ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Tektronix 671-5388-00* at our website: *Click HERE*

Instruction Manual

Tektronix

TMSSM3
700-Pin Socket Hardware Support

071-1387-00

www.tektronix.com

Copyright © Tektronix, Inc. All rights reserved.

Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supercedes that in all previously published material. Specifications and price change privileges reserved.

Tektronix, Inc., P.O. Box 500, Beaverton, OR 97077

TEKTRONIX and TEK are registered trademarks of Tektronix, Inc.

WARRANTY 2

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If a 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.

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.

THIS WARRANTY IS GIVEN BY TEKTRONIX IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. TEKTRONIX AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TEKTRONIX' RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. TEKTRONIX AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER TEKTRONIX OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

WARRANTY 9b

Tektronix warrants that the media on which this software product is furnished and the encoding of the programs on the media will be free from defects in materials and workmanship for a period of three (3) months from the date of shipment. If a medium or encoding proves defective during the warranty period, Tektronix will provide a replacement in exchange for the defective medium. Except as to the media on which this software product is furnished, this software product is provided “as is” without warranty of any kind, either express or implied. Tektronix does not warrant that the functions contained in this software product will meet Customer’s requirements or that the operation of the programs will be uninterrupted or error-free.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period. If Tektronix is unable to provide a replacement that is free from defects in materials and workmanship within a reasonable time thereafter, Customer may terminate the license for this software product and return this software product and any associated materials for credit or refund.

THIS WARRANTY IS GIVEN BY TEKTRONIX IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. TEKTRONIX AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TEKTRONIX’ RESPONSIBILITY TO REPLACE DEFECTIVE MEDIA OR REFUND CUSTOMER’S PAYMENT IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. TEKTRONIX AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER TEKTRONIX OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Table of Contents

General Safety Summary v
Service Safety Summary vii
Preface ix
Manual Conventions ix
Contacting Tektronix x

Getting Started

Product Description 1-1
Product Software Compatibility 1-1
Logic Analyzer Software Compatibility 1-1
Logic Analyzer Configuration 1-1
P6860 Probes 1-2
Labeling P6860 Probes 1-2
LAI Cables 1-2
Labeling LAI Cables 1-2
Standard and Optional Accessories 1-2
Probe Adapter Review 1-2
System Clock Rate 1-3
Acquisition before Reset 1-3
Data Bus 1-3
Address Bus 1-3
Disabling the Cache 1-3
Configuring the Probe Adapter 1-4
BINIT OBS Jumper 1-4
Connect the Logic Analyzer to the Target System 1-5
Removing the Probe Head from the Target System 1-8
Applying LAI Labels 1-9
Connect the Probes and the LAI Cables 1-10
PUB64G4, IA64G4, or IA64G4_C5 Setups 1-12
Applying and Removing Power 1-13
Installing the Software 1-14
Care and Maintenance 1-15
Short-Term Storage 1-16
Long-Term Storage 1-17
Shipping the Probe Adapter 1-19

Specifications

Circuit Description 2-1
Latched Operation 2-1
Signal Probing 2-2
Bus Tracking Logic 2-2
Common Clock 2-2
Probe Adapter Loading Diagrams 2-3
Specification Tables 2-5

Reference

Reference Tables 3-1
Viewing Reference Tables 3-1
To Extract Groups 3-2

Replaceable Parts List

Parts Ordering Information 4-1
Using the Replaceable Parts List 4-2

Index

List of Figures

Figure 1-1: Jumper location 1-4
Figure 1-2: Attach the brackets and probe head 1-6
Figure 1-3: Connect the microprocessor and attach your heatsink . 1-7
Figure 1-4: Apply LAI labels 1-9
Figure 1-5: LAI Cable, P6860 probe, and preprocessor unit 1-10
Figure 1-6: Module, cable, and probe configuration 1-12
Figure 1-7: Place the preprocessor unit and probe head in static-shielding bags. 1-17
Figure 1-8: Place foam in the cardboard carton 1-17
Figure 1-9: Place the preprocessor unit in the cardboard carton . . 1-18
Figure 1-10: Place the cables carefully over the preprocessor unit . 1-18
Figure 1-11: Place the foam and probe head in place 1-18
Figure 1-12: Place accessories in the accessory tray 1-19

Figure 2-1: Pin header electrical load model for typical signals . . . 2-3
Figure 2-2: Pin header electrical load model for typical signals . . . 2-4
Figure 2-3: ZIF electrical load model for typical signals 2-4
Figure 2-4: Mated Mictor model 2-4
Figure 2-5: BCLK model 2-4
Figure 2-6: Dimensions of the probe head 2-7
Figure 2-7: Dimensions of the preprocessor unit 2-8

Figure 4-1: Probe adapter exploded view 4-5
Figure 4-2: Preprocessor unit exploded view 4-6

List of Tables

Table 1-1: Jumper information 1-4
Table 1-2: P6860 probe and LAI Cable configuration 1-11

Table 2-1: Electrical specifications for the target system 2-5
Table 2-2: Electrical specifications for the AC input 2-5
Table 2-3: BCLK timing and electrical specifications 2-5
Table 2-4: Environmental specifications 2-6
Table 2-5: Certifications and compliances 2-6

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.

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.

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

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.

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:



CAUTION
Refer to Manual



WARNING
High Voltage



Protective Ground
(Earth) Terminal

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.

Preface

This instruction manual contains specific information about the TMSSM3 microprocessor support product and 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 products on the logic analyzer, all you need is this instruction manual to set up and run the support product.

If you are not familiar with operating microprocessor support products, you need to supplement this instruction manual with information on basic operations from the Tektronix logic analyzer online help to set up and run the support product.

Manual Conventions

This manual uses the following conventions:

- The phrase “information on basic operations” refers to basic information in the Tektronix logic analyzer online help.
- The terms “Master” and “Slave” refer to modules that are located in numbered slots (see Figure 1–6 on page 1–12).
- The term “LAI” is an acronym for Logic Analyzer Interface.

Contacting Tektronix

Phone	1-800-833-9200*
Address	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
Web site	www.tektronix.com
Sales support	1-800-833-9200, select option 1*
Service support	1-800-833-9200, select option 2*
Technical support	Email: techsupport@tektronix.com 1-800-833-9200, select option 3* 6:00 a.m. – 5:00 p.m. Pacific time

* **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.

Getting Started

Getting Started

This section contains information about configuring the probe adapter and applying power to the TMSSM3 product.

Product Description

The TMSSM3 product is an interposer design that allows the logic analyzer to acquire data from a microprocessor in an operating environment with little effect on the target system.

The probe adapter is connected to the target system and the microprocessor is connected to the probe adapter. Signals from the microprocessor-based system flow through the probe adapter to the logic analyzer.

Product Software Compatibility

The TMSSM3 product is shipped with the PUB64G4 software. The PUB64G4 software acquires signals for viewing state and timing signals.

***NOTE**. The TMS123 (IA64G4, IA64G4_T, IA64G4_C5, IA64G4_T_C5, and IA64G4_SST) software is compatible with the TMSSM3 product. The TMS123 software provides disassembly and timing analysis capabilities, synchronous transactions, and instruction decoding. The TMS123 software product is available only to customers with a valid, restricted, secret nondisclosure agreement (RS-NDA) with Intel.*

Logic Analyzer Software Compatibility

Software version 4.3 SP1 of the logic analyzer software is compatible with the TMSSM3 PUB64G4 software and the TMS123 software products.

Logic Analyzer Configuration

To use the probe adapter to acquire either disassembly or timing signals, you need a TLA7AAX or TLA7ABX logic analyzer equipped with a minimum of four, 136-channel, 450 MHz modules. The modules must be configured and merged. The memory depth is chosen automatically based on the shallowest memory depth of the modules.

Two additional merged modules can be added to acquire both disassembly and timing signals. The TLA7XM mainframe is needed when using six modules.

P6860 Probes

You can use the logic analyzer modules and P6860 probes to connect to the TMSSM3 probe adapter.

For more information on connecting the P6860 Probes to the preprocessor unit, see page 1–10.

Labeling P6860 Probes

The probe adapter relies on the default channel mapping and labeling scheme for the probes. Apply labels using the instructions described in the *P6860 High Density Logic Analyzer Probe Label Instructions,* Tektronix part number 071-1123-XX. This manual can be accessed from the Tektronix Web site (see the contact page at the front of this manual. This information is also located in the logic analyzer online help.

Refer to the *P6810, P6860, and P6880 Logic Analyzer Probes Instruction manual*, Tektronix part number 071-1059-XX, for more information. You can find information about the P6860 probes in the logic analyzer online help.

LAI Cables

The LAI cables are designed to connect the logic analyzer modules to the TMSSM3 probe adapter.

