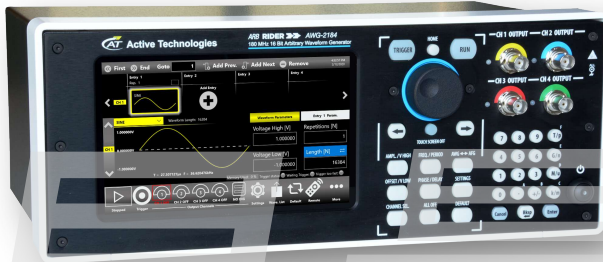


# RIDER

Time to **Reinvent** advance signal generation

## ARB Rider 2182 / 2184 Technical Datasheet



### 2-4 CHANNELS / 180 MHz ALL-IN-ONE: Function Generator, Arb Generator and Digital Pattern Generator

- 2 or 4 Analog Channels
- 600 MS/s (1.2 GS/s with x2 interpolation)
- 16-bit Vertical Resolution
- 180 MHz Bandwidth
- Up to 12V<sub>p-p</sub> into 50Ω load
- Up to 256Mpts Waveform Memory per Channel
- 8 Digital Channels in synchronous with analog Generation
- Simple Rider™ UI: designed for touch AWG/AFG user interfaces.

### Key performance specifications

- AFG Mode
  - 180 MHz Sine Waveforms
  - 1.2 GS/s fixed
  - 16-bit vertical resolution
  - Amplitude up to 12V<sub>p-p</sub> into 50Ω load
  - Improved DDS based technology
- AWG Mode
  - 600 MS/s Variable Clock (1.2 GS/s with x2 Interpolation)
  - 16-bit vertical resolution
  - 8-bit digital channels
  - Up to 256 Mpts Waveform Memory per Channel
  - 160 MHz Calculated Bandwidth
  - Amplitude up to 12V<sub>p-p</sub> into 50Ω load

### Features & Benefits

- Sample rate can be programmed in from 1 S/s to 600 MS/s (1 S/s to 1.2 GS/s with 2x interpolation), with 16-bit vertical resolution, ensuring exceptional signal integrity
- Arbitrary waveform memory up to 256 Mpts for each analog channel
- Mixed Signal Generation – 2 or 4 Analog channels with 8 synchronized Digital Channels for debugging and validating digital design
- Two operation modes – Simple Rider AFG (DDS AFG mode) and True Arb (variable clock Arbitrary AWG mode)
- Digital outputs provide up to 600Mb/s data rate in LVDS format. LVDS to LVTTTL adapter is available
- Advance sequencer with up to 16384 user defined waveforms provides the possibility of generating complex signal scenarios with the most efficient memory usage
- Windows based platform with 7" touch screen, front panel buttons and knob
- Compact form factor, convenient for bench top and fully fit with 3U – 10" rackmount standard
- LAN interfaces for remote control



## Applications areas

### Automotive



Today's cars are including a lot of highly sophisticated electronic control unit with very sensitive electronic components.

The Arb Rider 2182 / 2184 combining 600 MS/s (1.2 GS/s with 2x interpolation) with 16 bit vertical resolution, represents an ideal tool for successfully addressing the new testing challenges in automotive.

- CAN, CAN-FD, LIN, Flexray, SENT emulation
- EMI debugging, troubleshooting and testing
- Electrical standards emulation up to 12Vp-p
- Power MOSFET circuitry in automotive electronics optimization

### IoT and Ind 4.0 perfect RF Modulator



Arb and Function Riders will be the iconic instrument for this application. The possibility to emulate complex RF I/Q modulation for simulation and Test vs wireless devices or working on Internet of things of industry 4.0 applications. Each engineer may use the possibility to import waveform to emulate devices under test, impose distortion on waveform (such noise) to test the ability of devices to be compliant to the standards.

### Research Applications

Research centers and Universities, are key users of Arb Rider generator's series.

Complex waveform and/or sophisticated Pulses emulation based on variable edges or multilevel could be perfectly created. The combination of fast edge generation, excellent dynamic range and easy to use user interface meet perfectly scientists and engineers working on large experiments such Accelerators, Tokamak or synchrotrons to emulate signals without creating specific test boards.

