



Accurate
Reliable
Affordable

PRODUCT CATALOG

TEST & MEASUREMENT
INSTRUMENTS UP TO 65 GHz
MADE IN SWITZERLAND



Content

| Product | Frequency Range | Phase Noise at 1 GHz at 20 kHz | Page |
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Analog Signal Generators

Single-Channel

| | | | |
|-----------|-------------------|-------------|----|
| APSINX010 | 9 kHz to 6.1 GHz | -128 dBc/Hz | 4 |
| APSIN6G | 9 kHz to 6 GHz | -128 dBc/Hz | 4 |
| APSINXXG | 9 kHz to 26.5 GHz | -128 dBc/Hz | 4 |
| APULN | 8 kHz to 40 GHz | -144 dBc/Hz | 6 |
| APMQS20 | 8 kHz to 20 GHz | -146 dBc/Hz | 6 |
| APLCXX | 9 kHz to 54 GHz | -150 dBc/Hz | 10 |
| APHSPXX | 1 kHz to 51 GHz | -155 dBc/Hz | 10 |

Multi-Channel

| | | | |
|-----------|-------------------|-------------|----|
| APMS | 300 kHz to 40 GHz | -145 dBc/Hz | 8 |
| APLCXX-X | 9 kHz to 54 GHz | -150 dBc/Hz | 10 |
| APHSPXX-X | 1 kHz to 51 GHz | -155 dBc/Hz | 10 |

Vector Signal Generators

| | | | |
|-------------|-------------------|-------------|----|
| APVSGXX(-X) | 100 kHz to 40 GHz | -145 dBc/Hz | 12 |
|-------------|-------------------|-------------|----|

Frequency Synthesizers

Single-Channel

| | | | |
|-----------|-------------------|-------------|----|
| APSYN140 | 8 kHz to 40 GHz | -145 dBc/Hz | 14 |
| APSYN420 | 10 MHz to 20 GHz | -128 dBc/Hz | 14 |
| APMSYN22 | 100 kHz to 22 GHz | -132 dBc/Hz | 14 |
| APMSYN40 | 1 MHz to 40 GHz | -145 dBc/Hz | 14 |
| APUASYN20 | 8 kHz to 20 GHz | -125 dBc/Hz | 14 |

Multi-Channel

| | | | |
|-------------|-----------------|-------------|----|
| APSYN140-X | 8 kHz to 40 GHz | -145 dBc/Hz | 16 |
| APUASYN20-X | 8 kHz to 20 GHz | -125 dBc/Hz | 16 |

Phase Noise Analyzers

| | | | |
|------|-----------------|--|----|
| APPH | 1 MHz to 40 GHz | | 18 |
| APNA | 1 MHz to 65 GHz | | 18 |

Company Profile

AnaPico is an ISO9001:2015 certified technology leader developing, manufacturing and supplying RF and MW test & measurement instruments for a wide range of civilian and governmental applications. Established in 2005 in Zurich, Switzerland, AnaPico has been heavily investing in R&D and is dedicated to creating and continuously improving its innovative and cost-efficient T&M solutions that have best-in-class performance and unique features.

All our products are manufactured and 100% tested in Switzerland.

Our current product offering consists of the following:

- **RF and Microwave Signal Generators up to 54 GHz**
 - analog Signal Generators with lowest phase noise
 - ultra-agile with digital modulation
 - phase-coherent multiple outputs
 - different models ranging from 1 kHz to 54 GHz
- **Standard and customized Frequency Synthesizers**
 - wideband from 8 kHz to 20 or 43 GHz
 - ultra-compact with USB/LAN/FCP interfaces
 - fastest (<5 μ s) switching option: BCD/Binary format
- **Signal Source - & Phase Noise Analyzers up to 65 GHz**
 - highly flexible analysis of absolute and residual phase and amplitude noise, pulsed and CW
 - different models up to 7, 20, 26, 40, 50 or 65 GHz
 - transient analysis, short- and long-term stability analysis, one-step VCO characterization
 - spectral analysis

Unique features of our products are:

- Outstanding signal purity and lowest phase noise
- High output power and fast switching speed
- Ultra-low measurement sensitivity
- Compact size and lightweight
- Low power consumption and optional battery operation
- Flexible customization of hard- and software

What you can expect from us

At AnaPico we create Swiss made instruments with unique features. Our experienced engineering team has outstanding hardware and software skills and in partnership with our contracted distributors, AnaPico operates a growing service network in the world, offering services that meet customer expectations!



- ✓ **High reliability, superior performance instruments with low cost of ownership**
- ✓ **Short lead and service turnaround times**
- ✓ **Quick and competent after-sales support**
- ✓ **Continued hard- and software support and updates**

SERVICES

In partnership with our contracted distributors, AnaPico operates a growing service network worldwide, offering the following services.

Calibration

All our T&M Instruments are fully calibrated and delivered together with our calibration certificates. We recommend that our customers return the instruments to our local authorized service facilities or our headquarters in Switzerland for re-calibration every 2 years.

Maintenance and repair

All new products of AnaPico have a standard 2-year warranty period. The warranty period is extendable up to 5 years. Our product repair and calibration service is available for 5 additional years after product phase-out.

Product updates

Firmware and graphical user interface (GUI) software for all our products are continuously maintained and updated. They are available on our webpage and free-of-charge for our customers. Our local service facilities and partners also offer these updating services.

Technical and logistic support

Our locally contracted distributors have trained and knowledgeable engineers and service personnel ready to help our customers with requirement clarifications, instrument trial uses, application support, and delivery and service-related logistics.

Analog Signal Generators

APSINX010HC & APSINXXG & APSIN6G

ANALOG SIGNAL GENERATORS FROM 9 KHZ UP TO 26.5 GHZ

The APSINX010 and APSIN6G are analog RF signal generator series covering RF frequency ranges from 9 kHz to 2, 4 and 6.1 GHz. The APSINXXG is an analog signal generator series covering microwave frequency ranges from 9 kHz to 6, 12, 20 and 26.5 GHz. A combination of characteristics including good signal purity, low phase noise, fast switching speed and wide output power range, along with their very compact size, lightweight and low power consumption makes these instruments very well usable in labs, production environments and outdoor applications.



Option 1URM: 19" rack-mountable form factor



Option EB: Power bank adapter



APSINX010



APSINXXG



Option RM: 3HU 19" rack-mount kit mounting 2 portable units

SPECIFICATIONS

| | RF | | Microwave |
|--------------------------------|--|--|--|
| Models | APSIN2010HC APSIN4010HC APSIN6010HC | APSIN6G | APSIN12G APSIN20G APSIN26G |
| Frequency Range | 9 kHz to 2, 4 or 6.1 GHz | 9 kHz to 6 GHz | 100 kHz (9 kHz with option 9K) to 12, 20 or 26.5 GHz |
| Resolution | 0.001 Hz | 0.001 Hz | 0.001 Hz |
| Power Range | -30 to +18 dBm (-120 to +17 dBm with PE3) | -20 to +25 dBm (-120 to +25 dBm with PE3) | -20 to +15 dBm (-90 to +25 dBm with PE3/ HP) (-120 to +25 dBm with PE2/ HP) |
| Resolution | 0.01 dB | 0.01 dB | 0.01 dB |
| Harmonics | -30 dBc (-50 dBc with option FILT) | | |
| Switching Speed | 400 μ s | 300 μ s (<30 μ s with option FS) | 300 μ s (<30 μ s with option FS) |
| Phase Noise At 1 GHz | at 10 Hz: -80 dBc/Hz at 1 kHz: -117 dBc/Hz at 100 kHz: -130 dBc/Hz at 10 MHz: -150 dBc/Hz | at 10 Hz: -80 dBc/Hz at 1 kHz: -117 dBc/Hz at 100 kHz: -128 dBc/Hz at 10 MHz: -150 dBc/Hz | at 10 Hz: -80 dBc/Hz at 1 kHz: -117 dBc/Hz at 100 kHz: -128 dBc/Hz at 10 MHz: -150 dBc/Hz |
| Remote Control | Ethernet, USB, GPIB | | |
| Modulation | AM, FM, PM, PULSE, Chirp, AVIO (ILS, VOR) | | AM, FM, PM, PULSE, Chirp, N-Pulse |
| Sweeps | List, Frequency, Power | | |
| Dimensions (W x L x H), Weight | 173.6 x 270.7 x 116.9 mm; [6.83 x 10.66 x 4.60 in], 2.5 kg [5.5 lbs] | 173.6 x 261.7 x 116.9 mm [6.83 x 10.30 x 4.60 in], 2.5 kg [5.5 lbs] | 173.6 x 261.7 x 116.9 mm; [6.83 x 10.30 x 4.60 in], 2.5 kg [5.5 lbs] |



KEY FEATURES

| |
|---|
| High output power, low phase noise |
| Comprehensive AM, low-distortion, wideband DC-FM, and high-speed pulse modulation |
| Powerful trigger and sweeping modes |
| DC power supply, internal / external battery operation |
| Touch display, web browser- or desktop application GUI |

