NexAIoT Co., Ltd

VIC Flow

User Manual (Beta 1.2)

www.nexaiot.com

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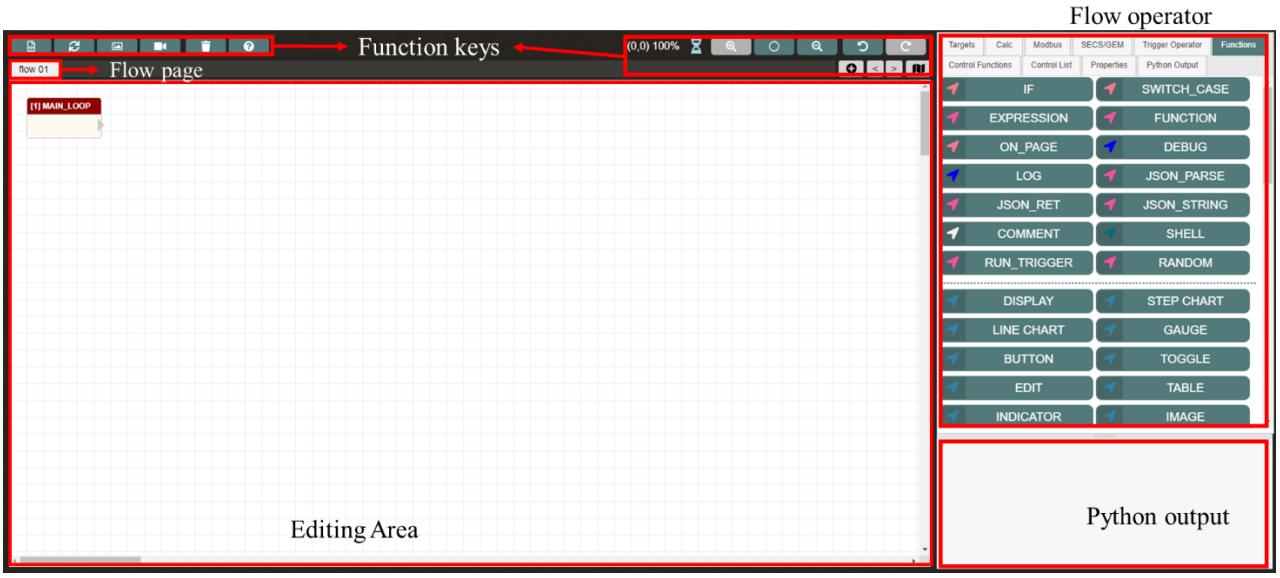
Contents

VIC Flow is a user-friendly interface for users to create multiple flow pages and control processes through drag-and-drop operators, allowing quick and easy development of process control systems. VIC Flow also provides dashboard mode for users to design their own instrument displays.

1 User Interface

The VIC Flow operating interface is as below.



The function keys and their corresponding behaviors are as follows:

icon	Behavior	icon	Behavior
	Switch to text mode		Increase the zoom ratio of the editing area.
	Reload Python module.		Reset the zoom ratio of the editing area.
	Open script image dialog*		Decrease the zoom ratio of the editing area.
	Open control image dialog*		Undo
	Reset content of VIC-Flow		Redo
	Display keyboard shortcuts information		Edit the X and Y coordinates of the top-left corner and the current zoom level of the editing area.
	Indicates that the current timer is enabled.		Indicates that the current timer is disabled.
	Add a new flow page		Move one flow page forward

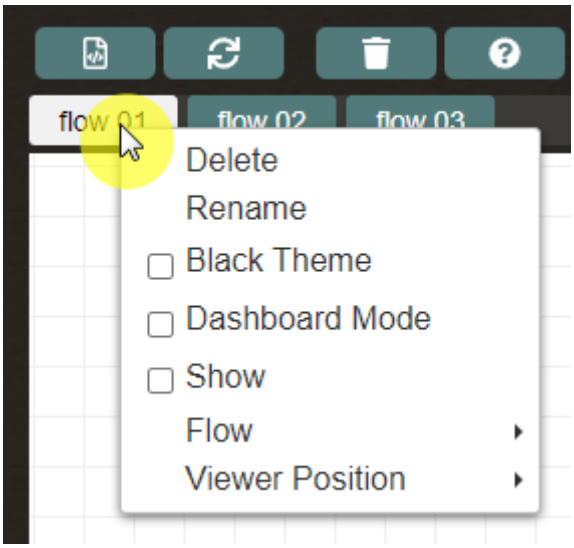
	Preview all the contents of this flow page	>	Move one flow page backward
flow 01	Flow Page 1	flow 02	Flow Page 2

Note: Undo and Redo will only record up to 100 actions each.

Note: The range of zoom ratio is from 40% to 250%.

Note:* indicates that it is only supported by VIC series products.

Right-clicking on a flow page button will bring up a function menu (as shown in the following figure), which is described in the table below:



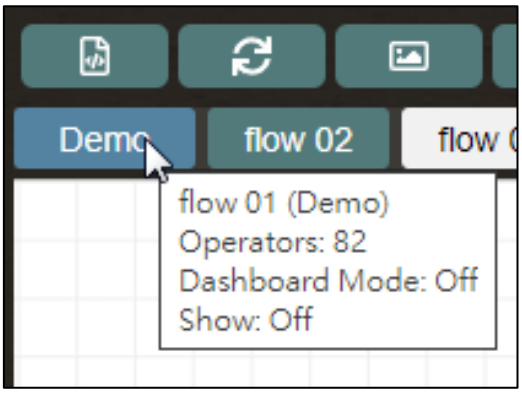
Name	Mean
Delete	Delete this flow page.
Rename	Rename this flow page. If empty, default to flow X.
Black Theme	Clicking this will switch the background of the flow page to black, and the operators will also switch to a black theme.
Dashboard Mode	Clicking this will hide all element except for the displayed operators on this flow page.
Show	Clicking this will make the flow page visible to the public without logging in.
Flow	Switch to another flow page.
Viewer Position	Set the initial view position of a flow page when entering the **Flow Viewer**.

Note: **Flow Viewer** can be viewed without login by accessing http://IP/flow.html.

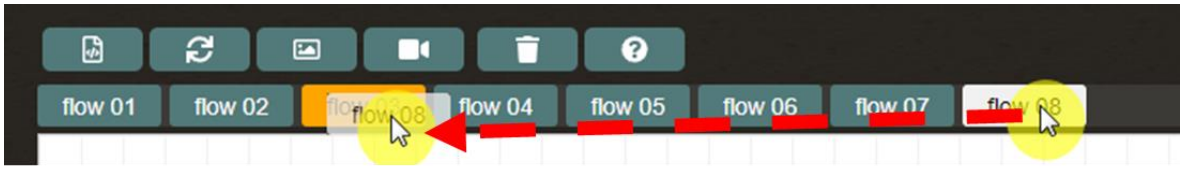
The function menu for Viewer Position is presented as follows:

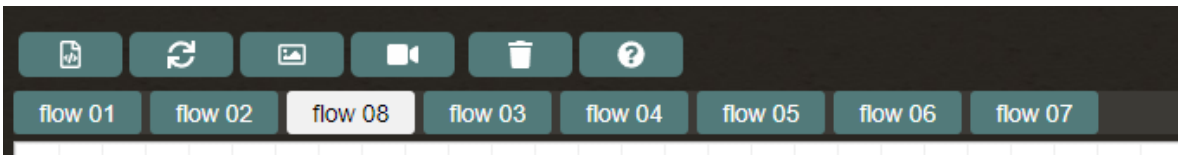
Name	Mean
Set Viewer Position	Set the initial viewing position.
Go To Viewer Position	Move to the configured viewing position.
Clear Viewer Position	Clear the configured viewing position.
Lock Viewer Position	Once activated, the flow page in the Flow Viewer will become immobile and unscalable.

When the mouse is moved over the flow page button, information about this flow page will be displayed. It includes the total number of operators on the flow page, the on/off status of dashboard mode, and whether it will be visible to the public.

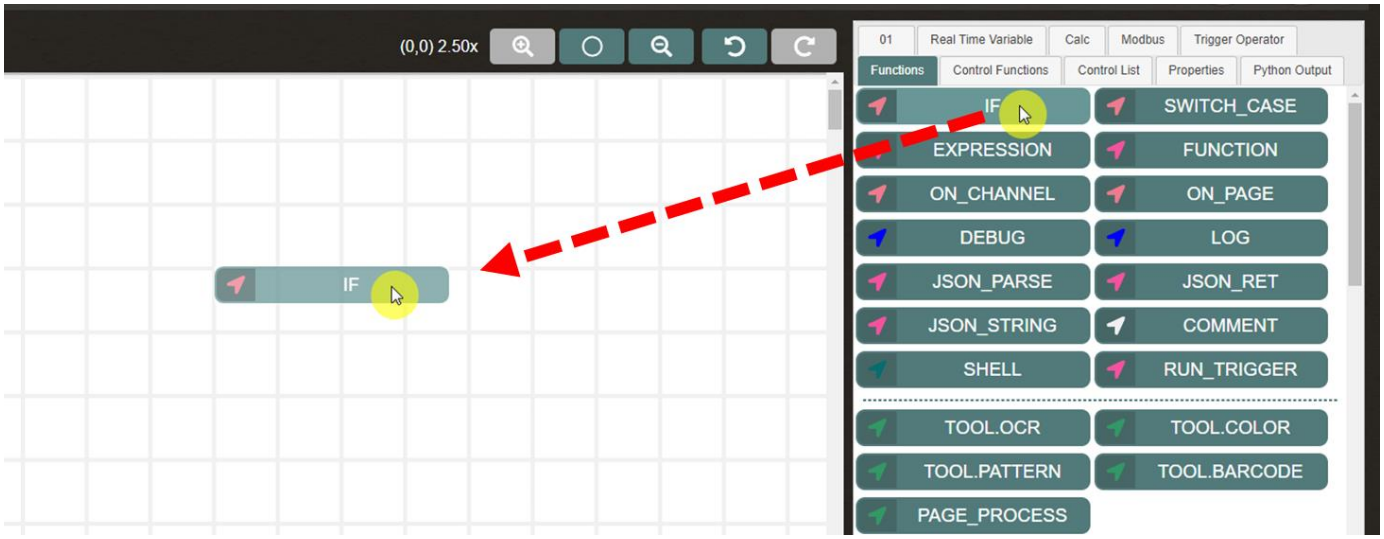


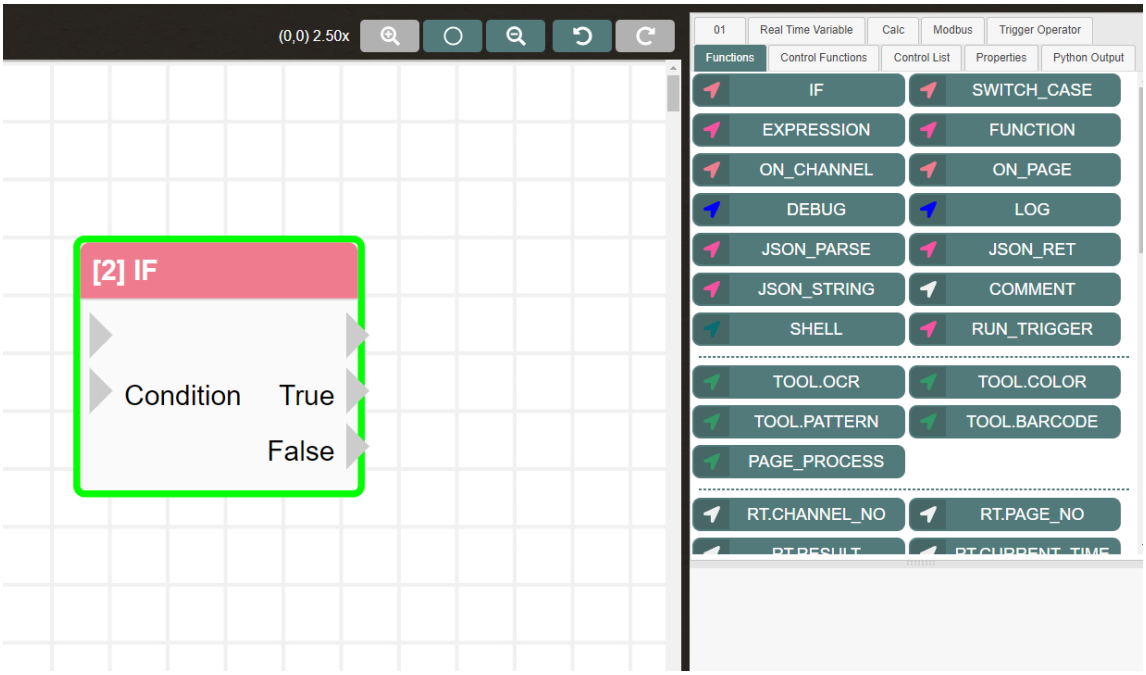
It is possible to change the order by dragging and dropping the flow page button, as shown in the diagram below.



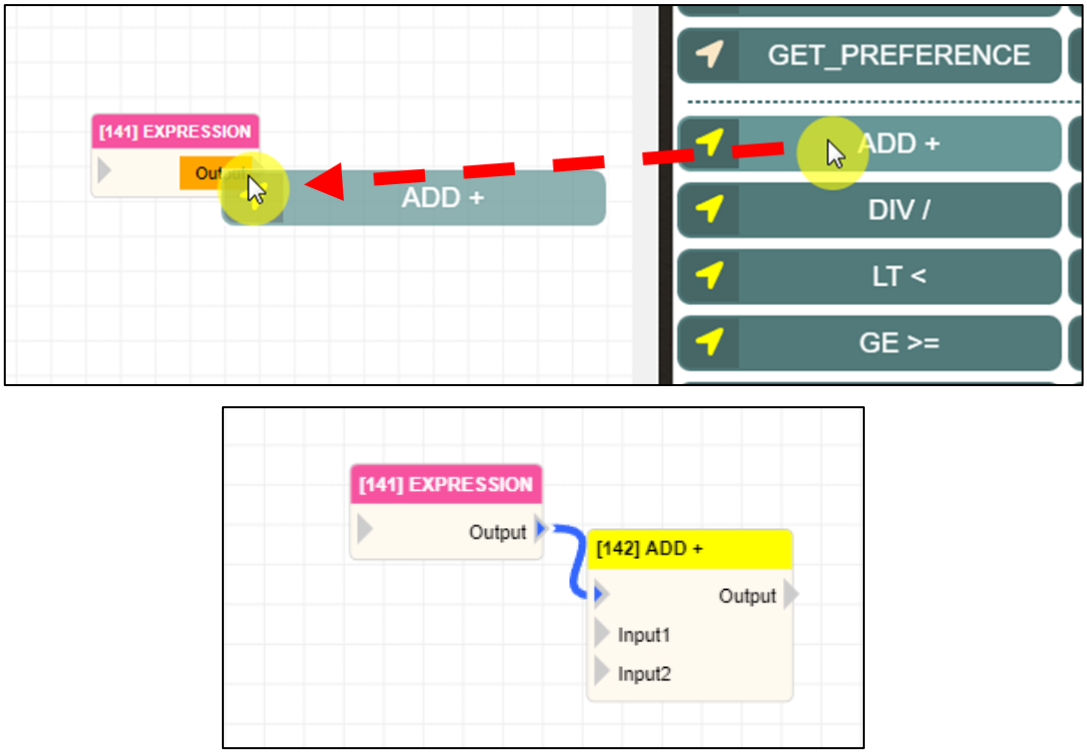


Dragging an operator from the list to the edit area creates the operator, as shown below.



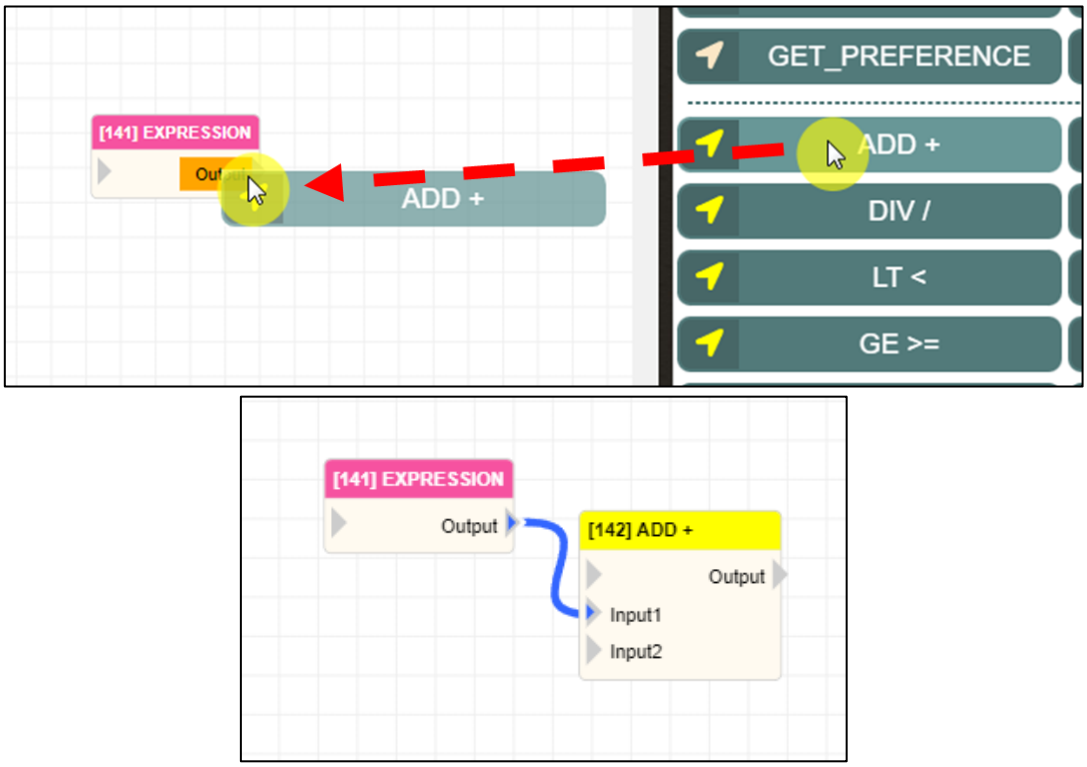


Dragging an operator to input or output of another operator will automatically connect the two operators, as shown in the following figure.



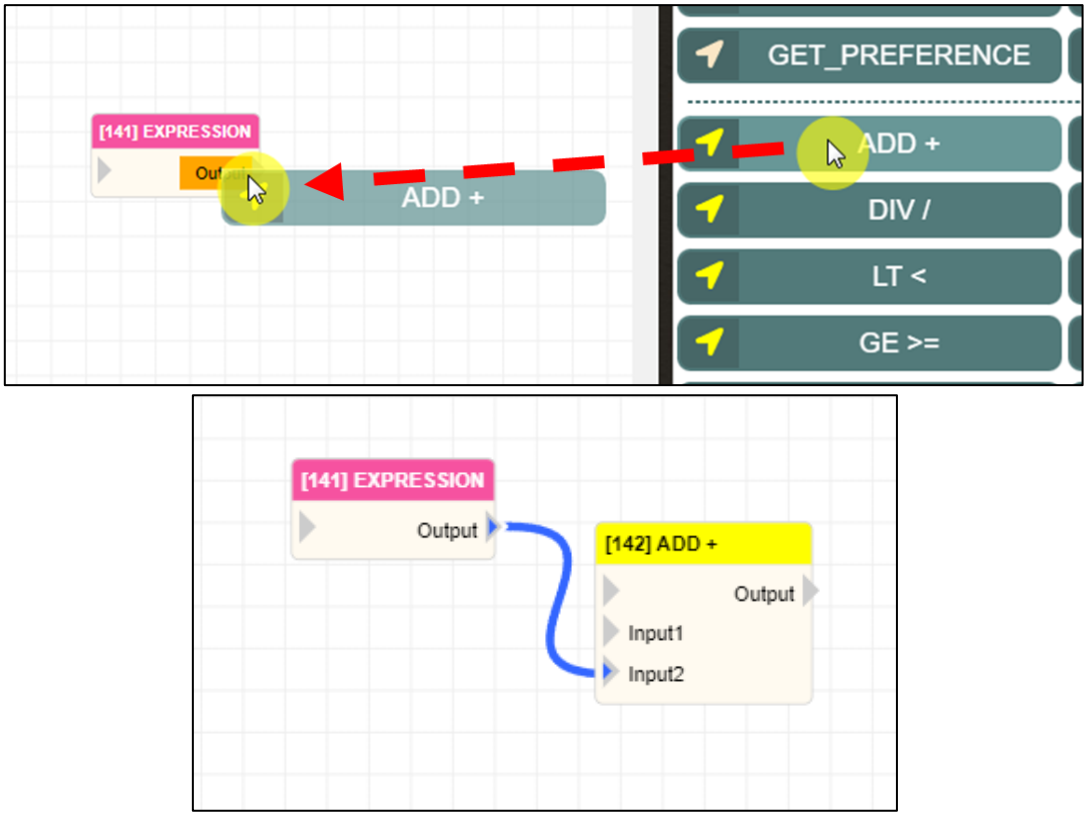
If a dragged operator has multiple inputs or outputs, **pressing the Ctrl key** while dragging to another operator's input or output will automatically connect the dragged operator's second input or output.

For example, in the following figure, dragging the ADD operator while **pressing the Ctrl key** to the EXPRESSION operator's output will automatically connect the output of EXPRESSION to the second input of ADD.

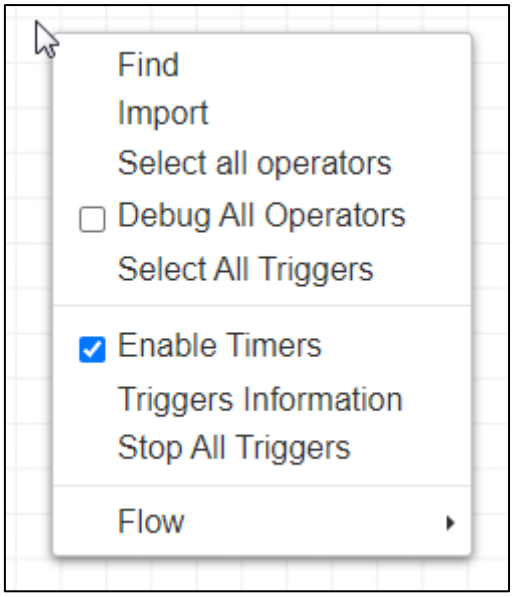


If a dragged operator has multiple inputs or outputs, **pressing the Alt key** while dragging to another operator's input or output will automatically connect the dragged operator's third input or output.

For example, in the following figure, dragging the ADD operator while **pressing the Alt key** to the EXPRESSION operator's output will automatically connect the output of EXPRESSION to the third input of ADD.

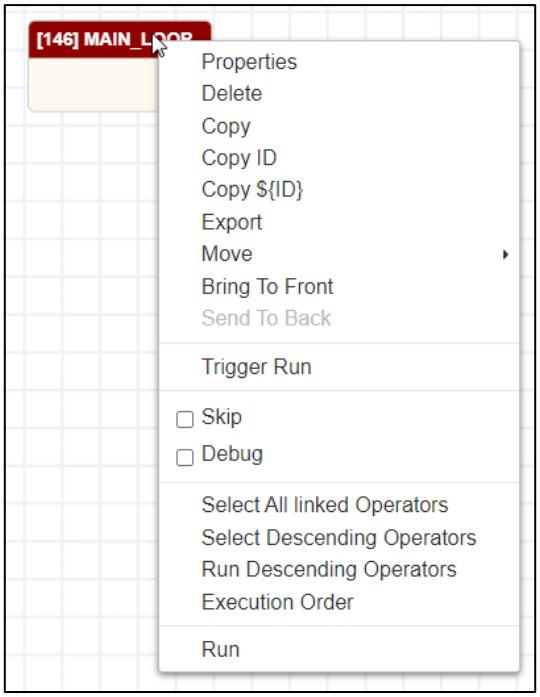


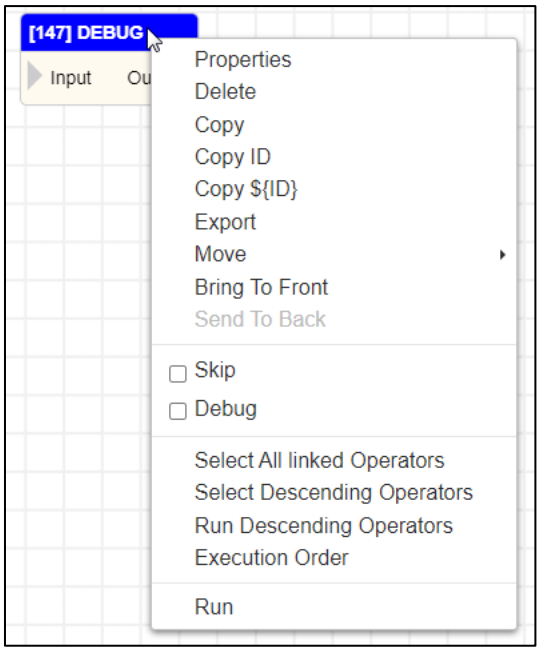
Right-clicking on the blank area in the editing area will bring up a contextual menu, as shown in the figure below. The menu options are described in the following table.



Name	Mean
Find	Search by operator order ID.
Import	Import *.OPS file.
Select All Operators	Select all operators.
Debug All Operators	Enable debug information for all operators.
Select All Triggers	Select all trigger operators.
Enable Timers	Whether to use timer operators.
Triggers Information	Display the process information of all trigger operators in the current VIC Flow. For further details, please refer to the appendix.
Stop All Triggers	Stop the execution of all trigger operators.
Flow	Switch to another flow page.

Right-clicking on a single operator brings up a context menu, as shown in the figure blew. The menu options are described in the following table.





Name	Mean
Properties	Display properties of the operator in the Properties field.
Delete	Delete the operator.
Copy	Duplicate the operator.
Copy ID	Copy the ID of the operator.
Copy ${ID}	Copy the ${ID} of the operator.
Export	Export the operator as a *.OPS file.
Move	Move the operator to another flow page.
Bring To Front	Move the operator above another operator.
Send To Back	Move the operator below another operator.
Trigger Run*	Trigger the executiono of the program. Note:Only applicable to Trigger Operator.
Update*	Display the update dialog of the operator for configuration.
Skip	Set whether to skip the operator.
Debug	Turn on/off debugging information for the operator.
Select All linked Operators	Select all operators connected to the operator.
Select Descending Operators	Select all child operators of the operator.
Run Descending Operators	Execute only the child operators of the operator.

