SigVSA

Vector Signal Analysis Software

Data Manual

EN01E

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SIGLENT TECHNOLOGIES CO.,LTD

SigVSA

Vector Signal Analysis Software

Product Overview

SigVSA is a professional vector signal analysis software application that runs on Windows operating systems. You can also contact us to customize a Linux environment version.

With SigVSA, users can repeatedly analyze signals under test and quickly troubleshoot issues, covering everything from simple BPSK to complex wideband signals such as 4G LTE, 5G NR, IEEE 802.11b/a/g/n/ac/ax/be, Bluetooth, HRP-UWB and various common modulation signals, such as 1024QAM, 4096QAM, 16/32APSK, etc.

SigVSA offers rich measurement capabilities, a user-friendly operation experience, and an interactive interface similar to that of a vector signal analyzer, ensuring both efficiency and ease of use.

It provides comprehensive local analysis functionality, supporting offline analysis of raw waveform files from vector signal analyzers.

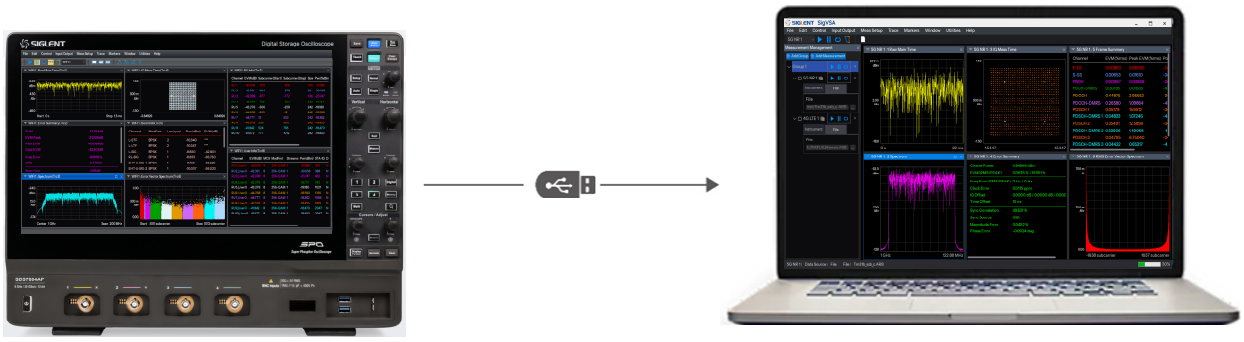
SigVSA enables remote vector signal analysis and debugging on a computer, allowing simultaneous control of multiple instruments for parallel operation. It also facilitates centralized processing of recorded data or simulation files, saving time by reducing the need for lab visits.

Features and Benefits

- Offline waveform data analysis on PC.
- Multiple IQ data formats .
- Supports a maximum analysis bandwidth of 8G for specified signals.
- Supports online control of multiple instruments for data acquisition and retrieves waveform data to the PC for analysis.
- Compatible with the same platform as Siglent's vector analyzer and vector analysis software, eliminating user concerns about future software maintenance. It also offers similar measurement and analysis capabilities, as well as a familiar UI interaction.
- Independent cloud control interface and analysis application interface.
- Supports analysis of multiple digital modulation signals.
- Supports custom OFDM signal analysis.
- Supports analysis for cellular standards such as GSM,WCDMA,LTE,NR and NB-Iot.
- Supports analysis of WLAN standard signals including IEEE 802.11b/a/g/n/ac/ax/be.
- Supports analysis of HRP-UWB signals.
- Supports analysis of FHSS/FMCW signals.
- Supports analysis of Buletooth 1.0/2.0/3.0/4.0/4.1/4.2/5.0/5.1/5.2/5.3/5.4) .
- Supports over ten measurement metrics, such as signal power, reference power, frequency offset error, clock error, delay offset, RMS EVM, peak EVM, single-channel EVM, and more.
- Supports over ten measurement functions, including time-domain graphs, frequency-domain graphs, vector error frequency-domain curves, vector error time-domain curves, constellation diagrams, and more.
- Supports simultaneous control of multiple instruments for parallel vector analysis.
- Multi-window display for more flexible observation.

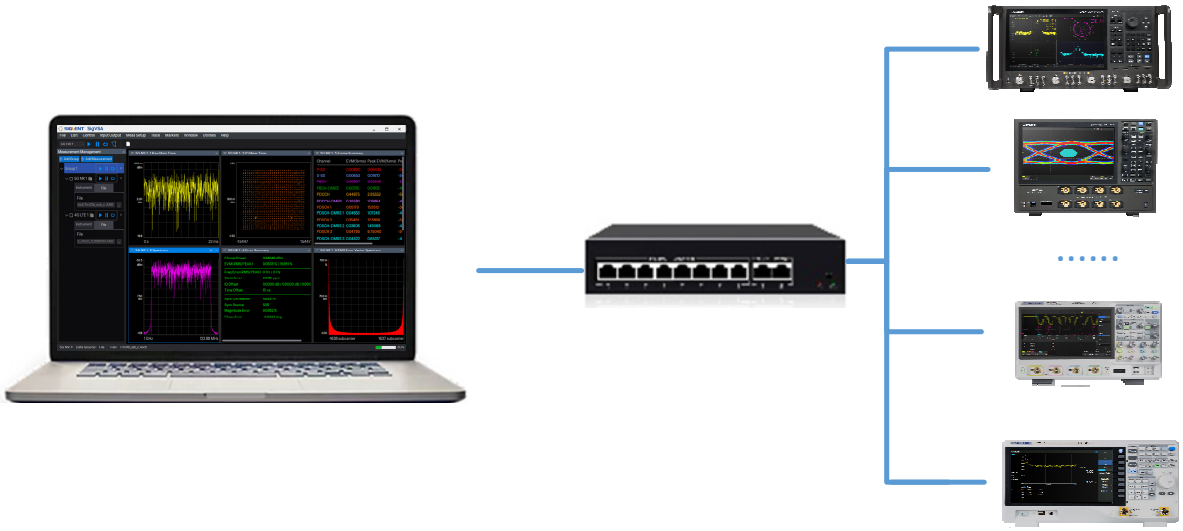
Design Features

On the same platform as Siglent's device-side vector analysis applications.Offline waveform data analysis



Export the specified waveform file from the measurement instrument, transfer it to the computer hard drive via USB or network server, and then use SigVSA's import function to load the waveform data for vector analysis.

Simultaneously control multiple instruments to collect waveform data to a central computer for consolidated analysis.



In this scenario, the SigVSA vector signal analysis software performs cloud control functions. It can automatically search for instruments within the network, select the required instruments, and perform remote control and data acquisition. After SigVSA collects the data, it reads the remote waveform data online and then performs local data analysis—eliminating dependence on the instrument's vector analysis options.

Multiple window display modes

Supports displaying multiple vector analysis application function windows simultaneously, with switchable window content.

