

# Instruction Manual



## TMS S1A SC242 Hardware Support

**071-0476-02**

### **Warning**

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

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

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# General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

*Only qualified personnel should perform service procedures.*

While using this product, you may need to access other parts of 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 indirectly grounded through the grounding conductor of the mainframe 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.

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

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

**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:



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**WARNING.** Warning statements identify conditions or practices that could result in injury or loss of life.

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

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**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:



# 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 TMS S1A SC242 hardware 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 for which the TMS S1A SC242 Hardware support package was purchased, you will only need this instruction manual to set up and run the support.

If you are not familiar with operating microprocessor support packages, you will need to supplement this instruction manual with information on basic operations to set up and run the support.

## Manual Conventions

This manual uses the following conventions:

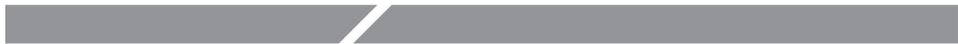
- A pound sign (#) following a signal name indicates an active low signal.
- The phrase “information on basic operations” refers to basic information in your online help.
- The term “HI module” refers to the module in the higher-numbered slot and the term “LO module” refers to the module in the lower-numbered slot.

## Contacting Tektronix

<b>Phone</b>	1-800-833-9200*
<b>Address</b>	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
<b>Web site</b>	<a href="http://www.tektronix.com">www.tektronix.com</a>
<b>Sales support</b>	1-800-833-9200, select option 1*
<b>Service support</b>	1-800-833-9200, select option 2*
<b>Technical support</b>	Email: <a href="mailto:support@tektronix.com">support@tektronix.com</a> 1-800-833-9200, select option 3* 1-503-627-2400 6:00 a.m. – 5:00 p.m. Pacific time

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



# Getting Started



# Getting Started

This chapter contains information on the TMS S1A SC242 hardware support product:

- Configuring the probe adapter
- Connecting the logic analyzer to the system under test
- Applying power and operating the probe adapter

## Support Package Description

The SC242 probe adapter is nonintrusive hardware that allows the logic analyzer to acquire data from a microprocessor in its own operating environment with little effect on that system.

The SC242 probe adapter is an interposer design. Using this design, the probe adapter connects to the system under test, and then the microprocessor connects to the probe adapter. Signals from the microprocessor module flow through the probe adapter into the P6434 probes and through the probe cables to the logic analyzer.

## Support Software Compatibility

The SC242 probe adapter is compatible with software products that provide timing analysis, and synchronous transactions and instruction decode. These software products are only available to customers with a valid restricted secret nondisclosure agreement (RS-NDA) with Intel.

At the time of printing, the compatible software support product is the TMS113. When using the SC242 probe adapter with the TMS113 software, choose any one of the SC242 custom clocking options.

However, for customers without RS-NDAs, Tektronix offers a basic clocking software for the SC242 probe adapter at no cost. This clocking software allows customers to conduct timing analysis by predefining channel assignments and configuring the logic analyzer to acquire all bus cycles. Contact your Tektronix representative to obtain this complementary software or to determine which latest software support products are compatible with the TMS S1A SC242 product.

## Logic Analyzer Configuration

To use the TMS S1A SC242 hardware support package you need a Tektronix logic analyzer equipped with two modules: either an 102 channel and 136-channel module or two 102 channel modules. The modules must be in adjacent slots and merged.

References to a 204-channel module include the two 102-channel modules that are merged and any other merged module combination of a minimum of 204-channels (for the merged combination).

You can acquire Debug and APIC bus activity through the SC242 probe adapter. Probing the APIC bus requires the TMS 801 APIC bus support package, a third 102-channel acquisition module, and standard probes. See *Alternate Connections* on page 1–7 for more details.

## Requirements and Restrictions



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**CAUTION.** *To keep the microprocessor from overheating, forced air cooling must be used*

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Review the general requirements and restrictions of the microprocessor support packages in the information on basic operations as they pertain to your system under test.

Also review electrical, environmental, and mechanical specifications in *Specifications* on page 2–1 as they pertain to your system under test, as well as the following descriptions of other TMS S1A SC242 hardware support requirements and restrictions.

### System Clock Rate

The TMS S1A SC242 Hardware support package can acquire data from front side buses operating at speeds of up to 100 MHz.

The operating clock rate specifications were measured at the time of printing. Contact your Tektronix sales representative for current information on the fastest devices supported.

### BCLK

Refer to the BCLK specifications and restrictions listed in Table 2–4 on page 2–5, in the *Specifications* chapter.

### System Under Test Power

Whenever you power off the system under test, remove power from the probe adapter. Refer to *Applying and Removing Power* on page 1–9.

**Signals Supported**

The following signals are supported by the SC242 probe adapter:

A[31:3]#	FLUSH#	RS[2:0]#
A20M#	HIT#	SLP#
ADS#	HITM#	SMI#
BCLK	IERR#	STPCLK#
BNR#	IGNNE#	TCK
BP[3:2]#	INIT#	TDI
BPM[1:0]#	LINT[1:0]	TDO
BPRI#	LOCK#	THERMTRIP#
BR0#	PICCLK	TMS
BR1#	PICD[1:0]	TRDY#
D[63:0]#	PRDY#	TRST#
DBSY#	PREQ#	
DEFER#	PWRGOOD	
DRDY#	REQ[4:0]#	
FERR#	RESET#	

**Labeling P6434 Probes**

The TMS S1A SC242 hardware support package relies on the standard channel mapping and labeling scheme for P6434 probes. Apply labels using the standard method described in the *P6434 Mass Termination Probe Instructions*.

**Configuring the Probe Adapter**

The probe adapter uses jumpers to acquire data for disassembly or for timing. Figure 1–1 shows the location of the jumpers.

**TIMING/NORMAL Jumper**

Place the TIMING/NORMAL jumper, J560, in the NORMAL position to acquire and disassemble data.

Place the TIMING/NORMAL jumper in the TIMING position to acquire timing data.

**MFG\_TEST Jumper**

To acquire data at frequencies below 40 MHz on the probe adapter, short the two pins on J830. This disables the PLL signal and buffers the BCLK signal to all clocked components.