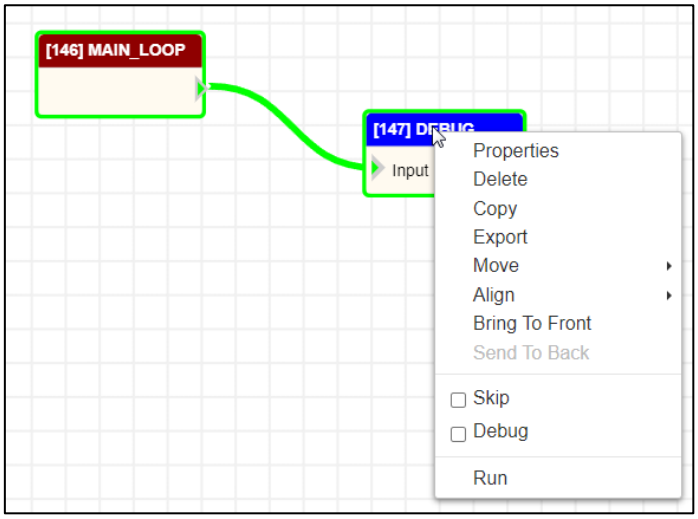
Execution Order	Print the execution sequence of the child operators.
Run	Execute only the operator.
Snap*	Capture an image and execute (require to be under MAIN_LOOP operator).

Note:* indicates that it is only applicable to operators with the Update field setting (such as TOOL.OCR, OCR_CLICK, CONTROL_FILE, etc.).

Note:* indicates that it is only applicable to trigger operators (such as MAIN_LOOP, TRIGGER, etc.).

Note:* indicates that it is only supported by VIC series products.

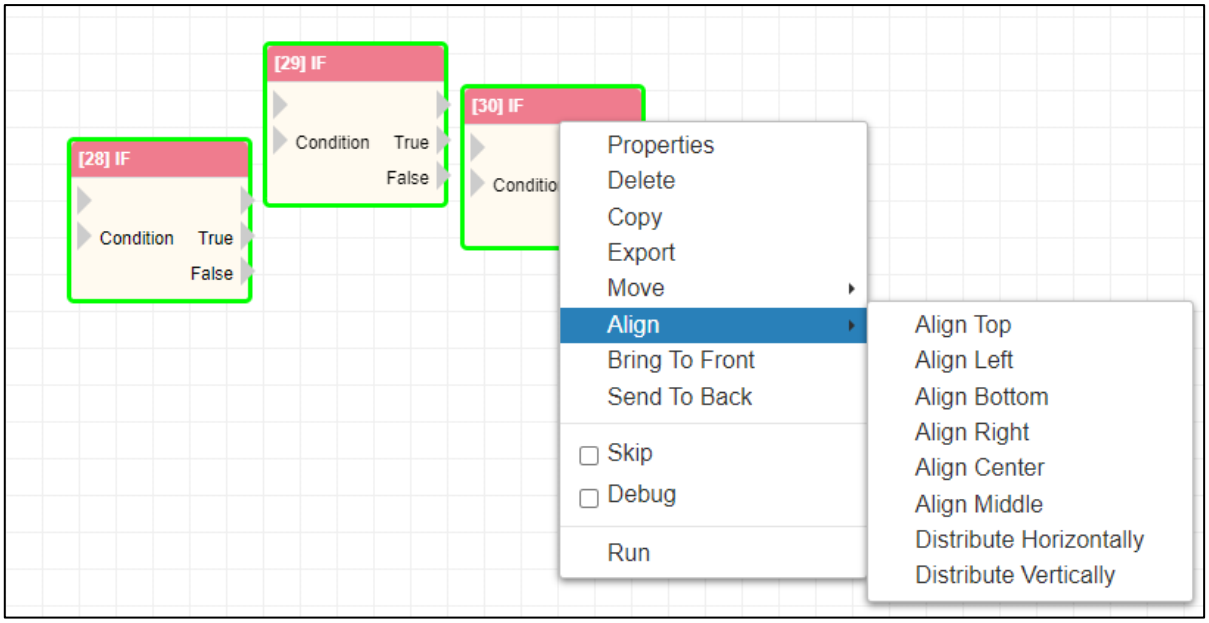
After selecting multiple operators and right-clicking on the theme, a menu with various functions will appear. The functions available in this menu are described in the following table.



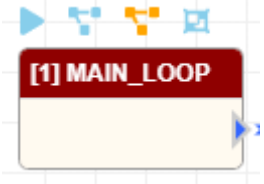
Name	Mean
Properties	Display the common attribute settings of the group operator in the properties field.
Delete	Delete the group operator.
Copy	Duplicate the group operator.
Export	Export the group operator as a *.OPS file.
Move	Move the group operator to another flow page.
Align	Align the operators in the group.
Bring To Front	Move the group operator above another operator.
Send To Back	Move the group operator below another operator.
Skip	Set whether to skip the group operator.
Debug	Turn on/off the debugging information of the group operator.
Run	Execute the group operator.
Snap*	Capture an image and execute (require to be under MAIN_LOOP operator).

Note:* indicates that it is only supported by VIC series products.

When aligning, if you select multiple operators all at once, the alignment will be based on the top, bottom, left, or right edges of the selected operators. If you Ctrl-click on operators, the alignment will be based on the first operator clicked as the reference for alignment.



When you hover your mouse over an operator, function buttons will appear above the operator, as shown in the figure below. The descriptions of these buttons are provided in the table below.

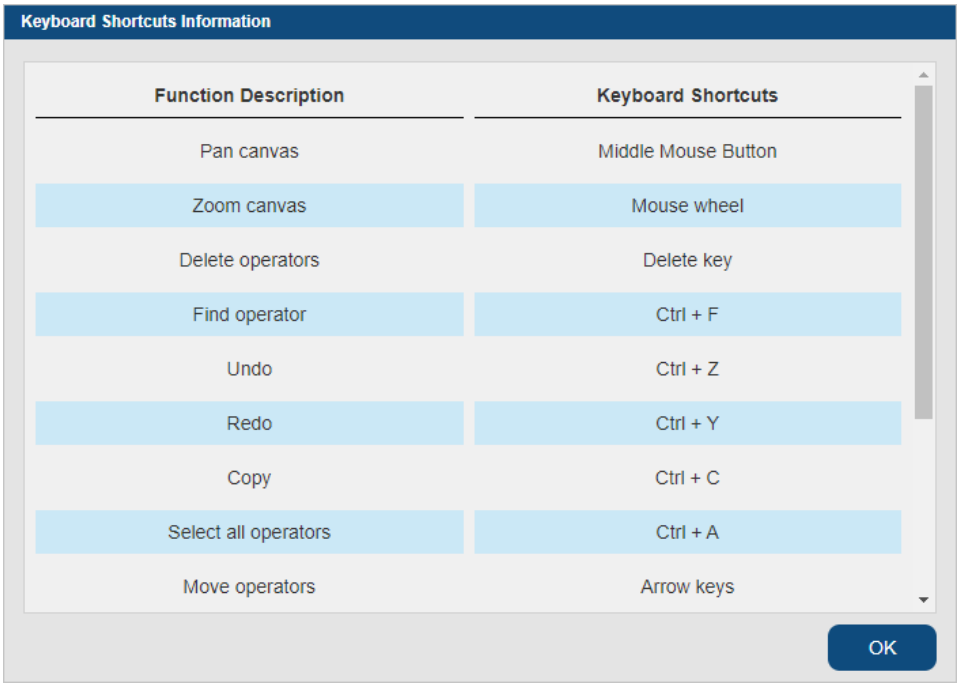


Icon	Name	Funciton
	Run	Execute only the operator.
	Run Descending Operators	Execute only the child operators of the operator.
	Run Descending Operators (delay)	Execute the child operators of the operator with a delay time.
	Select Descending Operators	Select all child operators of the operator.

Note: The field for setting the delay time is located in the Delay Time (ms) For Running Descending Operators in the system settings.

2 Keyboard Shortcuts

Clicking on the Shortcut Information button  will display a list of keyboard shortcuts with their respective explanations, as shown in the image below.



The detailed description of keyboard shortcuts behavior is shown in the table below.

Keyboard shortcuts	Behavior
F1	Select the previous selected operators.
F2	Execute selected operators.
F3	Turn on/off dashboard mode.
F4	Show triggers information dialog.
F6	Switch the script.
F9	Reload Python module.
Delete	Delete operator.
Arrow keys (up, down, left, right)	Move operators.
Ctrl + A	Select all operators.
Ctrl + C	Duplicate operator.
Ctrl + F	Find for operator.
Ctrl + Z	Undo
Ctrl + Y	Redo
Alt + Double-click with the left mouse button on an operator	Enter the update dialog of the operator directly.
Mouse wheel	Change zoom ratio.
Middle mouse button	Move editing area

3 Expressions

When setting up operators in VIC Flow, various expressions are often used. Expressions can be categorized as follows：

3.1 Python Expression

Python Expression can be used in VIC Flow, and they can include integer, string, boolean, as well as direct use of internal product operators.

These expressions are evaluated as a Python expression, using the globals and locals parameters as the global and local namespace, repectively.

3.2 Inline Python Expression String

In VIC Flow, Python Expression can be executed as string. However, to use product's internal operators, they must be enclosed in ${}.

3.3 Inline Python Expression String and %1

Similar to Python Expression String, but with an additional feature: using "%1" to call the input variable of the operator.

3.4 Python Expression List

Similar to Python Expression, except the output is a list. An example is as follows:
true, 123, "abc", which outputs [true, 123, "abc"].

3.5 Python Code

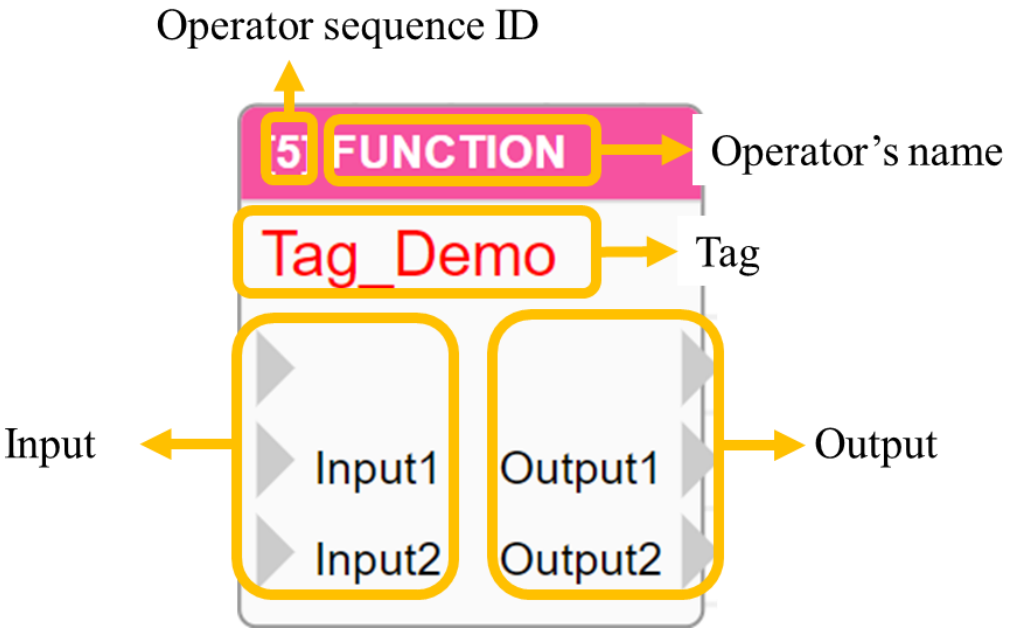
Similar to writing Python programming language.

4 Operator

In the editing area, an operator has fixed information and editing field, taking the FUNCTION operator as an example. The schematic diagram is as follows.

Note: The label field needs to be set in the operator content to display the operator's label.

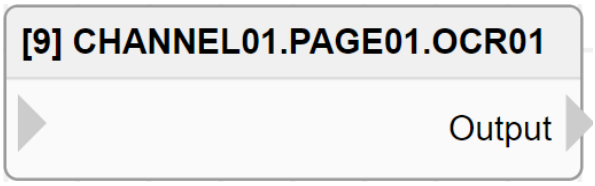
Note: The operator ID is the sequence in which the operator was created, not the order in which it will be executed.



4.1 Each product tool

4.1.1 Recognition tools (only supported VIC series products)

Retrieve the recognition results of OCR, COLOR, and PATTERN recognition tools in the channel and page of the recognition settings.



	UI Name	Behavior
Input		
Output	Output	Output the recognition results of the identification tool.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

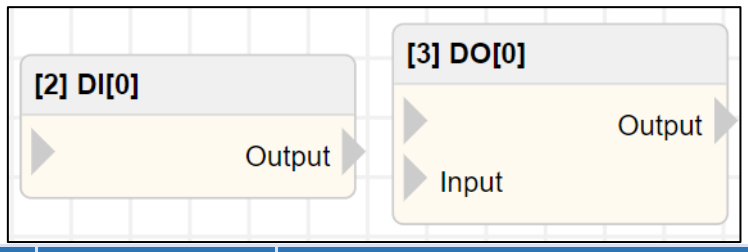
Note：Other operators can utilitze Python Expression String such as ${CHANNELx.PAGEy.OCRz}, ${CHANNELx.PAGEy.COLORz}, ${CHANNELx.PAGEy.PATTERNz} to retrieve the recognition results of recognition tools within channels and pages. Here, x represents the channel number, y represents the page number, and z represents the recognition tool number.

4.1.2 I/O tool (only supported by nDAS series and nPAC products)

Acquiring I/O signals or setting I/O signal outputs is done differently depending on the specific product. Please refer to the product manual for detailed instructions.

4.1.2.1 nDAS series products

If it is an input signal, there will only be an output; conversely, if it is an output signal, there will be both input and output, as shown in the diagram below.



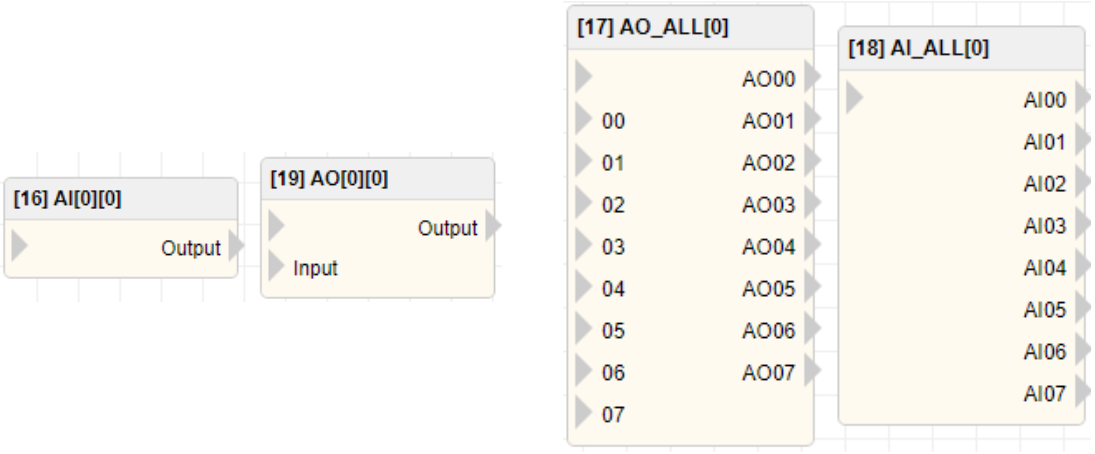
	UI Name	Behavior
Input		
	Input	Input the signal value to output.
Output	Output	Output the value obtained from the signal.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Channel	Set the index of the channel, starting from 0.	Integer

4.1.2.2 nPAC product

Digital and analog signals each have their own separate channel operators, as well as operators that apply to all channels in the slot, as shown below.

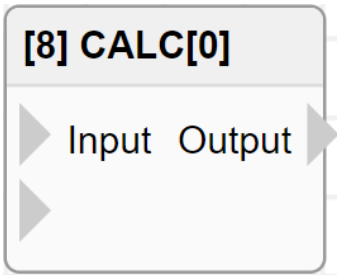


Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Slot	Set the index of the slot, starting from 0.	Integer
Channel	Set the index of the channel, starting from 0.	Integer

4.2 Calc

Calculation variables are variables within the script that can be used to store execution results, display execution results in the interface, record execution results and store them in the database, or send them via other communication protocols. This software provides a total of 100 calculation variables within the script.



	UI Name	Behavior
Input	Input	Input the value to write to the calculation variable.
Output	Output	Output the value stored in the calculation variable.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the operator to use the numerical identifier of the calculation variable.	Integer

4.3 Modbus

4.3.1 Bit Channel (only supported by nDAS series and nPAC products)

The product configuration page provides users with a Modbus TCP/RTU communication interface, and also offers Modbus Master COM/TCP Port monitoring. Each port supports a total of 64 Bit Channels.

	UI Name	Behavior
Input	Input	Input the value for Modbus Master's bit channel.
Output	Output	Output the value of the bit channel read by the Modbus Master.
	Error	Output the error code when reading the bit channel with the Modbus Master.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
COM	Specify the port number for the Modbus Master configuration.	
Channel	Set the number of the Modbus bit the operator uses .	Integer

4.3.2 Word Channel (only supported by nDAS series and nPAC products)

The product configuration page provides users with a Modbus TCP/RTU communication interface, and also offers Modbus Master COM/TCP Port monitoring. Each port supports a total of 64 Word Channels.

	UI Name	Behavior
Input	Input	Input the value for Modbus Master's word channel.
Output	Output	Output the value of the word channel read by the Modbus Master.
	Error	Output the error code when reading the word channel with the Modbus Master.

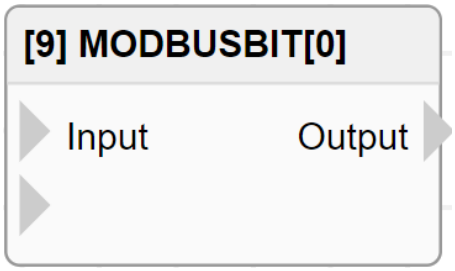
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
COM	Specify the port number for the Modbus Master configuration.	
Channel	Set the number of the Modbus word the operator uses.	Integer

4.3.3 Modbus Bit

The communication field for customized Modbus Bit is Input Status (1x). The address allocation table is shown in the following table. In the VIC series, there are a total of 100 available Modbus registers, while in the nDAS series and nPAC, there are 65535 Modbus registers.

VIC series		nDAS series and nPAC	
Address(1x)	**Explanation**	**Address(1x)**	**Explanation**
10101	MODBUSBIT[0]	**10001**	MODBUSBIT[1]
10102	MODBUSBIT[1]	**10002**	MODBUSBIT[2]
	. . .		. . .
10200	MODBUSBIT[99]	**165535**	MODBUSBIT[65535]



	UI Name	Behavior
Input	Input	Input the value to be written to the Modbus Bit.
Output	Output	Output the value stored in the Modbus Bit.

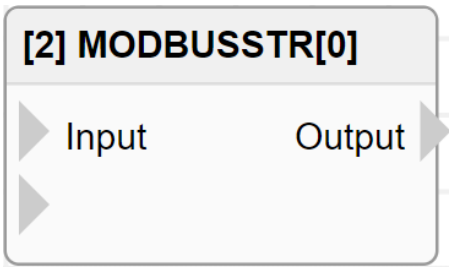
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the Modbus Bit number used by this operator.	Integer

4.3.4 Modbus String

The communication field for customized Modbus String is Input Register (3x). The address allocation table is as follows. In the VIC series products, the length of each MODBUSSTR is 249 bytes, equivalent to 125 words, and there are a total of 100 Modbus String available. However, in the nDAS series and nPAC, there are 65534 Modbus String available.

VIC series		nDAS series and nPAC	
Address(3x)	**Explanation**	**Address(3x)**	**Explanation**
337501 ~ 337625	MODBUSSTR[0]	**30001**	MODBUSSTR[1]
337626 ~ 337750	MODBUSSTR[1]	**30002**	MODBUSSTR[2]
.		.	
.		.	
.		.	
349876 ~ 350000	MODBUSSTR[99]	**365534**	MODBUSSTR[65534]



	UI Name	Behavior
Input	Input	Input the value to be written to the Modbus String.
Output	Output	Output the value stored in the Modbus String.

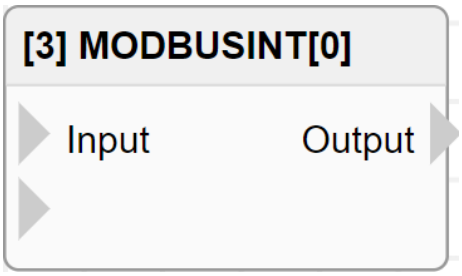
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the Modbus String number used by this operator.	Integer

4.3.5 Modbus Int

The communication field for customized Modbus Int is Input Register (3x). The length of each MODBUSINT is 4 bytes, equivalent to 2 words. The address allocation table is as follows. Each Modbus Int is a 32-bit signed integer, with a range of -2,147,483,648 to 2,147,483,647. In the VIC series, there are a toatal of 100 Modbus Int available, while in the nDAS series and nPAC, there are a total of 65534 Modbus Int available.

VIC series		nDAS series and nPAC	
Address(3x)	**Explanation**	**Address(3x)**	**Explanation**
350401 ~ 350402	MODBUSINT[0]	**30001**	MODBUSINT[1]
350403 ~ 350404	MODBUSINT[1]	**30002**	MODBUSINT[2]
. . .		. . .	
350599 ~ 350600	MODBUSINT[99]	**365534**	MODBUSINT[65534]



	UI Name	Behavior
Input	Input	Input the value to be written to the Modbus Int.
Output	Output	Output the value stored in the Modbus Int.

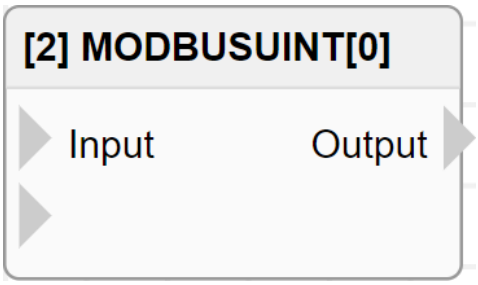
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSINT number used by this operator.	Integer

4.3.6 Modbus Uint

The communication field for customized Modbus Uint is Input Register (3x). The length of each MODBUSUINT is 4 bytes, equivalent to 2 words. The address allocation table is as follows. Each Modbus Uint is a 32-bit unsigned integer, with a range of 0 to 4,294,967,295. In the VIC series, there are a total of 100 Modbus Uint available, while in the nDAS series and nPAC, there are a total of 65534 Modbus Uint available.

VIC series		nDAS series and nPAC	
Address(3x)	**Explanation**	**Address(3x)**	**Explanation**
350601 ~ 350602	MODBUSUINT[0]	**30001**	MODBUSUINT[1]
350603 ~ 350604	MODBUSUINT[1]	**30002**	MODBUSUINT[2]
. . .		. . .	
350799 ~ 350800	MODBUSUINT[99]	**365534**	MODBUSUINT[65534]



	UI Name	Behavior
Input	Input	Input the value to be written to the Modbus Uint.
Output	Output	Ouput the value stored in the Modbus Uint.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSUINT number used by this operator.	Integer

4.3.7 Modbus UInt16 (only supported by nDAS series and nPAC products)

The communication field for customized Modbus UInt16 is Input Register(3x). The length of each MODBUSUINT16 is 2 bytes, equivalent to 1 Word. The address allocation table is as follows. This software can use up to 65535 Modbus UInt16. Each Modbus UInt16 is 16-bit unsigned integer, with a range of 1 to 65535.

Address(3x)	Explanation
30001	MODBUSUINT16[1]
30002	MODBUSUINT16[2]
	. . .
365535	MODBUSUINT16[65535]

	UI Name	Behavior
Input	Input	Input the value to be written to the Modbus UInt16.
Output	Output	Output the value stored in the Modbus UInt16.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSUINT16 number used by this operator.	Integer

4.3.8 ModbusH Bit (only supported by nDAS series and nPAC products)

The communication field for customized ModbusH Bit is Coil Status(0x). The available ModbusH Bit is up to 65535. The address allocation table is as follows.

Address(0x)	Explanation
00001	MODBUSHBIT[1]
00002	MODBUSHBIT[2]
	. . .
065535	MODBUSHBIT[65535]

	UI Name	Behavior
Input	Input	Input the value to be written to the ModbusH Bit.
Output	Output	Output the value stored in the ModbusH Bit.

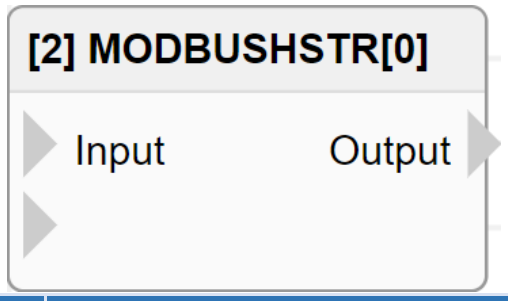
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSHBIT number used by this operator.	Integer

4.3.9 ModbusH String

The communication field for customized ModbusH String is Holding Register (4x).The address allocation table is as follows. In the VIC series products, the length of each MODBUSHSTR is 101 bytes, equivalent to 51 words and there are a total of 200 ModbusH String available. However, in nDAS series and nPAC, there are 65534 ModbusH String available.

VIC series		nDAS series and nPAC	
Address(4x)	**Explanation**	**Address(4x)**	**Explanation**
40001 ~ 40051	MODBUSHSTR[0]	**40001**	MODBUSHSTR[1]
40052 ~ 40102	MODBUSHSTR[1]	**40002**	MODBUSHSTR[2]
. . .		. . .	
410150 ~ 410200	MODBUSHSTR[199]	**465534**	MODBUSHSTR[65534]



	UI Name	Behavior
Input	Input	Input the value to be written to the ModbusH String.
Output	Output	Output the value stored in the ModbusH String.

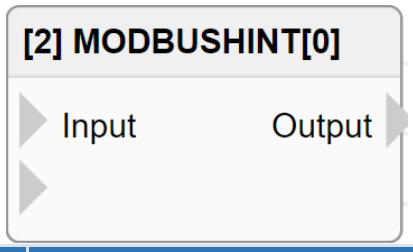
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSHSTR number used by this operator.	Integer

4.3.10 ModbusH Int

The communication field for customized ModbusH Int is Holding Register (4x). The length of each MODBUSHINT is 4 bytes, equivalent to 2 words. The address allocation table is as follows. Each ModbusH Int is a 32-bit signed integer, with a range of -2,147,483,648 to 2,147,483,647. In the VIC series, there are a total of 500 ModbusH Int available, while in the nDAS series and nPAC, there are a total of 65534 ModbusH Int available.

