Instruction Manual

Tektronix

TMSSC2
604-Pin Socket Hardware Support

071-1345-00

www.tektronix.com

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

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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 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 TMSSC2 604-Pin Socket support package 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 packages on the logic analyzer, you only need this instruction manual to set up and run the support package.

If you are not familiar with operating microprocessor support packages, 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 package.

Manual Conventions

This manual uses the following conventions:

- A pound sign (#) following a signal name indicates an active low signal.
- The phrase “information on basic operations” refers to basic information in the logic analyzer online help.
- The terms “Master” and “Slave” refer to modules that are located in numbered slots (see Figure 1–1 on page 1–2).
- The phrase “LAI cables” refers to the logic analyzer cables that connect the preprocessor unit to the logic analyzer modules.

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 the following information about the TMSSC2 604-Pin Socket support product:

- Configuring the probe adapter, see page 1–4
- Connecting the logic analyzer to the target system, see page 1–5
- Applying power to the probe adapter, see page 1–14
- Installing software, see page 1–15
- Caring for and maintaining the probe adapter, see page 1–16

Product Description

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

To accomplish this the probe adapter is connected to the target system, and then the microprocessor is connected to the probe adapter. Signals from the microprocessor based system flow through the probe adapter, the probe cables, and then to the logic analyzer.

This software acquires signals for viewing including timing signals. Included with the TMSSC2 604-Pin Socket probe adapter is the following software:

PUB32G10

PUB32G8N8

***NOTE**. The TMSSC2 probe adapter is compatible with the TMS117 and the TMS122 software support packages. These software support packages are available only to customers with a valid, restricted, secret nondisclosure agreement (RS-NDA) with Intel.*

Logic Analyzer Configuration

To use the probe adapter to acquire all signals except timing, you need a Tektronix logic analyzer equipped with a minimum of four, 136-channel, 235 MHz merged modules. To also acquire timing signals, you need five, 136-channel, 235 MHz merged modules.

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

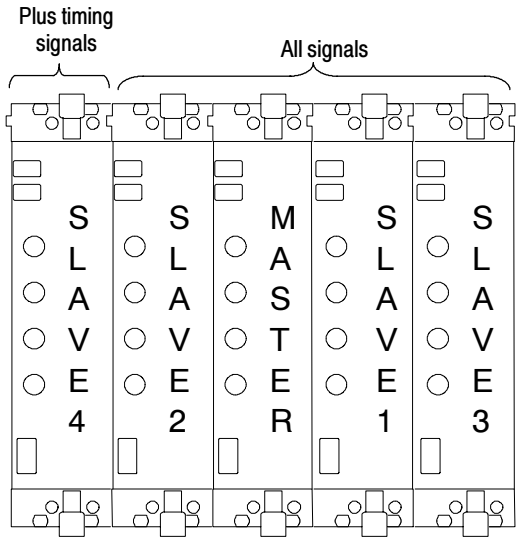


Figure 1-1: Master and Slave module configuration

The term *Master module* refers to the middle module of a 5-wide module merge. The term Slave module refers to the modules to the left or right of the master module of a 4 or 5-wide module merge. Figure 1–1 shows the configuration for a 4- or 5-wide module merge.

P6860 Probes

You can use the TLA7AXX, 235 MHz logic analyzer modules and P6860 probes to connect to the TMSSC2 probe adapter.

For more information on connecting the P6860 Probes to the preprocessor unit, see page 1–12.

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

LAI Cables

You can use the TLA7AXX, 235 MHz logic analyzer modules and logic analyzer interface (LAI) cables to connect to the TMSSC2 probe adapter. The LAI cables (012-1661-XX) are specifically designed for use with the TMSSC2 probe adapter.

For more information on connecting your LAI cables to the preprocessor unit, see page 1–12.

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.com web site. This information is also located in the logic analyzer online help.

Labeling LAI Cables

To apply labels to the LAI cables, see page 1–11.

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 the TMSSC2 instruction manual, each logic analyzer includes additional information that describes how to perform tasks common to support products 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 TMSSC2 support product can acquire data from the microprocessor operating at speeds of up to 200 MHz. The clock rate is not guaranteed for prototype shipment of the product.

Contact your 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 TMSSC2 probe adapter supports only a quad-pumped data bus.

Address Bus

The TMSSC2 probe adapter supports only a double-pumped 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.

Configure the Preprocessor Unit

You must configure the preprocessor unit for your software product before using the probe adapter.

Software Support Selection. To select your software support, use Table 1–1 to position the jumper on the preprocessor unit. Figure 1–2 shows the location of the software support selector.

Table 1-1: Software selection

Software support	Pin
PUB32G8N8 or TMS117	1-2
PUB32G10 or TMS122	2-3

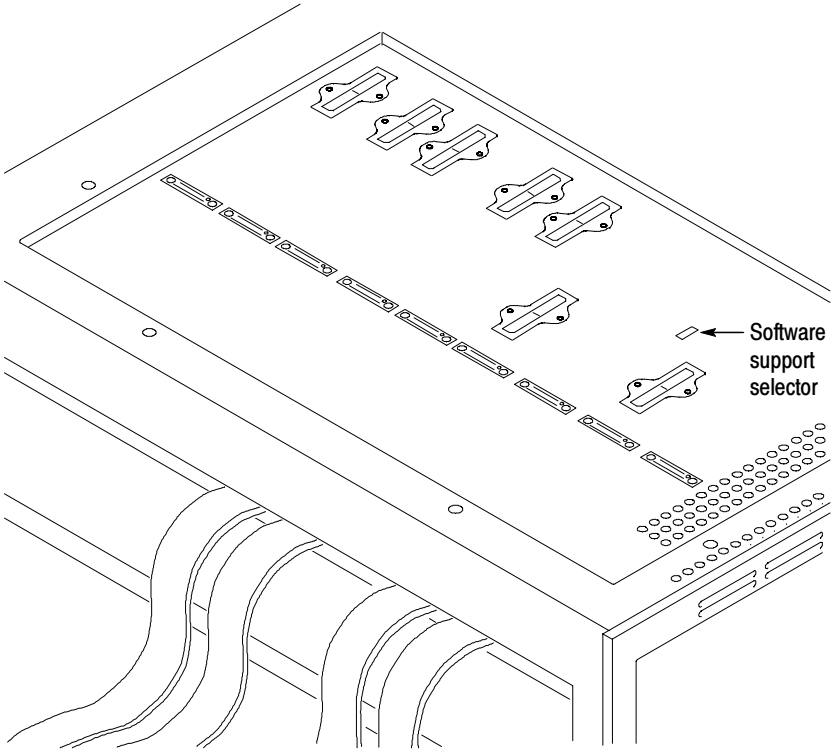


Figure 1-2: Selecting your software on the preprocessor unit

Connecting the Logic Analyzer to a Target System

Read the following instructions before removing or installing parts.

WARNING. *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.*

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.

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

Tools

Following is a list of required tools, unless stated otherwise:

- Use a flatbladed screwdriver (0.1 inch tip width) to tighten the probe head to the target system.
- When removing the microprocessor from the probe head, use the provided extraction tool to protect the probe head and microprocessor from damage.
- **Optional Tool.** A torque wrench helps to ensure reliable connections by meeting the nominal torque values that may be listed in these instructions. When attaching screws to the probe head use 4 in-lbs (0.451 Newton meters) of torque, unless stated otherwise.

CAUTION. *To prevent damage to the product when storing and shipping, retain the black case for the probe head, the cardboard cartons, and packing material shipped with the probe adapter.*

Connect the Logic Analyzer

Use the following steps to connect the logic analyzer to the target system:

1. Power off the target system. It is not necessary to power off the logic analyzer.
2. Power off any probe adapters (preprocessor units) that may be attached to your target system.
3. To discharge any static electricity, touch the ground connector located on the logic analyzer.

