

# iDigi X4 Starter Kit GETTING STARTED GUIDE

**ZB** Series



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## **OBJECTIVES**

Upon completing this kit, you will be able to:

- Configure your gateway
- Create an account on iDigi.com
- · Connect your gateway to iDigi.com
- Set up and configure your Drop-in Sensor Network
- Begin using iDigi Dia (Device Integration Application)
- View sensor data locally on your gateway
- View sensor data via iDigi.com



#### **Drop-in networking**

As an integral part of the Drop-in Networking strategy, the Python development environment is incorporated by Digi into each 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 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
	From KDD public and mobile phones: 001-010-800-3444-3666 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

# Contents

OBJECTIVES	3
Drop-in networking	3
iDigi Dia	3
QUESTIONS?	4
Digi contact numbers outside US	4
Starter Kit components, requirements, and resources	7
Kit components	7
PC requirement	8
Resources	8
Product configurations	8
	8
Introduction to iDigi	9
Create an account on iDigi.com	10
Configure the gateway	10
Connect and power on the ConnectPort X4	
Add gateway to iDigi.com device list	
Configure your gateway to connect to IDigi.com	14
Configure your XBee Network	
Associating each component to the gateway	
USB D0010	10
VBee Wall Pouter	10 18
XBee Sensor	10
System diagram	20
View nodes via local gateway using web interface	20
View and manage network via the iDigi Platform	2 າ ວວ
Configure and install the iDigi Dia Crean Dama application	
Configure and install Python 2.4	20
Installing the iDigi Dia Green Demo	25
Build your iDigi Dia program	20 26
Display live sensor data via the iDigi Platform	
	34

## Starter Kit components, requirements, and resources

## Kit components



The iDigi X4 Starter Kit contains several boxes:

Within the boxes will be the following components:



## PC requirement

To run the kit, you will also need:



A personal computer, connected to the Internet.

#### Resources

The following downloads are available at <u>www.idigi.com</u>.

- USB Development Board Windows Driver
- Digi Device Discovery Application
- iDigi Dia (Device Integration Application)
- Python version 2.4.X (follow link to Python site)

Go to <u>www.idigi.com</u> and refer to the following on-line documents for detailed information on accessing and utilizing your starter kit and data.

iDigi Dia Getting Started Guide

iDigi Dia Developer's Guide

iDigi Web Services Getting Started Guide

iDigi.com Web Services and Device Management Overview

## **Product configurations**



Digi ConnectPort X gateways are available in multiple configurations: XBee-to-Ethernet, XBee-to-WiFi, and XBee-to-Cellular. The latter two configurations enable end-to-end wireless device connectivity.

## Additional products

iDigi BL4S100 Add-On Kit - Enables the addition of wireless embedded control to a ZigBee network via the iDigi platform. Featuring the Rabbit BL4S100 Single Board Computer, intelligent I/O can be implemented to the iDigi platform and easily programmed via the included Dynamic C development software. Supervisory tasks can be remotely managed and localized I/O control can be added to any device that is part of the ZigBee network. For more information see:

http://www.rabbit.com/products/iDigi\_bl4s100\_add-on\_kit/

## Introduction to iDigi

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. The user is able to simply connect to the iDigi Platform and get to work.

For a list of on-line documents that provide more information about iDigi, see "Resources" on page 8.

## 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 button.
- 3. Click on the "Are you a new user" link and create your account.



## Configure the gateway

#### Connect and power on the ConnectPort X4

- 1. Open and unpack the box labeled ConnectPort X4 Gateway.
- 2. Connect the power supply to the X4 gateway and connect the power supply to an outlet.

**Note (International version only):** Connect the power supply to a power cable (not included), and the power cable to an outlet.

- 3. Attach the antenna to the X4 gateway.
- 4. Connect an Ethernet cable from the X4 gateway to your hub or switch that provides access to the Internet.
- 5. Use the downloaded Digi Device Discovery application to find the X4 gateway on your network.