Multiple measurements display

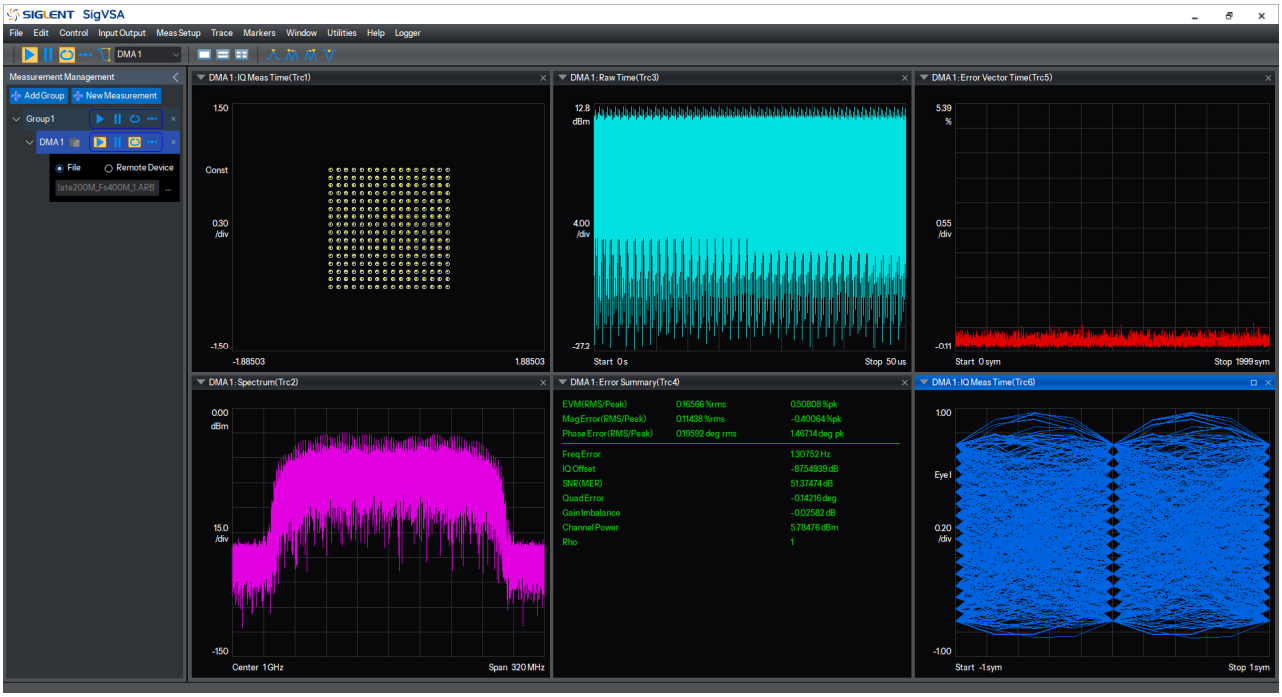
Activated measurement display

Remote management and configuration synchronization capabilities

Features a remote device inventory for easy configuration switching; supports synchronizing configurations from the vector analyzer to SigVSA, as well as from SigVSA to the vector analyzer, catering to diverse application scenarios.

Protocol Specifications

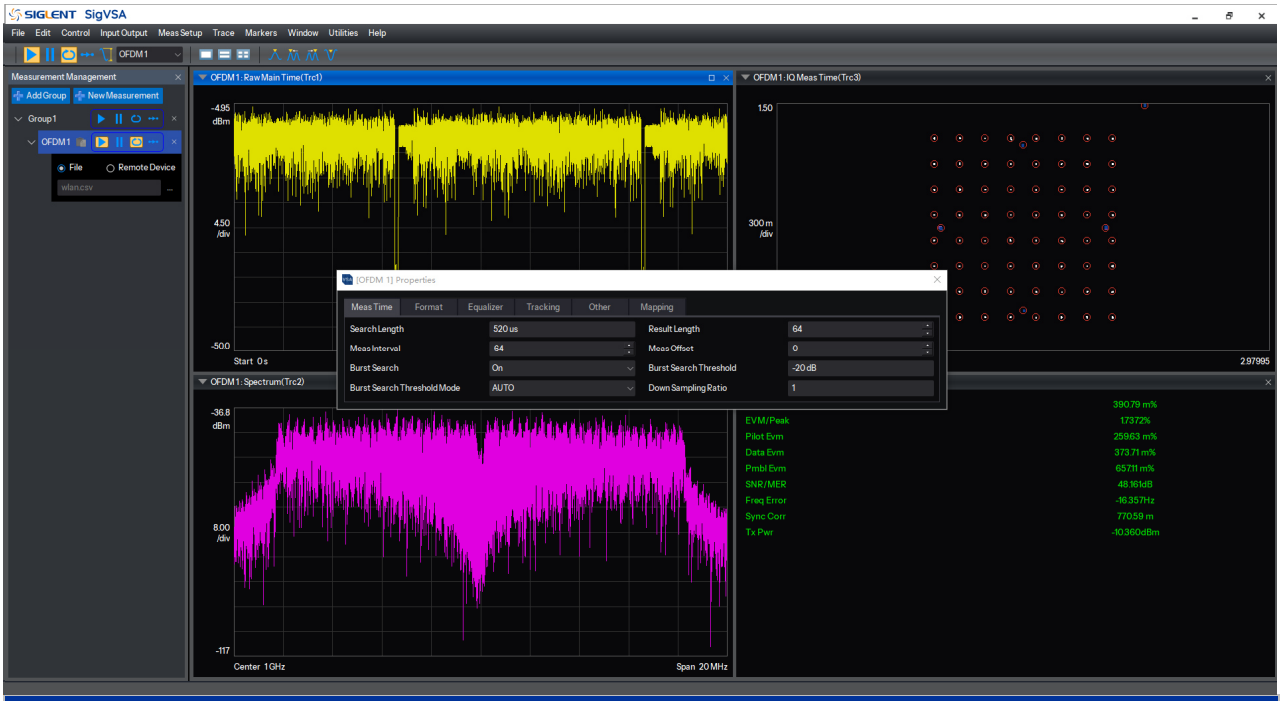
- Custom Vector Signal



Measurement Parameters	
Measurement Function	
Modulation Type	ASK: 2ASK; FSK: 2FSK，4FSK，8FSK，16FSK，32FSK; MSK: GMSK; PSK: BPSK，QPSK，OQPSK，8PSK; DPSK: DBPSK，DQPSK，D8PSK，π/4 -DQPSK，π/8 -D8PSK; QAM: 16，32，64，128，256，512，1024，4096; APSK: 16，32;
Measurement Symbol Length	10 ~ 9999999
Symbol Points / Oversampling Rate	1, 2, 4, 6, 8, 10, 12, 14, 16 OQPSK Minimum Value = 2, Others = 1
Symbol Rate	1kHz ~ 8GHz
Trigger Holdoff	200 ms
Synchronization & Search	Burst Power Trigger, Symbol Search, Bit Error Rate (BER) Test
Filter	
Filter Type	Raised Cosine / Nyquist Filter, Root Raised Cosine (RRC) / Root Nyquist Filter , Gaussian Filter, Half-Sine Filter, Rectangular Filter
Filter Length	2 ~ 128
Alpha/BT	Alpha：0.01 ~ 1，BT：0.01 ~ 10
View	
Data	IQ measurement time domain, IQ measurement frequency domain, IQ reference time domain, IQ reference frequency domain, Symbol Error Statistics Table, Error Vector

	Time Domain, Error Vector Frequency Domain, Time domain, frequency domain, IQ amplitude error, IQ phase error.
Format	Logarithmic amplitude, linear amplitude, real part, imaginary part, IQ chart, constellation chart, I eye chart, Q eye chart, Phase diagram, phase unfolding diagram, phase tree diagram.
Symbol Error Statistics Table	
PSK/DPSK/MSK/QAM	EVM (rms EVM, peak EVM), Magnitude error,Phase error, IQ offset, Carrier offset , SNR Quadrature error, Gain imbalance (not support for MSK).
ASK	ASK Error, ASK depth. carrier offset
FSK	FSK Error, Magnitude error, FSK deviation, carrier offset

