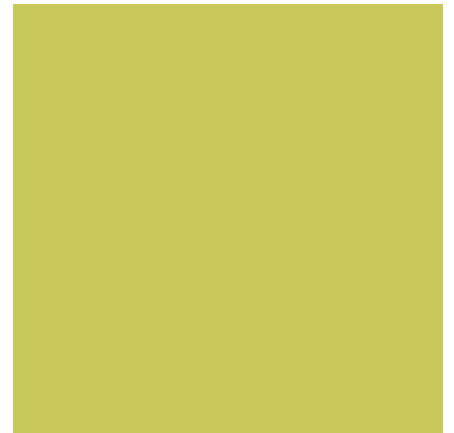




Dynamax

SapIP Gateway

Quick Start Guide



SAPIP QUICK START GUIDE

Introduction:

Starting and Provisioning Gateways, custom configured by Dynamax Inc for SapIp is fairly easy, as long as device discovery (Digi Utility) is loaded and connects to the Gateway device. All SapIP clients will need this to run by the installer, or by a system administrator.

Device Discovery:

Download device discovery and install it on a desktop directory with all of your SapIp tools. Device discover has been updated recently to run on all the latest Microsoft platforms.

Plug your laptop into the same LAN as the Gateway, or use a crossover cable (supplied) to connect directly to the Gateway, also called the Connectport X4. To join the remote SapIp Manager from the internet the PC for provisioning and the Gateway will need to be on the same LAN network (no routers or firewall between PC and Gateway) and will be automatically added to the iDigi cloud platform. The Gateway is programmed and loaded to support Internet connection via LAN as the default. All software loaded by Dynamax on the Gateway is custom configured to support SapIp devices, and for access by SapIP Manager. *SapIP Software* is copyrighted by Dynamax 2010-2011, all rights are reserved.



Start by running this link. [Digi Device Discovery \(2\).Ink](#)

TROUBLE SHOOTING - INTRODUCTION

This document contains a list of tips that will help people through the trouble of detecting their Digi Devices running plug and play firmware (-S ME, EM, SP, WiME, WiEM, WiSP modules) on their networks. Generally, when deploying a Digi Device it must be setup first. This is where the Digi Device Discovery Utility is used. It can be run from a host PC. This is a free utility from Digi that can be downloaded from our web site (<http://www.digi.com/support>).

These tips are presented in their order of most to least common problems.

DISCOVERY TROUBLESHOOTING TIPS

Firewalls: Check to make sure that any firewall software is disabled. This can block the discovery process. Also, any physical firewall will almost certainly block the discovery process as well.

Routers or Switches: Is there a router between the computer running the discovery utility and the Digi device itself? Normally, routers will block the discovery process. If possible remove them and use a hub instead. If there is a switch in between this may or may not be a problem. Occasionally they are configured to block the discovery traffic. If unsure use a hub or a direct Ethernet cable connection.

Cabling: If nothing else works try using a direct crossover Ethernet cable directly between the computer and the Digi device. Another option is to try another Ethernet cable.

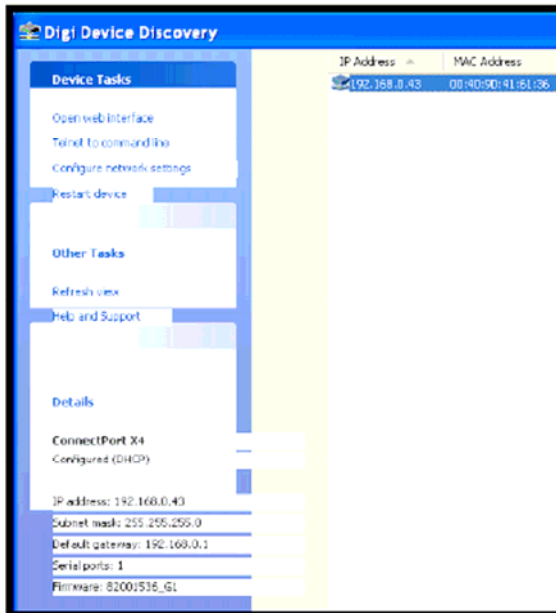
Ethernet LED: Check the Ethernet LED (Light Emitting Diode) on the Digi device. Is it lit? If not, there is not a valid network connection and it will not be possible to discover the device.

