

**1103**  
**Power Supply (SN B040000 and Above)**  
**Instruction Manual**



071-2544-01

**Tektronix**



# **1103**

## **Power Supply (SN B040000 and Above)**

### **Instruction Manual**

#### **Warning**

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

[www.tektronix.com](http://www.tektronix.com)  
071-2544-01

**Tektronix**

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### **Contacting Tektronix**

Tektronix, Inc.

14200 SW Karl Braun Drive

P.O. Box 500

Beaverton, OR 97077

USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit [www.tektronix.com](http://www.tektronix.com) to find contacts in your area.

## **Warranty**

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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# General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

To avoid potential hazards, use this product only as specified.

*Only qualified personnel should perform service procedures.*

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

## To Avoid Fire or Personal Injury

**Use Proper Power Cord.** Use only the power cord specified for this product and certified for the country of use.

**Connect and Disconnect Properly.** Do not connect or disconnect probes or test leads while they are connected to a voltage source.

**Connect and Disconnect Properly.** 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.

**Ground the Product.** This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

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

The inputs are not rated for connection to mains or Category II, III, or IV circuits.

Connect the probe reference lead to earth ground only.



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

**Power Disconnect.** The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.

**Do Not Operate Without Covers.** Do not operate this product with covers or panels removed.

**Do Not Operate With Suspected Failures.** If you suspect that there is damage to this product, have it inspected by qualified service personnel.

**Avoid Exposed Circuitry.** Do not touch exposed connections and components when power is present.

**Use Proper AC Adapter.** Use only the AC adapter specified for this product.

**Do Not Operate in Wet/Damp Conditions.**

**Do Not Operate in an Explosive Atmosphere.**

**Keep Product Surfaces Clean and Dry.**

## 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.*

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

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## Symbols and 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.

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



CAUTION  
Refer to Manual

---

# Compliance Information

This section lists the EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies.

## EMC Compliance

### EC Declaration of Conformity – EMC

Meets intent of Directive 2004/108/EC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

**EN 61326-1:2006, EN 61326-2-1:2006.** EMC requirements for electrical equipment for measurement, control, and laboratory use.<sup>1 2 3</sup>

- CISPR 11:2003. Radiated and conducted emissions, Group 1, Class A
- IEC 61000-4-2:2001. Electrostatic discharge immunity
- IEC 61000-4-3:2002. RF electromagnetic field immunity
- IEC 61000-4-4:2004. Electrical fast transient/burst immunity
- IEC 61000-4-5:2001. Power line surge immunity
- IEC 61000-4-6:2003. Conducted RF immunity
- IEC 61000-4-11:2004. Voltage dips and interruptions immunity<sup>4</sup>

**EN 61000-3-2:2006.** AC power line harmonic emissions

**EN 61000-3-3:1995.** Voltage changes, fluctuations, and flicker

### European Contact.

Tektronix UK, Ltd.  
Western Peninsula  
Western Road  
Bracknell, RG12 1RF  
United Kingdom

- 1 This product is intended for use in nonresidential areas only. Use in residential areas may cause electromagnetic interference.
- 2 Emissions which exceed the levels required by this standard may occur when this equipment is connected to a test object.
- 3 To ensure compliance with the EMC standards listed here, high quality shielded interface cables should be used.
- 4 Performance Criterion C applied at the 70%/25 cycle Voltage-Dip and the 0%/250 cycle Voltage-Interruption test levels (IEC 61000-4-11).

### **Australia / New Zealand Declaration of Conformity – EMC**

Complies with the EMC provision of the Radiocommunications Act per the following standard::

- CISPR 11:2003. Radiated and Conducted Emissions, Group 1, Class A, in accordance with EN 61326-1:2006 and EN 61326-2-1:2006.

## **Safety Compliance**

### **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**

Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only.

### **Installation (Overvoltage) Category Descriptions**

Terminals on this product may have different installation (overvoltage) category designations. The installation categories are:

- Measurement Category IV. For measurements performed at the source of low-voltage installation.
- Measurement Category III. For measurements performed in the building installation.
- Measurement Category II. For measurements performed on circuits directly connected to the low-voltage installation.
- Measurement Category I. For measurements performed on circuits not directly connected to MAINS.

## Environmental Considerations

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

### Product End-of-Life Handling

Observe the following guidelines when recycling an instrument or component:

**Equipment Recycling.** Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2002/96/EC and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site ([www.tektronix.com](http://www.tektronix.com)).

