Sapphire Instruments Co., Ltd.

Calibration Procedure of SI-200

This procedure is for use by qualified service personnel to adjust SI-200 properly. The equipments required are listed in Table 1.

No.	Item	Minimum Requirements
1	Power Supply	9VDC/300mA or 6VDC/300mA mains adaptor or 4xAA cells or power lead.
2	DMM	DC Accuracy < 0.5%
3	Function Generator	Maximum Frequency > 10MHz Sine-wave Distortion < 1%
4	Oscilloscope	Bandwidth >= 20MHz Accuracy <= 2%

Table 1

This procedure is divided into following steps;

A. Prepare the probe for adjustment.
B. Adjust input bias voltage.
C. Adjust output offset voltage.
D. Adjust CMRR at 60Hz.
E. Adjust square-wave compensation for +input.
F. Adjust square-wave compensation for -input.
G. Adjust CMRR at 10MHz.

A. Prepare the probe for adjustment.

A-1. Use a small flat screwdriver to peel the both panels off, referring to figure 1.

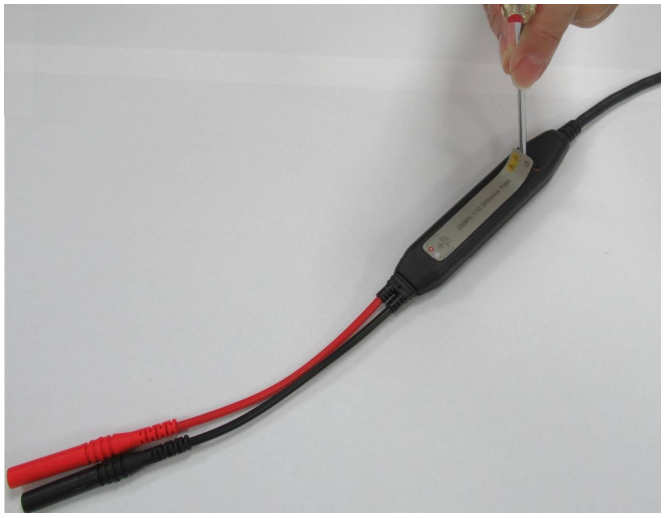

Fig. 1

A-2. Loosen the four screws on the plastic cases.

A-3. Remove the plastic cases. Figure 2 shows the location of adjustments on bottom side of the metal case.

A-4. Connect the power source.

A-5. Allow the probe and test equipments to warm up 20 minutes at an ambient temperature of 18 degree Celsius to 28 degree Celsius.

A-6. In order to make following operation easier, use one plastic case to support the metal case and the input head.

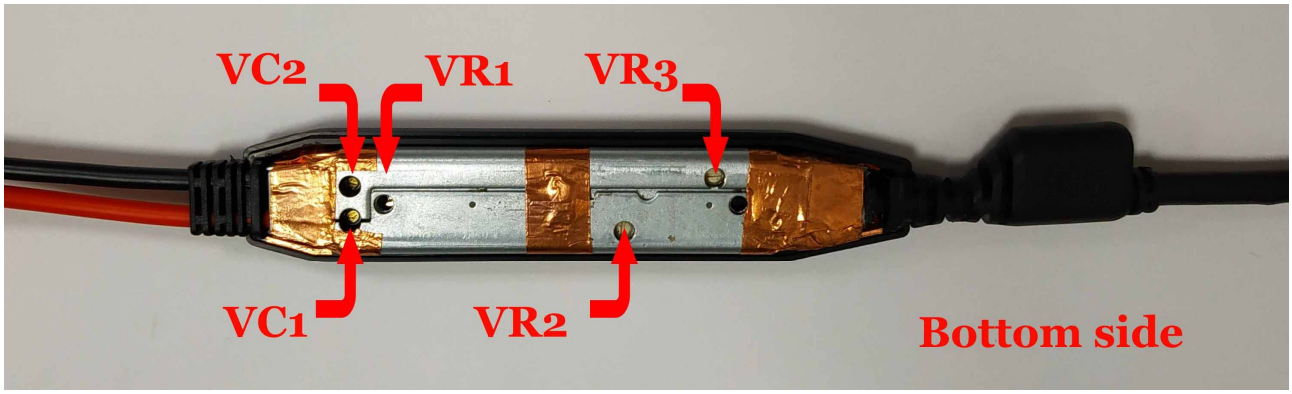

Fig. 2

B. **Adjust input bias voltage**

B-1. Connect the probe as shown in figure 3.

B-2. The value of input bias voltage now is displayed on the digital multimeter.

B-3. Adjust VR2 to make the input bias voltage as small as possible.

B-4. The criterion is -2mV <= Vib <= +2mV.

