

Supplement



TDS 500C, TDS 600B & TDS 700C Digitizing Oscilloscopes

071-0090-01

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Printed in the U.S.A.

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Introduction

This document contains three supplements to the TDS 500C, TDS 600B, and TDS 700C manuals:

- *TDS 580C Supplement* provides information that extends the TDS 500C, TDS 600B, and TDS 700C manuals to cover a new oscilloscope model, the TDS 580C Digitizing Oscilloscope. See page 3.
- *Version 5.2 Firmware Supplement* provides information that extends the manuals to cover the new or changed functions that are available in the TDS 500C and TDS 700C oscilloscopes, starting with firmware version 5.2. See page 5.
- *Option 1G Supplement* provides information that extends the manuals to cover two oscilloscope models, the TDS 540C and TDS 754C Option 1G Oscilloscopes. See page 29.

TDS 580C Supplement

The TDS 500C, TDS 600B, and TDS 700C model oscilloscope manuals also cover an oscilloscope model that is not mentioned in those manuals, the TDS 580C.

This supplement lists the differences between the TDS 580C and the TDS 784C, which is the model that the TDS 580C is most like.

Key Features

Except for the differences shown in the table below, The TDS 580C is identical to a TDS 784C. Most of the information in your user manual (and other TDS documents) that applies to the TDS 784C, also applies to the TDS 580C.

Like the TDS 784C, the TDS 580C provides four full-function channels, digitizing rates to 4 GS/second, a 1 GHz analog bandwidth, and up to 50 K record lengths (or longer with options 1M or 2M). The table below lists the key areas where the TDS 784C and the 580C differ:

Feature	784C	580C
Display	Color	Monochrome
FFT	Yes	Optional (2F)
RS232 and Centronics Port	Yes	Optional (13)
Accessory Pouch	Standard	Available (016-1268-00)

Options

All options listed for the TDS 784C are available for the TDS 580C. The TDS 784C, and the TDS 580C ships without probes. The probe options are:

- **Option 24.** Add four P6139A passive oscilloscope probes.
- **Option 26.** Add four P6245 1.5 GHz FET oscilloscope probes.

The option 1G, detailed in *Option 1G Supplement* in this document, is *not* available for the TDS 580C.

Firmware

The TDS 580C comes with the firmware features listed in *Version 5.2 Firmware Supplement* in this document; no upgrade is required. See page 5.

Service Information The TDS 500C, TDS 600B, and TDS 700C Service Manual (optional accessory) applies to the TDS 580C.

Use the part number listed for the TDS 784C when replacing the following parts:

- Circuit Board Assembly: Acquisition A10
- Front Panel Assembly A12

Use the part number listed for the TDS 520C, TDS 540C, TDS 620B, and TDS 680B when replacing the following parts:

- Display, Monochrome: 7-Inch A20
- Filter, Lt, Crt: 6.525 X 5.225, ESP, EMC
- Retainer, Filter: Dust Seal Assembly, Lexan

Use part number 334-8551-01 when replacing the Front-Panel Identification Label.

Version 5.2 Firmware Supplement

This supplement describes new or changed functions that are available starting with firmware version 5.2.

Masks

Masks now include the following functions.

Available Masks Table 1 contains a complete list of available masks.

Table 1: Standard masks

SONET SDH	ITU-T	T1.102	Fibre channel	Video	Ethernet	Miscellaneous
None	None	None	None	None	None	None
OC1/STM0 51.84 Mb/s	DS-0 Sgl Single 64.4 kb/s	DS1 1.544 Mb/s	FC133 Optical 132.8 Mb/s	4fsc NTSC "D2" 143.18 Mb/s	Gigabit Ethernet Optical 1.25 Gb/s	FDDI Halt 125 Mb/s
OC3/STM1 155.52 Mb/s	DS-0 Dbl Double 64 kb/s	DS1A 2.048 Mb/s	FC266 Optical 265.6 Mb/s	4:2:2 "D1" 270 Mb/s	100 Base-TX UTP 125 Mb/s	
OC12/STM4 622.08 Mb/s	DS-0 Data Data Contra 64 kb/s	DS1C 3.152 Mb/s	FC531 Optical 531.2 Mb/s	4:2:2 SMPTE 259M-D 360 Mb/s	100 Base-TX STP 125 Mb/s	
	DS-0 Tmg Timing 64 kb/s	DS2 6.312 Mb/s	FC1063 Optical 1.0625 Gb/s		10 Base-T Idle (IDL) Time Details 10 Mb/s	
	DS-1 Rate 1.544 Mb/s	DS3 Full Mask 44.736 Mb/s	FC133E Electrical 132.7 Mb/s		10 Base-T Idle (IDL) Volt Details 10 Mb/s	
	DS-3 Rate 44.736 Mb/s	DS3 Time Details 44.736 Mb/s	FC266E Electrical 265.6 Mb/s		10 Base-T Idle (IDL) Full Mask 10 Mb/s	
	E1 Sym Sym Pair 2.048 Mb/s	DS4NA 139.26 Mb/s	FC531E Electrical 531.2 Mb/s		10 Base-T Link Test Time Details 10 Mb/s	
	E1 Coax Coax Pair 2.048 Mb/s	DS4NA Mx Max Output 139.26 Mb/s	FC1063E Electrical 1.0625 Gb/s		10 Base-T Link Test Volt Details 10 Mb/s	
	E2 8.448 Mb/s	STS-1 Eye Eye 51.84 Mb/s			10 Base-T Link Test Full Mask 10 Mb/s	
	E3 34.368 Mb/s	STS-1 Pulse 51.84 Mb/s				

Table 1: Standard masks (Cont.)

SONET SDH	ITU-T	T1.102	Fibre channel	Video	Ethernet	Miscellaneous
	E4 0 Binary 0 139.26 Mb/s	STS-3 155.52 Mb/s				
	E4 1 Binary 1 139.26 Mb/s	STS-3 Mx Max Output 155.52 Mb/s				
	E5 CEPT 565 Mb/s					
	STM1E 0 Binary 0 155.52 Mb/s					
	STM1E 1 Binary 1 155.52 Mb/s					

Pass Fail Testing

If on, mask pass/fail testing displays the results in the Pass/Fail Testing side menu. To start mask pass/fail testing, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Counting** (main). Then toggle **Pass/Fail Test** (side) to **On**.

The Pass/Fail Test side menu displays the testing status:

- **Passing** is displayed if, for the requested number of acquired waveforms, the number of hits does not exceed the number of hits specified in the failure threshold
- **Failed** is displayed if there are hits greater than or equal to the Pass/Fail Failure Threshold in the masks in the requested number of acquired waveforms
- **OFF Passed** or **OFF Failed** is displayed when the test is complete, based on the result of the test

Pass/fail testing turns on mask counting and resets the mask count to 0.