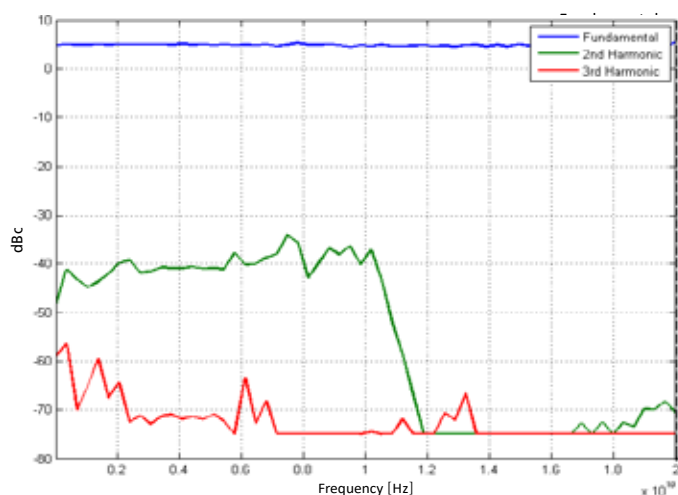
APPLICATIONS

| |
|---|
| General purpose compact signal source |
| EMC / EMI testing |
| Service and verification |
| Portable, battery operated source for field operation |

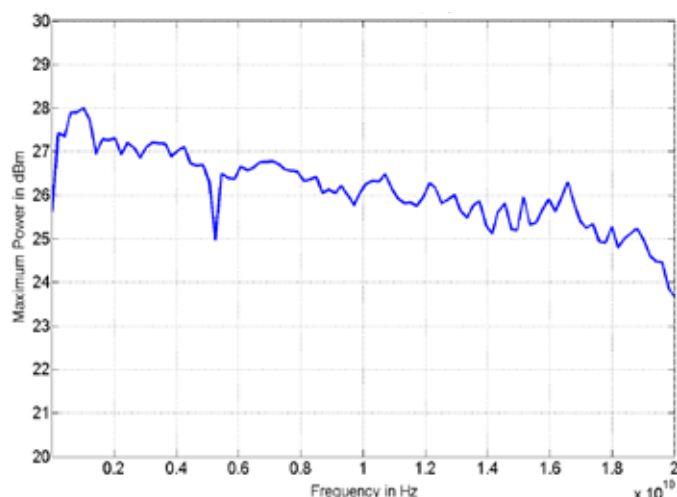
AVAILABLE OPTIONS

| | | APSINX010HC | APSIN6G | APSINXXG |
|-------|---|-------------|---------|----------|
| 9K | Frequency range extension to 9 kHz (APSIN12G/20G) | – | – | ✓ |
| HP | Higher output power | – | – | ✓ |
| PE3 | Mechanical step attenuator down to -90 dBm | ✓ | ✓ | ✓ |
| PE2 | Mechanical step attenuator down to -120 dBm | – | – | ✓ |
| NM | Remove modulation (APSIN20G/26G) | – | – | ✓ |
| NP | Narrow pulse modulation | – | – | ✓ |
| FS | Fast switching speed | – | ✓ | ✓ |
| AVIO | Avionics modulation capability (VOR/ILS) | ✓ | ✓ | – |
| B3 | Internal rechargeable battery module | ✓ | ✓ | ✓ |
| EB6 | External power bank adapter cable | ✓ | ✓ | ✓ |
| 1URM | 19" 1HU rack-mount module | ✓ | ✓ | ✓ |
| BAG | Portable Bag | ✓ | ✓ | ✓ |
| DATA | Commercial Calibration Certificate with test data | ✓ | ✓ | ✓ |
| FLASH | MicroSD card slot for removable SD memory | ✓ | ✓ | ✓ |
| GPIB | GPIB interface | ✓ | ✓ | ✓ |
| IEC | IEC 17025 calibration with certificate | ✓ | ✓ | ✓ |
| OEM | OEM package | ✓ | ✓ | ✓ |
| REAR | Move output to the rear panel | ✓ | ✓ | ✓ |
| ReCal | Recalibration with certificate (recommended: 2-year interval) | ✓ | ✓ | ✓ |
| RM | 19" 3HU rack-mount kit | ✓ | ✓ | ✓ |
| WE | One year warranty extension (standard: 2 years) | ✓ | ✓ | ✓ |

PERFORMANCE PLOTS



APSIN20G: Harmonic performance



APSIN20G: Typical maximum output power (option HP)

Analog Signal Generators

APULN & APMQS20

ULTRA-LOW NOISE RF MICROWAVE SIGNAL GENERATORS FROM 100 KHZ UP TO 40 GHZ

Ultra-low noise RF Microwave Signal Generators starting from 100 kHz up to 12.75, 20, 26 or 40 GHz

The APULN is a high-performance analog signal generator (analog signal source) series covering RF and microwave frequency ranges from 100 kHz (optionally 8 kHz) to 12.75, 20, 26 and 40 GHz. A combination of characteristics such as good signal purity, ultra-low phase noise, high output power and fast switching speed, along with their very compact size, low weight and low power consumption makes these instruments very well usable in labs, manufacturing, and outdoor applications.



APULN front and rear

APMQS20 Microwave Signal Generator from 10 MHz to 20 GHz

The APMQS20 microwave signal source modules deliver instrument-grade performance, increased functionality, and efficient power consumption at a reduced size and affordable cost. The design combines low phase noise with fast switching capability, covering a wide frequency range from 8 kHz up to 20 GHz. The low spurious and harmonic content of the signal makes it ideally suitable for many demanding applications.

The unit contains a high stability OCXO, providing accurate, power-calibrated, phase-lockable output signals.



APMQS20

SPECIFICATIONS

| Models | APULN | APMQS20 |
|--------------------------------|--|---|
| Frequency Range Resolution | 100 kHz (8 kHz with opt. 8K) to 12.75, 20, 26, or 40 GHz 0.001 Hz | 10 MHz (8 kHz with option 8K) to 20 GHz 0.001 Hz |
| Power Range | -20 to +25 dBm -55 to +25 dBm (with PE4) / -120 to +25 dBm (with PE2) | -20 to +15 dBm |
| Switching Speed | 500 μ s (30 μ s with option FS) | 500 μ s (20 μ s with option FS) |
| Phase Noise At 1 GHz | at 10 Hz: -87 dBc/Hz (-98 dBc/Hz with option LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -144 dBc/Hz at 100 kHz: -148 dBc/Hz | at 10 Hz: -85 dBc/Hz at 1 kHz: -133 dBc/Hz at 20 kHz: -145 dBc/Hz at 10 MHz: -155 dBc/Hz |
| Harmonics | -48 dBc with option FILT | -40 dBc |
| Remote Control | Ethernet, USB, GPIB | Ethernet, USB |
| Modulation | PULSE, AM, FM, PM, Pulsed Chirp | PULSE |
| Sweeps | List, Frequency, Power | |
| Dimensions (W x L x H), Weight | 174 x 290 x 113 mm [6.85 x 11.42 x 4.45 in], 2.5 kg [5.5 lbs] | 177.8 x 127 x 25.4 mm [7.0 x 5.0 x 1.0 in], < 1.0 kg [< 2.2 lbs] |

KEY FEATURES APULN

| |
|---|
| Excellent signal purity: Low phase noise and low spurious |
| Advanced pulse modulation 20 ns pulse width (digital ALC) |
| Low aging rate 0.02 ppm year |
| Broadband and fast CHIRP modulation |
| Combination of low-phase noise / fastest switching |
| Powerful and easy to use touch-display control |
| Portable operation from external 24V DC power bank |
| Remote control via Labview drivers, API programming library |

KEY FEATURES APMQS20

| |
|--|
| APMQS20 is a replacement for the QuickSyn models |
| Combination of low-phase noise and low spurs |
| Fast-switching speed |
| Outstanding power level accuracy |
| Communication capabilities through USB, LAN, and SPI ports |



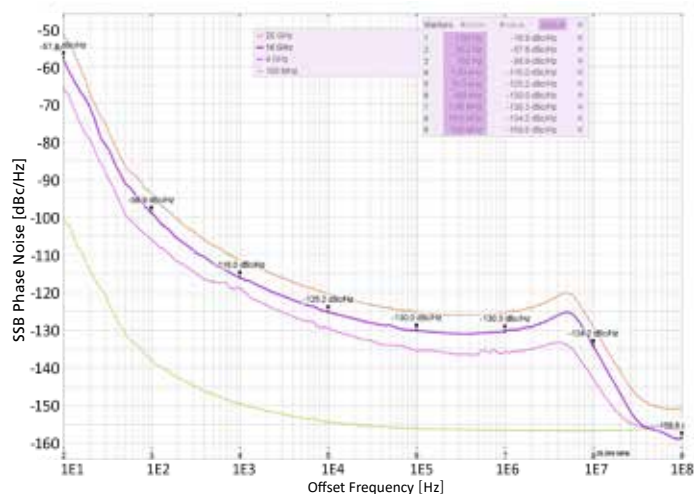
APPLICATIONS

| | |
|--------------------------------------|---|
| LO substitution in radar application | Chirp and pulse modulation for radar applications |
| Radar receiver testing | Automated production test |