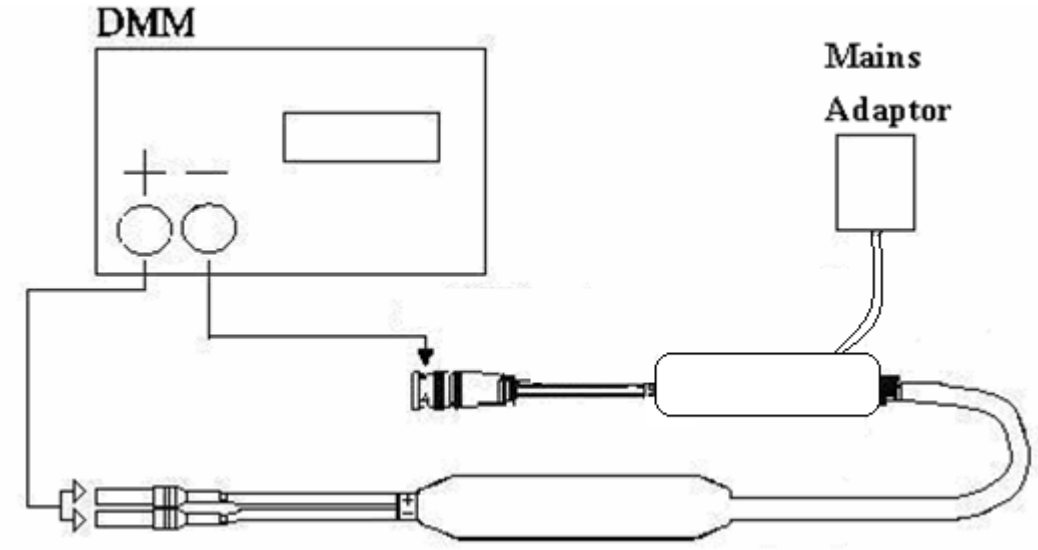

Fig. 3

C. **Adjust output offset voltage**

C-1. Connect the probe as shown in figure 4.

C-2. Adjust VR3 for minimum output offset voltage.

C-3. The criterion is -5mV <= Vout <= +5mV.

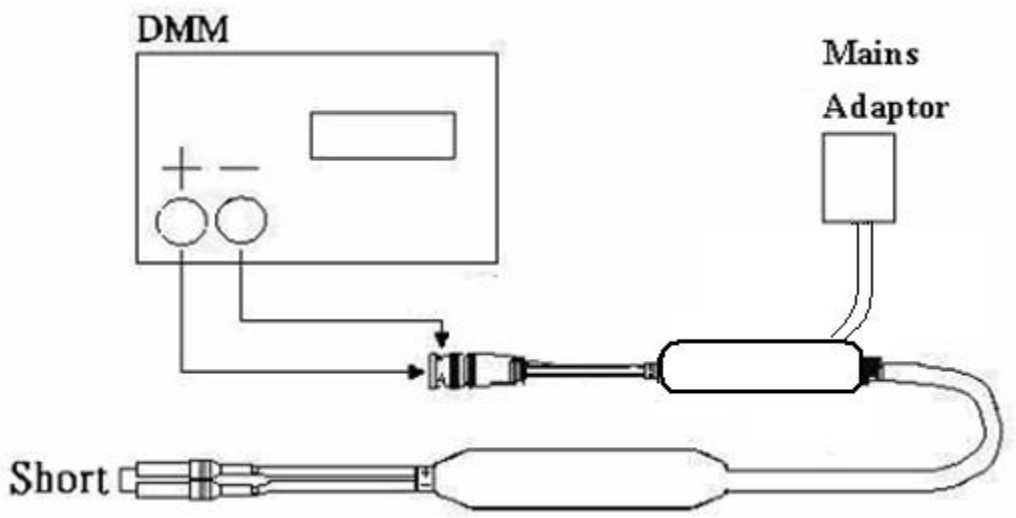

Fig. 4

D. **Adjust CMRR at 60Hz**

D-1. Connect the probe as shown in figure 5.

D-2. Set the output of the function generator to 20Vp-p 60Hz sine-wave, and set the input impedance of the oscilloscope to 50ohm. (Add a feedthrough 50ohm terminator to the input, if the oscilloscope doesn't provide the 50ohm input impedance.)

D-3. Adjust VR1 for minimum Vout displayed on the oscilloscope.

D-4. The criterion is Vout <= 0.2mVp-p.

