-right corner of the main window, or by selecting Windows > Open Perspective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

Figure 30 Selecting Debug Configurations



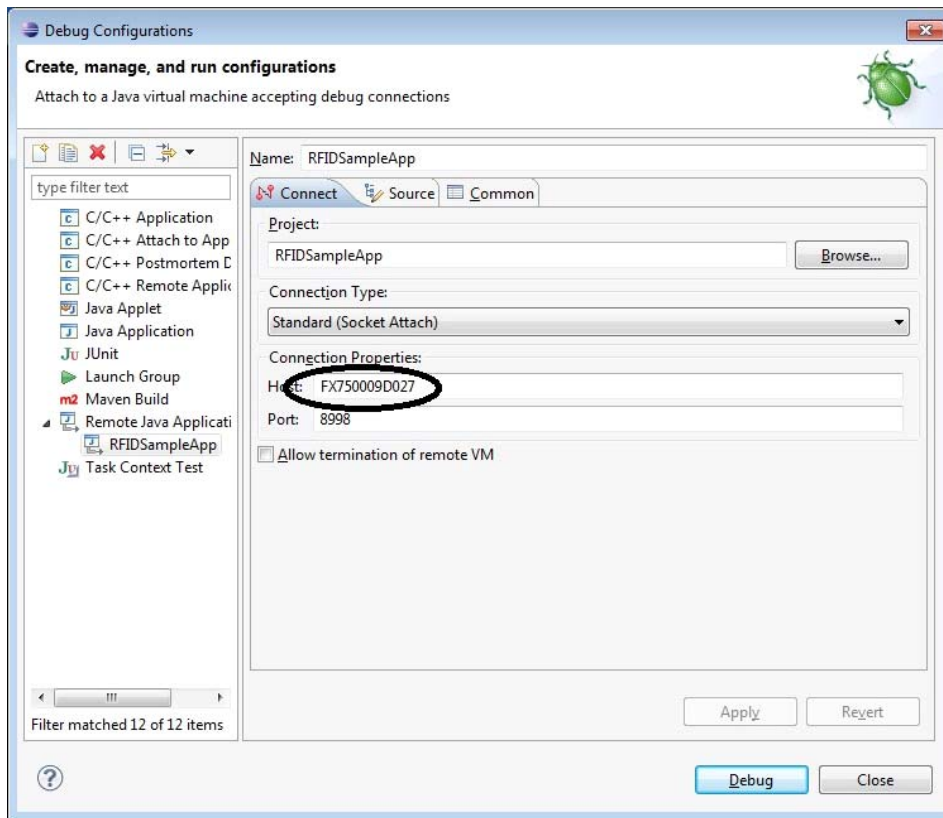
12. Select RFIDSample4App under Remote Java Application.

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.