VIC series		nDAS series and nPAC	
Address(4x)	**Explanation**	**Address(4x)**	**Explanation**
410201 ~ 410202	MODBUSHINT[0]	**40001**	MODBUSHINT[1]
410203 ~ 410204	MODBUSHINT[1]	**40002**	MODBUSHINT[2]
.		.	
.		.	
.		.	
411199 ~ 411200	MODBUSHINT[499]	**465534**	MODBUSHINT[65534]



	UI Name	Behavior
Input	Input	Input the value to be written to the ModbusH Int.
Output	Output	Output the value stored in the ModbusH Int.

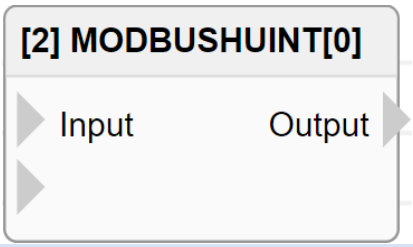
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSHINT number used by this operator.	Integer

4.3.11 ModbusH Uint

The communication field for customized ModbusH Uint is Holding Register (4x). The length of each MODBUSHUINT is 4 bytes, equivalent to 2 words. The address allocation table is as follows. Each ModbusH Uint is a 32-bit unsigned integer, with a range of 0 to 4,294,967,295. In the VIC series, there are a total of 500 ModbusH Uint available, while in the nDAS series and nPAC, there are a total of 65534 ModbusH Uint available.

VIC series		nDAS series and nPAC	
Address(4x)	**Explanation**	**Address(4x)**	**Explanation**
411201 ~ 411202	MODBUSHUINT[0]	**40001**	MODBUSHUINT[1]
411203 ~ 411204	MODBUSHUINT[1]	**40002**	MODBUSHUINT[2]
	.		.
	.		.
	.		.
412199 ~ 412200	MODBUSHUINT[499]	**465534**	MODBUSHUINT[65534]



	UI Name	Behavior
Input	Input	Input the value to be written to the ModbusH Uint.
Output	Output	Output the value stored in ModbusH Uint.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSHUINT number used by this operator.	Integer

4.3.12 ModbusH UInt16 (only supported by nDAS series and nPAC products)

The communication field for customized ModbusH UInt16 is Holding Register(4x). The length of each MODBUSHUINT16 is 2 bytes, equivalent to 1 Word. The address allocation table is as follows. This software can use up to 65535 ModbusH UInt16. Each ModbusH UInt16 is 16-bit unsigned integer, with a range of 1 to 65535.

Address(4x)	Explanation
40001	MODBUSHUINT16[1]
40002	MODBUSHUINT16[2]
	. . .
465535	MODBUSHUINT16[65535]

	UI Name	Behavior
Input	Input	Input the value to be written to the ModbusH UInt16.
Output	Output	Output the value stored in the ModbusH UInt16.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Index	Configure the MODBUSHUINT16 number used by this operator.	Integer

4.3.13 Read Modbus System Bit

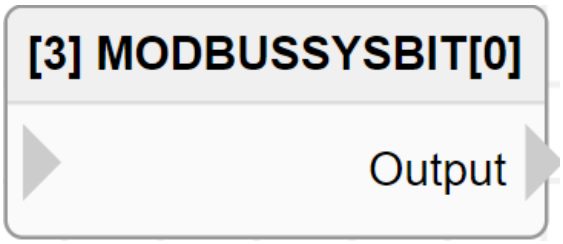
Reading the Modbus Bits of the product system can be used to obtain the current status of the system. The Modbus Bits planned for the system are listed in the following table along with detailed descriptions for each product. The communication field is Input Status (1x).

For VIC series products, please refer to the table below:

<table>
<tr><th>Address(1x)</th><th>Explanation</th><th>Address(1x)</th><th>Explanation</th></tr>
<tr><td>10001</td><td>Detecting if the project is running or stopped: 1 if running, 0 if stopped.</td><td>10009</td><td>Is the serial port control function enabled? 1 if enabled, 0 if disabled.</td></tr>
<tr><td>10002</td><td>Checking if there is a user logged in: 1 if logged in, 0 if not.</td><td>10010</td><td>Status of the selected serial port for serial port control: 1 if connected, 0 if disconnected.</td></tr>
<tr><td>10003</td><td>Checking system hard disk capacity of 100GB: 1 if capacity is low, 0 if capacity is sufficient.</td><td>10017</td><td>Detection of database hard disk capacity of 100G: 1 if below, 0 if above.</td></tr>
<tr><td>10004</td><td>Checking system hard disk capacity of 50GB: 1 if capacity is low, 0 if capacity is sufficient.</td><td>10018</td><td>Detection of database hard disk capacity of 50G: 1 if below, 0 if above.</td></tr>
<tr><td>10005</td><td>Checking if the database’s stop-save mechanism is enabled: 1 if enabled, 0 if disabled.</td><td>10019</td><td>Detection of recording hard disk capacity of 100G: 1 if below, 0 if above.</td></tr>
<tr><td>10006
(Bit 6)</td><td rowspan="2">OCR recognition result:
0 indicates successful recognition,
1 indicates recognition failure.
2 indicates comparison failure.
<table><tr><th>Bit 7</th><th>Bit 6</th><th>Sum</th><th>Recognition Result</th></tr><tr><td>0</td><td>0</td><td>0</td><td>Success</td></tr><tr><td>0</td><td>1</td><td>1</td><td>Failure</td></tr><tr><td>1</td><td>0</td><td>2</td><td>No matching</td></tr></table></td><td>10020</td><td>Detection of recording hard disk capacity of 50G: 1 if below, 0 if above.</td></tr>
<tr><td>10007
(Bit 7)</td><td>10021</td><td>Detection of external recording hard disk capacity of 100G: 1 if below, 0 if above.</td></tr>
<tr><td>10008</td><td colspan="2">Control Status.
1 if it is running and 0 if it is stopped.</td><td>10022</td><td>Is recording in progress? 1 if yes, 0 if stopped.</td></tr>
</table>

For nDAS series and nPAC products, please refer to the table below:

Address(1x)	Explanation
12001	Checking if there is a user logged in: 1 if logged in, 0 if not.
12002	Checking hard disk capacity of 1.5GB: 1 if capacity is low, 0 if capacity is sufficient.
12003	Checking hard disk capacity of 1GB: 1 if capacity is low, 0 if capacity is sufficient.



	UI Name	Behavior
Input		
Output	Output	Output the value stored in System Modbus Bit.

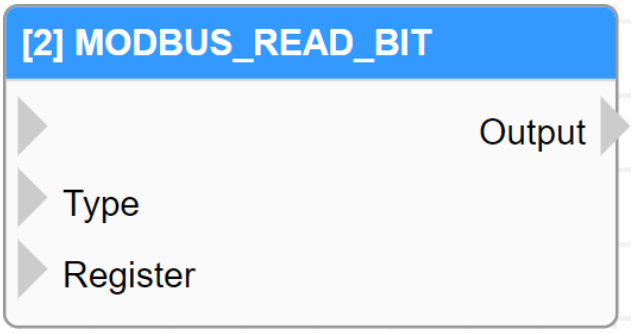
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.3.14 Modbus Functions

4.3.14.1 Modbus Read Bit

Read bit data from Modbus TCP Server or Modbus RTU Slave.



	UI Name	Behavior
Input		
	Type	Input the type that needs to be read, i.e., the address to be read from, such as Coil Status (0x) and Input Status (1x).
	Register	Enter the register address to be read.
Output	Output	Output the read result.

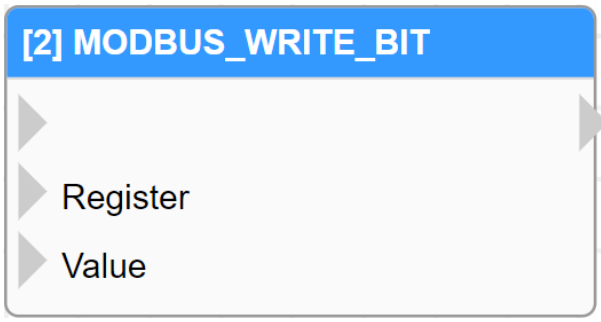
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Set up the Modbus connection to be used.	
Device ID	Configure the device id of the device to be connected.	Integer
Type	Specify the Modbus address code to be read. (0 = Coil Status、1 = Input Status)	
Register	Set the address of the register to be read.	Integer
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

Note: If there is a value input for the Type and the Register's input, the operator will use the value received from the input when executing.

4.3.14.2 Modbus Write Bit

Write bit data to the Coil Status address of a Modbus TCP Server or Modbus RTU Slave.



	UI Name	Behavior
Input		
	Register	Enter the register address to be written.
	Value	Enter the value to be written.
Output		

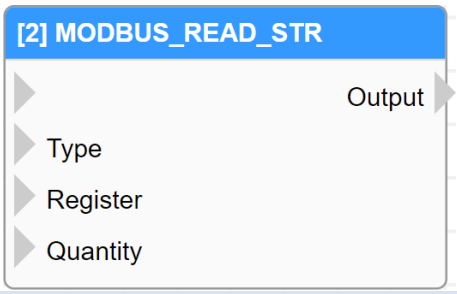
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Set up the Modbus connection to be used.	
Device ID	Configure the device id of the device to be connected.	Integer
Register	Set the address of the register to be written.	Integer
Value	Enter the value to be written.	Integer
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

Note: If there is a value input for the Value and the Register's input, the operator will use the value received from the input when executing.

4.3.14.3 Modbus Read String

Read string from Modbus TCP Server or Modbus RTU Slave, and convert the data in the registers to a string using the ASCII standard.



	UI Name	Behavior
Input		
	Type	Input the type that needs to be read, i.e., the address to be read from, such as Input Register(3) and Holding Register(4).
	Register	Enter the register address to be read.
	Quantity	Enter the number of registers to be read.
Output	Output	Output the read result.

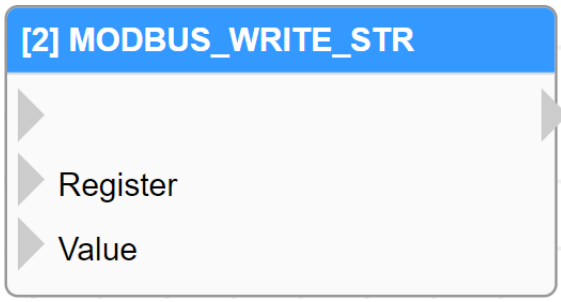
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Set up the Modbus connection to be used.	
Device ID	Configure the device id of the device to be connected.	Integer
Type	Specify the Modbus address code to be read. (3 = Input Register, 4 = Holding Register)	
Register	Set the address of the register to be read.	Integer
Quantity	Set the number of registers to be read.	Integer
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

Note: If there is a value input for the Type, Quantity and the Register's input, the operator will use the value received from the input when executing.

4.3.14.4 Modbus Write String

Write string to the Holding Register address of a Modbus TCP Server or Modbus RTU Slave.



	UI Name	Behavior
Input		
	Register	Enter the register address to be written.
	Value	Enter the value to be written.
Output		

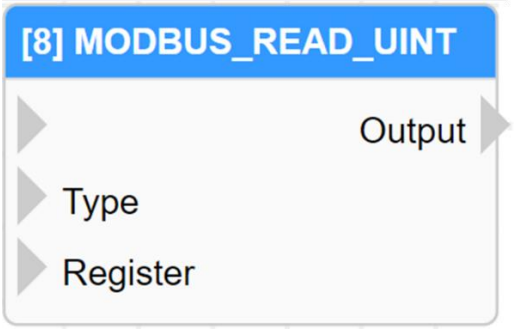
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Set up the Modbus connection to be used.	
Device ID	Configure the device id of the device to be connected.	Integer
Register	Set the address of the register to be written.	Integer
Value	Enter the value to be written.	String
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

Note: If there is a value input for the Value and the Register's input, the operator will use the value received from the input when executing.

4.3.14.5 Modbus Read Unit

Read integer from Modbus TCP Server or Modbus RTU Slave, retrieve the integer from a single register in the 16-bit unsigned integer format.



	UI Name	Behavior
Input		
	Type	Input the type that needs to be read, i.e., the address to be read from, such as Input Register(3) and Holding Register(4).
	Register	Enter the desired register address to be read.
Output	Output	Output the read result.

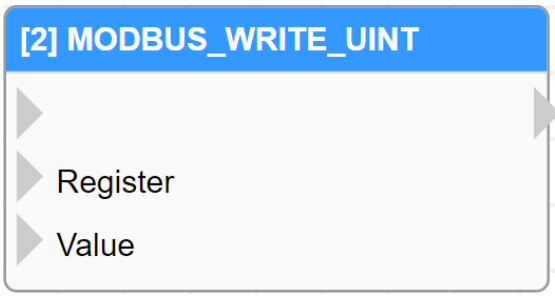
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Set up the Modbus connection to be used.	
Device ID	Configure the device id of the device to be connected.	Integer
Type	Specify the Modbus address code to be read. (3 = Input Register, 4 = Holding Register)	
Register	Set the address of the register to be read.	Integer
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

Note: If there is a value input for the Type and the Register's input, the operator will use the value received from the input when executing.

4.3.14.6 Modbus Write Unit

Write integer to the Holding Register address of a Modbus TCP Server or Modbus RTU Slave



	UI Name	Behavior
Input		
	Register	Enter the register address to be written.
	Value	Enter the value to be written.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Set up the Modbus connection to be used.	
Device ID	Configure the device id of the device to be connected.	Integer
Register	Set the address of the register to be written.	Integer
Value	Enter the value to be written.	Integer
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

Note: If there is a value input for the Value and the Register's input, the operator will use the value received from the input when executing.

4.4 SECS/GEM

4.4.1 Equipment

4.4.1.1 ON_S02F41

The operator triggered by the reception of S02F41.

	UI Name	Behavior
Output	json	Output the received parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

4.4.1.2 ON_S02F49

The operator triggered by the reception of S02F49.

	UI Name	Behavior
Output	json	Output the received parameters.

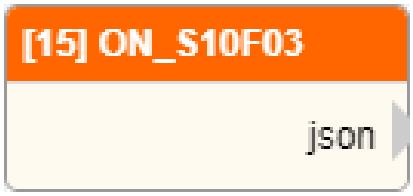
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

4.4.1.3 ON_S10F03

The operator triggered by the reception of S10F03.



	Name	Mean
Output	json	Output the received parameters.

Properties

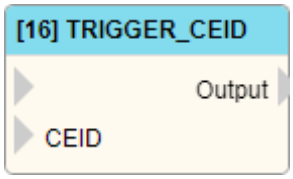
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

4.4.1.4 TRIGGER_CEID

An operator capable of transmitting messages in the S06F11 format of SECS/GEM.

Note: CEID must be set in the SECS/GEM page beforehand.



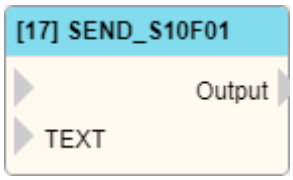
	UI Name	Behavior
Input		
	CEID	Input the CEID to trigger.
Output	Output	Output the returned parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
CEID	Set the CEID to trigger.	
Wait Response	When checked, the operator will wait for a response from the host before outputting and continuing with the subsequent flow; if unchecked, it will continue directly with the subsequent flow.	

4.4.1.5 SEND_S10F01

An operator capable of transmitting messages in the S10F01 format of SECS/GEM.



	UI Name	Behavior
Input		
	TEXT	Input the value of the TEXT to send.
Output	Output	Output the returned parameters.

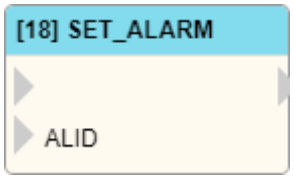
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
TID	Set the TID to send.	Integer
TEXT	Set the TEXT to send.	String
Wait Response	When checked, the operator will wait for a response from the host before outputting and continuing with the subsequent flow; otherwise, if unchecked, it will continue directly with the subsequent flow.	

4.4.1.6 SET_ALARM

An operator capable of transmitting messages in the S05F01 format of SECS/GEM.

Note: ALID must be set in the alarm on the SECS/GEM page beforehand.



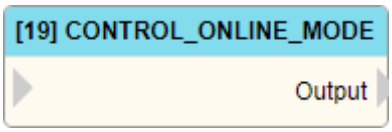
	UI Name	Behavior
Input		
	ALID	Input the value of the ALID to send.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
ALID	Set the ALID to send.	
Set	Set the ALID status to send.	
Wait Response	When checked, the operator will wait for a response from the host before outputting and continuing with the subsequent flow; otherwise, if unchecked, it will continue directly with the subsequent flow.	

4.4.1.7 CONTROL_ONLINE_MODE

Obtain the operator for the current ON-LINE control mode of the SECS/GEM equipment.



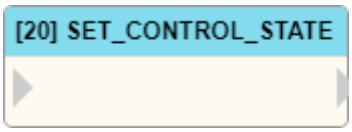
	UI Name	Behavior
Input		
Output	Output	Output the ON-LINE control of the current device, with the modes being LOCAL and REMOTE, respectively.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.4.1.8 SET_CONTROL_STATE

Setting up an operator to control the state of the SECS/GEM equipment.



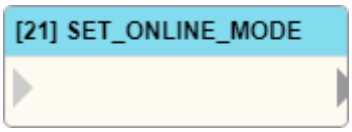
	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Control Mode	Configure the control status of the equipment at the ON-LINE and OFF-LINE states.	

4.4.1.9 SET_ONLINE_STATE

Setting up an operator to ON-LINE state of the SECS/GEM equipment.



	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
ON-LINE Mode	Set the ON-LINE status of the device to LOCAL and REMOTE respectively.	

4.4.2 Host (only supported VIC series products with SECS/GEM support.)

4.4.2.1 ON_S05F01

The operator triggered by the reception of S05F01.

	UI Name	Behavior
Output	json	Output the received parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

4.4.2.2 ON_S06F11

The operator triggered by the reception of S06F11.

	UI Name	Behavior
Output	json	Output the received parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

4.4.2.3 ON_S10F01

The operator triggered by the reception S10F01.

	UI Name	Behavior
Output	json	Output the received parameters.

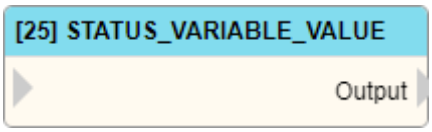
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

4.4.2.4 STATUS_VARIABLE_VALUE

An operator capable of transmitting messages in the S01F03 format of SECS/GEM.



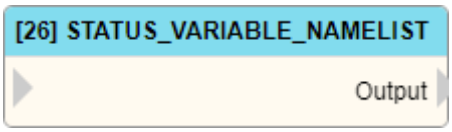
	UI Name	Behavior
Input		
Output	Output	Output the returned parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the SECS/GEM host connection to be used.	
SVIDs	Send the desired SVIDs to be retrieved, separated by commas.	
Wait Response	When checked, the operator will wait for a response from the equipment before outputting and continuing with the subsequent flow; otherwise, if unchecked, it will continue directly with the subsequent flow.	

4.4.2.5 STATUS_VARIABLE_NAMELIST

An operator capable of transmitting messages in the S01F11 format of SECS/GEM.



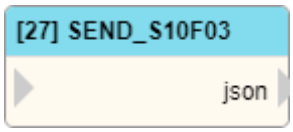
	UI Name	Behavior
Input		
Output	Output	Output the returned parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the SECS/GEM host connection to be used.	
SVIDs	Send the SVIDs to be retrieved, separated by commas.	
Wait Response	When checked, the operator will wait for a response from the equipment before outputting and continuing with the subsequent flow; otherwise, if unchecked, it will continue directly with the subsequent flow.	

4.4.2.6 SEND_S10F03

An operator capable of transmitting messages in the S10F03 format of SECS/GEM.



	UI Name	Behavior
Input		
Output	json	Output the returned parameters.

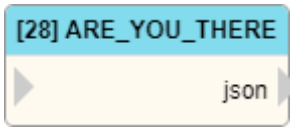
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the SECS/GEM host connection to be used.	
TID	Set the TID to send.	Integer
TEXT	Set the TEXT to send.	String
Wait Response	When checked, the operator will wait for a response from the equipment before outputting and continuing with the subsequent flow; if unchecked, it will continue directly with the subsequent flow.	

4.4.3 Common

4.4.3.1 ARE_YOU_THERE

An operator capable of transmitting messages in the S01F01 format of SECS/GEM.



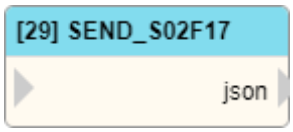
	UI Name	Behavior
Input		
Output	json	Output the returned parameters.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Role	Set the option to use either the host or the equipment for sending.	
Link ID	Configure the SECS/GEM host connection to be used.	
Wait Response	When checked, the operator will wait for a response from the other side before outputting and continuing with the subsequent flow; otherwise, if unchecked, it will continue directly with the subsequent flow.	

4.4.3.2 SEND_S02F17

An operator capable of transmitting messages in the S02F17 format of SECS/GEM.



	UI Name	Behavior
Input		
Output	json	Output the returned parameters.

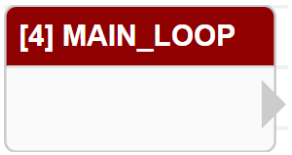
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Role	Set the option to use either the host or the equipment for sending.	
Link ID	Configure the SECS/GEM host connection to be used.	
Wait Response	When checked, the operator will wait for a response from the other side before outputting and continuing with the subsequent flow; otherwise, if unchecked, it will continue directly with the subsequent flow.	

4.5 Trigger Operator

4.5.1 MAIN_LOOP

The VIC-Flow main loop, which is triggered every time the software runs.



	UI Name	Behavior
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Sync	Configure synchronization settings.	

4.5.2 TRIGGER

Trigger operators can be activated through function in text mode scripts or the RUN_TRIGGER operator in VIC-Flow.

	UI Name	Behavior
Input		
Output	Output	Output the values inputted by the RUN_TRIGGER operator triggered by its Input.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Alias	Set the alias for the operator.	String
Fixed arr*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note:* indicates that it is only supported by VIC series products.

Note: The "TRIGGER_OPERATOR(operator_id)" API can be triggered through text mode scripting. If a return value is set, it will be obtained after the API execution is completed.

Note: The "RUN_TRIGGER" operator can be triggered through the flow chart mode scripting. If a value is input in the Input of the RUN_TRIGGER operator, it will be passed to the Output of the triggered TRIGGER operator.

4.5.3 ON_RESTFUL

Trigger operator execution through RESTful API.

	UI Name	Behavior
Output	json	Output the parameters sent to VIC-Flow through RESTful API. The data type is a JSON string.
	arr*	Output the image sent to VIC-Flow through RESTful API.

Note:* indicates that it is only supported by VIC series products.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

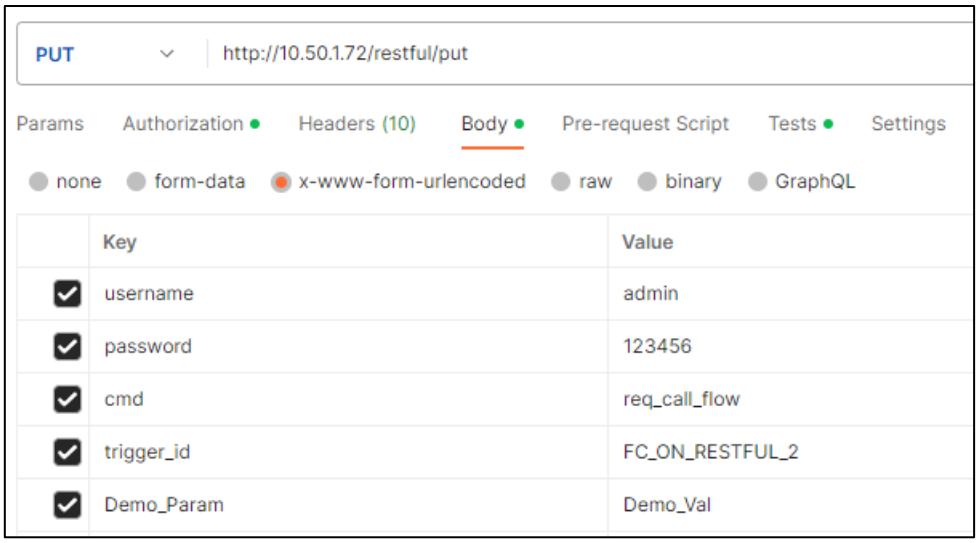
Note: * indicates that it is only supported by VIC series products.

Use RESTful API to call VIC-Flow and trigger this operator with the required parameters listed in the following table.

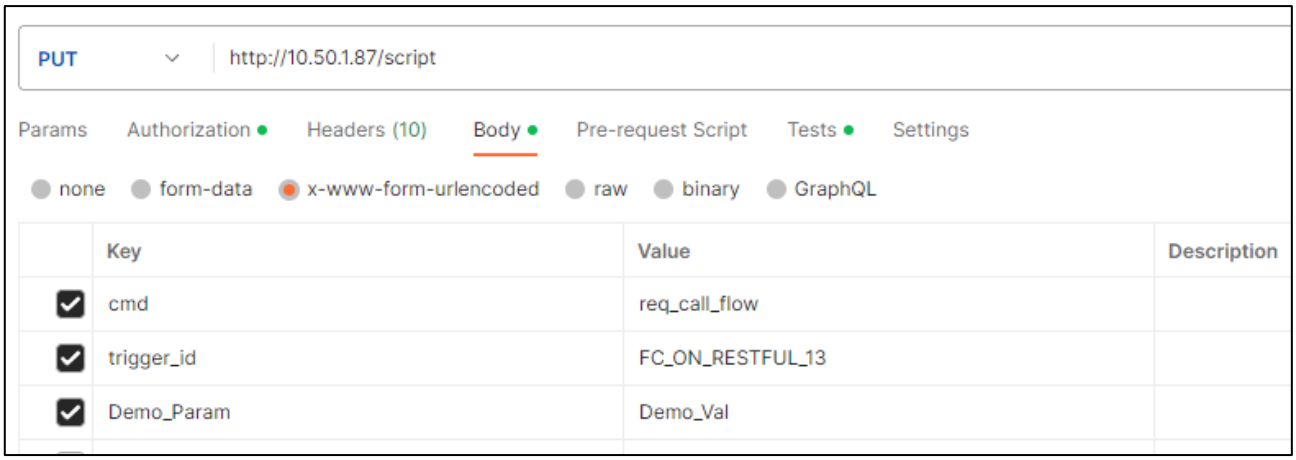
Parameter Name	Parameter Content
username*	admin or user
password*	123456(default)
cmd	req_call_flow
trigger_id	operator's ID
param1_name (Custom parameter name.)	param1_val (Custom parameter value.)

