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Ordering Information | Detailed Specifications
*For user manuals and dimensional drawings, visit the product page resources tab on ni.com.*

*Last Revised: 2014-11-06 07:14:05.0*

# 150 MS/s, 16-Bit Digitizer for Communications

## NI PXIe-5622



- 150 MS/s real-time sample rate
- 3 to 250 MHz band in direct path mode, or 50 MHz bandwidth centered at 187.5 MHz
- 16-bit resolution
- Ability to stream to disk at maximum sample rate for hours with PXI Express
- Quadrature digital downconversion (DDC) with up to 60 MHz IF bandwidth
- AC coupled only
- Alias-protected decimation for all sample rates

### Overview

The NI PXIe-5622 is a 150 MS/s digitizer with onboard signal processing (OSP). OSP functions include quadrature digital downconversion (DDC), real digital downconversion, and antialias filtering. The NI PXIe-5622 is ideal for communications applications with its high dynamic range front end and a high-throughput PXI Express interface, allowing it to stream IF data to disk for hours at the full 150 MS/s sample rate.

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### Ordering Information

For a complete list of accessories, visit the product page on ni.com.

| Products | Part Number | Recommended Accessories | Part Number |
|---|---|---|---|
| | | No accessories required. | |

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## Detailed Specifications

**16-Bit IF Digitizer with Onboard Signal Processing**

This document lists the specifications for the NI PXIe-5622 high-speed digitizer. Unless otherwise noted, the following conditions were used for each specification:

- Direct path filter setting
- Sample clock set to internal 150 MS/s, unlocked
- 1 V vertical range

*Specifications* describe the warranted, traceable product performance over temperature ranges of 0 to 55 °C, unless otherwise noted. Specifications warranted under the following conditions:

- 15 minute warm-up time at ambient temperature
- Calibration cycle maintained
- Chassis fan speed set to High
- NI-SCOPE instrument driver self-calibration performed after instrument temperature is stable

*Typical* values describe useful product performance beyond specifications that are not covered by warranty and do not include guardbands for measurement uncertainty or drift. Typical values may not be verified on all units shipped from the factory. Unless otherwise noted, typical values cover the expected performance of units over temperature ranges of 23 ±5 °C with a 90% confidence level, based on measurements taken during development or production.

*Nominal* values (or supplemental information) describe additional information about the product that may be useful, including expected performance that is not covered under Specifications or Typical values. Nominal values are not covered by warranty.

Specifications are subject to change without notice. For the most recent product specifications, visit ni.com/manuals.

To access NI PXIe-5622 documentation, navigate to **Start»All Programs»National Instruments»NI-SCOPE»Documentation**.

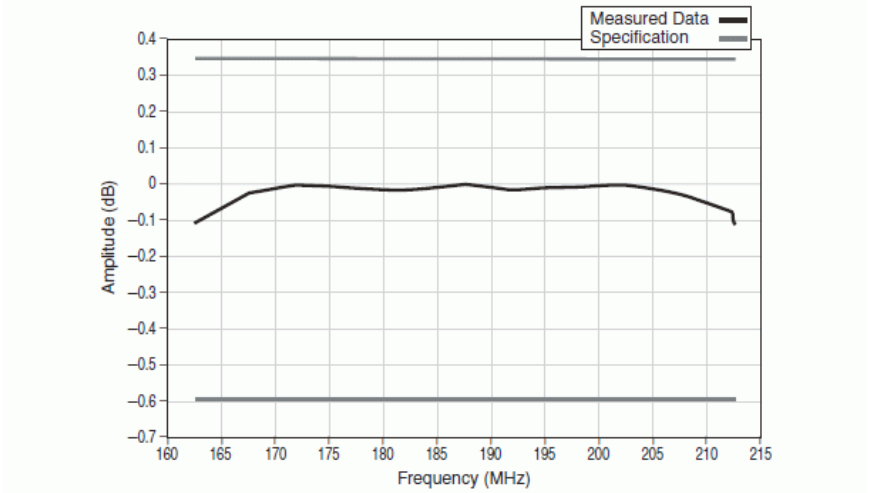
**Hot Surface** If the NI PXIe-5622 has been in use, the device or the shield may exceed safe handling temperatures and may cause burns. Allow the module to cool before touching the shield or removing the device from the chassis or PC. Refer to the *Environment* section for operating temperatures.

