

# Predefined action! values

## Bitwise actions

### and~

USAGE:

AND~ value1 value2

DESCRIPTION:

Returns the first value ANDed with the second.  
AND~ is an action! value.

ARGUMENTS:

value1            [logic! integer! char! bitset! binary! typeset! pair! tuple!  
vector!]  
value2            [logic! integer! char! bitset! binary! typeset! pair! tuple!  
vector!]

RETURNS:

[logic! integer! char! bitset! binary! typeset! pair! tuple! vector!]

### complement

USAGE:

COMPLEMENT value

DESCRIPTION:

Returns the opposite (complementing) value of the input value.  
COMPLEMENT is an action! value.

ARGUMENTS:

value            [logic! integer! tuple! bitset! typeset! binary!]

RETURNS:

[logic! integer! tuple! bitset! typeset! binary!]

### or~

**USAGE:**

OR~ value1 value2

**DESCRIPTION:**

Returns the first value ORed with the second.

OR~ is an action! value.

**ARGUMENTS:**

value1 [logic! integer! char! bitset! binary! typeset! pair! tuple!  
vector!]  
value2 [logic! integer! char! bitset! binary! typeset! pair! tuple!  
vector!]

**RETURNS:**

[logic! integer! char! bitset! binary! typeset! pair! tuple! vector!]

## xor~

**USAGE:**

XOR~ value1 value2

**DESCRIPTION:**

Returns the first value exclusive ORed with the second.

XOR~ is an action! value.

**ARGUMENTS:**

value1 [logic! integer! char! bitset! binary! typeset! pair! tuple!  
vector!]  
value2 [logic! integer! char! bitset! binary! typeset! pair! tuple!  
vector!]

**RETURNS:**

[logic! integer! char! bitset! binary! typeset! pair! tuple! vector!]

## I/O actions

### close

USAGE:

CLOSE port

DESCRIPTION:

Closes a port.

CLOSE is an action! value.

ARGUMENTS:

port [port!]

## create

USAGE:

CREATE port

DESCRIPTION:

Send port a create request.

CREATE is an action! value.

ARGUMENTS:

port [port! file! url! block!]

## delete

USAGE:

DELETE file

DESCRIPTION:

Deletes the specified file or empty folder.

DELETE is an action! value.

ARGUMENTS:

file [file! port!]

## open

**USAGE:**

OPEN port

**DESCRIPTION:**

Opens a port; makes a new port from a specification if necessary.

OPEN is an action! value.

**ARGUMENTS:**

port [port! file! url! block!]

**REFINEMENTS:**

/new => Create new file - if it exists, deletes it.

/read => Open for read access.

/write => Open for write access.

/seek => Optimize for random access.

/allow => Specifies right access attributes.

access [block!]

## open?

**USAGE:**

OPEN? port

**DESCRIPTION:**

Returns TRUE if port is open.

OPEN? is an action! value.

**ARGUMENTS:**

port [port!]

## query

**USAGE:**

QUERY target

**DESCRIPTION:**

Returns information about a file.

QUERY is an action! value.

**ARGUMENTS:**

target [file! port!]

## read

**USAGE:**

READ source

**DESCRIPTION:**

Reads from a file, URL, or other port.

READ is an action! value.

**ARGUMENTS:**

source [file! url! port!]

**REFINEMENTS:**

/part => Partial read a given number of units (source relative).

length [number!]

/seek => Read from a specific position (source relative).

index [number!]

/binary => Preserves contents exactly.

/lines => Convert to block of strings.

/info =>

/as => Read with the specified encoding, default is 'UTF-8.

encoding [word!]

## rename

**USAGE:**

RENAME from to

**DESCRIPTION:**

Rename a file.

RENAME is an action! value.

**ARGUMENTS:**

from [port! file! url!]

to [port! file! url!]

## update

**USAGE:**

UPDATE port

**DESCRIPTION:**

Updates external and internal states (normally after read/write).

UPDATE is an action! value.

**ARGUMENTS:**

port [port!]

# write

## USAGE:

WRITE destination data

## DESCRIPTION:

Writes to a file, URL, or other port.

WRITE is an action! value.

## ARGUMENTS:

destination [file! url! port!]

data [any-type!]

## REFINEMENTS:

/binary => Preserves contents exactly.

/lines => Write each value in a block as a separate line.