Set the Failure Threshold

Hits greater than or equal to the Pass/Fail Failure Threshold are a test failure. To set the threshold, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Counting** (main) → **Pass/Fail Failure Threshold** (side). Then use the general purpose knob or keypad to set the failure threshold.

Set the Minimum Number of Waveforms	The test continues until the minimum number of waveforms has been acquired. To set the minimum number of waveforms, press MEASURE → Measure (main) → Masks (pop-up) → Mask Counting (main) → Set Minimum Number of Waveforms (side). Then use the general purpose knob or keypad to set the number of waveforms.
Ring the Bell	<p>The Pass/Fail Bell menu controls whether the mask pass/fail test rings a bell. To control the Pass/Fail Bell, press MEASURE → Measure (main) → Masks (pop-up) → Mask Counting (main). Then toggle Pass/Fail Bell (side) to Off, On Failed, or On Completion.</p> <ul style="list-style-type: none"> ■ Off does not ring a bell ■ On Completion rings the bell when the test is complete ■ On Failed rings the bell when a failure is detected and when the test is complete
To Autoset the Oscilloscope	Use the procedures in your manual. Also, if a user mask is active, Autoset adjusts the selected trace to match the last standard mask selected, if possible.
Adjusting the Horizontal Position	Use the HORIZONTAL POSITION control or the Time Base Position menu to manually align the waveform to a mask. Adjusting the HORIZONTAL POSITION resets mask counting.
Setting Mask Margins	<p>Use Mask Margins to determine if your signal passes with a specific margin. To set a mask margin do the following steps:</p> <ol style="list-style-type: none"> 1. To enable mask margins, press MEASURE → Measure (main) → Masks (pop-up) → Mask Margins (main). Then toggle Mask Margins (side) to On or Off. If a user defined mask has more than three masks, turning on mask margins will generate an error. Turning Mask Margins off will set the Margin Percentage to 0%. 2. To set the margin percentage, press Margin Percentage (side). Then use the general purpose knob or the keypad to set the percentage. Mask margin percentage moves the mask boundaries to reflect the selected margin. Negative margins make it easier to pass a mask test.
Setting Mask Options	<p>Set mask options to determine which waveform the masks are compared against, to turn masks on or off, to enable Autoset to a mask, to enable offset adjustment to masks, and to enable the digital waveform filter (see Figure NO TAG).</p> <p>To select the channel that is compared against the selected mask, press MEASURE → Measure (main) → Masks (pop-up) → Mask Options (main). Then</p>

toggle **Mask Source** (side) to **Ch1**, **Ch2**, **Ch3**, or **Ch4**. Mask Source is not available in InstaVu II, because all on channels contribute to the mask.

To turn defined masks on or off, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Options** (main). Then toggle **Mask Display** (side) **ON** or **OFF**.

To invert a DS1, DS1A, DS1C, DS2, DS3, E1 Sym, E1 Coax, E2, E3, STS-1, STM1E, or E4 mask, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Options** (main). Then toggle **Invert Mask** (side) **ON** or **OFF**. When ON and you select one of the above masks, the created mask is for a pulse of opposite polarity to that of the standard mask.

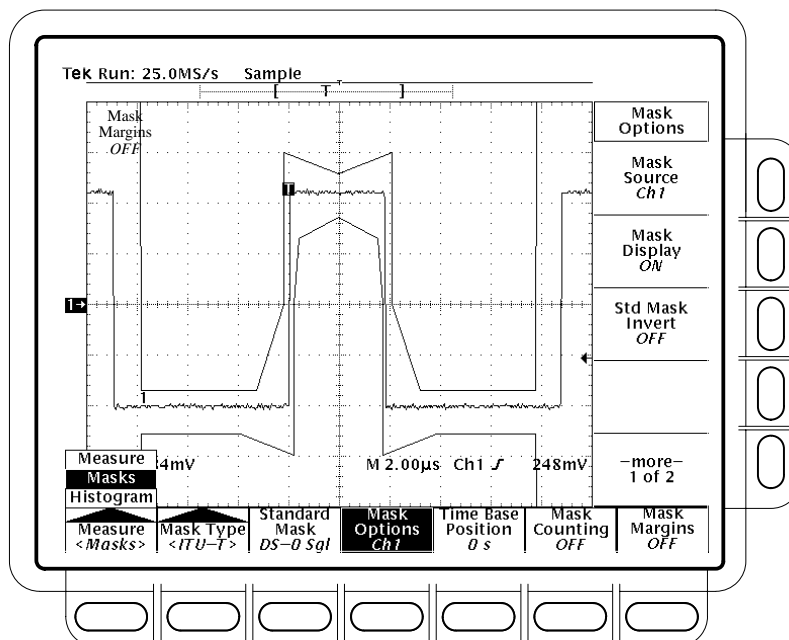


Figure 1: Mask menu

NOTE. If you select Manual, some controls are automatically adjusted; if you select Auto, a complete Autoset is performed. Also, if a user mask is active, Autoset adjusts the selected trace to match the last standard mask selected, if possible.

To control whether an autoset is performed when a standard mask is selected, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Options** (main). Then toggle **Std Mask Autoset** (side) to **Auto** or **Manual**.

NOTE. If you select **OFF**, offset is not adjusted when the **DS-0**, **E1**, **E2**, **E3**, or **T1.102** standards are selected.

To control whether a standard-mask autoset can adjust Vertical Offset to match the waveform to the mask, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Options** (main). Then toggle **Std Mask Offset Adj** (side) to **ON** or **OFF**.

To enable the optical reference receiver (option 3C and 4C), which is required by some optical standards that require a Bessel-Thompson response, press **MEASURE** → **Measure** (main) → **Masks** (pop-up) → **Mask Options** (main). Then toggle **Filter** (side) to **Enable**. The Filter menu is not available on a TDS 794D.

To determine the calibration status of the communication filter, press **SHIFT** → **UTILITY** → **System** (main) → **Cal** (pop-up). Then read the calibration status from the Comm Filter menu. If the status is not Pass, refer the oscilloscope to service personnel for repair or adjustment. The oscilloscope determines the status at power-up.

Histograms

You can now move the histogram box.

To Move the Histogram Box

To move the histogram box without changing its size, press **MEASURE** → **Measure** (main) → **Histogram** (pop-up) → **Histogram Box Limits** (main). Then toggle **Move Box** (side) to **Horizontal** or **Vertical** and use the general purpose knob to move the histogram box. (The **SELECT** button will also toggle Move Box.)

