VoIP Gateway Setup for the Q-SYS™ Platform

Patton SmartNode SN4112 or SN4114

This document applies to these Patton VoIP Gateway devices:
SN4112 or SN4114

Introduction

NOTE: The Patton SmartNode 4110 Series contains a number of models, but only the FXO-only ones are recommended for use with Q-SYS:

- Patton SmartNode SN4112 (model number: SN4112/JO/EUI)
- Patton SmartNode SN4114 (model number: SN4114/JO/EUI)

These instructions were developed for devices running firmware version 6.8 (the specific release used in developing thes instructions is SN4110_H323_SIP_R6.8_2015-11-13). Versions 6.7 and 6.8 are known to work successfully with these gateway models and Q-SYS. Patton firmware updates are free for the life of the product.

Create a Patton SmartNode 411x configuration file

1. If you do not have a Q-SYS User Components folder on your computer (<My Documents Folder>\QSC Audio\Q-SYS Designer\User Components\), create one. You might have to create multiple nested folders.
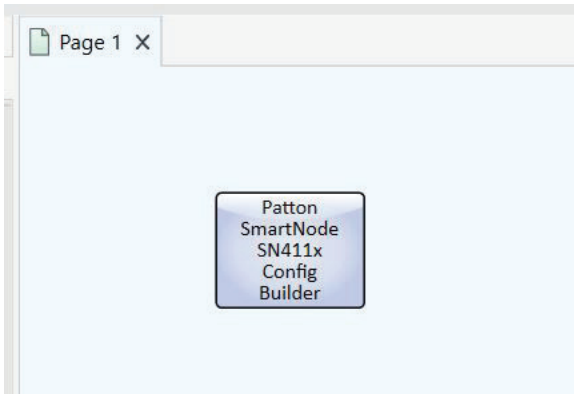
    (NOTE: If you have ever run **Q-SYS Designer Software** on your computer and had items in the User Library, the software will have already created the folder.)
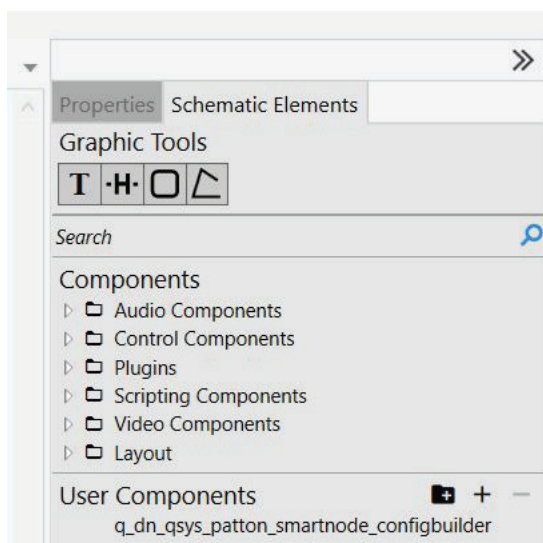
2. Download the file **Patton SmartNode Config Builder.quc** from the QSC web site. Copy it into the User Components folder.

3. Open **Q-SYS Designer Software**. The **Patton SmartNode Config Builder** should appear in the User Library at the bottom of the right side pane. Open the Q-SYS design in which you plan to configure Softphones.

4. Click on the **Patton SmartNode Config Builder** and drag it into the Schematic pane.

5. If your computer is connected to a Q-SYS Core Processor via a network, click on **File > Save to Core & Run** or press **F5**. If you have no Q-SYS Core Processor connected, click **File > Emulate** or press **F6**. The design file must be running or emulating in order to generate the configuration file.

6. Double click the Patton SmartNode Config Builder component. The component's configuration window will open.

7. On **Model**, select the model number of the Patton SmartNode.

8. Enter an extension number for each line (they are pre-populated as 1001 through 1004, so just renumber them as needed). These numbers need not match the POTS line numbers but must match the corresponding User Name numbers set on each Q-SYS Softphone.

9. In **Q-SYS IP Address**, enter the IP address of the Q-SYS Core Processor LAN port (that is, the Core Interface you assigned in the Softphone tab of Q-SYS Administrator) that all the Softphones are assigned to.

