

# SAP1000

## Active Probe

### User Manual

UM60010-E01A



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# 1 Introduction

This user manual includes important safety information related to the SAP1000 active probe and simple tutorials for basic operation of the probe.

## 2 General Safety Summary


This chapter contains information and warnings that must be followed to keep the probe operating under the appropriate safety conditions. In addition to the safety precautions specified in this section, you must also follow recognized safety procedures.

- **Connect and disconnect properly.** Connect probe to the measurement instrument before connecting the test leads to a circuit/signal being tested.
- **Use indoors only.**
- **Keep product surfaces clean and dry.**
- **Use only within operational environment listed.** Do not use in wet or explosive environments.
- **Be careful with sharp tips.** The tips may cause bodily injury if not handled properly.
- **Connect the signal wire correctly.** The potential of the signal wire ground is equal to the earth; therefore, do not connect the signal wire to a high voltage. Do not touch the exposed contacts or components.
- **Only qualified technical personnel should service this instrument.**
- **Do not operate with suspected failures.** Do not use the probe if any part is damaged. Cease operation immediately and remove the probe from use.

### 2.1 Safety Terms and Symbols

This symbol may appear on the probe body or in this manual to alert you to

important safety considerations.


	<b>CAUTION:</b> Potential for damage to probe or instrument it is connected to. Attend to the accompanying information to protect against personal injury or damage. Do not proceed until conditions are fully understood and met.
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## 2.2 Working Environment

The accessory is intended for indoor use and should be operated in a clean, dry environment. Before using this product, ensure that its operating environment is maintained within these parameters:

- Temperature: 5 to 40° C.
- Humidity: Maximum relative humidity 80% for temperatures up to 30 °C decreasing linearly to 50% relative humidity at 40° C.
- Altitude: Up to 10,000 ft (3,048 m).

**Note:** Direct sunlight, radiators, and other heat sources should be taken into account when assessing the ambient temperature.

	<b>WARNING:</b> Do not operate the probe in an explosive atmosphere or wet and damp conditions.
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	<b>CAUTION:</b> Do not exceed the specified input maximum voltage levels. Refer to Specifications for more details.
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## 2.3 Calibration

The recommended calibration interval is one year. Calibration should be only performed by qualified personnel.

## 2.4 Cleaning

The exterior of the probe and cable should be cleaned, using a soft cloth moistened with water. The use of abrasive agents, strong detergents, or other solvents may damage the probe. Always ensure that the input leads are free of debris. To avoid electrical shock, unplug the probe from the scope before cleaning.



No operator serviceable parts inside. Do not remove covers.  
Refer servicing to qualified personnel

## 2.5 Abnormal Conditions

Only operate the probe for the purposes specified by the manufacturer.

Do not operate the probe if there is any visible sign of damage or if it has been subjected to severe transport stresses.

If you suspect the probe has been impaired, disconnect the probe from the scope and secure the probe against any unintended operation.

Proper use of the probe depends on careful reading of all instruction and labels.



**Warning:** Any use of the probe in a manner not specified by the manufacturer may impair the probe. This probe should not be directly connected to human subjects or used for patient monitoring.

## 3 First steps

### 3.1 Delivery Checklist

First, verify that all items listed on the packing list have been delivered. If you note any omissions or damage, please contact your nearest SIGLENT customer service center or distributor as soon as possible. If you fail to contact us immediately in case of omission or damage, we will not be responsible for replacement.