To Save an Image Histogram

To save an image histogram, do the following steps:

1. Enter a mode where an image data base is generated (*InstaVu* II, Histograms, and Mask counting) you want to save. **Image Hist** is grayed out if *InstaVu* II is not active.
2. To store an image histogram, press **SAVE/RECALL WAVEFORM** → **Image Hist** (pop-up) → **Save Image Histogram** (main).
3. Press **To File** (side). Then use the general purpose knob and the **SELECT** button to select the drive (the file will contain over 800,000 bytes in deep mode and over 400,000 bytes in shallow mode) and the exact file from the resulting scrollbar list. Finally, press **Save To Selected File** (side) to complete the operation.



NOTE. Upon power on, the oscilloscope creates the “wild card” file, marked in the file utilities menu by the name **TEK?????.IMH** and by a wild-card icon (shown left), for storing image histograms. Selecting this file in step 3 stores an image histogram in a uniquely named, sequentially numbered file. For instance, the oscilloscope saves the first image histogram you save in the file **TEK00001.IMH**, the second in **TEK00002.IMH**, and so on.

Recalling an image histogram stops acquisitions.

Applications

There are now more applications to choose from.

Select an Application

You can select and load an application into the APPLICATION menu. Then you can control the application using the APPLICATION menus.

To select an application, do the following steps:

1. Press **SAVE/RECALL SETUP → Select Application** (main).
2. Then use the general purpose knob to select the exact file from the resulting scrollbar list. Only files with **.APP** extensions are displayed. Finally, press **Activate Application** (side) to complete the operation.

Setup and Hold Triggering

Keep the hold time setting to no more than 2.5 ns less than one-half the clock period ($\text{hold time} \leq (\text{period}/2) - 2.5 \text{ ns}$) or the oscilloscope cannot trigger (this assumes a 50% duty cycle clock).

GPIB Command Descriptions

The following GPIB commands support the new or changed features.

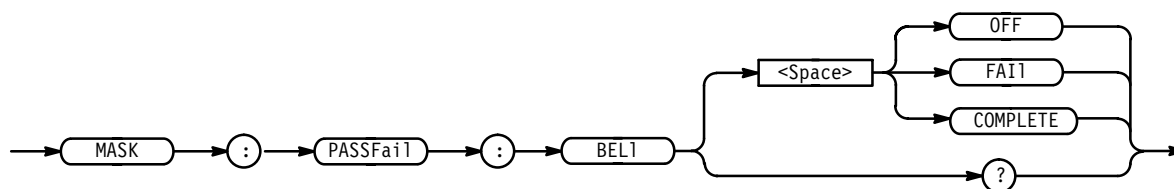
MASK:PASSFail:BEL1

TDS 500C & 700C Only

Turns the bell on for mask test failed or mask test complete, or turns the bell off.

Group Mask

Syntax MASK:PASSFail:BEL1 { OFF | FAIL | COMPLETE }
 MASK:PASSFail:BEL1?



Arguments FAIL turns the passfail bell on for test failed.
 OFF turns the passfail bell off.
 COMPLETE turns the passfail bell on for test completion.

Examples MASK:PASSFail:BEL1 OFF
 turns the passfail bell off.

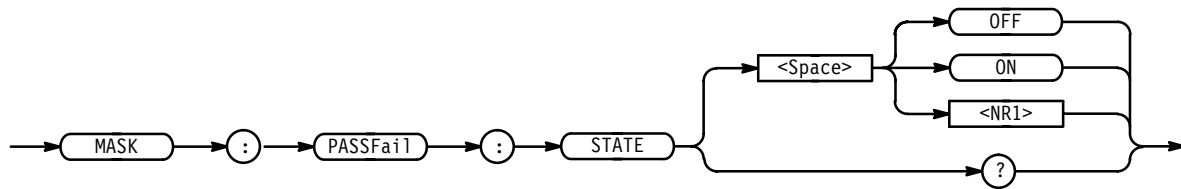
MASK:PASSFail:STATE

TDS 500C & 700C Only

Turns the mask conditional counting test ON or OFF.

Group Mask

Syntax MASK:PASSFail:STATE { ON | OFF | <NR1> }
 MASK:PASSFail:STATE?



Arguments OFF or <NR1> = 0 turns passfail counting off.
 ON or <NR1> ≠ 0 turns passfail counting on.

Examples MASK:PASSFAIL:STATE ON
 turns passfail counting on.

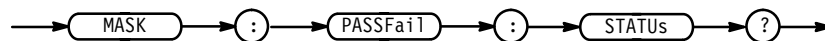
MASK:PASSFail:STATUS? (Query Only)

TDS 500C & 700C Only

Returns the result of the conditional mask test.

Group Mask

Syntax MASK:PASSFail:STATUS?



Examples MASK:PASSFail:STATUS?
 might return MASK:PASSFail:STATUS PASSING indicating the test is passing.

MASK:PASSFail:THReshold

TDS 500C & 700C Only

Sets the minimum number of mask hits that is a test failure.

Group Mask

Syntax MASK:PASSFail:THReshold <NR1>

Arguments <NR1> is the minimum number of mask hits, from 1 to (2**30).

Examples MASK:PASSFail:THReshold 2
sets the minimum number of mask hits to 2.

MASK:PASSFail:WAVEform <nr1>

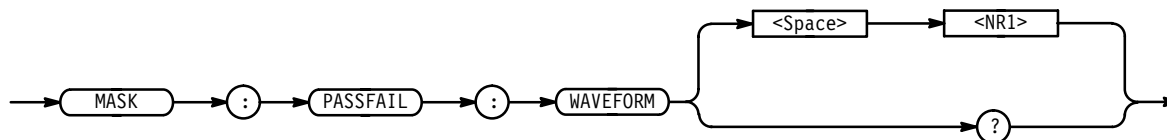
TDS 500C & 700C Only

Sets the minimum number of waveforms to be acquired for mask pass/fail counting.

Group Mask

Syntax MASK:PASSFail:WAVEform <NR1>

MASK:PASSFail:WAVEform?



Arguments <NR1> is the minimum number of waveform acquisitions, from 1 to (2**30).

Examples MASK:PASSFail:WAVEform 12
sets the minimum number of waveforms to 12.

