

Planning Your System

Before you set-up your NGX system, a few questions need to be answered. These questions will narrow the field of variables that exist in planning and configuring an NGX.

NOTES:

When planning a system that is tapping an Avaya / SDX INDEX, Siemens IBM Rolm 9751 CBX or a Mitel Sx2000 PBX an AI-Logix RTS is required. Refer to the wiring diagram at the end of this section.

Multi-Point monitoring is supported with the Panasonic TDA 50 using KX-T7600 series phones. Refer to the NGX Integration Guide for specific wiring instructions.

Answer the following questions:

1. What type of system are you looking to set up?
(There are three basic possibilities.)
 - a) **Vox Only:** the NGX is used for voice recording only, using activity detection to trigger recording. (Simplest configuration, quickest time to market, least control.)
 - b) **D-Channel:** the user application collects raw D-channel information to determine call states and control the NGX.
(Greatest amount of control, requires the most programming.)

NOTE: These configurations can be combined as well. For example, an application can be designed to record voice data, and report raw D-channel information.

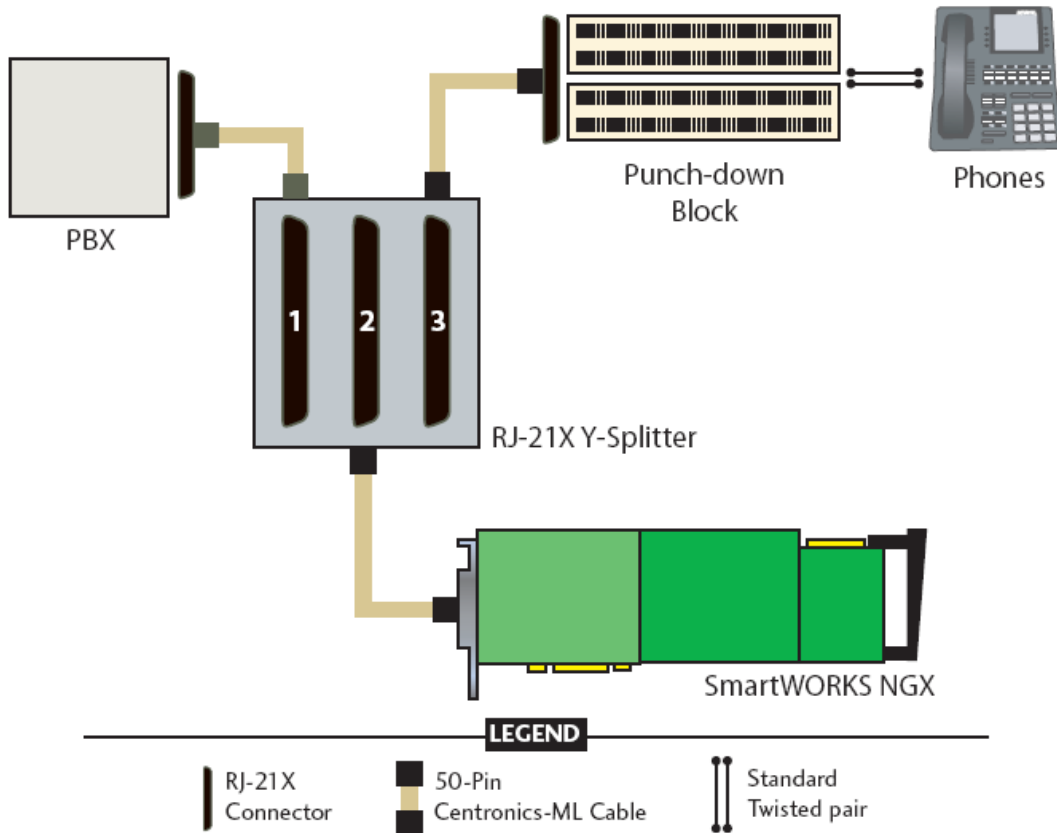
2. How will you connect the NGX between your PBX and phones?
(Again, there are three basic possibilities, as well as some variables to consider.)
 - a) **Using a Y-Splitter:** Where a Y-splitter is inserted between the PBX and the punch-down block that breaks out to phones (see [Figure 7-3 on page 82](#)).

