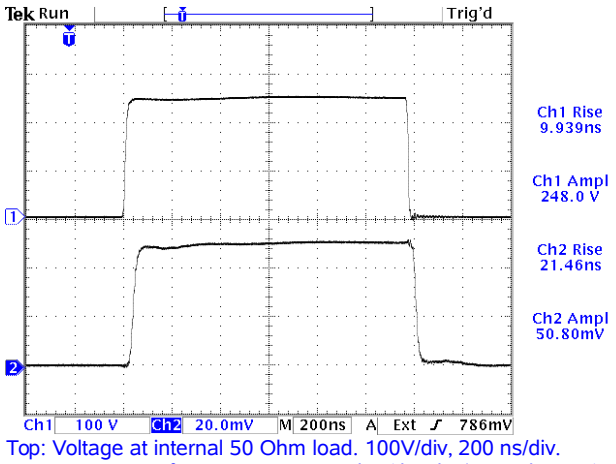
AVTECH

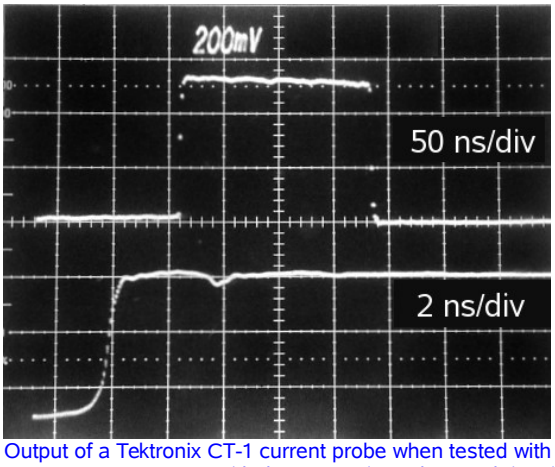
GPIB
IEEE-488

AVR-3-PW-TEK SERIES

5 A / 10 ns and 1 A / 0.5 ns
PULSE GENERATORS
FOR CURRENT PROBE TESTING



Top: Voltage at internal 50 Ohm load. 100V/div, 200 ns/div.
Bottom: Output of A6303 15 MHz probe (the device under test).
The A6303 probe is clamped to the shorting bar. 20 mV/div.



Output of a Tektronix CT-1 current probe when tested with the AVR-3-PW-TEK3-B-P with the -CT option. The rated rise time of the CT-1 is 350 ps, which agrees well with the lower waveform.

- **Amplitudes to 250 Volts, 5 Amps**
- **Internal or external 50.0 Ohm load**
- **Clamping bar or cable for attaching probes**
- **0.5 or 10 ns rise time**
- **Manual and GPIB-equipped models**
- **Ideal for testing of a wide range of current probes, such as the Tektronix A6303, TCP300 / 400 series, CT-1, CT-2, etc.**

The AVR-3-PW-TEK series was specially designed for the testing of current probes such as the Tektronix A6303, the TCP300 and TCP400 series, and the CT-1 and CT-2 high-speed probes.

Model AVR-3-PW-TEK2-C and model AVR-3-PW-TEK2-B generate 10 ns rise time voltage pulses (0 to 250V, 250 ns to 250 us), suitable for testing A6303 or TCP303 probes. A 50Ω termination is provided. A variable current of up to 5 Amperes is defined by the 250 Volt pulse and the 50Ω termination. For other applications, the output pulse may be connected to a user-supplied 50Ω load, if desired.

Model AVR-3-PW-TEK3-B has all of the features of the AVR-3-PW-TEK2-B, but adds a second output for testing lower-current, higher-speed current probes. This additional output can generate pulse amplitudes up to 50V and 1A, with 0.5 ns rise times. The pulse width is variable from 50 ns to 200 ns. The two outputs allow this model to test both high-speed lower-current probes such as the TCP312 or TCP305, and lower-speed high-current probes such as the A6303 or TCP303.

The AVR-3-PW-TEK2-C is provided with a "shorting bar" that is normally connected between the front-panel OUT and IN terminals. The IN terminal connects to ground via an internal 50.0 Ω termination. The current probe is clamped around the shorting bar.

The AVR-3-PW-TEK2-B and AVR-3-PW-TEK3-B use a slightly different physical arrangement. An external output module is provided for each output. Replaceable flexible shorting cables are mounted on these output modules. (The shorting cables are standard RG-316 coaxial cables.) During tests, the output module are connected to the mainframe by a 12" / 30 cm length of coaxial cable, and the current probes are clamped around the shorting cables. The output modules also contain the 50 Ohm termination.

The supplied shorting bars, cables, and output modules are designed to preserve the fast rise and falls times as much as possible, despite the parasitic inductance introduced by the probes and the unshielded connections (i.e., imperfect transmission lines) required to measure current flow.

Model AVR-3-PW-TEK3-B is optionally available with an additional output module that is physically suitable for use with the Tektronix CT-1 and CT-2 ultra-fast (i.e., sub-nanosecond rise time) current probes.

