Instruction Manual

Tektronix

TMSSY2
mPGA479 Socket Support

(Includes TMSMPH4 mPGA479 probe head installation instructions)

071-1899-00

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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.

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.

Power Disconnect. The power switch disconnects the product from the power source. See instructions for the location. Do not block the power switch; 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 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.

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.

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.*

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:

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

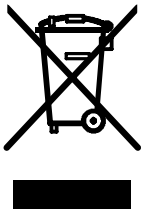
Environmental Considerations

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.



The symbol shown to the left indicates that this product complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Battery Recycling. This product may contain a Nickel Cadmium (NiCd) or lithium ion (Li-ion) rechargeable battery, which must be recycled or disposed of properly. Please properly dispose of or recycle the battery according to local government regulations.

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. This product complies with the RoHS Directive requirements except for the presence of hexavalent chromium in the surface coating of the aluminum chassis parts, assembly hardware, and 63/37 tin/lead solder used in the fabrication of the circuit boards.

Preface

This manual contains specific information about the TMSSY2 preprocessor unit and the TMSMPH4 probe head that combine to make a probe adapter. This manual is part of a set of information on how to operate this product on compatible Tektronix Logic Analyzers.

If you are familiar with operating microprocessor support probe adapters with the logic analyzer, you need only this manual to set up and run the probe adapter.

Getting Started

The TMSSY2 support product (preprocessor unit) is an interposer design that allows the logic analyzer to acquire data from a microprocessor in the operating environment with little affect on the SUT.

To accomplish this, the probe adapter (preprocessor unit and probe head) is connected to the SUT, and then the microprocessor is connected to the probe adapter. Signals from the microprocessor-based system flow through the probe adapter cables to the logic analyzer where the loaded support software disassembles data acquired from the SUT.

The TMSSY2 support product includes:

- TMSSY2 preprocessor unit
- CD-ROM with PUB32G15 support software and instruction manual

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NOTE. *To acquire signals from the SUT you also need compatible cables, probes, and probe head to complete the connection between the logic analyzer and the SUT. Contact your Tektronix sales representative for information about these other products.*

For optional and standard accessories for this product, see *Accessories* on page 29.

Logic Analyzer Configuration

To use the probe adapter to acquire state signals, you need a Tektronix Logic Analyzer equipped with four, merged 235 MHz, TLA7Ax4 logic analyzer modules.

The modules must be configured and merged as shown in Figure 1. The memory depth is automatically based on the shallowest memory depth of the modules.

The term *Master module* refers to the second module of a 4-wide module configuration. (See Figure 1). The term Slave module refers to the modules to the left or right of the Master module.

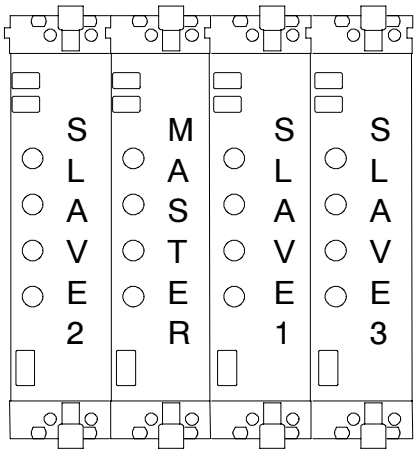

Figure 1: Master and Slave module configuration

All signals are acquired through probes connected to the logic analyzer. Use the logic analyzer modules and the P6960 probes to connect to the probe adapter. The probes should already be labeled; if you need to apply labels, refer to the instructions that came with your probe documentation.

CAUTION. *To prevent damage to the P6960 connectors on the preprocessor unit, Tektronix recommends that you use the strain relief method that is described in the* P69XX Series Instruction Manual, *Tektronix part number 071-1528-XX, after connecting the P6960 probes.*

You can access the *P69XX Series Instruction Manual* from the Tektronix.com Web site.

Connect the P6960 Probes and TMSCAB1 Cables

Use the P6960 probes and the TMSCAB1 cables to connect to the TLA7Ax4 logic analyzer modules to the preprocessor unit.

***NOTE**. If you need to attach labels to TMSCAB1 cables, refer to Appendix 30.*

Modules	TMSCAB1 cables	P6960 probes	Description	Support Software
4	5 (M,S1,S2)	6 (M,S3)	Does not acquire auxiliary common clock signals	PUB32G15

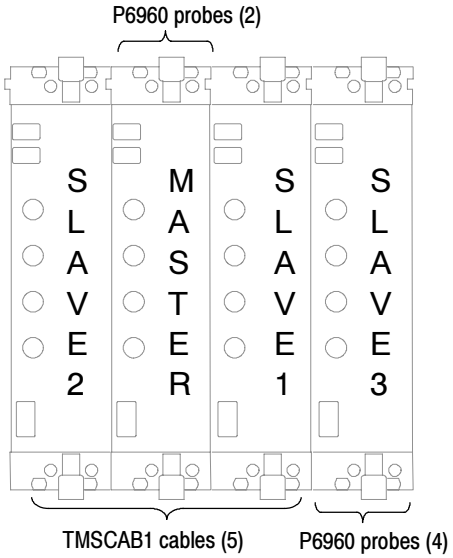

Figure 2: Module configuration

TMSCAB1 Cables

1. From the Master module, match the label on the TMSCAB1 cable with the corresponding connector label on the preprocessor unit and connect the cable. The TMSCAB1 cable connector is keyed for correct alignment to the preprocessor unit.
2. Use care to evenly tighten both screws on the module end of the probes or cables until they are snug. First slightly tighten both screws, then snug each screw to 4 in-lbs (max).
3. Repeat step 1 to attach the TMSCAB1 cables with the Slave1 and Slave2 modules.

CAUTION. *To prevent damage to the probe and preprocessor unit, always position the probes perpendicular to the footprint on the circuit board. Incorrect handling of the probe while connecting to or disconnecting from the preprocessor unit can damage the probe.*

When attaching the probe head, use care to evenly tighten the probe head screws until they are snug. First, tighten both screws until the nut bar makes contact with the board surface, and then snug each screw to 1 in-lbs (max). Under-tightening the screws can result in intermittence. Over-tightening can result in damage to the elastomer holder and stripped screws.

P6960 Probes

4. Match the A, D, C, and E probes from the Slave3 and Master module with the corresponding D3/D2 and A3/A2, D1/D0 and A1/A0, C1/C0 and C3/C2, and E3/E2 and E1/E0 connector labels on the preprocessor unit. The P6960 probe connector is keyed for correct alignment to the preprocessor unit.