TRIGger:MAIn:COMMunication:CMI:PULSEForm

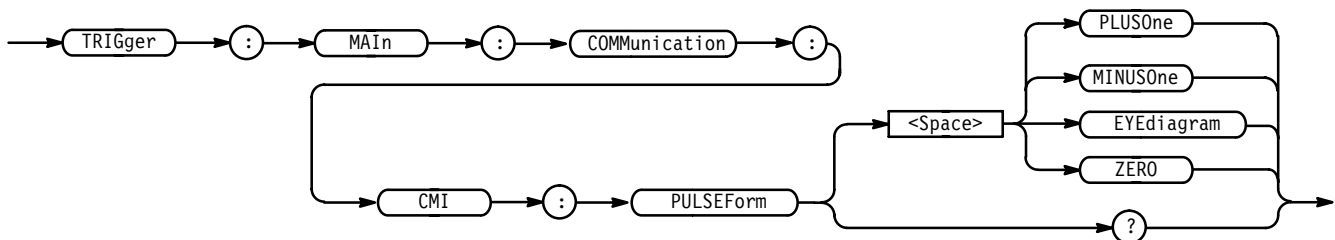
TDS 500C & 700C Only

Sets or queries the communication trigger CMI pulse form to one of four possibilities.

Group Trigger

Syntax TRIGger:MAIn:COMMunication:CMI:PULSEForm { PLUSOne | MINUSOne | EYEdiagram | ZERO }

TRIGger:MAIn:COMMunication:CMI:PULSEForm?



Arguments PLUSOne corresponds to triggering on a positive mark. This is the default value.

MINUSOne corresponds to triggering on a negative mark.

EYEdiagram selects an Eye Diagram image.

ZERO corresponds to triggering on a Zero bit.

Examples TRIGger:MAIn:COMM:CMIPULSEFORM PLUSONE
selects a trigger on a positive mark.

TRIGger:MAIn:COMMunication:STANdard

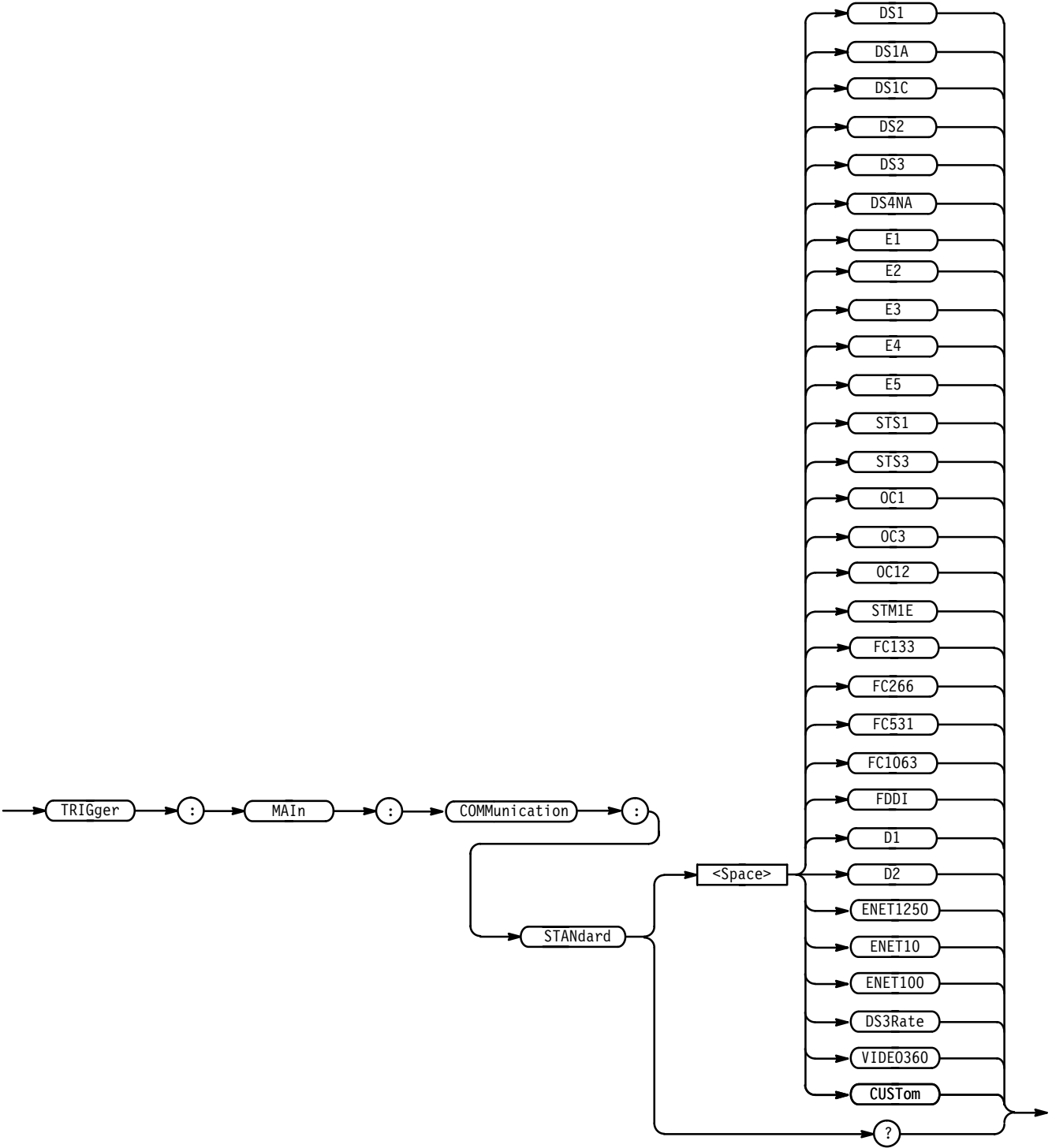
TDS 500C & 700C Only

Sets or queries the communication trigger standard which identifies the code and bit rate.

Group Trigger

Syntax TRIGger:MAIn:COMMunication:STANdard { DS1 | DS1A | DS1C | DS2 | DS3 | DS4NA | E1 | E2 | E3 | E4 | E5 | STS1 | STS3 | OC1 | OC3 | OC12 | STM1E | FC133 | FC266 | FC531 | FC1063 | FDDI | D1 | D2 | ENET1250 | ENET10 | ENET100 | DS3Rate | VIDE0360 | CUSTOm }

TRIGger:MAIn:COMMunication:STANdard?



Arguments DS1 refers to DS1 (1.544 Mb/s) AMI standard.
DS1A refers to DS1A (2.048 Mb/s) AMI standard.

DS1C refers to DS1C (3.152 Mb/s) AMI standard.

DS2 refers to DS2 (6.312 Mb/s) AMI standard.

DS3 refers to DS3 (44.736 Mb/s) AMI standard.

DS4NA refers to DS4NA (139.26 Mb/s) CMI standard.

E1 refers to E1 (2.048 Mb/s) AMI standard.

E2 refers to E2 (8.44 Mb/s) AMI standard.

E3 refers to E3 (34.368 Mb/s) AMI standard.

E4 refers to E4 (139.26 Mb/s) CMI standard.

E5 refers to E5 or CEPT (565 Mb/s) NRZ standard.

STS1 refers to STS-1 (51.84 Mb/s) AMI standard.