10. In **SmartNode 411x IP**, enter the IP address you plan to assign to the Patton SmartNode. This should be the same as the proxy address you set earlier in each Edit Smartphone window.

11. In **Subnet Mask**, enter the desired subnet values. Remember that the **SmartNode 411x** and **Q-SYS** IP addresses must be able to access each other via the VLAN; therefore, the subnet masks of the SmartNode 411x and the Q-SYS Core Processor's LAN interface should match.

12. Check over the values. When you are certain all is correct, click the green **Build Config** button.

    The Config Builder will create a new block of text in the **Setup Details** window. Select all the text and copy it to the Clipboard.

    Open an empty window in Notepad or any other simple text editor and paste the text into it.

    Save it as a .txt file. Give it a descriptive name that will help you find it later when it is time to upload it into the Patton SmartNode.

Configure the Q-SYS Softphones

The first step is to configure the Q-SYS Softphones in the system.

13. With the design file open in Q-SYS Designer Software, place and set up the Q-SYS Softphones. Rename them if you wish; otherwise Designer will assign the default incremental naming convention: Softphone-1, Softphone-2 … Softphone-*n*.

14. Click **File > Save to Core & Run** (or **F5**) if the computer is connected via a network to the Q-SYS Core Processor unit.

    If the computer is not connected to the Q-SYS Core Processor, click **File > Emulate** (or **F6**). This will limit your actions to opening Q-SYS Administrator and changing settings. It will not allow you to place calls to, or receive them from, the Patton SmartNode device or any other SIP destination.
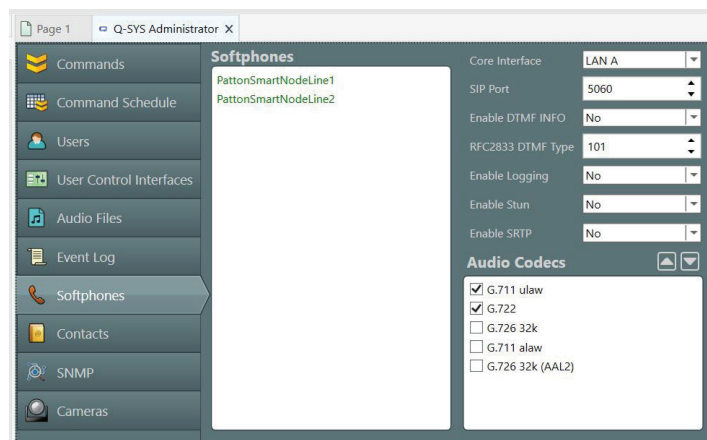
15. Open **Q-SYS Administrator**.

16. Click on **Softphones**. In the Softphones setup, select the Q-SYS Core Processor Interface that will be used for all Softphone calls. Softphone traffic can share a NIC with Q-LAN traffic, but this voice traffic can also be put onto a separate NIC (and VLAN) if the site's IT policies mandate or prefer this isolation of data.

    Note that the choice of Q-SYS Core Processor Interface does not affect Q-SYS performance or operation. In fact, in small projects it is much simpler to leave LAN A selected, with all services sharing the same Gigabit Ethernet port.

17. Double click on a Softphone name. A configuration box will open.

18. For **User Name**, assign a unique phone number that shall be shared between this Softphone instance and its corresponding FXO port on the SmartNode gateway. This number does not have to match that of the incoming POTS line; each User Name needs only to be unique within the Q-SYS system and to correspond exclusively to its FXO port. However, you may, in fact, find it makes the system more intuitive to assign actual POTS numbers and/or extension numbers.

19. For **CID Name**, the typical approach is to use the same number as User Name.

20. For **Proxy**, enter the IP address you intend to assign to the SmartNode gateway. The address will have to be accessible to the Q-SYS Core Processor Interface and within its subnet range.

21. For **Register With Proxy**: **No** (there is no need to register with proxy).

22. Click **OK**.

23. Repeat steps 5 through 11 for each remaining Softphone. If multiple Softphones are linked to a single SmartNode device, use the same IP address for all of them. When you have completed them all, click **Update** in the red **Settings have changed** bar.

