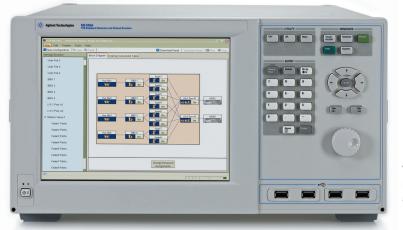


# N5106A PXB Baseband Generator and Channel Emulator

### **Configuration Guide**





The purpose of this guide is to assist in the ordering process for the PXB. Choose an order convenience bundle or start at *Step 1* to build your own configuration. Refer to the on-line configuration assistant for more detailed guidance on configuring the PXB.

www.agilent.com/find/PXBconfig



# Agilent N5106A PXB baseband generator and channel emulator bundle configurations

#### Choose an order convenience bundle

Options 2B2, 2B4, and 4B2 are order convenience bundles representing a specific set of PXB hardware and firmware options for MIMO baseband generation and channel emulation. Each MIMO bundle option supports internal baseband generation with real-time fading, RF fading with PXA/MXA/EXA signal analyzers as RF inputs and EXG/MXG/ESG vector signal generators as RF outputs, and all other valid configurations including baseband summing.

| Option      | Description  | Includes  |
|-------------|--|---|
| Application | on bundles   |   |
| 2B2         | 2x2 MIMO bundle  | N5106A, with Options 616, 634,<br>EFP, JFP, QFP |
| 2B4         | 2x4 MIMO bundle  | N5106A, with Options 620, 636,<br>EFP, JFP, QFP |
| 4B2         | 4x2 MIMO bundle  | N5106A, with Options 622, 636,<br>EFP, JFP, QFP |
| 185         | Global navigation satellite systems application bundle | N5106A, with Options 611, 632,<br>EFP, JFP      |
| 186         | Digital video application bundle                       | N5106A, with Options 612, 632,<br>EFP, JFP, QFP |

## Requirements and recommendations for using PXB with other instruments

- When an EXG/MXG is purchased for use with the PXB, internal baseband generation option is not required, only Option 503 or 506.
- When E5515C (8960) is purchased for use with the PXB, digital bus Option E5515C-004 is required.
- When a PXA is purchased for use with the PXB, all analysis bandwidth options are compatible for up to 40 MHz RF fading or signal capture. For MIMO inputs, PXA cannot be mixed with EXA/MXA, or different bandwidth options.
- When an EXA/MXA is purchased for use with the PXB, analysis bandwidth Option B25 or B40 is required. For MIMO inputs, analyzers must have the same bandwidth option.
- · When an analyzer is purchased with PXB Option QFP, a preamplifier option is recommended.
- When an ESG is purchased for use with the PXB, an internal baseband generator Option 601 or 602 is required.
- When the PXB is used for signal creation, Signal Studio software should be licensed to the PXB. When the ESG is used for signal creation for loopback fading, Signal Studio software should be licensed to the ESG.

# Agilent N5106A PXB configuration steps

The high level of flexibility offered by the PXB allows for a variety of configurations. It supports up to 12 independently licensed digital signal processing (DSP) blocks that can be defined by the instrument firmware to function as baseband generators or faders.

Refer to Figure 1 for an example of a MIMO 2x2 configuration. This 2x2 MIMO configuration illustrates 2 DSP blocks for baseband generation, 4 DSP blocks for fading, and two I/O ports connected to MXGs for RF outputs. A total of 6 DSP blocks and 2 I/O ports is required for this configuration.

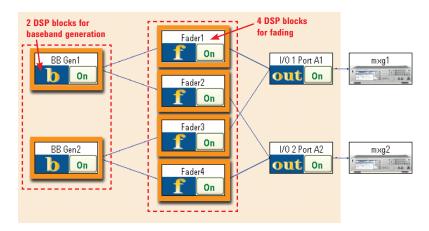


Figure 1. Example of a MIMO 2x2 configuration. Each orange block represents 1 DSP block.

The 4x4 and 2x8 MIMO configurations exceed the physical number of installed DSP blocks for the number of playback channels and faders needed. These configurations require firmware license options N5106A-R2C and N5106A-169. This maximizes the hardware resources and enables up to two faders per DSP block.

See the Release Notes or www.agilent.com/find/N5106AK-R2C for more information.

