Silent

Silent *num*

The Silent operation is largely obsolete. Only very obscure uses remain and most users can ignore this operation.

Prior to Igor Pro 7, Silent was used to enable or disable the display of macro commands in the command line as they were executed. It was also used to enable compatibility modes for very old experiments.

Parameters

If *num* is 2, commands issued by AppleEvents or ActiveX Automation are not shown in the history are of the command window. Use 3 to re-enable.

If *num* is 100, 101 or 102, all procedures are recompiled. For 102, the time to recompile is displayed in the history.

sin

sin(*angle*)

The sin function returns the sine of *angle* which is in radians.

In complex expressions, *angle* is complex, and sin(*angle*) returns a complex value:

$$\sin(x+iy) = \sin(x)\cosh(y) + i\cos(x)\sinh(y).$$

See Also

asin, **cos**, **tan**, **sec**, **csc**, **cot**

sinc

sinc(*num*)

The sinc function returns sin(*num*)/*num*. The sinc function returns 1.0 when *num* is zero. *num* must be real.

sinh

sinh(*num*)

The sinh function returns the hyperbolic sine of *num*:

$$\sinh(x) = \frac{e^x - e^{-x}}{2}.$$

In complex expressions, *num* is complex, and sinh(*num*) returns a complex value.

See Also

cosh, **tanh**, **coth**

Sleep

Sleep [*flags*] *timeSpec*

The Sleep operation puts Igor to sleep for a while. After the while is up, Igor continues execution.

You could use Sleep, for example, to give an instrument time to perform an action or to allow a user to admire a graph before proceeding.

More advanced programmers may prefer to use a background task as an alternative. See **Background Tasks** on page IV-319.

Parameters

The format of *timeSpec* depends on which flags, if any, are present.

If no flags are present, then *timeSpec* is in *hh*:*mm*:*ss* format and specifies the number of elapsed hours, minutes and seconds to sleep.

Flags

/A — *timeSpec* is an absolute time in 24 hour format (e.g., 16:00:00).

/A/W — Wait until tomorrow if absolute time has passed.

/B — Stop sleeping if the user clicks the mouse button.

The /B flag is ignored if you use the /PROG flag.

/C=*cursor* — Controls what kind of cursor to display during sleep.

cursor=-1:	No cursor change.
cursor=0:	Hour glass (default).
cursor=1:	Arrow.
cursor=2:	"Click".
cursor=3:	Spinning beachball.
cursor=4:	Watch with spinning hands.
cursor=5:	Jacob's ladder.
cursor=6:	Displays a progress dialog instead of changing the cursor.
cursor=7:	Spinning arrrows.
Other:	Watch.

cursor values 3 through 6 require Igor Pro 7.00 or later.

cursor value 7 requires Igor Pro 9.00 or later.

Under rare circumstances, cursors 0, 3, 4, and 5 may cause memory leaks.

/M=*message* — If you use /C=6 or /PROG, the progress dialog displays *message* above the progress bar. By default the message reads "Sleeping".

/PROG={*cancelButtonTitleStr*, *continueButtonTitleStr*, *abortMode*}

Displays a progress dialog with user-settable titles for the Cancel and Continue buttons.

If you pass "" for *cancelButtonTitleStr*, the Cancel button is hidden. If you pass "" for *continueButtonTitleStr*, the Continue button is hidden. It is an error to pass "" for both buttons.

If *abortMode* is 0, the **User Abort Key Combinations** and the Cancel button abort any running procedure code. If it is 1, the user abort key combinations and the Cancel button terminate the Sleep operation but user procedure code continues to run.

The /B and /Q flags are ignored if you use the /PROG flag.

See **Displaying a Progress Dialog** below for further information.

/Q — Continue executing the procedure containing the Sleep operation even if the **User Abort Key Combinations** were pressed.

The /Q flag is ignored if you use the /PROG flag.

/S — *timeSpec* is a numeric expression in seconds.

/T — *timeSpec* is a numeric expression in ticks (about 1/60 of a second).

Details

The Sleep operation does *not* let the user choose menus, move cursors, run procedures, draw in graphs, or do any other interactive task.

Normally *timeSpec* specifies an amount of elapsed time. If the /A flag is present, then *timeSpec* is an absolute time when sleep is to end. If the specified absolute time has already passed, no sleep occurs unless you also use /W, which makes it wait until tomorrow.

If you specify time in hh:mm:ss format, you can also specify the time indirectly through a string variable. See the examples.

You can end sleep by pressing the **User Abort Key Combinations**. Normally when you do this, it aborts any procedure that is running. However, if you use the /Q flag, the procedure continues running normally.

Displaying a Progress Dialog

When you specify /C=6 or if you use the /PROG flag, Sleep displays a progress dialog with a progress bar showing how much of the sleep time has passed. The dialog displays a prompt which you can control using the /M flag.

If you use /PROG, then /Q and /B are ignored.

If you use /C=6, then /Q and /B have special meanings:

/C=6	Progress dialog with Cancel button which aborts running procedures. The Abort key combinations abort running user procedures.
/C=6/B	Progress dialog with Abort button which aborts running procedures. The Abort key combinations abort running user procedures.
/C=6/Q	Progress dialog with Continue button which terminates the current sleep operation but allows procedures to continue. Abort key combinations allow running procedures to continue.
/C=6/B/Q	Progress dialog with Continue and Abort buttons. The Continue button terminates the current sleep operation but allows procedures to continue. The Abort button aborts running procedures. Abort key combinations allow running procedures to continue.

If you use the /PROG flag, you can provide your own titles for the Cancel and Continue buttons.

Examples

These examples assume the current time is 4 PM:

```
Sleep 00:01:30              // sleeps for 1 minute, 30 seconds
Sleep/A 23:30:00            // sleeps until 11:30 PM
Sleep/A 03:00:00            // doesn't sleep at all because time is past
Sleep/A/W 03:00:00          // sleeps until 3 AM tomorrow
String str1= "03:00:00"     // put wakeup call time in string
Sleep/A/W $str1             // sleeps until 3 AM tomorrow
Sleep/B/C=2/S/Q 60          // sleep 60 seconds, or until user clicks,
                            //  and keep going (don't abort)
```

The following function creates a graph and then periodically updates the displayed data. By default, it sleeps for a number of seconds specified by the sleepTime parameter.

```
Function SleepDemo(sleepTime, displayProgressDialog)
   Variable sleepTime                       // In seconds
   Variable displayProgressDialog           // 1 for progress dialog

   Make/N=200/O junk
   SetScale/I x 0, 2*pi, junk
   junk=sin(x)
   DoWindow/F SleepDemoGraph
   if (V_Flag == 0)
      Display/N=SleepDemoGraph junk
   endif
   DoUpdate

   try
      Variable i
      for (i = 0; i < 10; i+=1)
         if (displayProgressDialog)
            // Because the abortMode is 0, pressing the user abort key combinations
            // or pressing the Done button generates an abort instead of merely
            // terminating the current Sleep call.
            int abortMode = 0
            Sleep/S/PROG={"Done", "Continue", abortMode} sleepTime
         else
            // /B makes Sleep terminate if the user clicks.
```