Figure 32 Entering Host Name

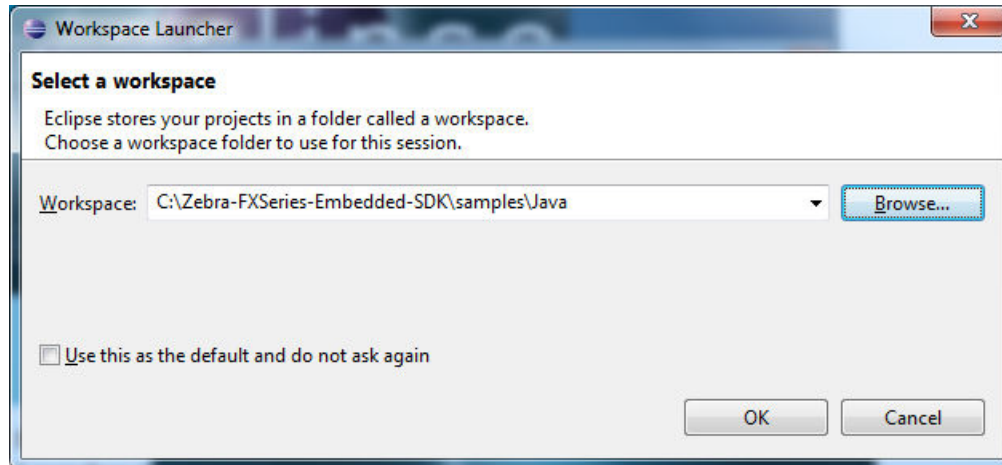


14. Select Close.

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



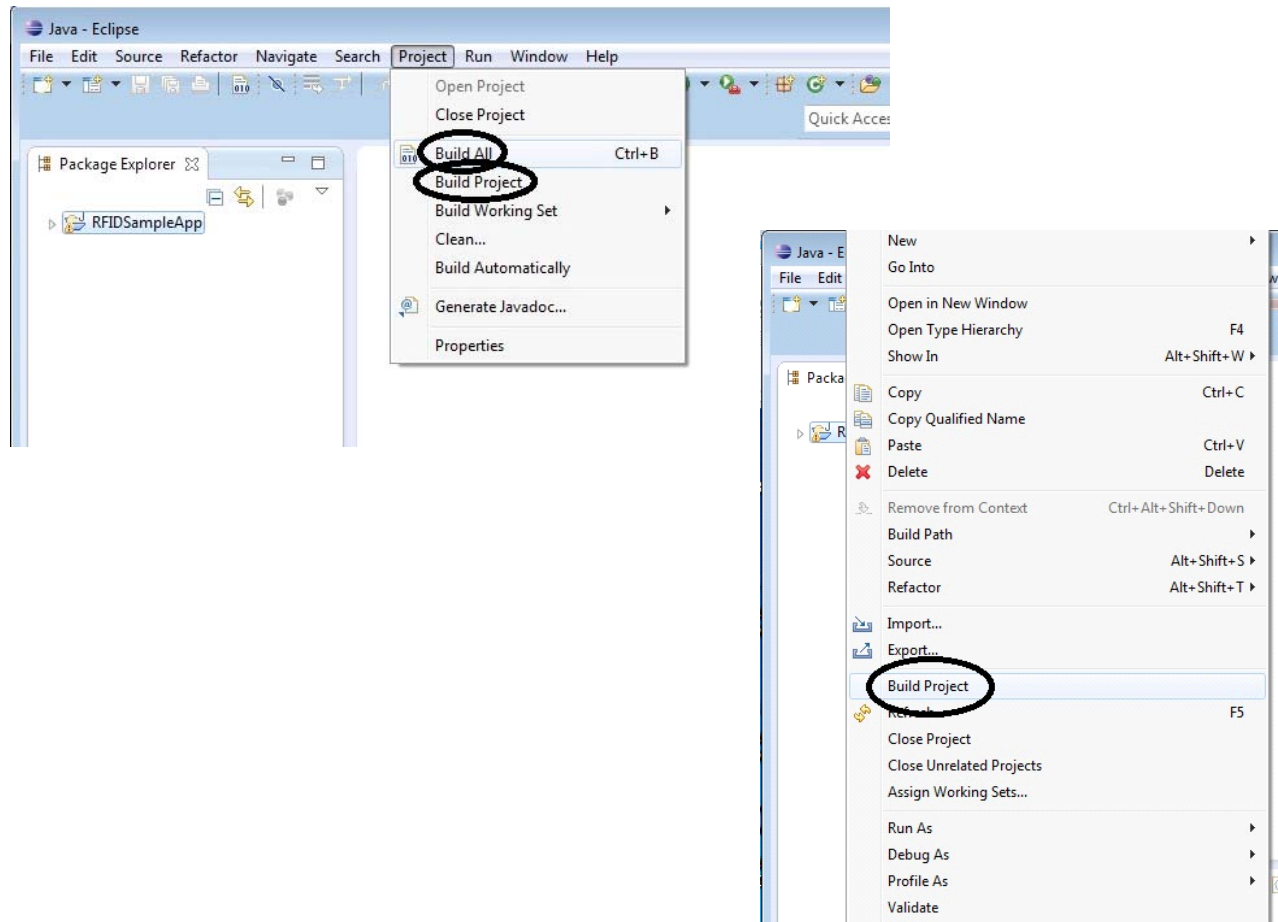
16. Select the workspace path of the Java sample application by clicking Browse... in the Workspace Launcher window.



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

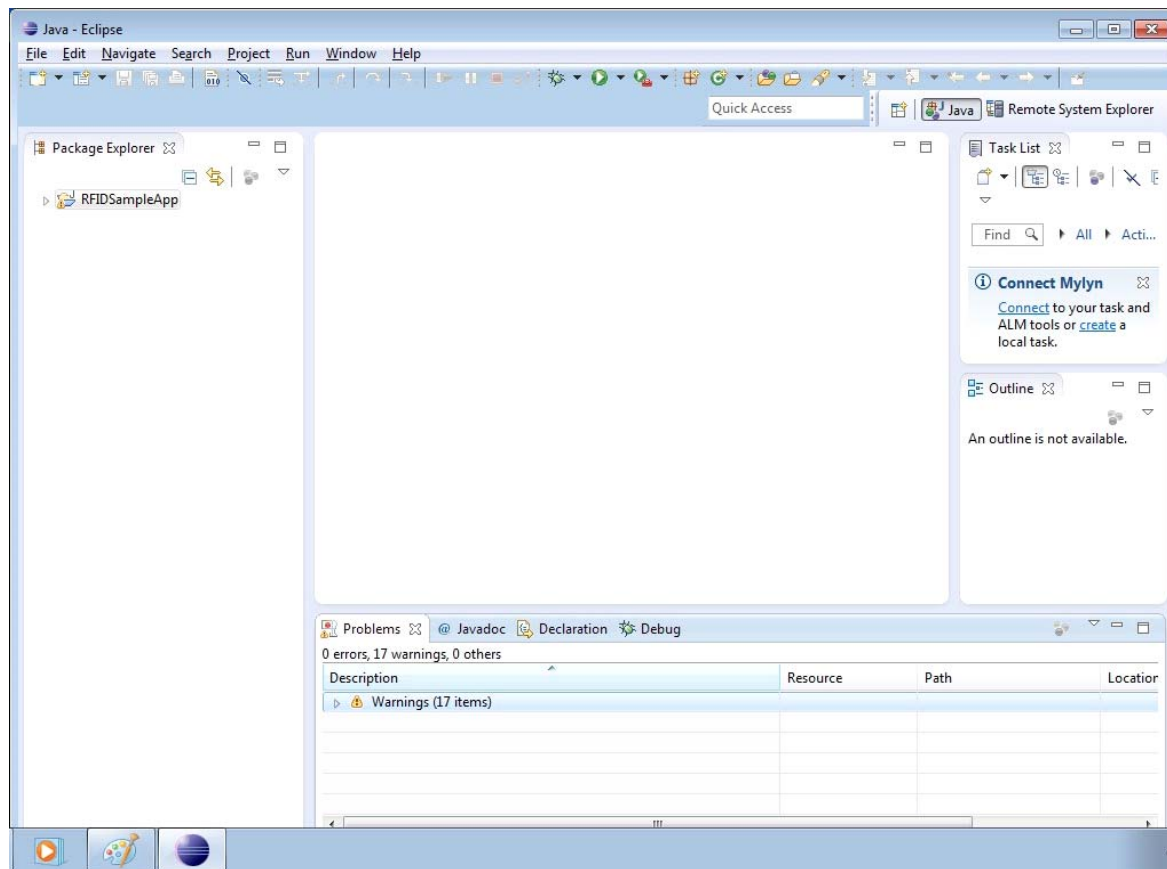
17. Select OK.
18. To compile the application select Build All or Build Project from the Project menu, or right-click the project name RFIDSample4App in the Project Explorer on the left side of the main window and select Build Project.

