

PULSE RIDER

- | 70 ps Edge Time
- | 5 V pk-pk Output Voltage Range
- | Min Pulse Width less than 300 ps
- | Dual and Quad Channels Systems
- | SimpleRider™ touch User Interface

Time to Reinvent Pulse Generators



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

The Generation of pulses requires only a few screen touches.

The output Voltage can be adjusted up to 5 Volts pk-pk in a window of ± 5 Volts with 70 ps edge rate (based on **RiderEdge™** technology) and transitions with minimal overshoot and ringing.

Its innovative hardware architecture provides the possibility to generate multiple pulse sequences, such as **double, triple or quad pulses**, with fully independent timing parameters.



Re-Inventing the Signal Generation

Rider DAC™

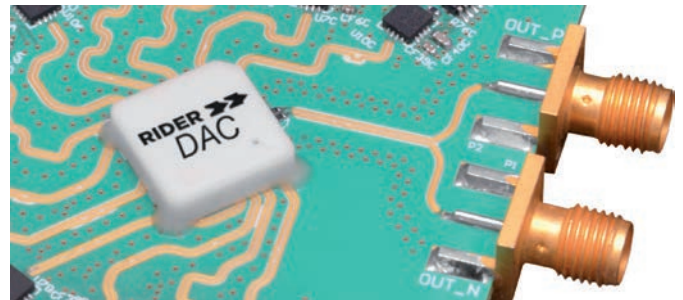
First of the Market: 16 Gs/s Real Time Sample Rate @ 16 bits resolution digital to analog converter.

This DAC is embedded in the Rider Series (AWGs and AFGs) and offers the best solution on the market to reach high speed signal generation and high resolution.

The market of Arbitrary Function or Waveform generator is mostly driven by the DAC performance limits.

Active Technologies is now releasing this new patent pending technology overdriving the signal generation market and redefining the future of DAC components.

AT roadmap is to develop faster DACs and break the limits in dynamic range and memory length to offer a real fully operative solution for best signal fidelity and complex waveform generation required in challenging situation or emulation.



RIDER DAC™ : 16 GS/s@16 Bits DAC ASIC by Active Technologies

Rider FastEdge™

First to market low cost Analog edge converter with the ability to reach less than 70 ps edge (20-80%) at 5 volts @ 50 ohms with fully adjustable output voltage.

FastEdge technology is lower in cost of any competitive solution and well prepared to be combined with more innovations in terms of edge variability and dynamic range expansion for specific applications.

FastEdge technology is patent pending and it will boost Active Technologies leadership in signal generation providing an excellent platform of components for the actual and future market of Modern Signal Generators.

Simple Rider™

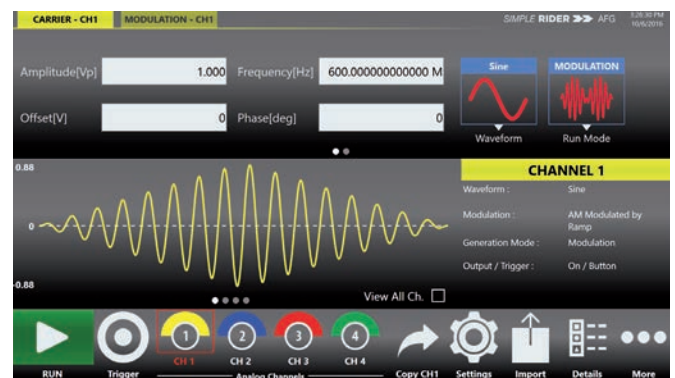
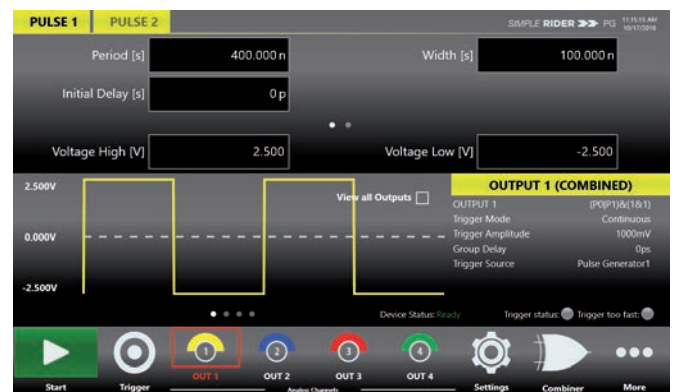
SimpleRider UI is designed for touch to drive simplicity in operating with a signal generator, by optimizing the today's modern technique, used on Tablet or smart phones, of capacitive touch screen display.

All important instrument controls and settings are always one touch away: swipe gesture to change the channel, pulse selection and have access to the modulation parameters, generate multiple pulses easily, swipe into the waveform gallery to import a signal in a glance, use the touch-friendly virtual numeric keyboard to change parameter values on the fly.

