



**AVTECH ELECTROSYSTEMS LTD.**

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

P.O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265  
TEL: (315) 472-5270  
FAX: (613) 226-2802

TEL: 1-800-265-6681  
FAX: 1-800-561-1970

e-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)  
<http://www.avtechpulse.com/>

BOX 5120, LCD MERIVALE  
OTTAWA, ONTARIO  
CANADA K2C 3H4  
TEL: (613) 226-5772  
FAX: (613) 226-2802

## INSTRUCTIONS

MODEL AVMP-3

0 TO 20 VOLTS, 1 MHz

HIGH SPEED PULSE GENERATOR MODULE

WITH 200 ps RISE TIME

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.

### TECHNICAL SUPPORT

Phone: 613-226-5772 or 1-800-265-6681

Fax: 613-226-2802 or 1-800-561-1970

E-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)

World Wide Web: <http://www.avtechpulse.com>

TABLE OF CONTENTS

**WARRANTY.....2**

**TECHNICAL SUPPORT.....2**

**TABLE OF CONTENTS.....3**

**INTRODUCTION.....4**

**AVAILABLE OPTIONS.....4**

**SPECIFICATIONS.....5**

**BASIC TEST ARRANGEMENT - POSITIVE UNITS.....6**

**BASIC TEST ARRANGEMENT - NEGATIVE UNITS.....7**

**CONTROLS.....8**

**CONTROLS - FRONT.....8**

**CONTROLS - REAR.....8**

**NEGATIVE UNITS.....8**

**GENERAL OPERATING NOTES.....9**

**PERFORMANCE CHECK SHEET.....10**

Manual Reference: T:\instructword\avmp\AVMP-3,edition1.sxw.  
Last modified February 17, 2005.  
Copyright © 2005 Avtech Electrosystems Ltd, All Rights Reserved.

## INTRODUCTION

The AVMP-3 is a high performance DC-powered module capable of generating up to 20V into 50 $\Omega$  loads at repetition rates up to 1 MHz. The output pulse width is variable from 8 to 100 ns. The rise time is less than 200 ps, and the fall time is less than 300 ps.

Instruments with the “-P” suffix can generate 0 to +20V directly.

Instruments with the “-N” suffix generate 0 to +20V at the output of the main module, and are supplied with an accessory inverting transformer (and bias tee) which inverts the amplitude to 0 to -20V.

The AVMP-3 must be triggered by an external TTL pulse (> 10 ns) applied to the “IN” connector.

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

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

## AVAILABLE OPTIONS

The AVMP-3 is available with several options:

-ECL Option: the input trigger levels are ECL, rather than TTL.

-EA Option: the output amplitude can be controlled by an externally generated 0 to +10V analog control voltage.

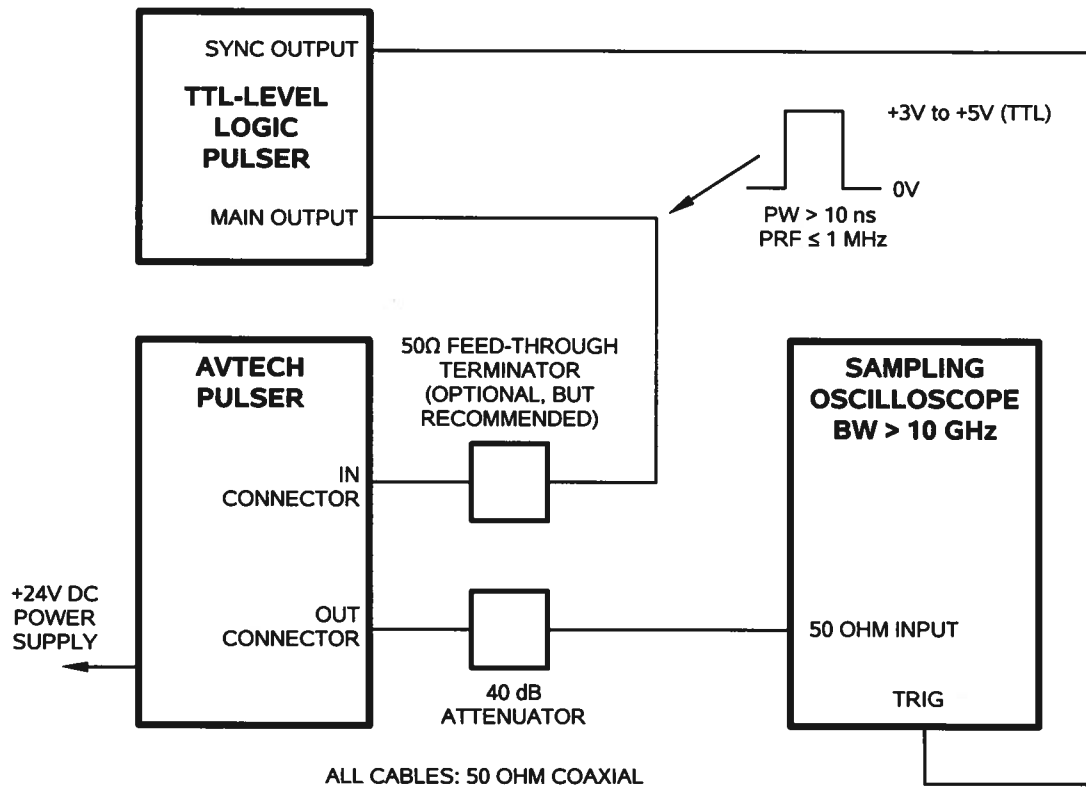
-EW Option: the output pulse width can be controlled by an externally generated 0 to +10V analog control voltage.

