PRODUCT CATALOG 2019

ANAPICO
INSTRUMENTS.
INNOVATION
MADE IN
SWITZERLAND!

Ana Pico

of Switzerland

Frequency Synthesizers

Signal Generators

Signal Source Analyzers

Introduction

ABOUT US

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 our 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 40 GHz
  - analog with lowest phase noise
  - ultra-agile with digital modulation
  - phase coherent multiple outputs
  - different models up to 2, 4, 6, 12, 20, 26, 33 or 40 GHz
- Standard and customized Frequency Synthesizer Modules
  - wideband from 300 kHz to 43 GHz
  - ultra-compact with USB/LAN interface
  - fastest <5 µs switching option: frequency control with parallel inputs, BCD/Binary format
- Signal Source Analyzers & Phase Noise Analyzers up to 40 GHz
  - highly flexible analysis of absolute and residual phase and amplitude noise
  - different models up to 7, 26 and 40 GHz
  - transient analysis, short- and long-term stability analysis, one-step VCO characterization and more.

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 low weight
- Low power consumption and optionally battery operation
- Flexible customization in hard- and software

AnaPico makes the difference. 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

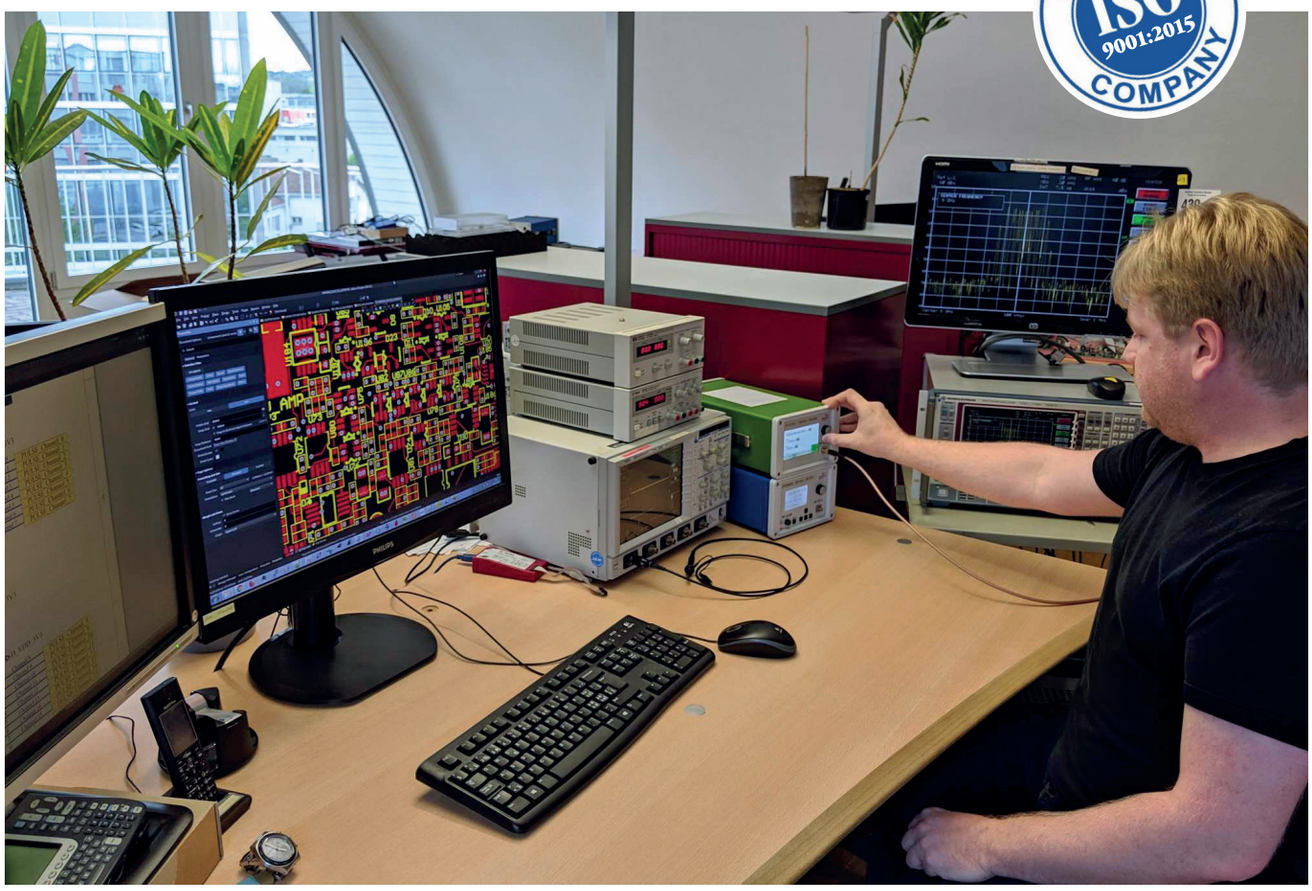
In partnership with our contracted distributors, AnaPico operates a growing service network worldwide, offering the following services:

Calibration:
All our T&M Instruments are fully calibrated and delivered together with our calibration certificates. We recommend our customers to return the instruments to our local authorized service facilities or our headquarter 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 another 5 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 local contracted distributors always have trained and knowledgeable engineers and service personnel helping our customers with requirement clarifications, instrument trial uses, application support, and delivery and service-related logistics.



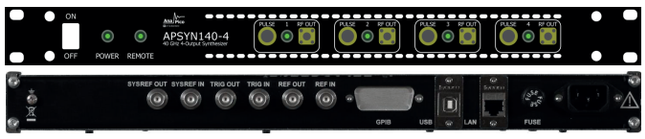
Frequency Synthesizers

LOW NOISE SYNTHESIZER MODELS UP TO 43.5 GHZ

GENERAL DESCRIPTION

The APSYN series consists of low phase-noise synthesizers operating up to 40 GHz. The modules have a mili-Hz frequency resolution and use a high-stability internal reference. The internal reference can be phase-locked to a programmable external reference. The modules have USB and LAN interfaces and can be controlled using SCPI 1999 command set. Operated with an external DC supply, they consume less than typically 10 W power.

AnaPico also offers multiple phase-coherent synchronous output configurations with up to 4 outputs.



MODELS

APSYN140, APSYN420, APSYN140-X

COMPARISON / SPECIFICATIONS

	APSYN140	APSYN420	APSYN140-X
# of channels	1	1	1, 2, 3, 4
Frequency **Range** **Resolution** **Accuracy**	 100 kHz to 40 GHz 0.001 Hz 0.1 ppm	 0.01 to 20 GHz 0.001 Hz 0.1 ppm	 100 kHz to 40 GHz 0.001 Hz 0.1 ppm
Output Power	-10 to +25 dBm	+23 dBm	-10 to +25 dBm
Switching Speed	500 µs (20 µs with option FS, <5 µs with option BCD)	180 µs (25 µs with option FS)	500 µs (20 µs with option FS)
Phase Noise At 1 GHz	at 10 Hz: -100 dBc/Hz at 1 kHz: -134 dBc/Hz at 100 kHz: -150 dBc/Hz at 10 MHz: -155 dBc/Hz	at 10 Hz: -62 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: -134 dBc/Hz at 100 kHz: -150 dBc/Hz at 10 MHz: -155 dBc/Hz
Remote Control	Ethernet, USB (SCPI v1999)	Ethernet, USB (SCPI v1999)	Ethernet, USB (SCPI v1999)
Modulation	Phase, Frequency & Pulse Modulation	FM/PM, Pulse, Chirp	Pulse
Sweeps	List, Frequency	List, Frequency	List, Frequency
Dimensions (W x L x H), Weight	270 x 105 x 60 mm [10.63 x 4.13 x 2.36 in] < 1.0 kg	210 x 105 x 60 mm [8.27 x 4.13 x 2.36 in] < 1.0 kg	430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in] < 10 kg

KEY FEATURES

	APSYN140	APSYN420	APSYN140-X
Low phase noise	✓	✓	–
Hyghly phase synchronous and phase coherent switching option	–	–	✓
Fast switching down to 20 µs	✓	✓	✓
Pulse	✓	✓	✓
Chirps	–	✓	–
FM, PM	✓	✓	✓
Internal OCXO, external variable reference	✓	✓	✓
Single DC supply	✓	✓	✓

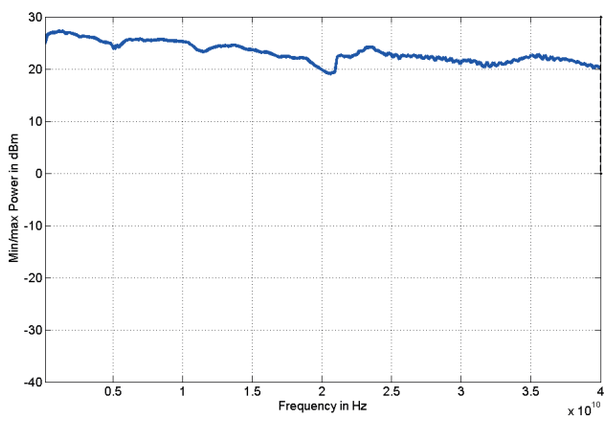
APPLICATIONS

	APSYN140	APSYN420	APSYN140-X
Automated Testing	✓	✓	✓
Test equipment LO	✓	✓	✓
Wireless infrastructure	✓	✓	✓
Military and Aerospace	✓	✓	✓