| Vertical |
| --- |
| **Analog Input (IF IN)** |

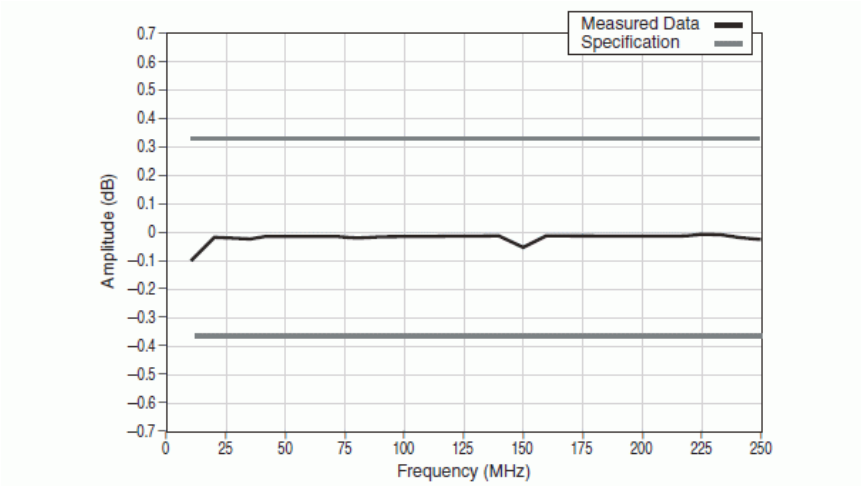
| Specification | Value | Comments |
|---|---|---|
| Number of Channels | One (IF IN) | — |
| **Impedance and Coupling** | | |
| Input Impedance | 50 Ω nominal | — |
| Input Return Loss, Typical | <–15 dB | 5 MHz to 300 MHz |
| Input Coupling | AC | — |
| **Voltage Levels** | | |
| Full Scale (FS) Input Range | 0.7 $V_{pk-pk}$ (+1 dBm), 1 $V_{pk-pk}$ (+4 dBm), 1.4 $V_{pk-pk}$ (+7 dBm) | Dither enabled. Can overrange up to 3 dB with Dither disabled. |
| Maximum Input Overload | 6.3 $V_{pk-pk}$ (+20 dBm) | — |

| Specification | Value | | Comments |
|---|---|---|---|
| **Accuracy** | | | |
| Resolution | 16 bits | | — |
| | Bandpass Path (187.5 MHz) | Direct Path (53 MHz) | |
| Absolute Amplitude Accuracy* | <±0.5 dB | <±0.4 dB | All input ranges.<br>At center frequency of specified bands.<br>* Specification is valid over 23 °C ±5 °C. Maximum drift of ±2 °C from last self-calibration. |
| Absolute Amplitude Accuracy, Typical | <±0.3 dB | <±0.25 dB | |
| Temperature Stability | <0.01 dB/°C | <0.02 dB/°C | All input ranges. Maximum drift of ±2 °C from last self-calibration. |
| **Absolute Amplitude Accuracy Examples at 40 °C in the Bandpass Path**<br>Amplitude accuracy specification: 0.5 + 0.01 × (40 – 23) = ±0.67 dB<br>Amplitude accuracy, typical: 0.3 + 0.01 × (40 – 23) = ±0.47 dB | | | |
| **Bandwidth and Frequency Response** | | | |
| | Bandpass Path (187.5 MHz) | Direct Path (53 MHz) | |
| Bandwidth (–3 dB), Typical | 50 MHz Centered at 187.5 MHz, 3rd Nyquist Zone | 3 MHz to 250 MHz | Bandwidth of unequalized response. |
| Dither Signal, Frequency Range, Typical | 100 kHz to 12 MHz | | Dither can be enabled. Dither disabled by default in NI-SCOPE. |