4. Follow the steps in Figures 1–3 through 1–6 to install the probe head on the target system.

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 target system. Also, reinstall the pin protector to the bottom of the probe head when the probe head is not in use.*

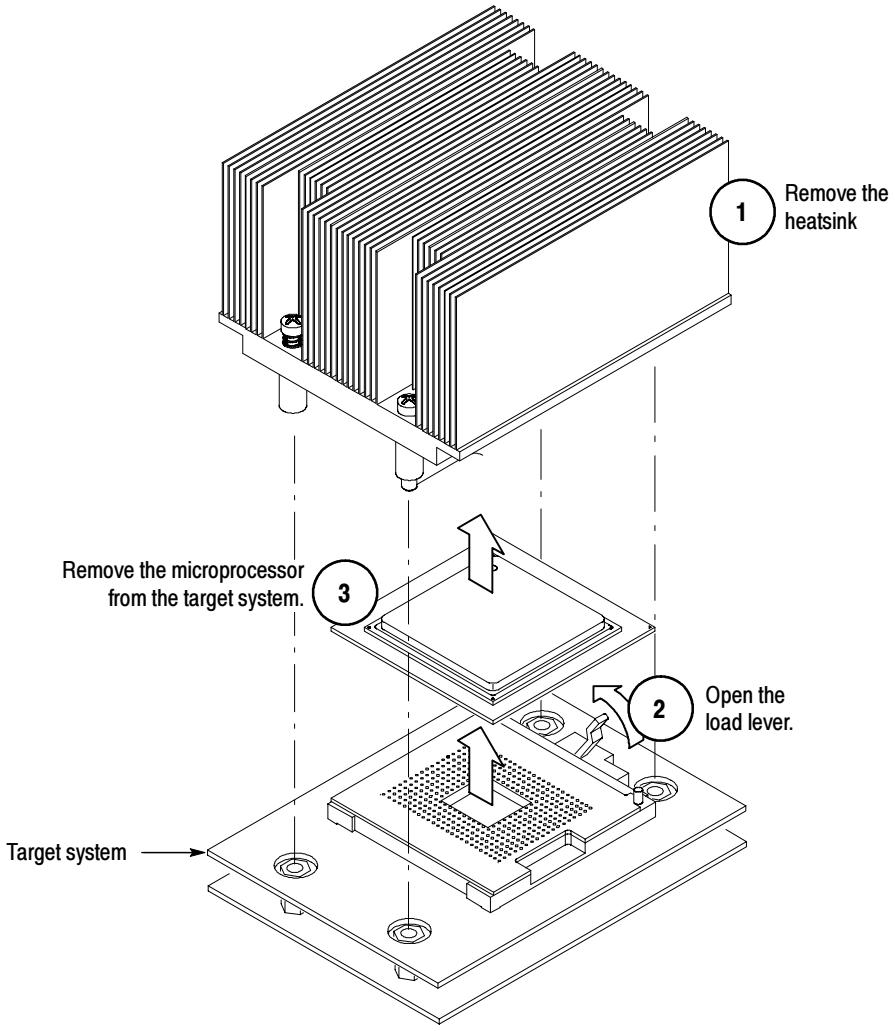


Figure 1-3: Removing microprocessor probe head from the target system

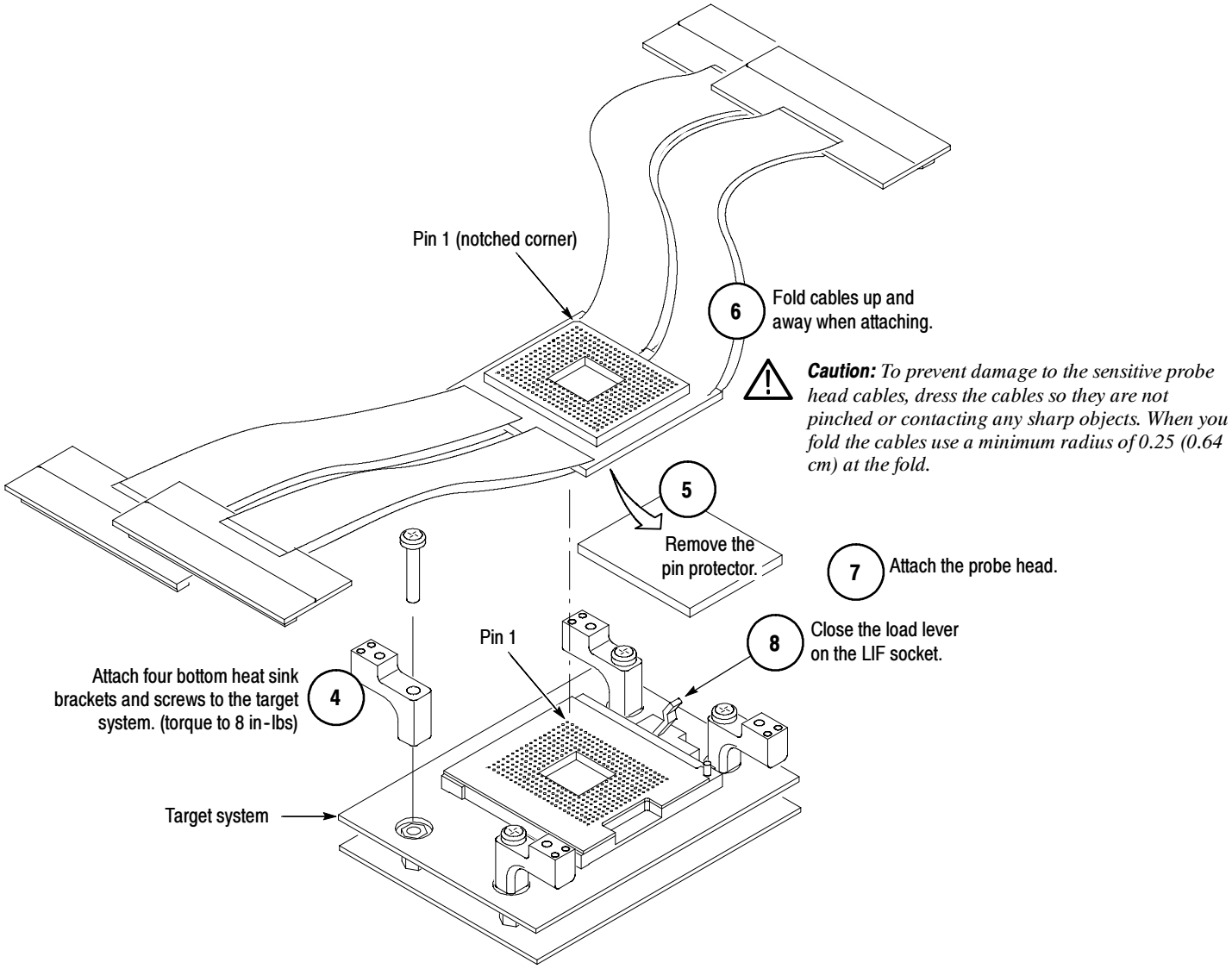
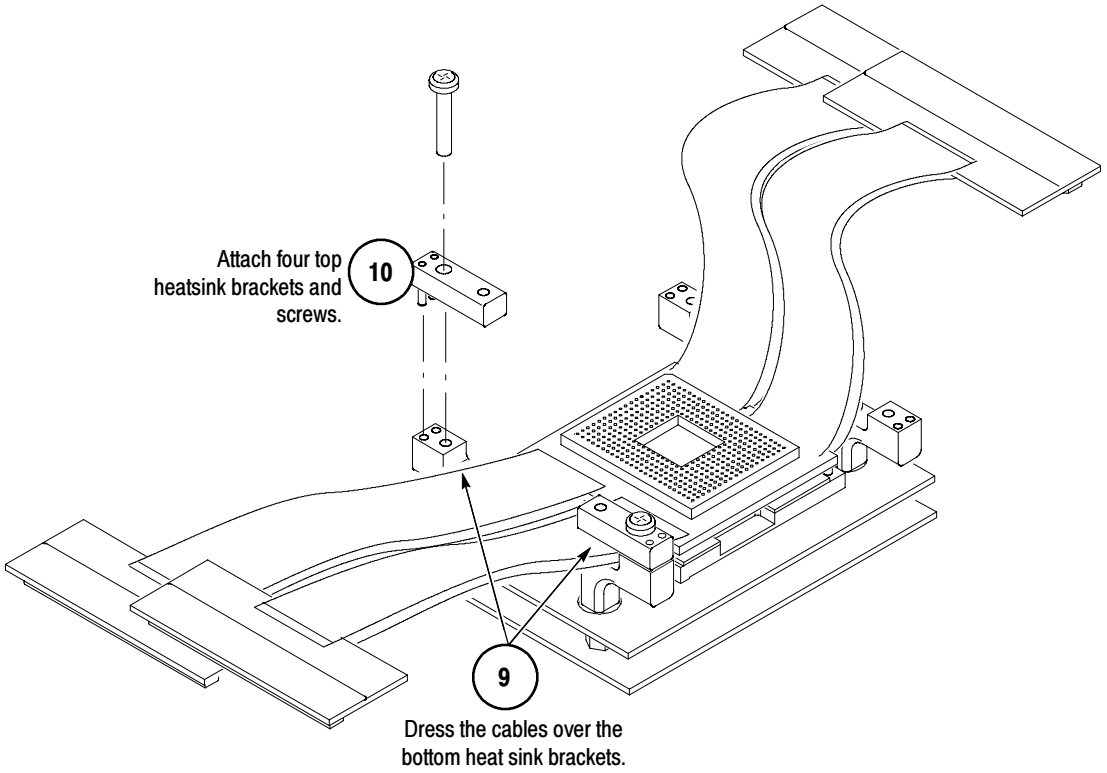


