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INSTRUCTIONS

MODEL AVMM-2

0 TO 5 VOLTS, 25 MHz

HIGH SPEED PULSE GENERATOR MODULE

WITH 300 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 dissembled, 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

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Manual Reference: Z:\officefiles\instructword\avmm\avmm-2 module, edE.odt.
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INTRODUCTION

The AVMM-2 is a high performance DC-powered pulse generator module capable of generating up to 5V into 50Ω loads at repetition rates up to 25 MHz. The output pulse width is variable from 1 to 10 ns. The rise time is less than 300 ps, and the fall time is less than 600 ps.

Instruments with the "-P" model suffix can generate 0 to +5V, whereas instruments with the "-N" model suffix can generate 0 to -5V.

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.

AVAILABLE OPTIONS

The AVMM-2 is available with several options:

-D Option: this option adds a 0-5 ns adjustable delay feature, which operates in both the internal and external trigger modes.

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

-ED Option: the 0-5 ns delay can be controlled by an externally generated 0 to +10V analog control voltage. Units with the -ED option incorporate the -D option as well.

-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.

-TR Option: variable rise/fall time option. Permits the rise time to be varied from 300 ps to 2.0 ns via a five-position switch. The TR switch also affects the fall time.

SPECIFICATIONS

Model:	AVMM-2
Amplitude[3,4]: (into 50 Ohm load)	Variable to 5 Volts
Pulse width (FWHM)[3]:	Variable 1 to 10 ns
PRF:	0 to 25 MHz
Rise time[2] (20% - 80%):	300 ps or variable 300 ps to 2.0 ns[2]
Fall time[2] (80% - 20%):	600 ps or variable 600 ps to 2.0 ns[2]
Polarity[5]:	Positive or negative (specify)
Propagation delay:	≤ 30 ns (Ext trig in to pulse out)
Variable propagation delay option[3,6]:	0 to 5 ns
Jitter:	± 15 ps (Ext trig in to pulse out)
Trigger required:	TTL-level[8] (Low: 0V, High: +3V to +5V), 10 ns or wider. ≥ 1 kΩ input impedance.
Monitor output option[8]:	Provides a 20 dB attenuated coincident replica of main output
Connectors:	In, Out: SMA, Power: Solder terminals
Dimensions (H x W x D):	43 x 66 x 107 mm (1.7" x 2.6" x 4.2")
Power requirement:	+24V DC.
Chassis material:	Cast aluminum, blue enamel
Temperature range:	+5°C to +40°C

1) -C suffix indicates stand-alone lab instrument with internal clock and line powering. No suffix indicates miniature module requiring DC power and external trigger. (See http://www.avtechpulse.com/formats for additional details of the basic formats).
2) For rise times variable from 300 ps to 2.0 ns via a five-position switch add suffix -TR. TR switch also affects fall time.
3) For electronic control (0 to +10V) of amplitude, pulse width, delay or offset suffix model number with -EA or -EW or -ED or -EO. Electronic control units also include the standard front panel one-turn controls.
4) 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.
5) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative) or -P-PN or -N-PN for dual polarity option where the suffix preceding -PN indicates the polarity at the mainframe output port. (-PN available only for -C units).
6) Indicate delay option by suffixing model number with -D.
7) For internally generated DC offset option (0 to ±5 V, one turn control) add suffix -OT to model number. -OT and -EO options not available on modules.
8) For monitor option add suffix -M.

EUROPEAN REGULATORY NOTES

EC DECLARATION OF CONFORMITY

We Avtech Electrosystems Ltd.
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Ottawa, Ontario
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declare that this pulse generator meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 50081-1 Emission

EN 50082-1 Immunity

and that this pulse generator meets the intent of the Low Voltage Directive 72/23/EEC as amended by 93/68/EEC. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use

CE

DIRECTIVE 2002/95/EC (RoHS)

This instrument is exempt from Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment. Specifically, Avtech instruments are considered "Monitoring and control instruments" (Category 9) as defined in Annex 1A of Directive 2002/96/EC. The Directive 2002/95/EC only applies to Directive 2002/96/EC categories 1-7 and 10, as stated in the "Article 2 - Scope" section of Directive 2002/95/EC.

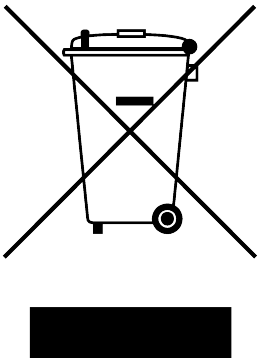
DIRECTIVE 2002/96/EC (WEEE)

European customers who have purchased this equipment directly from Avtech will have completed a “WEEE Responsibility Agreement” form, accepting responsibility for

