

Instructions



TLACAL2

Performance Verification and Adjustment Fixture

071-1125-00

This document applies to TLA System Software
version 4.20 and above.

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* **This phone number is toll free in North America. After office hours, please leave a voice mail message. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.**

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 the system. Read the *General Safety Summary* in other system 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.

Use Proper Voltage Setting. Before applying power, ensure that the line selector is in the proper position for the power source being used.

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.

Connect the ground lead of the probe to earth ground only.

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

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

Use Proper Fuse. Use only the fuse type and rating specified for this product.

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

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

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

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual’s installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

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.*

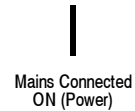
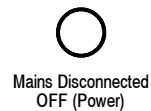
Terms on the Product. These terms may appear on the product:

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. The following symbols may appear on the product:



TLACAL2 Instructions

The TLACAL2 Performance Verification and Adjustment test fixture is used with the TLA7Axx series logic analyzer modules and the P68xx series logic analyzer probes. This test fixture is used with the TLACAL2 Performance Verification software to complete the performance verification, adjustment, and certification procedures for the TLA7Axx series logic analyzer modules and probes.

The performance verification procedures, adjustment procedures, and certification procedures are documented in the *TLA7Axx Logic Analyzer Module Service Manual*. Refer to that manual for complete instructions for performing these procedures and for using the TLACAL2 Performance Verification software.

Required Equipment and Accessories

Table 1 lists the parts and accessories that accompany the TLACAL2 Performance Verification and Adjustment fixture. Use this table to verify that you have all of the parts and accessories. If any parts or accessories are missing, contact your local Tektronix representative for information on replacing any missing parts. These parts and accessories are also listed in the *TLA7Axx Logic Analyzer Module Service Manual*.

Table 1: TLACAL2 Parts and Accessories

Item and description	Tektronix part number
4 Module Interface Cards	650-4298-00
1 Probe Interface Card	650-4299-00
4 34-pin ribbon cables	174-4678-00
8 MCX-to-MCX coaxial cables	174-4138-00
1 Package of color bands (used with MCX-to-MCX coaxial cables to assist in identification)	016-1315-00
4 P6041 BNC-to-SMB cables	P6041
1 RS-232 serial null modem cable	012-1379-00
1 GPIB 2 m cable	012-0991-00
1 Power cord, IEC320, North American, right-angle	161-0104-00
1 Certificate of calibration or compliance	-

The TLACAL2 Performance Verification and Adjustment software is available on the TLA Application CD that comes with your Tektronix logic analyzer. The software must be installed on the hard disk of your Tektronix logic analyzer mainframe before you can use it. Refer to the *TLA7Axx Logic Analyzer Module Service Manual* for instructions on installing and using the software.

In addition to the TLACAL2 fixture and its accessories, you will also need the following test equipment run the performance verification procedures, adjustment procedures, and certification procedures. This equipment must be ordered separately from the TLACAL2 fixture.

- TLA700 mainframe and a TLA7Axx logic analyzer module
- Tektronix TDS694C Digital Oscilloscope. This is required for the analog output procedures.
- Agilent 14401 Digital Multimeter
- iView External Oscilloscope cable kit (Tektronix part number 012-1614-00). It is assumed that you have the same National Instruments USB-to-GPIB software shipped with your logic analyzer.
- Four Analog Output BNC-to-BNC, low loss, 36-inch 10x cables (Tektronix part number 174-4595-00)
- One P6860 Logic Analyzer Probe for every 34 channels on the TLA7Axx Logic Analyzer Module (a maximum of one module, even in merged configurations). The same probe type is used in all tests. For example, four P6860 Logic Analyzer Probes are required for a 136 channel TLA7AA4 Logic Analyzer Module.
- TLA7Axx Logic Analyzer Module Service Manual (Tektronix part number 071-1043-00)

Options

Table 2 lists the TLACAL2 product options and Service Options. These options must be selected at the time of purchase.

Table 2: TLACAL2 Options

Option	Tektronix part number	Description
A1	161-0104-06	Universal European power cord, IEC320, right angle
A2	161-0104-07	United Kingdom power cord, IEC320, right angle
A3	161-0104-05	Australian power cord, IEC320, right angle
A4	161-0104-08	North American power cord, IEC320, right angle
A5	161-0167-00	Switzerland power cord, IEC320, right angle
A99	-	No power cord
AC	161-0306-00	China power cord, IEC320, straight
R3	-	Repair warranty extended to cover three years
R5	-	Repair warranty extended to cover five years
C3	-	Initial certification plus two years further certification
C5	-	Initial certification plus four years further certification
D1	-	Test data report
D3	-	Test data report (must order Option C3)
D5	-	Test data report (must order Option C5)

Installation Instructions

Detailed installation instructions, connection procedures, and operation procedures are described in the *TLA7Axx Logic Analyzer Module Service Manual*. This section describes line fuse and power cord information for the TLACAL2 test fixture.

Line Fuse Information

Check that the line fuse is correct for your application, see Table 3. The fuse and line cord connector are located at the back of the instrument.



WARNING. To avoid electrical shock, disconnect the power cord before removing the line fuse.

