



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

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## INSTRUCTIONS

MODEL AVH-M2

> 60 VOLT, < 2 ns, 1 MHz

HIGH SPEED

PULSE GENERATOR MODULE

SERIAL NUMBER: 13898, 13899

### 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.

### TECHNICAL SUPPORT

Phone: 888-670-8729 (USA & Canada) or +1-613-686-6675 (International)

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Manual Reference: /files/officefiles/instructword/avh/AVH-M2,ed2.odt.  
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## INTRODUCTION

The AVH-M2 is a high performance DC-powered module capable of generating up to >60V pulses into 50Ω loads with pulse widths of 2 ns or less, measured at the 20% peak-voltage point. The maximum pulse repetition frequency (PRF) is 1 MHz.

Instruments with the "-P" model suffix can generate > +60V, whereas instruments with the "-N" model suffix can generate > -60V.

The AVH-M2 must be triggered by an external TTL pulse (> 50 ns) applied to the "IN" connector.

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

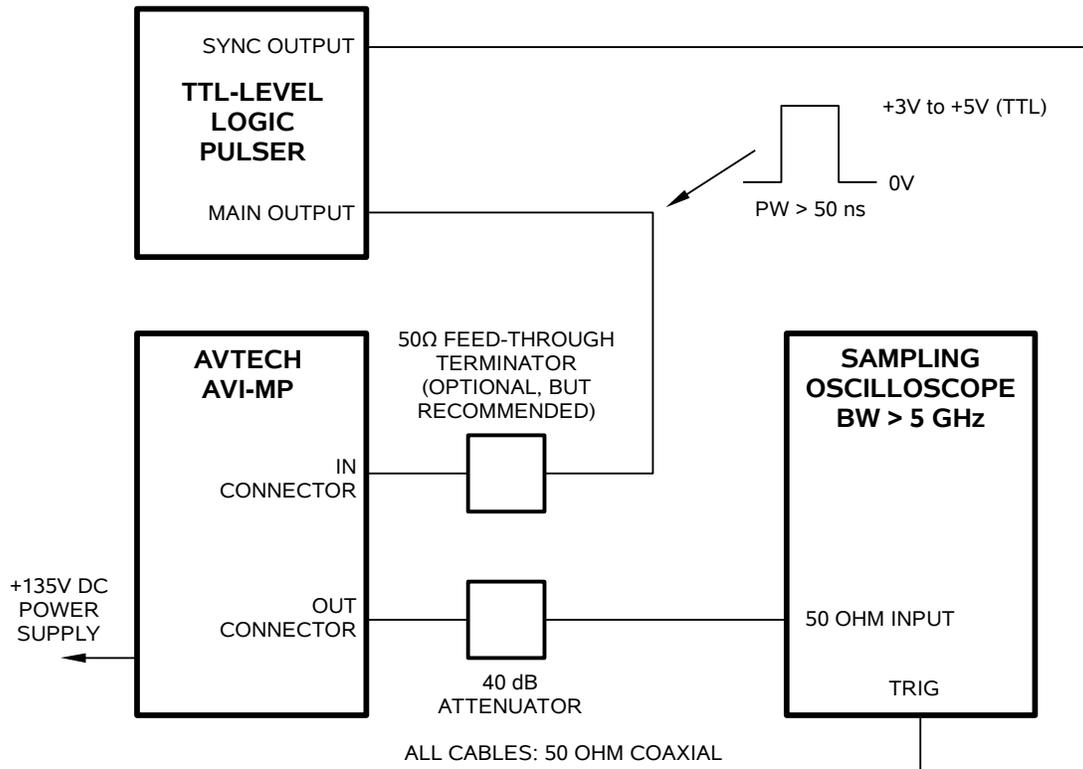
This instrument is intended for use in research, development, test and calibration laboratories by qualified personnel.

## SPECIFICATIONS

Model:	AVH-M2
Amplitude: (50Ω load)	≥ 60 V
Pulse width, measured at 20% rise time <sup>3</sup> :	≤ 2.0 ns
PRF:	0 to 1 MHz
Polarity <sup>1</sup> :	Positive or negative (specify)
Propagation delay:	≤ 2 ns
Required load impedance:	50 Ohms <sup>2</sup>
Jitter:	± 15 ps (Ext trig in to pulse out)
Trigger modes:	External trigger (TTL level pulse, > 50 ns, 1 kΩ input impedance).
Connectors:	In, Out: SMA, Power: Solder terminals
Calibration:	Not calibrated. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.
Power requirements:	+ 135 Volts, 5 mA
Dimensions (H x W x D):	23 x 28 x 38 mm (0.9" x 1.1" x 1.5")
Operating temperature:	+5°C to +40°C

- 1) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative) or -PN for dual polarity option. Polarity reversal achieved by means of a two-position switch that controls the polarity of the signal output port on -C units and via keypad control on -B units. -PN option not available on modules.
- 2) A 50 Ohm load is required. Other loads may damage the instrument. Consult Avtech (info@avtechpulse.com) if you need to drive other load impedances.
- 3) The FWHM pulse width, measured at 50% rise, will be lower.

## BASIC TEST ARRANGEMENT



### GENERAL OPERATING NOTES

- 1) The unit requires a +135 Volt DC supply (5mA typically). The allowed voltage range is +130 to +140 V. Higher voltages may damage the instrument.
- 2) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 5 GHz.
- 3) The use of 40 dB attenuator on the output will ensure a peak input signal to the sampling scope of less than 1 Volt.
- 4) When testing using a general purpose 50Ω laboratory pulse generator as the input trigger signal source, the input signal should be applied via a 50Ω feed-through terminator. This will prevent reflection (and degradation of the input pulse waveform) caused by the high impedance at the IN port.
- 5) The input trigger pulse width should be greater than 50 ns and less than one-half of the pulse repetition frequency period. The unit triggers on the leading edge of the input trigger signal.

## MINIMIZING WAVEFORM DISTORTIONS

### USE 50 OHM TRANSMISSION LINES AND LOADS

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

This instrument requires a 50 $\Omega$  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,  $I_{\text{LOAD}}$  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 AVH-M2 may fail if the PRF is greater than 1 MHz.

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.

PERFORMANCE CHECK SHEET