Network Adapters: Make sure the proper network adapter is enabled. Also, ensure all other network adapters are disabled. If more than one network adapter is enabled, this can cause the discovery process to fail.

Change Digi Device: If you have second Digi device, try discovering it and see if you have the same problem. Though it may not solve your original discovery problem, it should provide you with some additional troubleshooting clues.

Newest Discovery Utility: Make sure you are using the newest Digi Discovery Utility. This can be found on the Digi support site (<http://www.digi.com/support>).

OPENING THE GATEWAY WEB INTERFACE



Oct 2010



For Example:

Automatic Gateway Discovery
– Device Networking? How?

EASY -

- This Program adds the Gateway to your network,
- Looks for the IP address,
- Opens a web page for SapIP and the Gateway Management.

Here are the basic operations to be performed. For example we can check for any SapIp loggers in the range of the RF communications, by clicking the Xbee network view link under Configuration. However first the gateway time must be set to local time, and then all SapIp will be synchronized to the local time. Later versions (this version is SapIp device Driver 2.00) will support automatic time sync with a NIST or any other Time Servers(SNTP) on the web.

- Add SapIP node to a network
- Check the RF Signal
- Reboot a Gateway
- Update Software
- Change the Time zone
- Change Network setup from LAN to Cellular

Oct 2010



Index	Type	State	Ranking	Interval	FQDN
1	sntp server	on	100	60	ntp.nist.gov
2	gps	off	20	n/a	n/a
3	sntp server	on	10	3600	my.idigi.com
4	sntp server	on	10	86400	utcnet2.colorado.edu
5	sntp server	off	10	86400	n/a
	real-time clock	on	50	n/a	n/a

Set your time with the offset to UTC time.

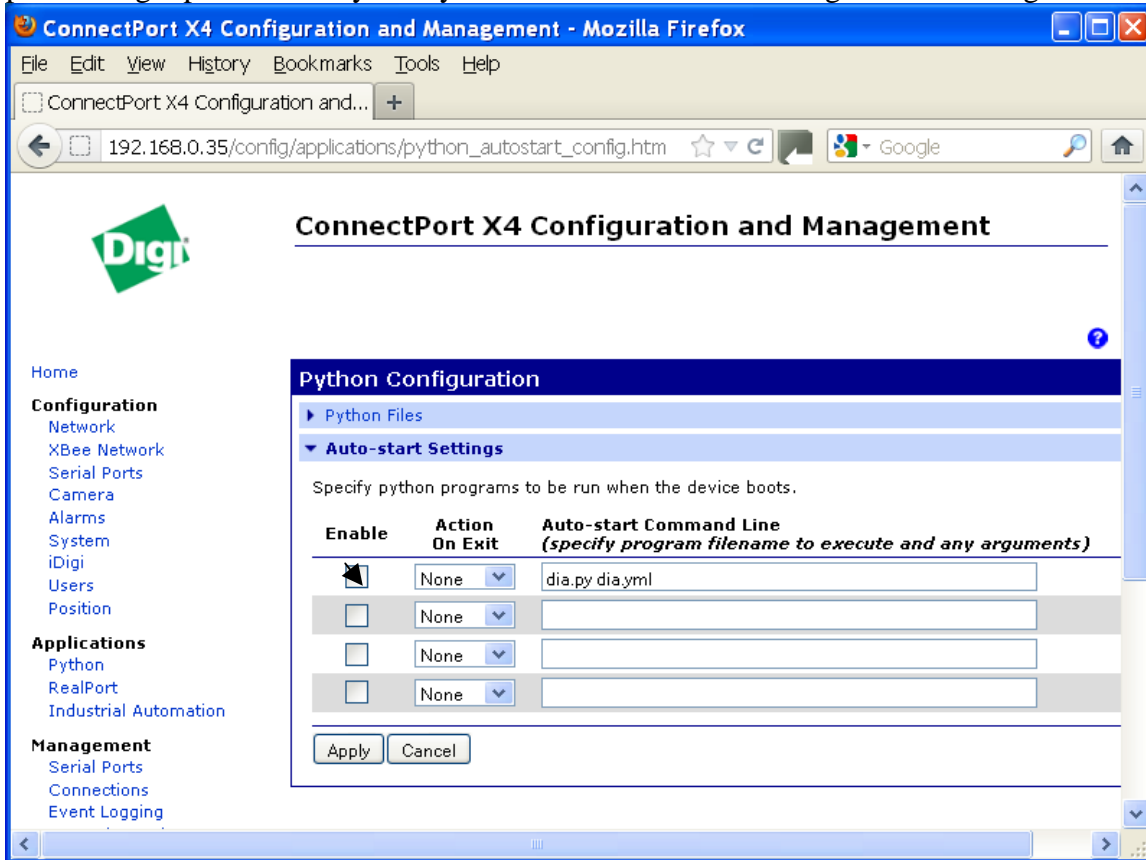
Update (2/28/2012): Use offset from UTC and adjust "time source setting".

