

**Features**

Supports compatible AiT SiPM Amplifiers

Passive Base Amplifiers

Active Base Receivers

Selective Active Bases

Provides filtered +5V and -5V amplifier voltages

1A maximum output current

HV80 provides 10V → 80V 4mA bias voltage

Coarse and fine bias voltage control

Bias current limit control

Enable on/off switch

Fault reset pushbutton

Fault bypass switch

Uses a standard +12V power supply

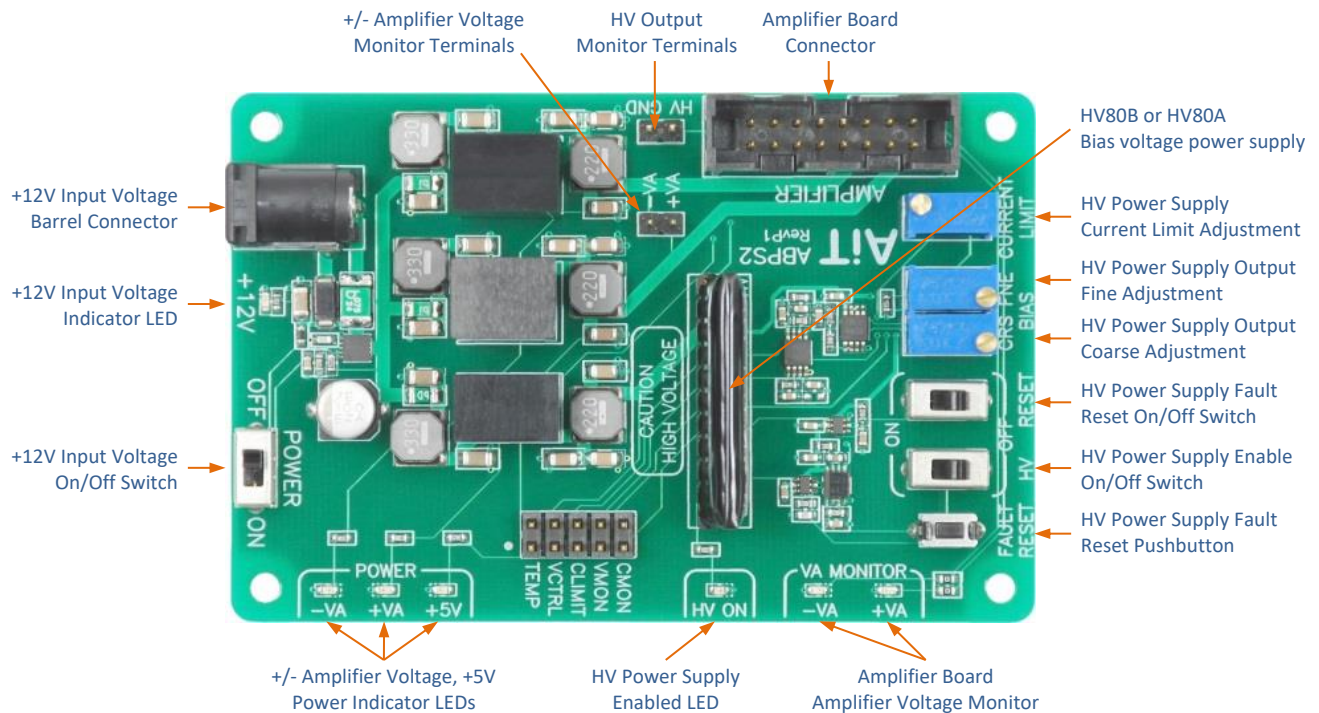
Input voltage on/off switch

Input over-current protection

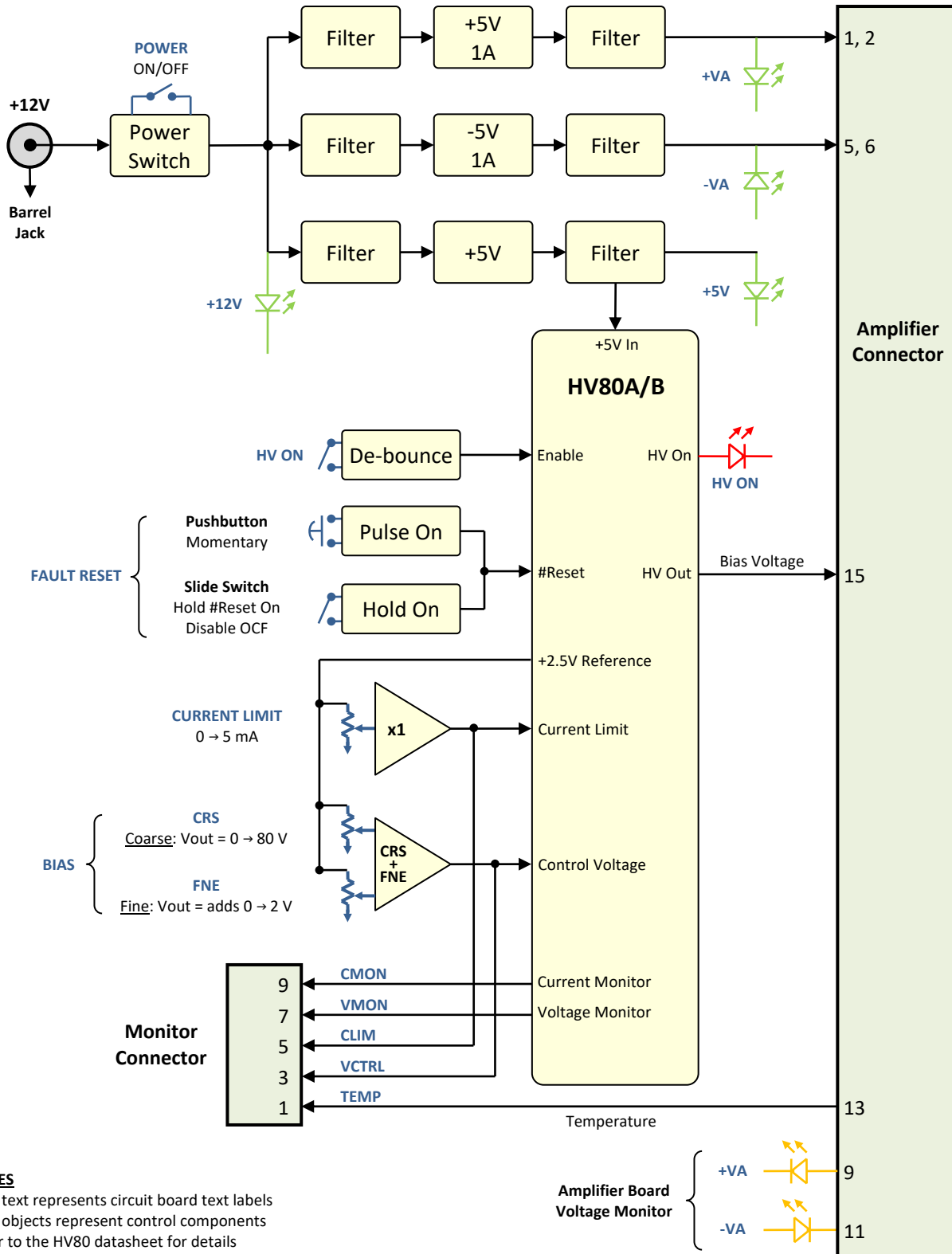


**Accessories Included**

- +12V, 1.25A desktop power supply
- HV80B bias power supply (HV80A optional)
- Four #4-40 aluminum standoffs with screws



**Architecture**



**NOTES**

Blue text represents circuit board text labels  
 Blue objects represent control components  
 Refer to the HV80 datasheet for details

## Specifications

### Input Power Supply Requirements

Input voltage	+9V → +14V, +12V typical
Fuse	1.1A, resettable
No-load current	25mA (HV disabled)
Full-load current	1.05A
	Conditions: HV=80V, 4mA load, ±VA = ±5V = ±1A load

### +5V Amplifier Power Supply (+VA)

Output current	1A
Ripple and noise	<5mVpp, <0.5mV RMS

### -5V Amplifier Power Supply (-VA)

Output current	1A
Ripple and noise	<5mVpp, <0.5mV RMS

### High Voltage Power Supply

	AiT Model HV80B (refer to the HV80 datasheet for details)	
Output voltage	10V → 80V	
Output current	4mA maximum at 80V	
Coarse control voltage	0V → 2.5V control	= 0V → 80V HV output
Fine control voltage	0V → 62.5mV control	= 0V → 2V added HV output
Current limit control voltage	0V → 2.5V control	= 0mA → 5mA HV output current
HV On switch	"ON" = Enables the HV80 main input voltage "OFF" = Disables the HV80 main input voltage	
Fault reset pushbutton	Temporarily asserts #Reset for approximately 500ms. Disables the over-current fault shutdown while #Reset is asserted.	
Fault reset switch	"ON" = Permanently asserts #Reset and disables over-current fault shutdown "OFF" = Permits over-current fault shutdown	
Caution	Disabling the over-current fault circuit or repeating HV reset during a persistent fault condition may damage system components. Identify and remove the cause of the fault, restart the HV power supply at a safe output voltage, then slowly increase to normal operating voltage.	