NOTE*. To prevent faulty connections and loss of data, check that the probe board connections are clean and free of debris.*

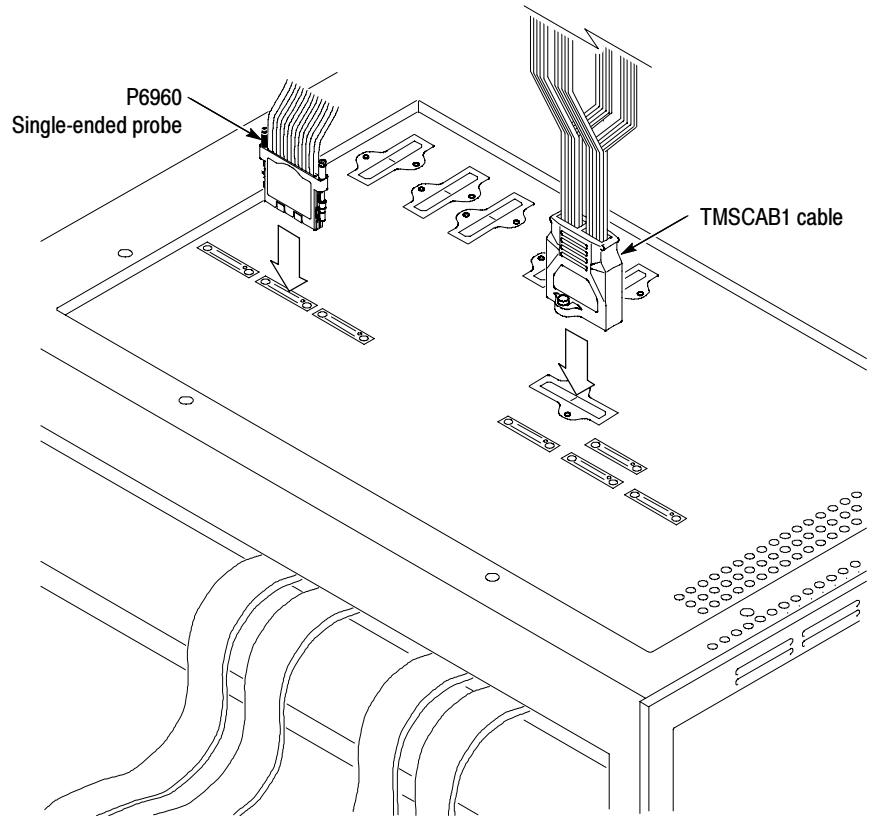

Figure 3: Probe, cable and preprocessor unit

Connect the Logic Analyzer to a SUT

CAUTION. *To prevent static damage to the microprocessor, the probe adapters, the probes, and the module, handle components only in a static-free environment. Always wear a grounding wrist strap, heel strap, or similar device while handling the microprocessor and probe adapter.*

WARNING. *To prevent harm to yourself or damage to the preprocessor unit, do not open the preprocessor unit. There are no operator serviceable parts inside the preprocessor unit. Refer servicing of internal parts in the preprocessor unit to Tektronix authorized personnel only. External parts may be replaced by qualified service personnel.*

Airflow Clearance

Table 1 lists airflow clearances for the preprocessor unit.

Table 1: Preprocessor airflow clearance

Characteristic	Description
Required airflow clearances for the preprocessor	
Front, top, left side	5.08 cm (2 in)
Back	7.60 cm (3 in)
Bottom, right side	0.635 cm (0.250 in)

Tools

Following is a list of tools:

- **Required.** Use a flatbladed screwdriver (0.1-in tip width) to lock the ZIF socket.
- **Required.** Phillips (P1) screwdriver to tighten the screws that attach the heatsink brackets.
- **Optional.** A torque wrench helps to ensure reliable connections to meet the nominal torque values that may be listed in these instructions. When attaching screws to the probe head use 2 in-lbs (0.226 Newton meters) of torque, unless stated otherwise.

NOTE*. For storage and shipping, retain the cardboard cartons and packing material that are shipped with the probe adapter.*

For a list of replaceable parts, see page 9.

Read the following instructions before removing or installing parts.

Connect the Logic Analyzer

Use the following steps to connect the logic analyzer to the SUT:

1. Power off the SUT. It is not necessary to power off the logic analyzer.
2. Power off any preprocessor units that may be attached to your SUT.

NOTE. *To discharge static electricity, touch the ground connector located on the logic analyzer.*

3. Remove the heat sink and any retention brackets from the SUT.

CAUTION. *To prevent damage to the probe head and pins, you must always handle the probe head carefully and use care to properly align the probe head pins to the ZIF socket on the SUT. Also, reinstall the pin protector on the bottom of the probe head when the probe head is not in use.*

4. Attach the TMSMPH4 probe head.

   To attach the probe head to the SUT use the Chipcool 1&2 heat sink attachment kit (020-2616-XX) and follow the steps shown in Figures 4 & 5 starting on page 7.