**Equalized Amplitude Response (Bandpass Path), Using Calibration Data**

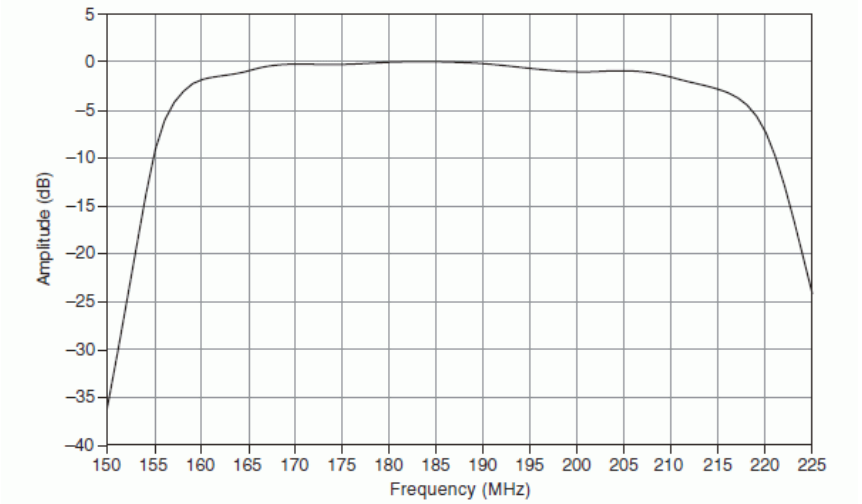



**Equalized Amplitude Response (Direct Path), Using Calibration Data**

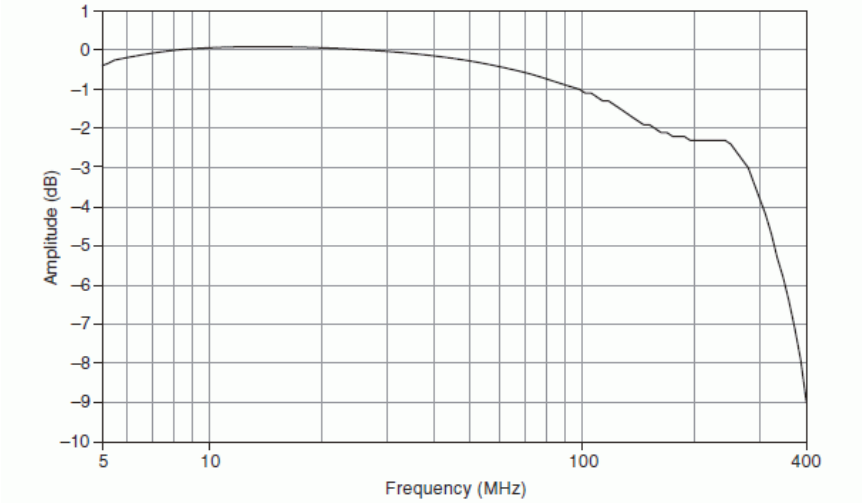



**Note** The Equalized Direct Path Equalized Amplitude Response shown in the previous figure is a composite plot of multiple segments of 40 MHz span each.

**Unequalized Amplitude Response (Bandpass Path)**




**Unequalized Amplitude Response (Direct Path)**



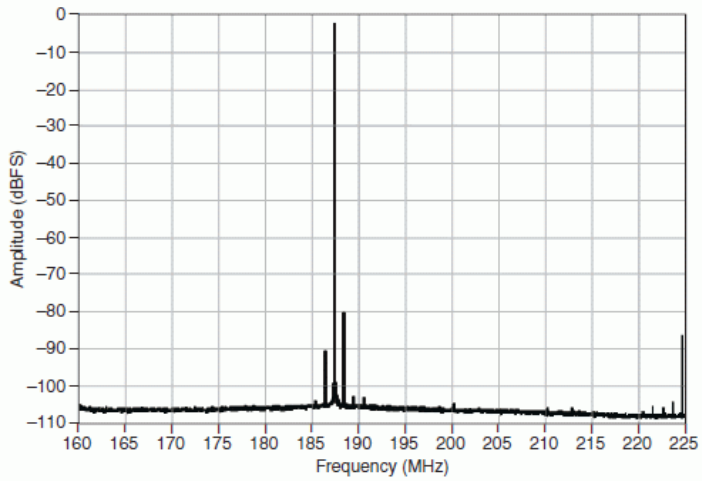

| Specification | Value | | Comments |
|---|---|---|---|
| | Bandpass Path | Direct Path | |
| Passband Amplitude Flatness* | < +0.35, –0.6 dB (equalized)<br>187.5 MHz ±25 MHz | < ±0.35 dB (equalized)<br>53 MHz ±19 MHz | * Specification valid for 1 V range.<br>† Typical specification valid for all ranges.<br>Equalization requires using the Digital Filter Design Toolkit to compute equalization filter coefficients. This software is not included with the NI-SCOPE driver. |
| | | < ±0.6 dB (equalized)<br>10 to 250 MHz (referenced to 100 MHz) | |

| Specification | Value | | Comments |
|---|---|---|---|
| Passband Amplitude Flatness, Typical† | < +0.25, –0.4 dB (equalized)<br>< +0.7, –3.5 dB (unequalized)<br>187.5 MHz ±25 MHz | < ±0.25 dB (equalized)<br>< ±0.6 dB (unequalized)<br>53 MHz ±19 MHz | |
| | | < ±0.5 dB (equalized)<br>< ±1.8 dB (unequalized)<br>10 to 250 MHz (referenced to 100 MHz) | |

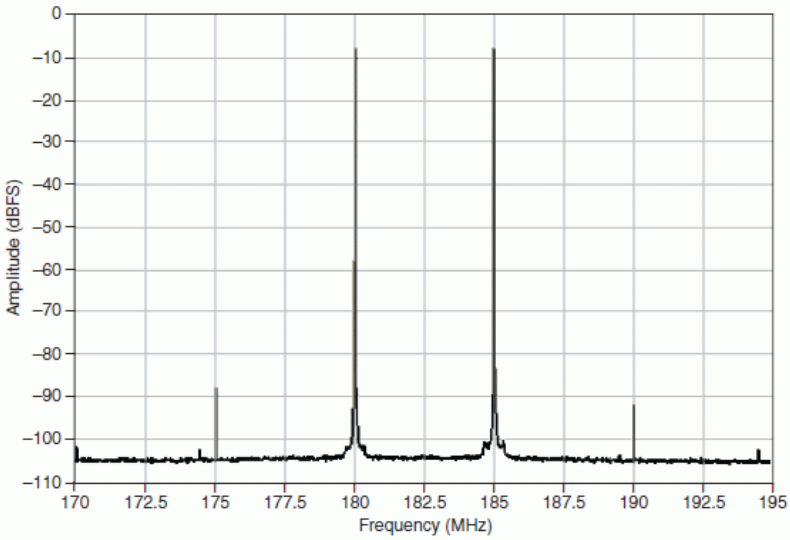
| | Bandwidth | Bandpass Path (187.5 MHz) | Direct Path (53 MHz) | |
|---|---|---|---|---|
| Passband Phase Linearity, Typical | 10 MHz | ±0.5° | ±0.5° | All input ranges. After equalization. |
| | 20 MHz | ±1° | ±1° | |
| | 40 MHz | ±1.75° | — | |
| | 50 MHz | ±2.5° | — | |

