Digi International

# iDigi Professional Development Kit

# GETTING STARTED GUIDE

ZB Series

90001109_B

# Table of Contents

## OBJECTIVES

Throughout this Getting Started Guide, you will:

- Create an account on iDigi.com
- Set up and configure your ConnectPort X4 gateway
- Set up and configure your Drop-in Mesh Network
- Install the Digi ESP for Python Development Environment
- Run your first iDigi Dia application

### Drop-in networking

As an integral part of the Drop-in Networking strategy, the Python development environment is incorporated by Digi into each ConnectPort X4 Gateway. Digi's integration of the open Python scripting language provides customers a truly open standard for complete control over connections to devices, manipulation of data, and event-based actions. For more information about the Digi Python custom development platform, visit our Python portal today at:

http://www.digi.com/technology/drop-in-networking/pdr.jsp

### iDigi Dia

Also available is a device connection application called iDigi Dia (Device Integration Application). iDigi Dia software runs on the Digi family of gateway devices. Dia simplifies developing custom applications for remote monitoring and sensor networking. Dia is written in the Python programming language and can easily be extended to accommodate additional requirements. Dia can be executed on a PC for prototyping when a suitable Python 2.4 interpreter is available.

## QUESTIONS?

For technical assistance with your Drop-in Network, call:

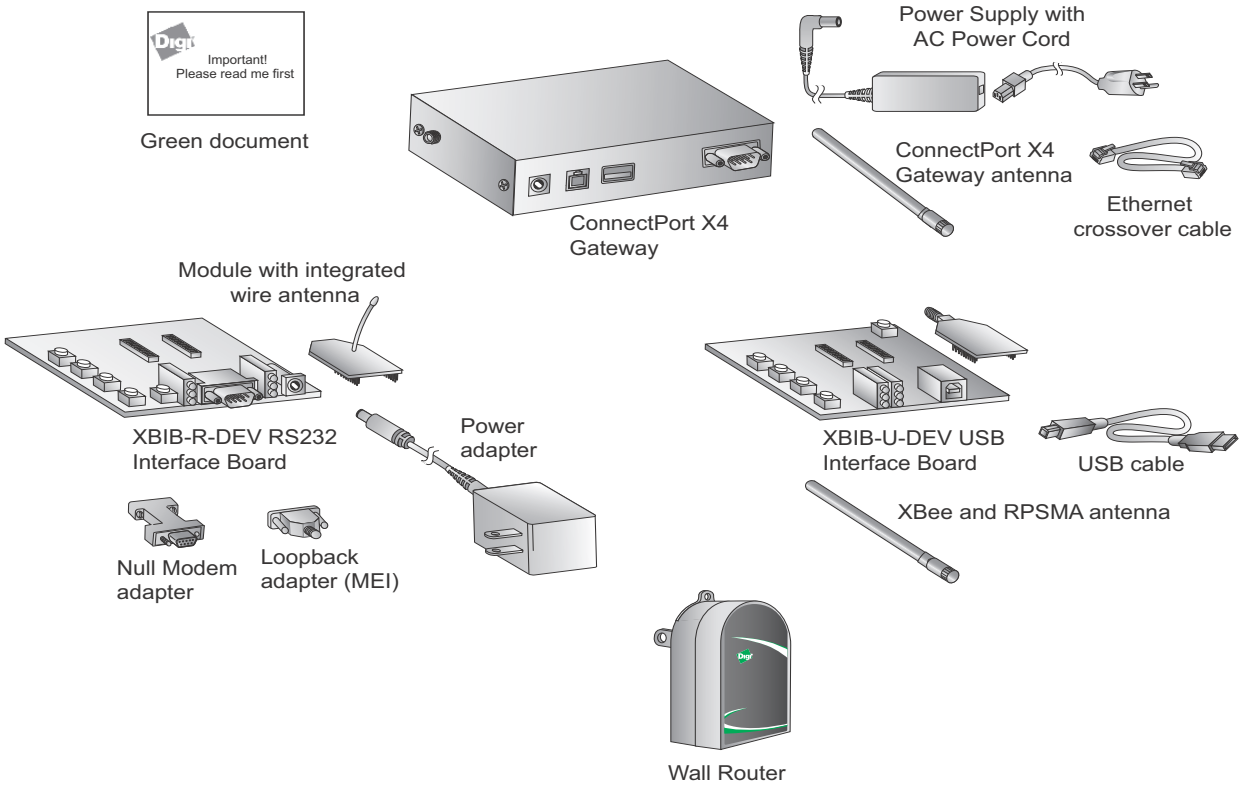
1-800-903-8430 (US Only)

### Digi contact numbers outside US

| Country | Toll Free Number |
|---|---|
| Argentina | 00-800-3444-3666 |
| Australia | 0011-800-3444-3666 |
| Brazil | 0021-800-3444-3666 |
| China North | 00-800-3444-3666 |
| China South | 00-800-3444-3666 |
| France | 00-800-3444-3666 |
| Germany | 00-800-3444-3666 |
| Hong Kong | 001-800-3444-3666 |
| India | 000-800-100-3383 |
| Israel | 00-800-3444-3666 |
| Italy | 00-800-3444-3666 |
| Japan | For calls from KDD fixed land-line phones: 010-800-3444-3666<br>From KDD public and mobile phones: 001-010-800-3444-3666<br>For non-KDD phones: 122-001-010-800-3444-3666 |
| Korea | 002-800-3444-3666 |
| Mexico | 001-800-903-8430 |
| Netherlands | 00-800-3444-3666 |
| New Zealand | 00-800-3444-3666 |
| South Thailand | 001-800-3444-3666 |
| Spain | 00-800-3444-3666 |
| United Kingdom | 00-800-3444-3666 |

# Starter Kit components, requirements, and resources

## Kit components




The following items are not pictured above but are included in the kit:

- DB-9 Serial cable
- 9V Battery
- 9V Battery Adapter cable

## System Requirements

To run the kit, you will also need:

PC running Microsoft Windows XP, Vista or Windows 7

## Web Browser Requirements

Microsoft Internet Explorer 7.0 or newer

Google Chrome 4.0 or newer

Mozilla Firefox 3.0 or newer

## Java Requirements

Java Runtime Environment (JRE) 1.6 or newer

## Additional Requirements

This Getting Start Guide assumes a scenario where there are no other XBee wireless devices in the network/area other than the ones provided with this kit.

## Resources

The following downloads are available at www.digi.com/idigi_prof_zb

***Downloads***

- USB Development Board Windows Driver
- Digi Device Discovery Application
- Digi Python Development Environment

***Documentation***

- iDigi Dia Getting Started Guide
- iDigi Dia Developer's Guide
- iDigi Web Services Getting Started Guide
- iDigi.com Web Services and Device Management Overview

# Introduction to iDigi

## iDigi Platform

The iDigi Platform is a Machine Relationship Management (MRM) delivery platform, the next step in the machine-to-machine (M2M) technology revolution. It supplies the fundamental components for enterprise applications and remote machine assets (devices) to easily work together. The iDigi Platform is based on industry-standard protocols and open technology for customers and partners to extend specifically for their industry. The result is faster to market and the lowest cost of ownership.

The iDigi Platform is an on-demand service. There are no infrastructure requirements. Remote devices and enterprise business applications connect to the iDigi Platform via standards-based Web Services. You will be able to simply connect to the iDigi Platform and get to work.

## Drop-in networking

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## iDigi Dia

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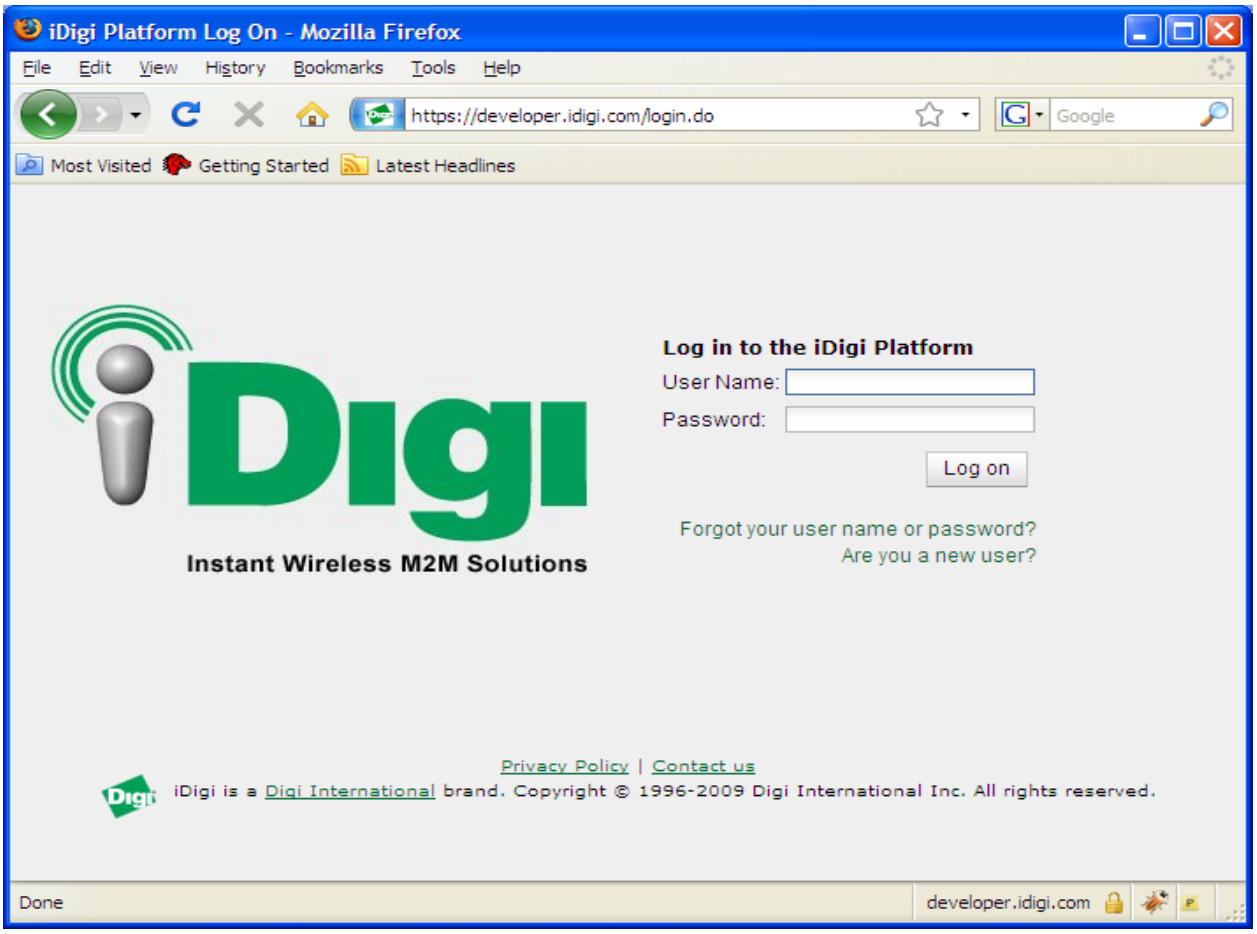
# Set up your iDigi Professional Development Kit

## Step 1: Create an account on iDigi.com

To get started, set up an account on the iDigi Platform as follows.

1. Navigate to http://www.idigi.com.
2. Click on the **iDigi Platform Login** Login button.

3. If you already have an account enter your user credentials in the User Name and Password fields, then click the **Log on** button. For new users, click on the “Are you a new user" link and create your account.

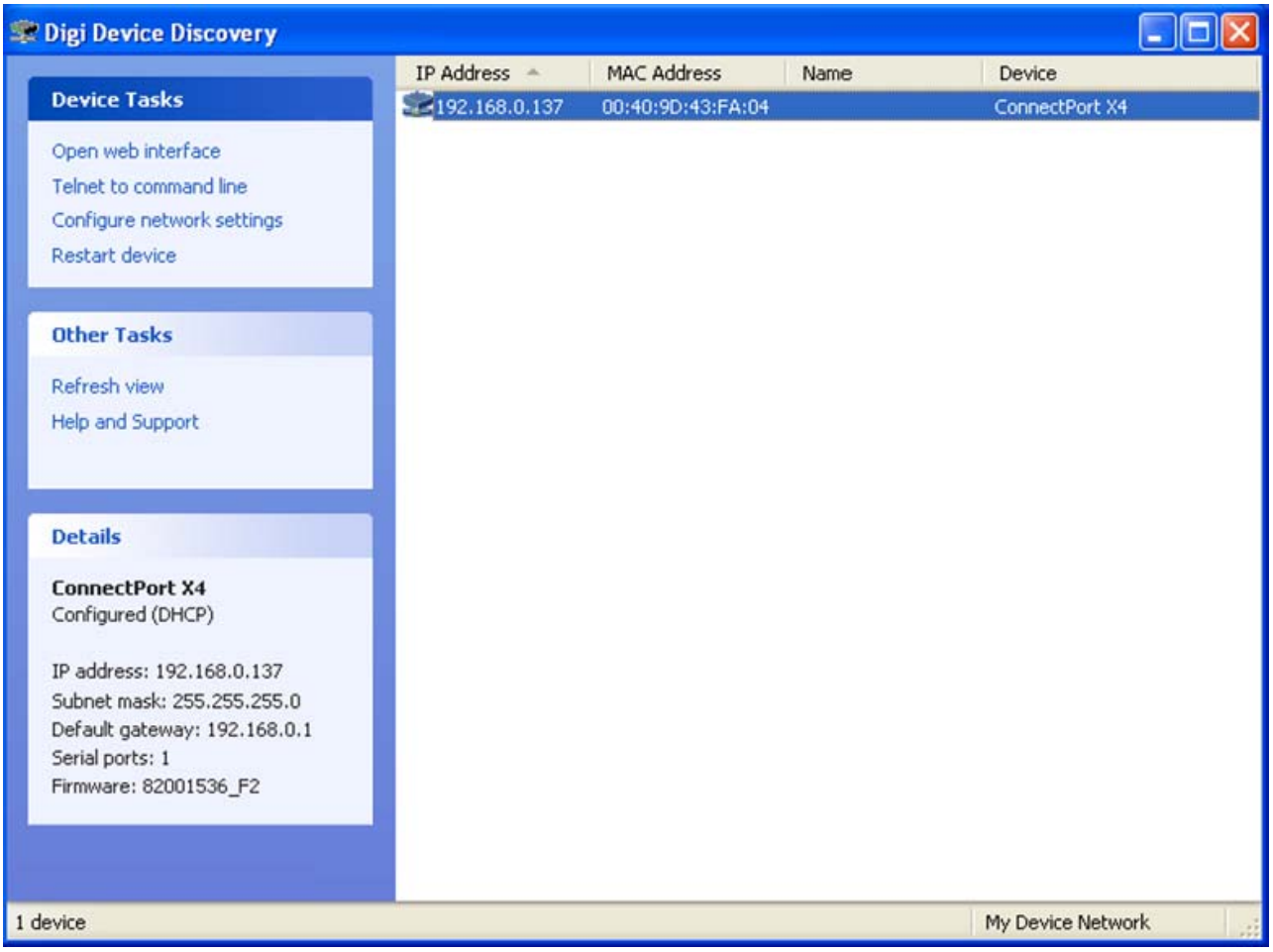


## Step 2: Set up the ConnectPort X4 gateway

### Connect and power on the ConnectPort X4

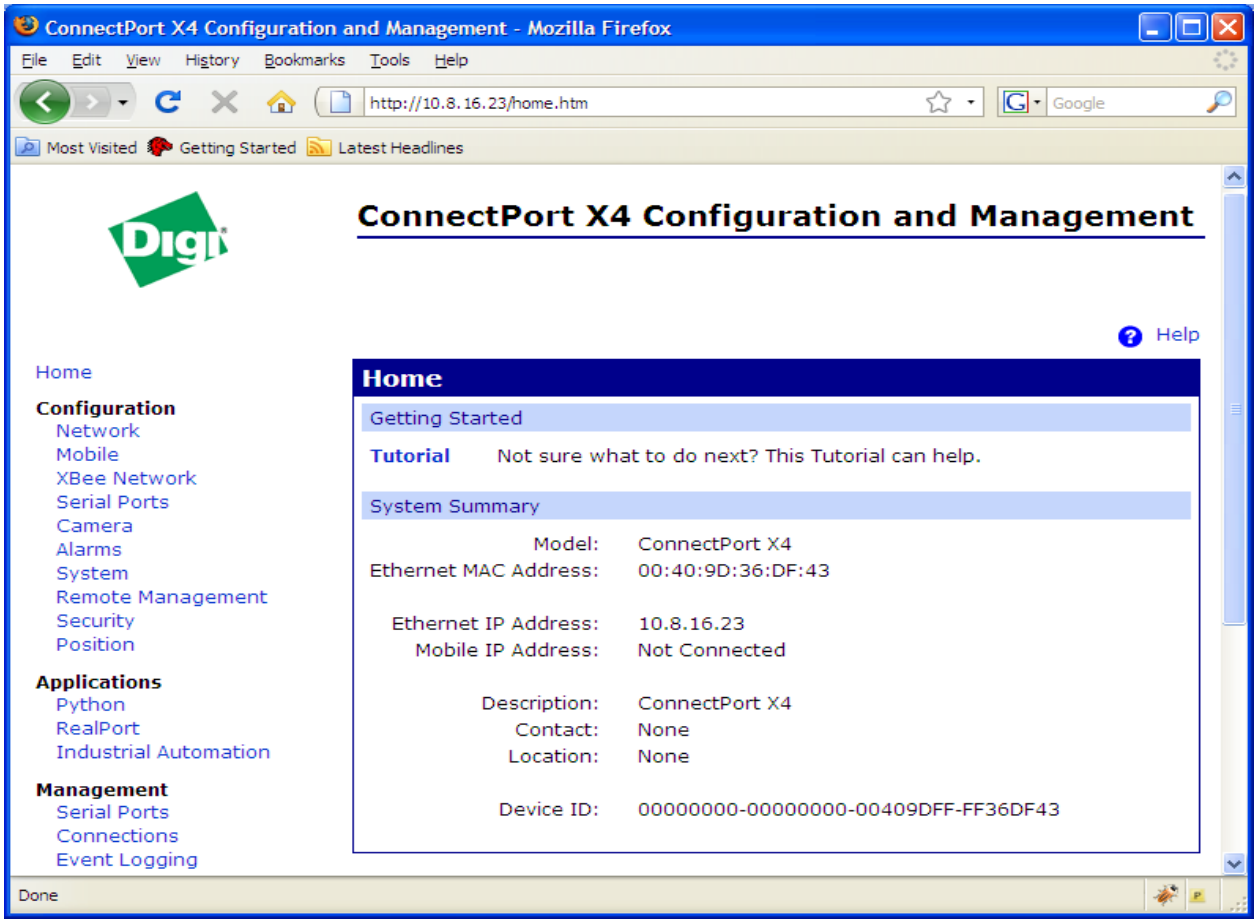
1. Attach the antenna to the ConnectPort X4 gateway.
2. Connect an Ethernet cable from the ConnectPort X4 gateway to your hub or switch that provides access to the Internet.
3. Connect the power supply to the ConnectPort X4 gateway and connect the power supply to an outlet.

   Note: **Note (International version only):** Connect the power supply to a power cable (not included), and the power cable to an outlet.
4. Use the downloaded Digi Device Discovery application to find the ConnectPort X4 gateway on your network.




Note: This is a sample IP address. Your IP address will be based upon your network.

