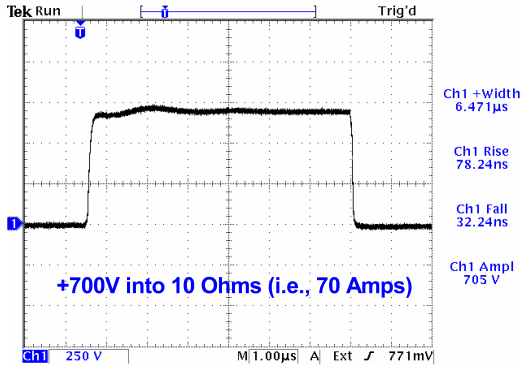
AVTECH

GPIB
IEEE-488

AVOZ-D SERIES

HIGH-VOLTAGE, HIGH-CURRENT PULSE GENERATORS FOR ATTENUATOR TESTING & LASER DIODE ARRAYS



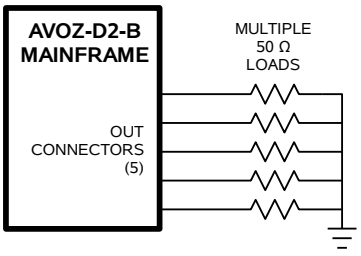
- High voltage, high current pulsers
- Currents of 4, 20, 40, 50, 70, 100, or 200 Amps
- Voltages to 40, 50, 200, 500, 700, or 1000 Volts
- Load resistances as low as 2.5, 5 or 10 Ohms, or as high as open circuits (∞)
- Can drive a single low-impedance load, or multiple 50 Ohm loads
- Peak powers to 200 kW, average powers to 100 W
- Pulse widths of 200 ns to 10 us
- Rise times of 30, 50, 70, 100, or 200 ns
- IEEE-488.2 GPIB and RS-232 interfaces

The AVOZ-D models are high-voltage, high-current pulsers that feature five, ten, or twenty identical outputs. These outputs can either be combined to drive a single low-impedance (2.5, 5 or 10 Ohm) load, or can be used separately to drive multiple 50 Ohm loads simultaneously. This unique flexibility makes the AVOZ-D series ideal for testing high-current laser diode arrays, as well as testing multiple identical lower-current devices (for instance, production testing of attenuators).

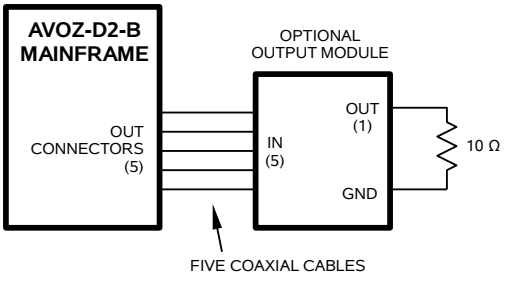
The 50V AVOZ-D5-B can drive up to twenty 50Ω loads, or a single 2.5Ω load, or a combination in between. The maximum total current output is 20A. Similarly, the 200V AVOZ-D4-B can drive up to five 50Ω loads (20A total), and the AVOZ-D3-B can drive up to ten (40A total). The 500V AVOZ-D1-B can drive up to five 50Ω loads (50A), the AVOZ-D2-B can operate to 700V (70A), and the AVOZ-D7-B can operate to 1000V (100A). The 1000V AVOZ-D6-B can drive ten 50Ω loads (200 Amps!).

All models offer pulse widths from 200 ns to 10 us, except for the AVOZ-D6-B which operates from 1 to 10 us.

To drive multiple 50Ω loads, simply attach one load per output connector, using a coaxial cable for each load. No output module is required in this configuration:



When used to drive loads with impedances less than 50 Ohms, two or more outputs can be combined at the load in an optional output module:



If used, the output module is connected to the mainframe using as many as five, ten, or twenty (depending on the model) identical coaxial cables connected in parallel. (The cables are available in an optional accessory kit, or user-supplied coaxial cables may be used.) The mainframe rear-panel and the output module each have a matching number of connectors for this purpose. This allows the effective characteristic impedance of the cabling (Z_0) to be "tuned" to the load impedance, to provide excellent impedance matching and minimal waveform distortion. For instance, when five cables are used, Z_0 = 50Ω / 5 = 10Ω, allowing proper transmission matching to 10Ω loads. If two cables are used, Z_0 = 50Ω / 2 = 25Ω, allowing proper transmission line matching to 25 Ω loads. And if one cable is used, the instrument can be used to drive conventional 50Ω loads. This provides enormous versatility. This arrangement allows the load to be placed away from the instrument without degrading rise time or the pulse shape. The load is connected to the type-N output connector on the output module. An adapter may be required to mate to the user's load. See the next page for possible sources of appropriate adapters.

Internally, all outputs are wired in parallel to a common point (the output switching transistors).