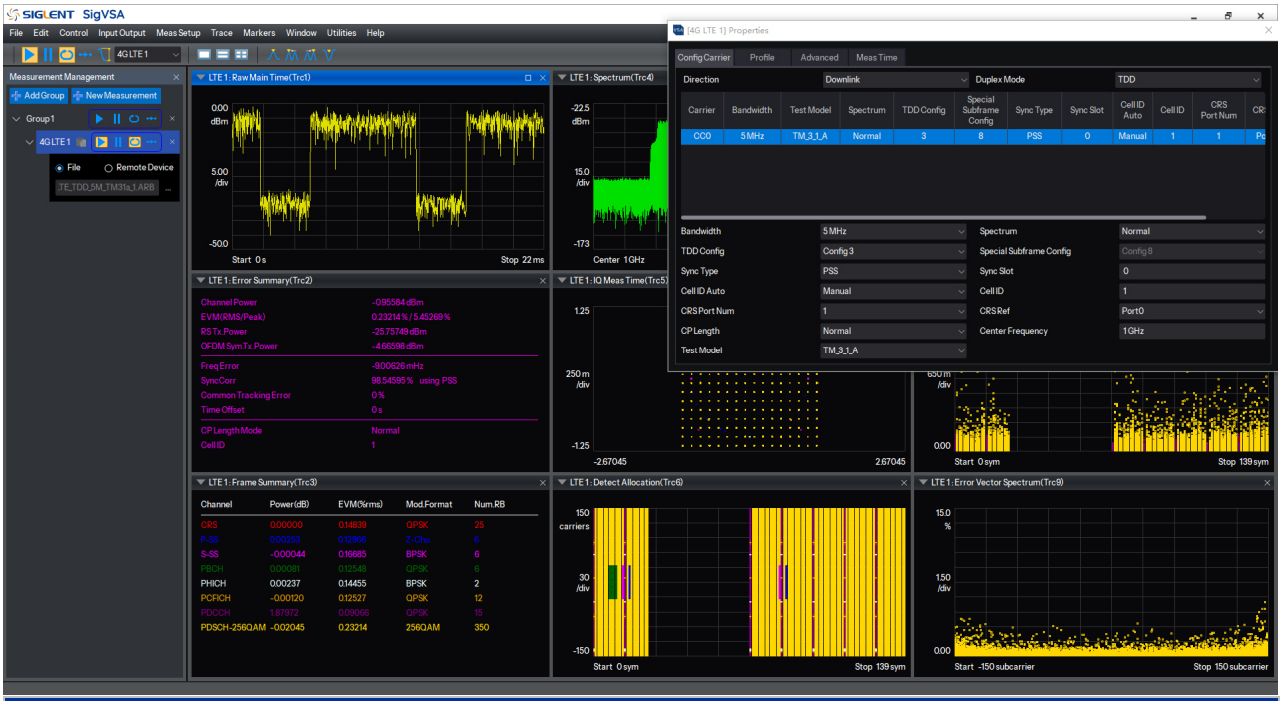
- OFDM



Measurement Parameters	
Preset Standards	
Cellular Communication	LTE FDD Downlink 5MHz、LTE FDD Uplink 5MHz
Wireless Connection	WLAN（802.11a）
Meas Time	
Search Length	4 μs ~ 1 s
Result Length	1 ~ 1000 Symbols
Meas Interval	1 ~ Result Length
Meas Offset	0 ~ Result Length
Format	
FFT Length	4 ~ 65536
System Sample Frequency	0 ~ 50 MHz
Guard Lower Subcarriers	0 ~ FFT Length
Guard Upper Subcarriers	0 ~ FFT Length
Half Subcarrier Shift	On	Off
DFT Spread	On	Off
Transmitter Window Beta	0 ~ Minimum Guard Interval per Symbol
Guard Interval per Symbol	0 ~ 1
Blank Time per Symbol	0 ~ 2147483647 points
Mapping	
Preamble	Symbol Index, Subcarrier Index
Pilot	Symbol Index, Subcarrier Index
Data	Symbol Index, Subcarrier Index, Modulation Type, Amplitude

Equalizer	
Equalizer	Use Preamble, Use DC Pilot, Use Pilot, Use Data
Tracking	
Include Data Subcarriers	On | Off
Tracking	Track Amplitude, Track Phase, Track Timing Offset
Filter	
Filter Type	None | Arbitrary | Windowed
Synchronization	
Synchronization Mode	Time Correlation | Cyclic Prefix
Symbol Timing Adjustment	-Minimum Guard Interval per Symbol*100% ~ 0
View	
Data	Raw Data Time Domain, Raw Data Frequency Domain, IQ Measurement Time Domain, IQ Reference Time Domain, Error Vector Time, Error Vector Frequency, Error Statistics Table, Trigger Information.
Format	Log Magnitude, Linear Magnitude, Real Part, Imaginary Part, IQ Plot, Constellation Diagram, I Eye Diagram, Q Eye Diagram, Phase Diagram, Unwrapped Phase Diagram, Phase Tree Diagram.
Parameter Table	
Error Statistics Table	EVM(RMS|Peak), Pilot EVM, Data EVM, Preamble EVM, SNR/MER, Frequency Error, Clock Error, CPE, Sync Corr, IQ Offstage, IQ Qual Error, IQ Gain Imbalance, Tx Power.
Trigger Information	Preamble, Pilot, Data, All, User (EVM, Power, Modulation Type, RU Count)

- LTE/LTE-A



Measurement Parameters	
Preset Standards	
Duplex Type	TDD	FDD
DL Test Mode	Downlink: TM1.1, TM2, TM2a, TM2b, TM3.1, TM3.1a, TM3.1b, TM3.2, TM3.3;
Carrier	
Carrier Bandwidth	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
Spectrum Mirroring	On	Off
Uplink-Downlink Configuration	0~6
Special Subframe Configuration	Normal CP: 0 ~ 10 Extended CP: 0 ~ 7
Synchronization Method	Downlink: CRS/PSS Uplink: PUSCH DMRS/PUCCH DMRS/SRS
Synchronization Time Slot	0 ~ Maximum Time Slot Number
Cell ID Source	Downlink: auto/manual Uplink: manual
Cell ID	0~503
CP Length	auto/normal/extended
Reference Signal Port Count	1/2/4
Reference Signal Port	0 ~ Maximum Reference Port Number
Channel Type	Downlink: CRS, PSS, SSS, PCFICH, PDCCH, PHICH, PBCH, PDSCH; Uplink: PUCCH, PUSCH, SRS;
Half Subcarrier Offset (Uplink)	On	Off

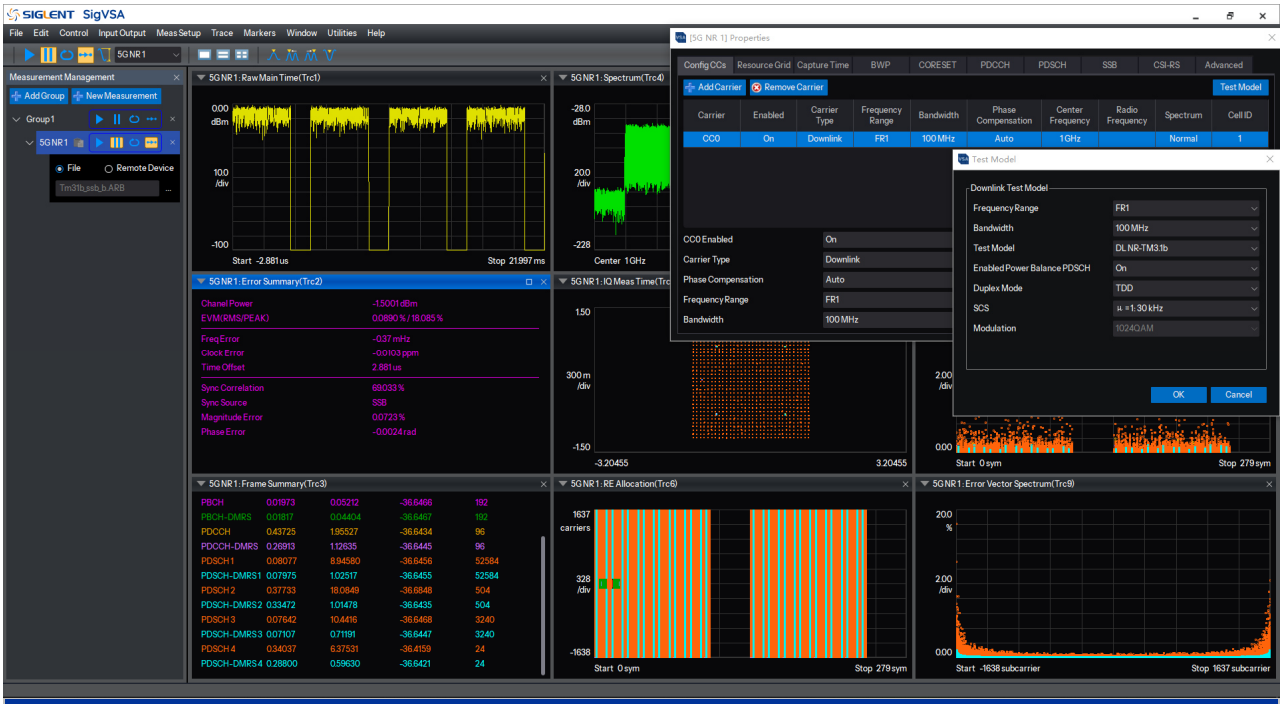
PUSCH DFT Switch (Uplink)	On	Off
Time Settings	
Time Slot Offset	0 ~ Maximum Time Slot Number
Symbol Offset	0 ~ Maximum Symbol Number in Time Slot
Measurement Time Slot Length	1 ~ Number of Time Slots
Measurement Symbol Length	0 ~ Number of Symbols in Time Slot
Advanced Features	
Window Type	3GPP/Custom
Window Length	1 ~ 512
Window Position	start/center/end
Equalizer Data	Off	RS	RS+Data
Equalizer Frequency Domain Smoothing Length	1 ~ Number of RBs - 1
Minimization Type	Off	3GPP	Tracking
Amplitude Compensation	On	Off
Phase Compensation	On	Off
Time Compensation	On	Off
View	
Data	Raw Data Time Domain, Raw Data Frequency Domain, IQ Measurement Time Domain, IQ Reference Time Domain, RB Power Time Domain, RB Power Frequency Domain, Channel Frequency Response, Common Tracking Error, Slot Frequency Offset, Error Vector Time, Error Vector Frequency, RMS Error Vector Time, RMS Error Vector Frequency, RB Error Vector Time Domain, RB Error Vector Frequency Domain, Error Statistics Table, Frame Statistics Table.
Format	Log Magnitude, Linear Magnitude, Real Part, Imaginary Part, IQ Plot, Constellation Diagram, I Eye Diagram, Q Eye Diagram, Phase Diagram, Unwrapped Phase Diagram, Phase Tree Diagram.
Parameter Table	
Error Statistics Table	Channel Power, EVM (RMS/Peak), Data EVM, Frequency Offset, Synchronization Correlation, Synchronization Source, CTE, Time Offset, Cell ID, CP Type.
Frame Statistics Table	Per Channel/UE: EVM, RE Power, Modulation Type.