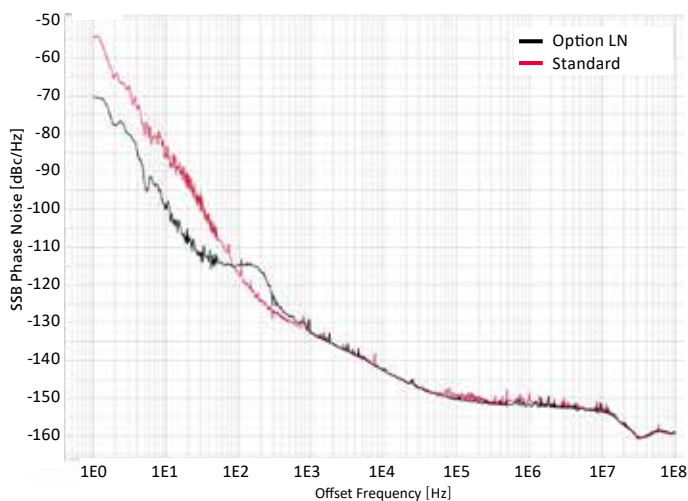
AVAILABLE OPTIONS

| | | APULN | APMQS20 |
|----------|--|-------|---------|
| 8K | Frequency range extension to 8 kHz | ✓ | ✓ |
| PE / PE2 | Mechanical step attenuator down to -90 dBm / -120 dBm | ✓ | — |
| PE4 | Electrical step attenuator | ✓ | — |
| MOD | Analog modulation | ✓ | — |
| LN | Enhanced close-in phase noise & frequency stability | ✓ | — |
| LN+ | Enhanced close in phase noise & further enhanced long term frequency stability | ✓ | — |
| FILT | Enhanced harmonic rejection | ✓ | — |
| FS | Fast switching speed | ✓ | ✓ |
| 1URM | 19" 1HU rack-mount module | ✓ | — |
| BAG | Portable Bag | ✓ | — |
| EB | External power bank adapter cable | ✓ | — |
| FLASH | MicroSD card slot for removable SD memory | ✓ | — |
| GPIB | GPIB interface | ✓ | — |
| RM | 19" 3HU rack-mount kit | ✓ | — |
| VREF | Variable external reference | ✓ | — |

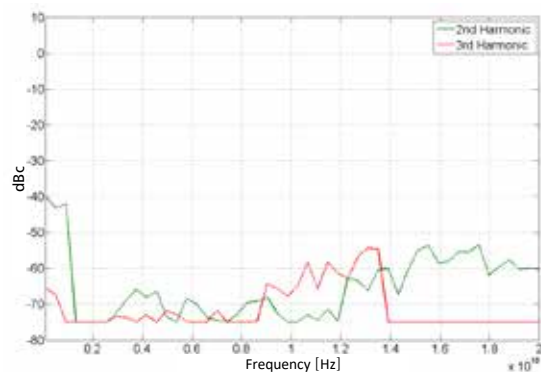
PERFORMANCE PLOTS



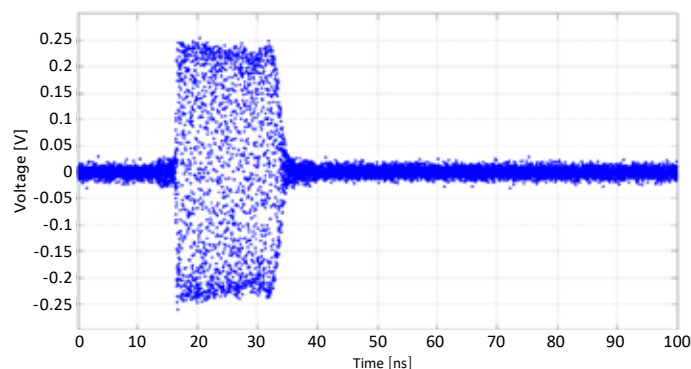
APMQS20: SSB Phase Noise Performance



Comparison: SSB phase noise performance with and without option LN



APULN: Harmonics 0 dBm with option FILT



APULN40: Pulse modulation width 20 ns at 40 GHz carrier

Analog Signal Generators

APMSXXG

MULTI-CHANNEL SIGNAL GENERATORS FROM 300 KHZ UP TO 40 GHZ

APMSXXG

The APMSXXG is a phase-coherent, multi-channel, ultra-fast switching, and low phase noise signal generator series with a frequency range from 300 kHz to 6, 12, 20, 33 and 40 GHz. They are ideally suited for a wide range of applications where good signal quality, accurate signal level and wide output power range are required. Excellent phase noise is combined with good spurious and harmonic rejection and a leading-edge switching speed of 25 μ s with option FS.

The unique phase coherent switching option adds the following feature:

- Phase-coherent switching: The phase relationship between 2 channels is deterministic
- Phase memory: After a channel switches back to a previous frequency, it behaves as if it had been continuously running at that frequency.

The APMS series has proven track record in fields such as quantum computing (QuBit manipulation and control), radar signal generation and satellite load testing.

The APMS generators come in a standard 19" 1U enclosure and offer USB and Ethernet control interfaces as well as the optional GPIB interface. Each interface allows for easy and fast communication using the SCPI 1999 command set. Remote control of the instrument can be quickly attained from any host system. A customer-supplied application programming interface (API) and programming examples for Matlab, Labview, C++ and other commercially available tools make test implementation very straightforward.



APMSXXG

SPECIFICATIONS

| | | |
|--------------------------------|--|---|
| Models | APMSXXG | |
| # of channels | 1, 2, 3, 4 | |
| Frequency Range Resolution | 300 kHz to 6, 12, 20, 33, 40 GHz <0.001 Hz | |
| Power Range | -20 to +25 dBm -60 to +23 dBm (with PE4) | |
| Switching Speed | 500 μ s (25 μ s with option FS) | |
| Phase Noise At 1 GHz | at 10 Hz: -87 dBc/Hz (-100 dBc/Hz with option LN) at 1 kHz: -130 dBc/Hz | at 20 kHz: -145 dBc/Hz at 100 kHz: -150 dBc/Hz |
| Remote Control | Ethernet, USB, GPIB | |
| Modulation | AM, FM, PM, PULSE | |
| Sweeps | List, Frequency, Power, Phase | |
| Dimensions (W x L x H), Weight | 19" 1HU enclosure: 440 x 470 x 44 mm [17.3 x 18.5 x 1.7 in], 10 kg [22 lbs] | |

KEY FEATURES

| | |
|-------------------------|--|
| Very low phase noise | Phase coherent switching option |
| Fast switching | Multiple phase coherent outputs |
| Low harmonic distortion | Excellent channel-to-channel phase stability |

APPLICATIONS

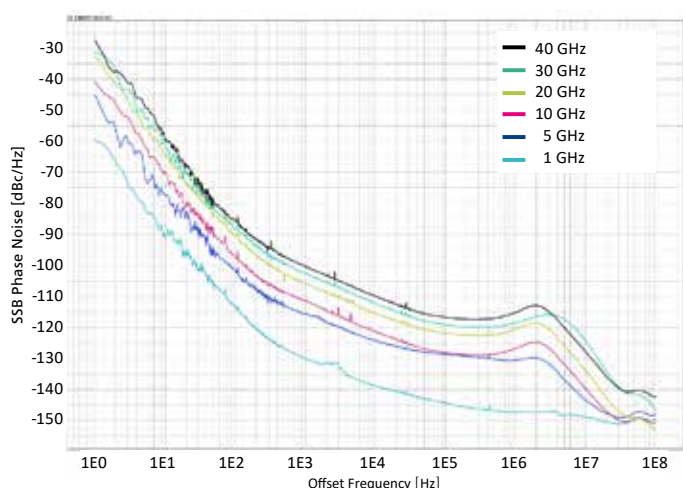
| | |
|-------------------------------|------------------------------------|
| Radar simulation | Phased array antenna / beamforming |
| Quantum computing | 5G Testing |
| High volume automated testing | |



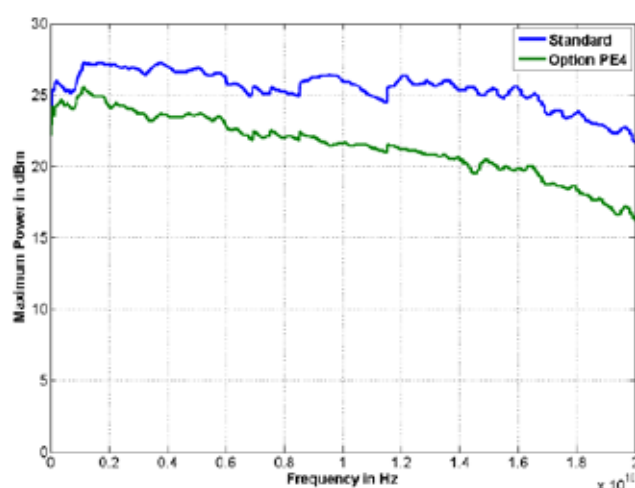
AVAILABLE OPTIONS

| | |
|-----------------|--|
| PE4 | Electrical step attenuator |
| PHS | Phase coherent switching |
| MOD | Add amplitude, frequency, phase modulation capability |
| FS | Ultra-fast switching speed |
| NEC | Fast switching speed, narrow pulse (no export control required) |
| LN / LN+ | Enhanced close-in phase noise & further enhanced long term frequency stability |
| FLASH | MicroSD card slot for removable SD memory |
| VREF | Flexible external reference frequency support in range 1 to 250 MHz |
| GPIB | GPIB interface |
| HI | High isolation 19" 1HU casing |
| DATA | Commercial calibration certificate with test data (per channel) |
| IEC | IEC 17025 calibration with certificate |

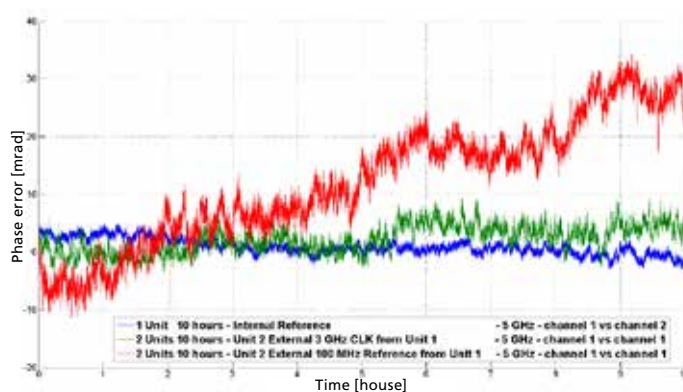
PERFORMANCE PLOTS



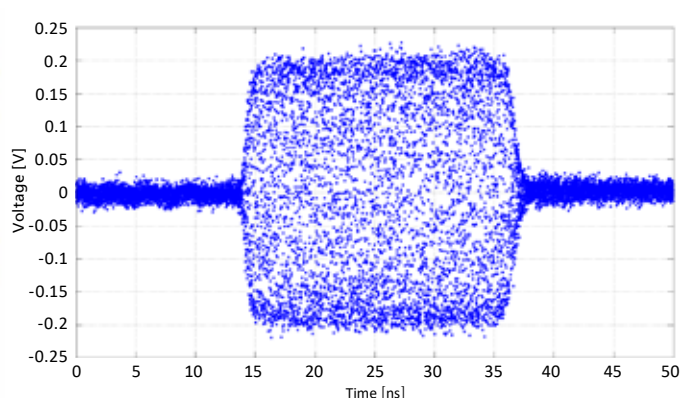
Phase Noise without Option LN (at max. output power)



Maximum Output Power APMS20G with and without Option PE4



Channel-to-Channel Phase Stability under Different Test Conditions



APMS40G-U1N 25 ns Pulse Modulation – 40 GHz Carrier Frequency

Analog Signal Generators

APLCXX & APLCXX-X & APHSPXX & APHSPXX-X

SINGLE- AND MULTI-CHANNEL SIGNAL GENERATORS FROM 9 KHZ UP TO 54 GHZ

APLCXX(-X)

The APLCXX(-X) is an agile ultra-low phase noise signal generator from 9 kHz to 12.75 GHz (APLC12), 20 GHz (APLC20), 40 GHz (APLC40) or 54 GHz (APLC50) with excellent harmonic and spurious performance.

The signal source is available as mountable module or in a desktop enclosure with display and front panel control.



Single-channel enclosure

APHSPXX(-X)

The APHSPXX(-X) series offers the industry's lowest phase noise signal generators, covering a frequency range from 1 kHz to 12.75 GHz (APHSP12), 20 GHz (APHSP20), 40 GHz (APHSP40) and 51 GHz (APHSP50).

APHSP provides outstanding spurs suppression and fast switching speed. For defense applications, the unit features a pulse modulator with the shortest rise/fall time in its class.



Multi-channel enclosure

SPECIFICATIONS

| Models | APLCXX & APLCXX-X | APHSPXX & APHSPXX-X |
|--------------------------------|---|---|
| # of channels | 1, 2, 3, 4 | |
| Frequency Range | 10 MHz (9 kHz with option 9K) to 12.75, 20, 40, 54 GHz | 10 MHz (1 kHz with option 1K) to 12.75, 20, 40, 51 GHz |
| Power Range | -20 to +20 dBm -120 to +20 dBm (with PE2) | -20 to +20 dBm -120 to +20 dBm (with PE2) |
| Switching Speed | 500 μ s (15 μ s with option FS) | 100 μ s (5 μ s with option FS) |
| Phase Noise At 10 GHz | at 10 Hz: -65 dBc/Hz (-85dBc/Hz with LN(+)) at 1 kHz: -122 dBc/Hz at 20 kHz: -131 dBc/Hz at 100 kHz: -133 dBc/Hz | at 10 Hz: -65 dBc/Hz (-83 dBc/Hz with LN(+)) at 1 kHz: -127 dBc/Hz at 20 kHz: -139 dBc/Hz at 100 kHz: -143 dBc/Hz |
| Harmonics | -50 dBc | |
| Non-Harmonics | f min to 4.5 GHz: -90 dBc 12.75 to 25.5 GHz: -70 dBc | 4.5 GHz to 12.75 GHz: -80 dBc 25.5 to 51 GHz: -70 dBc |
| Modulation | AM, FM, PM, PULSE | |
| Sweeps | List, Frequency, Power, Phase | |
| Remote Control | Ethernet, USB, GPIB | |
| Dimensions (W x L x H), Weight | Single-Channel: 232 x 393 x 96.75 mm [9.1 x 15.5 x 3.8 in], ≤ 10 kg [≤ 22 lbs] Multi-Channel: 19" 2HU enclosure: 444 x 594 x 88 mm [17.5 x 23.4 x 3.5 in], 18 kg [39.7 lbs] | |

KEY FEATURES

| | APLCXX(-X) | APHSPXX(-X) |
|--|------------|-------------|
| Very low phase noise | ✓ | ✓✓ |
| Fast switching | ✓ | ✓✓ |
| Low harmonic distortion | ✓ | ✓ |
| Non-harmonic spurious | ✓ | ✓ |
| Phase coherent switching option | ✓ | ✓ |
| Multiple phase coherent outputs | ✓ | ✓ |
| Excellent channel-to-channel phase stability | ✓ | ✓ |



APPLICATIONS

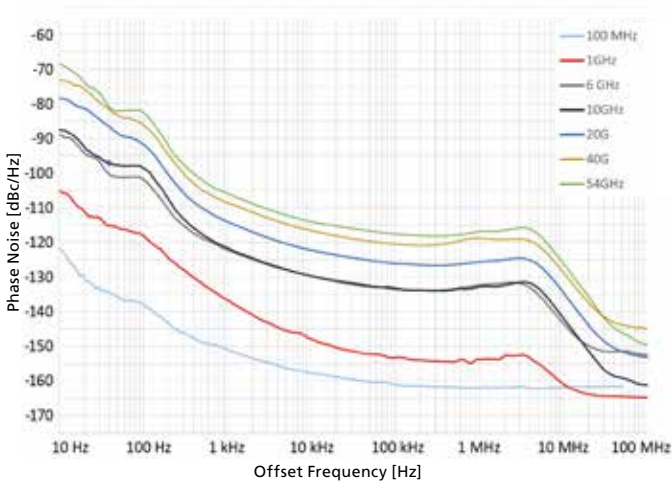
| |
|------------------------|
| LO substitution |
| Receiver blocking test |
| ADC Characterization |

| |
|--|
| Radar pulse simulation |
| Transmitter / receiver intermodulation |
| Quantum computing |