Figure 34 Building the Application



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

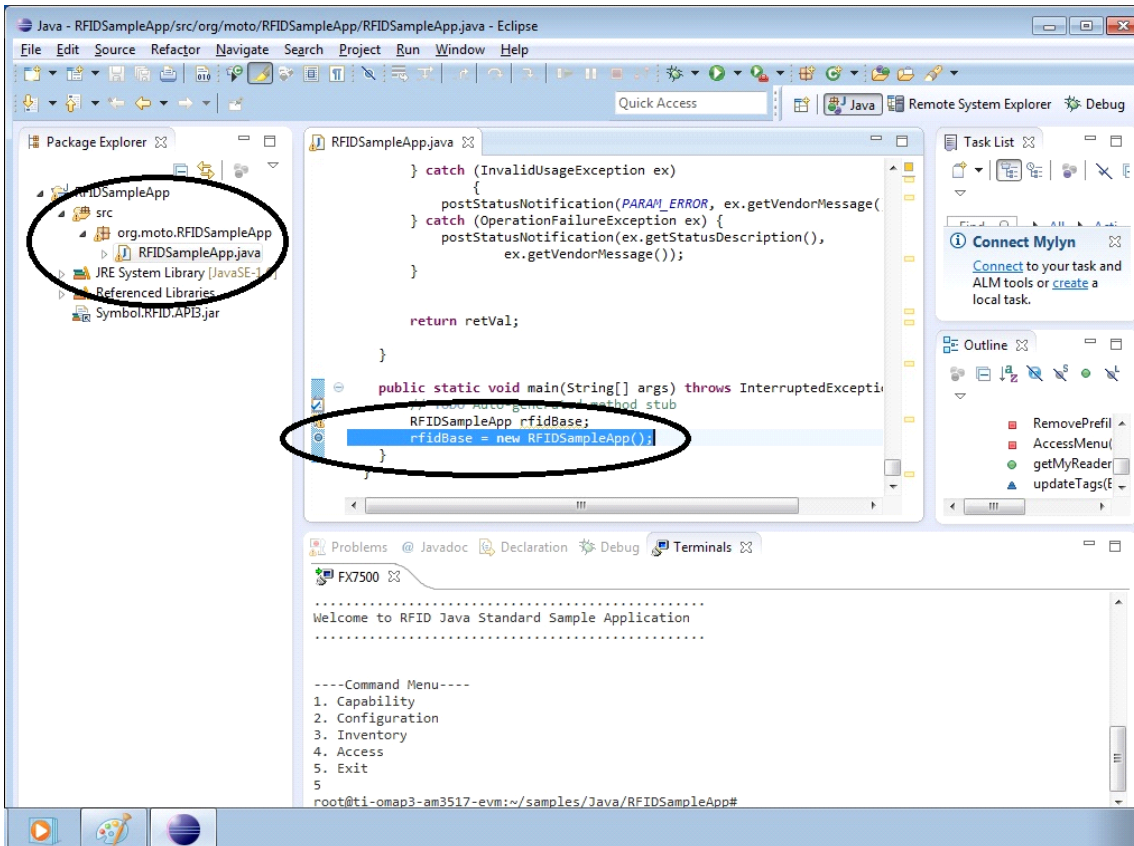
Figure 35 Problems Window



Debugging the Java Sample Application

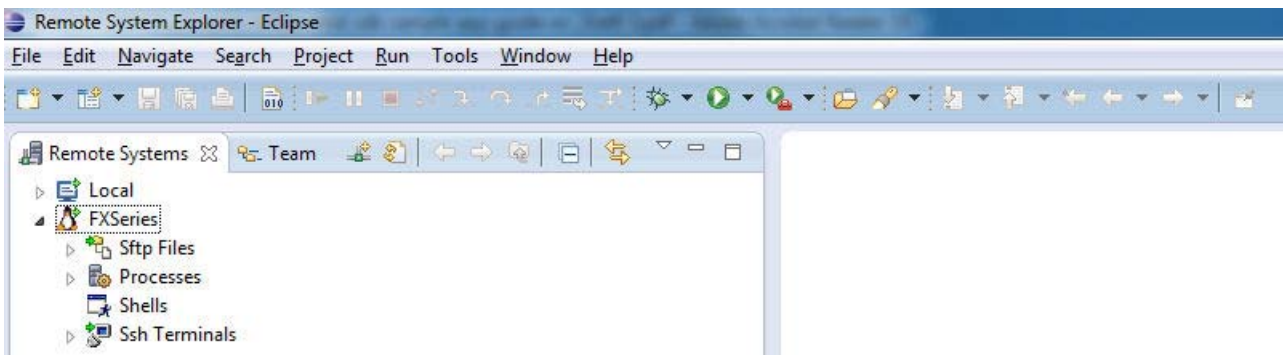
1. In the Package Explorer, open RFIDSample4App.java under RFIDSample4App > src > org > zebra > RFIDSample4App.