NOTE: A bug in Q-SYS Designer Software versions 4.1.x and in 4.2.x versions 4.2.45 and earlier did not update the Softphone settings properly when the **Update** button was clicked while a Q-SYS Core Processor was connected. If you are running one of the affected software versions, you must also follow up by clicking **File > Disconnect** and then **File > Save to Core & Run** to make the Softphone changes take effect. If you are running Designer in emulation mode, these extra steps are not necessary.

Assign an IP address to the Patton SmartNode

1. Connect your computer to the Patton SmartNode device through a serial interface. Consult the Patton SmartNode Quick Start guide for details.

   The Patton SmartNode comes with an accessory package that includes a Cat 5e straight-through patch cable and an RJ45 to DE-9 female adapter, and they can be used for this connection. A USB-to-serial adapter will also work.

2. Open a terminal program, such as PuTTY or HyperTerminal.

   Set these parameters:

   - 9600 baud
   - No parity
   - 8 bits
   - 1 stop bit
   - No flow control

   The SmartNode login screen will display. For the default login (i.e., user name), type **administrator** and then press **Enter**. The password is blank, so press **Enter** after the password prompt.

3. After you have logged in successfully you have entered operator execution mode, indicated by the command line prompt **>** (preceded by the device's default or current IP address). For example, the command line might appear as **172.16.40.1>**

   Type **enable** and press **Enter**. Then type **configure** and press **Enter**. Now the device is in configuration mode, and the prompt changes to (cfg)#. For example: **172.16.40.1 (cfg)#**

4. To enter IP configuration mode, type **context ip router** and press **Enter**.

5. Set the IP address and subnet for eth0 (the LAN port of the Patton SmartNode device). To do so, type **interface eth0** and press **Enter**.

6. Use the IP address that you selected in Step 10 of the previous section. This will become the IP address of the Smart-Node. You will use it to access the SmartNode device's web configuration interface in later setup steps. Type **ipaddress [unused IP address] [Subnet mask]** (where [unused IP address] and [Subnet mask] are the respective values entered in IPv4 format without brackets) and then press **Enter**.

   The eth0 port will reset and come back on line, and these lines will display:

   (yyyy-mm-dd)T00:09:40 : LOGINFO : Link down on interface eth0.
   (yyyy-mm-dd)T00:09:40 : LOGINFO : Link up on interface eth0.
   **(new ip address)(if-ip)[eth0]#**

   Note that the new IP address will appear in the command line prompt.

7. The next step will be to copy this current configuration into the start-up configuration so the Patton SmartNode device will initialize itself this way whenever it is turned on or reset. Type c`opy running-config startup-config` and press **Enter**.

8. The Patton SmartNode device can now be connected to the network. You may now close the terminal program and disconnect the serial connection.
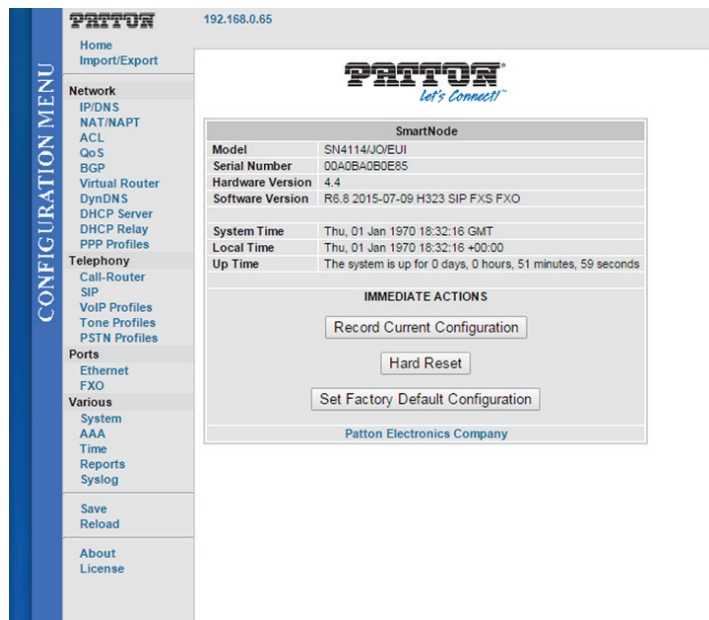
Using the web interface to upload the configfuration file

1. Connect the Patton SmartNode device and the computer to the same network or VLAN.

2. Open a web browser and type the SmartNode device's new IP address into the address bar, then press **Enter**.

3. When the login window appears, type **administrator** and click **OK**.

4. The home page will display the version of SmartWare firmware (described as "Software Version") currently running on the Patton SmartNode device. Check it against the latest SmartWare maintenance release version, which can be found at **http://www.patton.com/support/upgrades/index.asp?um=SmartNode%20411x** .

