User Manual

Tektronix

TDS2MEM
Storage Memory and Communications Module

071-1262-00

This document set supports English, Français, Deutsch, Italiano, Español, Português, 한국어 , 日本語 , 简体中文 , 繁體中文 , and Русский

This document supports firmware version FV:v6.00 and above.

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WARRANTY SUMMARY
TDS2MEM

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of three (3) years from the date of shipment from an authorized Tektronix distributor. If a product or CRT proves defective within the respective period, Tektronix will provide repair or replacement as described in the complete warranty statement.

To arrange for service or obtain a copy of the complete warranty statement, please contact your nearest Tektronix sales and service office.

EXCEPT AS PROVIDED IN THIS SUMMARY OR THE APPLICABLE WARRANTY STATEMENT, TEKTRONIX MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL TEKTRONIX BE LIABLE FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES.

WARRANTY
CompactFlash Card and CompactFlash Reader

Tektronix warrants that the parts, assemblies and supplies ("products") that it manufactures and sells will be free from defects in materials and workmanship for a period of three (3) months from the date of shipment. If a product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

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

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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.

To Avoid Fire or Personal Injury

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.

The common terminal is at ground potential. Do not connect the common terminal to elevated voltages.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

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.

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. These symbols may appear on the product:

CAUTION
Refer to Manual

Protective Ground
(Earth) Terminal

Battery Recycling

This product contains a non-replaceable Lithium battery. Please dispose of the battery properly according to your local regulations.

Contacting Tektronix

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

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

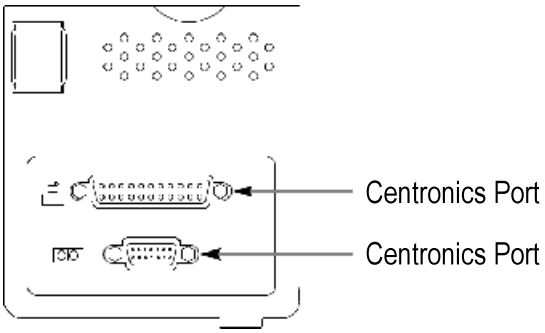
Using the TDS2MEM Storage Memory and Communications Module

The TDS2MEM Storage Memory and Communications module adds removable Type 1 CompactFlash (CF) card storage memory, RS-232 remote programming capability, and RS-232 and Centronics printer output connectivity to your TDS1000- or TDS2000-Series oscilloscope.

NOTE. *This module is not compatible with TDS200-Series oscilloscopes.*

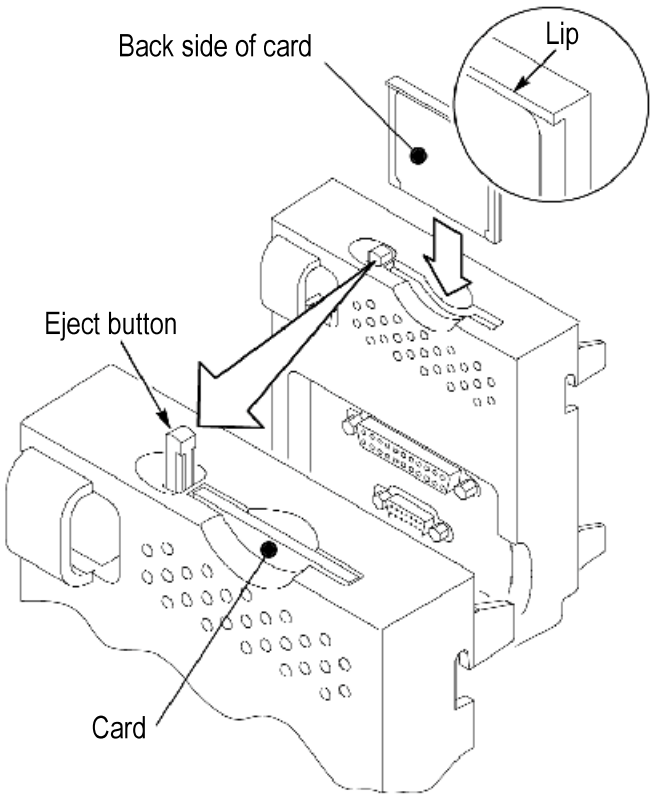
Installing the Module

See the *TDS200-, TDS1000- and TDS2000-Series Extension Module Installation* sheet for module installation instructions. The following illustration identifies the TDS2MEM module output ports.