Finally a display interface is offered that will become familiar in less than a minute: the signals will be generated quickly, adjustments can be done lively, set-up are at one touch.

AWG, AFG and Pulse Rider Series products are equipped with the same

Simple Rider UI to share the same benefits with different users and applications.



SimpleRider™ Pulse and AFG Touch User Interfaces

Application AREAS

Big Physics Applications

Physics applications have a perfect match with the Rider generator series and in particular with the Pulse Rider Generator.

The combination of fast edge generation, excellent dynamic range and easy to use user interface go perfectly on large experiments areas such Experiments colliders, Lasers modulation, detectors and strips silicon emulation.

High Energy/Voltage Semiconductors system for collider's applications can be

modulated and tested thanks to the Pulse Rider patterns.

Lasers applied for Plasma Physics experiments may require modulating pulses down to less than 100 ps.

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

Pulses may be also used in mass spectroscopy applications to test TOF (time of flight) systems and in chemistry application to easily prove functionality.



CERN - Assembling the last module of the vertex locator for LHCb. Photograph: Maximilien Brice. © 2007-2016 CERN. All Right Reserved.

Military Radar and Sonar applications

Army/Navy may also require fast pulse generation for testing or emulation.

Radar or Sonar systems perfectly match with these generators to better test and prove complex detection systems.

Pulse Rider is a good fit for areas where a large amount of channels is required and

the cost of DAC solutions are too high and too complex to be managed.

ATI Electromagnetic systems largely used in military applications may be tested by Rider Series Generators.

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.



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

Semiconductors Test

Speed of modern Silicon is imposing high quality and high fidelity test systems.

Today's patterns generators offer a

good combination of performance but limited in edge speed and dynamic range.

Pulse Rider, for the first time, offers both high speed and high dynamic range, combined with an easy to use interface and

pulse mixing capabilities in one or multiple channels.

This is excellent to test components and provide the right performance to test and prove specs to validate integrated circuits. DTG functionality may be created by synchronizing

one or more Pulse Riders units (4 Channels each).

The Rider series offers also, in the AWGs, digital outputs to be used for digital pattern generation.

Re-Inventing the Pulse Generators

EASE of use combined

with **POWERFUL** performance

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 pulses 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 configuration recalls.

2 2-4 Channels Pulse Generator

Multiple pulses generation is always available with the basic **Dual Channel** version or with the **Quad Channel** version.

Each channel may generate pulses with rise time as low as 70 ps, thanks to the **RiderEdge™** amplifier, and frequency repetition rate from mHz to 500 MHz.

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

The new family of **RiderPulse™** Generator can produce Multiple output pulses (double, triple, quad) with independent repetition rate, width, delay, amplitude and polarity.

This gives the possibility to use the instrument as a digital delay generator for rescaling, synchronizing, delaying, gating and triggering multiple devices with respect to one unique event.



The output channels can be combined in order to generate multiple pulses (i.e. double pulse, quad pulse) each of them with independent timing parameters (delay, width, repetition rate).

3 Trigger, view, generate and sync

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

The trigger output may be delayed according to the application and then, thanks to the **RiderEdge™** technology, amplified to increase the voltage dynamic from small signals inputs.

Trigger in and Trigger out may be used to synchronize multiple units to obtain several pulses and to provide a perfect solution for specific Big Physics or Military applications.

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

Active Technologies has a long knowledge in this application areas and provides specific products to complement the Rider Generator series.

4 SimpleRider Pulse Touch User Interface

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 single or multiple pulses in few touches.

- The swipe gesture gives easy access to the output 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 pulse combination operations.

Pulse Rider supports the most common interfaces for remote control (Ethernet, GPIB) for easy customized instrument programming.

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



RIDER 
SERIES

Other Rider Series Products

Arb Rider

Arb Rider, based on the Rider DAC™ ASIC, by combining 16 GS/s Real Time Sample Rate with 16 Bit Vertical Resolution, is the fastest 16 Bits resolution AWG on today's market.

Arb Rider combines fast analog and digital waveform generation with high resolution and with no compromise in memory depth to meet the demand for applications where speed, resolution and quality is an issue.

The product is configurable in one, two or four independent channels with full capabilities in each channel.

The four channel model offers 32 bit digital outputs (16 bit in the two channel model) for high speed digital pattern generation.

Arb Rider is controlled by the Expert Rider UI, an advanced waveform generation software that allows the user to define advanced waveforms, create waveform sequences, scenarios and control all the instrument features.

With arbitrary waveform generator (AWG), arbitrary function generator (AFG), and digital pattern generator (DPG) operating mode, the Arb Rider is the perfect 3-in-1 instrument for the diverse needs in today's testing environment.