STS3 refers to STS-3 (155.52 Mb/s) CMI standard.

OC1 refers to OC1/STM0 (51.84 Mb/s) CMI standard.

OC3 refers to OC3/STM1 (155.52 Mb/s) NRZ standard.

OC12 refers to OC12/STM4 (622.08 Mb/s) NRZ standard.

STM1E refers to STM1E (155.52 Mb/s) CMI standard.

FC133 refers to FC133 (132.7 Mb/s) NRZ standard.

FC266 refers to FC266 (265.6 Mb/s) NRZ standard.

FC531 refers to FC531 (531.2 Mb/s) NRZ standard.

FC1063 refers to FC1063 (1.063 Gb/s) NRZ standard.

FDDI refers to FDDI (125 Mb/s) NRZ standard.

D1 refers to 4:2:2 or D1 (270 Mb/s) NRZ standard.

D2 refers to 4fsc NTSC or D2 (143.18 Mb/s) NRZ standard.

ENET1250 refers to the IEEE Draft P802.3z/D3 (1.25 Gb/s) standard.

ENET10 refers to the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange (10 Mb/s) standard.

ENET100 refers to the ANSI X3.263-1995 for Information Technology (125 Mb/s) standard.

DS3Rate refers to the ITU G.703 standard (44.736 Mb/s).

VIDE0360 refers to the ANSI/SMPTE 259M 4:2:2 component serial video (360 Mb/s) standard.

CUSTom can take a non-standard, floating-point bit rate. <NR3>.

Examples TRIGGER:MAIN:COMM:STANDARD E4
selects the E4 communication standard.

MASK:AUTOSet:STANdard

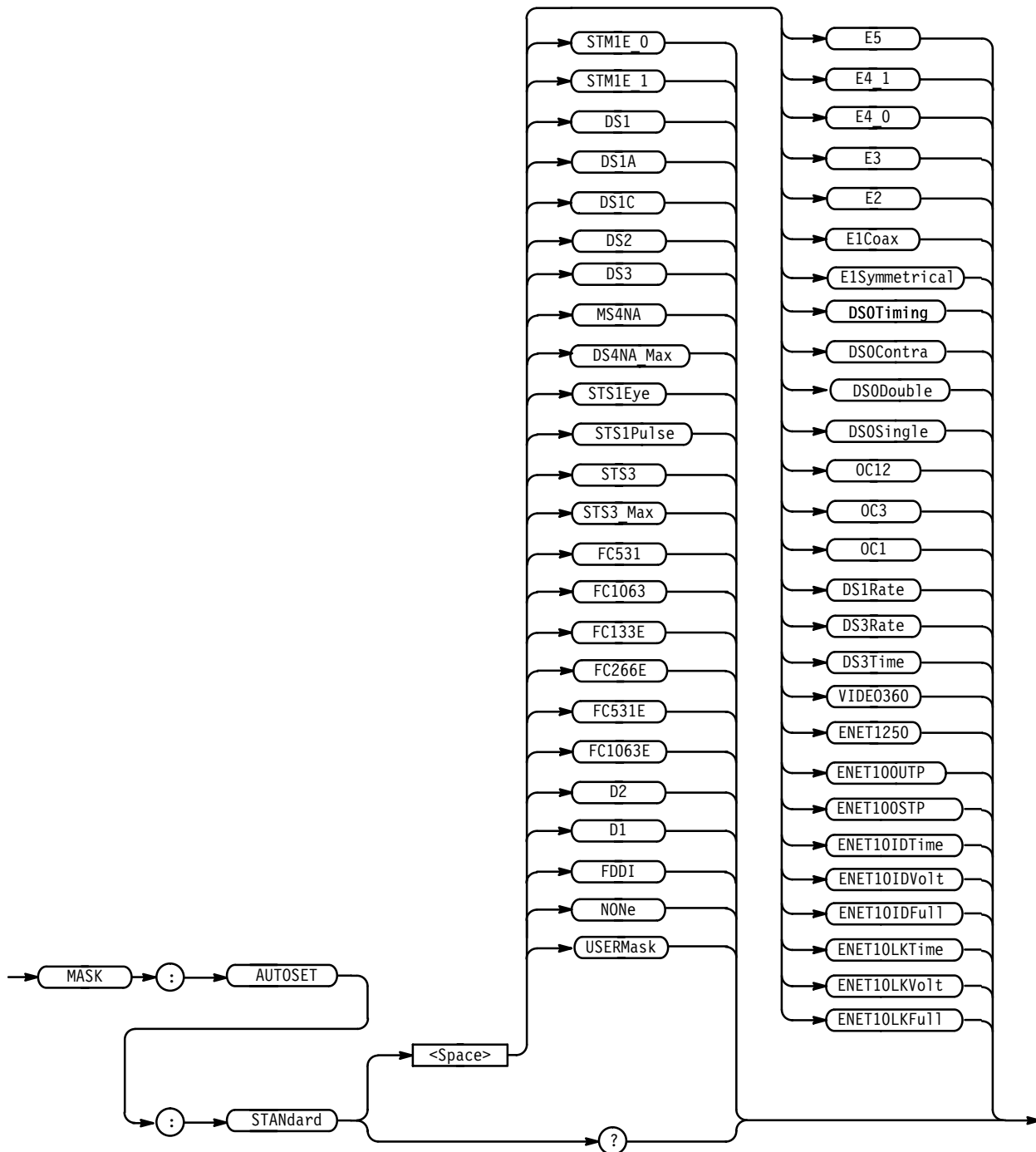
TDS 500C & 700C Only

Selects a standard mask for autose. You can modify a standard and still force the oscilloscope to autose to the standard.

Group Mask

Syntax MASK:AUTOSet:STANdard { OC1 | OC3 | OC12 | DS0Single | DS0Double | DS0Contra | DS0Timing | DS1Rate | E1Symmetrical | E1Coax | E2 | E3 | DS3Rate | E4_0 | E4_1 | E5 | STM1E_0 | STM1E_1 | DS1 | DS1A | DS1C | DS2 | DS3 | DS3Time | DS4NA | DS4NA_Max | STS1Eye | STS1Pulse | STS3 | STS3_Max | FC133 | FC266 | FC531 | FC1063 | FC133E | FC266E | FC531E | FC1063E | D2 | D1 | VIDE0360 | ENET1250 | ENET100UTP | ENET100STP | ENET10IDTime | ENET10IDVOLT | ENET10IDFull | ENET10LKTime | ENET10LKVOLT | ENET10LKFull | FDDI | NONE | USERMask }

MASK:AUTOSet:STANdard?