In this optimal solution, an RJ-21X Y-splitter is inserted between the punch-down block and the PBX, preferably as close to the PBX as possible. The PBX plugs into the first RJ-21X connector on the Y-splitter, after which the NGX and punch-down block can connect to either of the remaining connectors on the Y-splitter. This configuration offers the most flexibility. It allows the NGX to passively tap the PBX without having to interface to the punch-down block. The signal quality is optimized because it's routed to the NGX before reaching the punch-down block.

This is the recommended method of passively tapping with the NGX. If this solution is not possible for your particular system, see the other two solutions following this one.

Figure 7-3: NGX Wiring Solution #1

SmartWORKS NGX Wiring Solution # 1: RJ-21X Y-Splitter

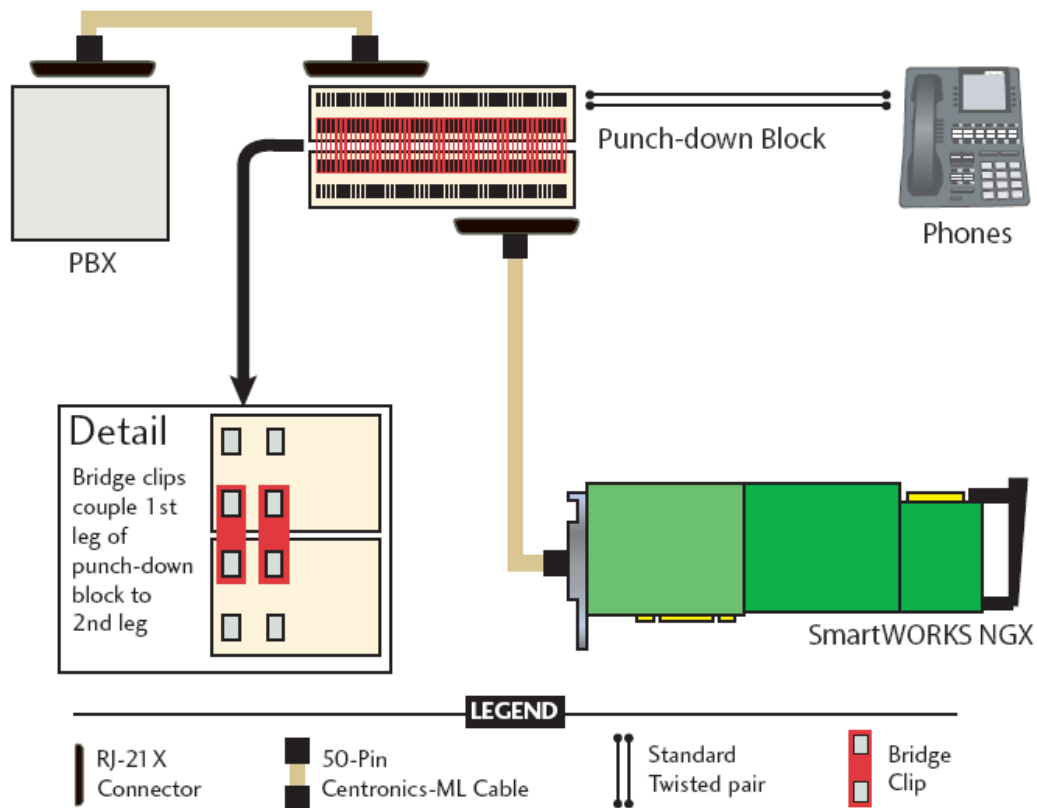


- b) **Using Bridge Clips:** Where the second leg of the punch-down block receives a duplicate PBX signal from the first leg through bridge clips, after which the NGX is connected to the second leg of the punch-down block (see [Figure 7-4 on page 83](#)). Depending on the quality of the components, this method may cause a mild signal degradation.

Although it is not as flexible as the first solution, this method is a viable means of passively tapping a PBX at the punch-down block with the NGX. Bridge clips are applied between the first leg of the punch-down block to the second leg to duplicate the PBX signal between the legs. This method limits the user to wiring only one leg of the punch-down block to the phones while the second leg must be dedicated entirely to the NGX.