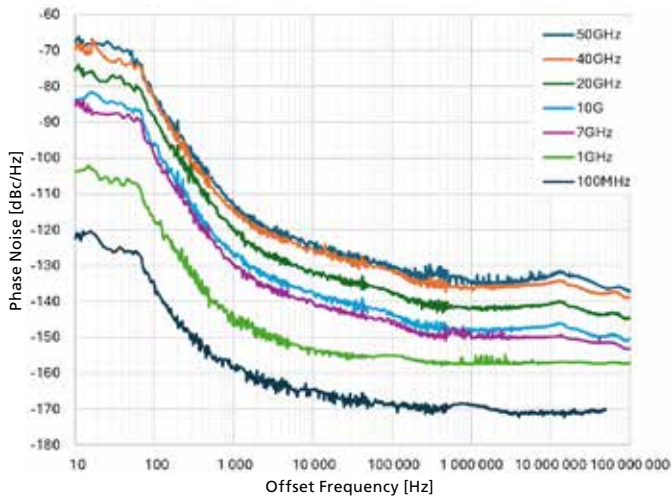
MOST IMPORTANT AVAILABLE OPTIONS

| | | APLCXX(-X) | APHSPXX(-X) |
|----------|--|------------|-------------|
| 1K | Frequency range extension to 1 kHz | – | ✓ |
| 9K | Frequency range extension to 9 kHz | ✓ | – |
| PE2 | Mechanical step attenuator down to -120 dBm | ✓ | ✓ |
| PHS | Phase coherent switching | ✓ | – |
| MOD | Add amplitude, frequency, phase modulation capability | ✓ | ✓ |
| PULSE | Pulse modulation | ✓ | ✓ |
| FS | Fast switching speed | ✓ | ✓ |
| LN / LN+ | Enhanced close-in phase noise & further enhanced long term frequency stability | ✓ | ✓ |
| FLASH | MicroSD card slot for removable SD memory | ✓ | ✓ |
| VREF | Flexible external reference frequency support in range 1 to 250 MHz | ✓ | ✓ |
| GPIB | GPIB interface | ✓ | ✓ |

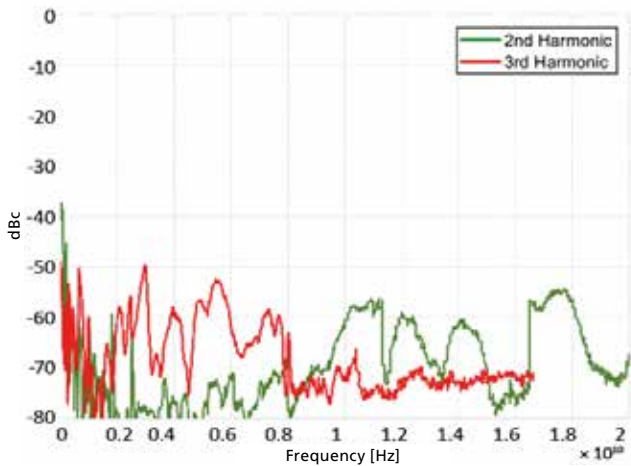
PERFORMANCE PLOTS



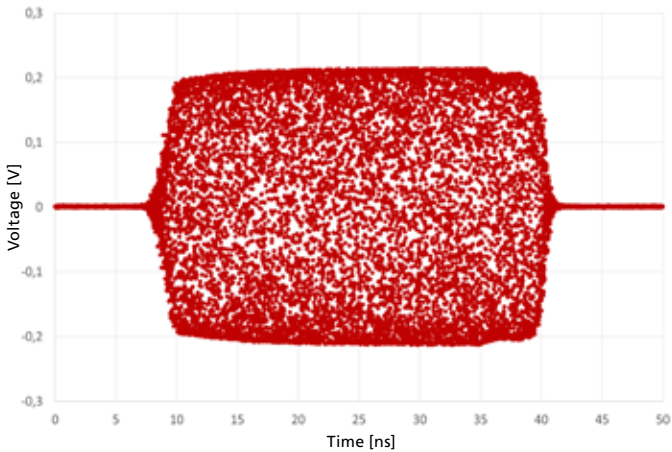
APLC: Phase noise at different frequencies, power +10 dBm, with option LN



APHSP: Phase noise at different frequencies. Power level +10 dBm, with option LN(+)



APLC: Harmonics at +10 dBm



APLC: 10 GHz pulse modulation 30 ns

Vector Signal Generators

APVSGXX & APVSGXX-X

SINGLE- & MULTI-CHANNEL ULTRA-AGILE VECTOR SIGNAL GENERATORS UP TO 40 GHZ

The APVSGXX(-X) is an ultra fast-switching vector-modulated signal source covering a continuous frequency range with models from 100 kHz to 4, 6, 12, 20 or 40 GHz.

The standard APVSG enables outstanding ultra-fast CW frequency sweeping, chirping, intra-pulse modulation, pulse shaping, all with very low phase noise. A high performance internal IQ modulator enables customized modulation waveforms and supports dedicated modulation schemes including avionics modulation.

Streaming of pulse description words (PDWs) in combination of ultra-fast frequency hopping across the entire frequency range allows for the creation of complex radar signal scenarios.

The compact unit is fully controllable from its dedicated GUI or the touch panel display.

APVSGXX-X with 2, 3 or 4 channels is mounted in a 19" 2HU enclosure. Each output can be programmed independently in frequency, power, phase and modulation. The outputs are phase-coherent with excellent phase stability.



APVSGXX



APVSGXX-X

SPECIFICATIONS

| | |
|----------------------------------|---|
| Models | APVSGXX & APVSGXX-X |
| # of channels | 1, 2, 3, 4 |
| Frequency Range Resolution | 100 kHz to 4, 6, 12, 20, 40 GHz 0.001 Hz |
| Power Range | -20 to +18 dBm / -120 to +15 dBm (with option PE2) |
| Switching Speed | 500 μ s (3 μ s with option UFS) |
| Phase Noise At 1 GHz | at 10 Hz: -87 dBc/Hz (-100 with option LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -145 dBc/Hz at 100 kHz: -150 dBc/Hz |
| IQ Modulation Bandwidth | 400 MHz |
| Modulation | Digital I/Q, AM, PM, FM, PULSE, AVIO, AWGN |
| Remote Control | Ethernet, USB, GPIB, FCP |
| Sweeps | Complex lists, Frequency, Power |
| Dimensions (W x L x H), Weight | Single-Channel: 182 x 301 x 124 mm [7.17 x 11.85 x 4.88 in], approx. 4 kg [8.8 lbs] Multi-Channel: 19" 2HU enclosure: 444 x 572 x 86 mm [17.5 x 22.5 x 3.4 in], 18 kg [39.7 lbs] |

KEY FEATURES

| |
|--|
| Very low WVM |
| Ultra-fast switching and frequency hopping |
| 500 MS IQ data rates, up to 512 MS deep internal playback memory |
| Various digital modulation standards supported |
| Pulse descriptor word streaming from memory or FCP (fast control port) |
| Supports third-party IQ file formats |

APPLICATIONS

| |
|--|
| Arbitrary IQ waveform playback |
| Radar signal simulation, EW |
| Phased array signal generation for beamforming |
| Avionic modulation emulation |
| High speed antenna testing |

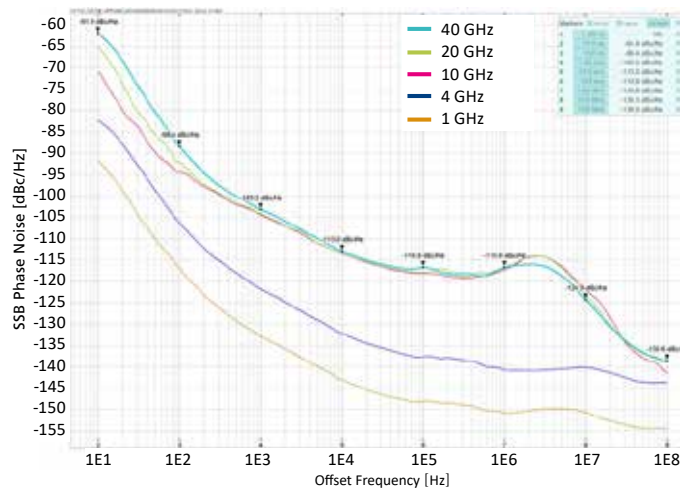


AVAILABLE OPTIONS

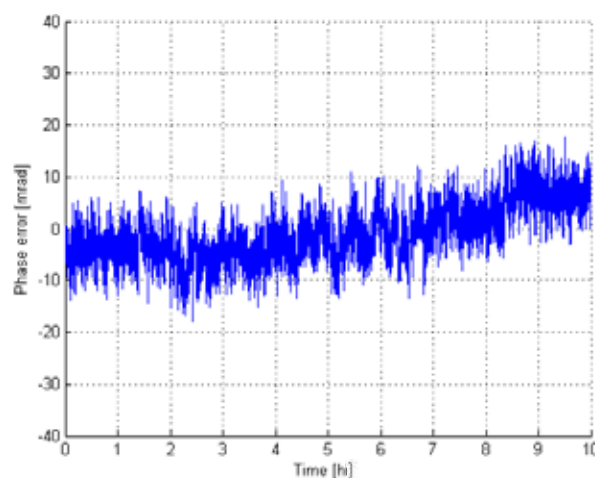
| | |
|-------------|--|
| UFS | Ultra-fast switching speed |
| PDW | Pulse descriptor word |
| FCP | Fast control port |
| AWGN | Additive white gaussian noise generation, bandwidth selective |
| PE4 | Electrical step attenuator |
| PE | Mechanical step attenuator (down to -90 dBm) |
| PE2 | Mechanical step attenuator (down to -120 dBm) |
| AIQ | External analog IQ Inputs |
| LN | Enhanced close-in phase noise & frequency stability |
| LN+ | Enhanced close in phase noise & further enhanced long term frequency stability |

| | |
|--------------|---|
| 100K | Frequency range extension to 100 kHz |
| MOD | Analog modulations (AM, PM, FM, Pulse) |
| IVM | Internal digital modulation schemes |
| AVIO | Avionic modulations |
| VREF | Variable reference input |
| SD | MicroSD card slot for non-volatile storage of IQ data |
| SYNC | Multiple device synchronization |
| GPIB | GPIB interface |
| EB | External power bank adapter cable |
| BAG | Portable bag |
| ReCal | Recalibration with certificate (recommended: 2-year interval) |
| WE | One year warranty extension (standard: 2 years) |