Aside from the internal clock, these instruments can also be triggered by a single-pulse pushbutton or an external TTL-level trigger input. When triggered externally the output pulse width can be set to track the input trigger pulse width (PW_{OUT} = PW_{IN}). A delay control and a sync output are provided for scope triggering. A gate input is also provided on models with the "-B" suffix.

Models with the "-B" suffix include a complete computer control interface. This provides GPIB and RS-232 computer-control, as well as front panel keypad and adjust knob control of the output pulse parameters. A large backlit LCD displays the output amplitude, frequency, pulse width, and delay. See http://www.avtechpulse.com/gpib for details. A LabView driver is available for download at http://www.avtechpulse.com/labview.

The AVR-3-PW-TEK2-C model provides output pulse parameters similar to the AVR-3-PW-TEK2-B, but does not include the GPIB or RS-232 interfaces (i.e. no computer control or LCD display). The output parameters are controlled by front-panel switches and one-turn controls.

It is recommended that test applications which previously used the AVR-3-PW-TEK2-C-P migrate to the newer AVR-3-PW-TEK2-B-P or AVR-3-PW-TEK3-B-P models instead. These have all of the functionality of the older AVR-3-PW-TEK2-C-P, and add new capabilities (such as computer control).

Many specifications can be adapted to meet particular requirements. Contact Avtech with your special needs!

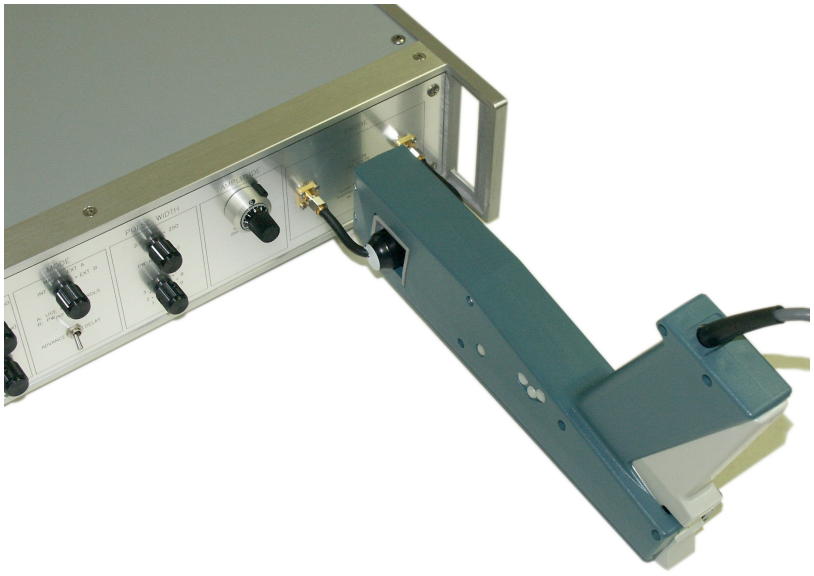
SPECIFICATIONS AVR-3-PW-TEK SERIES

Model:	AVR-3-PW-TEK2-C[1]	AVR-3-PW-TEK2-B[2]	AVR-3-PW-TEK3-B[2]	
Basic Description:	High current pulser, no GPIB / RS-232	High current pulser, with GPIB / RS-232	High and low current "combo" pulser, with GPIB / RS-232	
Number of Outputs:	1		2	
			Output 1	Output 2
Amplitude ($R_L \geq 50\ \Omega$)[3,4]:	10 to 250 V			10 to 50V
Amplitude accuracy ($R_L = 50\Omega$):	Greater of ±3% or ±0.5V.	Greater of ±2% or ±0.5V.		
Provided termination:	50.0Ω ± 1%			
Voltage rise & fall times:	≤ 10 ns (20%-80%)			≤ 0.5 ns (20%-80%)
Pulse width (FWHM):	250 ns to 250 us			50 to 200 ns
Droop (at max. pulse width):	≤ 2%			
Overshoot (at max. amp.):	≤ 5%			
PRF:	Internal trigger: 1 Hz to 10 kHz, External trigger: 0 Hz to 10 kHz			
Duty cycle (max):	0.25%			0.2%
Polarity[5]:	Positive or negative (specify)			
Propagation delay:	≤ 150 ns (Ext trig in to pulse out)			
Jitter:	± 100 ps ± 0.03% of sync delay (Ext trig in to pulse out)			
Output connector:	SMA	BNC		SMA
Probe attachment style:	Rigid clamping bar on front panel.	Flexible clamping cable on output module[6]. The output module is connected to the front panel by a 12" / 30 cm coaxial cable.		
Trigger modes: -B units:	Internal trigger, external trigger (TTL-level pulse, > 10 ns, 1 kΩ input impedance), front-panel "Single Pulse" pushbutton, or single pulse trigger via computer command.			
-C units:	Internal trigger, external trigger (TTL-level pulse, > 50 ns, 1 kΩ input impedance), front-panel "Single Pulse" pushbutton			
Variable delay: -B units:	0 to 1.0 seconds, for all trigger modes (including external trigger). Common to all outputs.			
(Sync to main out) -C units:	0 to 250 us, for internal trigger mode only. No variable delay in external trigger mode.			
Sync output (will drive 50Ω):	+3 Volts, 200 ns	+3 Volts, 100 ns		
Gated operation:	No gate function.	Synchronous, active high or low, switchable.		
GPIB and RS-232 control[2]:	Not available.	Standard feature on all -B units.		
Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web:	Not available.	Optional[7]. Recommended as a modern alternative to GPIB / RS-232. See http://www.avtechpulse.com/options/vxi for details.		
LabView drivers:	Not available.	Check for available downloads at http://www.avtechpulse.com/labview.		
Power requirements:	100 - 240 Volts, 50 - 60 Hz			
Dimensions:	100 mm x 430 mm x 375 mm (3.9" x 17" x 14.8")			
Mounting:	Any. Add -R5 to the model number to add a rack-mount kit.			
Temperature range:	+5°C to +40°C			