All models in the AVOZ-D series are voltage pulsers. For purely resistive loads, the output current can be calculated using Ohm's Law:

$$I_{OUT} = V_{OUT} / R_{LOAD}$$

When driving diode loads, a resistor must be connected in series with the diode under test to limit the current to the maximum rated current (or less). The output current (I_{OUT}) can be related to the pulser output voltage (V_{OUT}), the diode forward voltage drop (V_D) and the required series resistance (R_{SERIES}):

$$I_{OUT} = (V_{OUT} - V_D) / R_{SERIES}$$

Because of the extremely high output voltages of these instruments (up to 1000V), diodes or diode arrays with large forward voltage drops can be accommodated.

For all models, either output polarity can be provided. A dual polarity option is available on some models. Dual polarity units have two sets of output connectors on the mainframe rear panel, one for each polarity. Only one set is active at a time.

A delay control and a sync output are provided for scope triggering purposes. The units can also be triggered externally using a TTL-level pulse.

All models 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, polarity, frequency, pulse width, and delay.

4TECT
Телефон: +7 (499) 685-4444
info@4test.ru
www.4test.ru

The -VXI option adds a rear-panel Ethernet connector, allowing 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.

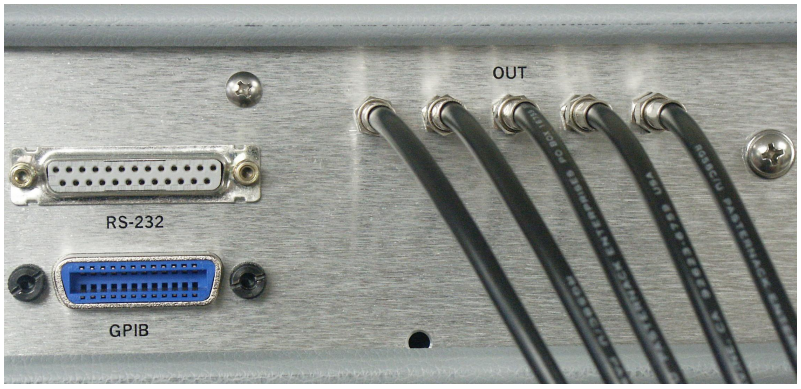
All models require 100 - 240 Volt, 50 - 60 Hz prime power. All models are protected against overload conditions such as excessively high duty cycles or a short-circuited load.

For 50Ω applications, see also the AVR-5B and AVR-7B families . These also high voltages with higher maximum duty cycles.

If the user prefers to use a single output and cable to drive a test jig which contains a splitter arrangement to drive multiple 50Ω loads, the Avtech AVOZ-A and AVOZ-B models may be more appropriate. These models normally use a single specially-designed composite cable which has Z_0=1Ω (instead of the more conventional Z_0=50Ω). Thus, a jig with fifty 50Ω devices could be accommodated.

Avtech can customize models (including single quantities) to meet your particular test requirements.

AVOZ-D2-B, with -CK5 option (cables) and -OM5 option (output module)



OUTPUT CABLES ON THE REAR PANEL OF AN THE AVOZ-D2-B MAINFRAME.

The cables can be connected to five separate 50Ω loads, or they can be connected to the output module (shown on the right) to drive a single load as small as 10Ω. The cables can be ordered as an option, or be provided by the customer.

OUTPUT MODULE (-OM5 OPTION)

The following adapters may be useful if your load does not have a type-N connector. Be careful not to exceed any voltage ratings!

BNC adapter: Pasternack PE9002 or PE9127, www.pasternack.com

Breakout box: Pomona 2420, www.pomonaelectronics.com

NUMBERS OF CABLES TO USE WITH THE OUTPUT MODULE FOR A SINGLE LOAD

Load Impedance (R_L)	Number of Cables Used to Connect Mainframe to Output Module (N)	Effective Z_0 of Cabling (Z_0 = 50Ω / N)
2.5 Ohms	20 (AVOZ-D5-B only)	2.5 Ohms
3.3 Ohms	15 (AVOZ-D5-B only)	3.3 Ohms
5.0 Ohms	10 (-D3, -D5, and -D6 only)	5.0 Ohms
7.0 Ohms	7 (-D3, -D5, and -D6 only)	7.1 Ohms
10 Ohms	5	10.0 Ohms
11 to 14 Ohms	4	12.5 Ohms
14 to 20 Ohms	3	16.7 Ohms
20 to 35 Ohms	2	25.0 Ohms
35 to ∞ Ohms	1	50.0 Ohms

