

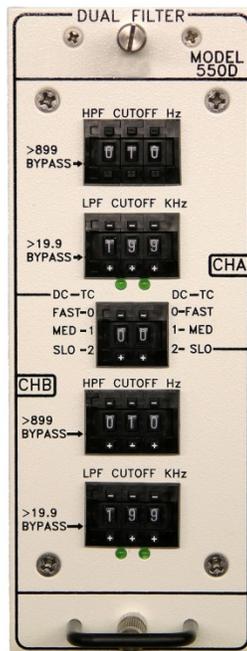
# Trig-Tek™

## 550D

# Dual Channel Filter

## User Manual

Publication No. 980973 Rev. B



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Authorization is required from Astronics Test Systems before you send us your product or sub-assembly for service or calibration. Call or contact Customer Support at 1-800-722-3262 or 1-949-859-8999 or via fax at 1-949-859-7139. We can also be reached at: [atshelpdesk@astronics.com](mailto:atshelpdesk@astronics.com).

If the original packing material is unavailable, ship the product or sub-assembly in an ESD shielding bag and use appropriate packing materials to surround and protect the product.

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# FOR YOUR SAFETY

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Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.



This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.



If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.



Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.



Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid “live” circuit points.

Before operating this instrument:

1. Ensure the proper fuse is in place for the power source to operate.
2. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

Do not operate until performance is checked by qualified personnel.

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## DOCUMENT CHANGE HISTORY

Revision	Date	Description of Change
A	9/12/2013	Document Control release
B	12/19/2013	Revised per ECN04232. Performance Test specifications updated.

# Chapter 1

## Introduction

The Trig-Tek 550D Dual Filter has two channels with variable high pass and low pass filters in a module 7" high x 2.6" wide. Six of the modules will plug into a 19" wide chassis (model 4550) or a single module can be operated in a single module cabinet (model 4551).

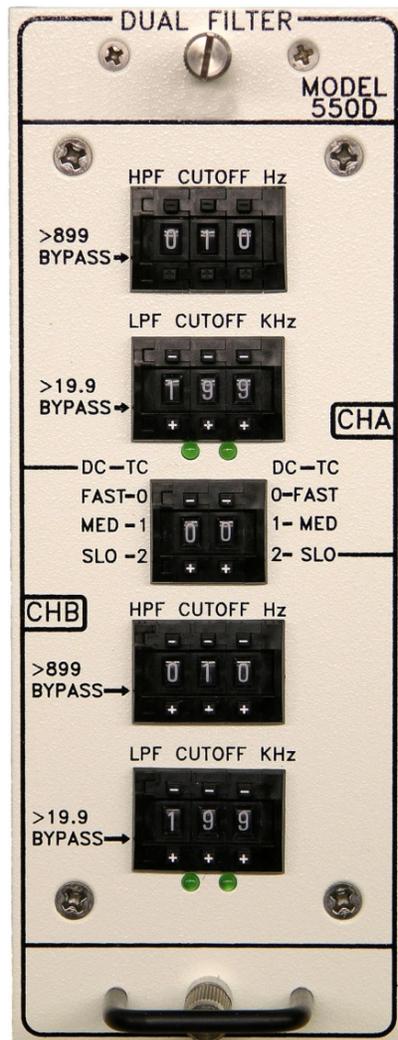


Figure 1-1, 550D Dual Channel Filter

The two channels are identical. Each has a high pass filter, a low-pass filter, and an AC-DC converter. The gain in the pass band is one. The low-pass filter is an 8<sup>th</sup>-order with cutoff frequencies set in 100 Hz steps, from 00.1 to 19.9 kHz setting, by a three-digit thumb switch marked HPF CUTOFF kHz. Also an X1-X0.1 switch selects cutoff in 10 Hz steps from 0.01 to 1.99 kHz. Above 199 settings, the low-pass filter is bypassed.

The high pass is an 8th-order filter with 48d dB/oct roll off. A three-digit, front panel thumb switch, marked HPF CUTOFF HZ, allows the operator to select cutoff frequencies in 1 Hz steps from 001 to 899. Above the 899 Hz section, the high-pass filter is bypassed.