Arguments OC1 selects the mask specified by the OC1/STM0 standard (51.84 Mb/s).
 OC3 selects the mask specified by the OC3/STM1 standard (155.52 Mb/s).
 OC12 selects the mask specified by OC12/STM4 standard (622.08 Mb/s).

DS0Single selects the mask specified by the DS-0 Single Pulse standard (64 kb/s).

DS0Double selects the mask specified by the DS-0 Double Pulse standard (64 kb/s).

DS0Contra selects the mask specified by the DS-0 Data Pulse, Contradirectional standard (64 kb/s).

DS0Timing selects the mask specified by the DS-0 Timing Pulse, Contradirectional standard (64 kb/s).

DS1Rate selects the mask specified by the ITU G.703 standard (1.544 Mb/s).

DS3Rate selects the mask specified by the ITU G.703 standard (44.736 Mb/s).

E1Symmetrical selects the mask specified by the E1 Symmetrical Pair standard (2.048 Mb/s).

E1Coax selects the mask specified by the E1 Coaxial Pair standard (2.048 Mb/s).

E2 selects the mask specified by the E2 standard (8.448 Mb/s).

E3 selects the mask specified by the E3 standard (34.368 Mb/s).

ITU44 selects the mask specified by the ITU G.703 standard (44.736 Mb/s).

E4_0 selects the mask specified by the E4 Binary 0 standard (139.26 Mb/s).

E4_1 selects the mask specified by the E4 Binary 1 standard (139.26 Mb/s).

E5 selects the mask specified by the E5 CEPT standard (565 Mb/s).

STM1E_0 selects the mask specified by the G.703 Binary 0 standard (155.52 Mb/s). The SONET standard GR-253-CORE calls this mask STS-3. ANSI standard T1.102 has STS-3 eye pattern standards.

STM1E_1 selects the mask specified by the G.703 Binary 1 standard (155.52 Mb/s). The SONET standard GR-253-CORE calls this mask STS-3. ANSI standard T1.102 has STS-3 eye pattern standards.

DS1 selects the mask specified by the DS1 standard (1.544 Mb/s).

DS1A selects the mask specified by the DS1A standard (2.048 Mb/s).

DS1C selects the mask specified by the DS1C standard (3.152 Mb/s).

DS2 selects the mask specified by the DS2 standard (6.312 Mb/s).

DS3 selects the mask specified by the DS3 standard (44.736 Mb/s).

DS3Time selects the mask specified by the DS3 standard (44.736 Mb/s). Mask removes 1% of the points from each end of the DS3 Full Mask to fit mask within 5 ns per division.

DS4NA selects the mask specified by the DS4NA eye standard (139.26 Mb/s).

DS4NA_Max selects the mask specified by the DS4NA Maximum equipment output eye standard (139.26 Mb/s).

STS1Eye selects the mask specified by the STS-1 Eye standard (51.84 Mb/s).

STS1Pulse selects the mask specified by the STS-1 Pulse standard (51.84 Mb/s).

STS3 selects the mask specified by the STS-3 eye standard (155.52 Mb/s).

STS3_Max selects the mask specified by the STS-3 Maximum equipment output eye standard (155.52 Mb/s).

FC133 selects the mask specified by the Fibre Channel 133 Optical standard (132.7 Mb/s).

FC266 selects the mask specified by the Fibre Channel 266 Optical standard (265.6 Mb/s).

FC531 selects the mask specified by the Fibre Channel 531 Optical standard (531.2 Mb/s).

FC1063 selects the mask specified by the Fibre Channel 1063 Optical standard (1.0635 Gb/s).

FC133E selects the mask specified by the Fibre Channel 133 Electrical standard (132.7 Mb/s).

FC266E selects the mask specified by the Fibre Channel 266 Electrical standard (265.6 Mb/s).

FC531E selects the mask specified by the Fibre Channel 531 Electrical standard (531.2 Mb/s).

FC1063E selects the mask specified by the Fibre Channel 1063 Electrical standard (1.0635 Gb/s).

D2 selects the mask implied by the ANSI/SMPTE 259M 4fsc NTSC standard (143.1818 Mb/s).

D1 selects the mask implied by the ANSI/SMPTE 259M 4:2:2 component serial video standard (270 Mb/s).

VIDE0360 selects the mask implied by the ANSI/SMPTE 259M 4:2:2 component serial video standard (360 Mb/s).

ENET1250 selects the mask implied by the IEEE Draft P802.3z/D3 standard (1.25 Gb/s).

ENET100UTP selects the mask implied by the ANSI X3.263-1995 for Information Technology standard (125 Mb/s).

ENET100STP selects the mask implied by the ANSI X3.263-1995 for Information Technology standard (125 Mb/s).

ENET10IDTime selects the mask implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask displays the first 20% of the IDL Full Mask, so that you can see that part of the signal in detail.

ENET10IDVolt selects the mask implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask changes the Vertical scale to zoom in on the middle 20% of the signal while looking at the Full mask on the time axis.

ENET10IDFull selects the mask implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s).

ENET10LKTime selects the mask implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask displays the first 20% of the Link Test Full Mask, so that you can see that part of the signal in detail.

ENET10LKVolt selects the mask implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask changes the Vertical scale to zoom in on the middle 20% of the signal while looking at the Full mask on the time axis.

ENET10LKFull selects the mask implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s).

FDDI selects the mask implied by the FDDI standard (125 Mb/s).

NONE causes the normal autoselect to happen.

USERMask is a no-op when received by the SET form of this command. It is allowed because a SET? can get it.

Examples

`MASK:AUTOSET:STANDARD OC3`
selects the OC3 standard for autoselect.