- Emulation of detectors
- Emulation of signal sources adding noise
- Generation/playback of real-world signals
- Emulation of long PRBS sequences
- Modulating and driving laser diode

### Aerospace and Defense applications

Electronic warfare signals driven by Radar or Sonar systems perfectly match with these generators. Large BW Riders can be used on digital modulation systems for Radio Applications or others I/Q signal modulation.

Pulses may be easily generated for applications such Pulse Electron Beam or X Ray Sources, Flash X-ray Radiography, Lighting pulse simulators, high Power Microwave modulators.

- Frequency response, intermodulation distortion and noise-figure measurements
- Phase Locked Loop (PLL) pull-in and hold range characterization
- Radar base-band signals emulation

### Semiconductors Test

Emulation of complex signals generated with inclusion of noise or distortions may become an excellent way to provide Compliance Components Test to help semiconductor engineers. The fast edges and pulse generation can be used to provide characterization in fast power devices.

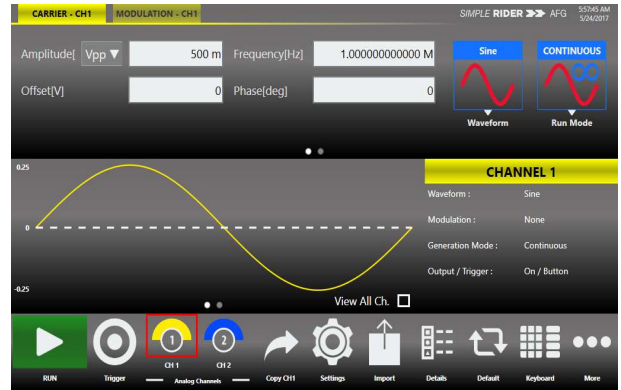
- Clock and Sensor signals generation
- MOSFET gate drive amplitude signal emulation
- Power up sequences of IC using the low (0 Ω) output impedance feature



## Simple Rider AFG: Function Generator Mode Interface

**Simple Rider AFG** UI is designed for touch and it has been developed to put all the capabilities of modern Waveform Generators right at your fingertips. All instrument controls and parameters are accessed through an intuitive UI that recalls the simplicity of Tablets and modern smart phones: touch features and gestures are available to engineers and scientists to create advanced waveforms or digital patterns in few touches.

- The swipe gesture gives easy access to the output waveform parameters
- A touch-friendly virtual numeric keypad has been designed to improve the user experience on entering the data
- Time saving shortcuts and intuitive icons simplify the instrument setup



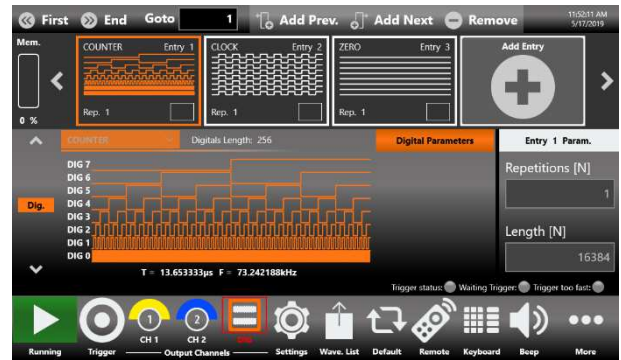
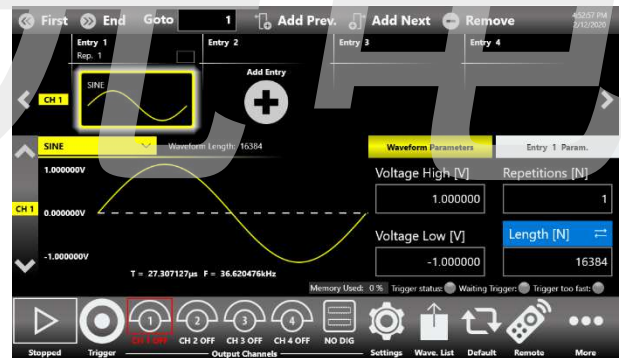
## Simple Rider TrueArb: AWG and DPG Mode Interface

In **Simple Rider True-Arb** interface, the users can define complex waveforms with up to 16,384 sequence entries of analog waveforms and digital patterns, define their execution flow by means of loops, jumps and conditional branches.