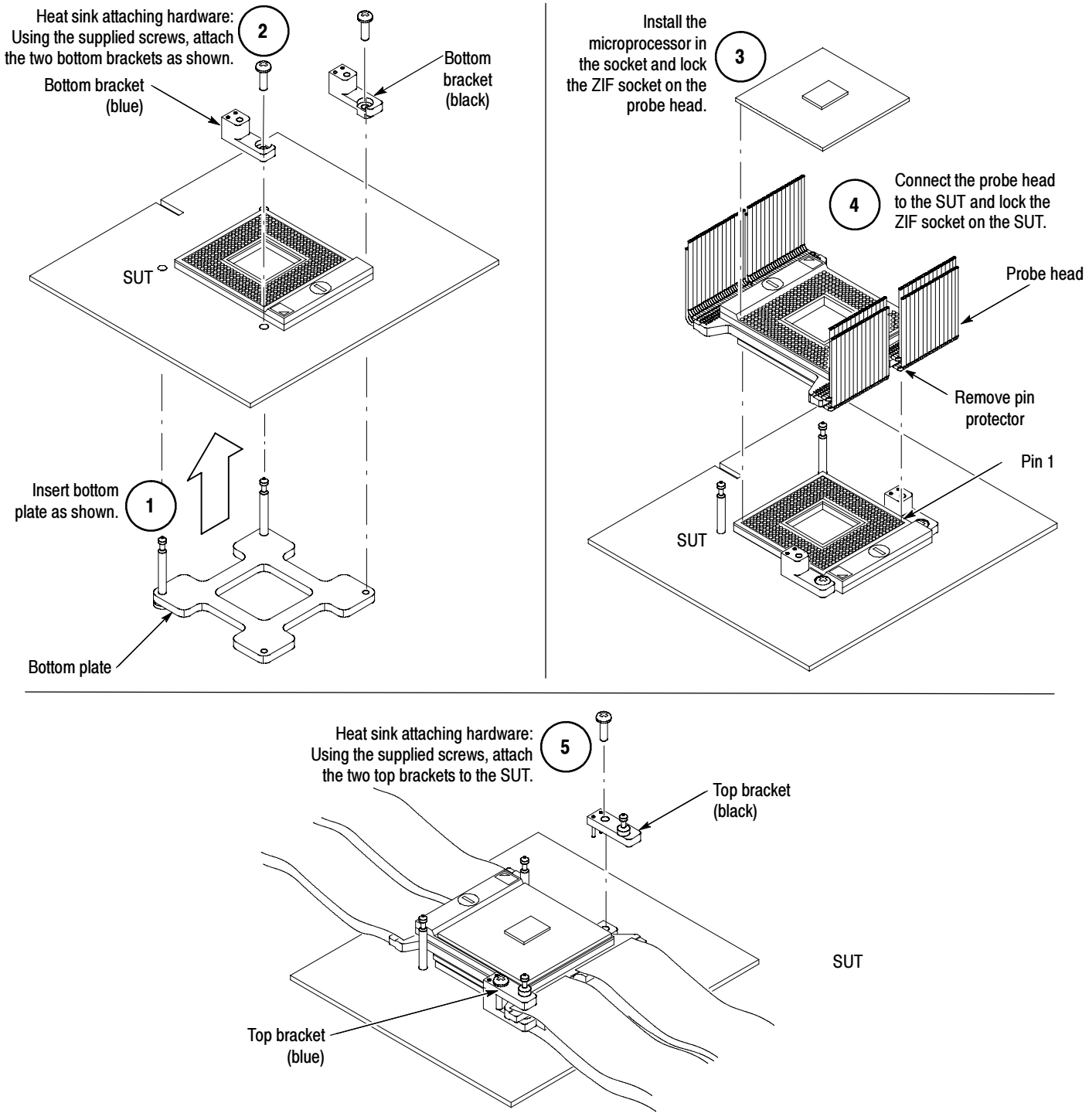

Figure 4: Probe head installation using Chipcool 1 & 2 heat sink hardware

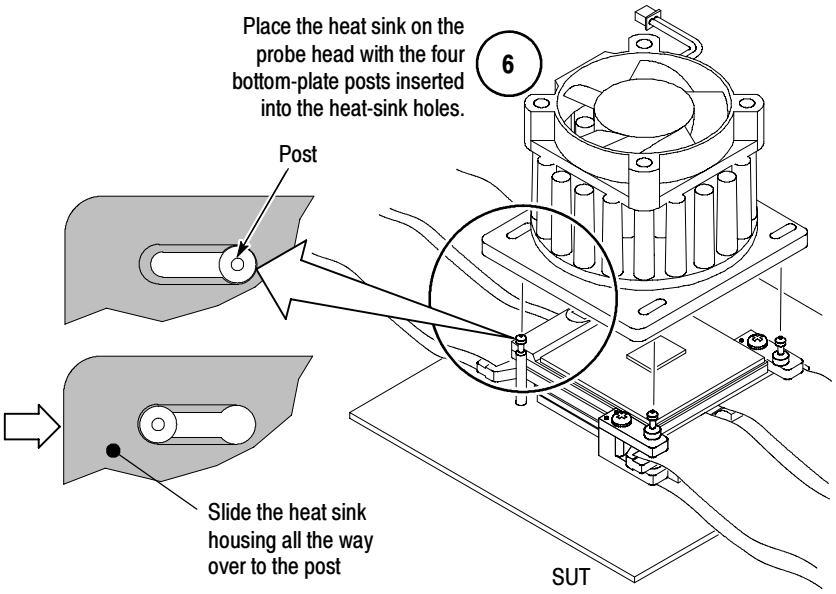

Figure 5: Install heat sink (Chipcool 1 & 2)

Probe Head Removal

Follow these steps to remove the probe head from the SUT:

1. Power off the SUT, and unplug the AC power cord on the preprocessor unit. The power switch is located on the back of the preprocessor unit. It is not necessary to power off the logic analyzer mainframe.
2. Reverse the steps in Figures 4 and 5 on pages 7 and 8 to remove the probe head.
3. Store the probe head in the original packing material.

Applying and Removing Power

To apply power to the probe adapter and SUT, follow these steps:

1. Make sure the power switch on the preprocessor unit is in the off position. If powered off, the zero (0) is visible on the power switch.
2. Plug the AC power cord into the IEC connector on the back of the preprocessor unit.
3. Plug the AC power cord into an electrical outlet.
4. Power on the preprocessor unit using the switch on the back of the preprocessor unit. A green, power-on LED lights on the front of the preprocessor unit, indicating that the preprocessor unit is active.
5. Power on the SUT.

To remove power from the SUT and the preprocessor unit, reverse the preceding steps.

Replaceable Parts List

Refer to Table 2 to reorder replaceable parts for the probe head and preprocessor unit.

***NOTE**. For a list of standard and optional accessories, refer to Appendix 2.*

Table 2: Replaceable parts list

Fig. number & page number	Part number	Quantity	Description
3 - 4	TMSSY2	1	CIRCUIT BOARD ASSY; PROBE HEAD BOARD W/CABLES & PADDLE BOARD;TESTED
4 - 7	TMSMPH4[1]	1	MICRO SUPPORT; PROBE HEAD; M-479 PIN MPGA FOR USE WITH TMSSY2
8 - 14	016-1941-XX	1	CASE, STORAGE: PLASTIC, W/FOAM, 12.4X8.9X2.9;FLEX CABLE ASSEMBLY

[1] To replace the heat sink attaching hardware, refer to the Appendix under *Standard Accessories* on page 29 for heat-sink kit part number.

Logic Analyzer Software Compatibility

Refer to the label on the software support CD for the current compatible version of the Tektronix Logic Analyzer system software.

Installing the Software

***NOTE**. Before you install any software, verify that the microprocessor support software is compatible with the logic analyzer software. Compare the version number on the CD to the Tektronix logic analyzer system software.*

To install the PUB32G15 software on the Tektronix logic analyzer, follow these steps:

1. Insert the CD in the CD drive.
2. Follow the on-screen instructions to install the software.

To remove or uninstall software, use the Add or Remove Programs utility in the Windows Control Panel. Close all windows before you uninstall any software.

