

### 3.26.16 :TIMEbase:XY:GRID

#### Syntax

```
:TIMEbase:XY:GRID <grid>
:TIMEbase:XY:GRID?
```

#### Description

Sets or queries the grid type of the XY display.

#### Parameter

Name	Type	Range	Default
<grid>	Discrete	{FULL HALF NONE}	FULL

#### Remarks

- **FULL:** turns the background grid and coordinates on.
- **HALF:** turns the background grid off and turns the coordinate on.
- **NONE:** turns the background grid and coordinate off.

#### Return Format

The query returns FULL, HALF, or NONE.

#### Example

```
:TIMEbase:XY: GRID NONE /*Sets the grid type of the XY display.*/
:TIMEbase:XY: GRID? /*The query returns NONE.*/
```

## 3.27 :TRIGger Commands

The :TRIGger commands are used to set the trigger source type, trigger input edge type and trigger delay as well as generating a trigger event.

### 3.27.1 :TRIGger:MODE

#### Syntax

```
:TRIGger:MODE <mode>
:TRIGger:MODE?
```

#### Description

Sets or queries the trigger type.

**Parameter**

Name	Type	Range	Default
<mode>	Discrete	{EDGE PULSe SLOPe VIDeo PATtern DURation TIMEout RUNT WINDow DELay SETup NEDGe RS232 IIC SPI CAN LIN}	EDGE

**Remarks**

LIN and CAN triggers are only supported by the DHO900 series.

**Return Format**

The query returns EDGE, PULS, SLOP, VID, PATT, DUR, TIM, RUNT, WIND, DEL, SET, NEDG, RS232, IIC, SPI, CAN, or LIN.

**Example**

```
:TRIGger:MODE SLOPe      /*Selects the Slope trigger.*/
:TRIGger:MODE?           /*The query returns SLOP.*/
```

## 3.27.2 :TRIGger:COUpling

**Syntax**

```
:TRIGger:COUpling <couple>
```

```
:TRIGger:COUpling?
```

**Description**

Selects or queries the trigger coupling type.

**Parameter**

Name	Type	Range	Default
<couple>	Discrete	{AC DC LFReject HFReject}	DC

**Remarks**

This command is only available for the Edge trigger in which the analog channel is selected as the source.

- **AC:** blocks any DC components to pass the trigger path.
- **DC:** allows DC and AC components to pass the trigger path.
- **LFReject:** blocks the DC components and rejects the low frequency components to pass the trigger path.

- **HFReject:** rejects the high frequency components to pass the trigger path.

#### Return Format

The query returns AC, DC, LFR, or HFR.

#### Example

```
:TRIGger:COUpling LFReject      /*Sets the trigger coupling type to  
low frequency rejection.*/  
:TRIGger:COUpling?             /*The query returns LFR.*/
```

### 3.27.3 :TRIGger:STATus?

#### Syntax

```
:TRIGger:STATus?
```

#### Description

Queries the current trigger status.

#### Parameter

N/A

#### Remarks

N/A

#### Return Format

The query returns TD, WAIT, RUN, AUTO, or STOP.

#### Example

N/A

### 3.27.4 :TRIGger:SWEep

#### Syntax

```
:TRIGger:SWEep <sweep>  
:TRIGger:SWEep?
```

#### Description

Sets or queries the trigger mode.

#### Parameter

Name	Type	Range	Default
<sweep>	Discrete	{AUTO NORMAl SINGle}	AUTO

## Remarks

- **AUTO:** Auto trigger. The waveforms are displayed no matter whether the trigger conditions are met.
- **NORMAl:** Normal trigger. The waveforms are displayed when trigger conditions are met. If the trigger conditions are not met, the oscilloscope displays the original waveforms and waits for another trigger.
- **SINGle:** Single trigger. The oscilloscope waits for a trigger, displays the waveforms when the trigger conditions are met, and then stops.

## Return Format

The query returns AUTO, NORM, or SING.

## Example

```
:TRIGger:SWEep NORMal      /*Selects the normal trigger mode.*/
:TRIGger:SWEep?            /*The query returns NORM.*/
```

## 3.27.5 :TRIGger:HOLDoff

### Syntax

```
:TRIGger:HOLDoff <value>
```

```
:TRIGger:HOLDoff?
```

### Description

Sets or queries the trigger holdoff time. The default unit is s.

### Parameter

Name	Type	Range	Default
<value>	Real	8 ns to 10 s	8 ns

### Remarks

- Trigger holdoff can be used to stably trigger complex waveforms (such as pulse waveform). Holdoff time indicates the time that the oscilloscope waits for rearming the trigger module. The oscilloscope will not trigger before the holdoff time expires.

- Holdoff time is not available for Video trigger, Timeout trigger, Setup&Hold trigger, Nth Edge trigger, RS232 trigger, I2C trigger, SPI trigger, CAN trigger, LIN trigger.
- Only the DHO900 series oscilloscope supports LIN and CAN.

### Return Format

The query returns the trigger holdoff time in scientific notation.

### Example

```
:TRIGger:HOLDOff 0.0000002 /*Sets the trigger holdoff time to 200 ns.*/
:TRIGger:HOLDOff?           /*The query returns 2.000000E-7.*/
```

## 3.27.6 :TRIGger:NREject

### Syntax

```
:TRIGger:NREject <bool>
:TRIGger:NREject?
```

### Description

Turns on or off noise rejection; or queries the on/off status of noise rejection.

### Parameter

Name	Type	Range	Default
<bool>	Bool	{{1 ON} {0 OFF}}	0 OFF

### Remarks

- Noise rejection reduces the possibility of the Noise trigger.
- This command is only available when the source is an analog channel or EXT.

### Return Format

The query returns 1 or 0.

### Example

```
:TRIGger:NREject ON      /*Enables the noise rejection function.*/
:TRIGger:NREject?        /*The query returns 1.*/
```

## 3.27.7 :TRIGger:POStion?

### Syntax

```
:TRIGger:POStion?
```

**Description**

Queries the waveform trigger position relative to the corresponding position in the internal memory.

**Parameter**

N/A

**Remarks**

N/A

**Return Format**

The query returns the waveform trigger position relative to the corresponding position in the internal memory in scientific notation.

**Example**

```
:TRIGger:POSITION? /*The query returns 0.000E+00.*/
```

## 3.27.8 :TRIGger:EDGE

Edge trigger identifies a trigger on the trigger level of the specified edge on the input signal.

### 3.27.8.1 :TRIGger:EDGE:SOURce

**Syntax**

```
:TRIGger:EDGE:SOURce <source>  
:TRIGger:EDGE:SOURce?
```

**Description**

Sets or queries the trigger source of Edge trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8  D9 D10 D11 D12 D13 D14 D15  CHANnel1 CHANnel2 CHANnel3  CHANnel4 EXT}	CHANnel1

**Remarks**

Only DHO900 series supports the digital channels D0-D15.

"EXT" is only available for DHO812 and DHO802.

## Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, CHAN4, or EXT.

## Example

```
:TRIGger:EDGE:SOURce CHANne11 /*Sets the trigger source to  
CHANne11.*/  
:TRIGger:EDGE:SOURce? /*The query returns CHAN1.*/
```

### 3.27.8.2 :TRIGger:EDGE:SLOPe

#### Syntax

```
:TRIGger:EDGE:SLOPe <slope>  
:TRIGger:EDGE:SLOPe?
```

#### Description

Sets or queries the edge type of Edge trigger.

#### Parameter

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative RFALI}	POSitive

#### Remarks

- POSitive:** indicates the rising edge.
- NEGative:** indicates the falling edge.
- RFALI:** indicates the rising or falling edge.

#### Return Format

The query returns POS, NEG, or RFAL.

## Example

```
:TRIGger:EDGE:SLOPe NEGative /*Sets the edge type to NEGative.*/  
:TRIGger:EDGE:SLOPe? /*The query returns NEG.*/
```

### 3.27.8.3 :TRIGger:EDGE:LEVel

#### Syntax

```
:TRIGger:EDGE:LEVel </level>  
:TRIGger:EDGE:LEVel?
```

## Description

Sets or queries the trigger level of Edge trigger. The unit is the same as that of current amplitude of the selected source.

## Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

## Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

## Return Format

The query returns the trigger level in scientific notation.

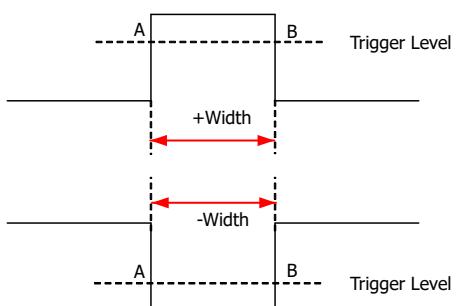
## Example

```
:TRIGger:EDGE:LEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:EDGE:LEVel?          /*The query returns 1.60000E-1.*/
```

## 3.27.9 :TRIGger:PULSe

Pulse width triggering sets the oscilloscope to trigger on the positive or negative pulse of a specified width. In this mode, the oscilloscope will trigger when the pulse width of the input signal satisfies the specified pulse width condition.

In this oscilloscope, positive pulse width is defined as the time difference between the two crossing points of the trigger level and positive pulse; negative pulse width is defined as the time difference between the two crossing points of the trigger level and negative pulse, as shown in the figure below.



### 3.27.9.1 :TRIGger:PULSe:SOURce

#### Syntax

```
:TRIGger:PULSe:SOURce <source>
:TRIGger:PULSe:SOURce?
```

#### Description

Sets or queries the trigger source of Pulse trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

#### Remarks

Only DHO900 series supports the digital channels D0-D15.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:PULSe:SOURce CHANnel1 /*Sets the trigger source to
CHANnel1.*/
:TRIGger:PULSe:SOURce? /*The query returns CHAN1.*/
```

### 3.27.9.2 :TRIGger:PULSe:POLarity

#### Syntax

```
:TRIGger:PULSe:POLarity <polarity>
:TRIGger:PULSe:POLarity?
```

#### Description

Sets or queries the polarity of Pulse trigger.

#### Parameter

Name	Type	Range	Default
<polarity>	Discrete	{POSitive NEGative}	POSitive

## Remarks

N/A

## Return Format

The query returns POS or NEG.

## Example

```
:TRIGger:PULSE:POLarity NEGative /*Sets the polarity of Pulse  
trigger to NEГative.*/  
:TRIGger:PULSE:POLarity? /*The query returns NEG.*/
```

### 3.27.9.3 :TRIGger:PULSE:WHEN

## Syntax

```
:TRIGger:PULSE:WHEN <when>  
:TRIGger:PULSE:WHEN?
```

## Description

Sets or queries the trigger condition of Pulse trigger.

## Parameter

Name	Type	Range	Default
<when>	Discrete	{GREater LESS GLESs}	GREater

## Remarks

- **GREater:** triggers when the positive/negative pulse width of the input signal is greater than the specified pulse width.
- **LESS:** triggers when the positive/negative pulse width of the input signal is smaller than the specified pulse width.
- **GLESs:** triggers when the positive/negative pulse is greater than than the specified lower limit of pulse width and smaller than the specified upper limit of pulse width.

## Return Format

The query returns GRE, LESS, or GLES.

## Example

```
:TRIGger:PULSE:WHEN LESS /*Sets the trigger condition to LESS.*/  
:TRIGger:PULSE:WHEN? /*The query returns LESS.*/
```

### 3.27.9.4 :TRIGger:PULSe:UWIDth

#### Syntax

```
:TRIGger:PULSe:UWIDth <width>
:TRIGger:PULSe:UWIDth?
```

#### Description

Sets or queries the pulse upper limit of the Pulse trigger. The default unit is s.

#### Parameter

Name	Type	Range	Default
<width>	Real	Pulse lower limit to 10 s	2 μs

#### Remarks

This command is only available when the trigger condition is set to LESS or GLESSs. To set or query the trigger condition of the Pulse trigger, send the [:TRIGger:PULSe:WHEN](#) command.

When the trigger condition is set to GLESSs, if the set pulse upper limit value is smaller than the lower limit, the lower limit will be automatically changed. You can send the [:TRIGger:PULSe:LWIDth](#) command to set or query the pulse lower limit value of the Pulse trigger.

#### Return Format

The query returns the pulse upper limit in scientific notation.

#### Example

```
:TRIGger:PULSe:UWIDth 0.000003 /*Sets the pulse upper limit to 3
μs.*/
:TRIGger:PULSe:UWIDth? /*The query returns 3.000000E-6.*/
```

### 3.27.9.5 :TRIGger:PULSe:LWIDth

#### Syntax

```
:TRIGger:PULSe:LWIDth <width>
:TRIGger:PULSe:LWIDth?
```

#### Description

Sets or queries the pulse lower limit of the Pulse trigger. The default unit is s.

#### Parameter

Name	Type	Range	Default
<width>	Real	1 ns to upper limit	1 μs

## Remarks

This command is only available when the trigger condition is set to GREater or GLEss. To set or query the trigger condition of the Pulse trigger, send the **:TRIGger:PULSe:WHEN** command.

When the trigger condition is set to GLEss, if the set pulse lower limit value is greater than the upper limit, the upper limit will be automatically changed. You can send the **:TRIGger:PULSe:UWIDth** command to set or query the pulse upper limit value of the Pulse trigger.

## Return Format

The query returns the pulse lower limit in scientific notation.

## Example

```
:TRIGger:PULSe:LWIDth 0.000003 /*Sets the pulse lower limit of  
the Pulse trigger to 3 μs.*/  
:TRIGger:PULSe:LWIDth? /*The query returns 3.000000E-6.*/
```

### 3.27.9.6 :TRIGger:PULSe:LEVel

#### Syntax

```
:TRIGger:PULSe:LEVel </level>  
:TRIGger:PULSe:LEVel?
```

#### Description

Sets or queries the trigger level of Pulse trigger. The unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

#### Remarks

For VerticalScale, refer to the **:CHANnel<n>:SCALe** command. For OFFSet, refer to the **:CHANnel<n>:OFFSet** command.

#### Return Format

The query returns the trigger level in scientific notation.

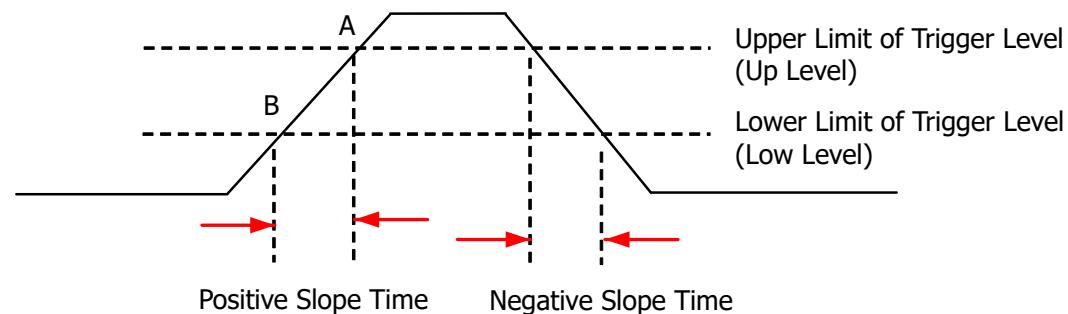
**Example**

```
:TRIGger:PULSE:LEVEL 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:PULSE:LEVEL?          /*The query returns 1.600000E-1.*/
```

**3.27.10 :TRIGger:SLOPe**

Slope triggering sets the oscilloscope to trigger on the positive or negative slope of the specified time. This trigger mode is applicable to ramp and triangle waveforms.

In this oscilloscope, positive slope time is defined as the time difference between the two crossing points of trigger level line A and B with the rising edge; negative slope time is defined as the time difference between the two crossing points of trigger level line A and B with the falling edge. See the figure below.

**3.27.10.1 :TRIGger:SLOPe:SOURce****Syntax**

```
:TRIGger:SLOPe:SOURce <channel>
:TRIGger:SLOPe:SOURce?
```

**Description**

Sets or queries the trigger source of Slope trigger.

**Parameter**

Name	Type	Range	Default
<channel>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

**Remarks**

N/A

**Return Format**

The query returns CHAN1, CHAN2, CHAN3, or CHAN4.

**Example**

```
:TRIGger:SLOPe:SOURce CHANnel2    /*Sets the trigger source to
CHANnel2.*/
:TRIGger:SLOPe:SOURce?           /*The query returns CHAN2.*/
```

**3.27.10.2 :TRIGger:SLOPe:POLarity****Syntax**

```
:TRIGger:SLOPe:POLarity <polarity>
:TRIGger:SLOPe:POLarity?
```

**Description**

Sets or queries the edge type of Slope trigger.

**Parameter**

Name	Type	Range	Default
<polarity>	Discrete	{POSitive NEGative}	POSitive

**Remarks**

- **POSitive:** triggers on the rising edge.
- **NEGative:** triggers on the falling edge.

**Return Format**

The query returns POS or NEG.

**Example**

```
:TRIGger:SLOPe:POLarity POSitive    /*Sets the polarity of Slope
trigger to POSitive.*/
:TRIGger:SLOPe:POLarity?           /*The query returns POS.*/
```

**3.27.10.3 :TRIGger:SLOPe:WHEN****Syntax**

```
:TRIGger:SLOPe:WHEN <when>
:TRIGger:SLOPe:WHEN?
```

**Description**

Sets or queries the trigger condition of Slope trigger.

**Parameter**

Name	Type	Range	Default
<when>	Discrete	{GREater LESS GLESs}	GREater

## Remarks

- **GREater:** the positive slope time of the input signal is greater than the specified time.
- **LESS:** the positive slope time of the input signal is smaller than the specified time.
- **GLESs:** the positive slope time of the input signal is greater than the specified lower time limit and smaller than the specified upper time limit.

## Return Format

The query returns GRE, LESS, or GLES.

## Example

```
:TRIGger:SLOPe:WHEN LESS      /*Sets the trigger condition to LESS.*/
:TRIGger:SLOPe:WHEN?          /*The query returns LESS.*/
```

### 3.27.10.4 :TRIGger:SLOPe:TUPPer

#### Syntax

```
:TRIGger:SLOPe:TUPPer <time>
:TRIGger:SLOPe:TUPPer?
```

#### Description

Sets or queries the upper time limit value of the Slope trigger. The default unit s.

#### Parameter

Name	Type	Range	Default
<time>	Real	Lower limit to 10 s	2 μs

#### Remarks

This command is only available when the trigger condition is set to LESS or GLES. To set or query the trigger condition of the Slope trigger, send the [:TRIGger:SLOPe:WHEN](#) command.

When the trigger condition is set to GLESs, if the set upper time limit value is smaller than the lower limit, the lower limit will be automatically changed. You can use the [:TRIGger:SLOPe:TLOWer](#) command to set or query the lower time limit value of the Slope trigger.

#### Return Format

The query returns the upper time limit in scientific notation.

**Example**

```
:TRIGger:SLOPe:TUPPer 0.000003 /*Sets the upper time limit to 3
μs.*/
:TRIGger:SLOPe:TUPPer? /*The query returns 3.000000E-6.*/
```

**3.27.10.5 :TRIGger:SLOPe:TLOWer****Syntax**

```
:TRIGger:SLOPe:TLOWer <time>
:TRIGger:SLOPe:TLOWer?
```

**Description**

Sets or queries the lower time limit value of the Slope trigger. The default unit s.

**Parameter**

Name	Type	Range	Default
<time>	Real	1 ns to upper limit	1 μs

**Remarks**

This command is only available when the trigger condition is set to GREater or GLEss. To set or query the trigger condition of the Slope trigger, send the [:TRIGger:SLOPe:WHEN](#) command.

When the trigger condition is set to GLEss, if the set lower time limit value is greater than the upper limit, the upper limit will be automatically changed. You can send the [:TRIGger:SLOPe:TUPPer](#) command to set or query the upper time limit value of the Slope trigger.

**Return Format**

The query returns the lower time limit in scientific notation.

**Example**

```
:TRIGger:SLOPe:TLOWer 0.000000020 /*Sets the lower time limit
to 20 ns.*/
:TRIGger:SLOPe:TLOWer? /*The query returns 2.000000E-8.*/
```

**3.27.10.6 :TRIGger:SLOPe:WINDOW****Syntax**

```
:TRIGger:SLOPe:WINDOW <window>
:TRIGger:SLOPe:WINDOW?
```

**Description**

Sets or queries the vertical window type of Slope trigger.

**Parameter**

Name	Type	Range	Default
<window>	Discrete	{TA TB TAB}	TA

**Remarks**

- **TA:** only adjusts the upper limit of the trigger level.
- **TB:** only adjust the lower limit of the trigger level.
- **TAB:** adjusts the upper and lower limits of the trigger level at the same time.

**Return Format**

The query returns TA, TB, or TAB.

**Example**

```
:TRIGger:SLOPe:WINDOW TB      /*Sets the vertical window type to
TB.*/
:TRIGger:SLOPe:WINDOW?        /*The query returns TB.*/
```

**3.27.10.7 :TRIGger:SLOPe:ALEVel****Syntax**

```
:TRIGger:SLOPe:ALEVel </eve/>
:TRIGger:SLOPe:ALEVel?
```

**Description**

Sets or queries the upper limit of the trigger level of Slope trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Lower limit of the trigger level to (4.5 x VerticalScale - Offset)	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

The query returns the upper limit of the trigger level in scientific notation.

**Example**

```
:TRIGger:SLOPe:ALEVel 0.16 /*Sets the upper limit of the trigger
level to 160 mV.*/
:TRIGger:SLOPe:ALEVel? /*The query returns 1.600000E-1.*/
```

**3.27.10.8 :TRIGger:SLOPe:BLEVel****Syntax**

```
:TRIGger:SLOPe:BLEVel </level/>
:TRIGger:SLOPe:BLEVel?
```

**Description**

Sets or queries the lower limit of the trigger level of Slope trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	(-4.5 x VerticalScale - VerticalOffset) to upper limit of the trigger level	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

The query returns the lower limit of the trigger level in scientific notation.

**Example**

```
:TRIGger:SLOPe:BLEVel 0.16 /*Sets the lower limit of the trigger
level to 160 mV.*/
:TRIGger:SLOPe:BLEVel? /*The query returns 1.600000E-1.*/
```

**3.27.11 :TRIGger:VIDeo**

The video signal can include image information and timing information, which adopts different standards and formats. This series can trigger on the standard video signal field or line of NTSC (National Television Standards Committee), PAL (Phase Alternating Line), or SECAM (Sequential Couleur A Memoire).

**3.27.11.1 :TRIGger:VIDeo:SOURce****Syntax**

```
:TRIGger:VIDeo:SOURce <source>
```

```
:TRIGger:VIDeo:SOURce?
```

### Description

Sets or queries the trigger source of Video trigger.

### Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

### Remarks

N/A

### Return Format

The query returns CHAN1, CHAN2, CHAN3, or CHAN4.

### Example

```
:TRIGger:VIDeo:SOURce CHANnel2      /*Sets the trigger source to  
CHANnel2.*/  
:TRIGger:VIDeo:SOURce?                /*The query returns CHAN2.*/
```

## 3.27.11.2 :TRIGger:VIDeo:POLarity

### Syntax

```
:TRIGger:VIDeo:POLarity <polarity>  
:TRIGger:VIDeo:POLarity?
```

### Description

Sets or queries the video polarity of Video trigger.

### Parameter

Name	Type	Range	Default
<polarity>	Discrete	{POSitive NEGative}	POSitive

### Remarks

N/A

### Return Format

The query returns POS or NEG.

### Example

```
:TRIGger:VIDeo:POLarity NEGative    /*Sets the video polarity to  
NEGative.*/  
:TRIGger:VIDeo:POLarity?            /*The query returns NEG.*/
```

### 3.27.11.3 :TRIGger:VIDeo:MODE

#### Syntax

```
:TRIGger:VIDeo:MODE <mode>  
:TRIGger:VIDeo:MODE?
```

#### Description

Sets or queries the sync type of Video trigger.

#### Parameter

Name	Type	Range	Default
<mode>	Discrete	{ODDField EVENfield LINE ALINes}	ALINes

#### Remarks

- **ODDField:** indicates the odd field. The oscilloscope triggers on the rising edge of the first ramp waveform in the odd field. It is available when the video standard is NTSC, PAL/SECAM, or 1080i.
- **EVENfield:** indicates the even field. The oscilloscope triggers on the rising edge of the first ramp waveform in the even field. It is available when the video standard is NTSC, PAL/SECAM, or 1080i.
- **LINE:** for NTSC and PAL/SECAM video standards, the oscilloscope triggers on the specified line in the odd or even field. For 480p, 576p, 720p, 480p and 1080i video standards, the oscilloscope triggers on the specified line.
- **ALINes:** triggers on all the horizontal sync pulses.

#### Return Format

The query returns ODDF, EVEN, LINE, or ALIN.

#### Example

```
:TRIGger:VIDeo:MODE ODDField      /*Sets the sync type to ODDField.*/  
:TRIGger:VIDeo:MODE?              /*The query returns ODDF.*/
```

### 3.27.11.4 :TRIGger:VIDeo:LINE

#### Syntax

```
:TRIGger:VIDeo:LINE </line>
```

:TRIGger:VIDEO:LINE?

### Description

Sets or queries the line number when the sync type of Video trigger is set to Line.

### Parameter

Name	Type	Range	Default
<line>	Integer	Refer to <i>Remarks</i>	1

### Remarks

- **PAL/SECAM:** 1 to 625
- **NTSC:** 1 to 525
- **480P:** 1 to 525
- **576P:** 1 to 625
- **720P60:** 1 to 750
- **720P50:** 1 to 750
- **720P30:** 1 to 750
- **720P25:** 1 to 750
- **720P24:** 1 to 750
- **1080P60:** 1 to 1125
- **1080P50:** 1 to 1125
- **1080P30:** 1 to 1125
- **1080P25:** 1 to 1125
- **1080P24:** 1 to 1125
- **1080I60:** 1 to 1125
- **1080I50:** 1 to 1125

### Return Format

The query returns an integer.

### Example

```
:TRIGger:VIDEO:LINE 100      /*Sets the line number to 100.*/
:TRIGger:VIDEO:LINE?        /*The query returns 100.*/
```

### 3.27.11.5 :TRIGger:VIDeo:STANdard

#### Syntax

`:TRIGger:VIDeo:STANdard <standard>`

`:TRIGger:VIDeo:STANdard?`

#### Description

Sets or queries the video standard of Video trigger.

#### Parameter

Name	Type	Range	Default
<standard>	Discrete	{PALSecam NTSC 480P 576P 720P60 720P50 720P30 720P25 720P24 1080P60 1080P50 1080P30 1080P25 1080P24 1080I60 1080I50}	NTSC

#### Remarks

Video Standard	Frame Frequency (Frame)	Sweep Function	TV Scan Line
PALSecam	25	Interlaced Scan	625
NTSC	30	Interlaced Scan	525
480P	60	Progressive Scan	525
576P	50	Progressive Scan	625
720P60	60	Progressive Scan	750
720P50	50	Progressive Scan	750
720P30	30	Progressive Scan	750
720P25	25	Progressive Scan	750
720P24	24	Progressive Scan	750
1080P60	60	Progressive Scan	1125
1080P50	50	Progressive Scan	1125
1080P30	30	Progressive Scan	1125
1080P25	25	Progressive Scan	1125
1080P24	24	Progressive Scan	1125
1080I60	60	Interlaced Scan	1125
1080I50	50	Interlaced Scan	1125

#### Return Format

The query returns PALS, NTSC, 480P, 576P, 720P60, 720P50, 720P30, 720P25, 720P24, 1080P60, 1080P50, 1080P30, 1080P25, 1080P24, 1080I60, or 1080I50.

**Example**

```
:TRIGger:VIDeo:STANDARD NTSC      /*Sets the video standard to
NTSC.*/
:TRIGger:VIDeo:STANDARD?          /*The query returns NTSC.*/
```

**3.27.11.6 :TRIGger:VIDeo:LEVel****Syntax**

```
:TRIGger:VIDeo:LEVel </level>
:TRIGger:VIDeo:LEVel?
```

**Description**

Sets or queries the trigger level of Video trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	(-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet)	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALE](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

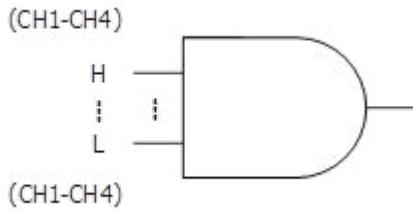
The query returns the trigger level in scientific notation.

**Example**

```
:TRIGger:VIDeo:LEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:VIDeo:LEVel?          /*The query returns 1.600000E-1.*/
```

**3.27.12 :TRIGger:PATTern**

The pattern trigger identifies a trigger condition by looking for a specified pattern. This pattern is a logical "AND" combination of channels. Each channel can be set to H (high), L (low), or X (don't care). A rising or falling edge (you can only specify a single edge) can be specified for one channel included in the pattern. When an edge is specified, the oscilloscope will trigger at the edge specified if the pattern set for the other channels are true (namely the actual pattern of the channel is the same as the preset pattern). If no edge is specified, the oscilloscope will trigger on the last edge that makes the pattern true. If all the channels in the pattern are set to "X", the oscilloscope will not trigger.



### 3.27.12.1 :TRIGger:PATTERn:PATTERn

#### Syntax

```
:TRIGger:PATTERn:PATTERn <pch1>[,<pch2>[,<pch3>[,<pch4>]]]  
:TRIGger:PATTERn:PATTERn?
```

#### Description

Sets or queries the channel pattern of Pattern trigger.

#### Parameter

Name	Type	Range	Default
<pch1>	Discrete	{H L X R F}	X
<pch2>	Discrete	{H L X R F}	X
<pch3>	Discrete	{H L X R F}	X
<pch4>	Discrete	{H L X R F}	X

#### Remarks

- The parameter "<pch1> to <pch4>" sets the patterns of the analog channels "CHANnel1 to CHANnel4".
- In the parameter range, H indicates high level (higher than the threshold level of the channel), L indicates low level (lower than the threshold level of the channel), and X indicates omitting the channel (This channel is not used as a part of the pattern. When all the channels are set to X, the oscilloscope will not trigger.) R indicates rising edge, and F indicates falling edge.
- In the pattern, you can only specify one edge (rising edge or falling edge). If one edge item is currently defined and then another edge item is defined in

another channel in the pattern, then a prompt message "Invalid input" is displayed. Then, the latter defined edge item will be replaced by X.

### Return Format

The query returns the currently set pattern of all the channels. The channels are separated by commas.

### Example

```
:TRIGger:PATTern:PATTern H,R,L,X /*Sets the patterns of "CHANnel1 to CHANnel4" to H,R,L,X.*/
:TRIGger:PATTern:PATTern? /*The query returns H,R,L,X.*/
```

## 3.27.12.2 :TRIGger:PATTern:SOURce

### Syntax

```
:TRIGger:PATTern:SOURce <source>
:TRIGger:PATTern:SOURce?
```

### Description

Sets or queries the trigger source of Pattern trigger.

### Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4 D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15}	CHANnel1

### Remarks

D0-D15 are only available for the DHO900 series.

### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

### Example

```
:TRIGger:PATTern:SOURce CHANnel2 /*Sets the trigger source to CHANnel2.*/
:TRIGger:PATTern:SOURce? /*The query returns CHAN2.*/
```

## 3.27.12.3 :TRIGger:PATTern:LEVel

### Syntax

```
:TRIGger:PATTern:LEVel <source>,</level>
```

**:TRIGger:PATTERn:LEVel? <source>**

### Description

Sets or queries the trigger level of the specified channel in Pattern trigger. The unit is the same as that of the current amplitude.

### Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4 D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15}	CHANnel1
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0

### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

### Return Format

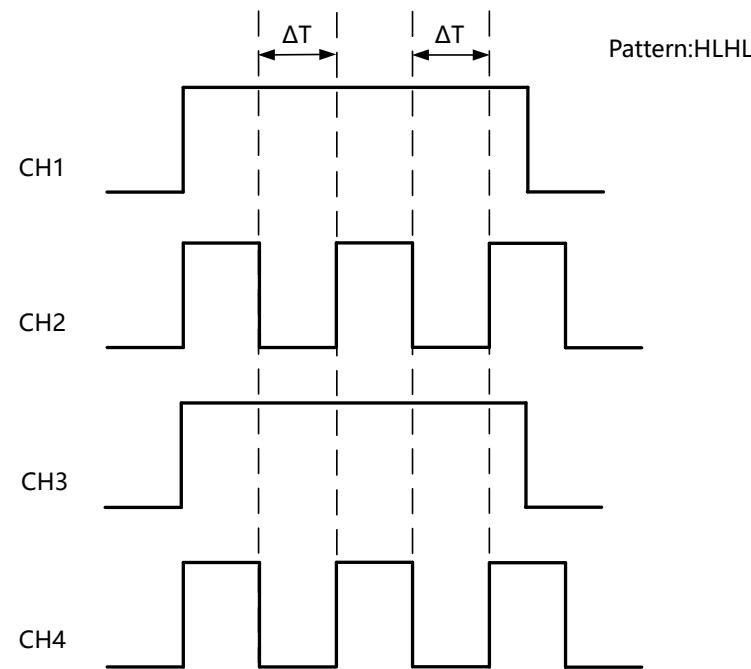
The query returns the trigger level in scientific notation.

### Example

```
:TRIGger:PATTERn:LEVel CHANnel2,0.16 /*Sets the trigger level of
CHANnel2 to 160 mV.*/
:TRIGger:PATTERn:LEVel? CHANnel2      /*The query returns
1.600000E-1.*/
```

## 3.27.13 :TRIGger:DURation

In Duration trigger, the oscilloscope identifies a trigger condition by searching for the duration of a specified pattern. This pattern is a logical "AND" combination of the channels. Each channel can be set to 1 (high), 0 (low), or X (don't care). The instrument triggers when the duration ( $\Delta T$ ) of this pattern meets the preset time, as shown in the figure below.



### 3.27.13.1 :TRIGger:DURation:SOURce

#### Syntax

```
:TRIGger:DURation:SOURce <source>
```

```
:TRIGger:DURation:SOURce?
```

#### Description

Sets or queries the trigger source of Duration trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2  CHANnel3 CHANnel4 D0 D1 D2  D3 D4 D5 D6 D7 D8 D9 D10 D11  D12 D13 D14 D15}	CHANnel1

#### Remarks

D0-D15 are only available for the DHO900 series.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:DURation:SOURce CHANnel2      /*Sets the trigger source to
CHANnel2.*/
:TRIGger:DURation:SOURce?                /*The query returns CHAN2.*/
```

### 3.27.13.2 :TRIGger:DURation:TYPE

#### Syntax

```
:TRIGger:DURation:TYPE <pch1>[,<pch2>[,<pch3>[,<pch4>]]]
:TRIGger:DURation:TYPE?
```

#### Description

Sets or queries the channel pattern of Duration trigger.

#### Parameter

Name	Type	Range	Default
<pch1>	Discrete	{H L X}	X
<pch2>	Discrete	{H L X}	X
<pch3>	Discrete	{H L X}	X
<pch4>	Discrete	{H L X}	X

#### Remarks

- The parameter "<pch1> to <pch4>" sets the patterns of the analog channels "CHANnel1 to CHANnel4".
- In the parameter range, H indicates high level (higher than the threshold level of the channel), L indicates low level (lower than the threshold level of the channel), and X indicates omitting the channel (This channel is not used as a part of the pattern. When all the channels are set to X, the oscilloscope will not trigger.)

#### Return Format

The query returns the currently set pattern of all the channels. The channels are separated by commas.

#### Example

```
:TRIGger:DURation:TYPE L,X,H,L /*Sets the patterns of "CHANnel1 to
CHANnel4" to L,X,H,L.*/
:TRIGger:DURation:TYPE? /*The query returns L,X,H,L.*/
```

### 3.27.13.3 :TRIGger:DURation:WHEN

#### Syntax

```
:TRIGger:DURation:WHEN <when>
:TRIGger:DURation:WHEN?
```

#### Description

Sets or queries the trigger condition of Duration trigger.

#### Parameter

Name	Type	Range	Default
<when>	Discrete	{GREater LESS GLESs UNGLess}	GREater

#### Remarks

- **GREater:** triggers when the set duration time of the pattern is greater than the preset time.
- **LESS:** triggers when the set duration time of the pattern is smaller than the preset time.
- **GLESs:** triggers when the set duration time of the pattern is smaller than the preset upper time limit and greater than the preset lower time limit.
- **UNGLess:** triggers when the set duration time of the pattern is greater than the preset upper time limit or smaller than the preset lower time limit.

#### Return Format

The query returns GRE, LESS, GLES, or UNGL.

#### Example

```
:TRIGger:DURation:WHEN LESS      /*Sets the trigger condition to
LESS.*/
:TRIGger:DURation:WHEN?          /*The query returns LESS.*/
```

### 3.27.13.4 :TRIGger:DURation:TUPPer

#### Syntax

```
:TRIGger:DURation:TUPPer <time>
:TRIGger:DURation:TUPPer?
```

## Description

Sets or queries the upper limit of the duration time of Duration trigger. The default unit is s.

## Parameter

Name	Type	Range	Default
<time>	Real	1.01 ns to 10 s	1 μs

## Remarks

This command is only available when the trigger condition is set to LESS, GLESSs, or UNGLess. To set or query the trigger condition of the Duration trigger, send the [:TRIGger:DURation:WHEN](#) command.

When the trigger condition is set to GLESSs or UNGLess, if the set upper limit of the duration time value is smaller than the lower limit, the lower limit will be automatically changed. You can send the [:TRIGger:DURation:TLOWer](#) command to set or query the lower limit of the duration time value of the Duration trigger.

## Return Format

The query returns the upper limit of the duration time in scientific notation.

## Example

```
:TRIGger:DURation:TUPPer 0.000003 /*Sets the upper limit of the
duration time to 3 μs.*/
:TRIGger:DURation:TUPPer?           /*The query returns
3.000000E-6.*/
```

## 3.27.13.5 :TRIGger:DURation:TLOWer

### Syntax

```
:TRIGger:DURation:TLOWer <time>
:TRIGger:DURation:TLOWer?
```

### Description

Sets or queries the lower limit of the duration time of Duration trigger. The default unit is s.

### Parameter

Name	Type	Range	Default
<time>	Real	1 ns to 9.9 s	1 μs

## Remarks

This command is only available when the trigger condition is set to GREater, GLEss, or UNGLess. To set or query the trigger condition of the Duration trigger, send the [:TRIGger:DURation:WHEN](#) command.

When the trigger condition is set to GLEss or UNGLess, if the set lower limit of the duration time value is greater than the upper limit, the upper limit will be automatically changed. You can send the [:TRIGger:DURation:TUPPer](#) command to set or query the upper limit of the duration time value of the Duration trigger.

## Return Format

The query returns the lower limit of the duration time in scientific notation.

## Example

```
:TRIGger:DURation:TLOWer 0.000003 /*Sets the lower limit of the
duration time to 3 μs.*/
:TRIGger:DURation:TLOWer?           /*The query returns
3.000000E-6.*/
```

### 3.27.13.6 :TRIGger:DURation:LEVel

#### Syntax

```
:TRIGger:DURation:LEVel <source>,</level>
:TRIGger:DURation:LEVel?<source>
```

#### Description

Sets or queries the trigger level of the specified channel in Duration trigger. The unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

#### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALE](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

Digital channels (D0 to D15) are only supported by the DHO900 series.

### Return Format

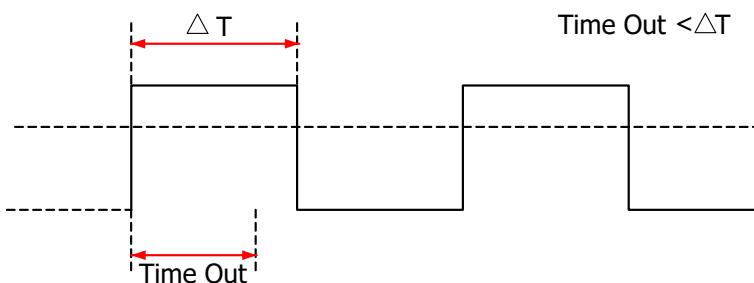
The query returns the trigger level in scientific notation.

### Example

```
:TRIGger:DURation:LEVel CHANnel2,0.16 /*Sets the trigger level of
CHANnel2 to 160 mV.*/
:TRIGger:DURation:LEVel? CHANnel2      /*The query returns
1.60000E-1.*/
```

## 3.27.14 :TRIGger:TIMEout

In Timeout trigger, the oscilloscope triggers when the time interval ( $\Delta T$ ) (the time from when the rising edge (or falling edge) of the input signal passes through the trigger level to the time from when the neighboring falling edge (or rising edge) passes through the trigger level) is greater than the preset timeout value, as shown in the figure below.



### 3.27.14.1 :TRIGger:TIMEout:SOURce

#### Syntax

```
:TRIGger:TIMEout:SOURce <source>
:TRIGger:TIMEout:SOURce?
```

#### Description

Sets or queries the trigger source of Timeout trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8  D9 D10 D11 D12 D13 D14 D15  CHANnel1 CHANnel2 CHANnel3  CHANnel4}	CHANnel1

## Remarks

D0-D15 are only available for the DHO900 series.

## Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:TIMEout:SOURce CHANnel2      /*Sets the trigger source to  
CHANnel2.*/  
:TRIGger:TIMEout:SOURce?                /*The query returns CHAN2.*/
```

### 3.27.14.2 :TRIGger:TIMEout:SLOPe

#### Syntax

```
:TRIGger:TIMEout:SLOPe <slope>  
:TRIGger:TIMEout:SLOPe?
```

#### Description

Sets or queries the edge type of Timeout trigger.

#### Parameter

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative RFALI}	POSitive

#### Remarks

- POSitive:** starts timing when the rising edge of the input signal passes through the trigger level.
- NEGative:** starts timing when the falling edge of the input signal passes through the trigger level.
- RFALI:** starts timing when any edge of the input signal passes through the trigger level.

#### Return Format

The query returns POS, NEG, or RFAL.

## Example

```
:TRIGger:TIMEout:SLOPe NEGative      /*Sets the edge type to  
NEGative.*/  
:TRIGger:TIMEout:SLOPe?              /*The query returns NEG.*/
```

### 3.27.14.3 :TRIGger:TIMEout:TIME

#### Syntax

```
:TRIGger:TIMEout:TIME <time>
:TRIGger:TIMEout:TIME?
```

#### Description

Sets or queries the timeout value of Timeout trigger. The default unit is s.

#### Parameter

Name	Type	Range	Default
<time>	Real	1 ns to 10 s	1 μs

#### Remarks

N/A

#### Return Format

The query returns the timeout value in scientific notation.

#### Example

```
:TRIGger:TIMEout:TIME 0.002      /*Sets the timeout value to 2 ms.*/
:TRIGger:TIMEout:TIME?    /*The query returns 2.000000E-3.*/
```

### 3.27.14.4 :TRIGger:TIMEout:LEVel

#### Syntax

```
:TRIGger:TIMEout:LEVel </eve/>
:TRIGger:TIMEout:LEVel?
```

#### Description

Sets or queries the trigger level of Timeout trigger. The unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

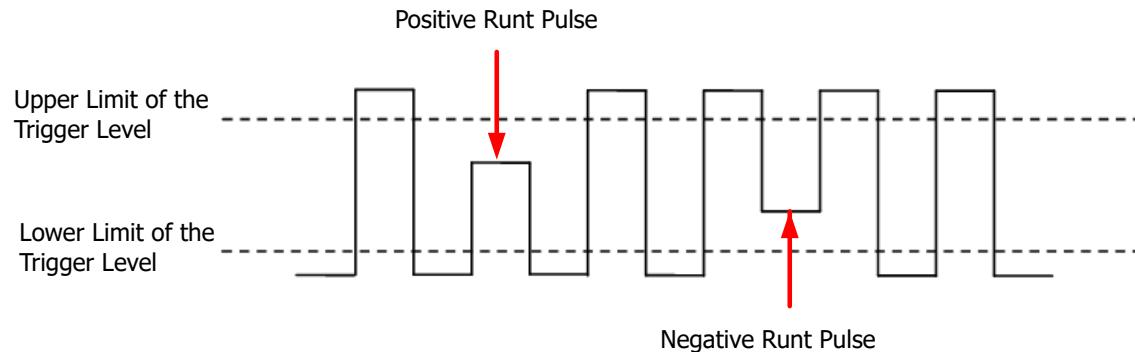
The query returns the trigger level in scientific notation.

**Example**

```
:TRIGger:TIMEout:LEVel 0.16      /*Sets the trigger level to 160
mV.*/
:TRIGger:TIMEout:LEVel?          /*The query returns 1.60000E-1.*/
```

### 3.27.15 :TRIGger:RUNT

The runt trigger sets the oscilloscope to trigger pulses that cross one trigger level but not another, as shown in the figure below.



#### 3.27.15.1 :TRIGger:RUNT:SOURce

**Syntax**

```
:TRIGger:RUNT:SOURce <source>
:TRIGger:RUNT:SOURce?
```

**Description**

Sets or queries the trigger source of Runt trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

**Remarks**

N/A

## Return Format

The query returns CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:RUNT:SOURce CHANnel2      /*Sets the trigger source to  
CHANnel2.*/  
:TRIGger:RUNT:SOURce?                /*The query returns CHAN2.*/
```

### 3.27.15.2 :TRIGger:RUNT:POLarity

#### Syntax

```
:TRIGger:RUNT:POLarity <polarity>  
:TRIGger:RUNT:POLarity?
```

#### Description

Sets or queries the polarity of Runt trigger.

#### Parameter

Name	Type	Range	Default
<polarity>	Discrete	{POSitive NEGative}	POSitive

#### Remarks

- **POSitive:** indicates the positive polarity. The oscilloscope triggers on the positive polarity of Runt trigger.
- **NEGative:** indicates the negative polarity. The oscilloscope triggers on the negative polarity of Runt trigger.

## Return Format

The query returns POS or NEG.

## Example

```
:TRIGger:RUNT:POLarity NEGative    /*Sets the polarity of Runt  
trigger to NEGative.*/  
:TRIGger:RUNT:POLarity?            /*The query returns NEG.*/
```

### 3.27.15.3 :TRIGger:RUNT:WHEN

#### Syntax

```
:TRIGger:RUNT:WHEN <when>  
:TRIGger:RUNT:WHEN?
```

**Description**

Sets or queries the trigger conditions of Runt trigger.

**Parameter**

Name	Type	Range	Default
<when>	Discrete	{NONE GREater LESS GLESs}	NONE

**Remarks**

- **NONE:** indicates not setting the trigger condition of Runt trigger.
- **GREater:** triggers when the runt pulse width is greater than the lower limit of pulse width.
- **LESS:** triggers when the runt pulse width is smaller than the upper limit of pulse width.
- **GLESs:** triggers when the runt pulse width is greater than the lower limit and smaller than the upper limit of pulse width.

The lower limit of the pulse width must be smaller than the upper limit.

**Return Format**

The query returns NONE, GRE, LESS, or GLES.

**Example**

```
:TRIGger:RUNT:WHEN LESS      /*Sets the trigger condition of Runt
trigger to LESS.*/
:TRIGger:RUNT:WHEN?          /*The query returns LESS.*/
```

**3.27.15.4 :TRIGger:RUNT:WUPPer****Syntax**

```
:TRIGger:RUNT:WUPPer <width>
:TRIGger:RUNT:WUPPer?
```

**Description**

Sets or queries the upper limit of the pulse width of Runt trigger. The default unit is s.

**Parameter**

Name	Type	Range	Default
<width>	Real	1.01 ns to 10 s	2 μs

## Remarks

This command is only available when the trigger condition is set to LESS or GLEsSs. To set or query the trigger condition of the Runt trigger, send the `:TRIGger:RUNT:WHEN` command.

When the trigger condition is set to GLEsSs, if the set upper limit of the pulse width is smaller than the lower limit, the lower limit will be automatically changed. You can send the `:TRIGger:RUNT:WLOWER` command to set or query the lower limit of the pulse width of Runt trigger.

## Return Format

The query returns the upper limit of the pulse width in scientific notation.

## Example

```
:TRIGger:RUNT:WUPPer 0.02    /*Sets the upper limit of the pulse  
width to 20 ms.*/
:TRIGger:RUNT:WUPPer?          /*The query returns 2.00000E-2.*/
```

### 3.27.15.5 :TRIGger:RUNT:WLOWER

## Syntax

```
:TRIGger:RUNT:WLOWER <width>
:TRIGger:RUNT:WLOWER?
```

## Description

Sets or queries the lower limit of the pulse width of Runt trigger. The default unit is s.

## Parameter

Name	Type	Range	Default
<width>	Real	1 ns to 9.9 s	1 μs

## Remarks

This command is only available when the trigger condition is set to GREater or GLEsSs. To set or query the trigger condition of the Runt trigger, send the `:TRIGger:RUNT:WHEN` command.

When the trigger condition is set to GLEsSs, if the set lower limit of the pulse width is greater than the lower limit, the upper limit will be automatically changed. You can send the `:TRIGger:RUNT:WUPPer` command to set or query the upper limit of the pulse width of Runt trigger.

## Return Format

The query returns the lower limit of the pulse width in scientific notation.

**Example**

```
:TRIGger:RUNT:WLOWER 0.01    /*Sets the lower limit of the pulse
width to 10 ms.*/
:TRIGger:RUNT:WLOWER?          /*The query returns 1.000000E-2.*/
```

**3.27.15.6 :TRIGger:RUNT:ALEVel****Syntax**

```
:TRIGger:RUNT:ALEVel </level/>
:TRIGger:RUNT:ALEVel?
```

**Description**

Sets or queries the upper limit of the trigger level of Runt trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Lower limit of the trigger level to (4.5 x VerticalScale - Offset)	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

The query returns the upper limit of the trigger level in scientific notation.

**Example**

```
:TRIGger:RUNT:ALEVel 0.16    /*Sets the upper limit of the trigger
level to 160 mV.*/
:TRIGger:RUNT:ALEVel?        /*The query returns 1.600000E-1.*/
```

**3.27.15.7 :TRIGger:RUNT:BLEVel****Syntax**

```
:TRIGger:RUNT:BLEVel </level/>
:TRIGger:RUNT:BLEVel?
```

**Description**

Sets or queries the lower limit of the trigger level of Runt trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	(-4.5 x VerticalScale - Offset) to upper limit of the trigger level	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

The query returns the lower limit of the trigger level in scientific notation.

**Example**

```
:TRIGger:RUNT:BLeVel 0.16    /*Sets the lower limit of the trigger
level to 160 mV.*/
:TRIGger:RUNT:BLeVel?        /*The query returns 1.600000E-1.*/
```

## 3.27.16 :TRIGger:WINDows

Window trigger provides a high trigger level and a low trigger level. The instrument triggers when the input signal passes through the high trigger level or the low trigger level.

### 3.27.16.1 :TRIGger:WINDows:SOURce

**Syntax**

```
:TRIGger:WINDows:SOURce <source>
:TRIGger:WINDows:SOURce?
```

**Description**

Sets or queries the trigger source of Window trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

**Remarks**

N/A

**Return Format**

The query returns CHAN1, CHAN2, CHAN3, or CHAN4.

**Example**

```
:TRIGger:WINDows:SOURce CHANnel2 /*Sets the trigger source to
CHANnel2.*/
:TRIGger:WINDows:SOURce? /*The query returns CHAN2.*/
```

**3.27.16.2 :TRIGger:WINDows:SLOPe****Syntax**

```
:TRIGger:WINDows:SLOPe <type>
:TRIGger:WINDows:SLOPe?
```

**Description**

Sets or queries the edge type of Windows trigger.

**Parameter**

Name	Type	Range	Default
<type>	Discrete	{POSitive NEGative RFALI}	POSitive

**Remarks**

- POSitive:** triggers on the rising edge of the input signal when the voltage level is greater than the preset high trigger level.
- NEGative:** triggers on the falling edge of the input signal when the voltage level is smaller than the preset low trigger level.
- RFALI:** triggers on either the rising or falling edge of the input signal when the voltage level meets the preset trigger level.

**Return Format**

The query returns POS, NEG, or RFAL.

**Example**

```
:TRIGger:WINDows:SLOPe NEGative /*Sets the edge type of Windows
trigger to NEGative.*/
:TRIGger:WINDows:SLOPe? /*The query returns NEG.*/
```

**3.27.16.3 :TRIGger:WINDows:POSIon****Syntax**

```
:TRIGger:WINDows:POSITION <pos>
:TRIGger:WINDows:POSITION?
```

**Description**

Sets or queries the trigger position of Window trigger.

**Parameter**

Name	Type	Range	Default
<pos>	Discrete	{EXIT ENTer TIME}	ENTer

**Remarks**

- **EXIT:** triggers when the input signal exits the specified trigger level range.
- **ENTer:** triggers when the input signal enters the specified trigger level range.
- **TIME:** triggers when the accumulated hold time after the trigger signal enters the specified trigger level range is equal to the window time.

**Return Format**

The query returns EXIT, ENT, or TIME.

**Example**

```
:TRIGger:WINDows:POSITION ENTer      /*Sets the trigger position to ENT.*/
:TRIGger:WINDows:POSITION?          /*The query returns ENT.*/
```

**3.27.16.4 :TRIGger:WINDows:TIME****Syntax**

```
:TRIGger:WINDows:TIME <time>
:TRIGger:WINDows:TIME?
```

**Description**

Sets or queries the window time of Window trigger.

**Parameter**

Name	Type	Range	Default
<time>	Real	1 ns to 10 s	1 μs

**Remarks**

N/A

**Return Format**

The query returns the window time in scientific notation.

**Example**

```
:TRIGger:WINDOWS:TIME 0.002 /*Sets the window time to 2 ms.*/
:TRIGger:WINDOWS:TIME? /*The query returns 2.000000E-3.*/
```

**3.27.16.5 :TRIGger:WINDOWS:ALEVel****Syntax**

```
:TRIGger:WINDOWS:ALEVel <level>
:TRIGger:WINDOWS:ALEVel?
```

**Description**

Sets or queries the upper limit of the trigger level of Window trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Lower limit to (4.5 x VerticalScale - OFFSet)	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

The query returns the upper limit of the trigger level in scientific notation.

**Example**

```
:TRIGger:WINDOWS:ALEVel 0.16 /*Sets the upper limit of the
trigger level to 160 mV.*/
:TRIGger:WINDOWS:ALEVel? /*The query returns 1.600000E-1.*/
```

**3.27.16.6 :TRIGger:WINDOWS:BLEVel****Syntax**

```
:TRIGger:WINDOWS:BLEVel <level>
:TRIGger:WINDOWS:BLEVel?
```

**Description**

Sets or queries the lower limit of the trigger level of Window trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	(-4.5 x VerticalScale - OFFSet) to upper limit	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

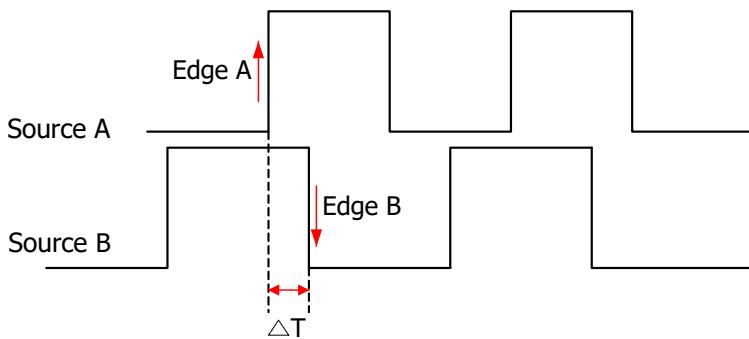
The query returns the lower limit of the trigger level in scientific notation.

**Example**

```
:TRIGger:WINDOWs:BLeVel 0.05 /*Sets the lower limit of the
trigger level to 50 mV.*/
:TRIGger:WINDOWs:BLeVel? /*The query returns 5.000000E-2.*/
```

### 3.27.17 :TRIGger:DElay

In Delay trigger, you need to set Source A and Source B. The oscilloscope triggers when the time difference ( $\Delta T$ ) between the specified edges (Edge A and Edge B) of Source A and Source B meets the preset time limit, as shown in the figure below. Edge A and Edge B must be two neighboring edges. See the figure below.



#### 3.27.17.1 :TRIGger:DElay:SA

**Syntax**

```
:TRIGger:DElay:SA <source>
:TRIGger:DElay:SA?
```

**Description**

Sets or queries the trigger source of Source A in Delay trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8  D9 D10 D11 D12 D13 D14 D15  CHANnel1 CHANnel2 CHANnel3  CHANnel4}	CHANnel1

**Remarks**

Only DHO900 series supports the digital channels D0-D15.

**Return Format**

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

**Example**

```
:TRIGger:DELay:SA CHANnel2 /*Sets the trigger source A to  
CHANnel2.*/  
:TRIGger:DELay:SA?           /*The query returns CHAN2.*/
```

**3.27.17.2 :TRIGger:DELay:ASLop****Syntax**

```
:TRIGger:DELay:ASLop <slope>  
:TRIGger:DELay:ASLop?
```

**Description**

Sets or queries the edge type of Edge A in Delay trigger.

**Parameter**

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative}	POSitive

**Remarks**

N/A

**Return Format**

The query returns POS or NEG.

**Example**

```
:TRIGger:DELay:ASLop NEGative    /*Sets the edge type of Edge A to  
NEGative.*/  
:TRIGger:DELay:ASLop?           /*The query returns NEG.*/
```

### 3.27.17.3 :TRIGger:DELay:SB

#### Syntax

```
:TRIGger:DELay:SB <source>
:TRIGger:DELay:SB?
```

#### Description

Sets or queries the trigger source of Source B in Delay trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel2

#### Remarks

Only DHO900 series supports the digital channels D0-D15.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:DELay:SB CHANnel4 /*Sets the trigger source B to
CHANnel4.*/
:TRIGger:DELay:SB? /*The query returns CHAN4.*/
```

### 3.27.17.4 :TRIGger:DELay:BSlop

#### Syntax

```
:TRIGger:DELay:BSlop <slope>
:TRIGger:DELay:BSlop?
```

#### Description

Sets or queries the edge type of Edge B in Delay trigger.

#### Parameter

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative}	POSitive

**Remarks**

N/A

**Return Format**

The query returns POS or NEG.

**Example**

```
:TRIGger:DELay:BSLop NEGative /*Sets the edge type of Edge B to  
NEGative.*/  
:TRIGger:DELay:BSLop? /*The query returns NEG.*/
```

**3.27.17.5 :TRIGger:DELay:TYPE****Syntax**

```
:TRIGger:DELay:TYPE <type>  
:TRIGger:DELay:TYPE?
```

**Description**

Sets or queries the trigger condition of the Delay trigger.

**Parameter**

Name	Type	Range	Default
<type>	Discrete	{GREater LESS GLESs GOUT}	GREater

**Remarks**

- **GREater:** triggers when the time difference ( $\Delta T$ ) between the specified edges of Source A and Source B is greater than the preset time limit.
- **LESS:** triggers when the time difference ( $\Delta T$ ) between the specified edges of Source A and Source B is smaller than the preset time limit.
- **GLESs:** triggers when the time difference ( $\Delta T$ ) between the specified edges of Source A and Source B is greater than the lower limit of the preset time and smaller than the upper limit of the preset time.
- **GOUT:** triggers when the time difference ( $\Delta T$ ) between the specified edges of Source A and Source B is smaller than the lower limit of the preset time or greater than the upper limit of the preset time.

## Return Format

The query returns GRE, LESS, GLES, or GOUT.

## Example

```
:TRIGger:DELay:TYPE GOUT      /*Sets the trigger condition to GOUT.*/
:TRIGger:DELay:TYPE?          /*The query returns GOUT.*/
```

### 3.27.17.6 :TRIGger:DELay:TUPPer

#### Syntax

```
:TRIGger:DELay:TUPPer <time>
:TRIGger:DELay:TUPPer?
```

#### Description

Sets or queries the upper limit of delay time of the Delay trigger. The default unit is s.

#### Parameter

Name	Type	Range	Default
<time>	Real	1.01 ns to 10 s	2 μs

#### Remarks

This command is only available when the trigger condition is set to LESS, GLESs, or GOUT. To set or query the trigger condition of the Delay trigger, send the [:TRIGger:DELay:TYPE](#) command.

When the trigger condition is set to GLESs or GOUT, if the set upper limit of the delay time is smaller than the lower limit, the lower limit will be automatically changed. You can send the [:TRIGger:DELay:TLOWer](#) command to set or query the lower limit of the delay time of the Delay trigger.

## Return Format

The query returns the upper limit of delay time in scientific notation.

## Example

```
:TRIGger:DELay:TUPPer 0.002    /*Sets the upper limit of delay time
                                to 2 ms.*/
:TRIGger:DELay:TUPPer?        /*The query returns 2.000000E-3.*/
```

### 3.27.17.7 :TRIGger:DELay:TLOWer

#### Syntax

```
:TRIGger:DELay:TLOWer <time>
:TRIGger:DELay:TLOWer?
```

**Description**

Sets or queries the lower limit of delay time of the Delay trigger. The default unit is s.

**Parameter**

Name	Type	Range	Default
<time>	Real	1 ns to 9.9 s	1μs

**Remarks**

This command is only available when the trigger condition is set to GREater, GLEss, or GOUT. To set or query the trigger condition of the Delay trigger, send the [:TRIGger:DELay:TYPE](#) command.

When the trigger condition is set to GLEss or GOUT, if the set lower limit of the delay time is greater than the upper limit, the upper limit will be automatically changed.

You can send the [:TRIGger:DELay:TUPPer](#) command to set or query the upper limit of the delay time of the Delay trigger.

**Return Format**

The query returns the lower limit of delay time in scientific notation.

**Example**

```
:TRIGger:DELay:TLOWer 0.002    /*Sets the lower limit of delay time
to 2 ms.*/
:TRIGger:DELay:TLOWer?          /*The query returns 2.000000E-3.*/
```

**3.27.17.8 :TRIGger:DELay:ALEVel****Syntax**

```
:TRIGger:DELay:ALEVel </level>
:TRIGger:DELay:ALEVel?
```

**Description**

Sets or queries the threshold level of Source A of Delay trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	(-4.5 x VerticalScale - Offset) to (4.5 x VerticalScale - Offset)	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

## Return Format

The query returns the threshold level of Source A in scientific notation.

### Example

```
:TRIGger:DELay:ALEVel 0.16 /*Sets the threshold level of Source
A to 160 mV.*/
:TRIGger:DELay:ALEVel? /*The query returns 1.60000E-1.*/
```

## 3.27.17.9 :TRIGger:DELay:BLEVel

### Syntax

```
:TRIGger:DELay:BLEVel </level/>
:TRIGger:DELay:BLEVel?
```

### Description

Sets or queries the threshold level of Source B of Delay trigger. The unit is the same as that of the current amplitude.

### Parameter

Name	Type	Range	Default
<level>	Real	(-4.5 x VerticalScale - Offset) to (4.5 x VerticalScale - Offset)	0 V

### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

### Return Format

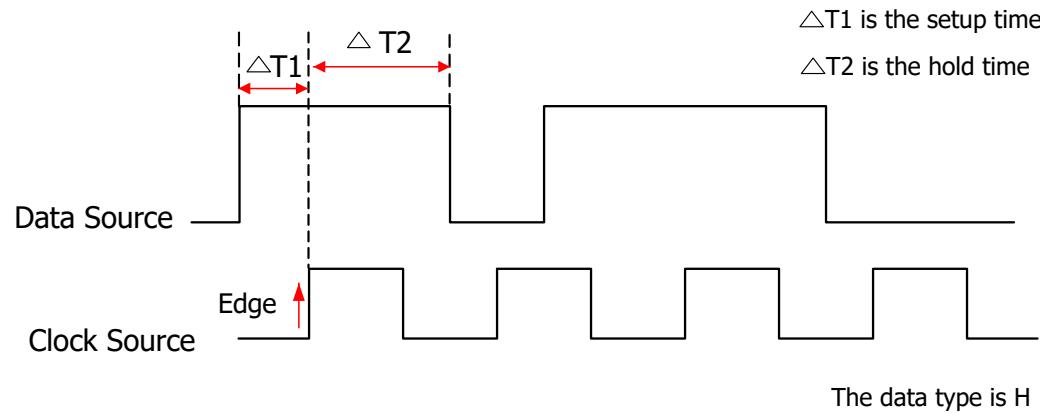
The query returns the threshold level of Source B in scientific notation.

### Example

```
:TRIGger:DELay BLEVel 0.05 /*Sets the threshold level of Source
B to 50 mV.*/
:TRIGger:DELay:BLEVel? /*The query returns 5.00000E-2.*/
```

## 3.27.18 :TRIGger:SHOLD

In setup&hold trigger, you need to set the clock source and data source. The setup time starts when the data signal passes the trigger level and ends at the coming of the specified clock edge; the hold time starts at the coming of the specified clock edge and ends when the data signal crosses the trigger level again, as shown in the figure below. The oscilloscope triggers when the setup time or hold time is smaller than the preset time.



### 3.27.18.1 :TRIGger:SHOLD:DSRC

#### Syntax

```
:TRIGger:SHOLD:DSRC <source>
```

```
:TRIGger:SHOLD:DSRC?
```

#### Description

Sets or queries the data source of Setup&Hold trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8  D9 D10 D11 D12 D13 D14 D15  CHANnel1 CHANnel2 CHANnel3  CHANnel4}	CHANnel2

#### Remarks

D0-D15 are only available for the DHO900 series.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:SHOLD:DSRC CHANnel1 /*Sets the data source to  
CHANnel1.*/  
:TRIGger:SHOLD:DSRC? /*The query returns CHAN1.*/
```

### 3.27.18.2 :TRIGger:SHOLD:CSRC

#### Syntax

```
:TRIGger:SHOLD:CSRC <source>
```

**:TRIGger:SHOLD:CSRC?**

### Description

Sets or queries the clock source of Setup&Hold trigger.

### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

### Remarks

D0-D15 are only available for the DHO900 series.

### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

### Example

```
:TRIGger:SHOLD:CSRC CHANnel2      /*Sets the clock source to  
CHANnel2.*/  
:TRIGger:SHOLD:CSRC?            /*The query returns CHAN2.*/
```

## 3.27.18.3 :TRIGger:SHOLD:SLOPe

### Syntax

```
:TRIGger:SHOLD:SLOPe <slope>  
:TRIGger:SHOLD:SLOPe?
```

### Description

Sets or queries the edge type of Setup&Hold trigger.

### Parameter

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative}	POSitive

### Remarks

N/A

### Return Format

The query returns POS or NEG.

**Example**

```
:TRIGger:SHOLD:SLOPe NEGative /*Sets the edge type to  
NEGative.*/  
:TRIGger:SHOLD:SLOPe? /*The query returns NEG.*/
```

**3.27.18.4 :TRIGger:SHOLD:PATTern****Syntax**

```
:TRIGger:SHOLD:PATTern <pattern>  
:TRIGger:SHOLD:PATTern?
```

**Description**

Sets or queries the data type of Setup&Hold trigger.

**Parameter**

Name	Type	Range	Default
<pattern>	Discrete	{H L}	H

**Remarks**

- H:** indicates high level.
- L:** indicates low level.

**Return Format**

The query returns H or L.

**Example**

```
:TRIGger:SHOLD:PATTern L /*Sets data type to L.*/  
:TRIGger:SHOLD:PATTern? /*The query returns L.*/
```

**3.27.18.5 :TRIGger:SHOLD:TYPE****Syntax**

```
:TRIGger:SHOLD:TYPE <type>  
:TRIGger:SHOLD:TYPE?
```

**Description**

Sets or queries the trigger condition of Setup/Hold trigger.

**Parameter**

Name	Type	Range	Default
<type>	Discrete	{SETup HOLD SETHold}	SETup

## Remarks

- **SETUp:** the oscilloscope triggers when the setup time is smaller than the specified setup time.
- **HOLD:** the oscilloscope triggers when the hold time is smaller than the specified hold time.
- **SETHold:** the oscilloscope triggers when the setup time or hold time is smaller than the specified time value.

## Return Format

The query returns SET, HOLD, or SETH.

## Example

```
:TRIGger:SHOLD:TYPE SETHold      /*Sets the trigger condition to  
SETHold.*/  
:TRIGger:SHOLD:TYPE?            /*The query returns SETH.*/
```

### 3.27.18.6 :TRIGger:SHOLD:STIMe

#### Syntax

```
:TRIGger:SHOLD:STIMe <time>
```

```
:TRIGger:SHOLD:STIMe?
```

#### Description

Sets or queries the setup time of Setup&Hold trigger. The default unit is s.

#### Parameter

Name	Type	Range	Default
<time>	Real	1 ns to 10 s	2 μs

#### Remarks

- Setup time indicates the time that the data remain stable and unchanged before the specified clock edge arrives.
- This command is only available when the hold type is SETUp or SETHOLD.

#### Return Format

The query returns the setup time value in scientific notation.

**Example**

```
:TRIGger:SHOLD:STIMe 0.002      /*Sets the setup time to 2 ms.*/
:TRIGger:SHOLD:STIMe?          /*The query returns 2.000000E-3.*/
```

**3.27.18.7 :TRIGger:SHOLD:HTIMe****Syntax**

```
:TRIGger:SHOLD:HTIMe <time>
:TRIGger:SHOLD:HTIMe?
```

**Description**

Sets or queries the hold time of Setup&Hold trigger. The default unit is s.

**Parameter**

Name	Type	Range	Default
<time>	Real	1 ns to 10 s	1 μs

**Remarks**

- Hold time indicates the time that the data remain stable and unchanged after the specified clock edge arrives.
- This command is only available when the hold type is HOLD or SETHOLD.

**Return Format**

The query returns the hold time value in scientific notation.

**Example**

```
:TRIGger:SHOLD:HTIMe 0.002      /*Sets the hold time to 2 ms.*/
:TRIGger:SHOLD:HTIMe?          /*The query returns 2.000000E-3.*/
```

**3.27.18.8 :TRIGger:SHOLD:DLEVel****Syntax**

```
:TRIGger:SHOLD:DLEVel </eve/>
:TRIGger:SHOLD:DLEVel?
```

**Description**

Sets or queries the trigger level of the data source. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

The query returns the trigger level of the data source in scientific notation.

**Example**

```
:TRIGger:SHOLD:DLEVel 0.16      /*Sets the trigger level of the data
source to 160 mV.*/
:TRIGger:SHOLD:DLEVel?          /*The query returns 1.600000E-1.*/
```

**3.27.18.9 :TRIGger:SHOLD:CLEVel****Syntax**

```
:TRIGger:SHOLD:CLEVel</level>
:TRIGger:SHOLD:CLEVel?
```

**Description**

Sets or queries the trigger level of the clock source. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

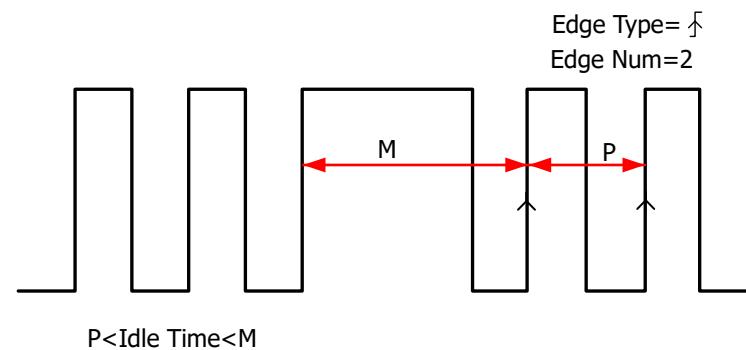
The query returns the trigger level of the clock source in scientific notation.

**Example**

```
:TRIGger:SHOLD:CLEVel 0.05    /*Sets the trigger level of the
clock source to 50 mV.*/
:TRIGger:SHOLD:CLEVel?        /*The query returns 5.000000E-2.*/
```

**3.27.19 :TRIGger:NEDGE**

The Nth edge trigger lets you to trigger on the Nth edge that occurs after a specified idle time. For example, in the waveform as shown in the figure below, the instrument should trigger on the second rising edge after the specified idle time (the time between two neighboring rising edges), and the idle time should be within the range between P and M ( $P < \text{Idle Time} < M$ ). Wherein, M is the time between the first rising edge and its previous rising edge; P is the maximum time between the rising edges that participate in counting.

**3.27.19.1 :TRIGger:NEDGE:SOURce****Syntax**

```
:TRIGger:NEDGE:SOURce <source>
:TRIGger:NEDGE:SOURce?
```

**Description**

Sets or queries the trigger source of Edge trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8  D9 D10 D11 D12 D13 D14 D15  CHANnel1 CHANnel2 CHANnel3  CHANnel4}	CHANnel1

## Remarks

Only DHO900 series supports the digital channels D0-D15.

## Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:NEDGE:SOURce CHANnel2 /*Sets the trigger source to  
CHANnel2.*/  
:TRIGger:NEDGE:SOURce? /*The query returns CHAN2.*/
```

### 3.27.19.2 :TRIGger:NEDGE:SLOPe

#### Syntax

```
:TRIGger:NEDGE:SLOPe <slope>  
:TRIGger:NEDGE:SLOPe?
```

#### Description

Sets or queries the edge type of the Nth Edge trigger.

#### Parameter

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative}	POSitive

#### Remarks

- POSitive:** indicates that the oscilloscope triggers on the rising edge of the input signal when the voltage level meets the preset trigger level.
- NEGative:** indicates that the oscilloscope triggers on the falling edge of the input signal when the voltage level meets the preset trigger level.

#### Return Format

The query returns POS or NEG.

#### Example

```
:TRIGger:NEDGE:SLOPe NEGative /*Sets the edge type to  
NEGative .*/  
:TRIGger:NEDGE:SLOPe? /*The query returns NEG.*/
```

### 3.27.19.3 :TRIGger:NEDGE:IDLE

#### Syntax

```
:TRIGger:NEDGE:IDLE <time>
:TRIGger:NEDGE:IDLE?
```

#### Description

Sets or queries the idle time of the Nth Edge trigger. The default unit is s.

#### Parameter

Name	Type	Range	Default
<time>	Real	16 ns to 10 s	1 μs

#### Remarks

N/A

#### Return Format

The query returns the idle time in scientific notation.

#### Example

```
:TRIGger:NEDGE:IDLE 0.002 /*Sets the idle time to 2 ms.*/
:TRIGger:NEDGE:IDLE? /*The query returns 2.000000E-3.*/
```

### 3.27.19.4 :TRIGger:NEDGE:EDGE

#### Syntax

```
:TRIGger:NEDGE:EDGE <edge>
:TRIGger:NEDGE:EDGE?
```

#### Description

Sets or queries the number of edges of the Nth Edge trigger.

#### Parameter

Name	Type	Range	Default
<edge>	Integer	1 to 65535	1

#### Remarks

N/A

#### Return Format

The query returns an integer ranging from 1 to 65535.

**Example**

```
:TRIGger:NEDGE:EDGE 20      /*Sets the number of edges to 20.*/
:TRIGger:NEDGE:EDGE?        /*The query returns 20.*/
```

**3.27.19.5 :TRIGger:NEDGE:LEVel****Syntax**

```
:TRIGger:NEDGE:LEVel </level/>
```

```
:TRIGger:NEDGE:LEVel?
```

**Description**

Sets or queries the trigger level of the Nth Edge trigger. The unit is the same as that of current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

**Remarks**

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

**Return Format**

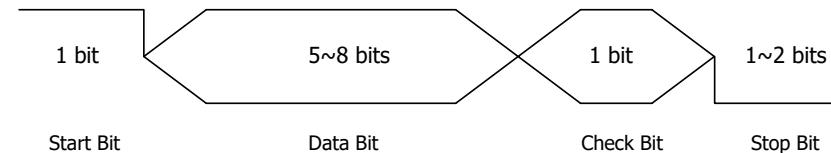
The query returns the trigger level in scientific notation.

**Example**

```
:TRIGger:NEDGE:LEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:NEDGE:LEVel?        /*The query returns 1.600000E-1.*/
```

**3.27.20 :TRIGger:RS232**

RS232 bus is a serial communication mode used in data transmission between PCs or between a PC and a terminal. In RS232 serial protocol, a character is transmitted as a frame of data. The frame consists of 1 start bit, 5-8 data bits, 1 check bit, and 1-2 stop bits. Its format is as shown in the figure below. This series oscilloscope triggers when detecting the start frame, error frame, check error, or the specified data of the RS232 signal.



**Figure 3.7 Schematic Diagram of RS232 Protocol**

### 3.27.20.1 :TRIGger:RS232:SOURce

#### Syntax

```
:TRIGger:RS232:SOURce <source>
:TRIGger:RS232:SOURce?
```

#### Description

Sets or queries the trigger source of RS232 trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

#### Remarks

D0-D15 are only available for the DHO900 series.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:RS232:SOURce CHANnel2      /*Sets the trigger source to
CHANnel2.*/
:TRIGger:RS232:SOURce?              /*The query returns CHAN2.*/
```

### 3.27.20.2 :TRIGger:RS232:LEVel

#### Syntax

```
:TRIGger:RS232:LEVel </level/>
:TRIGger:RS232:LEVel?
```

## Description

Sets or queries the trigger level of RS232 trigger. The unit is the same as that of the current amplitude.

## Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

## Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

## Return Format

The query returns the trigger level in scientific notation.

## Example

```
:TRIGger:RS232:LEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:RS232:LEVel?          /*The query returns 1.600000E-1.*/
```

## 3.27.20.3 :TRIGger:RS232:POLarity

### Syntax

```
:TRIGger:RS232:POLarity <polarity>
:TRIGger:RS232:POLarity?
```

### Description

Sets or queries the pulse polarity of RS232 trigger.

### Parameter

Name	Type	Range	Default
<polarity>	Discrete	{POSitive NEGative}	POSitive

### Remarks

N/A

### Return Format

The query returns POS or NEG.

**Example**

```
:TRIGger:RS232:POLarity POSitive    /*Sets the pulse polarity of
RS232 trigger to Positive.*/
:TRIGger:RS232:POLarity?           /*The query returns POS.*/
```

**3.27.20.4 :TRIGger:RS232:WHEN****Syntax**

```
:TRIGger:RS232:WHEN <when>
:TRIGger:RS232:WHEN?
```

**Description**

Sets or queries the trigger condition of RS232 trigger.

**Parameter**

Name	Type	Range	Default
<when>	Discrete	{START ERRor CERRor DATA}	START

**Remarks**

- START:** triggers at the start of a frame.
- ERRor:** triggers when an error frame is found.
- CERRor:** triggers when a check error is found.
- DATA:** triggers on the last bit of the preset data bits.

**Return Format**

The query returns STAR, ERR, CERR, or DATA.

**Example**

```
:TRIGger:RS232:WHEN ERRor      /*Sets the trigger condition to
ERRor.*/
:TRIGger:RS232:WHEN?          /*The query returns ERR.*/
```

**3.27.20.5 :TRIGger:RS232:DATA****Syntax**

```
:TRIGger:RS232:DATA <data>
:TRIGger:RS232:DATA?
```

**Description**

Sets or queries the data value of RS232 trigger when the trigger condition is "Data".

**Parameter**

Name	Type	Range	Default
<data>	Integer	0 to $2^n-1$	0

**Remarks**

In the expression  $2^n-1$ , n indicates the current data width, and its available value can be 5, 6, 7, and 8. You can send the :TRIGger:RS232:WIDTH command to set or query the data width.

**Return Format**

The query returns an integer.

**Example**

```
:TRIGger:RS232:DATA 10      /*Sets the data value to 10.*/
:TRIGger:RS232:DATA?        /*The query returns 10.*/
```

**3.27.20.6 :TRIGger:RS232:BAUD****Syntax**

```
:TRIGger:RS232:BAUD <baud>
:TRIGger:RS232:BAUD?
```

**Description**

Sets or queries the baud rate of RS232 trigger. The default unit is bps.

**Parameter**

Name	Type	Range	Default
<baud>	Integer	1 bps to 20 Mbps	9600 bps

**Remarks**

If the baud rate is set to a value with "M", then "A" should be added at the end of the value. For example, if you send 5M, you need to send 5MA.

**Return Format**

The query returns an integer ranging from 1 bps to 20 Mbps.

**Example**

```
:TRIGger:RS232:BAUD 4800      /*Sets the baud rate to 4800 bps.*/
:TRIGger:RS232:BAUD?          /*The query returns 4800.*/
```

### 3.27.20.7 :TRIGger:RS232:WIDTH

#### Syntax

```
:TRIGger:RS232:WIDTH <width>
:TRIGger:RS232:WIDTH?
```

#### Description

Sets or queries the data width of RS232 trigger when the trigger condition is "Data".

#### Parameter

Name	Type	Range	Default
<width>	Discrete	{5 6 7 8}	8

#### Remarks

N/A

#### Return Format

The query returns 5, 6, 7, or 8.

#### Example

```
:TRIGger:RS232:WIDTH 6      /*Sets the data width to 6.*/
:TRIGger:RS232:WIDTH?      /*The query returns 6.*/
```

### 3.27.20.8 :TRIGger:RS232:STOP

#### Syntax

```
:TRIGger:RS232:STOP <bit>
:TRIGger:RS232:STOP?
```

#### Description

Sets or queries the stop bits of RS232 trigger.

#### Parameter

Name	Type	Range	Default
<bit>	Discrete	{1 1.5 2}	1

#### Remarks

N/A

#### Return Format

The query returns 1, 1.5, or 2.

**Example**

```
:TRIGger:RS232:STOP 2      /*Sets the stop bits to 2.*/
:TRIGger:RS232:STOP?      /*The query returns 2.*/
```

**3.27.20.9 :TRIGger:RS232:PARity****Syntax**

```
:TRIGger:RS232:PARity <parity>
```

```
:TRIGger:RS232:PARity?
```

**Description**

Sets or queries the check mode of RS232 trigger.

**Parameter**

Name	Type	Range	Default
<parity>	Discrete	{EVEN ODD NONE}	NONE

**Remarks**

N/A

**Return Format**

The query returns EVEN, ODD, or NONE.

**Example**

```
:TRIGger:RS232:PARity EVEN      /*Sets the check mode to EVEN.*/
:TRIGger:RS232:PARity?          /*The query returns EVEN.*/
```

**3.27.21 :TRIGger:IIC**

I2C is a 2-wire serial bus used to connect the microcontroller and its peripheral device. It is a bus standard widely used in the microelectronic communication control field.

The I2C serial bus consists of SCL and SDA. Its transmission rate is determined by SCL, and its transmission data is determined by SDA, as shown in the figure below. The instrument triggers on the start condition, restart, stop, missing acknowledgment, specific device address, or data value. Besides, it can also trigger on the specific device address and data values at the same time.

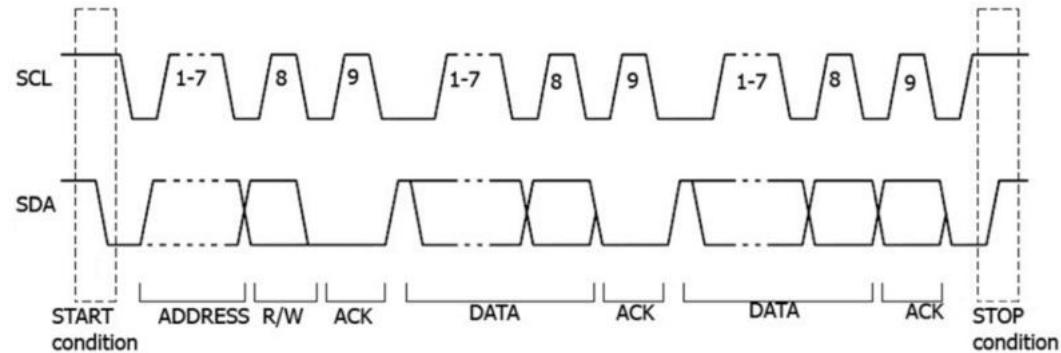


Figure 3.8 Sequence Diagram of I2C Protocol

### 3.27.21.1 :TRIGger:IIC:SCL

#### Syntax

```
:TRIGger:IIC:SCL <source>
```

```
:TRIGger:IIC:SCL?
```

#### Description

Sets or queries the source channel of the clock line of I2C trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8  D9 D10 D11 D12 D13 D14 D15  CHANnel1 CHANnel2 CHANnel3  CHANnel4}	CHANnel1

#### Remarks

D0-D15 are only available for the DHO900 series.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:IIC:SCL CHANnel2      /*Sets the clock source to CHANnel2.*/
:TRIGger:IIC:SCL?            /*The query returns CHAN2.*/
```

### 3.27.21.2 :TRIGger:IIC:CLeVel

#### Syntax

```
:TRIGger:IIC:CLeVel </level>
```

**:TRIGger:IIC:CLeVel?**

### Description

Sets or queries the trigger level of the clock line in I2C trigger. The unit is the same as that of the current amplitude.

### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

### Return Format

The query returns the trigger level in scientific notation.

### Example

```
:TRIGger:IIC:CLeVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:IIC:CLeVel?          /*The query returns 1.60000E-1.*/
```

## 3.27.21.3 :TRIGger:IIC:SDA

### Syntax

```
:TRIGger:IIC:SDA <source>
:TRIGger:IIC:SDA?
```

### Description

Sets or queries the source channel of the data line of I2C trigger.

### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel2

### Remarks

D0-D15 are only available for the DHO900 series.

## Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:IIC:SDA CHANnel2      /*Sets the data source to CHANnel2.*/
:TRIGger:IIC:SDA?             /*The query returns CHAN2.*/
```

### 3.27.21.4 :TRIGger:IIC:DLEVel

#### Syntax

```
:TRIGger:IIC:DLEVel </level>
:TRIGger:IIC:DLEVel?
```

#### Description

Sets or queries the trigger level of the data line in I2C trigger. The unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

#### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

## Return Format

The query returns the trigger level in scientific notation.

## Example

```
:TRIGger:IIC:DLEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:IIC:DLEVel?         /*The query returns 1.60000E-1.*/
```

### 3.27.21.5 :TRIGger:IIC:WHEN

#### Syntax

```
:TRIGger:IIC:WHEN <when>
:TRIGger:IIC:WHEN?
```

## Description

Sets or queries the trigger condition of I2C trigger.

## Parameter

Name	Type	Range	Default
<when>	Discrete	{STARt REStart STOP NACKnowledge ADDRess DATA ADATa}	STARt

## Remarks

- **STARt:** indicates that the oscilloscope triggers when SCL is high level and SDA transitions from high level to low level.
- **REStart:** indicates that the oscilloscope triggers when another start condition occurs before a stop condition.
- **STOP:** indicates that the oscilloscope triggers when SCL is high level and SDA transitions from low level to high level.
- **NACKnowledge:** indicates missing acknowledgment. The oscilloscope triggers when SDA is high level during the acknowledgment of the SCL bit.
- **ADDRess:** indicates that the oscilloscope searches for the specified address and triggers on the read/write bit.
- **DATA:** indicates that the oscilloscope searches for the specified data on the data line (SDA) and triggers on the clock line (SCL) of the jumping edge of the last bit of the data.
- **ADATa:** indicates that the oscilloscope searches for the specified address and data, and then triggers when both the address and data meet the conditions.

## Return Format

The query returns STAR, REST, STOP, NACK, ADDR, DATA, or ADAT.

## Example

```
:TRIGger:IIC:WHEN REStart      /*Sets the trigger condition to  
REStart.*/  
:TRIGger:IIC:WHEN?            /*The query returns REST.*/
```

### 3.27.21.6 :TRIGger:IIC:AWIDth

#### Syntax

```
:TRIGger:IIC:AWIDth <bits>
:TRIGger:IIC:AWIDth?
```

#### Description

Sets or queries the address width of I2C trigger when the trigger condition is "ADDRess" or "ADATa".

#### Parameter

Name	Type	Range	Default
<bits>	Discrete	{7 8 10}	7

#### Remarks

N/A

#### Return Format

The query returns 7, 8, or 10.

#### Example

```
:TRIGger:IIC:AWIDth 10      /*Sets the address width to 10.*/
:TRIGger:IIC:AWIDth?        /*The query returns 10.*/
```

### 3.27.21.7 :TRIGger:IIC:ADDRess

#### Syntax

```
:TRIGger:IIC:ADDRess <address>
:TRIGger:IIC:ADDRess?
```

#### Description

Sets or queries the address of I2C trigger when the trigger condition is "ADDRess" or "ADATa".

#### Parameter

Name	Type	Range	Default
<address>	Integer	0 to $2^n-1$	0

#### Remarks

In the expression  $2^n-1$ , n indicates the current address width. Its range is from 0 to 127, 0 to 255, or 0 to 1,023.

## Return Format

The query returns the address in integer.

### Example

```
:TRIGger:IIC:ADDRes 100      /*Sets the address to 100.*/
:TRIGger:IIC:ADDRes?          /*The query returns 100.*/
```

## 3.27.21.8 :TRIGger:IIC:DIRECTION

### Syntax

```
:TRIGger:IIC:DIRECTION <direction>
```

```
:TRIGger:IIC:DIRECTION?
```

### Description

Sets or queries the data direction of I2C trigger when the trigger condition is "ADDRes" or "ADATa".

### Parameter

Name	Type	Range	Default
<dir>	Discrete	{READ WRITe RWRite}	WRITe

### Remarks

This command is unavailable when the address width is set to 8.

### Return Format

The query returns READ, WRIT, or RWR.

### Example

```
:TRIGger:IIC:DIRECTION RWRite      /*Sets the data direction to
RWRite.*/
:TRIGger:IIC:DIRECTION?            /*The query returns RWR.*/
```

## 3.27.21.9 :TRIGger:IIC:DBYTES

### Syntax

```
:TRIGger:IIC:DBYTES <bytes>
```

```
:TRIGger:IIC:DBYTES?
```

### Description

Sets or queries of the data bytes of I2C trigger when the trigger condition is "DATA" or "ADATa".

**Parameter**

Name	Type	Range	Default
<bytes>	Real	1 to 5	1

**Remarks**

N/A

**Return Format**

The query returns the data bytes in scientific notation.

**Example**

```
:TRIGger:IIC:DBYTes 3      /*Sets the data bytes to 3 when the
trigger condition is "DATA" or "ADATa".*/
:TRIGger:IIC:DBYTes?        /*The query returns 3.*/
```

**3.27.21.10 :TRIGger:IIC:DATA****Syntax**

```
:TRIGger:IIC:DATA <data>
:TRIGger:IIC:DATA?
```

**Description**

Sets or queries the data value of I2C trigger when the trigger condition is "DATA" or "ADATa".

**Parameter**

Name	Type	Range	Default
<data>	Integer	0 to $2^{40}-1$	0

**Remarks**

The settable range of <data> is affected by the data bytes. You can send the `:TRIGger:IIC:DBYTes` command to set the data bytes. The maximum byte length can be set to 5, that is, 40-bit binary data. Therefore, the range of <data> is from 0 to  $2^{40}-1$ .

**Return Format**

The query returns an integer.

**Example**

```
:TRIGger:IIC:DATA 64      /*Sets the data value to 64.*/
:TRIGger:IIC:DATA?        /*The query returns 64.*/
```

### 3.27.21.11 :TRIGger:IIC:CURRbit

#### Syntax

```
:TRIGger:IIC:CURRbit <currbit>  
:TRIGger:IIC:CURRbit?
```

#### Description

Sets or queries the current bit of the I2C trigger data.

#### Parameter

Name	Type	Range	Default
<currbit>	Integer	0 to 39	0

#### Remarks

After configuring the settings for this command, you can send the [:TRIGger:IIC:CODE](#) command to set or modify the set bit data.

#### Return Format

The query returns an integer ranging from 0 to 39.

#### Example

```
:TRIGger:IIC:CURRbit 8      /*Sets the current bit of I2C trigger  
data to 8. That is, the oscilloscope triggers on the 9th bit of  
I2C trigger data.*/  
:TRIGger:IIC:CURRbit?        /*The query returns 8.*/
```

### 3.27.21.12 :TRIGger:IIC:CODE

#### Syntax

```
:TRIGger:IIC:CODE <code>  
:TRIGger:IIC:CODE?
```

#### Description

Sets or queries the data value of a certain bit of I2C trigger.

#### Parameter

Name	Type	Range	Default
<code>	Discrete	{0 1 255}	255

#### Remarks

When <code> is set to 255, it indicates the data value can be any value.

After sending the `:TRIGger:IIC:CURRbit` command to set the specified bit, you can send this command to query or modify the value of the specified data bit.

### Return Format

The query returns 0, 1, or 255.

### Example

```
:TRIGger:IIC:CODE 0      /*Sets the data value to 0.*/
:TRIGger:IIC:CODE?      /*The query returns 0.*/
```

## 3.27.22 :TRIGger:SPI

In SPI trigger, after the CS or timeout condition is satisfied, the oscilloscope triggers when the specified data is found. When using SPI trigger, you need to specify the CLK clock sources and MISO data sources.

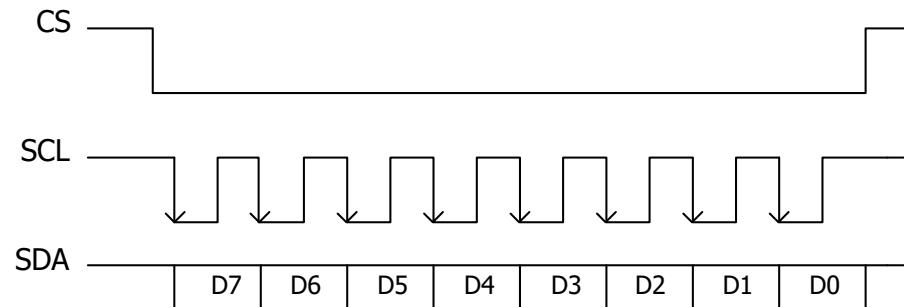


Figure 3.9 Sequential Chart of SPI Bus

### 3.27.22.1 :TRIGger:SPI:CLK

#### Syntax

```
:TRIGger:SPI:CLK <source>
:TRIGger:SPI:CLK?
```

#### Description

Sets or queries the channel source of the clock line of SPI trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

## Remarks

Only DHO900 series supports the digital channels D0-D15.

## Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:SPI:CLK CHANnel3    /*Sets the channel source of the data  
line of SPI trigger to CHANnel3.*/  
:TRIGger:SPI:CLK?           /*The query returns CHAN3.*/
```

### 3.27.22.2 :TRIGger:SPI:SCL

## Syntax

```
:TRIGger:SPI:SCL <source>  
:TRIGger:SPI:SCL?
```

## Description

Sets or queries the channel source of the clock line of SPI trigger.

## Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2  CHANnel3 CHANnel4 D0 D1 D2  D3 D4 D5 D6 D7 D8 D9 D10 D11  D12 D13 D14 D15}	CHANnel1

## Remarks

This command exists for backwards compatibility. Use the command [:TRIGger:SPI:CLK](#).

D0-D15 are only available for the DHO900 series.

## Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

## Example

```
:TRIGger:SPI:SCL CHANnel1    /*Sets the channel source of the clock  
line to CHANnel1.*/  
:TRIGger:SPI:SCL?           /*The query returns CHAN1.*/
```

### 3.27.22.3 :TRIGger:SPI:CLEVel

#### Syntax

```
:TRIGger:SPI:CLEVel <level>
:TRIGger:SPI:CLEVel?
```

#### Description

Sets or queries the trigger level of the clock channel of SPI trigger. The unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

#### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

#### Return Format

The query returns the trigger level in scientific notation.

#### Example

```
:TRIGger:SPI:CLEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:SPI:CLEVel?        /*The query returns 1.60000E-1.*/
```

### 3.27.22.4 :TRIGger:SPI:SLOPe

#### Syntax

```
:TRIGger:SPI:SLOPe <slope>
:TRIGger:SPI:SLOPe?
```

#### Description

Sets or queries the type of the clock edge of SPI trigger.

#### Parameter

Name	Type	Range	Default
<slope>	Discrete	{POSitive NEGative}	POSitive

## Remarks

- **POSitive:** samples the data on the rising edge of the clock.
- **NEGative:** samples the data on the falling edge of the clock.

## Return Format

The query returns POS or NEG.

## Example

```
:TRIGger:SPI:SLOPe POSitive      /*Sets the clock edge to POSitive.*/
:TRIGger:SPI:SLOPe?             /*The query returns POS.*/
```

### 3.27.22.5 :TRIGger:SPI:MISO

#### Syntax

```
:TRIGger:SPI:MISO <source>
:TRIGger:SPI:MISO?
```

#### Description

Sets or queries the channel source of the data line of SPI trigger.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel2

#### Remarks

Only DHO900 series supports the digital channels D0-D15.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:SPI:MISO CHANnel3 /*Sets the channel source of the data
line of SPI trigger to CHANnel3.*/
:TRIGger:SPI:MISO? /*The query returns CHAN3.*/
```

### 3.27.22.6 :TRIGger:SPI:SDA

#### Syntax

```
:TRIGger:SPI:SDA <source>
```

**:TRIGger:SPI:SDA?**

### Description

Sets or queries the channel source of the data line of SPI trigger.

### Parameter

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel2

### Remarks

Only DHO900 series supports the digital channels D0-D15.

### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

### Example

```
:TRIGger:SPI:SDA CHANnel2 /*Sets the channel source of the data
line of SPI trigger to CHANnel2.*/
:TRIGger:SPI:SDA? /*The query returns CHAN2.*/
```

## 3.27.22.7 :TRIGger:SPI:DLEVel

### Syntax

```
:TRIGger:SPI:DLEVel </level/>
:TRIGger:SPI:DLEVel?
```

### Description

Sets or queries the trigger level of the data channel of SPI trigger. The unit is the same as that of the current amplitude.

### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

## Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

## Return Format

The query returns the trigger level in scientific notation.

## Example

```
:TRIGger:SPI:DLEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:SPI:DLEVel?          /*The query returns 1.60000E-1.*/
```

## 3.27.22.8 :TRIGger:SPI:WHEN

### Syntax

```
:TRIGger:SPI:WHEN <when>
:TRIGger:SPI:WHEN?
```

### Description

Sets or queries the trigger condition of SPI trigger.

### Parameter

Name	Type	Range	Default
<when>	Discrete	{CS TImeout}	CS

### Remarks

- CS: if the CS signal is valid, the oscilloscope will trigger when the data (SDA) satisfying the trigger conditions is found.
- TImeout: the oscilloscope starts to search for the data (MISO) on which to trigger after the clock signal (CLK) stays in the idle state for a specified period of time.

For DHO800 series, only 4-channel models support the CS setting for SPI trigger condition.

### Return Format

The query returns CS or TIM.

### Example

```
:TRIGger:SPI:WHEN TImeout /*Sets the trigger condition to
TImeout.*/
:TRIGger:SPI:WHEN? /*The query returns TIM.*/
```

### 3.27.22.9 :TRIGger:SPI:CS

#### Syntax

```
:TRIGger:SPI:CS <source>
:TRIGger:SPI:CS?
```

#### Description

Sets or queries the source channel of the CS line when the trigger condition of SPI is set to CS.

#### Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1 CHANnel2 CHANnel3 CHANnel4 D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15}	CHANnel3

#### Remarks

This command is valid only when the trigger condition of SPI is set to CS. You can send :TRIGger:SPI:WHEN to set or query the trigger condition of SPI trigger.

Only DHO900 series supports the digital channels D0-D15.

For DHO800 series, only 4-channel models support this command.

#### Return Format

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

#### Example

```
:TRIGger:SPI:CS CHANnel2 /*Sets the source channel of the CS line
to CHANel2 when the trigger condition of SPI is set to CS.*/
:TRIGger:SPI:CS? /*The query returns CHAN2.*/
```

### 3.27.22.10 :TRIGger:SPI:SLEVel

#### Syntax

```
:TRIGger:SPI:SLEVel </level>
:TRIGger:SPI:SLEVel?
```

#### Description

Sets or queries the trigger level of the CS channel of SPI trigger. The unit is the same as that of the current amplitude.

**Parameter**

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

**Remarks**

- This command is valid only when the trigger condition of SPI is set to CS. You can send [:TRIGger:SPI:WHEN](#) to set or query the trigger condition of SPI trigger.
- For VerticalScale, refer to [:CHANnel<n>:SCALe](#). For OFFSet, refer to [:CHANnel<n>:OFFSet](#).
- For DHO800 series, only 4-channel models support this command.

**Return Format**

The query returns the trigger level in scientific notation.

**Example**

```
:TRIGger:SPI:SLEVel 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:SPI:SLEVel?          /*The query returns 1.60000E-1.*/
```

**3.27.22.11 :TRIGger:SPI:MODE****Syntax**

```
:TRIGger:SPI:MODE <mode>
:TRIGger:SPI:MODE?
```

**Description**

Sets or queries the CS mode of SPI trigger when the trigger condition is "CS".

**Parameter**

Name	Type	Range	Default
<mode>	Discrete	{HIGH LOW}	LOW

**Remarks**

This setting command is only valid in CS mode. You can send [:TRIGger:SPI:WHEN](#) to set or query the trigger condition of SPI trigger.

For DHO800 series, only 4-channel models support this command.

## Return Format

The query returns HIGH or LOW.

## Example

```
:TRIGger:SPI:MODE LOW /*Sets the CS mode to LOW.*/
:TRIGger:SPI:MODE? /*The query returns LOW.*/
```

### 3.27.22.12 :TRIGger:SPI:TIMEout

#### Syntax

```
:TRIGger:SPI:TIMEout <time>
:TRIGger:SPI:TIMEout?
```

#### Description

Sets or queries the timeout value when the trigger condition of SPI trigger is "Timeout". The default unit is s.

#### Parameter

Name	Type	Range	Default
<time>	Real	16 ns to 1 s	1μs

#### Remarks

This command is valid only when the trigger condition of SPI is set to timeout. You can send :TRIGger:SPI:WHEN to set or query the trigger condition of SPI trigger.

## Return Format

The query returns the timeout value in scientific notation.

## Example

```
:TRIGger:SPI:TIMEout 0.001      /*Sets the timeout value to 1 ms.*/
:TRIGger:SPI:TIMEout?          /*The query returns 1.000000E-3.*/
```

### 3.27.22.13 :TRIGger:SPI:WIDTH

#### Syntax

```
:TRIGger:SPI:WIDTH <width>
:TRIGger:SPI:WIDTH?
```

#### Description

Sets or queries the data width of data channel in SPI trigger.

**Parameter**

Name	Type	Range	Default
<width>	Integer	4 to 32	8

**Remarks**

N/A

**Return Format**

The query returns an integer ranging from 4 to 32.

**Example**

```
:TRIGger:SPI:WIDTh 10      /*Sets the data width to 10.*/
:TRIGger:SPI:WIDTh?        /*The query returns 10.*/
```

**3.27.22.14 :TRIGger:SPI:DATA****Syntax**

```
:TRIGger:SPI:DATA <data>
:TRIGger:SPI:DATA?
```

**Description**

Sets or queries the data value of SPI trigger.

**Parameter**

Name	Type	Range	Default
<data>	Integer	0 to $2^{32}-1$	0

**Remarks**

The range of the parameter <data> is related to the current data width. You can send the [:TRIGger:SPI:WIDTh](#) command to set or query the data width. The available maximum data width is 32. Therefore, the range of <data> is from 0 to  $2^{32}-1$ .

**Return Format**

The query returns an integer.

**Example**

```
:TRIGger:SPI:DATA 5      /*Sets the data value to 5.*/
:TRIGger:SPI:DATA?        /*The query returns 5.*/
```

### 3.27.22.15 :TRIGger:SPI:CURRbit

#### Syntax

```
:TRIGger:SPI:CURRbit <currbit>
:TRIGger:SPI:CURRbit?
```

#### Description

Sets or queries the current bit of the SPI trigger data.

#### Parameter

Name	Type	Range	Default
<currbit>	Integer	0 to 39	0

#### Remarks

After configuring the settings for this command, you can send the [:TRIGger:SPI:CODE](#) command to set or modify the set bit data.

#### Return Format

The query returns an integer ranging from 0 to 39.

#### Example

```
:TRIGger:SPI:CURRbit 8      /*Sets the current bit of SPI trigger
data to 8. That is, the oscilloscope triggers on the 9th bit of
SPI trigger data.*/
:TRIGger:SPI:CURRbit?        /*The query returns 8.*/
```

### 3.27.22.16 :TRIGger:SPI:CODE

#### Syntax

```
:TRIGger:SPI:CODE <code>
:TRIGger:SPI:CODE?
```

#### Description

Sets or queries the data value of a certain bit of SPI trigger.

#### Parameter

Name	Type	Range	Default
<code>	Discrete	{0 1 255}	255

#### Remarks

When <code> is set to 255, it indicates the data value can be any value.

After sending the `:TRIGger:SPI:CURRbit` command to set the specified bit, you can send this command to query or modify the value of the specified data bit.

### Return Format

The query returns 0, 1, or 255.

### Example

```
:TRIGger:SPI:CODE 0      /*Sets the data value to 0.*/
:TRIGger:SPI:CODE?        /*The query returns 0.*/
```

## 3.27.23 :TRIGger:CAN

The `:TRIGger:CAN` commands are used to set relevant parameters for the CAN trigger.

This oscilloscope can trigger on the start of a frame, end of a frame, frame of the specified type (e.g. Remote, Overload, Data, etc.), or error frame of the specified type (e.g. Answer Error, Check Error, Format Error, etc.) of the CAN signal.

The data frame format of the CAN bus is as shown in the figure below.

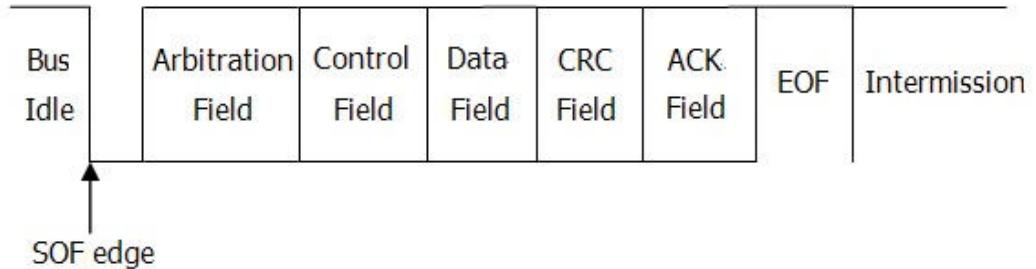


Figure 3.10 Data Frame Format of the CAN Bus

### NOTE

Only the DHO900 series supports `:TRIGger:CAN` commands.

### 3.27.23.1 :TRIGger:CAN:BAUD

#### Syntax

```
:TRIGger:CAN:BAUD <baud>
:TRIGger:CAN:BAUD?
```

#### Description

Sets or queries the signal rate of CAN trigger. The unit is bps.

**Parameter**

Name	Type	Range	Default
<baud>	Integer	10 kbps to 5 Mbps	1 Mbps

**Remarks**

If the baud rate is set to a value with "M", then "A" should be added at the end of the value. For example, if you send 5M, you need to send 5MA.

**Return Format**

The query returns an integer ranging from 10 kbps to 5 Mbps.

**Example**

```
:TRIGger:CAN:BAUD 125000 /*Sets the signal rate to 125000 bps.*/
:TRIGger:CAN:BAUD? /*The query returns 125000.*/
```

**3.27.23.2 :TRIGger:CAN:SOURce****Syntax**

```
:TRIGger:CAN:SOURce <source>
:TRIGger:CAN:SOURce?
```

**Description**

Sets or queries the trigger source of CAN trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

**Remarks**

Only DHO900 series supports the digital channels D0-D15.

**Return Format**

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

**Example**

```
:TRIGger:CAN:SOURce CHANnel2 /*Sets the trigger source to
CHANnel2.*/
:TRIGger:CAN:SOURce? /*The query returns CHAN2.*/
```

### 3.27.23.3 :TRIGger:CAN:STYPe

#### Syntax

:TRIGger:CAN:STYPe <stype>

:TRIGger:CAN:STYPe?

#### Description

Sets or queries the signal type of CAN trigger.

#### Parameter

Name	Type	Range	Default
<stype>	Discrete	{H L RXTX DIFFerential}	H

#### Remarks

- **H:** indicates the actual CAN\_H differential bus signal.
- **L:** indicates the actual CAN\_L differential bus signal.
- **RXTX:** indicates the Receive or Transmit signal from the CAN bus transceiver.
- **DIFFerential:** indicates the CAN differential bus signal connected to an analog channel by using a differential probe. Connect the differential probe's positive lead to the CAN\_H bus signal and connect the negative lead to the CAN\_L bus signal.

#### Return Format

The query returns H, L, RXTX, or DIFF.

#### Example

```
:TRIGger:CAN:STYPe L      /*Sets the signal type to CAN_L  
differential bus signal.*/  
:TRIGger:CAN:STYPe?      /*The query returns L.*/
```

### 3.27.23.4 :TRIGger:CAN:WHEN

#### Syntax

:TRIGger:CAN:WHEN <cond>

:TRIGger:CAN:WHEN?

#### Description

Sets or queries the trigger condition of CAN trigger.

**Parameter**

Name	Type	Range	Default
<cond>	Discrete	{SOF EOF IDRemote OVERload IDFFrame DATAframe IDData ERFrame ERANSWER ERCHECK ERFormat ERRandom ERBit}	SOF

**Remarks**

- **SOF:** indicates start of frame. It indicates that the oscilloscope triggers at the start of a data frame.
- **EOF:** indicates end of frame. It indicates that the oscilloscope triggers at the end of a data frame.

## Frame Type

- **IDRemote:** indicates remote ID. It indicates that the oscilloscope triggers on the remote frame with the specified ID.
- **OVERload:** indicates overload frame. It indicates that the oscilloscope triggers on the CAN overload frames.
- **IDFFrame:** indicates frame ID. It indicates that the oscilloscope triggers on the data frames with the specified ID.
- **DATAframe:** indicates frame data. It indicates that the oscilloscope triggers on the data frames with specified data.
- **IDData:** indicates Data & ID. It indicates that the oscilloscope triggers on the data frames with the specified ID and data.

## Frame Error

- **ERFrame:** indicates frame error. It indicates that the oscilloscope triggers on the error frame.
- **ERANSWER:** indicates answer error. It indicates that the oscilloscope triggers on the answer error frame.
- **ERCHECK:** indicates check error. It indicates that the oscilloscope triggers on the check error frame.

- **ERFormat:** indicates format error. It indicates that the oscilloscope triggers on the format error frame.
- **ERRandom:** indicates random error. It indicates that the oscilloscope triggers on the random error frame, such as the format error frame, answer error frame, etc.
- **ERBit:** indicates bit fill. It indicates that the oscilloscope triggers on the error frame with the bit fill.

### Return Format

The query returns SOF, EOF, IDR, OVER, IDFR, DAT, IDD, ERFR, ERAN, ERCH, ERF, ERR, or ERB.

### Example

```
:TRIGger:CAN:WHEN EOF      /*Sets the trigger condition to EOF.*/
:TRIGger:CAN:WHEN?          /*The query returns EOF.*/
```

## 3.27.23.5 :TRIGger:CAN:SPOint

### Syntax

```
:TRIGger:CAN:SPOint <spoint>
:TRIGger:CAN:SPOint?
```

### Description

Sets or queries the sample point position of CAN trigger (expressed in %).

### Parameter

Name	Type	Range	Default
<spoint>	Integer	10 to 90	50

### Remarks

The sample point is within the range of the bit time. The oscilloscope samples the bit level at the sample point. The sample point position is expressed as the ratio of "time from the bit start to the sample point" to "bit time", in %.

### Return Format

The query returns an integer ranging from 10 to 90.

**Example**

```
:TRIGger:CAN:SPoint 60      /*Sets the sample point position of
CAN trigger to 60%.*/
:TRIGger:CAN:SPoint?        /*The query returns 60.*/
```

**3.27.23.6 :TRIGger:CAN:EXTended****Syntax**

```
:TRIGger:CAN:EXTended <bool>
:TRIGger:CAN:EXTended?
```

**Description**

Enables or disables the extended ID when the trigger condition of CAN trigger is "Remote ID" or "Frame ID"; queries whether the extended ID is enabled when the trigger condition of CAN trigger is "Remote ID" or "Frame ID".

**Parameter**

Name	Type	Range	Default
<bool>	Bool	{1 ON} {0 OFF}	0 OFF

**Remarks**

- **0|OFF:** disables the extended ID.
- **1|ON:** enables the extended ID.

To set or query the trigger condition of CAN trigger, send the [:TRIGger:CAN:WHEN](#) command.

**Return Format**

The query returns 0 or 1.

**Example**

```
:TRIGger:CAN:EXTended ON /*Enables the extended ID.*/
:TRIGger:CAN:EXTended    /*The query returns 1.*/
```

**3.27.23.7 :TRIGger:CAN:DEFine****Syntax**

```
:TRIGger:CAN:DEFine <type>
:TRIGger:CAN:DEFine?
```

## Description

Sets Define to ID or Data when the trigger condition of CAN trigger is set to Data or ID; queries Define to ID or Data when the trigger condition of CAN trigger is set to Data or ID.

## Parameter

Name	Type	Range	Default
<type>	Discrete	{DATA ID}	DATA

## Remarks

- **DATA:** sets Define to Data.
- **ID:** sets Define to ID.

To set or query the trigger condition of CAN trigger, send the :TRIGger:CAN:WHEN command.

## Return Format

The query returns DATA or ID.

## Example

```
:TRIGger:CAN:DEFine ID /*Sets Define to ID.*/
:TRIGger:CAN:DEFine? /*The query returns ID.*/
```

### 3.27.23.8 :TRIGger:CAN:DWidth

## Syntax

```
:TRIGger:CAN:DWidth <data>
:TRIGger:CAN:DWidth?
```

## Description

Sets or queries the data width of CAN trigger when the trigger condition is "DATAframe" or "IDData".

## Parameter

Name	Type	Range	Default
<data>	Integer	1 to 8	1

## Remarks

N/A

## Return Format

The query returns an integer ranging from 1 to 8.

**Example**

```
:TRIGger:CAN:DWIDTH 5      /*Sets the data width of CAN trigger to 5
when the trigger condition is "DATAframe" or "IDData".*/
:TRIGger:CAN:DWIDTH?       /*The query returns 5.*/
```

**3.27.23.9 :TRIGger:CAN:DATA****Syntax**

**:TRIGger:CAN:DATA <data>**

**:TRIGger:CAN:DATA?**

**Description**

Sets or queries the data value of CAN trigger.

**Parameter**

Name	Type	Range	Default
<data>	Integer	0 to $2^{40}-1$	0

**Remarks**

The settable range of <data> is affected by the data bytes. You can send the **:TRIGger:IIC:DBYTES** command to set the data bytes. The maximum byte length can be set to 5, i.g. 40-bit binary data. Therefore, the range of <data> is from 0 to  $2^{40}-1$ .

This command is valid when the trigger condition is set to "Frame Data" or "Data & ID" (send **:TRIGger:CAN:WHEN** command to set or query).

- When the trigger condition is "Frame Data", the setting command is used to set the data value.
- When the trigger condition is "Data & ID", the value to be set by sending the setting command is based on the **:TRIGger:CAN:DEFINE** command.
  - When Define is set to "ID", the setting command is used to set the ID value.
  - When Define is set to "Data", the setting command is used to set the data value.

**Return Format**

The query returns an integer.

**Example**

```
:TRIGger:CAN:DATA 100      /*Sets the data value of CAN trigger to
100.*/
:TRIGger:CAN:DATA?          /*The query returns 100.*/
```

**3.27.23.10 :TRIGger:CAN:CURRbit****Syntax**

```
:TRIGger:CAN:CURRbit <currbit>
:TRIGger:CAN:CURRbit?
```

**Description**

Sets or queries the current bit of the CAN trigger data.

**Parameter**

Name	Type	Range	Default
<currbit>	Integer	0 to 39	0

**Remarks**

After configuring the settings for this command, you can send the **:TRIGger:CAN:CODE** command to set or modify the set bit data.

**Return Format**

The query returns an integer ranging from 0 to 39.

**Example**

```
:TRIGger:CAN:CURRbit 8      /*Sets the current bit of CAN trigger
data to 8. That is, the oscilloscope triggers on the 9th bit of
CAN trigger data.*/
:TRIGger:CAN:CURRbit?        /*The query returns 8.*/
```

**3.27.23.11 :TRIGger:CAN:CODE****Syntax**

```
:TRIGger:CAN:CODE <code>
:TRIGger:CAN:CODE?
```

**Description**

Sets or queries the data value of a certain bit of CAN trigger.

**Parameter**

Name	Type	Range	Default
<code>	Discrete	{0 1 255}	255

## Remarks

When <code> is set to 255, it indicates the data value can be any value.

After sending the :TRIGger:CAN:CURRbit command to set the specified bit, you can send this command to query or modify the value of the specified data bit.

## Return Format

The query returns 0, 1, or 255.

## Example

```
:TRIGger:CAN:CODE 0      /*Sets the data value to 0.*/
:TRIGger:CAN:CODE?      /*The query returns 0.*/
```

### 3.27.23.12 :TRIGger:CAN:LEVel

#### Syntax

```
:TRIGger:CAN:LEVel </level/>
```

```
:TRIGger:CAN:LEVel?
```

#### Description

Sets or queries the trigger level of CAN trigger. Its unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

#### Remarks

For VerticalScale, refer to the :CHANnel<n>:SCALe command. For OFFSet, refer to the :CHANnel<n>:OFFSet command.

#### Return Format

The query returns the trigger level in scientific notation.

#### Example

```
:TRIGger:CAN:LEVel 0.16    /*Sets the trigger level to 160 mV.*/
:TRIGger:CAN:LEVel?      /*The query returns 1.60000E-1.*/
```

### 3.27.24 :TRIGger:LIN

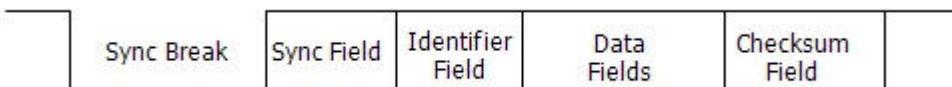
The :TRIGger:LIN commands are used to set relevant parameters for the LIN trigger.

**NOTE**

Only the DHO900 series supports :TRIGger:LIN commands.

The oscilloscope can trigger on the sync field of LIN signal, and can also trigger on the specified identifier, data, or frame.

The data frame format of the LIN bus is as shown in the figure below.



**Figure 3.11 Data Frame Format of the LIN Bus**

### 3.27.24.1 :TRIGger:LIN:SOURce

**Syntax**

:TRIGger:LIN:SOURce <source>

:TRIGger:LIN:SOURce?

**Description**

Sets or queries the trigger source of LIN trigger.

**Parameter**

Name	Type	Range	Default
<source>	Discrete	{D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 CHANnel1 CHANnel2 CHANnel3 CHANnel4}	CHANnel1

**Remarks**

D0-D15 are only available for the DHO900 series.

**Return Format**

The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3, or CHAN4.

**Example**

```
:TRIGger:LIN:SOURce CHANnel2      /*Sets the trigger source to  
CHANnel2.*/  
:TRIGger:LIN:SOURce?            /*The query returns CHAN2.*/
```

### 3.27.24.2 :TRIGger:LIN:LEVEL

#### Syntax

```
:TRIGger:LIN:LEVEL </level>
:TRIGger:LIN:LEVEL?
```

#### Description

Sets or queries the trigger level of LIN trigger. Its unit is the same as that of the current amplitude.

#### Parameter

Name	Type	Range	Default
<level>	Real	Analog channel: (-4.5 x VerticalScale - OFFSet) to (4.5 x VerticalScale - OFFSet) Digital channel: -20 V to 20 V	0 V

#### Remarks

For VerticalScale, refer to the [:CHANnel<n>:SCALe](#) command. For OFFSet, refer to the [:CHANnel<n>:OFFSet](#) command.

#### Return Format

The query returns the trigger level in scientific notation.

#### Example

```
:TRIGger:LIN:LEVEL 0.16      /*Sets the trigger level to 160 mV.*/
:TRIGger:LIN:LEVEL?          /*The query returns 1.60000E-1.*/
```

### 3.27.24.3 :TRIGger:LIN:STANDARD

#### Syntax

```
:TRIGger:LIN:STANDARD <std>
:TRIGger:LIN:STANDARD?
```

#### Description

Sets or queries the protocol version of LIN trigger.

#### Parameter

Name	Type	Range	Default
<std>	Discrete	{1X 2X BOTH}	BOTH

### Remarks

N/A

### Return Format

The query returns 1X, 2X, or BOTH.

### Example

```
:TRIGger:LIN:STANDARD 2X          /*Sets the protocol version of  
LIN trigger to 2X.*/  
:TRIGger:LIN:STANDARD?           /*The query returns 2X.*/
```

## 3.27.24.4 :TRIGger:LIN:BAUD

### Syntax

```
:TRIGger:LIN:BAUD <baud>  
:TRIGger:LIN:BAUD?
```

### Description

Sets or queries the baud rate of LIN trigger. The default unit is bps.

### Parameter

Name	Type	Range	Default
<baud>	Integer	1 kbps to 20 Mbps	9600 bps

### Remarks

If the baud rate is set to a value with "M", then "A" should be added at the end of the value. For example, if you send 5M, you need to send 5MA.

### Return Format

The query returns an integer ranging from 1 kbps to 20 Mbps.

### Example

```
:TRIGger:LIN:BAUD 19200          /*Sets the baud rate of LIN trigger  
to 19.2 kbps.*/  
:TRIGger:LIN:BAUD?              /*The query returns 19200.*/
```

## 3.27.24.5 :TRIGger:LIN:SAMPLEpoint

### Syntax

```
:TRIGger:LIN:SAMPLEpoint <value>  
:TRIGger:LIN:SAMPLEpoint?
```

### Description

Sets or queries the sample position of LIN trigger.

**Parameter**

Name	Type	Range	Default
<value>	Integer	10 to 90	50

**Remarks**

The sample position is expressed as the ratio of "time from the bit start to the sample point" to "bit time", in %.

**Return Format**

The query returns an integer ranging from 10 to 90.

**Example**

```
:TRIGger:LIN:SAMPLEpoint 40      /*Sets the sample point
position of LIN trigger to 40%.*/
:TRIGger:LIN:SAMPLEpoint?        /*The query returns 40.*/
```

**3.27.24.6 :TRIGger:LIN:WHEN****Syntax**

```
:TRIGger:LIN:WHEN <when>
```

```
:TRIGger:LIN:WHEN?
```

**Description**

Sets or queries the trigger condition of LIN trigger.

**Parameter**

Name	Type	Range	Default
<when>	Discrete	{SYNCbreak ID DATA IDData SLEEP WAKEup ERRor}	SYNCbreak

**Remarks**

- **SYNCbreak:** triggers on the last bit of the sync field.
- **ID:** triggers when the frames with the specified ID are found.
- **DATA:** triggers when the data that meet the preset conditions are found.
- **IDData:** triggers when the frames with the specified ID and data that meet the preset conditions are both found.
- **SLEEP:** triggers when the sleep frame is found.
- **WAKEup:** triggers when the wakeup frame is found.

- **ERRor:** triggers on the specified type of error frame.

### Return Format

The query returns SYNC, ID, DATA, IDD, SLE, WAK, or ERR.

### Example

```
:TRIGger:LIN:WHEN SYNCbreak          /*Sets the trigger condition to  
SYNCbreak.*/  
:TRIGger:LIN:WHEN?                  /*The query returns SYNC.*/
```

## 3.27.24.7 :TRIGger:LIN:ERRor

### Syntax

```
:TRIGger:LIN:ERRor <value>  
:TRIGger:LIN:ERRor?
```

### Description

Sets or queries the error type of LIN trigger when the trigger condition is error frame.

### Parameter

Name	Type	Range	Default
<value>	Discrete	{SYNC ID CHECK}	SYNC

### Remarks

- **SYNC:** indicates Sync error.
- **ID:** indicates Even Odd error.
- **CHECK:** indicates Check Sum error.

### Return Format

The query returns SYNC, ID, or CHEC.

### Example

```
:TRIGger:LIN:ERRor ID          /*Sets the LIN trigger error type to  
ID.*/  
:TRIGger:LIN:ERRor?          /*The query returns ID.*/
```

## 3.27.24.8 :TRIGger:LIN:ID

### Syntax

```
:TRIGger:LIN:ID <id>  
:TRIGger:LIN:ID?
```

**Description**

Sets or queries the ID value of LIN trigger when the trigger condition is "Data & ID".

**Parameter**

Name	Type	Range	Default
<id>	Integer	0 to 63	0

**Remarks**

N/A

**Return Format**

The query returns an integer ranging from 0 to 63.

**Example**

```
:TRIGger:LIN:ID 4          /*Sets the ID value of LIN trigger
to 4.*/
:TRIGger:LIN:ID?           /*The query returns 4.*/
```

**3.27.24.9 :TRIGger:LIN:DATA****Syntax**

```
:TRIGger:LIN:DATA <data>
:TRIGger:LIN:DATA?
```

**Description**

Sets or queries the data value of LIN trigger when the trigger condition is "Data".

**Parameter**

Name	Type	Range	Default
<data>	Integer	Refer to <i>Remarks</i>	0

**Remarks**

The range of the data value of LIN trigger is related to the value of data bytes. The maximum number of bytes can be set to 8, i.g. 64-bit binary data. Therefore, the range of <data> is from 0 to  $2^{64}-1$ .

**Return Format**

The query returns an integer ranging from 0 to  $2^{64}-1$ .

**Example**

```
:TRIGger:LIN:DATA 100    /*Sets the data value of LIN trigger to
100 when the trigger condition is "Data".*/
:TRIGger:LIN:DATA?       /*The query returns 100.*/
```

### 3.27.24.10 :TRIGger:LIN:CURRbit

#### Syntax

```
:TRIGger:LIN:CURRbit <currbit>  
:TRIGger:LIN:CURRbit?
```

#### Description

Sets or queries the current bit of the LIN trigger data.

#### Parameter

Name	Type	Range	Default
<currbit>	Integer	0 to 39	0

#### Remarks

After configuring the settings for this command, you can send the [:TRIGger:LIN:CODE](#) command to set or modify the set bit data.

#### Return Format

The query returns an integer ranging from 0 to 39.

#### Example

```
:TRIGger:LIN:CURRbit 8      /*Sets the current bit of LIN trigger  
data to 8. That is, the oscilloscope triggers on the 9th bit of  
LIN trigger data.*/  
:TRIGger:SPI:CURRbit?        /*The query returns 8.*/
```

### 3.27.24.11 :TRIGger:LIN:CODE

#### Syntax

```
:TRIGger:LIN:CODE <code>  
:TRIGger:LIN:CODE?
```

#### Description

Sets or queries the data value of a certain bit of LIN trigger.

#### Parameter

Name	Type	Range	Default
<code>	Discrete	{0 1 255}	255

#### Remarks

When <code> is set to 255, it indicates the data value can be any value.

After sending the `:TRIGger:LIN:CURRbit` command to set the specified bit, you can send this command to query or modify the value of the specified data bit.

### Return Format

The query returns 0, 1, or 255.

### Example

```
:TRIGger:LIN:CODE 0      /*Sets the data value to 0.*/
:TRIGger:LIN:CODE?       /*The query returns 0.*/
```

## 3.28 :WAVEform Commands

**:WAVEform** commands are used to read waveform data and relevant settings.

The `:WAVEform:MODE` command is used to set the reading mode of waveform data.

In different modes, the definitions for the parameters are different, as shown in [Figure 3.12](#) and [Figure 3.13](#).

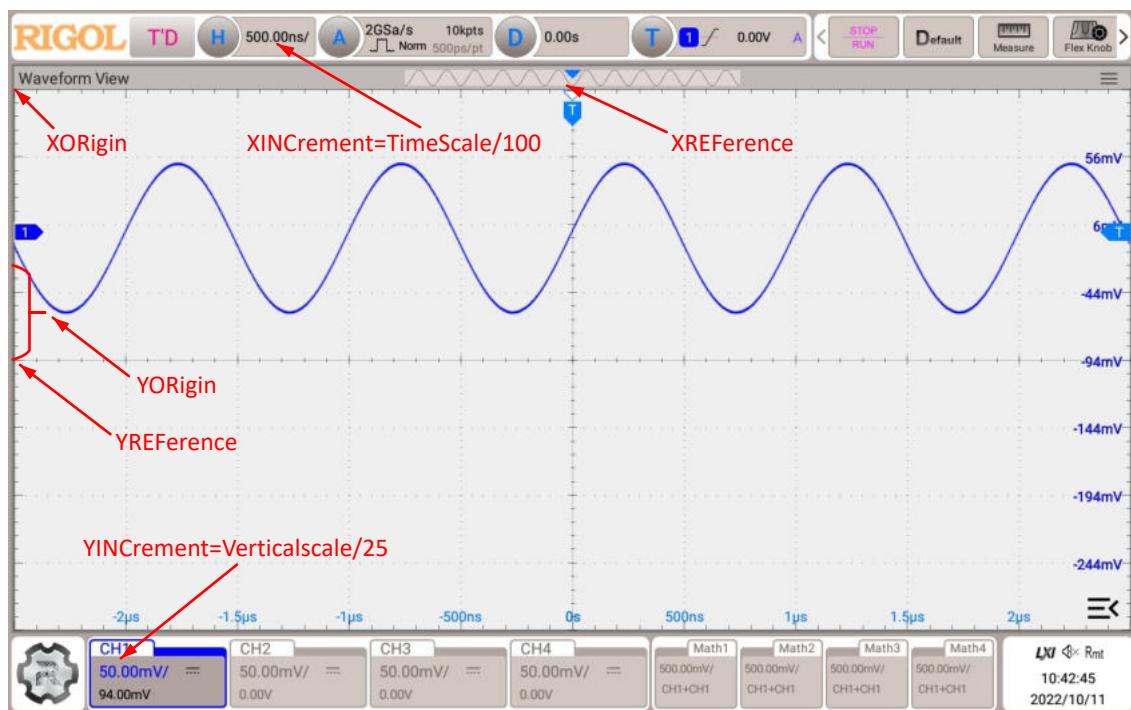


Figure 3.12 Parameter Definitions in NORMAL Mode