

INSTRUCTIONS

MODEL AVMH-3-PS-LTMA-D-P PULSE GENERATOR

S.N.:

### 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>



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ORIGINAL QUOTATION

To: Dr. Jim Siepmann  
jps@vbe.com  
Head of R&D  
LightTime

Jim,

following our telephone conversation and email exchanges, I am pleased to quote on the following special-purpose pulse generator:

Quote Number: 9863

Model Number: AVMH-3-PS-LTMA

Pulse Repetition Frequency: 10 MHz, maximum

Output Pulse Width: < 0.5 ns at 20% rise point

Output Voltage: 0 to 40V, into 50 Ohms

Input Trigger: > 0.4 ns, 20 mV

Propagation Delay: < 35 ns

Price: \$3998 US, FOB Destination.

Payment: by Visa credit card, in advance of shipment

Delivery: 60 days, after receipt of order.

Other: see the AVMH-3-PS datasheet at  
<http://www.avtechpulse.com/impulse/avmh-3/>

You would need to add a 50 Ohm resistance in series with your diode to limit the current, and to properly terminate the cabling. Also, if I understand you correctly, you intend to connect the laser diode, photodiode, and pulse generator in a loop to form a ring oscillator. You will need to add a delay line or other delaying element to keep the oscillation frequency well-defined. Also note that the AVMH propagation delay may drift with time and temperature, which would cause your frequency to drift. The drift characteristics are not well characterized, since our equipment is rarely used in this mode. (Indeed, we would test the instrument into a 50 Ohm load, and not in a ring oscillator configuration.) We can offer a variable propagation delay control (0 to +5ns), to adjust for drift. To specify this option, add "-D" to the model number and add \$303 to the price.

Regards,

Dr. Michael J. Chudobiak  
VP, New Product Development

--- Avtech Electrosystems Ltd. ----- since 1975 ---

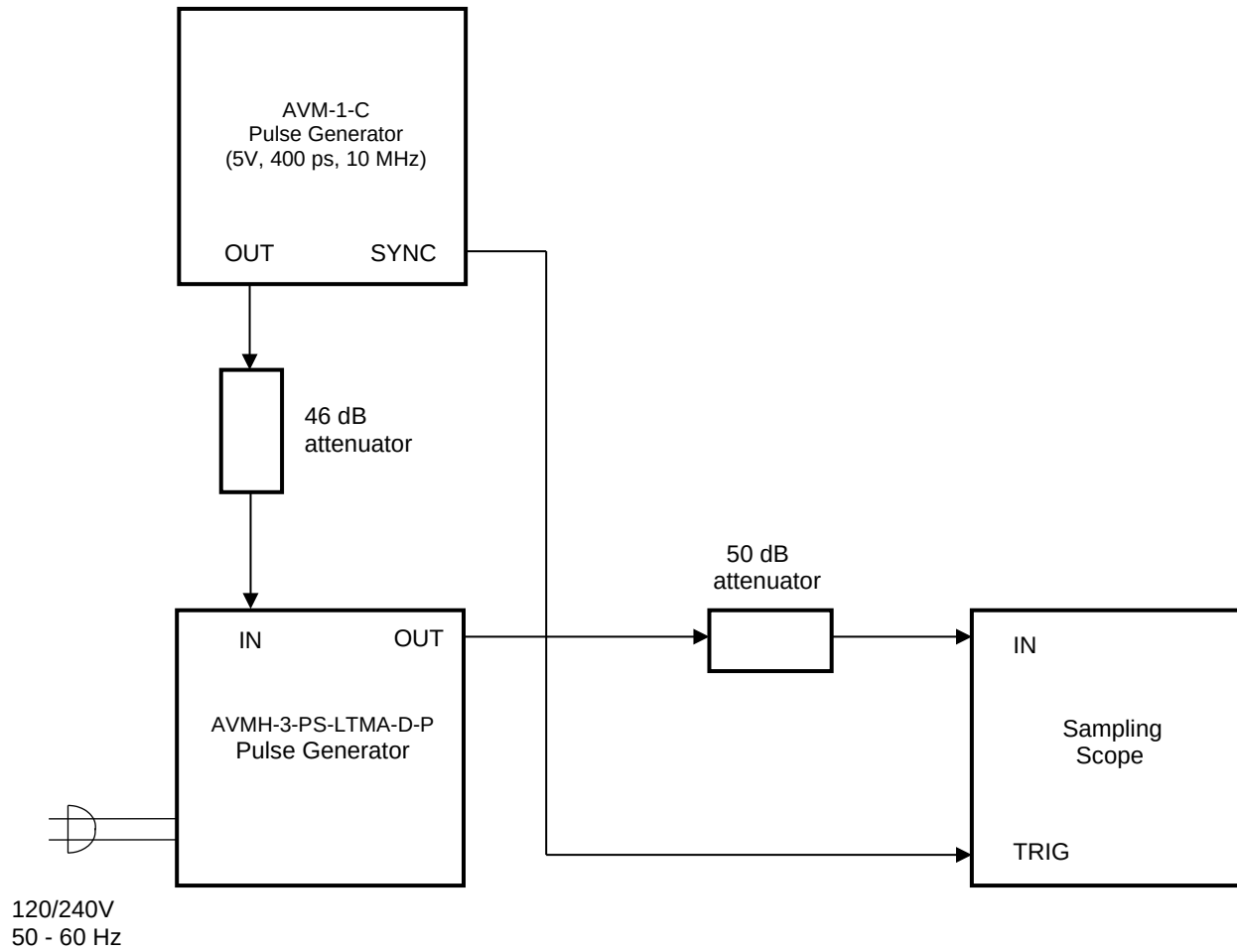
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USA 13669-0265	email: <a href="mailto:info@avtechpulse.com">info@avtechpulse.com</a>	Canada K2C 3H4
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Nanosecond Waveform Generators  
for general purpose, R&D and OEM applications