### LEDs

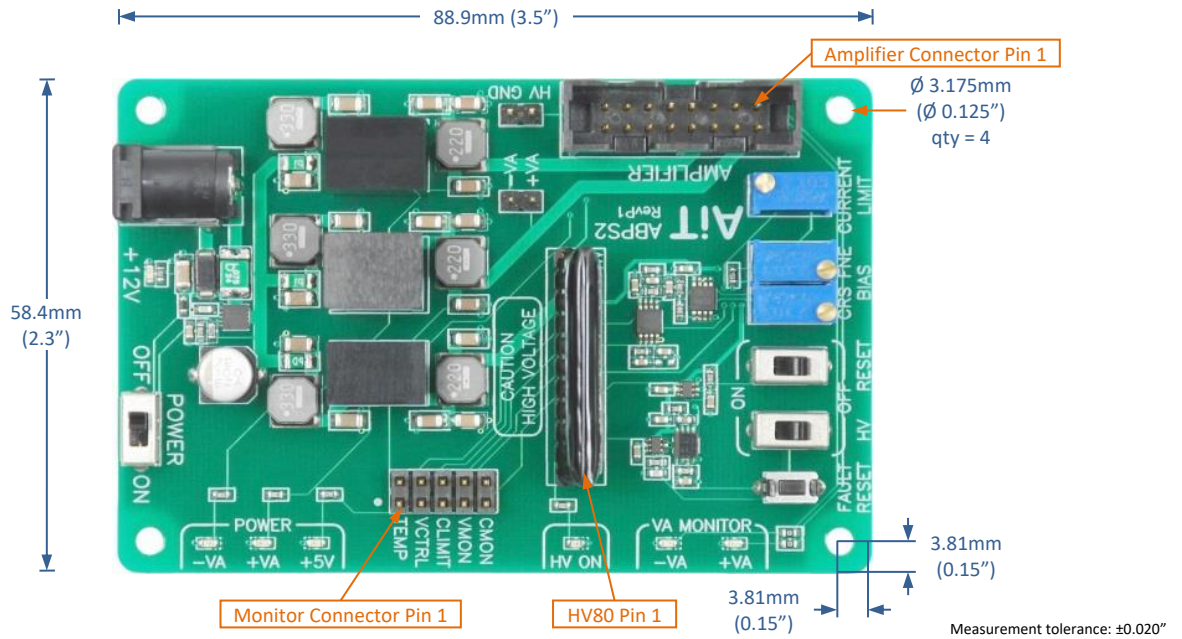
+12V	Green	= +12V input voltage connected and switched on
+VA	Green	= Positive amplifier voltage on (+5V)
-VA	Green	= Negative amplifier voltage on (-5V)
+5V	Green	= HV80 +5V power supply on
+VA MONITOR	Yellow	= Positive amplifier voltage monitor from the amplifier board

-VA MONITOR                      Yellow   = Negative amplifier voltage monitor from the amplifier board  
HV ON                                Red      = HV80 enabled and no over-current fault

**Connectors**

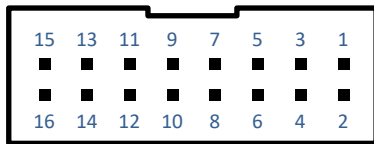
AMPLIFIER                         16-pin, 2-row shrouded header, 0.1" pitch  
MONITOR                            10-pin, 2-row unshrouded header, 0.1" pitch  
+12V                                 Circular barrel power jack, 2.1mm ID, 5.5mm OD, center positive

**Mechanical**



**Connectors**

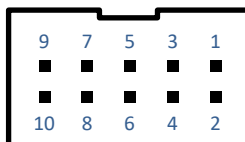
**AMPLIFIER**



16-pin 0.100" shrouded header

Pin	Function	Pin	Function
1	+VA	2	+VA
3	Ground	4	Ground
5	-VA	6	-VA
7	Ground	8	Ground
9	+VA Monitor	10	Ground
11	-VA Monitor	12	Ground
13	Temperature	14	Ground
15	Bias	16	Ground