Each channel also has a TRMS AC to DC converter to provide a DC output proportional to the AND signal.

## Specifications

### AC Output

Impedance	50 Ohms (10 mA max)
Accuracy	± 3% (in pass band)
Maximum Output	10 Volts RMS
Connector	BNC

### DC Output

Impedance	50 Ohms (10 mA max)
Accuracy	± 3%
Maximum Output	10 Volts DC
Connector	BNC

### Controls

High-Pass Cutoff Thumb Switch	Selects 001 to 899 Hz cutoff frequencies Selection above 899 Hz bypasses the high-pass filter.
Low-Pass Cutoff Thumb Switch	Any cutoff frequency between 00.1 kHz to 19.9 kHz can be selected for the cutoff frequency with 100 Hz resolution for the low-pass filter. Selection above 19.9 kHz bypasses the low-pass filter.

X1 – X0.1 Switch (located internally on main board)	Selects 00.1 to 19.9 or 0.01 to 1.99 kHz cutoffs
DC-TC (Thumb Switch)	Selects Medium, Fast, or Slow for the DC output time constant (TC)
CURR (Current) Switch (located internally on main board)	Selects input jack to have a current source
SE-ISO Switch (located internally on main board)	Allows the ground side of the input channel to be isolated or connected to signal ground of the unit
Power (located internally on main board)	115 or 230 $\pm 10\%$ V RMS, 50-400 Hz
Size	7" high x 2.6" wide x 13" deep; up to six units can be mounted side by side in a standard 19" wide rack

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## Chapter 2

# Operation

The Trig-Tek 550D Dual Filter is a modular package with a self-contained power supply. Insert the unit into a single-module cabinet or the six-module rack. Connect the AC line cord to the AC power input of the rack and energize the unit with the PWR Switch on the left-hand side of the rack.

A switch on the main board (Figure 2-1) selects either 115 Volt or 230 Volt operation. Ensure that you have selected the appropriate setting prior to use.

### CAUTION

**Operating with the switch on the main board set for 115 Volts when using 230 Volts power may damage the unit.**



Figure 2-1, Dual Power Mode Switch (shown set to 115 V)

## High-Pass Cutoff HZ Thumb Switch

This three-digit thumb switch (located on the front panel of the 550D) allows the operator to select from 1 Hz to 899 Hz cutoff frequencies in 1 Hz steps. There is one switch for each channel.

When cutoff frequencies above 899 Hz are selected, the high-pass filter is bypassed.

## Low-Pass Cutoff kHz Thumb Switch and X1-X0.1 Switch

With the X1-X0.1 switch in the X1 position (on the motherboard, see **Figure 2-2**), the 3-decade thumb switch (on the front panel of the 550D) allows the operator to select from 00.1 to 19.9 kHz with 100 Hz resolution as the cutoff frequency for the low pass filter and with the X1-X0.1 Switch in the X0.1 position from 0.01 to 1.99 kHz with 10 Hz resolution. There is one switch for each channel.

When settings above 199 are selected, the low-pass filter is bypassed.