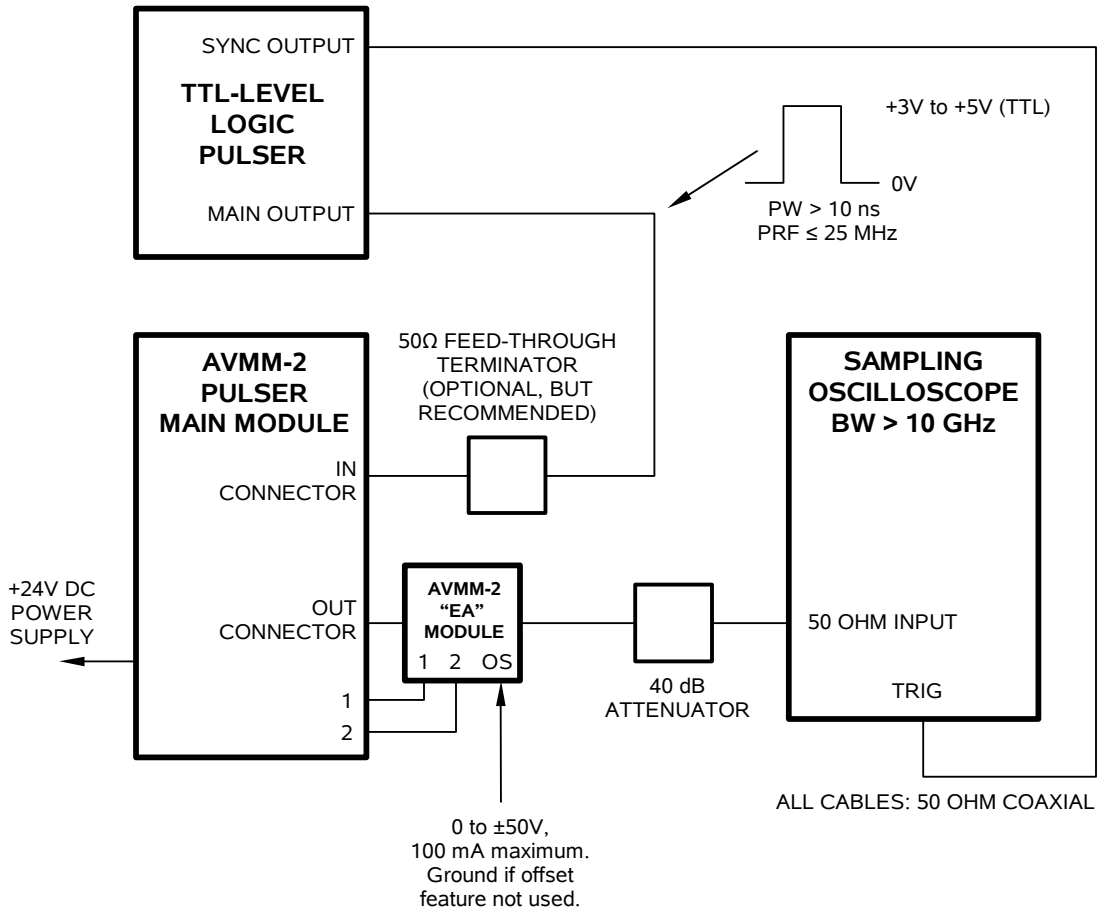
WEEE compliance (as mandated in Directive 2002/96/EC of the European Union and local laws) on behalf of the customer, as provided for under Article 9 of Directive 2002/96/EC.

Customers who have purchased Avtech equipment through local representatives should consult with the representative to determine who has responsibility for WEEE compliance. Normally, such responsibilities with lie with the representative, unless other arrangements (under Article 9) have been made.

Requirements for WEEE compliance may include registration of products with local governments, reporting of recycling activities to local governments, and financing of recycling activities.



BASIC TEST ARRANGEMENT



CONTROLS - FRONT

The AVMM-2 consists of two parts – the main module, and a smaller "EA" module installed on the front portion of the main module. Two factory-installed control lines ("1" and "2") link the two modules. The general arrangement is shown in the photo below.

The “AMP” and “PW” controls may be adjusted using a screwdriver.

Units with the -EA option will have a solder terminal to control the amplitude, rather than a screwdriver-adjustable trimpot. The amplitude is then controlled by a 0 to +10V DC voltage applied to the solder terminal.

Units with the -EW option will have a solder terminal to control the pulse width, rather than a screwdriver-adjustable trimpot. The pulse width is then controlled by a 0 to +10V DC voltage applied to the solder terminal.

Units with the -D option will have an additional screwdriver-adjustable trimpot, which controls the 0 to 5 ns delay feature. Units with the -ED option will have a solder terminal to control the 0 to 5 ns delay, rather than a screwdriver-adjustable trimpot. The 0 to 5 ns delay is then controlled by a 0 to +10V DC voltage applied to the solder terminal.

Units with the -M option will have an additional SMA output connector.

CONTROLS - REAR

The location of the power terminals are shown in the photo below.

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 ensure 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). The pot should initially be set maximum clockwise and the pulse width adjusted

using an oscilloscope.

7) The output pulse amplitude is controlled by means of the one-turn potentiometer (AMP). 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. Rotation of the PW pot causes the position of the falling edge of the pulse to change.

8) The output pulse position or delay can be varied for up to 5 ns by means of the delay (DELAY) control. Rotating the delay control clockwise increases the delay. If the full 5 ns delay cannot be achieved then the input pulse width should be increased by a few nanoseconds. (Option)

9) It is recommended that the module be bolted to a heatsink, for cooling purposes. This will improve the stability of the output, by reducing thermal drift.

10) WARNING: The module may fail if triggered at a PRF greater than 25 MHz.

11) To DC offset the output pulse connect a DC power supply set to required DC offset value to the terminals marked “OS”. The maximum attainable DC offset voltage is +50 volts. (Option).

12) The monitor output port (M) provides a coincident attenuated (÷10) replica of the main output to a 50 ohm load. (Option).

13) For additional information:

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PERFORMANCE CHECK SHEET