Digital output combined and synchronized with analog output signals represent an ideal tool to troubleshoot and validate digital design.

The waveform memory length of up to 256 Mpoints on each channel combined with up to 16,384 and up to 4,294,967,294 repetitions, make the Arb-Rider 2182 / 2184 the ideal generator for the most demanding technical applications.

Thanks to the intuitive and easy waveform sequencer user interface, the most complex waveform scenarios can be created with just few screen touches.



Arb Rider supports the standard Ethernet interface for remote control and easy customized instrument programming.



Document name **AWG - 2182 / 2184 - Technical Specifications** Last Date Update: 28/10/2021

All specifications are typical unless noted otherwise. The guaranteed performances are referred to a calibrated instrument that has been stored for a minimum of 2 hours within the operating temperature range of 5°C to 40°C and after a 45-minute warm up period. Within  $\pm 10^\circ\text{C}$  after auto-calibration.

Some specifications on this document refer to the available options and accessories that can be found in the table at the end of this document.

General Specifications		
	AWG-2182	AWG-2184
<b>Number of Channels</b>		
Analog out	2	4
Digital out	0/8 – optional	0/8 – optional
Marker out	1	1
<b>Operating Mode</b>	AFG Mode True Arb Mode	
<b>Amplitude</b>	0 to 6Vp-p (12Vp-p optional)	
Range (50Ω into 50Ω) <sup>1</sup>	$\pm(1\% \text{ of setting [Vp-p]} + 5\text{mV})$	
Accuracy (1kHz sine wave, 0V offset, >5mV <sub>p-p</sub> amplitude, 50Ω load) (guaranteed)		
Resolution	<0.5mVp-p or 5 digits	
Output impedance	Single-ended: 50Ω, Low Impedance: 0Ω	
<b>DC</b>	-3V to 3V (-6V to 6V optional)	
Amplitude range (50Ω into 50Ω) <sup>1</sup>	$\pm(1\% \text{ of }  \text{setting}  + 10\text{mV})$	
Amplitude accuracy (guaranteed)		
<b>Output attenuator</b>	0dB or 20dB selectable	
AFG Mode Specifications		
<b>Output Channels</b>	BNC on front panel	
Connectors	Single-ended	
Output type		

<sup>1</sup> Amplitude doubles into HiZ load



Output Impedance	50Ω or 0Ω (low impedance) programmable
<b>General Specifications</b>	
Operating mode	DDS mode
Standard Waveforms	Sine, Square, Pulse, Ramp, more (Noise, DC, Sin(x)/x, Gaussian, Lorentz, Exponential Rise, Exponential Decay, Haversine)
Run Modes	Continuous, modulation, sweep, burst
Arbitrary Waveforms	Vertical resolution: 16-bit Waveform length: 16,384 points
Internal Trigger Timer	
Range	13.4ns to 100s
Resolution	104ps
Accuracy	±(0.1% setting + 5ps)
<b>AWG-2182/2184</b>	
<b>Sine Waves</b>	
Frequency Range (50Ω into 50Ω)	1 μHz to ≤ 150 MHz: 6 V <sub>p-p</sub> >150 MHz to ≤ 180 MHz: 5 V <sub>p-p</sub> <u>HV option:</u> 1 μHz to ≤ 50 MHz: 12 V <sub>p-p</sub> >50 MHz to ≤ 60 MHz: 10 V <sub>p-p</sub> >60 MHz to ≤ 100 MHz: 8 V <sub>p-p</sub> >100 MHz to ≤ 150 MHz: 6 V <sub>p-p</sub> >150 MHz to ≤ 180 MHz: 5 V <sub>p-p</sub>
Max Frequency Value	180 MHz
Flatness (1V <sub>p-p</sub> , relative to 1 kHz)	DC to 180 MHz: ±0.5dB