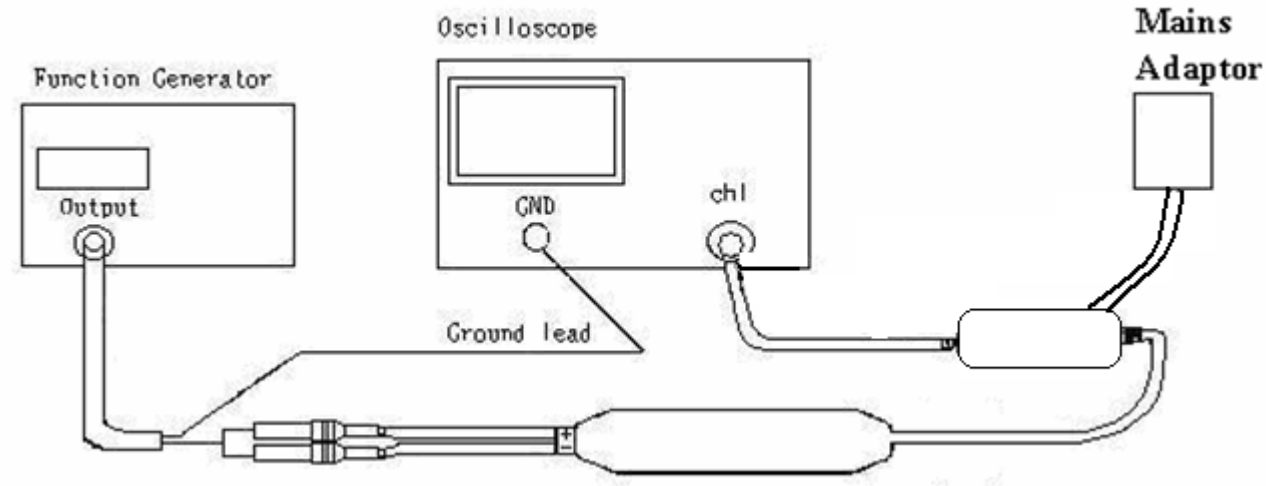

Fig. 5

E. **Adjust square-wave compensation for +input.**

E-1. Connect the probe as shown in figure 6.

E-2. Set the output of the function generator to 1.4Vp-p, 100KHz square-wave.

E-3. Set the input impedance of the oscilloscope to 50ohm (Add a feedthrough 50ohm terminator to the input, if the oscilloscope doesn't provide the 50ohm input impedance.)

E-4. Adjust VC1 to make the front corner roll off or overshoot of the square-wave displayed on the oscilloscope less than 2.8mV.

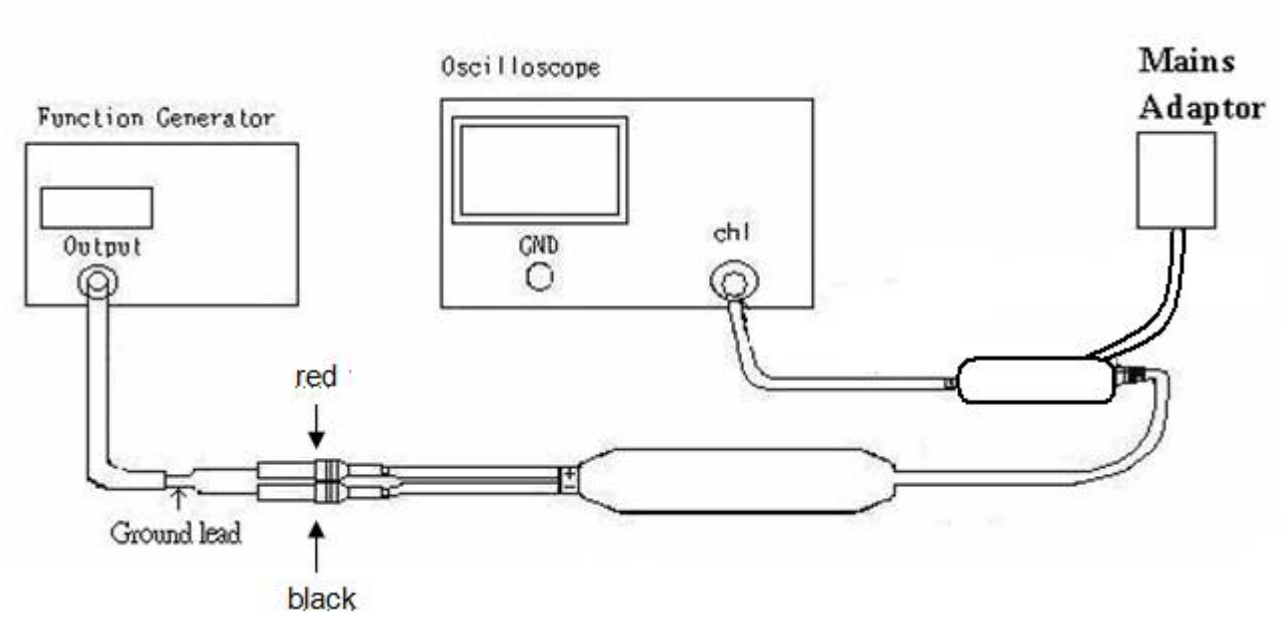

Fig. 6

F. **Adjust square-wave compensation for -input.**

F-1. Connect the probe as shown in figure 7.

F-2. Set the output of the function generator to 1.4Vp-p, 100KHz square-wave.

F-3. Set the input impedance of the oscilloscope to 50ohm (Add a feedthrough 50ohm terminator to the input, if the oscilloscope doesn't provide the 50ohm input impedance.)

F-4. Adjust VC2 to make the front corner roll off or overshoot of the square-wave displayed on the oscilloscope less than 2.8mV.

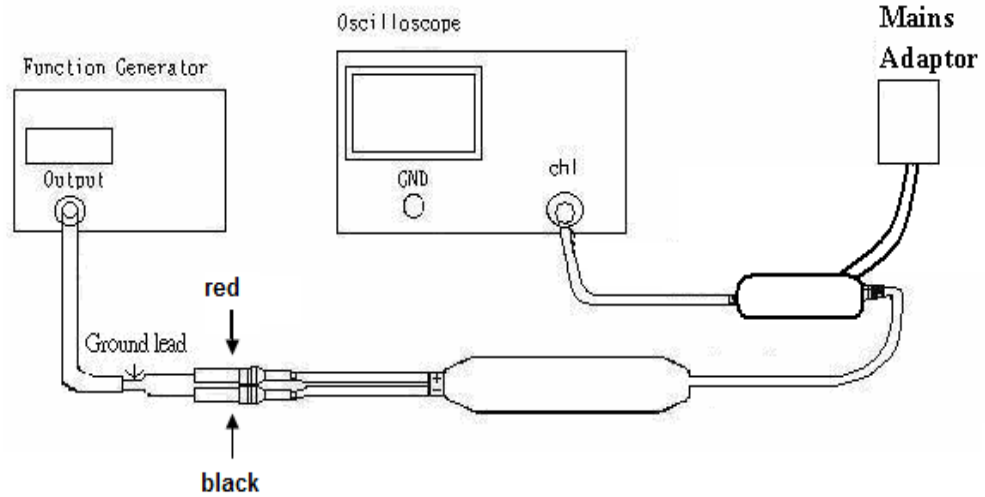

Fig. 7

G. **Adjust CMRR at 10MHz**

G-1. Connect the probe as shown in figure 8.

G-2. Set the output of the function generator to be 20Vp-p, 10MHz, sine-wave, and set the input impedance of the oscilloscope to be 50ohm (Add a feedthrough 50ohm terminator to the input , if the oscilloscope doesn't provide the 50ohm input impedance.)

G-3. Adjust VC1 slightly for minimum Vout displayed on the oscilloscope.

G-4. The criterion is Vout <= 6mVp-p.

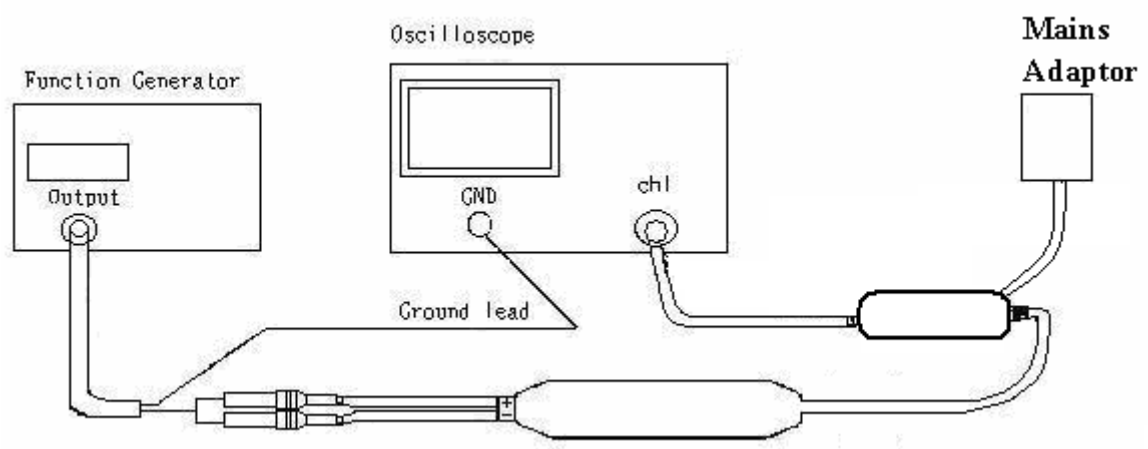

Fig. 8