

1.46 ClkStart - Starts a clock used for timing

Usage

`ClkStart` is used to start a clock that functions as a stop-watch used for timing.

Basic examples

The following example illustrates the instruction `ClkStart`:

Example 1

```
ClkStart clock1;
```

The clock `clock1` is started.

Arguments

```
ClkStart Clock
```

Clock

Data type: `clock`

The name of the clock to start.

Program execution

When a clock is started, it will run and continue counting seconds until it is stopped.

A clock continues to run when the program that started it is stopped. However, the event that you intended to time may no longer be valid. For example, if the program was measuring the waiting time for an input, the input may have been received while the program was stopped. In this case, the program will not be able to “see” the event that occurred while the program was stopped.

A clock continues to run when the robot is powered down as long as the battery back-up retains the program that contains the clock variable.

If a clock is running it can be read, stopped, or reset.

More examples

More examples of the instruction `ClkStart` are illustrated below.

Example 1

```
VAR clock clock2;  
VAR num time;  
  
ClkReset clock2;  
ClkStart clock2;  
WaitUntil di1 = 1;  
ClkStop clock2;  
time:=ClkRead(clock2);
```

The waiting time for `di1` to become 1 is measured.

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Error handling

The following recoverable errors can be generated. The errors can be handled in an ERROR handler. The system variable `ERRNO` will be set to:

Name	Cause of error
<code>ERR_OVERFLOW</code>	The clock runs for 4,294,967 seconds (49 days 17 hours 2 minutes 47 seconds), then it is overflowed.

Syntax

```
ClkStart  
[ Clock ':= ' ] < variable (VAR) of clock >';'
```

Related Information

For information about	See
Other clock instructions	<i>Technical reference manual - RAPID Overview</i>

2.41 ClkRead - Reads a clock used for timing

Usage

`ClkRead` is used to read a clock that functions as a stop-watch used for timing.

Basic examples

The following examples illustrate the function `ClkRead`.

Example 1

```
reg1:=ClkRead(clock1);
```

The clock `clock1` is read and the time in seconds is stored in the variable `reg1`.

Example 2

```
reg1:=ClkRead(clock1 \HighRes);
```

The clock `clock1` is read and the time in seconds is stored with high resolution in the variable `reg1`.

Return value

Data type: num

The time in seconds stored in the clock. Resolution is normally 0.001 seconds. If using `HighRes` switch it is possible to get a resolution of 0.000001 seconds.

Argument

```
ClkRead (Clock \HighRes)
```

Clock

Data type: clock

The name of the clock to read.

[\HighRes]

High Resolution

Data type: switch

Specifies that the time should be read with a higher resolution. If this switch is used it is possible to read the time with resolution 0.000001.

Due to the precision of the data type num, you can only get the micro second resolution as long as the read value is less than 1 second.

Program execution

A clock can be read when it is stopped or running.

Once a clock is read it can be read again, started again, stopped, or reset.

Error handling

The following recoverable errors are generated and can be handled in an error handler. The system variable `ERRNO` will be set to:

Name	Cause of error
ERR_OVERFLOW	The clock runs for 4,294,967 seconds (49 days 17 hours 2 minutes 47 seconds) then it becomes overflowed.

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If using the `HighRes` switch, then the error `ERR_OVERFLOW` can not occur, but the clock will wrap around after approximately 49700 days.

Syntax

```
ClkRead '('  
  [ Clock ':= ' ] < variable (VAR) of clock >  
  [ '\ ' HighRes ] ')'
```

A function with a return value of the type `num`.

Related information

For information about	See
Clock instructions	<i>Technical reference manual - RAPID Overview</i>
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