For more information on connecting the LAI cables to the preprocessor unit, see page 1–10.

Labeling LAI Cables

For information on how to label the LAI cables, see page 1–9.

Standard and Optional Accessories

A complete list of standard and optional accessories is provided in the *Replaceable Parts List* on page 4–4.

Probe Adapter Review

Along with this TMSSM3 instruction manual, each logic analyzer includes additional information about performing tasks that are common to microprocessor support packages on that platform.

This additional information is located in the logic analyzer online help, an installation manual, or a user manual. Review the additional information if you are unfamiliar with using support products on a logic analyzer product.

Review electrical, environmental, and mechanical specifications in the *Specifications* section on page 2–1 as they pertain to the target system, as well as the following information.

System Clock Rate

The TMSSM3 hardware support can acquire data from the microprocessor operating at speeds of up to 333 MHz and 400 MHz. The tested clock rate is 200 MHz.

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

Acquisition before Reset

If data is acquired just before a power on Reset signal is observed by the target system, the data acquired by the logic analyzer will be inaccurate.

Data Bus

The TMSSM3 probe adapter supports only a double data bus.

Address Bus

The TMSSM3 probe adapter supports only a common clock address bus.

Disabling the Cache

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

Configuring the Probe Adapter

Position the jumper on the probe adapter as described in Table 1–1. Figure 1–1 shows the location of the jumper on the preprocessor unit.

Table 1–1: Jumper information

Jumper designation	Pin numbers	Jumper name
BINIT_OBS	2–3	Observe BINIT
	1–2	Ignore BINIT assertion

BINIT OBS Jumper

Place the jumper in the pin 2 to pin 3 position to select BINIT observed, allowing the BINIT signal to act as another reset input. Place the jumper in the pin 1 to pin 2 position to select BINIT unobserved.

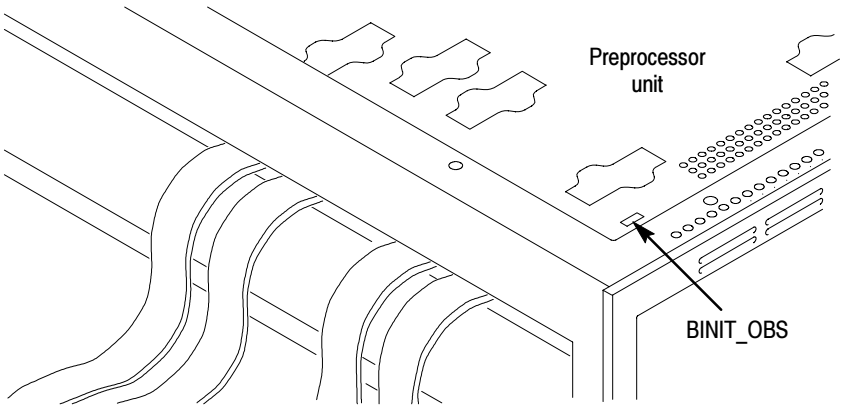


Figure 1–1: Jumper location

Connect the Logic Analyzer to the Target System

This probe-adaptor product comes with different mechanical kits that allow you to attach the probe adapter to specific platforms, processors, and power-pod adapters. If you do not know which of these mechanical kits you need to use, contact your Tektronix application engineer.



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.*

To prevent static damage to the microprocessor, the probe adapter, the probes, and the module, you must 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.

You must allow airflow clearance for the preprocessor unit. Refer to the dimensions described in Table 2–4 on page 2–6 for the required clearance.

Read the following instructions before installing parts.

Tools

The following tools are required:

- Phillips (P1) to attach the brackets to the target system.
- $^{3}/_{32}$-inch (2.5 mm) hexagonal wrench for the ZIF sockets
- Dremel (hand grinder) or wire cutters to trim off the heatsink alignment pins.
- (optional) A torque wrench helps to ensure reliable connections by meeting the nominal torque values. When attaching screws to the probe head, use 4 in-lbs (0.451 Newton meters) of torque.

To connect the logic analyzer to the target system, follow these steps:

1. Power off the target system. It is not necessary to power off the logic analyzer.
2. Power off any probe adapters that may be attached to your target system.
3. To discharge static electricity, touch the ground connector located on the logic analyzer.
4. Remove the microprocessor from your target system.
5. Follow the steps in Figures 1–2 and 1–3 to install the probe head.