- NB-Iot

Measurement Parameters	
Preset Standards	
Duplex Type	FDD
Deployment Mode	Standalone, Inband , Guardband
Carrier	
LTE Bandwidth (for Inband/Guardband)	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
Spectrum Mirroring	On	Off
Synchronization Method (Downlink)	NPSS/ NRS (non-anchor carrier)
Synchronization Time Subframe/Slot	NPSS(Subframe5)/ NRS(Slot0~19)
Cell ID Source	Downlink: auto/manual
Cell ID	0~503
CP Length	Normal only
Reference Signal Port Count	1/2
Reference Signal Port	0 ~ (Reference Signal Port Count-1)
Channel Type (Downlink only)	NPSS,NSSS,NPBCH ,NRS ,NPDCCH,NPDSCH
Half Subcarrier Offset	On	Off
Time Settings	
Time Slot Offset	0 ~ 19
Symbol Offset	0 ~6
Measurement Time Slot	1 ~20

Length	
Measurement Symbol Length	1~7
Advanced Features	
Window Type	3GPP/Custom
Window Length	1 ~ 512
Window Position	start/center/end
Equalizer Data	Off | RS | RS+Data
Equalizer Frequency Domain Smoothing Length	1 … 10(max 10; NB-IoT has only 1 RB, i.e., 12 subcarriers)
Minimization Type	Off | 3GPP | Tracking
Amplitude Compensation	On | Off
Phase Compensation	On | Off
Time Compensation	On | Off
View	
Data	Raw Data Time Domain, Raw Data Frequency Domain, IQ Measurement Time Domain, IQ Reference Time Domain, RB Power Time Domain, RB Power Frequency Domain, Channel Frequency Response, Common Tracking Error(CTE), Frequency Offset, Error Vector Time, Error Vector Frequency, RMS Error Vector Time, RMS Error Vector Frequency, RB Error Vector Time Domain, RB Error Vector Frequency Domain, Error Statistics Table, Frame Statistics Table.
Format	Log Magnitude, Linear Magnitude, Real Part, Imaginary Part, IQ Plot, Constellation Diagram, I Eye Diagram, Q Eye Diagram, Phase Diagram, Unwrapped Phase Diagram, Phase Tree Diagram.
Parameter Table	
Error Statistics Table	Channel Power, EVM (RMS/Peak), Data EVM, Frequency Offset, Synchronization Correlation, Synchronization Source, CTE, Time Offset, Cell ID, CP Type.
Frame Statistics Table	Per Channel/UE: EVM, RE Power, Modulation Type.

- NR/NR-A/NR-NTN



Measurement Parameters	
Preset Standards	
Duplex Type	TDD | FDD
DL Test Mode	FR1: TM1.1, TM1.2, TM2.0, TM2.0a, TM2.0b, TM3.1, TM3.1a, TM3.1b, TM3.2, TM3.3. FR2: TM1.1, TM2.0, TM2.0a, TM3.1, TM3.1a.
DL FRC Config	FR1: FR1 QPSK, FR1 64QAM, FR1 256QAM, FR1 1024QAM. FR2: FR2 QPSK, FR2 64QAM, FR2 256QAM.
UL RMC Config	Edge Full Left, Edge Full Right, Edge 1RB Left, Edge 1RB Right, Outer Full, Inner Full, Inner 1RB Left, Inner 1RB Right
PUCCH Test Config	3GPP TS 38.141 sections 8.3.1, 8.3.2.1, 8.3.2.2, 8.3.3.1, 8.3.3.2, 8.3.6.1.1, 8.3.6.1.2, 8.3.7, 8.3.8.1, 8.3.8.2
UL FRC Config	FR1: FR1-FRC-A-1~9; FR2: FR2-FRC-A-1~10.
Time	
Search Length	1ms ~ 200ms
Analysis Boundary	Frame | Subframe | Slot
Analysis Subframe	1 ~ 10
Analysis Slot	1 ~ 20
Measurement Interval	Subframe: 1 ~ Analysis Subframe; Slot: 0 ~ 2^u-1; Symbol: 0~13 (Normal CP) | 0~11 (Extended CP).
Measurement Offset	Subframe: 1 ~ Analysis Subframe - Measurement Offset; Slot: 0 ~ 2^u-1; Symbol: 0~13 (Normal CP) | 0~11 (Extended CP);
Carrier	
Carrier Number	1 ~ 16
Carrier Bandwidth	FR1: 5MHz, 10MHz, 15MHz, 20MHz, 25MHz, 30MHz, 35MHz, 40MHz, 45MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz.

	FR2: 50MHz, 100MHz, 200MHz, 400MHz, 800MHz, 1600MHz, 2000MHz.
Subcarrier Spacing	15kHz | 30kHz | 60kHz | 120kHz | 480kHz | 960kHz
BWP Number	0 ~ 100
Channel Type	Downlink: SSB, PDSCH, PDCCH, CSI-RS;Uplink: PUCCH, PUSCH, SRS
Advanced	
Sync Model	Time Correlation | Cyclic Prefix
Sync Signal	Downlink: SSB, PDSCH DMRS, PDCCH DMRS, CSI-RS;Uplink: PUCCH DMRS, PUSCH DMRS, SRS
Multicarrier Filter	On | Off
DC Punctured	On | Off
Report EVM in dB	dB | %
Symb Clock Err Compensation	On | Off
3GPP Conformance Test	On | Off
Equalizer Type	Off | RS | RS+Data
Time Averaging Type	Slot | Subframe | Frame | Measurement Interval
Frequency Moving Length	1 ~ 999999
Tracking Mode	Off | RS | RS+Data
Tracking Amplitude	On | Off
Track Phase	On | Off
Track Timing	On | Off
Symbol Time Adjust	WIN Start | WIN Center | WIN End | FFT size Percent
%FT size	-25% ~ 0
View	
Data	Original data time domain, original data frequency domain, PVT, IQ measurement time domain, IQ reference time domain, RMS power vs time, RMS power vs frequency, RE power 3D, error vector time, error vector frequency, RMS error vector time, RMS error vector frequency, error vector 3D, result statistics table, frame statistics table, slot statistics table, RE allocation diagram, MIMO information.
Format	Log magnitude, Linear magnitude, Real part, Imaginary part, IQ plot, Constellation diagram, I eye diagram, Q eye diagram, Phase plot, Unwrapped phase plot, Phase tree diagram.
Parameter Table	
Result Statistics Table	Channel Power, EVM (RMS/Peak), Frequency Offset, Symbol Clock Offset, IQ Offset, Timing Offset, Synchronization Correlation, Synchronization Source, Amplitude Error, Phase Error, IQ Gain Imbalance, IQ Quadrature Error, IQ Timing Skew, Cell ID.
Frame Statistics Table	Per channel/UE: EVM, RE power, Modulation type, Number of RBs, RNTI.
Slot Statistics Table	Per slot (grouped by channel/UE): EVM, RE power, Modulation type, Number of RBs, SINR.
MIMO Information	Port number, EVM, Power, TAE, Frequency offset, Phase offset, Symbol clock offset.