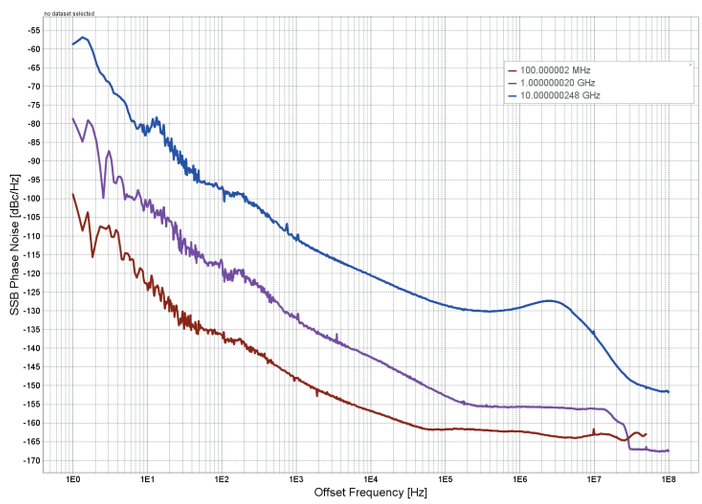
AVAILABLE OPTIONS

		APSYN140	APSYN420	APSYN140-X
LN	Enhanced close in phase noise & frequency stability	✓	–	✓
FS	Enhanced switching speed	✓	✓	✓
VREF	Variable external reference	✓	✓	✓
GPIB	GPIB interface	–	–	✓
WE	One year warranty extension (standard: 2 years)	✓	✓	✓
ReCal	Recalibration with test data (recommended: 2-year interval)	✓	✓	✓

PERFORMANCE PLOTS



APSYN140: Maximum output power



SSB phase noise

Signal Generators

ANALOG MODELS UP TO 26.5 GHZ

GENERAL DESCRIPTION

9 kHz to 2000 MHz, 4000 MHz or 6100 MHz Signal Generators

The APSIN HC models comprises a set of very compact, portable analog signal generator models up to 6100 MHz. A combination of good signal purity, fast switching speed and wide dynamic range makes these units useful for a variety of applications.
Optionally, the instruments can be operated from an internal battery module.

APSIN GHz models up to 12, 20 or 26.5 GHz
9 kHz (with option 9K) to 12, 20 or 26.5 GHz Signal Generators

The APSIN series comprises a set of very compact, portable analog signal generator models up to 26 GHz. A combination of good signal purity, fast switching speed and wide dynamic range makes these units useful for a variety of applications.
Optionally, the instruments can be operated from an internal battery module.

MODELS

RF: APSIN2010HC, APSIN4010HC, APSIN6010HC
MW: APSIN12G, APSIN20G, APSIN26G

COMPARISON / SPECIFICATIONS

	RF	Microwave
	APSIN2010HC **APSIN4010HC** **APSIN6010HC**	**APSIN12G** **APSIN20G** **APSIN26G**
Frequency **Range** **Resolution**	 9 kHz to 2, 4 or 6.1 GHz 0.001 Hz	 100 kHz to 12, 20 or 26.5 GHz 0.001 Hz
Power **Range** **Resolution**	 -30 to +17 dBm -120 to +17 dBm (with option PE3) 0.01 dB	 -20 to +15 dBm -90 to +25 dBm (with option PE3 / HP) 0.01 dB
Switching Speed	400 µs	400 µs (<30 µs 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
Remote Control	Ethernet, USB, GPIB (SCPI v1999)	
Modulation	AM, FM, PM, Pulse, Chirp	
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	173.6 x 261.7 x 116.9 mm [6.83 x 10.30 x 4.60 in], 2.5 kg

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
- Portable battery operation