### Restriction of Hazardous Substances

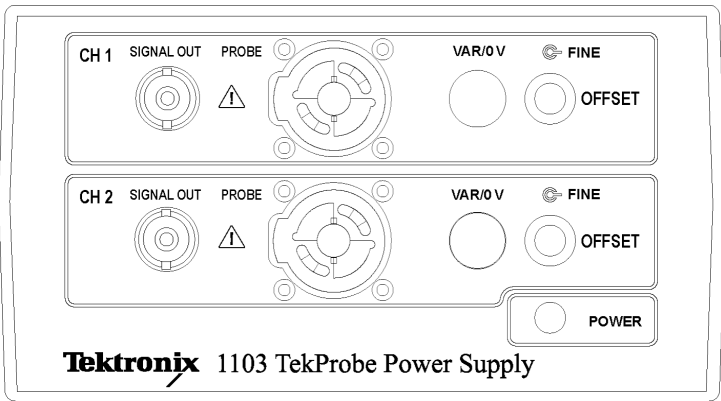
This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive.

# Getting Started

The 1103 product provides external power to accessories and probes when the oscilloscope or other instruments do not have the capability to do so.

There are connections and offset controls for two probe channels. Each channel has:

- A TekProbe connector (which combines power output and signal input)
- A BNC connector (SIGNAL OUT)
- An offset enable switch (VAR/0 V, yellow indicator)
- Fine and coarse offset controls



## Power Connections

The 1103 product is powered by an external DC power supply that is shipped with the 1103 product. This is the recommended power supply to use.

If you are not using the 1103 DC power supply, read the following caution.



**CAUTION.** *To prevent damage to the 1103 circuitry, power on the DC power supply first and then power on the 1103 product.*

---

The following steps are recommended to install the power cord and DC power supply:

1. Set the power switch on the 1103 product to off.

The power switch is located on the rear panel and a power indicator is on the front panel.

2. Connect the power cord to the wall socket and DC power supply.
3. Connect the DC power supply to the 1103 product. (See Figure 1 on page 3.)
4. Power on the 1103 product.

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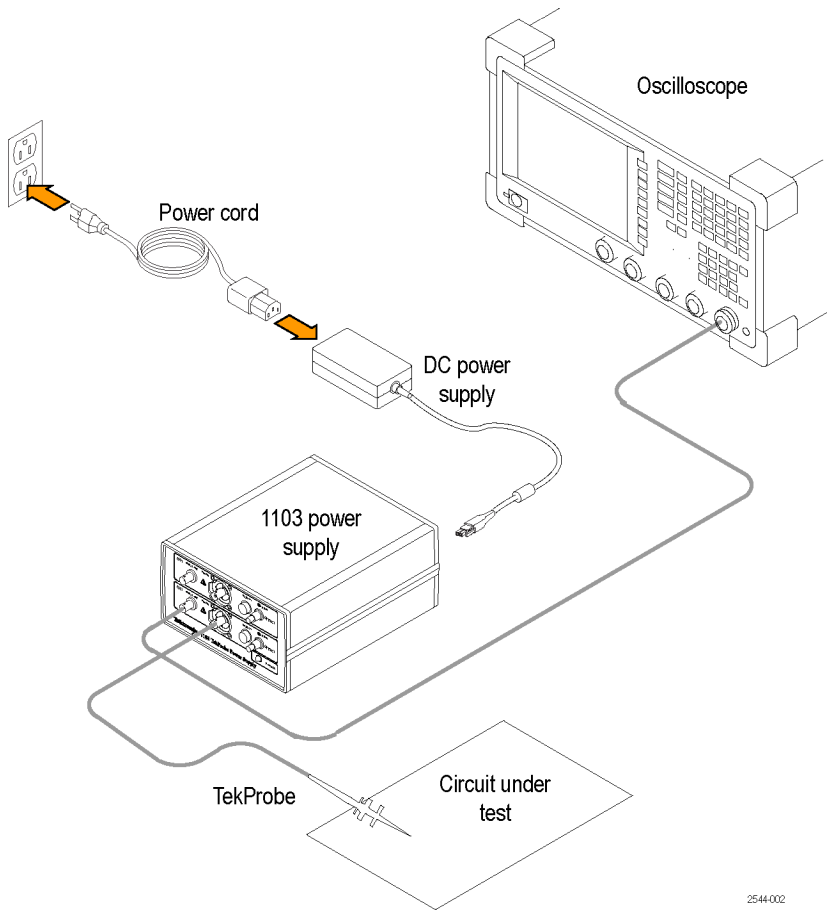
**NOTE.** *To avoid excessive common mode noise, use the provided power cord and connect the output BNC cable to an oscilloscope with a grounded connection.*

---

Optional power cords are available to provide compatibility with different power source connections. (See page 5, *Options*.)

There are no fuses in the 1103 product. Contact Tektronix Service Support for product repair.