Support Package Setup

The PUB32G15 support software installs one setup file. After installing the software, you need to load the PUB32G15 setup file. Follow these steps:

1. Open a logic analyzer system window and select File, Load Support Package.
2. In the Load Support Package dialog box, select the support and click load.
3. Follow the on-screen instructions.

Maintenance and Shipping

Care and Maintenance

Before cleaning this product, read the following information:

CAUTION. *To prevent static damage to the microprocessor, the probe adapter, the probes, and the module, handle components only in a static-free environment.*

Always wear a grounding wrist strap, heel strap, or similar device while handling the microprocessor and probe adapter.

The probe adapter, consisting of the probe head and preprocessor unit, does not require scheduled or periodic maintenance. However, to keep good electrical contact and efficient heat dissipation, keep the probe adapter free of dirt, dust, and contaminants. When not in use, store the probe adapter in the original shipping bags and cardboard carton.

External Cleaning Only

Clean dirt and dust with a soft bristle brush. For more extensive cleaning, use only a damp cloth moistened with deionized water; do not use any chemical cleaning agents.

WARNING. *To prevent harm to yourself or damage to the preprocessor unit, do not open the preprocessor unit for cleaning and do not allow any moisture inside the preprocessor unit. There are no operator serviceable parts inside the preprocessor unit. Refer servicing of internal parts in the preprocessor unit to Tektronix authorized personnel only. External parts may be replaced by qualified service personnel.*

Fuses

There are no user-replaceable fuses in the preprocessor unit.

If the probe adapter is not functioning correctly, contact your Tektronix sales representative.

Short-Term Storage

Follow steps 1 through 4 for short-term storage of the probe head:

CAUTION. *To prevent static damage to the microprocessor, the probe adapter, the probes, and the module, handle components only in a static-free environment.*

Always wear a grounding wrist strap, heel strap, or similar device while handling the microprocessor and probe adapter.

1. Power off the SUT and unplug the AC power cord on the preprocessor unit. It is not necessary to power off the logic analyzer.
2. To remove the probe head, reverse the probe installation instructions (starting on page 7) that apply to your heat sink attachment hardware.

CAUTION. *To prevent damage to the sensitive probe head cables, you must position the cables so that they are not pinched or contacting any sharp objects. When you fold the cables, use a minimum radius of 0.25 (0.64 cm) at the fold.*

3. Using antistatic nongenerating tape, tape the pin-protector board onto the pin header on the bottom of the probe head.
4. Store the probe head in an antistatic bag.

Long-Term Storage

Follow these steps using the existing cardboard carton and packaging:

1. Disconnect the preprocessor unit from the logic analyzer by removing the probes and TMSCAB1 cables from the top of the preprocessor unit.
2. Place the preprocessor unit and cables in static-shielding bags.

Figure 6: Preprocessor unit in static-shielding bags

3. Place the foam in the bottom of the cardboard carton.
4. Place the foam end caps on both sides of the preprocessor unit.
5. Place the preprocessor unit in the cardboard carton.

Figure 7: Folded cables

6. Place the preprocessor cables carefully over the preprocessor unit.
7. Place foam on top of the preprocessor unit and lay the preprocessor cables on top of the foam.

8. Place the accessory tray in the cardboard carton.
9. Place the probe head in the black plastic storage case.
10. Place the storage case in the accessory tray.

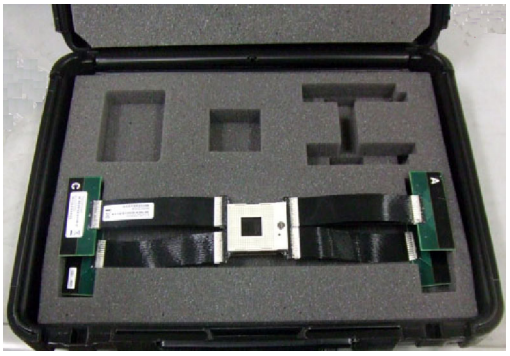

Figure 8: Probe head storage case

11. Close and tape the cardboard carton.

To ship the probe adapter, refer to *Shipping the Probe Adapter.*

Shipping the Probe Adapter

To commercially transport the probe adapter, package as follows:

1. Use the existing cardboard shipping carton and cushioning material to ship the probe adapter. See *Long-Term Storage* for repackaging instructions.

   If the existing shipping carton is not available, use a double-walled, corrugated cardboard shipping carton that allows a 3 inch (7.62 cm) minimum on all sides of the product.

2. If you are shipping a probe adapter to a Tektronix service center for Warranty service, attach a tag to the probe adapter showing the following:

   - Owner's name and address
   - Name of a person who can be contacted
   - Probe adapter type and serial number
   - Description of the problem

Specifications

Circuit Description

The probe adapter hardware uses a custom ASIC to preprocess the 4x (Quad Pumped) Signals before the signals are captured by the logic analyzer. The custom ASIC performs the following functions:

- Latches signals within a narrow valid window
- Demultiplexes double-pumped, source-synchronous signals
- Deterministically synchronizes source-synchronous signals to BCLK

All other signals are buffered and amplified in the probe adapter hardware before being captured by the logic analyzer.

Latched Operation

The microprocessor signals are processed in the probe adapter according to their type. Following is a description of each type:

4x Quad-Pumped Signals. These signals include D[63:00]# and DBI[3:0]#. The ASIC latches these signals using their dedicated strobes, STBP[3:0] and STBN[3:0], and then performs four-way demultiplexing on these signals. The ASIC also inverts the appropriate signals when the DBI[3:0] signals are active.

2x Double-Pumped Signals. These signals include A[39:03]# and REQ[4:0]#. The logic analyzer latches these signals using their dedicated strobes, ASTB[1:0], and then performs two-way demultiplexing on these signals.

1x Common-Clock Signals. These signals include all of the remaining front-side bus signals. The logic analyzer latches these signals using the rising edge of BCLK.

Signal Probing

The probe adapters use passive series isolation to acquire data.

Bus Tracking Logic

The probe adapter uses a bus tracking PAL to aid the disassembly software in linking various bus phases.