<p>Harmonic Distortion (1Vp-p)</p>	<p>1 <math>\mu</math>Hz to <math>\leq</math> 20 kHz: <math>&lt;-75</math>dBc  <math>&gt;20</math> kHz to <math>\leq</math> 1 MHz: <math>&lt;-70</math>dBc  <math>&gt;1</math> MHz to <math>\leq</math> 10 MHz: <math>&lt;-65</math>dBc  <math>&gt;10</math> MHz to <math>\leq</math> 50 MHz: <math>&lt;-55</math>dBc  <math>&gt;50</math> MHz to <math>\leq</math> 120 MHz: <math>&lt;-45</math>dBc  <math>&gt;120</math> MHz to <math>\leq</math> 180 MHz: <math>&lt;-40</math>dBc</p>
<p>Total Harmonic Distortion (1Vp-p)</p> <p>Spurious (1Vp-p) (excluding <math>f_{sa}-f_{out}</math>, <math>f_{sa}-2*f_{out}</math>)</p> <p>Phase Noise (1Vp-p, 10kHz offset)</p>	<p>10 Hz to 20 kHz: <math>&lt;0.04\%</math></p> <p>1 <math>\mu</math>Hz to <math>\leq</math> 10 MHz: <math>&lt;-80</math>dBc  <math>&gt;10</math> MHz to <math>\leq</math> 180 MHz:  <math>&lt;-80</math>dBc + 6dBc/octave</p> <p>10 MHz: <math>&lt;-127</math>dBc/Hz typ  100 MHz: <math>&lt;-115</math>dBc/Hz typ</p>
<p><b>Square Waves</b></p> <p>Frequency Range</p> <p>Rise/fall time</p> <p>Overshoot (1V<sub>p-p</sub>)</p> <p>Jitter (rms)</p>	<p>1 <math>\mu</math>Hz to 80 MHz: 6V<sub>p-p</sub>  <u>HV option:</u>  1 <math>\mu</math>Hz to <math>\leq</math> 30 MHz: 12V<sub>p-p</sub>  <math>&gt;30</math> MHz to <math>\leq</math> 50 MHz: 11V<sub>p-p</sub>  <math>&gt;50</math> MHz to <math>\leq</math> 70 MHz: 10V<sub>p-p</sub>  <math>&gt;70</math> MHz to <math>\leq</math> 80 MHz: 9V<sub>p-p</sub></p> <p>4ns</p> <p><math>&lt;1\%</math></p> <p><math>&lt;2</math>ps</p>



<p><b>Pulse Waves</b></p> <p>Frequency Range</p> <p>Pulse width</p> <p>Pulse width Resolution</p> <p>Leading/trailing edge transition time</p> <p>Transition time Resolution</p> <p>Pulse duty</p> <p>Overshoot (<math>1V_{p-p}</math>)</p> <p>Jitter (rms, with rise and fall time <math>\geq 4ns</math>)</p>	<p>1 <math>\mu</math>Hz to 80 MHz: <math>6V_{p-p}</math></p> <p><u>HV option:</u></p> <p>1 <math>\mu</math>Hz to <math>\leq 3</math> MHz: <math>12V_{p-p}</math></p> <p><math>&gt;3</math> MHz to <math>\leq 10</math> MHz: <math>11V_{p-p}</math></p> <p><math>&gt;10</math> MHz to <math>\leq 70</math> MHz: <math>10V_{p-p}</math></p> <p><math>&gt;70</math> MHz to <math>\leq 80</math> MHz: <math>9V_{p-p}</math></p> <p>5ns to (Period – 5ns)</p> <p>20ps or 15 digits</p> <p>4ns to 1000s</p> <p>2ps or 15 digits</p> <p>0% to 100% 14 digits (limitations of pulse width apply)</p> <p><math>&lt;1\%</math></p> <p><math>&lt;2ps</math></p>
<p><b>Double Pulse Waves</b></p> <p>Frequency Range</p> <p>Other Pulse Parameters</p>	<p>1 <math>\mu</math>Hz to <math>\leq 3</math> MHz: <math>12V_{p-p}</math></p> <p><math>&gt;3</math> MHz to <math>\leq 50</math> MHz: <math>6V_{p-p}</math></p> <p>where <math>V_{p-p} =  V_{p-p1}  +  V_{p-p2} </math></p> <p><u>HV option:</u></p> <p>1 <math>\mu</math>Hz to <math>\leq 3</math> MHz: <math>24V_{p-p}</math></p> <p><math>&gt;3</math> MHz to <math>\leq 10</math> MHz: <math>11V_{p-p}</math></p> <p><math>&gt;10</math> MHz to <math>\leq 50</math> MHz: <math>10V_{p-p}</math></p> <p>where <math>V_{p-p} =  V_{p-p1}  +  V_{p-p2} </math></p> <p>Same as Pulse Waves</p>
<p><b>Ramp Waves</b></p> <p>Frequency Range</p> <p>Linearity (<math>&lt;10</math> kHz, <math>1V_{p-p}</math>, 100%)</p> <p>Symmetry</p>	<p>1 <math>\mu</math>Hz to 5 MHz</p> <p><math>\leq 0.1\%</math></p> <p>0% to 100%</p>
<p><b>Other Waves</b></p> <p>Frequency Range</p>	