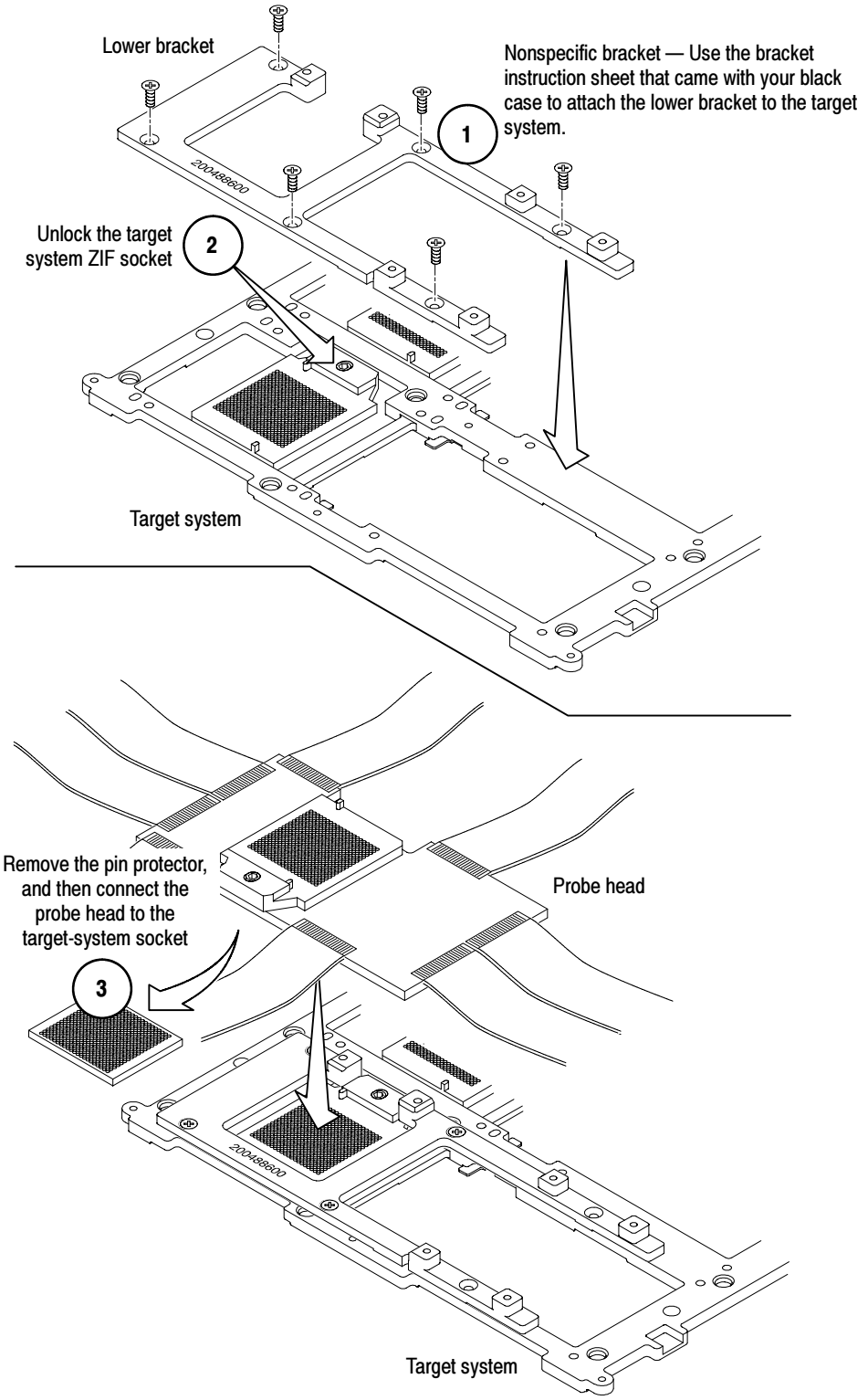


Figure 1-2: Attach the brackets and probe head

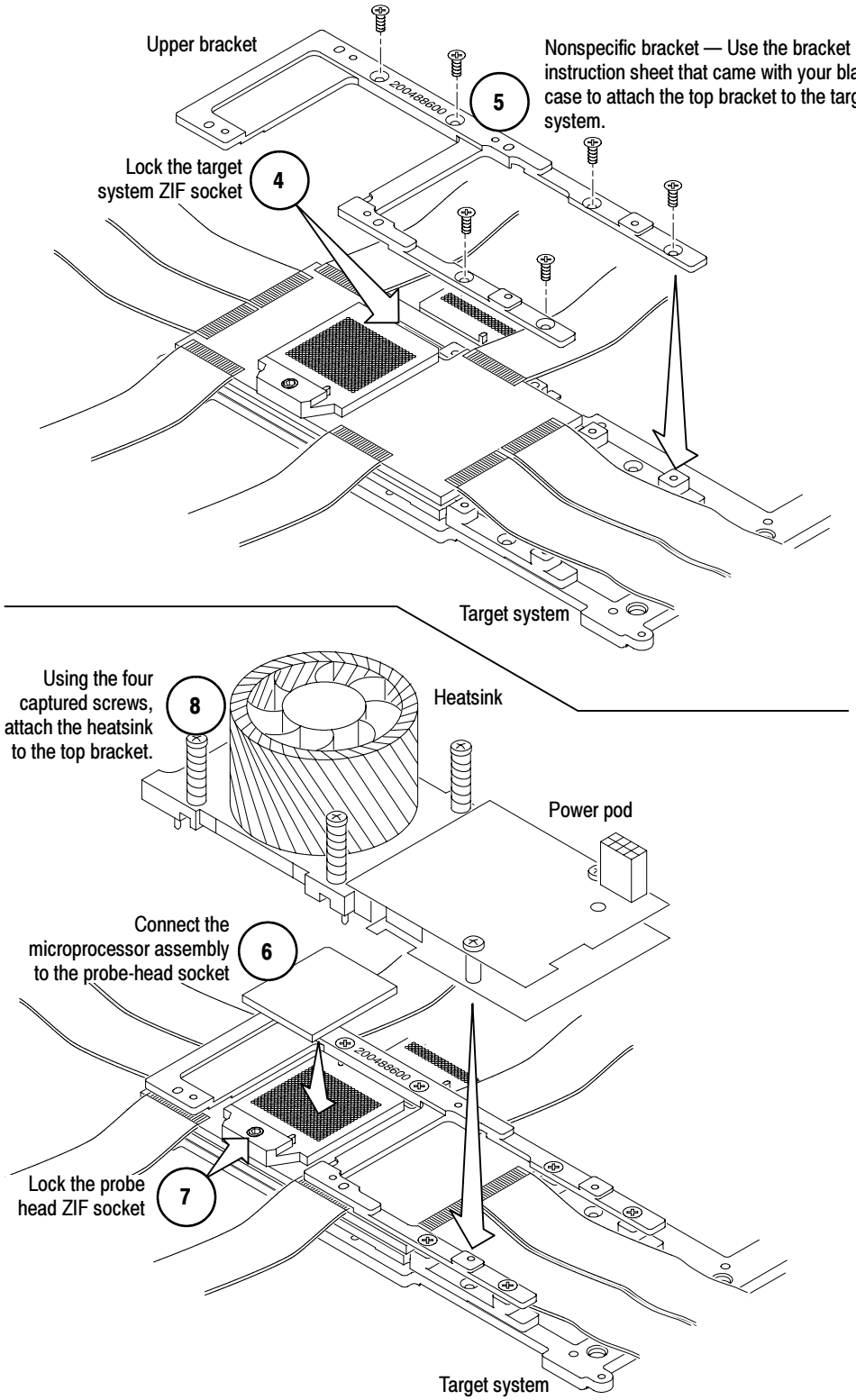


Figure 1-3: Connect the microprocessor and attach your heatsink

Removing the Probe Head from the Target System

Follow these steps to remove the probe head from the target system:

1. Power off the target system, and unplug the AC power cord on the preprocessor unit. The power switch for the probe adapter is located on the back of the preprocessor unit. It is not necessary to power off the logic analyzer.
2. Reverse the steps in Figures 1–2 and 1–3 to remove the probe head.
3. Store the probe head in the original packing material.

Applying LAI Labels

The LAI cables are shipped without labels; you must attach labels to the module end and the preprocessor end of the LAI cables. Read the following note before you begin attaching labels.

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 a 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 LAI cables, they are difficult to remove.

To attach labels, perform the following steps:

1. Determine which channel groups you are planning to use and identify the matching labels.
2. Follow the steps in Figure 1-4 while attaching the labels.

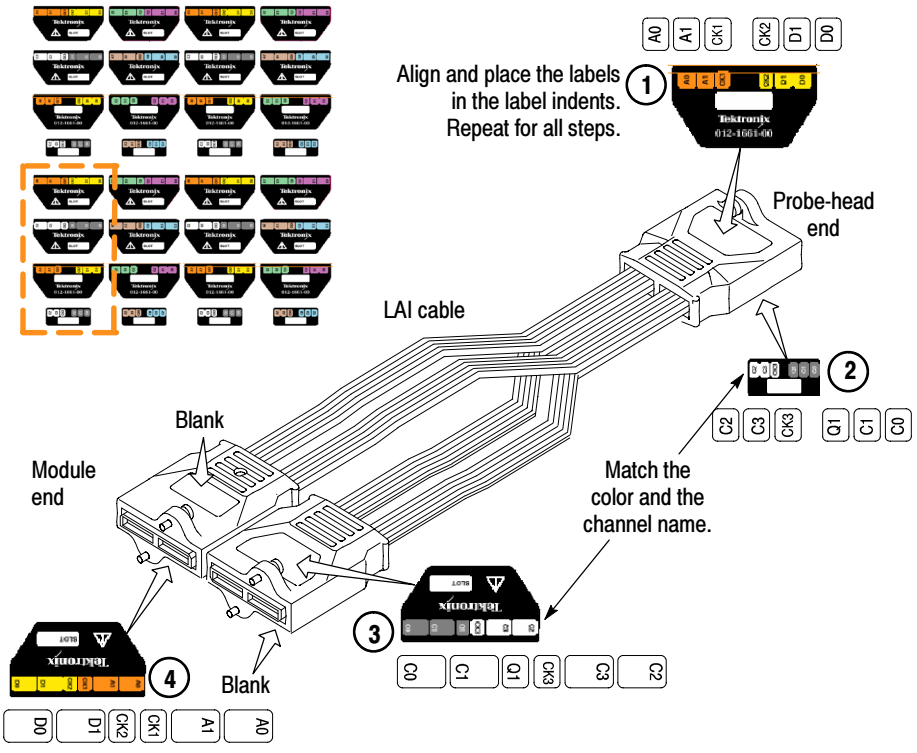


Figure 1-4: Apply LAI labels

Connect the Probes and the LAI Cables

To configure the P6860 probes and LAI cables for the disassembly and timing support functions, you must determine if you are using the four or six module configuration (see Table 1–2 on page 1–11). Then follow the steps on page 1–12 to connect the logic analyzer modules to the preprocessor unit.

To apply labels to the LAI cables, see page 1–9. Figure 1–5 shows a P6860 probe, an LAI cable, and the preprocessor unit.

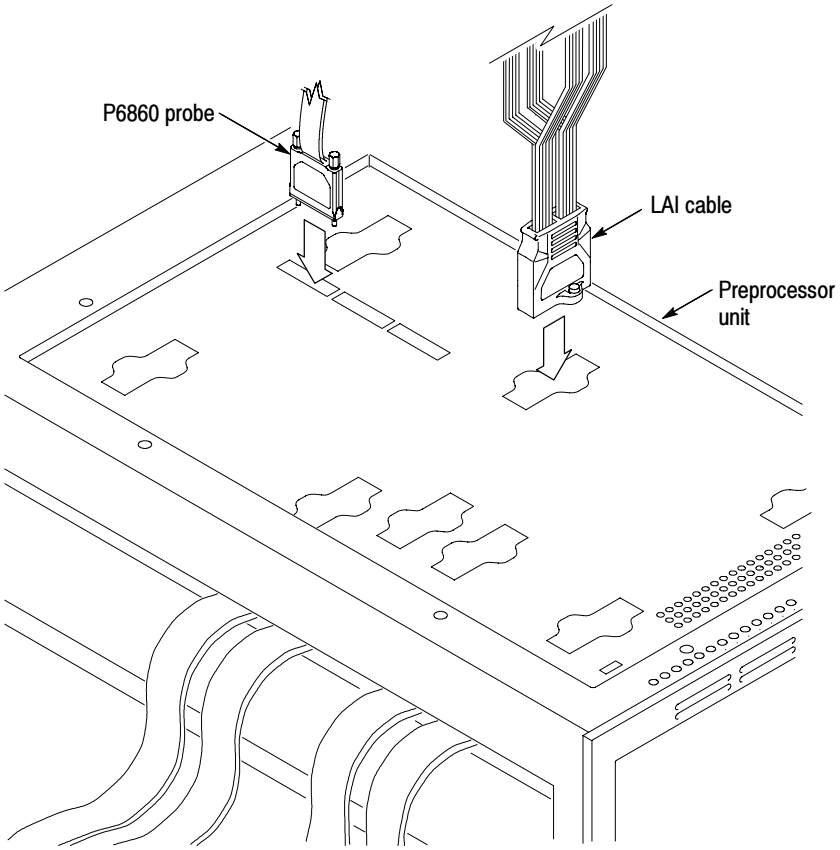


Figure 1–5: LAI cable, P6860 probe, and preprocessor unit

Table 1–2 lists the 4- or 6-module hardware and software configurations.