Figure 1-4: Attach the probe head to the target system



Caution: *To prevent damage to the pins on the microprocessor due to the high installation force required, check that the pins are aligned before installing the microprocessor.*

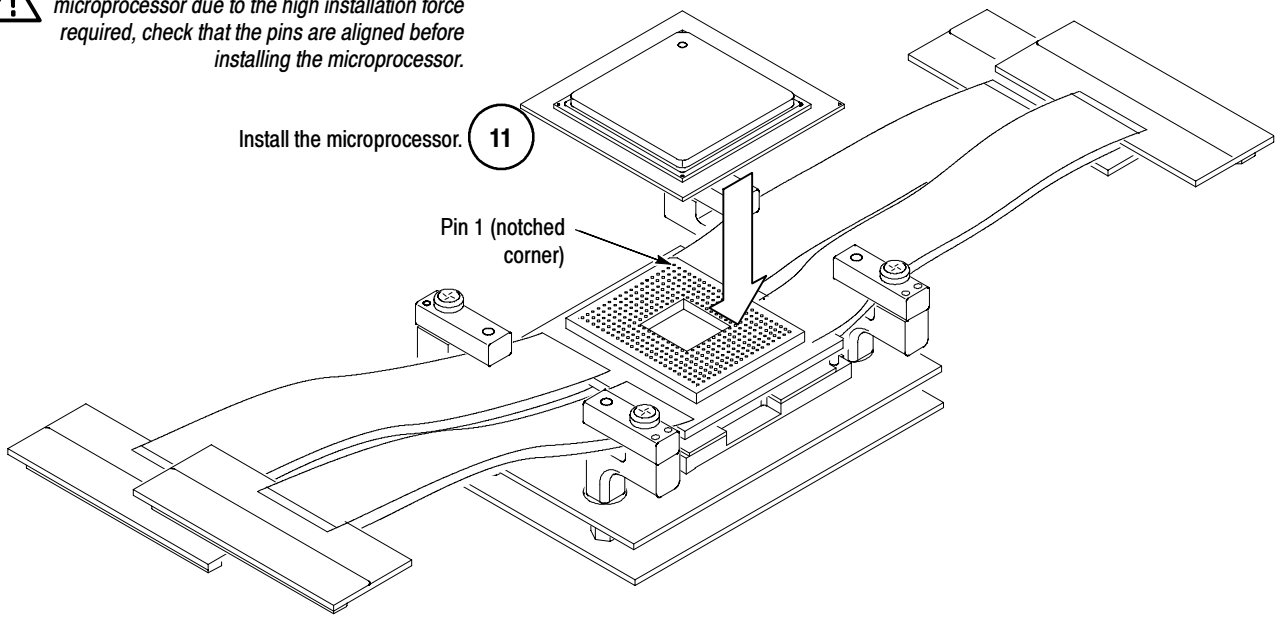


Figure 1- 5: Attaching the heat sink brackets and microprocessor to the target system

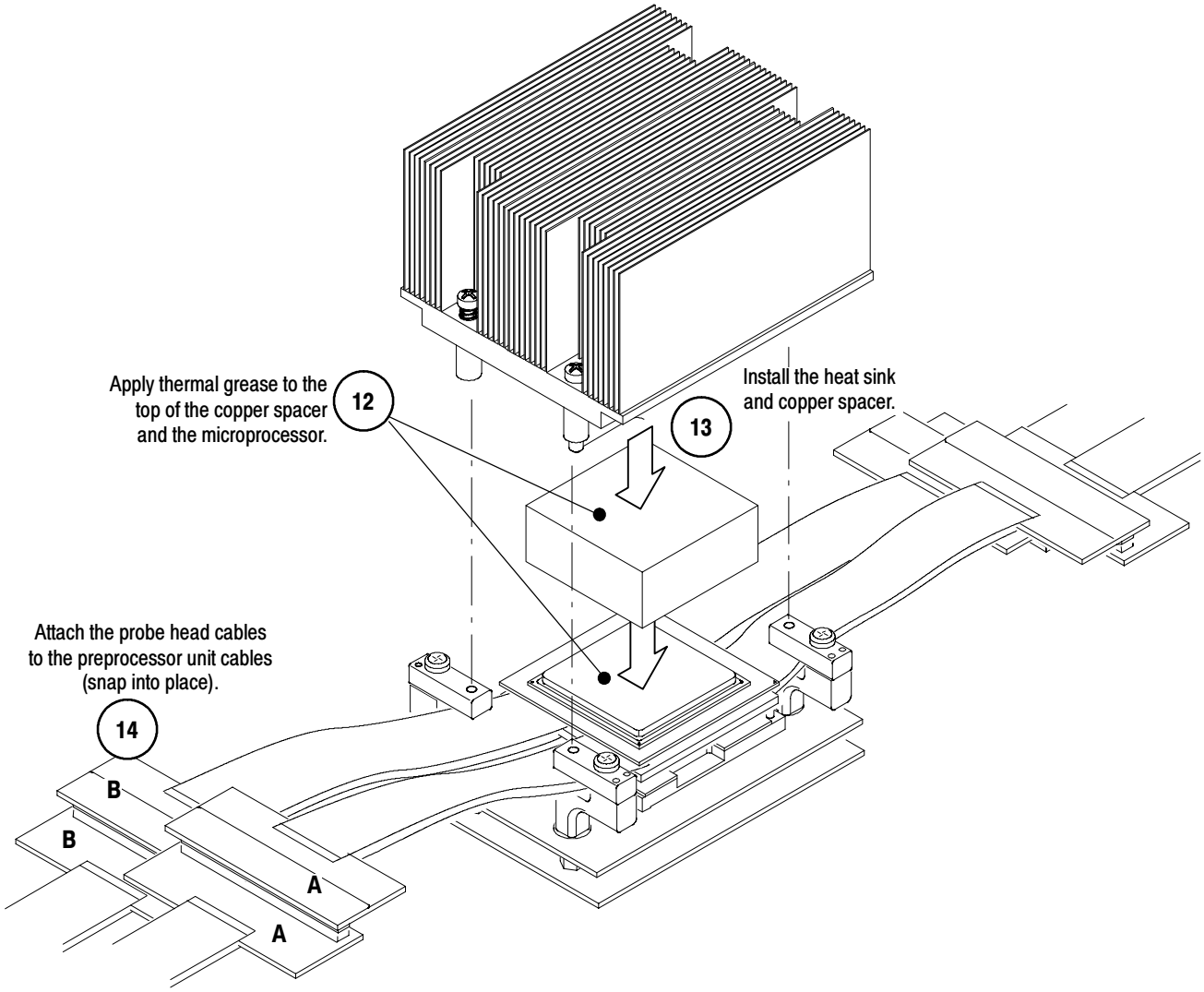


Figure 1- 6: Attaching the heat sink to the target system

Removing the Microprocessor

Follow the steps in Figure 1–7 to attach the extractor tool and remove the microprocessor from the probe head.

CAUTION. *To prevent damage to the probe head or microprocessor pins, use the provided extraction tool to remove the microprocessor from the probe head socket.*

The extractor tool must be attached as shown in Figure 1–7. Do not attach the extractor tool on the cable ends of the probe head.