Exponential Rise, Exponential Decay	1 μHz to 5 MHz
Sin(x)/x, Gaussian, Lorentz, Haversine	1 μHz to 10 MHz
Additive Noise	
Bandwidth (-3dB)	>200 MHz
Level	0V to 6V –  carrier max value [V <sub>pk</sub> ]
Resolution	1mV
<b>Arbitrary</b>	
Number of Samples	2 to 16,384
Frequency range	1 μHz to ≤ 80 MHz
Analog Bandwidth (-3 dB)	87.5 MHz
Rise/fall time	4ns
Jitter (rms)	<2ps
<b>Frequency Resolution</b>	
Sine, Square, Pulse, Arbitrary, Sin(x)/s	1 μHz or 15 digits
Gaussian, Lorentz, Exponential Rise, Exponential Decay, Haversine	1 μHz or 14 digits
<b>Frequency Accuracy</b>	
Non-ARB	±2.0 x 10 <sup>-6</sup> of setting
ARB	±2.0 x 10 <sup>-6</sup> of setting ±1 μHz
<b>Modulations</b>	
<b>Amplitude Modulation (AM)</b>	
Carrier waveforms	Standard waveforms (except Pulse, DC and Noise), ARB
Modulation source	Internal
Internal modulating waveforms	Sine, Square, Ramp, Noise, ARB
Modulating frequency	500 μHz to 48 MHz
Depth	0.00% to 120.00%
<b>Frequency Modulation (FM)</b>	
Carrier waveforms	Standard waveforms (except Pulse, DC and Noise), ARB
Modulation source	Internal
Internal modulating waveforms	Sine, Square, Ramp, Noise, ARB
Modulating frequency	500 μHz to 48 MHz
Peak deviation	DC to 180 MHz





<p><b>Phase Modulation (PM)</b></p> <p>Carrier waveforms Modulation source Internal modulating waveforms Modulating frequency Phase deviation range</p>	<p>Standard waveforms (except Pulse, DC and Noise), ARB Internal Sine, Square, Ramp, Noise, ARB 500 <math>\mu</math>Hz to 48 MHz 0° to 360°</p>
<p><b>Frequency Shift Keying (FSK)</b></p> <p>Carrier waveforms Modulation source Internal modulating waveforms Key rate Hop frequency Number of keys</p>	<p>Standard waveforms (except Pulse, DC and Noise), ARB Internal Square 500 <math>\mu</math>Hz to 48 MHz 1 <math>\mu</math>Hz to 180 MHz 2</p>
<p><b>Phase Shift Keying (PSK)</b></p> <p>Carrier waveforms Modulation source Internal modulating waveforms Key rate Hop phase Number of keys</p>	<p>Standard waveforms (except Pulse, DC and Noise), ARB Internal Square 500 <math>\mu</math>Hz to 48 MHz 0° to +360° 2</p>
<p><b>Pulse Width Modulation (PWM)</b></p> <p>Carrier waveforms Modulation source Internal modulating waveforms Modulating frequency Deviation range</p>	<p>Pulse Internal Sine, Square, Ramp, Noise, ARB 500 <math>\mu</math>Hz to 48 MHz 0% to 50% of pulse period</p>