Operating mode	AWG/AFG/DPG
Analog channels	1, 2, 4
Digital channels	8, 16, 32
Resolution	16 Bit
Sampling Rate	47 MS/s to 16 GS/s
Amplitude Range (into 50 Ohm)	2 Vpp SE, 4 Vpp Diff.
Rise/Fall times (10% to 90%)	< 87 ps (Pulse at 1 Vpp S.E.)
Calculated bandwidth (0.35/T10-90)	> 4 Ghz
Waveform length	4G Samples per channel

Function Rider

This product is breaking all barriers of today's AFGs market by offering 10 times the bandwidth of other solutions, solving the issue of Analog Generation in combination with digital modulations.

Function Rider is available in single, dual and quad channel configurations and 1 or 2 GHz bandwidth options performing full BW in each channel.

Function Rider is based on Rider DAC™ Technology (16 GS/s @ 16 Bits), so it offers an excellent performance and great resolution.

The product is the perfect solution for Wireless application as it combines 2 GHz analog bandwidth with advanced modulations.

The unit can be used in place of an ARB and an Analog RF generator to over pass the actual AFG limitation in Bandwidth.

Ethernet and GPIB are embedded for an easy and remote control approach.

Several modulations are available like AM, FM, PM, FSK, DQPSK, PWM Sweep and burst.



Channels	1, 2, 4
Resolution	16 Bit
Sampling Rate	Up to 16 GS/s
Amplitude Range (into 50 Ohm)	50 mVpp to 5 Vpp
DC offset Range (into 50 Ohm)	± 2.5 V
Waveform Characteristics	
Sine, Square, Pulse, Arbitrary Frequency Range	1 uHz to 2 Ghz
Pulse Rising/Falling Edge Time	200 ps to 200 s
Square Rising/Falling Edge Time	200 ps

Pulse Rider SPECIFICATION



Pulse Rider

Pulse Rider PG - 1072

Pulse Rider PG - 1074

Channel count	2	4
Amplitude pk-pk	10 mVpp to 5 Vpp Adj.	10 mVpp to 5 Vpp Adj.
Output impedance	50 Ohm nominal	50 Ohm nominal
Baseline Offset	± 2.5 V Adj.	± 2.5 V Adj.
Baseline Offset resolution	< 2 mV	< 2 mV
Amplitude resolution	< 10 mV	< 10 mV
DC amplitude accuracy	± (1% of setting + 10 mV)	± (1% of setting + 10 mV)
Rise/Fall time (10%-90%) Typ.	< 100 ps fixed	< 100 ps fixed
Rise/Fall time (20%-80%) Typ.	< 70 ps fixed	< 70 ps fixed
Overshoot Typ.	< 10%	< 10%
Channel count	2	4
Repetition rate	< 1 Hz to 500 Mhz	< 1 Hz to 500 Mhz
Period	2 ns to > 1 s	2 ns to > 1 s
Period resolution Typ.	10 ps	10 ps
Period accuracy Typ. @ 25°C	± 5 ppm	± 5 ppm
Period jitter, RMS Typ.	< 25 ps	< 25ps
Width	< 300 ps to > 1 s	< 300 ps to > 1 s
Width resolution Typ.	10 ps	10 ps
Width accuracy Typ.	± (0.01% + 20 ps)	± (0.01% + 20 ps)
Delay (Trigger out to Output)	0 to > 1 s	0 to > 1 s
Delay resolution Typ.	10 ps	10 ps
Delay accuracy Typ.	± (0,01% + 20 ps)	± (0,01% + 20 ps)
SE or Complementary output	Both	Both
Trigger mode	continuous, single, burst, gated, external	continuous, single, burst, gated, external
Trigger in threshold	programmable in 50 mV steps	programmable in 50 mV steps
Trigger in range	± 10 V	± 10 V
Trigger in impedance	50 Ohm or 1K Ohm programmable	50 Ohm or 1 K Ohm programmable
Trigger in to output jitter, RMS Typ.	< 35 ps	< 35ps
Trigger output impedance	50 Ohm nominal	50 Ohm nominal
Trigger output range (open load)	1,8 V to 3,3 V	1,8 V to 3,3 V
Display Characteristics & OS	7 inch, 1024x600, capacitive touch LCD - Windows 10	7 inch, 1024x600, capacitive touch LCD - Windows 10
Dimensions & Weight	W 445 mm - H 135 mm - D 320 mm D (3U 19" rackmount) - 11 Kg	W 445 mm - H 135 mm - D 320 mm D (3U 19" rackmount) - 11 Kg

About Active Technologies

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



70ps @ 5Vpp Pulse Generators

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S E R I E S

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