Loading Diagrams

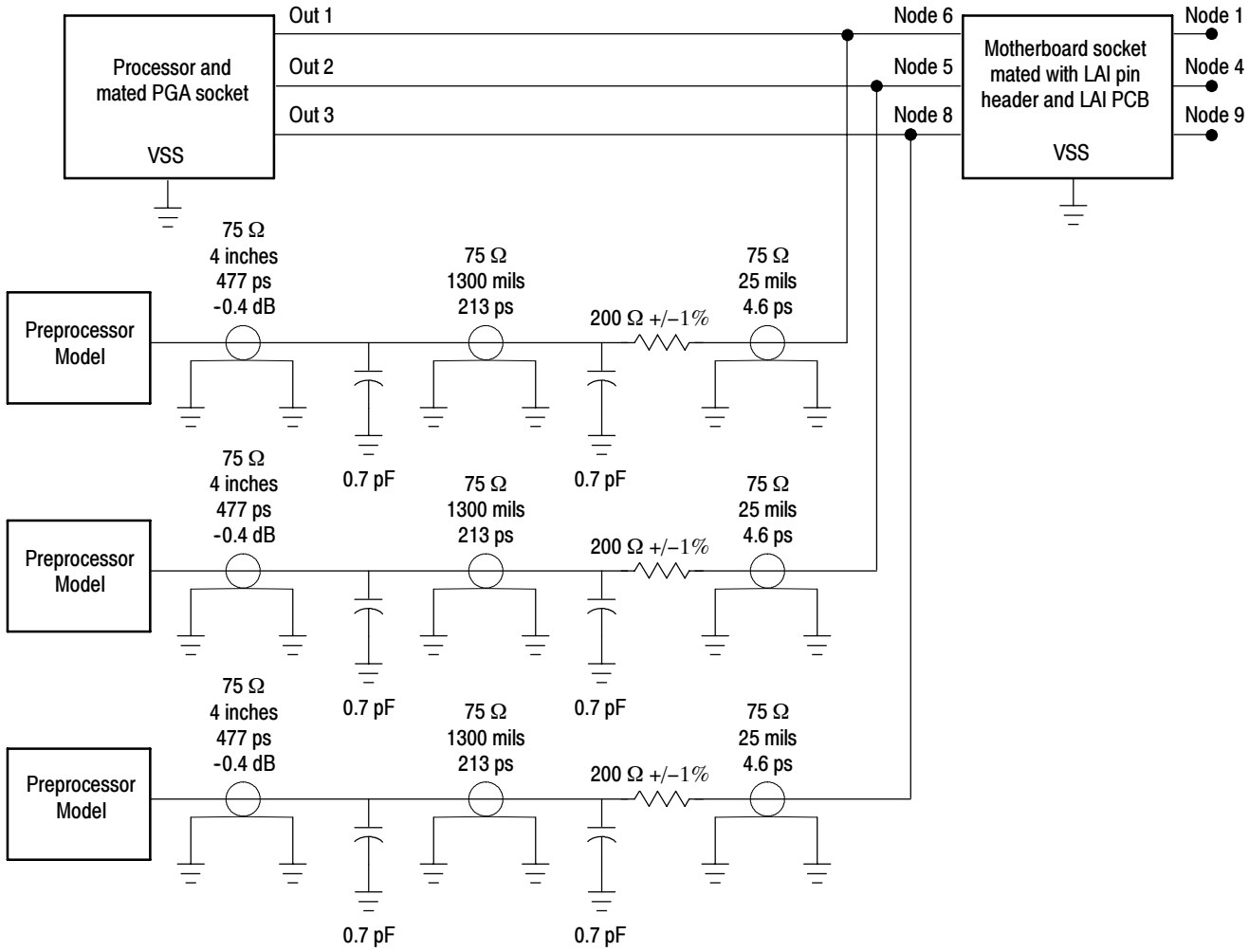

Figure 9: Probe adapter load model for typical signals

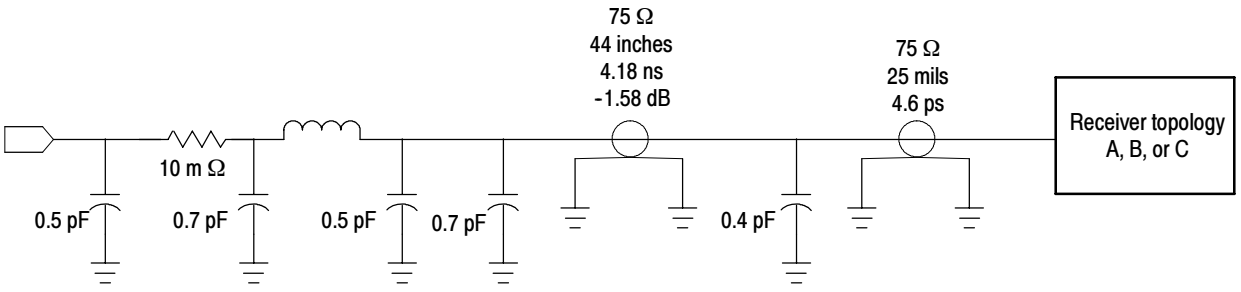

Figure 10: Preprocessor load model for typical signals

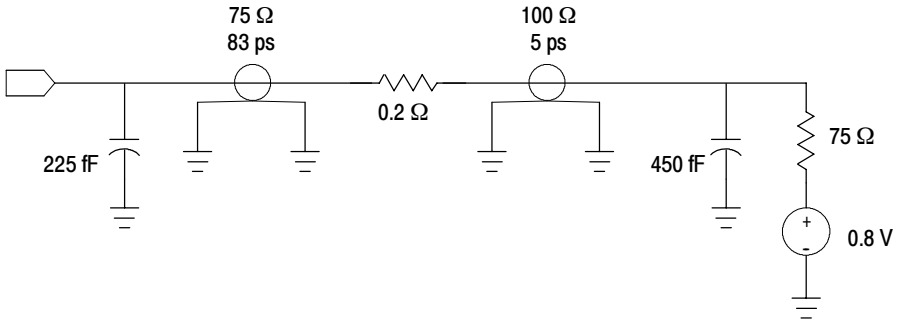

Figure 11: Receiver topology A

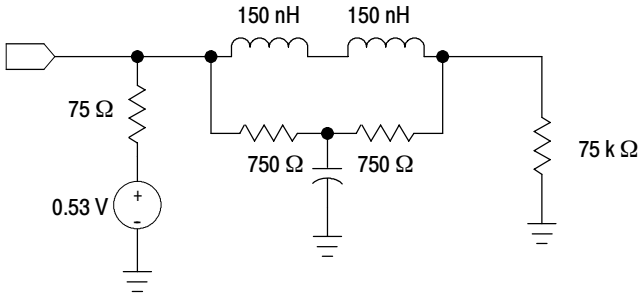

Figure 12: Receiver topology B

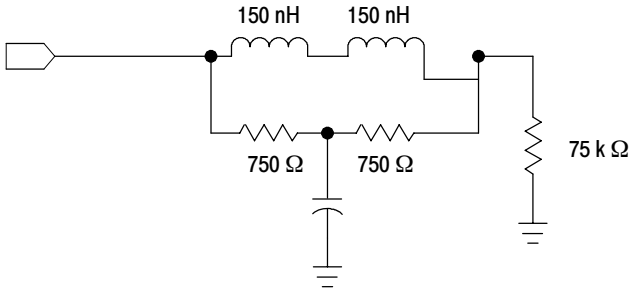

Figure 13: Receiver topology C

Specifications

These specifications are for a probe adapter connected between a compatible Tektronix logic analyzer and a SUT. Signal voltage swing in your SUT must be at least 200 mV_{p-p} around the GTL+ reference voltage.

Table 3 lists the electrical requirements of the SUT. Table 4 on page 21 lists the electrical requirements for the power supply that provides power to the probe adapter. Table 5 on page 21 lists the BCLK timing and electrical specifications. Table 6 on page 21 lists the environmental specifications.

Table 3: Electrical specifications for the SUT

Characteristics	Requirements (typical)
DC power requirements	
Voltage, V_{cc}	1.05 V ±5%
Current, GLT_{REF}	I maximum <15 nA, I typical <3 nA at 25 °C
Common clock rate	Maximum 200 MHz
Common clock capture	
Typical - V_{cc} = 1.05 V, V_{REF} = 0.7 V, V_{IH} = $V_{REF,}$ +100 mV, V_{IL} = V_{REF} -100 mV, at 25 °C	
Window	900 ps
T_{su}	900 ps
T_{hd}	0 ps
2x Source-Synchronous capture	
Window	750 ps
T_{su}	375 ps
T_{hd}	375 ps
4x Source-Synchronous capture (DBI disabled)	
Window	500 ps
T_{su}	200 ps
T_{hd}	300 ps

In Figure 14, the ±100 mV must be centered around GTLREF and the ringback cannot come within 60 mV of GTLREF after the initial 100 mV requirement to detect the initial transition.

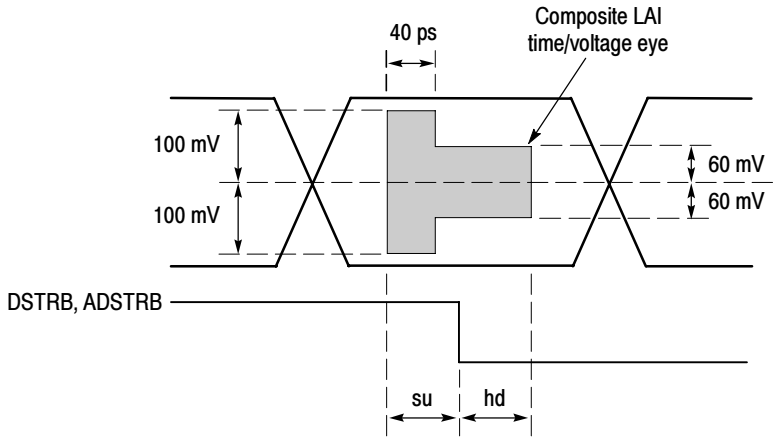

Figure 14: Eye diagram

Table 4: Electrical specifications for the AC input to the preprocessor unit

Characteristic	Description
Input Voltage rating	100 - 240 VAC ±10% CAT II
Input Frequency rating	50 - 60 Hz
Input Current rating	6 A maximum

Table 5: BCLK timing and electrical specifications at 25 °C

Characteristics	Minimum	Maximum	Units	Notes
V_{in} (lo) min	-	V_{REF} -100 mV	V	
V_{in} (hi) max	V_{REF} +100 mV	-	V	
Duty Cycle	45	55	%	

Table 6: Environmental specifications

Characteristic[1]	Description
Temperature	
Maximum operating	+50 °C (+122 °F)[2]

Table 6: Environmental specifications (cont.)

Characteristic[1]	Description