/info =>

/append => Write data at end of file.

/part => Partial write a given number of units.

length [number!]

/seek => Write at a specific position.

index [number!]

/allow => Specifies protection attributes.

access [block!]

/as => Write with the specified encoding, default is 'UTF-8.

encoding [word!]

# General actions

## form

**USAGE:**

FORM value

**DESCRIPTION:**

Returns a user-friendly string representation of a value.

FORM is an action! value.

**ARGUMENTS:**

value [any-type!]

**REFINEMENTS:**

/part => Limit the length of the result.

limit [integer!]

**RETURNS:**

[string!]

## make

**USAGE:**

MAKE type spec

**DESCRIPTION:**

Returns a new value made from a spec for that value's type.

MAKE is an action! value.

**ARGUMENTS:**

type [any-type!] "The datatype, an example or prototype value."

spec [any-type!] "The specification of the new value."

**RETURNS:**

Returns the specified datatype.

[any-type!]

## mold

**USAGE:**

MOLD value

**DESCRIPTION:**

Returns a source format string representation of a value.

MOLD is an action! value.

**ARGUMENTS:**

value           [any-type!]

**REFINEMENTS:**

/only           => Exclude outer brackets if value is a block.

/all            => TBD: Return value in loadable format.

/flat           => TBD: Exclude all indentation.

/part           => Limit the length of the result.

limit           [integer!]

**RETURNS:**

[string!]

## random

**USAGE:**

RANDOM value

**DESCRIPTION:**

Returns a random value of the same datatype; or shuffles series.

RANDOM is an action! value.

**ARGUMENTS:**

value           "Maximum value of result (modified when series)."

**REFINEMENTS:**

/seed           => Restart or randomize.

/secure         => Returns a cryptographically secure random number.

/only           => Pick a random value from a series.

**RETURNS:**

[any-type!]

## reflect



**USAGE:**

REFLECT value field

**DESCRIPTION:**

Returns internal details about a value via reflection.

REFLECT is an action! value.

**ARGUMENTS:**

value	[any-type!]
field	[word!] {spec, body, words, etc. Each datatype defines its own reflectors.}

## to

**USAGE:**

TO type spec

**DESCRIPTION:**

Converts to a specified datatype.

TO is an action! value.

**ARGUMENTS:**

type	[any-type!] "The datatype or example value."
spec	[any-type!] "The attributes of the new value."

## Series actions

### append

**USAGE:**

APPEND series value

**DESCRIPTION:**

Inserts value(s) at series tail; returns series head.

APPEND is an action! value.

**ARGUMENTS:**

series	[series! bitset! port!]
value	[any-type!]

**REFINEMENTS:**

/part	=> Limit the number of values inserted.
length	[number! series!]
/only	=> Insert block types as single values (overrides /part).
/dup	=> Duplicate the inserted values.
count	[integer!]

**RETURNS:**

[series! port! bitset!]

## at

**USAGE:**

AT series index

**DESCRIPTION:**

Returns a series at a given index.

AT is an action! value.

**ARGUMENTS:**

series	[series! port!]
index	[integer! pair!]

**RETURNS:**

[series! port!]

## back

**USAGE:**

BACK series

**DESCRIPTION:**

Returns a series at the previous index.

BACK is an action! value.

**ARGUMENTS:**

series            [series! port!]

**RETURNS:**

[series! port!]

## change

**USAGE:**

CHANGE series value

**DESCRIPTION:**

Changes a value in a series and returns the series after the change.

CHANGE is an action! value.

**ARGUMENTS:**

series            [series! port!] "Series at point to change."  
value            [any-type!] "The new value."

**REFINEMENTS:**

/part            => Limits the amount to change to a given length or position.  
         range        [number! series!]  
/only            => Changes a series as a series.  
/dup            => Duplicates the change a specified number of times.  
         count        [number!]

## clear

**USAGE:**

`CLEAR series`

**DESCRIPTION:**

Removes series values from current index to tail; returns new tail.  
CLEAR is an action! value.

**ARGUMENTS:**

`series`            `[series! port! bitset! map! none!]`

**RETURNS:**

`[series! port! bitset! map! none!]`

## copy

**USAGE:**

`COPY value`

**DESCRIPTION:**

Returns a copy of a non-scalar value.  
COPY is an action! value.