### **Build your own PXB** configuration

Step 1. Identify your PXB use model to determine the applicable baseband card, I/O card, and firmware options

| PXB use model (configuration)  | Baseband options | I/O<br>cards | PXB FW options   | Recommended PXB options |
|--|------------------|--------------|------------------|-------------------------|
| 1-Channel generate   | 611              | 632          | EFP              | JFP                     |
| 2-Channel generate   | 612              | 632          | EFP              | JFP                     |
| 4-Channel generate   | 614              | 634          | EFP              | JFP                     |
| 6-Channel generate   | 616              | 636          | EFP              | JFP                     |
| 2-Channel generate & sum   | 612              | 632          | EFP              | JFP                     |
| 4-Channel generate & sum   | 614              | 632          | EFP              | JFP                     |
| 1-Channel generate & fade  | 612              | 632          | EFP, QFP         | JFP                     |
| 2-Channel generate & fade  | 614              | 632          | EFP, QFP         | JFP                     |
| 1-Channel fading (ext. inputs)   | 611              | 632          | QFP              | JFP                     |
| 1-Channel loopback fading (ext. inputs)  | 611              | 632          | QFP              | JFP                     |
| 2-Channel fading (ext. inputs)   | 612              | 634          | QFP              | JFP                     |
| 1-Channel fading (ext inputs) with internal faded interferer                     | 613              | 632          | EFP, QFP         | JFP, 8FP                |
| 1x2 single-user MIMO   | 613              | 632          | EFP, QFP         | JFP, RFP, TFP           |
| 1x4 single-user MIMO   | 615              | 634          | EFP, QFP         | JFP, RFP, TFP           |
| 1x6 single-user MIMO   | 617              | 636          | EFP, QFP         | JFP, RFP, TFP           |
| 1x8 single-user MIMO   | 619              | 638          | EFP, QFP         | JFP, RFP, TFP           |
| 2x1 single-user MIMO   | 614              | 632          | EFP, QFP         | JFP, RFP, TFP           |
| 2x1x2 single/multi-user MIMO   | 616              | 634          | EFP, QFP         | JFP, RFP, TFP           |
| 2x2 single/multi-user MIMO   | 616              | 632          | EFP, QFP         | JFP, RFP, TFP           |
| 2x4 single/multi-user MIMO   | 620              | 634          | EFP, QFP         | JFP, RFP, TFP           |
| 2x8 single-user MIMO   | 620              | 638          | EFP, QFP, 169    | JFP, RFP, TFP           |
| 4x1 single-user MIMO   | 618              | 632          | EFP, QFP         | JFP, RFP, TFP           |
| 4x2 single/multi-user MIMO   | 622              | 632          | EFP, QFP         | JFP, RFP, TFP           |
| 4x4 single-user MIMO   | 622              | 634          | EFP, QFP, 169    | JFP, RFP, TFP           |
| 1x2 single-user MIMO (ext. inputs)   | 612              | 634          | QFP              | JFP, RFP, TFP           |
| 1x4 single-user MIMO (ext. inputs)   | 614              | 636          | QFP              | JFP, RFP, TFP           |
| 1x6 single-user MIMO (ext. inputs)   | 616              | 638          | QFP              | JFP, RFP, TFP           |
| 2x2 single-user MIMO (ext. inputs)   | 614              | 634          | QFP              | JFP, RFP, TFP           |
| 2x4 single-user MIMO (ext. inputs)   | 618              | 636          | QFP              | JFP, RFP, TFP           |
| 2x6 single-user MIMO (ext. inputs)   | 622              | 638          | QFP              | JFP, RFP, TFP           |
| 2x8 single-user MIMO (ext. inputs)   | 620              | 638          | QFP              | JFP, RFP, TFP           |
| 4x2 single-user MIMO (ext.inputs)  | 622              | 632          | QFP              | JFP, RFP, TFP           |
| 4x4 single-user MIMO (ext.inputs)  | 622              | 638          | QFP              | JFP, RFP, TFP           |
| 1-Channel fading for<br>Agilent E5515C (8960) 1, 2                               | 611              | 632          | QFP, 8FP         | JFP                     |
| 2-Channel fading for<br>Agilent E5515C (8960) 1, 2                               | 612              | 632          | QFP, 8FP         | JFP                     |
| 1-Channel fading with faded interferer for Agilent E5515C (8960) <sup>1, 2</sup> | 613              | 634          | EFP, QFP,<br>8FP | JFP                     |
| 1x2 single-user MIMO (Rx Diversity) for Agilent E5515C (8960) <sup>1, 2</sup>    | 612              | 634          | QFP, 8FP         | JFP                     |
| 2x2 MIMO for HSPA<br>Agilent E5515C (8960) <sup>2</sup>                          | 614              | 634          | QFP, 8FP,<br>R2C | JFP                     |

<sup>1.</sup> For DC-HSPA support with Agilent E5515C (8960)

configurations, Option R2C is required.