(3/26/2012) Set UTC time and offset -5 hours (ex. Chicago)from UTC. Use SNTP server below.

The screenshot shows the 'ConnectPort X4 Configuration and Management' web interface in a Windows Internet Explorer browser. The page title is 'ConnectPort X4 Configuration and Management'. On the left is a navigation menu with categories: Configuration (Network, XBee Network, Serial Ports, Camera, Alarms, System, iDigi, Users, Position), Applications (Python, RealPort, Industrial Automation), Management (Serial Ports, Connections, Event Logging, Network Services), and Administration (File Management, X.509 Certificate/Key Management, Backup/Restore, Update Firmware, Factory Default Settings, System Information, Reboot). The main content area is titled 'System Configuration' and includes sections for 'Device Identity Settings', 'Date and Time Settings', and 'Simple Network Management Protocol (SNMP) Settings'. The 'Date and Time Settings' section shows the current system and UTC times as 'Thu May 26 17:13:54 2011'. It offers a 'Set' button for manual time setting and an 'Offset From UTC' section with a form for 'Offset from UTC (hh:mm)' set to '00 : 00'. Below this is the 'Time Source Settings' table:

Index	Type	State	Ranking	Interval	FQDN
1	sntp server	off	100	3600	www.nist.gov
2	gps	off	20	n/a	n/a
3	sntp server	off	10	86400	
4	sntp server	off	10	86400	
5	sntp server	off	10	86400	
	real-time clock	on	50	n/a	n/a

Please check for automatic execution of the SapIP device drivers upon reboot, or powerering up the Gateway. dia.yml contains the default settings for our configuration.