**ARGUMENTS:**

`value`            `[series! any-object! bitset! map!]`

**REFINEMENTS:**

`/part`            => Limit the length of the result.  
    `length`        `[number! series! pair!]`  
`/deep`           => Copy nested values.  
`/types`          => Copy only specific types of non-scalar values.  
    `kind`          `[datatype!]`

**RETURNS:**

`[series! any-object! bitset! map!]`

## find

**USAGE:**

FIND series value

**DESCRIPTION:**

Returns the series where a value is found, or NONE.

FIND is an action! value.

**ARGUMENTS:**

series	[series! bitset! typeset! port! map! none!]
value	[any-type!]

**REFINEMENTS:**

/part	=> Limit the length of the search.
length	[number! series!]
/only	=> Treat a series search value as a single value.
/case	=> Perform a case-sensitive search.
/same	=> Use "same?" as comparator.
/any	=> TBD: Use * and ? wildcards in string searches.
/with	=> TBD: Use custom wildcards in place of * and ?.
wild	[string!]
/skip	=> Treat the series as fixed size records.
size	[integer!]
/last	=> Find the last occurrence of value, from the tail.
/reverse	=> Find the last occurrence of value, from the current index.
/tail	=> Return the tail of the match found, rather than the head.
/match	=> Match at current index only and return tail of match.

## head

**USAGE:**

HEAD series

**DESCRIPTION:**

Returns a series at its first index.

HEAD is an action! value.

**ARGUMENTS:**

series	[series! port!]
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**RETURNS:**

[series! port!]

## head?

**USAGE:**

HEAD? series

**DESCRIPTION:**

Returns true if a series is at its first index.  
HEAD? is an action! value.

**ARGUMENTS:**

series            [series! port!]

**RETURNS:**

[logic!]

## index?

**USAGE:**

INDEX? series

**DESCRIPTION:**

Returns the current index of series relative to the head, or of word in a context.  
INDEX? is an action! value.

**ARGUMENTS:**

series            [series! port! any-word!]

**RETURNS:**

[integer!]

## insert

**USAGE:**

INSERT series value

**DESCRIPTION:**

Inserts value(s) at series index; returns series past the insertion.

INSERT is an action! value.

**ARGUMENTS:**

series	[series! port! bitset!]
value	[any-type!]

**REFINEMENTS:**

/part	=> Limit the number of values inserted.
length	[number! series!]
/only	=> Insert block types as single values (overrides /part).
/dup	=> Duplicate the inserted values.
count	[integer!]

**RETURNS:**

[series! port! bitset!]

## length?

**USAGE:**

LENGTH? series

**DESCRIPTION:**

Returns the number of values in the series, from the current index to the tail.

LENGTH? is an action! value.

**ARGUMENTS:**

series	[series! port! bitset! map! tuple! none!]
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**RETURNS:**

[integer! none!]

## move

**USAGE:**

MOVE origin target

**DESCRIPTION:**

Moves one or more elements from one series to another position or series.  
MOVE is an action! value.

**ARGUMENTS:**

origin	[series! port!]
target	[series! port!]

**REFINEMENTS:**

/part	=> Limit the number of values inserted.
length	[integer!]

**RETURNS:**

[series! port!]

## next

**USAGE:**

NEXT series

**DESCRIPTION:**

Returns a series at the next index.  
NEXT is an action! value.

**ARGUMENTS:**

series	[series! port!]
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**RETURNS:**

[series! port!]

## pick



**USAGE:**

PICK series index

**DESCRIPTION:**

Returns the series value at a given index.

PICK is an action! value.

**ARGUMENTS:**

series [series! port! bitset! pair! tuple! money! date! time!]

index [scalar! any-string! any-word! block! logic! time!]

**RETURNS:**

[any-type!]

## poke

**USAGE:**

POKE series index value

**DESCRIPTION:**

Replaces the series value at a given index, and returns the new value.

POKE is an action! value.

**ARGUMENTS:**

series [series! port! bitset!]

index [scalar! any-string! any-word! block! logic!]

value [any-type!]

**RETURNS:**

[series! port! bitset!]

## put

**USAGE:**

```
PUT series key value
```

**DESCRIPTION:**

Replaces the value following a key, and returns the new value.  
 PUT is an action! value.