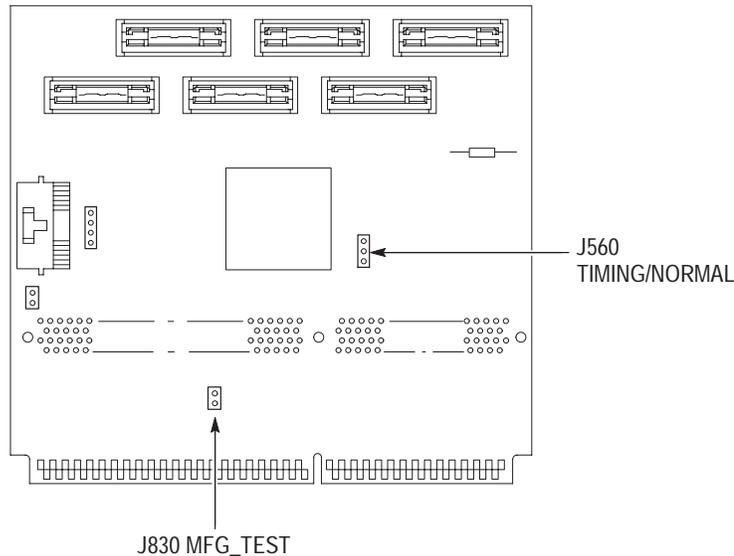


Figure 1-1: Jumper locations on the SC242 probe adapter

## Connecting the Logic Analyzer to a System Under Test

Before you connect the probe adapter to the system under test, connect three P6434 probes to the HI module and three P6434 probes to the LO module. The module in the higher-numbered slot is referred to as the HI module, and the module in the lower-numbered slot is referred to as the LO module.

Your system under test must allow clearance for the probe adapter. Refer to the dimensions on page 2-5 for the required clearances.

To connect the logic analyzer to your system under test, follow these steps:

1. Power off your system under test. It is not necessary to power off the logic analyzer.



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

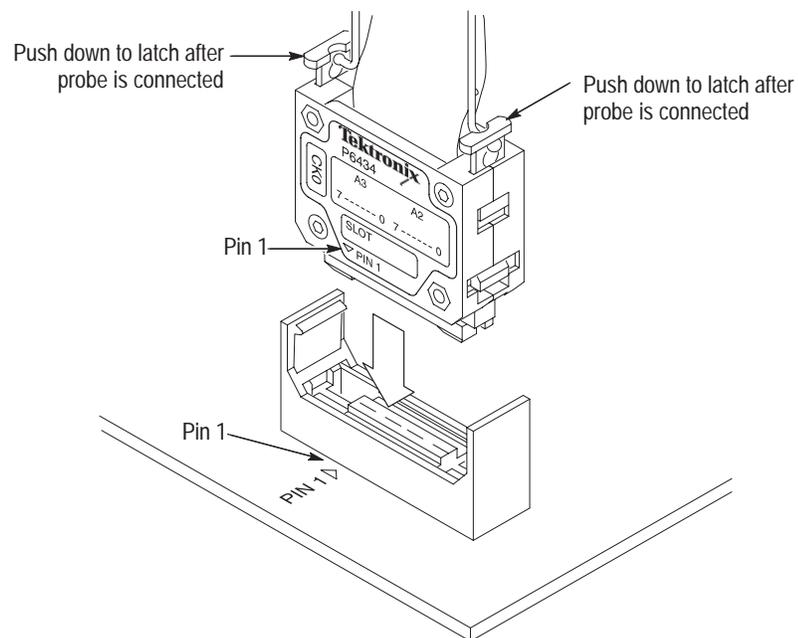
Always wear a grounding wrist strap, heel strap, or similar device while handling the microprocessor and probe adapter.

2. Match the A, C, and D probes from the HI module with the corresponding HI\_A, HI\_C, and HI\_D probe connectors on the probe adapter. Align the pin 1 indicator on the probe label with the pin 1 indicator of the connector on the probe adapter.



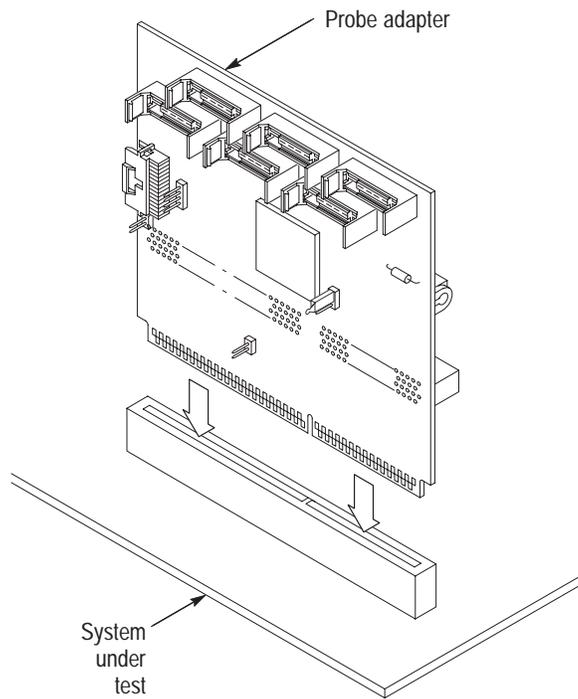
**CAUTION.** To prevent damage to the probe and probe adapter, always position the probe perpendicular to the mating connector and gently connect the probe. Incorrect handling of the P6434 probe while connecting it to the probe adapter can result in damage to the probe or to the mating connector on the probe adapter.

3. Position the probe tip perpendicular to the mating connector and gently connect the probe (see Figure 1–2).
4. When connected, push down the latch releases on the probe to set the latch.



**Figure 1–2: Connecting a probe to the probe adapter**

5. Match the A, C, and D probes from the LO module with the corresponding LO\_A, LO\_C, and LO\_D probe connectors on the probe adapter. Align the pin 1 indicator on the probe label with the pin 1 of the connector on the probe adapter.
6. Repeat steps 3 and 4.
7. Follow the procedure from the microprocessor vendor to remove the microprocessor from the SC242 connector on your system under test.
8. Insert the probe adapter into the system under test as shown in Figure 1–3.