<p><b>Sweep</b></p> <p>Type</p> <p>Waveforms</p> <p>Sweep time</p> <p>Hold/return times</p> <p>Sweep/hold/return time resolution</p> <p>Total sweep time accuracy</p> <p>Start/stop frequency range</p> <p>Trigger source</p>	<p>Linear, Logarithmic, Staircase, and user defined</p> <p>Standard waveforms (except Pulse, DC and Noise), ARB</p> <p>40ns to 2000s</p> <p>0 to (2000s – 40ns)</p> <p>20ns or 12digits</p> <p>≤0.4%</p> <p>Sine: 1 μHz to 180 MHz</p> <p>Square: 1 μHz to 80 MHz</p> <p>Internal / External / Manual</p>
<p><b>Burst</b></p> <p>Waveforms</p> <p>Type</p> <p>Burst count</p>	<p>Standard waveforms (except DC and Noise), ARB</p> <p>Triggered or Gated</p> <p>1 to 4,294,967,295 cycles or Infinite</p>
<p><b>True Arb mode specifications</b></p>	
<p><b>Output Channels</b></p> <p>Connectors</p> <p>Output type</p> <p>Output Impedance</p>	<p>BNC on front panel</p> <p>Single-ended DC coupled</p> <p>50Ω or 0Ω (low impedance)</p>
<p><b>General specifications</b></p> <p>Operating Mode</p> <p>Run Modes</p> <p>Vertical Resolution</p> <p>Waveform Length</p> <p>Waveform Granularity</p>	<p>Variable clock (True Arbitrary)</p> <p>Continuous, Triggered Continuous, Single/Burst, Stepped, Advanced</p> <p>16 bit</p> <p>16 to 2M samples per channel (up to 256M samples optional)</p> <p>1 if the entry length is &gt;384 samples</p>



Sequence Length	8 if entry length is $\geq 16$ and $\leq 384$ samples
Sequence Repeat Counter	1 to 16,384
Timer	1 to 4,294,967,295 or infinite
Range	23.52ns to 7s
Resolution	$\pm 1$ sampling clock period
<b>Analog Channel to Channels skew</b>	
Range	0 to 6.59 us (depending on internal sampling rate)
Resolution	Channel 1/2 to Channel 3/4: $\leq 5$ ps, Channel 1/3 to Channel 2/4: 1 DAC sampling period
Accuracy	$\pm(1\%$ of setting + 20ps)
Initial skew	<200 ps
<b>Calculated bandwidth</b> (0.35 / rise or fall time) <sup>2</sup>	$\geq 160$ MHz
<b>Harmonic distortion</b> (Sine wave 32 pts, 1V <sub>p-p</sub> )	< -62dBc (@ 600MS/s, 18.75 MHz)
<b>Spurious</b> (Sine wave 32 pts, 1V <sub>p-p</sub> )	< -80dBc (@ 600MS/s, 18.75 MHz)
<b>SFDR</b> (Sine wave 32 pts, 1V <sub>p-p</sub> , including Harmonics)	< -62dBc (@ 600MS/s, 18.75 MHz)
<b>Rise/fall time</b> (1V <sub>p-p</sub> single-ended 10% to 90%) <sup>2</sup>	$\leq 2.2$ ns
<b>Overshoot</b> (1V <sub>p-p</sub> single-ended) <sup>2</sup>	< 2%
<b>Timing and Clock</b>	
<b>Sampling Rate</b>	
Range	1 S/s to 600 MS/s (1 S/s to 1.2 GS/s with x2 interpolation)
Resolution	16 Hz
Accuracy	$\pm 2.0$ ppm
Random jitter on clock pattern (rms)	<2ps
<b>Digital outputs (Optional)</b>	
<b>Output Channels</b>	

<sup>2</sup> 2x interpolation OFF



Connectors	Mini-SAS HD connector on rear panel (Non-standard pin-out)
Number of connectors	1
Number of outputs	8 bits
<b>Output impedance</b>	100Ω differential
<b>Output type</b>	LVDS
<b>Rise/fall time (10% to 90%)</b>	<1ns
<b>Jitter (rms)</b>	20ps
<b>Maximum update rate</b>	600 Mbps
<b>Memory depth</b>	2MSamples per digital channel (up to 256MSamples optional)
<b>8 bit LVDS to LVTTTL Converter Probe (Optional AT-DTTL8)</b>	
<b>Output connector</b>	20 position 2.54 mm 2 Row IDC Header
<b>Output type</b>	LVTTTL
<b>Output impedance</b>	50Ω nominal
<b>Output voltage</b>	0.8V to 3.8V programmable
<b>Maximum Update Rate</b>	125Mbps@0.8V and 400Mbps@3.6V
<b>Dimensions</b>	W 52mm – H 22mm – D 76mm
<b>Input Connector</b>	Proprietary standard
<b>Cable Length</b>	1 meter
<b>Cable Type</b>	Proprietary standard
<b>Proprietary Mini SAS HD to SMA cable (Optional)</b>	