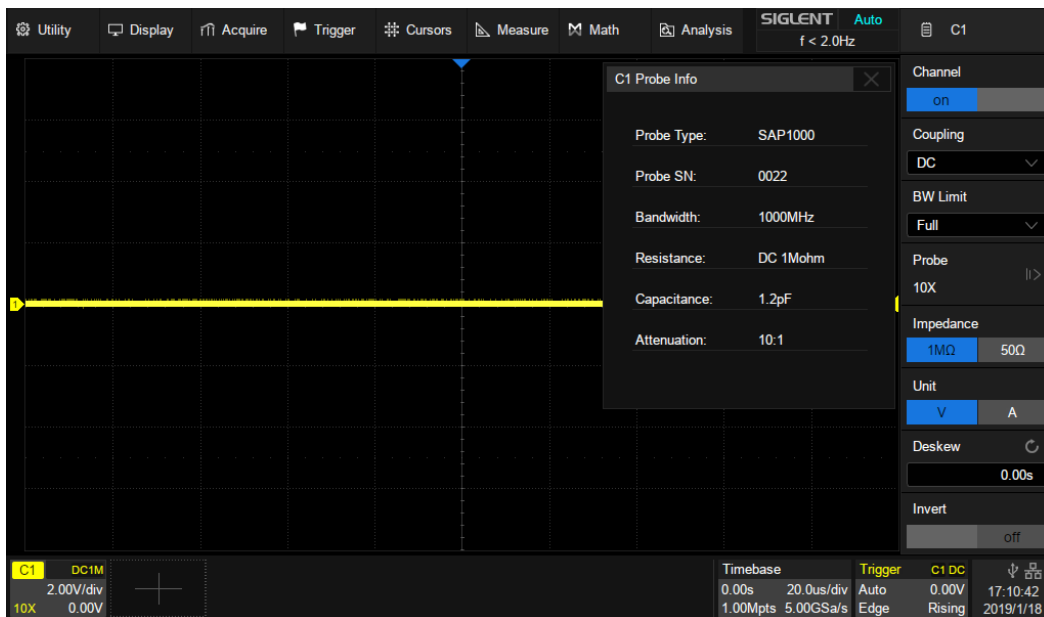
### 3.2 Functional Check

The functional check verifies the basic functional of the probe functions.

1. Turn the oscilloscope on and allow at least 30 minutes warm-up time before functional check.



2. Connect the SAP1000 probe to channel 1 of the oscilloscope.
3. Touch **Probe** in the C1 menu, and then check the information of the probe, including the probe type, probe SN, bandwidth, resistance, capacitance and attenuation.
4. Set the vertical scale of channel 1 to 2 V/div.
5. Set the offset of channel 1 to zero.
6. Measure the average voltage of channel 1. The measurement should be within  $\pm (1.5\% * \text{full screen reading} + 10 \text{ mV})$ .
7. Set the vertical scale of channel 1 to 1 V/div, 500 mV/div, 200 mV/div, 100 mV/div, 50 mV/div, 20 mV/div, 10 mV/div, and repeat step 6.



### 3.3 Quality Assurance

The probe has a 3-year warranty (1-year warranty for probe attachments) from the date of shipment, during normal use and operation. SIGLENT can repair or replace any product that is returned to the authorized service center during the warranty period. We must first examine the product to make sure that the

defect is caused by the process or material, not by abuse, negligence, accident, abnormal conditions or operation.

SIGLENT shall not be responsible for any defect, damage, or failure caused by any of the following:

- a) Attempted repairs or installations by personnel other than SIGLENT.
- b) Connection to incompatible devices/incorrect connection.
- c) For any damage or malfunction caused by the use of non-SIGLENT probe power supplies.

### **3.4 Maintenance Agreement**

SIGLENT provides various services on the basis of maintenance agreements. We offer extended warranties as well as installation, training, enhancement and on-site maintenance and other services through specialized supplementary support agreements. For details, please consult your local SIGLENT customer service center or distributor.

## 4 Introduction

The SAP1000 is a compact, high impedance active probe designed to meet today's increasing demand for measurements on a variety of tests. Thanks to its low input capacitance and high input resistance, the circuit loading is minimized.

With the SAPBus interface, the SAP1000 becomes a part of the oscilloscope system. The probe can be controlled from the oscilloscope. The oscilloscope provides power to the probe, so there is no need for a separate power supply or batteries.