**Figure 1-3: Inserting the probe adapter into the system under test**

9. Insert the microprocessor module into the probe adapter as shown in Figure 1-4.

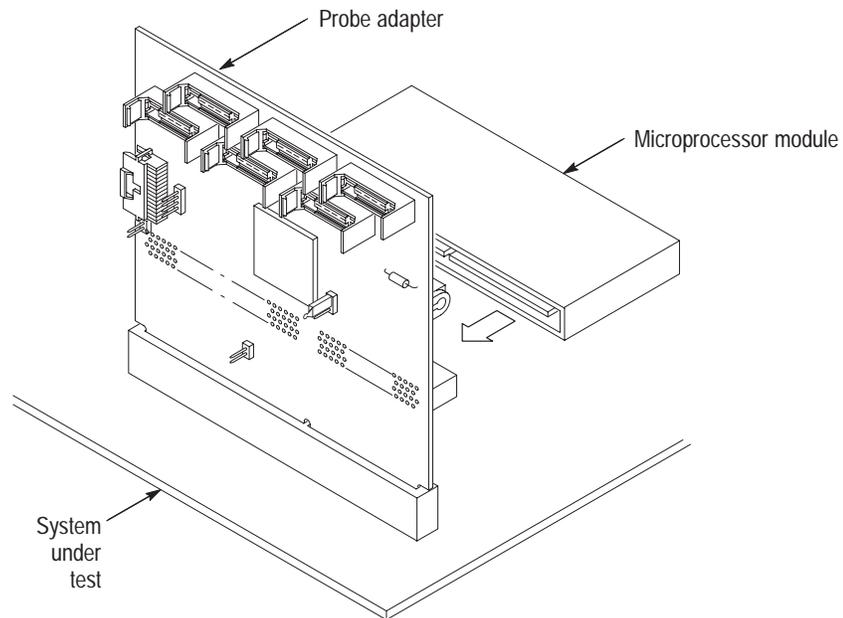


Figure 1-4: Placing the microprocessor module into the probe adapter

10. Apply forced air cooling across the microprocessor module to keep it from overheating.

## Alternate Connections

**APIC** Four pins on J510 are provided to connect the TMS 801 APIC bus probe adapter to the PICCLK, PICD0 and PICD1 signals for APIC bus support. See Table 1-1 for pin numbers and associated signals. See Figure 1-5 for the location of pins on the probe adapter.

Table 1-1: APIC information

J510 pin number	SC242 connector pin number	APIC connector signal name
1	GND	---
2	B18	PICCLK
3	B22	PICD1
4	A19	PICD0

**Debug Port** The SC242 probe adapter provides J511 as a way to connect to JTAG Run Control debugging hardware. This Run Control debugging hardware is not included with the TMS S1A SC242 hardware support package. Contact your microprocessor vendor for information on how to obtain Run Control debugging hardware.

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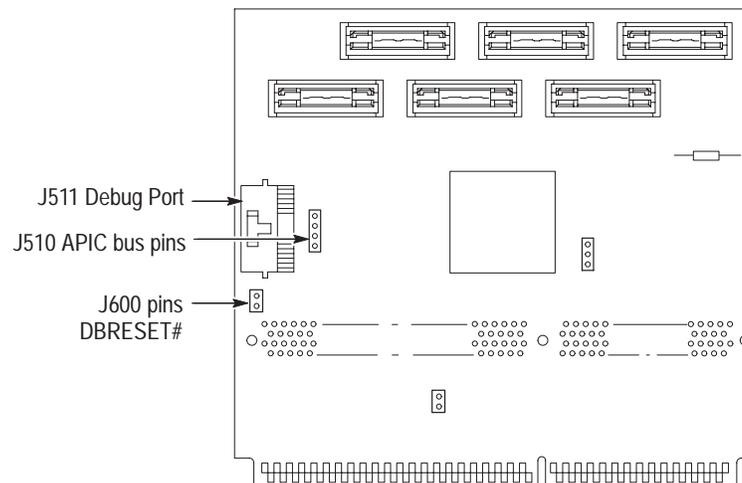
**NOTE.** *The Debug port circuitry on the Probe Adapter is active only when the Debug port probe cable is connected to J511. If the Debug port probe cable is disconnected from J511, all Debug port data and control lines on the Probe Adapter are tristated.*

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**Optional System Reset.** The Debug port circuitry on the Probe Adapter does not allow external Run Control debugging hardware to induce a system reset through the DBRESET# signal on the Debug port connector. If you need to enable this feature you must provide the connection to your system under test. Table 1–2 lists the signals on the J600. Figure 1–5 shows the location of the pins on the probe adapter.

**Table 1–2: Jumper (J600) information**

Pin number	Debug port signal name
1	GND
2	DBRESET#



**Figure 1–5: Location of APIC, Debug Port, and DBRESET# pins on the probe adapter**

## Applying and Removing Power

A power supply for the SC242 probe adapter is included with this TMS S1A SC242 hardware support. The power supply provides +5 volts power to the probe adapter.



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**CAUTION.** *Whenever you power off the system under test, be sure to remove power from the probe adapter.*

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To apply power to the SC242 probe adapter and system under test, follow these steps:



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**CAUTION.** *To prevent permanent damage to the probe adapter and microprocessor module, use the +5 V power supply provided by Tektronix. Do not mistake another power supply that looks similar for the +5 V power supply.*

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1. Connect the +5 V power supply to the jack on the probe adapter. Figure 1–6 shows the location of the jack on the adapter board.

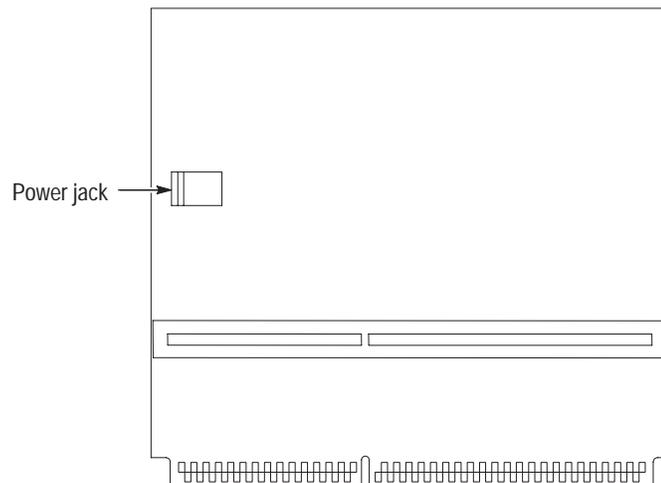


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**CAUTION.** *To prevent permanent damage to the microprocessor module and system under test, apply power to the probe adapter before applying power to your system under test.*

---

2. Plug the power supply for the probe adapter into an electrical outlet. When power is present on the probe adapter, an LED lights near the power jack.
3. Power on the system under test.



**Figure 1-6: Location of the power jack**

To remove power from the system under test and the probe adapter, follow these steps:



---

**CAUTION.** To prevent permanent damage to the microprocessor module and system under test, apply power to the probe adapter before applying power to your system under test.