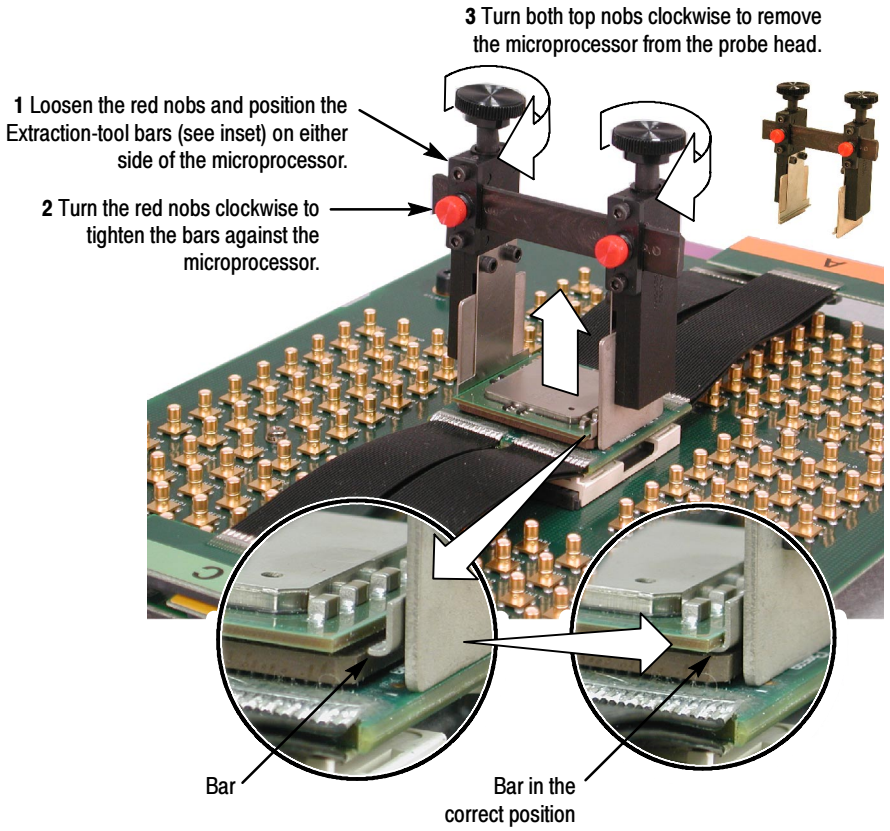


Figure 1-7: Remove the microprocessor with the extraction tool

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 1–3 through 1–6 to remove the probe head.
3. Store the probe head in the original packing material (see page 1–17).

Applying LAI Labels

You need to attach labels to the module end of the LAI cables and the preprocessor-unit 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 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 LAI cables, they become very 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 1–8 while attaching the labels.

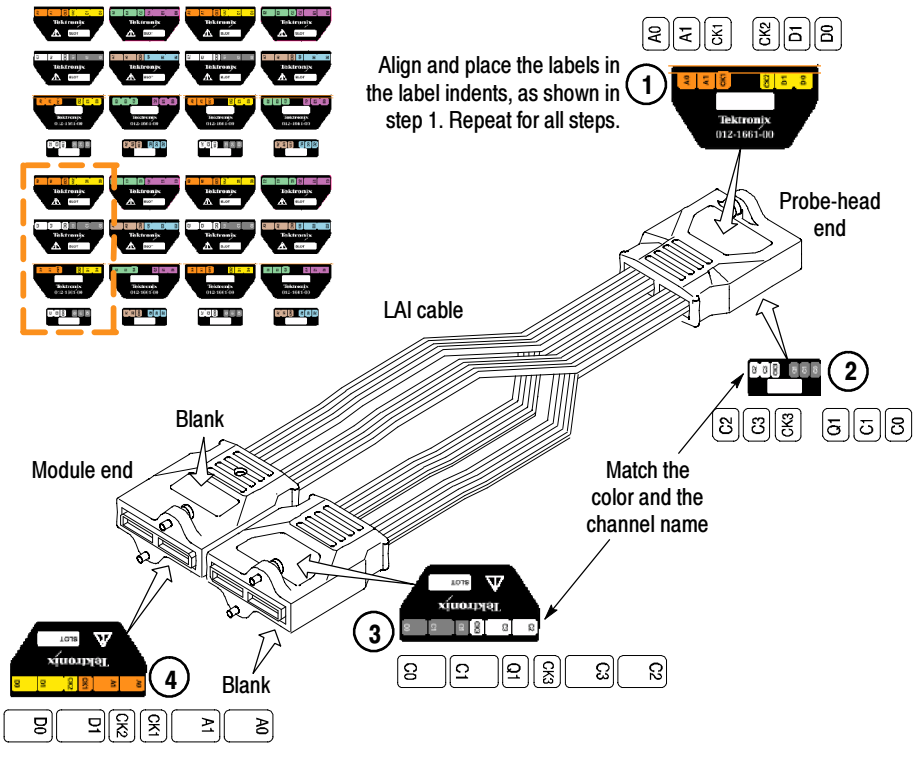


Figure 1-8: Apply LAI labels

Connect the Probes and LAI Cables

To configure the P6860 probes and LAI cables for the disassembly and timing support functions, you must determine if you are using a four or a five module configuration (see Table 1–2 on page 1–13). Then, follow the steps on page 1–14. Figure 1–9 shows a P6860 probe, an LAI Cable, and a preprocessor unit.

If you need to apply labels to the LAI cables, see page 1–11.

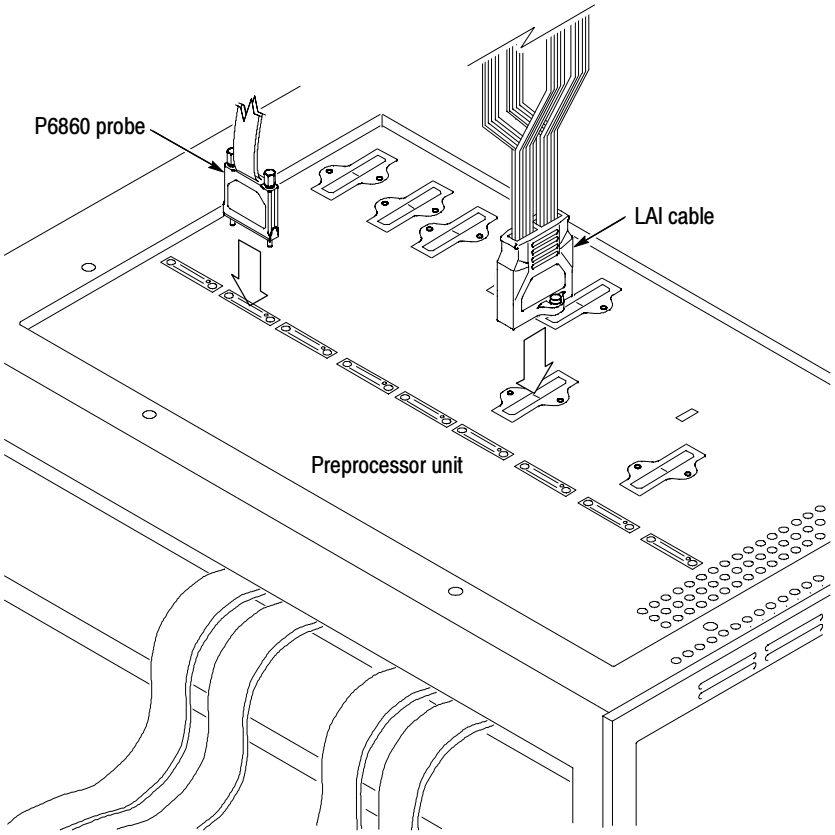


Figure 1- 9: LAI cable, P6860 probe, and preprocessor unit

Table 1–2 lists the P6860 probe and LAI Cable configurations for a 4- or 5-module configuration.