Figure 7-4: NGX Wiring Solution #2

SmartWORKS NGX Wiring Solution # 2: Bridging Clips



- c) **Using Dual Punch Down Blocks:** the PBX signal is duplicated by wiring each channel on the main punch-down block to a second punch-down block that connects to the NGX (see [Figure 7-5 on page 84](#)). This solution is the least desirable method. Use this method when the alternatives are not possible.

Use this configuration if you meet the following criteria:

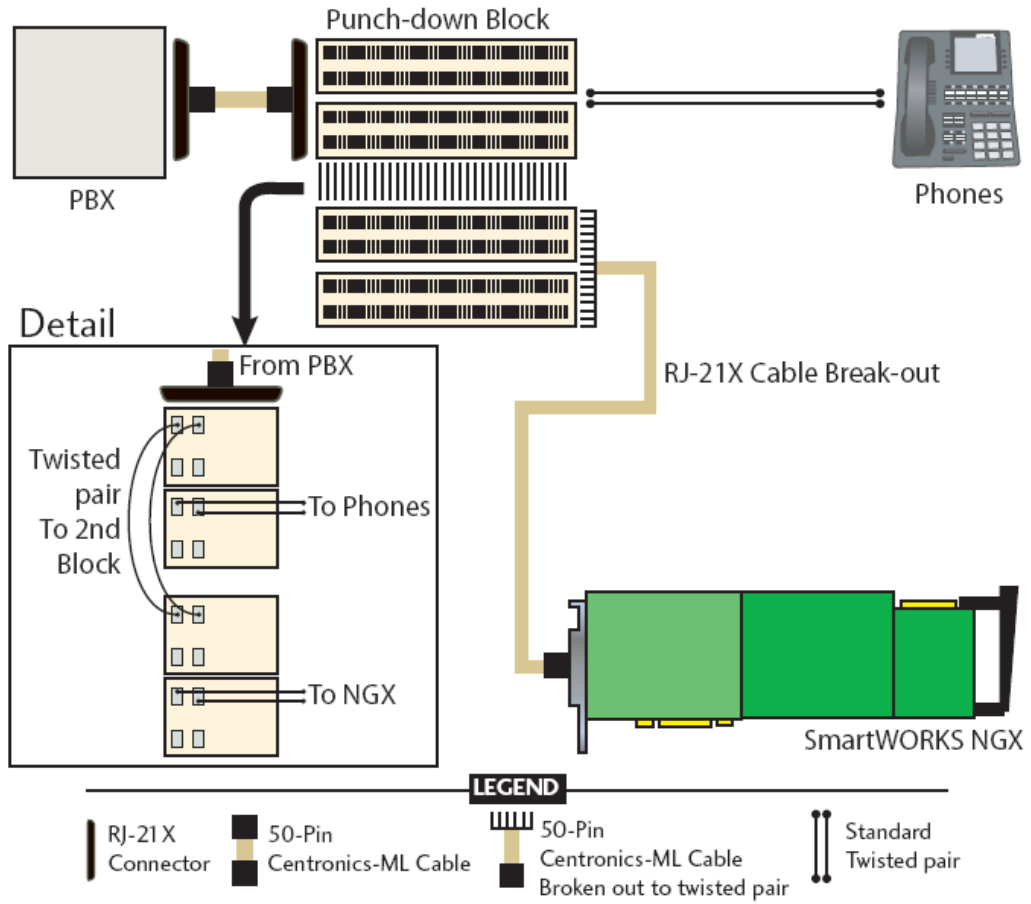
- You have no access to alter the PBX signal path, which eliminates solution 1
- You are not able to reconfigure the punch-down block that routes the PBX to the phones, which eliminates solution #2.

Using standard twisted pair wire, each channel is connected to an additional punch-down block that the NGX can connect to through either an RJ-21X connection, or if necessary, by manually breaking out the HD68 cable that normally connects to the RK-21X connector into its individual lines and connecting them each to a channel.

NOTE: This method can seriously degrade signal quality. Each additional connection made on the punch-down block reduces signal energy and therefore signal quality. This is due to the nature of the method, and not due to a limitation of the NGX.