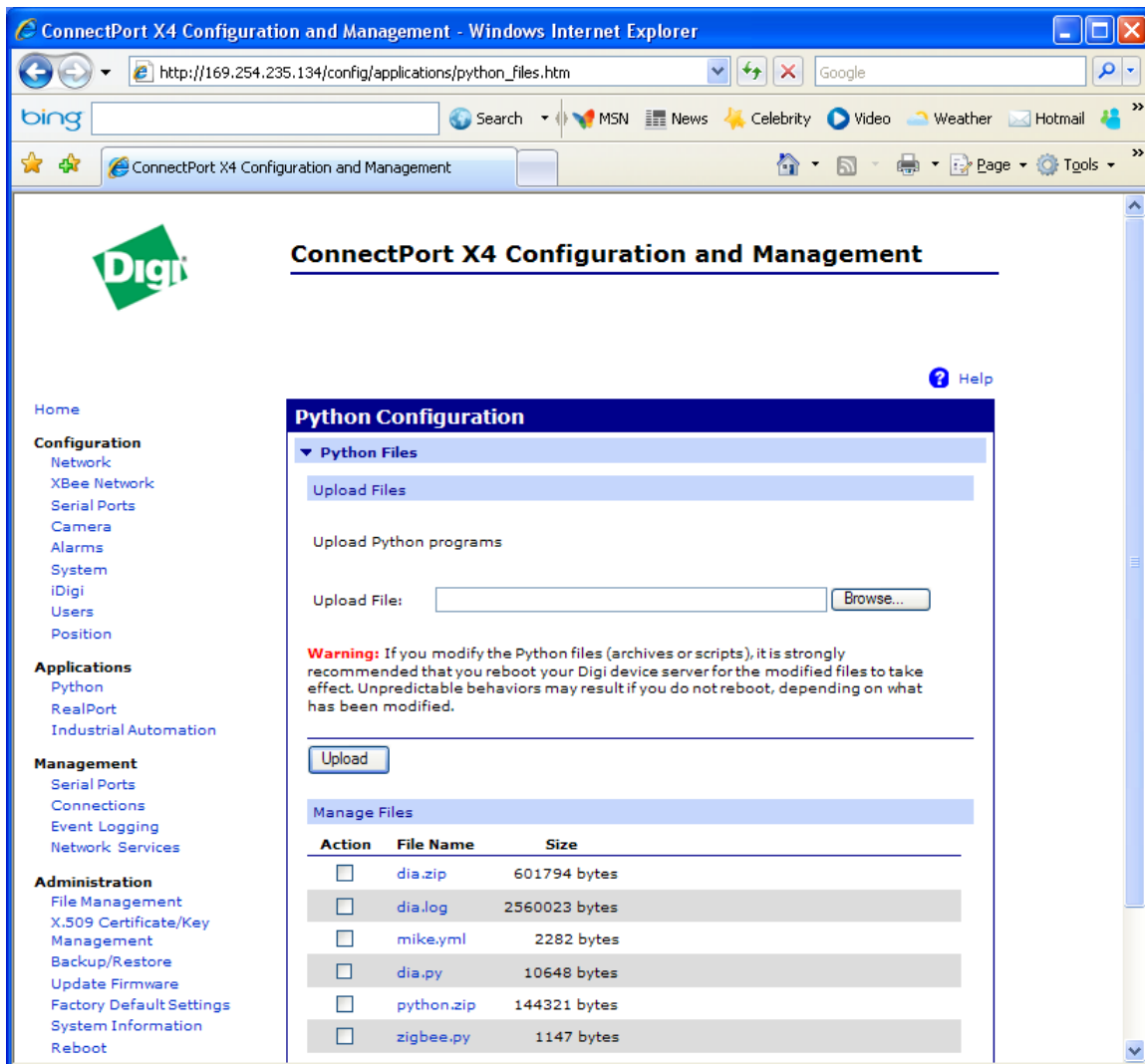


Hit Apply to save this auto start.

You can close all the windows and go to Agrisensors.com to test the operations, and then set up devices.

The Python files, are the high level language to control SapIp and the data collection process. Once the Gateway is rebooted, it takes about 4 minutes to create and load all the files. Look for the dia.log, about 2.5 MB. When this is loaded it is a sign that all the tasks are complete, and the system is running, ready to scan for any new SapIp.

There can be up to 20 SapIP on the same gateway. Later in 2012, we will be able to support 25 to 30 per gateway. The SapIp driver will search every 60 minutes for a new unit, and put the new SAPIP devices in communication with the Gateway. You do not need to do anything else except put the device in range of the Gateway antenna, and turn the SapIp on. Agrisensors has a feature to accelerate the “Discovery Autoenum” which adds more SapIP within minutes of the REFRESH command.



The Administration section provides statistics, which are useful for viewing memory usage (System Information), and transmission quality (Xbee network). Rarely you may need to reboot the Gateway (Reboot).