- WLAN

Measurement Parameters	
Preset Standards	
Protocol Standard	802.11b/a/g/n/ac/ax/be
Time	
Search Length	100ms
Maximum Result Length	1 ~ 1000 Symbols
Meas Interval	1 ~ Result Length
Meas Offset	0 ~ Result Length
Carrier	
Carrier Bandwidth	20M、40M、80M、80+80M、160M、320M
Subcarrier Spacing	312.5kHz	78.125kHz
Signal Type	Preamble, Sig, Pilots, Data
Advanced	
Multicarrier Filter	On	Off
DC Punctured	On	Off
Display EVM in Percent	dB	%
Symbol Clock Error Compensation	On	Off
3GPP Conformance Testing	On	Off
Frequency Estimation Mode	Preamble	Preamble+Pilots+Data
Equalizer Training	Measurement Interval
Equalizer Smoothing	1 ~ 999999

Tracking Mode	Pilots	Pilots +Data
Amplitude Tracking	On	Off
Phase Tracking	On	Off
Time Tracking	On	Off
Maximum Symbol Timing Adjustment	-25%
FFT size Percent	-25% ~ 0
View	
Data	Original data time domain, original data frequency domain, IQ measurement time domain, IQ reference time domain, channel frequency response, common tracking error Time slot frequency offset, error vector time, error vector frequency, RMS error vector time, RMS error vector frequency, error statistics table, frame statistics table.
Format	Logarithmic amplitude, linear amplitude, real part, imaginary part, IQ chart, constellation chart, I eye chart, Q eye chart, Phase diagram, phase unfolding diagram, phase tree diagram.
Parameter Table	
Error Statistics Table	Signal Power, EVM (RMS/Peak), Pilot EVM, Data EVM, Frequency Offset, Synchronization Correlation, Synchronization Source etc.
Frame Statistics Table	Different types of signals: EVM, power, modulation type.

- Bluetooth

Measurement Parameters	
Preset Standards	
Protocol Standard	Bluetooth 5.4
Protocol Frame format	Basic Rate/Enhanced Data Rate/Low Energy
General	
Max Search Length	20ms
Waveform Type	Basic Rate/Enhanced Data Rate/Low Energy
I/Q Map	Normal/Invert
Manual Sample Rate	Auto/Manual
Sample Rate	-
Result	
Packet ID	0 ~ Avg Hold Number-1
Averaging	ON/OFF
Max Avg Hold Number	10000
Tx Power	
Output Power Start Marker	0% ~ 99%
Output Power Stop Marker	Output Power Start Marker+1% ~ 100%
GFSK Start Marker	0% ~ 99%
GFSK Stop Marker	GFSK Start Marker+1% ~ 100%
DPSK Start Marker	0% ~ 99%
DPSK Stop Marker	DPSK Start Marker+1% ~ 100%
Limit	
Limit Test	ON/OFF

Limit Type	BR: Average Power, Peak Power, Δf1Avg, Δf2Max, Δf2Avg/Δf1Avg, Freq Drift, Max Drift Rate, ICFT; LE: Average Power, Peak Power, Δf1Avg, Δf2Max, Δf2Avg/Δf1Avg, Freq Drift, Freq Offset, Max Drift Rate, Initial Freq Drift; EDR: Relative Power, Initial Freq, Block Freq, Total Freq, RMS DEVM, 99%DEVM
Advanced	
Scale Conversion	ON/OFF
View	
Data	Rf Envelope, Rf Spectrum, Demod Waveform, I/Q Measured Polar, Result Summary
Parameter Table	
Result Statistics Table	BR: Standard, Packet Type, Payload Length, Payload, Average Power, Peak Power, Δf1(Max/Avg), Δf2(Max/Avg), Δf2>115kHz, Δf2/Δf1, Freq Drift, Max Drift Rate, ICFT; LE: Standard, Packet Type, Payload Length, Payload, Average Power, Peak Power, Δf1(Max/Avg), Δf2(Max/Avg), Δf2>185/370kHz, Δf2/Δf1, Freq Drift/CTE Freq Drift, Max Drift Rate/CTE Max Drift Rate, Freq Offset/CTE Freq Offset, Initial Freq Drift/CTE Initial Freq Drift, CTE Time, RFU, CTE Type; EDR: Standard, Packet Type, Payload Length, Payload, Freq Offset ωi, Freq Offsetωo, ωi+ωo, RMS DEVM, Peak DEVM, 99%DEVM, GFSK Avg Power, DPSK Avg Power, Rel Avg Power, BER, Bit Errors, Guard Interval

- HRP-UWB

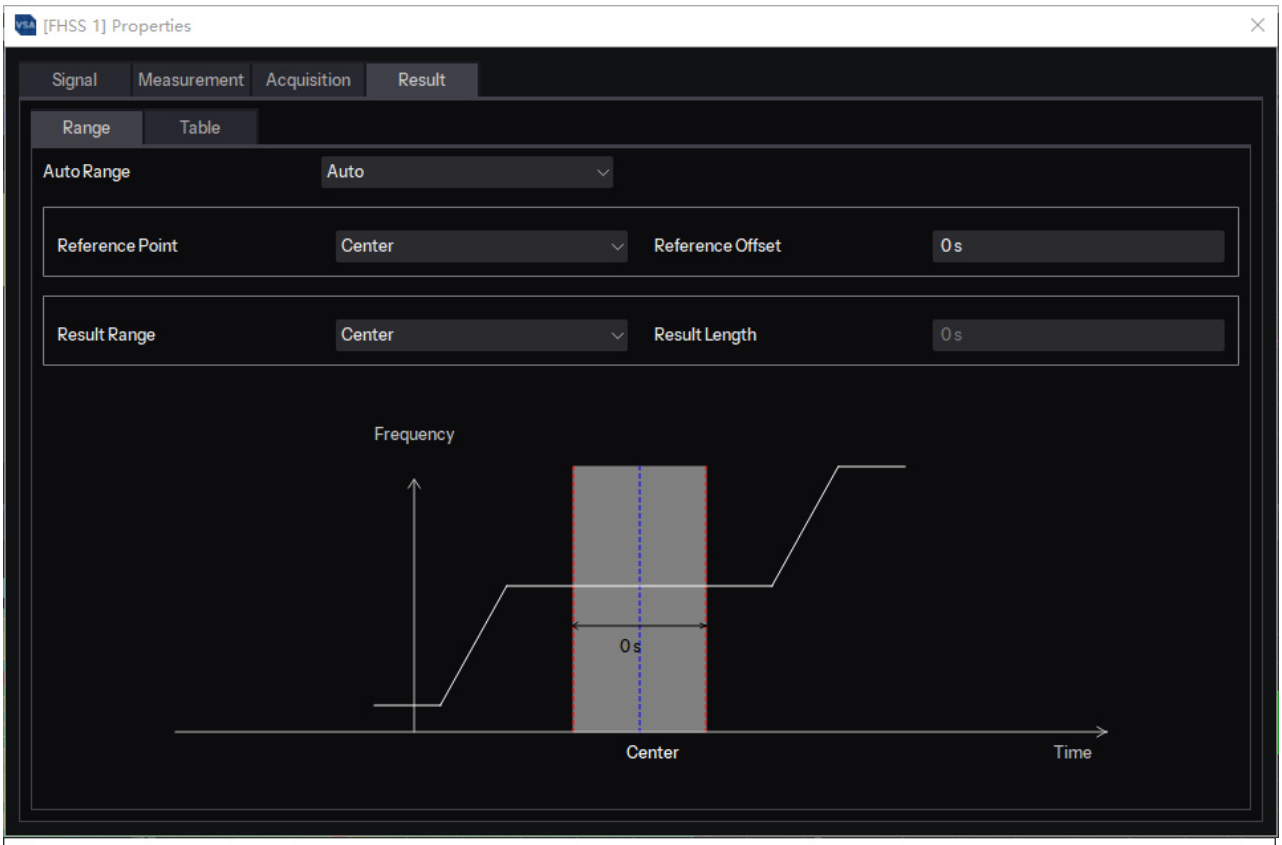
Measurement Parameters	
Preset Standards	
Protocol Standard	802.15.4a/z
Protocol Frame format	Non-ERDEV/ ERDEV-HPRF/ ERDEV-BPRF
Time	
Maximum Search Length	20ms
Maximum Result Length	1 ~ 1000 Symbols
Meas Interval	1 ~ Result Length
Meas Offset	0 ~ Result Length
Carrier	
Carrier Bandwidth	499.2M、1081.6M、1331.2M、1354.97M
Signal Type	Preamble、PHR、STS、PSDU（Data）
Advanced	
Frequency Error Compensation	On | Off
Phase Tracking	On | Off
Estimation From	EntireFrame | SYNC
Symbol Clock Error Compensation	On | Off
Equalizer Training	None | InverseMeasuredPulse
Delay Spread	0~200
Reference Filter	None | MeasuredPulse
Sample Rate Set	Auto | Manual