Figure 7-5: NGX Wiring Solution #3

SmartWORKS NGX Wiring Solution # 3: Dual Punch Blocks



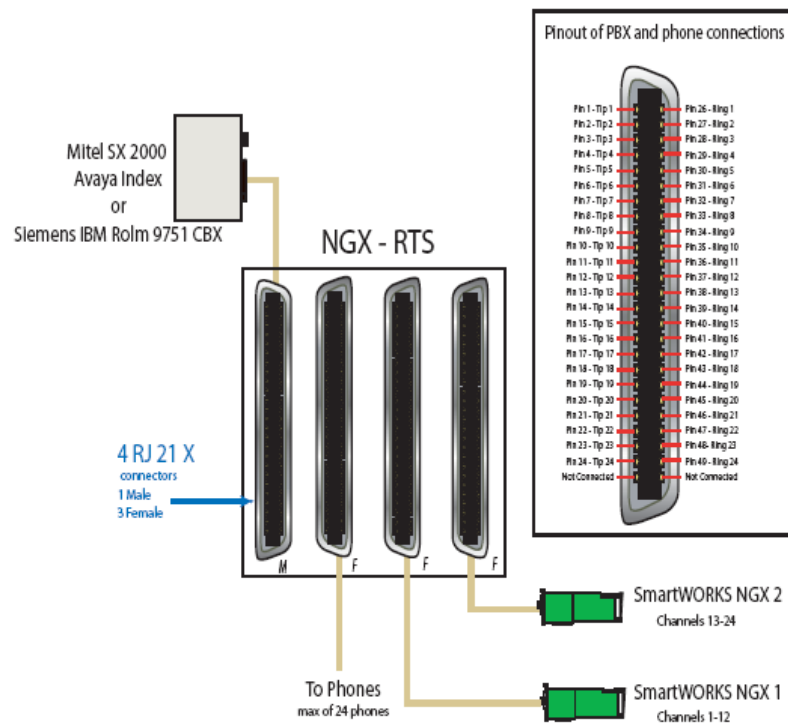
USING THE AI-LOGIX RTS

An Ai-Logix RTS is required when tapping an Avaya SDX INDEX, a Siemens IBM Rolm 9751 CBX, or a Mitel Sx2000 PBX.

Rush surge can damage the RTS box when power is first applied to the phone. To prevent this the following rules must be adhered to when installing the RTS box:

- the PBX's line card must current limit the line - contact technical support for assistance
- the line card must not exceed more than 100mA. Refer to your line card's exact specifications

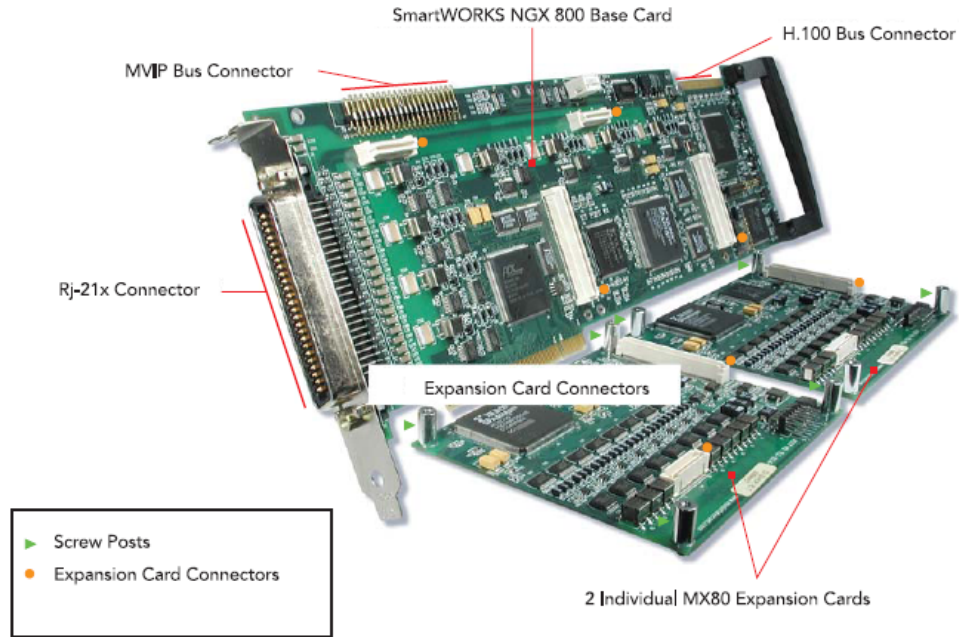
The following diagram illustrates the wiring requirements:



SmartWORKS NGX Hardware

The following section details the SmartWORKS NGX hardware, including LED locations and meanings. Figure 7-6, located below, identifies the components of the NGX.