The screenshot shows the 'ConnectPort X4 Configuration and Management' web interface. The browser address bar shows the URL: `http://169.254.214.12/admin/sysinfo/mesh_network_view.htm`. The page content is organized into several sections:

- Navigation Menu (Left):**
 - Alarms
 - System
 - iDigi
 - Users
 - Position
 - Applications**
 - Python
 - RealPort
 - Industrial Automation
 - Management**
 - Serial Ports
 - Connections
 - Event Logging
 - Network Services
 - Administration**
 - File Management
 - X.509 Certificate/Key Management
 - Backup/Restore
 - Update Firmware
 - Factory Default Settings
 - System Information
 - Reboot
 - Logout
- Main Content Area:**
 - XBee Network** (Expanded)
 - Python Application XBee Socket Counters**

Frames Sent:	2	Frames Received:	1
Bytes Sent:	8	Bytes Received:	73
 - Python Application XBee Socket Error Counts**

Transmit Frame Errors:	0	Receive Frame Errors:	0
Transmit Bytes Dropped:	0	Receive Bytes Dropped by User:	0
Receive Bytes Dropped by Stack:	0		
 - XBee Network Counters**

Frames received:	110	Bytes received:	703
Frames transmitted:	14	Bytes transmitted:	24
Remote commands:	12	Address discoveries:	0
Route discoveries:	0	Transmission retries:	0
 - XBee Network Error Counts**

Removed from queue:	0	Unable to transmit:	0
Address not found:	0	Route not found:	0
Not acknowledged:	0	No response or status:	0
 - Refresh** button
 - Diagnostics** (Collapsed)

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Starting a system - Working with Relays (Repeater Modules)

Repeaters are modules with only 2 power leads, and a radio antenna on top. Connect red lead to + 12 V battery terminal, and Black lead to the (-) terminal. First check the xbee network. Note SAPIP90080 is a repeater. All other nodes are SapIP already joined in the network. Click discover to see any new nodes just turned on.

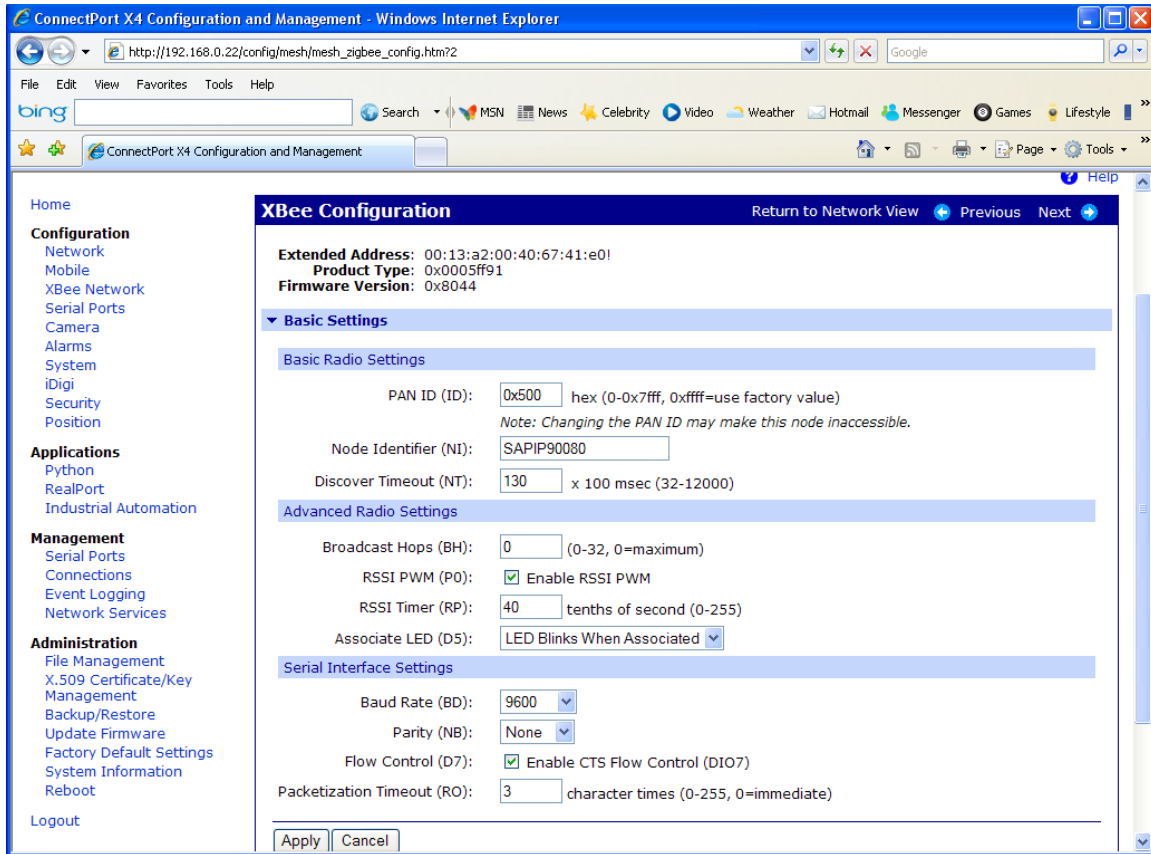
When the repeater shows up on the list, it is working, and performing all of its functions. There are no SapIP functions performed by a repeater node, even though it will appear on the SapIP - Agrisensors node list.