Table 1-2: P6860 probe and LAI cable configurations

Software support	Modules	LAI cables	P6860 probes	Probe acquires
TMS122 TMS117	4	7 (M,S1,S2,S3)	1 (S3)	All signals for disassembly, except timing signals
PUB32G10 PUB32G8N8	5	7 (M,S1,S2,S3)	1 (S3) 4 (S4)	Timing and State signals only, disassembly is not available
TMS117_5W TMS122_5W	5	7 (M,S1,S2,S3)	1 (S3) 4 (S4)	All signals for disassembly, plus timing signals

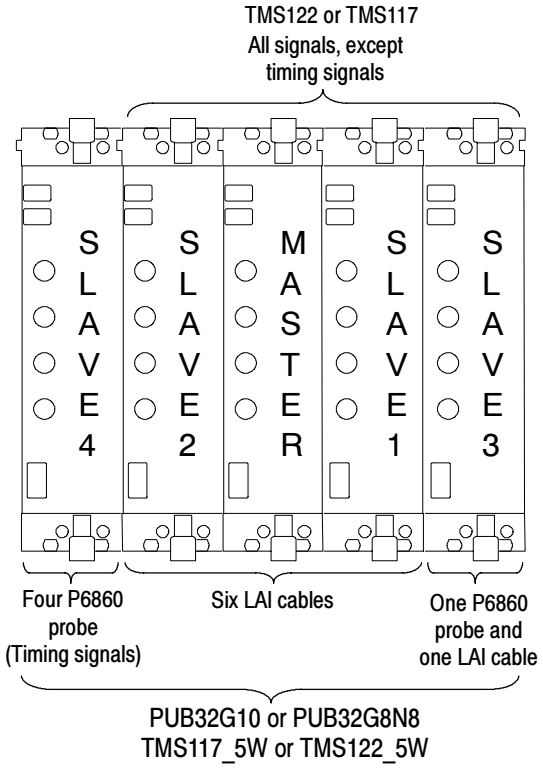


Figure 1-10: LAI cable, P6860 probe, and module configurations

LAI Cable and P6860 Probe Connections (Four Modules)

1. Match and connect the A, D, C, and E LAI cables from the 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 on the preprocessor unit. The LAI cable connector is keyed for correct alignment to the preprocessor unit.
2. Repeat step 1 to match and connect an LAI cable between Slave1 and Slave2 modules and the connectors on the preprocessor unit.

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

3. Repeat step 1 to match and connect the additional P6860 probe and LAI cable connections between the Slave3 module and the connectors on the preprocessor unit.

Fifth Module

4. Match and connect the A, D, C, and E P6860 probes from the Slave4 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 on the preprocessor unit. The P6860 probe connector is keyed for correct alignment to the preprocessor unit.

NOTE*. For more information about how to attach a P6860 probe to the preprocessor unit, refer to the P6860 probe information on page 1–2.*

Applying and Removing Power

To apply power to the probe adapter and target system, 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 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.

Logic Analyzer Software Compatibility

The disk label on the software support disk states that version 4.3 SP1+ of the logic analyzer software is compatible with the PUB32G8N8 and the PUB32G10 software.

Installing the Software

Now you are ready to install the software. If you have not used a support product, you may want to refer to information on general tasks and functions in the Tektronix logic analyzer online help or the user manual.

***NOTE**. Before you install any software, it is recommended you verify that the microprocessor support software is compatible with the logic analyzer software.*

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 other 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

All fuses located in the preprocessor unit 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.

CAUTION. *To prevent damage to the probe head or microprocessor, use the provided extraction tool and follow the procedure from the extraction tool vender to remove the microprocessor from the probe head.*

2. Reverse the steps in Figures 1–3 through 1–6 to remove the probe head.

CAUTION. *To prevent damage to the sensitive probe head cables, you must dress the cables so 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 the black case it was shipped in.

Figure 1- 11: Nonspecific probe head and case

Long-Term Storage

For long-term storage, use the existing cardboard carton and packaging, and follow steps 1 through 7:

5. Disconnect the preprocessor unit from the logic analyzer by removing the probes and LAI cables from the top of the preprocessor unit.
6. Place the preprocessor unit inside the static shielding bag and follow Figures 1–12 through 1–14.

Figure 1-12: Place preprocessor unit in the cardboard carton

Figure 1-13: Place cables in the cutouts

Figure 1- 14: Place accessories in the accessory tray

7. Close and tape the cardboard carton.

To ship the probe adapter, refer to page 1–19.

Shipping the Probe Adapter

To commercially transport the TMSSC2 probe adapter, package as follows:

1. Use the existing cardboard shipping carton and cushioning material. Follow the steps on page 1–17 to package the probe head and preprocessor unit.

   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

Specifications

This section contains specifications for the TMSSC2 hardware support.

Circuit Description

The probe adapter hardware uses a custom ASIC to preprocess all signals on the microprocessor 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

Latched Operation

The ASIC latches all signals on the microprocessor. The latched signals are processed in the ASIC according to their type. Following is a description of each type:

4x Quad-Pumped Signals. These signals include D[63:00]#, DEP[7:0]#, 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 ASIC 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 ASIC latches these signals using the rising edge of BCLK.

Derived Signals

The TMSSC2 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 these 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]#, IDS#, OOD#, and SNOOP_D.

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

Signal Probing

The TMSSC2 probe adapter uses passive series isolation to acquire data.

Bus Tracking Logic

The TMSSC2 probe adapter uses a bus tracking PAL to aid the disassembly software in linking various bus phases.

Common Clock

The IA32G8N8 and IA32G10 software allows disassembly from a data bus operating at the common clock rate specified in Table 2–1. The setup and hold sample points are set to default timing numbers based on FSB specifications.

