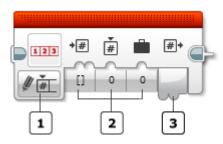# Array Operations Block

The Array Operations block does operations on the Numeric Array and Logic Array data types. You can create an array, add elements, read and write individual elements, and get the length of an array.

See Data Types for more information on arrays and other data types.

> **Choose the Operation**

1 Mode Selector
2 Inputs
3 Output

Use the Mode Selector to choose the array operation and the array type (Numeric or Logic). The Inputs and Outputs available will change depending on the mode.
Modes: Append, Read at Index, Write at Index, Length

> **Modes**

Append

The Append mode adds an element to the end of an array. You can also create a new array.

The Array In input specifies an existing array, and the Value specifies the element to add to the end of the array. If you leave Array In blank, a new array will be created with just the new element in it.

The Array Out output will be a new array containing the combined elements. The original input array is not affected.

This table shows some examples of the Append – Numeric mode.

Array In	Value to Add	Array Out
	3	[3]
[1; 2; 3]	4	[1; 2; 3; 4]
[2; 1; 1; 6]	1	[2; 1; 1; 6; 1]

Read at Index

The Read at Index mode gets the value of an individual element in an array. The Array In input is the array to use. The element to get is specified by the Index. The first element in an array has an Index of 0, the second element has an Index of 1, and so on. The value of the selected element is output in Value.

This table shows some examples of the Read at Index – Numeric mode.

Array In	Index	Value
[1; 2; 3]	0	1
[1; 2; 3]	2	3

Write at Index

The Write at Index mode changes the value of an individual element in an array. The Array In input is the original array. The element to change is specified by the Index. The first element in an array has an Index of 0, the second element has an Index of 1, and so on.

The value to change the selected element to is specified by the Value. A new array with the element changed is output in Array Out. The original array in Array In is not affected.

This table shows some examples of the Write at Index – Numeric mode.

Array In	Index	Value	Array Out
[1; 2; 3]	0	5	[5; 2; 3]
[1; 2; 3]	2	0	[1; 2; 0]

Length

The Length mode gets the length of an array. The length of the array in the Array In input is output in Length.

The length of an array is the number of elements in the array. An empty array has a length of 0, and an array with a single element in has a length of 1.

Inputs and Outputs

The inputs available for the Array Operations block will depend on the mode selected. You can enter the input values directly into the block. Alternatively, the input values can be supplied by Data Wires from the outputs of other Programming Blocks.

Input	Types	Notes
Array In	Numeric Array, Logic Array	Array to operate on
Value	Numeric, Logic	Value to append in Append mode.

		Value to change an element to in Write at Index mode.
Index	Numeric	Location of an array element to access. 0 = First element 1 = Second element Length − 1 = Last element

The output available will depend on the mode selected. To use an output, use a Data Wire to connect it to another Programming Block.

Output	Types	Notes
Array Out	Numeric Array, Logic Array	Array result of the operation
Value	Numeric, Logic	Value of an array element in Read at Index mode
Length	Numeric	Length of the array in Length mode