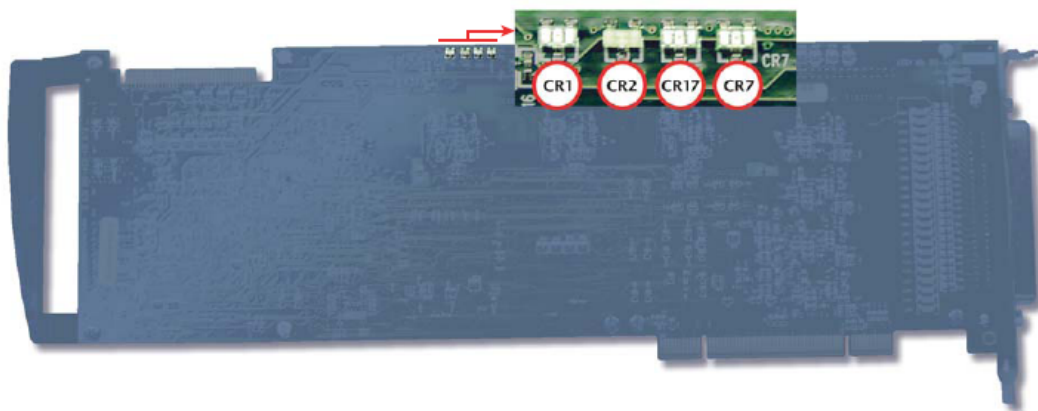
Figure 7-6: The SmartWORKS NGX and Components



BOARD STATUS LEDs

Four board status LEDs are located on the SmartWORKS NGX. The location of each LED is shown in Figure 7-7.

Figure 7-7: SmartWORKS NGX LEDs



CR1

When "ON" this LED indicates that the DSP has been started. If the LED is ON, the board downloaded successfully. This doesn't occur until the first time an application starts.

CR2

Three stage channel monitoring LED with the following occurrences:

- "GREEN," indicating all channels are connected, synchronized, and functioning properly.
- "AMBER," indicating one or more channels is not synchronized.
- "RED," indicating no channels are synchronized.

CR7

This LED indicates that the TDM clock has been terminated. "ON" indicates the boards TDM clocks are being terminated. The TDM clocks can be terminated via the control panel.

CR17

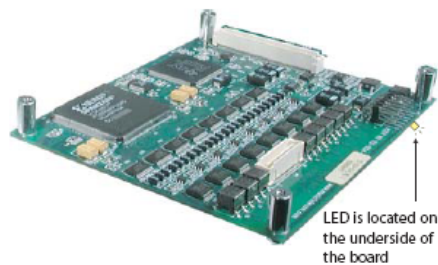
Three stage power and board initialization monitoring LED with the following occurrences:

- "ON," indicates that the board has successfully loaded.
- "OFF," no communication to the board.
- "BLINKING," board ready to be downloaded and the driver is properly communicating with the board. After the DLL is loaded this light will stop blinking. If light continues blinking the download failed or board panic has occurred.

MX-80 EXPANSION LEDs

Figure 7-8 displays the SmartWORKS MX-80 expansion card LED. The LED is DSP started. If the LED is "ON," the board downloaded successfully. This doesn't occur until the first time an application starts.

Figure 7-8: MX-80 Expansion



Making Connections

The following sections cover audio jack, audio cable, Telco, and MVIP connections.

AUDIO JACK

The SmartWORKS NGX is equipped with a 3-pin audio jack that can be used to listen to audio in real-time. The audio jack is located adjacent to the board's MVIP connector as shown below. The audio jack is designed for use with an Ai-Logix 3.5mm to 3-pin connector audio cable, which facilitates a microphone/headset.