🐲 Digi Device Discovery				
	IP Address 🔺	MAC Address	Name	Device
Device Tasks	\$\$192.168.1.5	00:40:9D:37:57:0A		ConnectPort X4
Open web interface				
Telnet to command line				
Configure network settings				
Restart device				
Other Tasks				
Refresh view				
Help and Support				
Details				
1 device				My Device Network

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

- ConnectPort X4 Configuration and Management - Mozilla Firefox <u>F</u>ile Edit View History Bookmarks Tools Help - C × A ( http://10.8.16.23/home.htm) ☆ • G• Google Ø < 应 Most Visited 🌮 Getting Started 脑 Latest Headlines ~ ConnectPort X4 Configuration and Management Help Home Home Configuration Getting Started Network Mobile Not sure what to do next? This Tutorial can help. Tutorial XBee Network Serial Ports System Summary Camera Model: ConnectPort X4 Alarms Ethernet MAC Address: 00:40:9D:36:DF:43 System Remote Management Security Ethernet IP Address: 10.8.16.23 Position Mobile IP Address: Not Connected Applications Description: ConnectPort X4 Python RealPort Contact: None Industrial Automation Location: None Management Serial Ports Device ID: 0000000-0000000-00409DFF-FF36DF43 Connections Event Logging 1
- 6. Double click on the gateway which will bring you to the web interface.

## Add gateway to iDigi.com device list

To add a gateway to the device list, follow these steps.

- 1. Log into the iDigi.com user portal using the username and password you just created.
- 2. Select the **Devices** tab.
- 3. Click the button to bring up the **Add Device**s dialog and type in the MAC address of your gateway that can be found on the top label of the gateway module.

🕲 iDigi Platform	- Mozilla Firefox		
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C C	🗙 🏠 🕼 https://developer.idigi.com/home.do	☆ • G• Google	P
🔎 Most Visited 🌮 🤇	Setting Started 🔝 Latest Headlines		
<b><sup>9</sup>Dıgı</b>	<u>About   Loq Off</u> jdoe, Acme iDigi Connectivity Server: <b>sd1-na.idigi.com</b>	< ▶ @	e 🗖
Welcome Dev	ices Data My Account	Resources	
Devices	Add Devices	8	
MAC Address           00409D:1234	MAC Address: 00:40:9D:12:34:56 Add Discover MAC Address IP Address Device Type Device Name	Remove S 1Di	<u>Dia</u> <u>ai Products</u> tions and
		s 2 <u>TU</u> boa d pa	<u>iscovery</u> ard USB age
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Ready	1 devices		
		developer.idigi.com	🔒 🦑 🗷 🐰

- 🕑 iDigi Platform - Mozilla Firefox File Edit View History Bookmarks Tools Help -🗙 🏠 💽 https://developer.idigi.com/home.do ☆ • G• Google C Ø < 应 Most Visited 🌮 Getting Started 脑 Latest Headlines About | Log Off ۵ 🕨 . 4 **Piq** jdoe, Acme iDigi Connectivity Server: sd1-na.idigi.com Resources Data Welcome Devices My Account Devices Support Forums Support Forums 🔄 💠 🗶 🤪 💖 Launch iDigi Device Manager MAC Address Device ID IP Address Device Type Status iDigi Dia Resources Download current iDigi Dia Embedded 00409D:123456 00409DFF-FF123458 10.52.35.154 Connected **.** iDigi Dia 101 - Basics Gateway iDigi Dia 102 - Dia on Digi Products iDigi Dia 103 - Presentations and Transforms Additional Resources Download current XCTU Download Digi Device Discovery Download XBee dev board USB driver Python 2.4x download page 1 devices (1 selected) Ready developer.idigi.com 🔒 🦑 🗷
- 4. Ensure your device is now displayed in the devices list as shown below:

## Configure your gateway to connect to iDigi.com

To configure your gateway and connect to the iDigi Platform, follow these steps:

- 1. Switch back to the web UI for your gateway and select **Remote Management** from the **Configuration** section.
- 2. Enter the URL of the iDigi Platform connectivity server (e.g. sd1na.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.**



## **Configure your XBee Network**

## Associating each component to the gateway

Use the following steps for associating each component to the gateway.

- 1. Power on component.
- 2. Confirm association is required by clicking the Ident button once.
- 3. Watch the Associate LED on the X4 gateway.
- 4. If the LED blinks rapidly for one second, the component is associated with the gateway.
- 5. If the LED behavior does not change, click the Ident button four times, the associate LED will go solid for a few seconds and should start blinking.
- 6. Return to step two above and repeat as needed until each component associates with the network.

