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INSTRUCTIONS

MODEL AVIR-3

0 to 200 VOLT, 10 to 200 ns PULSE WIDTH

HIGH SPEED PULSE GENERATOR

WITH 2 ns RISE & FALL TIMES

SERIAL NUMBER: _____

WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

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Manual Reference: T:\instructword\avir\avir-3 module, edition1.sxw.
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INTRODUCTION

The AVIR-3 is a high performance module capable of generating up to 200V into 50 Ω loads at repetition rates up to 20 kHz. The output pulse width is variable from 10 to 200 ns. The rise and fall times are less than 2 ns.

Instruments with the "-P" model suffix can generate 0 to +200V, whereas instruments with the "-N" model suffix can generate 0 to -200V.

The amplitude and pulse width are controlled by potentiometers on the module, which can be adjusted using a screwdriver.

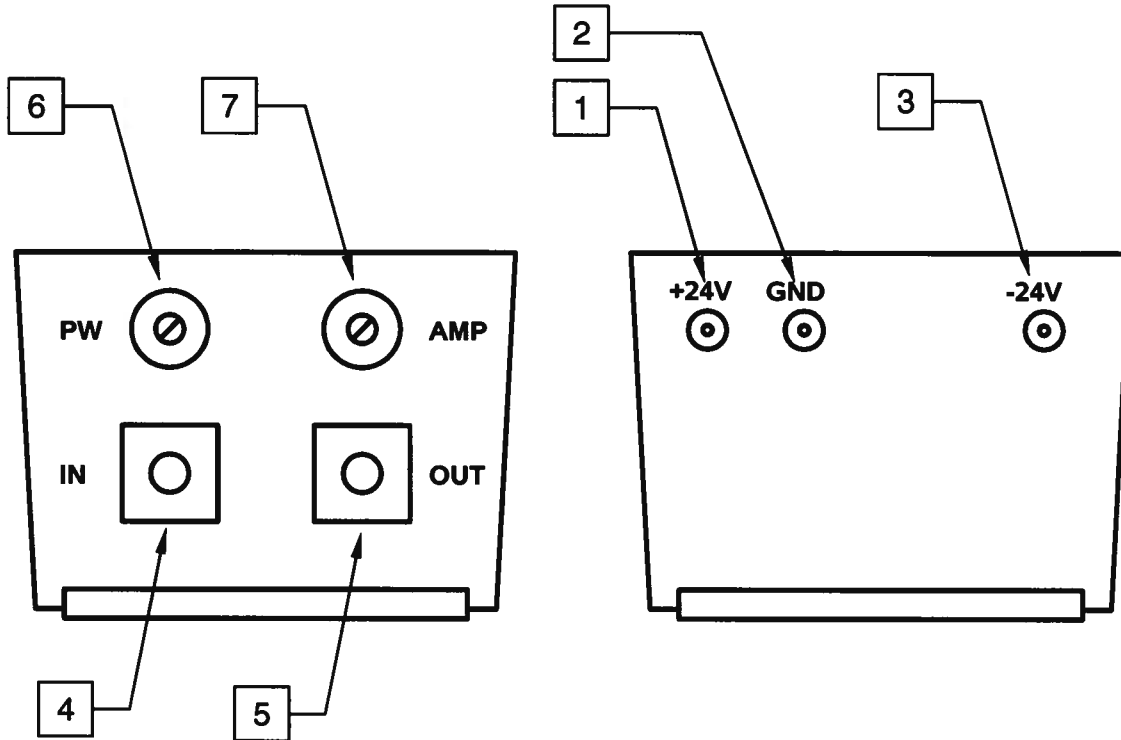
The output is designed to drive 50 Ω loads. (A 50 Ω load is required for proper operation.) The output is AC-coupled.

This instrument is intended for use in research and development laboratories.

SPECIFICATIONS

Model:	AVIR-3
Amplitude ^{3,4,5} : (50 Ohm load)	0 to 200 Volts
Pulse width (FWHM) ⁴ :	10 to 200 ns
Rise time (20%-80%):	≤ 2 ns
Fall time (80%-20%):	≤ 2 ns
PRF:	0 to 20 kHz
Polarity ⁶ :	Positive or negative (specify)
Propagation delay:	≤ 100 ns (Ext trig in to pulse out)
Jitter:	± 100 ps (Ext trig in to pulse out)
Trigger required:	Ext trig mode: + 5 Volts, 50 ns or wider (TTL)
Connectors:	In, Out: SMA
Power requirement:	+24V (0.5A) and -24V (0.1A)
Dimensions: (H x W x D)	43 mm x 66 mm x 107 mm (1.7" x 2.6" x 4.2")
Temperature range:	+5°C to +40°C