GPIB IEEE-488

SPECIFICATIONS AVOZ-D SERIES

Model[1]:	AVOZ-D5-B	AVOZ-D3-B	AVOZ-D8-B	AVOZ-D4-B	AVOZ-D1-B	AVOZ-D2-B	AVOZ-D7-B	AVOZ-D6-B
Amplitude[2]: voltage (each output): current (sum of all outputs):	2.5 - 50V 0 - 20A	10 - 200V 0 - 40A	2 - 40V 0 - 4A	10 - 200V 0 - 20A	20 - 500V 0 - 50A	25 - 700V 0 - 70A	30 - 1000V 0 - 100A	30 - 1000V 0 - 200A
Minimum load impedance: (parallel combination of loads on all outputs)	2.5 Ω	5 Ω	10 Ω					5 Ω
Max. number of 50Ω loads (if outputs used separately):	20	10	5					10
Load impedance notes:	The load must be non-inductive[3]							
Pulse width:	200 ns - 10 us							1 us - 10 us
Rise time (20%-80%):	< 25 ns	< 50 ns	< 20 ns	< 50 ns	< 70 ns	< 100 ns	< 120 ns	< 200 ns
Fall time (80%-20%):	< 25 ns	< 50 ns	< 20 ns	< 50 ns	< 70 ns	< 100 ns	< 120 ns	< 200 ns
Maximum PRF:	5 kHz	5 kHz	20 kHz	5 kHz	5 kHz	2.5 kHz	1 kHz	500 Hz
Duty cycle: (max)	1 %	0.3 %	15.6 %	0.6 %	0.1 %	0.05 %	0.025%	0.05 %
Output impedance (approx.):	0.1 Ohms	0.1 Ohms	0.1 Ohms	0.1 Ohms	0.2 Ohms	0.4 Ohms	0.3 Ohms	0.2 Ohms
Max. average output power:	10W	25W						100W
Droop:	< 5%, at maximum pulse width and maximum amplitude							
Polarity[4]:	Positive or negative (specify)		Positive or negative or dual polarity (specify)					Pos or neg (specify)
GPIB & RS-232 control[1]:	Standard on -B units.							
LabView drivers:	Download							
Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web:	Optional[5]. Recommended as a modern alternative to GPIB / RS-232.							
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 ±1V or ± 2 ns) after 10 minute warmup. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.							
Propagation delay:	< 200 ns (Ext trig in to pulse out)							
Jitter:	± 100 ps ± 0.03% of sync delay (Ext trig in to pulse out)							
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.							
Variable delay:	Sync to main out: 0 to 1.0 seconds, for all trigger modes (including external trigger).							
Sync output:	> +3 Volts, > 50 ns, will drive 50 Ohm loads							
Gate input:	Synchronous or asynchronous, active high or low, switchable. Suppresses triggering when active.							
Output connectors: (see above for quantity)	Mainframe: Multiple SMA female connectors, for connection to an equal number of separate 50 Ohm loads, or for connection to the output module. Output module (if ordered): Multiple SMA female connectors for connection to mainframe, and one Type-N female connector for connection to a low impedance load.							
Number of output connectors:	20	10	5					10
Optional cable kit: (RG58C/U cables, 5 feet / 152 cm)	20 cables. Add -CK20 to model.	10 cables. Add -CK10 to model.	5 cables. Add -CK5 to model number.					10 cables. Add -CK10 to model.
Optional output module (for combining multiple outputs on to a single Type-N connector):	Add -OM20 to model.	Add -OM10 to model.	Add -OM5 to the model number.					Add -OM10 to model.
Other connectors:	Trig, Gate, Sync: BNC							
Power, temperature:	100 - 240 Volts, 50 - 60 Hz.							
Dimensions:	Mainframe: 100 x 430 x 375 mm (3.9 x 17 x 14.8”), -OM5 optional output module: 28 x 36 x 58 mm (1.1 x 1.4 x 2.3”) -OM10 and -OM20 optional output modules: 43 mm x 66 mm x 107 mm (1.7” x 2.6” x 4.2”)							
Chassis material:	Anodized aluminum, with blue plastic trim							
Temperature range:	+5°C to +40°C							

1) -B suffix indicates IEEE-488.2 GPIB and RS-232 control of pulse amplitude, pulse width, delay and PRF. (See http://www.avtechpulse.com/gpib).
2) For operation at voltage amplitudes of less than 10% of full-scale, better results may be obtained by setting the amplitude near full-scale and increasing the load impedance accordingly. This will provide lower output currents.
3) For applications where additional resistance must be added in series with the device under test, Avtech recommends connecting multiple Ohmite (www.ohmite.com) OY-series ceramic composition resistors in parallel to create a high-power, low-inductance effective resistance. These resistors can be purchased readily at http://www.digi-key.com.
4) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative) or -PN for dual polarity option.
5) Add the suffix -VXI to the model number to specify the Ethernet port.

4TECT
Телефон: +7 (499) 685-4444
info@4test.ru
www.4test.ru