| Specification | Value | | Comments |
|---|---|---|---|
| **Spectral Characteristics (+3 dBm total power at 1 V range, Dither ON)** | | | |
| | Bandpass Path (187.5 MHz) | Direct Path (53 MHz) | |
| Spurious-Free Dynamic Range with Harmonics (SFDR), Typical | <–76.5 dBc | <–73 dBc | Down to –10 dBFS level. |
| Total Harmonic Distortion (THD), Typical | <–76 dBc | <–71 dBc | Includes 2nd through 5th harmonics. |
| Intermodulation Distortion (IMD), Typical | <–74 dBc | <–73 dBc | Two tones, 1 MHz apart. Down to –10 dBFS level. |

**Single Tone Spectrum at 5.5 dBm, Bandpass Path, 4 kHz RBW**

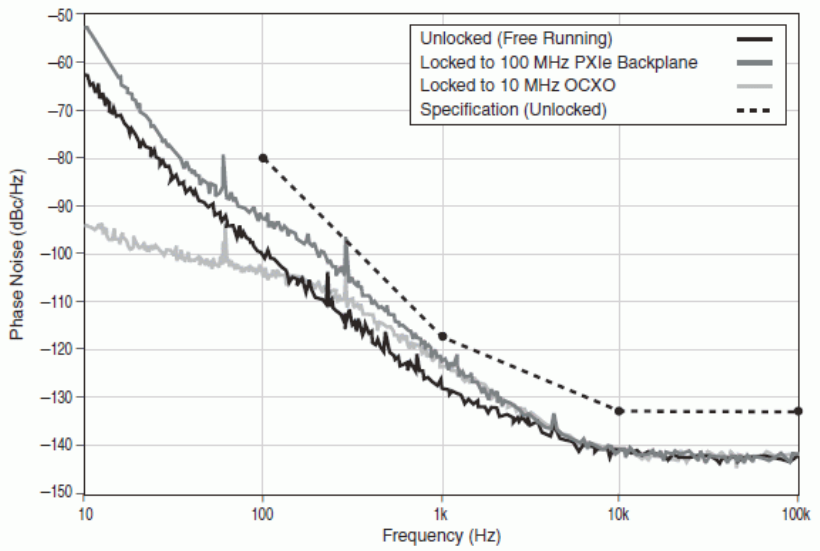



**Two Tone Spectrum at 2 dBm Each, Bandpass Path, 4 kHz RBW**

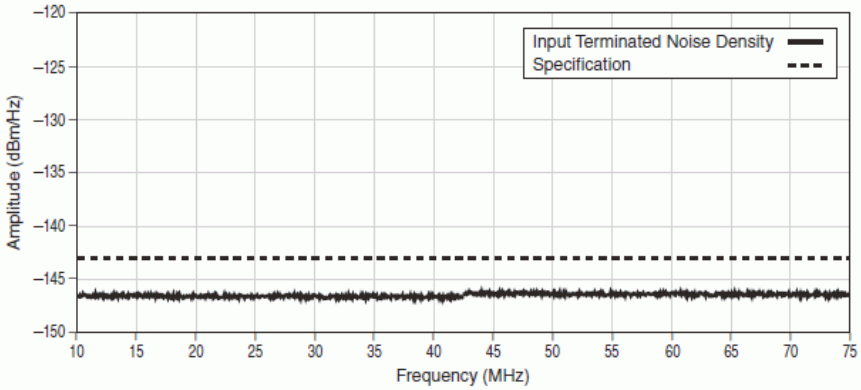



| Specification | Value | | | Comments |
|---|---|---|---|---|
| | Bandpass Path (187.5 MHz) | Direct Path (53 MHz) | | |
| Full Bandwidth Signal-to-Noise Ratio (SNR), Typical | >66.5 dB | >67 dB | | Internal VCXO at 150 MS/s. |
| 4 MHz Bandwidth SNR, Typical | >71.5 dB | >73 dB | | Sample rate 5.35 MS/s, DDC enabled (4.28 MHz bandwidth). |
| | Bandwidth | Bandpass Path (187.5 MHz) | Direct Path (53 MHz) | |
| SSB Phase Noise | 100 Hz | <–80 dBc/Hz | <–90 dBc/Hz | Internal VCXO; unlocked. |
| | 1 kHz | <–117 dBc/Hz | <–128 dBc/Hz | |
| | 10 kHz and above | <–134 dBc/Hz | <–141 dBc/Hz | |
| SSB Phase Noise, Typical | 100 Hz | <–83 dBc/Hz | <–94 dBc/Hz | |
| | 1 kHz | <–120 dBc/Hz | <–132 dBc/Hz | |
| | 10 kHz and above | <–140 dBc/Hz | <–144 dBc/Hz | |
| | Range | Value | | |
| Average Noise Density | 0.7 V/+1 dBm<br>1 V/+4 dBm<br>1.4 V/+7 dBm | <–146 dBm/Hz<br><–143 dBm/Hz<br><–140 dBm/Hz | | Input terminated noise floor. Maintained for low-level input signals. Both filter paths. |
| Average Noise Density, Typical | 0.7 V/+1 dBm<br>1 V/+4 dBm<br>1.4 V/+7 dBm | <–149 dBm/Hz<br><–146 dBm/Hz<br><–143 dBm/Hz | | |

