

## Using Compact Flash Cards on Oscilloscopes in Antennas, Microwaves, and Electronics Laboratory (EP127)

### Introduction

This handout discusses using the compact flash memory cards to save oscilloscope data (e.g., screen shots, trace data, ...) in an electronic form (i.e., computer files). In EP127, we have Tektronix TDS2012 Digital Storage Oscilloscopes (see Fig. 1) with the TDS2MEM communications module that accepts Type I compact flash memory cards (a card is depicted in Fig. 2a). These cards are used to transfer information from the oscilloscopes to a networked computer in EP127 via a PQI CompactFlash™ Card Reader/Writer (a card reader shown in Fig. 2b) that connects to a USB cable connected to the computer.

The following designations will be used to help give instructions on using/operating the equipment:

- Front panel buttons will be depicted by a box outline, e.g. **BUTTON**.
- Boxed groups of related buttons will be referenced by the box name in quotes, e.g., "MENUS".
- Softkeys on the VNA display will be denoted  $\langle \rangle$ , e.g.,  $\langle$ File Utilities $\rangle$ .
- Softkey options that can be toggled will be indicated by highlighting, e.g. **Option**.

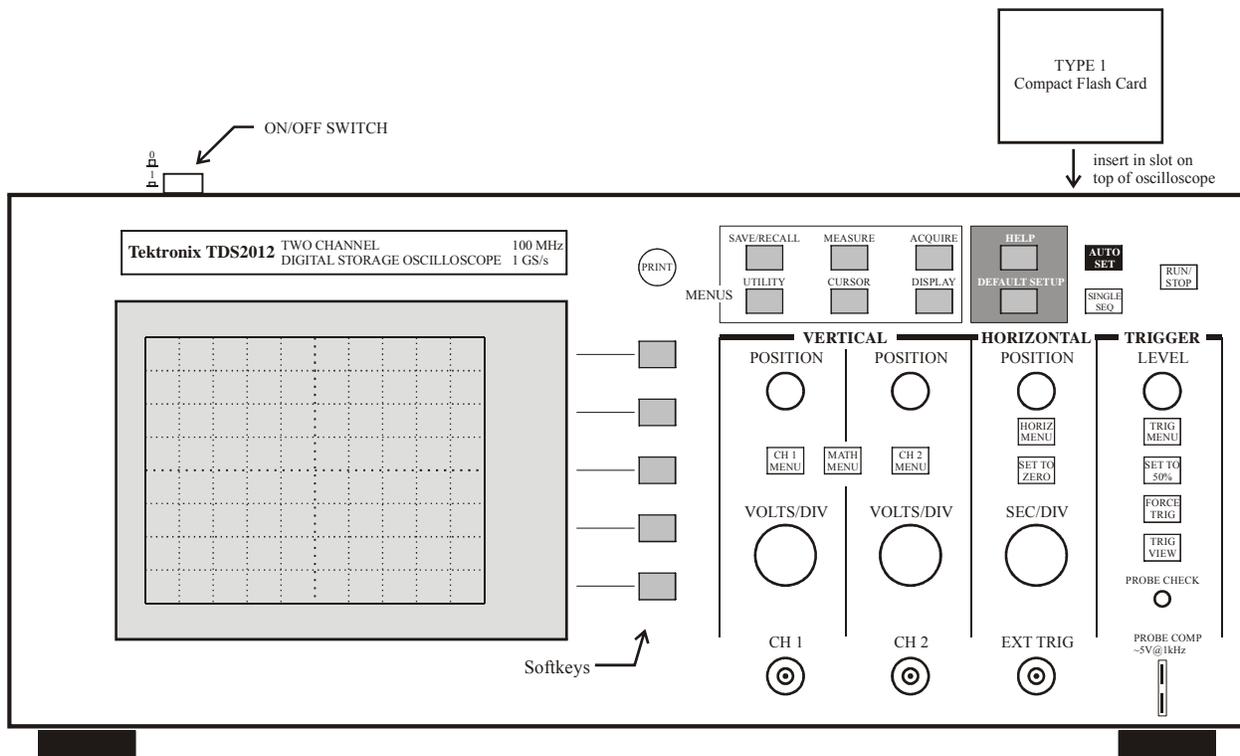


Figure 1 Front panel layout of TDS2012 Digital Storage Oscilloscope.

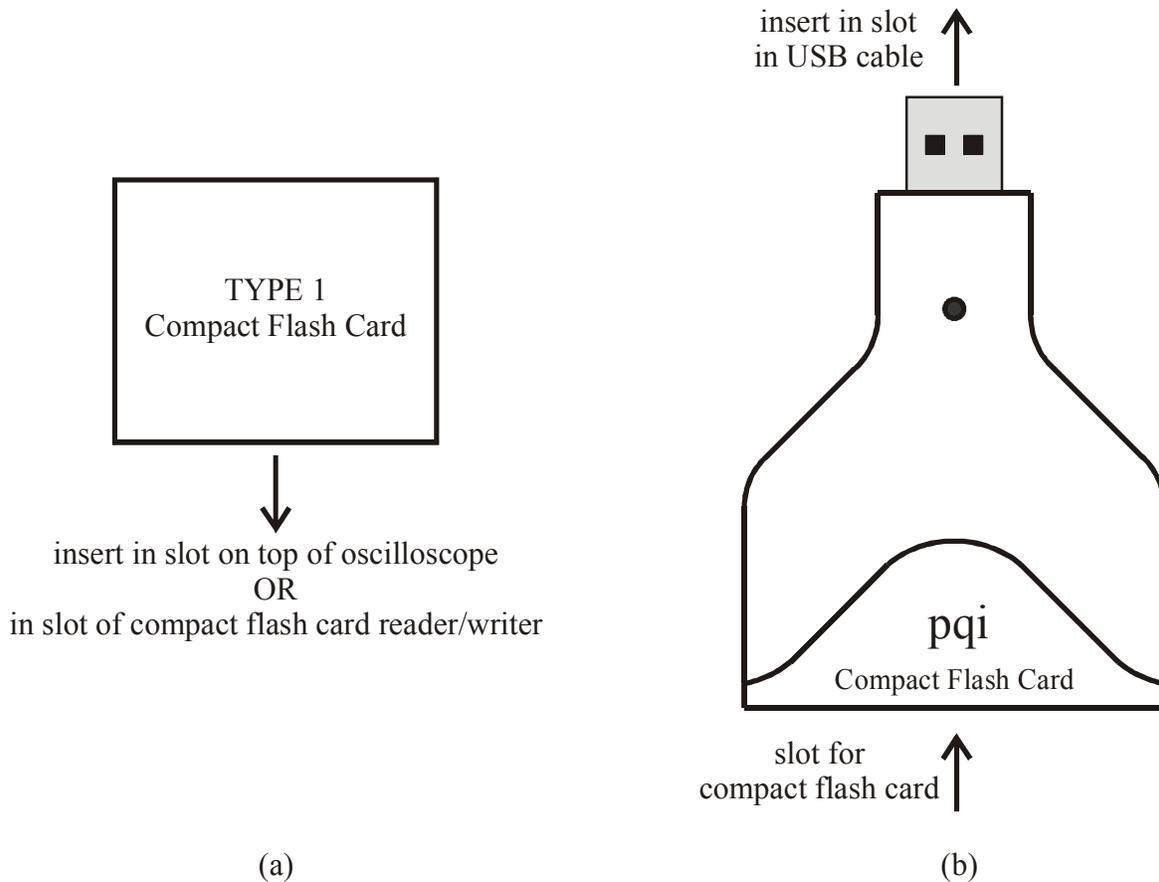


Figure 2 (a) Compact Flash Card and (b) CompactFlash™ Card Reader/Writer

### **Loading compact flash cards into oscilloscope**

- 1) With power on or off, insert the card (hole array down) into the slot on the top of the oscilloscope. The cards are labeled with an arrow and the word FRONT. The card should slide in place easily until the top is flush with the top of the oscilloscope case.
- 2) If necessary, turn-on the oscilloscope. Wait for the oscilloscope, to read the card. Ignore the message about formatting the card.
- 3) To check the contents of the card, press the UTILITY button in “MENUS” on the face of the oscilloscope, and then press the <File Utilities> softkey to see card contents and softkey options (e.g., <Change Folder>, <New Folder>, <Delete>, etc.)

**Please clear your files and/or folders from the flash card when before and after using the card (as necessary). This can be done either using the computer or the oscilloscope.**

### **To save an oscilloscope screen shot**

- 1) Press the **UTILITY** button in “MENUS” on the face of the oscilloscope to bring up a softkey menu.
- 2) Press the <Options> softkey to bring up related softkeys.
- 3) Press the <Printer Setup> softkey to bring up related softkeys.
- 4) Toggle the < Print Button **Prints** > softkey to < Print Button **Saves Image To File** >.
- 5) Toggle the < File Format **BMP** > softkey to < File Format **TIFF** >. The \*.tif file format is more memory efficient than the \*.bmp file format and supported by more software packages than the \*.pcx format.
- 6) Get oscilloscope set-up as desired (e.g., place cursors, make measurements, etc.).
- 7) Press the **PRINT** button on the face of the oscilloscope and wait for file to be saved.

Note: By default the oscilloscope screen shots are saved as TEK0000.TIF, TEK0001.TIF, TEK0002.TIF, ... These files are approximately 15 to 20KB in size. You can rename these files on the oscilloscope (**UTILITY** → <File Utilities> → ...), but it is much easier on a computer.

### **To save oscilloscope screen shot, settings, and trace data**

- 1) Press the **UTILITY** button in “MENUS” on the face of the oscilloscope to bring up a softkey menu.
- 2) Press the <Options> softkey to bring up related softkeys.
- 3) Press the <Printer Setup> softkey to bring up related softkeys.
- 4) Toggle the < Print Button **Prints** > softkey to < Print Button **Saves All To Files** >.
- 5) Toggle the < File Format **BMP** > softkey to < File Format **TIFF** >.
- 6) Get oscilloscope set-up as desired (e.g., place cursors, make measurements, etc.).
- 7) Press the **PRINT** button on the face of the oscilloscope and wait for files to be saved.

Note: By default the oscilloscope creates folders ALL0000, ALL0001, ALL0002, ... These folders contain 3 or more files. For example, ALL0000 might contain F0000CH1.CSV (a Microsoft Excel Comma Separated Values file with the channel 1 horizontal and vertical data, ~80KB), F0000TEK.SET (a text file detailing oscilloscope settings, ~10-20KB), and F0000TEK.TIF (a \*.tif image file of oscilloscope screen, ~ 15KB).

**To transfer data saved on card to floppy/network drive**

- 1) Press the black eject button on the top of the oscilloscope to the right of the card slot to eject the card (power can be on or off).
- 2) Insert card into card reader. The card reader should be disconnected from the USB cable.
- 3) Log into the computer.
- 4) Connect the card reader/card combination to the USB cable coming from the back of the computer (from here on out they can be treated like any other USB storage device/drive).
- 5) Double click the “My Computer” icon on the desktop. The card reader/card combination should show up as Removable Disk (E:\).
- 6) Copy/Move files to a 3.5” floppy (A:\) or to your network folder(s) on the (H:\) drive. **Do NOT** save anything to the local hard drive (C:\), it will be deleted. As a courtesy to others, delete contents of card.
- 7) Using the mouse, left click the icon with the green arrow on the windows taskbar (bottom right). When the “Safely remove USB Mass Storage Device- Drive E:” message appears, left click, wait for the “Safe To Remove Hardware” message, and disconnect the card reader/card combination from the USB cable. Leave the USB cable connected to the computer.
- 8) Log off computer.
- 9) Remove card from reader. Leave reader by computer (do NOT connect to USB cable). Return card to slot in oscilloscope.