Minimum operating	0 °C (+32 °F)
Nonoperating	-55 °C to +75 °C (-67 °F to +167 °F)
Humidity	10 to 95% relative humidity, noncondensing
Altitude	
Operating	3 km (10,000 ft) maximum
Nonoperating	15 km (50,000 ft) maximum
Electrostatic immunity	The probe adapter is static sensitive

1 Designed to meet Tektronix standard 062-2847-00 class 5.

2 Not to exceed microprocessor thermal considerations. Customer supplied cooling might be required across the CPU.

Certifications and Compliances

EC Declaration of Conformity - EMC

Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 61326. EMC requirements for Class A electrical equipment for measurement, control, and laboratory use (conducted emissions). Annex D.

- IEC 61000–4–2. Electrostatic discharge immunity
- IEC 61000–4–3. RF electromagnetic field immunity
- IEC 61000–4–4. Electrical fast transient / burst immunity
- IEC 61000–4–5. Power line surge immunity
- IEC 61000–4–6. Conducted RF Immunity
- IEC 61000–4–11. Voltage dips and interruptions immunity

EN 61000-3-2. AC power line harmonic emissions

EN 61000-3-3. Voltage changes, fluctuations, and flicker

Australia / New Zealand Declaration of Conformity - EMC

Complies with EMC provision of Radiocommunications Act per these standard(s):

- AS/NZS 2064.1/2. Industrial, Scientific, and Medical Equipment: 1992
- AS/NZS 3548. Information Technology Equipment: 1995

EMC Compliance

Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility when it is used with the product(s) stated in the specifications table. Refer to the EMC specification published for the stated products. May not meet the intent of the directive if used with other products.

FCC Compliance

Emissions comply with FCC 47 CFR, Part 15, Subpart B for Class A equipment.

Russian Federation

This product was certified by the GOST ministry of Russia to be in compliance with all applicable EMC regulations.

Peoples Republic of China

This product has received the Chinese Metrology Certification. (CMC).

EC Declaration of Conformity - Low Voltage

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

Low Voltage Directive 73/23/EEC, amended by 93/68/EEC.

- EN 61010-1:2001. Safety requirements for electrical equipment for measurement control and laboratory use.

U.S. Nationally Recognized Testing Laboratory Listing

- UL 61010B–1:2003. Standard for electrical measuring and test equipment.