The screenshot shows the 'ConnectPort X4 Configuration and Management' web interface. The 'XBee Devices' section is expanded, showing 'Gateway Device Details' and a 'Network View of the XBee Devices' table. The table lists 12 routers with their Node IDs, Network Addresses, Extended Addresses, Node Types, and Product Types. A 'Discover XBee Devices' button is visible below the table.

Node ID	Network Address	Extended Address	Node Type	Product Type
GATE6	[fffe]!	00:13:a2:00:40:2d:48:74!	router	X4 Gateway
SAPIP90080	[fffe]!	00:13:a2:00:40:67:41:e0!	router	0x0005ff91
SAPIP90120	[fffe]!	00:13:a2:00:40:67:4a:a7!	router	0x0005ff91
SAPIP90121	[fffe]!	00:13:a2:00:40:67:4a:8e!	router	0x0005ff91
SAPIP90124	[fffe]!	00:13:a2:00:40:67:4a:87!	router	0x0005ff91
SAPIP90125	[fffe]!	00:13:a2:00:40:67:4a:60!	router	0x0005ff91
SAPIP90129	[fffe]!	00:13:a2:00:40:67:4a:a9!	router	0x0005ff91
SAPIP90130	[fffe]!	00:13:a2:00:40:67:49:dd!	router	0x0005ff91
SAPIP90131	[fffe]!	00:13:a2:00:40:67:49:ad!	router	0x0005ff91
SAPIP90132	[fffe]!	00:13:a2:00:40:78:41:4b!	router	0x0005ff91
SAPIP90133	[fffe]!	00:13:a2:00:40:67:49:b6!	router	0x0005ff91
SAPIP90134	[fffe]!	00:13:a2:00:40:67:49:a6!	router	0x0005ff91

The repeaters and nodes are programmed with a default network by Dynamax, (usually 0500 PAN ID for 900 Mhz nodes). 2.4 Ghz nodes are set to a PAN of 400 by default.

Click on the node if you are moving a node to another gateway. Before you move a node to a new PAN – install the x4 gateway on the same LAN network, and assign a new PAN ID to the Gateway. Then change the node, SapIP or repeater, to the **new** Gateway PAN ID, for example 0x600. When in the PAN assignment box, do not erase 0x ---- or it is interpreted as decimal, (not HEX)