Figure 36 Opening RFID Sample Application



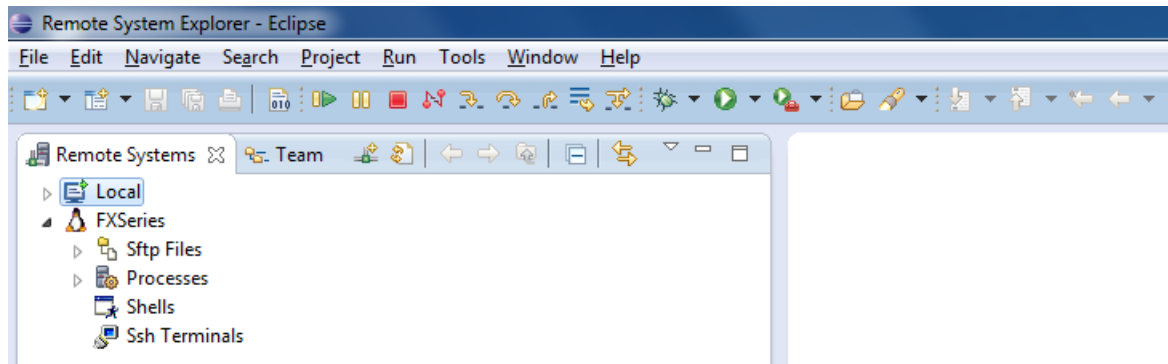
2. Set a breakpoint in the main window by double-clicking the location of the blue circle at the source code line (the blue circle indicates the breakpoint is active).
3. Select the Remote System Explorer button in the top-right corner of the main window, or select Windows > Open Perspective > Other.

Figure 37 Selecting Remote System Explorer



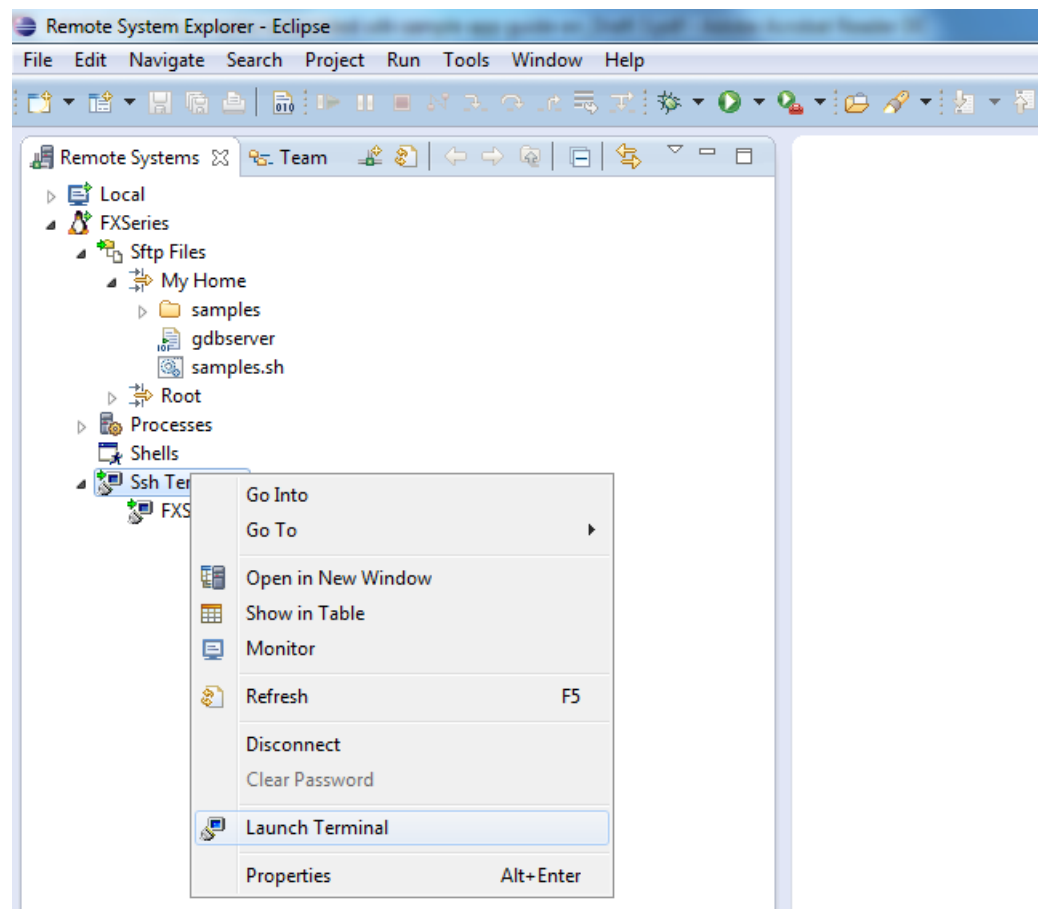
4. Expand the FX7500 entry.

