Specifications

This section begins with a general description of the traits of the TDS 500D, TDS 600C, TDS 700D and TDS 714L oscilloscopes. Three sections follow, one for each of three classes of traits: *nominal traits, warranted characteristics,* and *typical characteristics*.

Product Description

The TDS 500D, TDS 600C, TDS 700D and TDS 714L oscilloscopes are portable, four-channel instruments suitable for use in a variety of test and measurement applications and systems. Table 1–1 lists key features.

Table 1–1: Key features of TDS 500D, 600C, 700D and 714L oscilloscopes

Feature	TDS 600C	TDS 500D, TDS 700D & TDS 714L
Digitizing rate, maximum	TDS 684C: 5 GS/s on ea. of 4 ch TDS 680C: 5 GS/s on ea. of 2 ch TDS 654C: 5 GS/s on ea. of 4 ch TDS 694C: 10 GS/s on ea. of 4 ch	TDS 580D, TDS 784D, TDS 794D: 4 GS/s TDS 540D, 754D: 2 GS/s TDS 520D, 724D: 1 GS/s TDS 714L: 500 MS/s
Analog bandwidth	TDS 694C: 3 GHz TDS 794D: 2 GHz TDS 580D, TDS 680C, 684C, and 784D: 1 GHz TDS 520D, 540D, 654C, 714L, 724D and 754D: 500 MHz	
No. of Channels	TDS 654C, 684C & 694C: 4 TDS 680C: 2 + 2[1]	TDS 540D, 580D, TDS 714L, 754D, 784D & 794D: 4 TDS 520D & 724D: 2 + 2[1]
Record lengths, maximum	15,000 samples TDS 694C: 30,000 samples (120,000 with option 1M)	50,000 (250,000 on TDS 714L) samples (500,000 with option 1M, not available on TDS 714L) (8,000,000 with option 2M)
Acquisition modes	Sample, envelope, peak detect and average	Sample, envelope, average, high-resolution, and peak-detect

Table 1–1: Key features of TDS 500D, 600C, 700D and 714L oscilloscopes (cont.)

Feature	TDS 600C	TDS 500D, TDS 700D & TDS 714L
Trigger modes	Modes include: Edge, logic, and pulse. Video trigger, with option 05, modes include: NTSC, SECAM, PAL, HDTV, and FlexFormat. (Not available on TDS 694C/794D) Communications Trigger with option 2C (not available on TDS 600C and TDS 714L), modes include: AMI, CMI, and NRZ	
Display	TDS 520D, 540D, 580D, 680C: Monochrome TDS 645C, 684C, 694C, 714L, 724D, 754D, 784D, 794D: Color	
Storage	Floppy disk drive: 1.44 Mbyte, 3.5 inch, DOS 3.3-or-later floppy disk drive Internal hard disk drive (optional) Iomega Zip drive compatible NVRAM storage for saving waveforms, hardcopies, and setups	
I/O	Full GPIB programmability. Hardcopy output using GPIB, RS-232, or Centronics ports	

1 Two plus Two channel operation allows up to two of the four channels to be displayed simultaneously. Channels not displayed can be used to couple a triggering signal to the oscilloscope.

User Interface

Use a combination of front-panel buttons, knobs, and on-screen menus to control the many functions of the oscilloscope. The front-panel controls are grouped according to function: vertical, horizontal, trigger, and special. Set a function you adjust often, such as vertical positioning or the time base setting, directly by its own front-panel knob. Set a function you change less often, such as vertical coupling or horizontal mode, indirectly using a selected menu.

Menus   Pressing one (sometimes two) front-panel button(s), such as vertical menu, displays a *main* menu of related functions, such as coupling and bandwidth, at the bottom of the screen. Pressing a main-menu button, such as coupling, displays a *side* menu of settings for that function, such as AC, DC, or GND (ground) coupling, at the right side of the screen. Pressing a side-menu button selects a setting such as DC.

Indicators   On-screen readouts help you keep track of the settings for various functions, such as vertical and horizontal scale and trigger level. Some readouts use the cursors or the automatic parameter extraction feature (called measure) to display the results of measurements made or the status of the instrument.

General Purpose Knob   Assign the general purpose knob to adjust a selected parameter function. More quickly change parameters by toggling the **SHIFT** button. Use the same method as for *selecting* a function, except the final side-menu selection assigns the general purpose knob to *adjust* some function, such as the position of measurement cursors on screen, or the setting for a channel fine gain.
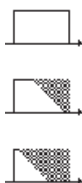
GUI   The user interface also makes use of a GUI, or Graphical User Interface, to make setting functions and interpreting the display more intuitive. Some menus and status are displayed using iconic representations of function settings, such as those shown here for full, 250 MHz and 20 MHz bandwidth. Such icons allow you to more readily determine status or the available settings.

Signal Acquisition System

The signal acquisition system provides up to four, full-featured vertical channels with calibrated vertical scale factors from 1 mV to 10 V per division, depending on TDS model. All channels can be acquired simultaneously.

Each of the full-featured channels can be displayed, vertically positioned, and offset, and their vertical coupling specified. Some models can have their bandwidth limited (250 MHz or 20 MHz). Fine gain can also be adjusted.

Besides these channels, up to three math waveforms and four reference waveforms are available for display. (A math waveform results when you specify dual waveform operations, such as add, on any two channels. A reference waveform results when you save a waveform in a reference memory).

Horizontal System

There are three horizontal display modes: main only, main intensified, and delayed only. You can select among various horizontal record length settings.

A feature called "Fit to Screen" allows you to view entire waveform records within the 10 division screen area. Waveforms are compressed to fit on the screen. See Table 1–2.

Both the delayed only display and the intensified zone on the main intensified display may be delayed by time with respect to the main trigger. Both can be set to display immediately after the delay (delayed runs after main mode). The delayed display can also be set to display at the first valid trigger after the delay (delayed-triggerable modes).

The delayed display (or the intensified zone) may also be delayed by a selected number of events. In this case, the events source is the delayed-trigger source. The delayed trigger can also be set to occur after a number of events plus an amount of time.

Table 1–2: Record length and divisions per record versus TDS model

Standard Models	Record length	Divisions per record	
		FTS[1] Off[2]	FTS[1] On3
All TDS 500D, TDS600C, TDS 694C, TDS 700D, & TDS 714L, all channels[4]	500	10 div	10 div
	1,000	20 div	10 div
	2,500	50 div	10 div
	5,000	100 div	10 div
	15,000	300 div	10 div
TDS 694C, all channels	30,000	600 div	15 div
TDS 500D, TDS 700D, & TDS 714L, all channels	50,000	1,000 div	15 div
Models with Option 1M[5]	Record length	Divisions per record	
		FTS[1] Off[2]	FTS[1] On3
TDS 694C, all channels	50,000	1,000 div	10 div
TDS 500D, TDS 694C, TDS 700D, & TDS 714L, all channels	75,000	1,500 div	15 div
TDS 500D, TDS 694C, TDS 700D, & TDS 714L, all channels	100,000	2,000 div	12 div
TDS 694C, all channels	120,000	2,400 div	13 div
TDS 500D, TDS 700D, TDS 714L, all channels	130,000	2,600 div	10 div
TDS 520D, one channel only TDS 540D, TDS 580D, all TDS 700D, & TDS 714L, one or two channels	250,000	5,000 div	10 div
TDS 540D, TDS 580D, & all TDS 700D, one channel only	500,000	10,000 div	10 div

Table 1–2: Record length and divisions per record versus TDS model (cont.)

Models with Option 2M	Record length	Divisions per record	
		FTS[1] Off[2]	FTS[1] On[3]
TDS 520D & TDS 724D, one or two channels TDS 540D, TDS 580D, TDS 714L, TDS 754D, TDS 784D & TDS 794D, three or four channels	2,000,000	40,000 div	10 div
TDS 520D & TDS 724D, one channel only TDS 540D, TDS 580D, TDS 714L, TDS 754D, TDS 784D & TDS 794D, two channels	4,000,000	80,000 div	10 div
TDS 540D, TDS 714L, TDS 754D, TDS 784D & TDS 794D, one channel only	8,000,000	160,000 div	10 div

[1] **Fit to Screen setting**

[2] **Fit to Screen off preserves 50 samples/division in a 1–2–5 sec/division sequence.**

[3] **Fit to Screen on lets the samples/division and the sec/division sequence vary.**

[4] **All channels means all that may be displayed at one time: four channels for some models, two for others. See Table 1–1 and its footnote.**

[5] **1M is the standard record length on the TDS 714L.**

Trigger System

The triggering system supports a varied set of features for triggering the signal-acquisition system. Trigger signals recognized include:

■ Edge (main- and delayed-trigger systems): This familiar type of triggering is fully configurable for source, slope, coupling, mode (auto or normal), and holdoff.

■ Logic (main-trigger system): This type of triggering can be based on pattern (asynchronous) or state (synchronous). In either case, logic triggering is configurable for sources, for Boolean operators to apply to those sources, for logic pattern or state on which to trigger, for mode (auto or normal), and for holdoff. Time qualification may be selected in pattern mode. Another class of logic trigger, setup/hold, triggers when data in one trigger source changes state within the setup and hold times that you specify relative to a clock in another trigger source.