AUDIO CABLE

The SmartWORKS NGX series can be used with an optional 3-pin to 3.5mm adapter (part number: 129-0004-001) that connects to the board's audio jack header.

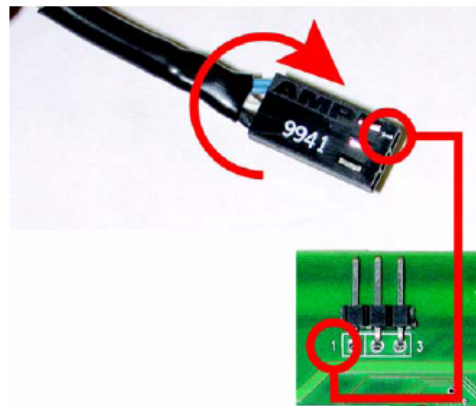
Figure 7-9: 5mm to 3-pin Connector Audio Cable



CONNECTING THE ADAPTER TO THE AUDIO JACK HEADER

When connecting the adapter, ensure it is properly aligned with the pins on the audio jack header. As shown in Figure 7-10, rotate the adapter's connector until the "1" identifying mark aligns with pin 1 of the audio jack header.

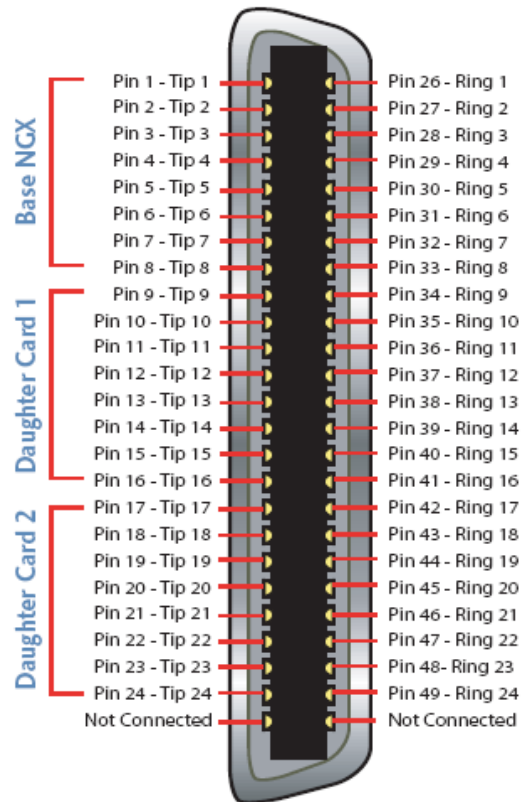
Figure 7-10: Connecting Adapter to the Audio Jack



CONNECTIONS

Figure 7-11 shows the 50-pin high impedance digital tap RJ-21 connector on the SmartWORKS NGX, which is used to interface the NGX to a standard Telco punch-down block or break-out box. As shown in Figure 7-11, pins 1–16 of the connector connect to Rings 1–16 on the punch-down block while pins 26–41 connect to Tips 1–16. For an NGX base board, only pins 1-8 and 26-33 need to be connected.

Figure 7-11: Telco Connector Pinout



Installing an MX80 Expansion Card

The SmartWORKS NGX is field upgradable and can expand its channel capacity with the addition of MX80 8-channel expansion cards. Up to two MX80s can be installed onto a SmartWORKS NGX for a total of 24 channels (8 channels on the NGX base board, 8 channels per MX80 expansion card).

To install the MX80 expansion card(s), perform the following steps:

1. Remove the SmartWORKS NGX from its PC. Be sure to wear an ESD wrist strap and unplug the PC before removing the NGX.
2. Identify the two expansion areas on the SmartWORKS NGX base board (see Figure 7-12). If you are only installing one MX80 expansion card, you must use expansion area #1. If you are installing two cards, the installation order does not matter.
3. Properly align the MX80 and secure it to the NGX using the screw posts that were provided.
4. Re-install the NGX and restart the PC.

Figure 7-12: Installing an MX80 Expansion Card