Table 1–2: P6860 probe and LAI cable configuration

Software loaded	Function	Modules	LAI cables	P6860 probes	Description
PUB64G4	State	4	7 (M,S1,S2,S3**)	---	Acquires state only
IA64G4 or IA64G4_C5	Disassembly	4	7 (M,S1,S2,S3**)	---	Acquires disassembly only: • Can on trigger common clock signals • Can view common clock signals in timing • Can trigger on data content • Cannot view source synchronous data in timing
IA64G4_T or IA32G4_T_C5	Timing	4	3 (M,S3**)	6 (S1,S2)	Acquires timing only: • Can trigger on common clock signals • Can view common clock signals in timing • Cannot trigger on data content • Can view source synchronous data in timing
IA64G4 and IA64G4_SST	Disassembly, plus Timing	4, +2*	7 (M,S1,S2,S3**)	6	Acquires complete disassembly and timing: • Can trigger on common clock signals • Can view common clock signals in timing • Can trigger on data content • Can view source synchronous data in timing on a separately unmerged modules (IA64G4_SST software on two auxiliary modules)

*** You need a TLA7XM mainframe for six modules.**

**** Do not connect to RESERVED on the Slave3 module.**

Figure 1–6 shows the configuration for a 4-wide and 6-wide module merge. An expanded mainframe is needed for 6 modules and the order of the modules does not matter.

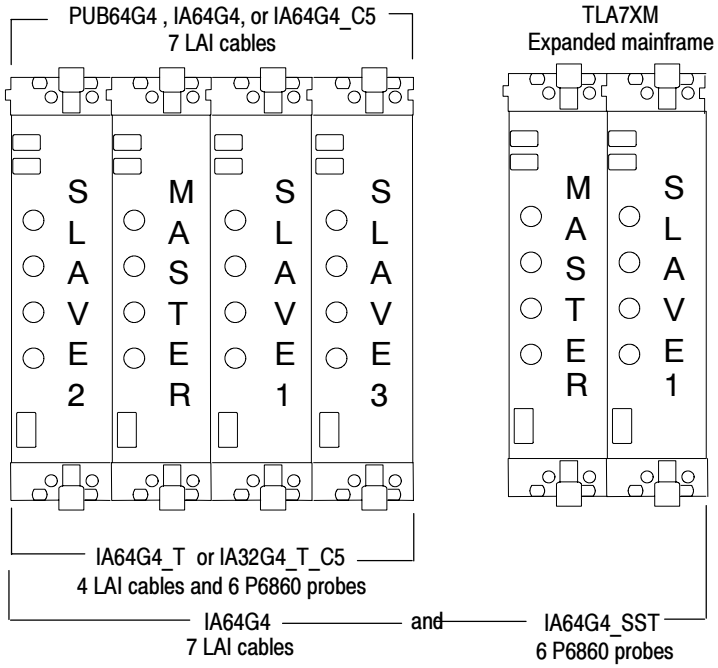


Figure 1–6: Module, cable, and probe configuration

Choose your software support, and then follow the steps to connect your logic analyzer module to the preprocessor unit:

PUB64G4, IA64G4, or IA64G4_C5 Setups

1. Match the A, D, C, and E LAI cables from the Master module with the corresponding M_ D3/D2 and A3/A2, M_D1/D0 and A1/A0, M_C1/C0 and C3/C2, and M_E3/E2 and E1/E0 connector labels on the preprocessor unit. The LAI cable connector is keyed for correct alignment to the preprocessor unit. Connect the LAI cable to the preprocessor.
2. Match and connect the rest of the LAI cables between the Slave1 (S1), Slave2 (S2), and Slave3 (S3) modules to the top of the preprocessor unit. Do not connect to RESERVED on the Slave3 module.

IA64G4_T or IA32G4_T_C5 Setups

1. Match the A, D, C, and E LAI cables from the Master module with the corresponding M_ D3/D2 and A3/A2, M_D1/D0 and A1/A0, M_C1/C0 and C3/C2, and M_E3/E2 and E1/E0 connector labels on the preprocessor unit. The LAI cable connector is keyed for correct alignment to the preprocessor unit. Connect the LAI cables to the top of the preprocessor.
2. Match and connect an LAI cable to the Slave3(S3) module and preprocessor. Do not connect to RESERVED on the Slave3 module.

3. Match and connect the P6860 probes between the Slave1 and Slave2 modules and the top of the preprocessor unit.



CAUTION. *To prevent damage to the P6860 probe and the preprocessor unit, you must always position the probes perpendicular to the footprint on the PCB. Incorrect handling of the P6860 probe while connecting to or disconnecting from the preprocessor unit can damage the probe.*

NOTE*. For more detailed information about how to attach a P6860 probe, refer to the P6860 probe manual references listed on page 1–2.*

IA64G4 and IA64G4_SST Setups

1. Match the A, D, C, and E LAI cables from the Master module with the corresponding M_ D3/D2 and A3/A2, M_D1/D0 and A1/A0, M_C1/C0 and C3/C2, and M_E3/E2 and E1/E0 connector labels on top of the preprocessor unit. Connect the LAI cable.
2. Match and connect the LAI cables between the Slave1 (S1), Slave2 (S2), and Slave3 (S3) modules on top of the preprocessor unit. Do not connect to RESERVED on the Slave3 module.
3. Match and connect the P6860 probes between the Master and Slave1 modules in the expanded mainframe and the top of the preprocessor unit.

Applying and Removing Power

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

1. Check that 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 that you know is working properly.
4. Power on the probe adapter at the back of the preprocessor unit. A green, power-on LED lights on the front of the preprocessor unit, indicating that the probe adapter is active.
5. Power on the target system.

To remove power from the target system and the probe adapter, reverse the preceding steps. You can skip step 1.

Installing the Software

If you have not used a support product, you may want to refer to microprocessor support information in the Tektronix logic analyzer online help or the user manual.

NOTE. *Before you install any software, verify that the microprocessor support software is compatible with the logic analyzer software (see page 1-1).*

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

1. Insert the disk in the disk drive.
2. Click the Windows Start button, point to Settings, and click Control Panel.
3. In the Control Panel window, double-click Add/Remove Programs.
4. Follow the instructions on the screen for installing the software from the disk.

To remove or uninstall software, follow the above instructions except select Uninstall. You must close all windows before you uninstall any software.

Care and Maintenance

Before cleaning this product, read the following information:



CAUTION. *To prevent static damage, you must handle components only in a static-free environment. Static discharge can damage the microprocessor, the probe adapter, the probes, and the module.*

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 to get 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

All fuses in the probe adapter are not replaceable by the customer (operator). 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 target system, and unplug the AC power cord on the preprocessor unit. The power switch for the probe adapter is located on the back of the preprocessor unit. It is not necessary to power off the logic analyzer.
2. To remove the probe head, reverse the instructions in Figures 1–2 and 1–3 on pages 1–6 and 1–7.



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

For long-term storage, use the existing cardboard carton and packaging, and follow these steps:

1. Disconnect the preprocessor unit from the logic analyzer by removing the probes and LAI cables from the top of the preprocessor unit.
2. Follow Figures 1–7 through 1–12 to repackage the probe adapter.



Figure 1–7: Place the preprocessor unit and probe head in static-shielding bags.



Figure 1–8: Place foam in the cardboard carton



Figure 1-9: Place the preprocessor unit in the cardboard carton



Figure 1-10: Place the cables carefully over the preprocessor unit



Figure 1-11: Place the foam and probe head in place



Figure 1-12: Place accessories in the accessory tray

3. 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 TMSSM3 probe adapter, package as follows:

1. Use the existing cardboard shipping carton and cushioning material to ship the probe adapter.

   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. Follow Figures 1-7 through 1-12 on pages 1-17 through 1-19 to package the probe head and preprocessor unit.

3. 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

Specifications

This section contains information regarding the specifications of the TMSSM3 hardware support.

Circuit Description

The TMSSM3 probe adapter hardware uses a custom ASIC to preprocess all signals on the 700-pin microprocessor before being 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

Latched Operation

These 2x double-pumped signals include D[127:00]# and DEP[15:0]#. The ASIC latches these signals using their dedicated strobes: STBN[...]#, STBP[...]#. The ASIC then performs two-way demultiplexing on these signals and synchronizes the STB[7:0]# results to BCLK. The resulting signals are sent out by the ASIC four clock cycles after they were received on the system bus.