2544-002

Figure 1: Power cord and DC power supply connections

## TekProbe Compatibility

The 1103 product supports only probes with TekProbe interfaces. Listed below are the compatible probes.

<b>Probe model</b>	<b>Description</b>	<b>Offset control</b>
ADA400A	Differential MicroVolt Amplifier, 1MHz	No
P5205	Differential High Voltage, 100 MHz	Yes
P5210	Differential High Voltage, 100 MHz	Yes
P6204	Active Single-Ended, 4 GHz	Yes
P6205	Active Single-Ended, 750 MHz	No
P6241	Active Single-Ended, 4 GHz	Yes
P6243	Active Single-Ended, 1 GHz	No
P6249	Active Single-Ended, 4 GHz	Yes
P6231	Bias Offset Single-Ended	Yes
P6246	Differential, 400 MHz	Yes
P6247	Differential, 1.0 GHz	Yes
P6248	Differential, 1.5 GHz	Yes
P6330	Differential, 3.5 GHz	Yes
P6701(A,B)	O-to-E Converter	No
P6703(A,B)	O-to-E Converter No	No

## Standard Accessories

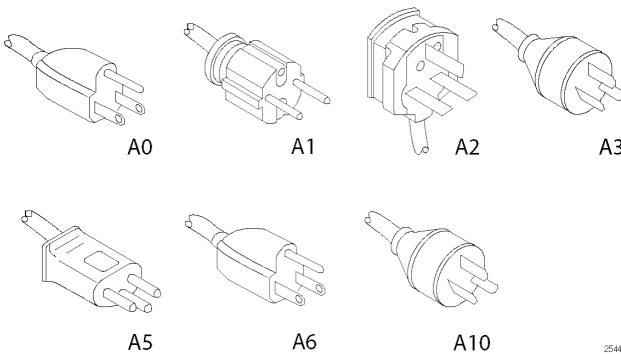
Listed below are the standard accessories.

Name	Tektronix part number
1103 instruction manual (this manual)	071-2544-xx
Power supply adapter	119-7289-xx

## Options

Listed below are the power cord options that are available for the 1103 product.

Option number	Normal usage	Tektronix part number
A0	North America	161-0104-00
A1	Europe	161-0066-09
A2	United Kingdom	161-0104-07
A3	Australia	161-0066-13
A5	Swiss	161-0154-00
A6	Japan	161-A005-00
A10	China	161-0306-00



# Operating Basics

This section describes how to use the 1103 product. If you are in doubt about whether a probe is compatible with the 1103 product, contact your Tektronix field representative.

## Understanding the Controls

Information in this section describes the power switch, controls and indicators, and connecting the probe.

### Power Switch and Indicator

A rocker-type power switch is located on the rear panel of the product. When the power is on, the POWER indicator on the front panel is lighted.

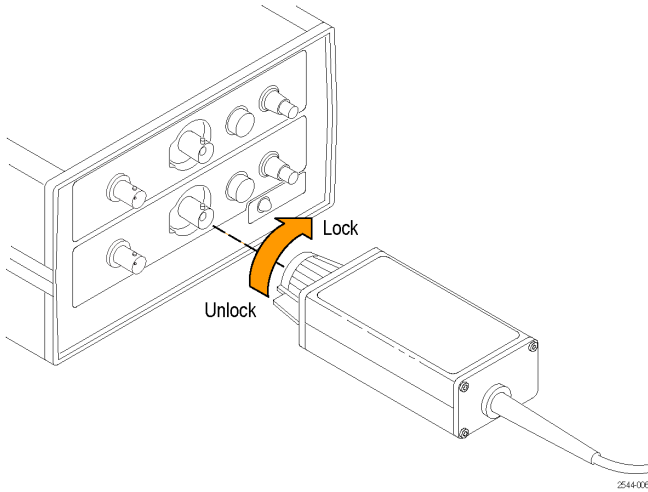
### Probe Connection

The 1103 product has two independent channels. Connect a probe with the TekProbe interface to the CH 1 or CH 2 input on the front panel.

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**NOTE.** Before installing the probe, make sure that the probe BNC shell is in the unlocked position (CCW) as shown. The probe cannot be installed if the BNC shell is in the locked position (CW).

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- Connect a 50  $\Omega$  BNC coax cable (or BNC cable with a 50  $\Omega$  terminator) between the CH 1 or CH 2 output connector and the respective input channel on the host oscilloscope.
- Use the probe as described in the probe instruction manual.

Information is available on applying a DC offset signal. (See page 8, *Offset Controls*.)