Note: See "LED Indications" on page 34.

## USB board

# **Set up the USB** 1. Open and unpack the box labeled USB Interface Board.

- 2. Install the XBee module on the USB Interface Board.
- 3. Attach antenna to the XBee module.
- 4. Unzip the USB Driver package to a directory of your choice and note that location.
- 5. Connect the XBee module to a PC using a USB cable. The **Found New Hardware Wizard** dialog box is displayed.

The USB interface board is a "plug-and-play" device that should be detected by the PC automatically.

6. After the USB interface board is detected, a wizard for installing USB drivers is launched.

#### **USB** interface

To interface between the modem and a PC, two drivers must be installed: a USB driver, and a virtual COM port driver that makes the USB port look and perform like a physical COM port.

Use the downloaded USB Driver package and follow 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. Select **Search** for the best driver in these locations and Include this location in the search, and then enter the location to where you expanded the USB driver package in step 1.

Found New Hardware Wizard
Please choose your search and installation options.
⊙ Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
Include this location in the search:
D:\software\drivers\WINDOWS drivers  Browse Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

A Hardware Installation Windows Logo Testing alert box is displayed.

- 4. Click Continue Anyway.
- 5. Click Finish.
- 6. You are prompted to install another driver, the virtual COM port driver.
- 7. Repeat steps 3 through 6.



I/O and Associate/Power LEDs

8. Refer back to "Configure your XBee Network" on page 15 for steps on associating the interface board with the gateway.

## **XBee Wall Router**



Associate the wall router with the gateway



- 1. Plug the XBee Wall Router into an outlet.
- 2. Refer back to "Configure your XBee Network" on page 15 for steps for associating the router with the gateway.

#### **XBee Sensor**



The XBee Sensor family is a group of XBee-enabled, battery-powered sensors incorporating an RF module. As a part of Digi's Drop-in Networking solutions, XBee-enabled sensors read real-time data from sensors such as temperature, humidity, and light.

Associate XBee Sensor with the gateway

- Install batteries by removing the two outer case screws and inserting batteries according to the polarity diagram printed on the board. Device power is indicated by the green ASSC LED on the front panel of the XBee Sensor.
- 2. Refer back to "Configure your XBee Network" on page 15 for steps for associating the sensor with the gateway.

Sensor LEDs, buttons, and integrated sensors XBee Sensors have one button and one LED.

XBee Sensor /L/T models have integrated light and temperature sensors. XBee Sensor /L/T/H models have integrated light, temperature, and humidity sensors.





Alkaline Battery Model: This product is powered by three AA batteries (1.5V).

# System diagram

Your starter kit should appear as below:



## View nodes via local gateway using web interface

The USB interface board, the XBee Wall Router, and the XBee Sensor are known as nodes. In this task you will see a network view of the nodes from the gateway web interface.

1. First, return to the home page of the gateway web interface as shown below:



- 2. From the menu on the left side, select Administration > System Information.
- 3. In the list of System Information links on the **System Information** page, click **XBee Network**.

SconnectPort X4 Configuration a	and Managemer	nt - Mozilla Firefox				
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Configuration	▶ General					^
Mobile	Serial					
XBee Network	Network					
Serial Ports	<ul> <li>Mobile</li> </ul>					
Camera	Mobile					
System	IP Networ	k Failover				
Remote Management	Position					
Security	▼ XBee Net	work				
Position	Gateway D	evice Details				
Applications	Gateway D	evice Decails				
Python RealPort		PAN ID: 0xb:	18b - 0x0000000000004a59			
Industrial Automation	Gat	Channel: UXIC	3:>2:00:40:54:1d:fbl			
Management	000	eway Address. 00.1	3.82.00.40.34.10.05			
Serial Ports	Network Vi	ew of the XBee Devic	es			
Connections	Node ID	Network Address	Extended Address	Node Type	Product Type	
Event Logging		[0000]!	00:13:a2:00:40:54:1d:fb!	coordinator	X4 Gateway	
Network services		[146f]!	00:13:a2:00:40:3e:26:47!	router	Wall Router	
Administration		[4a46]!	00:13:a2:00:40:0a:4a:b5!	router	Unspecified	
X.509 Certificate/Kev		[d981]!	00:13:a2:00:40:4a:ba:40!	end node	XBee /L/T Adapter	
Management						
Backup/Restore						
Factory Default Settings	Clear li	st before device disco	overy			
System Information						
Reboot	Discover >	(Bee Devices				
Done						₩ <u>×</u>

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

To discover nodes:

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

In the **Node Type** column, the XBee module attached to the gateway is listed as the **coordinator**. The XBee interface board and XBee Wall Router are listed as **routers**. The XBee Sensor is listed as the **end node**.