**ARGUMENTS:**

```
series    [series! port! map! object!]
key       [scalar! any-string! any-word! binary!]
value     [any-type!]
```

**REFINEMENTS:**

```
/case      => Perform a case-sensitive search.
```

**RETURNS:**

```
[series! port! map! object!]
```

## remove

**USAGE:**

```
REMOVE series
```

**DESCRIPTION:**

Returns the series at the same index after removing a value.  
 REMOVE is an action! value.

**ARGUMENTS:**

```
series    [series! port! bitset! map! none!]
```

**REFINEMENTS:**

```
/part      => Removes a number of values, or values up to the given series
index.
```

```
length    [number! char! series!]
/key      => Removes a key in map.
key-arg    [scalar! any-string! any-word! binary! block!]
```

**RETURNS:**

```
[series! port! bitset! map! none!]
```

## reverse

**USAGE:**

REVERSE series

**DESCRIPTION:**

Reverses the order of elements; returns at same position.  
REVERSE is an action! value.

**ARGUMENTS:**

series [series! port! pair! tuple!]

**REFINEMENTS:**

/part => Limits to a given length or position.  
length [number! series!]  
/skip => Treat the series as fixed size records.  
size [integer!]

**RETURNS:**

[series! port! pair! tuple!]

## select

**USAGE:**

SELECT series value

**DESCRIPTION:**

Find a value in a series and return the next value, or NONE.  
SELECT is an action! value.

**ARGUMENTS:**

series [series! any-object! map! none!]  
value [any-type!]

**REFINEMENTS:**

/part => Limit the length of the search.  
length [number! series!]  
/only => Treat a series search value as a single value.  
/case => Perform a case-sensitive search.  
/same => Use "same?" as comparator.  
/any => TBD: Use \* and ? wildcards in string searches.  
/with => TBD: Use custom wildcards in place of \* and ?.  
wild [string!]  
/skip => Treat the series as fixed size records.  
size [integer!]  
/last => Find the last occurrence of value, from the tail.  
/reverse => Find the last occurrence of value, from the current index.

## skip

### USAGE:

SKIP series offset

### DESCRIPTION:

Returns the series relative to the current index.  
SKIP is an action! value.

### ARGUMENTS:

series	[series! port!]
offset	[integer! pair!]

### RETURNS:

[series! port!]

## sort

### USAGE:

SORT series

### DESCRIPTION:

Sorts a series (modified); default sort order is ascending.  
SORT is an action! value.

### ARGUMENTS:

series	[series! port!]
--------	-----------------

### REFINEMENTS:

/case	=> Perform a case-sensitive sort.
/skip	=> Treat the series as fixed size records.
size	[integer!]
/compare	=> Comparator offset, block (TBD) or function.
comparator	[integer! block! any-function!]
/part	=> Sort only part of a series.
length	[number! series!]
/all	=> Compare all fields (used with /skip).
/reverse	=> Reverse sort order.
/stable	=> Stable sorting.

## swap

**USAGE:**

```
SWAP series1 series2
```

**DESCRIPTION:**

Swaps elements between two series or the same series.  
SWAP is an action! value.

**ARGUMENTS:**

```
series1    [series! port!]  
series2    [series! port!]
```

## tail

**USAGE:**

```
TAIL series
```

**DESCRIPTION:**

Returns a series at the index after its last value.  
TAIL is an action! value.

**ARGUMENTS:**

```
series      [series! port!]
```

**RETURNS:**

```
[series! port!]
```

## tail?

**USAGE:**

```
TAIL? series
```

**DESCRIPTION:**

Returns true if a series is past its last value.  
TAIL? is an action! value.

**ARGUMENTS:**

```
series      [series! port!]
```

**RETURNS:**

```
[logic!]
```

## take

**USAGE:**

TAKE series

**DESCRIPTION:**

Removes and returns one or more elements.

TAKE is an action! value.

**ARGUMENTS:**

series [series! port! none!]

**REFINEMENTS:**

/part => Specifies a length or end position.

length [number! series!]

/deep => Copy nested values.

/last => Take it from the tail end.

## trim

**USAGE:**

TRIM series

**DESCRIPTION:**

Removes space from a string or NONE from a block.

TRIM is an action! value.

**ARGUMENTS:**

series [series! port!]

**REFINEMENTS:**

/head => Removes only from the head.

/tail => Removes only from the tail.