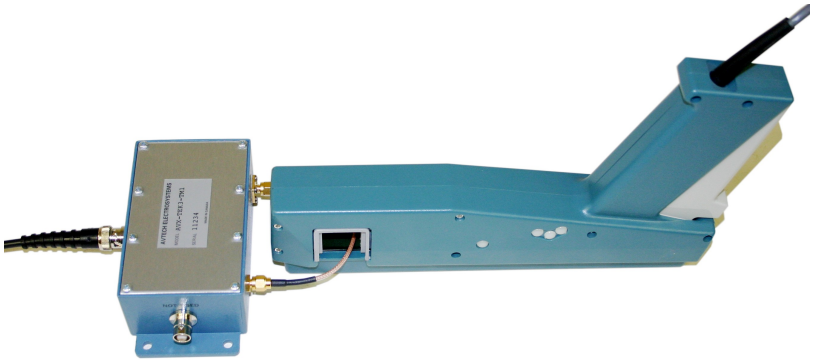
1) -C suffix indicates stand-alone lab instrument with internal clock and line powering. (See http://www.avtechpulse.com/formats for the basic instrument formats). Not recommended for new designs. Use -B versions instead.
2) -B suffix indicates IEEE-488.2 GPIB and RS-232 control of amplitude, pulse width, PRF and delay (See http://www.avtechpulse.com/gpib).
3) For operation at amplitudes of less than 10% of full-scale, best results will be obtained by setting the amplitude near full-scale and using external attenuators on the output.
4) The amplitude of the AVR-3-PW-TEK2-C may also be controlled by a 0 to +10V DC voltage applied to a rear-panel BNC connector, in addition to the standard front-panel controls.
5) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative).
6) An optional additional output module is available for "Output 2" of the AVR-3-PW-TEK3-B, which is suitable for use with CT-1 and CT-2 current probes. This output module uses a very short length of de-solderable bus-bar wire (instead of flexible cable) which must be fed through the probe. Add the suffix "-CT" to the model number to specify this option.
7) Add the suffix -VXI to the model number to specify the Ethernet port..

AVR-3-PW-TEK3-B-P

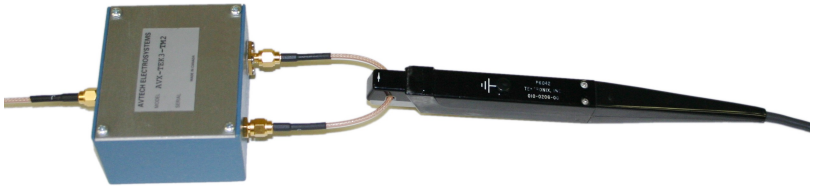
AVR-3-PW-TEK2-C-P



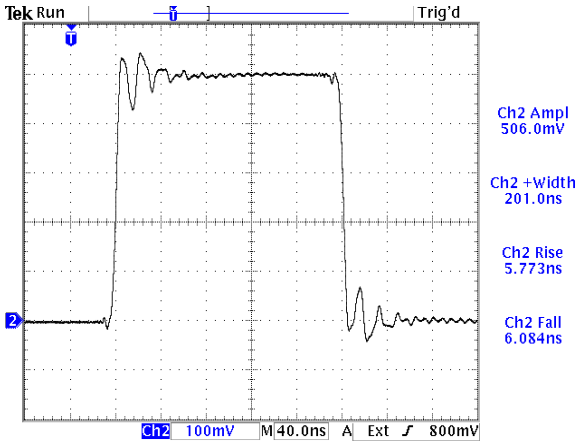
AVR-3-PW-TEK2-C-P being used to test a Tektronix A6303 probe. The probe is clamped to the shorting bar.



A high-current probe is clamped to the shorting bar on the AVX-TEK3-TM1 output module supplied with the AVR-3-PW-TEK3-B. The cable fed through the probe is a standard, replaceable RG-316 coaxial cable.



A low-current probe is clamped to the shorting bar on the AVX-TEK3-TM2 output module supplied with the AVR-3-PW-TEK3-B.



Output of P6042 50 MHz probe when driven by a 50V, 1A pulse with 0.5 ns rise time from the AVR-3-PW-TEK3-B. 40 ns/div. The slight ringing is caused by the impedance mismatch of the unshielded section of cable where the current probe is installed.