5. If the Patton SmartNode device's current software version is not the latest, then register on the Patton web site with the unit's serial number and download the latest SmartWare maintenance release. Q-SYS compatibility with SmartWare version 6.6 and prior releases has not been tested and is not supported. NOTE: Patton offers free firmware upgrades for the life of the product.

6. To update the SmartWare, go to the web interface home page and click **Import/Export**.

7. Click the **Shutdown SIP Gateway** button. Next, choose and and import the .zip file downloaded from Patton.
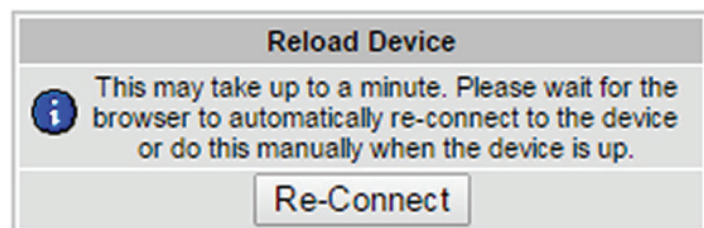

8. Wait for the **Reload** button to appear, and then click it. A Reload Device confirmation screen will appear. Click **Reload** to restart the unit using the new firmware. A message will appear asking you to wait up to a minute. The Patton SmartNode device will be ready again for web configuration when the **Enet 0** LED indicators on the front panel come on.

9. Log into the web interface again. Click **Import/Export**.

10. Click **Import Configuration**.

11. Click **Choose File**. Locate and select the .txt file you created using the Patton SmartNode Config Builder. Click **Import**.

12. Click **Reload**. A Reload Device confirmation screen will appear. Click **Reload** to restart the unit using the new configuration file.

    A message will appear asking you to wait up to a minute. The Patton SmartNode device will be ready again for web configuration when the **Enet 0** LED indicators on the front panel come on.
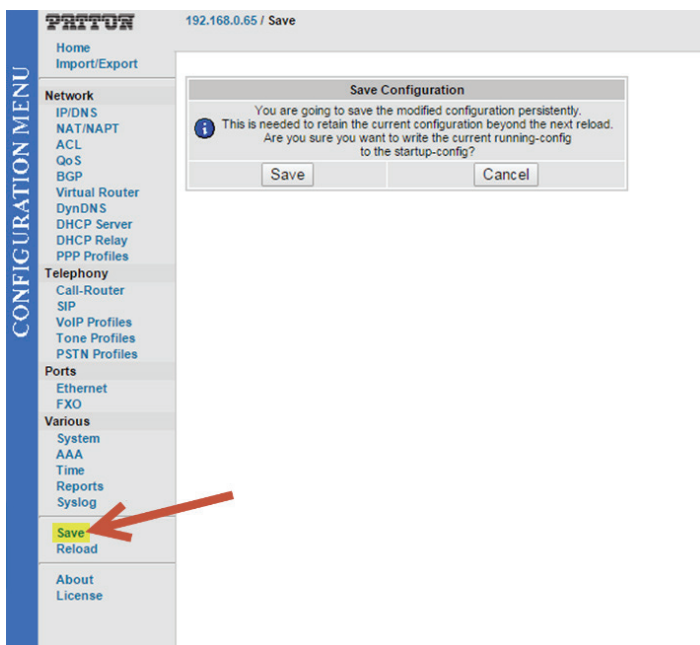
13. **NOTE:** If you make any changes via the web interface, they will not persist after reboots, reloads, or power cycles unless you click **Save** and then also click the **Save** button on the Save Configuration page that follows.

Notes on call disconnection

If calls do not end when the remote party hangs up, this is neither a fault of Q-SYS nor of the Patton SmartNode device. The generated config file allows the SmartNode to detect "Disconnect Signaling" from the source of the POTS line (PBX or PSTN provider).