---

1. Power off the system under test.
2. Unplug the power supply for the probe adapter from the electrical outlet.

## CPU To Mictor Connections

To probe the microprocessor, you will need to make connections between the CPU and the Mictor pins of the P6434 Mass Termination Probe. Refer to the *P6434 Mass Termination Probe* manual, Tektronix part number 070-9793-XX, for more information on mechanical specifications. Tables 1–3 through 1–10 show the CPU pin to Mictor pin connections.

Tektronix uses a counterclockwise pin assignment. Pin 1 is located at the top left, and pin 2 is located directly below it. Pin 20 is located on the bottom right, and pin 21 is located directly above it (see Figure 1–7).

AMP uses an odd side-even side pin assignment. Pin 1 is located at the top left, and pin 3 is located directly below it. Pin 2 is located on the top right, and pin 4 is located directly below it (see Figure 1–7).

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**NOTE.** When designing Mictor connectors into your system under test, always follow the Tektronix pin assignment.

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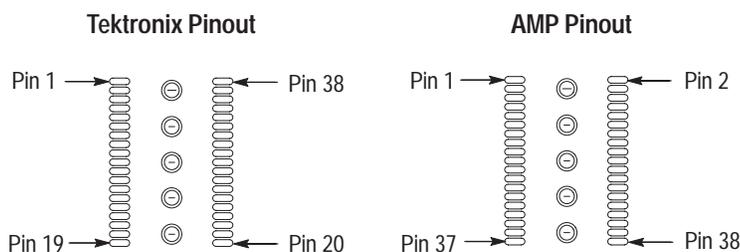


Figure 1–7: Pin assignments for a Mictor connector (component side)

Table 1–3: Clock Channels (stored in the acquisition memory)

Clock channel	CLK, QUAL, or DATA	Active CLK edge	Processor pin name	Processor pin number
LO_CLK:3	CLK	Rising	BCLK	A75
LO_CLK:2	DATA	X	---	---
LO_CLK:1	DATA	X	---	---
LO_CLK:0	---	X	---	---
HI_CLK:3	DATA	X	---	A75
HI_CLK:2	DATA	X	---	---

Table 1-3: Clock Channels (stored in the acquisition memory) (cont.)

Clock channel	CLK, QUAL, or DATA	Active CLK edge	Processor pin name	Processor pin number
HI_CLK:1	DATA	X	--	--
HI_CLK:0	--	X	--	--

Table 1-4: Qualifier Channels (stored in the acquisition memory)

QUAL channel	QUAL, or DATA	Processor pin name	Processor pin number
LO_QUAL:3	--	--	--
LO_QUAL:2	--	--	--
LO_QUAL:1	DATA	--	--
LO_QUAL:0	DATA	--	--
HI_QUAL:3	--	--	--
HI_QUAL:2	--	--	--
HI_QUAL:1	DATA	--	--
HI_QUAL:0	DATA	--	--

**NOTE.** Dashes — indicate: the CLK or QUAL channel is not used, the channel is not supported by the support software, or the channel is not connected to the microprocessor.

CLK and QUAL channels designated as DATA are logged in on the master strobe defined by the support software.

Table 1-5: CPU to Mictor connections for Mictor C pins (high)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
4	7	C3:7	FLUSH#	B2
8	15	C3:3	DEP0#	A25
12	23	C2:7	DEP3#	A28
16	31	C2:3 <sup>1</sup>	RESET#	B74
5	9	C3:6	INIT#	B4
9	17	C3:2	DEP2#	B26

Table 1-5: CPU to Mictor connections for Mictor C pins (high) (cont.)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
13	25	C2:6	DEP7#	B28
17	33	C2:2 <sup>1</sup>	BREQ1#	B75
6	11	C3:5	PRDY#	A23
10	19	C3:1	DEP1#	A27
14	27	C2:5	DEP5#	A29
18	35	C2:1 <sup>1</sup>	BREQ0#	A76
7	13	C3:4	Not Specified	Not Specified
11	21	C3:0	Not Specified	Not Specified
15	29	C2:4	Not Specified	Not Specified
19	37	C2:0 <sup>1</sup>	Derived	Derived
35	8	C1:7	Derived	Derived
31	16	C1:3	Derived	Derived
27	24	C0:7	Derived	Derived
23	32	C0:3	Not Specified	Not Specified
34	10	C1:6	Derived	Derived
30	18	C1:2	Derived	Derived
26	26	C0:6	Derived	Derived
22	34	C0:2	Derived	Derived
33	12	C1:5	SLP#	B8
29	20	C1:1	Derived	Derived
25	28	C0:5	Derived	Derived
21	36	C0:1	Derived	Derived
32	14	C1:4	Derived	Derived
28	22	C1:0	Derived	Derived
24	30	C0:4	Derived	Derived
20	38	C0:0	PWRGOOD	A12

<sup>1</sup> Possible qualifier line

Table 1–6: CPU to Mictor connections for Mictor A pins (high)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
4	7	A3:7	D#[62]	B30
5	9	A3:6	D#[61]	A32
6	11	A3:5	D#[55]	A33
7	13	A3:4	D#[60]	A35
8	15	A3:3	D#[53]	A36
9	17	A3:2	D#[57]	A37
10	19	A3:1	D#[46]	A39
11	21	A3:0	D#[49]	A40
12	23	A2:7	D#[51]	A41
13	25	A2:6	D#[42]	A43
14	27	A2:5	D#[45]	A44
15	29	A2:4	D#[39]	A45
16	31	A2:3	D#[40]	B47
17	33	A2:2	D#[34]	B48
18	35	A2:1	D#[38]	B50
19	37	A2:0	D#[32]	B51
35	8	A1:7	D#[58]	B31
34	10	A1:6	D#[63]	B32
33	12	A1:5	D#[56]	B34
32	14	A1:4	D#[50]	B35
31	16	A1:3	D#[54]	B36
30	18	A1:2	D#[59]	B38
29	20	A1:1	D#[48]	B39
28	22	A1:0	D#[52]	B40
27	24	A0:7	D#[41]	B42
26	26	A0:6	D#[47]	B43
25	28	A0:5	D#[44]	B44
24	30	A0:4	D#[36]	B46
23	32	A0:3	D#[43]	A48
22	34	A0:2	D#[37]	A49
21	36	A0:1	D#[33]	A51
20	38	A0:0	D#[35]	A52