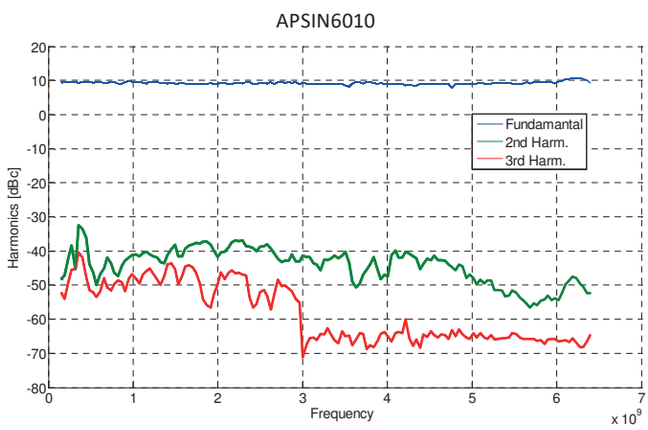
APPLICATIONS

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

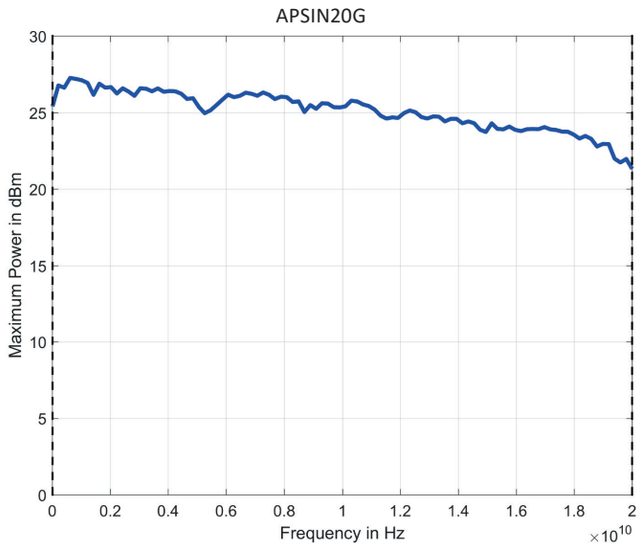
AVAILABLE OPTIONS

		APSIN2010HC APSIN4010HC APSIN6010HC	APSIN12G APSIN20G APSIN26G
9K	Frequency range extension to 9 kHz (APSIN12G / 20G)	–	✓
HP	Higher output power	–	✓
PE3	mechanical step attenuator	✓	✓
NM	Remove modulation (APSIN20G / 26G)	–	✓
FS	Ultra-fast switching speed	–	✓
B3	Internal rechargeable battery module	✓	✓
GPIB	GPIB interface	✓	✓
AVIO	Avionics modulation capability (VOR / ILS)	✓	–
1URM	19” 1HU rack-mount module	✓	✓
TP	Color touch display	–	✓
REAR	Move output to the rear panel	✓	✓
OEM	OEM package	✓	✓
WE	One year warranty extension (standard: 2 years)	✓	✓
ReCal	Recalibration with test data (recommended: 2-year interval)	✓	✓

PERFORMANCE PLOTS



Harmonic performance at + 10 dBm



Typical maximum output power (option HP)

Signal Generators

HIGH-PERFORMANCE MODELS UP TO 40 GHZ

GENERAL DESCRIPTION

Ultra low noise Microwave Signal Generators starting from 100 kHz up to 6, 12.75, 20, 26 or 40 GHz

The APULN models comprises a set of highest performance signal generator models with a range from 100 kHz up to 6, 12.75 or 20, 26 or 40 GHz. Unrivaled signal purity in combination of fastest switching and high output power make these models suitable for the most advanced measurement tasks.

MODELS

APULN06, APULN12, APULN20, APULN26, APULN40

SPECIFICATIONS

Frequency **Range** **Resolution**	 100 kHz to 6, 12.75, 20, 26, or 40 GHz 0.001 Hz
Power Range	-20 to +25 dBm / -80 to +25 dBm (with option PE4)
Switching Speed	500 µs (20 µs 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 (SCPI v1999)
Modulation	Pulse, AM, FM, PM
Sweeps	List, Frequency, Power
Dimensions (W x L x H), Weight	173.6 x 291.7 x 116.9 mm [6.83 x 11.48 x 4.60 in], 2.5 kg

KEY FEATURES

- Excellent signal purity: ultra-low phase noise and low spurious
- Combination of highest output power / fastest switching
- Powerful and easy to use touch-display control
- Portable, operation from external 24V DC power bank
- Versatile control via certified Labview drivers, API programming library, VISA support
- Best-in-class performance and low cost of ownership