CONTROLS

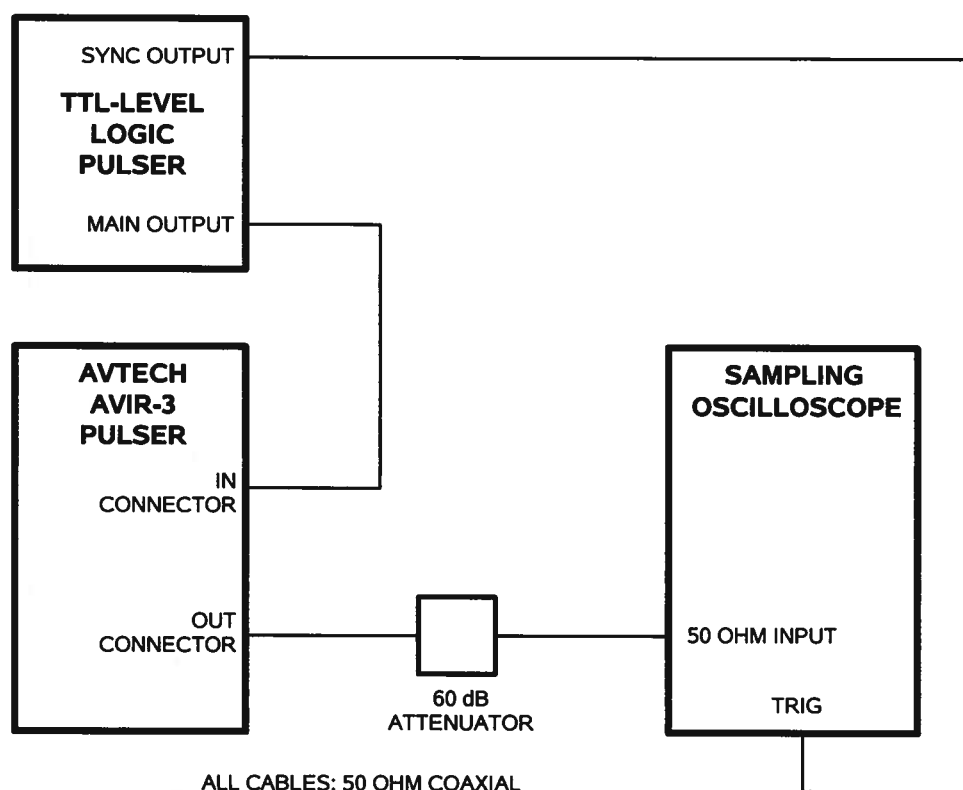


1. +24V POWER Input. Apply +24V prime power to this solder terminal.
2. Ground. Connect this solder terminal to your power supply ground.
3. -24V POWER Input. Apply -24V prime power to this solder terminal.
4. IN Connector. The module triggers from TTL logic levels applied to this SMA connector. The input impedance of this input is $> 1 \text{ k}\Omega$. Depending on the length of cable attached to this input, and the source driving it, it may be desirable to add a coaxial 50 Ohm terminator to this input to provide a proper transmission line termination. The Pasternack (www.pasternack.com) PE6026 SMA feed-thru 50 Ohm terminator is suggested for this purpose.
5. OUT Connector. This is the main output. (This output *requires* a 50Ω load to function properly).
6. PW Control. To control the pulse width of the output, rotate this potentiometer using a small screwdriver. Fully counter-clockwise corresponds to minimum output pulse width, and fully clockwise corresponds to maximum output pulse width.
7. AMP Control. To control the amplitude of the output, rotate this potentiometer using a small screwdriver. Fully counter-clockwise corresponds to minimum output amplitude, and fully clockwise corresponds to maximum output amplitude.

GENERAL INFORMATION

BASIC TEST ARRANGEMENT

The AVIR-3 should be tested with a sampling oscilloscope with a bandwidth of at least 1 GHz to properly observe the high-speed waveform. A typical test arrangement is shown below:



The attenuator is required to prevent damage to the sampling oscilloscope. Avtech suggest the Midwest Microwave ATT-0527-XX-SMA-07 family of fixed 12 GHz, 20 Watt attenuators for use with the AVIR-3.

GENERAL OPERATING NOTES

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 1 GHz.
- 2) The use of a 60 dB attenuator at the sampling scope vertical input channel will ensure a peak input signal to the sampling scope of less than 1 Volt.
- 3) **WARNING:** Model AVM-C may fail if triggered at a PRF greater than 20 kHz.

MINIMIZING WAVEFORM DISTORTIONS

USE 50 OHM TRANSMISSION LINES AND LOADS

Connect the load to the pulse generator with 50 Ω transmission lines (e.g. RG-58 or RG-174 cable).

This instrument requires a 50 Ω load for proper operation. It will not properly drive a high-impedance load. The output stage will be damaged if it is operated into an open circuit (or any other high impedance). Failures due to improper output loading are not covered by the warranty.

USE LOW-INDUCTANCE LOADS

Lenz's Law predicts that for an inductive voltage spike will be generated when the current through an inductance changes. Specifically, $V_{\text{SPIKE}} = L \times dI_{\text{LOAD}}/dt$, where L is the inductance, I_{LOAD} is the load current change, and t is time. For this reason, it is important to keep any parasitic in the load low. This means keeping wiring short, and using low inductance components. In particular, wire-wound resistors should be avoided.

PREVENTING DAMAGE

The AVIR-3 may fail if triggered at a PRF greater than 20 kHz.

This unit is designed to operate into a load impedance of 50 Ohms and the output stage will be damaged if it is operated into an open circuit (or any other high impedance). Failures due to improper output loading are not covered by the warranty.

The lifetime of the switching elements in the pulse generator module is proportional to the running time of the instrument. For this reason the prime power to the instrument should be turned off when the instrument is not in use.

May 27/04