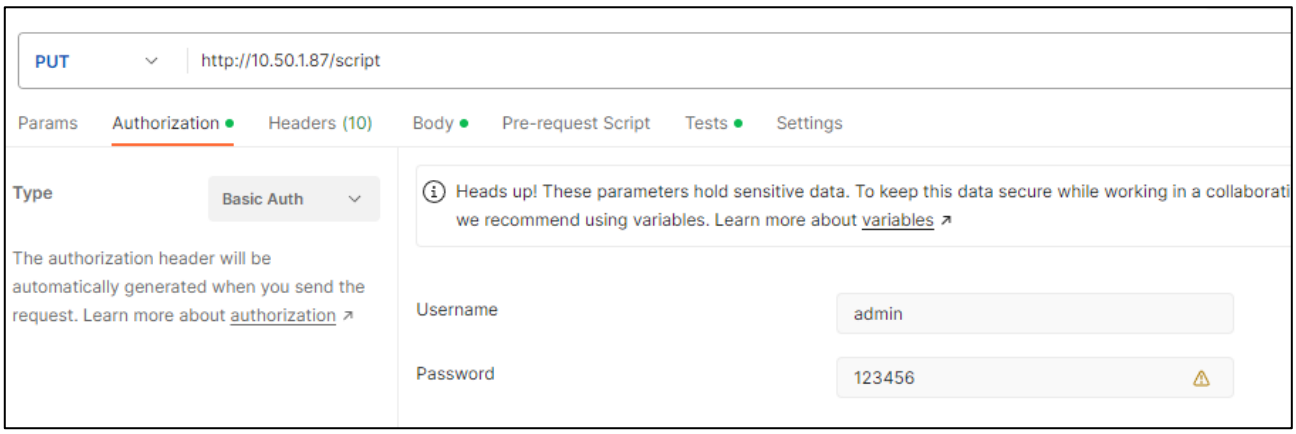
Note: If no trigger_id parameter is specified when calling, all ON_RESTFUL operators will be triggered.
Note:* indicates that the parameter is required only for VIC series products.

The following example demonstrates the utilization of Postman within the VIC series products to send RESTful API calls to VIC-Flow.



The following example demonstrates the utilization of Postman in nDAS series and nPAC products to send RESTful API calls to VIC-Flow.





4.5.4 ON_RELOAD

This operator will be triggered when the reload Python module button is clicked or when the F9 key is pressed.

	UI Name	Behavior
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: * indicates that it is only supported by VIC series products.

4.5.5 ON_EVENT (only supported VIC series products)

This operator is triggered when an event occurs, which may include capture card plug in or plug out, detection of a source signal, a change in the source resolution, and so on.

<table>
<tr><th></th><th>UI Name</th><th>Behavior</th></tr>
<tr><td rowspan="3">Output</td><td></td><td></td></tr>
<tr><td>eventType</td><td>Output the triggered event.
<table>
<tr><th>eventType</th><th>Content</th></tr>
<tr><td>vic_event_capture_card_removed</td><td>Capture card plug out</td></tr>
<tr><td>vic_event_capture_card_detected</td><td>Detect capture card</td></tr>
<tr><td>vic_event_signal_removed</td><td>Screen signal has been disconnected</td></tr>
<tr><td>vic_event_signal_not_detected</td><td>Screen signal cannot be detected</td></tr>
<tr><td>vic_event_format_changed</td><td>Signal has changed</td></tr>
</table></td></tr>
<tr><td>info</td><td>Output the information that triggered the event.</td></tr>
</table>

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Use Fixed arr	When selected, the designated image (arr) will be used.	
Fixed arr	Choose the desired image (arr) to use.	

4.5.6 ON_INIT_SCRIPT

This operator is triggered when the project is loaded and the script is initialized.

	UI Name	Behavior
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: * indicates that it is only supported by VIC series products.

4.5.7 ON_ACQ_START (only supported VIC series products)

This operator is triggered as soon as capture begins, in addition to controlling the page.

	UI Name	Behavior
Output		
	cause	Output the trigger point for starting capture.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Use Fixed arr	When selected, the designated image (arr) will be used.	
Fixed arr	Choose the desired image (arr) to use.	

4.5.8 ON_ACQ_STOP (only supported VIC series products)

This operator will be triggered when the capture is stopped, in addition to the control page.

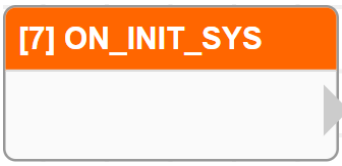
	UI Name	Behavior
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Use Fixed arr	When selected, the designated image (arr) will be used.	
Fixed arr	Choose the desired image (arr) to use.	

4.5.9 ON_INIT_SYS

This operator will be triggered upon the program's opening and initialization completion, as well as the automatic loading of the project.



	UI Name	Behavior
Output		

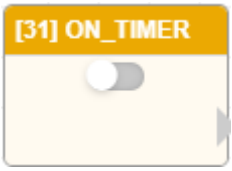
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: * indicates that it is only supported by VIC series products.

4.5.10 ON_TIMER

Can specify a fixed time or interval to trigger the operator.



	UI Name	Behavior
Output		

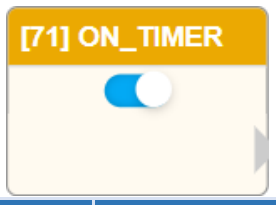
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Activate	Once selected, it will trigger based on the set time.	
Update	Clicking it will lead to the trigger time settings.	
Method	There are two ways to set the trigger timr: Interval and At an exact time.	
Millisecond	The millisecond of trigger.	
Second	The second of trigger.	
Minute	The minute of trigger.	
Hour	The hour of trigger.	
Day	The day of trigger.	
Day Of Week	The week of trigger.	
Fixed arr*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: * indicates that it is only supported by VIC series products.

4.5.11 ON_TIMER (1s)

Can specify a fixed time or interval to trigger the operator, but by default, it triggers every 1 second at intervals and it is activated.



	UI Name	Behavior
Output		

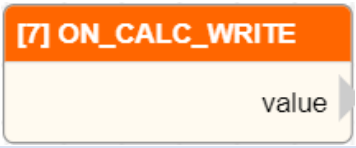
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Activate	Once selected, it will trigger based on the set time.	
Update	Clicking it will lead to the trigger time settings.	
Method	There are two ways to set the trigger time: Interval and At an exact time.	
Millisecond	The millisecond of trigger. Set to default as 1000 milliseconds.	
Second	The second of trigger.	
Minute	The minute of trigger.	
Hour	The hour of trigger.	
Day	The day of trigger.	
Day Of Week	The week of trigger.	
Fixed arr*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: * indicates that it is only supported by VIC series products.

4.5.12 ON_CALC_WRITE (only nDAS series products are supported.)

When input is received on OLED and corresponds to CALC, this operator will be triggered.



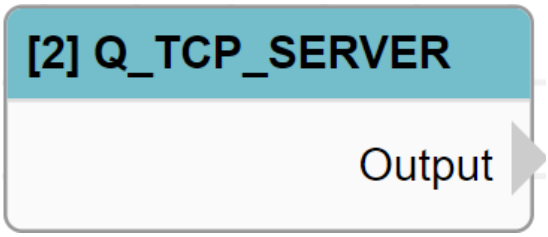
	UI Name	Behavior
Output	Output	Output the written value on the OLED.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
CALC Index	Set the corresponding CALC index.	Integer

4.5.13 Q_TCP_SERVER

Create a TCP/IP server that triggers this operator upon receiving a message, and outputs the received message.



	UI Name	Behavior
Output	Output	Output the received message.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Port	Set the communication port for TCP/IP Server. The default value is 8001.	
Fixed arr*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

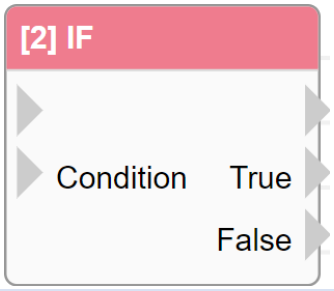
Note: * indicates that it is only supported by VIC series products.

4.6 Functions

4.6.1 Fundamental features

4.6.1.1 IF

It can evaluate input conditions and direct the corresponding output operator based on the evaluation result.



	UI Name	Behavior
Input		
	Condition	Input the conditional statement for evaluation.
Output		
	True	If the result is true, then output from this port.
	False	If the result is false, then output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Condition	If there is an input, its value will be used as the condition.	Python Expression

Note: If the conditions are integers or non-empty strings, the evaluation result will be true.

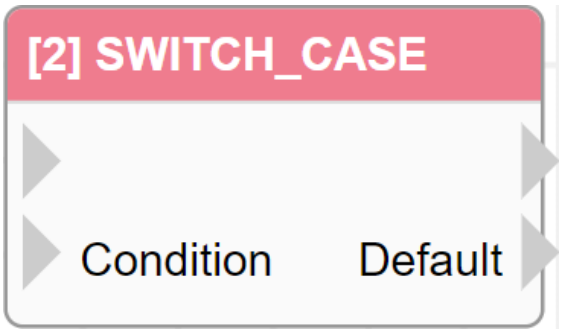
Note: The output does not contain any values.

Note: If values are input into the conditions as an input, the operator will use those values for evaluation during execution.

4.6.1.2 SWITCH_CASE

The operator that allows multiple selections based on variables or expressions used as conditional statements has the following syntax structure.

```
switch(Variable or expression)
{
    case Condition 1 satisfied:
        Statement 1;
        break;
    case Condition 2 satisfied:
        Statement 2;
        break;
    case Condition 3 satisfied:
        Statement 3;
        break;
    default:
        Default statement;
        break;
}
```



	UI Name	Behavior
Input		
	Condition	Input the condition to be evaluated.
Output		
	Default	If there are no cases that meet the condition, then output from this port.
	Case1	If the condition for case 1 is met, then output from this port.
	Case2	If the condition for case 2 is met, then output from this port.
	CaseX	If the condition for case X is met, then output from this port.

Note: The maximum number of cases that can be added is limited to 10.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Condition	Set the condition to be evaluated.	Python Expression
Add Case	Upon clicking, a new case will be added.	
Case1	Set the condition for Case 1.	String
Case2	Set the condition for Case 2.	String
CaseX	Set the condition for Case X.	String

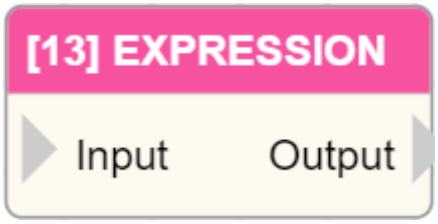
Note: In the case of a successful comparison, the output value will be set to the condition value.

Note: The default output does not contain any values.

Note: If the input of the condition has a value, the operator will use the input value as the condition when executed.

4.6.1.3 EXPRESSION

This operator is capable of parsing the program content into a set of Python statements and outputting them.



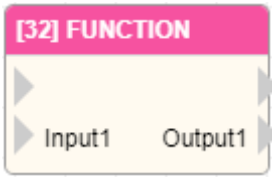
	UI Name	Behavior
Input	Input	Input the value to be processed.
Output	Output	Output the execution result.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Body	Set the expression content for execution output. By using "%1" to call the input variable of the operator.	Python Expression
Editor	Upon clicking, an editing dialog will appear.	

4.6.1.4 FUNCTION

A customizable operator that allows for defining and executing user-defined functions, and also allows for defining the number of inputs and outputs.



	UI Name	Behavior
Input		
	Input1	Input the value for Input1 of the function.
	Input2	Input the value for Input2 of the function.
	InputX	Input the value for InputX of the function.
Output		
	Output1	The function outputs Output1 based on the inputs.
	Output2	The function outputs Output2 based on the inputs.
	OutputX	The function outputs OutputX based on the inputs.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Inputs Number	Set the number of inputs.	Integer
Outputs Number	Set the number of outputs.	Integer
Body	Set the code content to be executed for output. Configuring/Using Parameters: Method Input: inputs[n] Output: self.outputs[n] Return: self.ret Skip: self.skip[n] Note: n Indicates which number.	Python Code
Editor	Upon clicking, an editing dialog will appear.	

Note: When other operators use ${ID} to refer to the FUNCTION operator, they will obtain the value set by that operator's self.ret.

Body

The syntax for writing the body is similar to writing Python code.

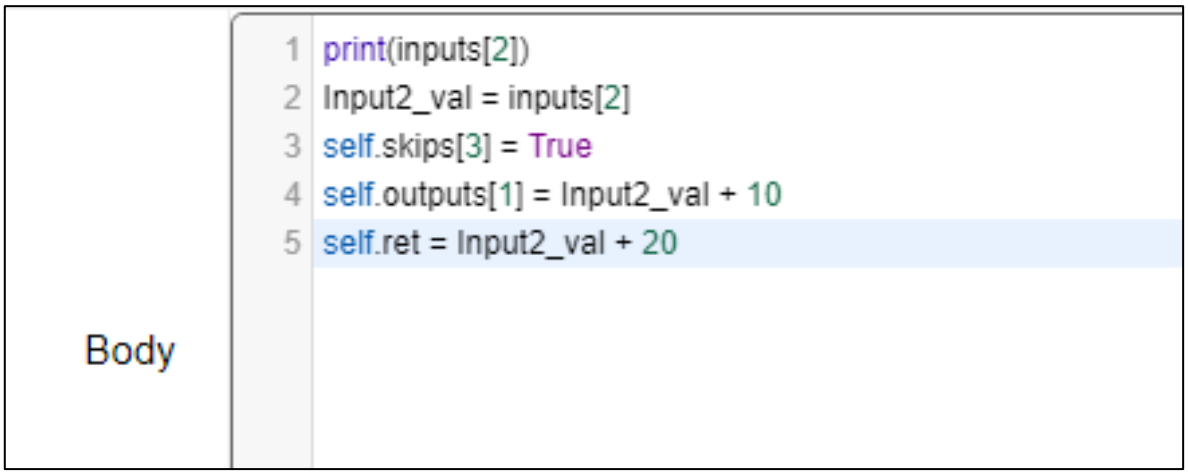
To use Input parameters, call the method as inputs[n], where n is the number of the Input, generated sequentially. For example, to retrieve the value of the third Input, use the variable inputs[3] to obtain its value.

To set the value of the output, use self.outputs[n], where n is the number of the Output, generated sequentially. For example, to set the value of the third Output, write the value into self.outputs[3].

To set the return value, set the value of self.ret. Other operators can obtain the return value of this operator by calling ${ID}, where ID is the ID of this operator. For example, to retrieve the return value of a FUNCTION operator with ID FC_FUNC_2 in other operators, use ${FC_FUNC_2} to obtain the return value of this operator.

To skip a single Output, set self.skips[n] = True to skip the specified Output. By default, all Output values are set to False, where n is the number of the Output.

In the following example, we will print the input value of the second Input, skip the third Output, add 10 to the input value of the second Input as the value of the first Output, and set the return value of the operator to the parameter value of the second Input plus 20.



4.6.1.5 ON_CHANNEL (only supported VIC series products)

Set a designated channel, if the currently recognized channel matches the designated channel, it is true; otherwise, it is false.

	UI Name	Behavior
Input		
Output	True	If the current channel is recognized as the set channel, then output from this port.
	False	If the current channel is not the set channel, then output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Channel	Set the designated channel.	Integer

Note: The output does not contain any values.

4.6.1.6 ON_PAGE (only supported VIC series products)

Set the designated page and determine whether the currently recognized channel is the designated page. If it is, then the statement is true, otherwise it is false.

	UI Name	Behavior
Input		
Output	True	If the current page is recognized as the set page, then output from this port.
	False	If the current page is not the set page, then output from this port.

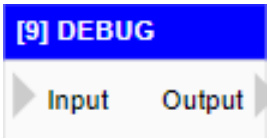
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Page	Set the designated page.	Integer

Note: The output does not contain any values.

4.6.1.7 DEBUG

The operator that can print the contents of the input or settings in the Python output field.



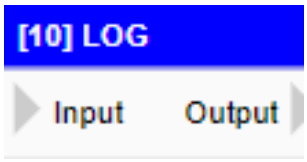
	UI Name	Behavior
Input	Input	Input the content to be printed.
Output	Output	Output the printed content.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Color	Set the color for printing text.	
Content	Set the content to be printed. If the field is not empty, the value set in the field will be used. Note: If %i is set, it will print the ID of the operator.	Inline Python Expression String and %1

4.6.1.8 LOG

The operator that can record the input or configuration content to the system log.



	UI Name	Behavior
Input	Input	Input the content to be recorded.
Output	Output	Output the recorded content.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Color	Set the character color for the recorded content.	
Module	The module category to be recorded. If this field is empty, the default value 'calc' will be applied.	String
Content	Set the content to be recorded. If this field is not empty, the value set in this field will be recorded. If this field is empty, the value of Input will be recorded.	Inline Python Expression String and %1
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

4.6.1.9 JSON_PARSE

This operator for converting and parsing JSON strings would be the "JSON Parse" operator.

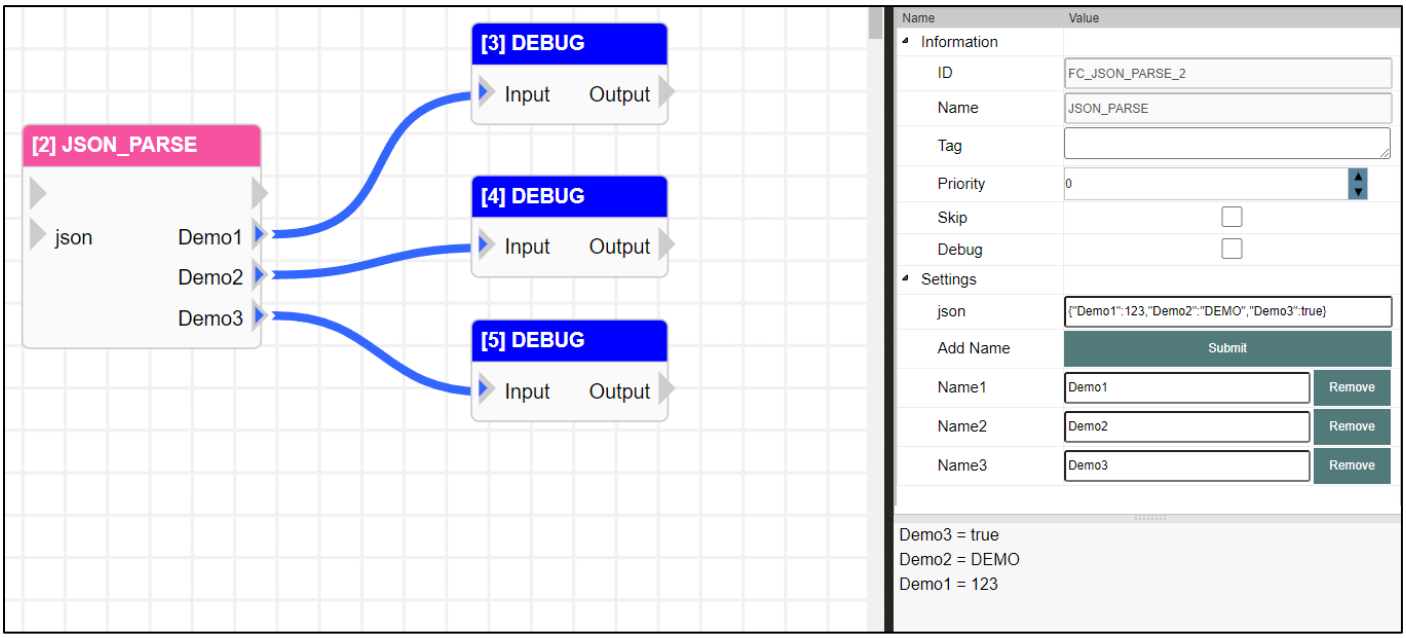
	UI Name	Behavior
Input		
	json	Input the JSON string to be parsed.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
json	Set the JSON string to be parsed. If there is an input, its value will be used.	String
Add Name	Upon clicking, a new name will be added.	
Name 1	Set the name for the first output after parsing the JSON string.	String
Name 2	Set the name for the second output after parsing the JSON string.	String
Name X	Set the name for the X output after parsing the JSON string.	String

Note: The addition of Name fields is limited to a maximum of 100.

Below is an example of operator operation. The incoming JSON string is {"Demo1":123, "Demo2":"DEMO", "Demo3":true}, which is converted using the JSON_PARSE operator, and the parsed values are printed using the DEBUG operator.



4.6.1.10 JSON_RET

This operator can be configured to return a JSON string.

	UI Name	Behavior
Input		
	json	Input JSON string

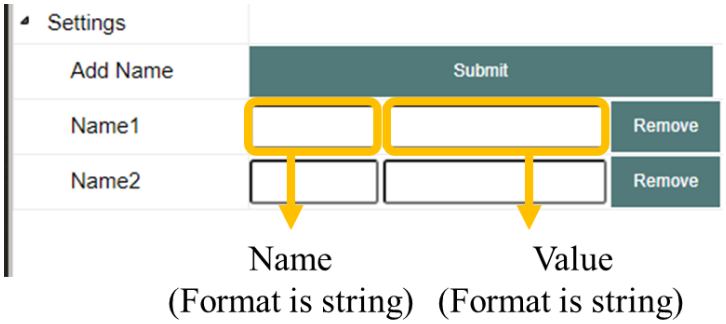
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
json	Directly provide a JSON string for output. If there is input value, it will be applied and ignore the name and value set in the operator.	String
Add Name	Clicking will add a new name.	
Name 1	Set name 1 for the JSON string to return.	String
Name 2	Set name 2 for the JSON string to return.	String
Name X	Set name X for the JSON string to return.	String

Note: The addition of Name fields is limited to a maximum of 100.

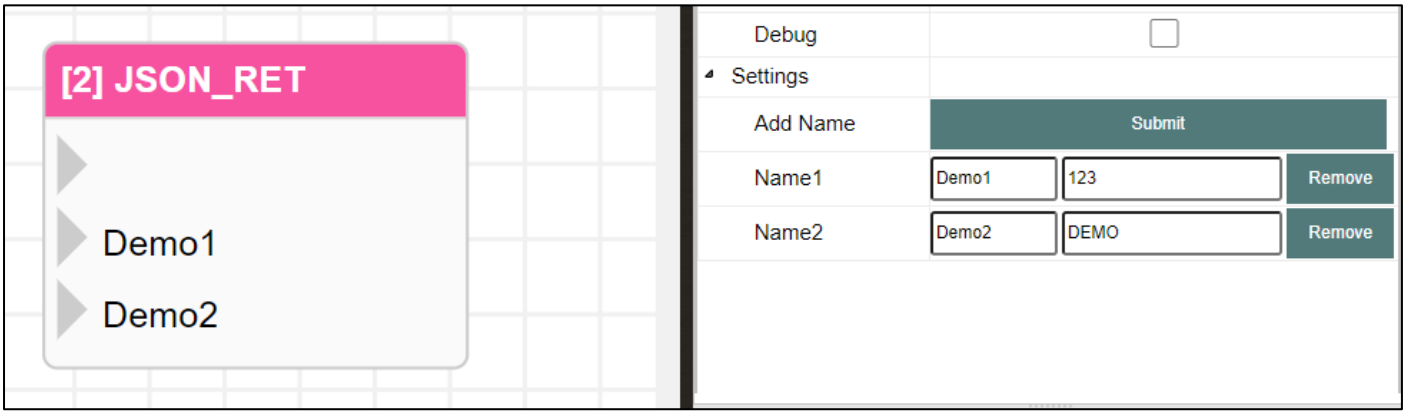
Note: If the JSON string has a value, then return only that JSON string.

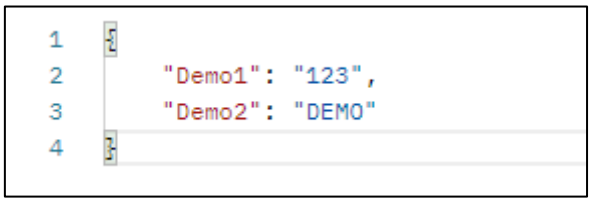
In the operator's settings, you can specify the name and value of the JSON object to be returned, as shown in the figure below.



Note: If there is a value in the numerical field, it takes precedence over the value of the Input's name, ignoring it.

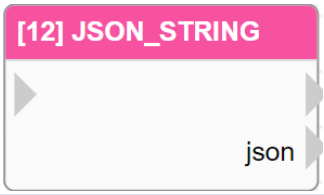
An example is provided below, where two variables are named Demo1 and Demo2, with values of 123 and DEMO, respectively. By making a RESTful call, a response value of {"Demo1":"123", "Demo2":"DEMO"} can be obtained, as shown in the figure below.





4.6.1.11 JSON_STRING

The operator that can convert input or configured content to a JSON string.



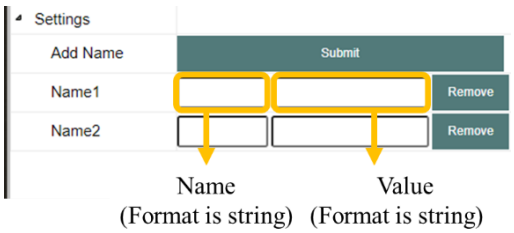
	UI Name	Behavior
Input		
Output		
	json	Output JSON string

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Add Name	Clicking will add a new name.	
Name 1	Set the name of the JSON string to be converted to as "Name 1".	String
Name 2	Set the name of the JSON string to be converted to as "Name 2".	String
Name X	Set the name of the JSON string to be converted to as "Name X".	String

Note: The addition of Name fields is limited to a maximum of 100.

In the operator settings, you can configure the name and value of the JSON object content to be transformed, as shown in the following figure.



Note: If there is a value in the numerical field, it takes precedence over the value of the Input's name, ignoring it.

4.6.1.12 COMMENT

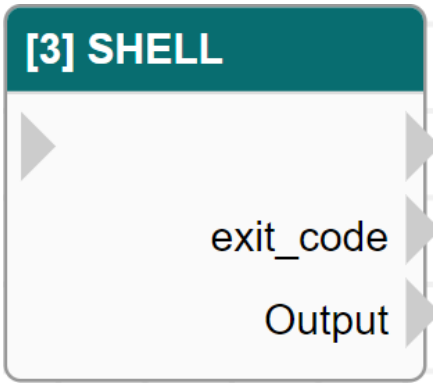
This operator can add comment in the editing area.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Width	The width of the operator.	Integer

4.6.1.13 SHELL

This operator enables the execution of command-line operations on the local hardware.



