Instruction Manual

Tektronix

TMS 142
8XC196 N-Series Microcontroller Support

070-9815-00

There are no current European directives that apply to this product. This product provides cable and test lead connections to a test object of electronic measuring and test equipment.

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.

Printed in the U.S.A.

Tektronix, Inc., P.O. Box 1000, Wilsonville, OR 97070–1000

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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.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and marking 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:

WARNING
High Voltage

Protective Ground
(Earth) Terminal

CAUTION
Refer to Manual

Double
Insulated

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, disconnect the main power by means of the power cord or, if provided, the power switch.

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: Microcontroller Support Documentation

This instruction manual contains specific information about the TMS 142 8XC196 N-Series microcontroller 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 microcontroller support packages on the logic analyzer for which the TMS 142 8XC196 N-Series support was purchased, you will probably only need this instruction manual to set up and run the support.

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

Information on basic operations of microcontroller support packages is included with each product. Each logic analyzer has basic information that describes how to perform tasks common to supports on that platform. This information can be in the form of online help, an installation manual, or a user manual.

This manual provides detailed information on the following topics:

- Connecting the logic analyzer to the system under test
- Setting up the logic analyzer to acquire data from the system under test
- Acquiring and viewing disassembled data
- Using the probe adapter

Manual Conventions

This manual uses the following conventions:

- The term “disassembler” refers to the software that disassembles bus cycles into instruction mnemonics and cycle types.
- The phrase “information on basic operations” refers to online help, an installation manual, or a basic operations of microcontroller supports user manual.
- In the information on basic operations, the term “XXX” or “P54C” used in field selections and file names must be replaced with “196NX”. This is the name of the microcontroller in field selections and file names you must use to operate the 8XC196 N-Series support.

- The term “system under test (SUT)” refers to the microcontroller-based system from which data will be acquired.
- The term “logic analyzer” refers to the Tektronix logic analyzer for which this product was purchased.
- The term “module” refers to a 102/136-channel or a 96-channel module.
- “196NX” refers to all supported variations of the 8XC196 N-Series microcontroller unless otherwise noted.
- An asterisk (*) following a signal name indicates an active low signal.

Logic Analyzer Documentation

A description of other documentation available for each type of Tektronix logic analyzer is located in the corresponding module user manual. The manual set provides the information necessary to install, operate, maintain, and service the logic analyzer and associated products.

Contacting Tektronix

Product Support	For application-oriented questions about a Tektronix measurement product, 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 Or, contact us by e-mail: tm_app_supp@tek.com For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Contact your local Tektronix distributor or sales office. Or, visit our web site for a listing of worldwide service locations. http://www.tek.com
For other information	In North America: 1-800-TEK-WIDE (1-800-835-9433) An operator will direct your call.
To write us	Tektronix, Inc. P.O. Box 1000 Wilsonville, OR 97070-1000

Getting Started

Getting Started

This chapter provides information on the following topics and tasks:

- A description of the TMS 142 microcontroller support package
- Logic analyzer software compatibility
- Logic analyzer and probe adapter configuration
- Requirements and restrictions
- How to connect to the System Under Test (SUT)
- Applying and removing power

Support Description

The TMS 142 microcontroller support package disassembles data from systems that are based on the Intel 8XC196 N-Series microcontroller. The support runs on a compatible Tektronix logic analyzer equipped with a 102/136-channel module or a 96-channel module.

Refer to information on basic operations to determine how many modules and probes your logic analyzer needs to meet the minimum channel requirements for the TMS 142 microcontroller support.

Table 1–1 shows which microcontrollers, packages, and clock rates the TMS 142 supports.

Table 1–1: Supported microcontrollers

Microcontroller	Package	Clock rate
8XC196NP	QFP	25 MHz
8XC196NT	PLCC	20 MHz

A complete list of standard and optional accessories is provided at the end of the parts list in the *Replaceable Mechanical Parts* chapter.

To use this support efficiently, you need to have the items listed in the information on basic operations as well as the *8XC196 N-Series Microcontroller User's Manual*, Intel, 1994.

Information on basic operations also contains a general description of supports.

Logic Analyzer Software Compatibility

The label on the microcontroller support floppy disk states which version of logic analyzer software the support is compatible with.

Logic Analyzer Configuration

To use the 8XC196 N-Series support, the Tektronix logic analyzer must be equipped with either a 102/136-channel module, or a 96-channel module at a minimum. The module must be equipped with enough probes to acquire channel and clock data from signals in your 8XC196 N-Series-based system.

Refer to information on basic operations to determine how many modules and probes the logic analyzer needs to meet the channel requirements.

Requirements and Restrictions

You should review the general requirements and restrictions of microcontroller supports in the information on basic operations as they pertain to your SUT.

You should also review electrical, environmental, and mechanical specifications in the *Specifications* chapter in this manual as they pertain to your system under test, as well as the following descriptions of other 8XC196 N-Series support requirements and restrictions.

System Clock Rate. The TMS 142 support can acquire data from the 8XC196NP microcontroller at speeds of up to 25 MHz[1] and the 8XC196NT microcontroller at speeds of up to 20 MHz[1].

SUT Power. Whenever the SUT is powered off, be sure to remove power from the probe adapter. Refer to *Applying and Removing Power* at the end of this chapter for information on how to remove power from the probe adapter.

Hardware Reset. If a hardware reset occurs in your 8XC196 N-Series system during an acquisition, the disassembler might acquire an invalid sample.

Idle or Power Down Modes. When the 8XC196 N-Series-based system enters an Idle or Power Down mode, the logic analyzer displays a Slow Clock message and stops the Acquisition until the SUT reverts back to the original state.

1 **Specification at time of printing. Contact your Tektronix sales representative for current information on the fastest devices supported.**

Internal EPROM. The support cannot acquire and disassemble data from systems executing code in the internal EPROM.

Internal ROM: DAS/TLA Only. If the logic analyzer is set up to trigger on code executed immediately after code in Internal ROM, the code will not be visible or acquired.

For example, if the code is executing from 003000h and the trigger is defined as that address, the logic analyzer will not see or acquire the sample. To acquire data following 003000h, you can define the logic analyzer to trigger on 003001h.

8XC196NT Signal Configuration. The support requires a specific configuration for some signals in your 8XC196NT-based system as shown in Table 1–2.

Table 1–2: 8XC196NT signal configuration

Possible function	Required function	Possible function	Required function
AD7-AD0 / P3.7-P3.0 / PBUS7-PBUS0 / SLP7-SLP0	AD7-AD0	BUSWIDTH / P5.7	BUSWIDTH
AD15-AD8 / P4.7-P4.0 / PBUS15-PBUS8	AD15-AD8	INST / P5.1 / SLPCS*	INST
ALE/ ADV* / P5.0 / SLPADDR / SLPALE	ALE / ADV*	RD* / P5.3 / SLPRD*	RD*
BHE* / WRH* / P5.7	BHE* / WRH*	WR* / WRL* / P5.2 / SLPWR*	WR* / WRL*

Programming Modes. The support cannot disassemble data from 8XC196NT systems operating in the following programming modes: Auto Programming, Slave Programming, Serial Programming, or ROM Dump programming.

DMA and ONCE Modes. The support cannot disassemble data from 8XC196NT systems operating in DMA or ONCE modes.

Configuring the Probe Adapter

There are two jumpers on the probe adapter. One is set to power the probe adapter from the SUT or an alternate power supply. The second is set to match the strobe mode of the 8XC196 N-Series microcontroller.

Power Source Jumper

The Power Source jumper (J210 on the 8XC196NP probe adapter or J310 on the 8XC196NT probe adapter) must be placed in the INT position if you have a +5 V microcontroller and the probe adapter will be powered from the SUT.

If your SUT has a +3 V microcontroller or you do not want your SUT to provide power to the probe adapter, you can use an alternate power source. If you use an alternate power source, you must place the Power Source jumper to the EXT position.

For more information on using an alternate power source, refer to *Applying and Removing Power* in this chapter.

Figure 1–1 shows the location of the Power Source jumper, J210 or J310.

Strobe Mode Jumper

The Strobe Mode jumper (J430 on the 8XC196NP probe adapter or J331 on the 8XC196NT probe adapter) should be placed in the WR_STB position if your SUT is configured to run in Write strobe mode or in the STD_WR if your SUT is configured to run in Standard Write Control mode.

Figure 1–1 shows the location of the Strobe Mode jumper, J331 or J430.

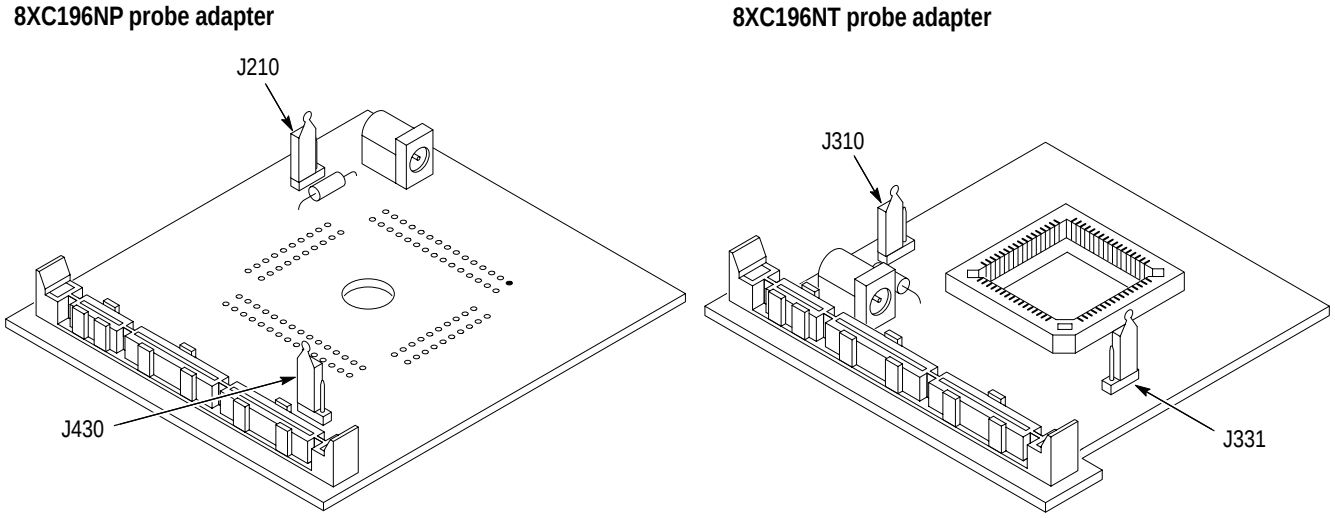


Figure 1–1: Jumper locations

Connecting to a System Under Test

Before you connect to the SUT, you must connect the probes to the module. Your SUT must also have a minimum amount of clear space surrounding the microcontroller to accommodate the probe adapter. Refer to the *Specifications* chapter in this manual for the required clearances.

The channel and clock probes shown in this chapter are for a 102/136-channel module. The probes will look different if you are using a 96-channel module.

The general requirements and restrictions of microcontroller supports in the information on basic operations shows the vertical dimensions of a channel or clock probe connected to square pins on a circuit board.

8XC196NT Probe Adapter

To connect the logic analyzer to a SUT using the 8XC196NT probe adapter and a high-density probe, follow these steps:

1. Turn off power to your SUT. It is not necessary to turn off the logic analyzer.

CAUTION. *Static discharge can damage the microcontroller, the probe adapter, the acquisition probes, or the module. To prevent static damage, handle all of the above only in a static-free environment.*

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

2. To discharge your stored static electricity, touch the ground connector located on the back of the logic analyzer. Then, touch the black foam on the underside of the probe adapter to discharge stored static electricity from the probe adapter.
3. Remove the microcontroller from your SUT.
4. Line up the pin 1 indicator on the microcontroller with pin 1 of the PLCC socket on the probe adapter.

CAUTION. *Failure to correctly place the microcontroller into the probe adapter might permanently damage all electrical components once power is applied.*

5. Place the microcontroller into the probe adapter as shown in Figure 1–2.

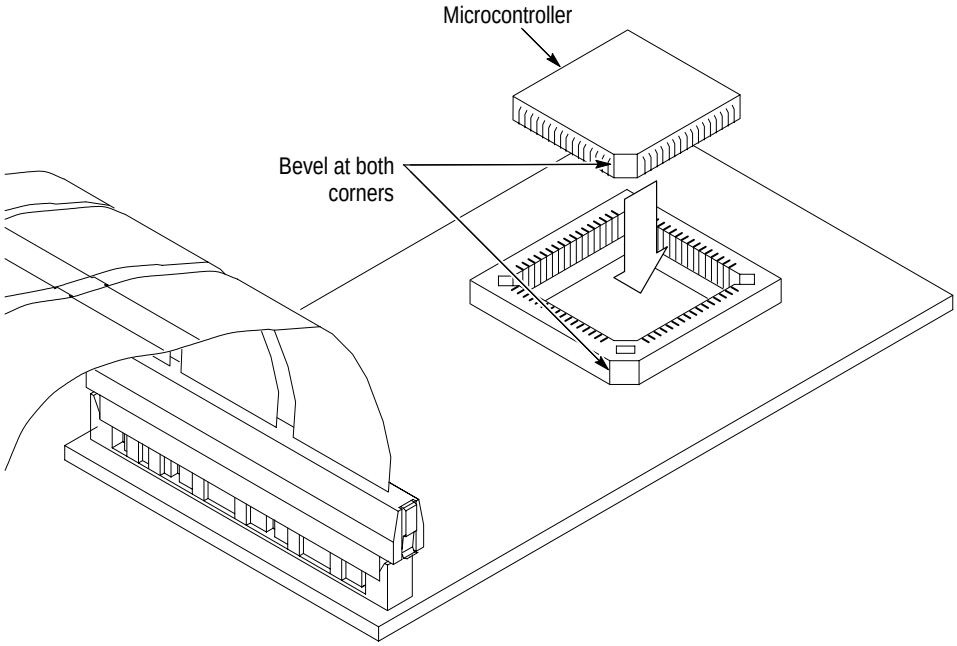


Figure 1–2: Placing a microcontroller into a PLCC probe adapter

6. Remove the black foam from the underside of the probe adapter.

7. Line up the pin 1 indicator on the probe adapter board with the pin 1 indicator on the SUT.

8. Place the probe adapter onto the SUT as shown in Figure 1–3.

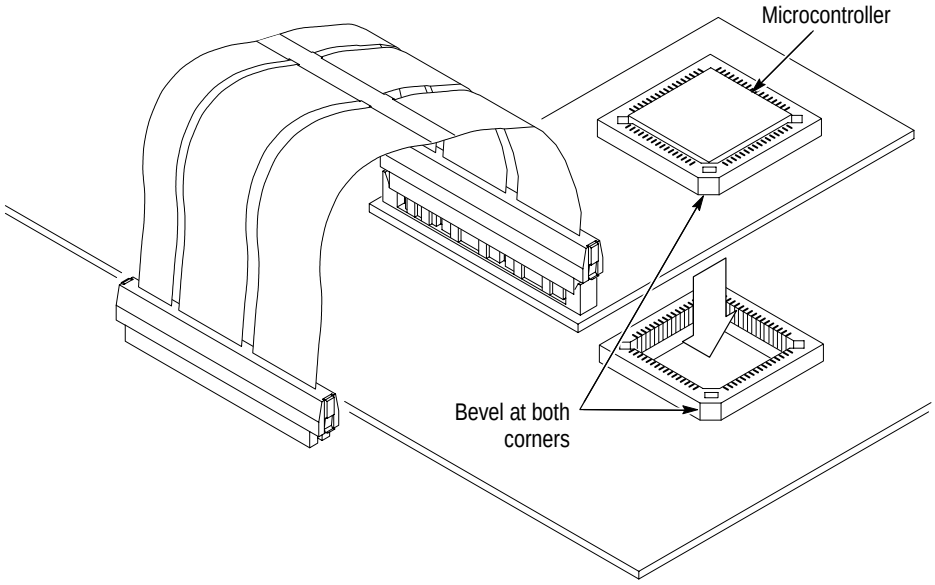


Figure 1–3: Placing a PLCC probe adapter onto the SUT

9. Connect the channel and clock probes to the high-density probe as shown in Figure 1–4. Match the channel groups and numbers on the probe labels to the corresponding pins on the high-density probe. Match the ground pins on the probes to the corresponding pins on the probe adapter.

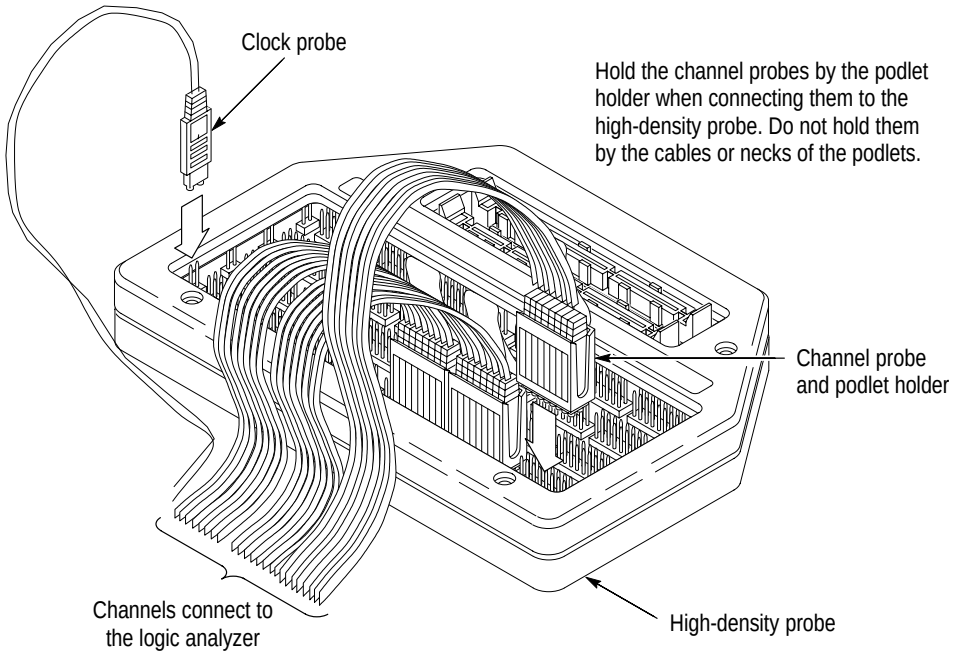


Figure 1–4: Connecting channel and clock probes to a high-density probe

10. Align pin 1 on the cable connector, the end on the narrowest cable strip of the cable, with pin 1 on the LO connector on the high-density probe. Connect the cable to the connector as shown in Figure 1–5.

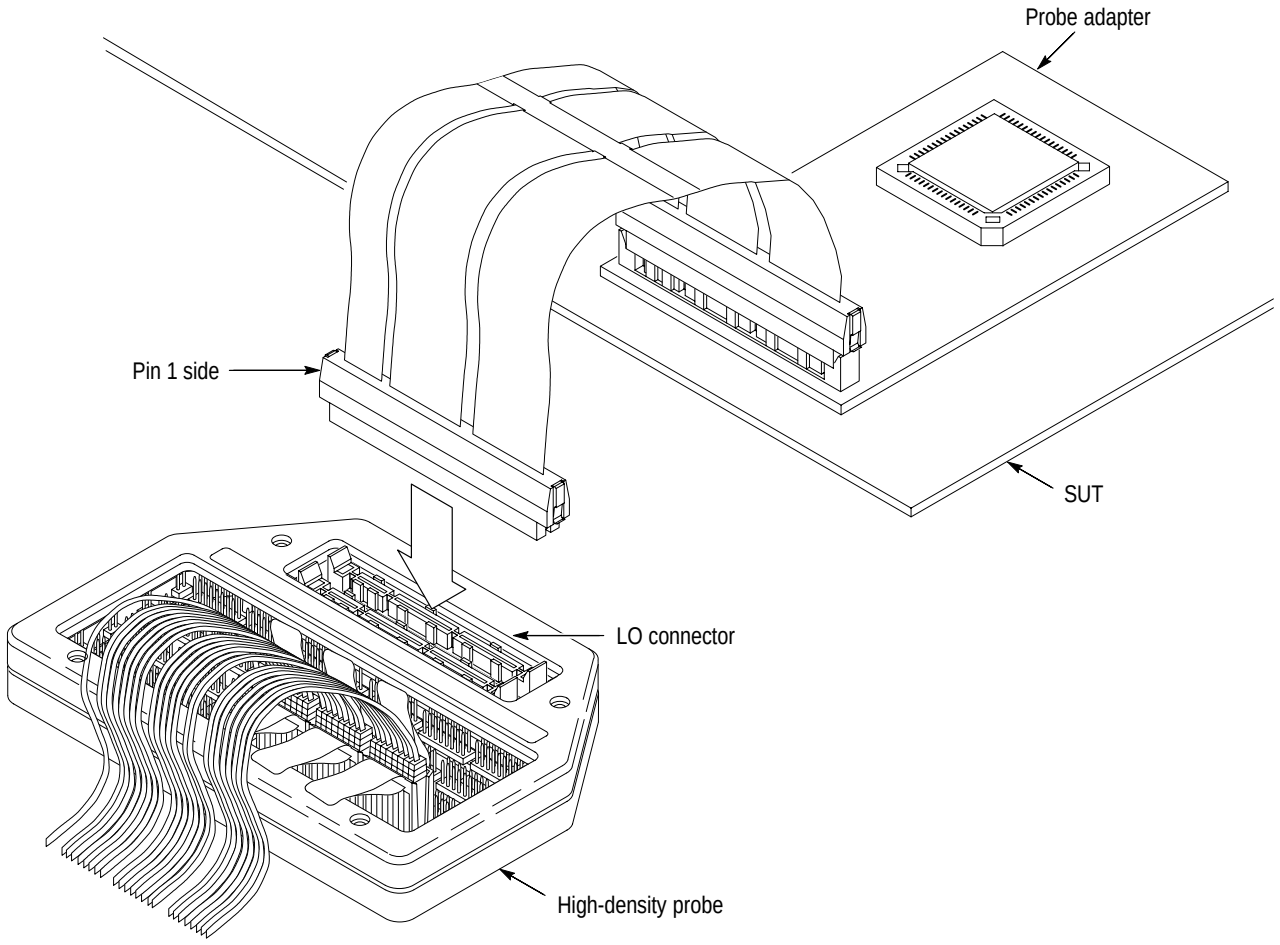


Figure 1–5: Connecting the cable to an high-density probe

8XC196NP Probe Adapter

This procedure requires thermal joint compound. To connect the logic analyzer to a SUT using the 8XC196NP probe adapter with a converter clip, follow these steps:

1. Turn off power to your SUT. It is not necessary to turn off the logic analyzer.

CAUTION. *Static discharge can damage the microcontroller, the probe adapter, the acquisition probes, or the module. To prevent static damage, handle all the above only in a static-free environment.*

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

2. To discharge your stored static electricity, touch the ground connector located on the back of the logic analyzer. Then, touch the black foam on the underside of the probe adapter to discharge stored static electricity from the probe adapter.
3. Use a magnifying glass to examine the pins of the microcontroller soldered into the SUT. Check for the following characteristics:
   a. The pins are cleanly soldered to the board without excess solder or deformity.
   b. The bends of the pins are uniform (consistant and even).
4. Remove the black foam from the underside of the probe adapter.

CAUTION. *Failure to correctly place the converter clip onto the probe adapter might permanently damage the microcontroller, probe adapter, and clip once power is applied.*

5. Line up the pin A1 indicator on the converter clip with the pin A1 indicator on the underside of the probe adapter, as shown in Figure 1–6.
6. Place the converter clip onto the probe adapter and press the clip on while slightly rocking the clip.

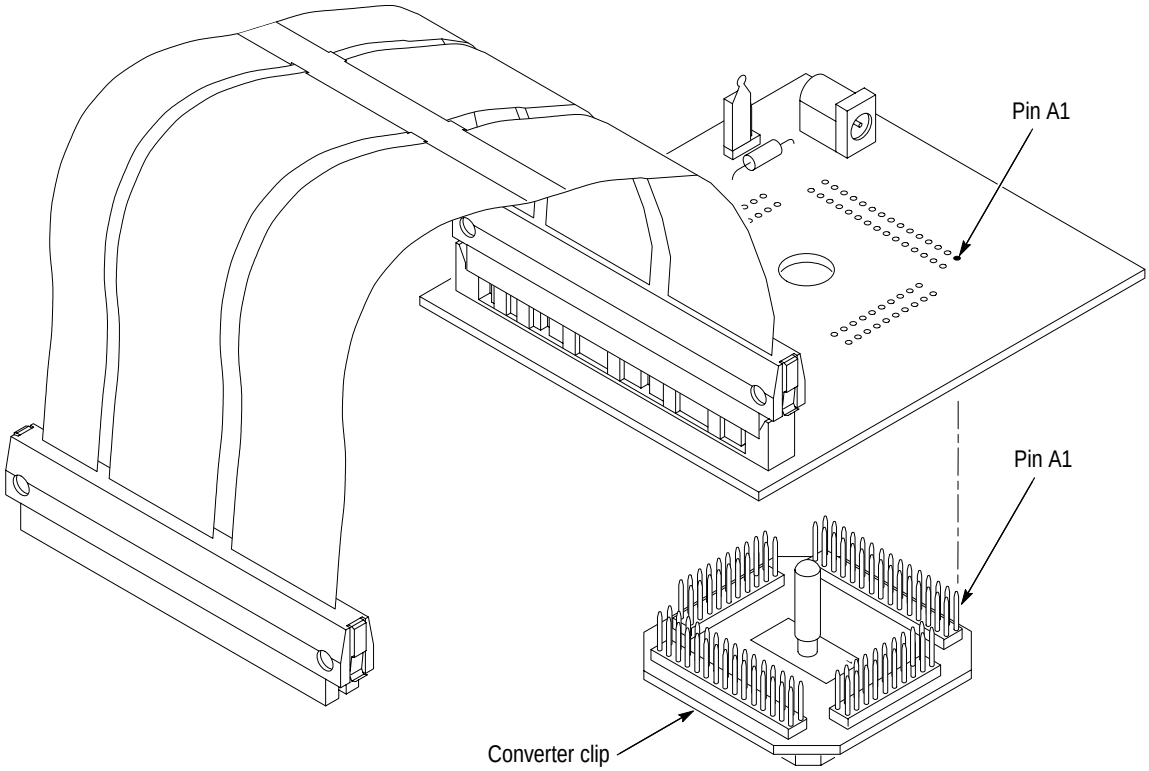


Figure 1–6: Placing the converter clip onto the probe adapter

7. Apply contact lubricant to the pins of the converter clip to improve the connection to the microcontroller.
8. Line up the pin A1 indicator on the converter clip with the pin A1 indicator on the microcontroller.
9. Hold the handle of the converter clip and place the clip onto the microcontroller as shown in Figure 1–7.
10. Gently press the converter clip onto the microcontroller while slightly rocking the clip.

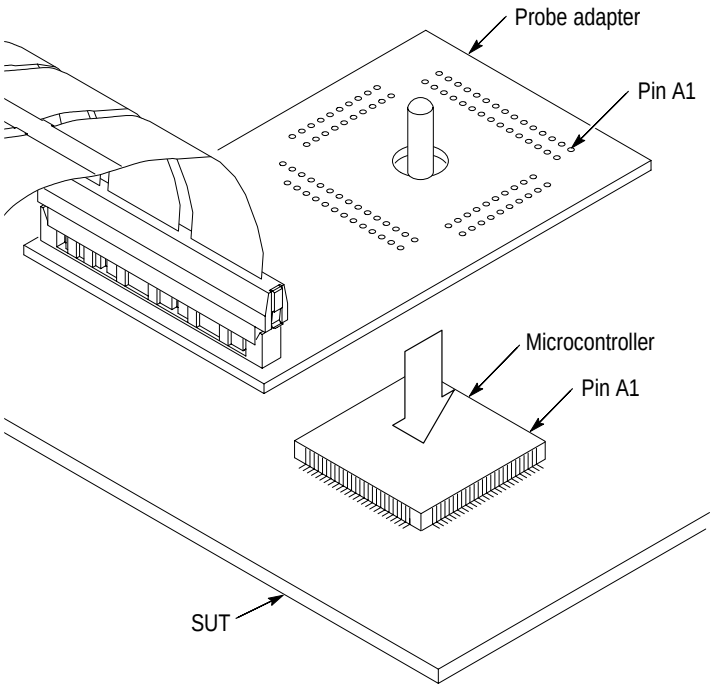


Figure 1–7: Placing a QFP probe adapter onto the microcontroller

11. Connect the channel and clock probes to the high-density probe as shown in Figure 1–8. Match the channel groups and numbers on the probe labels to the corresponding pins on the high-density probe. Match the ground pins on the probes to the corresponding pins on the probe adapter.

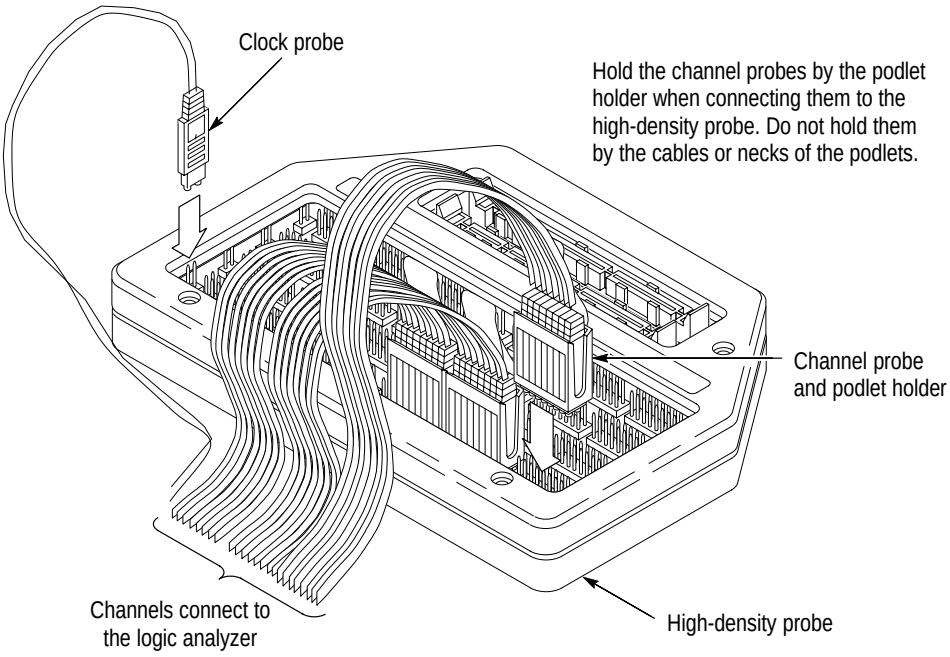


Figure 1–8: Connecting channel and clock probes to a high-density probe

12. Align pin 1 on the cable connector, the end on the narrowest cable strip of the cable, with pin 1 on the LO connector on the high-density probe. Connect the cable to the connector as shown in Figure 1–9.

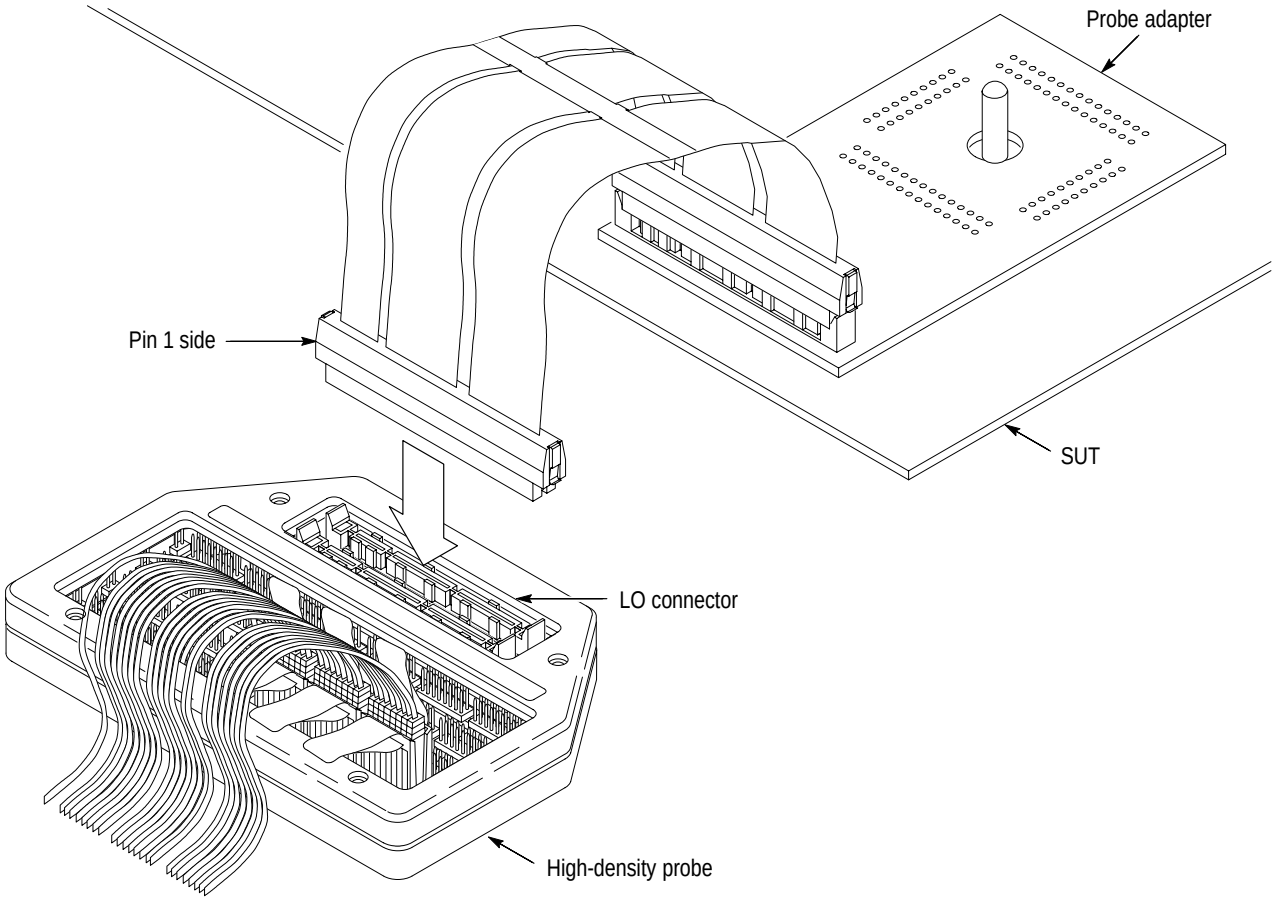


Figure 1–9: Connecting the cable to the high-density probe

Without a Probe Adapter

You can use the acquisition probes and leadsets with a commercial test clip (or adapter) to make connections between the logic analyzer and your SUT.

If you decide to connect the logic analyzer to your SUT without the TMS 142 probe adapter, you need to pay attention to the following restrictions:

- You can disassemble data from 8XC196 N-Series microcontrollers with 8-bit or 16-bit wide buses operating in Standard Write Control mode.
- You can disassemble data from 8XC196 N-Series microcontrollers with an 8-bit wide bus operating in Write Strobe mode.
- Disassembled data will be incorrect if acquired from an 8XC196NT microcontroller-based system operating in Dynamic Bus Width mode.

To connect acquisition probes to 8XC196 N-Series signals in the SUT using a test clip (or adapter), follow these steps:

1. Turn off power to your SUT. It is not necessary to turn off power to the logic analyzer.

CAUTION. *Static discharge can damage the microcontroller, the acquisition probes, or the module. To prevent static damage, handle all of the above only in a static-free environment.*

Always wear a grounding wrist strap or similar device while handling the microcontroller.

2. To discharge your stored static electricity, touch the ground connector located on the back of the logic analyzer. If you are using a test clip, touch any of the ground pins on the clip to discharge stored static electricity from it.

CAUTION. *Failure to place the SUT on a horizontal surface before connecting the test clip may permanently damage the pins on the microcontroller.*

3. Place the SUT on a horizontal static-free surface.
4. Use Table 1–3 to connect the acquisition channel probes to 8XC196 N-Series signal pins on the test clip or in the SUT.

   Use leadsets to connect at least one ground lead from each channel probe and the ground lead from each clock probe to ground pins on your test clip.

Table 1–3: 8XC196 N-Series signal connections for the channel probes

Section: channel	Connect to 8XC196NP signal	Connect to 8XC196NT signal	Section: channel	Connect to 8XC196NP signal	Connect to 8XC196NT signal
A3:7	CLKOUT†	CLKOUT†	D3:7	P3_7†	P6_7†
A3:6	CS5*	Not connected	D3:6	P3_6†	P6_6†
A3:5	CS4*	Not connected	D3:5	Not connected	P6_5†
A3:4	CS3*	Not connected	D3:4	Not connected	P6_4†
A3:3	CS2*	Not connected	D3:3	Not connected	P6_3†
A3:2	CS1*	Not connected	D3:2	Not connected	P6_2†
A3:1	CS0*	BW_L	D3:1	Not connected	P6_1†
A3:0	Not connected	P5_4†	D3:0	Not connected	P6_0†
A2:7	P4_3†	P0_7†	D2:7	P2_6†	P2_6†
A2:6	P4_2†	P0_6†	D2:6	P2_5†	P2_5†

Table 1–3: 8XC196 N-Series signal connections for the channel probes (cont.)

Section: channel	Connect to 8XC196NP signal	Connect to 8XC196NT signal	Section: channel	Connect to 8XC196NP signal	Connect to 8XC196NT signal
A2:5	P4_1†	P0_5†	D2:5	P2_4†	P2_4†
A2:4	P4_0†	P0_4†	D2:4	P2_3†	P2_3†
A2:3	A19	A19	D2:3	P2_2†	P2_2†
A2:2	A18	A18	D2:2	P2_1†	P2_1†
A2:1	A17	A17	D2:1	P2_0†	P2_0†
A2:0	A16	A16	D2:0	ALE†	ALE†
A1:7	A15	AD15	D1:7	D15	AD15
A1:6	A14	AD14	D1:6	D14	AD14
A1:5	A13	AD13	D1:5	D13	AD13
A1:4	A12	AD12	D1:4	D12	AD12
A1:3	A11	AD11	D1:3	D11	AD11
A1:2	A10	AD10	D1:2	D10	AD10
A1:1	A9	AD9	D1:1	D9	AD9
A1:0	A8	AD8	D1:0	D8	AD8
A0:7	A7	AD7	D0:7	D7	AD7
A0:6	A6	AD6	D0:6	D6	AD6
A0:5	A5	AD5	D0:5	D5	AD5
A0:4	A4	AD4	D0:4	D4	AD4
A0:3	A3	AD3	D0:3	D3	AD3
A0:2	A2	AD2	D0:2	D2	AD2
A0:1	A1	AD1	D0:1	D1	AD1
A0:0	A0	AD0	D0:0	D0	AD0
C3:7	ONCE†	ONCE†	C2:7	P1_3†	P1_3†
C3:6	RESET†	RESET†	C2:6	P1_2†	P1_2†
C3:5	NMI†	NMI†	C2:5	P1_1†	P1_1†
C3:4	READY†	READY†	C2:4	P1_0†	P1_0†
C3:3	P1_7†	P1_7†	C2:3	INST	INST
C3:2	P1_6†	P1_6†	C2:2	BHE*	BHE*
C3:1	P1_5†	P1_5†	C2:1	RD*	RD*
C3:0	P1_4†	P1_4†	C2:0	WR*	WR*
C1:7-0	Extra 92A96 channel probes only.		C0:7-0	Extra 92A96 channel probes only.	

† **Signal not required for disassembly.**

NOTE. *Since the 8XC196NT microcontroller multiplexes address A15-A0 and data D15-D0 (as the AD15-AD0 signals), the D1:7-0 and D0:7-0 channel probes do not need to be connected.*

These channels are not considered to be extra channels, even though they are not connected. Do not use them to make connections to other signals in your SUT.

Table 1–4 shows the acquisition clock probes, and the 8XC196 N-Series signal to which they must connect for disassembly to be correct.

Table 1–4: 8XC196 N-Series signal connections for clock probes

Section: channel	Connect to 8XC196 N-Series signal
CK:3	Not connected
CK:2	WR*
CK:1	RD*
CK:0	ALE

5. Align pin 1 or A1 of your test clip with the corresponding pin 1 or A1 of the 8XC196 N-Series microcontroller in your SUT and attach the clip to the microcontroller.

Applying and Removing Power

If your SUT has a +3 V microcontroller or you do not want your SUT to provide power to the probe adapter, you can use an alternate power source. The power supply provides +5 volts power to the probe adapter. The center connector of the power jack connects to Vcc.

To use an alternate power source, you must place the Power Source jumper (J210 on the 8XC196NP probe adapter or J310 on the 8XC196NT probe adapter) to the EXT position.

NOTE. *Whenever the SUT is powered off, be sure to remove power from the probe adapter.*

To apply power to the 8XC196 N-Series probe adapter and SUT, follow these steps:

CAUTION. *Failure to use the +5 V power supply provided by Tektronix may permanently damage the probe adapter and 8XC196 N-Series microcontroller. 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 1–10 shows the location of the jack on the adapter board.

CAUTION. *Failure to apply power to the probe adapter before applying power to your SUT may permanently damage the 8XC196 N-Series microcontroller and SUT.*

2. Plug the power supply for the probe adapter into an electrical outlet.
3. Power on the SUT.

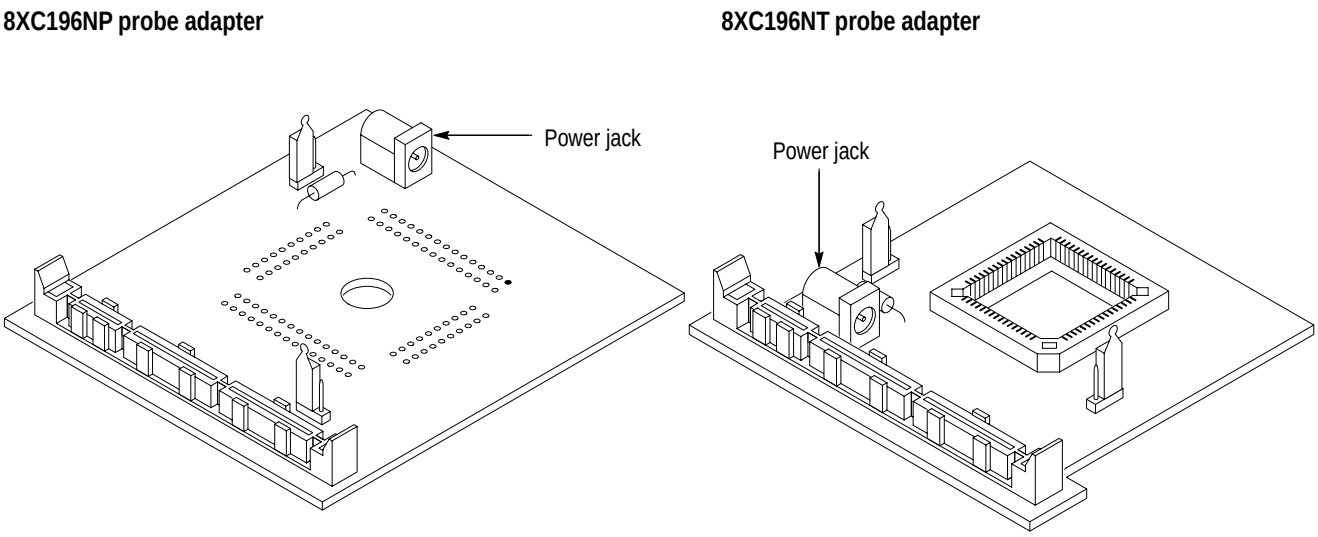


Figure 1–10: Location of the power jack

To remove power from the SUT and 8XC196 N-Series probe adapter, follow these steps:

CAUTION. *Failure to power down your SUT before removing the power from the probe adapter may permanently damage the 8XC196 N-Series microcontroller and SUT.*

1. Power down the SUT.
2. Unplug the power supply for the probe adapter from the electrical outlet.

Operating Basics

Setting Up the Support

This section provides information on how to set up the support. Information covers the following topics:

- Channel group definitions
- Clocking options
- Symbol table files

Remember that the information in this section is specific to the operations and functions of the TMS 142 8XC196 N-Series support on any Tektronix logic analyzer for which it can be purchased. Information on basic operations describes general tasks and functions.

Before you acquire and disassemble data, you need to load the support and specify setups for clocking and triggering as described in the information on basic operations. The support provides default values for each of these setups, but you can change them as needed.

Channel Group Definitions

The disassembler software automatically defines channel groups for the support. The channel groups for the 8XC196 N-Series support are Address, Data, Control, MemRegn, Port1, Port6_3, Port4_0, Port2, and Misc. If you want to know which signal is in which group, refer to the channel assignment tables beginning on page 3–7.

Clocking Options

The TMS 142 support offers a microcontroller-specific clocking mode for the 8XC196 N-Series microcontroller. This clocking mode is the default selection whenever you load the 196NX support.

A description of how cycles are sampled by the module using the support and probe adapter is found in the *Specifications* chapter.

Disassembly will not be correct with the Internal or External clocking modes. Information on basic operations describes how to use these clock selections for general purpose analysis.

The clocking option for the TMS 142 support is the Processor.

When you select 8XC196NP, multiplexed and demultiplexed 8XC196NP microcontroller operation is supported. When you select 8X196NT, only multiplexed operation for the 8XC196NT microcontroller is supported.

Symbols

The TMS 142 support supplies one symbol table file. The 196NX_Ctrl file replaces specific Control channel group values with symbolic values when Symbolic is the radix for the channel group.

Table 2–1 shows the name, bit pattern, and meaning for the symbols in the file 196NX_Ctrl, the Control channel group symbol table.

Table 2–1: Control group symbol table definitions

Symbol	Control group value WR* BHE* RD* INST	Meaning
FETCH	1 X 0 1	Memory code read (Opcode Fetch)
WRITE	0 0 1 0	Any memory write cycle
WRITE_HI	1 0 1 0	A memory write when the high byte is valid in 16-bit Write Strobe mode
WRITE_LO	0 1 1 0	A memory write when the low byte is valid in 16-bit Write Strobe mode
READ	1 X 0 0	Non-opcode fetch memory read cycle
UNDEFINED	x x x x	Cycle cannot be identified

Information on basic operations describes how to use symbolic values for triggering and for displaying other channel groups symbolically, such as the Address channel group.

Acquiring and Viewing Disassembled Data

This section describes how to acquire data and view it disassembled. Information covers the following topics and tasks:

- Acquiring data
- Viewing disassembled data in various display formats
- Cycle type labels
- Changing the way data is displayed
- Changing disassembled cycles with the mark cycles function

Acquiring Data

Once you load the 196NX support, choose a clocking mode, and specify the trigger, you are ready to acquire and disassemble data.

If you have any problems acquiring data, refer to information on basic operations in your online help or *Appendix A: Error Messages and Disassembly Problems* in the basic operations user manual.

Viewing Disassembled Data

You can view disassembled data in four display formats: Hardware, Software, Control Flow, and Subroutine. The information on basic operations describes how to select the disassembly display formats.

NOTE. *Selections in the Disassembly property page (the Disassembly Format Definition overlay) must be set correctly for your acquired data to be disassembled correctly. Refer to* Changing How Data is Displayed *on page 2–7.*

The default display format shows the Address, Data, and Control channel group values for each sample of acquired data.

The disassembler displays special characters and strings in the instruction mnemonics to indicate significant events. Table 2–2 shows these special characters and strings, and gives a definition of what they represent.

Table 2–2: Meaning of special characters in the display

Character or string displayed	Meaning
>> or m	The instruction was manually marked.
****	Indicates there is insufficient data available for complete disassembly of the instruction; the number of asterisks indicates the width of the data that is unavailable. Each two asterisks represent one byte.
#	Indicates an immediate value.
t	Indicates the number shown is in decimal, such as #12t.

Hardware Display Format

In Hardware display format, the disassembler displays certain cycle type labels in parentheses. Table 2–3 shows these cycle type labels and gives a definition of the cycle they represent. Reads to interrupt and exception vectors will be labeled with the vector name.

Table 2–3: Cycle type definitions

Cycle type	Definition
(UNKNOWN)	An unrecognized cycle type
(READ)	A read from external memory which is not tied to the CS0*-CS5* signals for the 8XC196NP, or an External Memory Read for the 8XC196NT
(WRITE)	A write to external memory which is not tied to the CS0*-CS5* signals for the 8XC196NP, or an External Memory Write for the 8XC196NT
(CS0_WRITE)	A write to external memory which is tied to CS0†‡
(CS1_WRITE)	A write to external memory which is tied to CS1†‡
(CS2_WRITE)	A write to external memory which is tied to CS2†‡
(CS3_WRITE)	A write to external memory which is tied to CS3†‡
(CS4_WRITE)	A write to external memory which is tied to CS4†‡
(CS5_WRITE)	A write to external memory which is tied to CS5†‡
(CS0_READ)	A read from external memory which is tied to CS0†‡
(CS1_READ)	A read from external memory which is tied to CS1†‡
(CS2_READ)	A read from external memory which is tied to CS2†‡
(CS3_READ)	A read from external memory which is tied to CS3†‡
(CS4_READ)	A read from external memory which is tied to CS4†‡
(CS5_READ)	A read from external memory which is tied to CS5†‡
(FLUSH)	A fetch cycle computed to be an opcode flush†

Table 2–3: Cycle type definitions (cont.)

Cycle type	Definition
(CS#_ERROR–READ)	A read cycle when more than one Chip Select signal is asserted low†
(CS#_ERROR–WRITE)	A write cycle when more than one Chip Select signal is asserted low†
(EXTENSION)	A fetch cycle computed to be an opcode extension†
UNIMPLEMENTED OP-CODE	Indicates a reserved opcode†

† **Computed cycle type; cannot be used for triggering.**

‡ **Only displayed with data from the 8XC196NP microcontroller.**

Figure 2–1 shows an example of the Hardware display.

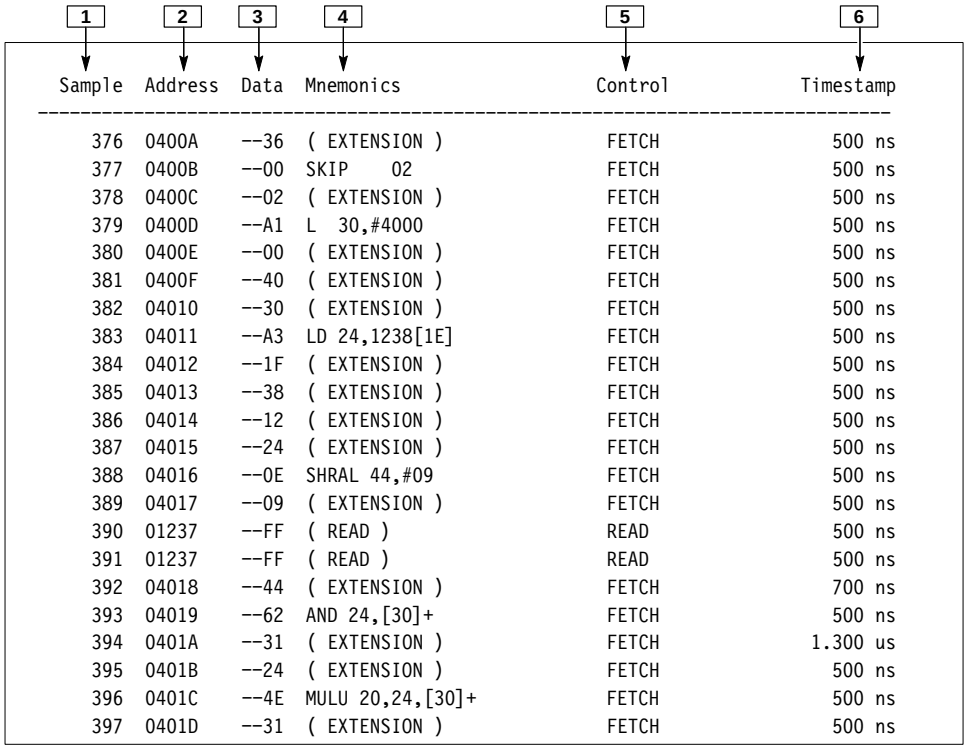


Figure 2–1: Hardware display format

1 **Sample Column.** Lists the memory locations for the acquired data.

2 **Address Group.** Lists data from channels connected to the 8XC196 N-Series address bus.

3 **Data Group.** Lists data from channels connected to the 8XC196 N-Series data bus.

4 **Mnemonics Column.** Lists the disassembled instructions and cycle types.

5 **Control Group.** Lists data from channels connected to 8XC196 N-Series microcontroller control signals (shown symbolically).

6 **Timestamp.** Lists the timestamp values when a timestamp selection is made. Information on basic operations describes how you can select a timestamp.

Software Display Format

The Software display format shows only the first fetch of executed instructions. Flushed cycles and extensions are not shown, even though they are part of the executed instruction. Read extensions will be used to disassemble the instruction, but will not be displayed as a separate cycle in the Software display format. Data reads and writes are not displayed.

Control Flow Display Format

The Control Flow display format shows only the first fetch of instructions that change the flow of control.

Instructions that generate a change in the flow of control in the 8XC196 N-Series microcontroller are as follows:

BR	EJMP	RST	TIJMP
EBR	LJMP	SJMP	

Instructions that might generate a change in the flow of control in the 8XC196 N-Series microcontroller are as follows:

DJNZ	JE	JLT	JNV
DJNZW	JGE	JNC	JNVT
JBC	JGT	JNE	JST
JBS	JH	JNH	JV
JC	JLE	JNST	JVT

Subroutine Display Format

The Subroutine display format shows only the first fetch of subroutine call and return instructions. It will display conditional subroutine calls if they are considered to be taken.

Instructions that generate a subroutine call or a return in the 8XC196 N-Series microcontroller are as follows:

RET ECALL LCALL SCALL TRAP

All exception vector reads that are taken, Unknown cycles, Illegal Instructions, and Bad Address Mode labels are also displayed, as well as some instructions that cause traps or interrupts.

Changing How Data is Displayed

There are common fields and features that allow you to further modify displayed data to suit your needs. You can make common and optional display selections in the Disassembly property page (the Disassembly Format Definition overlay).

You can make selections unique to the 8XC196 N-Series support to do the following tasks:

- Change how data is displayed across all display formats
- Change the interpretation of disassembled cycles

Optional Display Selections

You can make optional selections for disassembled data. In addition to the common selections (described in the information on basic operations), you can change the displayed data in the following ways:

- Specify the microcontroller from which you will acquire data.
- Specify the EPORT bus configuration to match that in your SUT.
- Specify the bus width for memory regions CS0*-CS2* or CS3*-CS5* for the 8XC196NP microcontroller.
- Specify the bus width for other memory regions for the 8XC196NP microcontroller.
- Specify the bus width for the 8XC196NT microcontroller.

Processor. You need to tell the disassembler which microcontroller you will acquire data from and the memory mode your SUT is operating in. Selections are:

- 8XC196NP - 1 MB (default)
- 8XC196NP - 64 KB
- 8XC196NT - 1 MB
- 8XC196NT - 64 KB

After you choose an 8XC196NP selection in the Processor field, the support has specific fields for the microcontroller as follows: CS0-2 BW-NP, CS3-5 BW-NP, and Other Region BW-NP, Bus Width-NT.

After you choose an 8XC196NT selection in the Processor field, the support has a specific field for that microcontroller: Bus Width. These fields appear in the area indicated in the basic operations user manual.

EPORT3-EPORT0 Configuration. For either microcontroller, you can specify the configuration of the EPORT3:EPORT0 signals to match the configuration in your SUT.

CS0-CS2 Bus Width. For the 8XC196NP microcontroller, you can specify the bus width for each of three memory regions. The selection list shows various combinations of 8- or 16-bit wide regions, with memory region CS0* on the left, memory region CS1* in the middle, and memory region CS2* on the right.

CS3-CS5 Bus Width. For the 8XC196NP microcontroller, you can specify the bus width for each of three memory regions. The selection list shows various combinations of 8- or 16-bit wide regions, with memory region CS3* on the left, memory region CS4* in the middle, and memory region CS5* on the right.

Other Region Bus Width. For the 8XC196NP microcontroller, you can specify an 8- or 16-bit bus width for other memory regions that are not accessed by Chip Select signals. The 8-bit wide bus is the default.

Bus Width. For the 8XC196NT microcontroller, you can specify the bus width as fixed (8 bits or 16 bits) or as dynamically changing.

Table 2–4 shows how these fields can be combined.

Table 2–4: Custom field combinations

Processor field	EPORT3-EPORT0 Configuration field	CS2-CS0 Bus Width field	CS5-CS3 Bus Width field	Other Region Bus Width field	Bus Width field
8XC196NP- 1 MB or 8XC196NP- 64 KB	A19 A18 A17 A16 A19 A18 A17 IO A19 A18 IO A16 A19 A18 IO IO A19 IO A17 A16 " " " " " " " " IO IO IO IO	8 8 8 8 8 16 8 8 IO " " " " " " IO IO IO	8 8 8 8 8 16 8 8 IO " " " " " " IO IO IO	8 or 16	Not valid
8XC196NT- 1 MB or 8XC196NT- 64 KB		Not valid	Not valid	Not valid	8, 16, or dynamic

Marking Cycles

The disassembler has a Mark Opcode function that allows you to change the interpretation of a cycle type. Using this function, you can select a cycle and change it to one of the following cycle types:

- Opcode (the first word of an instruction)
- Extension (a subsequent word of an instruction)
- Flush (an opcode or extension that is fetched but not executed)

Mark selections for a double-byte fetch are as follows:

```
Any          Opcode
Opcode       Extension
Extension    Extension
Opcode       Flush
Flush        Extension
Flush        Flush

Undo marks on this cycle
```

Mark selections for a single-byte fetch are as follows:

```
Opcode
Extension
Flush

Undo marks on this cycle
```

Displaying Exception Vectors

The disassembler can display 8XC196 N-Series exception vectors for the Interrupt Controller Service or PTS Service vectors.

Table 2–5 lists exception vector labels for 8XC196NP Interrupt Controller Service vectors.

Table 2–5: 8XC196NP exception labels for Interrupt Controller Service

Interrupt source	Interrupt name	Displayed interrupt name
Timer 1 overflow	INT00	(TIMER 1 OVERFLOW VECTOR)
Timer 2 overflow	INT01	(TIMER 2 OVERFLOW VECTOR)
Reserved	INT02	(RESERVED)
EXTINT 0 pin	INT03	(EXTINT 0 VECTOR)
EXTINT 1 pin	INT04	(EXTINT 1 VECTOR)
SIO transmit	INT05	(SIO TRANSMIT VECTOR)
SIO receive	INT06	(SIO RECEIVE VECTOR)
EPA0	INT07	(EPA0 VECTOR)
Software Trap instruction	---	(TRAP VECTOR)
Unimplemented opcode	---	(UNIMPLEMENTED CODE VECTOR)
EPA1	INT08	(EPA1 VECTOR)
EPA2	INT09	(EPA2 VECTOR)
EPA3	INT10	(EPA3 VECTOR)
EPA overrun error in module 0 and/or 1	INT11	(EPA OVERRUN–MODULE 0/1)
EPA overrun error in module 2 and/or 3	INT12	(EPA OVERRUN–MODULE 2/3)
EXTINT 2 pin	INT13	(EXTINT 2 VECTOR)
EXTINT 3 pin	INT14	(EXTINT 3 VECTOR)
NMI	INT15	(NMI VECTOR)

Table 2–6 lists exception vector labels for 8XC196NP PTS Service vectors.

Table 2–6: 8XC196NP exception labels for PTS Service

Interrupt source	Interrupt name	Displayed exception name
Timer 1 overflow	PTS00	(TIMER 1 OVERFLOW VECTOR –PTS)
Timer 2 overflow	PTS01	(TIMER 2 OVERFLOW VECTOR –PTS)
Reserved	PTS02	(RESERVED –PTS)
EXTINT 0 pin	PTS03	(EXTINT 0 VECTOR –PTS)
EXTINT 1 pin	PTS04	(EXTINT 1 VECTOR –PTS)
SIO transmit	PTS05	(SIO TRANSMIT VECTOR –PTS)
SIO receive	PTS06	(SIO RECEIVE VECTOR –PTS)
EPA0	PTS07	(EPA0 VECTOR –PTS)
EPA1	PTS08	(EPA1 VECTOR –PTS)
EPA2	PTS09	(EPA2 VECTOR –PTS)
EPA3	PTS10	(EPA3 VECTOR –PTS)

Table 2–6: 8XC196NP exception labels for PTS Service (cont.)

Interrupt source	Interrupt name	Displayed exception name
EPA overrun error in module 0 and/or 1	PTS11	(EPA OVERRUN–MODULE 0/1 –PTS)
EPA overrun error in module 2 and/or 3	PTS12	(EPA OVERRUN–MODULE 2/3 –PTS)
EXTINT 2 pin	PTS13	(EXTINT 2 VECTOR –PTS)
EXTINT 3 pin	PTS14	(EXTINT 3 VECTOR –PTS)

Table 2–7 lists exception vector labels for 8XC196NT Interrupt Controller Service vectors.

Table 2–7: 8XC196NT exception labels for Interrupt Controller Service

Interrupt source	Interrupt name	Displayed interrupt name
EPA4-9, EPA0-9 Overrun, EPA Compare 0-1, Timer 1 overflow, Timer 2 overflow	INT00	(EPAx MULTIPLEXED INTR.)
EPA3	INT01	(EPA3 VECTOR)
EPA2	INT02	(EPA2 VECTOR)
EPA1	INT03	(EPA1 VECTOR)
EPA0	INT04	(EPA0 VECTOR)
A/D conversion complete	INT05	(A/D CONV. COMPLETE)
SLP output buffer empty	INT06	(SLP O/P BUFFER EMPTY)
SLP input buffer full	INT07	(SLP I/P BUFFER FULL)
Software Trap instruction	---	(SOFTWARE TRAP INSTR.)
Unimplemented opcode	---	(UNIMPLEMENTED OPCODE)
SLP command buffer full	INT08	(SLP COMMAND BUFFER FULL)
SSIO channel 0 transfer	INT09	(SSIO CHANNEL 0 TRANSFER)
SSIO channel 1 transfer	INT10	(SSIO CHANNEL 1 TRANSFER)
SIO transmit	INT11	(SIO TRANSMIT)
SIO receive	INT12	(SIO RECEIVE)
Reserved	INT13	(RESERVED)
EXTINT pin	INT14	(EXTINT PIN)
NMI	INT15	(NMI VECTOR)

Table 2–8 lists exception vector labels for 8XC196NT PTS Service vectors.

Table 2–8: 8XC196NT exception labels for PTS Service

Interrupt source	Interrupt name	Displayed exception name
EPA4-9, EPA0-9 Overrun, EPA Compare 0-1, Timer 1 overflow, Timer 2 overflow	PTS00	(EPAx MULTIPLEXED INTR. –PTS)
EPA3	PTS01	(EPA3 VECTOR –PTS)
EPA2	PTS02	(EPA2 VECTOR –PTS)
EPA1	PTS03	(EPA1 VECTOR –PTS)
EPA0	PTS04	(EPA0 VECTOR –PTS)
A/D conversion complete	PTS05	(A/D CONV. COMPLETE –PTS)
SLP output buffer empty	PTS06	(SLP O/P BUFFER EMPTY –PTS)
SLP input buffer full	PTS07	(SLP I/P BUFFER FULL –PTS)
SLP command buffer full	PTS08	(SLP COMMAND BUFFER FULL –PTS)
SSIO channel 0 transfer	PTS09	(SSIO CHANNEL 0 TRANSFER –PTS)
SSIO channel 1 transfer	PTS10	(SSIO CHANNEL 1 TRANSFER –PTS)
SIO transmit	PTS11	(SIO TRANSMIT –PTS)
SIO receive	PTS12	(SIO RECEIVE –PTS)
Reserved	PTS13	(RESERVED)
EXTINT pin	PTS14	(EXTINT PIN –PTS)

Viewing an Example of Disassembled Data

A demonstration system file (or demonstration reference memory) is provided so you can see an example of how your 8XC196 N-Series microcontroller bus cycles and instruction mnemonics look when they are disassembled. Viewing the system file is not a requirement for preparing the module for use and you can view it without connecting the logic analyzer to your SUT.

Information on basic operations describes how to view the file.

Specifications

Specifications

This chapter contains the following information:

- Probe adapter description
- Specification tables
- Channel assignment tables
- How data is acquired
- Alternate microcontroller connections

Probe Adapter Description

The probe adapter is nonintrusive hardware that allows the logic analyzer to acquire data from a microcontroller in its own operating environment with little effect, if any, on that system. Information on basic operations contains a figure showing the logic analyzer connected to a typical probe adapter. Refer to that figure while reading the following description.

The probe adapter consists of a circuit board and a socket for a 8XC196 N-Series microcontroller. The probe adapter connects to the microcontroller in the SUT. Signals from the microcontroller-based system flow from the probe adapter to the channel groups and through the probe signal leads to the module.

Circuitry on the probe adapter can be powered from either the SUT or an external power source. Refer to *Applying and Removing Power* in the *Getting Started* chapter on page 1–17 for information on using an external power source.

One probe adapter accommodates an Intel 8XC196NP microcontroller in a 100-pin QFP package. Another probe adapter accommodates an 8XC196NT microcontroller in a 68-pin PLCC package.

Configuration

There are two jumpers on the probe adapter. One is set to power the probe adapter from the SUT or an alternate power supply. The second is set to match the strobe mode of the 8XC196 N-Series microcontroller.

Power Source Jumper. The Power Source jumper (J210 on the 8XC196NP probe adapter or J310 on the 8XC196NT probe adapter) must be placed in the INT position if you have a +5 V microcontroller and the probe adapter will be powered from the SUT.

If your SUT has a +3 V microcontroller or you do not want your SUT to provide power to the probe adapter, you can use an alternate power source. If you use an alternate power source, you must place the Power Source jumper to the EXT position.

For more information on using an alternate power source, refer to *Applying and Removing Power* in the *Getting Started* chapter.

Figure 3–1 shows the location of the Power Source jumper, J210 or J310.

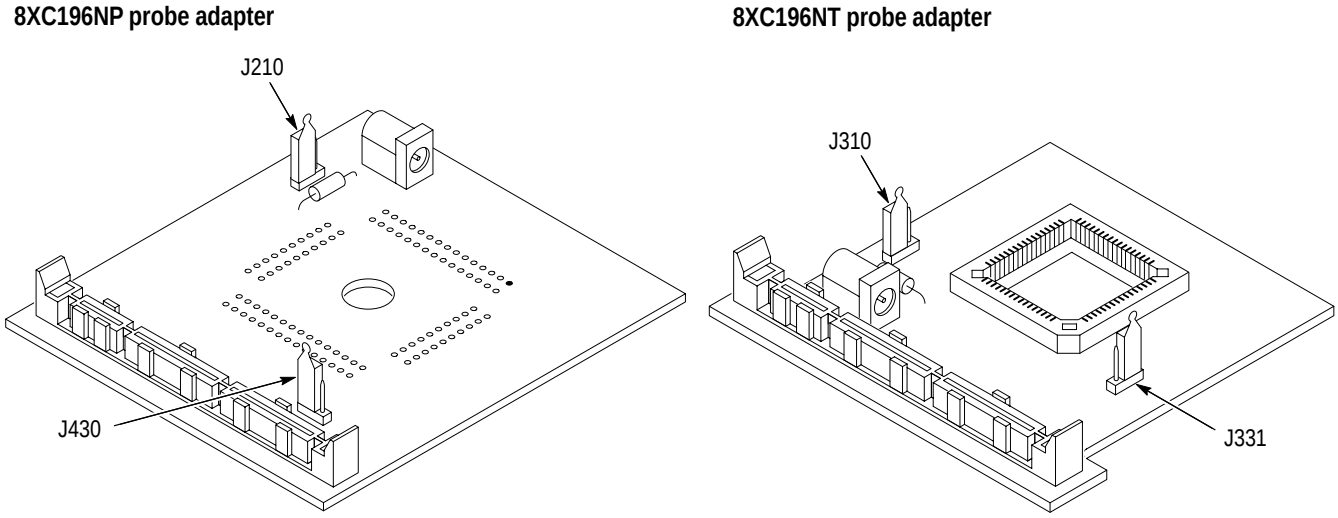


Figure 3–1: Jumper locations

Strobe Mode Jumper. The Strobe Mode jumper (J430 on the 8XC196NP probe adapter or J331 on the 8XC196NT probe adapter) should be placed in the WR_STB position if your SUT is configured to run in Write strobe mode or in the STD_WR if your SUT is configured to run in Standard Write Control mode.

Figure 3–1 shows the location of the Strobe Mode jumper, J430 or J331.

Specifications

These specifications are for a probe adapter connected between a compatible Tektronix logic analyzer and a SUT. Table 3–1 shows the electrical requirements the SUT must produce for the support to acquire correct data.

In Table 3–1, for the 102/136-channel module, one podlet load is 20 kΩ in parallel with 2 pF. For the 96-channel module, one podlet load is 100 kΩ in parallel with 10 pF.

Table 3–1: Electrical specifications

Characteristics	Requirements	
Adapter DC power requirements		
Voltage	4.75-5.25 VDC	
Current	I max (calculated) 200 mA	
Probe adapter power supply requirements		
Voltage	90-265 VAC	
Current	1.1 A maximum at 100 VAC	
Frequency	47-63 Hz	
Power	25 W maximum	
SUT clock		
8XC196NP clock rate	Max. 25 MHz	
8XC196NT clock rate	Max. 20 MHz	
Minimum setup time required		
All signals	5 ns	
Minimum hold time required		
All signals	0 ns	
	Specification	
	AC load	**DC load**
8XC196NP measured typical SUT signal loading		
WR*, BHE*	<20 pF	3,.74F08
AD15-AD0, ONCE, RD*, ALE, CLKOUT, RESET*, NMI, READY, P1_7-P1_0, P2_6-P2_0, P3_7, P3_6, P4_3-P4_0	<10 pF	74FCT162244ET
8XC196NT measured typical SUT signal loading		
AD15-AD0, A19-A16	8.5 pF	74FCT162244ET
CLKOUT, ALE	<21 pF	74FCT162244ET || 20V8h_5
WR*, BHE*	<10 pF	20V8h_5
RESET*, NMI, READY, BUSWIDTH, P0_7-P0_4, P1_7-P1_0, P5_4, P6_7-P6_0	8.5 pF	74FCT162244ET
BUSWIDTH*	<12.5 pF	74FCT162244ET

Table 3–2 shows the environmental specifications.

Table 3–2: Environmental specifications*

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

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

† **Not to exceed 8XC196 N-Series microcontroller thermal considerations. Forced air cooling might be required across the CPU.**

Table 3–3 shows the certifications and compliances that apply to the probe adapter.

Table 3–3: Certifications and compliances

EC Compliance	There are no current European Directives that apply to this product.

Figure 3–2 shows the dimensions of the 8XC196NP probe adapter. The figure also shows the minimum vertical clearance of the LAHDP2 probe cable.

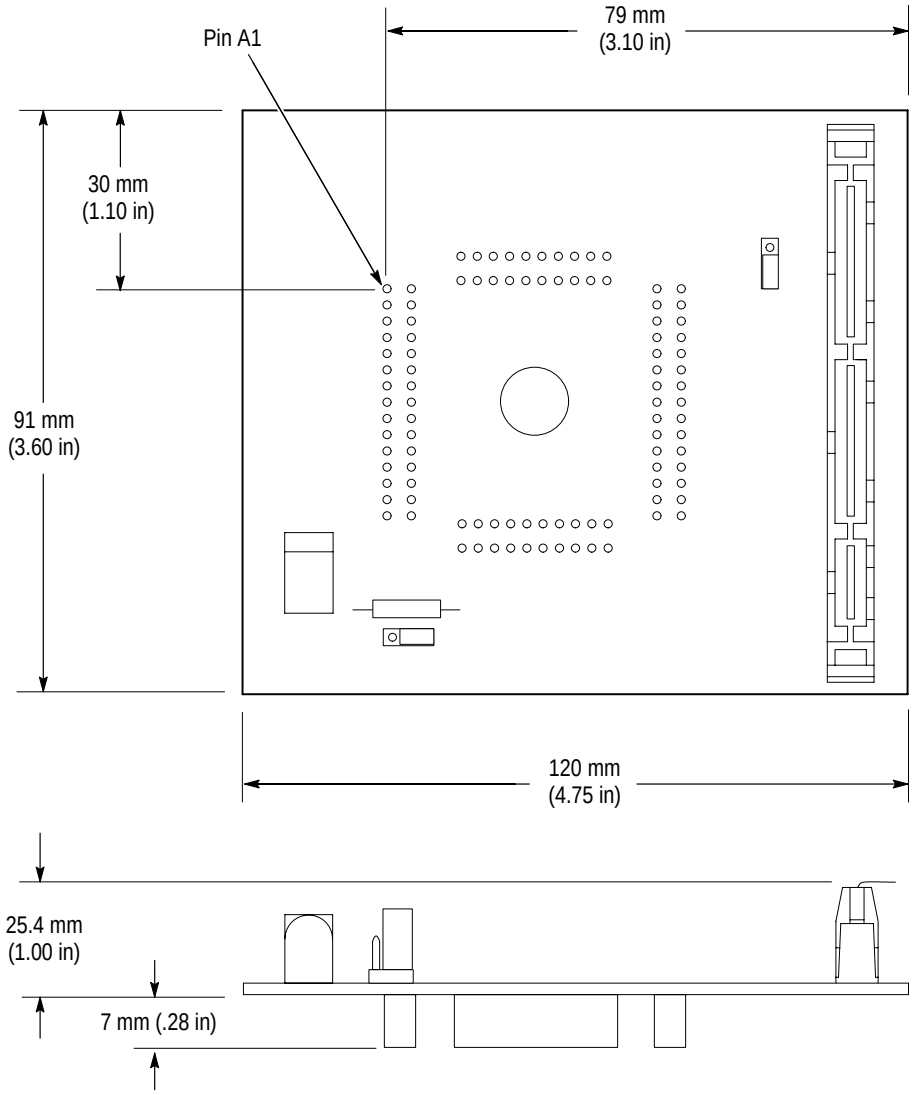


Figure 3–2: Dimensions of the 8XC196NP probe adapter

Figure 3–3 shows the dimensions of the 8XC196NT probe adapter. The figure also shows the minimum vertical clearance of the LAHDP2 probe cable.

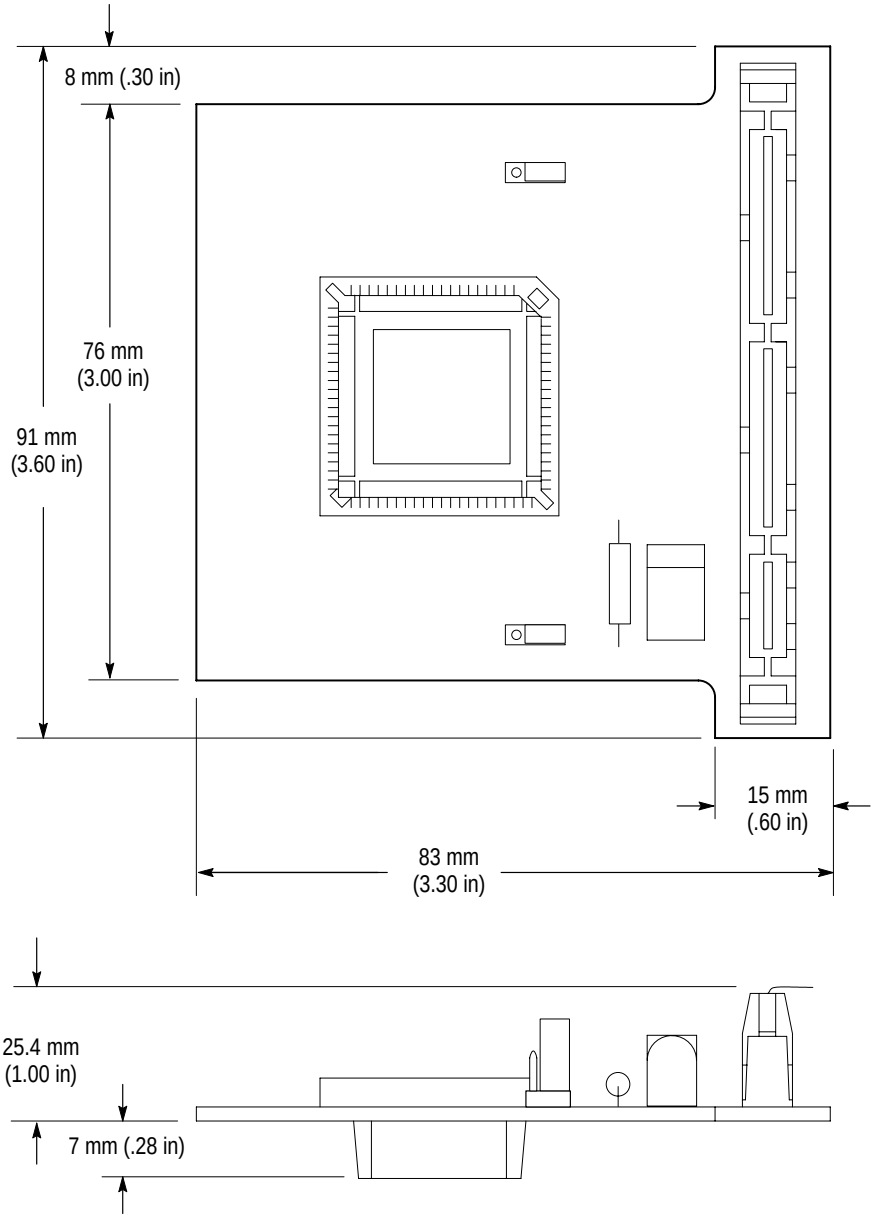


Figure 3–3: Dimensions of the 8XC196NT probe adapter

Channel Assignments

Channel assignments shown in Table 3–4 through Table 3–13 use the following conventions:

- All signals are required by the support unless indicated otherwise.
- Channels are shown starting with the most significant bit (MSB) descending to the least significant bit (LSB).
- Channel group assignments are for all modules unless otherwise noted.
- An asterisk (*) following a signal name indicates an active low signal.
- An equal sign (=) following a signal name indicates that it is double probed.

Table 3–4 shows the probe section and channel assignments for the Address group, and the microcontroller signal to which each channel connects. By default, this channel group is displayed in hexadecimal.

Table 3–4: Address group channel assignments

Bit order	Section: channel	8XC196NP signal name	8XC196NT signal name
19	A2:3	A19	A19
18	A2:2	A18	A18
17	A2:1	A17	A17
16	A2:0	A16	A16
15	A1:7	A15	AD15
14	A1:6	A14	AD14
13	A1:5	A13	AD13
12	A1:4	A12	AD12
11	A1:3	A11	AD11
10	A1:2	A10	AD10
9	A1:1	A9	AD9
8	A1:0	A8	AD8
7	A0:7	A7	AD7
6	A0:6	A6	AD6
5	A0:5	A5	AD5
4	A0:4	A4	AD4
3	A0:3	A3	AD3
2	A0:2	A2	AD2
1	A0:1	A1	AD1
0	A0:0	A0	AD0

Table 3–5 shows the probe section and channel assignments for the Data group, and the microcontroller signal to which each channel connects. By default, this channel group is displayed in hexadecimal.

NOTE. *Since the 8XC196NT microcontroller multiplexes address A15-A0 and data D15-D0 (as the AD15-AD0 signals), the D1:7-0 and D0:7-0 channel probes do not need to be connected.*

These channels are not considered to be extra channels, even though they are not connected. Do not use them to make connections to other signals in your SUT.

Table 3–5: Data group channel assignments

Bit order	Section: channel	8XC196NP signal name	8XC196NT signal name†
15	D1:7	D15	AD15
14	D1:6	D14	AD14
13	D1:5	D13	AD13
12	D1:4	D12	AD12
11	D1:3	D11	AD11
10	D1:2	D10	AD10
9	D1:1	D9	AD9
8	D1:0	D8	AD8
7	D0:7	D7	AD7
6	D0:6	D6	AD6
5	D0:5	D5	AD5
4	D0:4	D4	AD4
3	D0:3	D3	AD3
2	D0:2	D2	AD2
1	D1:1	D1	AD1
0	D0:0	D0	AD0

† **For the 8XC196NT microcontroller, do not connect the D1:7-0 or D0:7-0 probes.**

Table 3–6 shows the probe section and channel assignments for the Control group, and the microcontroller signal to which each channel connects. By default, this group is displayed symbolically.

Table 3–6: Control group channel assignments

Bit order	Section: channel	8XC196 N-Series signal name
3	C2:0	WR*
2	C2:2	BHE*
1	C2:1	RD*=
0	C2:3	INST

Table 3–7 shows the probe section and channel assignments for the MemRegn group, and the 8XC196NP or 8XC196NT microcontroller signal to which each channel connects. By default, this group is displayed symbolically.

Table 3–7: MemRegn group channel assignments

Bit order	Section: channel	8XC196NP signal name	8XC196NT signal name
5	A3:1	CS0*	BW_L
4	A3:2	CS1*	none
3	A3:3	CS2*	none
2	A3:4	CS3*	none
1	A3:5	CS4*	none
0	A3:6	CS5*	none

Table 3–8 shows the probe section and channel assignments for the Port1 group, and the microcontroller signal to which each channel connects. By default, this group is not visible.

Table 3–8: Port1 group channel assignments

Bit order	Section: channel	8XC196 N-Series signal name
7	C3:3	P1_7†
6	C3:2	P1_6†
5	C3:1	P1_5†
4	C3:0	P1_4†
3	C2:7	P1_3†
2	C2:6	P1_2†
1	C2:5	P1_1†
0	C2:4	P1_0†

† **Signal not required for disassembly.**

Table 3–9 shows the probe section and channel assignments for the Port6_3 group, and the microcontroller signal to which each channel connects. By default, this group is not visible.

Table 3–9: Port6_3 group channel assignments

Bit order	Section: channel	8XC196NP signal name	8XC196NT signal name
7	D3:7	P3_7†	P6_7†
6	D3:6	P3_6†	P6_6†
5	D3:5	Not connected	P6_5†
4	D3:4	Not connected	P6_4†
3	D3:3	Not connected	P6_3†
2	D3:2	Not connected	P6_2†
1	D3:1	Not connected	P6_1†
0	D3:0	Not connected	P6_0†

† **Signal not required for disassembly.**

Table 3–10 shows the probe section and channel assignments for the Port4_0 group, and the microcontroller signal to which each channel connects. By default, this group is not visible.

Table 3–10: Port4_0 group channel assignments

Bit order	Section: channel	8XC196NP signal name	8XC196NT signal name
3	A2:7	P4_3†	P0_7†
2	A2:6	P4_2†	P0_6†
1	A2:5	P4_1†	P0_5†
0	A2:4	P4_0†	P0_4†

† **Signal not required for disassembly.**

Table 3–11 shows the probe section and channel assignments for the Port2 group, and the microcontroller signal to which each channel connects. By default, this group is not visible.

Table 3–11: Port2 group channel assignments

Bit order	Section: channel	8XC196 N-Series signal name
6	D2:7	P2_6†
5	D2:6	P2_5†
4	D2:5	P2_4†
3	D2:4	P2_3†
2	D2:3	P2_2†
1	D2:2	P2_1†
0	D2:1	P2_0†

† **Signal not required for disassembly.**

Table 3–12 shows the probe section and channel assignments for the Misc group, and the microcontroller signal to which each channel connects. By default, this group is not visible.

Table 3–12: Misc group channel assignments

Bit order	Section: channel	8XC196NP signal name	8XC196NP signal name
6	C3:4	READY†	READY†
5	C3:6	RESET†	RESET†
4	D2:0	ALE_B†	ALE_B†
3	C3:5	NMI†	NMI†
2	A3:7	CLKOUT†	CLKOUT†
1	C3:7	ONCE†	ONCE†
0	A3:0	Not connected	P5_4†

† **Signal not required for disassembly.**

Table 3–13 shows the probe section and channel assignments for the clock probes (not part of any group), and the 8XC196 N-Series signal to which each channel connects.

Table 3–13: Clock channel assignments

Section: channel	8XC196 N-Series signal name
CK:2	WR_D*
CK:1	RD*=
CK:0	ALE

These channels are used only to clock in data; they are not acquired or displayed. To acquire data from any of the signals shown in Table 3–13, you must connect another channel probe to the signal, a technique called double probing.

How Data is Acquired

This part of this chapter explains how the module acquires 8XC196 N-Series signals using the TMS 142 software and probe adapter. This part also provides additional information on microcontroller signals accessible on or not accessible on the probe adapter, and on extra probe channels available for you to use for additional connections.

Custom Clocking

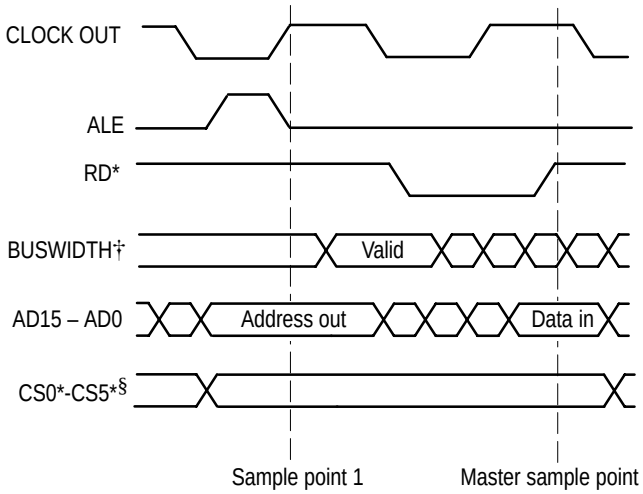
A special clocking program is loaded to the module every time you load the 196NX support. This special clocking is called Custom.

With Custom clocking, the module logs in signals from multiple groups of channels at different times as they become valid on the 8XC196 N-Series bus. The module then sends all the logged-in signals to the trigger machine and to the memory of the module for storage.

In Custom clocking, the module clocking state machine (CSM) generates one master sample for each microcontroller bus cycle, no matter how many clock cycles are contained in the bus cycle.

In the next two figures, the address bus signals are sampled on the falling edge of the ALE signal. This is Sample Point 1. The data bus and control signals are sampled on the rising edges of the RD* and WR_D* signals. This sample is combined with the first sample and logged in as the Master Sample Point.

Figure 3–4 shows the sample points and the master sample point for an 8XC196NP or 8XC196NT microcontrollers operating with multiplexed address and data.



†For the 8XC196NT microcontroller, the BUSWIDTH signals are latched on the falling edge of the CLOCKOUT signal immediately after the falling edge of the ALE signal.

§The CS0*-CS5* signals are on the 8XC196NP only, and are logged at Sample Point 1.

Figure 3–4: Multiplexed bus timing for 8XC196NP and 8XC196NT microcontrollers

Figure 3–5 shows the sample points and the master sample point for an 8XC196NP microcontroller operating with demultiplexed address and data.

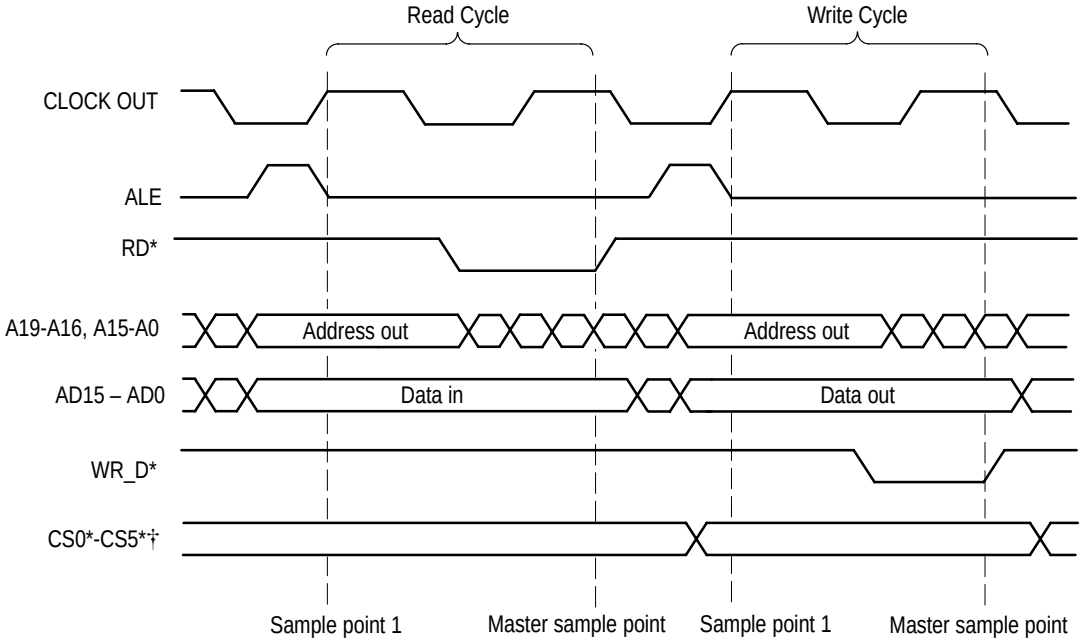


Figure 3–5: Demultiplexed bus timing for the 8XC196NP microcontroller only

Clocking Options

The clocking algorithm for the 8XC196 N-Series support has two variations, one for the 8XC196NP microcontroller and one for the 8XC196NT microcontroller.

8XC196NP Microcontroller. Multiplexed and demultiplexed data is logged. This is the clocking used when 8XC196NP is selected as the Processor clocking option.

8XC196NT Microcontroller. Multiplexed data is logged. This is the clocking used when 8XC196NT is selected as the Processor clocking option.

Alternate Microcontroller Connections

You can connect to microcontroller signals that are not required by the support so that you can do more advanced timing analysis.

For a list of signals required or not required for disassembly, refer to the channel assignment tables beginning on page 3–7. Remember that these channels are already included in a channel group. If you do connect these channels to other signals, you should set up another channel group for them.

Extra Channels

Table 3–14 lists extra sections and channels that are left after you have connected all the probes used by the support. You can use these extra channels to make alternate SUT connections.

Table 3–14: Extra module sections and channels

Module	Section: channels
102-channels	C1:7-0, C0:7-0, Qual:1, Qual:0
136-channels	C1:7-0, C0:7-0, E3:7-0, E2:7-0, E1:7-0, E0:7-0, Qual:3-0
96-channels	C1:7-0, C0:7-0

These channels are not defined in any channel group and data acquired from them are not displayed. To display data, you will need to define a channel group.

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 chapter contains information on the following topics:

- Probe adapter circuit description
- How to replace signal leads
- How to replace protective sockets
- How to replace a fuse

Probe Adapter Circuit Description

The 74FCT162244ET integrated circuits are used to reduce DC and AC loading on critical control signals of the microcontroller.

On the 8XC196NT probe adapter, the 74F08 integrated circuits are used to derive the WR_D* signal by combining the WR* and BHE* signals. On the 8XC196NP probe adapter, a 20V8_5 PAL is used to latch the BUSWIDTH signal and to derive the WR_D* signal.

The Power Source jumper determines how the power is provided to the probe adapter, either internally from the SUT or externally from the power supply included with the support. The Strobe Mode jumper needs to match the mode used in your SUT, either Standard Write Control or Write Strobe mode.

Replacing Signal Leads

Information on basic operations describes how to replace signal leads (individual channel and clock probes).

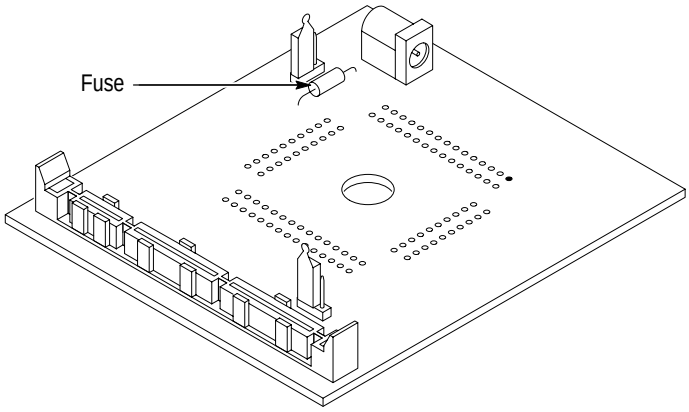
Replacing Protective Sockets

Information on basic operations describes how to replace protective sockets.

Replacing the Fuse

If the fuse on the 8XC196 N-Series probe adapter opens (burns out), you can replace it with a 5 A, 125 V fuse. Figure 4–1 shows the location of the fuse on the probe adapters.

8XC196NP probe adapter



8XC196NT probe adapter

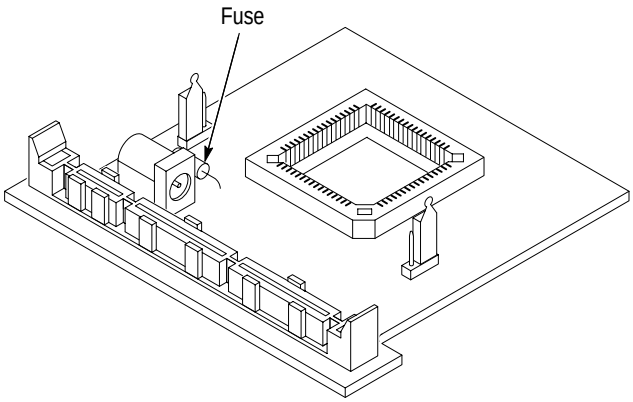


Figure 4–1: Location of the fuse

Replaceable Electrical Parts

Replaceable Electrical Parts

This chapter contains a list of the replaceable electrical components for the TMS 142 8XC196 N-Series microcontroller support. Use this list to identify and order replacement parts.

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.

Change information, if any, is located at the rear of this manual.

Using the Replaceable Electrical Parts List

The tabular information in the Replaceable Electrical 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 each column of the electrical parts list.

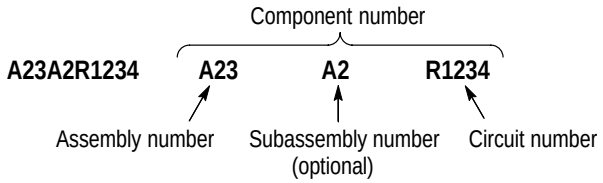
Parts list column descriptions

Column	Column name	Description
1	Component number	The component number appears on diagrams and circuit board illustrations, located in the diagrams section. Assembly numbers are clearly marked on each diagram and circuit board illustration in the *Diagrams* section, and on the mechanical exploded views in the *Replaceable Mechanical Parts* list section. The component number is obtained by adding the assembly number prefix to the circuit number (see Component Number illustration following this table). The electrical parts list is arranged by assemblies in numerical sequence (A1, with its subassemblies and parts, precedes A2, with its subassemblies and parts). Chassis-mounted parts have no assembly number prefix, and they are located at the end of the electrical parts list.
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	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.
6	Mfr. code	This indicates the code number of the actual manufacturer of the part.
7	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.

Component Number



Read: Resistor 1234 (of Subassembly 2) of Assembly 23

List of Assemblies

A list of assemblies is located at the beginning of the electrical parts list. The assemblies are listed in numerical order. When a part's complete component number is known, this list will identify the assembly in which the part is located.

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
05276	ITT POMONA ELECTRONICS	1500 E NINTH ST	POMONA, CA 91766–3835
0LXM2	LZR ELECTRONICS INC	8051 CESSNA AVENUE	GAITHERSBURG, MD 20879
22526	BERG ELECTRONICS INC	857 OLD TRAIL ROAD	ETTERS, PA 17319
26742	METHODE ELECTRONICS INC	BACKPLAIN DIVISION 7444 WEST WILSON AVE	CHICAGO, IL 60656–4548
61857	SAN–O INDUSTRIAL CORP	91–3 COLIN DRIVE	HOLBROOK, NY 11741
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077–0001

Replaceable electrical parts list

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A01	010–0599–00			PROBE,ADAPTER:80C196NX,PLCC–68 SOCKETED	80009	010–0599–00
A01	119–5061–01			POWER SUPPLY:25W,5V 5A,CONCENTRIC 2MM,90–265V,47–63 HZ IEC,15X8.6X5 CM, UL,CSA, TUV,IEC,SELF	80009	119–5061–01
A01	671–3802–00			CIRCUIT BD ASSY:80C196NX,PLCC–68,SOCKETED,389–2214–00 WIRED	80009	671–3802–00
A01F310	159–0059–00			FUSE,WIRE LEAD:5A,125V	61857	SPI–5A
A01J310	131–4530–00			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
A01J311	131–5527–00			JACK,POWER DC:PCB,MALE,RTANG,2MM PIN,11MM H(0.433) X 3.5MM(0.137) TAIL,9MM(0.354) W,TIN,W/SWI	0LXM2	DJ005A
A01J331	131–4530–00			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
A01J410	131–5947–00			CONN,BOX:PCB,MICRO–STRIP,FEMALE,STR,100 POS,0.05 CTR,W/GRD PLANE,0.320 H X 0.125 TAIL,LAT	00779	121289–7
A01P310	131–4356–00			CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,	26742	9618–302–50
A01P331	131–4356–00			CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,	26742	9618–302–50
A01W410	174–3418–00			CA ASSY,RF:TLC,MICRO–STRIP,TLC,50 OHM,FEP,PROP DELAY 1.4NS,12.0 L,100 POS,PLUG,LATCHING BOT	00779	1–340014–0

Replaceable electrical parts list (cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A02	010–0598–00			PROBE ADAPTER:QFP–100,SOLDERED,32/92DM82,1S	80009	010–0598–00
A02	103–0390–00			ADAPTER:CONN ADAPTER,100 PIN EIAJ PQFP TEST CLIP,32/92DM82,1S	05276	5643
A02	671–3803–00			CIRCUIT BD ASSY:80C196NX, QFP–100, 389–2215–00 WIRED, 32/92DM82,1S	80009	671–3803–00
A02F210	159–0059–00			FUSE,WIRE LEAD:5A,125V	61857	SPI–5A
A02J110	131–5527–00			JACK,POWER DC:PCB,MALE,RTANG,2MM PIN,11MM H(0.433) X 3.5MM(0.137) TAIL,9MM(0.354) W,TIN,W/SWI	0LXM2	DJ005A
A02J210	131–4530–00			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
A02J220	131–2515–00			CONN,BOX:PCB,FEMALE,STR,2 X 10,0.1 CTR,0.340 H X 0.120 TAIL,10 GOLD,	00779	86418–1
A02J221	131–4057–00			CONN,BOX:PCB,FEMALE,STR,2 X 15,0.1 CTR,0.276 H X 0.118 TAIL,30 GOLD,0.070 DIA PTH,DUAL E	22526	68682–315
A02J320	131–4057–00			CONN,BOX:PCB,FEMALE,STR,2 X 15,0.1 CTR,0.276 H X 0.118 TAIL,30 GOLD,0.070 DIA PTH,DUAL E	22526	68682–315
A02J330	131–2515–00			CONN,BOX:PCB,FEMALE,STR,2 X 10,0.1 CTR,0.340 H X 0.120 TAIL,10 GOLD,	00779	86418–1
A02J410	131–5947–00			CONN,BOX:PCB,MICRO–STRIP,FEMALE,STR,100 POS,0.05 CTR,W/GRD PLANE,0.320 H X 0.125 TAIL,LAT	00779	121289–7
A02J430	131–4530–00			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
A02P210	131–4356–00			CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,	26742	9618–302–50
A02P430	131–4356–00			CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,	26742	9618–302–50
A02W410	174–3418–00			CA ASSY,RF:TLC,MICRO–STRIP,TLC,50 OHM,FEP,PROP DELAY 1.4NS,12.0 L,100 POS,PLUG,LATCHING BOT	00779	1–340014–0

Replaceable Mechanical Parts

Replaceable Mechanical Parts

This chapter contains a list of the replaceable mechanical components for the TMS 142 8XC196 N-Series microcontroller support. Use this list to identify and order replacement parts.

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.

Change information, if any, is located at the rear of this manual.

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 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.

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
05276	ITT POMONA ELECTRONICS	1500 E NINTH ST	POMONA, CA 91766–3835
0LXM2	LZR ELECTRONICS INC	8051 CESSNA AVENUE	GAITHERSBURG, MD 20879
22526	BERG ELECTRONICS INC	857 OLD TRAIL ROAD	ETTERS, PA 17319
26742	METHODE ELECTRONICS INC	BACKPLAIN DIVISION 7444 WEST WILSON AVE	CHICAGO, IL 60656–4548
61857	SAN–O INDUSTRIAL CORP	91–3 COLIN DRIVE	HOLBROOK, NY 11741
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077–0001

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
1–0	010–0599–00			1	PROBE ADAPTER:8XC196NT,PLCC–68,SOCKETED, TMS 142	80009	010–0599–00
–1	174–3418–00			1	CA ASSY,RF:TLC,MICRO–STRIP,TLC,50 OHM,FEP,PROP DELAY 1.4NS,12.0 L,100 POS,PLUG,LATCHING BOT	00779	1–340014–0
–2	131–4356–00			2	CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,	26742	9618–302–50
–3	131–4530–00			2	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
–4	671–3802–00			1	CIRCUIT BD ASSY:80C196NX, PLCC–68, SOCKETED, 389–2214–00 WIRED, TMS 142	80009	671–3802–00
–5	131–5947–00			1	CONN,BOX:PCB,MICRO–STRIP,FEMALE,STR,100 POS,0.05 CTR,W/GRD PLANE,0.320 H X 0.125 TAIL,LAT	00779	121289–7
–6	131–5527–00			1	JACK,POWER DC:PCB,MALE,RTANG,2MM PIN,11MM H(0.433) X 3.5MM(0.137) TAIL,9MM(0.354) W,TIN,W/SWI	0LXM2	DJ005A
–7	159–0059–00			1	FUSE,WIRE LEAD:5A,125V	61857	SPI–5A
					STANDARD ACCESSORIES		
	070–9815–00			1	MANUAL,TECH:INSTRUCTION,196NX,DISSASEMBLER, TMS 142	80009	070–9815–00
	070–9803–00			1	MANUAL, TECH:TLA 700 SERIES MICRO SUPPORT INSTALLATION	80009	070–9803–00
	119–5061–01			1	POWER SUPPLY:25W,5V 5A,CONCENTRIC 2MM,90–265V,47–63HZ (NOT SHOWN)	14310	SW106KA002F01
	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		
	070–9802–00			1	MANUAL, TECH:BASIC OPS MICRO SUP ON DAS/TLA 500 SERIES LOGIC ANALYZERS	80009	070–9802–00
	161–0104–06			1	CA ASSY,PWR:3,1.0MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, EUROPEAN,SAFETY CONTROLLED (OPT A1)	S3109	ORDER BY DESCRIPTION
	161–0104–07			1	CA ASSY,PWR:3,1.0MM SQ,240V/10AMP,2.5 METER, RTANG,IEC320,RCPT X 13A, FUSED, UK PLUG, (13A FUSE), UNITED KINGDOM,SAFETY CONTROL (OPT A2)	S3109	ORDER BY DESCRIPTION
	161–0104–05			1	CA ASSY,PWR:3,1.0MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, AUSTRALIA,SAFETY CONTROLLED (OPT A3)	S3109	ORDER BY DESCRIPTION
	161–0167–00			1	CA ASSY,PWR:3,0.75MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, SWISS,NO CORD GRIP, SAFETY CONTROLLED (OPT A5)	S3109	ORDER BY DESCRIPTION

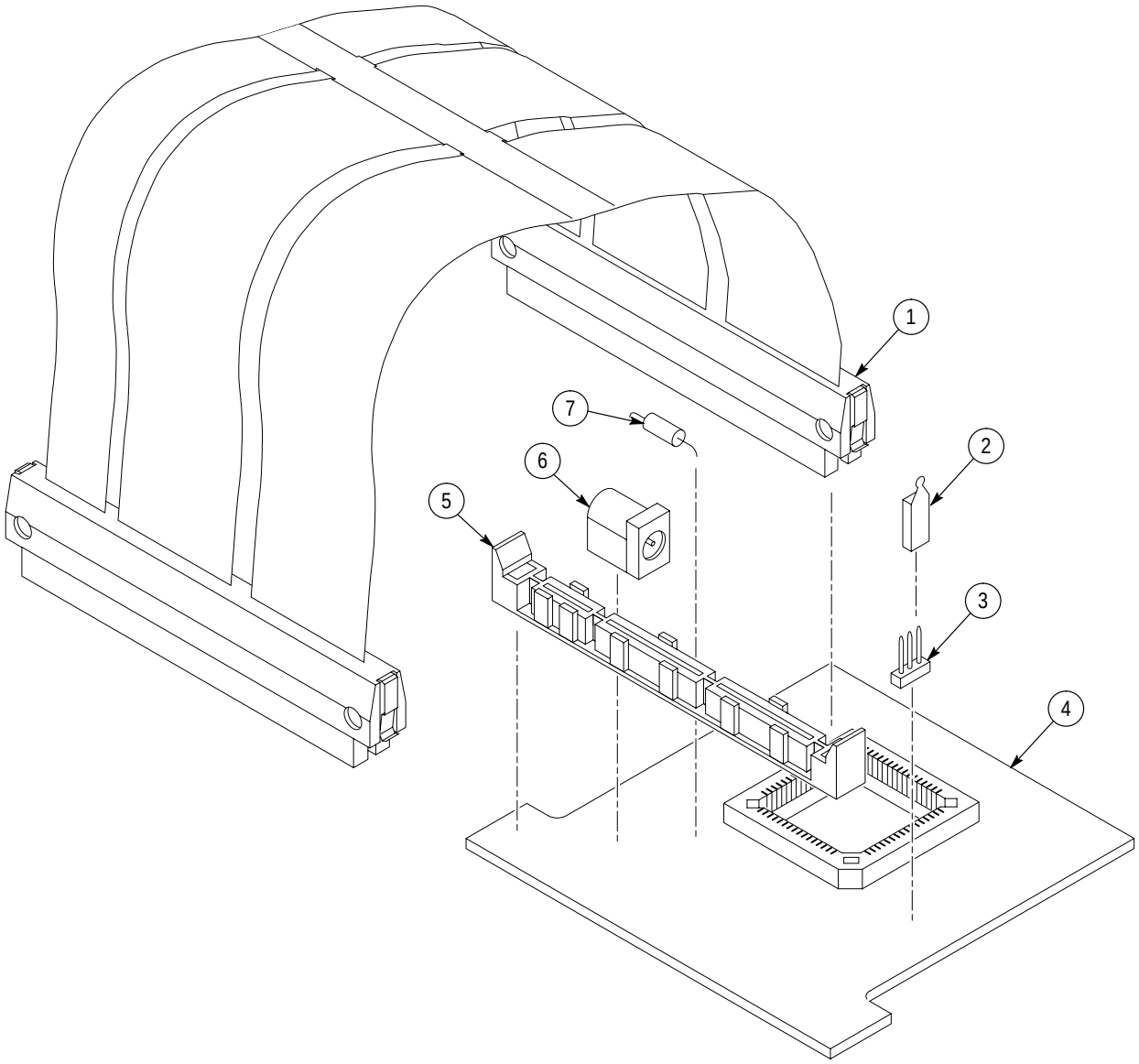


Figure 1: 8XC196NT probe adapter exploded view

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
2–0	010–0598–00			1	PROBE ADAPTER:8XC196NP,QFP–100,SOLDERED, TMS 142	80009	010–0598–00
–1	174–3418–00			1	CA ASSY,RF:TLC,MICRO–STRIP,TLC,50 OHM,FEP,PROP DELAY 1.4NS,12.0 L,100 POS,PLUG,LATCHING BOT	00779	1–340014–0
–2	131–4356–00			2	CONN,SHUNT:SHUNT/SHORTING,FEMALE,1 X 2,0.1 CTR,0.63 H,BLK,W/HANDLE,JUMPER,	26742	9618–302–50
–3	131–4530–00			2	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
–4	159–0059–00			1	FUSE,WIRE LEAD:5A,125V	61857	SPI–5A
–5	131–5527–00			1	JACK,POWER DC:PCB,MALE,RTANG,2MM PIN,11MM H(0.433) X 3.5MM(0.137) TAIL,9MM(0.354) W,TIN,W/SWI	0LXM2	DJ005A
–6	131–2515–00			2	CONN,BOX:PCB,FEMALE,STR,2 X 10,0.1 CTR,0.340 H X 0.120 TAIL,10 GOLD,	00779	86418–1
–7	103–0390–00			1	ADAPTER:CONN ADAPTER,100 PIN EIAJ PQFP TEST CLIP,32/92DM82,1S	05276	5643
–8	131–4057–00			2	CONN,BOX:PCB,FEMALE,STR,2 X 15,0.1 CTR,0.276 H X 0.118 TAIL,30 GOLD,0.070 DIA PTH,DUAL E	22526	68682–315
–9	671–3803–00			1	CIRCUIT BD ASSY:80C196NX, QFP–100, 389–2215–00 WIRED, TMS 142	80009	671–3803–00
–10	131–5947–00			1	CONN,BOX:PCB,MICRO–STRIP,FEMALE,STR,100 POS,0.05 CTR,W/GRD PLANE,0.320 H X 0.125 TAIL,LAT	00779	121289–7
					STANDARD ACCESSORIES		
	070–9815–00			1	MANUAL,TECH:INSTRUCTION,196NX,DISSASEMBLER, TMS 142	80009	070–9815–00
	070–9803–00			1	MANUAL, TECH:TLA 700 SERIES MICRO SUPPORT INSTALLATION	80009	070–9803–00
	119–5061–01			1	POWER SUPPLY:25W,5V 5A,CONCENTRIC 2MM,90–265V,47–63HZ (NOT SHOWN)	14310	SW106KA002F01
	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		
	070–9802–00			1	MANUAL, TECH:BASIC OPS MICRO SUP ON DAS/TLA 500 SERIES LOGIC ANALYZERS	80009	070–9802–00
	161–0104–06			1	CA ASSY,PWR:3,1.0MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, EUROPEAN,SAFETY CONTROLLED (OPT A1)	S3109	ORDER BY DESCRIPTION
	161–0104–07			1	CA ASSY,PWR:3,1.0MM SQ,240V/10AMP,2.5 METER, RTANG,IEC320,RCPT X 13A, FUSED, UK PLUG, (13A FUSE), UNITED KINGDOM,SAFETY CONTROL (OPT A2)	S3109	ORDER BY DESCRIPTION
	161–0104–05			1	CA ASSY,PWR:3,1.0MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, AUSTRALIA,SAFETY CONTROLLED (OPT A3)	S3109	ORDER BY DESCRIPTION
	161–0167–00			1	CA ASSY,PWR:3,0.75MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, SWISS,NO CORD GRIP, SAFETY CONTROLLED (OPT A5)	S3109	ORDER BY DESCRIPTION

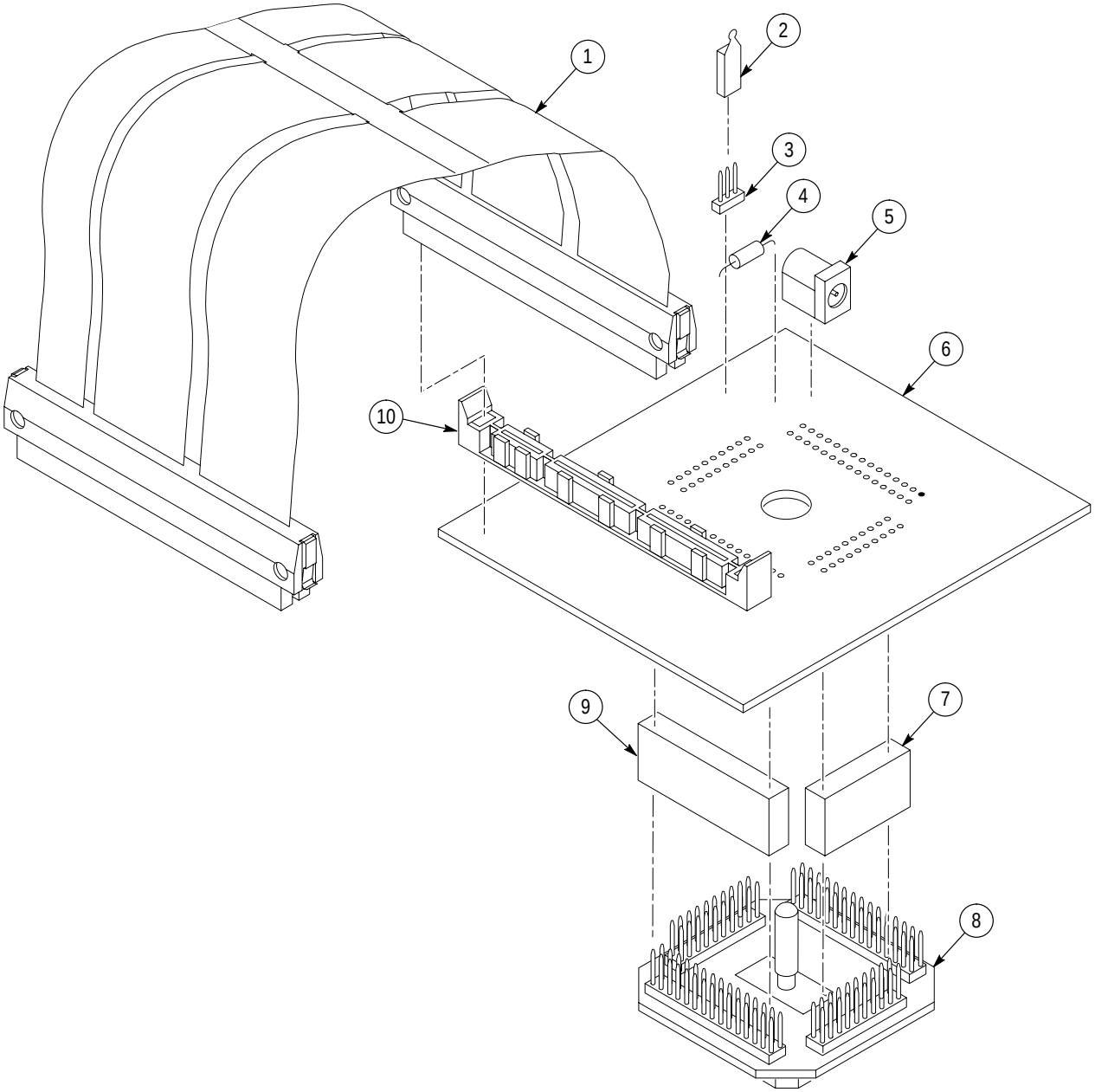


Figure 2: 8XC196NP probe adapter exploded view

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
3–0	010– 0582–00			1	ADAPTER,PROBE:192–CHANNEL,HIGH DENSITY PROBE	80009	010058200
–1	380–1095–00			1	HOUSING,HALF:UPPER,192 CHANNEL HIGH DENSITY PROBE	80009	380109500
–2	211–0152–00			4	SCR,ASSEM WSHR:4–40 X 0.625,PNH,BRS,NP,POZ	TK0435	ORDER BY DESC
–3	131–5947–00			2	CONN BOX:CPCB, MICRO–STRIP;FEMALE,STR,100 POS,0.05 CTR,W/GRD PLANE,0.320 H X 0.124 TAIL, LATCHING, 4 ROW, 0.05 PCB, STAGGER (J150, J250)	80009	131594700
–4	671–3395–00			1	CKT BD ASSY:192–CHANNELS,HIGH DENSITY PROBE	80009	671339500
–5	380–1096–00			1	HOUSING,HALF:LOWER,192 CHANNEL HIGH DENSITY PROBE	80009	380109600
–6	348–0070–01			2	PAD,CUSHIONING:2.03 X 0.69 X 0.18 SI RBR	85471	ORDER BY DESC
–7	131–4917–00			8	CONN,HDR CPCB,;MALE,STR,1 X 2,0.1 CTR,0.235 MLF X 0.110 TAIL,20 BOLD, TUBE, HIGH TEMP (J300,J340J400,J440J500,J640,J600)	53387	131491700
–8	131–5267–00			5	CONN,HDR CPCB,;MALE,STR,2 X 40.O.1 CTR,0.234 MLG X 0.110 TAIL, 30 GOLD (J310,J320,J330,J340,J350,J360,J370,J410,J420,J430,J450,J460,J470,J510,J520,J530,J550,J560,J570,J610,J620,J630,J650,J660,J670)	53387	131526700

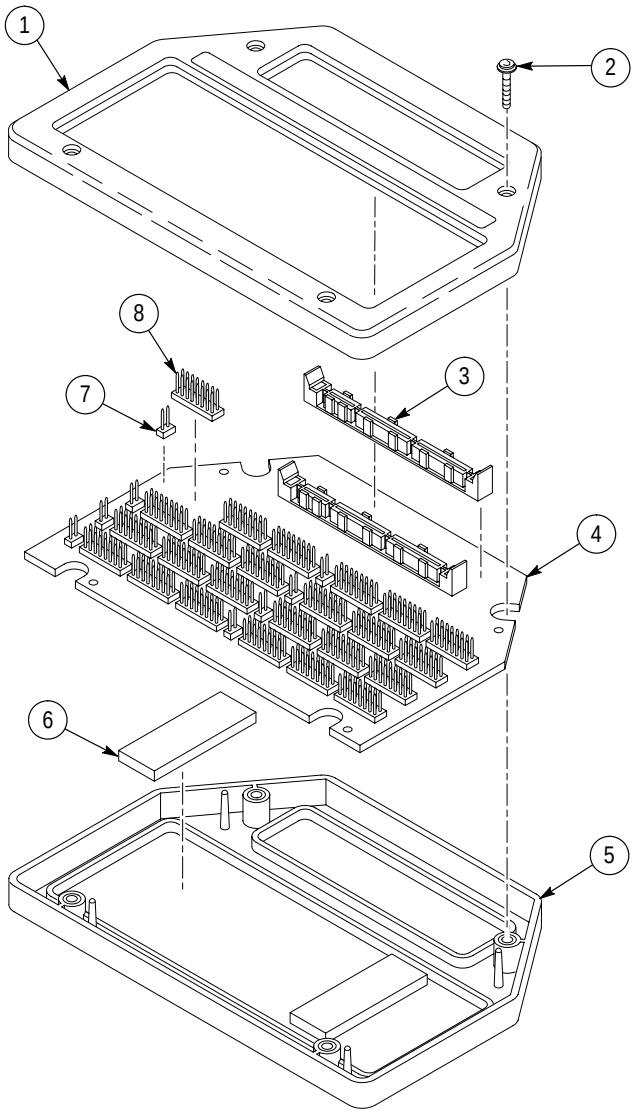


Figure 3: 192-Channel High-Density Probe exploded view

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