

Status and Error Command Group

Status and Error Overview

You use the commands in the Status and Error command Group to determine the status of the oscilloscope and control events.

Several commands and queries used with the oscilloscope are common to all devices on the GPIB bus. The IEEE Std 488.2–1987 defines these commands and queries. The common commands begin with an asterisk (*) character.

Status and Error Commands

Command	Description
*CLS	Clears status
*ESE?	Returns the bits in the Event Status Enable Register
*ESE	Sets the bits in the Event Status Enable Register
*ESR?	Returns the contents of the Standard Event Status Register
*OPC?	Returns "1" when all current operations are finished
*OPC	Generates the operation complete message in the standard event status register when all pending operations are finished
*OPT?	Returns a list of options installed in the oscilloscope
*PSC?	Returns the power on status flag setting
*PSC	Sets the power on status flag
*PUD?	Returns a string of protected user data
*PUD	Sets a string of protected user data
*RST	Resets the oscilloscope to factory default settings
*SRE?	Returns the bits in the Service Request Enable Register
*SRE	Sets the bits in the Service Request Enable Register
*STB?	Returns the contents of the Status Byte Register
*WAI	Prevents the oscilloscope from executing further commands until all pending operations finish
ALLEv?	Returns all events and their messages
BUSY?	Returns oscilloscope status
DESE?	Returns the bits in the Device Event Status Enable Register
DESE	Sets the bits in the Device Event Status Enable Register
EVENT?	Returns event code from the event queue
EVMsg?	Returns event code, message from the event queue
EVQty?	Returns number of events in the event queue

***CLS**

Description

This command (no query form) clears the following:

- Event Queue
- Standard Event Status Register
- Status Byte Register (except the MAV bit)

If the *CLS command immediately follows an <EOI>, the Output Queue and MAV bit (Status Byte Register bit 4) are also cleared. MAV indicates that information is in the output queue. The device clear (DCL) GPIB control message will clear the output queue and thus MAV. *CLS does not clear the output queue or MAV.

*CLS can suppress a Service Request that is to be generated by an *OPC. This will happen if a single sequence acquisition operation is still being processed when the *CLS command is executed.

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Related Commands

DESE (see page 331), *ESE (see page 319), *ESR? (see page 320), EVENT? (see page 332), EVMsg? (see page 333), *SRE (see page 326), *STB? (see page 327)

Syntax

*CLS

Example

*CLS

This command clears the oscilloscope status data structures.

***ESE**

Description

This command sets and queries the bits in the Event Status Enable Register (ESER). The ESER prevents events from being reported to the Status Byte Register (STB). For a more detailed discussion of the use of these registers, see Registers on page 522.

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Status and Error

Related Commands

*CLS (see page 318), DESE (see page 331), *ESR? (see page 320), EVENT? (see page 332), EVMsg? (see page 333), *SRE (see page 326), *STB? (see page 327)

Syntax 1

*ESE <NR1>

Syntax 2

*ESE?

Argument

- <NR1>

This specifies the binary bits of the ESER according to this value, which ranges from 0 through 255.

The power-on default for ESER is 0 if *PSC is 1. If *PSC is 0, the ESER maintains the previous power cycle value through the current power cycle.

Note: Setting the DESER and the ESER to the same values allows only those codes to be entered into the Event Queue and summarized on the ESB bit (bit 5) of the Status Byte Register. Use the DESE command to set the DESER.

Example 1

*ESE 209

This command sets the ESER to binary 11010001, which enables the PON, URQ, EXE and OPC bits.

Example 2

*ESE?

This query form of this command returns 186, showing that the ESER contains the binary value 10111010.

***ESR?**

Description

This query-only command returns the contents of the Standard Event Status Register (SESR). *ESR? also clears the SESR (since reading the SESR clears it). For a more detailed discussion of the use of these registers, see Registers on page 522.

Group

Status and Error

Related Commands

ALLEv? (see page 329), *CLS (see page 318), DESE (see page 331), *ESE (see page 319), EVENT? (see page 332), EVMsg? (see page 333), *SRE (see page 326), *STB? (see page 327)

Syntax

*ESR?

Example

*ESR?

This query might return 213, showing that the SESR contains the binary value 11010101.

***OPC**

Description

This command generates the operation complete message in the Standard Event Status Register (SESR) when all pending operations finish. The *OPC? query places the ASCII character "1" into the output queue when all pending operations are finished. The *OPC? response is not available to read until all pending operations finish. For a complete discussion of the use of these registers and the output queue, see Registers on page 522 and Queues on page 527.

The *OPC command allows you to synchronize the operation of the oscilloscope with your application program. For more information, see Synchronization Methods on page 542.

Commands that Generate an OPC Message	
Operation	Command
Single sequence acquisition	ACQuire:STATE ON <i>or</i> ACQuire:STATE RUN (when ACQuire:STOPAfter is set to SEquence)

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Status and Error

Related Commands

BUSY? (see page 330), *WAI (see page 328)

Syntax 1

*OPC

Syntax 2

*OPC?

Example 1

*OPC

Upon completion of all pending operations, this command generates the operation complete message in the SESR.

Example 2

*OPC?

This query might return 1 to indicate that all pending operations are finished.

***OPT?**

Description

This query-only command returns a list of the options installed in your oscilloscope.

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Syntax

*OPT?

Example

*OPT?

This query might return :3M:16 Meg Max 4M/CH

***PSC**

Description

This command sets and queries the power-on status flag that controls the automatic power-on handling of the DESER, SRER, and ESER registers. When *PSC is true, the DESER register is set to 255 and the SRER and ESER registers are set to 0 at power-on. When *PSC is false, the current values in the DESER, SRER, and ESER registers are preserved in nonvolatile memory when power is shut off and are restored at power-on.

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Status and Error

Related Commands

DESE (see page 331), *ESE (see page 319), FACTory (see page 308), *RST (see page 325), *SRE (see page 326)

Syntax 1

*PSC <NR1>

Syntax 2

*PSC?

Argument

- <NR1>

A 0 sets the power-on status clear flag to false, disables the power-on clear and allows the oscilloscope to possibly assert SRQ after power-on; any other value sets the power-on status clear flag to true, enabling the power-on status clear and prevents any SRQ assertion after power on.

Example 1

*PSC 0

This command sets the power-on status clear flag to false.

Example 2

*PSC?

The query form of this command might return 1 to indicate that the power-on status clear flag is set to true.

***PUD**

Description

This command sets or queries a string of Protected User Data. This data is protected by the **PASSWord** command. You can modify it only by first entering the correct password. This password is not necessary to query the data.

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Related Commands

PASSWord (see page 293)

Syntax 1

*PUD {<Block>|<String>}

Syntax 2

*PUD?

Argument

- <Block>
This is a block containing up to 100 characters.
- <String>
This is a string containing up to 100 characters.

Example 1

*PUD #229This oscilloscope belongs to me

This command stores the string "This oscilloscope belongs to me" in the user protected data area.

Example 2

*PUD?

This query might return #221Property of Company X

***RST**

Description

This command (no query form) resets the oscilloscope to the factory default settings. The *RST command does not alter the following:

- The state of the IEEE Std 488.1-1987 interface
- The selected IEEE Std 488.1-1987 address of the oscilloscope
- Calibration data that affect device specifications
- The Output Queue
- The Service Request Enable Register setting
- The Power-on status clear flag setting
- Alias definitions
- Stored settings
- The *PUD? Response

This command is equivalent to pressing the **DEFAULT SETUP** button on the front-panel.

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Related Commands

FACtory (see page), RECAI:SETUp (see page 309), SAVe:SETUp (see page 311)

Syntax

*RST

Argument

None.

Example

*RST

This command resets the oscilloscope settings to factory defaults.

***SRE**

Description

The *SRE (Service Request Enable) command sets and queries the bits in the Service Request Enable Register. For more information, refer to Registers on page 522.

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Related Commands

*CLS (see page 318), DESE (see page 331), *ESE (see page 319), *ESR? (see page 320), EVENT? (see page 332), EVMSg? (see page 333), FACtory (see page 308), *STB? (see page 327)

Syntax 1

*SRE <NR1>

Syntax 2

*SRE?

Argument

- <NR1>

This is a value in the range from 0 through 255. The binary bits of the SRER are set according to this value. Using an out-of-range value causes an execution error. The power-on default for SRER is 0 if *PSC is 1. If *PSC is 0, the SRER maintains the previous power cycle value throughout the current power cycle.

Example 1

*SRE 48

This command sets the bits in the SRER to 00110000 binary.

Example 2

*SRE?

This query might return 32, showing that the bits in the SRER have the binary value of 00100000.

***STB?**

Description

The *STB? (Read Status Byte) query returns the contents of the Status Byte Register (SBR) using the Master Summary Status (MSS) bit. For more information, refer to Registers on page 522.

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Related Commands

CLS (see page 318), DESE (see page 331), *ESE (see page 319), *ESR? (see page 320), EVENT? (see page 332), EVMSg? (see page 333), FACtory (see page 308), *SRE? (see page 326)

Syntax

*STB?

Returns

<NR1>

Example

*STB?

This query might return 96, showing that the SBR contains the binary value 01100000.

***WAI**

Description

The *WAI (Wait) command (no query form) prevents the oscilloscope from executing further commands or queries until all pending operations finish. This command allows you to synchronize the operation of the oscilloscope with your application program. For more information, refer to Synchronization Methods on page 542.

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Related Commands

BUSY? (see page 330), *OPC (see page 321)

Syntax

*WAI

Example

*WAI

This command prevents the oscilloscope from executing any further commands or queries until all pending operations finish.

ALLEV?

Description

This query-only command prompts the oscilloscope to return all events and their messages (delimited by commas), and removes the returned events from the Event Queue. Use the *ESR? query to enable the events to be returned. This command is similar to repeatedly sending *EVMsg? queries to the oscilloscope.

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Related Commands

*ESR? (see page 320), *EVMsg? (see page 333)

Syntax

ALLev?

Example

ALLev?

This query might return :ALLEV 2225,"Measurement error, No waveform to measure; "420,"Query UNTERMINATED;"

BUSY?

Description

This query-only command returns the status of the oscilloscope. This command allows you to synchronize the operation of the oscilloscope with your application program.

Group

Status and Error

Related Commands

*OPC (see page 321), *WAI (see page 328)

Syntax

BUSY?

Returns

<NR1>

If 0 is returned, it means that the oscilloscope is not busy processing a command whose execution time is extensive. If 1 is returned, it means that the oscilloscope is busy processing one of the commands listed in the table below.

Commands that Affect BUSY? Response	
Operation	Command
Single sequence acquisition	ACQUIRE:STATE ON or ACQUIRE:STATE RUN (when ACQUIRE:STOPAfter is set to SEQUENCE)

Example

BUSY?

This query might return :BUSY 1, indicating that the oscilloscope is currently busy.

DESE

Description

This command sets and queries the bits in the Device Event Status Enable Register (DESER). The DESER is the mask that determines whether events are reported to the Standard Event Status Register (SESR), and entered into the Event Queue. For a more detailed discussion of the use of these registers, see Registers on page 522.

Group

Status and Error

Related Commands

*CLS (see page 318), *ESE (see page 319), *ESR? (see page 320), *EVENT? (see page 332), EVMsg? (see page 333), *SRE (see page 326), *STB? (see page 327)

Syntax 1

DESE <NR1>

Syntax 2

DESE?

Argument

- <NR1>

The binary bits of the DESER are set according to this value, which ranges from 1 through 255. For example, DESE 209 sets the DESER to the binary value 11010001 (that is, the most significant bit in the register is set to 1, the next most significant bit to 1, the next bit to 0, etc.).

The power-on default for DESER is all bits set if *PSC is 1. If *PSC is 0, the DESER maintains the previous power cycle value through the current power cycle.

Note: Setting the DESER and ESER to the same value allows only those codes to be entered into the Event Queue and summarized on the ESB bit (bit 5) of the Status Byte Register. Use the *ESE command to set the ESER.

Example 1

DESE 209

This sets the DESER to binary 11010001, which enables the PON, URQ, EXE and OPC bits.

Example 2

DESE?

This query might return :DESE 186, showing that the DESER contains the binary value 10111010.

EVENT?

Description

This query-only command returns an event code from the Event Queue that provides information about the results of the last *ESR? read. EVENT? also removes the returned value from the Event Queue.

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Related Commands

ALLEv? (see page 329), *CLS (see page 318), DESE (see page 331), *ESE (see page 319), *ESR? (see page), EVMsg? (see page 333), *SRE (see page 326), *STB? (see page 327)

Syntax

EVENT?

Example

EVENT?

This query might return :EVENT 110, showing that there was an error in a command header.

EVMsg?

Description

This query-only command removes a single event code from the Event Queue that is associated with the results of the last *ESR? read and returns the event code along with an explanatory message. For more information, see Event Handling on page 530.

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Related Commands

ALLEv? (see page 329), *CLS (see page 318), DESE (see page 331), *ESE (see page 319), *ESR? (see page), EVENT? (see page 332), *SRE (see page 326), *STB? (see page 327)

Syntax

EVMsg?

Returns

The event code and message in the following format:

<Event Code><Comma><Qstring>[<Event Code><Comma><Qstring>...]
<Qstring>::= <Message>[<Command>]

where <Command> is the command that caused the error and may be returned when a command error is detected by the oscilloscope. As much of the command will be returned as possible without exceeding the 60 character limit of the <Message> and <Command> string combined. The command string is right-justified.

Example

EVMsg?

This query might return :EVMSG 110, "Command header error"

EVQty?

Description

This query-only command returns the number of event codes that are in the Event Queue. This is useful when using the ALLEv? query, since it lets you know exactly how many events will be returned.

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Status and Error

Related Commands

ALLEv? (see page 329), EVENT? (see page 332), EVMsg? (see page 333)

Syntax

EVQty?

Example

EVQty?

This query might return :EVQTY 3, indicating the number of event codes in the Event Queue.