Table 1–7: CPU to Mictor connections for Mictor D pins (high)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
4	7	D3:7	D#[28]	B52
5	9	D3:6	D#[29]	B54
6	11	D3:5	D#[26]	B55
7	13	D3:4	D#[25]	B56
8	15	D3:3	D#[22]	B58
9	17	D3:2	D#[19]	B59
10	19	D3:1	D#[18]	B60
11	21	D3:0	D#[20]	B62
12	23	D2:7	D#[17]	B63
13	25	D2:6	D#[15]	B64
14	27	D2:5	D#[12]	B66
15	29	D2:4	D#[7]	B67
16	31	D2:3	D#[6]	B68
17	33	D2:2	D#[5]	A71
18	35	D2:1	D#[3]	A72
19	37	D2:0	D#[1]	A73
35	8	D1:7	D#[31]	A53
34	10	D1:6	D#[30]	A55
33	12	D1:5	D#[27]	A56
32	14	D1:4	D#[24]	A57
31	16	D1:3	D#[23]	A59
30	18	D1:2	D#[21]	A60
29	20	D1:1	D#[16]	A61
28	22	D1:0	D#[13]	A63
27	24	D0:7	D#[11]	A64
26	26	D0:6	D#[10]	A65
25	28	D0:5	D#[14]	A67
24	30	D0:4	D#[9]	A68
23	32	D0:3	D#[8]	A69
22	34	D0:2	D#[4]	B70
21	36	D0:1	D#[2]	B71
20	38	D0:0	D#[0]	B72

Table 1–8: CPU to Mictor connections for Mictor C pins (Low)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
4	7	C3:7	RSP#	B115
8	15	C3:3	RP#	B114
12	23	C2:7	AP1#	B116
16	31	C2:3 <sup>1</sup>	AP0#	A117
5	9	C3:6	BNR#	A101
9	17	C3:2	LOCK#	B106
13	25	C2:6	DBSY#	A111
17	33	C2:2 <sup>1</sup>	AERR#	B118
6	11	C3:5	BPRI#	A103
10	19	C3:1	DRDY#	B107
14	27	C2:5	RS2#	B111
18	35	C2:1 <sup>1</sup>	ADS#	A115
7	13	C3:4	NA	NA
11	21	C3:0	NA	NA
15	29	C2:4	Not Specified	Not Specified
19	37	C2:0 <sup>1</sup>	Derived	Derived
35	8	C1:7	A35#	B78
31	16	C1:3	A34#	A80
27	24	C0:7	A33#	A79
23	32	C0:3	A32#	B79
34	10	C1:6	RS1#	A112
30	18	C1:2	RS0#	B108
26	26	C0:6	DEFER#	A105
22	34	C0:2	HITM#	A109
33	12	C1:5	BERR#	A77
29	20	C1:1	REQ4#	B104
25	28	C0:5	HIT#	B110
21	36	C0:1	TRDY#	A104
32	14	C1:4	REQ3#	A108
28	22	C1:0	REQ2#	A107
24	30	C0:4	REQ1#	B103
20	38	C0:0	REQ0#	B102

<sup>1</sup> Possible qualifier line

Table 1-9: CPU to Mictor connections for Mictor A pins (Low)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
4	7	A3:7	A#[31]	A83
5	9	A3:6	A#[30]	A81
6	11	A3:5	A#[29]	B80
7	13	A3:4	A#[28]	B84
8	15	A3:3	A#[27]	A84
9	17	A3:2	A#[26]	B82
10	19	A3:1	A#[25]	B88
11	21	A3:0	A#[24]	B83
12	23	A2:7	A#[23]	A87
13	25	A2:6	A#[22]	A85
14	27	A2:5	A#[21]	B87
15	29	A2:4	A#[20]	B86
16	31	A2:3	A#[19]	A89
17	33	A2:2	A#[18]	A91
18	35	A2:1	A#[17]	B91
19	37	A2:0	A#[16]	A92
35	8	A1:7	A#[15]	B90
34	10	A1:6	A#[14]	A95
33	12	A1:5	A#[13]	A93
32	14	A1:4	A#[12]	B94
31	16	A1:3	A#[11]	B92
30	18	A1:2	A#[10]	A96
29	20	A1:1	A#[09]	A99
28	22	A1:0	A#[08]	B95
27	24	A0:7	A#[07]	B96
26	26	A0:6	A#[06]	B99
25	28	A0:5	A#[05]	A97
24	30	A0:4	A#[04]	A100
23	32	A0:3	Derived	Derived
22	34	A0:2	Derived	Derived
21	36	A0:1	Derived	Derived
20	38	A0:0	Derived	Derived

Table 1-10: CPU to Mictor connections for Mictor D pins (Low)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor pin name	Processor pin number
4	7	D3:7	Derived	Derived
5	9	D3:6	Derived	Derived
6	11	D3:5	Derived	Derived
7	13	D3:4	Derived	Derived
8	15	D3:3	TDO	A11
9	17	D3:2	THRMTRP#	A15
10	19	D3:1	LINT0	A17
11	21	D3:0	PICD0	A19
12	23	D2:7	PREQ#	A20
13	25	D2:6	BPM0#	A23
14	27	D2:5	BCLK	A75
15	29	D2:4	STPCLK#	B6
16	31	D2:3	TCK	B7
17	33	D2:2	TDI	A9
18	35	D2:1	A20M#	A5
19	37	D2:0	BP3#	A21
35	8	D1:7	IERR#	A4
34	10	D1:6	FERR#	A7
33	12	D1:5	IGNNE#	A8
32	14	D1:4	TMS	B10
31	16	D1:3	TRST#	B11
30	18	D1:2	LINT1#	B16
29	20	D1:1	PICCLK#	B18
28	22	D1:0	BP2#	B19
27	24	D0:7	PICD1	B22
26	26	D0:6	BPM1#	B24
25	28	D0:5	FRCERR#	B76
24	30	D0:4	SMI#	B3
23	32	D0:3	BINIT#	A24
22	34	D0:2	DEP4#	B27
21	36	D0:1	DEP6#	A31
20	38	D0:0	Not Specified	Not Specified



# Specifications



# Specifications

This chapter contains information regarding the specifications of the TMS S1A SC242 Hardware support package.

## Probe Adapter Description

The probe adapter is nonintrusive hardware that allows the logic analyzer to acquire data from a microprocessor in its own operating environment with little effect on that system. The following paragraphs describe specific circuitry used in the SC242 probe adapter.