**Phase Noise at 187 MHz, Bandpass Path, Signal Level = 3 dBm**




**Noise Density (Direct Path)**




## Horizontal

**Sample Clock**

| Specification | Value | Comments |
|---|---|---|
| Sources | Internal VCXO<br>External CLK IN (front panel connector) | Internal VCXO can be free running or locked to a reference clock. |

**Internal Sample Clock (Onboard VCXO)**

| Specification | Value | | Comments |
|---|---|---|---|
| Sample Rate | 150 MS/s with decimation by *N* | | Refer to the *Onboard Signal Processing (OSP)* section for possible N values (with and without fractional resampling).<br>Non-OSP decimation does not protect the acquired data from undersampling aliasing. Non-OSP decimation and OSP decimation are mutually exclusive. |
| Accuracy, Typical | ±5 × $10^{-6}$ | | — |
| Accuracy Over Temperature, Typical | ±12 × $10^{-6}$ | | 0 to 55 °C |
| SSB Phase Noise of 150 MHz sample clock when exported to CLK OUT, Typical | 100 Hz | <–90 dBc/Hz | Internal VCXO, unlocked. |
| | 1 kHz | <–130 dBc/Hz | |
| | 10 kHz | <–140 dBc/Hz | |
| | 100 kHz and above | <–150 dBc/Hz | |

### Phase-Locked Loop (PLL) External Reference Clock

| Specification | Value | Comments |
|---|---|---|
| Reference Clock Sources | CLK IN (front panel connector)<br>PXIe 100 MHz (PXIe backplane) | Used to phase lock onboard VCXO. |
| Sample Clock Delay Range | ±1 Sample Clock period | Delay relative to reference clock when VCXO is locked. |
| Sample Clock Delay Resolution | ≤4 ps | |
| Reference Clock Frequency Range | 1 MHz to 100 MHz, in 1 MHz increments | — |
| Reference Clock Frequency Accuracy | Within $\pm 25 \times 10^{-6}$ | Refer to your chassis documentation to ensure it meets this requirement. |
| Reference Clock Duty Cycle Tolerance, Typical | 45% to 55% | — |
| Reference Clock Export Ports | CLK OUT (front panel connector) | — |

### External Sample Clock

| Specification | Value |
|---|---|
| Sample Clock Frequency Range | 20 MHz to 150 MHz |
| Sample Clock Duty Cycle Tolerance, Typical | 45% to 55% |
| Sample Clock Export Ports | CLK OUT (front panel connector) |

### CLK IN (Sample Clock and Reference Clock Input, Front Panel Connector)

| Specification | Value |
|---|---|
| Input Impedance, Typical | 50 Ω |
| Coupling | AC |
| Amplitude | Sine wave: 0.63 to 2.8 $V_{pk-pk}$ (0 to +13 dBm)<br>Square wave: 0.25 to 2.8 $V_{pk-pk}$ |
| Maximum Input Overload | 6.3 $V_{pk-pk}$ (+20 dBm) |

### CLK OUT (Sample Clock and Reference Clock Output, Front Panel Connector)

| Specification | Value |
|---|---|
| Output Impedance, Typical | 50 Ω |
| Coupling | AC |
| Amplitude, Typical | 50 Ω load: >+10 dBm<br>1 kΩ load: square wave, >2 $V_{pk-pk}$ |

### PFI 1 (Programmable Function Interface)

| Specification | Value |
|---|---|
| Direction | Bi-directional |

## Trigger

| Specification | Value |
|---|---|
| **As an Input (Trigger)** | |
| Destinations | Start Trigger (Acquisition Arm)<br>Reference (Stop) Trigger<br>Arm Reference Trigger<br>Advance Trigger |
| Input Impedance | 150 kΩ, nominal |
| Range | 0 to 5 V, TTL compatible |
| Maximum Input Overload | –3.5 V to +8 V, continuous |
| Maximum Frequency | 20 MHz |
| Minimum Trigger Width | >25 ns |
| **As an Output (Event)** | |

| Specification | Value |
|---|---|
| Sources | Start Trigger (Acquisition Arm)<br>Reference (Stop) Trigger<br>End of Record<br>Done (End of Acquisition) |
| Output Impedance | 50 Ω, nominal |
| Logic Type | 3.3 V LVTTL |
| Maximum Drive Current | ±12 mA |
| Maximum Frequency | 25 MHz |

## TClk Specifications

National Instruments TClk synchronization method and the NI-TClk driver are used to align the sample clocks on any number of SMC-based modules in a chassis. For more information about TClk synchronization, refer to the *NI-TClk Synchronization Help*, which is located within the *NI High-Speed Digitizers Help*.