**MONITOR**



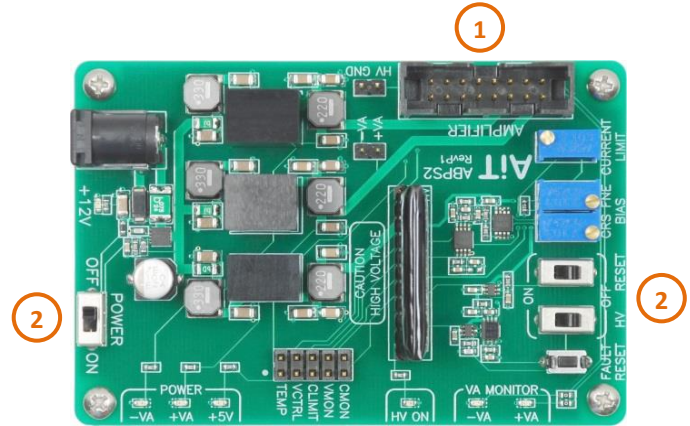
10-pin 0.100" unshrouded header

Pin	Function	Pin	Function
1	Base Temperature	2	Ground
3	HV Control Voltage	4	Ground
5	HV Current Limit	6	Ground
7	HV Voltage Monitor	8	Ground
9	HV Current Monitor	10	Ground

## Operation

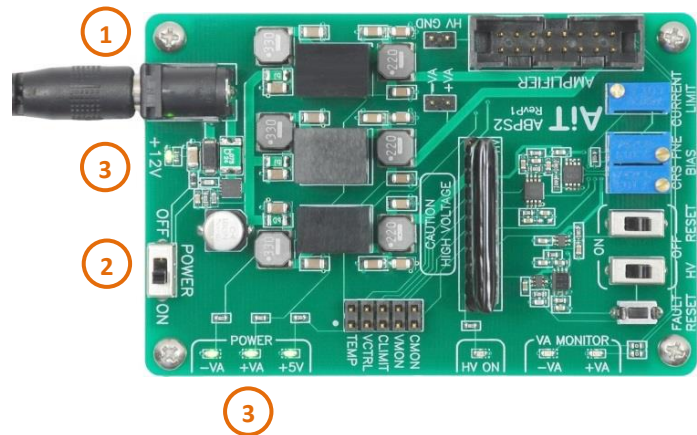
### STEP 1: Prepare for operation

1. Disconnect the amplifier board
2. Place all switches in the "OFF" position



### STEP 2: Turn on the main power

1. Connect the +12V input power supply
2. Slide the "POWER" switch to "ON"
3. Verify that the green LEDs +12V, -VA, +VA, and +5V are on



### STEP 3: Set the HV output current limit

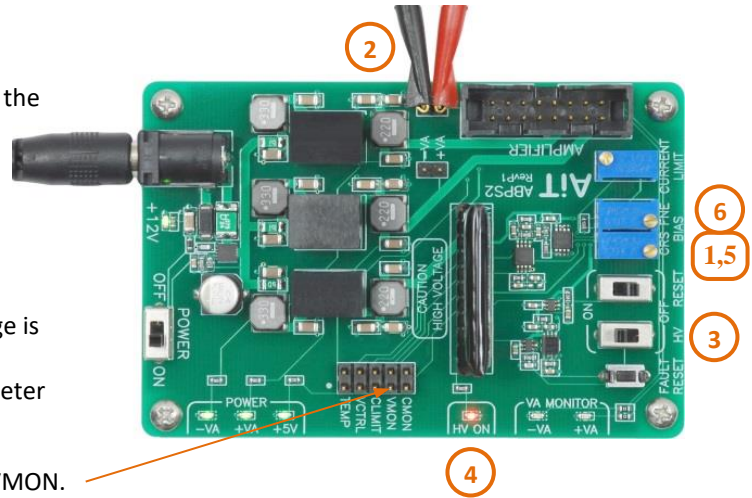
1. Slide the "POWER" switch to "OFF"
2. Connect a voltmeter to the CLIMIT pin and GROUND pin
3. Slide the "POWER" switch to "ON"
4. Slide the "HV" switch to "ON"
5. Adjust the CURRENT LIMIT potentiometer to set the required current limit while monitoring CLIMIT
6. Slide the "HV" switch to "OFF"