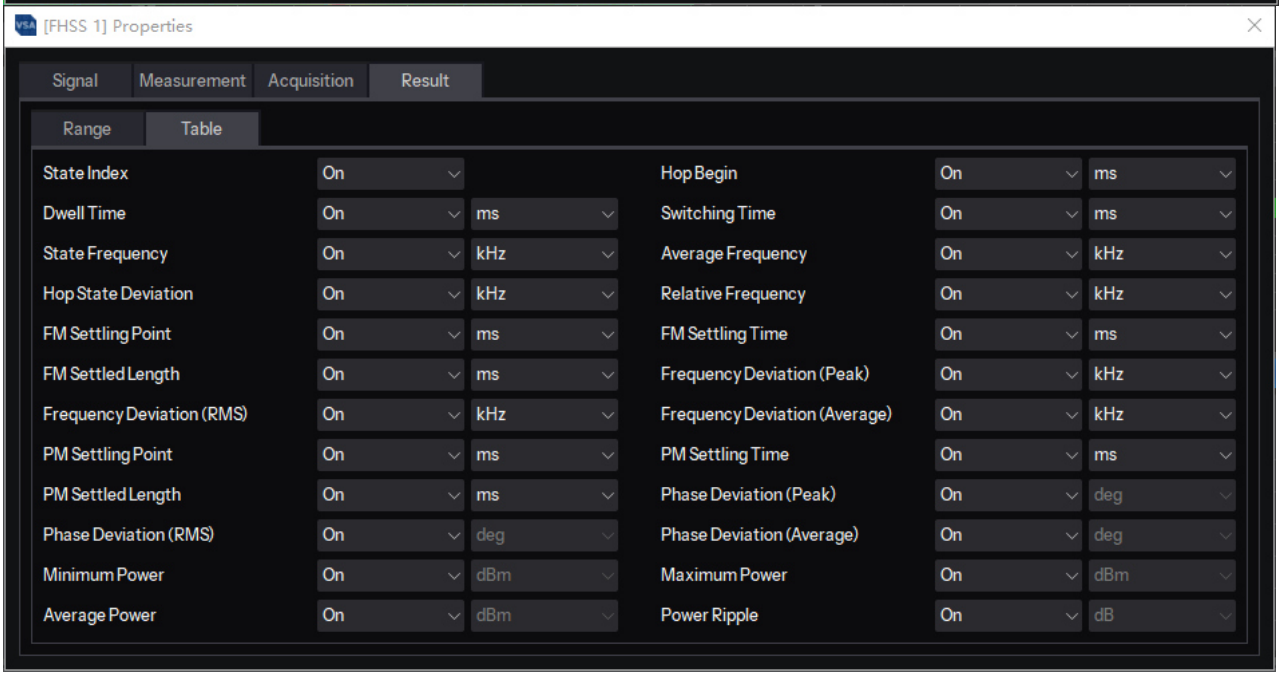
Sample Rate Value	-
Parameter Table	
Error Statistics Table	Signal Power, NRMSE, SHR NRMSE, PHR NRMSE, STS NRMSE, PSDU NRMSE, Pusle Mask Pass/Fail, Frequency Offset, Time Offset etc.
Frame Statistics Table	Different types of signals: Status, Frame Length/format. etc

- FHSS

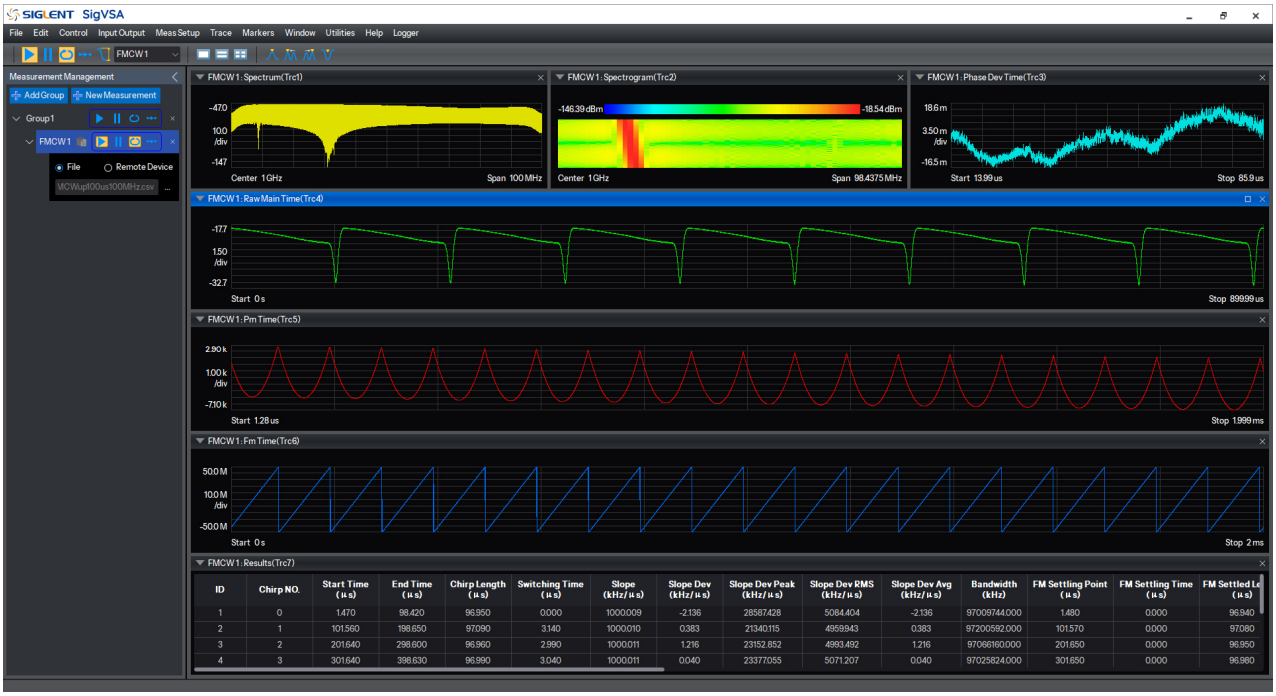
ID	HOP NO.	State Index	Hop Begin (ms)	Dwell Time (ms)	Switching Time (ms)	State Frequency (kHz)	Avg Frequency (kHz)	Hop State Deviation (kHz)	Relative Frequency (kHz)	FM Settling Point (ms)	FM Settling Time (ms)	FM Settled Length (ms)	Freq Dev (kH
22	22	22	0.220	0.010	0.000	-0.175	-0.041	0.134	24999961	0.220	0.000	0.010	71.9(
23	23	23	0.230	0.010	0.000	-20000.398	-20000.065	0.333	-20000.024	0.230	0.000	0.010	128.5
24	24	24	0.240	0.010	0.000	-40000.086	-40000.010	0.075	-19999.945	0.240	0.000	0.010	73.9
25	25	25	0.250	0.010	0.000	29999.872	29999.987	0.115	69999.997	0.250	0.000	0.010	67.8
26	26	26	0.260	0.010	0.000	39999.752	39999.995	0.243	10000.008	0.260	0.000	0.010	61.2
27	27	27	0.270	0.010	0.000	35000.184	35000.019	-0.165	-4999.976	0.270	0.000	0.010	74.2
28	28	28	0.280	0.010	0.000	25000.128	24999.991	-0.137	-10000.028	0.280	0.000	0.010	72.2
29	29	29	0.290	0.010	0.000	-34999.630	-35000.022	-0.392	-60000.012	0.290	0.000	0.010	68.1
30	30	30	0.300	0.010	0.000	9999.817	9999.992	0.174	45000.013	0.300	0.000	0.010	63.0