## View and manage network via the iDigi Platform

In addition to being able to view your XBee network locally from the gateway's web user interface, you may view and manage your network remotely using the iDigi Platform.

Viewing your network remotely allows you to have access to your gateway regardless of the type of network on which it resides. As long as your gateway is able to get out to the Internet, you will be able to access it from the iDigi Platform.

- 1. Log into or return to the iDigi Platform home page.
- 2. When prompted for a username and password, enter the same username and password you used to log into the iDigi Platform
- 3. Select the **Devices** tab.
- 4. Click Launch Device Manager.

Once the Device Management Application loads, you will see the device you added to the iDigi Platform.

😻 iDigi Platform - Mo:	zilla Firefox					
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🔎 Most Visited Ҏ Getting	g Started 🔝 Latest Head	llines				
<b><sup>9</sup>Dıgı</b>			Digi Connectivity Serve	<u>About   Loq Off</u> jdoe, Acme r: <b>sd1-na.idigi.com</b>	<ul> <li>&lt; b ⊕</li> </ul>	•
Welcome Devices	Data My Accour	ıt			Resources	_
Devices					Support Forums	
🛷   🔹 🗶 🤪			🧐 Launch iE	igi Device Manager	Support Forums	
MAC Address	Device ID	IP Address	Device Type	Status	iDigi Dia Resources	
00409D:123488	00409DFF-FF123468	10.52.35.154	Embedded Gateway	Connected	iDiai Dia 101 - Basics iDiai Dia 102 - Dia on Diai Products iDiai Dia 103 - Presentations and Transforms Additional Resources Download current XCTU Download Current XCTU Download Current XCTU Download XBee dev board USB driver Python 2.4x download page	
Ready				1 devices		
					developer.idigi.com 🔒 💸	P

- 5. Double-click on the row containing your device which will open a properties view.
  - Note: This is the same configuration information that is available in the web user interface. You are able to configure your device remotely in the same way as you would locally.

🕌 Connectware Device M	lanagement - sd1-na.idigi	.com	
<u>F</u> ile <u>V</u> iew <u>D</u> evice <u>G</u> roup	p <u>M</u> ap <u>H</u> elp		
Groups 🖪 🗶 🕸	All Devices/*-*-00409	9DFF-FF123456	
All Devices (1)			×
*-*-00409DFF-FF12346	Home	章 Home	
	Configuration	System Summary	
	Network	Model: Embedded Gateway	
	Serial Ports	IP Address: 10.52.35.154	
	Alarms	MAC Address: 00:40:9D:12:34:56	
	System	Description: None	
	Remote Management	Contact: None	
	Security	Location: None	
	Applications	Device ID: 00000000-0000000-00409DFF-FF123456	
	Python		
	Administration		
	File Management		
	Customization Admini		A Links
		w Reiresn	Лер
	🗄 Properties 🛛 😽 Mes	sh 🔄 🔄 Connections	
Messades		View	Messages
messages	18	Ten i	
Ready		*-^-00409DFF-FF123456 - Connect	ed 🖴 🔿

6. Click on the **Mesh** tab and you will see a list of the nodes that make up your XBee device network.

📓 Connectware Device Manageme	ent - sd1-na.io	digi.com					(	
<u>File View Device Group Map</u>	<u>H</u> elp							
Groups	<b>₽ × @</b>	All Devi	ces/*-*-00409DF	F-FF36DF43				
☐ ☐ All Devices (2)     ☐ ④ *-*-00409DFF-FF36DF43     ④ *-*-00409DFF-FF382CF3		Mesh N	etwork	Table View -	R R 100% - X	🔗 Discover w	vith clear o	cache 👫
		Node ID A	Туре	Network Address	Physical Address	Role	Parent	Status
		*	Digi ConnectPort X4	0x0	00:13:a2:00:40:54:1d:fb!	coordinator	0xfffe	ok
			Wall Router	0x146f	00:13:a2:00:40:3e:26:47!	router	0xfffe	ok
		(LED) (Carol)	unknown	0x4a46	00:13:a2:00:40:0a:4a:b5!	router	Oxfffe	ok
		. In	unknown	0xd981	00:13:a2:00:40:4a:ba:40!	ena node	0X4a46	ок
			0	<u>A</u>				
		Prope	rties 😪 Mesh	Sconnections				
Ready					*-*-004	109DFF-FF36DF43	- Connect	ed 🖴 🔿