Canadian Certification

- CAN/CSA C22.2 No. 1010.1:1997. Particular requirements for electrical equipment for measurement, control, and laboratory use. Part 1.

Additional Compliance

- IEC 61010–1:2001. Safety requirements for electrical equipment for measurement, control, and laboratory use.

Equipment Type

Test and measuring equipment

Safety Class

Class 1 – grounded product

Pollution Degree Descriptions

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.

- 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.

Overvoltage Category

Overvoltage Category II (as defined in IEC 61010-1), for power input only.

Dimensions

Figure 15 shows the dimensions of the probe head.

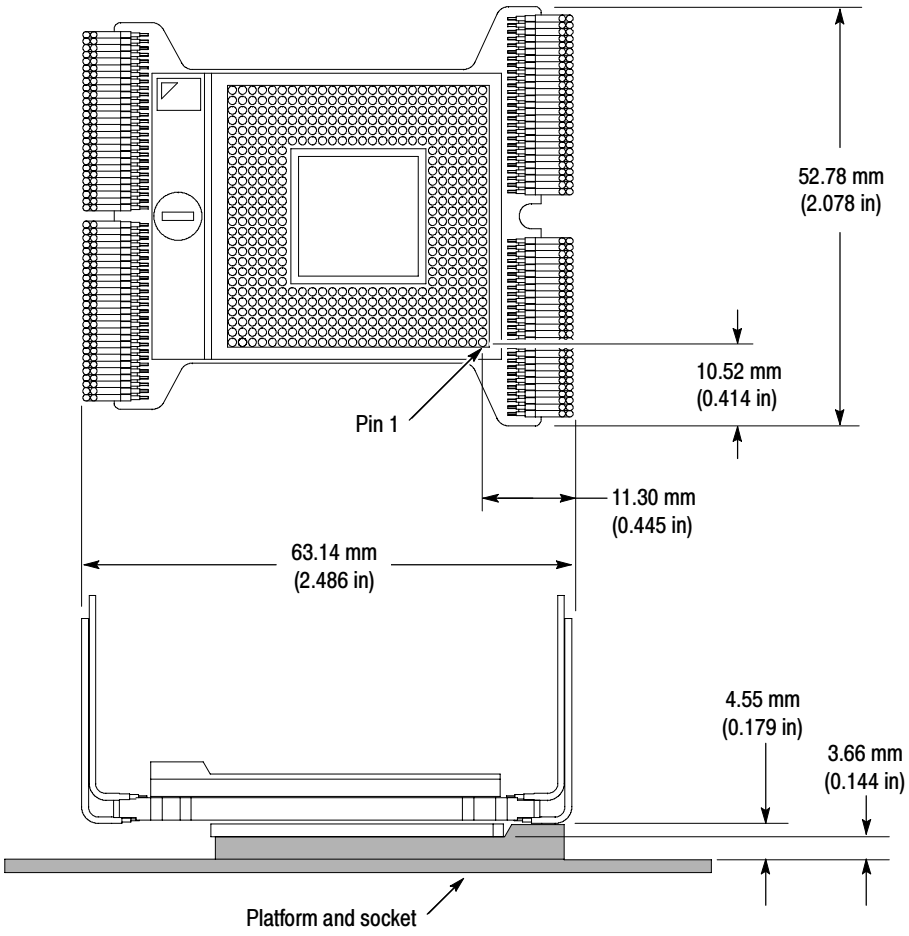

Figure 15: Dimensions of the probe head

Figure 16 shows the dimensions of the preprocessor unit.

CAUTION. *To prevent damage to the circuitry in the preprocessor unit, you must observe the required clearances in Table 1 on page 5 (clearances are not shown in Figure 16).*

