



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

MODEL AVMR-2-C-P-R5-APG2A

TWELVE CHANNEL
+5V, 500 kHz
PULSE GENERATOR

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

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INTRODUCTION

The AVMR-2-C-P-R5-APG2A is a twelve channel, +5V pulse generator, with rise and fall times of less than 3 ns. The output pulse width may be varied between 100 ns and 1 us.

The amplitude of all channels is fixed at +5V, when driving a 50 Ohm load. The output impedance of each channel is 50 Ohms. (Note that this means that the amplitude into an open circuit will be +10V).

The instrument may be triggered by the internal 0.5 Hz to 500 kHz adjustable oscillator, by a 0 to +5V external trigger pulse, by a 0 to -5V external trigger pulse, or by a front-panel pushbutton.

ORIGINAL QUOTATION

May 4, 2000

Bruce Cable
CSTA-NED
STECS-NE (CABLE)
860
Aberdeen Proving Ground, MD 21005-5059

Dear Bruce,

Following our phone conversation of May 4th concerning Quote No. 9820, I am pleased to offer a revised price and delivery quotation for a special purpose 12-channel pulse generator meeting the following specifications:

Quote No:	9857
Module Designation:	AVMR-2-C-P-R5-APG2A
Number of Output Channels:	12
Output Amplitude:	Fixed at +5 Volts to 50 Ohms.
Output Resistance:	50 Ohms.
Output Pulse Width:	100 ns to 1.0 us via one ten-turn locking dial control.
Rise, Fall Time:	≤ 3 ns.
Pulse Repetition Frequency:	0.5 Hz to 500 KHz via a six-position range switch and a one-turn fine control. Includes manual push-button for one-shot operation.
Duty Cycle (max):	50%.

External Trigger:	Unit may also be triggered externally by a TTL level pulse (± 5 Volts, PW ≥ 50 ns.) External trigger input will withstand a ± 400 Volt 1 us transient spike on the input. Polarity of input trigger pulse switch must be set on + or - by operator.
Propagation Delay: (EXT Trigger Mode)	≤ 100 ns.
Propagation Delay Matching: (all 12 channels)	Within ± 0.5 ns.
Jitter:	$\leq \pm 50$ ps.
Output Connectors:	BNC (12). Located on back panel.
Other Connectors:	BNC.
Package Size:	3.9" x 17" x 14.8". Includes -R5 rack mount kit for 19" rack mounting.
Prime Power:	120/240 V, 50-60 Hz.
Price - Quantity of 1:	\$9,796.00 US, FOB Destination
Price - Quantity of 2:	\$8,598.00 US, each, FOB Destination
Delivery:	60 - 90 days, after receipt of order

Thank you for your continuing interest in our products. Please call me again if you require any additional information, or please see www.avtechpulse.com for our complete product line.

Yours truly,

Dr. Walter Chudobiak
Chief Engineer

WC:mf

INSTALLATION

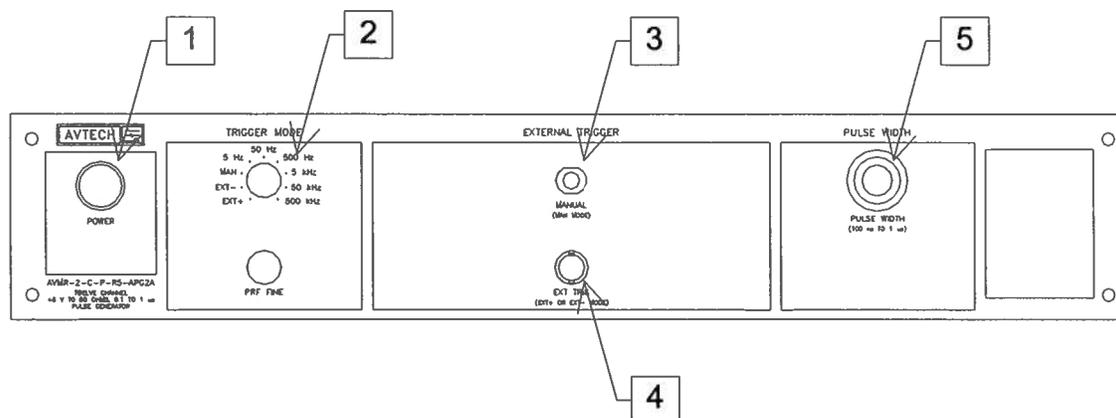
VISUAL CHECK

After unpacking the instrument, examine to ensure that it has not been damaged in shipment. Visually inspect all connectors, knobs, and handles. Confirm that a power cord is with the instrument. If the instrument has been damaged, file a claim immediately with the company that transported the instrument.

PLUGGING IN THE INSTRUMENT

Examine the rear of the instrument. There will be a male power receptacle, a fuse holder and the edge of the power selector card visible. Confirm that the power selector is in the correct orientation - it should be marked either 120 or 240, indicating whether it expects 120V AC or 240V AC. If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse. In the 120V setting, a 0.5A slow blow fuse is required. In the 240V setting, a 0.25A slow blow fuse is required.

FRONT PANEL CONTROLS



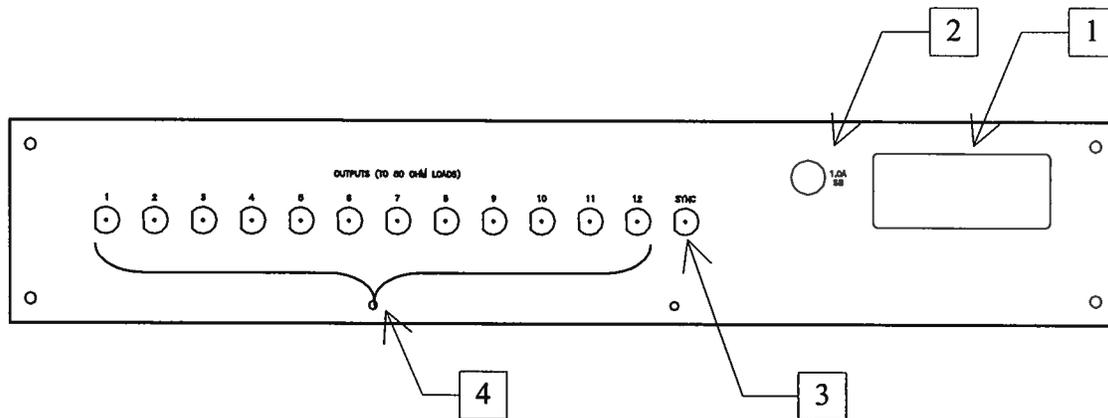
1. **POWER Switch.** The POWER push button switch applies AC prime power to the primaries of the transformer, turning the instrument on. The push button lamp (#382 type) is connected to the internal +15V DC supply.
2. **TRIGGER MODE.** This switch controls the triggering of the instrument. The possible settings are:
 - EXT+:* In this mode, the instrument is triggered by a 0 to +5V (i.e., TTL-level) pulse on the EXT TRIG connector (item 4). The pulse must be >50ns in width.
 - EXT-:* In this mode, the instrument is triggered by a 0 to -5V pulse on the EXT TRIG connector (item 4). The pulse must be >50ns in width.
 - MAN:* In this mode, the instrument is triggered by the MANUAL pushbutton (item 3). Each press of the pushbutton generates a single output pulse.
 - 5Hz, 50Hz, 500Hz, 5kHz, 50kHz, 500 kHz:* In these modes, the trigger is supplied by the internal oscillator. The mode name represents the upper limit of the frequency range. Within each range, the PRF FINE knob may be used to vary the frequency.
3. **MANUAL PUSHBUTTON.** When the TRIGGER MODE switch (item 3) is in the "MAN" position, the instrument will be triggered when this button is pushed. Each press of the pushbutton generates a single output pulse.
4. **EXT TRIG CONNECTOR.** In the "EXT+" trigger mode, the instrument is triggered by a 0 to +5V (i.e., TTL-level) pulse on this connector.

In the "EXT-" trigger mode, the instrument is triggered by a 0 to -5V pulse on this connector.

The pulse must be >50ns in width.

5. PULSE WIDTH CONTROL. This dial controls the output pulse width. The pulse width may be varied between 100 ns and 1 us, approximately. Note that the output duty cycle (i.e., pulse width \div period) should always be kept below 50%, or the rear-panel fuses may blow, or the instrument may be damaged.

REAR PANEL CONTROLS



1. **AC POWER INPUT.** A three-pronged recessed male connector is provided on the back panel for AC power connection to the instrument. Also contained in this assembly is a 0.5A slow blow fuse and a removable card that can be removed and repositioned to switch between 120V AC in and 240V AC in.
2. **1.0A SB.** This fuse protects the output stage if the output duty cycle rating is exceeded.
3. **SYNC.** This connector provides an output approximately synchronous with the trigger, for oscilloscope triggering purposes. The amplitude of this signal is approximately 2V when driving a 50 Ohm load. When the instrument is externally triggered, the pulse width of this output will be approximately equal to the pulse width of the external trigger. In the internal trigger modes, the pulse width will be approximately 50% of the period ($1/\text{frequency}$).
4. **OUTPUTS 1-12.** These BNC connectors are the 12 main outputs. The amplitude of all channels is fixed at +5V, when driving a 50 Ohm load. The output impedance of each channel is 50 Ohms. (Note that this means that the amplitude into an open circuit will be +10V). All channels are synchronous, $\pm 0.5\text{ns}$.

MECHANICAL INFORMATION

TOP COVER REMOVAL

The interior of the instrument may be accessed by removing the four Phillips screws on the top panel. With the four screws removed, the top cover may be slid back (and off).

RACK MOUNTING

A rack mounting kit is available. The -R5 rack mount kit may be installed after first removing the one Phillips screw on the side panel adjacent to the front handle.

ELECTROMAGNETIC INTERFERENCE

To prevent electromagnetic interference with other equipment, all used outputs should be connected to shielded 50 Ω loads using shielded 50 Ω coaxial cables. Unused outputs should be terminated with shielded 50 Ω BNC terminators or with shielded BNC dust caps, to prevent unintentional electromagnetic radiation. All cords and cables should be less than 3m in length.