1x Common-Clock Signals

These signals include all of the remaining front-side bus signals. The ASIC latches these signals using the rising edge of BCLK. The ASIC then delays the signals so that the final results are sent out four clock cycles after they were received onto the system bus.

Derived Signals

The TMSSM3 probe adapter hardware derives several custom signals from the front-side bus signals captured by the ASIC. These signals are used by the logic analyzer support software to provide clocking, transaction phase linking, and disassembly. Following is a description of custom signals:

PHASE_D. This signal can be used by the logic analyzer to store only bus cycles that contain active information. The PHASE_D signal is asserted when any of the following signals are asserted: ADS#, DRDY#, INIT#, RESET#, RS[2:0]#, and SNOOP_D.

SNOOP_D. This signal is asserted at the end of each successful snoop phase, taking into account any stall conditions that might have occurred. SNOOP_D is asserted only once per each request and is not asserted during a stall condition.

RCNT_D[2:0]. The request counter tracks the number of outstanding requests on the front-side bus. The request counter is incremented by each new request phase and decrememted by each response phase. The maximum allowable count is 8.

SCNT_D[2:0]. The snoop counter tracks the number of outstanding snoops on the front-side bus. The snoop counter is incremented by each new request phase and decrememted by each successful snoop phase. The maximum allowable count is 8.

TRACK_ERR_D. This signal is asserted whenever the request or snoop counters exceed their maximum value of 8, or a minimum value of 0. This signal is also asserted when ADS# has been observed active for two clock cycles in a row.

Signal Probing

The 700-Pin Socket probe adapter uses passive series isolation to acquire data.

Bus Tracking Logic

The 700-Pin Socket probe adapter uses a bus tracking PAL to aid the disassembly software in linking various bus phases.

Common Clock

The TMSSM3 software allows disassembly from a data bus operating at up to 200 MHz. The setup and hold sample points are set to default timing numbers based on FSB specifications.

Probe Adapter Loading Diagrams

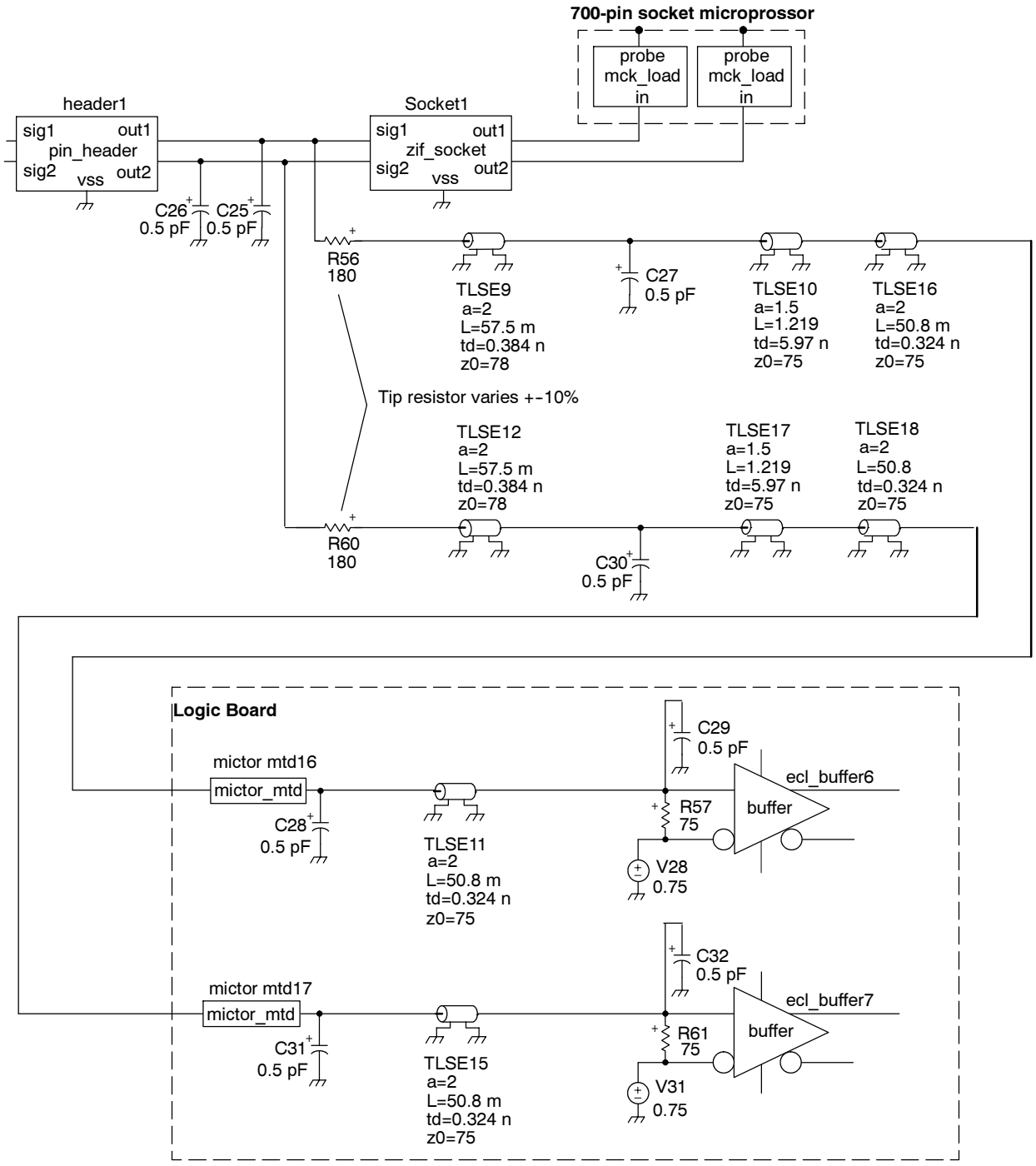


Figure 2-1: Pin header electrical load model for typical signals

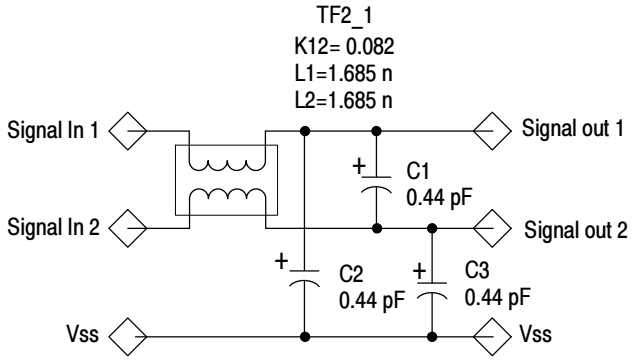


Figure 2-2: Pin header electrical load model for typical signals

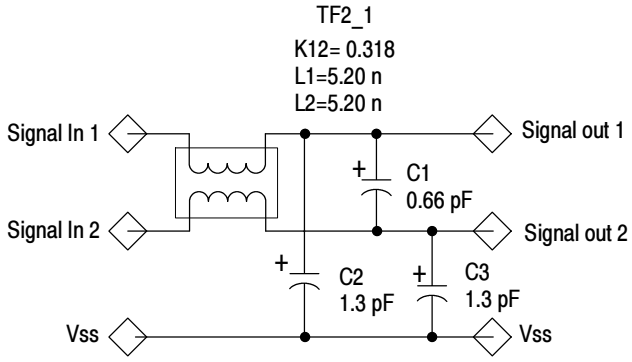


Figure 2-3: ZIF electrical load model for typical signals

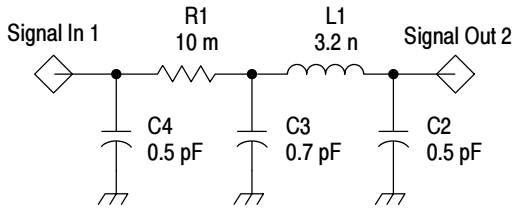


Figure 2-4: Mated Mictor model

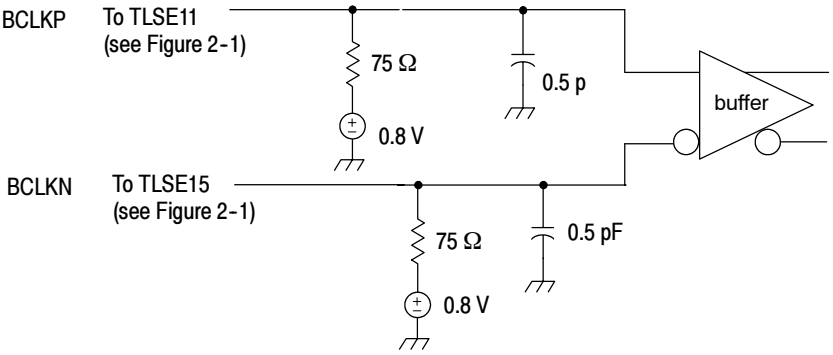


Figure 2-5: BCLK model

Specification Tables

These specifications are for a probe adapter connected between a compatible Tektronix logic analyzer and a target system. Signal voltage swing in your target system must be at least 600 mV_{p-p} around the GTL+ reference voltage.