- Specifications are valid for any number of modules installed in one NI PXIe-1062Q chassis.
- All parameters set to identical values for each SMC-based module.
- Sample Clock set to 150 MS/s and all filters are disabled.
- For other configurations, including multichassis systems, contact NI Technical Support at ni.com/support.

**Note** Although you can use NI-TClk to synchronize non-identical modules, these specifications apply only to synchronizing identical modules.

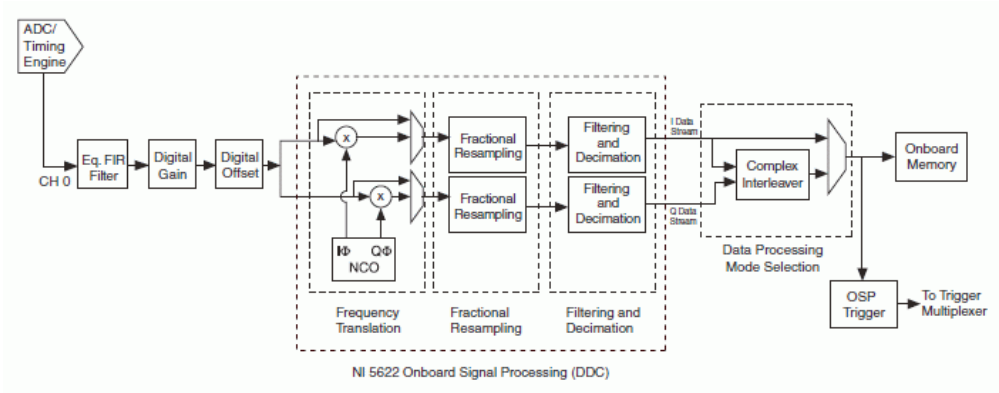
| Specification | Value | Comments |
|---|---|---|
| **Intermodule SMC Synchronization Using NI-TClk for Identical Modules, Typical** | | |
| Skew | ≤ 500 ps | Caused by clock and analog path delay differences.<br>No manual adjustment performed. |
| Average Skew After Manual Adjustment | ≤4 ps | For information about manual adjustment, refer to the *Synchronization Repeatability Optimization* topic in the *NI-TClk Synchronization Help*. For additional help with the adjustment process, contact NI Technical Support at ni.com/support. |
| Sample Clock Delay/Adjustment Resolution | ≤4 ps | — |

## Waveform Specifications

| Specification | Value | | Comments |
|---|---|---|---|
| Onboard Memory Size | 64 MB per Channel Option | 256 MB per Channel Option | * Assumes 2-byte samples. In Complex data processing mode (only available when using onboard signal processing), each sample is 4 bytes, so this number is halved. |
| | 32 megasamples per channel* | 128 megasamples per channel* | |
| Allocated Onboard Memory per Record | Real Data | Complex Data | — |
| | (*Record Length* × 2 bytes/S) + 480 bytes, rounded up to the next multiple of 128 bytes | (*Record Length* × 4 bytes/S) + 960 bytes, rounded up to the next multiple of 128 bytes | |
| Minimum Record Length | 1 Sample | | — |
| Number of Pretrigger Samples | Zero up to full *Record Length* | | Single-record mode and multiple-record mode. |
| Number of Posttrigger Samples | Zero up to full *Record Length* | | Single-record mode and multiple-record mode. |
| Maximum Number of Records in Onboard Memory | 100,000† | | † It is possible to exceed this number if you fetch records while acquiring data. For more information, refer to the *NI High-Speed Digitizers Help*. |

## Onboard Signal Processing (OSP)

**NI PXIe-5622 Onboard Signal Processing Block Diagram**




NI 5622 Onboard Signal Processing (DDC)

**Note** To use onboard signal processing (OSP) on the NI PXIe-5622, the DDC Enabled property/attribute must be set to TRUE.

The following four OSP operations are available:

- Send one IF signal to CH 0 and perform quadrature downconversion on the signal (complex data is returned).
- Send a signal to CH 0 and perform alias-protected decimation (real data is returned).
- Send a signal to CH 0 and perform real downconversion on the signal (real data is returned).