	UI Name	Behavior
Input		
Output		
	exit_code	Output the exit code after the execution is finished.
	Output	Output the execution result.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Command	Desired command to execute.	String
Working Directory	Working directory for the task to be executed.	String
Wait Time (ms)	Wait time for the next execution.	Integer

4.6.1.14 DELAY

This operator that can delay the execution of subsequent processes for a certain amount of time.

	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Delay (ms)	Specify the delay time.	

Note: If it is a VIC series product, the operator will be listed under Control Functions.

4.6.1.15 RUN_TRIGGER

This operator that can execute trigger operators.

	UI Name	Behavior
Input		
Output		

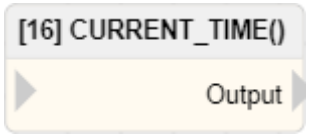
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Trigger ID	Set the ID of the trigger operator to be executed.	String
Immediate	If checked, the set trigger operator and its child operators will be executed immediately.	

4.6.1.16 CURRENT_TIME (Only nDAS series and nPAC products are supported.)

Operator for obtaining the current time, outputting a string format of YYYY-MM-DD HH:MM:SS.

This operator is formatted as an object and the year, month, day, hour, minute, and second, and can be obtained individually as shown in the table below.



Method	Mean
${OPERATOR_ID.YEAR}	Retrieve the current year.
${OPERATOR_ID.MONTH}	Retrieve the current month.
${OPERATOR_ID.DAY}	Retrieve the current date.
${OPERATOR_ID.HOUR}	Retrieve the current hour of the time.
${OPERATOR_ID.MINUTE}	Retrieve the current minute of the time.
${OPERATOR_ID.SECOND}	Retrieve the current second of the time.

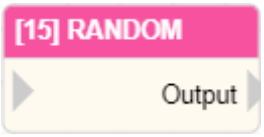
	UI Name	Behavior
Input		
Output	Output	Output current time.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.1.17 RANDOM

This operator can generate random numerical values within a specified range.



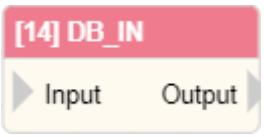
	UI Name	Behavior
Input		
Output	Output	Output a randomly generated numerical value.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Float	When selected, the output random value will be a floating-point number; otherwise, it will be an integer.	
Min.	Set the minimum value of the random value range.	Integer
Max.	Set the maximum value of the random value range.	Integer

4.6.1.18 DB_IN (Only nDAS series and nPAC products are supported.)

This operator is capable of storing input values into a database.



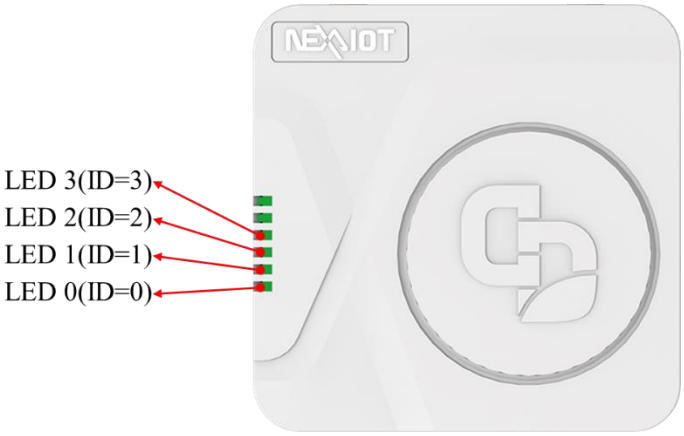
	UI Name	Behavior
Input	Input	Input the desired value to be saved.
Output	Output	Output the value inputted to the operator.

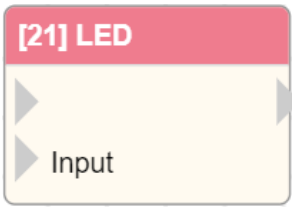
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Slot	Set the field value of the slot stored in the database.	Integer
Channel	Set the field value of the channel stored in the database.	Integer
Log Change	Whether to store the value when the input changes.	

4.6.1.19 LED (Only nDAS series and nPAC products are supported.)

To control the illumination of the red or green signals on the nDAS, where the actual signal represents as follows.





	UI Name	Behavior
Input	Input	Input command to control the led state. Input 0 to turn off the led；Input 1 to turn on the led.
Output		

Properties

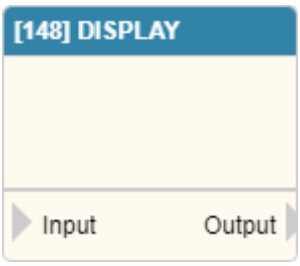
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
ID	Specify the ordinal of the led to be controlled.	Integer
Color	Set the color for the led to be controlled.	

Note: Only available when the WiFi is not enabled.

4.6.2 Dashboard

4.6.2.1 DISPLAY

The input value can be displayed on the operator.



	UI Name	Behavior
Input	Input	Input the value to be displayed.
Output	Output	Output the value inputted to the operator.

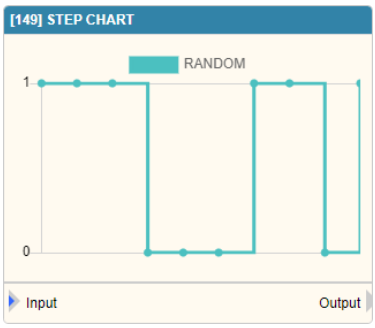
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Color	Set the color of the displayed text.	
Color Picker	If the color field is set to color selection, the color of the displayed text will be the color set in the color selection field.	
Font Size	Set the size of the displayed text.	Integer
Relative X	Set the X offset of the displayed text relative to the center position.	Integer
Relative Y	Set the Y offset of the displayed text relative to the center position.	Integer
Prefix	Set the prefix of the displayed text.	String
Suffix	Set the suffix of the displayed text.	String

Note: If the color selection is set to "Auto", the displayed text color will be adjusted based on the background.

4.6.2.2 STEP_CHART

The operator that can plot input values into a step chart.



	UI Name	Behavior
Input	Input	Input the values to be plotted.
Output	Output	Output the value inputted to the operator.

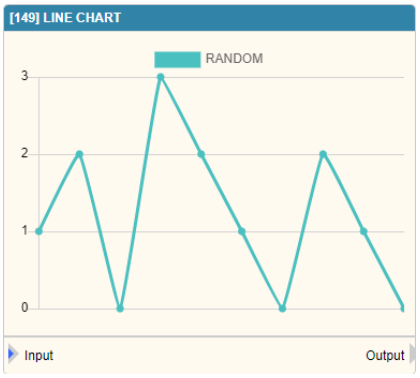
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Queue Size	Set the maximum number of data points displayed in the step chart.	Integer
Show X-axis	Set whether to display the X-axis of the step chart.	
Update Label	Click to update the labels displayed on the step chart.	

Note: The labels of the step chart will automatically use the names of the connected operators. However, if the connected operator has a title or tag with set content, that content will be used as the tag for the chart. If there is content set for both, the content set for the title will take priority.

4.6.2.3 LINE_CHART

The operator that can plot input values into a line chart.



	UI Name	Behavior
Input	Input	Input the values to be plotted.
Output	Output	Output the value inputted to the operator.

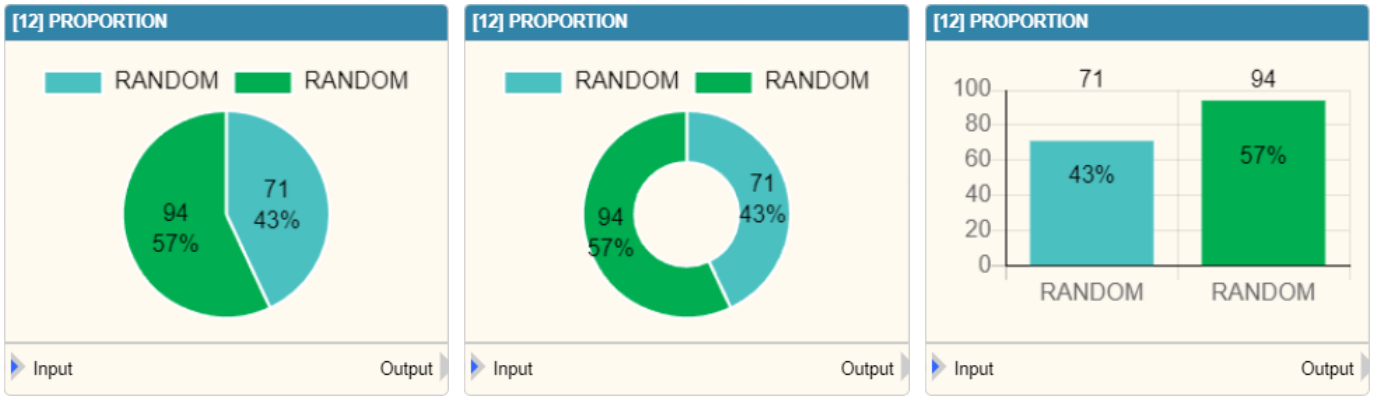
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Queue Size	Set the maximum number of data points displayed in the line chart.	Integer
Show X-axis	Set whether to display the X-axis of the line chart.	
Update Label	Click to update the labels displayed on the line chart.	

Note: The labels of the line chart will automatically use the names of the connected operators. However, if the connected operator has a title or tag with set content, that content will be used as the tag for the chart. If there is content set for both, the content set for the title will take priority.

4.6.2.4 PROPORTION (only nDAS series and nPAC products are supported.)

The operator that can plot input values into a proportional chart.



	UI Name	Behavior
Input	Input	Input the values to be plotted.
Output	Output	Output the value inputted to the operator.

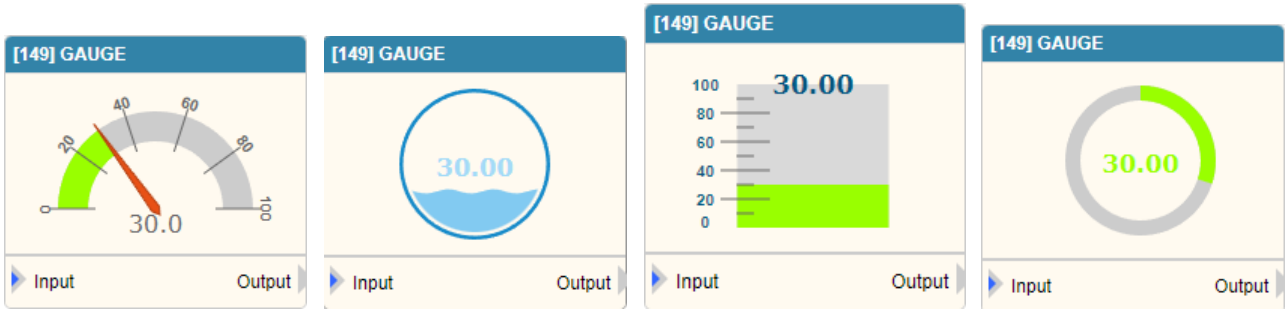
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Type	Set the displayed chart style, as shown in the three figures from left to right: pie chart, doughnut chart, and bar chart.	
Label Font Size	Set the font size of the labels.	Integer
Value Font Size	Set the size of the values displayed on the chart.	Integer
Show Percentage	Set the display of the percentages of the proportions.	
Update Label	Click to update the labels displayed on the proportional chart.	

Note: The labels of the proportional chart will automatically use the names of the connected operators. However, if the connected operator has a title or tag with set content, that content will be used as the tag for the chart. If there is content set for both, the content set for the title will take priority.

4.6.2.5 GAUGE

The operator that can display input values in a gauge.



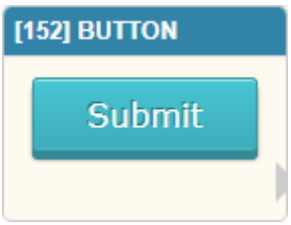
	UI Name	Behavior
Input	Input	Input the value to display.
Output	Output	Output the value inputted to the operator.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Type	Set the display style of the gauge, as shown in the four figures above, which include pointer, liquid, linear and circular gauges.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Min.	Set the minimum value of the gauge.	Integer
Max.	Set the maximum value of the gauge.	Integer
Font Size	Set the font size of the displayed value on the gauge.	Integer
Percentage	Set whether to display the input value as a percentage.	
Prefix	Set the prefix for the displayed value.	String
Suffix	Set the suffix for the displayed value.	String

4.6.2.6 BUTTON

By clicking the button on the operator, you can trigger the execution of the subsequent process.



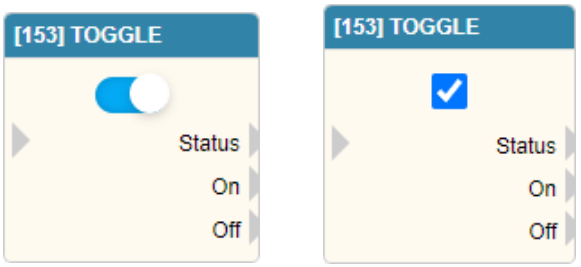
	UI Name	Behavior
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Color	Set the color of the button.	
Text	Set the text displayed on the button.	String
Trigger ID	Set the trigger operator to be triggered.	String
Immediate	Whether to execute the trigger operator immediately.	

4.6.2.7 TOGGLE

Execute the subsequent operators of the process by toggling the switch



	UI Name	Behavior
Input		
Output	Status	Output the status of the toggle operator, 1 if it is turned on, and 0 if it is turned off.
	On	If the toggle operator is turned on, then output from this port.
	Off	If the toggle operator is turned off, then output from this port.

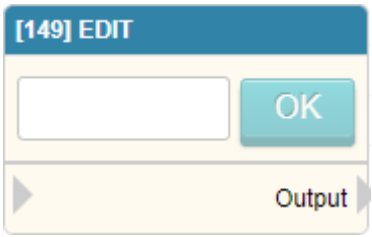
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Type	Set the type of Toggle and Checkbox for switching operators, as shown in the two diagrams above.	
Trigger	If checked, the corresponding subsequent processes will be executed when switching; otherwise, if not checked, the subsequent processes will only be executed when the operator is reached, based on its status.	
Fixed arr*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: * indicates that it is only supported by VIC series products.

4.6.2.8 EDIT

The operator that allows editing of their contents and output



	UI Name	Behavior
Input		
Output	Output	Output content of operator

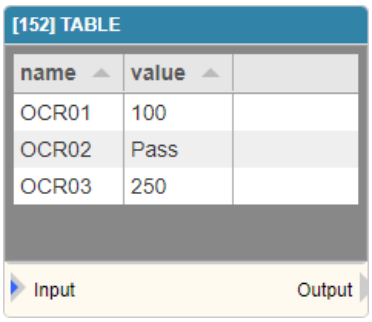
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Real Time	If checked, the editing content will be outputted in real-time. Otherwise, if unchecked, the confirmation button must be clicked before the editing content can be outputted.	
Type	Set the type of editing, which includes text, integer, float, and date.	
Type - Integer, Float		
Min.	Set the minimum value for editing.	Integer
Max.	Set the maximum value for editing.	Integer
Step	Set the increment/decrement value for editing.	Integer

Note: Edit the operator to output the edited content when executed.

4.6.2.9 TABLE

The operator that can present the input data in a table.



	UI Name	Behavior
Input	Input	Input the data to be displayed in the table.
Output	Output	Output the data entered into the operator.

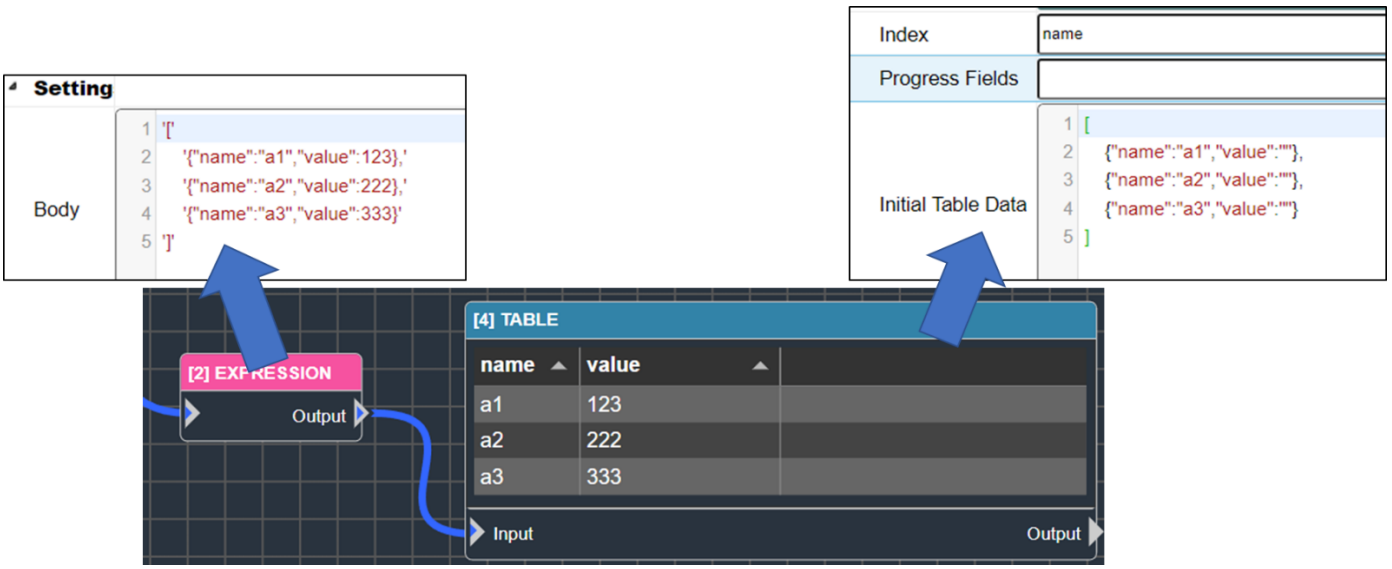
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Font Size	Setting the font size displayed on the table.	Integer
Update Table	Upon clicking, the table will be updated accordingly.	
Index	Setting the field names for data arrangement in input.	String
Progress Fields	Whether to use a progress bar in the following format: field name: enable text: text color.	String
Initial Table Data	Setting the initial data for the table.	String
Editor	Upon clicking, a window for editing the initial table data will appear.	

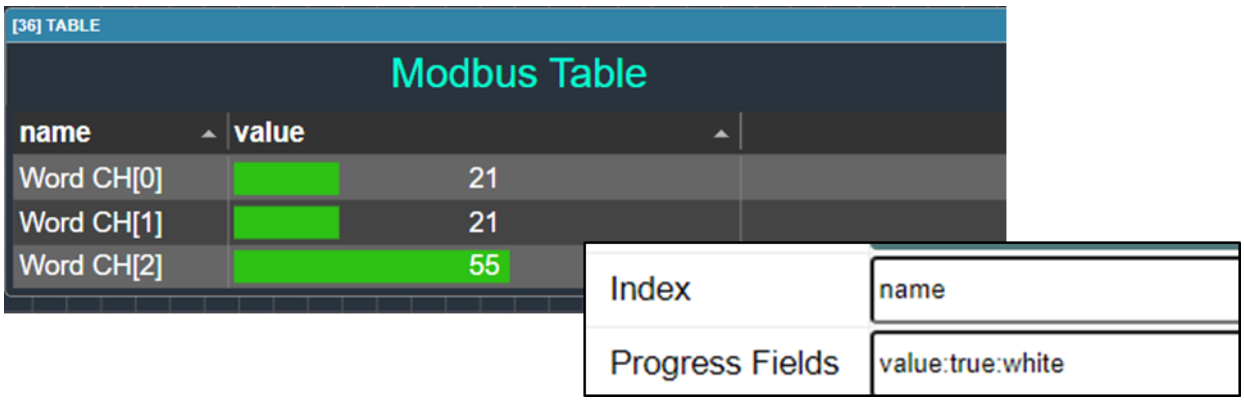
Note: Remember to click the "Update List" button after making any changes to the settings.

Note: Multiple progress bars can be used in the same list by configuring them in the progress bar field, separated by commas ",".

The following is an example of using the EXPRESSION operator to output a list of data and display it in the TABLE operator, as shown in the figure below.

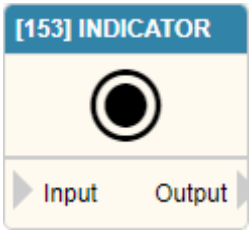


Here is an example of a progress bar:



4.6.2.10 INDICATOR

The operator to display an indicator and change its color based on the input value.



	UI Name	Behavior
Input	Input	Input the value for the desired color transformation.
Output	Output	Output the value inputted to the operator.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Font Size	Set the size of the display indicator.	Integer
Font Pattern	Set the style of the display indicator.	
Color 0	If the input value is 0, the indicator will be displayed in this color.	
Color 1	If the input value is 1, the indicator will be displayed in this color.	
Color 2	If the input value is 2, the indicator will be displayed in this color.	
Color 3	If the input value is 3, the indicator will be displayed in this color.	
Color 4	If the input value is 4, the indicator will be displayed in this color.	

Note: If the blink option is checked in the color settings field, the indicator not only changes to the selected color but also blink.

4.6.2.11 IMAGE

The operator that can display image.

	UI Name	Behavior
Input		Input the image to be displayed.*
	arr*	Input the image to be displayed.
Output		

Note: * indicates that it is only supported by nDAS series and nPAC products

Note: * indicates that it is only supported by VIC series products.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Title	Set the content displayed in the title when switching to dashboard mode. If the option to hide settings is checked, the title will be hidden when switching to dashboard mode.	
Width	Set the width of the operator.	Integer
Height	Set the height of the operator.	Integer
Image Format	Set the image format to be displayed, including JPEG, BMP, and PNG.	
Image	Display the name of the loaded image file.	
Image Load	Click to load the image file.	
Clear Image	Click to clear the displayed image and reset the loaded image	

	parameters.	

4.6.2.12 IMAGE_GEN

Operator for recursively reading image files from a directory and outputting the images.

	UI Name	Behavior
Input		
Output	arr	Output the read image file.

Properties

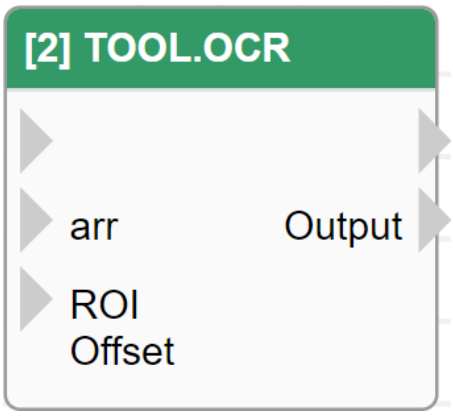
Name	Mean	Format
Information		
ID	Operator’s ID.	
Name	Operator’s name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Sort By	Set the sorting method for reading image files.	
Select Image Folder	Set the directory path for reading image files.	
Image Folder	Display the set directory path for image files.	
Update Image	Clicking will reload the image file directory.	

Note: If the image file path is reset, remember to click "update image" to reload the images.

4.6.3 Recognition tool (only supported VIC series products)

4.6.3.1 TOOL.OCR

A customizable operator is available for image recognition and OCR, which allows you to set the image files and recognition parameters for OCR.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, it will use the current image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10,20.
Output		
	Output	Output the recognition result.

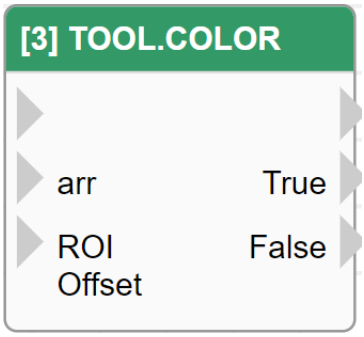
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Input Parameters		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression

ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is CURRENT_IMAGE.	
White List	Enable only recognition of the specified setting value; if no setting is provided, full recognition will be performed.	String
Allow Empty String	When enabled, if an empty string is recognized, it will not display as "NG."	
Remove Whitespace	When enabled, if the recognition result contains white space characters, they will be automatically removed.	
Recognition Rate(%)	Set the minimum allowable recognition rate; if the rate falls below this value, recognition will fail.	
Image Preprocess		
Image Preprocess-Resize		
Resize Method	Setting the method for resizing.	
Resize	Setting the value for resizing.	
Image Preprocess-Threshold		
Threshold Method	Setting the threshold method.	
Threshold Algorithm	Setting the threshold algorithm.	
Threshold Value	Setting the threshold. Only applicable when the threshold algorithm is set to “none”.	
OCR Font		
Segmentation Mode	Setting the OCR segmentation method.	
Select Font	Setting the font to be used.	
Load Font	Click to select a font file.	
Font File	Displaying the name of the currently used font file.	

4.6.3.2 TOOL.COLOR

A customizable operator is available for image recognition and color, which allows you to set the image files and recognition parameters for color.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, then will use the current image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10,20.
Output		
	True	If match successfully, then output from this port.
	False	If match fails, then output from this port.

Note: The output does not contain any values.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Input Parameters		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression

ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is CURRENT_IMAGE.	
Matching Parameters		
Color Picker	Clicking on this will allow you to select the location where you want to compare colors, and the color at that location will replace the color being compared.	
Red	Set the match to the red color component in RGB.	
Green	Set the match to the green color component in RGB.	
Blue	Set the match to the blue color component in RGB.	
Matching Tolerance	Set the tolerance for color match.	

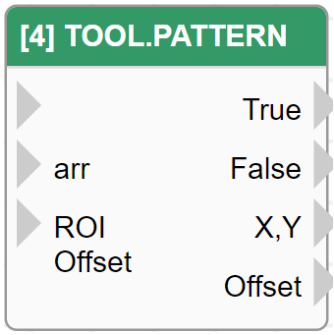
Note: The output port (True and False) outputs a boolean value.

The information returned by TOOL.COLOR includes RED, GREEN, BLUE, MATCH, and VALUE. The calling method and their representative meanings are as follows.

Method	Mean
${TOOL_COLOR_ID.RED}	Compare the color red in the RGB primary colors.
${TOOL_COLOR_ID.GREEN}	Compare the color green in the RGB primary colors.
${TOOL_COLOR_ID.BLUE}	Compare the color blue in the RGB primary colors.
${TOOL_COLOR_ID.VALUE}	If the comparison result matches, the value is true; otherwise it is false.
${TOOL_COLOR_ID.MATCH}	To determine if the comparison was successful, use 1 for success and 0 for failure.