Installing and Removing the CompactFlash Card

Insert a Type 1 CompactFlash card into the slot until the card is flush with the module case, as shown below. The CF card is keyed to be inserted only one way. If the CF card does not easily slide into place, remove and correctly reinsert it.



To remove the CompactFlash card, push and release the eject button until the button fully extends, then push the eject button again to release the CF card from the slot. Pull the CF card out of the module slot.

CompactFlash Card Initial Read Time

The TDS2MEM reads a CF card's internal structure every time you insert a CF card. The time to complete the read depends on the size of the CF card and how it was formatted. To significantly shorten the initial read time of 64 MB and larger CF cards used in the TDS2MEM module, format the CF card using the TDS2MEM format function (UTILITY ▸ File Utilities ▸ Format).

Formatting a CompactFlash Card

1. Insert a CF card into the module.
2. Push the UTILITY front panel button.
3. Select the File Utilities menu option.
4. Select the More menu option to display menu page 2.
5. Select the Format menu option.
6. Select the Yes menu option to format the CF card. Formatting deletes all data on the CF card.

CompactFlash Card Capacities

The following are the approximate number of files, by type, that you can store per 1 MB of CF card memory.

- 5 Save All operations (see *Saving Information Using the PRINT Button* on page 5)
- 16 screen image files (actual capacity depends on the selected image format) (see *Saving a Screen Image to a File* on page 7)

- 250 oscilloscope setting (.set) files (see *Saving Oscilloscope Settings* on page 8)
- 18 waveform (.csv) files (see *Saving Waveform Files* on page 9)

File Management Conventions

- The oscilloscope checks for available space on the CompactFlash card before writing files, and displays a warning message if there is not enough memory for the files you are writing.
- The term folder as used in this manual refers to a directory location on the CF card.
- The default file save or recall location is the current folder.
- The root folder is A:\.
- The oscilloscope resets the current folder to A:\ when powering on the instrument, or when inserting a CF card after the oscilloscope is powered on.
- File names can have one to eight characters, followed by a period, followed with an extension of one to three characters.
- Long file names created on PC operating systems are displayed using the operating system's shortened file name.
- File names are upper case.

Saving Information Using the PRINT Button

You use the Save All menu (SAVE/RECALL ▸ Action = Save All) to set the PRINT button to do one of three functions:

- Automatically save oscilloscope information to multiple files in a folder.
- Save the screen image to a file.
- Print the screen image to the current printer port.

Options	Settings or Submenus	Comments
Print Button	Saves All To Files	Sets the print button to save all active oscilloscope information (waveforms, screen image, settings) to files in a new subfolder in the current CF card folder. See Saves All to Files on page 6.
	Saves Image To FIle	Sets the print button to send the screen image to a file on the CF card.
	Prints	Sets the print button to send the screen image to the current printer port.
Select Folder		Lists the contents of the current CF card folder and displays the following menu items.
	Change Folder	See *Managing Files and Folders* on page 14.
	New Folder	
	Back	Returns to the Save All menu.
About Save All		Displays the help text for this task.

Key Points

Saves All To Files. Setting the Print Button to Saves All To Files is a fast and easy way to save all of the current oscilloscope information to files with a single button push. Pushing the PRINT button creates a new folder and saves the following information in separate files in that new folder, using the current instrument and file format settings, as listed in the following table:

Source	File name
CH(x)	FnnnnCHx.CSV, where nnnn is an automatically-generated number, and x is the channel number.
MATH	FnnnnMTH.CSV
Ref(x)	FnnnnRFx.CSV, where x is the reference memory letter.
Screen Image	FnnnnTEK.???, where ??? is the current Save Image file format.
Settings	FnnnnTEK.SET

.CSV Files. CSV (comma-separated value) files contain ASCII text string that lists the time (relative to the trigger) and voltage values for each of the 2500 waveform data points. You can import .csv files into many spreadsheet and math analysis applications.

Screen Image Files. You can import screen image files into many spreadsheet and word processing applications. The type of image file you can import depends on you application.

.SET files. SET files contain an ASCII text string listing of the oscilloscope settings.

Saving a Screen Image to a File

You use the Save Image menu (SAVE/RECALL ▸ Action = Save Image) to save the oscilloscope screen image to a default file named TEKnnnn.???, where .??? is the specified graphics file format. You can import screen image files into many spreadsheet and word processing applications.