Table 2–1 lists the electrical requirements of the target system. Table 2–2 lists the electrical requirements for the power supply that provides power to the 700-Pin Socket probe adapter. Table 2–3 lists the BCLK timing and electrical specifications. Table 2–4 lists the environmental specifications.

Table 2–1: Electrical specifications for the target system

Characteristics	Requirements
Target system DC power requirements	
Voltage, V_{TT}	1.2 V ± 5%
Current, VREF6	I maximum <1 mA, I typical <1 mA
Target system clock rate	Maximum 333 MHz and 400 MHz
Target system tested clock rate	Maximum 200 MHz
Common clock capture	
T_{su}	0.4 ns
T_{hd}	0.1 ns
Source Synchronous capture	
T_{su}	0.3 ns
T_{hd}	0.3 ns

Table 2–2: Electrical specifications for the AC input

Characteristic	Description
Input Voltage rating	100 – 240 VAC CAT II
Input Frequency Rating	50 – 60 Hz
Input Current Rating	6.0 A maximum

Table 2–3: BCLK timing and electrical specifications

Characteristics	Minimum	Maximum	Units	Notes
V_{in} (lo)		0.4	V	
V_{in} (hi)	1.0		V	

Table 2-3: BCLK timing and electrical specifications (cont.)

Characteristics	Minimum	Maximum	Units	Notes
Duty Cycle	25	75	%	
t_{lh}		1.25	ns	Monotonically increasing
t_{hl}		1.25	ns	Monotonically decreasing

Table 2-4: Environmental specifications

Characteristic[1]	Description
Temperature	
Maximum operating	+50 °C (+122 °F)[2]
Minimum operating	0 °C (+32 °F)
Nonoperating	-55 °C to +75 °C (-67 ° 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
Required airflow clearances for the preprocessor unit	
Front, top, left side	5.08 cm (2 in)
Back	7.62 cm (3 in)
Bottom, right side	0.635 cm (0.250 in)

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.

Table 2-5: Certifications and compliances

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 61010-1:1993/A2:1995 Safety requirements for electrical equipment for measurement, control, and laboratory use

Table 2-5: Certifications and compliances (cont.)

Approvals	UL3111-1 - Standard for electrical measuring and test equipment CAN/CSA C22.2 No. 1010.1-92 - Safety requirements for measurement, control, and laboratory use.
Installation Category Descriptions	Terminals on this product may have different installation category designations. The installation categories are: CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected CAT I Secondary (signal level) or battery operated circuits of electronic equipment

Dimensions Figure 2-6 shows the dimensions of the TMSSM3 probe head.

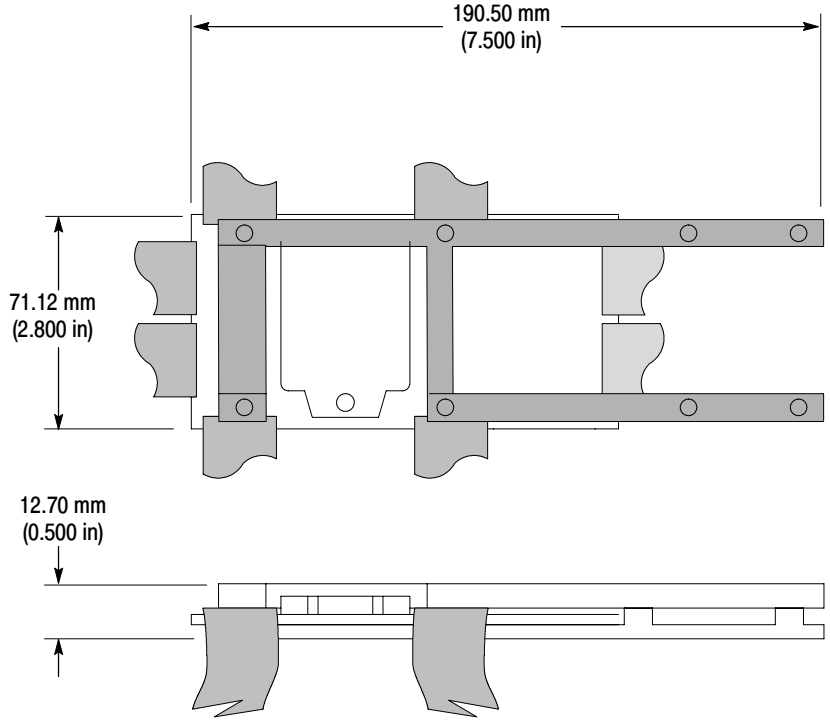


Figure 2-6: Dimensions of the probe head

Figure 2–7 shows the dimensions of the preprocessor unit. For required clearances around the preprocessor unit, refer to Table 2–4 on page 2–6).

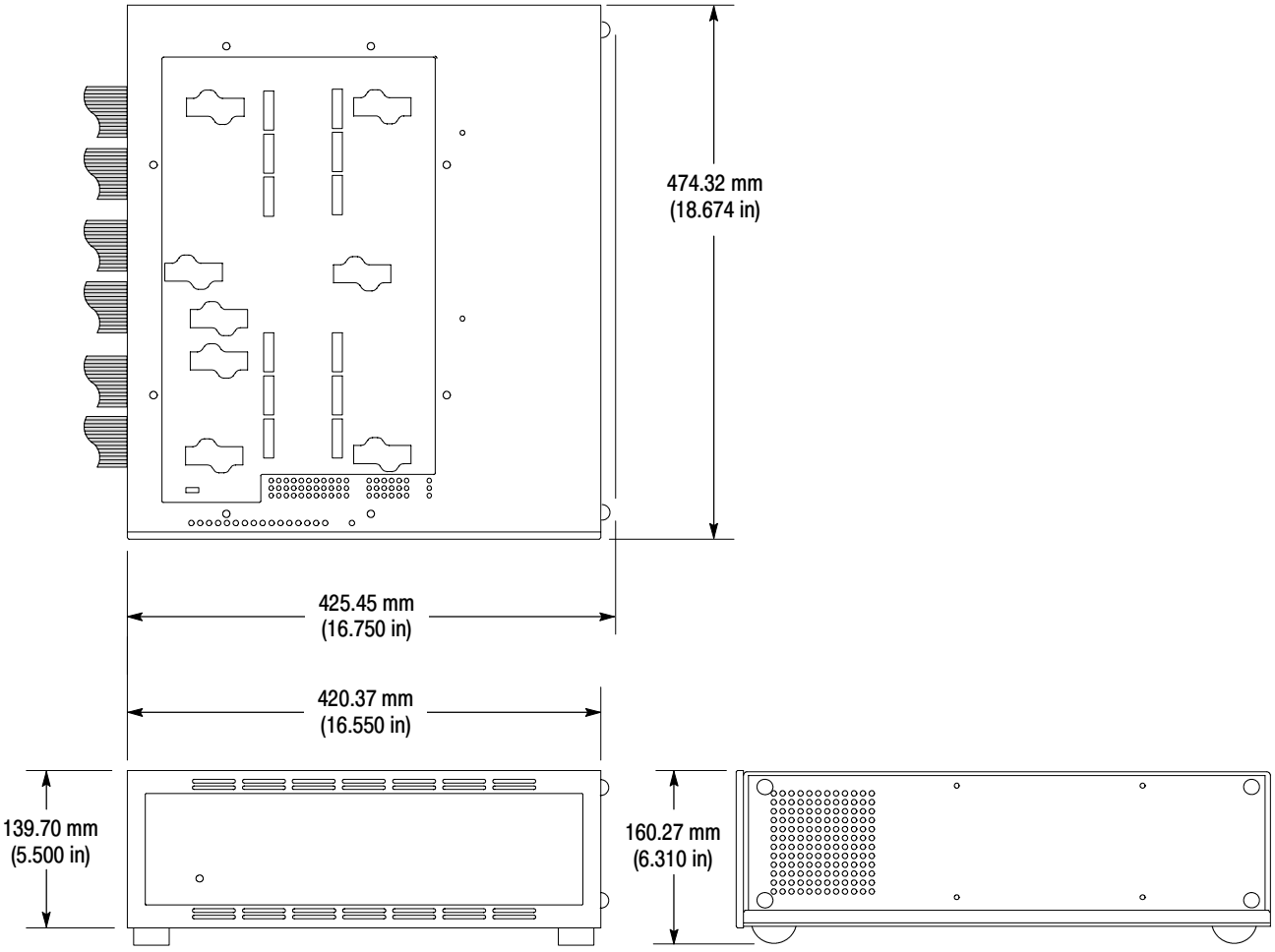


Figure 2–7: Dimensions of the preprocessor unit

Reference

Reference Tables

The TMSSM3 software disk contains the following reference tables. Viewing a table is not a requirement when preparing the module for use. You can view the reference tables without connecting the TLA to your target system. These tables are provided to assist you when you are debugging a target system.