Loading Diagrams

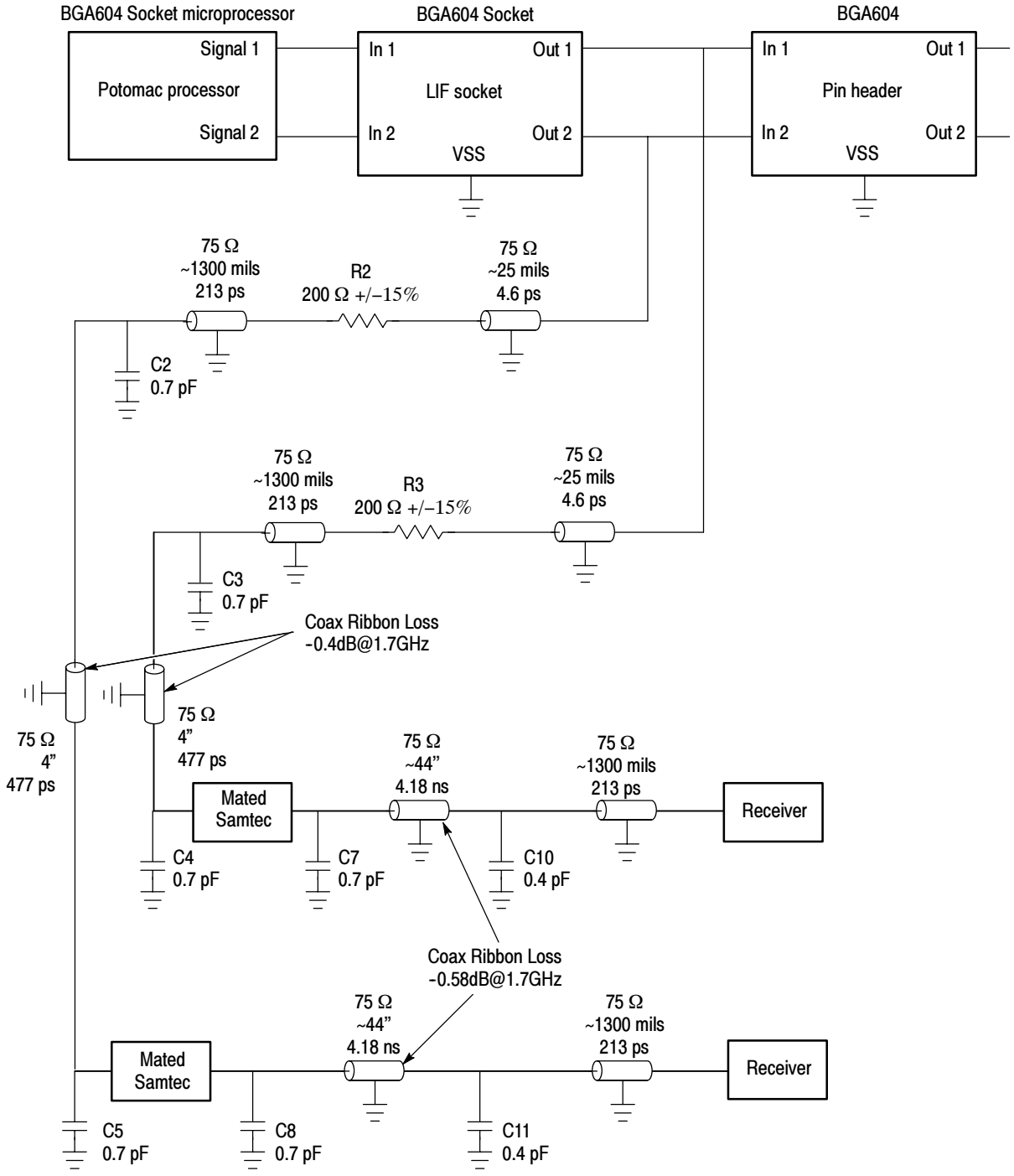


Figure 2-1: Probe adapter preliminary load model for typical signals

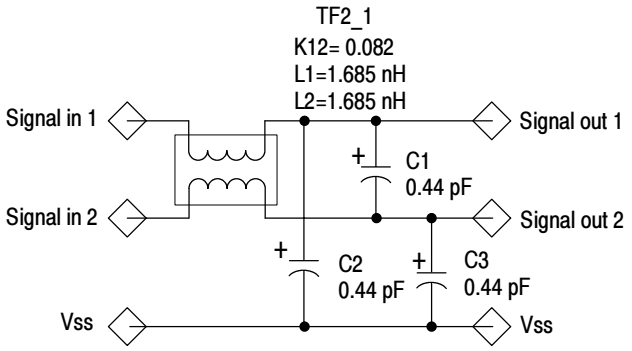


Figure 2-2: Pin header electrical load model for typical signals

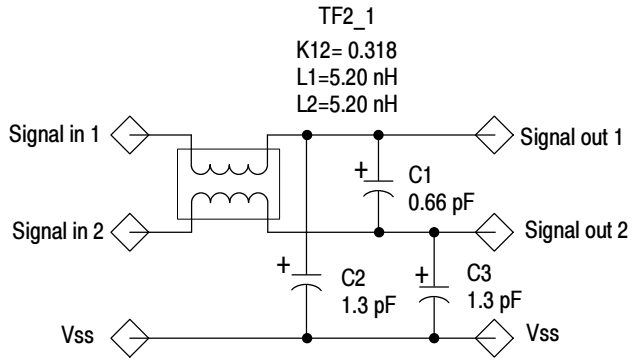


Figure 2-3: Socket electrical load model for typical signals

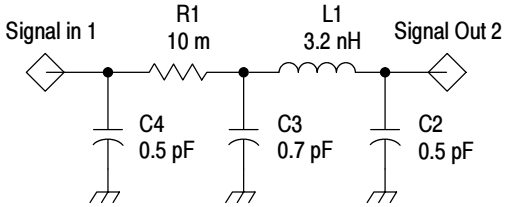


Figure 2-4: Mated Samtec model

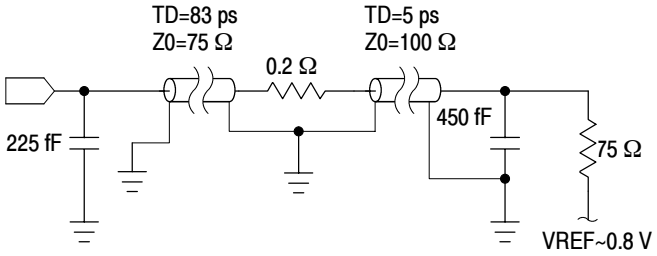


Figure 2-5: Receiver Model

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.

NOTE. *The functionality and specifications are not guaranteed for the prototype product.*

Table 2–1 lists the electrical requirements of the target system. Table 2–2 on page 2–6 lists the electrical requirements for the power supply that provides power to the probe adapter. Table 2–3 on page 2–6 lists the BCLK timing and electrical specifications. Table 2–4 on page 2–6 lists the environmental specifications.

Table 2–1: Electrical specifications for the target system

Characteristics	Requirements
Typical - V_{cc} = 1.2 V, V_{REF} = 0.8 V, at 25 °C	
DC power requirements	
Voltage, V_{cc}	1.2 V ± 5% (Typ)
Current, V_{REF}	I maximum <0.8 mA, I typical <1 mA at 25 °C
Common clock rate	Maximum 200 MHz (Typ)
Common clock capture	
Typical - V_{cc} = 1.2 V, V_{REF} = 0.8 V, V_{IH} = V_{REF}, +400 mV, V_{IL} = V_{REF} -400 mV, at 25 °C	
Window	750 ps (Typ)
T_{su}	1 ns (Typ)
T_{hd}	-250 ps (Typ)
2x Source-Synchronous capture	
Window	500 ps (Typ)
T_{su}	250 ps (Typ)
T_{hd}	250 ps (Typ)
4x Source-Synchronous capture (DBI disabled)	
Window	350 ps (Typ)
T_{su}	175 ps (Typ)
T_{hd}	175 ps (Typ)

Table 2-2: Electrical specifications for the AC input to the preprocessor unit

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

Table 2-3: BCLK timing and electrical specifications at 25 °C

Characteristics	Minimum	Maximum	Units	Notes
V_{in} (lo) min	-	V_{REF} -125 mV	V	
V_{in} (hi) max	V_{REF} +125 mV	-	V	
Duty Cycle	45	55	%	
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 °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
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

Category	Standards or description	
EC Declaration of Conformity - Low Voltage	Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities: Essential requirements of the Low Voltage Directive 73/23/EEC, amended by 93/68/EEC	
U.S. Nationally Recognized Testing Laboratory Listing	UL61010B:2003	Standard for electrical measuring and test equipment.
Canadian Certification	CAN/CSA C22.2 No. 1010.1	Safety requirements for electrical equipment for measurement, control, and laboratory use.
Additional Compliance	IEC61010-1/A2:1995	Safety requirements for electrical equipment for measurement, control, and laboratory use
Installation (Overvoltage) Category Descriptions	Terminals on this product may have different installation (overvoltage) category designations. The installation categories are: CAT III CAT II CAT I	 Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location. Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected. Secondary (signal level) or battery operated circuits of electronic equipment.
Equipment Type	Test and measuring	
Safety Class	Class 1 (as defined in IEC 61010-1, Annex H) - grounded product	
Overvoltage Category	Mains input: Overvoltage Category II (as defined in IEC 61010-1, Annex J) All other inputs and outputs: 5 V maximum	
Pollution Degree Descriptions	Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only.	

Dimensions Figure 2–6 shows the dimensions of the probe head.

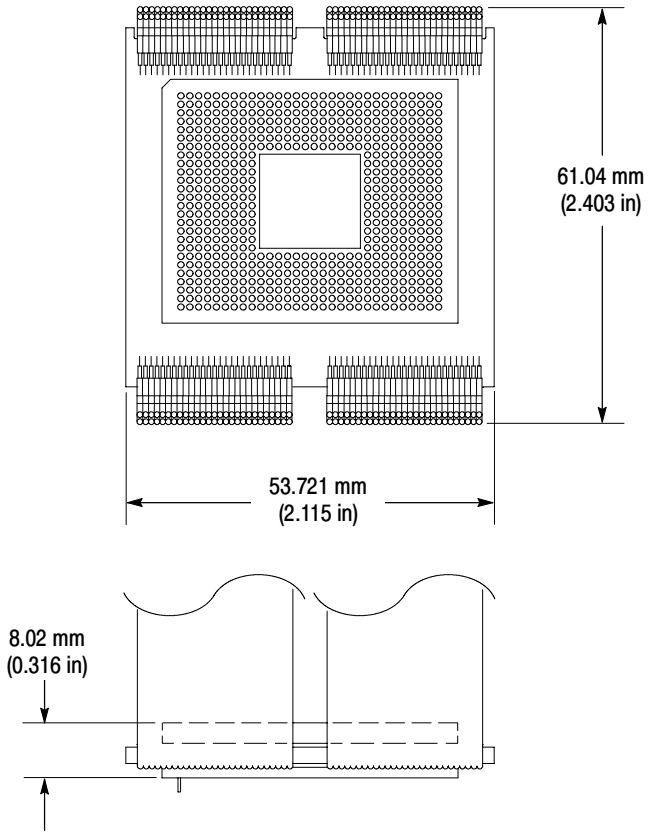


Figure 2–6: Dimensions of the probe head

Figure 2–7 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 2–4 on page 2–6 (clearances are not shown in Figure 2–7).*