Options	Settings or Submenus	Comments
File Format	BMP, PCX, TIFF, RLE, EPSIMAGE	Sets the screen image graphics file format.
About Saving Images		Displays the help text for this task.
Select Folder		Lists the contents of the current CF card folder and displays the following menu items.
	Change Folder	See *Managing Files and Folders* on page 14.
	Layout	Select portrait or landscape image layout.
	Ink Saver On, Off	Toggles Ink Saver mode On or Off (color models only).
	New Folder	See *Managing Files and Folders* on page 14.
Save	filename	Saves the screen image to the automatically generated file name in the current CF card folder.

Saving Oscilloscope Settings

You use the Save Setup menu (SAVE/RECALL ▶ Action = Save Setup) to save the current oscilloscope settings to file name TEKnnnn.SET in the specified folder or in nonvolatile setup memory. A setting file contains an ASCII text string that lists the oscilloscope settings.

Options	Settings or Submenus	Comments
Save To	Setup	Specifies saving the current oscilloscope settings to nonvolatile setup memory
	File	Specifies to save the current oscilloscope settings to a file on the CF card.
Setup	1 to 10	Specifies the nonvolatile setup memory location.
Select Folder		Lists the contents of the current CF card folder and displays the following menu items.
	Change Folder	See *Managing Files and Folders* on page 14.
	New Folder	Returns to the Save All menu.
Save		Saves the settings to the specified setup memory location.
	filename	Saves the settings to the automatically generated file name in the current CF card folder.

Saving Waveform Files

You use the Save Wfm menu (SAVE/RECALL ▶ Action = Save Wfm) to save the specified waveform to file name TEKnnnn.CSV, or to reference memory. The module saves waveform data to files as comma-separated values (.csv format), which is an ASCII text string that lists the time (relative to the trigger) and voltage values for each of the 2500 waveform data points. You can import .csv files into many spreadsheet and math analysis applications.

Options	Settings or Submenus	Comments
Save To	File	Specifies to save the source waveform data to a file on the CF card.
	Ref	Specifies to save the source waveform data in reference memory.
Source	CH(x), Ref(x), MATH	Specifies which source waveform to save.
Save To	Ref(x)	Specifies the reference memory location in which to save the source waveform.
Select Folder		Lists the contents of the current CF card folder and displays the following menu items.
	Change Folder	See *Managing Files and Folders* on page 14.
	New Folder	
Save		Saves the waveform to the specified reference memory.
	filename	Saves the waveform data to the automatically generated file name in the current CF card folder.

Recalling Oscilloscope Settings

You use the Recall Setup menu (SAVE/RECALL ▶ Action = Recall Setup) to load oscilloscope setup information from a file or memory location.

Options	Settings or Submenus	Comments
Recall From	Setup	Specifies to recall oscilloscope settings from nonvolatile memory.
	File	Specifies to recall oscilloscope settings from a file on the CF card.
Setup	1 to 10	Specifies the nonvolatile memory location from which to recall oscilloscope settings.
Select Folder		Lists the contents of the current CF card folder from which to select a file, and displays the following menu item.
	Change Folder	See *Managing Files and Folders* on page 14.
Recall		Recalls the settings from nonvolatile memory.
	filename	Recalls the settings from the specified CF card file.

Recalling Waveform Files

You use the Recall Wfm menu (SAVE/RECALL ▶ Action = Recall Wfm) to load waveform data from a CF card file into the specified reference memory location.

Options	Settings or Submenus	Comments
To	Ref(x)	Specifies the reference memory location in which to load the waveform data.
		Lists the contents of the current CF card folder from which to select a file, and displays the following menu items.
	Change Folder	See *Managing Files and Folders* on page 14.
	To Ref(x)	Specifies the reference memory location in which to load the waveform data.
Recall	filename	Loads the waveform data from the specified file into reference memory.

Displaying Reference Waveforms

You use the Display Refs menu (SAVE/RECALL ▶ Action = Display Refs) to toggle on or off display of the specified reference memory waveform.

Options	Settings or Submenus	Comments
Ref(x)	On, Off)	Toggles on or off display of the specified reference memory waveform.

Setting the Printer Options

You use the Printer Setup menu (UTILITY ▶ Options ▶ Printer Setup) to configure the printer file format and port settings.

