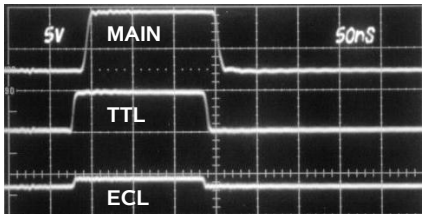
AV-1021, AV-1041 SERIES

±10V AND ±20V
GENERAL-PURPOSE
PULSE GENERATORS



- IEEE-488.2 GPIB (and RS-232) control
- Ethernet included
- AV-1021-B: ±10 Volt / 5 MHz / 10 ns rise time
- AV-1041-B: ±20 Volt / 100 kHz / 100 ns rise time
- Variable DC offset
- Variable delay with low jitter

Model AV-1021-B is a general-purpose 5 MHz lab pulse generator which includes IEEE-488.2 GPIB (and RS-232) computer control of amplitude, polarity, DC offset, pulse width, pulse repetition frequency, trigger mode and delay.

This instrument features a front panel keyboard and adjust knob control of the output pulse parameters along with a four line by 40 character back-lit LCD display of the output amplitude, polarity, pulse width, pulse repetition frequency, DC offset and delay.

The output pulse amplitude and the DC offset are both variable up to ±10V. The output impedance can be set at 50Ω (for transmission-line backmatching) or at 2Ω for maximum output voltage. (The amplitude and offset are reduced by a factor of two when the 50Ω setting is used with a 50Ω load.) The instrument can be triggered by its own internal clock, by an external TTL-level signal, by the front-panel "Single Pulse" pushbutton, or by a computer command. The internal clock is variable from 1 Hz to 5 MHz. A double pulse mode is available and a gate input is provided for synchronous or asynchronous control of the triggering. The output pulse width is variable from 20 ns to 0.5 sec, and the delay is variable up to 1 second. The rise time of the main output is less than 10 ns (or less than 5 ns with the -TR option). The unit also provides logic and logic-complement outputs, which may be set to operate at TTL or ECL logic levels (into 50 Ohms or higher).

The AV-1041-B offers higher amplitudes (up to ±20V) at PRFs up to 100 kHz, with 100 ns rise and fall times.

All models can be triggered by the internal oscillator, by an external TTL pulse, by a front-panel pushbutton, or by computer command. All models include a gate input that can be used to inhibit triggering. A SYNC output is provided for oscilloscope triggering purposes.

A standard rear-panel Ethernet connector allows the instrument to be remotely controlled using the VXI-11.3, ssh, telnet, and web protocols. In particular, the VXI-11.3 features allows software like LabView to control an instrument using standard VISA communications drivers and network cabling, instead of using older-style GPIB cabling and GPIB controller cards. Visit http://www.avtechpulse.com/options/vxi for details.

For applications requiring sub-nanosecond rise times, consider the AV-1030 series described at:

http://www.avtechpulse.com/general/av-1030

For applications not requiring GPIB computer control, see the general-purpose models AV-1000-C, AV-1020-C, or AV-1023-C at:

http://www.avtechpulse.com/general

AV-1021-B

Model:	AV-1021-B	AV-1041-B
Outputs:	One main output, One logic output, One logic-complement output.	
Logic output levels:	May be set to operate at TTL or ECL levels. This setting applies to both the logic and logic-complement outputs.	
Amplitude and peak output (to 50 Ohms)[1]:	Main output (when Z_{OUT}=2Ω): < ±0.5 to ±10 V Main output (when Z_{OUT}=50Ω): < ±0.25 to ±5 V Logic outputs (nominally): TTL: 0 and +5V, ECL: -0.8V and -1.6V.	Main output (when Z_{OUT}=2Ω): < ±1 to ±20 V Main output (when Z_{OUT}=50Ω): < ±0.5 to ±10 V Logic outputs (nominally): TTL: 0 and +5V, ECL: -0.8V and -1.6V.
Pulse repetition frequency (PRF):	1 Hz to 5 MHz	1 Hz to 100 kHz
Pulse width (FWHM):	20 ns to 0.5 sec, or DC (subject to duty cycle limits)	200 ns to 0.5 sec, or DC (subject to duty cycle limits)
Rise and fall times: (20%-80%)	Main: ≤ 10 ns standard, 5 ns optional[2] TTL: ≤ 5 ns ECL: ≤ 2 ns	Main: ≤ 100 ns TTL: ≤ 5 ns ECL: ≤ 2 ns
Adjustable DC offset[1]:	0 to ±10 V for Z_{OUT}=2Ω, 0 to ±5 V for Z_{OUT}=50Ω	0 to ±20 V for Z_{OUT}=2Ω, 0 to ±10 V for Z_{OUT}=50Ω
Parasitic DC offset:	< ±100 mV	< ±200 mV
Source impedance Z_{OUT}:	Main output: 2Ω or 50Ω, switchable. This is the impedance in series with the output internally (not the load impedance).	
Required load impedance:	≥ 50Ω	
Duty cycle (maximum):	70% (100% in PW DC mode). Additionally, there must be at least 100 ns between the trailing edge of one pulse and the leading edge of the next pulse. This “dead-time” requirement will reduce the maximum duty cycle at high PRFs.	
Waveform aberrations:	Overshoot and ringing are less than ≤ 15% at amplitudes of 1 V and higher with outputs terminating in 50Ω.	
Propagation delay:	< 200 ns (Ext trig in to pulse out, with delay set to zero)	
Trigger modes:	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.	
Trigger required (Gate in):	TTL, synchronous or asynchronous, active high or low	
Delay jitter:	≤ ± 35ps ± 0.015% RMS (sync out to pulse out)	
Delay:	0 to ±1 sec (sync out to pulse out)	
Sync output:	> +3 Volts, > 50 ns, will drive 50 Ohm loads	
Double pulse mode spacing:	1 us to 1 second (measured between the two leading edges of the pulse doublet). Must not exceed one-half of the period. There must be at least (PW + 100 ns) of “dead time” (no pulsing) between the trailing edge of the first pulse and the leading edge of the second pulse. For instance, if the pulse width is 1 us, the programmed delay between leading edges must be greater than 1 us (the pulse width) + 1.1 us (the minimum dead time) = 2.1 us, and the period must be greater than 4.2 us.	
Signal connectors:	BNC. Main outputs and Sync are on the front panel. Logic outputs & Gate & Trig inputs are on the rear.	
GPIB and RS-232 control:	Included. See http://www.avtechpulse.com/gpib for details.	
LabView Drivers:	Check http://www.avtechpulse.com/labview for availability and downloads	
Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web:	Included. Recommended as a modern alternative to GPIB / RS-232. See http://www.avtechpulse.com/options/vxi for details.	
Settings resolution:	The resolution of the timing parameters (pulse width, delay, period) varies, but is always better than 0.15% of (|set value| + 20 ns). The amplitude resolution is < 0.1% of the maximum amplitude.	
Settings accuracy:	Typically ± 3% (plus ±0.1V or ± 2 ns) after 10 minute warmup. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.	
Power requirement:	100 - 240 Volts, 50 - 60 Hz	
Dimensions, Weight, Chassis:	100 x 430 x 375 mm (3.9” x 17” x 14.8”), 10 kg (22 lbs), anodized aluminum with blue-gray plastic trim	
Temperature range:	+5°C to +40°C	

1) Peak output = amplitude + offset. The amplitude and offset can not be set to maximum at the same time, or the peak output rating will be exceeded.

2) Add the suffix -TR to the model number to specify the 5 ns rise time option.