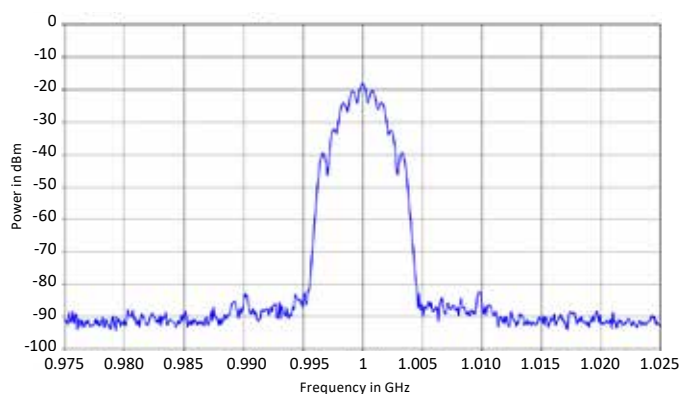
PERFORMANCE PLOTS



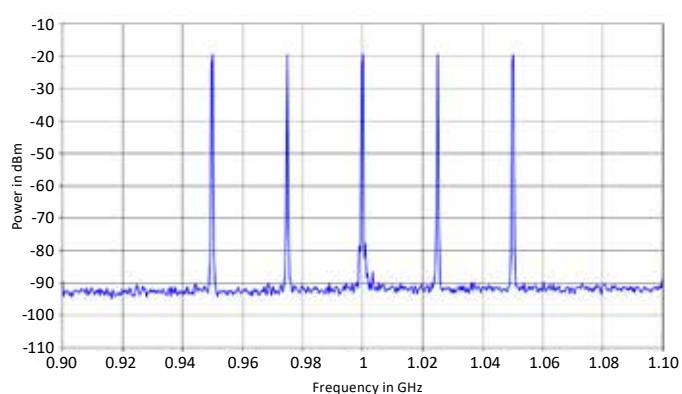
APVSG: phase noise (without option LN)



APVSG40-4: 38 GHz phase stability between Ch1 and Ch2 within 10h of operation



APVSG: DME Spectrum (X channel, raised cosine filter)



APVSG: Multi-Tone 100 MHz bandwidth

Frequency Synthesizers

APMSYN22 & APMSYN40 & APSYN420 & APSYN140 & APUASYN20

SINGLE-CHANNEL FREQUENCY SYNTHESIZER MODELS UP TO 43.5 GHZ

AnaPico offers a variety of single-output wideband synthesizers. Starting from as low as 8 kHz they cover beyond 43.5 GHz. Depending on the requirements the devices can offer exceptional phase noise, high output power, adjustable output amplitudes, harmonic filtering and extremely fast switching.

The instruments are available in compact flange mount enclosures, in modules, in compact desktop enclosures with color touch display or in standard 1URM chassis. The instruments are controlled via SCPI command language using USB, Ethernet or GPIB. Drivers and API are supplied.



APMSYN22



APMSYN40



APSYN140 / 420
APUASYN20



Option TOUCH

SPECIFICATIONS

| Models | APMSYN22 | APMSYN40 | APSYN420 | APSYN140 | APUASYN20 |
|---------------------------------------|--|--|--|---|---|
| Frequency Range | 100 kHz to 22 GHz | 1 MHz to 40 GHz | 10 MHz to 20 GHz | 100 kHz to 43.5 GHz | 100 kHz to 20 GHz |
| Resolution | 0.01 Hz | 0.001 Hz | 0.001 Hz | 0.001 Hz | 0.01 Hz |
| Accuracy | 0.1 ppm | 0.5 ppm | 0.1 ppm | 0.03 ppm | 0.1 ppm |
| Power Range | -20 to +25 dBm | -10 to +23 dBm | +23 dBm | -10 to +25 dBm | 0 to +18 dBm |
| Switching Speed | 500 μ s (<10 μ s with option FS) | 500 μ s (50 μ s with option FS) | 180 μ s (25 μ s with option FS) | 500 μ s (20 μ s with option FS) | 500 μ s (10 μ s with option FS) |
| Phase Noise at 1 GHz | at 10 Hz: -87 dBc/Hz at 1 kHz: -122 dBc/Hz at 100 kHz: -132 dBc/Hz at 10 MHz: -155 dBc/Hz | at 10 Hz: -80 dBc/Hz at 1 kHz: -125 dBc/Hz at 100 kHz: -140 dBc/Hz at 10 MHz: -150 dBc/Hz | at 10 Hz: -82 dBc/Hz at 1 kHz: -118 dBc/Hz at 100 kHz: -128 dBc/Hz at 10 MHz: -150 dBc/Hz | at 10 Hz: -100 dBc/Hz at 1 kHz: -127 dBc/Hz at 100 kHz: -144 dBc/Hz at 10 MHz: -155 dBc/Hz | at 10 Hz: -85 dBc/Hz at 1 kHz: -115 dBc/Hz at 20 kHz: -125 dBc/Hz at 10 MHz: -155 dBc/Hz |
| Remote Control | Ethernet, USB | | | Ethernet, USB, GPIB | |
| Modulation | PULSE | | FM, PM, PULSE, Chirp | FM, PM, PULSE | PULSE |
| Sweeps | List, Frequency | | | | |
| Dimensions (W x L x H), Weight | 130 x 95 x 25 mm [5.12 x 3.74 x 0.98] <0.6 kg [< 1.3 lbs] | 60 x 150 x 26 mm [2.36 x 5.9 x 1.02 in] 0.6 kg [1.3 lbs] | 105 x 210 x 60 mm [4.13 x 8.27 x 2.36 in] < 1.0 kg [< 2.2 lbs] | 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] | 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] |

APPLICATIONS

| | AP-SYN140 | AP-SYN420 | APUA-SYN20 | APM-SYN22 | APM-SYN40 |
|-------------------------|-----------|-----------|------------|-----------|-----------|
| Automated Testing | ✓ | ✓ | ✓ | ✓ | ✓ |
| Test equipment LO | ✓✓ | ✓✓ | ✓ | ✓ | ✓✓ |
| Wireless infrastructure | ✓ | ✓ | ✓ | ✓ | ✓ |
| Military and Aerospace | ✓ | ✓ | ✓ | ✓ | ✓ |



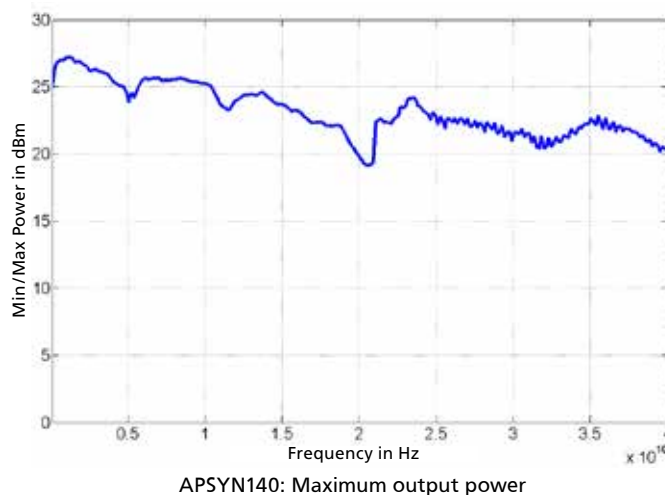
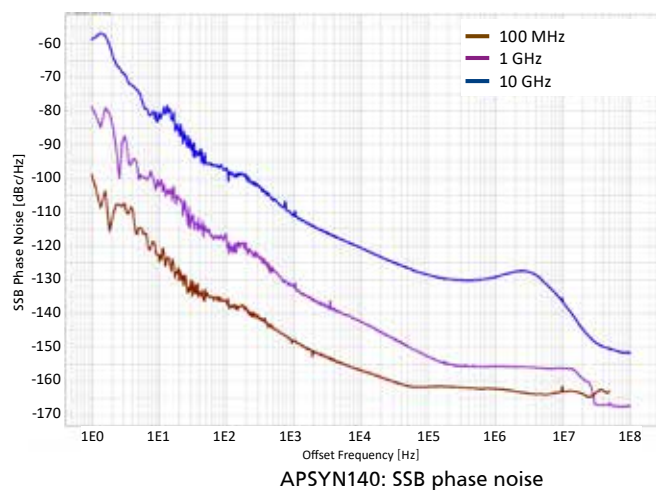
KEY FEATURES

| | AP-SYN140 | AP-SYN420 | APUA-SYN20 | APM-SYN22 | APM-SYN40 |
|---|-----------|-----------|------------|-----------|-----------|
| Low phase noise | ✓✓ | ✓ | ✓ | ✓ | ✓✓✓ |
| Highly phase-synchronous and -coherent switching option | – | – | – | – | – |
| Fast switching down to 20 μ s | ✓ | ✓ | ✓✓ | ✓✓✓ | ✓ |
| Pulse | ✓ | ✓ | ✓ | ✓ | ✓ |
| Chirps | ✓ | ✓ | – | – | – |
| FM, PM | ✓ | ✓ | – | – | ✓ |
| Internal OCXO, external variable reference | ✓ | ✓ | ✓ | ✓ | ✓ |
| Single DC supply | ✓ | ✓ | ✓ | ✓ | ✓ |