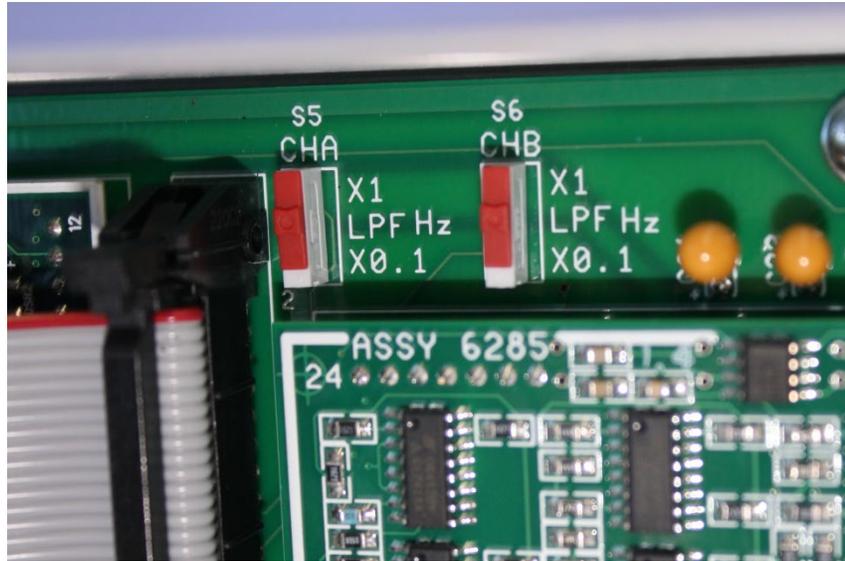


Figure 2-2, Low-Pass Cutoff X1-X0.01 Switch

## DC-TC Thumb Switch

The DC-TC thumb switch (on the front panel) has three positions to select FAST, MED, or SLO for the DC output time constant (TC) for both channels.

## SE-ISO Switch

This switch allows the ground side of the input of CHA or CHB to be either isolated from the signal ground of the unit (ISO) or be connected to signal ground (SE). Refer to **Figure 2-3**.

## CURR (Current) ON-OFF Switch

This switch allows the input jack to have a current source. The current is factory set to  $3 \pm 1$  mA but it could be adjusted using R5 and R6. Refer to **Figure 2- 3**.