MASK:STANdard

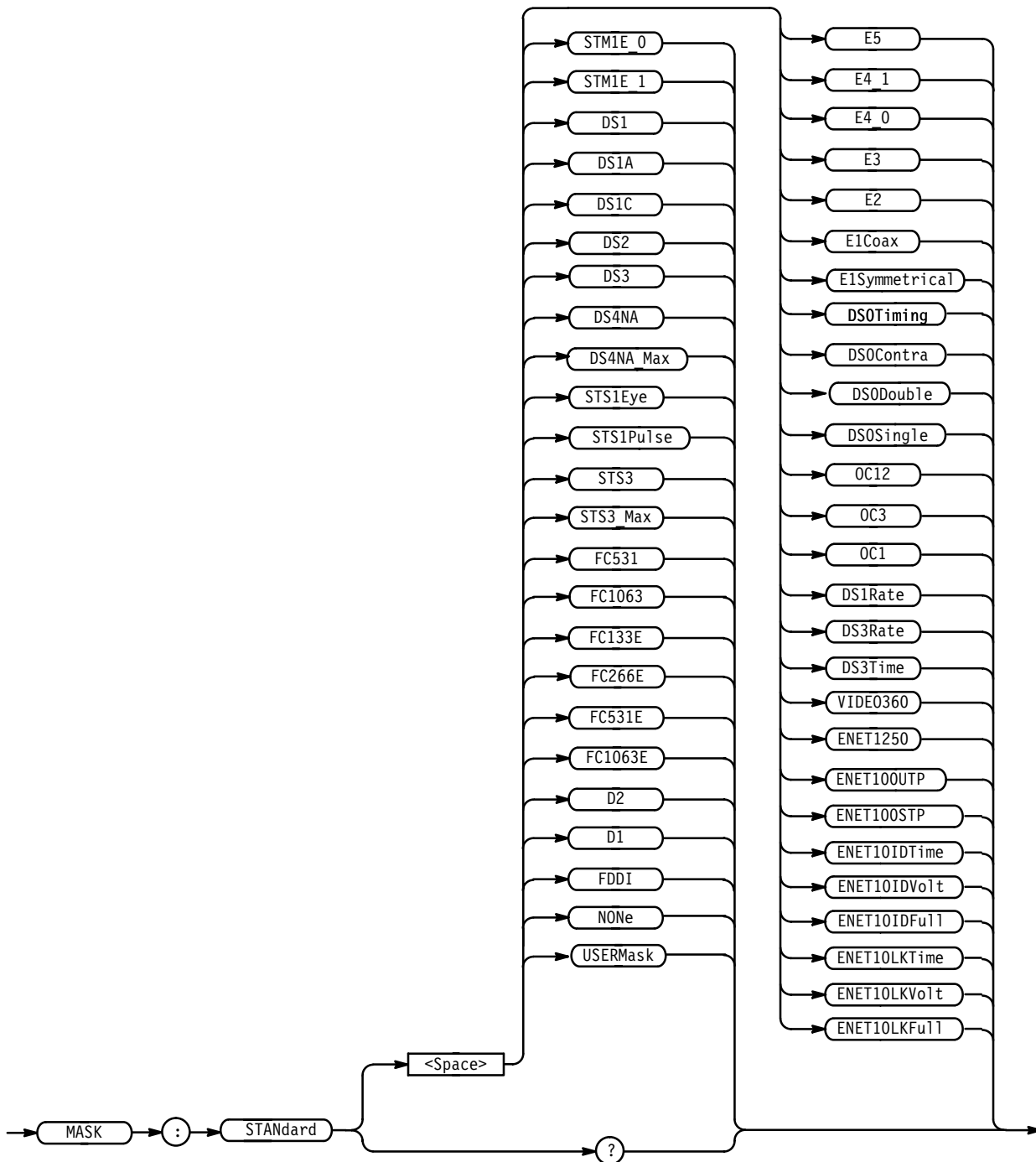
TDS 500C & 700C Only

Deletes the existing mask and sets the standard mask. The query form queries the standard mask.

Group Mask

Syntax MASK:STANdard { OC1 | OC3 | OC12 | DS0Single | DS0Double | DS0Contra | DS0Timing | DS1Rate | E1Symmetrical | E1Coax | E2 | E3 | DS3Rate | E4_0 | E4_1 | E5 | STM1E_0 | STM1E_1 | DS1 | DS1A | DS1C | DS2 | DS3 | DS3Time | DS4NA | DS4NA_Max | STS1Eye | STS1Pulse | STS3 | STS3_Max | FC133 | FC266 | FC531 | FC1063 | FC133E | FC266E | FC531E | FC1063E | D2 | D1 | VIDE0360 | ENET1250 | ENET100OUTP | ENET100STP | ENET10IDTime | ENET10IDVOLT | ENET10IDFull | ENET10LKTime | ENET10LKVOLT | ENET10LKFull | FDDI | NONE | USERMask }

MASK:STANdard?



Arguments OC1 means delete any user defined masks and then create masks as specified by OC1/STM0 standard (51.84 Mb/s).

OC3 means delete any user defined masks and then create masks as specified by OC3/STM1 standard (155.52 Mb/s).

OC12 means delete any user defined masks and then create masks as specified by OC12/STM4 standard (622.08 Mb/s).

DS0Single means delete any user defined masks and then create masks as specified by the DS-0 Single Pulse standard (64 kb/s).

DS0Double means delete any user defined masks and then create masks as specified by the DS-0 Double Pulse standard (64 kb/s).

DS0Contra means delete any user defined masks and then create masks as specified by the DS-0 Data Pulse, Contradirectional standard (64 kb/s).

DS0Timing means delete any user defined masks and then create masks as specified by the DS-0 Timing Pulse, Contradirectional standard (64 kb/s).

DS1Rate means delete any user defined masks and then create the masks as specified by the ITU G.703 standard (1.544 Mb/s).

E1Symmetrical means delete any user defined masks and then create masks as specified by the E1 Symmetrical Pair standard (2.048 Mb/s).

E1Coax means delete any user defined masks and then create masks as specified by the E1 Coaxial Pair standard (2.048 Mb/s).

E2 means delete any user defined masks and then create masks as specified by the E2 standard (8.448 Mb/s).

E3 means delete any user defined masks and then create masks as specified by the E3 standard (34.368 Mb/s).

DS3Rate means delete any user defined masks and then create the masks as specified by the ITU G.703 standard (44.736 Mb/s).

E4_0 means delete any user defined masks and then create masks as specified by the E4 Binary 0 standard (139.26 Mb/s).

E4_1 means delete any user defined masks and then create masks as specified by the E4 Binary 1 standard (139.26 Mb/s).

E5 means delete any user defined masks and then create masks as specified by the E5 CEPT standard (565 Mb/s).

STM1E_0 means delete any user defined masks and then create masks as specified by the G.703 Binary 0 standard (155.52 Mb/s). The SONET standard GR-253-CORE calls this mask STS-3. ANSI standard T1.102 has STS-3 eye pattern standards.

STM1E_1 means delete any user defined masks and then create masks as specified by the G.703 Binary 1 standard (155.52 Mb/s). The SONET standard GR-253-CORE calls this mask STS-3. ANSI standard T1.102 has STS-3 eye pattern standards.

DS1 means delete any user defined masks and then create masks as specified by the DS1 standard (1.544 Mb/s).

DS1A means delete any user defined masks and then create masks as specified by the DS1A standard (2.048 Mb/s).

DS1C means delete any user defined masks and then create masks as specified by the DS1C standard (3.152 Mb/s).

DS2 means delete any user defined masks and then create masks as specified by the DS2 standard (6.312 Mb/s).

DS3 means delete any user defined masks and then create masks as specified by the DS3 standard (44.736 Mb/s).

