

ARB RIDER 4000 Series

Time to **Reinvent** Advance Signal Generator

Dual Channel 1 GHz
Arbitrary Waveform Generator,
AFG and DPG all in one
instrument.

- | 2.5 GS/s, 14 Bit Vertical Resolution
- | Minimum Edge time down to 350 ps
- | Maximum dynamic range up to 5Vpp into 50 ohms
- | Up to 64 Mpts per Channel
- | 16-32 Digital Channels in synchronous with analog Generation
- | Multi Instrument Synchronization: up to 8 Analog Channels
- | SW User Interfaces: Expert Rider for AWG mode and Simple Rider for AFG mode

The **ARB Rider Series** offers premium signal integrity with the easiest to use touch screen display interface (**SimpleRider™**).

The Generation of complex signals requires only a few screen touches.

The output Voltage can be adjusted in Amplified mode up to 5 Volts pk-pk into a 50 Ω load with the possibility, thanks to the analog Bandwidth of 1 Ghz, of performing edges down to 350 ps with minimal overshoot and ringing.

The Disruptive and innovative architecture provides the possibility to generate unmatched performance, versatile functionality, outstanding usability, and upgradability during the life of the instrument.

ARB Rider 4000 is also an affordable waveform generation platform which helps to stretch the specifications of your project to the Limit, offering not just analog output but also digital Channels.



 **Active Technologies**

Technology

Re-Inventing the Signal Generation

Software Technology

The **Arb Rider 4022** perfectly matches the multi function requirement of an AWG, AFG and DPG on a single platform solution.

Expert Rider and **Simple Rider AFG** user interfaces make quick and easy the generation of complex arbitrary waveforms and complex modulations in few bottom clicks.



Expert Rider UI

With the **Expert Rider UI**, the designers can take advantage of all the AWG mode features: they can create complex waveforms with up to 16,384 entries of analog waveforms and digital patterns, insert them in a sequence, apply loops, jumps, and conditional branches. Moreover an external screen can be connected to use the **Expert Rider** as a powerful mixed waveform editor having the possibility of adding noise, filters and

importing large set of modulated data like RF or I/Q waveforms.

Channel1 and **Channel2** can be synchronized with a skew control of 10 ps.

The outputs may be configured to be differential, single ended, or AC coupled.

Digital output combined with analog generation is an ideal tool to simplify digital designs and validation (*digital channels are optional*).



ExpertRider Import of I/Q Signals

Intuitive User Interface: Simple Rider AFG™

SimpleRider UI is designed as a quick touch to drive to impose simplicity in operating with a signal generator, by optimizing the today's modern technique, used on Tablet or smart phones, of capacitive touch screen display.

The **7"** capacitive touch-screen displays all the related parameters at one glance.

The DDS's Patent feature used in **Simple Rider AFG Software**, lets the user to change all the parameters on-the-fly glitch free preserving the waveform shape.

All controls and settings are always one touch away: swipe gesture to change the channel, the carrier selection and have access to the modulation parameters, swipe into the waveform gallery to import a signal in a glance, add easily noise to test the device limits and use the touch-friendly virtual numeric keyboard to change parameter values on the unit.



IoT & Ind 4.0 perfect RF Modulator

ARB and **Function Riders** will be the iconic instrument for those applications.

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.

In all those kind of applications, it is fundamental to have multiple synchronized units.

System extension with multi-unit synchronization

Up to four instruments can be synchronized together in order to build a real 8 channel waveform generator system, which is extremely useful in the applications where multiple channels are needed, like MIMO.



Research Applications

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

Complex waveform and/ or sophisticated Pulses emulation based variable or multilevel edges 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.

There are several large experiments where Riders can be the perfect solution to combine high- speed transition time with high channels density (4 channel in just 3U – 19" rackmount).



SONAR - Sonar image of shipwreck of the Latvian Naval Forces ship *Virsaitis* in Estonian waters.

Army applications

Electronics warfare signals driven by Radar or Sonar systems perfectly match with these generators.

Large BW Riders may be also used on digital modulation systems for Radio Applications or others I/Q signal modulation.

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 semiconductors engineers.

The fast edges and pulse generation may be used to provide characterization in fast Power devices.



CERN - Assembling the last module of the vertex locator for LHCb. Photograph: Maximilien Brice. © 2007-2017 CERN. All Right Reserved.

ARB Rider 4000 Series

Re-Inventing the Advance Signal Generators

SIMPLY RIDER INTERFACE FOR AN EASY AND QUICK USE OF Riders ARBs

1 Touch Screen display and Soft Keyboard

The new **Rider Series** delivers **7" capacitive** touch screen display to the mainstream waveform generator market for the first time.

The touch-screen friendly **SimpleRider™** software allows users to generate waveforms quickly by a few screen touches.

The UI ergonomic approach is well balanced to offer multiple ways to operate the instrument by offering a complementary soft keyboard and a useful central knob for fine tuning and adjustments during the set up operation.

Standard configurations may be stored on the system memory for easy set-up recalls.

2 Dual Analog Channel + 32 Digital Channels

Variable sampling rate range from 100 S/s to 2.5 GS/s, with 14-bit vertical resolution, offer best signal integrity at unmatched price performance.