- **Channel and Group Definition Tables** — The TMSSM3 software automatically defines channel groups. These groups define the channel assignments and the groups for a software support setup. If you want to know what the group definition is for a channel group or which signal is in which channel group, refer to these tables.
- **Symbol Tables** — Symbol files are files of alphanumeric symbol names and associated data values. Symbol files are used to map a channel group value to a text string and/or color. For example, a symbol file could map an address group value to a function name. This is faster and easier to interpret than a numeric value.

NOTE*. The Color symbol table is not associated with any channel groups.*

Viewing Reference Tables

You must load your support and merge the modules before completing the following steps.

To view a symbol table, follow these steps:

1. In the System window under System, select Symbol to display the Symbol window.
2. Select Load to display the Load Symbol File window.
3. Select and right click one of the .tsf files to display the Select menu.
4. Select Open and select the appropriate editor, (Word Pad for example) to view the symbol table.

To Extract Groups

To extract a channel group or a group definition table, follow these steps:

1. Open a System window.
2. Select the Setup icon.
3. In the Setup window, open the Window menu and select Setup: <support file name>.
4. In the Setup window under Group Name, select a group.
5. Open File, select Export Channel Setup to display a Channel Setup Export window. Notice the Export Path name to locate your exported file later.

   In the Channel Setup Export window under Export Selections, check that the Export Channel Information and the Export Group Information boxes are checked.

   The Field delimiter box controls how the tables are displayed. See the Tektronix logic analyzer online help for more information.
6. Select Export.

Replaceable Parts List

Replaceable Parts List

This section contains a list of the replaceable components or modules for the TMSSM3 Hardware Support package.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Module Servicing

Modules can be serviced by selecting one of the following three options. Contact your local Tektronix service center or representative for repair assistance.

Module Exchange. In some cases you may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, call 1-800-833-9200. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix Web site for a list of offices: www.tektronix.com.

Module Repair and Return. You may ship your module to us for repair, after which we will return it to you.

New Modules. You may purchase replacement modules in the same way as other replacement parts.

Using the Replaceable Parts List

This section contains a list of the mechanical and/or electrical components that are replaceable for the TMSSM3 Hardware Support package. Use this list to identify and order replacement parts. The following table describes each column in the parts list.

Parts list column descriptions

Column	Column name	Description
1	Figure & index number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
7	Mfr. code	This indicates the code of the actual manufacturer of the part.
8	Mfr. part number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1–1972.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
060D9	TENSOLITE COMPANY	PRECISION HARNESS AND ASSEMBLY,3000 COLUMBIA HOUSE BLVD,#120	VANCOUVER, WA 98661
0B445	ELECTRI-CORD MFG CO INC	312 EAST MAIN STREET	WESTFIELD, PA 16950
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214-4657
S3109	FELLER U.S. CORPORATION	10B VAN DYKE AVENUE	NEW BRUNSWICK, NJ 08901
TK1373	PATELEC-CEM	10156 TORINO,VAICENTALLO,62/456	ITALY
TK2548	XEROX CORPORATION	7431 EVERGREEN PARKWAY	HILLSBORO, OR 97124
TK6121	TUMBLER CORP	4241 BUSINESS CENTER DR	FREMONT, CA 94538

Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
4-1-1	672-1613-50			1	CIRCUIT BOARD, W/PGA SOCKET AND CABLES;TMSSM3	80009	672-1613-50
-2	211-1187-00			12	SCREW; M3.5 X 8MM,FLT,PHL,STL 18-8;.3C8MXFS	0KB01	.3C8MXFS
					STANDARD ACCESSORIES		
	071-1387-XX			1	MANUAL,TECH; INSTRUCTION, HARDWARE;TMSSC2,DP	TK2548	071-1387-XX
	161-0104-00			1	CA ASSY,PWR:3,18 AWG,98 L,250V/10AMP,98 INCH,RTANG,IEC320,RCPT X STR,NEMA 15-5P,W/CORD GRIP	TK6121	ORDER BY DESCRIPTION
	012-1661-50			7	CA ASSY; INTCON,SHLD RIBBON,MCP,72 L	060D9	012-1661-50
	016-1947-00				CASE,STORAGE; PLASTIC,W/FOAM,12 1/4 X 8 13/16 X 3 7/8;MONTE	---	016-1947-00
	065-0701-00				SHIPPING KIT;TMSSM3	---	065-0701-00
					OPTIONAL ACCESSORIES		
-3	020-2550-00			1	ACCESSORY KIT,BLUE;RETENTION BRACKET #4	80009	020-2550-00
-4	020-2551-00			1	ACCESSORY KIT,RED;RETENTION BRACKET #5	80009	020-2551-00
-5	020-2558-00			1	ACCESSORY KIT,GREEN;RETENTION BRACKET #1	80009	020-2558-00
	----------*			4-5	P6860 PROBE	80009	ORDER BY DESCRIPTION
	161-0104-05			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,RTANG,IEC320,RCPT,AUSTRALIA,SAFTEY CONTROLLED	TK1373	ORDER BY DESCRIPTION
	161-0104-06			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,RTANG,IEC320,RCPT,EUROPEAN,SAFTEY CONTROLLED	TK1373	ORDER BY DESCRIPTION
	161-0104-07			1	CA ASSY,PWR:3,1.0MM SQ,240V/10A,2.5 METER,RTANG,IEC320,RCPT X 13A,FUSED,UK PLUG,(13A FUSE),UK PLUG,(13A FUSE),UNITED KINGDOM,SAFTEY CONTROL	TK2541	ORDER BY DESCRIPTION
	161-0167-00			1	CA ASSY,PWR:3,0.75MM SQ,250V/10A,2.5 METER,RTANG,IEC320,RCPT,SWISS,NO CORD GRIP,SAFTEY CONTR	S3109	ORDER BY DESCRIPTION