<b>Output connector</b>	SMA		
<b>Output type</b>	LVDS		
<b>Number of SMA</b>	16 (8 bits)		
<b>Cable type</b>	Proprietary standard		
<b>Cable Length</b>	1 meter		
<b>Auxiliary input and output characteristics</b>			
	<b>AWG-2182</b>	<b>AWG-2184</b>	
<b>Marker Output</b>			
<b>Connector type</b>	BNC on front panel	BNC on rear panel	
<b>Number of connectors</b>	1		
<b>Output impedance</b>	50 $\Omega$		
<b>Output level (into 50 <math>\Omega</math>)</b>	1V to 2.5V		
Amplitude	10mV		
Resolution	$\pm(2\% \text{ setting} + 10\text{mV})$		
Accuracy			
<b>Rise/fall time (10% to 90%, 2.5V<sub>p-p</sub>)</b>	<700ps		
<b>Jitter (rms)</b>	20ps		
<b>Marker out to analog channel skew</b>			
Range	True Arb Mode: 0 to 3 $\mu$ s AFG Mode: 0 to 14s in Continuous Mode 0 to 3 $\mu$ s in Triggered Mode		
Resolution	True Arb Mode: 78ps, AFG Mode: 39ps		
Accuracy	$\pm(1\% \text{ of setting} + 140 \text{ ps})$		
Initial skew	< 1 ns		
<b>Trigger/Gate input</b>			
<b>Connector</b>	BNC on front panel	BNC on rear panel	
<b>Input impedance</b>	50 $\Omega$ / 1k $\Omega$ programmable		
<b>Slope/Polarity</b>	Positive or negative or both		



Input damage level	<-15V or >+15V
Threshold control level	-10V to 10V
Resolution	10mv
Threshold control accuracy	$\pm(10\% \text{ of }  \text{setting}  + 0.2V)$
Input voltage swing	0.5V <sub>p-p</sub> minimum
Minimum pulse width (1V <sub>p-p</sub> )	3ns
Initial trigger/gate delay to Analog Output	AFG mode: <400 ns (<460 ns in triggered sweep mode) True Arb mode: <131*DAC sampling period + 22.5 ns (<143*DAC sampling period+22.5 ns with 2x interpolation)
Trigger In to output jitter	AFG mode: <45ps True Arb mode: 0.29*DAC sampling period
Maximum Frequency	AFG mode: 65 MTps on Rising/Falling Edge, 80 MTps on Both Edges True Arb mode: 42.5 MTps where MTps = Mega Transitions per second
<b>Reference clock input</b>	
Connector type	SMA on rear panel
Input impedance	50Ω, AC coupled
Input voltage range	-4 dBm to 11dBm sine or square wave (rise time T <sub>10-90</sub> <1ns and duty cycle from 40% to 60%)
Damage level	+14dBm
Frequency range	5 MHz to 100 MHz
<b>Reference clock output</b>	
Connector type	SMA on rear panel
Output impedance	50Ω, AC coupled
Frequency	10 MHz
Accuracy	$\pm 2.0 \times 10^{-6}$
Aging	$\pm 1.0 \times 10^{-6}$ /year
Amplitude	1.65V
Jitter (rms)	<20ps
<b>Power</b>	
Source Voltage and Frequency	100 to 240VAC $\pm 10\%$ @ 45 Hz to 66 Hz