APPLICATIONS

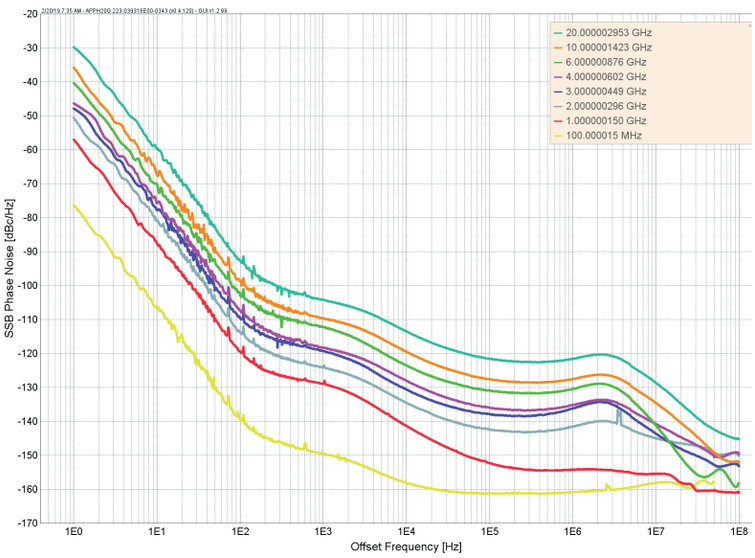
- Automated testing
- Video broadcasting, satellite communications
- Low jitter clock and LO source

AVAILABLE OPTIONS

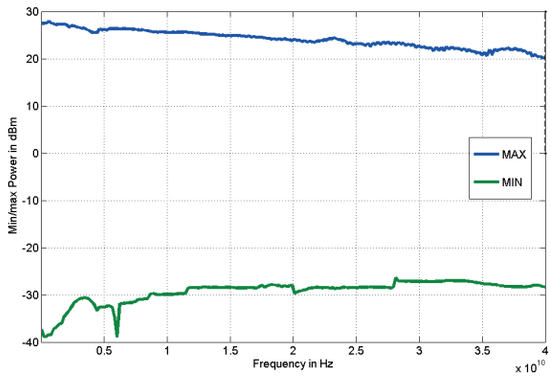
LN	Enhanced close in phase noise & frequency stability
FS	Ultra-fast switching speed
MOD	Analog modulation
VREF	Variable external reference
PE4-6/12	Electrical step attenuator (6 & 12 GHz version)
PE4-20/26	Electrical step attenuator (20 & 26 GHz version)
PE4-40	Electrical step attenuator (40 GHz version)
EB	External power bank adapter cable
GPIB	GPIB interface
LH	Desktop housing with color touch display

1URM	19” 1HU rack-mount module
REAR	Move output to rear panel
WE	One year warranty extension (standard: 2 years)
RECAL	Recalibration with test data (recommended: 2-year interval)
RM	19’’ 3HU rack-mount kit
DATA	Commercial Calibration Certificate with test data
IEC	IEC 17025 calibration with certificate
Retrofit	Applies when options are back-ordered

PERFORMANCE PLOTS



APULN: SSB phase noise performance, without option LN



APULN40: Minimum / maximum output power

Signal Generators

MULTI-CHANNEL MODELS UP TO 40 GHZ

GENERAL DESCRIPTION

300 kHz to 6, 12, 20, 33 or 40 GHz Phase Coherent 2, 3 or 4 Channel Signal Generators

The APMS-ULN models are phase-coherent, multi - channel, ultra-fast switching, and ultra-low phase noise signal generators with a frequency range from 300 kHz to 6, 12, 20, 33 or 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 µs with Option FS.

A high-stability OCXO reference provides excellent frequency accuracy and stability. The generator accepts a wide range of external references including the range from 1 to 250 MHz or higher frequency clocks to 3 GHz.

The APMS-ULN comes in a standard 19“ 1U (up to 4 channels) enclosure and offers USB and LAN control interfaces as well as the optional GPIB interface.

Each interface allows for easy and fast communication using SCPI 1999 command set. Remote control of the instrument can be quickly attained from any host system. A customer-supplied application programming interface (API) or programming examples for Matlab, Labview, C++ and other commercially available tools make test implementation very straightforward.

MODELS

APMS06G-ULN, APMS12G-ULN, APMS20G-ULN, APMS33G-ULN, APMS40G-ULN

SPECIFICATIONS

# of channels	2, 3, 4
Frequency **Range** **Resolution**	 300 kHz to 6, 12, 20, 33 or 40 GHz 0.001 Hz
Power Range	-20 to +25 dBm / -80 to +25 dBm (with option PE4)
Switching Speed	500 µs (25 µs with option FS)
Phase Noise At 1 GHz	at 10 Hz: -100 dBc/Hz at 1 kHz: -130 dBc/Hz at 20 kH: -145 dBc/Hz at 100 kHz: -150 dBc/Hz
Remote Control	Ethernet, USB, GPIB (SCPI v1999)
Modulation	Pulse, AM, FM, PM
Sweeps	List, Frequency, Power, Phase
Dimensions (W x L x H), Weight	19‘‘ 1HE enclosure: 426 x 460 x 43 mm [16.8 x 18.1 x 1.7 in], 10 kg

KEY FEATURES

Very Low phase noise
Fast switching
Phase coherent switching option
2, 3 or 4 phase coherent outputs

APPLICATIONS

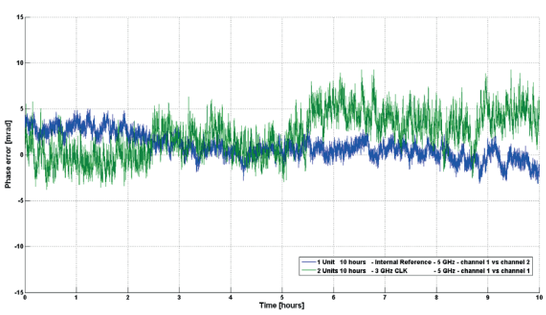
Radar simulation
Quantum computing
High volume automated testing
Phased array antenna / beamforming
Electronic warfare

AVAILABLE OPTIONS

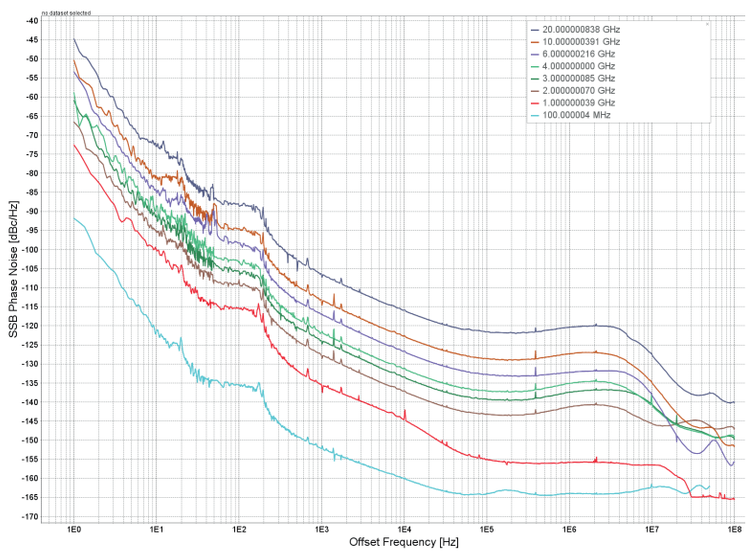
PHS	Phase coherent switching
FS	Ultra-fast switching speed
VREF	Flexible external reference frequency support in range 1 to 250MHz
MOD	Add Amplitude, Frequency, Phase modulation capability
PE4-12	Electrical step attenuator (6 & 12 GHz version)

PE4-20	Electrical step attenuator (20 GHz version)
PE4-40	Electrical step attenuator (33 GHz & 40 GHz version)
GPIB	GPIB interface
WE	One year warranty extension (standard: 2 years)
ReCal	Recalibration with test data (recommended: 2-year interval)

PERFORMANCE PLOTS



APMS phase stability at 5GHz
Between channels within a single unit (blue)
Between channels of separate units (green)



APMS-ULN: phase noise

Signal Generators

ULTRA-AGILE VECTOR MODELS UP TO 20 GHZ

GENERAL DESCRIPTION

Ultra-agile Vector Signal Generators up to 3, 5, 20 or 40 GHz

The APVSG is an ultra fast-switching vector-modulated signal source covering a continuous frequency range with models 0.01 to 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 I/Q modulator enables customized modulation waveforms and supports dedicated modulation schemes including avionics modulation.

The compact unit allows for full front panel control via touch panel display.

MODELS

APVSG03, APVSG05, APVSG20, APVSG40

SPECIFICATIONS

	APVSG	APVSG-X
# of channels	1	1, 2, 3, 4
Frequency **Range** **Resolution**	 0.01 to 3, 5, 20, 40 GHz 0.001 Hz	 0.01 to 3, 5, 20, 40 GHz 0.001 Hz
Output Power	-20 to +15dBm	-20 to +15dBm
Switching Speed	200 ns (list mode)	200 ns (list mode)
Phase Noise At 1 GHz	at 10 Hz: -90 dBc/Hz at 1 kHz: -132 dBc/Hz at 20 kHz: -144 dBc/Hz at 100 kHz: -148 dBc/Hz	at 10 Hz: -90 dBc/Hz at 1 kHz: -132 dBc/Hz at 20 kHz: -144 dBc/Hz at 100 kHz: -148 dBc/Hz
Remote Control	Ethernet, USB, GPIB (SCPI v1999)	Ethernet, USB, GPIB (SCPI v1999)
Modulation	I/Q, Pulse, analog modulation	I/Q, Pulse, analog modulation
Sweeps	Complex lists	Complex lists
Dimensions (W x L x H), Weight	173.6 x 291.7 x 116.9 mm [6.83 x 11.48 x 4.60 in], 2.5 kg	19'' 1HE enclosure: 426 x 460 x 43 mm [16.8 x 18.1 x 1.7 in], 10 kg

KEY FEATURES

- Excellent phase noise
- Ultra-fast switching
- Ultra high I/Q data rates, deep internal memory
- Wideband linear chirps

APPLICATIONS

- Arbitrary I/Q waveform
- Radar signal simulation
- Receiver testing
- Avionic modulation emulation
- High speed antenna testing

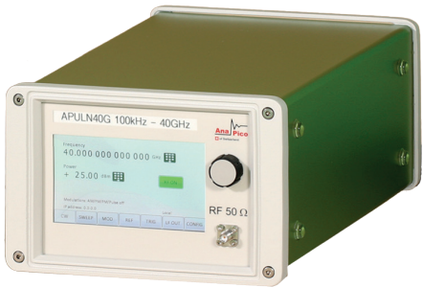
AVAILABLE OPTIONS

WE	One year warranty extension (standard: 2 years)
ReCal	Recalibration with test data (recommended: 2-year interval)

Extras

PACKAGING SOLUTIONS AVAILABLE FOR ALL SIGNAL GENERATORS

AnaPico offers its signal generators in different enclosures and packaging solutions depending on customer requirements and needs. Here are some examples of existing packaging solutions:

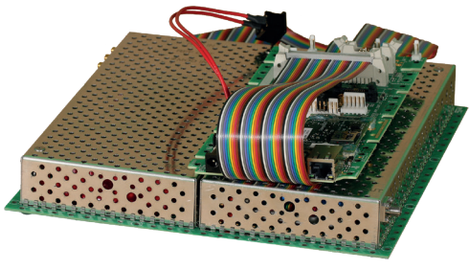


Portable enclosure with touch display: modern front panel control

Portable enclosure with LCD: most compact and rugged enclosure where size & weight matter

1HU 19“ RACK-MOUNT ENCLOSURE: standardized

Portable 3HU with touch display: combine portability with highest flexibility & performance



OEM MODULE: most compact, flexible assembly and operation

3HU 19“ RACK-MOUNT KIT: mounting 2 portable units

Signal Source Analyzers

SIGNAL SOURCE ANALYZERS MODELS UP TO 40 GHZ

GENERAL DESCRIPTION

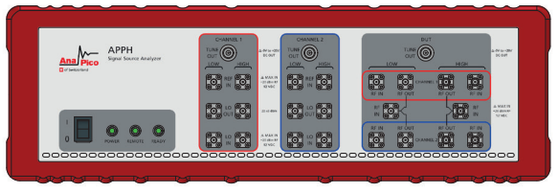
1 MHz to 40 GHz Signal Source Analyzer

The APPH is a fully contained signal source analyzer with models up to 7, 26 and 40 GHz. It offers an indispensable set of measurement functions for evaluating signal sources ranging from VHF to microwave frequencies but also 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:

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



Option LO

MODELS

APPH6040, APPH20G, APPH40G

SPECIFICATIONS

Frequency Range	APPH6040: 1 MHz to 7 GHz APPH20G: 1 MHz to 26 GHz APPH40G: 1 MHz to 40 GHz
Input Power Range	-15 to +20 dBm
Analysis Range	0.01 Hz to 100 MHz
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
Measurements Supported	phase noise (absolute & additive, CW, pulsed or burst-mode), amplitude noise (CW & pulsed), jitter, frequency counter, Allan deviation, transients of frequency / power / phase, spectrum monitoring, VCO test bench