| Specification | Value | | Comments |
|---|---|---|---|
| **OSP General** | | | |
| Number of Digital Downconverters (DDCs) | One | | — |
| Data Processing Modes | Real (I path only)<br>Complex (IQ) | | — |
| OSP Decimation Range | 1, 2, 4, 6, 8, 10<br>12 to 4,096 (multiples of 4)<br>4,096 to 8,192 (multiples of 8)<br>8,192 to 16,384 (multiples of 16) | | OSP decimation protects acquired data from high-frequency aliasing within the ADC Nyquist zone, whereas non-OSP decimation does not. Non-OSP decimation and OSP decimation are mutually exclusive. |
| | Fractional resampling enabled:<br>2 to 16,384 to 48 bits of precision | | |
| Sample Rate Range, OSP Enabled | Internal Sample Clock Timebase | External Sample Clock Timebase | For sample rates less than 9.155 kS/s, use an external sample clock or perform additional software decimation. |
| | 9.155 kS/s to 75 MS/s with fractional resampling; or to 150 MS/s without fractional resampling. | Sample Clock Timebase/OSP Decimation<br>Fractional resampling not available. | |
| Bandwidth | Real Flat Bandwidth = 0.4 × *Sample Rate*<br>Complex Flat Bandwidth = 0.8 × *Sample Rate* | | Example: Complex bandwidth is 60 MHz with a complex sample rate of 75 MS/s.<br>Using a decimation rate of 1 (sample rate of 150 MS/s with internal clock) bypasses the filters in the OSP block. |
| **Digital Gain and Offset** | | | |
| Digital Gain and Offset Resolution | 18 bits | | — |
| Digital Gain Range | –1.5 to +1.5 \| Values \| <1 attenuate user data | | — |
| Digital Offset | (–0.4 × *Vertical Range*) to (+0.4 × *Vertical Range*) | | Applied after Digital Gain. |
| Output | (*ADC Data* × *Digital Gain*) + *Digital Offset* | | (–0.5 × Vertical Range) ≤ Output ≤ (+0.5 × Vertical Range) |
| **Numerically-Controlled Oscillator (NCO)** | | | |
| Frequency Range | Internal Sample Clock Timebase | External Sample Clock Timebase | Undersampling can be used for carrier frequencies >75 MHz. |
| | 0 MHz to 75 MHz | 0 Hz to (0.5 × *Sample Clock Timebase*) | |
| Frequency | 533 nHz | Sample Clock | — |

| Specification | Value | | Comments |
|---|---|---|---|
| Resolution | | Timebase / $2^{48}$ | |
| I and Q Phase Resolution | 0.0055° | | — |
| **Digital Performance** | | | |
| Maximum NCO Spur | <–100 dBFS | | — |
| Decimating Filter Passband Ripple | <0.1 dB | | Passband is from 0 to (0.4 × *IQ Rate*). |
| Decimating Filter Out-of-Band Suppression | >80 dB | | Stopband suppression from (0.6 × *IQ Rate*). |

| Specification | Value | | | | Comments |
|---|---|---|---|---|---|
| **IF Demodulation Typical Performance: Modulation Error Ratio (MER)** | | | | | |
| | Bandpass Path Carrier Frequency: 187.5 MHz | | Direct Path Carrier Frequency: 20 MHz | | |
| | Reference Clocks: Internal (Unlocked) | Reference Clocks: PXIe Chassis | Reference Clocks: Internal (Unlocked) | Reference Clocks: PXIe Chassis | |
| GSM Physical Layer[1] | 50 dB | 59 dB | 48 dB | 62 dB | For the Bandpass Path, the NI PXIe-5673 is the signal source. For the Direct path, the NI PXI-5441 is the signal source. In the *Unlocked* specification, both source and receiver use internal clocks and are not locked to any external reference. In the *PXIe-Chassis* specification, both source and receiver are locked to the PXIe 100 MHz (or PXI 10 MHz) chassis backplane clock. |
| W-CDMA Physical Layer[2] | 47 dB | 50 dB | 39 dB | 58 dB | |
| DVB Physical Layer[3] | 46 dB | 48 dB | 40 dB | 56 dB | |
| 20 MSymbols/s QAM[4] | 43 dB | 44 dB | 37 dB | 49 dB | |
| 26 MSymbols/s QAM[5] | 39 dB | 37 dB | 36 dB | 40 dB | |
| 34 MSymbols/s QAM[6] | 38 dB | 37 dB | 38 dB | 37 dB | |

[1] Typical. MSK modulation, 270.833 kSymbols/s, 1024 Symbols, Gaussian, BT = 0.3

[2] Typical. QPSK modulation, 3.84 MSymbols/s, 1024 Symbols, root raised cosine, alpha = 0.22

[3] Typical. 32 QAM modulation, 6.92 MSymbols/s, 1024 Symbols, root raised cosine, alpha = 0.15

[4] Typical. 64 QAM modulation, 20 MSymbols/s, 1024 Symbols, root raised cosine, alpha = 0.15

[5] Typical. 64 QAM modulation, 26.09 MSymbols/s, 1024 Symbols, root raised cosine, alpha = 0.15

[6] Typical. 64 QAM modulation, 34.78 MSymbols/s, 1024 Symbols, root raised cosine, alpha = 0.15.