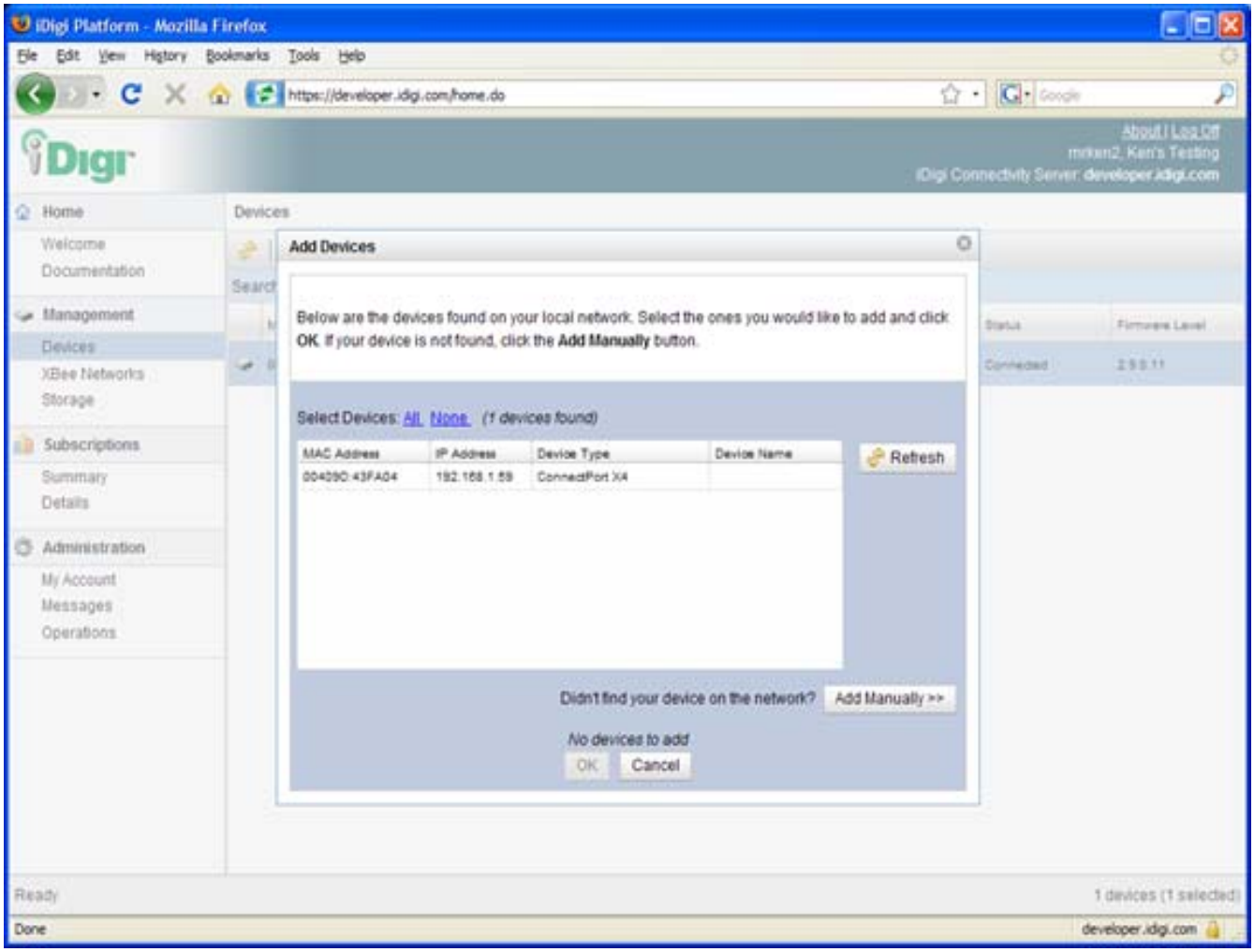
5. Double click on the ConnectPort X4 entry in the Digi Device Discovery Tool to bring up the Web UI.



### Add the ConnectPort X4 Gateway to your iDigi device list

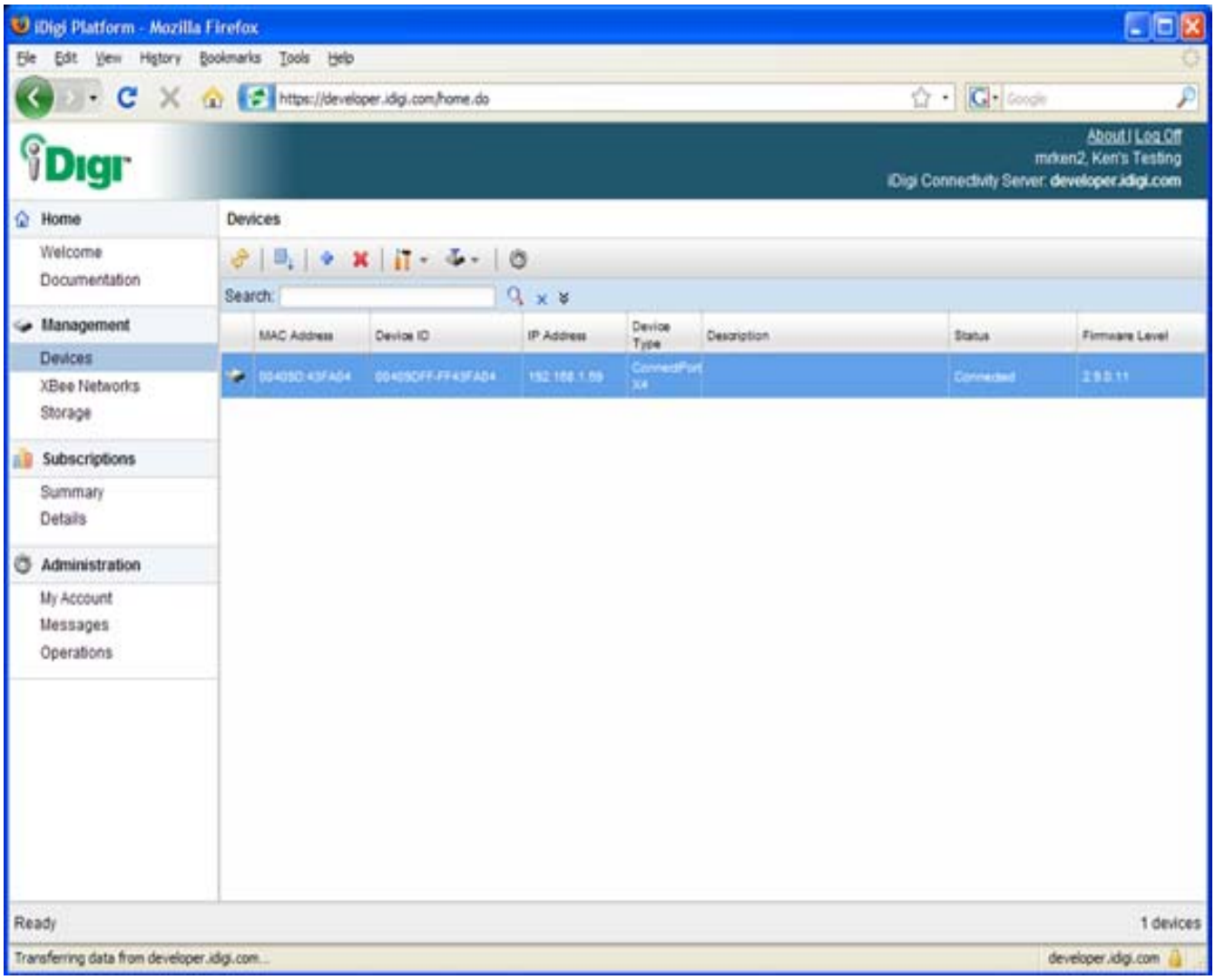
To add the ConnectPort X4 to the device list, follow these steps.

1. Log into iDigi (www.idigi.com) using the username and password you just created.
2. Select the **Devices** link in the Left Navigation Bar.
3. Click the button to bring up the **Add Devices** applet. The Add Devices applet will discover the Digi devices on your network and the ConnectPort X4 gateway should appear in the list.
4. Select the ConnectPort X4 and click the **OK** button.

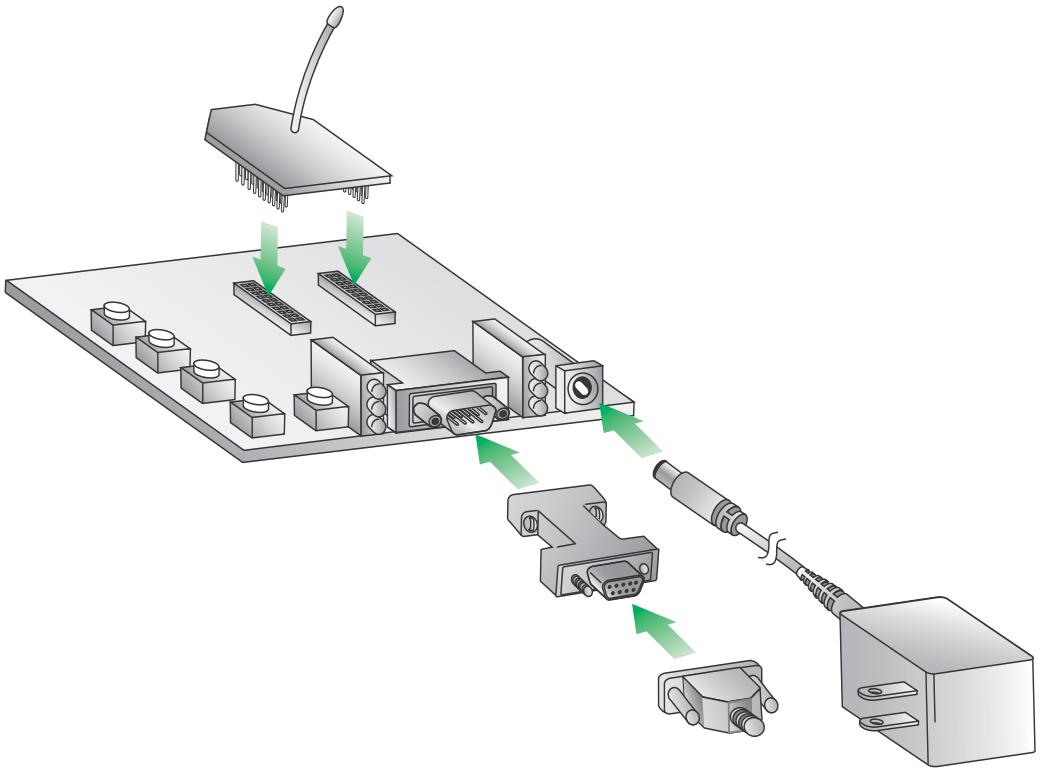



Note: If you cannot discover you device see Appendix A: Troubleshooting.

5. Ensure your device is now displayed in the devices list as shown below:

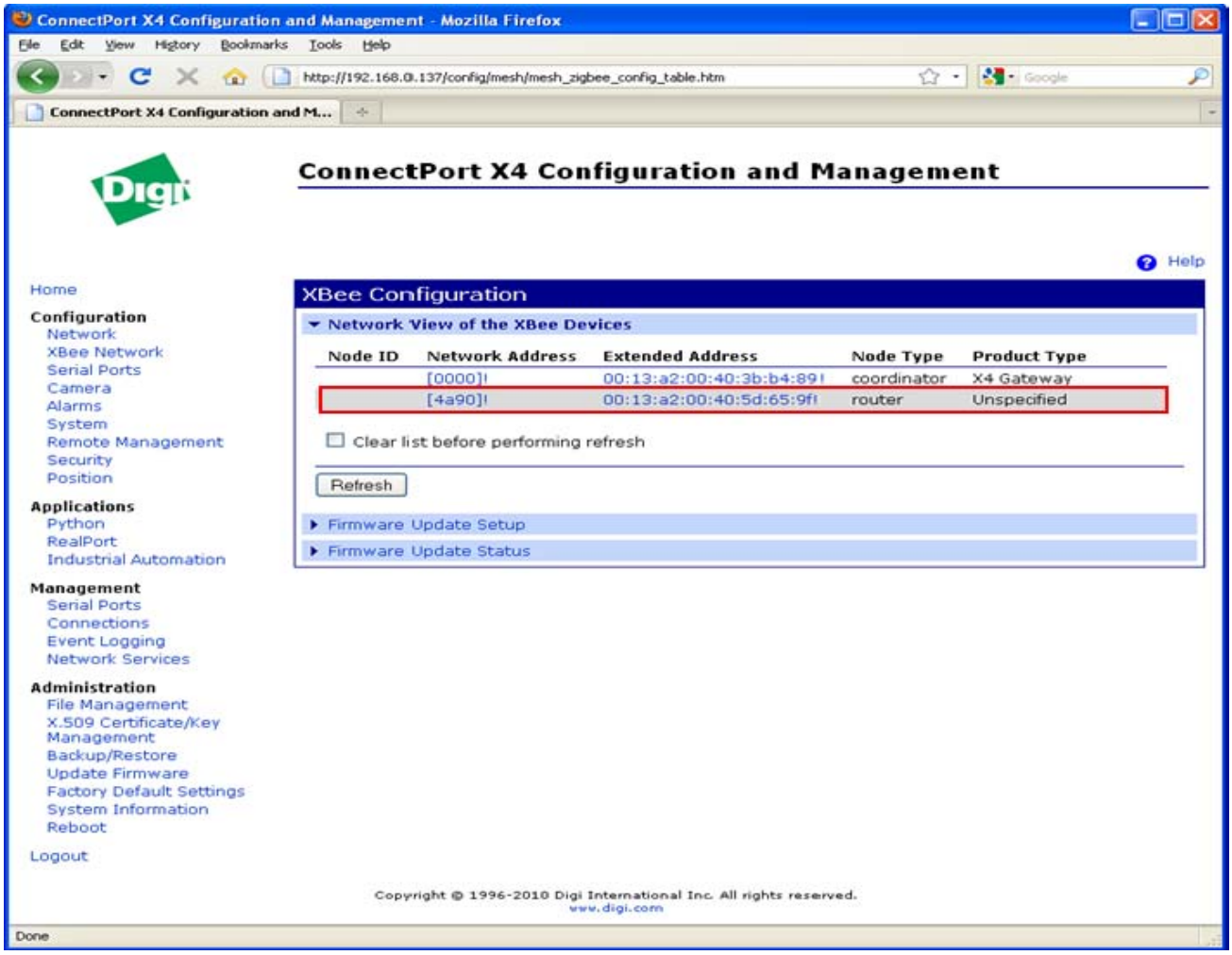


## Step 3: Set up the XBIB-R-DEV RS232 Interface Board

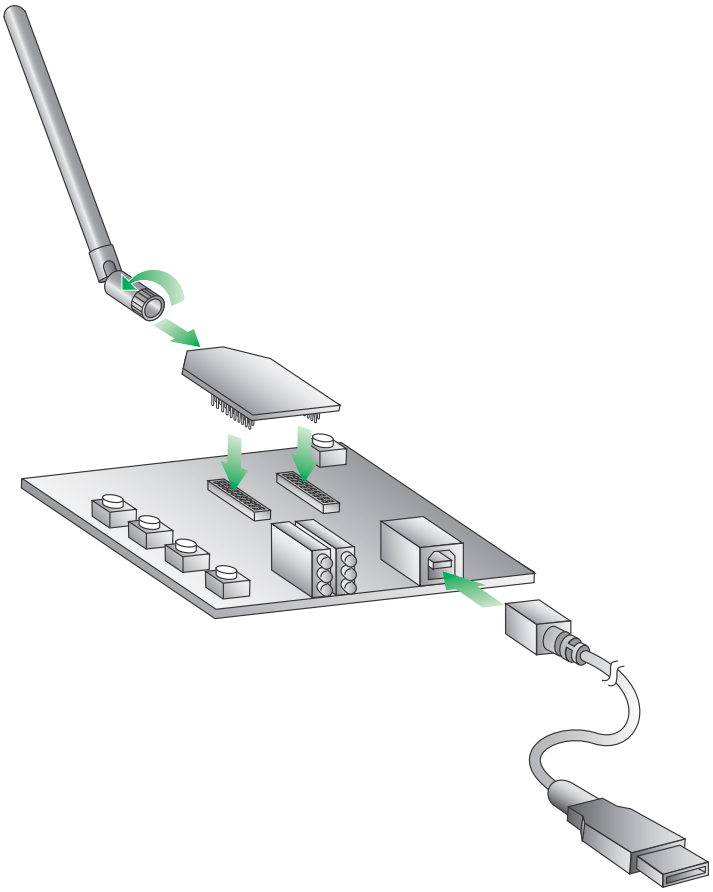


1. Install the XBee module with the pigtail antenna on the XBIB-R-DEV RS232 Interface Board.
2. Connect the power supply cable into the XBIB-R-DEV RS232 Interface Board.
3. Plug the power supply into an outlet.

4. Wait 10 seconds then click the **Refresh** button on the ConnectPort X4 Web page. Once the XBIB-R-DEV RS232 Interface Board attaches to the ConnectPort X4 your XBee network devices list should be updated as shown below.



## Step 4: Set up the XBIB-U-DEV USB Interface Board



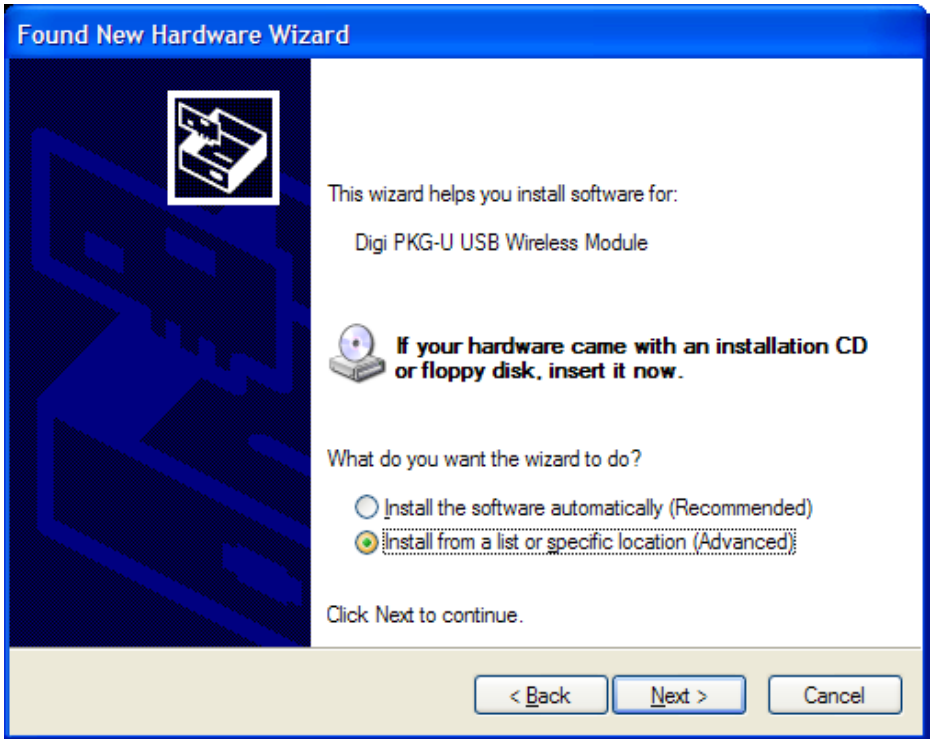
1. Install the XBee module on the XBIB-U-DEV USB Interface Board.
2. Attach antenna to the XBee module.
3. Download the USB Driver from the Digi support site at: http://www.digi.com/support/productdetl.jsp?pid=3992&osvid=0&tp=1.

   Select the "PKG-U USB Drivers for Windows 98 SE - XP" entry in the General Drivers section.
4. Unzip the USB Driver package to a directory of your choice and note that location.
5. Connect the XBee module to the PC using a USB cable. The **Found New Hardware Wizard** dialog box is displayed.