Figure 38 Expanding FX Series Selection



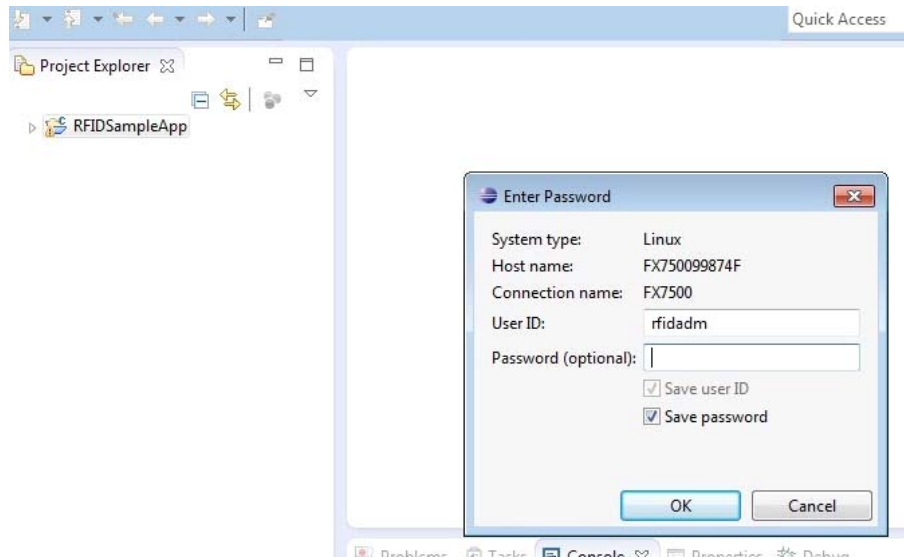
5. Right-click on Ssh Terminals and select Launch Terminal.

Figure 39 Launching Terminal



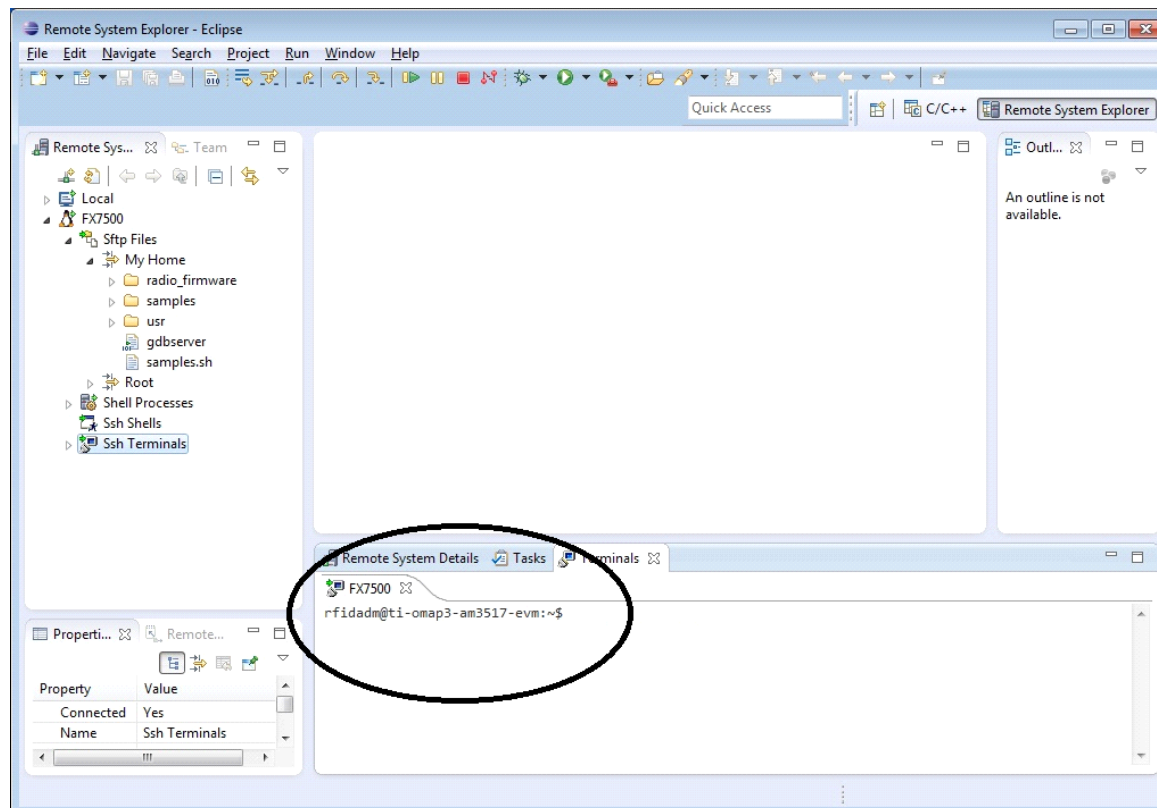
6. If the Enter Password window appears, leave the Password field blank and check Save password.