Any FXO product is only as intelligent about when to disconnect as the telephone system it is connected with allows, if it properly alerts that a call has ended. By default, many PBX systems are configured to not send any disconnect signaling to analog POTS "station" ports when a remote party disconnects (they expect a human to know when to hang up). On Avaya analog ports, for example, a port's line-type settings must be changed to classify it as "IVR" (instead of "Standard Telephone") to instruct the PBX to signal a "Current Disconnect" at the end of a call.

Disconnect signaling (i.e., CPC: Call Progress Control) can take any of the following forms to indicate the termination of the call:

- **Current Disconnect** (most common: a momentary disconnection of the line voltage—typically < 600 ms); this is set with the Config Builder.
- **Polarity Reversal** (not common: a momentary swapping of DC polarity—typically < 600 ms), set in the **Configuration** section of the dialog box (as "Battery Reversal") mentioned below.
- **Disconnect Tones** (a specific tone that indicates the end of the call; these are rare) set in the **Configuration** section of the dialog box mentioned below.

  On the SmartNode device, disconnect tones require additional configuring of frequency, maximum length, etc. Do not configure these unless you are certain that these tones are being used; you will be able to hear them on a call if they are present.
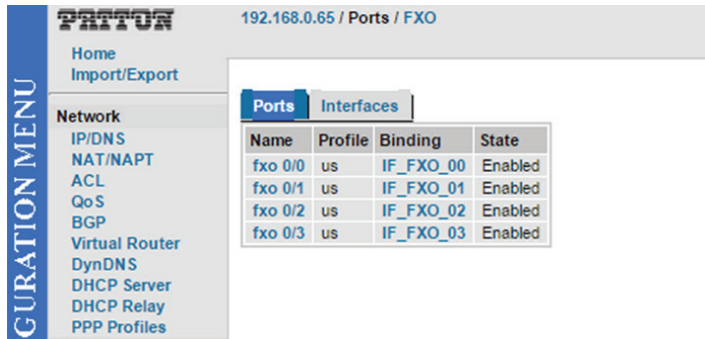
If disconnect signaling cannot be enabled on the PBX, there is little more that can be done. You can, however, adjust the FXO settings of the gateway to recognize different types of disconnect signals:

- In the SmartNode web interface, click **FXO**, then click the binding of the port you wish to configure.
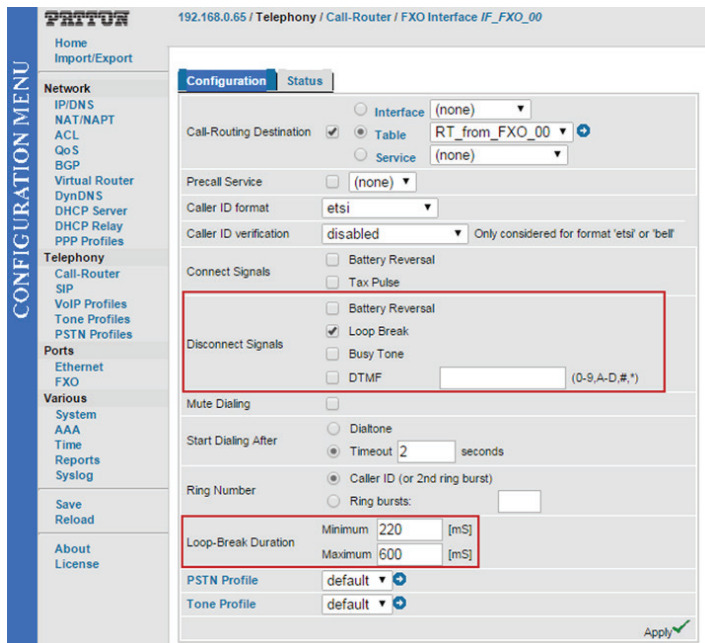
- In the dialog box are the available disconnect signal choices. Select the one appropriate for the PBX.
  Loop-Break Duration only applies to the most common method, which is current disconnection ("Loop Break"); the disconnection period must be within the limits defined by the minimum and maximum values.

Note on VLAN setup

The Patton SmartNode device, like any FXO gateway used with Q-SYS, must lie on the same VLAN that the Q-SYS Core Processor is on.

AET Application Engineering Team