### Signal Probing

The SC242 probe adapter acquires all signals except BCLK through series isolation resistors. For some signals (see Table 2–2), the probe adapter also presents an active device load.

### Debug Port

The SC242 probe adapter provides a connection point for a debug port. In addition to the standard debug port, the probe adapter contains circuitry to terminate the debug control and data signals to their appropriate voltage levels.

The debug circuitry on the probe adapter can only control the debug signals when an debug probe cable is plugged into the debug port on the logic board. The ITP circuitry serves all debug signals from the system under test when a debug cable is plugged into J511. When the cable is removed, all debug data and control lines are tristated.

### Probe Adapter Loading Diagrams

Figures 2–1 through 2–3 are provided for loading reference.

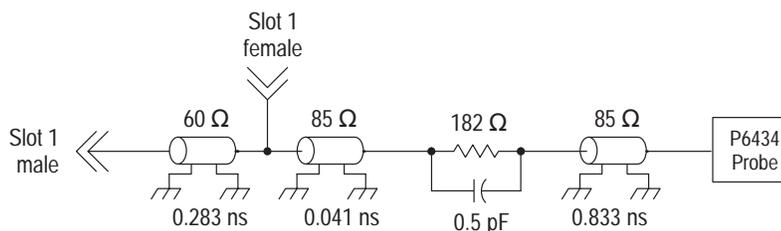


Figure 2–1: SC242 signals without active loads

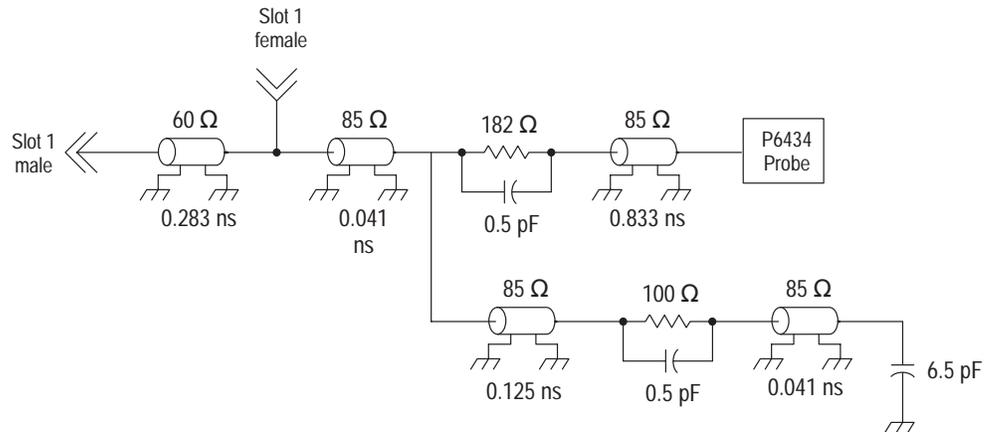


Figure 2-2: SC242 signals with active loads

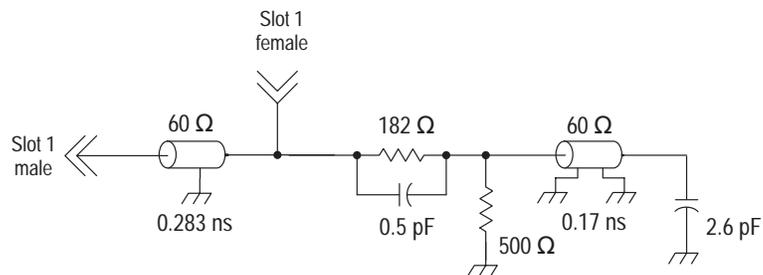


Figure 2-3: SC242 BCLK

Table 2-1 shows the values you can use to calculate characteristics of the Lossy delay lines shown in Figure 2-4, which is the equivalent circuit of the P6434 probe.

Table 2-1: Lossy delay line values

Characteristic	Value
C (capacitance)	1.58 pF per inch
L (inductance)	8.9 nH per inch
R (resistance)	.067 Ω per inch
Z <sub>0</sub> (impedance)	75 Ω

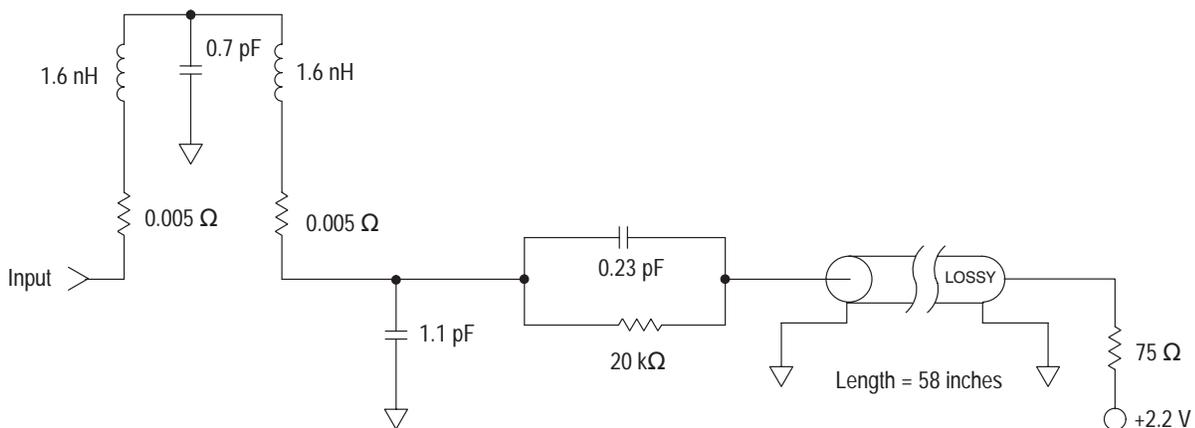


Figure 2-4: Equivalent circuit for the P6434 probe

## Specification Tables

These specifications are for a probe adapter connected between a compatible Tektronix logic analyzer and a system under test. The signal voltage swing in your system under test must be at least 200 mV around the GTL+ reference voltage.

Table 2-2 lists the electrical requirements of the system under test, the AC adapter, and the power supply that provides power to the SC242 probe adapter. Table 2-3 lists the environmental specifications. Table 2-4 lists the BCLK timing restrictions and electrical specifications.