/auto => Auto indents lines relative to first line.

/lines => Removes all line breaks and extra spaces.

/all => Removes all whitespace.

/with => Same as /all, but removes characters in 'str'.

str [char! string! binary! integer!]

## Scalar actions

### absolute

**USAGE:**

ABSOLUTE value

**DESCRIPTION:**

Returns the non-negative value.

ABSOLUTE is an action! value.

**ARGUMENTS:**

value            [number! money! char! pair! time!]

**RETURNS:**

[number! money! char! pair! time!]

## add

**USAGE:**

ADD value1 value2

**DESCRIPTION:**

Returns the sum of the two values.

ADD is an action! value.

**ARGUMENTS:**

value1            [scalar! vector!] "The augend."

value2            [scalar! vector!] "The addend."

**RETURNS:**

The sum.

[scalar! vector!]

## divide

**USAGE:**

`DIVIDE value1 value2`

**DESCRIPTION:**

Returns the quotient of two values.

`DIVIDE` is an action! value.

**ARGUMENTS:**

value1 [number! money! char! pair! tuple! vector! time!] "The dividend (numerator)."

value2 [number! money! char! pair! tuple! vector! time!] "The divisor (denominator)."

**RETURNS:**

The quotient.

[number! money! char! pair! tuple! vector! time!]

## multiply

**USAGE:**

`MULTIPLY value1 value2`

**DESCRIPTION:**

Returns the product of two values.

`MULTIPLY` is an action! value.

**ARGUMENTS:**

value1 [number! money! char! pair! tuple! vector! time!] "The multiplicand."

value2 [number! money! char! pair! tuple! vector! time!] "The multiplier."

**RETURNS:**

The product.

[number! money! char! pair! tuple! vector! time!]

## negate



**USAGE:**

NEGATE number

**DESCRIPTION:**

Returns the opposite (additive inverse) value.

NEGATE is an action! value.

**ARGUMENTS:**

number            [number! money! bitset! pair! time!]

**RETURNS:**

[number! money! bitset! pair! time!]

## power

**USAGE:**

POWER number exponent

**DESCRIPTION:**

Returns a number raised to a given power (exponent).

POWER is an action! value.

**ARGUMENTS:**

number            [number!] "Base value."

exponent          [integer! float!] "The power (index) to raise the base value by."

**RETURNS:**

[number!]

## remainder

**USAGE:**

REMAINDER value1 value2

**DESCRIPTION:**

Returns what is left over when one value is divided by another.

REMAINDER is an action! value.

**ARGUMENTS:**

value1 [number! money! char! pair! tuple! vector! time!] "The dividend (numerator)."

value2 [number! money! char! pair! tuple! vector! time!] "The divisor (denominator)."

**RETURNS:**

The remainder.

[number! money! char! pair! tuple! vector! time!]

## round

**USAGE:**

ROUND n

**DESCRIPTION:**

Returns the nearest integer. Halves round up (away from zero) by default.

ROUND is an action! value.

**ARGUMENTS:**

n [number! money! time! pair!]

**REFINEMENTS:**

/to => Return the nearest multiple of the scale parameter.

scale [number! money! time!] "Must be a non-zero value."

/even => Halves round toward even results.

/down => Round toward zero, ignoring discarded digits. (truncate).

/half-down => Halves round toward zero.

/floor => Round in negative direction.

/ceiling => Round in positive direction.

/half-ceiling => Halves round in positive direction.

## subtract

**USAGE:**

SUBTRACT value1 value2

**DESCRIPTION:**

Returns the difference between two values.

SUBTRACT is an action! value.

**ARGUMENTS:**

value1            [scalar! vector!] "The minuend."

value2            [scalar! vector!] "The subtrahend."

**RETURNS:**

The difference.

[scalar! vector!]

## even?

**USAGE:**

EVEN? number

**DESCRIPTION:**

Returns true if the number is evenly divisible by 2.

EVEN? is an action! value.

**ARGUMENTS:**

number            [number! money! char! time!]

**RETURNS:**

[logic!]

## odd?

**USAGE:**

ODD? number

**DESCRIPTION:**

Returns true if the number has a remainder of 1 when divided by 2.

ODD? is an action! value.

**ARGUMENTS:**

number            [number! money! char! time!]

**RETURNS:**

[logic!]