Sapphire Instruments Co.,Ltd.

Calibration Procedure of SI-800

This procedure is for use by qualified service personnel to adjust SI-800 properly. The equipments required are listed in Table 1.

No.	Item	Minimum Requirements
1	Power Supply	12VDC/100mA mains adaptor
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: VR3.
C. Adjust output offset voltage: VR2.
D. Adjust square-wave compensation for +input: VC1.
E. Adjust square-wave compensation for –input: VC2.
F. Adjust CMRR at 60 Hz: VR1.
G. Adjust CMRR at 1 MHz: VC1.

A. Prepare the probe for adjustment.

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

Fig. 1

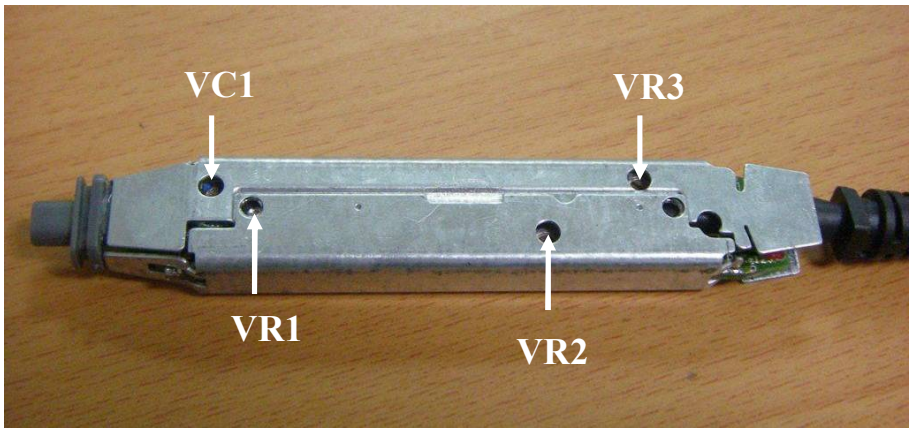
A-2. Loosen the four screws on the plastic cases.

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

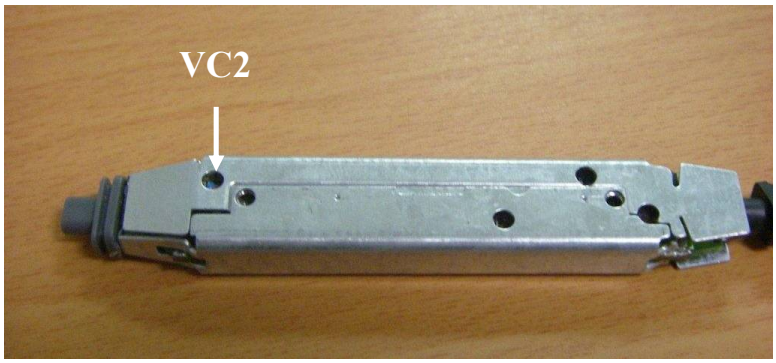
A-4. Use 12 VDC /50 mA Mains adaptor and turn on all test equipments.

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.

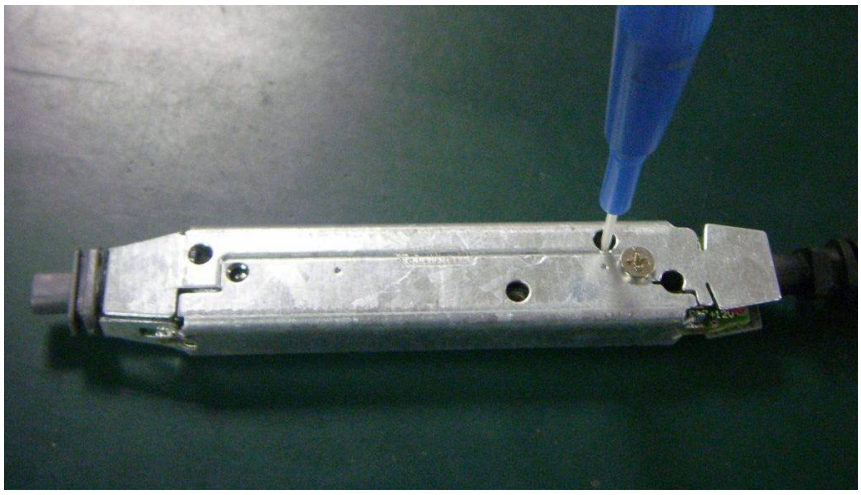


Top side



Bottom side

Fig. 2



B. Adjust input bias voltage

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

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

B-3. Adjust VR3 to make the input bias voltage as small as possible.