Table 2-2: Electrical specifications

Characteristics	Requirements
Probe adapter: DC power requirements	
Voltage, VCC	4.75 – 5.25 VDC
Current, VCC	I maximum 490 mA, I typical 210 mA
AC adapter	
Input Voltage rating	90 – 265 V CAT II
Input Frequency Rating	47 – 63 Hz
Output Voltage Rating	5 V
Output Current Rating	5 V
Output Power Rating	25 W
System under test: DC power requirements	
Voltage, VCC 1.5 V	1.5 V ± 9%

**Table 2–2: Electrical specifications (cont.)**

Characteristics	Requirements	
Current, VCC 1.5 V	I maximum 15.1 mA, I typical 5.0 mA	
System under test: clock rate	Maximum 100 MHz	
Minimum setup time required, all signals at edge fingers	2.0 ns	
Minimum hold time required, all signals at edge fingers	1.0 ns	
Measured typical system-under-test signal loading  All signals with active loads (except BCLK): INIT#, BREQ0#, REQ4#, RESET#, ADS#, RS0#, RS1#, RS2#, HIT#, HITM#, DRDY#, BNR#, A3#, A8# – A15#,	Specification	
	AC load	DC load
	8 pF	74GTL16622 in parallel with 20 k $\Omega$
	BCLK	AD8009
Signals without active loads	2.5 pF	20 k $\Omega$

**Table 2–3: Environmental specifications<sup>1</sup>**

Characteristic	Description
Temperature	
Maximum operating	+50° C (+122° F) <sup>2</sup>
Minimum operating	0° C (+32° F)
Nonoperating	–55° C to +75° C (–67° to +167° F)
Humidity	10 to 95% relative humidity
Altitude	
Operating	4.5 km (15,000 ft) maximum
Nonoperating	15 km (50,000 ft) maximum
Electrostatic immunity	The probe adapter is static sensitive

<sup>1</sup> Designed to meet Tektronix standard 062-2847-00 class 5.

<sup>2</sup> Not to exceed microprocessor thermal considerations. Forced air cooling might be required across the CPU.

Table 2-4: BCLK timing and electrical specifications

Characteristics	Minimum	Maximum	Units	Notes
$V_{in} (lo)$		0.5	V	
$V_{in} (hi)$	2.0		V	
Duty Cycle	25	75	%	
$t_{lh}$		1.25	ns	Monotonically increasing
$t_{hl}$		1.25	ns	Monotonically decreasing

**Dimensions** Figure 2-5 shows the dimensions of the SC242 probe adapter.

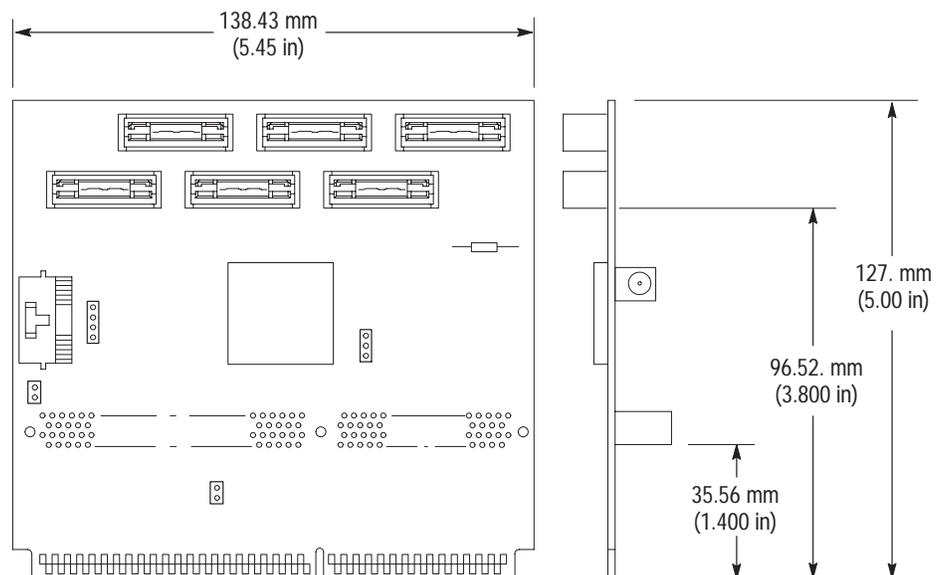


Figure 2-5: Dimensions of the SC242 probe adapter





# Maintenance



# Maintenance

This section contains information on replacing the SC242 probe adapter fuse.

## Replacing the Fuse

If the fuse on the probe adapter opens (burns out), you can replace it with a 5 A, 125 V fuse. Figure 3–1 shows the location of the fuse on the SC242 probe adapter. See the *Replaceable Mechanical Parts* chapter for part descriptions.

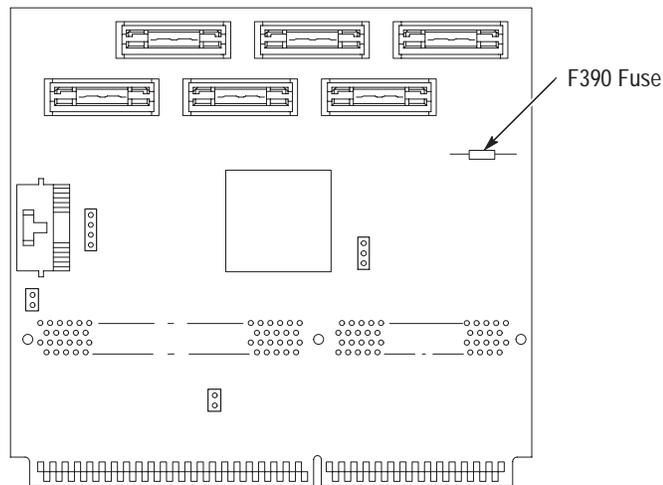
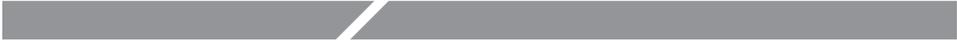


Figure 3–1: Fuse location on the SC242 probe adapter





# Replaceable Parts List



# Replaceable Parts List

This chapter contains a list of the replaceable components for the TMS S1A SC242 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.

## Using the Replaceable Parts List

The tabular information in the Replaceable Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes the content of 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 entries 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.