**NOTE:** A +1.0V (2mA) current limit is recommended for most applications.

**STEP 4: Set the bias voltage**

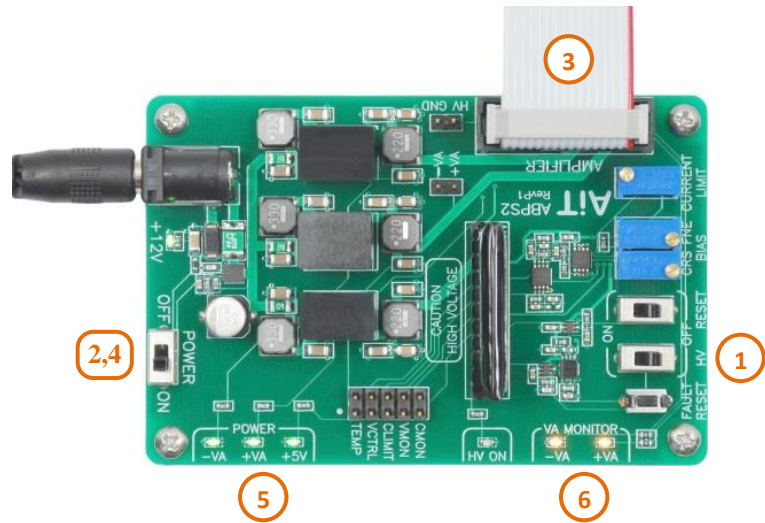
1. Turn the “CRS” coarse bias voltage potentiometer fully counter-clockwise to set the bias voltage to zero
2. Connect a voltmeter to the “HV” and “GND” pins
3. Slide the “HV” switch to “ON”
4. Verify that the red LED “HV ON” is on
5. Slowly turn the “CRS” coarse bias voltage potentiometer clockwise until the bias voltage is within 1V of the desired voltage
6. Adjust the “FNE” fine bias voltage potentiometer to achieve the desired voltage



**NOTE:** The bias voltage can also be monitored using VMON.

**STEP 5: Connect and power the amplifier board**

1. Slide the “HV” switch to OFF
2. Slide the “POWER” switch to OFF
3. Connect the amplifier board
4. Slide the “POWER” switch to ON
5. Verify that green LEDs -VA, +VA, +5V are on
6. Verify that the yellow LEDs -VA and +VA Monitor are on

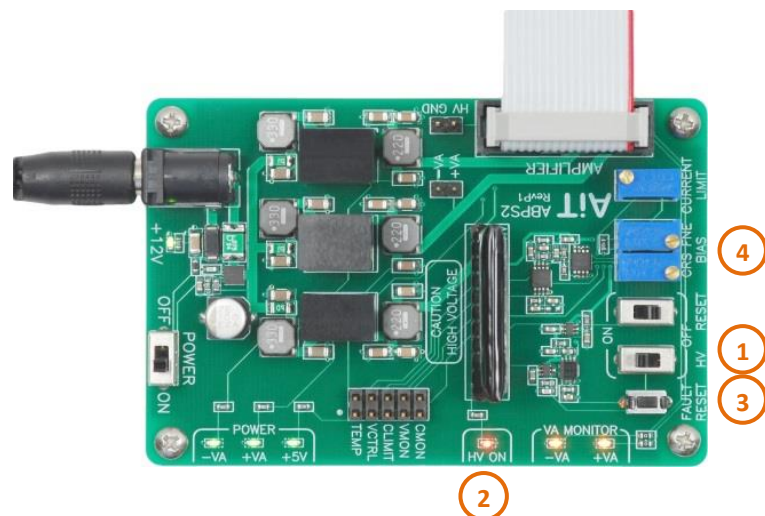


**STEP 6: Enable the bias voltage**

1. Slide the “HV” switch to ON
2. Verify that the red LED “HV ON” is on
3. If the “HV ON” led is off then press the “FAULT RESET” pushbutton
4. Adjust the bias voltage if necessary

**NOTE**

It is often useful to monitor the bias current and bias voltage during operation. Bias current can be monitored by connecting a voltmeter to CMON.



## Safety Information



### **WARNING – High Voltage**

- High voltage may be present during operation
- High voltage stored on capacitors may be present after power is removed
- Improper handling may result in personnel injury or equipment damage

This high-voltage device must be used only by personnel trained and qualified in safe handling, installation, and operation of high-voltage equipment.



### **CAUTION – Electrostatic Discharge (ESD) Sensitivity**

The circuit board can be damaged by electrostatic discharge. Observe precautions for handling electrostatic sensitive devices. Handle only at static-safe workstations.

## High-Gain Photodetectors

High-gain photodetectors such as silicon photomultipliers may conduct damaging currents if exposed to high optical signal levels while the bias voltage is applied, or if the bias voltage exceeds the recommended operating range. These devices must be operated only in low-light conditions, and only within the manufacturer's recommended bias voltage range.

## Handling and Disassembly

This product may be provided with a protective enclosure. Disassembled enclosure components and circuit boards may contain sharp edges. Take appropriate safety precautions while assembling or disassembling the enclosure and handling disassembled components.

## Indoor Use Only

Do not operate this product in a wet or damp environment. Do not operate in an explosive atmosphere.

Use of this product, and AiT Instruments' liability related to use of this product, is further governed by AiT Instruments' standard terms and conditions of sale, which were provided upon purchase of this product.