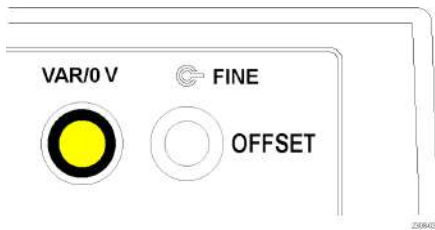
### Offset Controls

The front panel contains a VAR/0 V offset switch with coarse and fine adjustments for each channel. These controls enable you to apply a DC offset from  $-1$  VDC to  $+1$  VDC to the probe offset circuitry. Each probe has a different offset range capability. For further information, refer to the manual for the particular probe you are using.

The following describes how to use the offset switches, indicators, and controls. Both channels function the same.

To apply a DC offset signal:

- Press the VAR/0 V switch.



A yellow indicator is visible when the offset feature is enabled. To set the desired DC offset level, adjust the coarse offset control (the outer knob) to make the initial setting and then use the fine offset control (the inner knob) to make a more precise setting.

- Press the VAR/0V switch again to disable the offset feature.

The DC offset voltage is disabled and the DC level is set to 0 V.

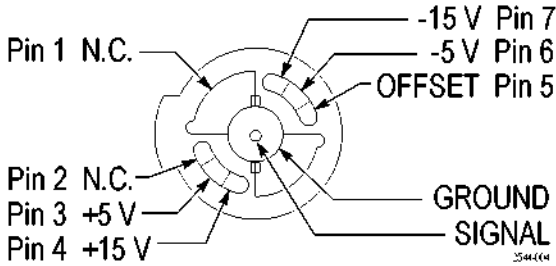
# Specifications

This section lists the electrical, environmental, and physical characteristics of the product. The electrical characteristics listed in the following table apply when an adjusted 1103 product is operating within the environmental conditions

**Table 1: Electrical characteristics**

<b>Characteristic</b>	<b>Information</b>
Input voltage	12 V DC, $\pm 3$ V DC
Output voltage	
+15 VDC	$\pm 2\%$
-15 VDC	$\pm 2\%$
+5 VDC	$\pm 2\%$
-5 VDC	$\pm 2\%$
Output current	300 mA from each supply
Power consumption	30 W maximum, 15 W typical
Output configuration	TekProbe connector
	Pin 1: No connection
	Pin 2: No connection
	Pin 3: +5 VDC
	Pin 4: +15 VDC
	Pin 5: Offset 1 V
	Pin 6: -5 VDC
	Pin 7: -15 VDC

The pinout configuration of the TekProbe connector on the front of the product is shown below.



**Table 2: Environmental characteristics**

Characteristic	Information
Temperature range	
Operating	0 °C to +50 °C (32 °F to 122 °F)
Nonoperating	-40 °C to +70 °C (-40 °F to 158 °F)
Humidity	
Operating	5% to 95% relative humidity (% RH) at up to +30 °C, 5% to 45% RH above +30 °C up to +50 °C, non-condensing
Nonoperating	5% to 95% RH (Relative Humidity) at up to +30 °C, 5% to 45% RH above +30 °C up to +50 °C, non-condensing
Altitude	
Operating	3,000 meters (~10,000 ft)
Nonoperating	15,240 meters (50,000 ft)

**Table 3: Physical characteristics**

Characteristic	Information
Weight <sup>1</sup>	2.0 kg (4.5 lb)
Length	16.5 cm (6.5 in)
Width	15.7 cm (6.2 in)
Height	8.9 cm (3.5 in)

<sup>1</sup> Does not include accessories and shipping container



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# Maintenance

This section contains information on how to clean and maintain your equipment.

## Inspecting and Cleaning

Remove accumulated loose dust from the probe adapter with a soft cloth or brush. Remaining dirt may be removed with a soft cloth dampened with isopropyl alcohol.

Do not immerse any equipment in cleaning solutions or use abrasive cleaners.



**CAUTION.** *To prevent damage to the product, avoid using cleaning materials that contain acetone, benzene, toluene, xylene, or similar solvents.*

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## Repackaging for Shipment

If possible, use the original packaging to ship the instrument. If the original packaging is unfit for use or not available, use the following packaging guidelines:

1. Use a corrugated cardboard shipping carton having inside dimensions at least one inch greater than the dimensions of the equipment. The box must have a carton test strength of at least 200 pounds.
2. Place the product into an antistatic bag and wrap it to protect it from dampness.
3. Place the product into the box and stabilize it with light packing material.
4. Seal the carton with shipping tape.

## **Shipping the Instrument to the Service Center**

Contact Tektronix Service Center to request an RMA (Return Material Authorization) number. Refer to the contact information on the back of the title page of this manual.

- The RMA number
- Owner's name and address
- Name of a person who can be contacted
- Product name and serial number
- Description of the problem