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



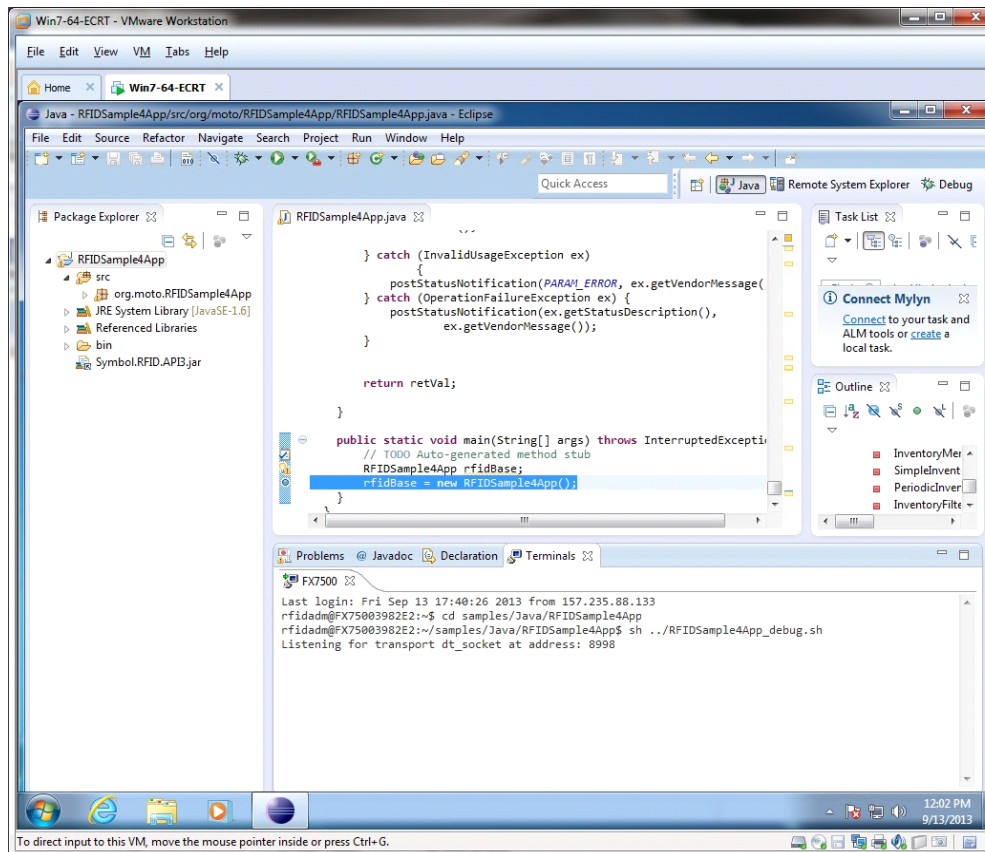
9. **Return to the Java perspective by selecting the Java button in the top-right corner of the main window or by selecting Windows > Open Perspective > Other....**
10. **Select Windows > Show View > Other... to open the Terminal window.**
11. **Select Remote Systems > Terminals.**

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.

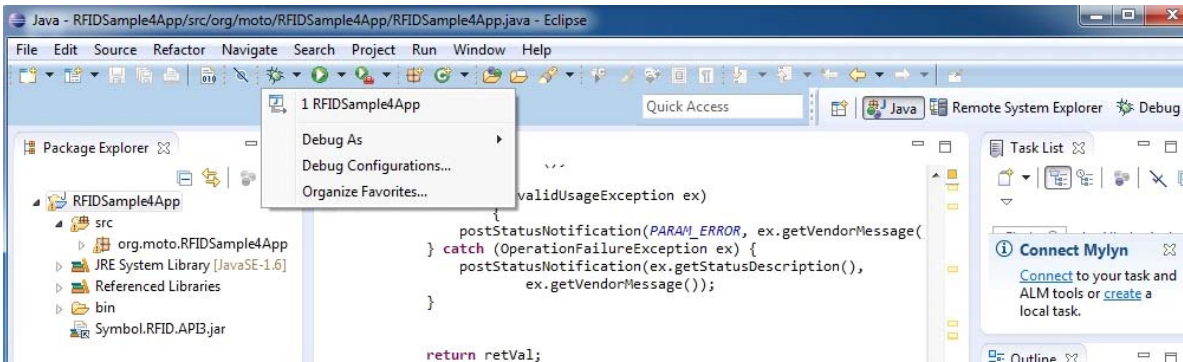
Figure 42 Renaming Sample Application



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

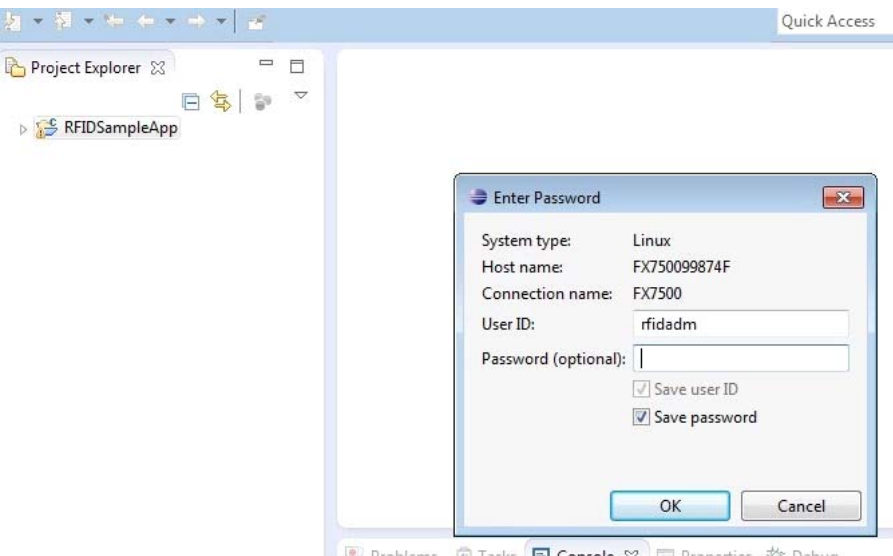
15. Click the debug symbol down arrow , located at the top of the window near the menus.
16. Select 1 RFIDSample4App.