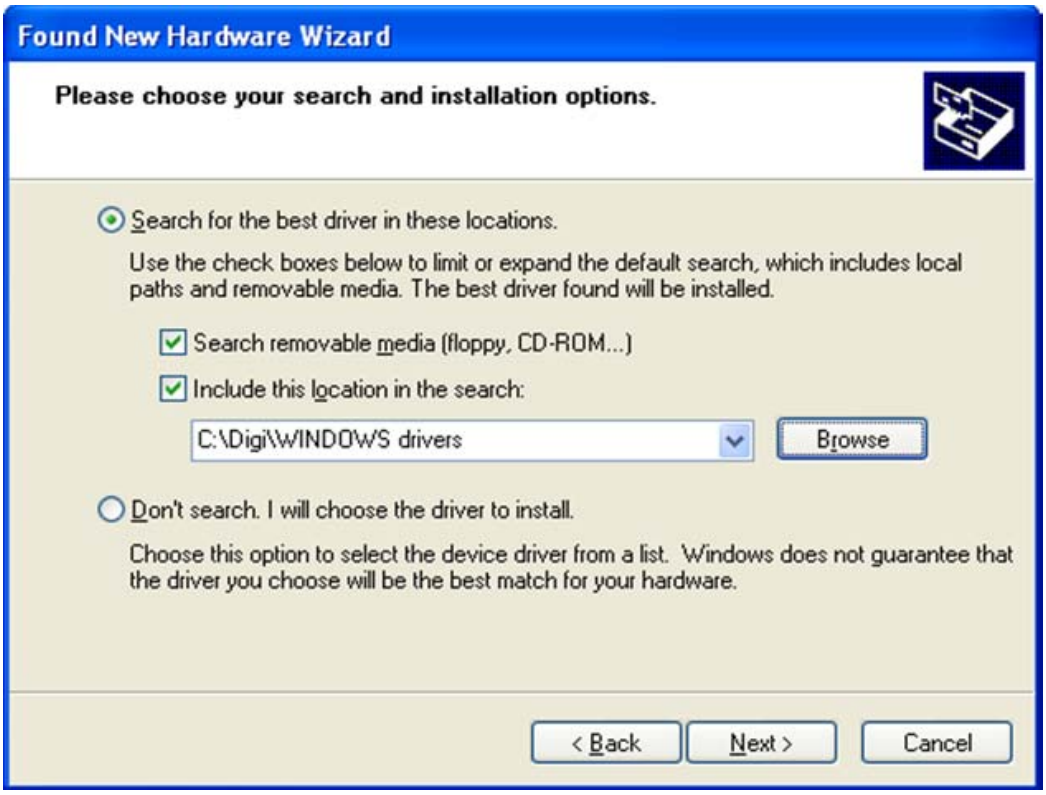
To attach the XBIB-U-DEV USB Interface Board to the PC, two drivers must be installed by following these steps:

1. On the first screen, select “No, not this time” when asked to allow Windows Update to search for software in order to save time in the installation process.


2. Select “Install from a list or specific location (Advanced); then click **Next.**



3. Check “Include this location in the search” and browse to the folder where you extracted the drivers to in Step 1, then click **Next.** .

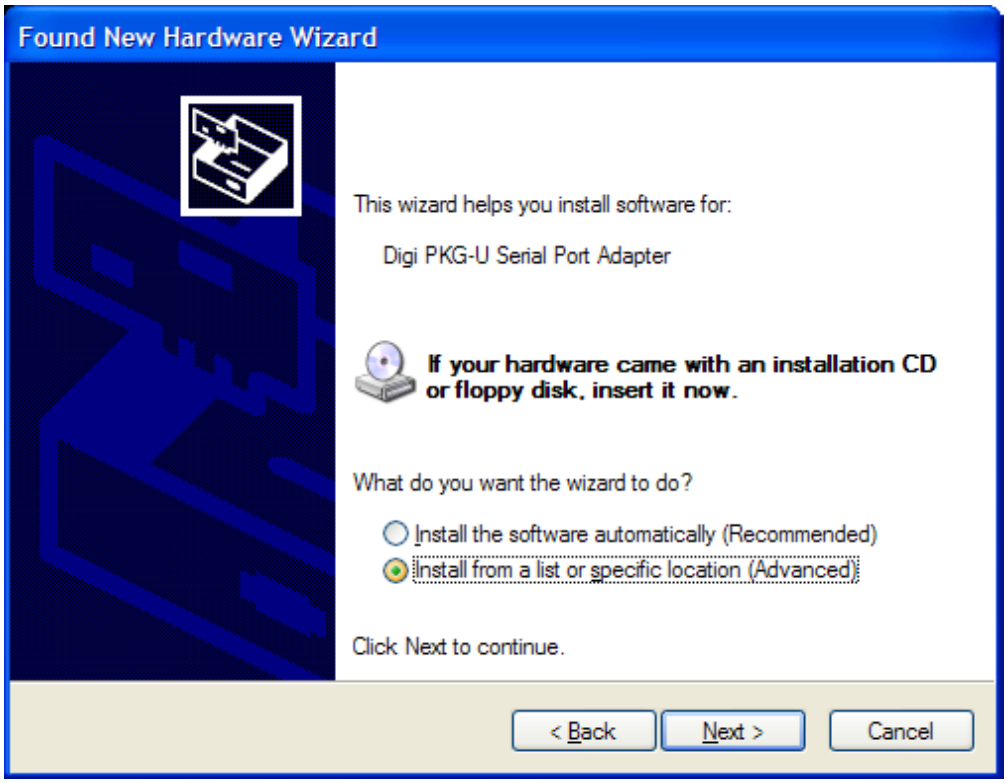


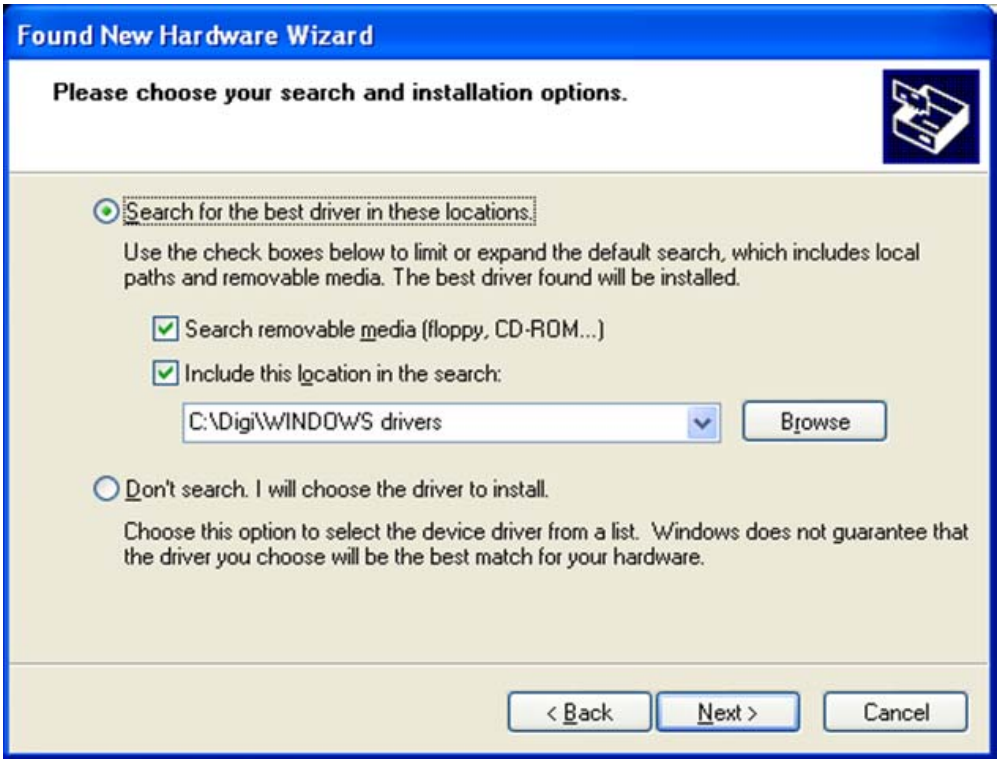


4. A Hardware Installation warning dialog is displayed, click **Continue Anyway**.
5. Click **Finish.**

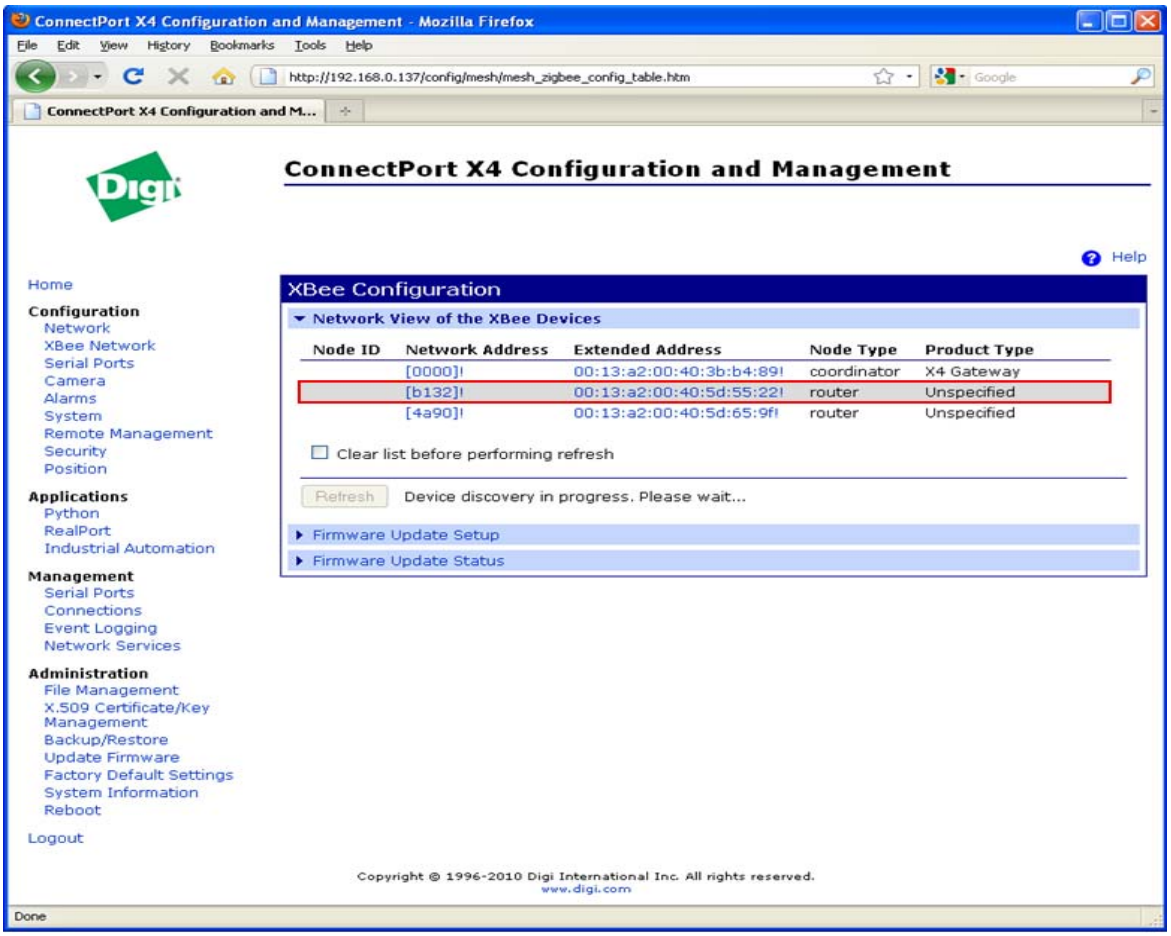
You are then prompted to install the second driver, the virtual COM port driver.

6. To install the COM port driver repeat steps 2 through 5 using the following screenshots as a reference.

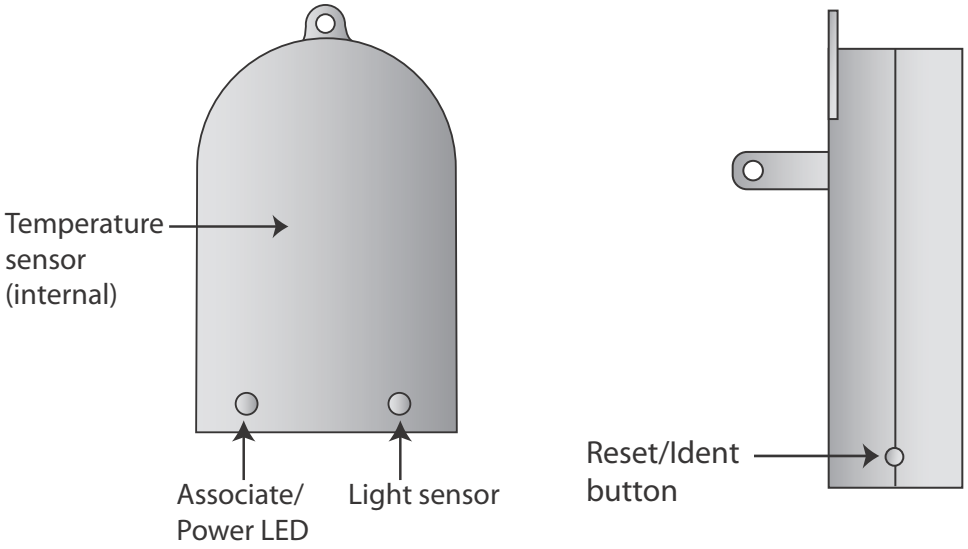



Wait 10 seconds then click the **Refresh** button on the ConnectPort X4 Web page. Once the XBIB-R-DEV RS232 Interface Board attaches to the ConnectPort X4 your XBee network devices list should be updated as shown below.



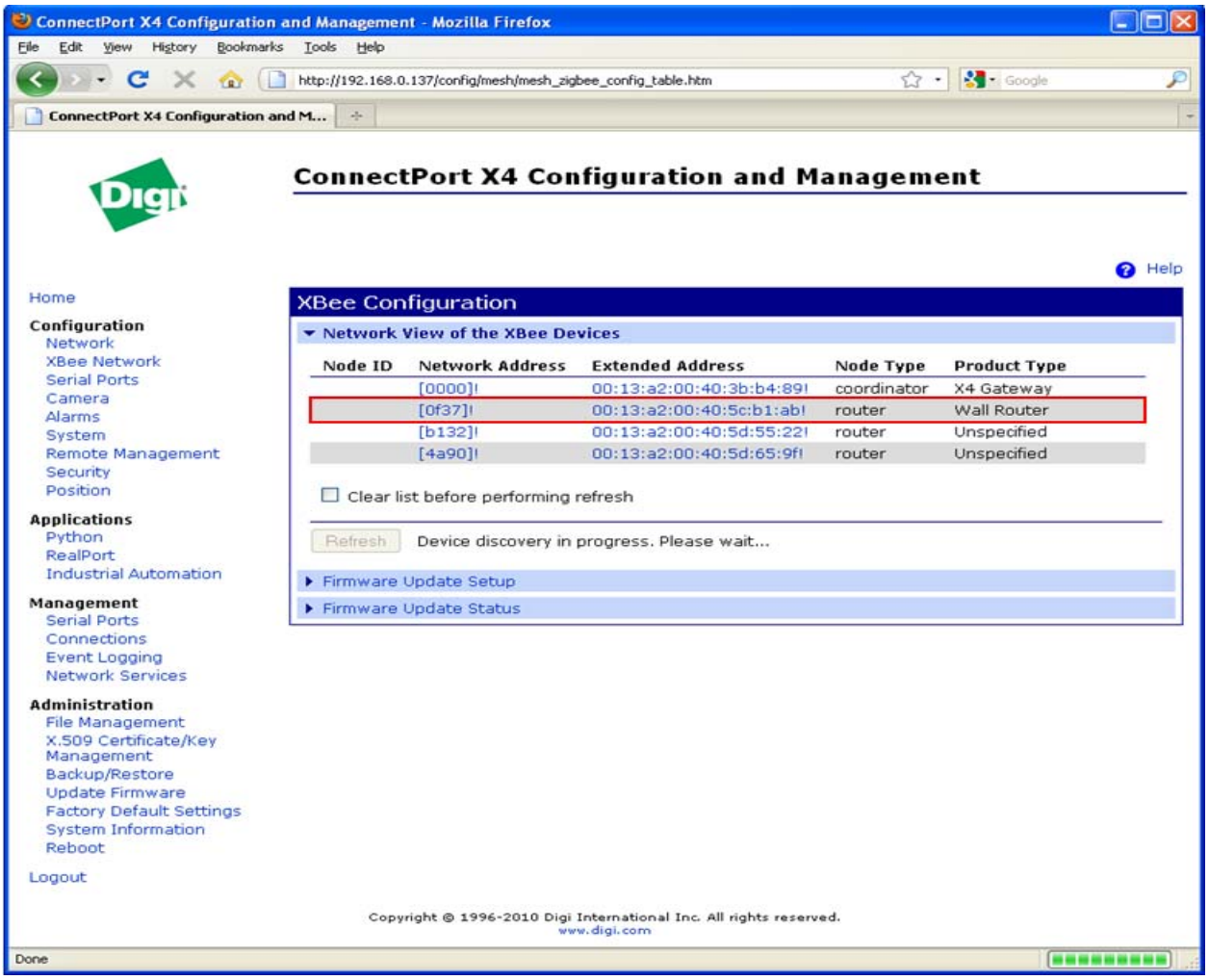
## Step 5: Set up XBee Wall Router





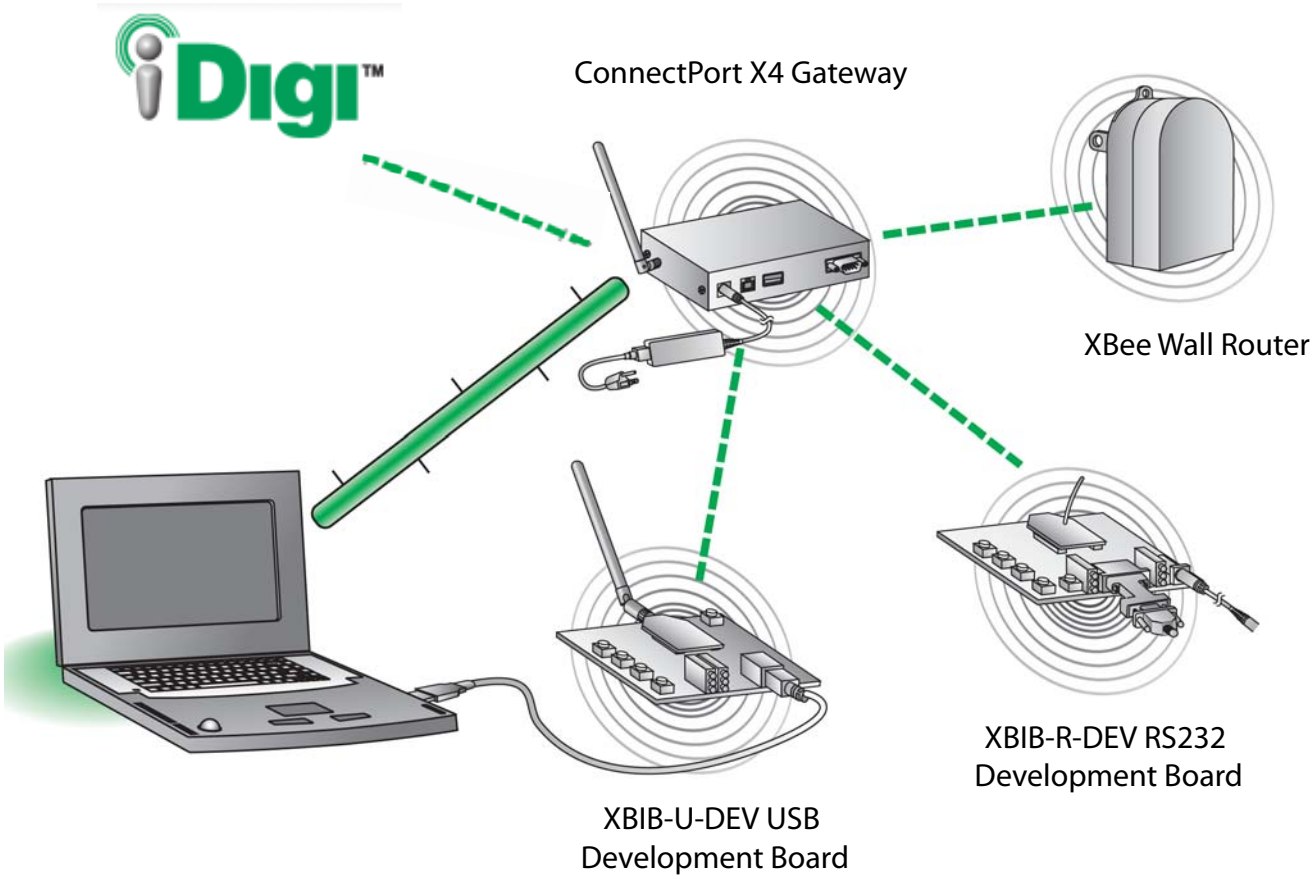
1. Plug the XBee Wall Router into an outlet.
2. Wait 10 seconds then click the **Refresh** button on the ConnectPort X4 Web page. Once the XBee Wall Router attaches to the ConnectPort X4 your XBee network devices list should be updated as shown below.