4.6.3.3 TOOL.PATTERN

A customizable operator is available for image recognition and pattern, which allows you to set the image files and recognition parameters for pattern.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, then will use the current image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10,20.
Output	True	If match successfully, then this port output.
	False	If match fails, then this port output.
	X,Y	Output the central coordinates of the matched pattern.
	Offset	Output the matched pattern and the position offset set during configuration.

Note: The output does not contain any values.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

Input Parameters		
ROI-Width	Set the X-coordinate value of the ROI.	Python Expression
ROI-Height	Set the Y-coordinate value of the ROI.	Python Expression
Update	Set the width of the ROI.	Python Expression
ROI X Offset	Set the height of the ROI.	Python Expression
ROI Y Offset	Clicking will open the update dialog.	
ROI-Width	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI-Height	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is CURRENT_IMAGE.	
Matching Parameters		
Pattern Name	Display the file name of the matching pattern image.	
Pattern Load	Clicking on it will display the pattern loading dialog.	
Pattern X	Set the X value for the matching pattern.	
Pattern Y	Set the Y value for the matching pattern.	
Gray Matching	When enabled, the image will be converted to grayscale for pattern matching, which can speed up the process.	
Minimum Score	Set the minimum score for successful pattern matching, which is 0.95 by default and valid range is from 0 to 1, where 1 is a perfect match.	
Wait Time(ms)	Set the wait time for each matching attempt.	
Wait Condition	Set the waiting condition: Until True, which means waiting until the matching is successful. Until False, which means waiting until the matching fails.	

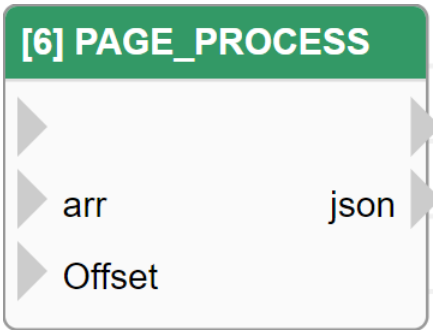
Note: The output port (True and False) outputs a boolean value.

The information returned by TOOL.PATTERN includes FOUND, VALUE, etc. The calling method and their representative meanings are as follows.

Method	Mean
${TOOL_PATTERN_ID.FOUND}	Whether the pattern matching is successful, 1 if successful, 0 otherwise.
${TOOL_PATTERN_ID.VALUE}	Output of pattern matching result, true if successful, false otherwise.
${TOOL_PATTERN_ID.SCORE}	Pattern matching score, ranging from 0 to 1.0.
${TOOL_PATTERN_ID.X}	X coordinate of the matched pattern.
${TOOL_PATTERN_ID.Y}	Y coordinate of the matched pattern.
${TOOL_PATTERN_ID.WIDTH}	Width of the matched pattern.
${TOOL_PATTERN_ID.HEIGHT}	Height of the matched pattern.
${TOOL_PATTERN_ID.BASE_X}	X coordinate of the set pattern (can be used to calculate the offset).
${TOOL_PATTERN_ID.BASE_Y}	Y coordinate of the set pattern (can be used to calculate the offset).
${TOOL_PATTERN_ID.CENTER_X}	X coordinate of the center point of the matched pattern.
${TOOL_PATTERN_ID.CENTER_Y}	Y coordinate of the center point of the matched pattern.
${TOOL_PATTERN_ID.OFFSET_X}	X offset between the matched pattern and the set pattern.
${TOOL_PATTERN_ID.OFFSET_Y}	Y offset between the matched pattern and the set pattern.

4.6.3.4 PAGE_PROCESS

The operator for image recognition can be used with recognition settings specified for a designated page.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized.
	Offset	Input the offset for setting ROI in the recognition settings.
Output		
	json	Output the recognition result in JSON string format.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Channel	Channel number for the page settings to be used.	Integer
Page Id	Page number for the page settings to be used.	Integer
Tools List	The tool to be used for recognition, such as OCR01, COLOR01, PATTERN01. Note: If left empty, it means all recognition tools set in the page will be used. Note: Alias for recognition tools can be	String

	used.	
X Offset	Set the X offset of the recognition area for the page tool. If there is an Input, its value will be used.	Python Expression
Y Offset	Set the Y offset of the recognition area for the page tool. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is CURRENT_IMAGE.	
Detailed json	Set whether to output detailed recognition results. Note: Detailed recognition results include the individual RGB values for COLOR recognition results and the matching score, matching pattern coordinates, and other information for PATTERN recognition results.	

Note: If the result of OCR is "NG", it will not be included in the output JSON string.

4.6.4 Real time variable (only supported VIC series products)

4.6.4.1 RT.CHANNEL_NO

This operator retrieves the current channel number being executed and outputs it as a string in a specific format. For example, if the current channel being executed is Channel 2, the output string would be "02".

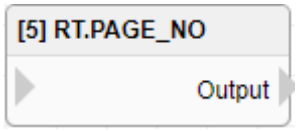
	UI Name	Behavior
Input		
Output	Output	Output the current executing channel

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.4.2 RT.PAGE_NO

This operator retrieves the current executing page number and outputs it as a string in a specific format. For example, if the current executing page is page 3, the output string will be "03".



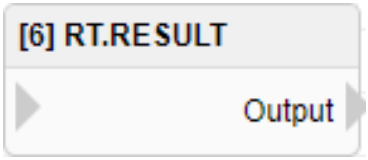
	UI Name	Behavior
Input		
Output	Output	Output the current executing page.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.4.3 RT.RESULT

The operator that provides the current recognition result can output an integer representing the following meanings:



Recognition Result	Output
Recognition successful	0
NG	1
No Matching	2

	UI Name	Behavior
Input		
Output	Output	Output recognition result.

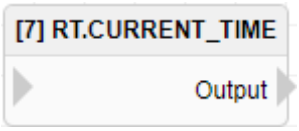
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.4.4 RT.CURRENT_TIME

Operator for obtaining the current time is available, outputting a string format of YYYY-MM-DD HH:MM:SS.

. This operator is formatted as an object and the year, month, day, hour, minute, and second can be obtained individually as shown in the table below.



Method	Mean
${OPERATOR_ID.YEAR}	Retrieve the current year.
${OPERATOR_ID.MONTH}	Retrieve the current month.
${OPERATOR_ID.DAY}	Retrieve the current date.
${OPERATOR_ID.HOUR}	Retrieve the current hour of the time.
${OPERATOR_ID.MINUTE}	Retrieve the current minute of the time.
${OPERATOR_ID.SECOND}	Retrieve the current second of the time.

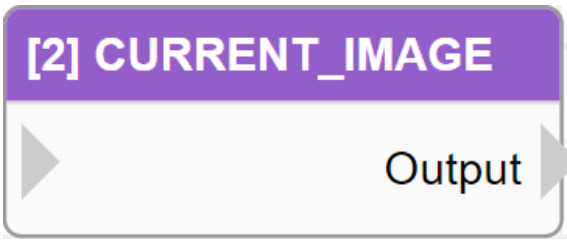
	UI Name	Behavior
Input		
Output	Output	Output current time.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.4.5 CURRENT_IMAGE

The operator which obtains the current image recognized.



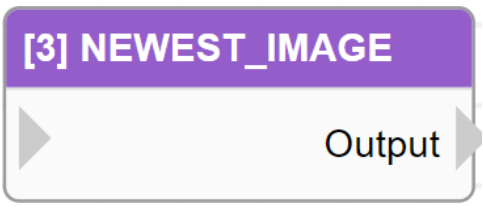
	UI Name	Behavior
Input		
Output	Output	Output the current image.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.4.6 NEWEST_IMAGE

The operator to obtain the latest captured image can be obtained.



	UI Name	Behavior
Input		
Output	Output	Output the latest captured image.

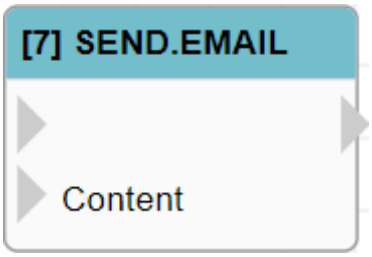
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer

4.6.5 Communication

4.6.5.1 SEND.EMAIL

This is an operator that can send notifications via email containing the input or configured content.



	UI Name	Behavior
Input		
	Content	Input the content to send.
Output		

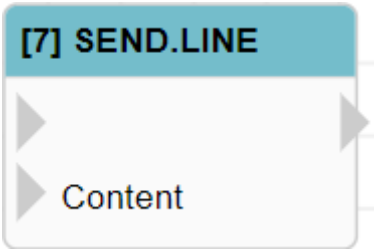
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the SMTP connection to be used.	
Recipient	Set the email address of the recipient.	String
Subject	Set the subject line of the email to be sent.	String
Content	Set the content of the email to be sent. If a field is not empty, its value will be used.	Inline Python Expression String and %1
Send Image*	Set whether to send the current screen. Check the box to send it.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	
arr*	Configure the transmitted image. By default, it is CURRENT_IMAGE.	

Note: * indicates that it is only supported by VIC series products.

4.6.5.2 SEND.LINE

This is an operator that can send notifications via Line Notify containing the input or configured content.



	UI Name	Behavior
Input		
	Content	Input the content to send.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the Line Notify to be used.	
Content	Set the content of the message to be sent. If a field is not empty, its value will be used.	Inline Python Expression String and %1
Send Image*	Whether to send the current screen. Check the box to send it.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	
arr*	Configure the transmitted image. By default, it is CURRENT_IMAGE.	

Note: * indicates that it is only supported by VIC series products.

4.6.5.3 SEND.WECHAT

The operator can be used to send the content of inputs or settings to every user who follows the WeChat Official Account.

	UI Name	Behavior
Input		
Output		

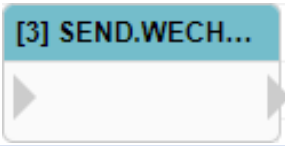
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the WeChat to be used.	
Template ID	The ID of the template message to be sent.	String
keyword1	Set the data for keyword1 in the template message to be sent.	Inline Python Expression String
keyword2	Set the data for keyword2 in the template message to be sent.	Inline Python Expression String
keyword3	Set the data for keyword3 in the template message to be sent.	Inline Python Expression String
Send Image*	Whether to send the current screen. Check the box to send it.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	
arr*	Configure the transmitted image. By default, it is CURRENT_IMAGE.	

Note: * indicates that it is only supported by VIC series products.

4.6.5.4 SEND.WECHAT_P

The operator can send the input or configured content to specific users who follow the WeChat public account via message.



	UI Name	Behavior
Input		
Output		

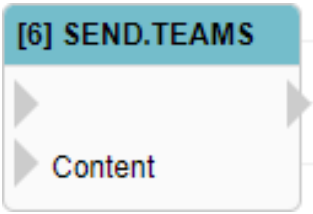
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the WeChat to be used.	
Template ID	The ID of the template message to be sent.	String
Open ID	WeChat ID of the user who has subscribed to the public account and to whom the template is to be sent.	String
keyword1	Set the data for keyword1 in the template message to be sent.	Inline Python Expression String
keyword2	Set the data for keyword2 in the template message to be sent.	Inline Python Expression String
keyword3	Set the data for keyword3 in the template message to be sent.	Inline Python Expression String
Send Image*	Set whether to send the current screen. Check the box to send it.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	
arr*	Configure the transmitted image. By default, it is CURRENT_IMAGE.	

Note: * indicates that it is only supported by VIC series products.

4.6.5.5 SEND.TEAMS

This is an operator that can send notifications via Microsoft Teams containing the input or configured content.



	UI Name	Behavior
Input		
	Content	Input the content to send.
Output		

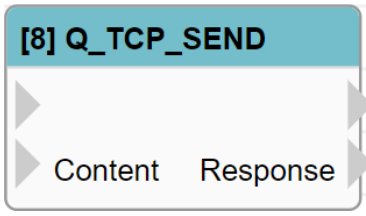
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Link ID	Configure the Teams to be used.	
Title	Set the title of the message to be sent. This field cannot be empty.	Inline Python Expression String
Content	Set the content of the message to be sent. If a field is not empty, its value will be used.	Inline Python Expression String and %1
Send Image*	Whether to send the current screen. Check the box to send it.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	
arr*	Configure the transmitted image. By default, it is CURRENT_IMAGE.	

Note: * indicates that it is only supported by VIC series products.

4.6.5.6 Q_TCP_SEND

This operator enables transmission of the input or configured content through a TCP/IP client.



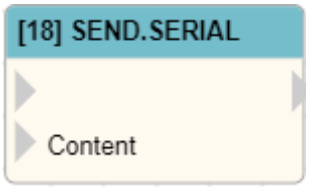
	UI Name	Behavior
Input		
	Content	Input the content to send.
Output		
	Response	Output the content returned by the Host.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
IP	Set the IP address of the host to be connected.	String
Port	Set the communication port of the host to be connected.	Integer
Wait Time (ms)	Set the time to wait before the next execution.	Integer
Content	Set the content of the message to be sent. If a field is not empty, its value will be used.	String

4.6.5.7 SEND.SERIAL (only nDAS series and nPAC products are supported.)

This operator can send input or configured content through Serial communication.



	UI Name	Behavior
Input		
	Content	Input the content to send.
Output		

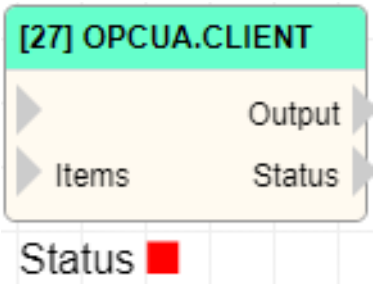
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Port	Set the desired communication port.	
Baud Rate	Configure the baud rate for the selected port.	
Data Bits	Configure the data bits for the selected port.	
Parity	Configure the parity check for the selected port.	
Stop Bits	Configure the stop bits for the selected port.	
Content	Set the content of the message to be sent. If a field is not empty, its value will be used.	Inline Python Expression String and %1
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	

4.6.6 OPC UA

4.6.6.1 OPC UA.CLIENT

Configure an OPC UA Client operator to connect to a server, enabling the operator to perform reading, writing, and method calling operations.



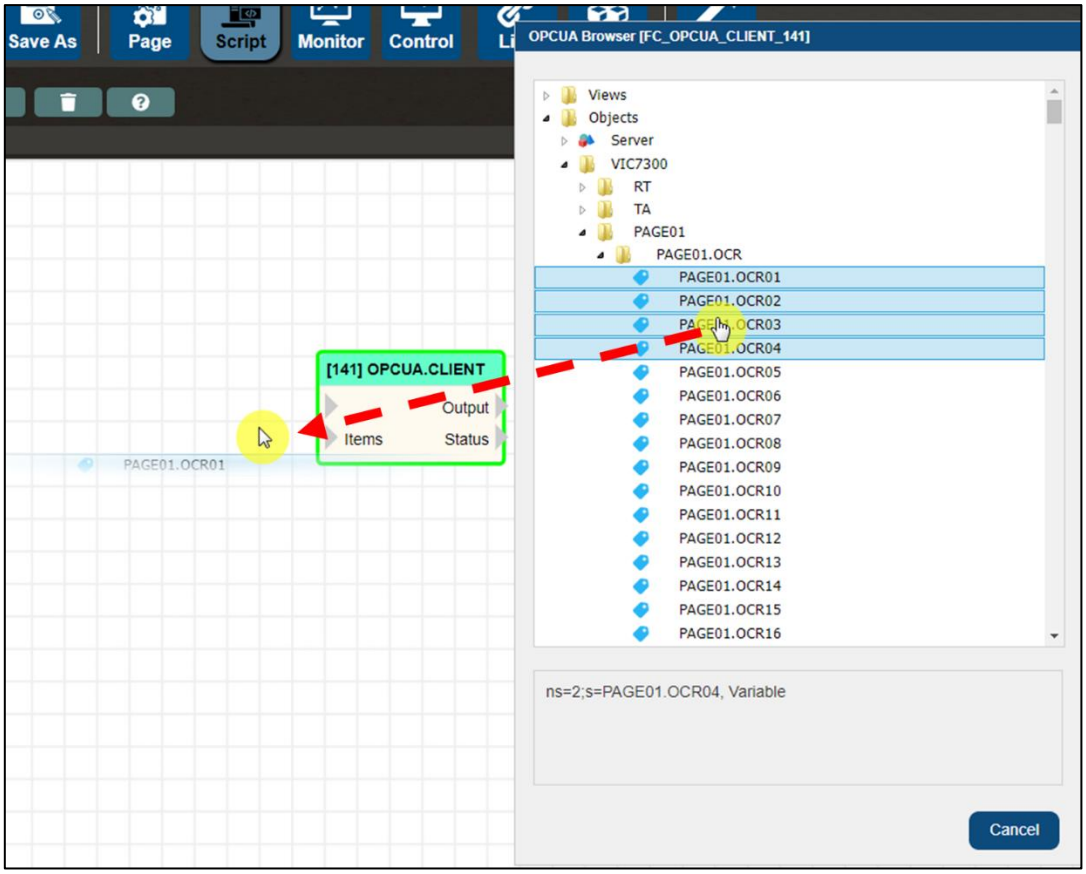
	UI Name	Behavior
Input		
	Items	Input the item to be operated.
Output	Output	Output the result of the read.
	Status	Output the status of the read.

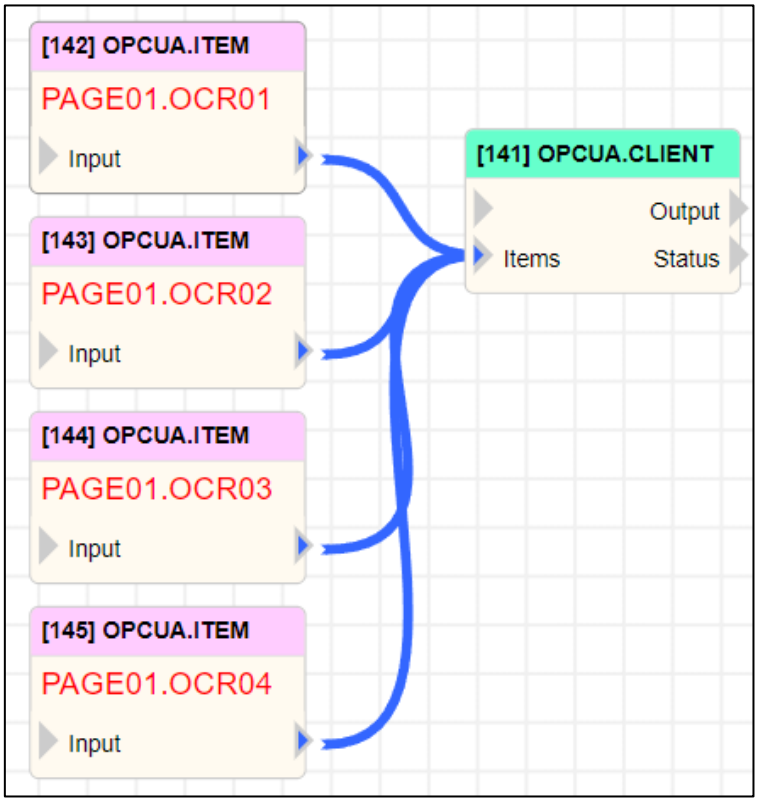
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Status	Display the connection status of the OPC UA Client.	
Url	Set the URL of the OPC UA Server to be connected.	String
Action	Set the actions of the OPC UA Client towards the Server, including read, write, and call method.	
Automatic Reconnect	Whether to automatically connect when the operator is executed.	
Output Name	Set the output of the operator, including Display Name, Identifier, and Full Name.	

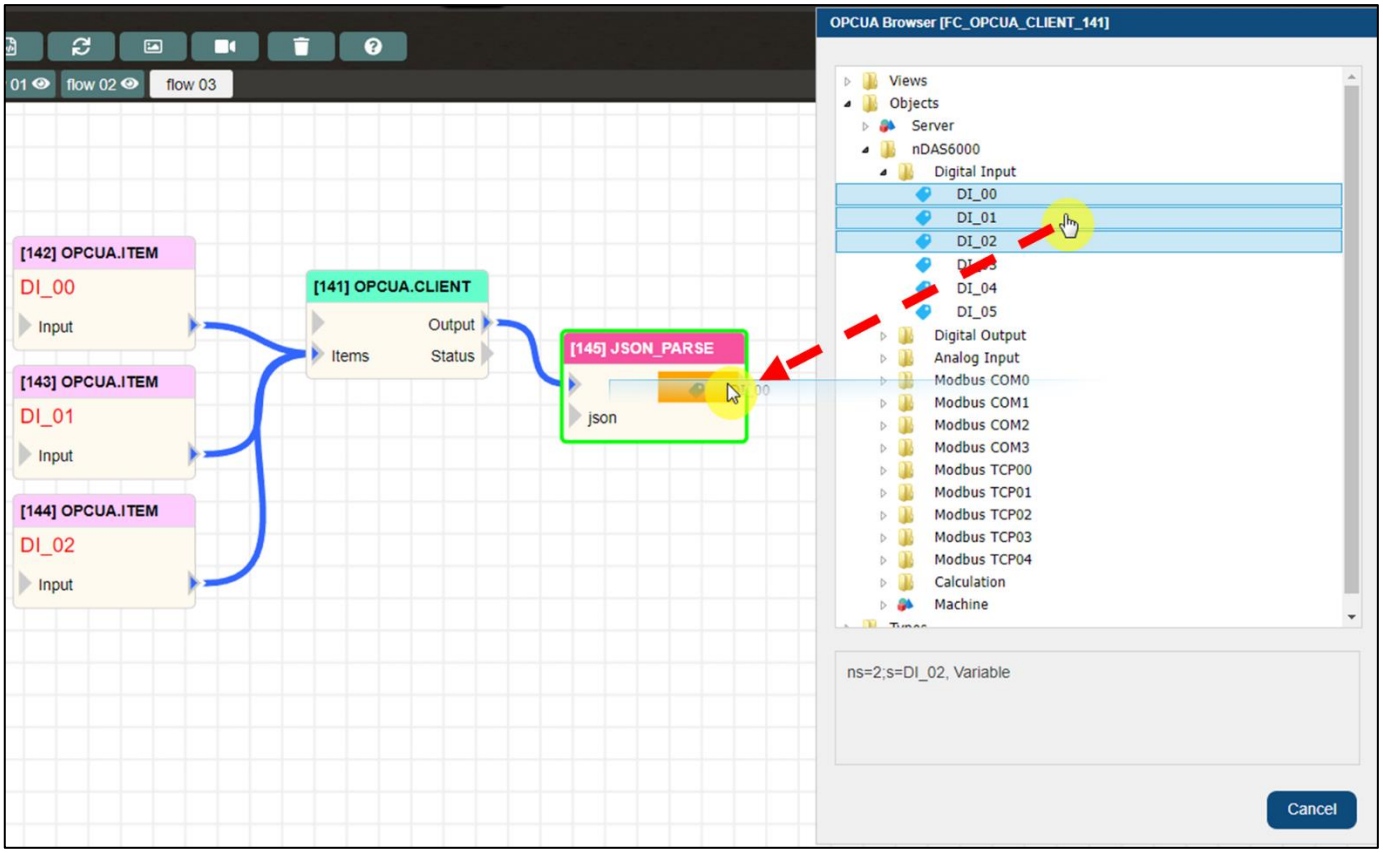
Connect	Click to initiate the connection with the Server.	
Disconnect	Click to terminate the connection with the Server.	
Browser	Clicking on the button will bring up the browsing dialog for the OPC UA server.	
Security		
Security Policy	Configure the security policy used to connect to the OPC UA server.	
Security Mode	Set the security mode used to connect to the OPC UA server.	
Use Best Security	Selecting the option will automatically choose the most secure way to connect to the OPC UA server.	
Authentication		
Method	Set the authentication method for connecting to the OPC UA server, including Anonymous, User Name, and Certificate.	
Method-User Name		
User Name	Set the user name for the connection to the OPC UA server.	
Password	Set the password for the connection to the OPC UA server.	
Method-Certificate		
Certificate	Configure the certificate used to connect to the OPC UA server.	
Private Key	Set the private key for the connection to the OPC UA server.	

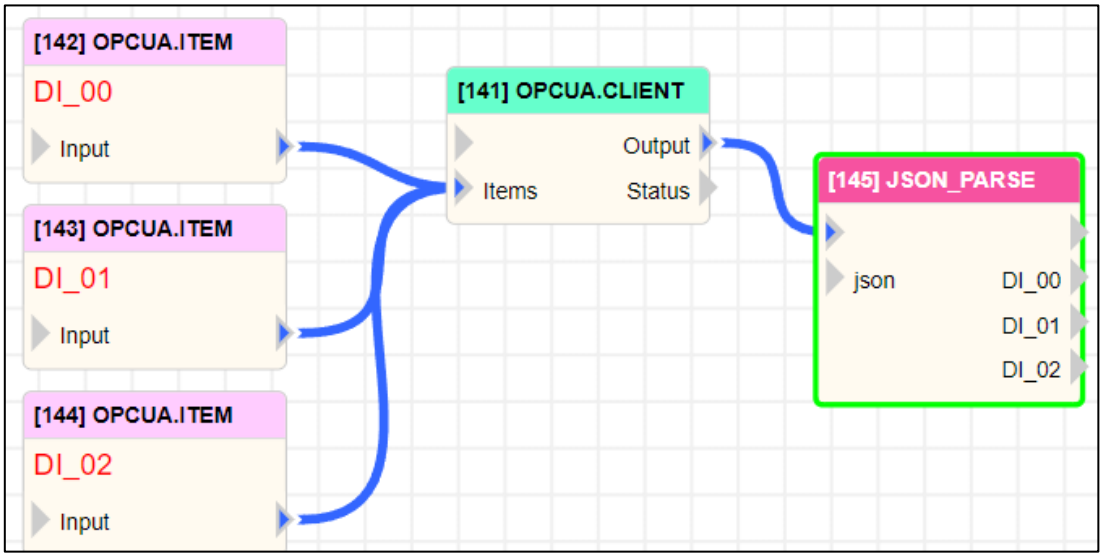
After pressing the Alt key, double-clicking on the OPCUA Client operator will display the browsing dialog of the OPC UA Server, if it is connected. You can then select multiple items and drag them into the flow page, and the system will automatically generate OPCUA items, as shown in the figure below.





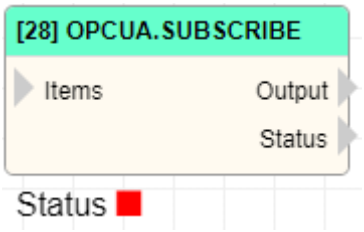
When an OPCUA Client reads multiple items, the output data will be in JSON format. At this point, you can directly select and drag the items read to the Output of JSON_PARSE. The software will automatically generate the corresponding output in JSON_PARSE's Output, as shown in the figure below.