Figure 43 Selecting Sample Application



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

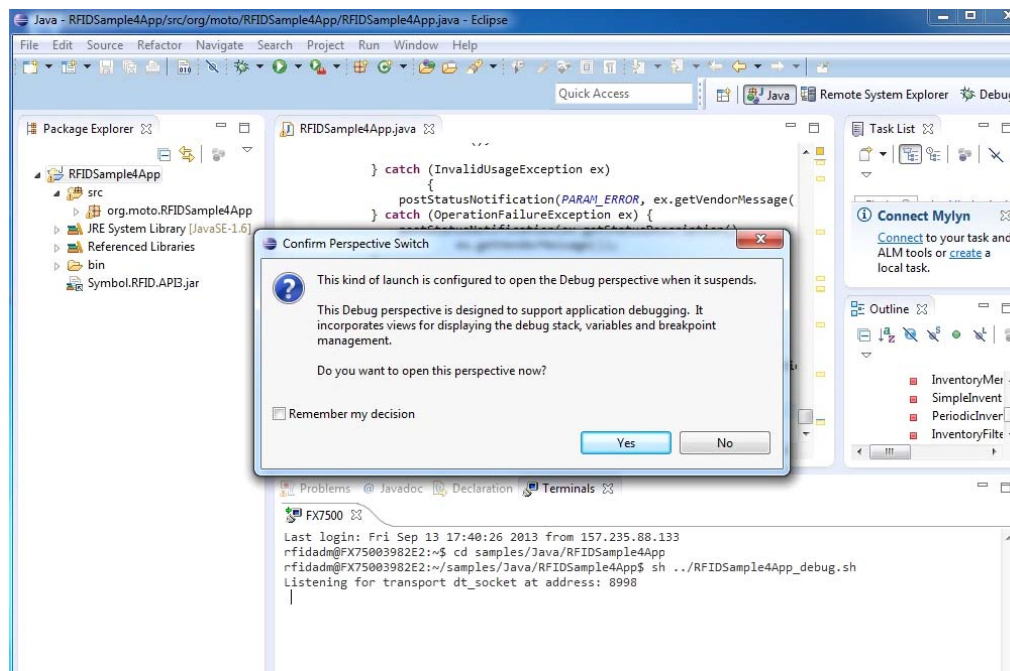
Figure 44 Enter Password Window



18. Select OK.

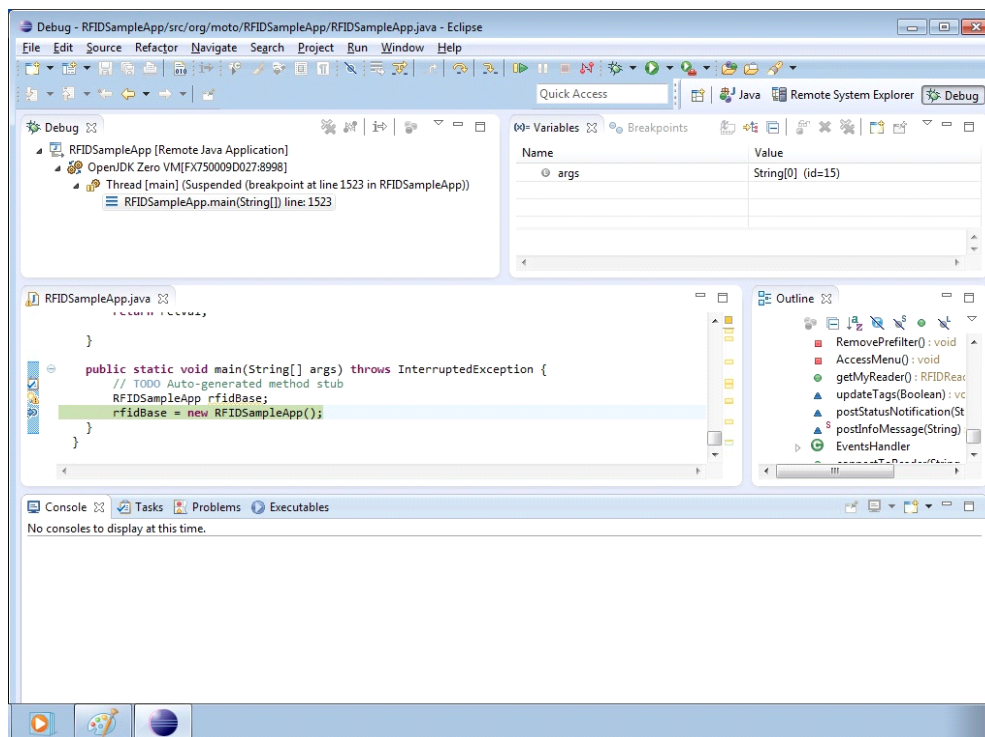
19. Select Yes or OK on any warning message windows regarding authentication and missing folders for SSH handling.