AVAILABLE OPTIONS

| | | AP-SYN140 | AP-SYN420 | APUA-SYN20 | APM-SYN22 | APM-SYN40 |
|--------------|---|-----------|-----------|------------|-----------|-----------|
| 8K | Frequency range extension to 8 kHz | – | – | ✓ | – | – |
| EB | External power bank adapter cable | ✓ | – | ✓ | – | – |
| FILT | Harmonic filtering (available with TOUCH) | ✓ | – | – | – | – |
| FS | Fast switching speed | ✓ | ✓ | ✓ | ✓ | ✓ |
| FCP | Fast control port | – | – | – | – | – |
| FM | Frequency/Phase Modulation | – | – | – | – | – |
| PHS | Phase coherent switching | – | – | – | – | – |
| FLASH | MicroSD card slot for removable SD memory | – | – | – | – | – |
| GPIB | GPIB interface | – | – | – | – | – |
| HI | High isolation 19" 1HU casing | – | – | – | – | – |
| IEC | IEC 17025 calibration with certificate | – | – | – | – | – |
| LN | Enhanced phase noise & frequency stability | ✓ | – | – | – | – |
| TOUCH | Enclosure with touch display control | ✓ | – | ✓ | – | – |
| VREF | Variable external reference | ✓ | ✓ | – | – | – |
| DATA | Commercial Calibration Certificate with test data | – | – | – | ✓ | ✓ |

PERFORMANCE PLOTS



Frequency Synthesizers

APSYN140-X & APUASYN20-X

MULTI-CHANNEL FREQUENCY SYNTHESIZER MODELS UP TO 43.5 GHZ

AnaPico offers a variety of multi-channel wideband synthesizers. Starting from as low as 8 kHz they cover beyond 43.5 GHz. Depending on the requirements the APSYN and APUASYN series can offer exceptional phase noise, high output power, adjustable output amplitudes, harmonic filtering and extremely fast switching.

The devices are available in compact flange mount enclosures or in standard 1URM chassis. The instruments are controlled via SCPI command language using USB, Ethernet or GPIB. Drivers and API are supplied.



APSYN140-X



APUASYN20-X

SPECIFICATIONS

| Models | APSYN140-X | APUASYN20-X |
|--------------------------------|--|--|
| # of channels | | 1, 2, 3, 4 |
| Frequency Range | 100 kHz to 43.5 GHz | 100 kHz to 20 GHz |
| Resolution | 0.001 Hz | 0.01 Hz |
| Accuracy | 0.03 ppm | 0.1 ppm |
| Power Range | -10 to +25 dBm | 0 to +18 dBm |
| Switching Speed | 500 μ s (20 μ s with option FS) | 500 μ s (10 μ s with option FS) |
| Phase Noise at 1 GHz | at 10 Hz: -100 dBc/Hz at 1 kHz: -127 dBc/Hz at 100 kHz: -144 dBc/Hz at 10 MHz: -155 dBc/Hz | at 10 Hz: -85 dBc/Hz at 1 kHz: -115 dBc/Hz at 20 kHz: -125 dBc/Hz at 10 MHz: -155 dBc/Hz |
| Remote Control | Ethernet, USB, GPIB | |
| Modulation | FM, PM, PULSE | PULSE |
| Sweeps | List, Frequency | |
| Dimensions (W x L x H), Weight | Single: 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] Multi: 430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in], < 10 kg [< 22 lbs] | Single: 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] Multi: 430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in], < 10 kg [< 22 lbs] |

KEY FEATURES

| | APSYN140-X | APUASYN20-X |
|---|------------|-------------|
| Low phase noise | ✓✓ | ✓ |
| Highly phase-synchronous and -coherent switching option | ✓✓ | ✓ |
| Fast switching down to 20 μ s | ✓ | ✓✓✓ |
| Pulse | ✓ | ✓ |
| Chirps | ✓ | – |
| FM, PM | ✓ | ✓ |
| Internal OCXO, external variable reference | ✓ | ✓ |
| Single DC supply | AC | AC |



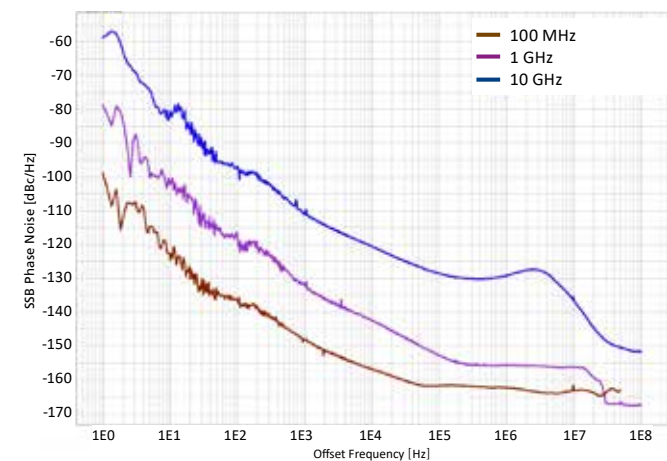
APPLICATIONS

| | APSYN140-X | APUASYN20-X |
|-------------------------|------------|-------------|
| Automated Testing | ✓ | ✓ |
| Test equipment LO | ✓ | ✓✓ |
| Wireless infrastructure | ✓ | – |
| Military and Aerospace | ✓ | ✓ |

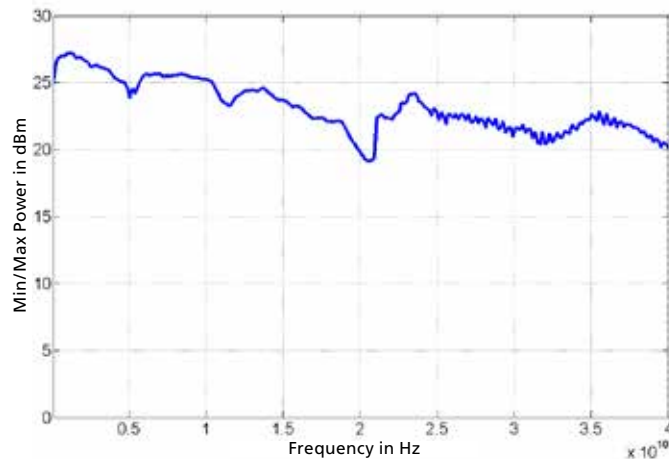
AVAILABLE OPTIONS

| | | APSYN140-X | APUASYN20-X |
|--------------|---|------------|-------------|
| 8K | Frequency range extension to 8 kHz | ✓ | ✓ |
| FILT | Harmonic filtering (available with TOUCH) | ✓ | – |
| FS | Fast switching speed | ✓ | ✓ |
| FCP | Fast control port | – | ✓ |
| FM | Frequency/Phase Modulation | ✓ | – |
| PHS | Phase coherent switching | ✓ | – |
| FLASH | MicroSD card slot for removable SD memory | ✓ | ✓ |
| GPIB | GPIB interface | ✓ | ✓ |
| HI | High isolation 19" 1HU casing | ✓ | ✓ |
| IEC | IEC 17025 calibration with certificate | ✓ | ✓ |
| LN | Enhanced phase noise & frequency stability | ✓ | – |
| VREF | Variable external reference | ✓ | – |
| DATA | Commercial Calibration Certificate with test data | ✓ | ✓ |