B-4. The criterion is -3 mV <= Vid<= +3 mV.

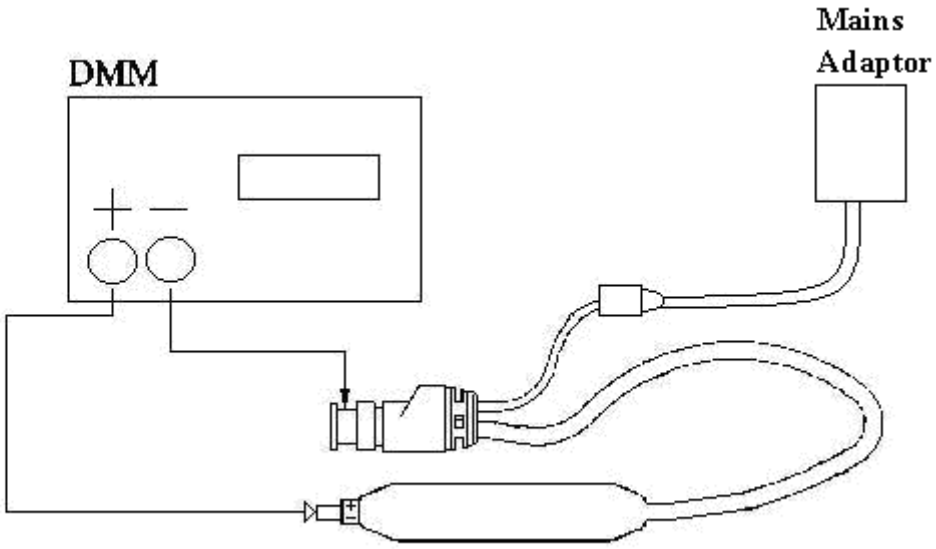


Fig. 3

C. Adjust output offset voltage

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

C-2. Adjust VR2 for minimum output offset voltage.

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

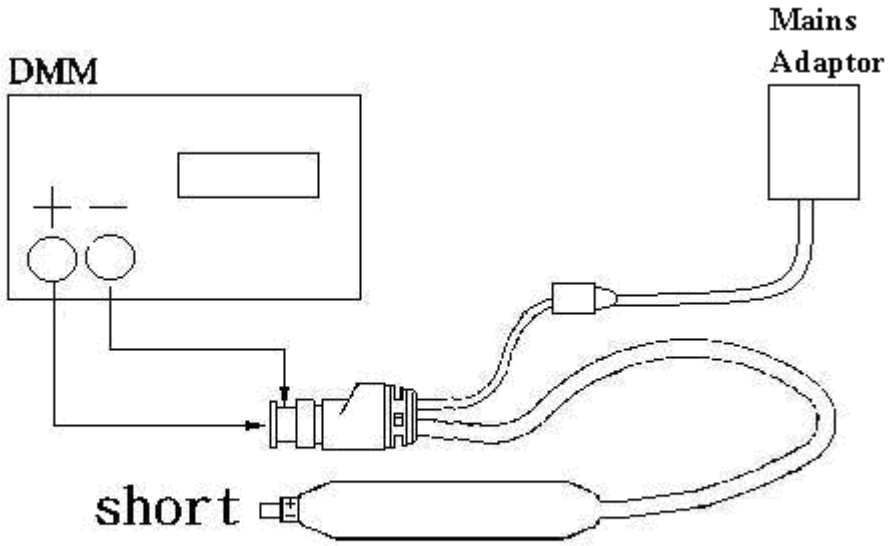


Fig. 4

D. Adjust square-wave compensation for +input.

E-1. Connect the probe as shown in Fig 5.

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

E-3. Set the input impedance of the oscilloscope to 50 ohm (Add a feed through 50 ohm terminator to the input, if the oscilloscope doesn't provide the 50 ohm 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 2.8 mV.

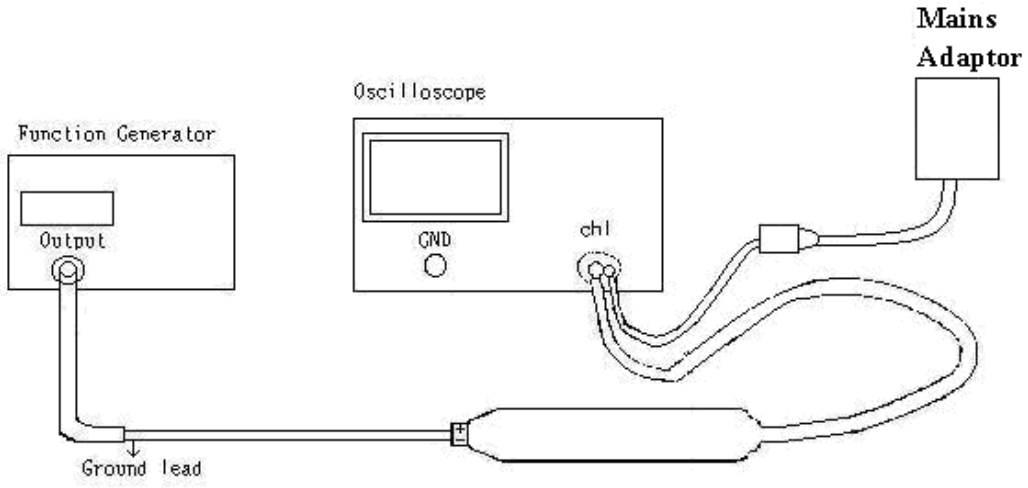


Fig. 5

E. Adjust square-wave compensation for - input.

F-1. Connect the probe as shown in Fig 6.

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

F-3. Set the input impedance of the oscilloscope to 50 ohm (Add a feedthrough 50 ohm terminator to the input, if the oscilloscope doesn't provide the 50 ohm 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 2.8 mV.

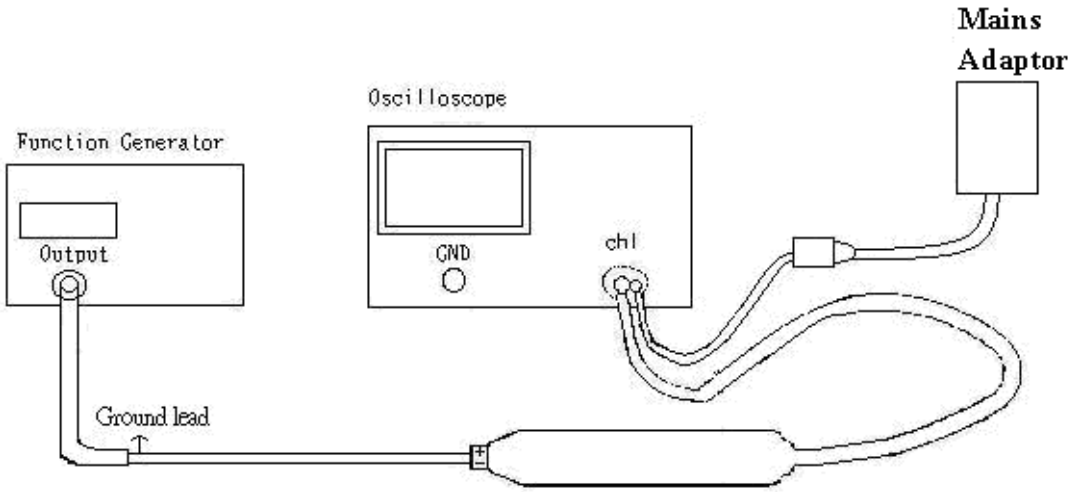


Fig. 6

F. Adjust CMRR at 60 Hz

D-1. Connect the probe as shown in Fig 7.

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

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

D-4. The criterion is Vout <= 2 mVp-p (after excluding noise).

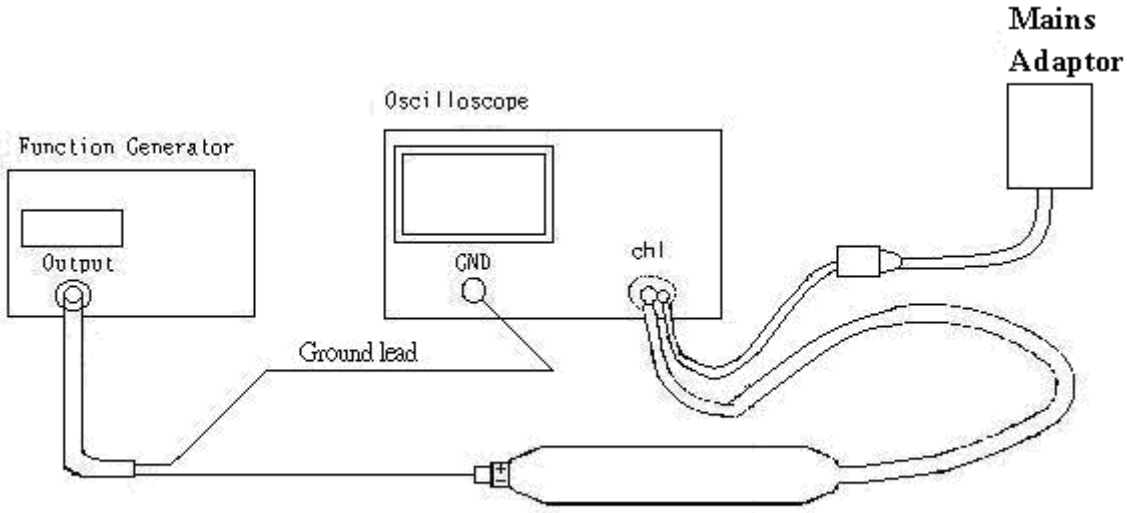


Fig. 7

G. Adjust CMRR at 1 MHz

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

G-2. Set the output of the function generator to be 20 Vp-p, 1 MHz, sine-wave, and set the input impedance of the oscilloscope to be 50 ohm (Add a feedthrough 50 ohm terminator to the input , if the oscilloscope doesn't provide the 50 ohm input impedance.)

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

G-4. The criterion is Vout <= 2 mVp-p (after excluding noise).

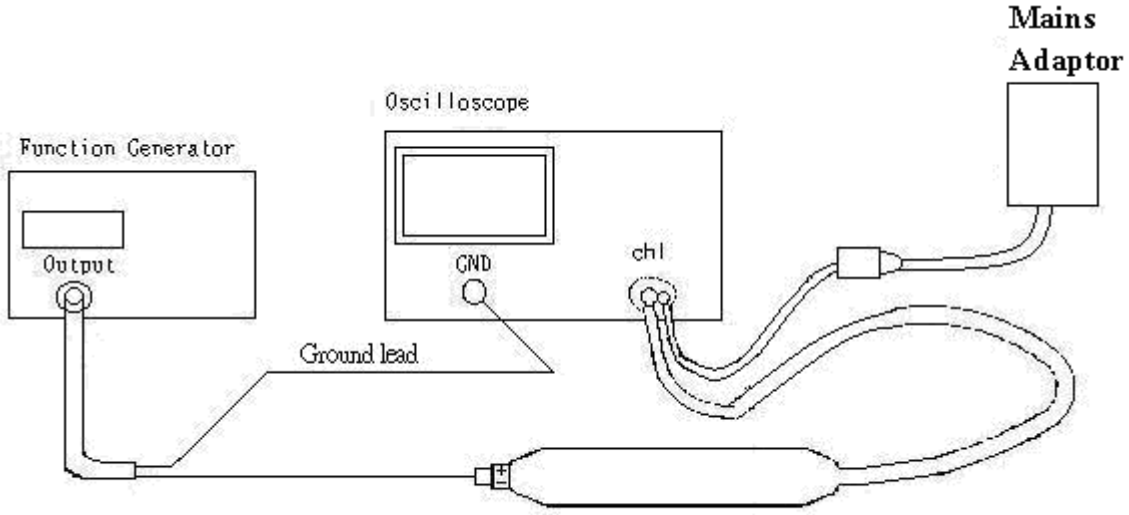


Fig. 8