Figure 45 Confirm Perspective Switch Message



20. Select Yes to open the Debug perspective.

Figure 46 Debug Window



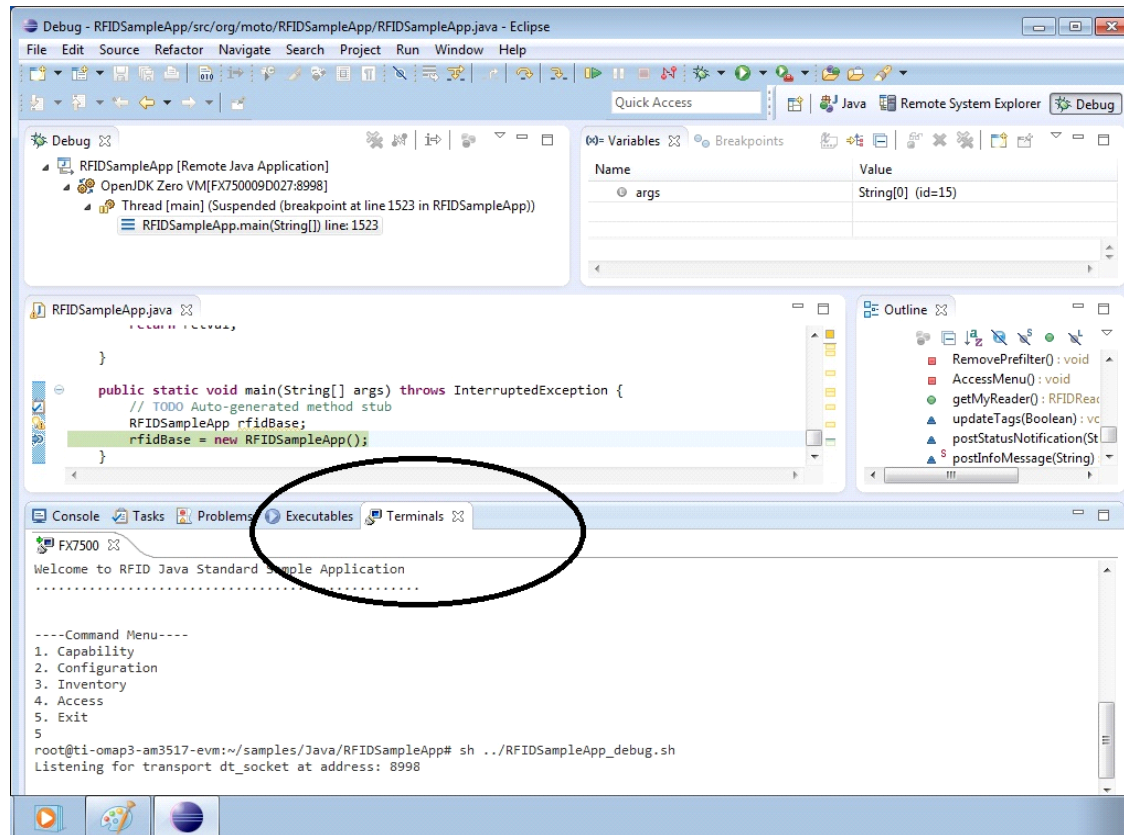
NOTE: To switch between the build perspective and the debug perspective, select the appropriate button at the top right section of the main window, or select **Windows > Open Perspective > Other**.

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

22. Select Remote Systems > Terminals.

23. Select OK.

Figure 47 Terminals Window



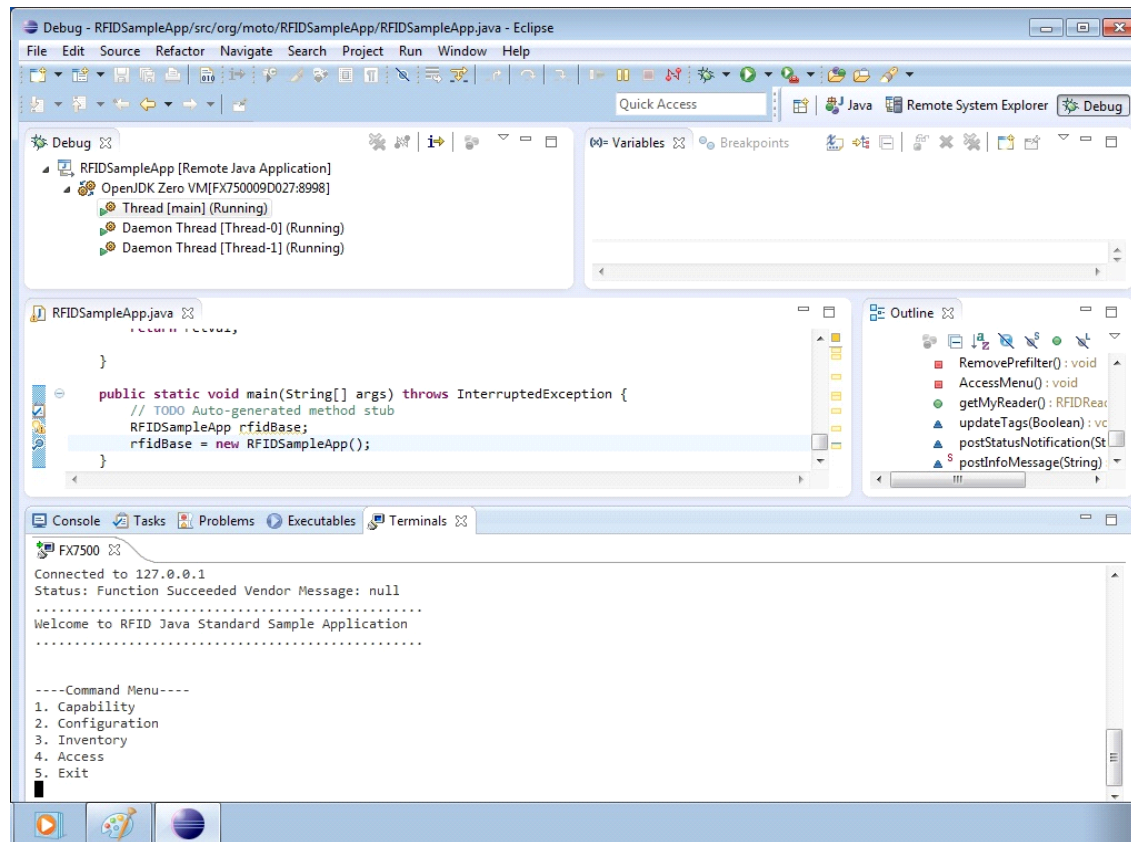
24. Continue debugging by selecting the Go button  at the top of the main window.



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.

Figure 48 Application Output



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