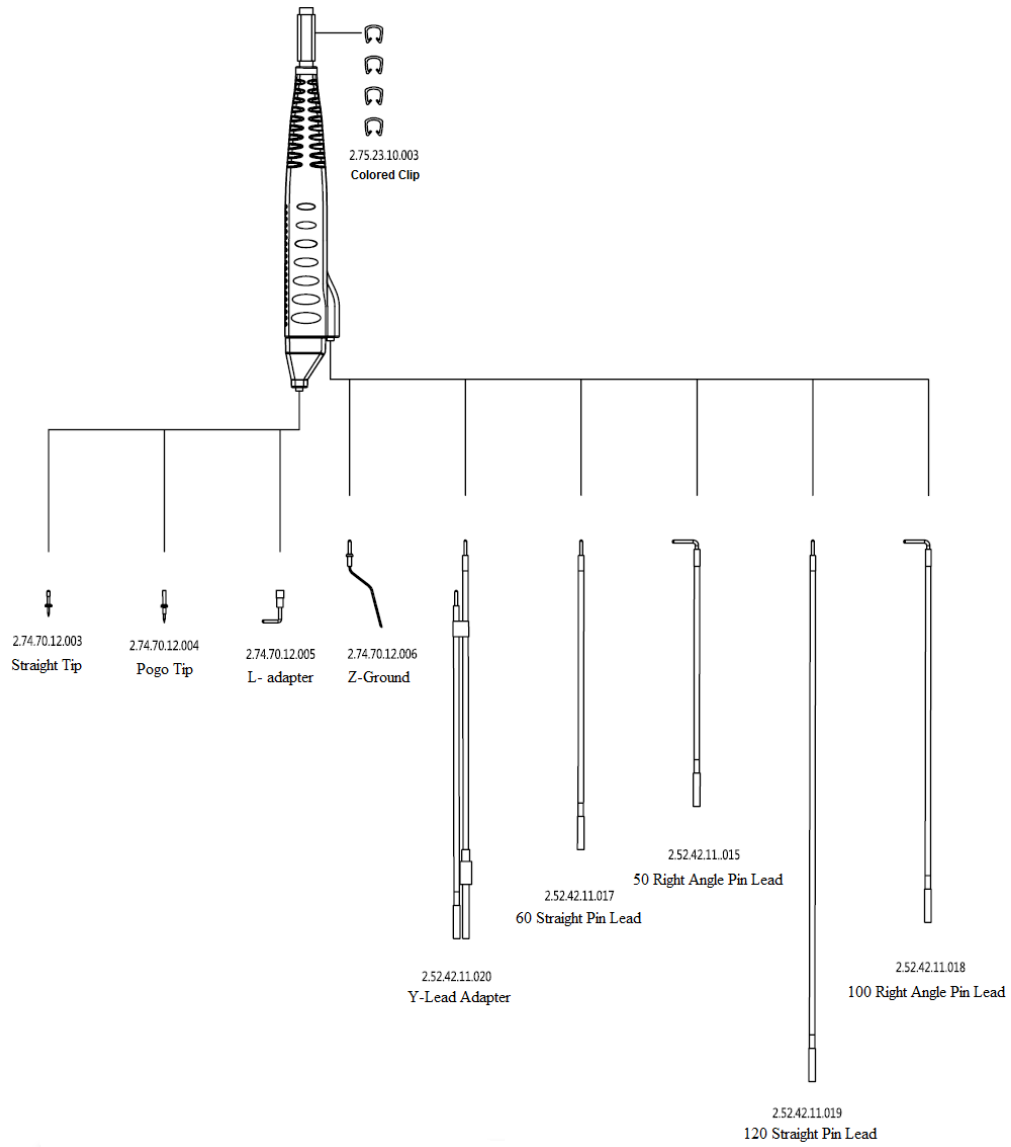
Key Benefits:

- Probe Bandwidth > 1 GHz
- DC Input Resistance 1 M $\Omega$
- Input Capacitance 1.2 pF
- Input Dynamic Range  $\pm 8$  V
- Probe Offset Range  $\pm 12$  V
- SAPBus interface

## 5 Standard Accessories

The SAP1000 probe is shipped with the following standard accessories:

Standard Accessory	Part Number	Quantity
Straight Tip	2.74.70.12.003	5
Pogo Tip	2.74.70.12.004	5
L-adapter	2.74.70.12.005	1
Z-Ground	2.74.70.12.006	1
Y-Lead Adapter	2.52.42.11.020	1
50 Right Angle Pin Lead	2.52.42.11.015	1
60 Straight Pin Lead	2.52.42.11.017	1
100 Right Angle Pin Lead	2.52.42.11.018	1
120 Straight Pin Lead	2.52.42.11.019	1
Colored Clip	2.75.23.10.003	8



**Straight Tip:** The straight tip is rugged and designed for general probing.



**Pogo Tip:** The pogo tip provides z axis compliance. The tip can fit into a socket or via and onto an IC leg.



**L-adapter**: This adapter has a socket on one end and a square pin with a right angle on the other to connect to the input or ground socket of the probe body, and may be used for high frequency applications.



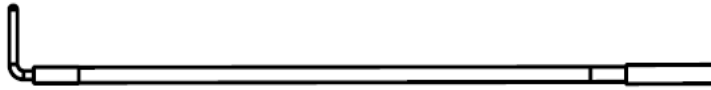
**Z-Ground**: The Z-Ground is designed to be attached to either socket of the probe head. The Z-Ground is the highest quality grounding solution and is recommended in high frequency applications.



**Y-Lead Adapter**: This lead is used for both ground and input lead simultaneously. It has two sockets on one end and two round pins on the other and may be used for general purpose probing.



**60/120 Straight Pin Lead**: These leads have a socket on one end and a round pin on the other to connect to the input or ground socket of the probe body, and may be used for general purpose probing.



**50/100 Right Angle Pin Lead :**These leads have a socket on one end and a round pin with a right angle on the other to connect to the input or ground socket of the probe body, and may be used for general purpose probing.



**Colored Clips:** These colored clips can be used to distinguish a specific probe from other similar probes being used in the measurement.

## 6 Probe Operation

The SAP1000 probe is a precision test instrument. Exercise care when handling and storing the probe. Always handle the probe by the probe body or compensation box. Avoid putting excessive strain or exposing the probe cable to sharp bends.



ESD Sensitive: The tips of the probes are sensitive to Electrostatic Discharge (ESD). Avoid causing damage to the probe by always following anti-static procedures when using or handling the probe.

### 6.1 Connecting the Probe to an Oscilloscope

The SAP1000 probe has been designed for being used with SIGLENT's SDS5000X oscilloscope equipped with the SAPBus interface. When you attach the probe output connector to the oscilloscope's input connector, the oscilloscope detects the probe automatically.

When the SAP1000 probe is connected to any compatible SIGLENT oscilloscope, the displayed scale factor and measurement values are automatically adjusted. The probe can be controlled through the oscilloscope graphical user interface. Turning the Volts/div knob controls the oscilloscope's scale factor to give full available dynamic range up to 2 V/div (16 V peak to peak). Turning the channel offset knob controls the probe input offset circuit over its range of  $\pm 12$  V.



## **6.2 Connecting the Probe to the Test Circuit**

To maintain the high-performance capability of the probe in measurement applications, care must be exercised in connecting the probe to the test circuit. Increasing the parasitic capacitance or inductance in the input paths may introduce a “ring” or slow the rise time of fast signals. Input leads which form a large loop area will pick up any radiated electromagnetic field which passes through the loop and may induce noise into the probe input.

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#### **About SIGLENT**

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, function/arbitrary waveform generators, digital multimeters, DC power supplies, spectrum analyzers, isolated handheld oscilloscopes and other general purpose test instrumentation. Since its first oscilloscope, the ADS7000 series, was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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