DS3Time means delete any user defined masks and then create the masks as specified by the DS3 standard (44.736 Mb/s). Mask removes 1% of the points from each end of the DS3 Full Mask to fit mask within 5 ns per division.

DS4NA means delete any user defined masks and then create masks as specified by the DS4NA eye standard (139.26 Mb/s).

DS4NA_Max means delete any user defined masks and then create masks as specified by the DS4NA Maximum equipment output eye standard (139.26 Mb/s).

STS1Eye means delete any user defined masks and then create masks as specified by the STS-1 Eye standard (51.84 Mb/s).

STS1Pulse means delete any user defined masks and then create masks as specified by the STS-1 Pulse standard (51.84 Mb/s).

STS3 means delete any user defined masks and then create masks as specified by the STS-3 eye standard (155.52 Mb/s).

STS3_Max means delete any user defined masks and then create masks as specified by the STS-3 Maximum equipment output eye standard (155.52 Mb/s).

FC133 means delete any user defined masks and then create masks as specified by the Fibre Channel 133 Optical standard (132.7 Mb/s).

FC266 means delete any user defined masks and then create masks as specified by the Fibre Channel 266 Optical standard (265.6 Mb/s).

FC531 means delete any user defined masks and then create masks as specified by the Fibre Channel 531 Optical standard (531.2 Mb/s).

FC1063 means delete any user defined masks and then create masks as specified by the Fibre Channel 1063 Optical standard (1.0635 Gb/s).

FC133E means delete any user defined masks and then create masks as specified by the Fibre Channel 133 Electrical standard (132.7 Mb/s).

FC266E means delete any user defined masks and then create masks as specified by the Fibre Channel 266 Electrical standard (265.6 Mb/s).

FC531E means delete any user defined masks and then create masks as specified by the Fibre Channel 531 Electrical standard (531.2 Mb/s).

FC1063E means delete any user defined masks and then create masks as specified by the Fibre Channel 1063 Electrical standard (1.0635 Gb/s).

D2 means delete any user defined masks and then create masks as implied by the ANSI/SMPTE 259M 4fsc NTSC standard (143.1818 Mb/s).

D1 means delete any user defined masks and then create masks as implied by the ANSI/SMPTE 259M 4:2:2 component serial video standard (270 Mb/s).

VIDE0360 means delete any user defined masks and then create the masks as implied by the ANSI/SMPTE 259M 4:2:2 component serial video standard (360 Mb/s).

ENET1250 means delete any user defined masks and then create the masks as implied by the IEEE Draft P802.3z/D3 standard (1.25 Gb/s).

ENET100UTP means delete any user defined masks and then create the masks as implied by the ANSI X3.263-1995 for Information Technology standard (125 Mb/s).

ENET100STP means delete any user defined masks and then create the masks as implied by the ANSI X3.263-1995 for Information Technology standard (125 Mb/s).

ENET10IDTime means delete any user defined masks and then create the masks as implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask displays the first 20% of the IDL Full Mask, so that you can see that part of the signal in detail.

ENET10IDVolt means delete any user defined masks and then create the masks as implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask changes the Vertical scale to zoom in on the middle 20% of the signal while looking at the Full mask on the time axis.

ENET10IDFull means delete any user defined masks and then create the masks as implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s).

ENET10LKTime means delete any user defined masks and then create the masks as implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask displays the first 20% of the Link Test Full Mask, so that you can see that part of the signal in detail.

ENET10LKVo1t means delete any user defined masks and then create the masks as implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s). This mask changes the Vertical scale to zoom in on the middle 20% of the signal while looking at the Full mask on the time axis.

ENET10LKFull means delete any user defined masks and then create the masks as implied by the ANSI/IEEE 802.3 Fifth Edition 1996 – Information Technology – Telecommunications and Information Exchange standard (10 Mb/s).

FDDI means delete any user defined masks and then create masks as implied by the FDDI standard (125 Mb/s).

NONE causes all masks to be deleted. This even includes user masks.

USERMask is a no-op when received by the SET form of this command. It is allowed because a SET? can get it.

Examples MASK:STANDARD OC3
selects the OC3 standard.

MASK:INVert

TDS 500C & 700C Only

Controls whether or not defined masks are inverted on the display. This is useful for testing the opposite polarity of a pulse. Once on, the current mask and all following masks are displayed in their inverted form until the mask invert command is turned off.

Group MaskMask_Commands

Syntax MASK:INVert {ON | OFF | <NR1>}
MASK:INVert?

Arguments OFF or <NR1> = 0 turns off mask inversion. The default is OFF.
ON or <NR1> not = 0 turns on mask inversion.

Examples MASK:INVert ON
Turns mask inversion on.

MASK:MARgin:PERCent

TDS 500C & 700C Only

Sets or queries the mask margin percentage.

Group MaskMask_Commands

Syntax MASK:MARgin:PERCent <NR1>
MASK:MARgin:PERCent?

Arguments <NR1> is -50.0 to +50.0. The default is 5. A positive margin percentage will cause the signal space to become smaller and the mask pass/fail test harder to pass. A percentage that would cause a displayed mask to cross another mask, or to go off of the screen is not allowed, the last valid margin is then restored.

Examples MASK:MARgin:PERCent 25
Sets the mask margin percent to 25.

MASK:MARgin:STATE

TDS 500C & 700C Only

Turns the mask margins on and off.

Group MaskMask_Commands

Syntax MASK:MARgin:STATE {ON | OFF | <NR1>}
MASK:MARgin:STATE?

Arguments OFF or <NR1> = 0 turns off mask margins. The default is OFF.
ON or <NR1> not = 0 turns on mask margins.

Examples MASK:MARgin:STATE ON
Turns on mask margins.

Option 1G Supplement

The TDS 500C, TDS 600B, and TDS 700C manuals cover the TDS 540C and TDS 754C Option 1G oscilloscopes which are not mentioned in the manuals.

This document lists the differences between the TDS 540C and the TDS 540C Option 1G and the TDS 754C and the TDS 754C Option 1G.

Key Features The TDS 540C Option 1G is identical to a TDS 540C and the TDS 754C Option 1G is identical to a TDS 754C except for the differences shown in the table below. Therefore, most information in your user manual that applies to the TDS 540C and TDS 754C also applies to the TDS 540C and TDS 754C Option 1G.

Feature	540C Option 1G	540C	754C Option 1G	754C
Digitizing rate, 1 channel	1 GS/s	2 GS/s	1 GS/s	2 GS/s
Digitizing rate, 2 channels	1 GS/s	1 GS/s	1 GS/s	2 GS/s
Digitizing rate, 3 or 4 channels	500 MS/s	500 MS/s	1 GS/s	1 GS/s
Options 2C, 3C and 4C	Not Available	Available	Not Available	Available