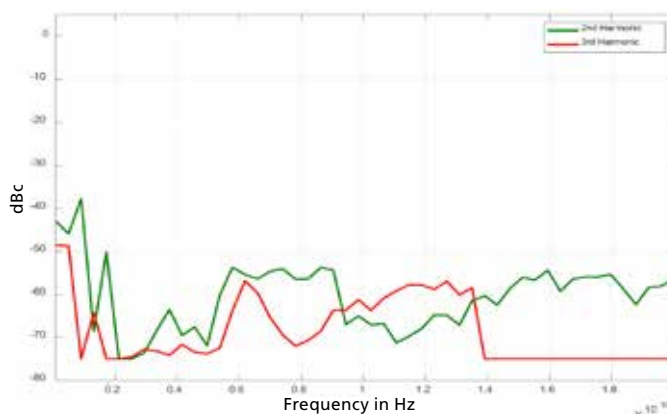
PERFORMANCE PLOTS



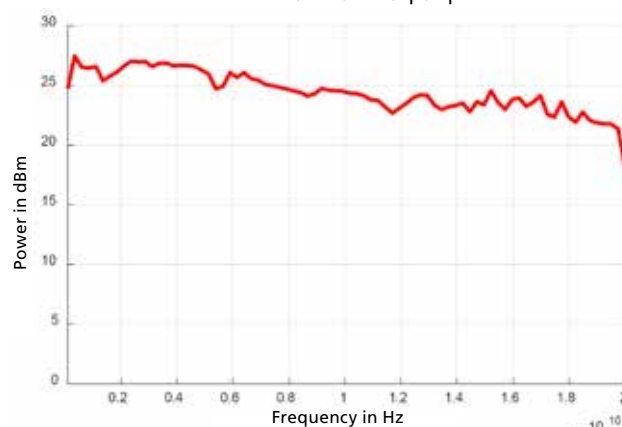
APSYN140: SSB phase noise



APSYN140: Maximum output power



APSYN140-X: Harmonics @ 0 dBm (with option FILT)



APUASYN20-X: Maximum output power

Phase Noise Analyzers

APPH & APNA

SIGNAL SOURCE ANALYZERS FROM 1 MHZ UP TO 65 GHZ

The APPH is a fully contained phase noise analyzer with models up to 7, 26, 40, 50 and 65 GHz. It offers an indispensable set of measurement functions for evaluating signal sources ranging from VHF to microwave frequencies, both active and passive non-self-oscillating devices like amplifiers, or frequency dividers. A mixed-signal system architecture with a FPGA cross-spectrum engine enables very fast signal processing and ultra-low phase noise sensitivity.

Built-in programmable power supplies and low-noise tuning voltages make the unit extremely flexible and easy to use.

The full set of functions includes:

- absolute and residual phase noise measurement of CW and pulse modulated signals
- amplitude noise measurement of CW and pulse modulated signals
- time stability measurements including Allan deviation
- cross-spectrum FFT analysis with 100 MHz bandwidth
- transient measurements
- oscillator test bench
- spectrum monitoring



APPH40G



Option LO offers access to internal LO's and individual RF channels

SPECIFICATIONS

| Models | APPH6040 APPH20G APPH40G | APNA20 APNA50 APNA60 |
|--------------------------------|---|--|
| Frequency Range | 1 MHz to 7, 26 or 40 GHz | 1 MHz to 20, 50 or 65 GHz |
| Input Power Range | -15 to +20 dBm | |
| Phase Noise Sensitivity | -190 dBc/Hz | |
| Analysis Range | 0.01 Hz to 100 MHz | |
| Measurements | Phase noise (absolute & additive, CW, pulsed or burst-mode), amplitude noise (CW & pulsed), jitter, allan deviation, transients of frequency / power / phase, spectrum monitoring, VCO test bench | Phase noise (absolute & additive, CW, pulsed), amplitude noise (CW & pulsed), jitter, transients of frequency / power / phase, allan deviation |
| Dimensions (W x L x H), Weight | 468.0 x 341.0 x 152.5 [18.4 x 13.5 x 6.0 in] without handle, 11 kg [24.3 lbs] | |

KEY FEATURES

| |
|---|
| All-in-one compact measurement system |
| Measurements down to -190 dBc/Hz |
| Offset range from 0.01 Hz to 100 MHz |
| Highest flexibility & dynamic range by selectable internal or external references |
| Programmable low noise power supplies |
| Powerful GUI and programming interface |

APPLICATIONS

| |
|---|
| Ultra-low phase noise crystal oscillator analysis |
| Versatile phase noise and amplitude noise analysis |
| Analysis of pulsed signals |
| High-speed production testing of phase noise |
| Additive phase noise characterization of amplifiers, transmitters, mixers |
| Time stability analysis of clocks |
| VCO testing |

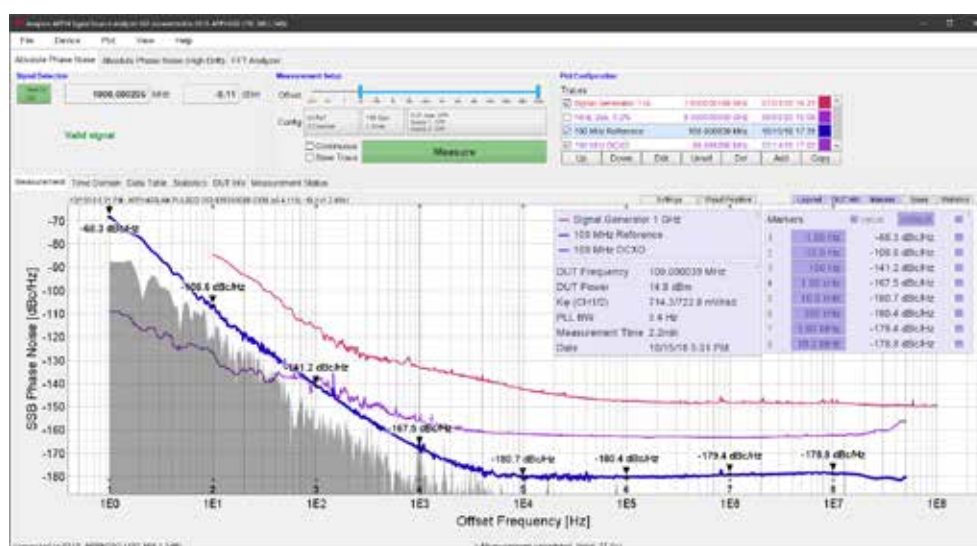


AVAILABLE OPTIONS

| | |
|--------------|---|
| AM | Amplitude noise measurements |
| APN | Additive phase noise measurement |
| APNS | Accessory: Traceable AM / PN noise standard |
| BURST | Burst mode phase noise measurement |
| GPIB | GPIB interface |
| LN | Ultra-low noise internal sources |
| LO | Access to internal references for residual phase noise measurements |
| PS06 | Accessory: 1-6 GHz mechanical phase shifter |

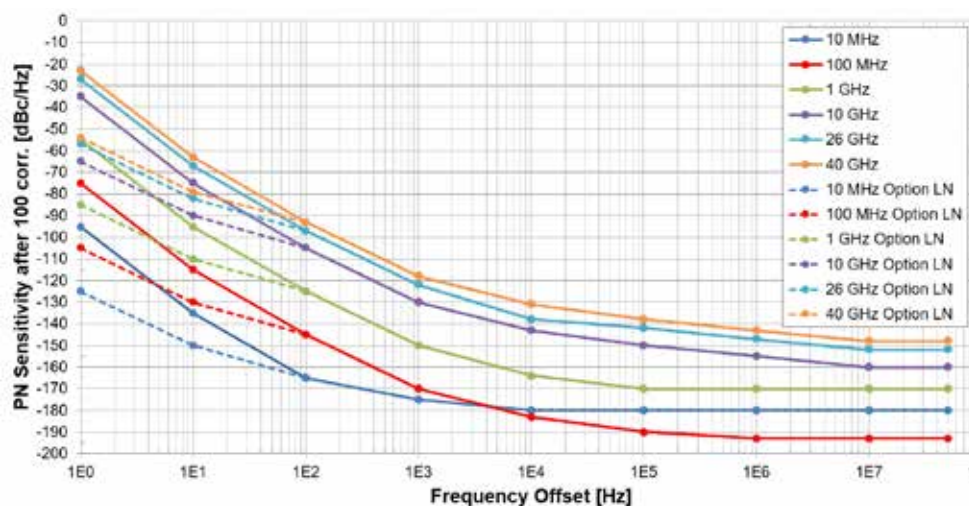
| | |
|--------------|---|
| PS18 | Accessory: 4-18 GHz mechanical phase shifter |
| PULSE | Pulsed signal measurement |
| ReCal | Recalibration with certificate (recommended: 2-year interval) |
| SPEC | Spectrum monitoring |
| TRAN | Transient analysis |
| TSTAB | Time stability analysis |
| VCO | VCO characterization |
| WE | One year warranty extension (standard: 2 years) |

GRAPHICAL USER INTERFACE



APPH GUI: flexible desktop application to perform measurements via USB and ethernet

PERFORMANCE PLOTS



APPH: Phase noise sensitivity after 100 correlation



 of Switzerland

Accurate
Reliable
Affordable

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Scan for our datasheets
and product info:

