

TPP0850 800 MHz 50X High Voltage Probe

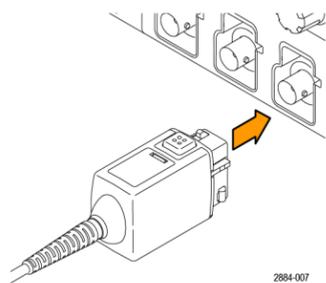
Instructions



Operating information

The TPP0850 Probe is a high impedance probe with 50X attenuation that is designed for use with Tektronix 4/5/6 Series Mixed Signal Oscilloscopes.

Connect the probe as shown in the illustrations below. Compensate the probe before initial use.



Compensate the TPP Series probes

Probe compensation adjusts the high frequency response of a probe for best waveform capture and measurement accuracy. The oscilloscope can automatically test and store compensation values for an unlimited number of probe/channel combinations.

About this task

The oscilloscope stores the compensation values for each probe/channel combination, and automatically recalls the compensation values when you plug in the probe. Probe compensation status is shown in the Probe Setup panel of the Channel configuration menu.

- If the Probe Compensation Status field displays **Pass**, the probe is compensated and ready for use.
- If the Probe Compensation Status field displays **Default**, the attached probe has not been compensated and needs to have this probe compensation procedure run.
- If the Probe Compensation Status field displays **Fail**, the attached probe has failed the probe compensation procedure. Reconnect the probe and run probe compensation again.
- If there is no probe compensation status field shown in the panel, the oscilloscope cannot store compensation values for that probe. See the oscilloscope Help for how to manually compensate passive probes not supported by the probe compensation function.

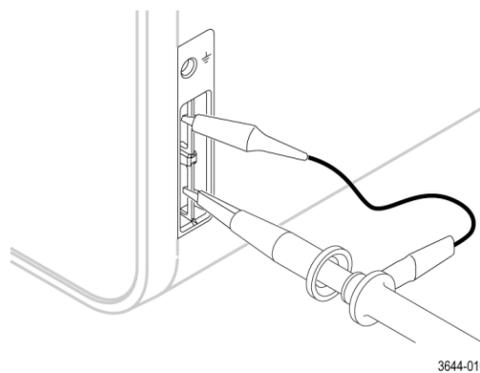
Before you begin

The oscilloscope must be powered on for at least 20 minutes before compensating a probe.

Procedure

Use this procedure to compensate supported TPP-family probes that show a **Default** status when connected to the oscilloscope.

Note: Doing a **Default Setup** does not delete probe compensation values. A factory calibration does delete all stored probe compensation values.



- Connect a supported probe to an input channel.
 - Connect the probe tip and ground lead of the probe to the **PROBE COMP** terminals.
- Note:** Connect only one probe at a time to the PROBE COMP terminals.
- Turn off all channels.
 - Turn on the channel to which the probe is connected.
 - Push the front-panel **Autoset** button. The screen displays a square wave.
 - Double-tap the badge of the channel that you want to compensate.
 - Tap the **Probe Setup** panel. If the Probe Compensation Status says **Pass**, the probe is already compensated for this channel. You can move the probe to another channel and start again from step 1, or connect a different probe to this channel and start from step 1. If the Probe Compensation Status says **Default**, continue with this procedure.
 - Tap **Compensate Probe** to open the **Probe Compensation** dialog.
 - Tap **Compensate Probe** to run the probe compensation.
 - The probe compensation is finished when the Probe Compensation Status displays **Pass**. Disconnect the probe tip and ground from the PROBE COMP terminals.
 - Repeat these steps for each supported passive probe that you want to compensate for this channel.
 - Repeat these steps to compensate supported probes on other channels of the oscilloscope.

Note: For most accurate measurements, open the **Probe Setup** panel and verify the Probe Compensation Status is **Pass** whenever you attach a probe to a channel.

Standard accessories

WARNING: Do not substitute accessories from other products for use with this probe. Only use the accessories that are included with this probe.

WARNING: To avoid electric shock when using the probe or accessories, keep your fingers behind the finger guard of the probe body and away from the shaded area shown in the accessory illustrations below.

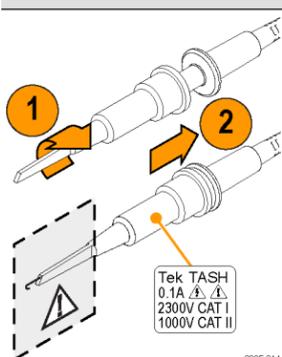
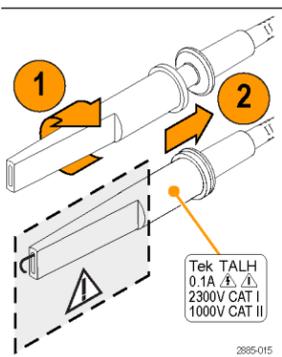
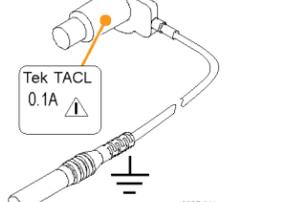
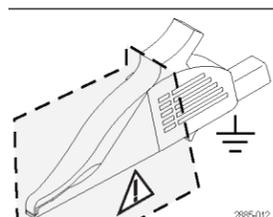
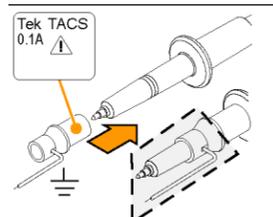
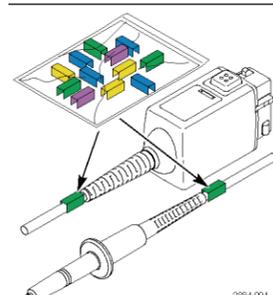
Item	Description
	<p>Small hook tip (TASH)</p> <p>Use this tip to access test points in tight spaces. Screw the hook tip onto the probe tip and then clamp the hook onto the circuit.</p> <p>Rating: 1000 V CAT II. Only the 1000 V CAT II rating is applicable when used with the TPP0850 probe.</p> <p>Tektronix part number 013-0388-XX</p>
	<p>Large hook tip (TALH)</p> <p>Screw the hook tip onto the probe tip and then clamp the hook onto the circuit.</p> <p>Rating: 1000 V CAT II. Only the 1000 V CAT II rating is applicable when used with the TPP0850 probe.</p> <p>Tektronix part number 013-0389-XX</p>
	<p>Common leads (6 in and 18 in) (TACL)</p> <p>Slide the lead over the probe head and snap it into place.</p> <p>Connect the banana plug end directly to your circuit common, or use the crocodile clip included with the probe.</p>

Table continued...

Item	Description
	<p>Tektronix part numbers: 196-3526-XX (6 inch) and 196-3527-XX (18 inch)</p>
	<p>Crocodile clip</p> <p>Attach the clip to the banana end of the common lead and then to your circuit common.</p> <p>Tektronix part number: 344-0461-XX</p>
	<p>Common spring (TACS)</p> <p>Use this accessory to limit aberrations on high frequency signals caused by common lead path inductance. Bend the spring to reach nearby common connections (~1 in).</p> <p>WARNING: Do not touch isolated lead when connecting to circuit</p> <p>Tektronix part number 214-5299-XX</p>
	<p>Color bands</p> <p>Use these bands to identify the oscilloscope channel at the probe head.</p> <p>Tektronix part number: 016-1886-XX (5 pairs)</p>

Optional accessories

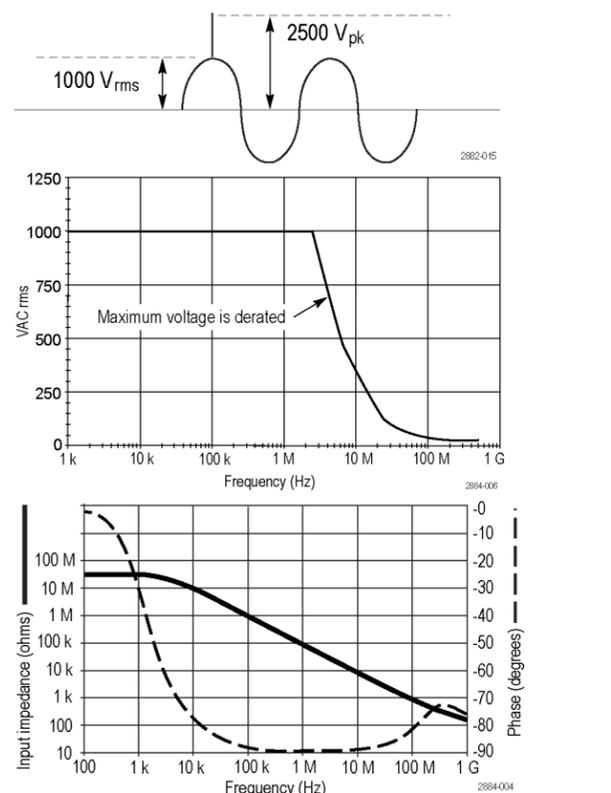
The accessories shown below are available for the probes and are rated ≤30 V unless indicated otherwise.

Accessory	Part number
BNC to Tip Adapter, Unterminated	013-0291-XX
Rubber Spring Tip	206-0060-XX
Probe Holder	TPH1000

Specifications

Electrical and mechanical specifications	
Bandwidth (-3 dB)	800 MHz
System rise time (typical)	<525 ps
System input capacitance (typical)	1.8 pF
System attenuation accuracy	50:1 ±2.2%
System input resistance @DC	40 MΩ ±1%
Propagation delay	~6.1 ns
Cable length	1.3 m
Maximum input voltage (see Performance Graphs)	1000 V _{RMS} CAT II (2500 V _{pk})

Performance graphs



Environmental specifications

Temperature	Operating: 0 °C to +50 °C (+32 °F to +122 °F)
	Nonoperating: -40 °C to +71 °C (-40 °F to +160 °F)
Humidity	Operating: 5% to 95% relative humidity (RH) up to +30 °C 5% to 75% RH above +30 °C to +50 °C. Noncondensing
	Nonoperating: 5% to 45% RH +65 °C to +85 °C. Noncondensing
Altitude	Operating: 3.0 km (9,842 ft) maximum
	Nonoperating: 15.4 km (50,000 ft) maximum

Safety compliance

This section lists the safety standards with which the product complies and other safety compliance information.

EU declaration of conformity – low voltage

Compliance was demonstrated to the following specification as listed in the Official Journal of the European Union:

Low Voltage Directive 2014/35/EU.

- EN 61010-031. Particular requirements for handheld probe assemblies for electrical measurement and test equipment

U.S. nationally recognized testing laboratory listing

- UL 61010-031. Particular requirements for handheld probe assemblies for electrical measurement and test equipment

Canadian certification

- CAN/CSA-C22.2 No. 61010-031. Particular requirements for handheld probe assemblies for electrical measurement and test equipment

Additional compliances

- IEC 61010-031. Particular requirements for handheld probe assemblies for electrical measurement and test equipment

Pollution degree description

A measure of the contaminants that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.

- Pollution Degree 1. No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms.
- Pollution Degree 2. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.
- Pollution Degree 3. Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind.
- Pollution Degree 4. Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.

Pollution degree rating

Pollution Degree 2

Measurement and overvoltage category descriptions

Measurement terminals on this product may be rated for measuring mains voltages from one or more of the following categories (see specific ratings marked on the product and in the manual).

- Overvoltage Category I. For equipment intended to be connected to a mains supply in which means have been taken to substantially and reliably reduce transient overvoltages to a level where they cannot cause a hazard.
- Measurement Category II. For measurements performed on circuits directly connected to the low-voltage installation.
- Measurement Category III. For measurements performed in the building installation.
- Measurement Category IV. For measurements performed at the source of low-voltage installation.



Note: Only mains power supply circuits have an overvoltage category rating. Only measurement circuits have a measurement category rating. Other circuits within the product do not have either rating.

Environmental compliance

This section provides information about the environmental impact of the product.



This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2012/19/EU and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Tektronix Web site (www.tek.com/productrecycling).

Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

To avoid fire or personal injury

Connect and disconnect properly

Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Use only insulated voltage probes, test leads, and adapters supplied with the product, or indicated by Tektronix to be suitable for the product.

Connect the probe output to the measurement instrument before connecting the probe to the circuit under test. Connect the probe reference lead to the circuit under test before connecting the probe input. Disconnect the probe input and the probe reference lead from the circuit under test before disconnecting the probe from the measurement instrument.

De-energize the circuit under test before connecting or disconnecting the current probe.

Observe all terminal ratings

To avoid fire or shock hazard, observe all rating and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not exceed the Measurement Category (CAT) rating and voltage or current rating of the lowest rated individual component of a product, probe, or accessory. Use caution when using 1:1 test leads because the probe tip voltage is directly transmitted to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Do not float the common terminal above the rated voltage for that terminal.

The measurement terminals on this product are not rated for connection to Category III or IV circuits.

Do not connect a current probe to any wire that carries voltages above the current probe voltage rating.

Do not operate without covers

Do not operate this product with covers or panels removed, or with the case open. Hazardous voltage exposure is possible.

Avoid exposed circuitry

Do not touch exposed connections and components when power is present.

Do not operate with suspected failures

If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cord. Clearly mark the product to prevent its further operation.

Before use, inspect voltage probes, test leads, and accessories for mechanical damage and replace when damaged. Do not use probes or test leads if they are damaged, if there is exposed metal, or if a wear indicator shows.

Examine the exterior of the product before you use it. Look for cracks or missing pieces.

Use only specified replacement parts.

Wear eye protection

Wear eye protection if exposure to high-intensity rays or laser radiation exists.

Do not operate in wet/damp conditions

Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

Do not operate in an explosive atmosphere

Keep product surfaces clean and dry

Remove the input signals before you clean the product.

Provide a safe working environment

Always place the product in a location convenient for viewing the display and indicators.

Avoid improper or prolonged use of keyboards, pointers, and button pads. Improper or prolonged keyboard or pointer use may result in serious injury.

Be sure your work area meets applicable ergonomic standards. Consult with an ergonomics professional to avoid stress injuries.

Use care when lifting and carrying the product. This product is provided with a handle or handles for lifting and carrying.



WARNING: The product is heavy. To reduce the risk of personal injury or damage to the device get help when lifting or carrying the product.



WARNING: The product is heavy. Use a two-person lift or a mechanical aid.

Use only the Tektronix rackmount hardware specified for this product.

Probes and test leads

Before connecting probes or test leads, connect the power cord from the power connector to a properly grounded power outlet.

Keep fingers behind the protective barrier, protective finger guard, or tactile indicator on the probes. Remove all probes, test leads and accessories that are not in use.

Use only correct Measurement Category (CAT), voltage, temperature, altitude, and amperage rated probes, test leads, and adapters for any measurement.

Beware of high voltages

Understand the voltage ratings for the probe you are using and do not exceed those ratings. Two ratings are important to know and understand:

- The maximum measurement voltage from the probe tip to the probe reference lead.
- The maximum floating voltage from the probe reference lead to earth ground.

These two voltage ratings depend on the probe and your application. Refer to the Specifications section of the manual for more information.



WARNING: To prevent electrical shock, do not exceed the maximum measurement or maximum floating voltage for the oscilloscope input BNC connector, probe tip, or probe reference lead.

Connect and disconnect properly.

Connect the probe output to the measurement product before connecting the probe to the circuit under test. Connect the probe reference lead to the circuit under test before connecting the probe input. Disconnect the probe input and the probe reference lead from the circuit under test before disconnecting the probe from the measurement product.

De-energize the circuit under test before connecting or disconnecting the current probe.

Connect the probe reference lead to earth ground only.

Do not connect a current probe to any wire that carries voltages or frequencies above the current probe voltage rating.

Inspect the probe and accessories

Before each use, inspect probe and accessories for damage (cuts, tears, or defects in the probe body, accessories, or cable jacket). Do not use if damaged.

Ground-referenced oscilloscope use

Do not float the reference lead of this probe when using with ground-referenced oscilloscopes. The reference lead must be connected to earth potential (0 V).

Floating measurement use

Do not float the reference lead of this probe above the rated float voltage.

Terms in this manual

These terms may appear in this manual:



WARNING: Warning statements identify conditions or practices that could result in injury or loss of life.



CAUTION: Caution statements identify conditions or practices that could result in damage to this product or other property.

Terms on the product

These terms may appear on the product:

- DANGER indicates an injury hazard immediately accessible as you read the marking.
- WARNING indicates an injury hazard not immediately accessible as you read the marking.
- CAUTION indicates a hazard to property including the product.

Symbols on the product



When this symbol is marked on the product, be sure to consult the manual to find out the nature of the potential hazards and any actions which have to be taken to avoid them. (This symbol may also be used to refer the user to ratings in the manual.)

The following symbol(s) may appear on the product.



CAUTION: Refer to Manual



Earth Terminal

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