Max. power consumption	100W	
<b>Environmental characteristics</b>		
Temperature (operating)	+5°C to +40°C (+41°F to 104°F)	
Temperature (non-operating)	-20°C to +60°C (-4°F to 140°F)	
Humidity (operating)	5% to 80% relative humidity with a maximum wet bulb temperature of 29°C at or below +40°C, (upper limit de-rates to 20.6% relative humidity at +40°C). Non-condensing.	
Humidity (non-operating)	5% to 95% relative humidity with a maximum wet bulb temperature of 40°C at or below +60°C, upper limit de-rates to 29.8% relative humidity at +60°C. Non-condensing.	
Altitude (operating)	3,000 meters (9,842 feet) maximum at or below 25°C	
Altitude (non-operating)	12,000 meters (39,370 feet) maximum	
<b>EMC and safety</b>		
Compliance	CE compliant	
Safety	EN61010-1	
Main Standards	EN 61326-1:2013 – Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements	
Immunity	EN 61326-1:2013	
<b>System specifications</b>		
	<b>AWG-2182</b>	<b>AWG-2184</b>
Display	7", 1024x600, capacitive touch LCD	
Operative System	Windows 10	
External Dimensions	W 362 mm – H 143 mm – D 258 mm (3U 10" rackmount)	
Weight	6.25 kg	
Front panel connectors	CH1, CH2 OUTPUT (BNC) MARKER OUT (BNC) TRIGGER IN (BNC)	CH1, CH2 OUTPUT (BNC) CH3, CH4 OUTPUT (BNC)
Rear panel connectors	REF CLK IN (SMA)	



SPECIFICATIONS

	<p>REF CLK IN (SMA) REF CLK OUT (SMA) External Monitor ports DIGITAL POD A[7..0] 1 USB 2.0 ports or more Ethernet port (10/100/1000BaseT Ethernet, RJ45 port) 2 PS/2 keyboard and mouse ports</p>	<p>REF CLK OUT (SMA) MARKER OUT (BNC) TRIGGER IN (BNC) External Monitor ports DIGITAL POD A[7..0] 1 USB 2.0 ports or more Ethernet port (10/100/1000BaseT Ethernet, RJ45 port) 2 PS/2 keyboard and mouse ports</p>
<b>Hard Disk</b>	240 GB SSD or better	
<b>Processor</b>	Intel® Celeron J1900, 2 GHz (or better)	
<b>Processor Memory</b>	4 GB or better	

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## Table of Available Models

Item	Description
<b>AWG-2100-DIG8</b>	8 channel Digital license (Mini SAS cable included)
<b>AWG2182-2M</b>	2ch 600Ms/s AWG 2Ms memory - 180MHz AFG
<b>AWG2182-64M</b>	2ch 600Ms/s AWG 64Ms memory - 180MHz AFG
<b>AWG2182-256M</b>	2ch 600Ms/s AWG 256Ms memory - 180MHz AFG
<b>AWG2184-2M</b>	4ch 600Ms/s AWG 2Ms memory - 180MHz AFG
<b>AWG2184-64M</b>	4ch 600Ms/s AWG 64Ms memory - 180MHz AFG
<b>AWG2184-256M</b>	4ch 600Ms/s AWG 256Ms memory - 180MHz AFG

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## Table of Available Options and Accessories

Item	Description
<b>Options</b>	
<b>AWG-2182-HV</b>	High voltage output (12Vpp on 50ohm) for AWG2182
<b>AWG-2184-HV</b>	High voltage output (12Vpp on 50ohm) for AWG2184
<b>AWG-2100-DIG8</b>	8 channel Dig license (Mini SAS cable included) for AWG2000
<b>AWG2002-WAR</b>	3 years warranty extension for AWG2182
<b>AWG2004-WAR</b>	3 years warranty extension for AWG2184
<b>Accessories</b>	
<b>AT-DTTL8</b>	LVDS to LVTTTL digital adapter probe
<b>AT-LVDS-SMA8</b>	LVDS to SMA digital adapter cable
<b>RIDER-C-RACK</b>	Rackmount kit for Rider C series (AWG2000)
<b>GPIB / USB-TMC</b>	GPIB and USBTMC Ports for Remote Control
<b>SSD-250</b>	Additional 250GB Solid State Disk for RIDER series
<b>SSD-500</b>	Additional 500GB Solid State Disk for RIDER series
<b>SSD-1000</b>	Additional 1TB Solid State Disk for RIDER series