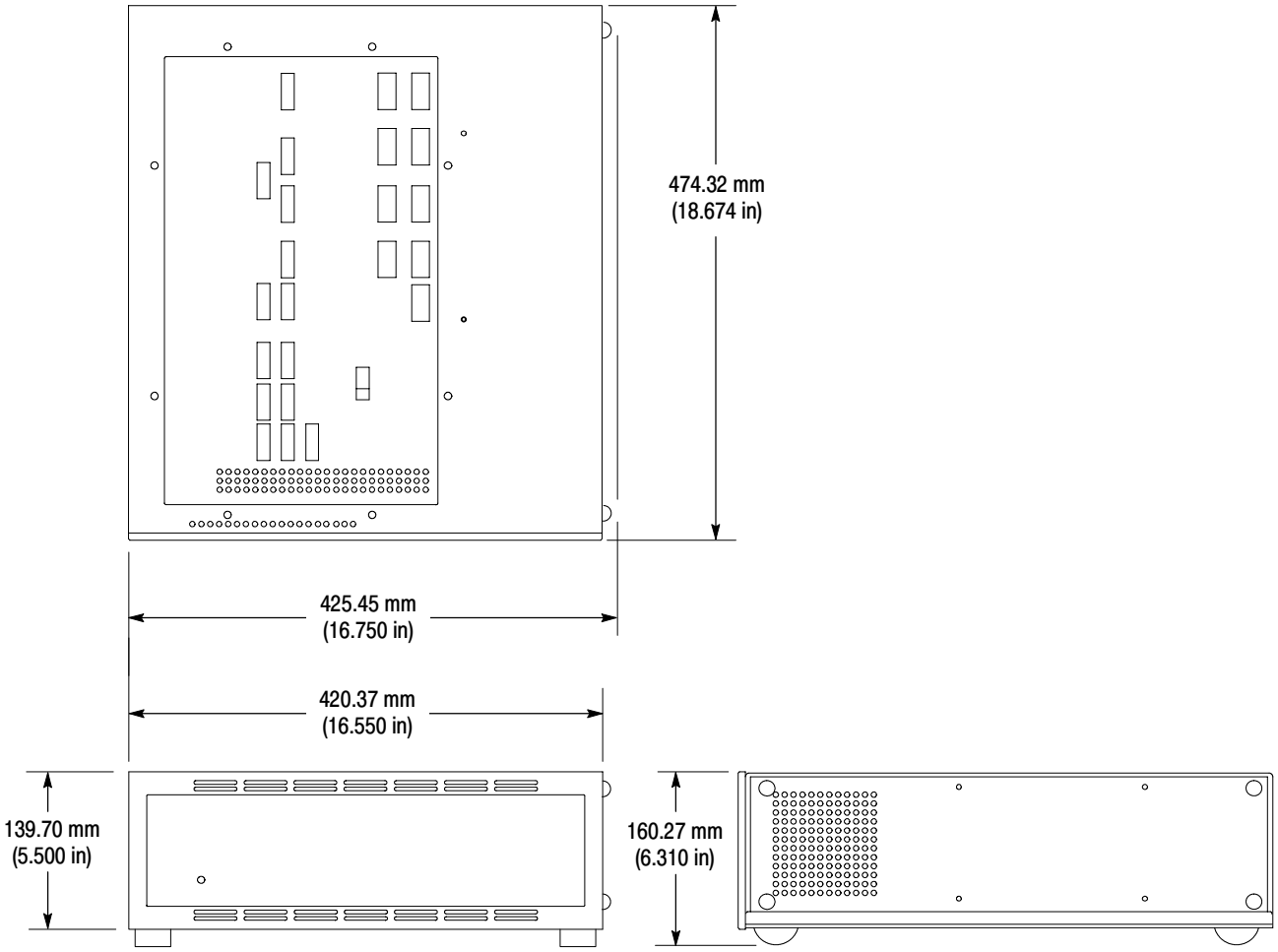


Figure 2–7: Dimensions of the preprocessor unit

Reference

Reference Tables

The TMSSC2 product software provides reference files of the symbol and channel group tables. Viewing the tables is not a requirement when preparing the module for use. You can view the reference tables without connecting the Tektronix logic analyzer to your target system.

Viewing Reference Tables

The following procedures provide information on how to view symbol and channel group tables.

To View a Symbol Table

After you load your support product, you can view the symbol tables on your PC. The path is C:\Program Files\TLA 700\Supports\ <support files>. Use WordPad, for example, to open a .tsf symbol file.

Symbol tables are not available for the PUB32G8N8 and PUB32G10 software products.

Follow these steps to view symbol tables while using the logic analyzer:

***NOTE**. You must load the support software, merge the modules, and open a listing window before beginning the following steps.*

1. In the System menu, Select Symbols... and a Symbol window appears.
2. Select Load and a Load Symbol File window appears.
3. Select and right click one of the .tsf files and the Select menu appears.
4. Select Open With, for example WordPad, and a symbol text file appears.

To Extract Channel Assignments and Groups

To extract channel groups, your Tektronix logic analyzer software must be version 4.3 Service Pack 1+ or later.

To extract the channel assignments, follow these steps:

1. Open the Window menu and select Setup: <support file name>.
2. Open the File menu, select Export Channel Setup, and a Channel Setup Export window appears.

In the Channel Setup Export window, notice the Export Path to locate your file later, and check that the Export Channel Information and the Export Group Information boxes are checked (see Figure 3–1).

Under Field Delimiter there are four choices that control how the tables are displayed, Tab is the default. Refer to the logic analyzer online help for more information about delimiters.

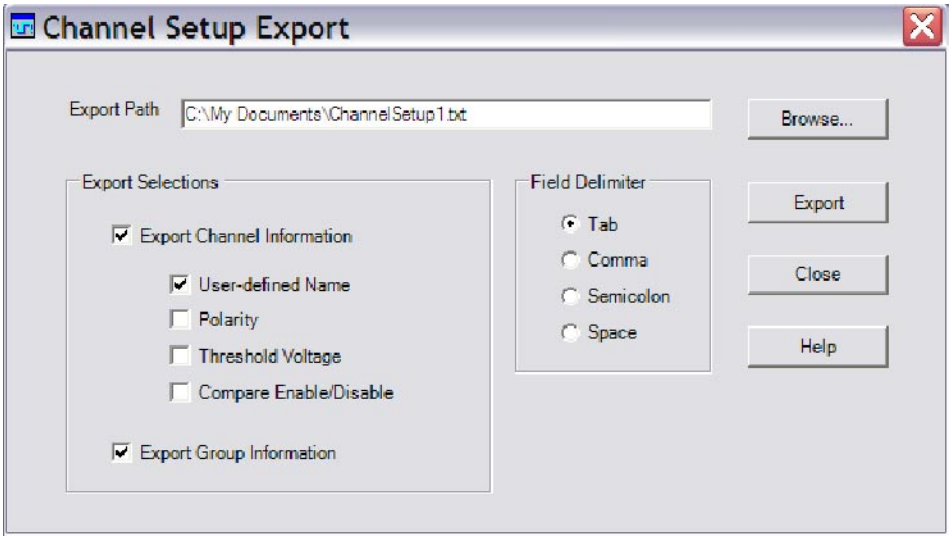


Figure 3-1: Channel Setup Export window

3. Select Export. Locate and view the exported ChannelSetup.txt file.

Replaceable Parts List

Replaceable Parts List

This section contains a list of the replaceable components or modules for the TMSSC2 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 TMSSC2 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
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
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214-4657
61638	ADVANCED INTERCONNECTIONS CORP	5 ENERGY WAY~PO BOX 1019	WEST WARWICK, RI 02893-1019
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
TK6585	TRESKE PRECISION MACHINE INC	14140 SW GALBREATH DRIVE	SHERWOOD, OR 97140

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	672-5706-50			1	CIRCUIT BD ASSY; TMSSC2 PROBE HEAD BOARD W/CABLES & PADDLE BD;TESTED	80009	672-5706-50
-2	361-1807-00			1	SPACER;HEATSINK ATTACH;TEJAS	TK6585	361-1807-00
-3	200-4861-00			4	COVER; BOTTOM,HEATSINK ATTACH;TEJAS	TK6585	200-4861-00
-4	200-4862-00			4	COVER,TOP; HEATSINK ATTACH;TEJAS	TK6585	200-4862-00
-5	211-0511-00			4	SCREW,MACHINE; 6-32 X 0.5,PNH,STL CD PL, POZ	0KB01	211-0511-00
-6	211-0687-00			4	SCREW,MACHINE; 6-32 X 0.75,FLH,100 DEG,STL CD PL,POZ	0KB01	211-0687-00 OBD
					STANDARD ACCESSORIES		
	071-1345-XX			1	MANUAL,TECH; INSTRUCTION, HARDWARE;TMSSC2,DP	TK2548	071-1345-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
	003-1889-00			1	TOOL, EXTRACTION;PGA SOCKET,TWO-SIDED,19 TEETH PER SIDE;1710-19	61638	1710-19
	012-1661-00			7	CA ASSY; INTCON,SHLD RIBBON,MCP,72 L	060D9	012-1661-00
					OPTIONAL ACCESSORIES		
	----------*			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