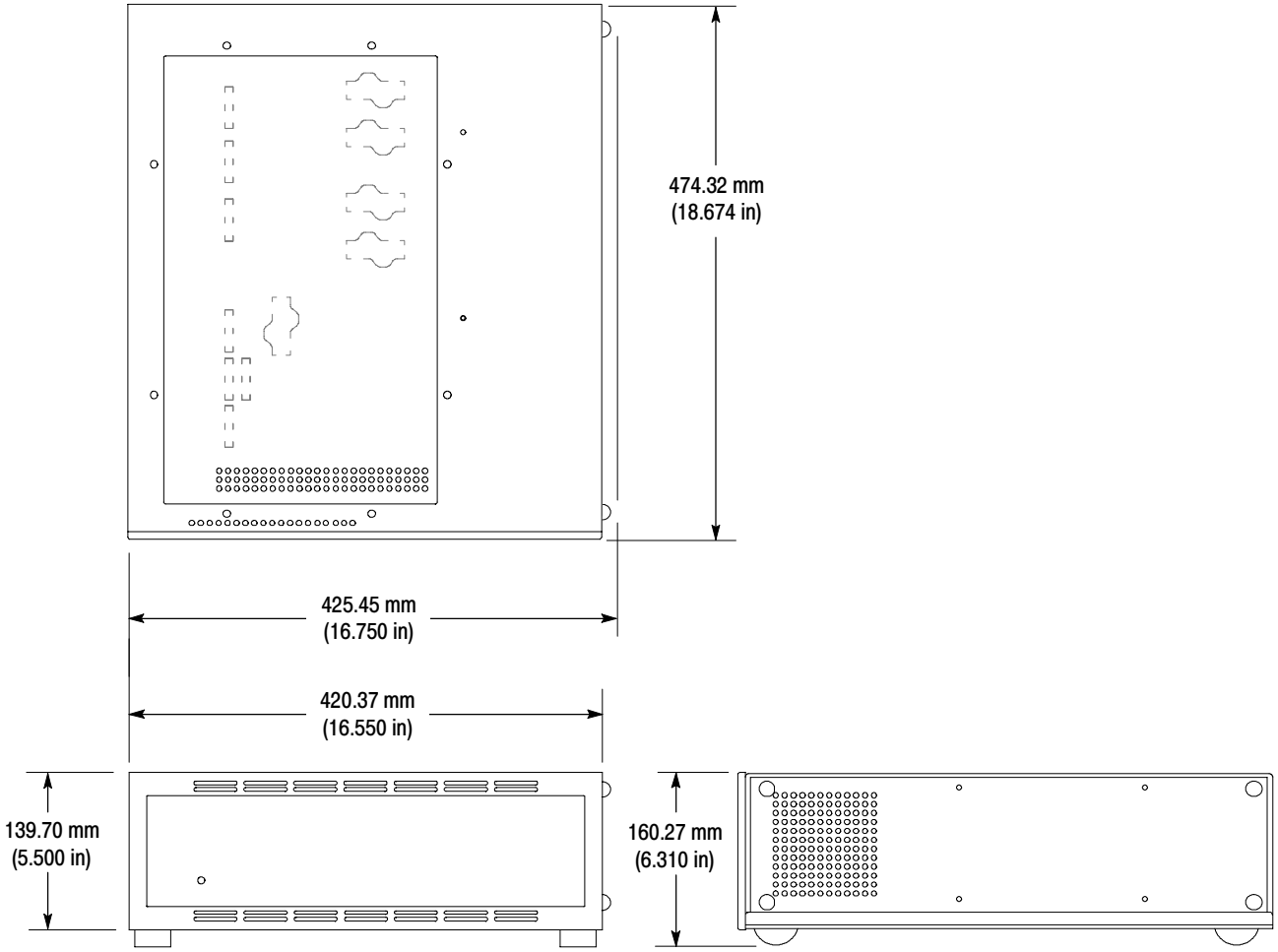

Figure 16: Dimensions of the preprocessor unit

Appendix

Accessories

Standard Accessory

The following standard accessories are shipped with these products, as noted by a check mark.

TMSSY2	TMSMPH4	Quantity	Description	Part number
✓	---	1	SOFTWARE PKG; W/INSTRUCTIONS MANUAL, TMSSY2 PUB32G15	063-3983-XX
---	✓	1	ACCESSORY KIT; CHIPCOOL 1 & 2 HEATSINK,JEWEL CASE & HEAT SINK PARTS; TMSMPH4	020-2719-XX

Optional Accessories

The following optional accessories are available for the probe adapter.

Option	Description	Part number
-	LOGIC ANALYZER PROBE:SINGLE ENDED 34-CH HIGH-DENSITY	P6960[1]
-	PREPROCESSOR CABLE ASSEMBLY W/ LABELS	TMSCAB1[2]
-	TMS131 MICRO SUPPORT; IA32G15 SOFTWARE W/HW & SW MANUALS; MICROPROCESSOR SUPPORT, RUL *2	063-3927-XX[3]
A0	US POWER CORD. (STANDARD ACCESSORY)	161-0104-00
A1	UNIVERSAL EURO POWER CORD	161-0104-06
A2	UNITED KINGDOM POWER CORD	161-0104-07
A3	AUSTRALIA POWER CORD	161-0166-13
A5	SWITZERLAND POWER CORD	161-0167-00
A6	JAPAN POWER CORD	161-0298-00
A10	CHINA POWER CORD	161-0304-00

1 Requires six probes

2 Requires five cables

3 This support software is available only to customers with a valid, restricted, and secret nondisclosure agreement (RS-NDA) with Intel and Tektronix.

Apply TMSCAB1 Labels

To attach labels to the module- and preprocessor ends of the TMSCAB1 cables, use the following instructions.

***NOTE**. Always use flat-nosed tweezers to remove the labels from the sheet of labels. Never peel labels with your fingers. The labels are made of soft vinyl and can stretch and distort easily. To avoid stretching the label, always grasp it from the top right corner while removing it from the sheet of labels.*

The adhesive on the vinyl labels is extremely strong. Carefully align the label to the indented outline on the module end and preprocessor unit end. Once labels are placed on the TMSCAB1 cables, they are difficult to remove.

1. Determine which channel groups you plan to use and identify the matching labels.
2. Follow the steps in Figure 17 while attaching the labels.

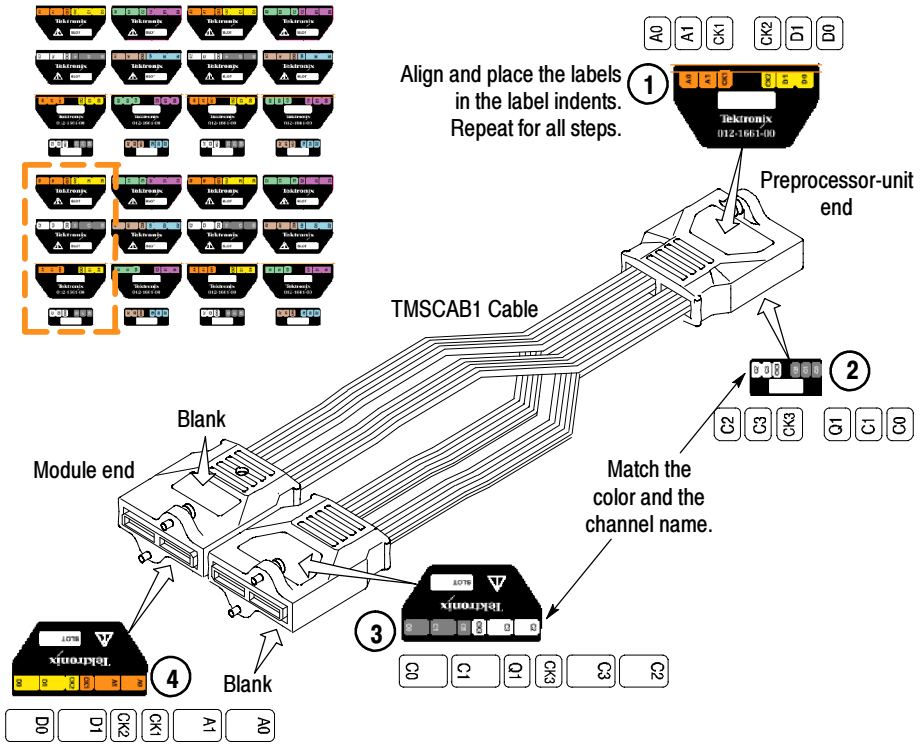

Figure 17: Apply TMSCAB1 labels

Probe Adapter Notes

System Clock Rate

The TMSSY2 hardware support can acquire data from the microprocessor operating at speeds of up to 200 MHz.

Contact your Tektronix sales representative for current information on the fastest devices supported.

Acquisition before Reset

If data is acquired before a processor Reset signal is observed by the preprocessor unit, the data acquired by the logic analyzer will be inaccurate.

Data Bus

The TMSSY2 product supports only a quad-pumped data bus.

Address Bus

The TMSSY2 product supports only a double-pumped address bus.

Disabling the Cache (disassembly)

The cache bus is not observable; therefore, disassembly requires that the cache must be disabled. Disabling the cache makes all instruction prefetches visible on the bus so that they are acquired, displayed and correctly disassembled.

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