Measurement Parameters	
Measurement Function	
Modulation Type	Hop
Signal	
BandWidth	4GHz（Max）
Sample Rate	Auto/ Manual
Data Sample Rate	100kHz~5GHz
Measurement	
FM Setting Tolerance	0~512MHz
PM Setting Tolerance	0~180°
Acquisition	
Analysis Regions Mode	Auto/ Manual
Analysis Regions Start	0~9999us
Acquisition Length	1us~10ms
View	
Data	RF spectrum, Meas Time, FM time, Spectrogram, Frequency dev time, Results
Parameter Table	ID, HOP NO., State index, Hop begin, Dwell time, Switching time,State/Avg frequency, Hop state deviation, Relative frequency, Fm/Pm settling point, Fm/Pm settling time, Fm/Pm settling length,Freq/Phase dev peak, Freq/Phase dev rms, Freq/Phase dev avg,Min/Max/Avg power, Power ripple
Result	
Range	see graph below
Table	see graph below

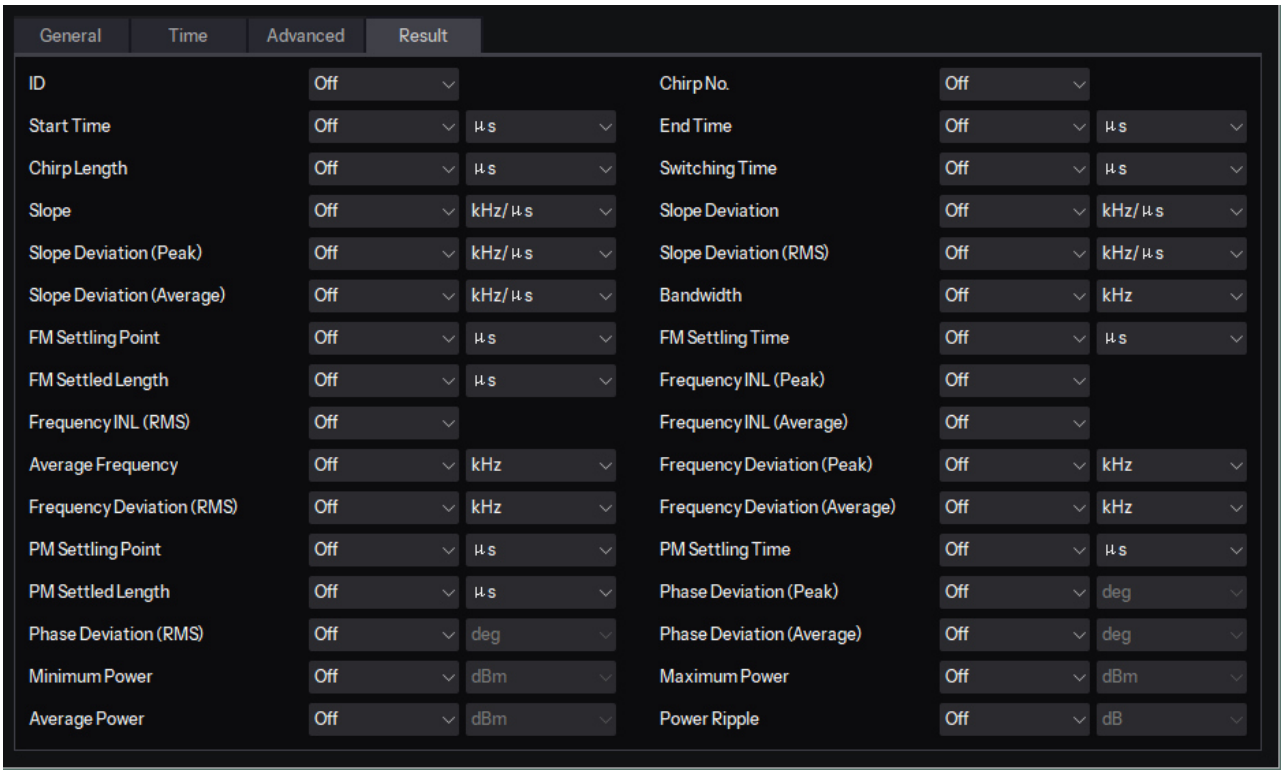

[FHSS 1] Properties
Signal
Measurement
Acquisition
Result
Range
Table
Auto Range
Auto
Reference Point
Center
Reference Offset
0 s
Result Range
Center
Result Length
0 s
Frequency
0 s
Center
Time


[FHSS 1] Properties
Signal
Measurement
Acquisition
Result
Range
Table
State Index
On
Hop Begin
On
ms
Dwell Time
On
ms
Switching Time
On
ms
State Frequency
On
kHz
Average Frequency
On
kHz
Hop State Deviation
On
kHz
Relative Frequency
On
kHz
FM Settling Point
On
ms
FM Settling Time
On
ms
FM Settled Length
On
ms
Frequency Deviation (Peak)
On
kHz
Frequency Deviation (RMS)
On
kHz
Frequency Deviation (Average)
On
kHz
PM Settling Point
On
ms
PM Settling Time
On
ms
PM Settled Length
On
ms
Phase Deviation (Peak)
On
deg
Phase Deviation (RMS)
On
deg
Phase Deviation (Average)
On
deg
Minimum Power
On
dBm
Maximum Power
On
dBm
Average Power
On
dBm
Power Ripple
On
dB

- FMCW



Measurement Parameters	
Measurement Function	
Modulation Type	FMCW
Signal	
BandWidth	4GHz（Max）
Sample Rate	Auto/ Manual
Data Sample Rate	100kHz~5GHz
Measurement	
FM Setting Tolerance	0~512MHz
PM Setting Tolerance	0~180°
Acquisition	
Analysis Regions Mode	Auto/ Manual
Analysis Regions Start	0~9999us
Acquisition Length	1us~10ms
View	
Data	RF spectrum, Time, FM time, PM time, Spectrogram, Frequency dev time, Phase dev time, Results table
Results table	ID, Chirp NO., State index, Chirp start/end time, Chirp Length, Switching time,Chirp Slope, Slope Dev (peak/rms/Avg), Bandwidth, Fm/Pm settling point, Fm/Pm settling time, Fm/Pm settling length, Average frequency / phase, Freq/Phase dev(peak / rms/ Avg),INL (peak / rms/ Avg), power(Min/Max/Avg), Power ripple
Result	
Table	see graph below

