

Instruction Manual



TMS MC2 Logic Board Adapter Hardware Support 071-0613-00

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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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.

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.

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

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

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:



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.

Preface

This instruction manual contains specific information about the TMS MC2 Logic Board Adapter 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 MC2 Logic Board Adapter support 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.

This manual provides detailed information on the following topics:

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

Manual Conventions

This manual uses the following conventions:

- The term “module” refers to two 102-channel modules, a 102-channel module plus a 136-channel module, or two 136-channel modules.
- The phrase “information on basic operations” refers to basic information in your online help.

Contacting Tektronix

Product Support	<p>For questions about using Tektronix measurement products, call toll free in North America: 1-800-TEK-WIDE (1-800-835-9433 ext. 2400) 6:00 a.m. – 5:00 p.m. Pacific time</p> <p>Or contact us by e-mail: tm_app_supp@tektronix.com</p> <p>For product support outside of North America, contact your local Tektronix distributor or sales office.</p>
Service Support	<p>Tektronix offers extended warranty and calibration programs as options on many products. Contact your local Tektronix distributor or sales office.</p> <p>For a listing of worldwide service centers, visit our web site.</p>
For other information	<p>In North America: 1-800-TEK-WIDE (1-800-835-9433) An operator will direct your call.</p>
To write us	<p>Tektronix, Inc. P.O. Box 1000 Wilsonville, OR 97070-1000 USA</p>
Website	<p>Tektronix.com</p>



Getting Started

Getting Started

This chapter contains information on the TMS MC2 Logic Board Adapter Hardware Support package, and information on connecting your logic analyzer to your system under test.

Support Package Description

The TMS MC2 Logic Board Adapter is nonintrusive hardware that allows the logic analyzer to acquire data from a microprocessor in its own operating environment with little affect on that system.

The TMS MC2 Logic Board Adapter can be used with a variety of interposer boards. An example of an interposer board is the MPROBE interposer board from Ironwood electronics. Signals from the microprocessor flow through the MPROBE interposer board, and then, to the TMS MC2 Logic Board Adapter into the P6434 probes and through the probe cables to the logic analyzer.

Contact your Tektronix representative if you are interested in other interposer board solutions.

Support Software Compatibility

The TMS MC2 Logic Board Adapter requires a Tektronix software support package. At the time of printing, the compatible software support package is the TMS113. When using the TMS MC2 Logic Board Adapter with the TMS113 software, choose any one of the PG370 clocking options to acquire data.

Contact your Tektronix representative to determine which latest software support package is compatible with the TMS MC2 Logic Board Adapter Hardware Support package.

Logic Analyzer Configuration

To use the TMS MC2 Logic Board Adapter Hardware Support package you need a Tektronix logic analyzer equipped with two 102-channel modules. The modules must be in adjacent slots and merged.

References to a 204-channel module include two merged 102-channel modules.

Requirements and Restrictions



CAUTION. Use Forced air cooling to keep the microprocessor from overheating.

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

You should also review electrical, environmental, and mechanical specifications in the *Specifications* chapter beginning on page 2–1 as they pertain to your system under test, as well as the following descriptions of other TMS MC2 Logic Board Adapter Hardware Support requirements and restrictions.

System Clock Rate

The TMS MC2 Logic Board Adapter Hardware Support can acquire data from the from the system under test at bus speeds of up to 100 MHz; the TMS MC2 Logic Board Adapter has been tested to 66 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 2–5 on page 2–4, 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 1–11.

Signals Supported

The following signals of the front side bus may be supported by the TMS MC2 Logic Board Adapter:

NOTE. Refer to the specifications for the third party interposer board to identify the exact set of signals that can be acquired by the TMS MC2 Logic Board 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#	THERMDN
BR0#	PICCLK	THERMDP
BSEL#	PICD[1:0]	THERMTRIP#
D[63:0]#	PRDY#	TMS
DBSY#	PREQ#	TRDY#
DEFER#	PWRGOOD	TRST#
DRDY#	REQ[4:0]#	
FERR#	RESET#	

Labeling P6434 Probes

The TMS MC2 Logic Board Adapter 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*.

Assembling the Probe Adapter

The TMS MC2 probe adapter assembly consists of one board, the Logic board.



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

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

To assemble the probe adapter, follow these steps:

1. To discharge any static electricity, touch the ground connector located on the logic analyzer. Then, before you remove the probe adapter circuit boards from their protective bags, touch each bag to discharge stored static electricity.
2. Align the Logic board connector pins with the connector pins on the connecting circuit board, and press firmly to seat the board connector (see Figure 1–1). Both connectors are polarized and will only mate in one orientation.

NOTE. To ensure a reliable electrical connection between the Logic board and the connecting circuit board, the 190-pin mictor connector must be completely seated at both ends (see Figure 1–1).

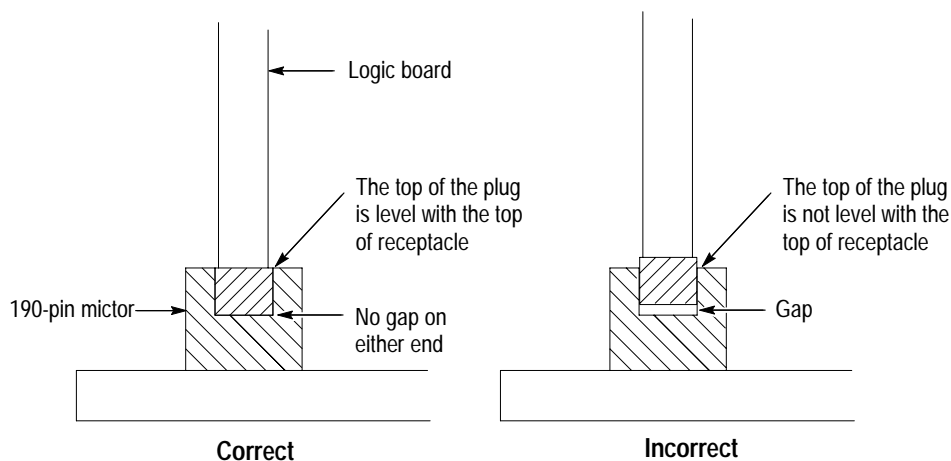


Figure 1–1: Seating the 190-pin mictor connector

3. Align the mounting brackets on the logic board with the mounting holes on the connecting circuit board (see Figure 1–2).
4. Attach and tighten the screws (not provided with this product) (see Figure 1–2).

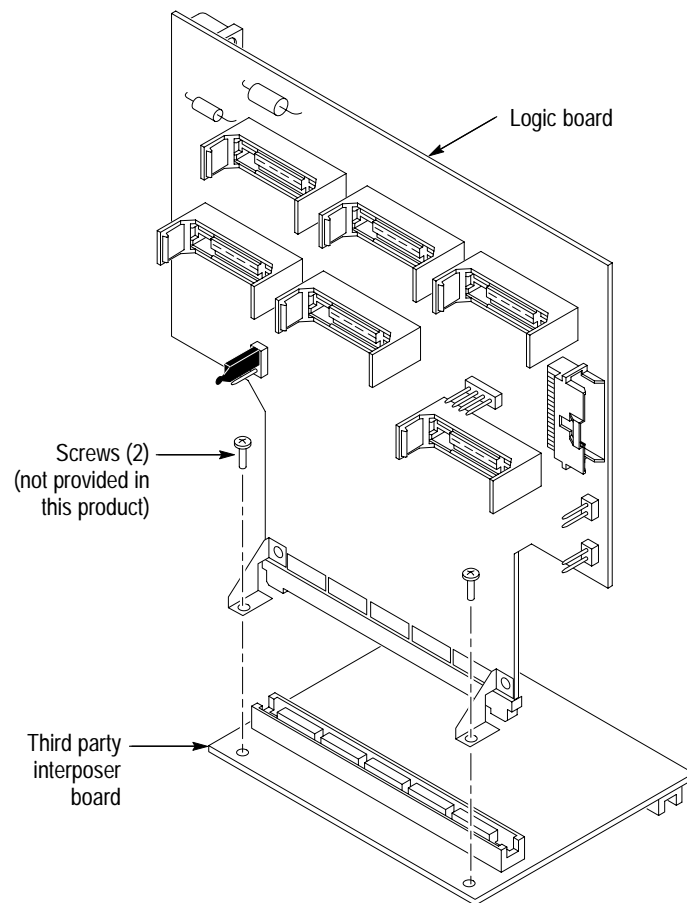


Figure 1–2: Attaching the Logic board to the 190-pin connector

Configuring The Probe Adapter

The probe adapter uses jumpers to acquire data for disassembly or for timing. Figure 1–3 shows the location of the jumpers.

TIMING/NORMAL Jumper

Place the TIMING/NORMAL jumper, J600, in the NORMAL position to acquire and disassemble data.

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

Figure 1–3 shows the location of J600 on the probe adapter.

MFG_TEST Jumper

To acquire data at frequencies below 40 MHz on the probe adapter, short the two pins on J512. This disables the PLL signal and buffers the BCLK signal to all clocked components.

Figure 1–3 shows the location of J512 on the probe adapter.

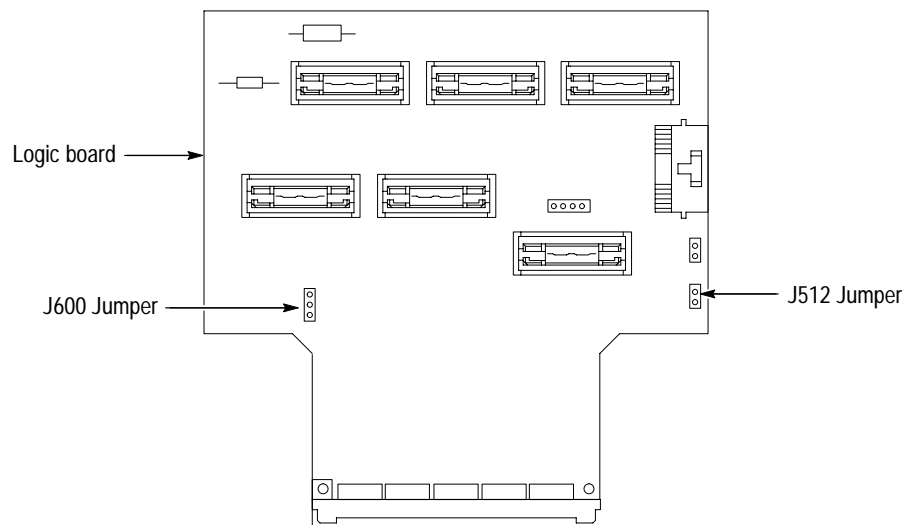


Figure 1–3: Jumper locations on the TMS MC2 probe adapter

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, the probe adapter, the probes, and the module.

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. 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. To avoid damaging the probe and probe adapter, always position the probe perpendicular to the mating connector and gently connect the probe.

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

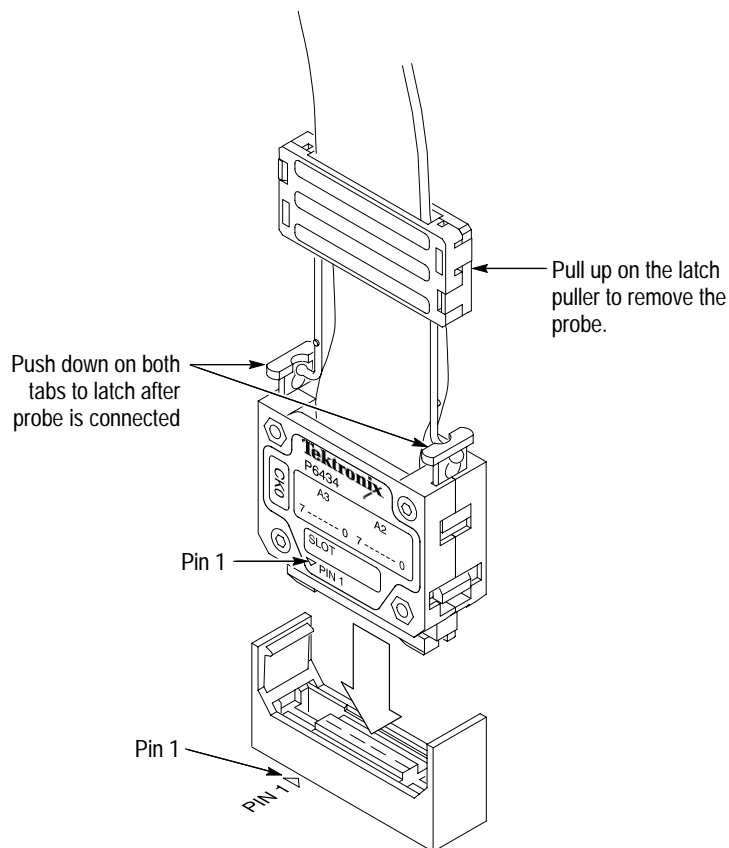


Figure 1-4: Connecting a probe to the probe adapter

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 pin 1 of the connector on the probe adapter.
6. Repeat steps 3 and 4.
7. Follow the procedure from the interposer circuit board or microprocessor vendor to remove or instal other components.

Alternate Connections

APIC Four pins on J410 are provided to connect the TMS 801 APIC bus probe adapter to the PICCLK, PICD0 and PICD1 signals for APIC bus support. The TMS 801 APIC bus probe adapter is not included with the TMS MC2 Logic Board Adapter Hardware Support package. Contact a Tektronix representative for information on how to obtain the TMS 801 APIC bus probe adapter.

Figure 1–5 shows the APIC bus signal pins for the TMS MC2 probe adapter.

NOTE. The APIC bus signals are acquired only if they are supported by the third party interposer board.

Table 1–1: APIC information

J410 pin number	Microprocessor pin number	Microprocessor signal name
1	GND	---
2	J33	PICCLK
3	L35	PICD1
4	J35	PICD0

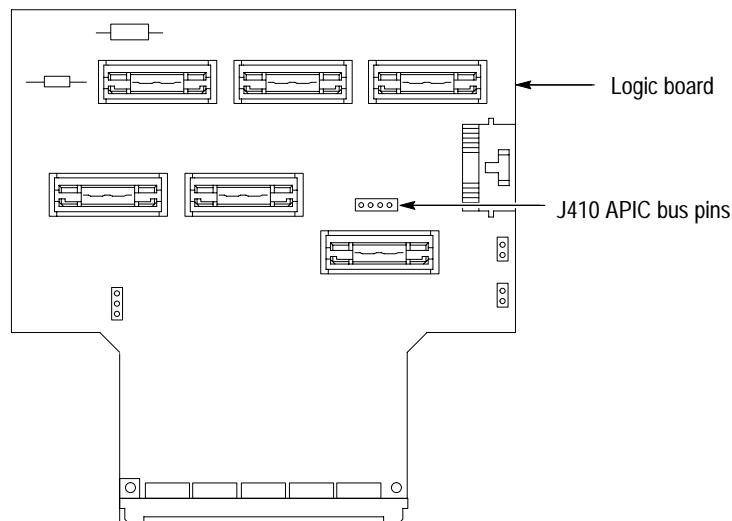


Figure 1–5: APIC bus pins location on the probe adapter

ITP The TMS MC2 probe adapter logic board provides J310 as a way to connect to In-Target Probing (ITP) debugging hardware. ITP debugging hardware is not included with the TMS MC2 Logic Board Adapter Hardware Support package. Contact your microprocessor vendor for information on how to obtain ITP debugging hardware.

NOTE. *The following ITP information is only for microprocessors with ITP circuitry.*

The ITP circuitry on the Logic board is active only when the ITP probe cable is connected to J310 and the ITP signals are supported by a third party interposer board. If the ITP probe cable is disconnected from J310, all ITP data and control lines on the logic board are tristated.

Optional System Reset. The ITP circuitry on the Logic board does not allow external ITP debugging hardware to induce a system reset through the DBRESET# signal on the ITP 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 J510.

Table 1–2: Jumper (J510) information

Pin number	ITP signal name
1	GND
2	DBRESET#

Figure 1–6 shows the location of the DBRESET# jumper and the ITP pin header on the logic board of the probe adapter.

When using ITP debugging hardware with the TMS MC2 probe adapter, the ITP signals on the system under test must be isolated from the CPU.

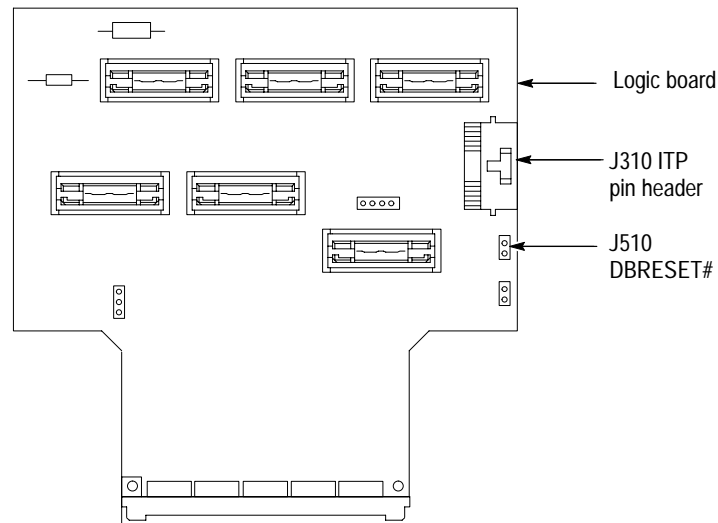


Figure 1-6: ITP pin locations on the probe adapter logic board

Applying and Removing Power

A power supply is included with the TMS MC2 Logic Board Adapter Hardware Support. The power supply provides +5 volts power to the probe adapter.

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

To apply power to the TMS MC2 probe adapter and the system under test, follow these steps:



CAUTION. To prevent damage to the probe adapter and MC2 microprocessor, use the +5 V power supply provided by Tektronix. Do not mistake another power supply that looks similar for the +5 V power supply.

1. Connect the +5 V power supply to the jack on the probe adapter. Figure 1-7 shows the location of the jack on the adapter board.



CAUTION. To prevent damage to the microprocessor 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.

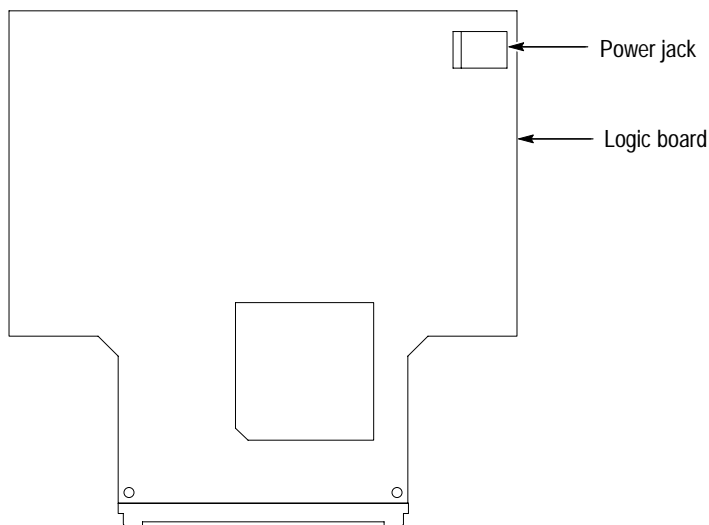


Figure 1-7: Location of the power jack

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



CAUTION. To prevent damage to the MC2 microprocessor and the system under test, power off your system under test before removing the power from the probe adapter.

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

Removing the Probe Adapter from the SUT

To remove the TMS MC2 probe adapter from the system under test, follow these steps:



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

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

1. Power off your system under test. It is not necessary to power off the logic analyzer.
2. Disconnect the probes from the probe adapter assembly. Use the latch puller to release the probes (see Figure 1-4 on page 1-8).



CAUTION. To prevent damage to the connectors carefully perform step 3.

3. Disconnect the probe adapter from the connecting board, by first removing two screws then the connecting board.
4. Place the probe adapter back into the protective bag it was shipped in.

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 1–8).

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 1–8).

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

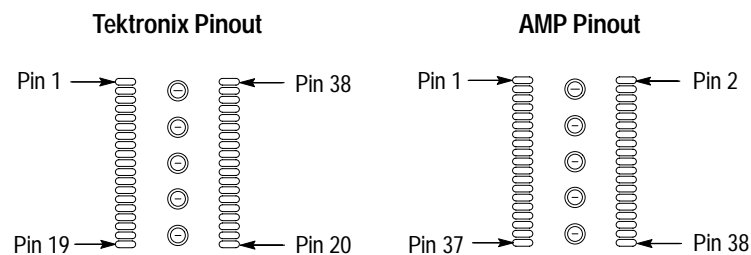


Figure 1–8: Pin assignments for a Mictor connector (component side)

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

Clock channel	CLK, QUAL, or DATA	Active CLK edge	Processor signal name
LO_CLK:3	CLK	Rising	W37
LO_CLK:2	DATA	X	--
LO_CLK:1	DATA	X	--
LO_CLK:0	--	X	--
HI_CLK:3	DATA	X	--
HI_CLK:2	DATA	X	--
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 signal name
LO_QUAL:3	--	--
LO_QUAL:2	--	--
LO_QUAL:1	DATA	AL21
LO_QUAL:0	DATA	G37
HI_QUAL:3	--	--
HI_QUAL:2	--	--
HI_QUAL:1	DATA	AN21
HI_QUAL:0	DATA	F10

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 signal name
4	7	C3:7	AE37
8	15	C3:3	C33
12	23	C2:7	A31
16	31	C2:3*	X4
5	9	C3:6	AG33
9	17	C3:2	A33
13	25	C2:6	A29
17	33	C2:2*	AK16
6	11	C3:5	A35
10	19	C3:1	C31
14	27	C2:5	C29
18	35	C2:1*	AN29
7	13	C3:4	Not Specified
11	21	C3:0	Not Specified
15	29	C2:4	Not Specified
19	37	C2:0*	DERIVED
35	8	C1:7	DERIVED
31	16	C1:3	DERIVED
27	24	C0:7	DERIVED
23	32	C0:3	Not Specified

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 signal name
34	10	C1:6	DERIVED
30	18	C1:2	DERIVED
26	26	C0:6	DERIVED
22	34	C0:2	DERIVED
33	12	C1:5	AH30
29	20	C1:1	DERIVED
25	28	C0:5	DERIVED
21	36	C0:1	DERIVED
32	14	C1:4	DERIVED
28	22	C1:0	DERIVED
24	30	C0:4	DERIVED
20	38	C0:0	AK26

* Signal is active low

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 signal name
4	7	A3:7	E25
5	9	A3:6	A27
6	11	A3:5	C19
7	13	A3:4	A25
8	15	A3:3	A23
9	17	A3:2	A19
10	19	A3:1	A21
11	21	A3:0	C13
12	23	A2:7	A13
13	25	A2:6	D12
14	27	A2:5	C11
15	29	A2:4	D10
16	31	A2:3	C15
17	33	A2:2	C7
18	35	A2:1	D8
19	37	A2:0	F6

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

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor signal name
35	8	A1:7	C23
34	10	A1:6	F16
33	12	A1:5	C27
32	14	A1:4	C25
31	16	A1:3	C21
30	18	A1:2	C17
29	20	A1:1	A17
28	22	A1:0	D16
27	24	A0:7	D14
26	26	A0:6	A15
25	28	A0:5	A11
24	30	A0:4	C9
23	32	A0:3	A7
22	34	A0:2	A9
21	36	A0:1	C1
20	38	A0:0	B2

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 signal name
4	7	D3:7	A5
5	9	D3:6	A3
6	11	D3:5	E1
7	13	D3:4	E3
8	15	D3:3	F8
9	17	D3:2	H6
10	19	D3:1	P4
11	21	D3:0	L3

Table 1-7: CPU to Mictor connections for Mictor D pins (high) (cont.)

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor signal name
12	23	D2:7	R4
13	25	D2:6	U3
14	27	D2:5	Q1
15	29	D2:4	J1
16	31	D2:3	T6
17	33	D2:2	S3
18	35	D2:1	M6
19	37	D2:0	T4
35	8	D1:7	C5
34	10	D1:6	J3
33	12	D1:5	F12
32	14	D1:4	K6
31	16	D1:3	G3
30	18	D1:2	G1
29	20	D1:1	H4
28	22	D1:0	L1
27	24	D0:7	M4
26	26	D0:6	Q3
25	28	D0:5	N3
24	30	D0:4	P6
23	32	D0:3	S1
22	34	D0:2	U1
21	36	D0:1	N1
20	38	D0:0	W1

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 signal name
4	7	C3:7	AN11
8	15	C3:3	AN23
12	23	C2:7	AN13
16	31	C2:3	AL11
5	9	C3:6	AH14

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

Tektronix Mictor A pin number	AMP Mictor A pin number	LA channel	Processor signal name
9	17	C3:2	AK20
13	25	C2:6	AL27
17	33	C2:2	AK24
6	11	C3:5	AN17
10	19	C3:1	AN27
14	27	C2:5	AK28
18	35	C2:1	AN31
7	13	C3:4	AL13
11	21	C3:0	AN15
15	29	C2:4	NOT SPECIFIED
19	37	C2:0	NOT SPECIFIED
35	8	C1:7	AF4
31	16	C1:3	W3
27	24	C0:7	AC1
23	32	C0:3	X6
34	10	C1:6	AH22
30	18	C1:2	AH26
26	26	C0:6	AN19
22	34	C0:2	AL23
33	12	C1:5	V4
29	20	C1:1	AL17
25	28	C0:5	AL25
21	36	C0:1	AN25
32	14	C1:4	AL19
28	22	C1:0	AH18
24	30	C0:4	AH16
20	38	C0:0	AK18

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 signal name
4	7	A3:7	AD4
5	9	A3:6	AA3
6	11	A3:5	Z4
7	13	A3:4	AK6
8	15	A3:3	AA1
9	17	A3:2	Y3
10	19	A3:1	AF6
11	21	A3:0	AB4
12	23	A2:7	AB6
13	25	A2:6	AE3
14	27	A2:5	AJ1
15	29	A2:4	AC3
16	31	A2:3	AG3
17	33	A2:2	Z6
18	35	A2:1	AE1
19	37	A2:0	AN7
35	8	A1:7	AL5
34	10	A1:6	AK14
33	12	A1:5	AL7
32	14	A1:4	AN5
31	16	A1:3	AK10
30	18	A1:2	AH6
29	20	A1:1	AL9
28	22	A1:0	AH10
27	24	A0:7	AL15
26	26	A0:6	AN9
25	28	A0:5	AH8
24	30	A0:4	AH12
23	32	A0:3	DERIVED
22	34	A0:2	DERIVED
21	36	A0:1	DERIVED
20	38	A0:0	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 signal name
4	7	D3:7	DERIVED
5	9	D3:6	DERIVED
6	11	D3:5	DERIVED
7	13	D3:4	DERIVED
8	15	D3:3	AN37
9	17	D3:2	AH28
10	19	D3:1	M36
11	21	D3:0	J35
12	23	D2:7	J37
13	25	D2:6	C35
14	27	D2:5	W37
15	29	D2:4	AG35
16	31	D2:3	AL33
17	33	D2:2	AM35
18	35	D2:1	AE33
19	37	D2:0	E37
35	8	D1:7	AE35
34	10	D1:6	AC35
33	12	D1:5	AG37
32	14	D1:4	AK32
31	16	D1:3	AN33
30	18	D1:2	L37
29	20	D1:1	J33
28	22	D1:0	G33
27	24	D0:7	L35
26	26	D0:6	E35
25	28	D0:5	Y1
24	30	D0:4	AJ35
23	32	D0:3	B36
22	34	D0:2	E31
21	36	D0:1	E29
20	38	D0:0	NOT SPECIFIED



Specifications

Specifications

This chapter contains information regarding the specifications of the TMS MC2 Logic Board Adapter Hardware Support.

Circuit Description

The following is a description of Signal Probing.

Signal Probing The TMS MC2 probe adapter uses series isolation to acquire data. For unlatched signals, the probe adapter acquires data through series isolation resistors. For the latched signals, the probe adapter acquires data through series isolation resistors in parallel with GTL+ latches after the resistors.

Probe Adapter Loading Diagrams

Figures 2–1 through 2–4 are provided for loading reference.

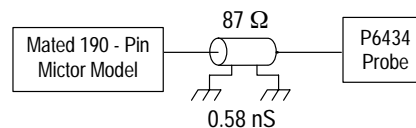


Figure 2–1: TMS MC2 signals without active loads

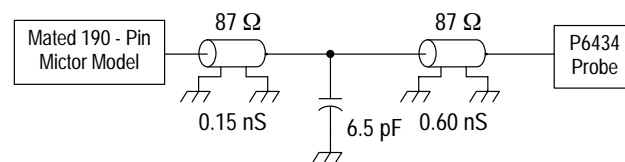


Figure 2–2: TMS MC2 signals with active loads

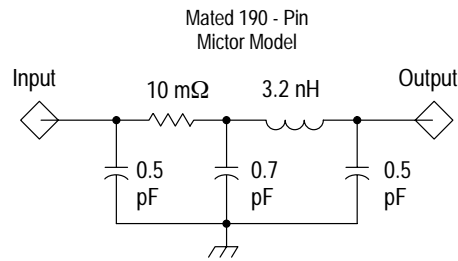


Figure 2-3: Detail of TMS MC2 sockets and 190-pin mictor connector.

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 ₀ (impedance)	75 Ω

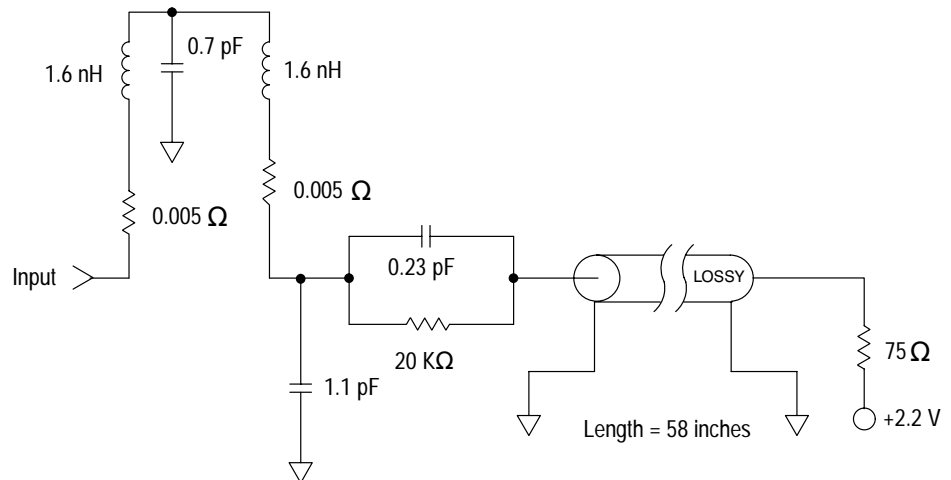


Figure 2-4: Equivalent circuit for the P6434 probe

Specification Tables

These specifications are for a probe adapter connected between a compatible Tektronix logic analyzer and a system under test. 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. Table 2–3 lists the electrical requirements for the power supply that provides power to the TMS MC2 probe adapter. Table 2–4 lists the environmental specifications. Table 2–5 lists the BCLK timing restrictions and electrical specifications.

Table 2–2: Electrical specifications for the system under test

Characteristics	Requirements		
System under test DC power requirements			
Voltage, VCC_1.5V	1.5 V \pm 9 %		
Current, VCC_1.5V	I maximum 35 mA, I typical 1.8 mA		
Voltage, VREF6	1.0 V \pm 2 %		
Current, VREF6	I maximum <1 mA, I typical <1 mA		
Voltage, VCC_CMOS (1.5 V) ¹	1.5 V \pm 9 %		
Current, VCC_CMOS (1.5 V) ¹	I maximum 20 mA, I typical 0.9 mA		
Voltage, VCC_CMOS (2.5 V) ¹	2.5 V \pm 5 %		
Current, VCC_CMOS (2.5 V) ¹	I maximum 35 mA, I typical 1.4 mA		
System under test clock rate	Maximum 100 MHz		
System under test tested clock rate	Maximum 66 MHz		
Minimum setup time required, all signals	2.8 ns		
Minimum hold time required, all signals	0.2 ns		
Measured typical SUT signal loading	Specification		
	AC load	DC load	
	All latched signals: INIT#, BREQ0#, REQ4#, RESET#, ADS#, RS0#, RS1#, RS2#, HIT#, HITM#, DRDY#, BNR#, A3#, A8# – A15#,	8 pF	74GTL16622 in parallel with 20 k Ω
	BCLK	2.6 pF	AD8009
	All other signals	2.5 pF	20 k Ω

¹ The VCC_CMOS supply voltage can be either 1.5. V or 2.5 V depending on the CMOS I/O voltage level of the target microprocessor.

Table 2–3: Electrical specifications for the AC adapter

Characteristic	Description
Input Voltage rating	90 – 265 V CATII
Input Frequency Rating	47 – 63 Hz
Maxium Input current	1.1 A at 100 V AC
Output Voltage Rating	5 V
Output Current Rating	5 A
Output Power Rating	25 W

Table 2–4: Environmental specifications

Characteristic	Description ¹
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
Altitude	
Operating	4.5 km (15,000 ft) maximum
Nonoperating	15 km (50,000 ft) maximum
Electrostatic immunity	The probe adapter is static sensitive

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

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

Table 2–5: 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 TMS MC2 probe adapter.

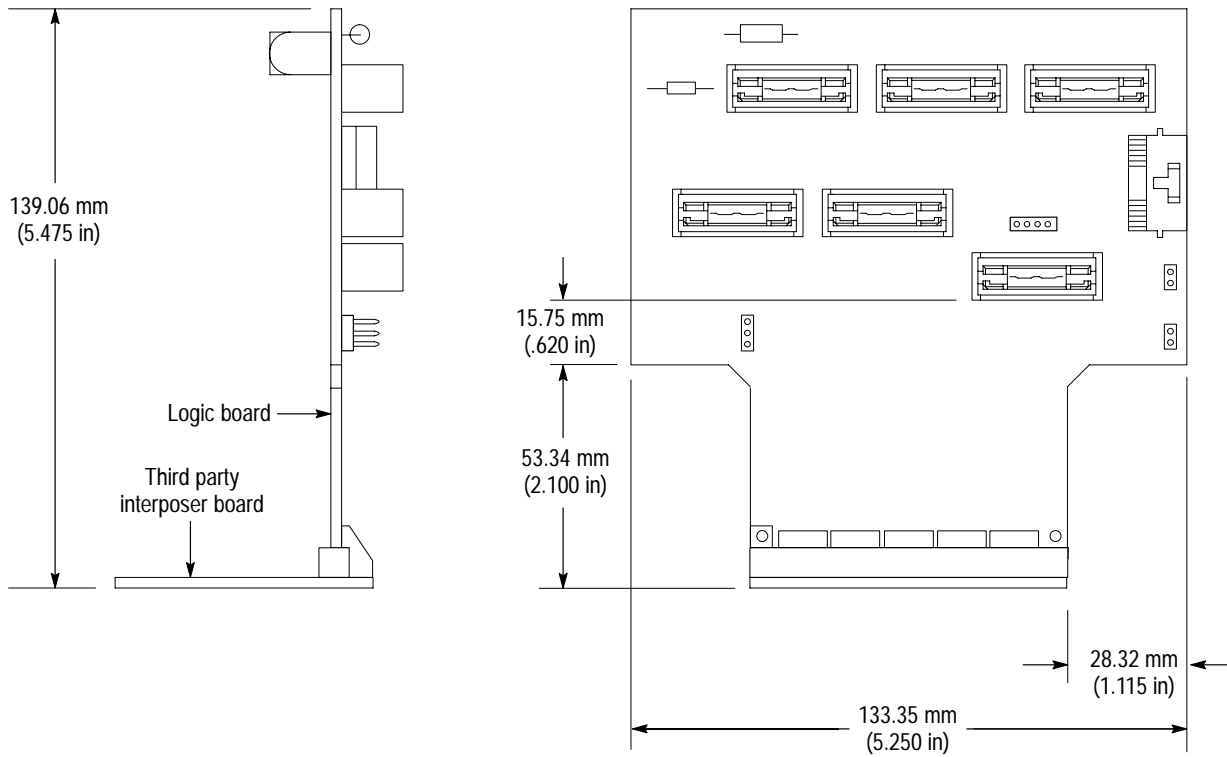


Figure 2-5: Dimensions of the TMS MC2 probe adapter

WARNING

The following servicing instructions are for use only by qualified personnel. To avoid injury, do not perform any servicing other than that stated in the operating instructions unless you are qualified to do so. Refer to all safety summaries before performing any service.



Maintenance

Maintenance

This section contains information on replacing the TMS MC2 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 illustrates the location of the fuse on the TMS MC2 probe adapter. See the *Replaceable Mechanical Parts* chapter for part descriptions.

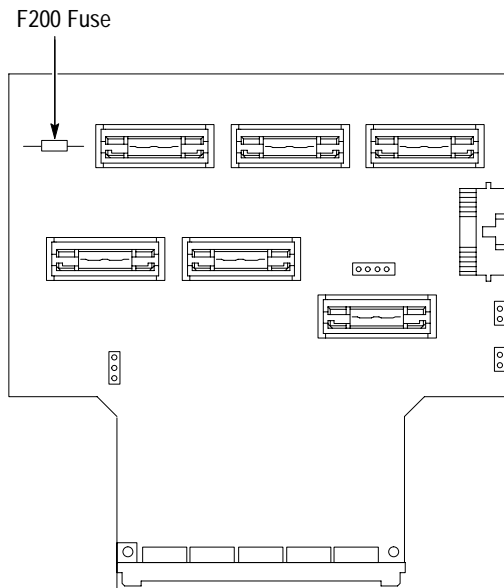


Figure 3-1: Fuse location on the TMS MC2 probe adapter



Replaceable Mechanical Parts

Replaceable Mechanical Parts

This chapter contains a list of the replaceable mechanical components for the TMS MC2 Logic Board Adapter 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 Mechanical Parts List

The tabular information in the Replaceable Mechanical 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

Mfr. code	Manufacturer	Address	City, state, zip code
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
5Y400	TRIAx METAL PRODUCTS INC	1880 SW MERLO DRIVE	BEAVERTON, OR 97006
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 mechanical 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	671-4707-00			1	CIRCUIT BD ASSY:370 PIN PPGA,SOCKETED LOGIC BD,TMS112 OPT 03	80009	671-4707-00
-2	131-6610-00			1	JACK,POWER DC:PCB,MALE,RTANG,2MM PIN DIA,BRASS,SILVER PLATE,5A,	82389	RAPC722TB
-3	131-1857-00			1	CONN,HDR: PCB, MALE, STR, 1 X 36, 0.1 CTR, 0.230 MLG X 0.100 TAIL, GOLD	22526	65507-136
-4	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
-5	131-4917-00			2	CONN,HDR: PCB, MALE, STR,1 X 2, 0.1 CTR, 0.235 MLG X 0.110 TAIL, 30 GOLD, TUBE, HIGH TEMP	00779	104350-1
-6	103-0420-00			1	CIRCUIT BD ASSY: ADAPTER SWIZZLE BD;TMSMC2 OPT.11	0KVL1	C2507
-7	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
-8	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
-9	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
10	131-6134-01			6	CONN,PLUG:SMD,MICTOR,PCB,FEMALE,STR,38 POS,0.025 CTR,0.245 H,GOLD,TLA7QS	00779	767054-1
-11	159-0059-00			1	FUSE,WIRE LEAD:5A,125V	61857	SPI-5A
					STANDARD ACCESSORIES		
	071-0613-00			1	MANUAL,TECH MPROBE, HARDWARE;TMSMC2	TK2548	071-0613-00
	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
	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
					OPTIONAL ACCESSORIES		
	-----*			6	P6434 MASS TERMINATION PROBE, Opt 21 *	80009	ORDER BY DESCRIPTION

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

Replaceable mechanical parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discontinued	Qty	Name & description	Mfr. code	Mfr. part number
	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),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

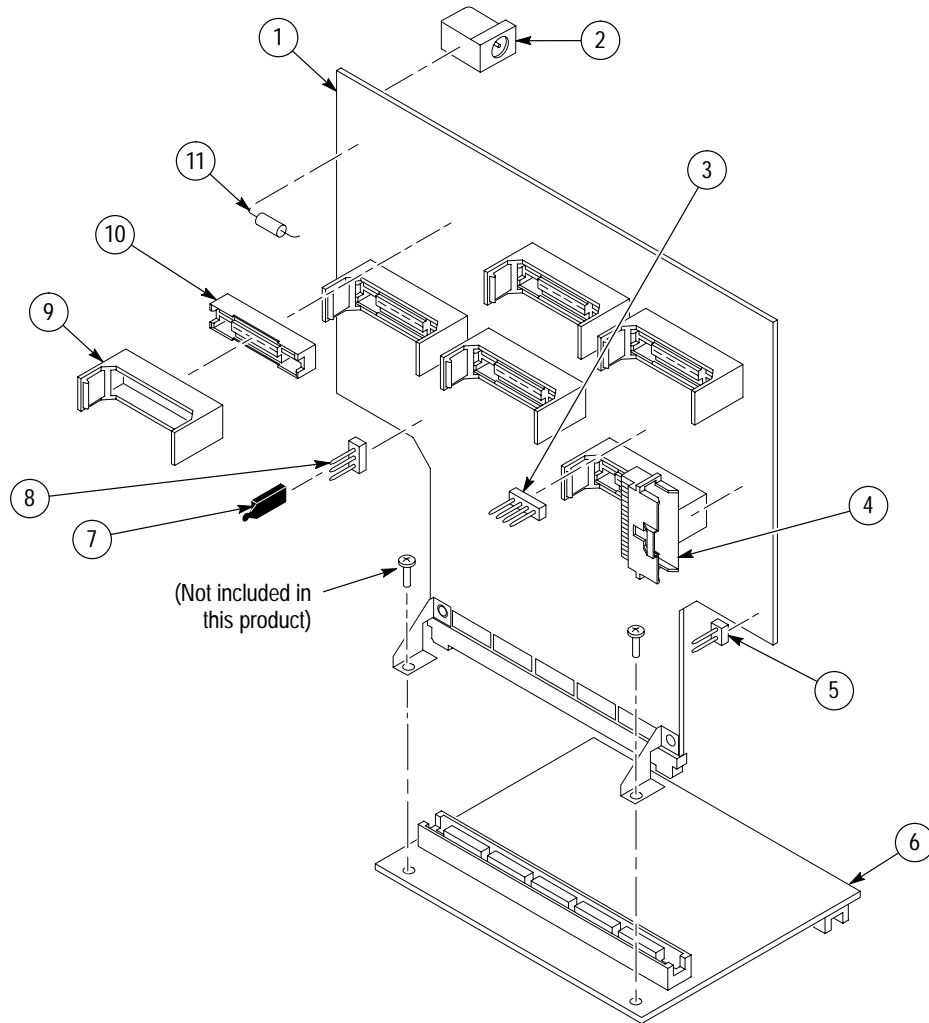


Figure 4-1: TMS MC2 probe adapter exploded view



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