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

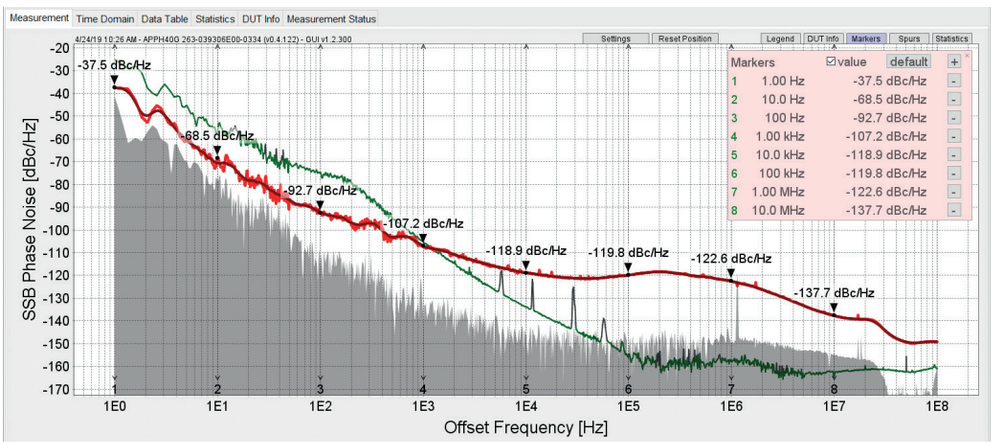
- Ultra-low phase noise crystal oscillator analysis
- Versatile phase noise and amplitude noise analysis
- Analysis of pulsed signals
- High-speed production testing of phase noise
- Additive phase noise characterization of amplifiers, transmitters, mixers
- Time stability analysis of clocks
- VCO testing

AVAILABLE OPTIONS

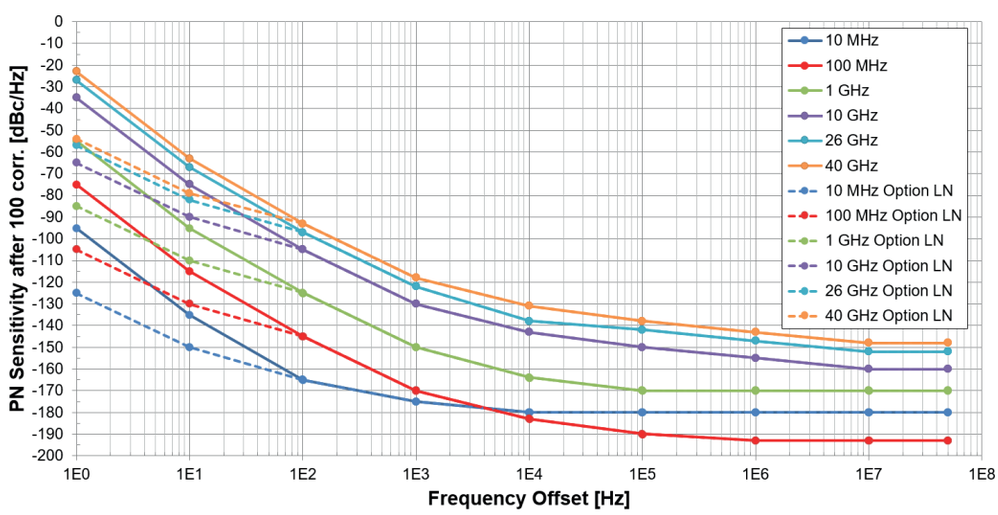
AM	Amplitude noise measurements
LN	Ultra-low noise internal sources
PULSE	Pulsed signal measurement
BURST	Burst mode phase noise measurement
APN	Additive phase noise measurement
TRAN	Transient analysis
TSTAB	Time stability analysis
VCO	VCO characterization
SPEC	Spectrum monitoring

GPIB	GPIB interface
LO	Access to internal reference for residual phase noise measurements
WE	One year warranty extension (standard: 2 years)
ReCal	Recalibration with test data (recommended: 2-year interval)
Retrofit	Applies when options are backordered
APNS	Accessory: Traceable AM / PN noise standard
PS06	Accessory: 1-6 GHz mechanical phase shifter
PS18	Accessory: 4-18 GHz mechanical phase shifter

GRAPHICAL USER INTERFACE



PERFORMANCE PLOTS



Phase noise sensitivity after 100 correlation

Scan for our data sheets and product info:

AnaPico Ltd.
Europastrasse 9
CH-8152 Glattbrugg ZH
Switzerland

Phone: +41 44 515 55 01
Fax: +41 44 440 00 50
Email: sales@anapico.com
Web: www.anapico.com