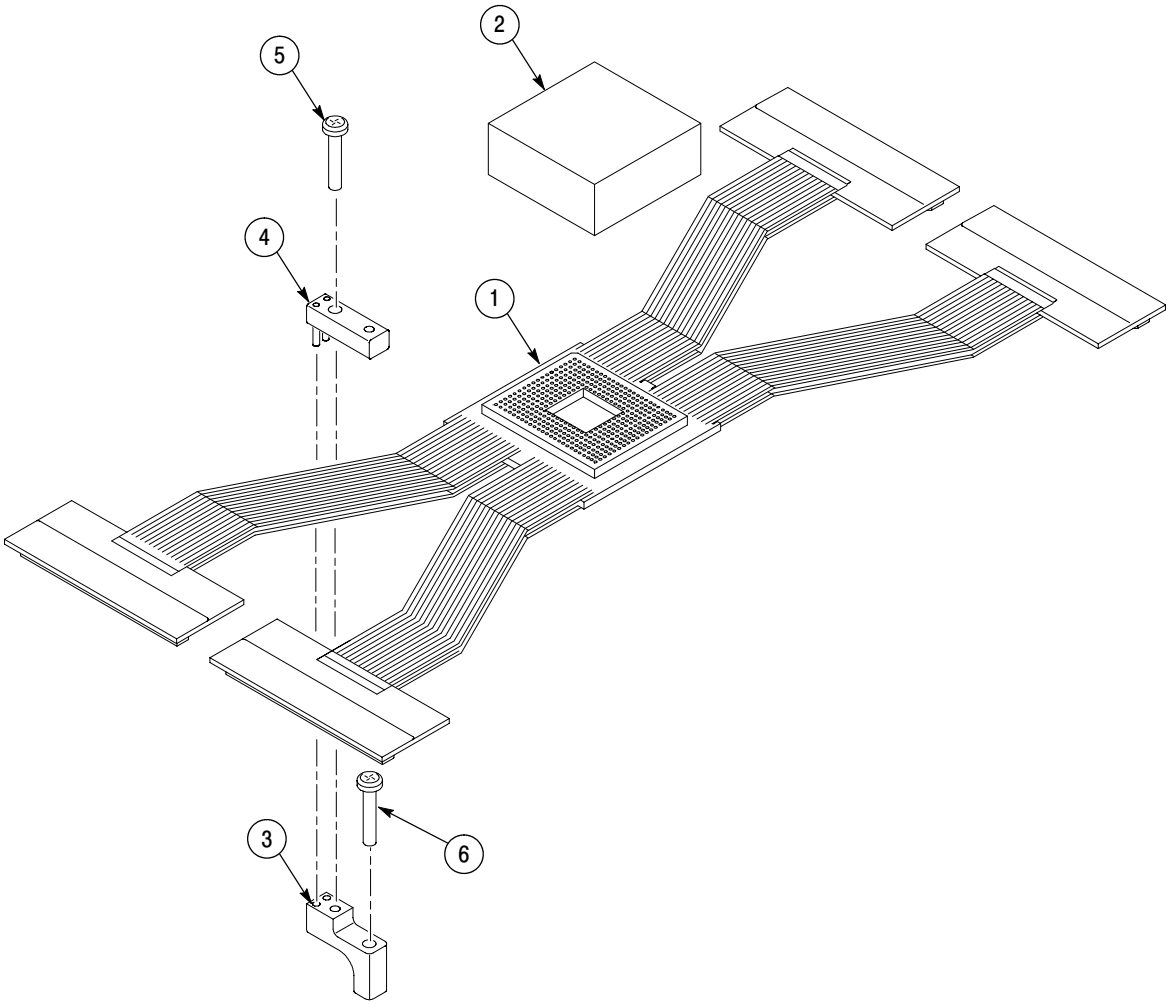


Figure 4-1: Probe adapter exploded view

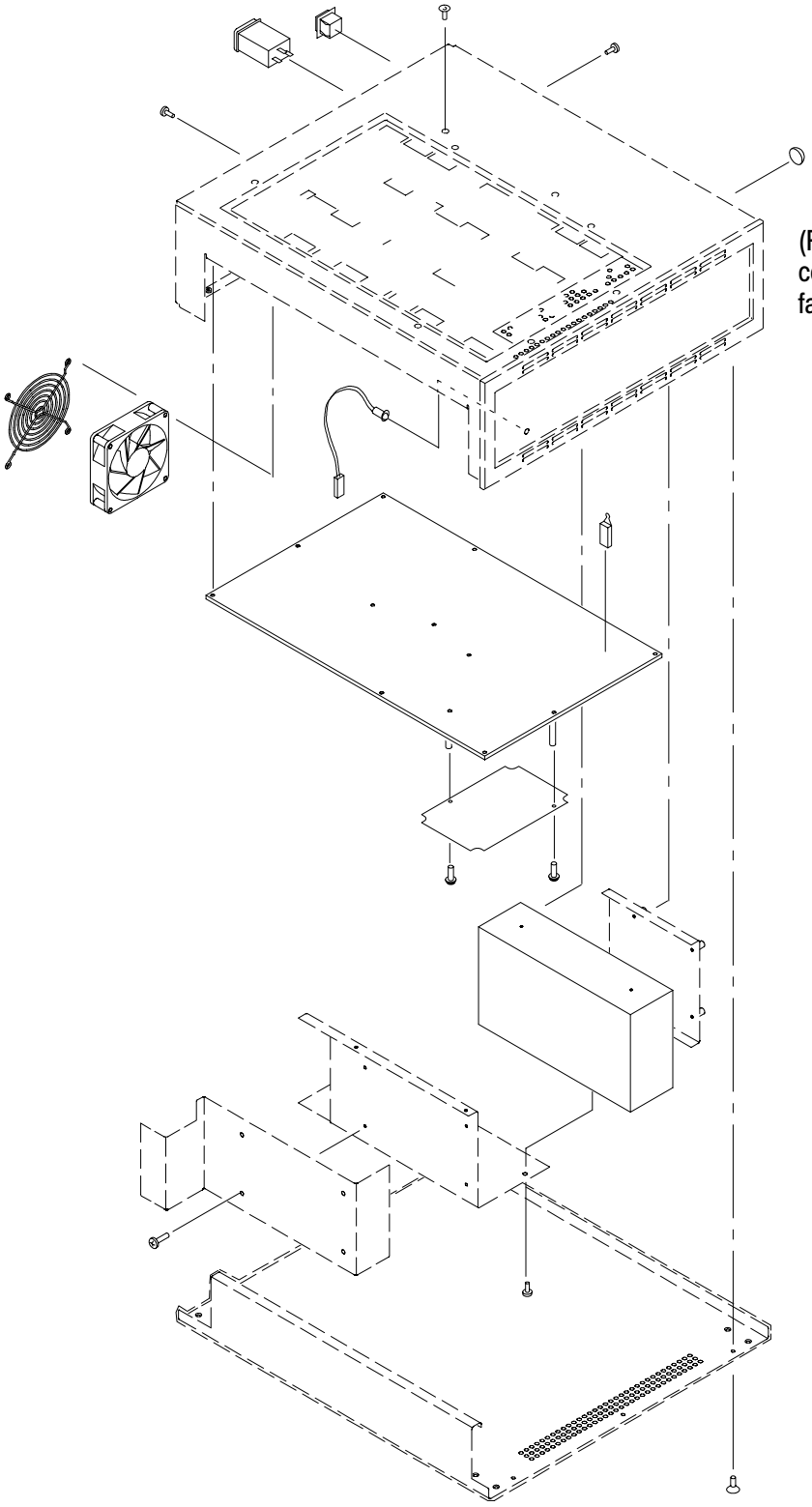


Figure 4–2: Preprocessor unit exploded view

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