

## Nominal Traits

This subsection contains a collection of tables that list the various *nominal traits* that describe the TDS 520 and 540 Digitizing Oscilloscopes. (Traits that differ according to model or only apply to one model are preceded by the appropriate model number, TDS 520 or TDS 540, in the tables.) Included are electrical and mechanical traits.

Nominal traits are described using simple statements of fact such as "Four, all identical" for the trait "Input Channels, Number of," rather than in terms of limits that are performance requirements.

**Table A-7: Nominal Traits—Signal Acquisition System**

Name	Description								
Bandwidth Selections	20 MHz, 100 MHz, and FULL (500 MHz)								
TDS 540: Digitizers, Number of	Four, all identical								
TDS 520: Digitizers, Number of	Two, both identical								
Digitized Bits, Number of	8 bits <sup>1</sup>								
TDS 540: Input Channels, Number of	Four, all identical								
TDS 520: Input Channels, Number of	Two full-featured (CH 1 and CH 2), plus two limited, auxiliary inputs (AUX 1 and AUX 2)								
Input Coupling <sup>2</sup>	DC, AC, or GND								
Input Impedance Selections	1 M $\Omega$ or 50 $\Omega$								
TDS 540: Ranges, Offset, All Channels	<table border="1"> <thead> <tr> <th>Volts/Div Setting</th> <th>Offset Range</th> </tr> </thead> <tbody> <tr> <td>1 mV/div–99.5 mV/div</td> <td><math>\pm 1</math> V</td> </tr> <tr> <td>100 mV/div–995 mV/div</td> <td><math>\pm 10</math> V</td> </tr> <tr> <td>1 V/div–10 V/div</td> <td><math>\pm 100</math> V</td> </tr> </tbody> </table>	Volts/Div Setting	Offset Range	1 mV/div–99.5 mV/div	$\pm 1$ V	100 mV/div–995 mV/div	$\pm 10$ V	1 V/div–10 V/div	$\pm 100$ V
Volts/Div Setting	Offset Range								
1 mV/div–99.5 mV/div	$\pm 1$ V								
100 mV/div–995 mV/div	$\pm 10$ V								
1 V/div–10 V/div	$\pm 100$ V								
TDS 520: Ranges, Offset, CH 1 and CH 2	Same as is listed for the TDS 540								
TDS 520: Ranges, Offset, AUX 1 and AUX 2	<table border="1"> <thead> <tr> <th>Volts/Div Setting</th> <th>Offset Range</th> </tr> </thead> <tbody> <tr> <td>100 mV/div</td> <td><math>\pm 0.5</math> V</td> </tr> <tr> <td>1 V/div</td> <td><math>\pm 5.0</math> V</td> </tr> <tr> <td>10 V/div</td> <td><math>\pm 50</math> V</td> </tr> </tbody> </table>	Volts/Div Setting	Offset Range	100 mV/div	$\pm 0.5$ V	1 V/div	$\pm 5.0$ V	10 V/div	$\pm 50$ V
Volts/Div Setting	Offset Range								
100 mV/div	$\pm 0.5$ V								
1 V/div	$\pm 5.0$ V								
10 V/div	$\pm 50$ V								
Range, Position	$\pm 5$ divisions								

<sup>1</sup>Displayed vertically with 25 digitization levels (DLs) per division and 10.24 divisions dynamic range with zoom off. A DL is the smallest voltage level change that can be resolved by the 8-bit A-D Converter, with the input scaled to the volts/division setting of the channel used. Expressed as a voltage, a DL is equal to 1/25 of a division times the volts/division setting.

<sup>2</sup>The input characteristics (*Input Coupling, Input Impedance Selections, etc.*) apply to both full-featured and auxiliary inputs except where otherwise specified.

Table A-7: Nominal Traits—Signal Acquisition System (Cont.)

Name	Description
TDS 540: Range, Sensitivity, All Channels	1 mV/div to 10 V/div <sup>3</sup>
TDS 520: Range, Sensitivity, CH 1 and CH 2	Same as listed for the TDS 540
TDS 520: Range, Sensitivity, AUX 1 and AUX 2	100 mV/div, 1 V/div, and 10 V/div <sup>4</sup>

<sup>3</sup>The sensitivity ranges from 1 mV/div to 10 V/div in a 1–2–5 sequence of coarse settings. Between a pair of adjacent coarse settings, the sensitivity can be finely adjusted. The resolution of such a fine adjustment is 1% of the more sensitive of the pair. For example, between 50 mV/div and 100 mV/div, the volts/division can be set with 0.5 mV resolution.

<sup>4</sup>There is no fine adjustment between the three sensitivity selections for AUX 1 and AUX 2.

Table A-8: Nominal Traits—Time Base System

Name	Description
TDS 540: Range, Sample-Rate <sup>1,3</sup>	<b>Number of Channels On</b>
	1
	2
	3 or 4
TDS 520: Range, Sample-Rate <sup>1,3</sup>	<b>Input Channel</b>
	CH 1 or CH 2
	CH 1 or CH 2
	AUX 1 or AUX 2
Range, Equivalent Time or Interpolated Waveform Rate <sup>2,3</sup>	500 MSamples/s to 100 GSamples/s (2 ns/Sample to 1 ps/Sample)
Range, Seconds/Division	500 ps/div to 10 s/div
Range, Time Base Delay Time	16 ns to 250 seconds
Record Length Selection <sup>4</sup>	500 points, 1000 points, 2500 points, 5000 points, 15000 points. A record length 50000 points is available with Option 1M.

<sup>1</sup>The range of real-time rates, expressed in samples/second, at which a digitizer samples signals at its inputs and stores the samples in memory to produce a record of time-sequential samples

<sup>2</sup>The range of waveform rates for equivalent time or interpolated waveform records.

<sup>3</sup>The Waveform Rate (WR) is the equivalent sample rate of a waveform record. For a waveform record acquired by real-time sampling of a single acquisition, the waveform rate is the same as the real-time sample rate; for a waveform created by interpolation of real-time samples from a single acquisition or by equivalent-time sampling of multiple acquisitions, the waveform rate is faster than the real time sample rate. For all three cases, the waveform rate is  $1/(\text{Waveform Interval})$  for the waveform record, where the waveform interval (WI) is the time between the samples in the waveform record.

<sup>4</sup>The maximum record length of 15,000 points (50,000 points with Option 1M) is selectable with all acquisition modes except Hi Res. In Hi Res, the maximum record length is 5,000 points (15,000 points with Option 1M).

Table A-9: Nominal Traits—Triggering System

Name	Description	
Range, Delayed Trigger Time Delay	16 ns to 250 seconds	
Range, Events Delay	2 to 10,000,000	
Range (Time) for Pulse-Glitch or Pulse-Width Triggering	2 ns to 1 s	
Ranges, Trigger Level or Threshold	<b>Source</b>	<b>Range</b>
	Any Channel	±12 divisions from center of screen
	Auxiliary (TDS 540 only)	±4 V
	Line	±300 V

Table A-10: Nominal Traits—Display System

Name	Description
Video Display Resolution	640 pixels horizontally by 480 pixels vertically in a display area of 5.2 inches horizontally by 3.9 inches vertically
Waveform Display Graticule	Single Graticule: 401 × 501 pixels/8 × 10 divisions, where divisions are 1 cm by 1 cm
Waveform Display Grey Scale	Sixteen levels in infinite-persistence and variable persistence display styles

Table A-11: Nominal Traits—Interfaces, Output Ports, and Power Fuse

Name	Description
Interface, GPIB	GPIB interface complies with IEEE Std 488.1-1987 and IEEE Std 488.2-1987
Interface, RS-232 (Option 13 only)	RS-232 interface complies with EIA/TIA 574
Interface, Centronics (Option 13 only)	Centronics interface complies with Centronics interface standard C332-44 Feb 1977, REV A
Logic Polarity for Main- and Delayed-Trigger Outputs	Negative TRUE. High to low transition indicates the trigger occurred.
Fuse Rating	Either of two fuses <sup>1</sup> may be used: a 0.25" × 1.25" (UL 198.6, 3AG): 6 A FAST, 250 V, or a 5 mm × 20 mm, (IEC 127): 5 A (T), 250 V

<sup>1</sup>Each fuse type requires its own fuse cap.

Table A-12: Nominal Traits—Mechanical

Name	Description
Cooling Method	Forced-air circulation with no air filter
Construction Material	Chassis parts constructed of aluminum alloy; front panel constructed of plastic laminate; circuit boards constructed of glass-laminate. Cabinet is aluminum and is clad in Tektronix Blue vinyl material.
Finish Type	Tektronix Blue vinyl-clad aluminum cabinet
Weight	<p>Standard digitizing oscilloscope</p> <p>12.3 kg (27 lbs), with front cover. 20.0 kg (44 lbs), when packaged for domestic shipment</p> <p>Rackmount digitizing oscilloscope</p> <p>12.3 kg (27 lbs) plus weight of rackmount parts, for the rack-mounted digitizing oscilloscope (Option 1R). 20.5 kg (45 lbs), when the rackmounted digitizing oscilloscope is packaged for domestic shipment</p> <p>Rackmount conversion kit</p> <p>2.3 kg (5 lbs), parts only; 3.6 kg (8 lbs), parts plus package for domestic shipping</p>
Overall Dimensions	<p>Standard digitizing oscilloscope</p> <p>Height: 193 mm (7.6 in), without the accessories pouch installed</p> <p>Width: 445 mm (17.5 in), with handle</p> <p>Depth: 432 mm (17.1 in), with front cover installed</p> <p>Rackmount digitizing oscilloscope</p> <p>Height: 178 mm (7.0 in)</p> <p>Width: 483 mm (19.0 in)</p> <p>Depth: 558.8 mm (22.0 in)</p>