If you wish to get more information about a specific node, simply doubleclick on the row associated with that node and you will be presented with a properties page for that node. Note: For more information on accessing your data go to <u>www.idigi.com</u> and refer to the following documents within the developer section:

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

## Configure and install the iDigi Dia Green Demo application

## **Configure and install Python 2.4**

The Python programming language needs to be installed on your personal computer in order to be able to use the Digi Device Integration Application. Digi products use Python version 2.4.3 and therefore the version of Python installed on your computer must be from the Python 2.4 series. Ideally, Python version 2.4.3 should be used. It may be downloaded from the Python website:

http://www.python.org

Note: You may have multiple major versions Python installed on your system at any one time. For example, an installation of Python 2.4 has no problems coexisting with an installation of Python 2.5. If you do have multiple versions of Python installed, take care to know which version of Python is being executed when running the iDigi Dia. If you are having difficulty, make sure to consult your system PATH variable, etc.

## Installing the iDigi Dia Green Demo

- 1. Go to <u>www.idigi.com</u> and download the iDigi Dia from the resources section.
- 2. You will need to enter the username and password you established when signing up for your iDigi account.
- 3. Extract the ZIP file to a directory on your hard drive (e.g. c:\idigi\_dia).
- 4. Open a Windows command prompt by clicking the Windows **Start** menu button and selecting **Run**. Then type **cmd** and click **OK**.
- 5. Change directories into your iDigi Dia installation. For example:

```
C:\Users\Joe> cd \idigi_dia
C:\idigi dia>
```

- 6. Open a text editing application (e.g. wordpad).
- 7. Open the configuration file for the iDigi Green Getting Started Demo located in the idigi\_dia\demos\green\_getting\_started folder called

```
green_getting_started.yml.
```

8. Underneath the **devices** section you will find a configuration entry for each XBee-based device included with the iDigi Starter Kit. The **extended\_address** field must be modified for each device in order for

the iDigi Dia program to be able to find and configure each device when the application is executed on the gateway.

 In order to find these extended addresses, load the Web UI of the gateway and click on XBee Network underneath the Configuration heading. There you will find a list of nodes, their product type (e.g. "Wall Router") and their associated extended address (e.g. "<u>00:13:a2:00:40:3e:26:47!</u>").

ConnectBoxt V4 Configuration	A)				Google 👝 🗖 🗙
ConnectPort X4 Conngorati			2 DYN 72		
C ☆ http://10.8.	16.23/config/me	sh/mesh_zigbee_cont	fig_table.htm		
🗀 Bills 🦳 Comics 🦳 Digi 🦳 Hus	sney.Com 📋 New	s & Humor 🛛 🗰 Wikipedia	🛐 Google Reader 📄 del.icio.us/	amoebapr 🕒 po	st to del.icio.us 🎽 🦳 Other bookmarks
Digit	<u>Connect</u>	Port X4 Con	figuration and M	anagem	ent
Home	XBee Con	figuration			<b>у</b> нер
Configuration	▼ Network \	/iew of the XBee De	vices		
Network Mobile	Nede ID	Notwork Addross	Extended Address	Node Tupe	Broduct Tupo
XBee Network	Node ID		Extended Address	Node Type	Y4 Catoway
Serial Ports		[146f]	00:13:32:00:40:34:10:00	routor	Wall Poutor
Camera		[4546]]	00:13:32:00:40:38:20:471	router	Unspecified
System		[h4f2]]	00:13:a2:00:40:53:2a:e0	end node	XBee Sensor /I /T Adapter
Remote Management		[042]:	00.13.82.00.40.33.28.80	ena noue	xbee Sensor /L/T Adapter
Security Position	🗖 Clear lis	st before performing	refresh		
Applications Python RealPort Industrial Automation Management Serial Ports	Refresh	Jpdate			
Connections					
Event Logging					
Administration					
File Management X.509 Certificate/Key					
Management Backun/Restore					
Update Firmware					
Factory Default Settings					
System Information					
Reboot					
Logoat					
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10. Save your modified configuration file and switch back to the console window.