2. If purchasing the E5515C (8960) for use with the PXB, digital bus Option E5515C-004 is required.

### Step 2. Choose firmware options (required)

| Option           | Description                        | Requires                        | Upgrade <sup>1</sup> |
|------------------|------------------------------------|---------------------------------|----------------------|
| EFP              | Baseband generation                |                                 | Yes                  |
| 8FP <sup>2</sup> | Connect to E5515C (8960)           | N5106A-QFP                      | Yes                  |
| JFP              | Calibrated AWGN                    |                                 | Yes                  |
| QFP              | Fading with SISO channel models    |                                 | Yes                  |
| RFP              | Mobile WiMAX™ channel models       | N5106A-QFP                      | Yes                  |
| TFP              | LTE channel models                 | N5106A-QFP                      | Yes                  |
| 169              | Fader interleaving for 4x4 and 2x8 | N5106A-QFP, R2C<br>+ RFP or TFP | Yes                  |

**Note:** Option EFP or QFP is required for a valid N5106A configuration.

The PXB currently supports the following 8960 wireless communications test set applications

| Model                  | Description   | Firmware version |
|------------------------|---|------------------|
| E1962B <sup>2, 3</sup> | cdma2000 <sup>®</sup> mobile test application                             | B.16.12 or later |
| E1966A <sup>2, 3</sup> | 1xEV-D0 terminal test application   | A.11.12 or later |
| E1987A <sup>2, 3</sup> | Fast Switch test application supports: cdma2000 and 1xEV-DO               | A.10.12 or later |
| E6701G                 | GSM/GPRS Lab App G  | G.01.12 or later |
| E6702C                 | cdma2000 Lab App C  | C.01.12 or later |
| E6703C                 | W-CDMA Lab App C  | C.01.17 or later |
| E6706C                 | 1xEV-DO Lab App C   | C.01.12 or later |
| E6785G                 | Fast Switch Lab App G<br>Supports: GSM/GPRS, cdma2000, W-CDMA and 1xEV-DO | G.00.15 or later |

### **Step 3.** Choose accessory options

- For upgrade model, options, and quantities, refer to the N5106A configuration assistant www.agilent.com/find/PXBconfig and the upgrade section in this guide.
- 2. If purchasing the E5515C (8960) for use with the PXB, digital bus Option E5515C-004 is required.
- Requires the 8960 test application's corresponding Option 405 digital bus software license (E1962B-405, E1966A-405). The E1987A Fast Switch test application requires the corresponding Option 405 license to use a desired format.

| Option | Description                                    | Not<br>compatible | Upgrade |
|--------|--|-------------------|---------|
| 181    | USB enabled keyboard, mouse, and DVD-ROM drive |                   | Yes     |
| 1CP    | Rack mount and front handle kit                | N5106A-1CR        | Yes     |
| 1CR    | Rack slide kit                                 | N5106A-1CP        | Yes     |

### Step 4. Choose signal creation software options

| Option              | Description   | Real-time generation | Upgrade |
|---------------------|---|----------------------|---------|
| N7600B <sup>1</sup> | Signal Studio for 3GPP W-CDMA FDD                     | Yes                  | Yes     |
| N7601B <sup>1</sup> | Signal Studio for cdma2000/1xEV-D0                    | Yes                  | Yes     |
| N7602B <sup>1</sup> | Signal Studio for GSM/EDGE                            | Yes                  | Yes     |
| N7606B <sup>1</sup> | Signal Studio for <i>Bluetooth</i> ®                  | No                   | Yes     |
| N7609B <sup>1</sup> | Signal Studio for global navigation satellite systems | Yes                  | Yes     |
| N7611B <sup>1</sup> | Signal Studio for broadcast radio                     | No                   | Yes     |
| N7612B <sup>1</sup> | Signal Studio for TD-SCDMA                            | No                   | Yes     |
| N7615B <sup>1</sup> | Signal Studio for 802.16 WiMAX                        | No                   | Yes     |
| N7617B <sup>1</sup> | Signal Studio for 802.11 WLAN                         | No                   | Yes     |
| N7622B              | Signal Studio Toolkit                                 | None                 | Yes     |
| N7623B <sup>1</sup> | Signal Studio for digital video                       | Yes                  | Yes     |
| N7624B <sup>1</sup> | Signal Studio for 3GPP LTE FDD                        | Yes                  | Yes     |
| N7625B <sup>1</sup> | Signal Studio for 3GPP LTE TDD                        | Yes                  | Yes     |

# Step 5. Choose extended warranty and start up assistance options

| Option       | Description   |
|--------------|---|
| Included     | 3-year warranty (return-to-Agilent), standard       |
| R-51B-001-5C | Warranty Assurance Plan, Return to Agilent, 5 years |
| PS-S10       | Remote scheduled assistance 1-999 hours             |
| PS-S20       | Daily productivity assistance                       |
| PS-S20-01    | Recommended startup assistance                      |
| PS-X10       | Custom services to be qualified by Agilent          |

For factory installation of Signal Studio software, Signal Studio model-number must be ordered under the N5106A.

# Available upgrades for the PXB



www.agilent.com/find/N5106A\_upgrade

For upgrade DSP block licenses, baseband cards and I/O cards, first identify the current N5106A configuration. To determine the correct upgrade options (031, 032, or 034) and quantities to order, refer to the N5106A configuration assistant at www.agilent.com/find/PXBconfig.

#### www.agilent.com www.agilent.com/find/PXB



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