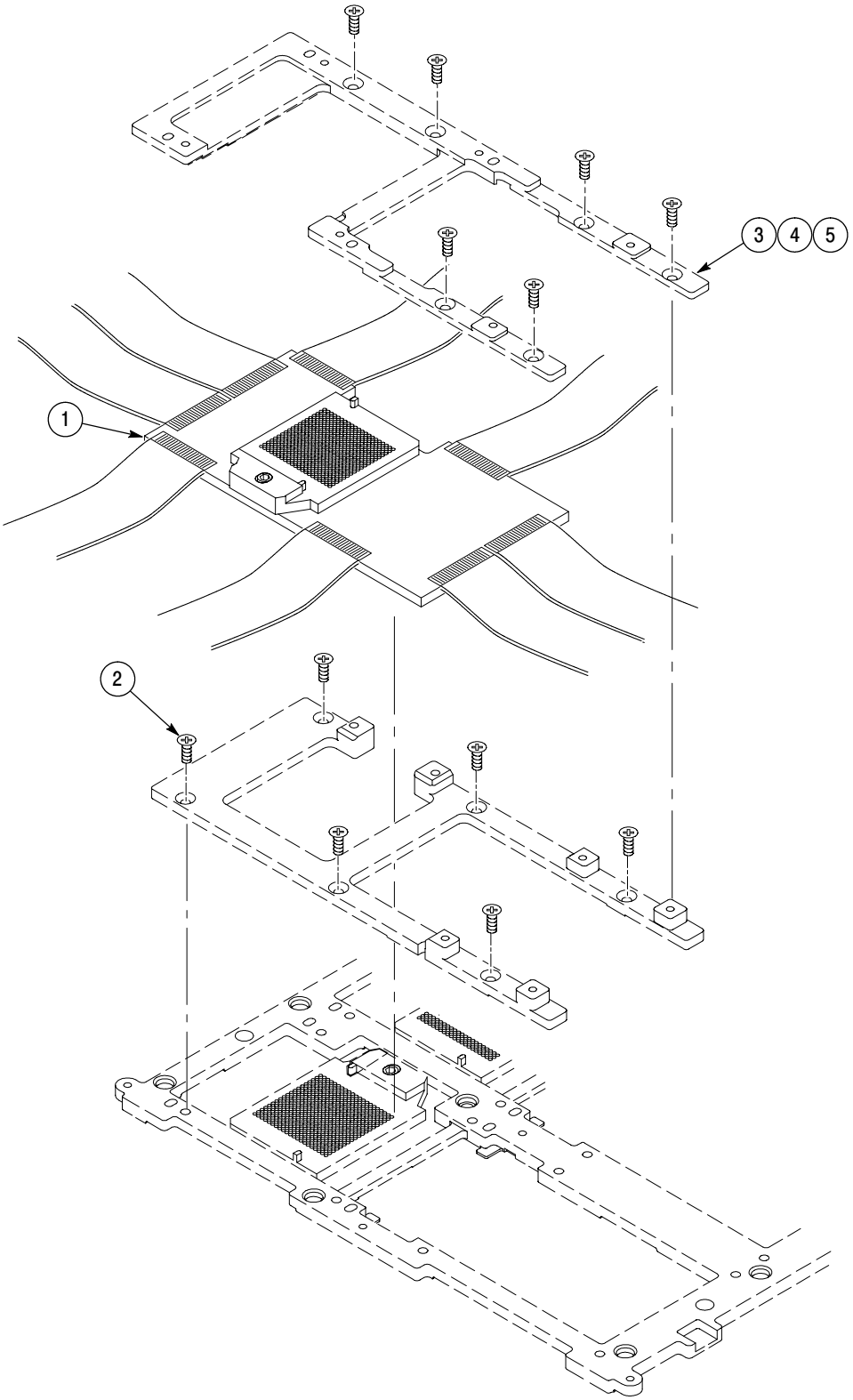


Figure 4-1: Probe adapter exploded view

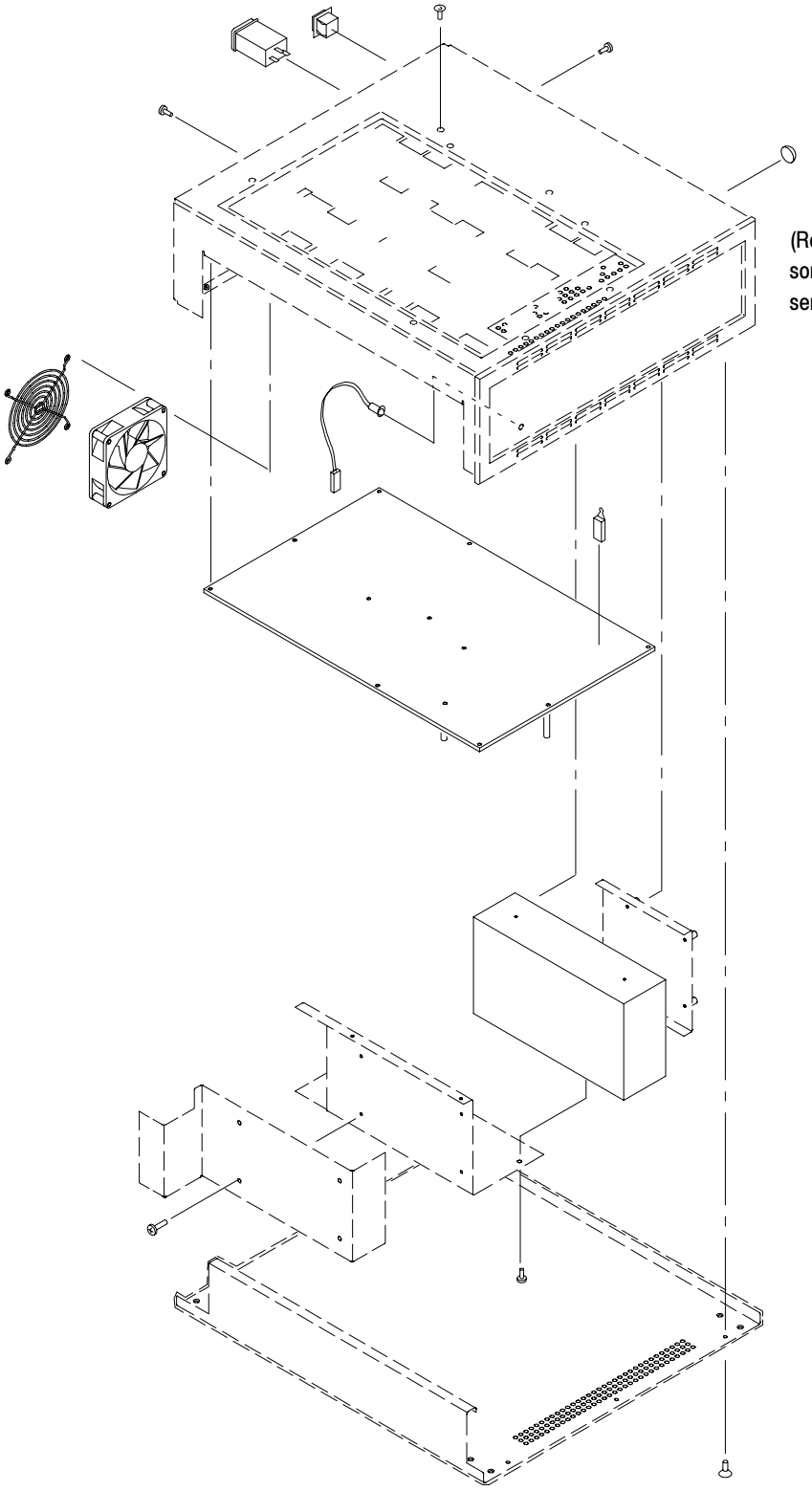


Figure 4–2: Preprocessor unit exploded view

Index

Index

A

About this manual set, ix
AC adapter, 2-5
Address, Tektronix, x
Address bus, 1-3
Airflow clearance, 2-6
Application, logic analyzer configuration, 1-1

B

BINIT OBS jumper, 1-4

C

Care and maintenance
  cleaning, 1-15
  external, 1-15
Cetifications and compliance, 2-6
Channel assignment tables, 3-1
Clock rate, 1-3
Connections
  LAI Cable, 1-2
  P6860, 1-2
Contacting Tektronix, x
Cooling requirements, 1-2

D

Data bus, 1-3
Default channel mapping
  LAI Cable labels, 1-2
  probe labels, 1-2
Definitions
  information on basic operations, ix
  Master module, ix
  Slave module, ix
Dimensions, probe adapter, 2-8
Disabling the cache, 1-3
Disassembler
  logic analyzer configuration, 1-1
  setup, 1-14

E

Electrical specifications, 2-1, 2-5
  AC adapter, 2-5
  BCKL timing, 2-5
  clock rate, 2-5
  power requirements, 2-5
  setup time, 2-5
  tested clock rate, 2-5
Environmental specifications, 2-6
  airflow clearance, 2-6
  altitude, 2-6
  electrostatic immunity, 2-6
  humidity, 2-6
  temperature, 2-6

F

Forced, air cooling, 1-2
Fuses, maintenance, 1-15

G

Group definitions, 3-1

I

Installing support software, 1-14

J

Jumpers, observed, 1-4

L

LAI Cable
  configuration, 1-11
  connections, 1-2
LAI Cable labels, default channel mapping, 1-2
Loading diagrams, 2-3
Logic analyzer
  configuration for disassembler, 1-1
  configuration for the application, 1-1
  connecting to the target system, 1-5
  software compatibility, 1-1

M

Maintenance, fuses, 1-15
Manual
  conventions, ix
  how to use the set, ix

Master module, definition, ix
Module connections, 1-2

O

Options, 1-2

P

P6860, 1-2
P6860 probe, configuration, 1-11
Phone number, Tektronix, x
Power, applying, 1-13
Probe adapter
  configuring, 1-4
  hardware description, 1-1
  jumper positions, 1-4
  software compatibility, 1-1
Probe labels, default channel mapping, 1-2
Product support, contact information, x

R

Reference tables
  symbol, channel group, group definition, 3-1
  viewing, 3-1
Removing hardware, from target system, 1-8, 1-16
Requirements, forced air cooling, 1-2
Reset, 1-3
Restrictions, 1-2
  address bus, 1-3
  clock rate, 1-3
  data bus, 1-3
  disabling the cache, 1-3

S

Service support, contact information, x
Setups
  disassembler, 1-14
  support, 1-14
Shipping, probe adapter, assembled, 1-19
Slave module, definition, ix
Software compatibility, 2-1
Specifications, 2-1
  electrical, 2-1, 2-5
  environmental, 2-6
  mechanical (dimensions), 2-8
Storage, long-term, 1-17
Support, setup, 1-14
Symbol tables, 3-1

T

Technical support, contact information, x
Tektronix, contacting, x
Terminology, ix
TLA7AX, probes, measurements, 1-2
TLA7AX module, measurements, 1-2

U

URL, Tektronix, x

W

Web site address, Tektronix, x

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP