



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

□ P.O. BOX 265
OGDENSBURG, NY
U.S.A. 13669-0265

TEL: 888-670-8729 (USA & Canada) or +1-613-686-6675 (Intl)
FAX: 800-561-1970 (USA & Canada) or +1-613-686-6679 (Intl)

info@avtechpulse.com - <http://www.avtechpulse.com/>

☒ BOX 5120, LCD MERIVALE
OTTAWA, ONTARIO
CANADA K2C 3H4

INSTRUCTIONS

MODEL AVB1-3

50 VOLTS PEAK-TO-PEAK

400 TO 900 MHz

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

Fax: 800-561-1970 (USA & Canada) or +1-613-686-6679 (International)

E-mail: info@avtechpulse.com

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

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Manual Reference: /files/officefiles/instructword/avb/AVB1-3,edition2.odt.
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INTRODUCTION

The AVB1-3 monocycle generator allows the generation of high-speed monocycle waveforms, with peak-to-peak amplitudes of ≥ 50 V into 50Ω loads. The amplitude is not adjustable.

The monocycle center frequency is adjustable over the range of 400 to 900 MHz. See the online application note, "TB13 - How Is the Center Frequency of a Monocycle Waveform Measured?" at <http://www.avtechpulse.com/appnote/techbrief13/> for information about center frequency measurements.

The AVB1-3 can operate at repetition rates of up to 100 kHz. An externally-generated TTL-level signal is required to trigger the AVB1-3.

The AVB1-3 is powered by +15V DC.

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 AVB1-3 is available with these options:

-AK1 Option: an accessory kit that consists of three SMA, 18 GHz, 2 Watt attenuators (10, 20 & 30 dB) and two 50 Ohm, 1 GHz, 1 Watt feed-through terminators (one SMA, one BNC).

-AK8 Option: an accessory kit that consists of one 12-inch SMA-M/SMA-M PE-SR405FL coaxial cable, one 12-inch SMA-M/SMA-M RG-316 coaxial cable, one 36-inch SMA-M/SMA-M RG-316 coaxial cable, one 24-inch SMA-M/BNC-M RG-316 coaxial cable, one 36-inch BNC-M/BNC-M RG58C/U coaxial cable, one SMA-F to BNC-M adapter, one SMA-M to BNC-F adapter, one SMA-F to SMA-F adapter, and one SMA-F to solder cup adapter.

SPECIFICATIONS

| | |
|---------------------------------------|---|
| Model: | AVB1-3 |
| Center frequency: | 400 - 900 MHz, tunes full range ¹ |
| Amplitude: (to 50 Ohms ²) | ≥ 50 V _{pp} , fixed (not adjustable) |
| Maximum repetition rate: | 100 kHz |
| Spurious signals: | -20 dB with respect to peak |
| Propagation delay: | ≤ 50 ns (Ext trig in to pulse out) |
| Jitter: | ± 15 ps (Ext trig in to pulse out) |
| Trigger required: | +5 Volts, 50 to 500 ns (TTL) |
| Connectors: | Out: SMA, In: SMA, Power: Solder terminals |
| Power requirements: | +15 Volts, 400 mA |
| Dimensions: | 43 x 76 x 152 mm (1.7" x 3" x 6") |
| Chassis material: | cast aluminum, blue enamel |
| Temperature range: | +5°C to +40°C |

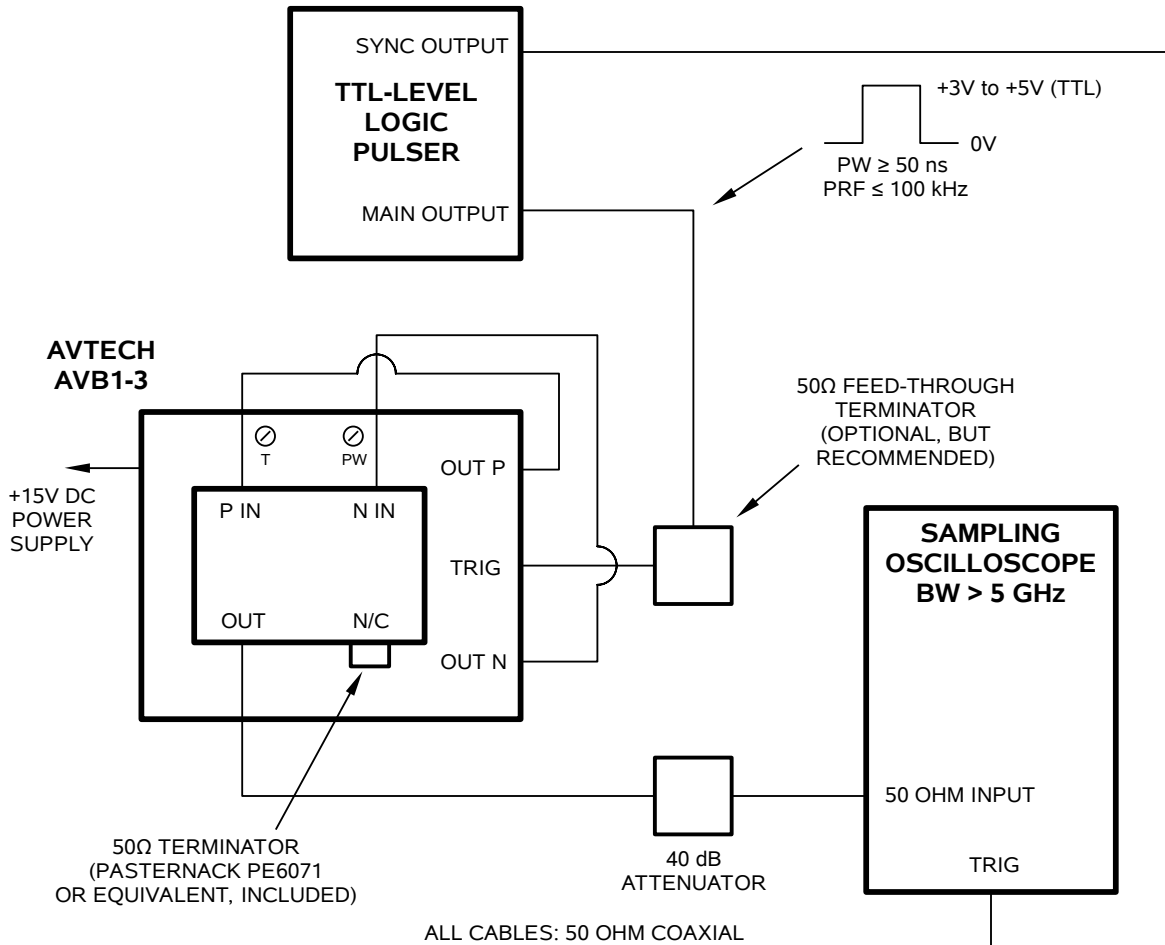
1) May be tuned either by front-panel one-turn control or by applying 0 to +10 Volts DC to a solder terminal. Input impedance greater than 10 kilohms.

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.

GENERAL INFORMATION

BASIC TEST ARRANGEMENT

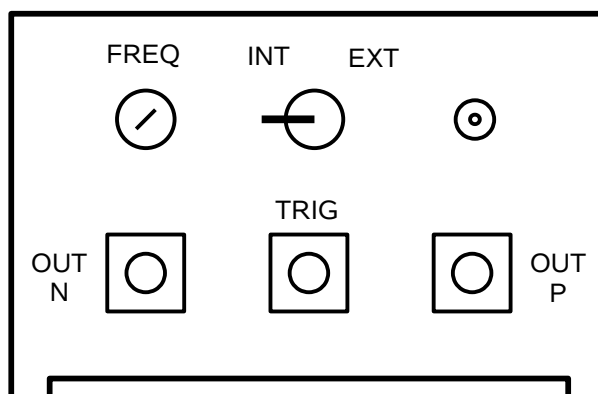
The AVB1-3 should be tested with a sampling oscilloscope with a bandwidth of at least 2 GHz to properly observe the high-speed waveform. A typical test arrangement is shown below:



The AVB1-3 generates a positive pulse and a negative pulse internally. These are added together in the pulse combiner located on the top of the main chassis. The OUT P to P IN and OUT N to N IN cables shown in the diagram above are preinstalled on the AVB1-3 (and should never be removed).

The attenuators are required to prevent damage to the sampling oscilloscope. A 40 dB attenuator with sufficient voltage rating should be used on the main output.

CONTROLS



The “OUT N” and “OUT P” SMA connectors are connected to the pulse combiner on the top of the main module, through factory-installed cabling.

The external trigger is applied to the TRIG input connector. The input impedance is $\geq 1\text{k}\Omega$. A feed-through 50 terminator is recommended for maximum signal integrity.

When the INT / EXT switch is in the INT position, the center frequency of the output waveform is controlled by the FREQ potentiometer. This potentiometer may be adjusted with a screwdriver.

When the INT / EXT switch is in the EXT position, the center frequency of the output waveform is controlled by a voltage applied to the solder terminal adjacent to the INT / EXT switch. This user-generated voltage may be adjusted from 0 to +10V, corresponding to a center frequency range of 400 to 900 MHz.

The +15V and GND power terminals are on the opposite face of the module.

TRIMPOT ADJUSTMENTS

The ten-turn trim pots PW and T control the pulse widths (PW) and pulse separation (T) of the positive and negative components of the monocycle waveform. At the time of shipping, these controls were set to provide optimal output and should not require any further adjustment.

OTHER GENERAL OPERATING NOTES

- 1) The bandwidth capability of components and instruments used to display the monocycle generator output signal (attenuators, cables, connectors, etc.) should exceed 5 GHz.

- 2) The use of a 40 dB attenuator will ensure a peak input signal to the sampling scope of less than one volt.
- 3) The module shown should be bolted to a heat sink capable of dissipating at least 5 Watts.
- 4) Various settings are sensitive to variations in the +15 VDC voltage supply and therefore a well-regulated DC supply is required.

PERFORMANCE CHECK SHEET