3. All 3 XBee nodes should have been discovered by the ConnectPort X4 as shown below.



## System diagram

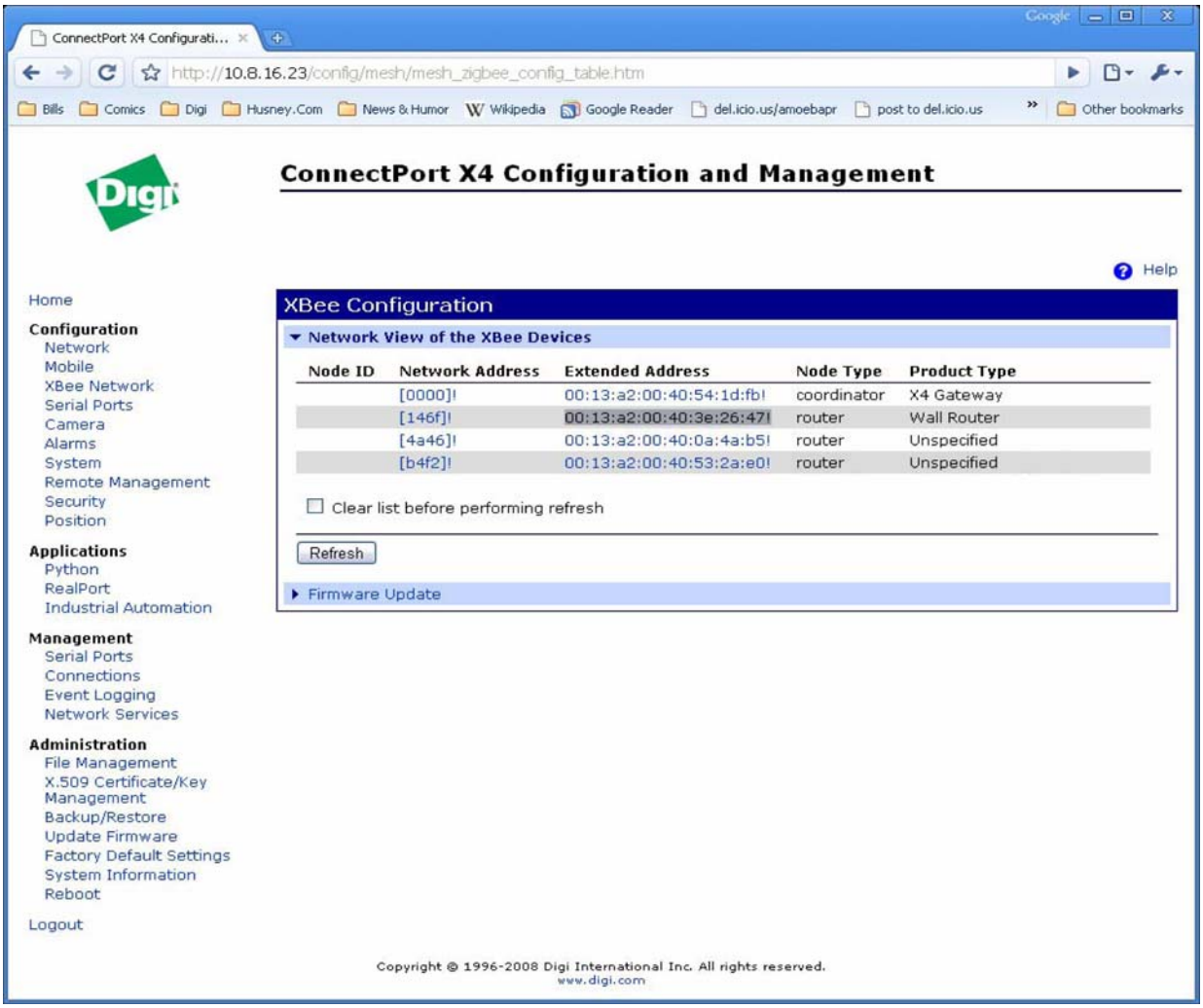
Your iDigi Professional Development Kit is now set up as shown below:



## View the XBee Nodes via the ConnectPort X4 using the Web Interface

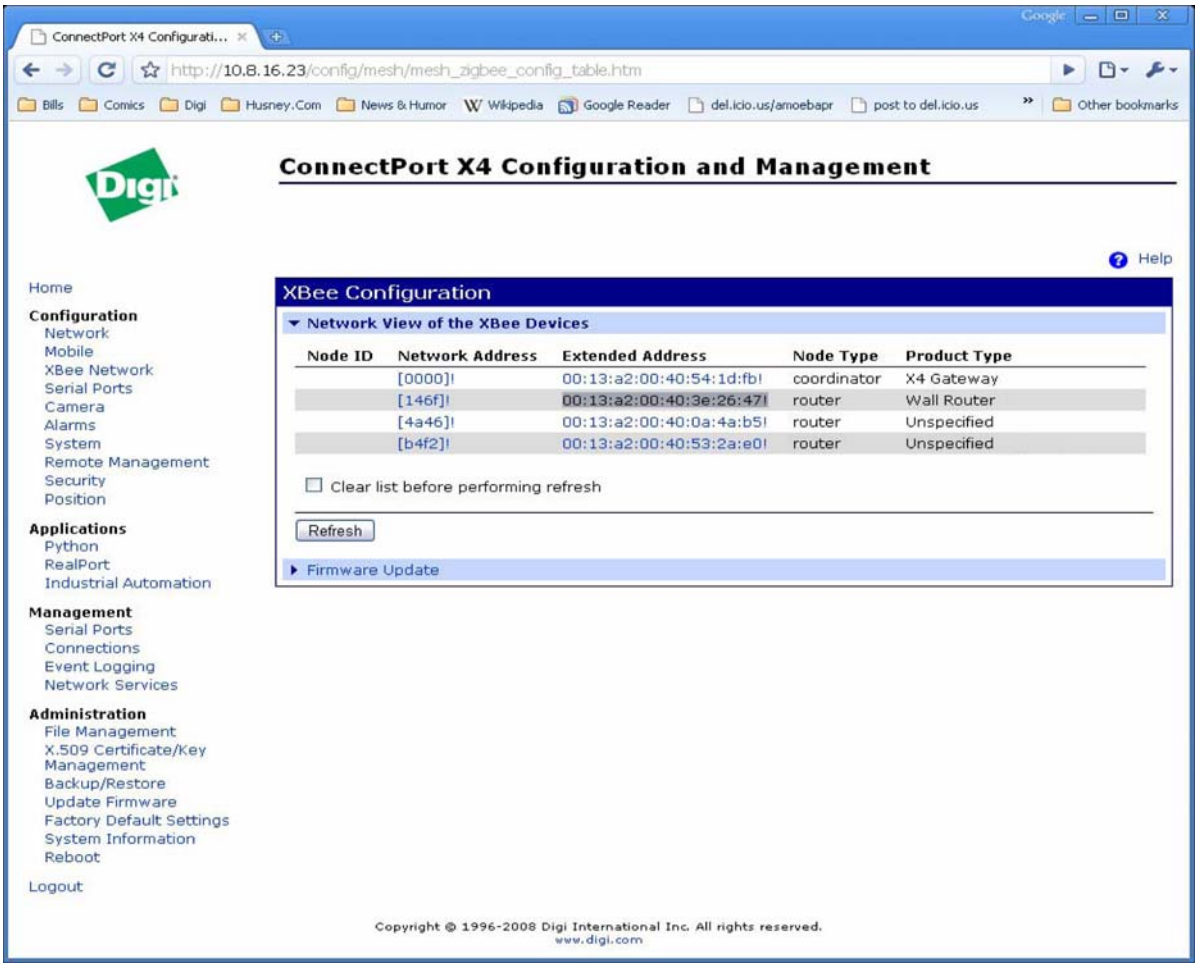
The three XBee devices in this kit are known as nodes. In this task you will see a network view of the nodes from the ConnectPort X4 Web UI.

1. First, return to the home page of the ConnectPort X4 Web UI as shown below:




2. From the menu on the left side, select **Administration > System Information**.

3. In the list of Configuration links on the **Home** page, click **XBee Network**.




4. The XBee Network page is displayed. It shows several settings for the XBee module inside the ConnectPort X4, followed by a network view of the XBee devices, or nodes. Initially, this page will not show any nodes aside from the PAN coordinator (the ConnectPort X4).

   To discover nodes:

   - Check **Clear list before device discovery** checkbox. This check box clears any previously read and displayed network information from the ConnectPort X4's cache before the device discovery operation occurs.
   - Click the **Refresh** button.

In the **Node Type** column, the XBee module attached to the gateway is listed as the **coordinator**. The XBee Interface boards and XBee Wall Router are listed as **routers**.

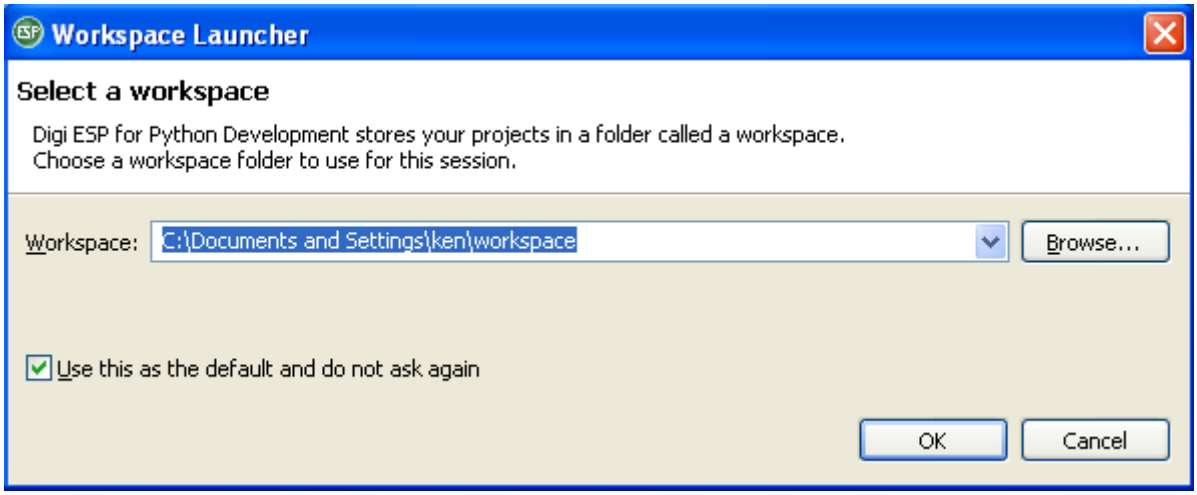
## Step 6: Install the Digi Python Development Framework

Run the Digi Python Development Environment installation wizard that you have previously downloaded. Follow the steps in the wizard to complete the installation.

## Step 7: Run the Digi ESP

After the installation completes, run the Digi ESP program, select **Start > Programs > Digi > iDigi > Digi ESP** or double-click on the desktop icon "Digi ESP for Python Development."

1. The Digi ESP for Python Development needs to build a workspace; you will be prompted with a dialog similar to the one below. Check "Use this as the default and do not ask again", then click **OK**.



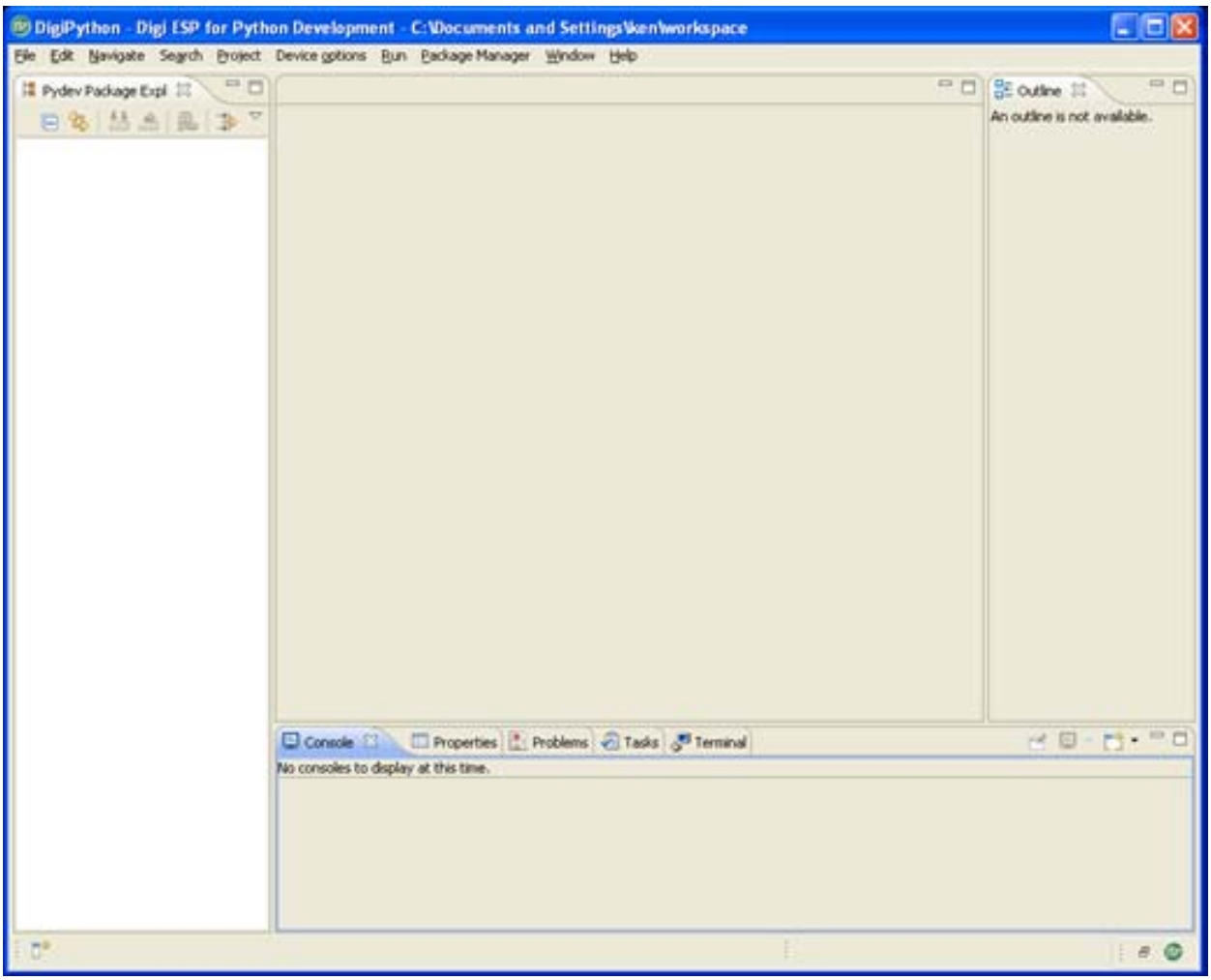

2. After a few moments the Digi ESP for Python Development Welcome Screen and the Package Manager Welcome Page will be displayed (see below).


DigiPython - Digi ESP for Python Development - C:\Documents and Settings\Ken\workspace
File Edit Navigate Search Project Device options Run Package Manager Window Help
Welcome
Welcome to Digi ESP for Python Development

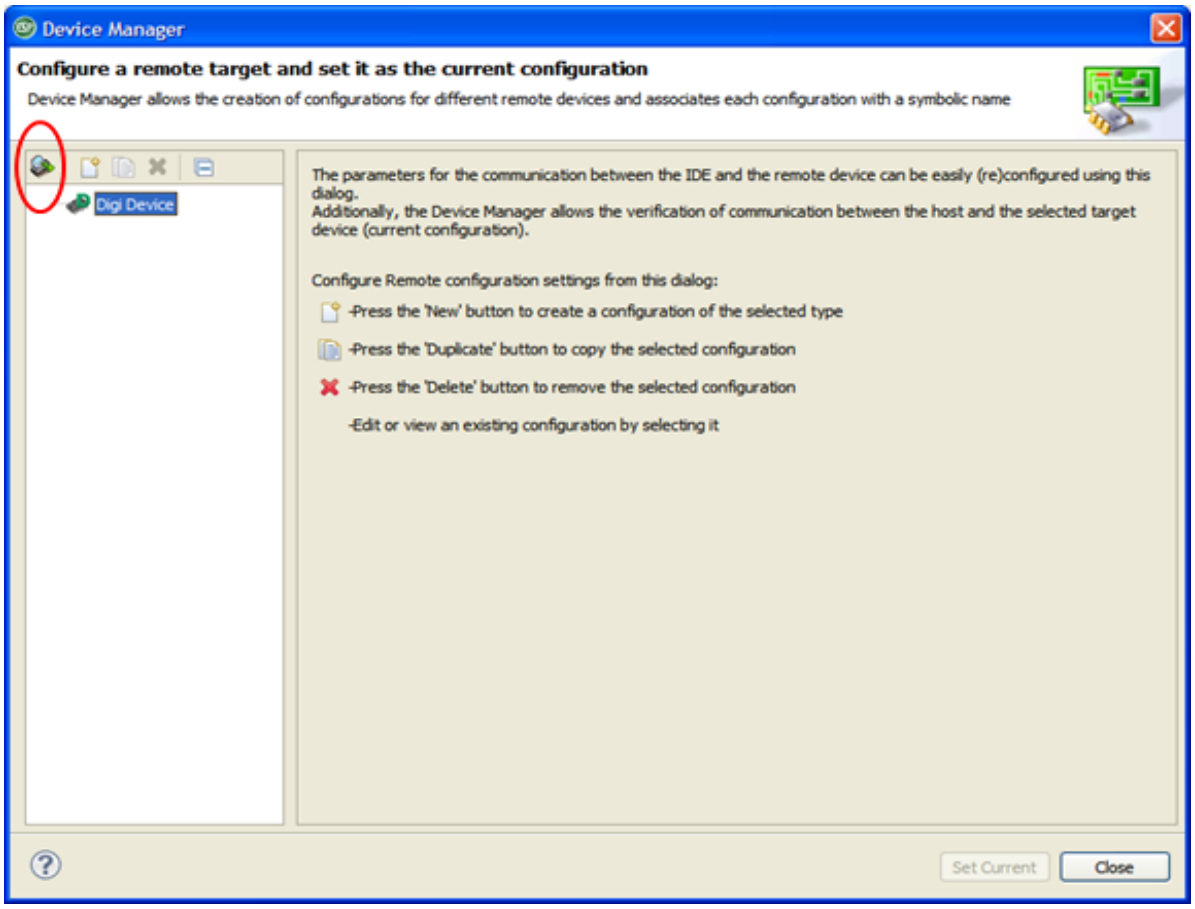

Package Manager Welcome Page
Welcome to Package Manager
ESP
Package Manager
Package Manager is a Digi ESP feature that manages all the different software, documentation, updates and patch packages to keep Digi development environment updated. It allows you to choose which packages you want to install or uninstall.
For this purpose, Package Manager requires an environment file database to determine which files are original and which ones have been updated. This database will be automatically generated in case it is not found.
Digi ESP Package Manager
Version: 1.4.0
Which action do you want to perform?:
Start Package Manager now
Open Package Manager and start working with the tool.
Configure Package Manager
Open Package Manager general preferences page to configure Package Manager general options.
Open Package Manager Help
Learn more about the tool by opening Package Manager Documentation.
Open this dialog at startup
Close

3. Close the Package Manager Screen, and return to the Digi ESP for Python Development Welcome Screen. Next, close the Welcome Screen to reveal the Workbench (as shown below):

   Note: To close the Welcome Screen click the white “X” located in the “Welcome” tab in the upper left side of the screen.

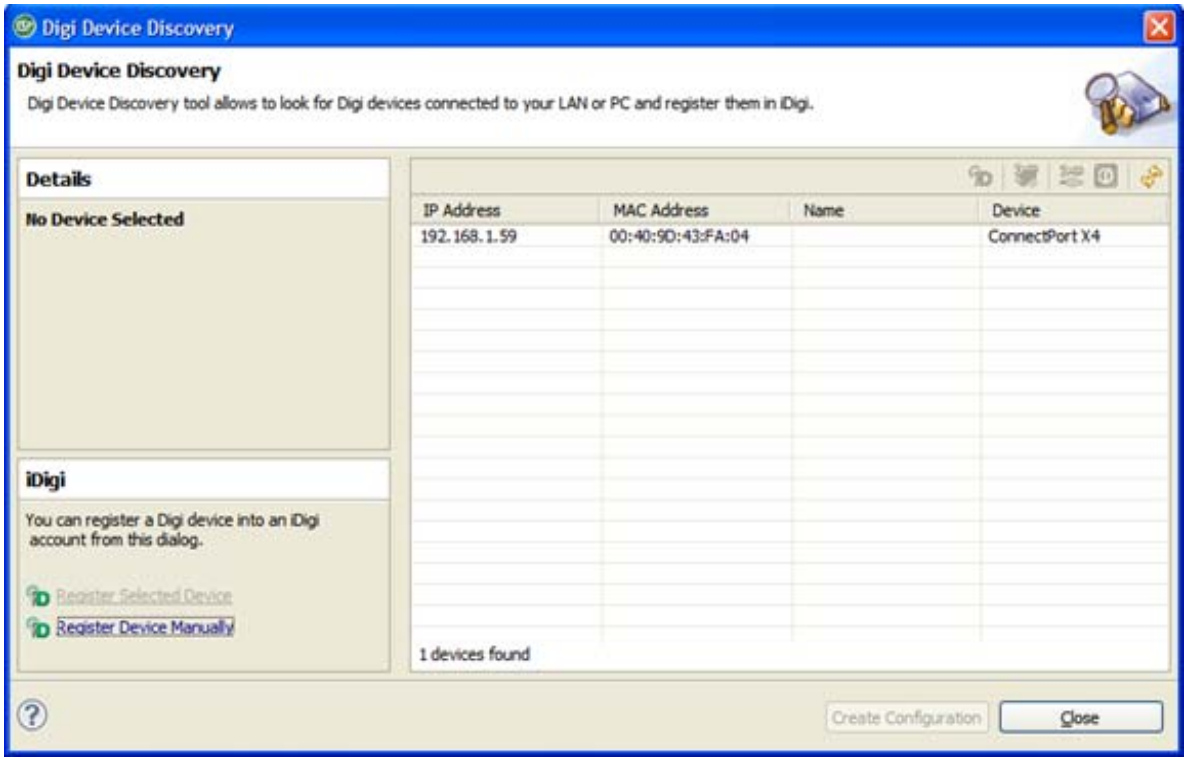


4. You will need to add the ConnectPort X4 to the list of devices that the ESP for Python Development environment interfaces with, this is done using the Device Manager. Navigate to the Device Manager by selecting the following menu option: **Device Options > Device Manager**.

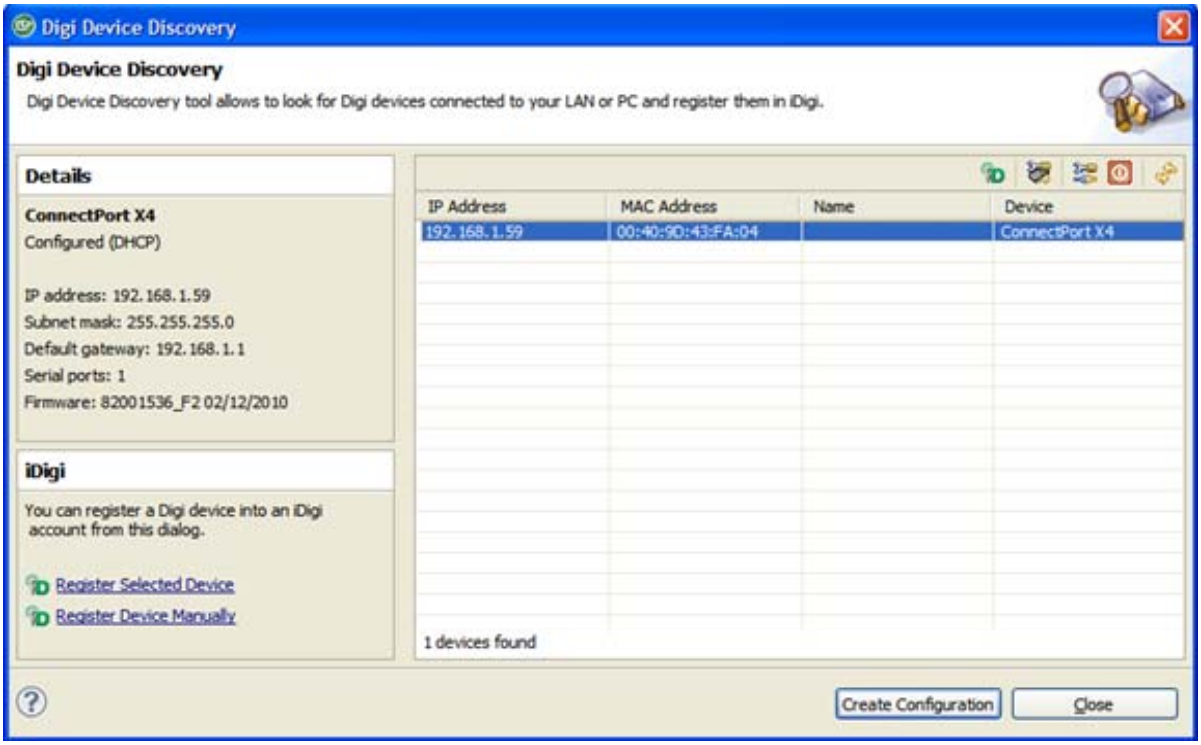



5. Let the Device Manager discover the ConnectPort X4 automatically by clicking the Discover Devices button (circled in red above). The Device Manager will ask you to determine where the search will be performed; in this case select the "Local area network / USB devices" option, and then click **OK** to continue.

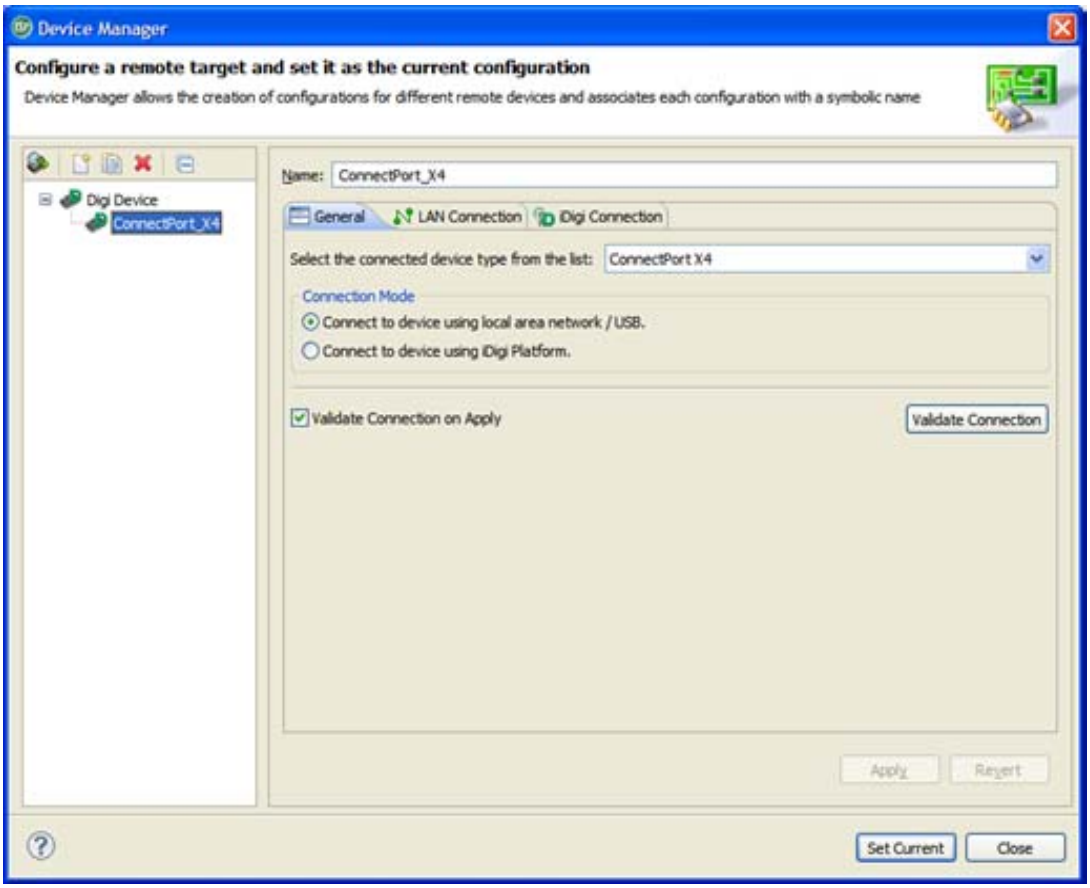
6. The Device Discovery should come up and display the ConnectPort X4 as shown below.




7. Select the ConnectPort X4, and then click the **Create Configuration** button.

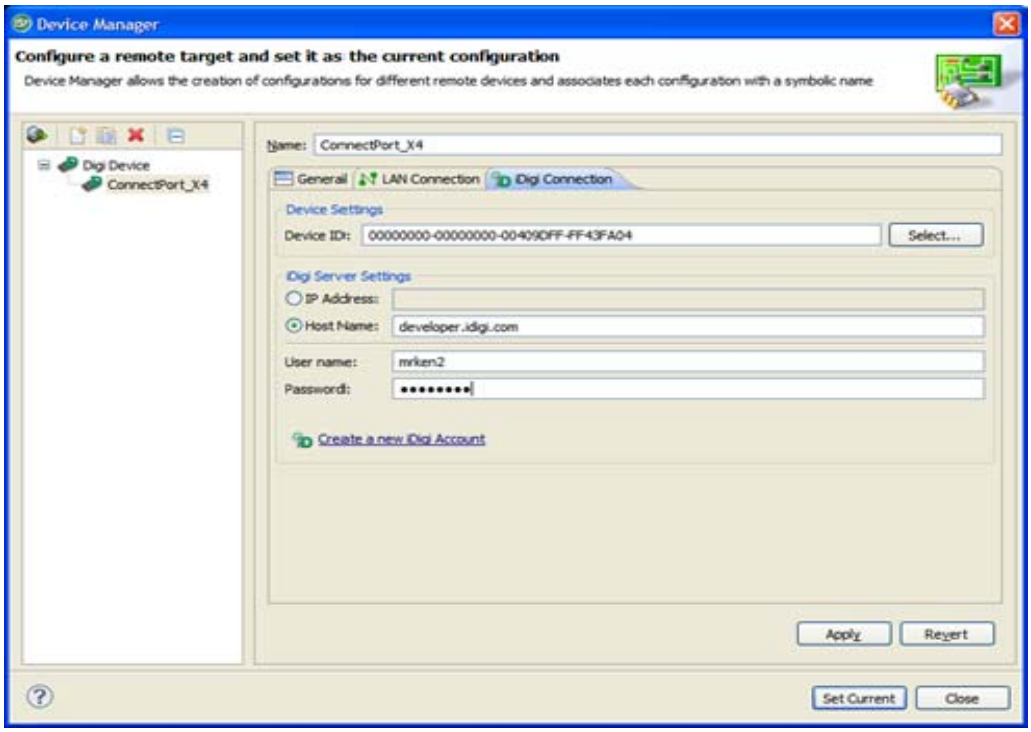


8. The ConnectPort X4 will be added to the list of devices under the Digi Device entry as shown below:

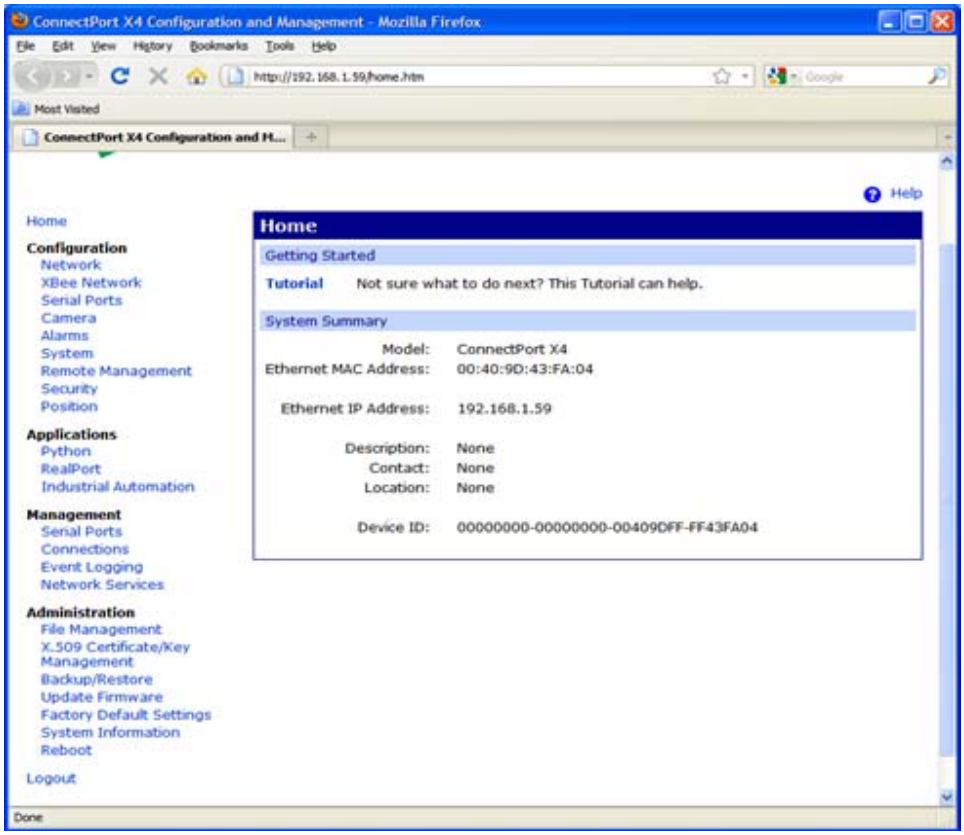



9. The ConnectPort X4 configuration is not quite complete. The iDigi Connection tab information needs to be completed. Click the “iDigi Connection” tab.

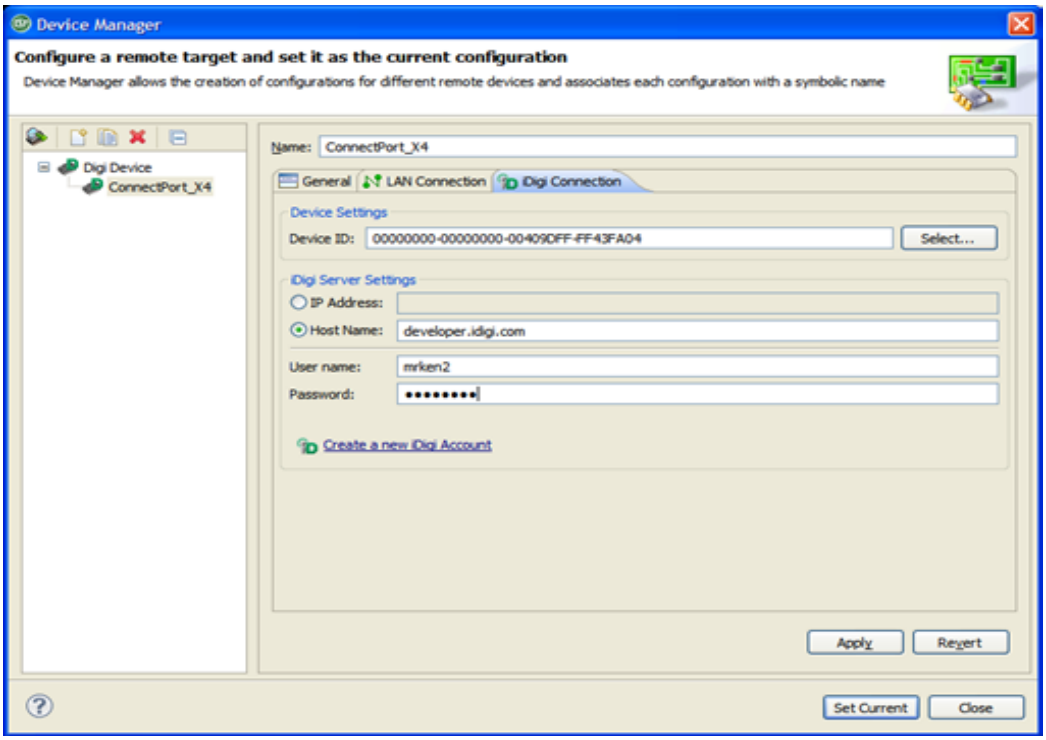
10. Within the iDigi Connection tab dialog box (pictured below), fill in the Device ID and your iDigi Username and Password.



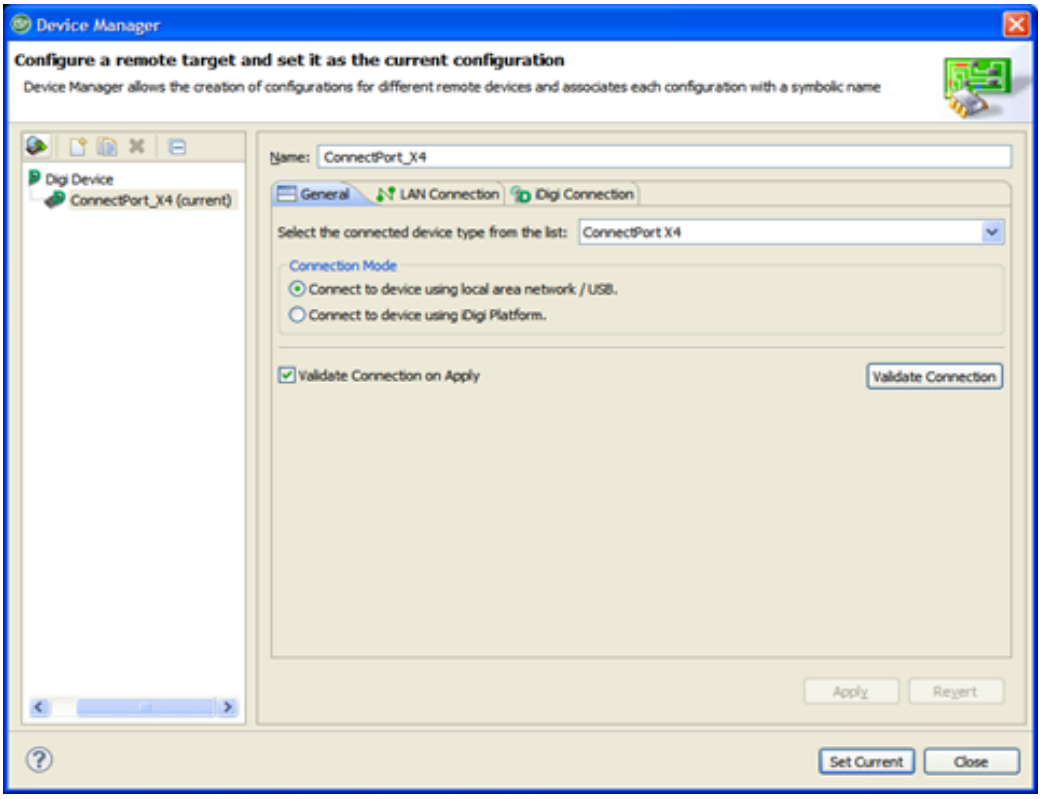

11. The Device ID of the ConnectPort X4 is displayed on its Web UI Home page as shown below.



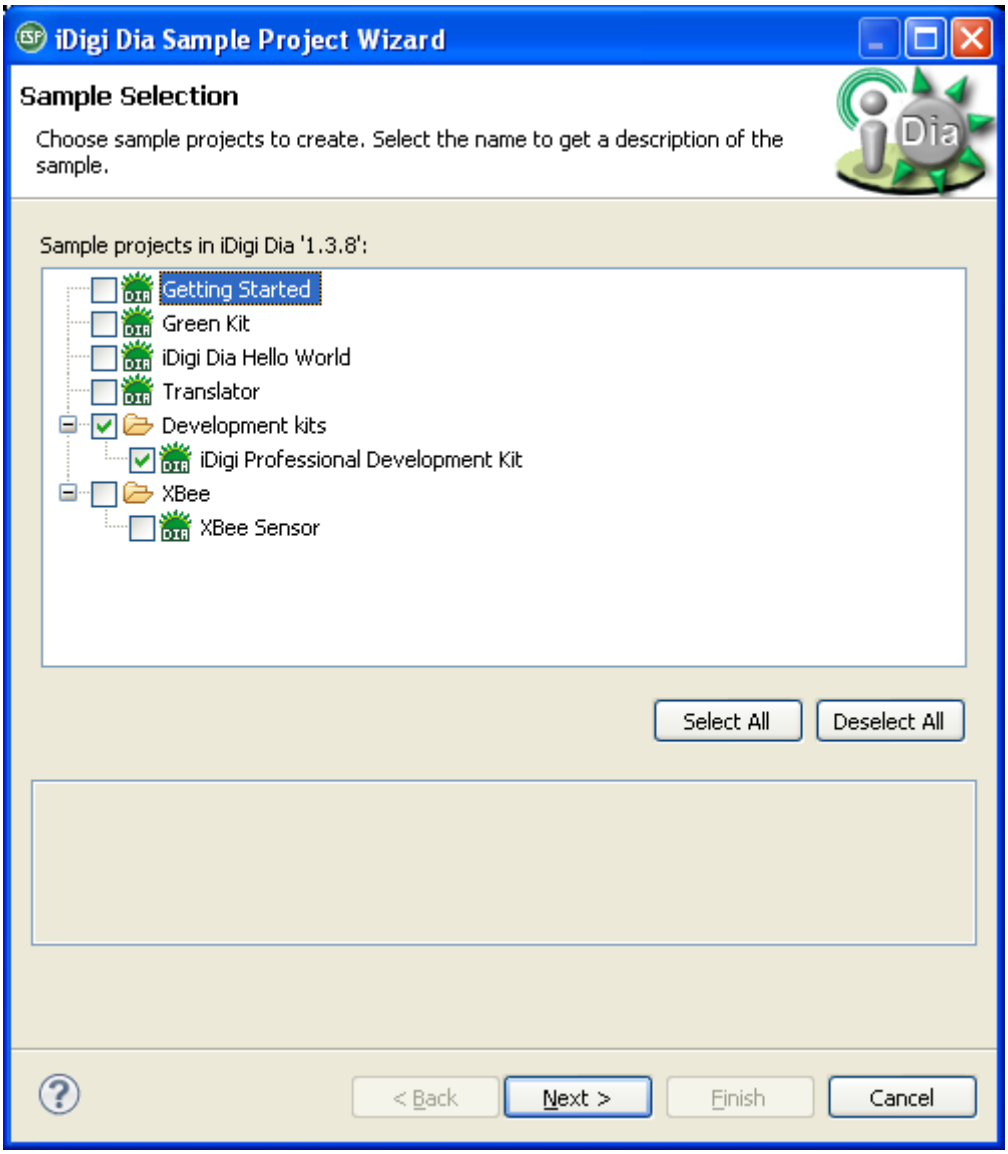
12. After you enter the Device ID and your iDigi Username and Password, click **Apply**.
13. Before exiting the Device Manager, click **Set Current**.



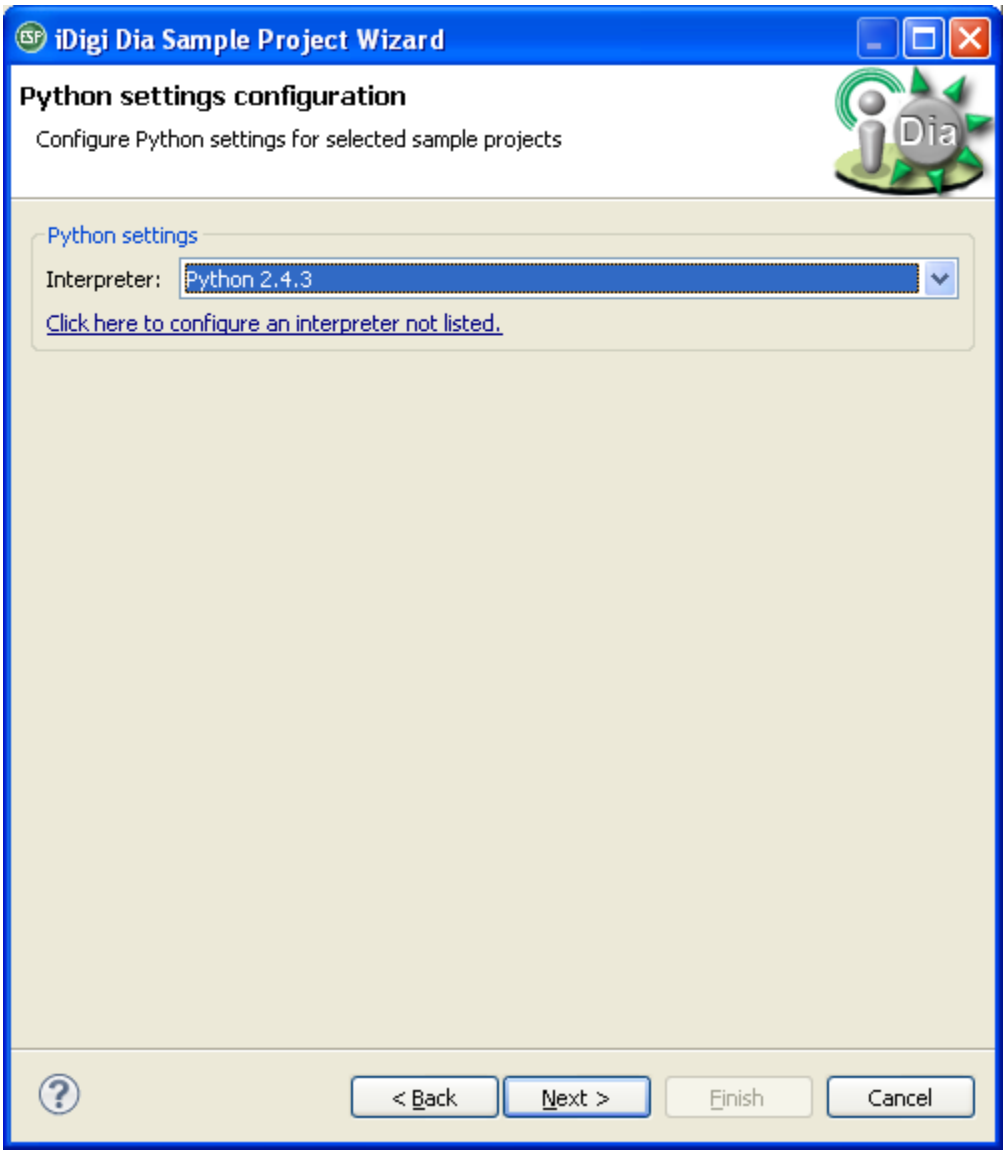

14. The Device Manager will now have the following configuration:



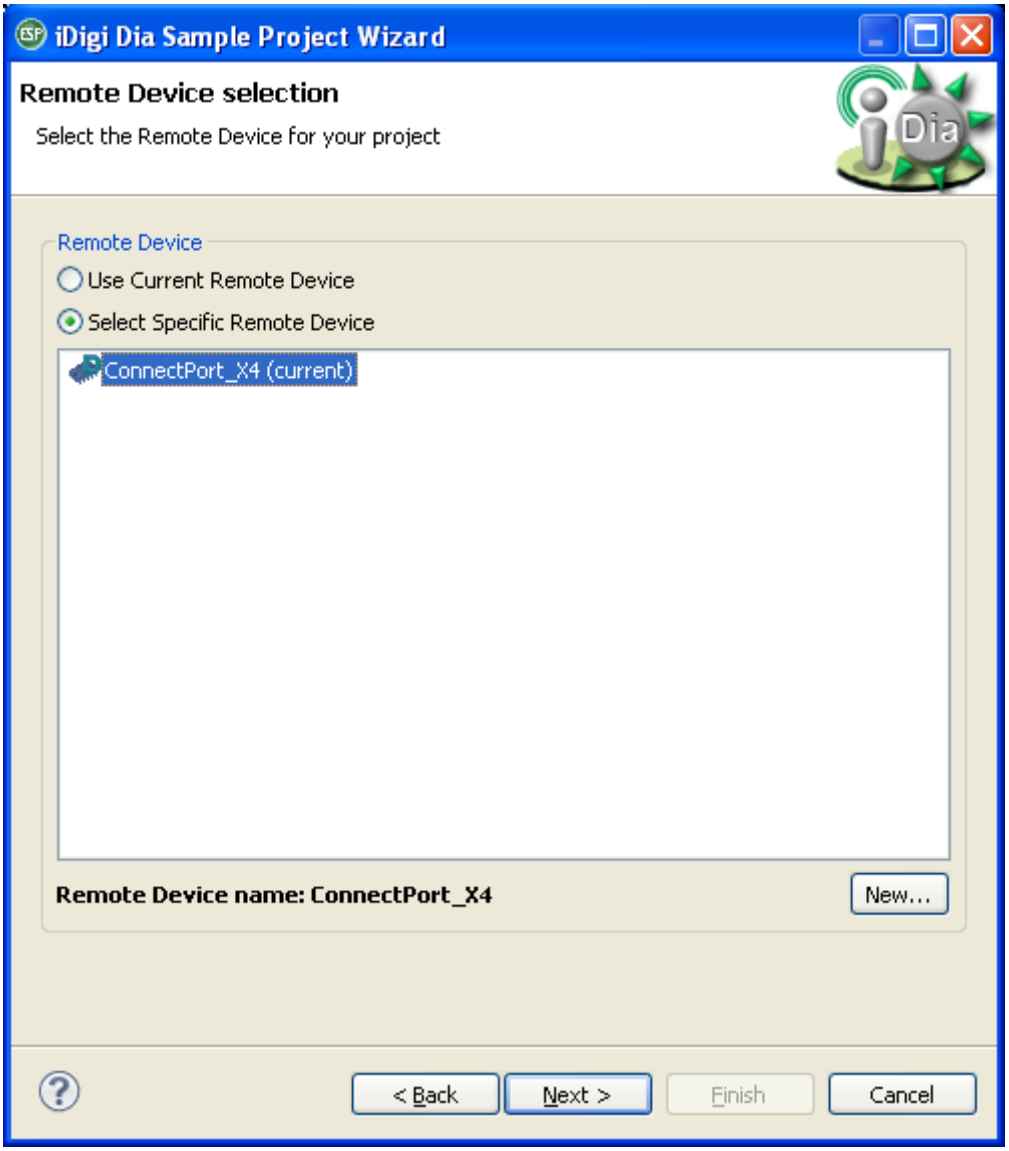
15. Now you are ready to build your first project. Do this by selecting the following menu option: **File > New > iDigi Dia Sample Project.** This will display the list of sample projects. Select the "iDigi Professional Development Kit", and then click Next.



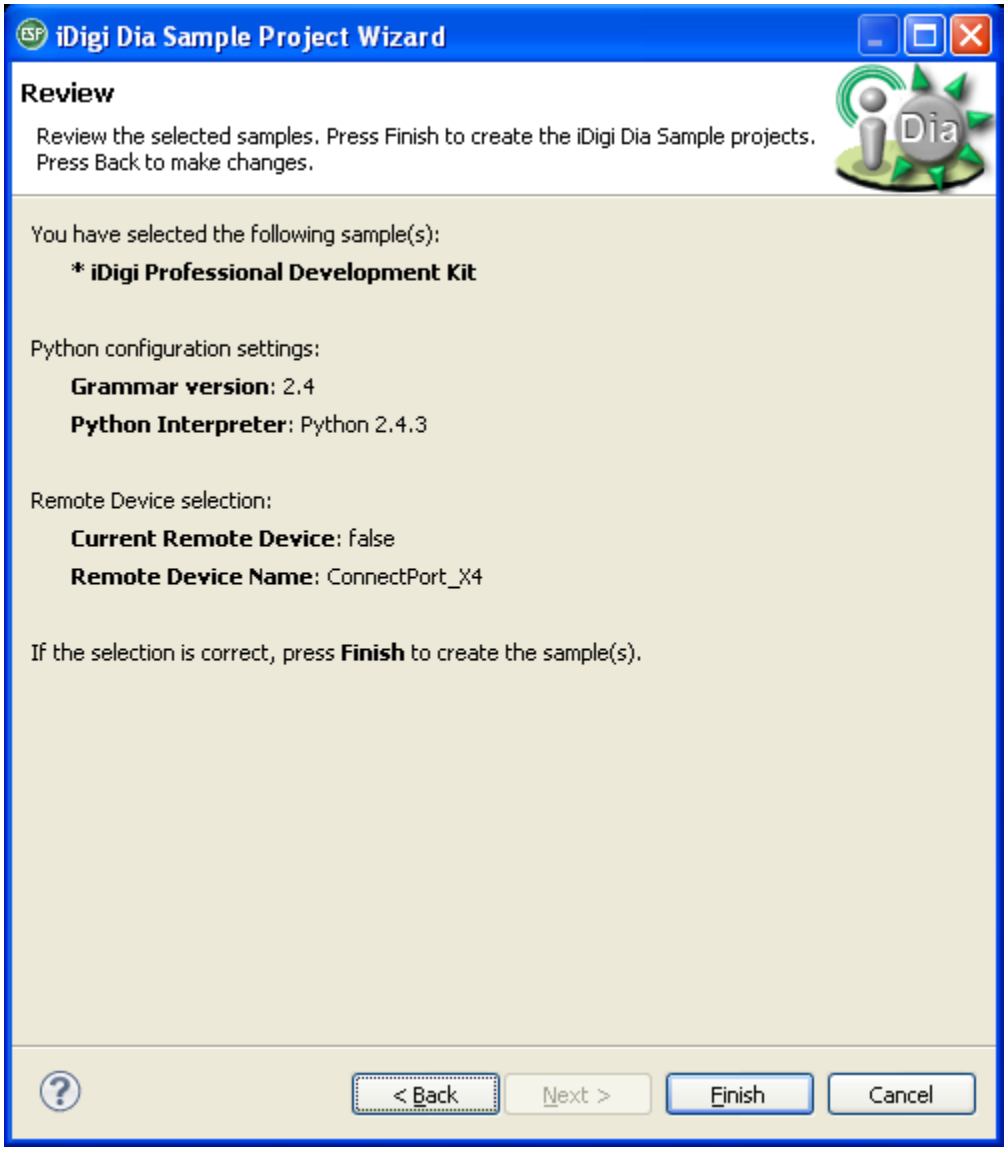
16. Select Python 2.4.3 in the Python settings Interpreter drop-down box, and then click **Next**.



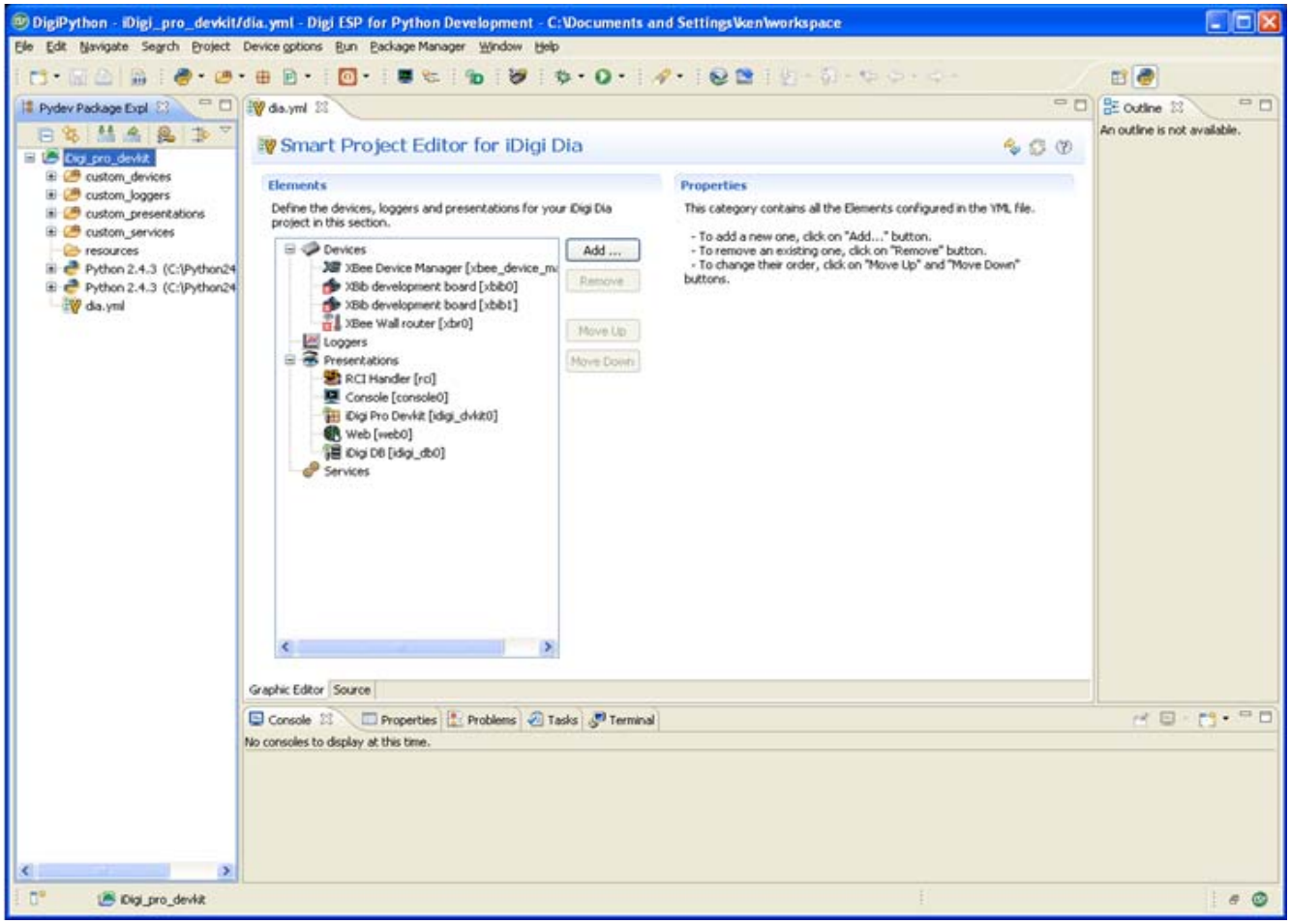
17. From the Remote Device selection dialog, select the "ConnectPort_X4" device, and then click **Next**.



18. The Review dialog will be displayed summarizing the Project Options. Click **Finish** to create the Project.

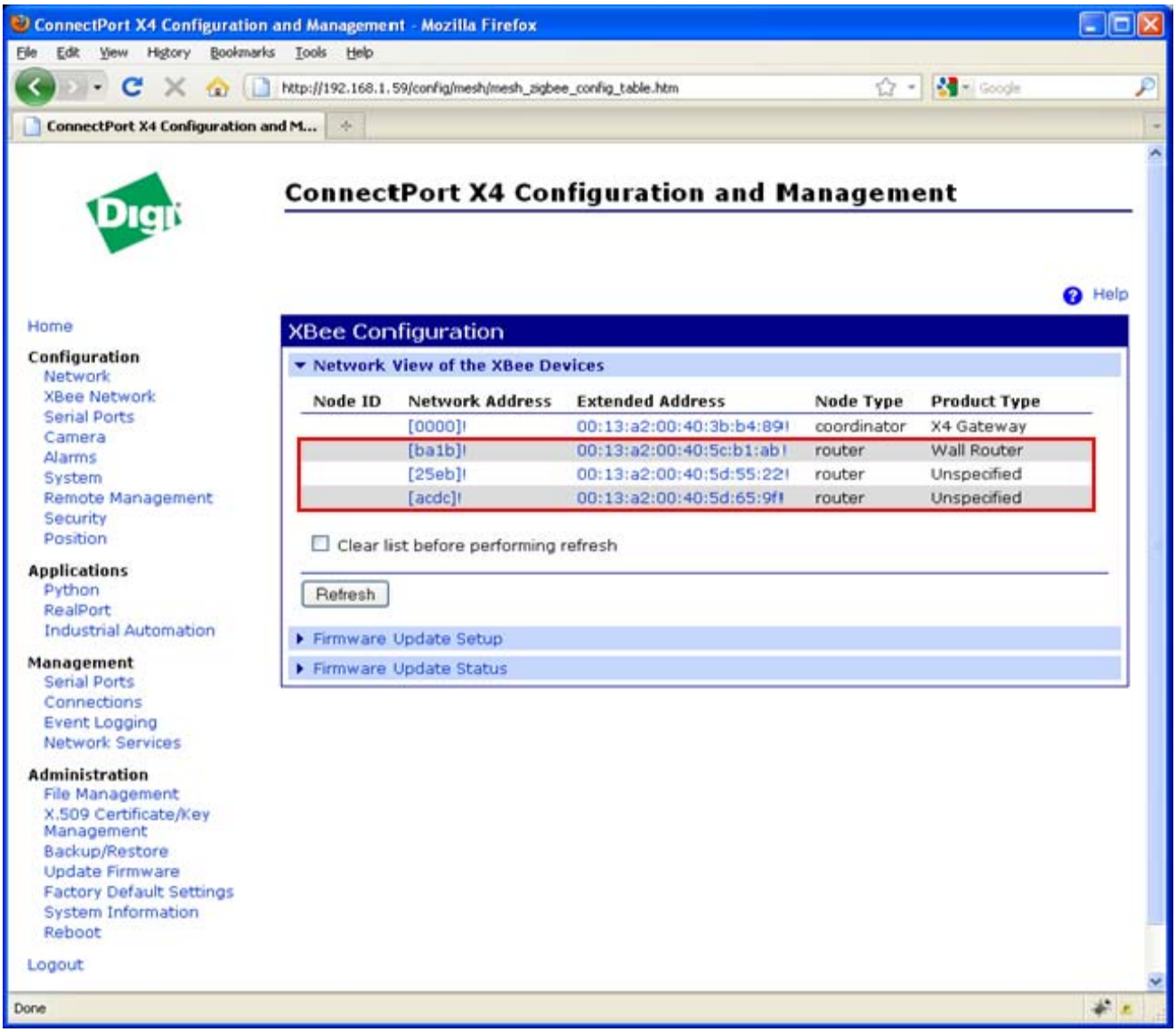


19. Your Workbench should look similar the following:

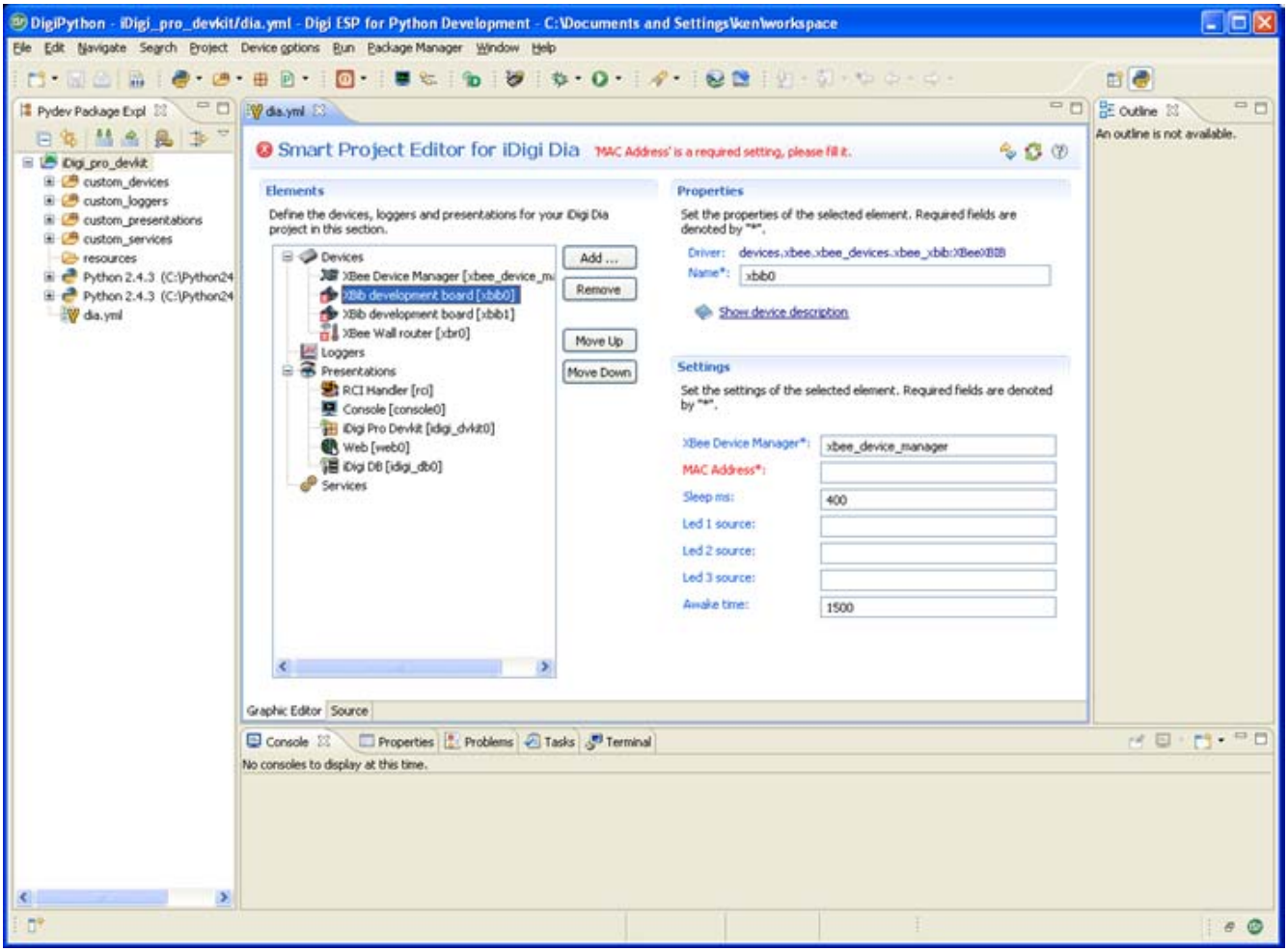



20. The XBee Device Manager entry, lists the three XBee devices contained in your Development Kit: two XBee Interface Boards and an XBee Wall Router. The XBee MAC address for each of these devices needs to be updated with the actual MAC addresses of the devices provided in the Development Kit.

21. Use the Web UI of the ConnectPort X4 to retrieve the XBee MAC addresses of all the devices. Open the Home page and select the "XBee Network" link. A screen similar to the following should appear:

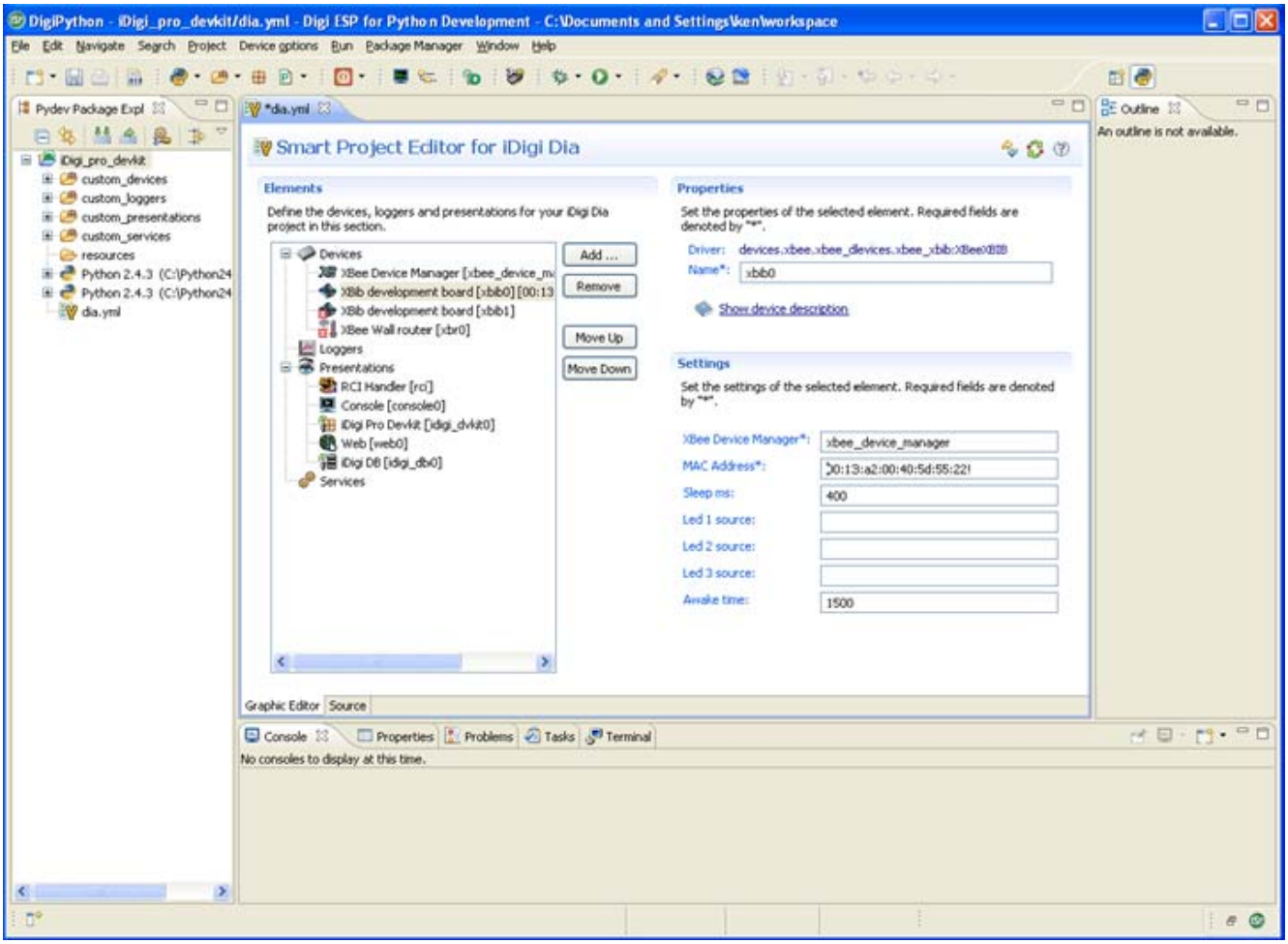


22. On the Workbench, click on the "XBib development board [xbib0]" entry and you will see a screen similar to the following:



23. Fill in the MAC Address field with the Extended Address entry for that device from the Web UI (as shown below):

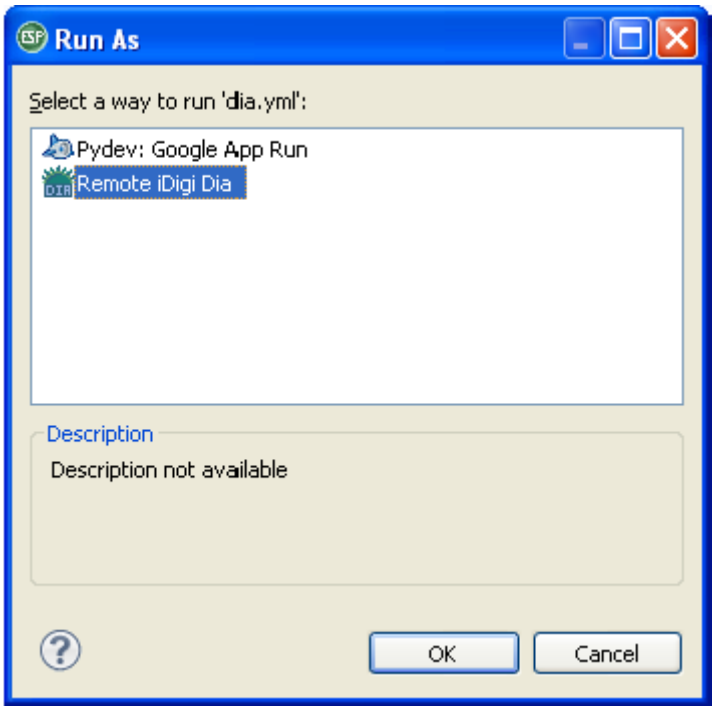
    Note: When entering MAC Addresses ensure that only the corresponding Extended Address (from Step 21) for each device is entered into each of the MAC Address fields below.



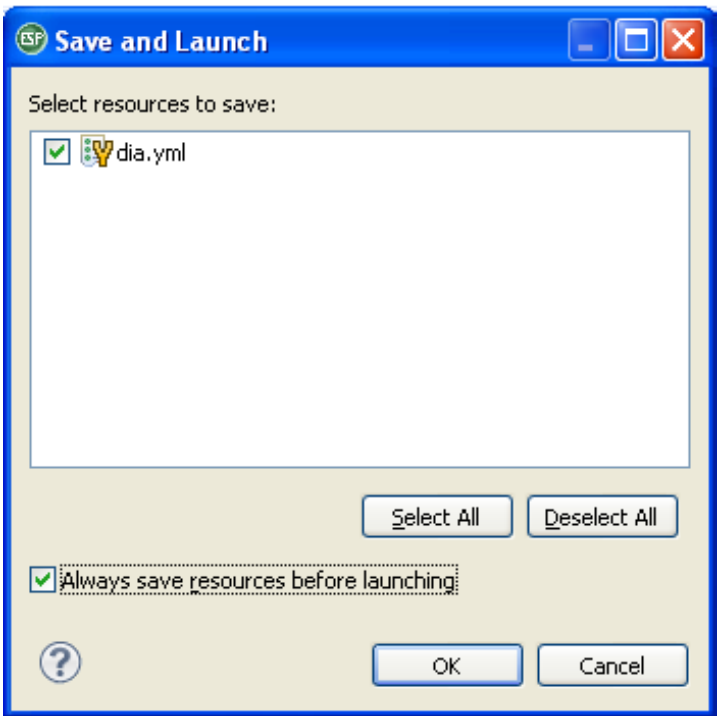

24. Repeat this process and fill in the XBee MAC Addresses for the other Interface Board and the XBee Wall Router.

25. Now that all three XBee MAC Addresses have been configured, the Project is ready to launch.

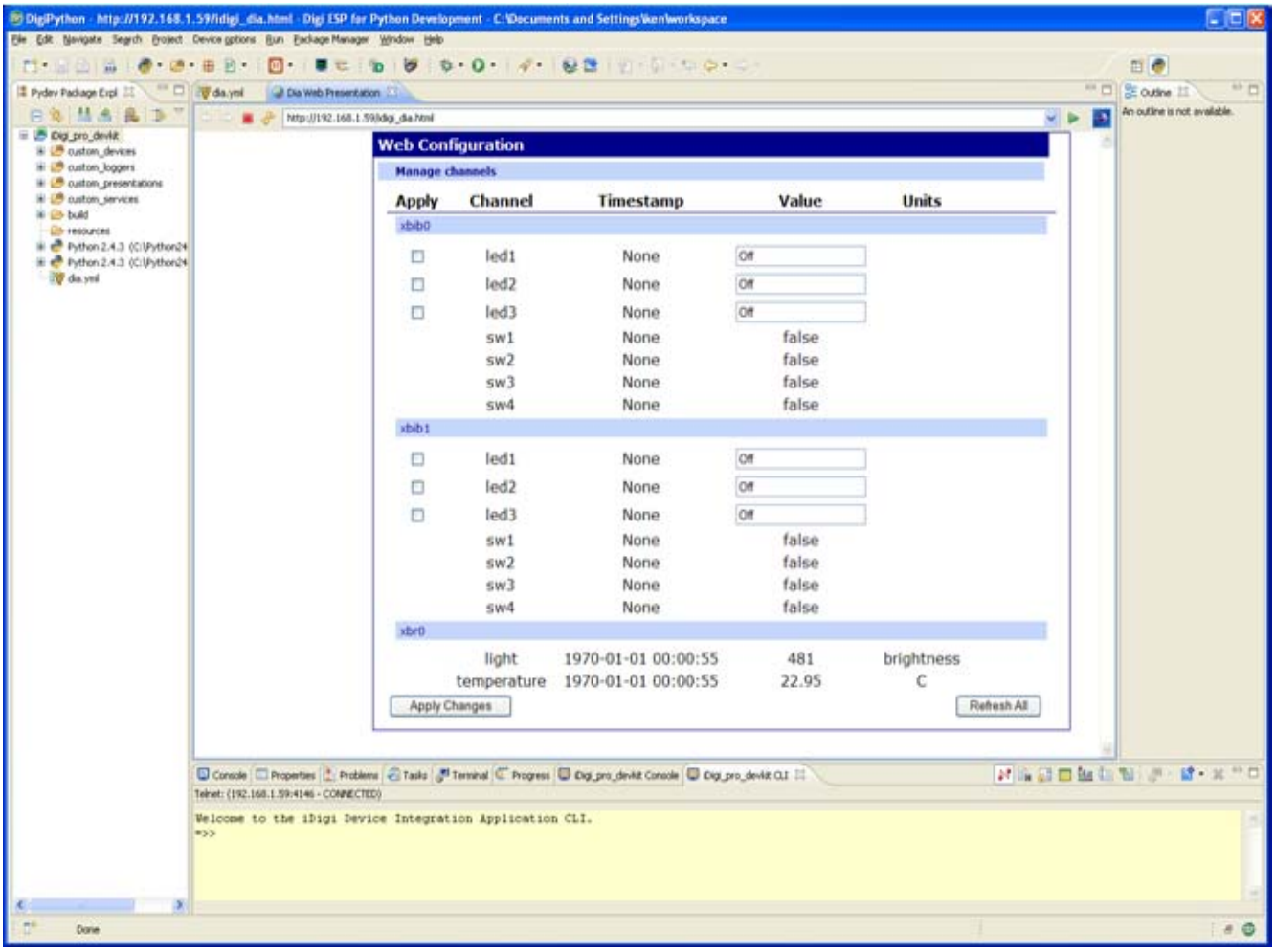
26. Click the **Run** button to launch your 'iDigi_pro_devit' Project. Then select the "Remote iDigi Dia" option and click **OK** to continue.




27. You will see a dialog similar to the following. Click **OK** to launch the Project.



28. The Source View at the bottom of the Workbench Screen will display status messages as the:
    Building of the Project,
    Loading the Project onto the ConnectPort X4,
    Rebooting the ConnectPort X4,
    and finally the running of the Project on the ConnectPort X4 all take place.
29. The Workbench will now display the "Dia Web Presentation" tab, and your screen will look similar to the following:



Now for a brief overview of the functionality of this demo.

Each of the XBIB Interface Boards has 4 push buttons labeled: SW1, SW2, SW3, and SW4.

Each of the XBIB Interface Boards has 4 Amber LEDs labeled: LED1, LED2, LED3, and LED4 (LED4 is not used during this demonstration and will be kept turned ON).

### Button Pushing Demonstration

When one of the push button switches (labeled SW1, SW2, or SW3) is pushed down for about one second, the corresponding LED on the other XBIB Interface Board will toggle either ON/OFF (and vice versa).