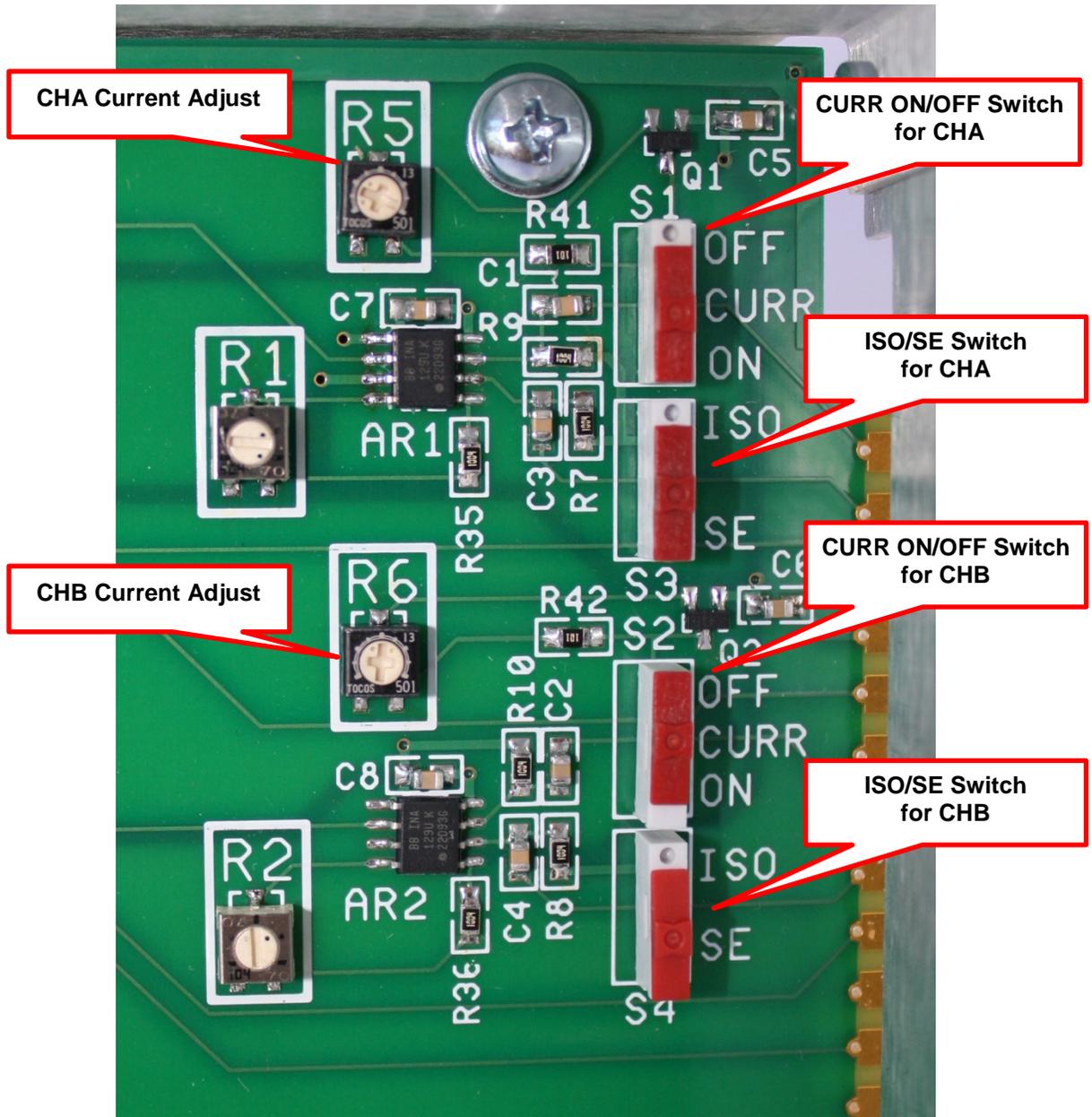


Figure 2-3, SE-ISO and CURR ON/OFF Switches

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## Chapter 3

# Performance Test

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The following procedure is for a single channel, and must be repeated for the other channel. In the event that a reading is out of tolerance, contact our Customer Service team for assistance.

### Test Equipment

**Note: Equivalent equipment can be used.**

Function Generator	Trig-Tek 346B
AC-DC Digital Voltmeter	Keithley 179A

### Switch Settings

1. For the channel you are checking (A or B), place the High-Pass (HPF) switch to 5 Hz, the Low-Pass (LPF) switch to 10.0 kHz, and the DC-TC switch to MED.
2. Connect the power cord of the rack assembly into the power line and turn the POWER switch on the left side of the rack to PWR.

### Performance Procedure

1. Connect a sine wave of  $9.00 \pm 0.05$  Volts RMS at 2 kHz to the INPUT jack.
2. Connect the AC Voltmeter to the AC OUTPUT jack.
3. Observe an indication of  $9.00 \pm 0.27$  Volts RMS on the AC Voltmeter.
4. Connect the DC Voltmeter to the DC OUTPUT jack.
5. Observe an indication of  $9.00 \pm 0.27$  Volts DC on the DC Voltmeter.
6. Reduce the sine wave input to  $5.00 \pm 0.01$  Volts RMS.
7. Observe an indication of  $5.00 \pm 0.15$  Volts RMS on the AC Voltmeter (the DC Voltmeter should also read  $5.00 \pm 0.15$  Volts DC).
8. Reduce the sine wave input to  $2000 \pm 10$  millivolts RMS.
9. Observe an indication of  $2000 \pm 50$  millivolts RMS on the AC Voltmeter.
10. Reduce the sinewave input to  $1.000 \pm 30$  millivolts RMS.
11. Observe a  $1000 \pm 30$  millivolts RMS on the AC Voltmeter.
12. Reduce the frequency of the input sine wave to  $5 \pm 0.5$  Hz.

13. Observe an indication of  $760 \pm 90$  millivolts RMS on the AC Voltmeter.
14. Place the High-Pass switch to 100 HZ.
15. Increase the frequency of the input sine wave to  $100 \pm 1$  Hz.
16. Observe an indication of  $760 \pm 90$  millivolts RMS on the AC Voltmeter.
17. Place the High-Pass switch to 899.
18. Increase the frequency of the input sine wave to  $900 \pm 5$  Hz.
19. Observe an indication of  $760 \pm 90$  millivolts RMS on the AC Voltmeter.
20. Place the High-Pass switch to 900 Hz.
21. Observe an indication of  $1000 \pm 30$  millivolts RMS on the AC voltmeter.
22. Increase the frequency of the input sine wave until the AC Voltmeter reads  $707 \pm 20$  millivolts RMS.
23. Observe that the frequency of the sine wave generator is  $10.5 \pm 0.6$  kHz.