**Chassis Parts**      Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

**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

<b>Mfr. code</b>	<b>Manufacturer</b>	<b>Address</b>	<b>City, state, zip code</b>
00779	AMP INC.	CUSTOMER SERVICE DEPT PO BOX 3608	HARRISBURG, PA 17105-3608
14310	AULT INC	7300 BOONE AVE NORTH BROOKLINE PARK	MINNEAPOLIS, MN 55428
1AW87	LEWIS SCREW CO.	4300 SOUTH RACINE AVENUE	CHICAGO, IL 60609
26742	METHODE ELECTRONICS INC	BACKPLAIN DIVISION 7444 WEST WILSON AVE	CHICAGO, IL 60656-4548
60381	PRECISION INTERCONNECT CORP.	16640 SW 72ND AVE	PORTLAND, OR 97224
61857	SAN-O INDUSTRIAL CORP	91-3 COLIN DRIVE	HOLBROOK, NY 11741
63058	BERG ELECTRONICS INC.	MCKENZIE SOCKET DIV 910 PAGE AVE	FREMONT, CA 94538-7340
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077-0001
82389	SWITCHCRAFT	DIV OF RAYTHEON 5555 N. ELSTON AVENUE	CHICAGO, IL 60630-1314
S3109	FELLER U.S. CORPORATION	72 VERONICA AVE UNIT #4	SOMERSET, NJ 08873
TK1373	PATELEC-CEM	10156 TORINO VAICENTALLO 62/456	ITALY,
TK2541	AMERICOR ELECTRONICS LTD	UNIT-H 2682 W COYLE AVE	ELK GROVE VILLAGE, IL 60007
TK2548	XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON, OR 97005

## Replaceable Parts List

### 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	671-4525-00			1	CIRCUIT BD ASSYIA32G4,SLOT 1,TMSS1A	80009	671-4525-00
-2	131-6610-00			1	JACK,POWER DC:PCB,MALE,RTANG,2MM PIN DIA,BRASS,SILVER PLATE,5A	82389	RAPC722TB
-3	159-0059-00			1	FUSE,WIRE LEAD:5A,125V	61857	SPI-5A
-4	131-4530-00			1	CONN,HDR:PCB,MALE,STR,1 X 3,0.1 CTR,0.230 MLG X 0.120 TAIL,30 GOLD,BD RETENTION	00779	104344-1
-5	131-4356-00			1	CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,30 GOLD	26742	9618-302-50
-6	105-1089-00			6	LATCH ASSY:LATCH HOUSING ASSY,VERTICAL MOUNT,0.48 H X 1.24 L,W/PCB SINGLE CLIP,P6434	60381	105-1089-00
-7	131-6134-01			6	CONN,PLUG:SMD,MICRO,PCB,FEMALE,STR,38 POS,0.025 CTR,0.245 H,GOLD,TLA7QS	00779	767054-1
-8	131-4850-00			1	CONN,HDR:PCB,MALE,RTANG,2 X 15,0.05 X 0.1 CTR,0.35 H X 0.10 TAIL,CTR PLZ,LATCHING,30 GOL	00779	104069-5
<b>STANDARD ACCESSORIES</b>							
	071-0476-02			1	MANUAL,TECH:INSTRUCTION,SC242 HARDWARE SUPPORT;TMSS1A	TK2548	071-0476-02
	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	S3109	ORDER BY DESCRIPTION
	119-5061-01			1	POWER SUPPLY:25W,5V 5A,CONCENTRIC 2MM,90-265V,47-63 HZ IEC,15X8.6X5 CM, UL,CSA, TUV,IEC,SELF	14310	SW108KA0002F01
<b>OPTIONAL ACCESSORIES</b>							
	-----*			6	P6434 MASS TERMINATION PROBE, Opt 21 *	80009	P6434
	161-0104-05			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,RTANG,IEC320,RCPT,AUSTRALIA,SAFTEY CONTROLLED,	TK1373	161-0104-05
	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)	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

\* Check the P6434 manual for detailed replaceable part number information.

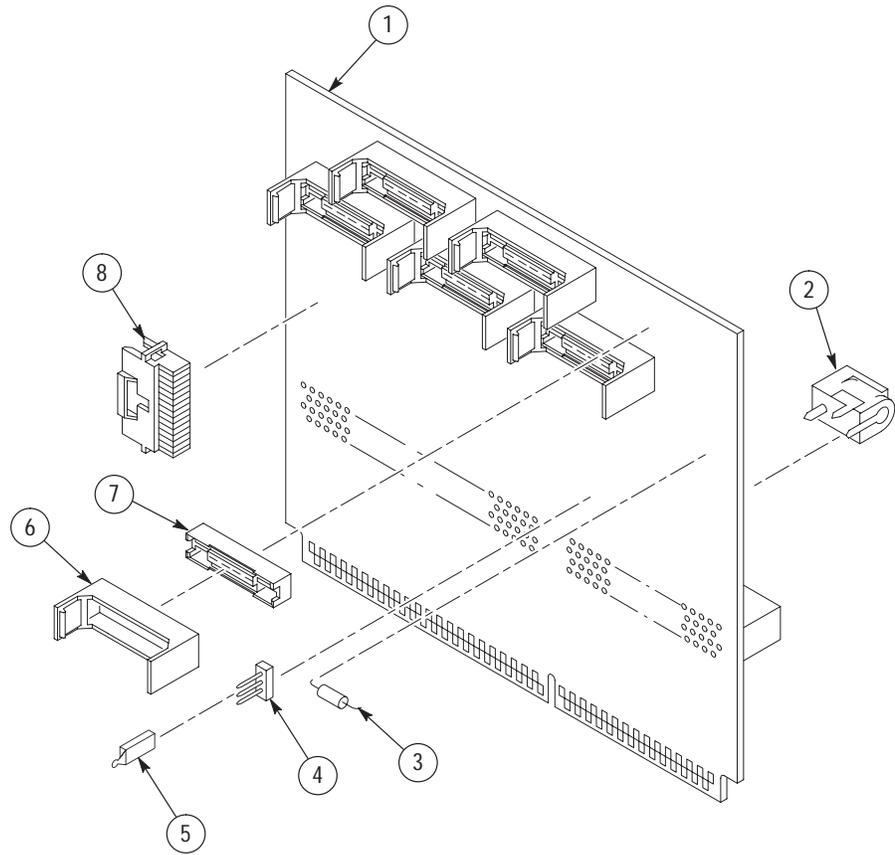
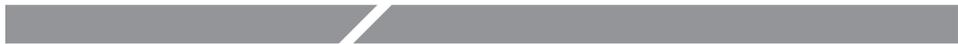


Figure 4-1: TMS S1A SC242 probe adapter exploded view





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