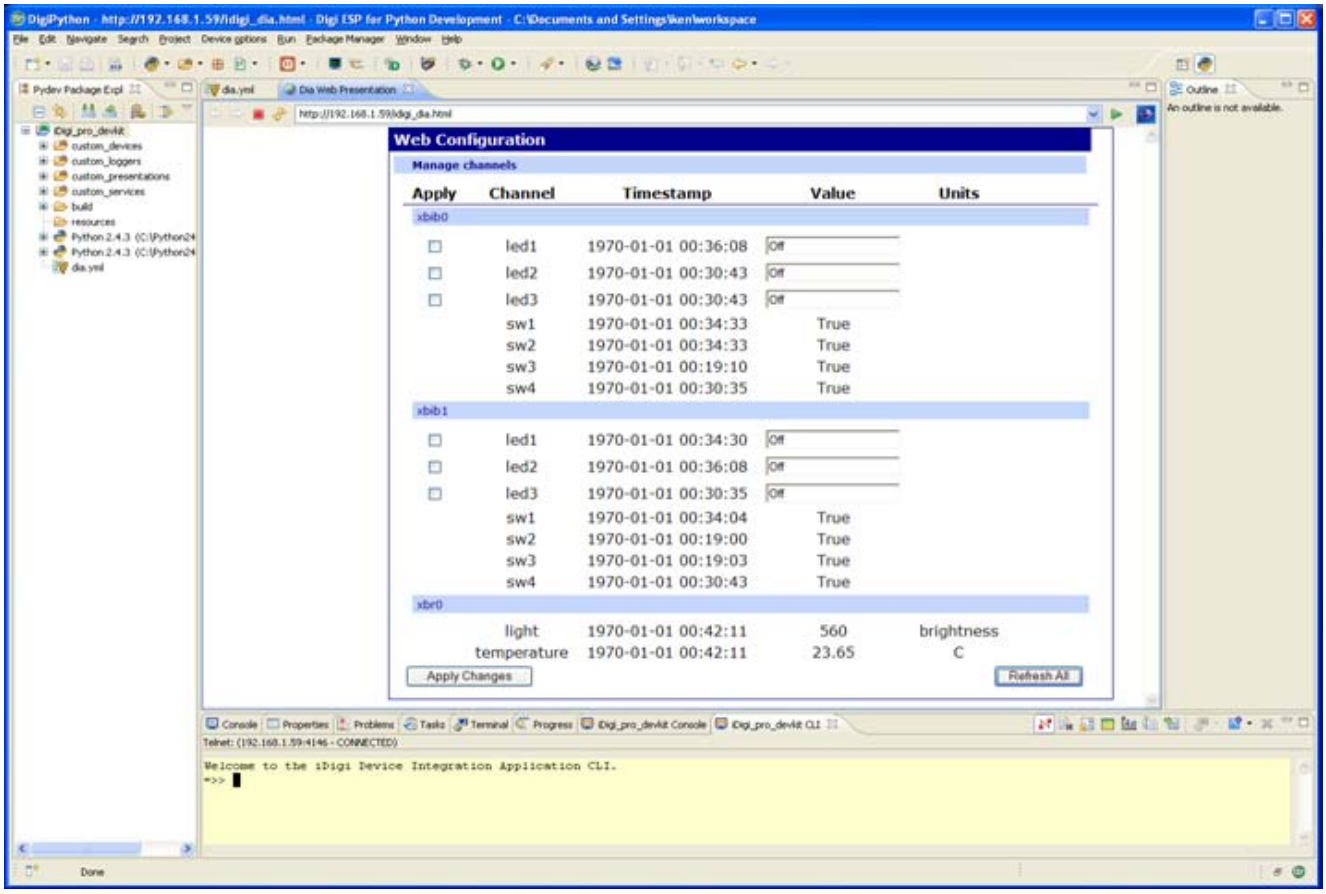
Push Button SW4 has different functionality. It toggles the state of the LED1, LED2, or LED3 on the other XBIB Interface Board.

### Web Configuration Demonstration

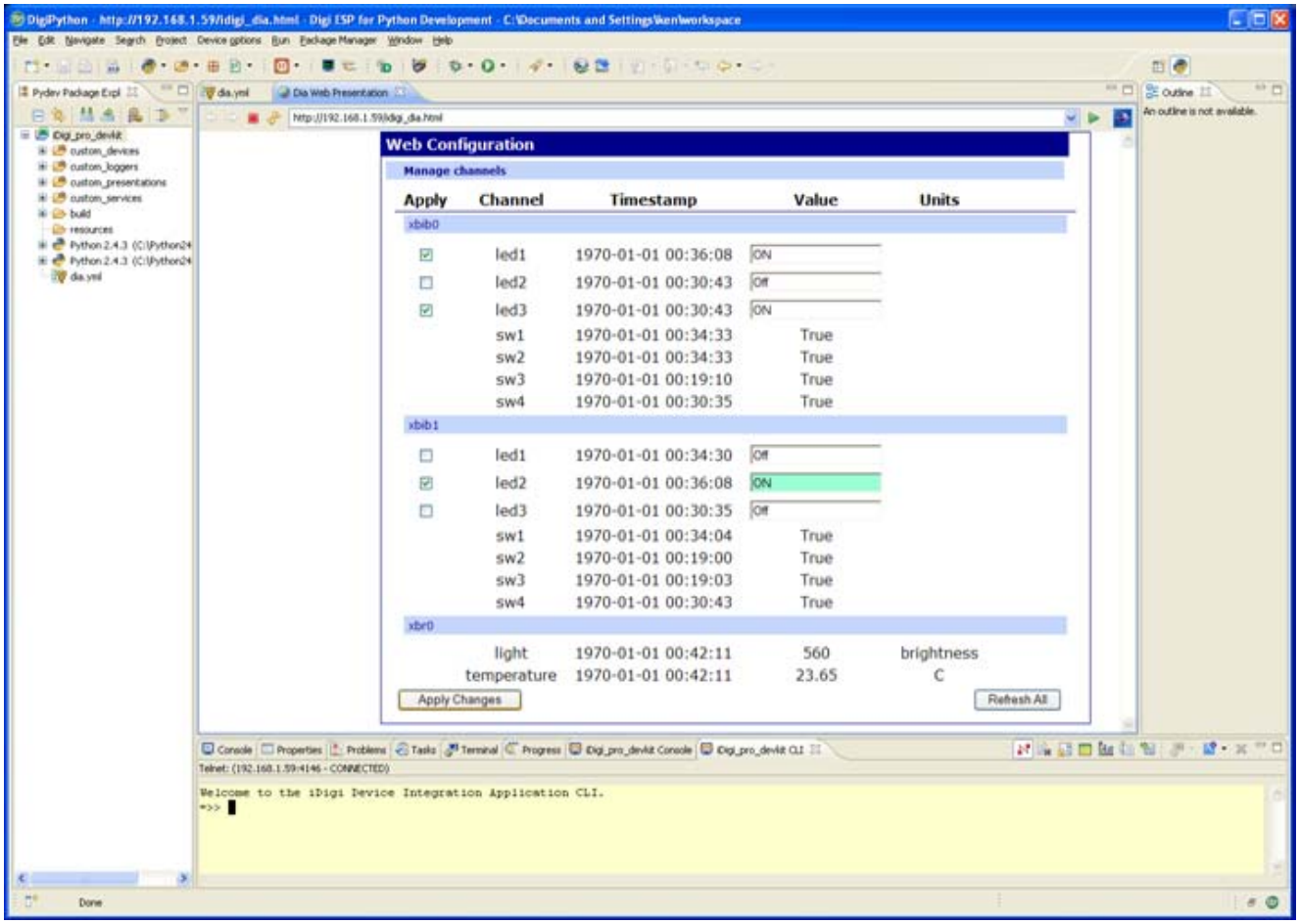
The **Refresh All** button updates the Web Configuration Screen to provide the current configuration of the two XBIB Interface Boards.

The **Apply Changes** button pushes the LED configuration down to both of the XBIB Interface Boards.

The following screen reflects a configuration where all of the 3 LEDs are turned OFF on both XBIB Interface Boards.

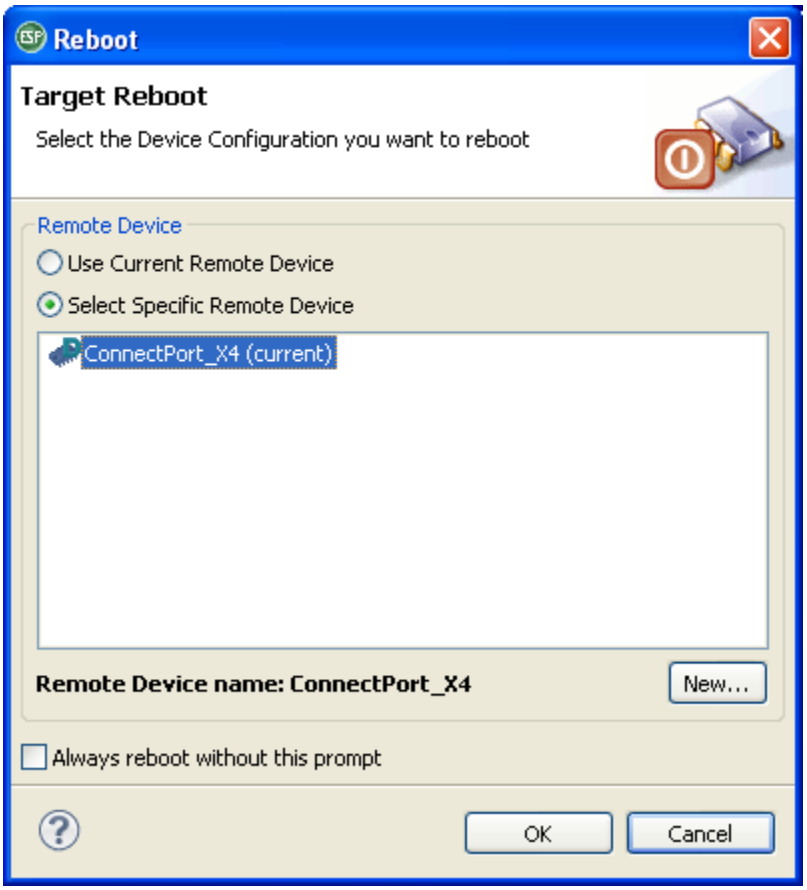



Change several of the LED values to ON and then click **Apply Changes** (as shown below):



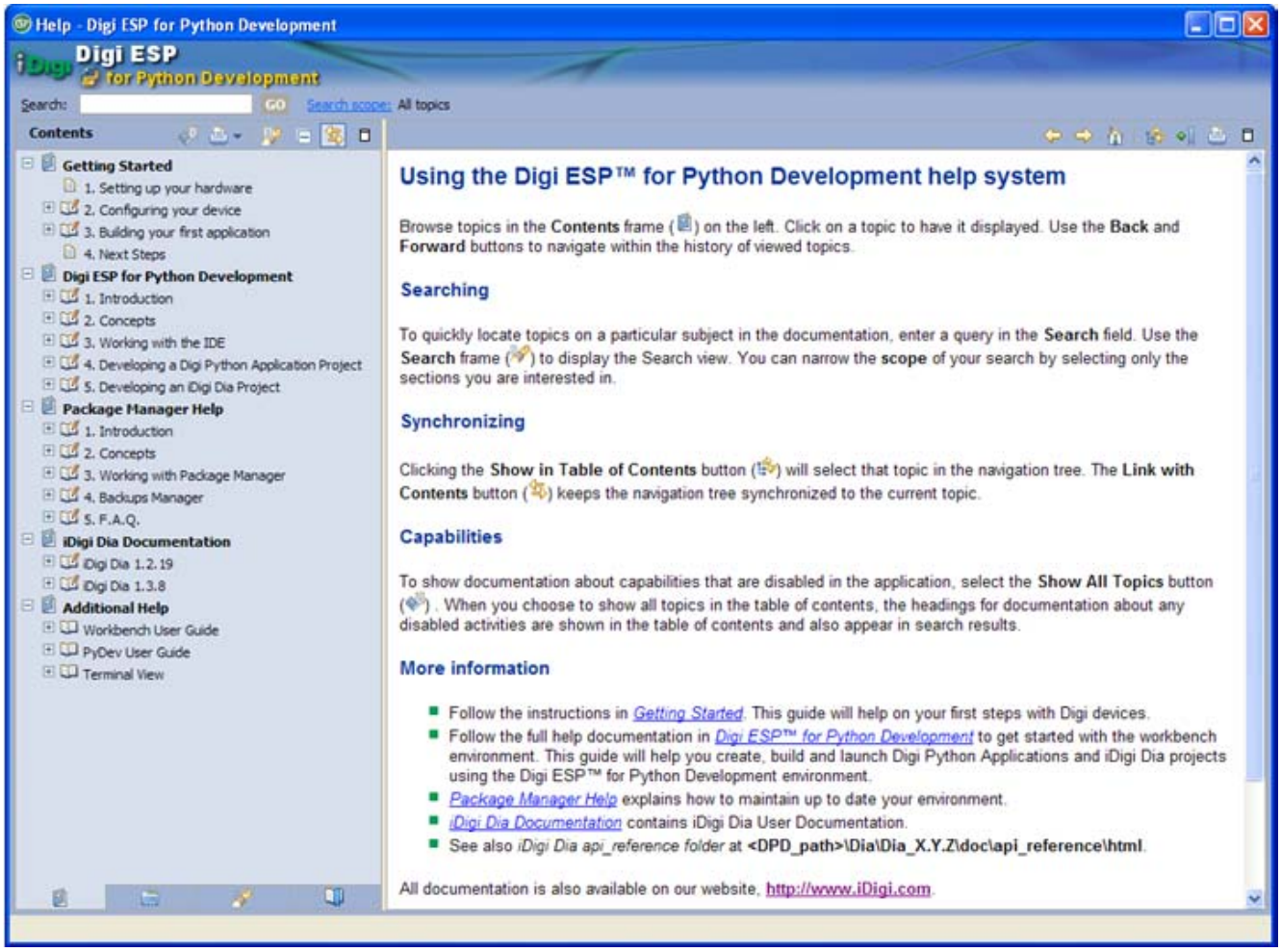

Now, the first XBIB Interface Board will have LEDs 1 and 3 turned on, and the second XBIB Interface Board will have LED 2 turned on.

30. When you are finished with the Project evaluation, simply click the **Reboot Target** button. You will see the following dialog box:




31. Select the ConnectPort_X4 entry, and then click **OK**.

32. Be sure to check out the extensive online Help. Select the following menu option: **Help > Help Contents**, in order to display the Digi ESP online Help.

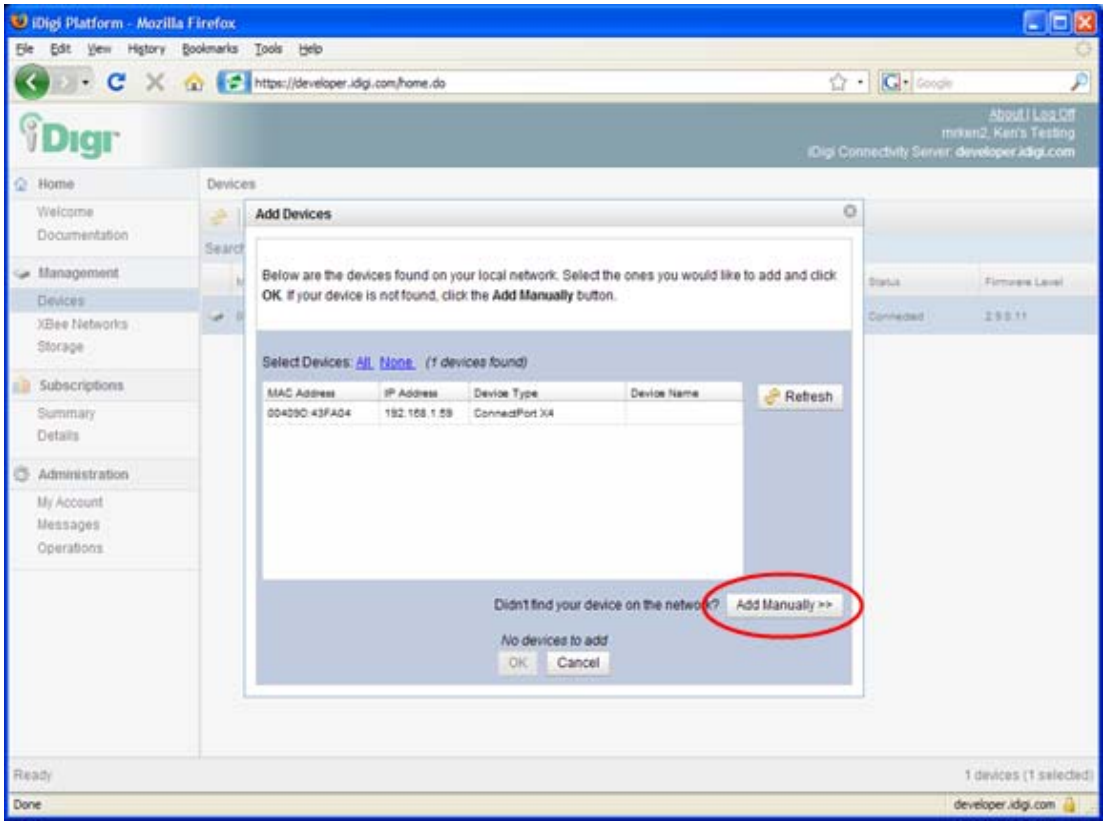



33. If you would like to customize the Workbench, go to the following menu: **Window > Show View**.
34. To reset the Workbench view (to appear as shown in Step 29) select the following menu option: **Window > Reset Perspective**.

# Appendix A: Troubleshooting

## Manually discovering you ConnectPort X4

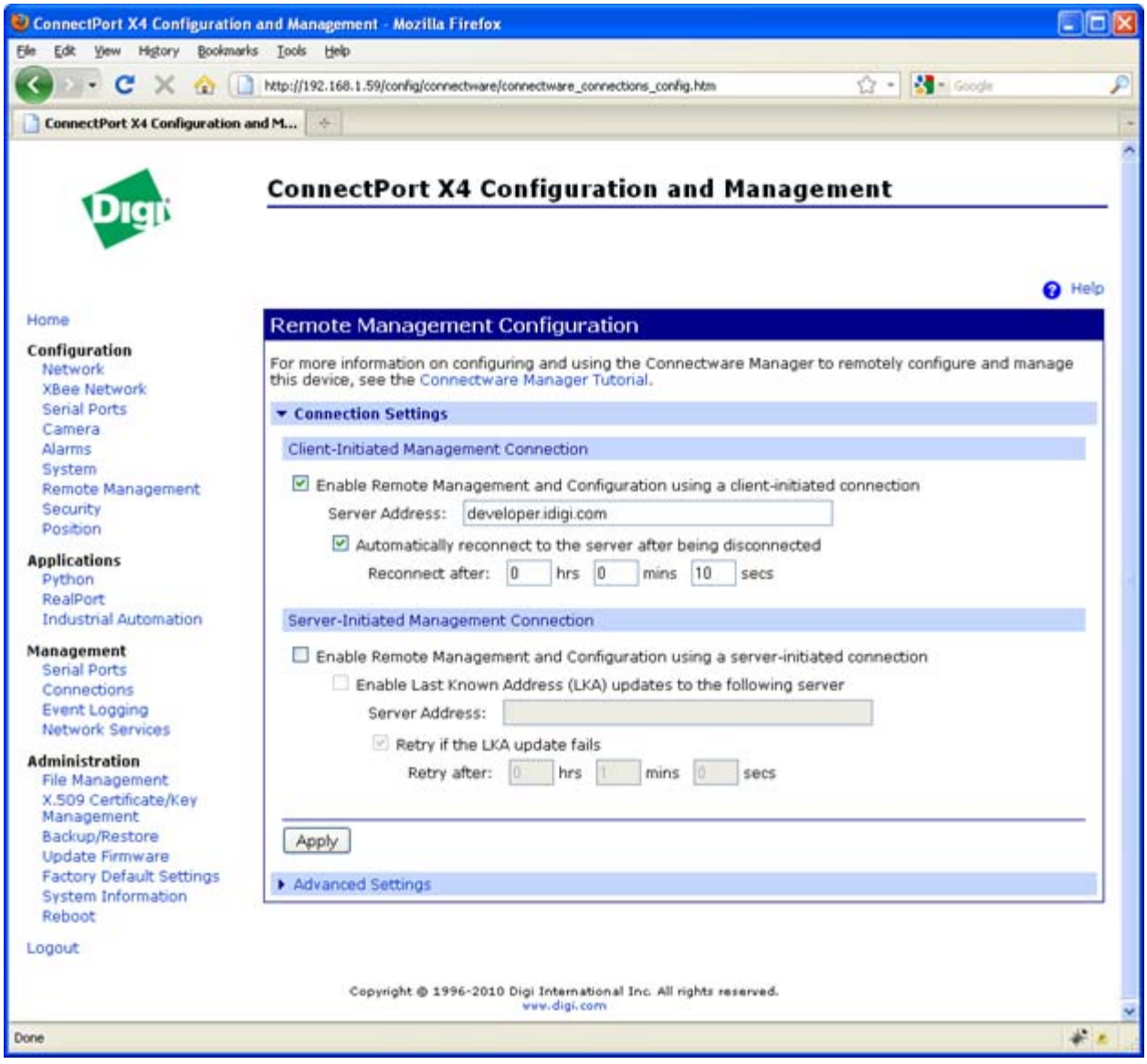
If the ConnectPort X4 is not discovered, you can add it manually by clicking the **Add Manually >>** button shown below. Please note that the MAC address label is located on the bottom of the gateway.



## Configure your ConnectPort X4 to connect to iDigi

To configure your ConnectPort X4 Gateway and connect to the iDigi Platform, follow these steps:

1. Switch back to the Web UI for your ConnectPort X4 and select **Remote Management** from the **Configuration** section.
2. Enter the URL of the iDigi Platform (developer.idigi.com). You can find this URL from the iDigi Platform user portal screen header near the top of the screen under **About |Log off**.
3. Click the check box labeled “Automatically reconnect to the server after being disconnected.”

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