Table 3: TLACAL2 line fuses

Line voltage	Description	Tektronix part number
100 V to 120 V operation	5.0 mm x 20 mm, 1.0 A FAST 250 V	159-0356-00
200 V to 240 V operation	5.0 mm x 20 mm, 0.5 A FAST 250 V	159-0351-00

Setting the Line Voltage

The line voltage should be properly set at the factory. If you need to change the line voltage setting, complete the following steps:

1. Disconnect the power cord at the rear of the instrument.
2. Locate the line selector/fuse holder at the rear of the instrument. The voltage setting appears in the small window on the line selector.
3. Note the fuse setting, either 115 V or 230 V. If you need to change the line voltage selection or if you need to change the line fuse, continue with the following steps.
4. Pry open the latch over the line voltage selector with a small flat-blade screwdriver.
5. Remove the red fuse holder with the flat-blade screwdriver.
6. Remove the fuse. If you are replacing a blown fuse, install the fuse holder and fasten the latch in place.
7. Remove the conversion clip from its current location and install it on the other side of the fuse holder.
8. Turn the fuse holder over.
9. Install the new fuse into the holder (see Table 3 for fuse information).

10. Install the fuse holder.
11. Fasten the latch in place.

Connecting the Line Cord

Connect the line cord to the rear of the instrument. Connect the other end of the line cord to the appropriate power connector.

Additional Installation and Operating Instructions

Refer to the *Performance Verification* chapter of the *TLA7Axx Logic Analyzer Module Service Manual* for detailed installation instructions, connection procedures, and operation procedures.



CAUTION. *Do not connect or disconnect any ribbon cables, module interface cards, or the probe interface card to or from the test fixture while power is applied. Doing so will damage the fixture or the module interface cards or the probe interface card. Refer to the TLA7Axx Logic Analyzer Module Service Manual for complete installation instructions.*

TLACAL2 Service

The TLACAL2 fixture is calibrated at the factory. No additional calibration is required. If the fixture requires servicing or calibration you must return the fixture and all accessories to Tektronix.

Preventive Maintenance

Preventive maintenance mainly consists of periodic cleaning. Periodic cleaning reduces instrument breakdown and increases reliability. Clean the instrument as needed, based on the operating environment. Dirty conditions may require more frequent cleaning than computer room conditions.

Clean the exterior surfaces with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is useful for cleaning in narrow spaces around the controls and connectors. Do not use abrasive compounds on any part of the instrument.



CAUTION. Avoid getting moisture inside the instrument during external cleaning; and use only enough solution to dampen the cloth or swab.

Use only deionized water when cleaning. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.

Do not use chemical cleaning agents; they may damage the instrument. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Specifications

The Table 4 provides abbreviated information on the TLACAL2 specifications. For detailed specifications, refer to the *TLA7Axx Logic Analyzer Module Service Manual*.

Table 4: Performance verification test fixture characteristics

Characteristic	Description
Power consumption	40 W maximum
Source voltage and frequency	100 V _{RMS} to 240 V _{RMS} ±10%, 50 Hz to 60 Hz ±10%, continuous range CAT II 115 V _{RMS} ±10%, 400 Hz, ±10%, continuous range CAT II
Cooling clearance	51 mm (2 inches) front, sides, and rear. Prevent blockage of airflow to bottom of instrument by placing on a solid, noncompressable surface.
Temperature: Operating and nonoperating	Operating: +20° C to +30° C Nonoperating: +5° C to +50° C, 15° C/hr maximum gradient, non-condensing.
Relative Humidity: Operating and nonoperating	Operating: 20% to 80% relative humidity, non-condensing. Maximum wet bulb temperature: +29° C (derates relative humidity to approximately 22% at +50° C). Nonoperating: 8% to 80% relative humidity, non-condensing. Maximum wet bulb temperature: +29° C (derates relative humidity to approximately 22% at +50° C).
Altitude: Operating and nonoperating	Operating: To 3040 m (10,000 ft.), (derated 1° C per 305 m (1000 ft.) above 1524 m (5000 ft.) altitude) Nonoperating: 12190 m (40,000 ft.)

Table 5: TLACAL2 Performance verification and adjustment fixture certifications and compliances

Category	Standards or description
EC Declaration of Conformity - Low Voltage	<p>Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities:</p> <p>Low Voltage Directive 73/23/EEC, amended by 93/68/EEC</p> <p>EN 61010-1/A2:1995 Safety requirements for electrical equipment for measurement control and laboratory use.</p>
U.S. Nationally Recognized Testing Laboratory Listing	<p>UL3111-1 Standard for electrical measuring and test equipment.</p>
Canadian Certification	<p>CAN/CSA C22.2 No. 1010.1 Safety requirements for electrical equipment for measurement, control, and laboratory use.</p>
Additional Compliance	<p>IEC61010-1/A2:1995 Safety requirements for electrical equipment for measurement, control, and laboratory use.</p>
Installation (Overvoltage) Category Descriptions	<p>Terminals on this product may have different installation (overvoltage) category designations. The installation categories are:</p> <p>CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location.</p> <p>CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected.</p> <p>CAT I Secondary (signal level) or battery operated circuits of electronic equipment.</p>
Pollution Degree Descriptions	<p>A measure of the contaminates 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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Pollution Degree 4 Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.</p>
Equipment Type	Test and measuring
Safety Class	Class 1 (as defined in IEC 61010-1, Annex H) - grounded product
Overvoltage Category	Overvoltage Category II (as defined in IEC 61010-1, Annex J)
Pollution Degree	Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only.