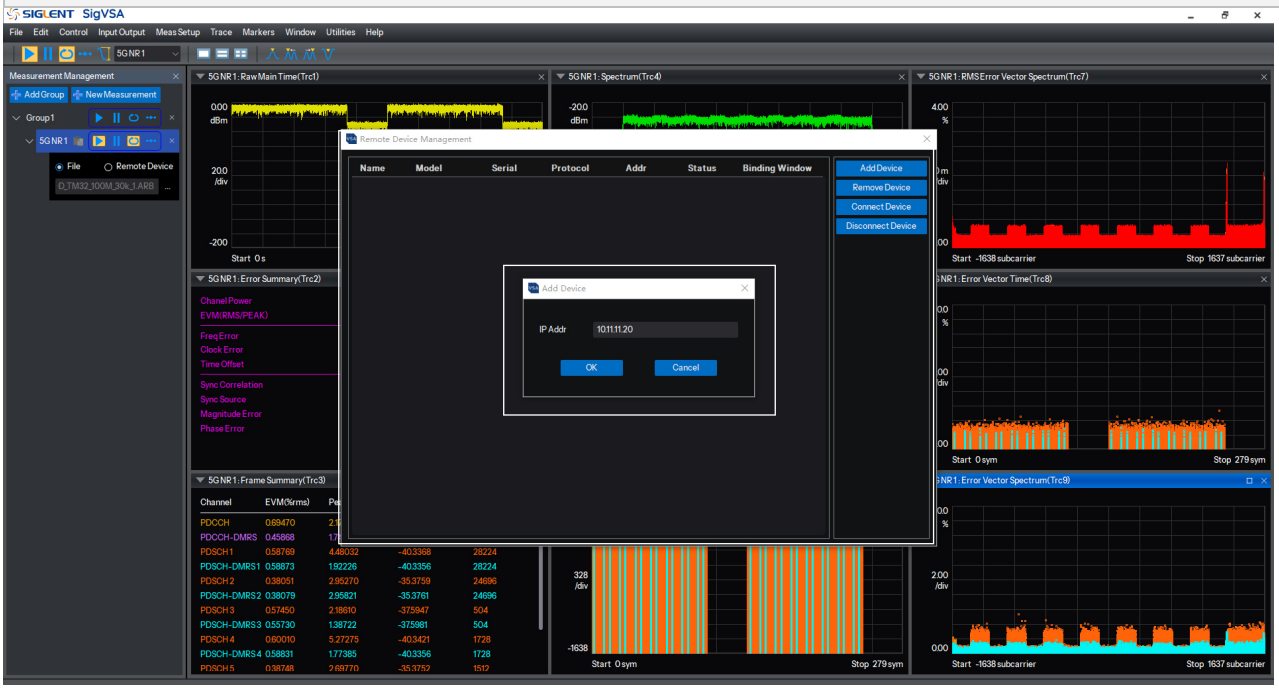

General
Time
Advanced
Result
ID
Off
Chirp No.
Off
Start Time
Off
µs
End Time
Off
µs
Chirp Length
Off
µs
Switching Time
Off
µs
Slope
Off
kHz/µs
Slope Deviation
Off
kHz/µs
Slope Deviation (Peak)
Off
kHz/µs
Slope Deviation (RMS)
Off
kHz/µs
Slope Deviation (Average)
Off
kHz/µs
Bandwidth
Off
kHz
FM Settling Point
Off
µs
FM Settling Time
Off
µs
FM Settled Length
Off
µs
Frequency INL (Peak)
Off
Frequency INL (RMS)
Off
Frequency INL (Average)
Off
Average Frequency
Off
kHz
Frequency Deviation (Peak)
Off
kHz
Frequency Deviation (RMS)
Off
kHz
Frequency Deviation (Average)
Off
kHz
PM Settling Point
Off
µs
PM Settling Time
Off
µs
PM Settled Length
Off
µs
Phase Deviation (Peak)
Off
deg
Phase Deviation (RMS)
Off
deg
Phase Deviation (Average)
Off
deg
Minimum Power
Off
dBm
Maximum Power
Off
dBm
Average Power
Off
dBm
Power Ripple
Off
dB

General Parameters

General Parameters	
Number of cloud control instruments	0~32
Maximum Measurement Quantity	4
Online Control, Maximum Storage Depth	2M Point/Channel

Remote Instrument Management

Remote Instrument Management
Add/Remove Device
Device List
Set Analysis Type
Host computer controls instrument equipment
The host computer retrieves data from the instrument/equipment



Computer System Requirements

Unless otherwise specified, all specifications are guaranteed to be met only under the following conditions:

Minimum System Requirements	
Operating System	Windows 10 or later 64-bit operating system
Processor	Intel® CoreTM i5 Processor or better
Memory	8 GB RAM or better
Hard Drive	At least 16GB of available space
Display resolution	Minimum 1280x720, recommended 1920x1080.
Virtual Memory	More than 1GB of available virtual memory.

Ordering Information

Standard configuration

Serial Number	Name	Description	Order Number
1	Basic Vector Signal Analysis Signal analysis software	Provides measurement functions such as spectrum analysis and IQ analysis.	SIGV-VSAA1
2	Custom OFDM modulation analysis	Provides an option for general OFDM signal demodulation analysis.	SIGV-VSAO1
3	Digital modulation analysis	Provides options for general digital modulation signal demodulation analysis.	SIGV-VSAD1

Options

Serial Number	Name	Description	Order Number
1	32 Measurement vector signal analysis	Provides an option for running up to 32 measurements simultaneously.	SIGV-VSAA2
2	LTE/LTE-A FDD modulation analysis	Provides options for LTE/LTE-A FDD demodulation analysis.	SIGV-VSAL1
3	LTE/LTE-A TDD modulation analysis	Provides options for LTE/LTE-A TDD demodulation analysis.	SIGV-VSAL2
4	5G NR/NR-A Modulation Analysis	Provides options for NR/NR-A demodulation analysis.	SIGV-VSAN1
5	5G NR-NTN modulation analysis	Provides options for NR-NTN demodulation analysis.	SIGV-VSAN2
6	WLAN 802.11b/a/g/n/ac/ax modulation analysis	Provides options for WLAN 802.11b/a/g/n/ac/ax demodulation analysis.	SIGV-VSAW1
7	WLAN 802.11be modulation analysis	Provides options for WLAN 802.11be demodulation analysis.	SIGV-VSAW2
8	HRP-UWB modulation analysis	Provides options for HRP-UWB with various bandwidths demodulation analysis.	SIGV-VSAU1
9	Bluetooth modulation analysis	Provides options for Bluetooth demodulation analysis.	SIGV-VSAB1
10	Frequency-Hopping Signal analysis	Provides options for frequency-hopping signal analysis.	SIGV-VSAF1

More options coming soon! Follow us for updates.

Serial Number	Name	Description	Order Number
1	GSM/EDGE modulation analysis	Provides options for GSM demodulation analysis.	SIGV-VSAG1
2	NB-Iot downlink modulation analysis	Provides options for NB-Iot demodulation analysis.	SIGV-VSAG3

3	FMCW Signal analysis	Provides options for linear frequency modulation (chirp) signal analysis.	SIGV-VSAF2
4	WCDMA/HSPA modulation analysis	Provides options for WCDMA demodulation analysis.	SIGV-VSAG2
5	Pulse Signal analysis	Provides options for Pulse signal analysis.	SIGV-VSAP1
6	DVB-S2\S2X modulation analysis	Provides options for DVB-S2\S2X analysis.	SIGV-VSAV1

About SIGLENT

SIGLENT Technologies is a leading enterprise in the field of general-purpose electronic test and measurement instruments and a publicly listed company on the A-share market.

In 2002, SIGLENT's founders began focusing on oscilloscope development, and in 2005, the company successfully developed its first digital oscilloscope. Over the years, SIGLENT's product portfolio has expanded to include digital oscilloscopes, handheld oscilloscope meters, function/arbitrary waveform generators, spectrum analyzers, vector network analyzers, RF/microwave signal sources, benchtop multimeters, DC power supplies, electronic loads, and other fundamental test and measurement instruments.

SIGLENT is one of the very few global manufacturers capable of independently developing, producing, and selling all four major categories of general-purpose electronic test and measurement instruments: digital oscilloscopes, signal generators, spectrum analyzers, and vector network analyzers. It is recognized as a national-level "Little Giant" enterprise. Additionally, SIGLENT is among the few domestic competitors with a comprehensive high-end product line across all four major instrument categories.

Headquartered in Shenzhen, SIGLENT has established subsidiaries in Cleveland (USA), Augsburg (Germany), and Tokyo (Japan), as well as a branch in Chengdu. Its products are sold in over 80 countries and regions worldwide, making SIGLENT a globally renowned brand in test and measurement instrumentation.

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