**Note** In this case, Direct Path data is at a Center Frequency of 35 MHz using the NI PXIe-5450 as the source.

## Calibration

| Specification | Value |
|---|---|
| Self-calibration | Calibrates absolute amplitude accuracy. |
| External Calibration | Calibrates absolute and relative (flatness) amplitude accuracy, VCXO accuracy. |
| External Calibration Interval | 1 year |
| Warm-Up Time | 15 minutes |

## Power

| Specification | Value | Comments |
|---|---|---|
| **Maximum Power Consumption** | | |

| Specification | Value | Comments |
|---|---|---|
| +3.3 VDC | 1.75 A | At highest operating temperature. |
| +12 VDC | 2.25 A | |
| Total Power | 32.8 W | |

## Software

| Specification | Value |
|---|---|
| Driver Software | NI-SCOPE 3.5 or later.<br>NI-SCOPE is an IVI-compliant driver that allows you to configure, control, and calibrate the NI PXIe-5622. NI-SCOPE provides application programming interfaces for many development environments. |
| Application Software | NI-SCOPE provides programming interfaces, documentation, and examples for the following application development environments:<br>▪ LabVIEW<br>▪ LabWindows™/CVI™<br>▪ Measurement Studio<br>▪ Microsoft Visual C/C++<br>▪ Microsoft Visual Basic |
| Interactive Soft Front Panel and Configuration | The NI-SCOPE Soft Front Panel 2.9 or later supports interactive control of the NI PXIe-5622. The NI-SCOPE Soft Front Panel is included on the NI-SCOPE CD. |
| Test Panel | National Instruments Measurement & Automation Explorer (MAX) provides Test Panels with basic resource ID configuration. MAX is included on the NI-SCOPE CD. |

## Environment

**Note** To ensure that the NI PXIe-5622 cools effectively, follow the guidelines in the *Maintain Forced Air Cooling Note to Users* included in the NI PXIe-5622 kit.
The NI PXIe-5622 is intended for indoor use only.

| Specification | Value |
|---|---|
| Operating Temperature | 0 ºC to +55 ºC in all NI PXI Express chassis. |
| Storage Temperature | –40 ºC to +70 ºC. Meets IEC 60068-2-1 and IEC-60068-2-2. |
| Operating Relative Humidity | 10% to 90%, noncondensing. Meets IEC 60068-2-56. |
| Storage Relative Humidity | 5% to 95%, noncondensing. Meets IEC 60068-2-56. |
| Operating Shock | 30 g, half-sine, 11 ms pulse. Meets IEC 60068-2-27. Test profile developed in accordance with MIL-PRF-28800F. |
| Storage Shock | 50 g, half-sine, 11 ms pulse. Meets IEC 60068-2-27. Test profile developed in accordance with MIL-PRF-28800F. |
| Operating Vibration | 5 Hz to 500 Hz, 0.31 $g_{rms}$. Meets IEC 60068-2-64. |
| Storage Vibration | 5 Hz to 500 Hz, 2.46 $g_{rms}$. Meets IEC 60068-2-64. Test profile exceeds requirements of MIL-PRF-28800F, Class 3. |
| Altitude | 0 to 2,000 m (at 25 °C ambient temperature) |
| Pollution Degree | 2 |

## Safety, Electromagnetic Compatibility, and CE Compliance

### Safety Standards

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

**Note** For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

### Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

**Note** For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

**Note** For EMC compliance, operate this device with RG223/U or equivalent shielded cable. Operate according to product documentation.


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### CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

### Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit ni.com/certification, search by module number or product line, and click the appropriate link in the Certification column.

### Environmental Management

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

### Waste Electrical and Electronic Equipment (WEEE)

**EU Customers** At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.htm.

电子信息产品污染控制管理办法 （中国 RoHS）

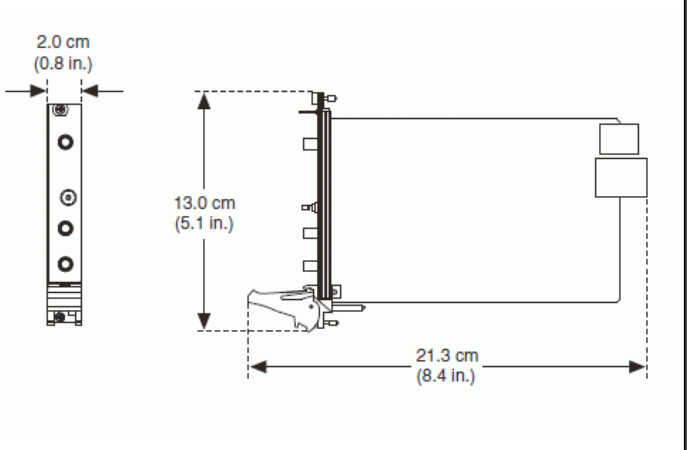
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(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

## Physical

### Front Panel Connectors

| Label | Function | Connector Type |
|---|---|---|
| IF IN | Analog Input | SMA jack |
| PFI 1 | PFI 1 Bi-directional Connector | SMB jack |
| CLK IN | Sample Clock Input and Reference Clock Input | SMA jack |
| CLK OUT | Sample Clock Output and Reference Clock Output | SMA jack |
| **LEDs** | | |
| ACCESS | The ACCESS LED indicates the status of the PCIe bus and the interface from the NI PXIe-5622 to the controller. | |
| ACTIVE | The ACTIVE LED indicates the status of the onboard acquisition hardware of the NI PXIe-5622. | |

### Dimensions and Weight

| | |
|---|---|
| Dimensions | 3U, One slot, PXI/cPCI Module, PXIe compatible<br>21.6 × 2.0 × 13.0 cm<br>(8.5 × 0.8 × 5.1 in.) |
| |  |
| Weight | 400 g (14.1 oz) |

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