4.6.6.2 OPCUA.SUBSCRIBE

Operator that can subscribe to an OPC UA server.



	UI Name	Behavior
Input	Items	Input the item to be read.
Output	Output	Output the subscription result.
	Status	Output the subscription status.

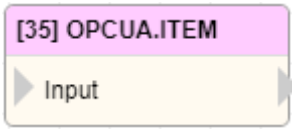
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Status	Display the connection status of the OPC UA Client.	
Url	Set the URL of the OPC UA Server to be connected.	String
Automatic Reconnect	Whether to automatically connect when the operator is executed.	
Output Name	Set the output of the operator, including Display Name, Identifier, and Full Name.	
Connect	Click to initiate the connection with the Server.	
Disconnect	Click to terminate the connection with the Server.	
Browser	Clicking on the button will bring up the browsing dialog for the OPC UA server.	

Subscribe		
Interval (ms)	Set the interval time for each reading.	Integer
Security		
Security Policy	Configure the security policy used to connect to the OPC UA server.	
Security Mode	Set the security mode used to connect to the OPC UA server.	
Use Best Security	Selecting the option will automatically choose the most secure way to connect to the OPC UA server.	
Authentication		
Method	Set the authentication method for connecting to the OPC UA server, including Anonymous, User Name, and Certificate.	
Method-User Name		
User Name	Set the user name for the connection to the OPC UA server.	String
Password	Set the password for the connection to the OPC UA server.	String
Method-Certificate		
Certificate	Configure the certificate used to connect to the OPC UA server.	
Private Key	Set the private key for the connection to the OPC UA server.	

4.6.6.3 OPCUA.ITEM

Configuring the operator for OPC UA items.



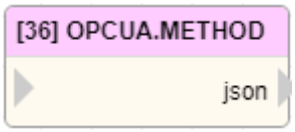
	UI Name	Behavior
Input	Input	Input the content to be written.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Namespace Index	Set the namespace index for the OPC UA item.	Integer
Identifier Type	Set the identifier type for the OPC UA item.	
Identifier	Set the identifier for the OPC UA item.	String
Write		
Data Type	Set the data type for the OPC UA item.	
Input	Set the content to be written for the OPC UA item.	Python Expression
Subscribe		
Mode	Set the subscription mode.	
Use Client Interval	If selected, the time interval of the OPCUA DESCRIBE operator will be used.	
Interval (ms)	If not selected, the interval read will be set according to the time set in the field using the client.	Integer

4.6.6.4 OPCUA.METHOD

Configuring the operator for OPC UA call method.



	UI Name	Behavior
Input		
Output	json	Output JSON format to OPCUA Client operator.

Properties

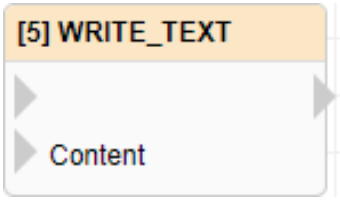
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Object ID	Set the ID of the object to which the OPC UA method belongs.	String
Method ID	Set the ID of the OPC UA method.	String
Add Argument	Click to add a new parameter.	
Name 1	Set the name and value of parameter 1.	
Name 2	Set the name and value of parameter 2.	
Name X	Set the name and value of parameter X.	

Note: After calling, the OPCUA Client operator will output the call_status. A value of 0 indicates a successful call, while a value of 1 indicates a failed call.

4.6.7 System and Other Functions

4.6.7.1 WRITE.TEXT

This is an operator that can save the input or configured content as a text file.



	UI Name	Behavior
Input		
	Content	Input the text content to be saved.
Output		

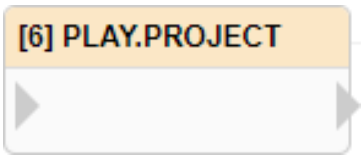
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
File Path	Set the file path location for the text file. If only the file name is set, the file will be created in the system's Export folder.	String
Download	Upon clicking, you will be able to download the text file of the file path.	
Content	Set the content to be written to the text file. If the field is not empty, the value configured in the field will be applied.	Inline Python Expression String and %1
Newline	Whether to add a line break after each execution. If checked, a line break will be automatically added after writing to the file.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	

Note: The system directories for each product are as follows: VIC→C:\VIC7000；nDAS→/opt/nDAS；nPAC→C:\nPAC

4.6.7.2 PLAY.PROJECT (only supported VIC series products)

Operator with control over project running.



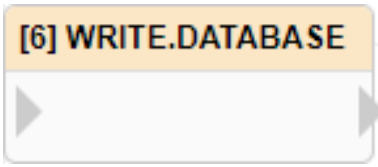
	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Play	Set the option to play the project. Check the box to play project.	

4.6.7.3 WRITE.DATABASE (only supported VIC series products)

Operator that can control whether the recognition data is written to the database or not.



	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Write	Set the option to write to the database. Check the box to enable writing.	

4.6.7.4 RECORD_EVENT (only VIC7200W in the VIC series products supports)

Operators that can trigger recording events.

	UI Name	Behavior
Input	Message	Input messages that trigger recording events into the system log.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Message	Set messages that trigger recording events into the system log. If the field is not empty, apply the value set in the field.	String
Channel	Set the channel to trigger.	Integer
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

4.6.7.5 SAVE_IMAGE (only supported VIC series products)

This is an operator that can store recognized images as image files.

	UI Name	Behavior
Input		
	arr	Input the image to be saved.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
File Path	Set the file path for storage.	String
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer
arr	If there is no input, the image specified in this field will be applied. You can set it to display CURRENT_IMAGE or NEWEST_IMAGE, which can specify a specific channel.	

4.6.7.6 SHOW.IMAGE (only supported VIC series products)

This operator can display images in the script image display dialog

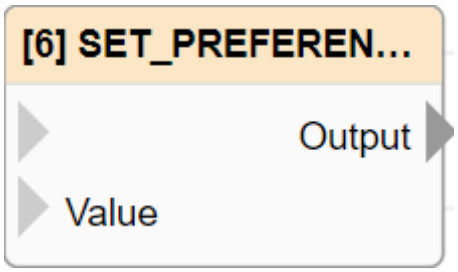
	UI Name	Behavior
Input		
	arr	Input the image to be displayed.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Image Format	Set the format of the displayed image, including JPEG and BMP. Note: JPEG format is a compressed file format for images.	
arr	If there is no input, the image specified in this field will be applied. You can set it to display CURRENT_IMAGE or NEWEST_IMAGE, which can specify a specific channel.	

4.6.7.7 SET_PREFERENCE

The operator that can be used to set system variables allows the variables to persist even after software restarts.



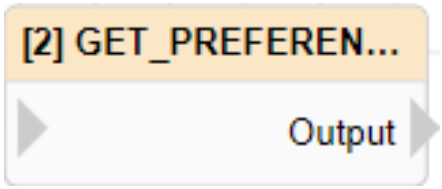
	UI Name	Behavior
Input		
	Value	Input the parameter value.
Output	Output	Output the parameter value that has been set.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Key	Set the parameter name.	String
Value	Set the parameter value. If the field is not empty, apply the value set in the field.	Inline Python Expression String and %1

4.6.7.8 GET_PREFERENCE

The operator that can be used to retrieve the value of system variables will return the default value if the variable does not exist.



	UI Name	Behavior
Input		
Output	Output	If the variable does not exist, the default value set will be output. Otherwise, the value stored in the variable will be output.

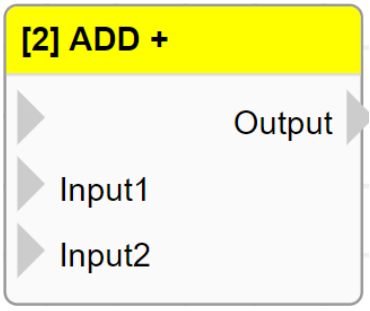
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Key	Set the parameter name.	String
Default Value	Set the parameter default value.	Inline Python Expression String

4.6.8 Operators and logical symbols

4.6.8.1 ADD +

An operator capable of adding two numerical values.



	UI Name	Behavior
Input		
	Input1	Input the first numerical value to be added.
	Input2	Input the second numerical value to be added.
Output	Output	Output the result of adding the two values.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first numerical value to be added.	Python Expression
Input2	Set the second numerical value to be added.	Python Expression

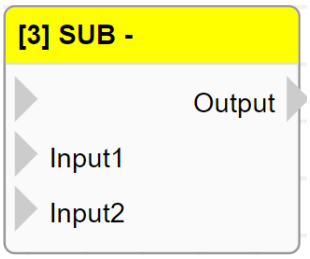
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will prioritize converting the Input value to a numerical value for the operation. If it cannot be converted to a numerical value, it will be processed in its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.2 SUB -

The operator that can subtract two numerical values.



	UI Name	Behavior
Input		
	Input1	Input the first value to be subtracted.
	Input2	Input the second value to be subtracted.
Output	Output	Output the result of the subtraction operation.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value to be subtracted.	Python Expression
Input2	Set the second value to be subtracted.	Python Expression

Note: If the "Input" attribute has a value, it will be used for the operation.

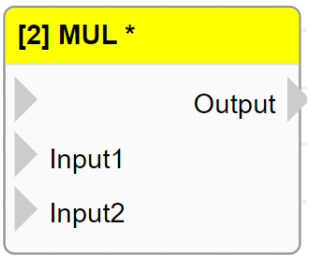
Note: This operator prioritizes converting input to numbers for calculations. If the input cannot be converted to a number, it will not be calculated.

Note: If the input data type is a string, it will not be calculated.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.3 MUL *

The operator that can multiply two numerical values.



	UI Name	Behavior
Input		
	Input1	Input the first value to be multiplied.
	Input2	Input the second value to be multiplied.
Output	Output	Output the result of the multiplication operation.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value to be multiplied.	Python Expression
Input2	Set the second value to be multiplied.	Python Expression

Note: If the "Input" attribute has a value, it will be used for the operation.

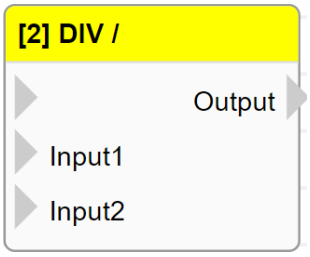
Note: This operator prioritizes converting the input to a numerical value for computation. Inputs that cannot be converted to numerical values will not be computed.

Note: If the input data type is a string, it will not be calculated.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.4 DIV /

The operator that can divide two numerical values.



	UI Name	Behavior
Input		
	Input1	Input the first value to be divided.
	Input2	Input the second value to be divided.
Output	Output	Output the result of the division operation.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value to be divided.	Python Expression
Input2	Set the second value to be divided.	Python Expression

Note: If the "Input" attribute has a value, it will be used for the operation.

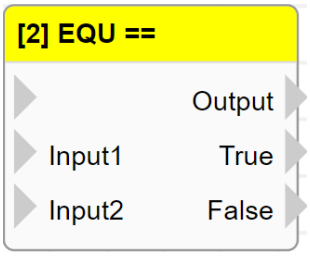
Note: This operator prioritizes converting the input to a numerical value for computation. Inputs that cannot be converted to numerical values will not be computed.

Note: If the input data type is a string or the input is 0, the computation will not be performed.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.5 EQU ==

Operator that performs comparison between two values, outputs true if Input1 is equal to Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If they are equal, output from this port.
	False	If they are not equal, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

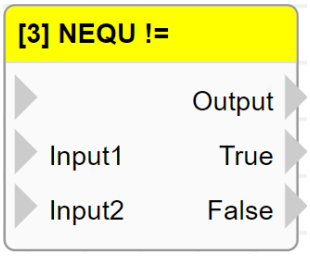
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will first convert the value of Input to a numerical value for comparison. If it cannot be converted to a numerical value, it will be compared using its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.6 NEQU !=

Operator that performs comparison between two values, outputs true if Input1 is not equal to Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If they are not equal, output from this port.
	False	If they are equal, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

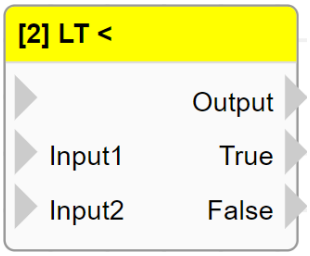
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will first convert the value of Input to a numerical value for comparison. If it cannot be converted to a numerical value, it will be compared using its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.7 LT <

Operator that performs comparison between two values, outputs true if Input1 is less than Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If Input1 is less than Input2, output from this port.
	False	If Input1 is greater than or equal to Input2, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

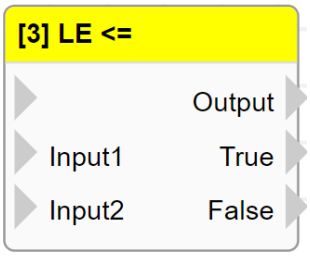
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will first convert the value of Input to a numerical value for comparison. If it cannot be converted to a numerical value, it will be compared using its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.8 LE <=

Operator that performs comparison between two values, outputs true if Input1 is less than or equal to Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If Input1 is less than or equal to Input2, output from this port.
	False	If Input1 is greater than Input2, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priorty of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

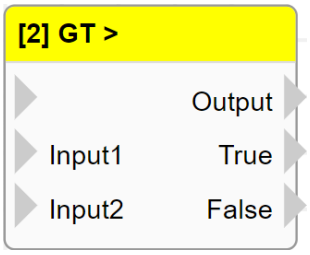
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will first convert the value of Input to a numerical value for comparison. If it cannot be converted to a numerical value, it will be compared using its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.9 GT >

Operator that performs comparison between two values, outputs true if Input1 is greater than Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If Input1 is greater than Input2, output from this port.
	False	If Input1 is less than or equal to Input2, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

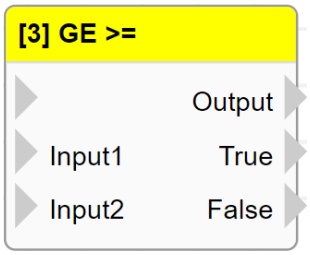
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will first convert the value of Input to a numerical value for comparison. If it cannot be converted to a numerical value, it will be compared using its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.10 GE >=

Operator that performs comparison between two values, outputs true if Input1 is greater than or equal to Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If Input1 is greater than or equal to Input2, output from this port.
	False	If Input1 is less than Input2, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

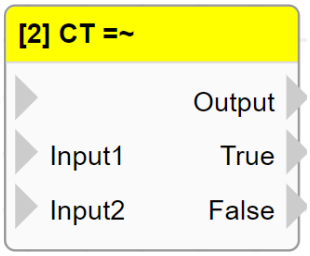
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will first convert the value of Input to a numerical value for comparison. If it cannot be converted to a numerical value, it will be compared using its original data type.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.11 CT =~

Operator that performs comparison between two values, outputs true if Input1 is contains Input2; otherwise outputs false.



	UI Name	Behavior
Input		
	Input1	Input the first value for comparison.
	Input2	Input the second value for comparison.
Output	Output	Output the comparison result.
	True	If Input1 contains Input2, output from this port.
	False	If Input1 does not contain Input2, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value for comparison.	Python Expression
Input2	Set the second value for comparison.	Python Expression

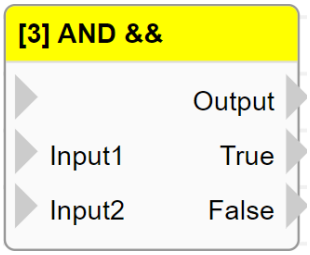
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: This operator will prioritize converting the input to a string for comparison.

Note: If the data type is boolean, and it is true, it will be converted to the string "True". Conversely, if it is false, it will be converted to the string "False".

4.6.8.12 AND &&

Operator that performs the logical "AND" operation on two input values. If the result of the operation is true, output "true"; otherwise, output "false".



	UI Name	Behavior
Input		
	Input1	Input the first value to be operated on.
	Input2	Input the second value to be operated on.
Output	Output	Output the result of the operation.
	True	If the result of the operation is true, output from this port.
	False	If the result of the operation is false, output from this port.

Properties

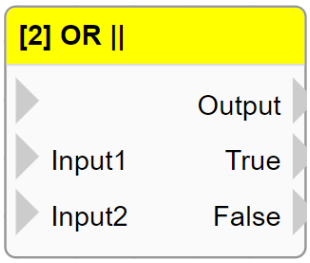
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value to be operated on.	Python Expression
Input2	Set the second value to be operated on.	Python Expression

Note: If the "Input" attribute has a value, it will be used for the operation.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.13 OR ||

Operator that performs the logical "OR" operation on two input values. If the result of the operation is true, output "true"; otherwise, output "false".



	UI Name	Behavior
Input		
	Input1	Input the first value to be operated on.
	Input2	Input the second value to be operated on.
Output	Output	Output the result of the operation.
	True	If the result of the operation is true, output from this port.
	False	If the result of the operation is false, output from this port.

Properties

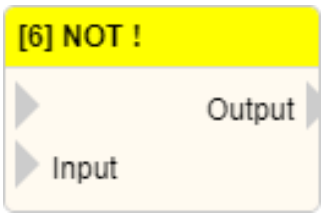
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input1	Set the first value to be operated on.	Python Expression
Input2	Set the second value to be operated on.	Python Expression

Note: If the "Input" attribute has a value, it will be used for the operation.

Note: If the data type is Boolean, True will be converted to the integer 1 and False will be converted to the integer 0.

4.6.8.14 NOT !

Operator that performs the logical "NOT" operation on two input values. If the result of the operation is true, output "true"; otherwise, output "false".



	UI Name	Behavior
Input		
	Input	Input the value to be operated on.
Output	Output	Output the result of the operation.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Input	Set the value to be operated on.	Python Expression

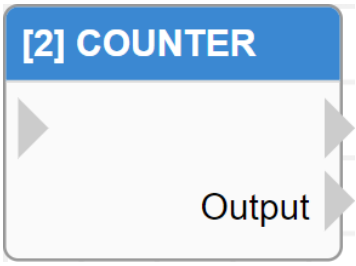
Note: If the "Input" attribute has a value, it will be used for the operation.

Note: The data type is an integer, and if it's not equal to 0, it will be converted to true; otherwise, if it is equal to 0, it will be converted to false.

4.6.9 Python Module

4.6.9.1 COUNTER

This operator can be used as a counter.



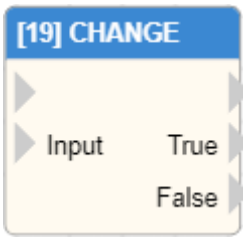
	UI Name	Behavior
Input		
Output		
	Output	Output the current count value.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Reset	Reset the counter.	
Print	Print the current count value of the counter.	

4.6.9.2 CHANGE

This operator can be used to determine whether there has been a change in the Input value compared to the previous execution.



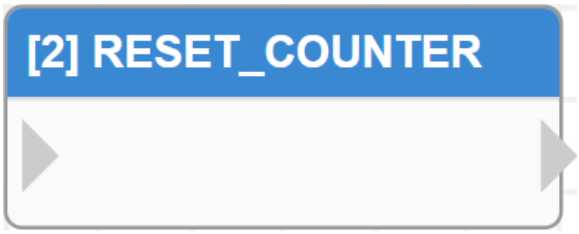
	UI Name	Behavior
Input		
	Input	Input the value to be evaluated.
Output		
	True	If there is a change, output from this port.
	False	If there is no change, output from this port.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Reset	Reset the recorded Input value.	
Print	Print the current recorded Input value.	
Deviation(%)	Set the tolerance value. If the Input value differs from the previous execution by more than the specified tolerance range, it will be deemed as a change in value.	Integer

4.6.9.3 RESET_COUNTER

Operator for resetting a designated counter.



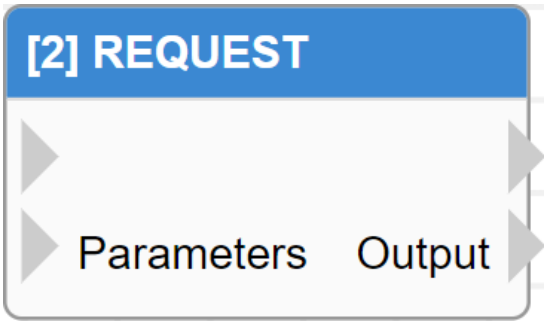
	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Reset	Reset a specified counter.	
Print	Print the current count value of the designated counter.	
Operator ID	Set the ID of the counter operator to be reset.	String

4.6.9.4 REQUEST

Operator for sending RESTful requests.



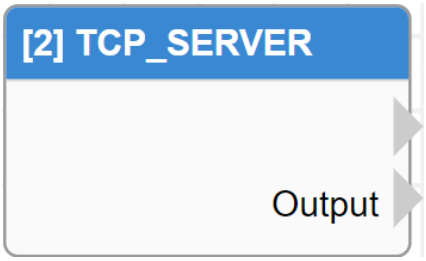
	UI Name	Behavior
Input		
	Parameters	Input the parameters to be sent.
Output		
	Output	Output the returned result.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
URL	Set the URL to be sent.	String
Parameters	Set the parameters to be sent. If the Input has a value input, apply the value of Input.	Python Expression
Method	Set the method to be sent.	
Timeout (s)	Set the time limit for waiting for a response after sending the request.	Integer

4.6.9.5 TCP_SERVER

This operator is capable of establishing a TCP server and receiving data.



	UI Name	Behavior
Output		
	Output	Output the returned value.

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Port	Configure the communication port for the TCP Server.	Integer
Buffer Size	Specify the maximum size of the message to be received.	Integer
Sync	Enable or disable synchronization.	
Fixed arr*		
Use Fixed arr*	When selected, the designated image (arr) will be used.	
Fixed arr*	Choose the desired image (arr) to use.	

Note: If a return value is set, the system will send it back to the TCP Client that sent the message.

Note:* indicates that it is only supported by VIC series products.

4.6.9.6 COLOR_DETECT (only supported VIC series products)

This is an operator capable of detecting colors in images.

	UI Name	Behavior
Input		
	arr	Input the image to be processed.
	ROI Offset	Input the offset of the ROI during processing.
Output	json	Output processed result in JSON format.

Properties

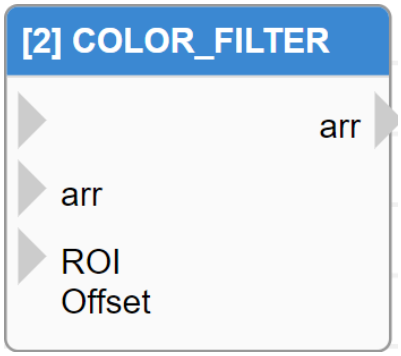
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
HSV		

Enable	Set option to use HSV mode.	
Hue	Set hue for HSV mode.	Integer
Saturation	Set saturation for HSV mode.	Integer
Value	Set value for HSV mode.	Integer
Parameters		
Red	Set red value for RGB color comparison.	Integer
Green	Set green value for RGB color comparison.	Integer
Blue	Set blue value for RGB color comparison.	Integer
Tolerance	Set tolerance for color detection.	Integer
Min. Length	Set minimum width and height for detected colors.	Integer

Note: If no image input (arr) is provided, the operator will use the current image (CURRENT_IMAGE) for processing.

4.6.9.7 COLOR_FILTER (only supported VIC series products)

Operator that allows filtering of colors in an image.



	UI Name	Behavior
Input		
	arr	Input the image to be processed.
	ROI Offset	Input the offset of the ROI during processing.
Output		
	arr	Output the processed image.

Properties

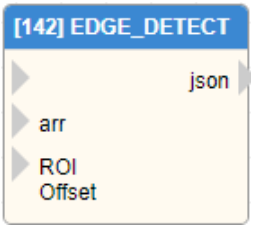
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI.	Python Expression

	If there is an Input, its value will be used.	
Method	Set the filtering method to RGB or HSV.	
Mode	Set the filtering mode to Retention or Exclusion.	
Target Color	Preview the current target color.	
Red	Set the red value to compare in the RGB primary colors.	Integer
Green	Set the green value to compare in the RGB primary colors.	Integer
Blue	Set the blue value to compare in the RGB primary colors.	Integer
Matching Tolerance	Set the tolerance of the color comparison,	Integer
Fill Color	Preview the fill color.	
Fill Red	Set the input value for the red component of the RGB color.	Integer
Fill Green	Set the input value for the green component of the RGB color.	Integer
Fill Blue	Set the input value for the blue component of the RGB color.	Integer
Border Mode	Enable or disable the border mode.	
Stroke Width	Set the width of the border.	Integer

Note: If no image input (arr) is provided, the operator will use the current image (CURRENT_IMAGE) for processing.

4.6.9.8 EDGE_DETECT (only supported VIC series products)

This operator enables edge detection on images.



	UI Name	Behavior
Input		
	arr	Input the image to be processed.
	ROI Offset	Input the offset of the ROI during processing.
Output	json	Output processed result in JSON format.

Properties

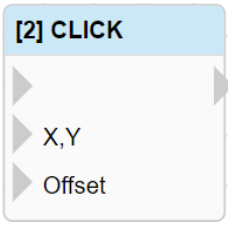
Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
Parameters		
Gaussian Blur	Set the value for Gaussian blur.	Integer
High Threshold	Set the high threshold value.	Integer
Low Threshold	Set the low threshold value.	Integer
Minimum Edge Length	Set the minimum length of edges.	Integer

Note: If no image input (arr) is provided, the operator will use the current image (CURRENT_IMAGE) for processing.

4.7 Control Functions (only supported VIC series products)

4.7.1 CLICK

Executable operator for a single mouse click.



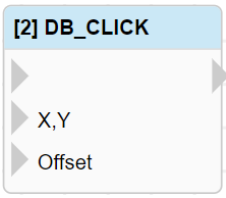
	UI Name	Behavior
Input		
	X,Y	Input the X and Y coordinates of the mouse click.
	Offset	Input the amount of displacement desired during execution. Input format is x_offset,y_offset.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Update	Clicking will open the update dialog.	
X	Set the X coordinate of the mouse click.	Python Expression
Y	Set the Y coordinate of the mouse click.	Python Expression
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
X Offset	Set the amount of X displacement to be executed. If there is an input value, apply that value.	Python Expression
Y Offset	Set the amount of Y displacement to be executed. If there is an input value, apply that value.	Python Expression
Delay Before (ms)	Set the delay time before executing the action.	Integer
Delay After (ms)	Set the delay time after executing the action.	Integer

4.7.2 DB_CLICK

Executable operator for a double mouse click.