Optional arbitrary waveform memory up to 64 Mpts for each analog channel and 32 Mbit for each digital channel for long waveforms are available.

16-32 digital channel outputs can be purchased as option.

Dual operation modes **SimpleRider™** AFG (DDS AFG mode) and **ExpertRider™** (arbitrary AWG mode).

Each channel may generate edges with rise time as low as 350 ps.



Output Voltage is fully adjustable up to 5 Volts pk-pk inside a voltage window of ± 5 Volts.

3 Trigger, view, generate and sync

Trigger events may be generated internally or captured by an external trigger source or remotely from Ethernet connection.

The large dynamic range combined with the fast edge rate represents a great solution for semiconductor testing as well.

4 Create Easily waveforms and pulses with Simple Rider UI

Simple Rider UI is designed for touch and it has been developed to put all the capabilities of the modern Pulse and 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 waveforms, modulated signals and pulses in few touches.

- The swipe gesture gives easy access to carrier, modulation and pulse 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 your setup also during waveform creation.

SimpleRider supports the ethernet interface for remote control and instrument programming.

SimpleRider Touch UI is available on all the instruments of the Rider Series product family.



RIDER 
SERIES

ARB Rider 4000 SPECIFICATION

ARB Rider 4000 SERIES

AFG MODE - 4022

Operating Mode	DDS
Analog Channels	2
Real Time Sample Rate	2.5GS/s, fixed
Vertical resolution	14 bit
Amplitude	5 Vp-p into 50 Ohm load
programmable offset	+/- 2.5V
Run Modes	Continuous, modulation, sweep, burst
Standard Waveforms	Sine, Square, Pulse, Ramp, more (Noise, DC, Sin(x)/x, Gaussian, Lorentz, Exponential Rise, Exponential Decay, Haversine)
Arbitrary Waveforms	16384 points

Frequency Range	
Sine	1 μ Hz to 600 MHz
Square, Pulse	1 μ Hz to 330 MHz
Ramp, Exponential Rise, Exponential Decay	1 μ Hz to 30 MHz
Sin(x)/X, Gaussian, Lorentz, Haversine	1 μ Hz to 60 MHz
Arbitrary	1 μ Hz to 400 MHz

Square waves	
Rise/fall time (typical)	1 ns
Overshoot (1 Vp-p, typical)	<2%
Jitter (rms, typical)	<10 ps

Pulse waves	
Pulse width	1 ns to (Period - 1 ns)
Resolution	10 ps or 15 digits
Leading/trailing edge transition time	800 ps to 1000 s
Resolution	1 ps or 15 digits
Overshoot (1 Vp-p, typical)	<2%
Jitter (rms, typical)	<10 ps

Modulation Type	AM, FM, PM, FSK, PSK, PWM
Modulation Frequency	Internal: 500 μ Hz to 50 MHz, External: 10 MHz maximum

Common Characteristics

Display Characteristics & OS	7 inch, capacitive touch LCD – Windows 10
Dimensions & Weight D(3U19"rackmount)	W 445 mm – H 135 mm – D320mm – 11 KG
Removable Hard Disk	Ensures the security of confidential data
Remote Control	Ethernet

ARB Rider 4000 SPECIFICATION

ARB Rider 4000 SERIES

AWG MODE - 4022

Operating Mode	AWG
Number of channels: Analog, Digital, Markers	2, 16/32(optional), 2
Real Time Sample Rate	100 S/s to 2.5 GS/s variable
Vertical resolution	14 bit
Waveform Length	Standard: 1 M points; Optional: 16 M, 32 M, 64 M points
Run Modes	Continuous, sequencer, triggered, gated
Channel Skew	≤20 ps
Skew Adjust Resolution	10 ps

Output Characteristics

Output Type and Amplitude	DC-AMP (single ended or differential), 0 to 5Vpp into 50 Ω
Rise/Fall Time and Calculated Bandwidth	800 ps, 460 MHz
Vocm Range (50 Ω load, single ended)	-2.5V to 2.5V
Vocm Range (HiZ load)	-5V to 5V

Output Type and Amplitude	DIRECT DAC (single-ended or differential), 0 to 0.8vpp into 50 Ohm
Rise/Fall Time and Calculated Bandwidth	350 ps, 1 GHz

Output Type and Amplitude	AC (single-ended AC coupled), 0 to 2 vpp into 50 Ohm
Rise/Fall Time and Calculated Bandwidth	350 ps, 1 GHz

Digital Outputs

Channel Count	32
Electrical Standard	LVDS
Connector	Mini SAS HD

Accessories	Mini SAS HD to SMA	For slower applications, LVDS to LVTTTL are available as well
 		

About Active Technologies

Active Technologies is an Italian company expert in semiconductor test equipment and electronic instrumentation design.



ARB Rider

4000

AWG, AFG and DPG

Series

RIDER 
SERIES

© 2017 by Active Technologies All rights reserved. Specifications, prices, availability, and delivery subject to change without notice.

Product or brand names are trademarks or requested trademarks of their respective holders.

RIDER™ is an Active Technologies trademark

RIDER Fast Edge™ is an Active Technologies trademark

RIDER DAC™ is an Active Technologies trademark

All other product or brand names are trademarks or requested trademarks of their respective holders.