#### Build your iDigi Dia program

When you see the following console prompt, it is time to build your iDigi Dia program:

C:\idigi\_dia>python.exe make.py demos green\_getting\_started\green\_getting\_started.yml

Note: If python.exe is not in your PATH, you may need to use the direct path to your python executable such as

C:\Python24\python.exe



The build process will produce a file named **dia.zip** in the **bin**\ subdirectory of the iDigi Dia installation.

Now upload this file to the gateway device.

- 1. Via the Web UI, click on the Python link underneath the Applications heading.
- 2. Click Choose File and navigate to find your dia.zip file (e.g.

C:\idigi\_dia\bin\dia.zip)

3. Click **Upload**. The page will refresh when the upload is complete with a message indicating that the file was uploaded successfully.

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Configuration Network Mobile XBee Network Serial Ports Camera Alarms System Remote Management Security Position Applications Python RealPort	✓ Python Files     Upload Files     Upload Python programs     Upload File: Choose File_digi_dia.zip     Upload     Manage Files     Action_File Name Size	
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#### Uploading iDigi Dia application files

We will also need to upload the **dia.py** file. It is used to start the iDigi Dia program on the gateway. It is located in the root of the iDigi Dia installation.

4. Repeat steps 1 and 2, uploading the **dia.py** file (rather than the **dia.zip** file).

**iDigi Dia Green** Once the files have been uploaded, it is time to start the iDigi Dia Green demonstration application.

- 5. Open a telnet connecting to your device either by right clicking on the device from the Digi Discovery application or by using your own telnet client.
- 6. At the prompt type:

#> python dia.py

As your application begins, it will print some trace messages. Shortly, your application will print the message **Core services started**. You may also see some trace messages indicating that samples are arriving from one of your sensors.

7. Click in the URL bar of your web browser and enter the following URL:

http://[IP address of your gateway]/idigi\_dia Note: Do not enter a trailing / after idigi\_dia in the URL. 8. You will be presented with a live web presentation of the data from your sensor network:

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Digit	ConnectPort X4 Configuration and Management	
Home	Digi DIA	🕜 Help
Configuration Network Mobile XBee Network Serial Ports Camera Alarms System Remote Management Security Position	▼ sensor0     light:   334.0   low_battery:   ∅   temperature:   20.61   ✓ wall_router0   light:   999.0   temperature:   21.43	
Applications Python RealPort Industrial Automation Management Serial Ports Connections Event Logging	• xbbU         led1:       •         led2:       •         sw1:       •         sw2:       •         sw3:       •	
Administration File Management X.509 Certificate/Key Management Backup/Restore Update Firmware Factory Default Settings System Information Reboot	sw4:	
Logout		
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#### iDigi Green Application

You may also interact with the console interface of your iDigi Green Dia program.

1. Open a telnet application and connect to port 4146 of the ip address of your gateway. For example, from a Window's console type:

C:\idigi dia>telnet <ip of your gateway> 4146

2. You will be presented with the following welcome from the Dia console interface:

Welcome to the iDigi Device Integration Application CLI.

=>>

3. You may type **help** at the prompt to see a list of commands you may execute at the console. One example command is **channel\_dump** which allows you to see a snapshot of your sensor network in a textual form:

=>2	> channel_c	dump		
Device instance: Channel light low_battery temperature	sensor0 Value 290.0 False 20.61	Unit lux C	Timestamp 2009-03-05 1970-01-01 2009-03-05	16:38:34 00:00:00 16:38:34
Device instance: Channel light temperature	wall_route Value 994.0 21.43	er0 Unit lux C	Timestamp 2009-03-05 2009-03-05	16:38:34 16:38:34
Device instance: Channel led1 led2 led3 sw1 sw2 sw3 sw4	xbib0 Value Off Off True True True True True	Unit	Timestamp 1970-01-01 1970-01-01 2009-03-05 2009-03-05 2009-03-05 2009-03-05	00:00:00 00:00:00 16:30:50 16:30:50 16:30:50 16:30:50

4. You may investigate other commands such as **channel\_get** and **channel\_set** at this point in order to retrieve and set individual channels.