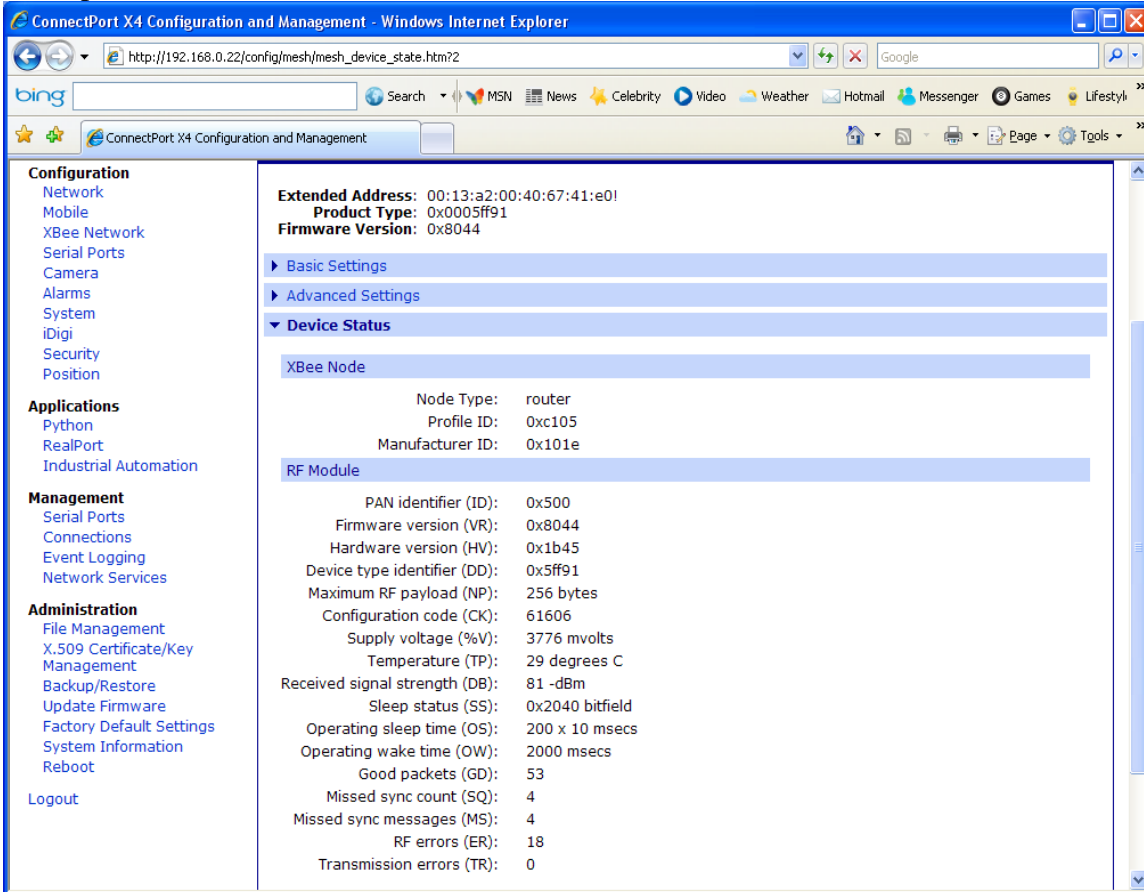


Immediately the node will be reassigned to the new PAN ID, and should be recognized by the XBEE discover command on the new Gateway.

Under device status, you may check the signal strength, which should be a number less than 100 –db. If the signal is a higher number (less gain), the node should be moved closer to the gateway antenna or closer to another node that is in good communication. Note that –db readings of -80 to -85 are excellent in reception, and the 900 Mhz nodes do not have the ability to report better values –78 or less.

Node identifiers, NI, and Baud rates (BD): In SapIp nodes after version 100.6 they must use a BD setting of 56K. Do not change any of these settings from (NI) or below.

If a device is congested with traffic or not in a good reception mode, the RF transmission errors (TR and ER) will accumulate quickly. Software reset to the RF module is the only way to clear these counters. In this future releases of SapIp (3.5.2), we use synchronization for sleeping nodes, so those error counters (SQ, and MS)can be ignored for Sap Flow nodes.



In device operations (scroll to Below device Status) you may reset the node radio, and also identify a remote node is in good communication by applying the Identify Device command for 5 or more seconds. This causes the red led on the Radio Module to fast blink (2 x /sec), for the specified duration.