Options	Settings or Submenus	Comments
Print Button		See page 5 for information on the Print Button settings.
Print Port	Centronics, RS-232	Communication port used to connect the oscilloscope to a printer.
Printer Format	Thinkjet, Deskjet, Laser Jet, Bubble Jet, Epson Dot, DPU411, DPU412, DPU3445, Epson C60, Epson C80, BMP, PCX, TIFF, RLE, EPSIMAGE	Type of printer connected to the communication port. This menu option is active when the Print Button is set to Prints.
File Format	BMP, PCX, TIFF, RLE, EPSIMAGE	Type of graphics image file format. This menu option is active when the Print Button is set to Saves Image to Files.
Layout	Portrait, Landscape	Printer output orientation.
Ink Saver	On, Off	Toggles On or off printing the screen as a black image on a white background. Only available in TDS2000-Series oscilloscopes.
Abort Printing		Stops sending screen data to the printer.

Setting the Date and Time

You use the Set Date and Time menu (UTILITY ▶ Options ▶ Set Date and Time) to set the module clock date and time. The module uses this information to time stamp files written to the card. The module contains a built-in non-replaceable battery to maintain the clock settings.

Options	Settings	Comments
↑↓		Moves the field selection highlight up or down through the list. Use the TRIGGER LEVEL knob to change the value of the selected field.
Set Date and Time		Updates the module with the specified date and time settings.
Cancel		Closes the menu and returns to the previous menu without saving any changes.

Key Points

Seasonal Time Changes. The module clock/calendar does not automatically adjust for seasonal time changes. The module does adjust for Leap years.

Managing Files and Folders

You use the File Utilities function (UTILITY ▶ File Utilities) to do the following:

- List the contents of the current folder.
- Select a file or folder.
- Navigate to other folders.
- Create, rename, and delete files and folders.
- Format the CompactFlash card.

Options	Comments
Change Folder	Navigates to the selected CF card folder. Use the HORIZONTAL POSITION knob to select a file or folder, then push the Change Folder menu option to navigate to the selected folder. To return to the previous folder, select the UP folder item and push the Change Folder menu option.
New Folder	Creates a new CF card folder at the current folder location, named NEW_FOL, and displays the file Rename menu for changing the default name.
Delete (filename/folder)	Deletes the selected file name or folder. A folder must be empty before you can delete it.
Confirm Delete	Displays after pressing Delete, to confirm a file delete action. Pressing any button or knob other than Confirm Delete cancels the file delete action.
Rename	Displays the Rename screen to rename a folder or file; see *Renaming Files and Folders* on page 15.

Options	Settings	Comments
Format	Yes, No	Formats the CompactFlash card. Formatting deletes all data on the CF card.

Renaming Files and Folders

You use the Rename screen (UTILITY ▶ File Utilities ▶ Rename) to change the names of files and folders on the CompactFlash card.

Options	Settings or Submenus	Comments
Enter Character	A - Z 0 - 9 _ .	Enters the highlighted alphanumeric character at the current Name field cursor position. Use the HORIZONTAL POSITION knob to select an alphanumeric character or the Backspace, Delete Character, or Clear Name functions.
	Backspace	Changes the menu button 1 option to the Backspace function. Deletes the character to the left of the highlighted character in the Name field.
	Delete Character	Changes the menu button 1 option to the Delete Character function. Deletes the highlighted character from the Name field.
	Clear Name	Changes the menu button 1 option to Clear Name. Deletes all characters from the Name field.

Options	Settings or Submenus	Comments
← →		Moves the Name field cursor left or right by one position.
OK		Changes the folder of file name to that shown in the Name field.
Cancel		Cancels the rename action (does not change the folder or file name) and returns to the previous menu.

Using Programming Commands through the RS-232 Port

See the *TDS2CMA Communications Module* section in the *TDS1000- and TDS2000-Series Digital Storage Oscilloscope User Manual* for information on controlling the TDS2MEM or the oscilloscope functions through the RS-232 port. See the *TDS1000- and TDS2000-Series Digital Storage Oscilloscope Programmer Manual* (Tektronix part number 071-1075-01 or later) for command syntax information.

Using the CompactFlash Card Reader

Refer to the included CF card reader documentation to install, configure, and use the CF card reader on your PC's USB port. You may need to install USB drivers to use the CF card reader.

Tektronix warrants the included CF card and CF card reader for three (3) months. Refer to the front of this document for specific warranty information. Please contact the respective manufacturers of these items for warranty or service support after the three-month Tektronix warranty period.