-M Option: a monitor output is provided.

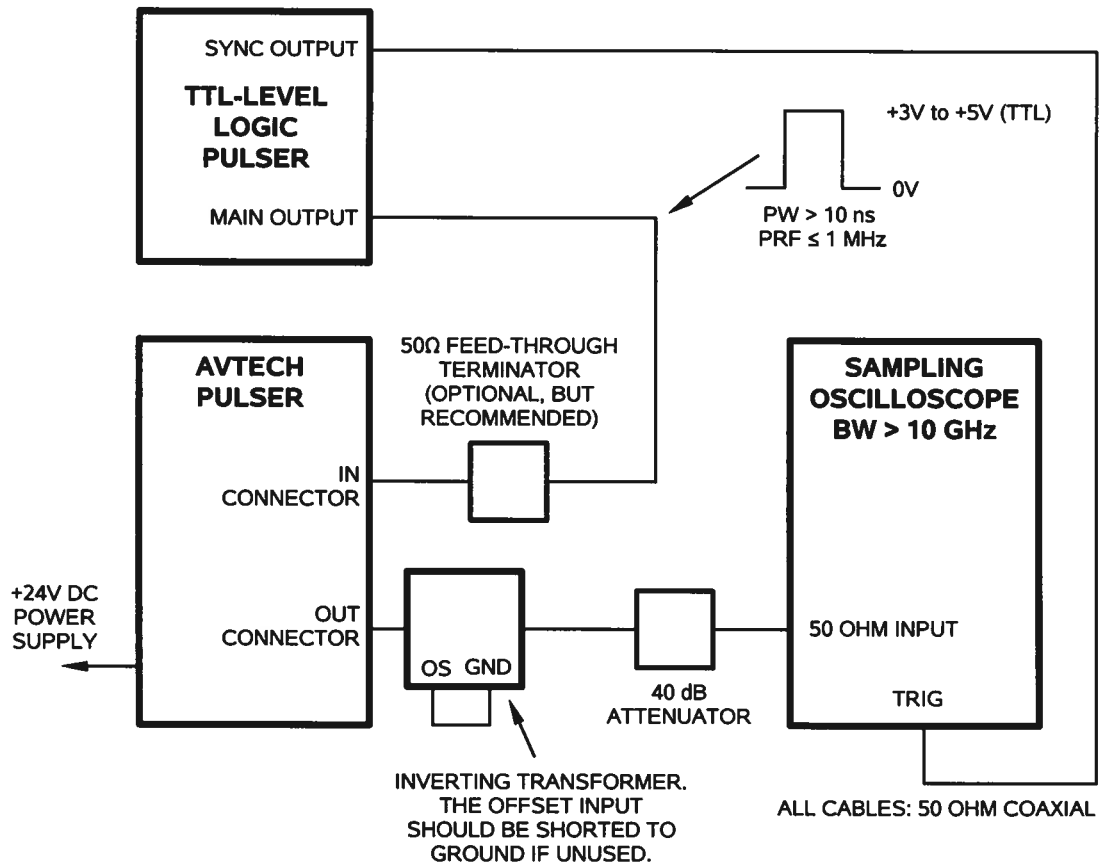
## SPECIFICATIONS

Model:	AVMP-3
Amplitude <sup>1,2</sup> : (50Ω load)	0 - 20 Volts
Pulse width (FWHM):	8 ns - 100 ns
Maximum PRF:	1 MHz
Maximum duty cycle:	10%
Rise time (20%-80%):	≤ 200 ps
Fall time (80%-20%):	≤ 300 ps
Polarity <sup>3</sup> :	Positive or negative (specify)
Propagation delay:	Modules: ≤ 30 ns, -C and -B units: ≤ 120 ns (Ext trig in to pulse out)
Jitter:	± 35ps ± 0.015% of sync delay
DC offset:	Apply required DC offset to solder terminals (± 50 Volts, 250 mA max)
Trigger required:	+5 Volts, 10 ns or wider (TTL) <sup>5</sup>
Monitor output option:	Provides a 20 dB attenuated coincident replica of main output
Connectors:	Trig, Out, Monitor: SMA, Power: Solder terminals
Power requirements:	+24V DC
Dimensions: (H x W x D)	43 mm x 66 mm x 109 mm (1.7" x 2.6" x 4.3")
Chassis material:	Cast aluminum with blue enamel
Temperature range:	+5°C to +40°C

- 1) For analog electronic control (0 to +10V) of amplitude or pulse width with -EA or -EW.
- 2) For operation at amplitudes of less than 20% of full-scale, best results will be obtained by setting the amplitude near full-scale and using external attenuators on the output.
- 3) Indicate desired polarity by suffixing model number with -P or -N.
- 4) Add -M to model number for monitor option.
- 5) Add -ECL to the model number to specify an ECL-level trigger input (-1.6V and -0.8V logic levels) instead of TTL.

**BASIC TEST ARRANGEMENT - POSITIVE UNITS**

## BASIC TEST ARRANGEMENT - NEGATIVE UNITS



## CONTROLS

### CONTROLS - FRONT

The location of the IN and OUT connectors, the optional “M” connector, and the amplitude and pulse width controls are shown in the photo below.



The “AMP” and “PW” controls may be adjusted using a screwdriver. Units with the -EA or -EW options will have solder terminals instead of screwdriver-adjustable controls.

### CONTROLS - REAR

The +24V DC power input and the ground terminal are located on the rear of the module.

Positive (-P) units will have an “OS” offset input solder terminal on the rear panel as well.

### NEGATIVE UNITS

Instruments with the “-N” suffix generate 0 to +20V at the output of the main module, and are supplied with an accessory inverting transformer (and bias tee) which inverts the amplitude to 0 to -20V. The inverting transformer can be installed directly onto the OUT connector of the main module.

The “OS” offset input solder terminal for negative units is located on the inverting transformer.



## 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 10 GHz.
- 2) The use of 40 dB attenuator on the output will insure a peak input signal to the sampling scope of less than one volt.
- 3) In general, the source pulse generator trigger delay control should be set in the 0.1 to 1.0 us range, for proper positioning of the output pulse on the sampling oscilloscope display.
- 4) When testing using a general purpose 50 ohm laboratory pulse generator as the input trigger signal source, the input signal should be applied via a 50 ohm feed-through terminator, or alternatively the input to the AVM unit should be shunted with a 50 ohm resistor. This will prevent reflection (and degradation of the input pulse waveform) caused by the high impedance at the IN port. When triggering from a TTL source, no 50 ohm feed-through load or resistor is necessary but lead length should be as short as possible. High-speed TTL Schottky logic is recommended for the driving circuitry.
- 5) The input trigger pulse width should be greater than 10 ns and less than one half of the pulse repetition frequency period. The unit triggers on the leading edge of the input trigger signal.
- 6) The output pulse width is controlled by means of the one-turn potentiometer (PW), except on -EW units. The pot should initially be set maximum clockwise and the pulse width adjusted using an oscilloscope. On -EW units, apply 0 to +10V to the PW solder terminal to control the pulse width.
- 7) The output pulse amplitude is controlled by means of the one-turn potentiometer (AMP), except on -EA units. On -EA units, apply 0 to +10V to the AMP solder terminal to control the amplitude.
- 8) **WARNING:** The module may fail if triggered at a PRF greater than 1 MHz.
- 9) The monitor output port (M) provides a coincident attenuated ( $\div 10$ ) replica of the main output to a 50 ohm load. (Option).
- 10) For additional information:

Tel: 613-226-5772  
Fax: 613-226-2802  
Email: [info@avtechpulse.com](mailto:info@avtechpulse.com)

Feb 17/05