Pulse Generators - Laser Diode Drivers - Pulse Amplifiers  
Impulse Generators - Delay Generators - Comb Generators - Splitters  
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FIG. 1: PULSE GENERATOR TEST ARRANGEMENT



## GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed ten gigahertz.
- 2) The use of 50 dB attenuator at the sampling scope vertical input channel will insure a peak input signal to the sampling scope of less than one Volt.
- 3) The input connector has an internal 50 Ohm termination. The input is design to be driven by a 10 MHz, 20 mV, 400 ps wide signal. For test purposes, this input can be generated using an Avtech AVM-1-C pulse generator with 46 dB of attenuation. The SYNC output of the AVM-1-C can be used to trigger the sampling oscilloscope.
- 4) The output pulse width is controlled by means of the one turn  $T_R$  and  $T_F$  controls. The  $T_R$  control controls the position of the leading edge while the  $T_F$  control determines the position of the falling edge. Clockwise rotation of these controls causes the pulse edge to move to the right. It is necessary to sequentially adjust the  $T_R$ ,  $T_F$  and AMP controls to obtain the desired output pulse width and amplitude.
- 5) The output pulse amplitude is controlled by means of the front panel one turn AMP control. The pulse width may change by several nanoseconds as the output amplitude is reduced from maximum to minimum. Therefore it is convenient to first set the desired amplitude and then set the desired pulse width as described above.
- 6) The output pulse can be delayed by several nanoseconds relative to the input trigger by adjusting the front-panel DELAY control. After adjusting the delay control, it may be necessary to re-adjust the  $T_R$  and  $T_F$  controls to obtain the desired rise and fall times and amplitude.
- 7) WARNING: This instrument may fail if triggered at a PRF greater than 10 MHz.
- 8) The pulse generator can withstand an infinite VSWR on the output port.
- 9) The instrument can be converted from 120 to 240V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.



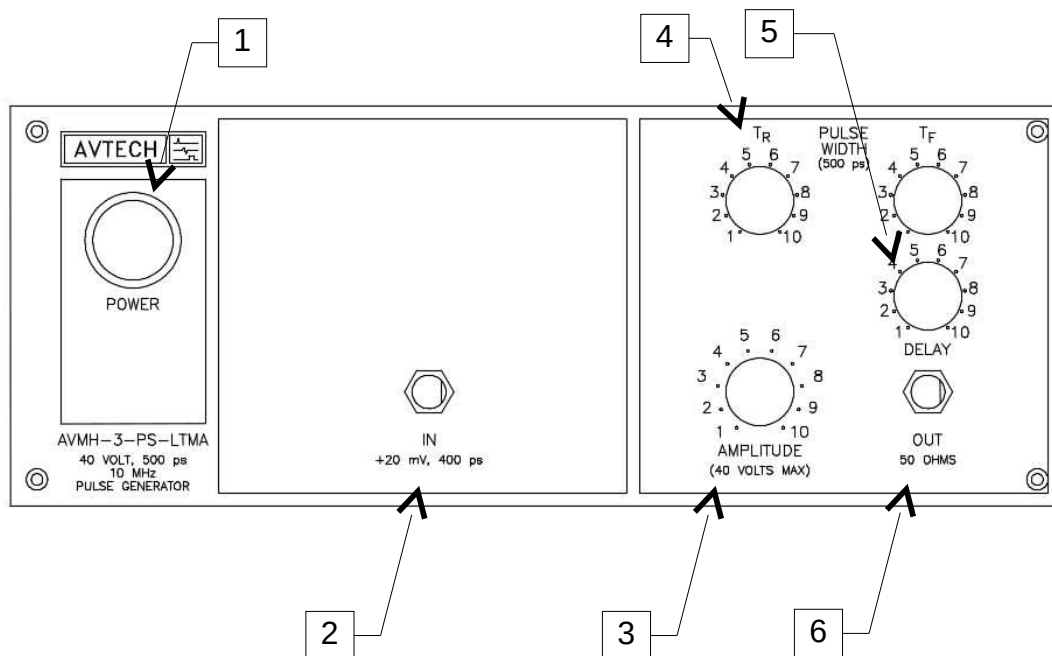
10) For additional assistance:

Tel: (613) 226-5772

Fax: (613) 226-2802

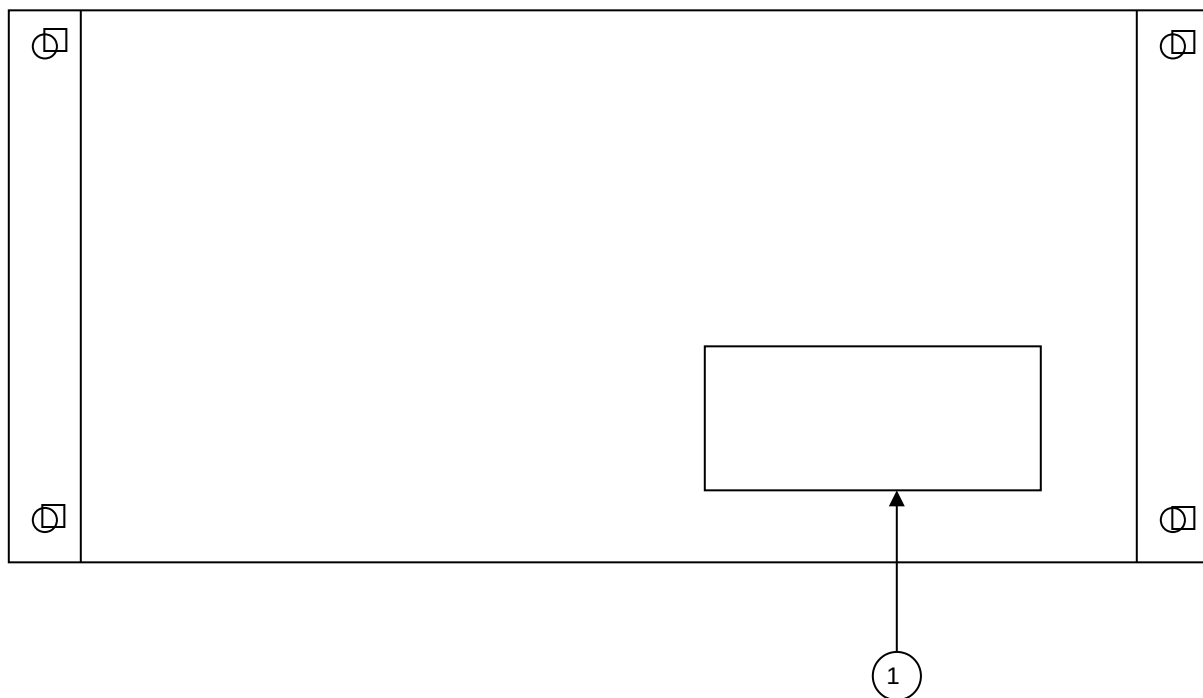
Email: [info@avtechpulse.com](mailto:info@avtechpulse.com)

FIG. 2: FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) IN Input. The external trigger signal is applied at this SMA connector. This input is will trigger from a 20 mV to 200 mV, 400 ps or wider pulse.
- (3) AMP Control. A one-turn control, which varies the output pulse amplitude from 0 to maximum output to a fifty Ohm load.
- (4) PW Control. Two one turn controls, which varies the output pulse width. TR determines the position of the rising edge while TF determines the position of the falling edge.
- (5) DELAY Control. Controls the relative delay between the trigger pulse IN input (2) and the main output (6).
- (6) OUT Connector. SMA connector provides output to a fifty Ohm load.

FIG. 3: BACK PANEL CONTROLS

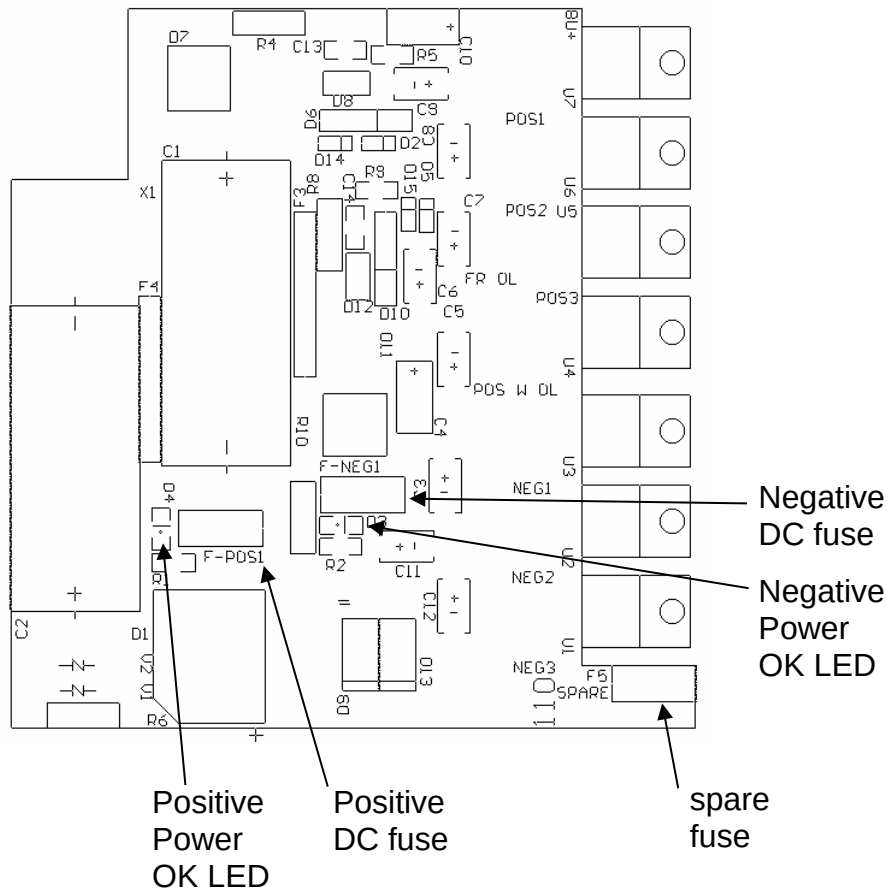


- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse (0.5A SB).

## POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three fuses (plus one spare). One, which protects the AC input, is located in the rear-panel power entry module, as described in the “Rear Panel Controls” section of this manual. If the power appears to have failed, check the AC fuse first.

The other two fuses (plus one spare) are located on the internal DC power supply, as shown below:



The spare fuse may be used to replace one of the other fuses, if required.

The three fuses on this circuit board are 0.5A slow-blow fuses, Littlefuse part number R452.500. (This fuse can be ordered from Digikey, [www.digikey.com](http://www.digikey.com). The Digikey part number is F1341CT-ND).

If you suspect that the DC fuses are blown, follow this procedure:

1. Remove the top cover, by removing the four Phillips screws on the top cover and then sliding the cover back and off.
2. Locate the two "Power OK" LEDs on the power supply circuit board, as illustrated above.
3. Turn on the instrument.
4. Observe the "Power OK" LEDs. If the fuses are not blown, the two LEDs will be lit (bright red). If one of the LEDs is not lit, the fuse next to it has blown.
5. Turn off the instrument.
6. If a fuse is blown, use needle-nose pliers to remove the blown fuse from its surface-mount holder.
7. Replace the fuse.

PERFORMANCE CHECK SHEET