For example, to turn on an LED on the development board you may type:

=>> channel set xbib0.led1 On

#### Display live sensor data via the iDigi Platform

The iDigi Dia demo application is pre-configured to utilize two messaging components of the iDigi Platform.

- 1. SCI (Server Command Interface)
- 2. Temporary data cache for gateway

The SCI messaging option allows you to make web services requests at any time in order to retrieve the latest samples directly from the gateway. Your web services requests are passed via the iDigi Platform to the iDigi Dia running on your gateway. The Dia responds immediately to the request with the appropriate data.

SCI utilizes the Digi RCI protocol to send web services requests and to receive responses. This option is included in the demo configuration file (green\_getting\_started.yml) under the Presentations section as follows:

The temporary data cache option provides a mechanism for the gateway to autonomously collect and upload samples to the iDigi Platform for later retrieval by a web services client application. This option is included in the demo configuration file (green\_getting\_started.yml) under the Presentations section as follows:

```
# Upload data to the ConnectWare XML database using
the thresholds
# given below:
- name: cwm_exist
driver: presentations.cwm_exist.cwm_exist:CWMExist
settings:
    interval: 60
    sample_threshold: 25
    collection: green_demo
    file_count: 10
    filename: channel samples
```

The quickest way to perform a test web services request to view data from your gateway is to use your web browser to query the temporary data cache on iDigi.com for your device. To do that, enter the following URL into your browser's address bar:

```
http://sdl-na.idigi.com/ws/data/~/[your device
ID]/green demo
```

Your device ID is a 128-bit hex number based on your gateway's MAC address with the first 8 octets being padded with 00. Example: If your gateway's MAC address is 00:40:9D:36:DF:43, your device ID would be 00000000-00000000-00409DFF-FF36DF43.

Once you enter the URL containing your device ID (as illustrated above), you will be prompted for a username and password. Use the same username and password that you created when you set up your iDigi.com test account. You should then see a list of XML files under the "green\_demo" collection.

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Note: Some web browsers, such as Chrome and Safari, may not display the data due to the lack of XML style information so we recommend Internet Explorer or Firefox. Another way end users may view the data would be to click on the Data tab in the iDigi Platform user portal.

Append the URL string in your browser location bar with one of the file names:

http://sdl-na.idigi.com/ws/data/~/[your device
ID]/green demo/channel samples1.xml

You will see data from the same set of channels that you viewed in the previous step:



For more information on obtaining your data go to

iDigi.com and refer to the "iDigi.com Web Services Getting Started Guide."

## **LED Indications**

The following LED indications apply to the XBee interface board, the XBee Sensor, and the XBee Wall Router.

Button press	Network association	Action
Single	Associated	<ul> <li>If node is asleep, wakes unit for 30 seconds.</li> </ul>
		<ul> <li>Sends a Node Identification broadcast transmission.</li> </ul>
		All devices that receive this transmission will blink their Associate LED rapidly
		for 1 second.
		All API devices that receive this transmission will send a Node Identification frame out their UART (universal asynchronous receiver/transmitter) (API ID
		0x95).
	Unassociated	<ul> <li>If node is asleep, wakes unit for 30 seconds.</li> </ul>
		<ul> <li>Blinks a numeric error code on the Assc LED, indicating the cause of join failure.</li> </ul>
		1 blink: Scan found no PANs.
		<b>2 blinks:</b> Scan found no valid PANs based on current SC (Scan Channel) and ID (PAN ID) settings.
		<b>3 blinks:</b> Valid Coordinator or Routers found, but they are not allowing joining
		(NJ expired).
		7 blinks: Node Joining attempt failed.
		<b>10 blinks:</b> Coordinator Start attempt failed.
Two	Associated	Temporarily enables joining on the Wall Router and the entire ZigBee network for 1 minute (if the XBee module's NJ command setting is less than 255). If joining is permanently enabled on a module (NJ = 255), joining remains permanently enabled, and this button press has no effect.
Four	Associated/ Unassociated	Node leaves PAN, if associated, and restores default parameters, then re-attempts to join a network. Default PAN ID is 0x0.
Hold for five seconds	Associated/ Unassociated	Performs a hardware reset.