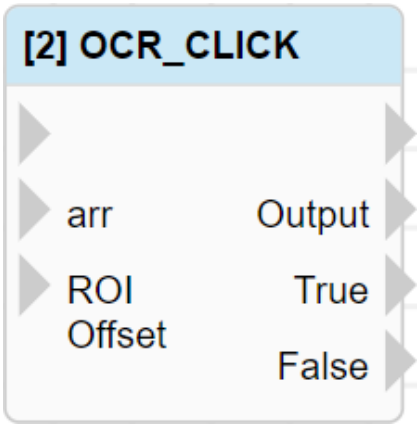
	UI Name	Behavior
Input		
	X,Y	Input the X and Y coordinates of the mouse click.
	Offset	Input the amount of displacement desired during execution. Input format is x_offset,y_offset.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Update	Clicking will open the update dialog.	
X	Set the X coordinate of the mouse click.	Python Expression
Y	Set the Y coordinate of the mouse click.	Python Expression
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
X Offset	Set the amount of X displacement to be executed. If there is an input value, apply that value.	Python Expression
Y Offset	Set the amount of Y displacement to be executed. If there is an input value, apply that value.	Python Expression
Delay Before (ms)	Set the delay time before executing the action.	Integer
Delay After (ms)	Set the delay time after executing the action.	Integer

4.7.3 OCR_CLICK

It is possible to configure the OCR recognition range, such that when the recognition result meets the set conditions, a single mouse click will activate the operator located at the center of the OCR position that meets the conditions.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, then will use the newest captured image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10, 20.
Output		
	Output	Output the recognition result.
	True	If there is a match in the recognition result, output this port.
	False	If there is no match in the recognition result, output this port.

Note: The output (True and False) does not contain any values

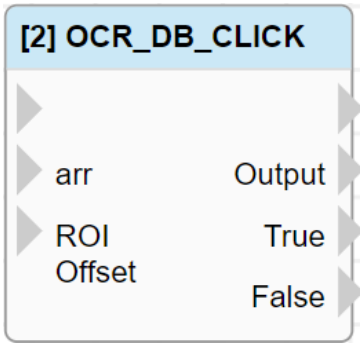
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Input Parameters		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is NEWEST_IMAGE.	
White List	Enable only recognition of the specified setting value; if no setting is provided, full recognition will be performed.	String
Remove Whitespace	When enabled, if the recognition result contains white space characters, they will be automatically removed.	
Recognition Rate(%)	Set the minimum allowable recognition rate; if the rate falls below this value, recognition will fail.	
Click		
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
Matching Text	The text to be searched.	Inline Python Expression String
Wait Time (ms)	Set the waiting time for each recognition.	
Wait Condition	Set the waiting condition, including "Until True" and "Until False".	
Delay Before (ms)	Set the delay time before executing the action.	Integer

Delay After (ms)	Set the delay time after executing the action.	Integer
Image Preprocess		
Image Preprocess – Resize		
Resize Method	Setting the method for resizing.	
Resize	Setting the value for resizing.	
Image Preprocess – Threshold		
Threshold Method	Setting the threshold method.	
Threshold Algorithm	Setting the threshold algorithm.	
Threshold Value	Setting the threshold. Only applicable when the threshold algorithm is set to “none”.	Integer
OCR Font		
Segmentation Mode	Setting the OCR segmentation method.	
Select Font	Setting the font to be used.	
Load Font	Click to select a font file.	
Font File	Displaying the name of the currently used font file.	

4.7.4 OCR_DB_CLICK

It is possible to configure the OCR recognition range, such that when the recognition result meets the set conditions, a double mouse click will activate the operator located at the center of the OCR position that meets the conditions.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, then will use the newest captured image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10, 20.
Output		
	Output	Output the recognition result.
	True	If there is a match in the recognition result, output this port.
	False	If there is no match in the recognition result, output this port.

Note: The output (True and False) does not contain any values

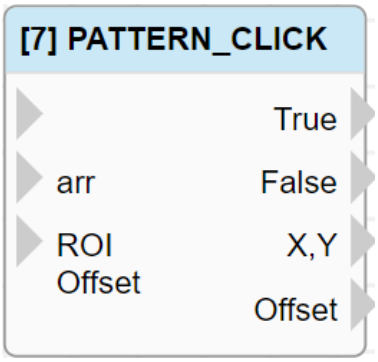
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Input Parameters		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is NEWEST_IMAGE.	
White List	Enable only recognition of the specified setting value; if no setting is provided, full recognition will be performed.	String
Remove Whitespace	When enabled, if the recognition result contains white space characters, they will be automatically removed.	
Recognition Rate(%)	Set the minimum allowable recognition rate; if the rate falls below this value, recognition will fail.	
Click		
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
Matching Text	The text to be searched.	Inline Python Expression String
Wait Time (ms)	Set the waiting time for each recognition.	
Wait Condition	Set the waiting condition, including "Until True" and "Until False".	

Delay Before (ms)	Set the delay time before executing the action.	Integer
Delay After (ms)	Set the delay time after executing the action.	Integer
Image Preprocess		
Image Preprocess – Resize		
Resize Method	Setting the method for resizing.	
Resize	Setting the value for resizing.	
Image Preprocess – Threshold		
Threshold Method	Setting the threshold method.	
Threshold Algorithm	Setting the threshold algorithm.	
Threshold Value	Setting the threshold. Only applicable when the threshold algorithm is set to “none”.	Integer
OCR Font		
Segmentation Mode	Setting the OCR segmentation method.	
Select Font	Setting the font to be used.	
Load Font	Click to select a font file.	
Font File	Displaying the name of the currently used font file.	

4.7.5 PATTERN_CLICK

One can set the recognition scope for pattern matching and perform an operator that clicks on the center point of the matched pattern upon a single mouse click.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, then will use the newest captured image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10, 20.
Output	True	If match successfully, output from this port.
	False	If match fails, then output from this port.
	X,Y	Output the central coordinates of the matched pattern.
	Offset	Output the matched pattern and the position offset set during configuration.

Note: The output (True and False) does not contain any values

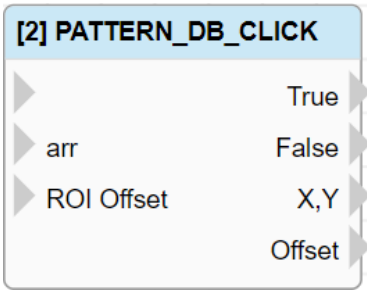
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Input Parameters		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression

ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression
ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is NEWEST_IMAGE.	
Click		
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
Matching Parameters		
Pattern Name	Display the file name of the matching pattern image.	
Pattern Load	Clicking on it will display the pattern loading dialog.	
Pattern X	Set the X value for the matching pattern.	Integer
Pattern Y	Set the Y value for the matching pattern.	Integer
Gray Matching	When enabled, the image will be converted to grayscale for pattern matching, which can speed up the process.	
Minimum Score	Set the minimum score for successful pattern matching, which is 0.95 by default and valid range is from 0 to 1, where 1 is a perfect match.	Float
Wait Time(ms)	Set the wait time for each matching attempt.	Integer
Wait Condition	Set the waiting condition: Until True, which means waiting until the matching is successful. Until False, which means waiting until the matching fails.	
Delay Before (ms)	Set the delay time before executing the action.	Integer
Delay After (ms)	Set the delay time after executing the action.	Integer

4.7.6 PATTERN_DB_CLICK

One can set the recognition scope for pattern matching and perform an operator that clicks on the center point of the matched pattern upon a double mouse click.



	UI Name	Behavior
Input		
	arr	Input the image to be recognized. If not inputted, then will use the newest captured image for recognition.
	ROI Offset	Input the offset value for the ROI as offset_x, offset_y format. For example, if X offset is 10 and Y offset is 20, input the format as 10, 20.
Output	True	If match successfully, output from this port.
	False	If match fails, output from this port.
	X,Y	Output the central coordinates of the matched pattern.
	Offset	Output the matched pattern and the position offset set during configuration.

Note: The output (True and False) does not contain any values

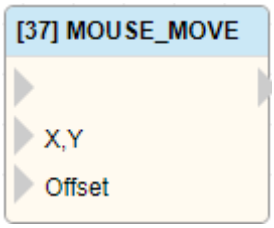
Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Input Parameters		
ROI-X	Set the X-coordinate value of the ROI.	Python Expression
ROI-Y	Set the Y-coordinate value of the ROI.	Python Expression

ROI-Width	Set the width of the ROI.	Python Expression
ROI-Height	Set the height of the ROI.	Python Expression
Update	Clicking will open the update dialog.	
ROI X Offset	Set the X-offset of the ROI. If there is an Input, its value will be used.	Python Expression
ROI Y Offset	Set the Y-offset of the ROI. If there is an Input, its value will be used.	Python Expression
arr	Set the image used for recognition. By default, it is NEWEST_IMAGE.	
Click		
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
Matching Parameters		
Pattern Name	Display the file name of the matching pattern image.	
Pattern Load	Clicking on it will display the pattern loading dialog.	
Pattern X	Set the X value for the matching pattern.	Integer
Pattern Y	Set the Y value for the matching pattern.	Integer
Gray Matching	When enabled, the image will be converted to grayscale for pattern matching, which can speed up the process.	
Minimum Score	Set the minimum score for successful pattern matching, which is 0.95 by default and valid range is from 0 to 1, where 1 is a perfect match.	Float
Wait Time(ms)	Set the wait time for each matching attempt.	Integer
Wait Condition	Set the waiting condition: Until True, which means waiting until the matching is successful. Until False, which means waiting until the matching fails.	
Delay Before (ms)	Set the delay time before executing the action.	Integer
Delay After (ms)	Set the delay time after executing the action.	Integer

4.7.7 MOUSE_MOVE

Operator that allows for the movement of the mouse cursor to a specified loaction.



	UI Name	Behavior
Input		
	X,Y	Input the X and Y coordinates of the mouse move.
	Offset	Input the amount of displacement desired during execution. Input format is x_offset,y_offset.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Update	Clicking will open the update dialog.	
X	Set the X coordinate of the mouse move.	Python Expression
Y	Set the X coordinate of the mouse move.	Python Expression
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
X Offset	Set the amount of X displacement to be executed. If there is an input value, apply that value.	Python Expression
Y Offset	Set the amount of Y displacement to be executed. If there is an input value, apply that value.	Python Expression
Delay Before (ms)	Set the delay time before executing the action.	Integer
Delay After (ms)	Set the delay time after executing the action.	Integer

4.7.8 DELAY

This operator that can delay the execution of subsequent processes for a certain amount of time.

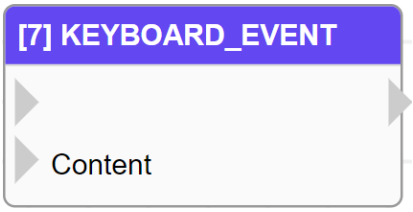
	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Delay (ms)	Specify the desired delay time.	Integer

4.7.9 KEYBOARD_EVENT

Operator capable of simulating a keyboard and inputting content.



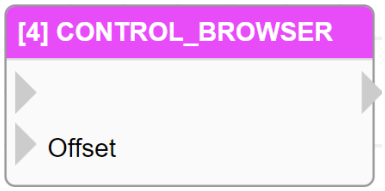
	UI Name	Behavior
Input		
	Content	Input the content to be simulated keyboard input for.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Update	Clicking will open the update dialog.	
Content	Set the content of the message to be sent. If a field is not empty, its value will be used.	Inline Python Expression String and %1

4.7.10 CONTROL_BROWSER

Operator capable of executing browser control file.



	UI Name	Behavior
Input		
	Offset	Input the amount of offset desired when executing the control file. Input format is x_offset,y_offset.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Channel	Set the channel for control execution.	
Control File	Set the control file for execution.	
Update	Clicking will open the update dialog.	
X Offset	Set the amount of X displacement to be executed. If there is an input value, apply that value.	Python Expression
Y Offset	Set the amount of Y displacement to be executed. If there is an input value, apply that value.	Python Expression
Use Input/Queue	Whether to apply the Input and Queue properties of the control file. Check the box to use.	
Sync	Whether to apply synchronous execution. Check the box to use.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

4.7.11 CONTROL_FILE

Operator capable of executing control file.

	UI Name	Behavior
Input		
	Offset	Input the amount of offset desired when executing the control file. Input format is x_offset,y_offset.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Control File	Set the control file for execution.	
Update	Clicking will open the update dialog.	
X Offset	Set the amount of X displacement to be executed. If there is an input value, apply that value.	Python Expression
Y Offset	Set the amount of Y displacement to be executed. If there is an input value, apply that value.	Python Expression
Use Input/Queue	Set whether to apply the Input and Queue properties of the control file. Check the box to use.	
Sync	Whether to apply synchronous execution. Check the box to use.	
Block Time (sec.)	Configure the blocking time for the operator. After execution, the operator will not be executed within this time frame.	Integer

4.7.12 DRAG

Executable operator for a double mouse drag.

	UI Name	Behavior
Input		
	Offset	Input the amount of displacement desired during execution. Input format is x_offset,y_offset.
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Update	Clicking will open the update dialog.	
X1	Set the initial value of the X-coordinate for the starting position.	Python Expression
Y1	Set the initial value of the Y-coordinate for the starting position.	Python Expression
X2	Set the initial value of the X-coordinate for the ending position.	Python Expression
Y2	Set the initial value of the Y-coordinate for the ending position.	Python Expression
Interval (ms)	Set the time interval for the movement between the two coordinate positions.	Integer
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.	
X Offset	Set the amount of X displacement to be executed. If there is an input value, apply that value.	Python Expression
Y Offset	Set the amount of Y displacement to be executed. If there is an input value, apply that value.	Python Expression

4.7.13 BORWSER_RELOAD

Operator for reloading a browser URL setting.

	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Channel	Set the channel number that requires a browser reload.	Integer

4.7.14 CONTROL_DISABLED

This operator can be configured to enable or disable its control functions.

	UI Name	Behavior
Input		
Output		

Properties

Name	Mean	Format
Information		
ID	Operator's ID.	
Name	Operator's name.	
Tag	Configure the tag of the operator.	String
Priority	Set the execution priority of the operator within the same level.	Integer
Skip	Option to skip execution of the operator.	
Debug	Option to enable debugging mechanism for this operator.	
z-index	Set the operator stacking order.	Integer
Settings		
Disable	Set the option to halt the execution of control commands. Check the box to activate it.	

4.8 Custom Operators

This software allows users to create their own custom operators based on their specific needs, by designing a *py file. Operators are divided into two types: general operator and trigger operator, The usage is as below.

Note: The edited *py file needs to be placed in the bin\py\vic_operator_modules folder within the system directory.

Note: The system directories for each product are as follows: VIC→C:\VIC7000；nDAS→/opt/nDAS；nPAC→C:\nPAC

4.8.1 General Operator

The usage of a general operator is as follows:

1. Define the operator as a class.
   Note: The parameter assigned must be **VIC_OPERATOR_MODULE**, indicating that it inherits from the VIC_OPERATOR_MODULE class.
2. Within this module, there are five functions, which are as follows:
   (1) init(self) →Declare variable initial value.
   (2) process(self, inputs) →Function to process the operator's operation.
   (3) writeProperty(self, name, value) →Write the value to the column based on the name.
   (4) fetchProperties(self) →Parse the configured JSON file into the operator variables. (JSON file must be placed in the bin\py\vic_operator_modules folder inside the system folder.)

3. After the operator is created, it needs to be registered in the software. If **no further changes** are needed, the registration code can be written in the OnInitScript() function, which will be triggered upon reloading the project.
   If **further modifications are expected**, the code can be written in the OnReloadFunction() function, which will be triggered upon clicking the Reload button.

   To register the operator in the software, use the function REGISTER_OPERATOR_MODULE('operator_name', class_name)

   operator_name: It is the name of the operator that will be displayed in VIC Flow.
   class_name: It is the name of the operator class to be registered.
   Note: If the operator name has been modified, the operator must be recreated in addition to reloading before the modified operator can be used.

```
from vic import *

class DEMO(VIC_OPERATOR_MODULE):
    def init(self):
        pass
    def process(self, inputs):
        if self.properties['demo1']:
            sum = inputs['I1'] + self.properties['demo2']
            self.outputs['O2'] = sum
        pass
    def writeProperty(self, name, value):
        pass


    def fetchProperties(self):
        return "demo.json"

def OnInitScript():
    REGISTER_OPERATOR_MODULE('DEMO',DEMO)
```

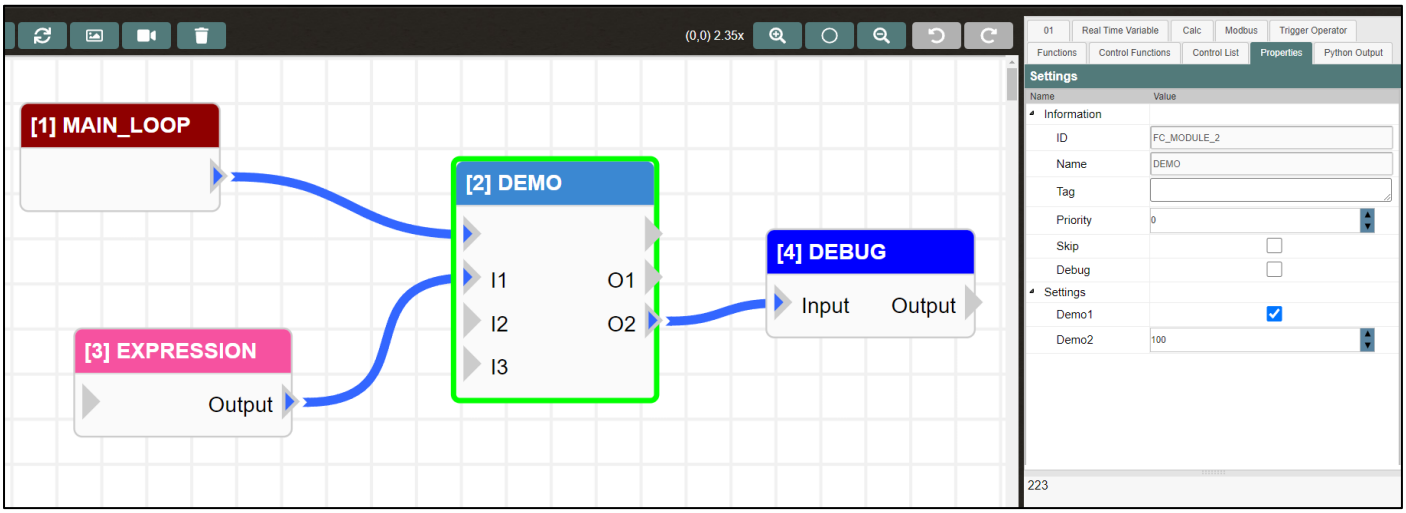
4.8.1.1 process(self, inputs)

Function for the operation of this operator will be handled as follows: when Demo1 is checked, the value of Input1 will be added with the value set in Demo2, and the result will be output through O2.

The JSON file and process configuration for this setting are as follows.

```
{
    "width" :"110",
    "color" : "white",
    "background_color":"#3B88D2",
    "inputs":["","I1","I2","I3"],
    "outputs":["","O1","O2"],
    "profile": [
        { "title": "Demo1", "name":"demo1", "type":"boolean", "value":false},
        { "title": "Demo2", "name":"demo2", "type":"integer", "max":300, "min":1, "step":1, "value":0}
        ]
}
```

```
def process(self, inputs):
    if self.properties['demo1']:
        sum = inputs['I1'] + self.properties['demo2']
        self.outputs['O2'] = sum
```



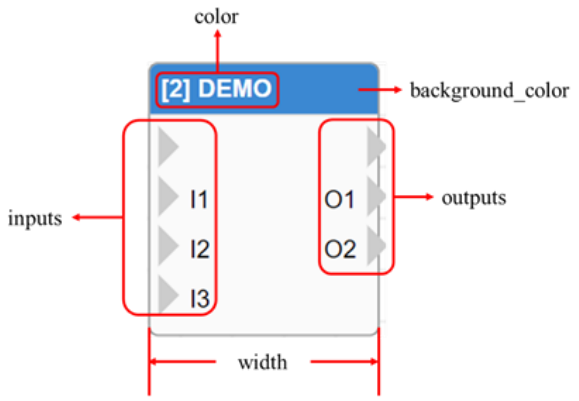
4.8.1.2 fetchProperties(self)

Through the use of a JSON file, operator settings can be configured as follows.

Note: If the contents of the JSON file have been modified, in addition to reloading, it is necessary to create a new operator again in order to use the modified operator.

```
def fetchProperties(self):
    return 'demo.json'
```

```
{
    "width" :"110",
    "color" : "white",
    "background_color":"#3B88D2",
    "inputs":["","I1","I2","I3"],
    "outputs":["","O1","O2"],
    "profile":    [
        { "title": "Demo1", "name":"demo1", "type":"string", "maxlength":1024, "value":""},
        { "title": "Demo2", "name":"demo2", "type":"integer", "max":300, "min":1, "step":1, "value":0},
        { "title": "Demo3", "name":"demo3", "type":"float", "max":10.0, "min":0, "step":0.01, "value":0.1},
        { "title": "Demo4", "name":"demo4", "type":"boolean", "value":false},
        { "title": "Demo5", "name":"demo5", "type":"enumeration", "entries":["D1","D2","D3"], "entry_values":[0,1,2], "index":1},
        { "title": "Demo6", "name":"demo6", "type":"command"}
        ]
}
```

Operator diagram	Parameter name	Set the content of the operator
	width	Width, measured in pixels.
	color	Color of the title text.
	background_color	Background color of the title.
	inputs	Content displayed in the input, if blank, an empty string will be used.
	outputs	Content displayed in the output, if blank, an empty string will be used.
	profiles	Properties field.

4.8.1.2.1 Parameter configuration in the Properties field.

The parameter settings in the Properties field of an operator are as below.

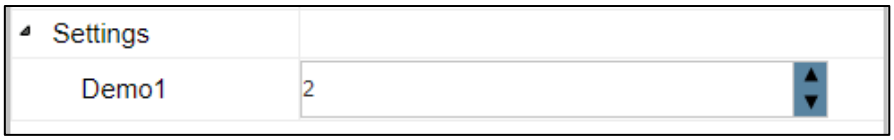
Integer

The integer type parameter is set as shown in the following table.

Parameter name	Content	Parameter name	Content
title	Display name	max	Maximum value
name	Parameter name	min	Minimum value
type	Data type, with integer being the data type.	step	Increment/Decrement value
value	Default value		

Here is an example JSON and its execution result. The display name of the parameter is Demo1, its name is demo1, the type is integer, the maximum value is 300, the minimum value is 1, the default value is 2, and the increment/decrement value is 1.

```
"profile":[
        { "title":"Demo1", "name":"demo1", "type":"integer", "max":300, "min":1, "step":1, "value":2}
]
```



Float

The float type parameter is set as shown in the following table.

Parameter name	Content	Parameter name	Content
title	Display name	max	Maximum value
name	Parameter name	min	Minimum value
type	Data type, with float being the data type.	step	Increment/Decrement value
value	Default value		

The JSON example and execution result are shown below, with the parameter display name as "Demo2", parameter name as "demo2", type as "float", maximum value as 10.0, minimum value as 0, default value as 0.1, and incremental/decremental value as 0.01.

```
"profile":[
        { "title":"Demo2", "name":"demo2", "type":"float", "max":10.0, "min":0, "step":0.01, "value":0.1}
]
```

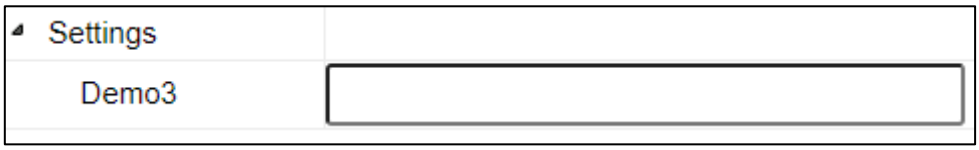
String

The string type parameter is set as shown in the following table.

Parameter name	Content	Parameter name	Content
title	Display name	maxlength	Maximum length
name	Parameter name	value	Default value
type	Data type, with string being the data type.		

The JSON example and execution result as shown below. The parameter display name is Demo3, the parameter name is demo3, the type is string, the maximum length is 1024, and the default value is an empty string.

```
"profile":[
        { "title":"Demo3", "name":"demo3", "type":"string", "value":""}
]
```



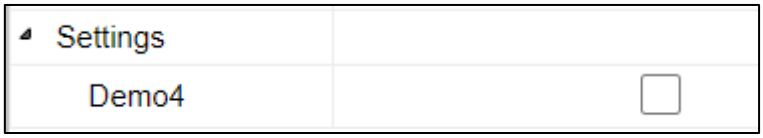
Boolean

The boolean type parameter is set as shown in the following table.

Parameter name	Content	Parameter name	Content
title	Display name	type	Data type, with boolean being the data type.
name	Parameter name	value	Default value

The JSON example and execution result are shown below, with the parameter display name set as Demo4, parameter name as demo4, type as boolean, and default value as false.

```
"profile":[
        { "title":"Demo4", "name":"demo4", "type":"boolean", "value":false}
]
```



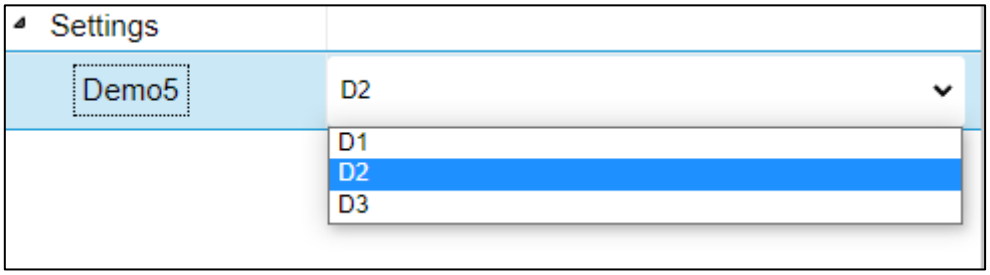
Enumeration

The enumeration type parameter is set as shown in the following table.

Parameter name	Content	Parameter name	Content
title	Display name	entries	Displayed menu contents.
name	Parameter name	entry_values	Corresponding numerical values for the menu contents
type	Data type, with enumeration being the data type.	index	Default menu contents.

The JSON example and its execution result are shown below. The parameter display name is Demo5, the parameter name is demo5, and the type is enumeration. The menu contains D1, D2, and D3, with values of 0, 1, and 2, respectively. The default selection is D2.

```
"profile":[
        { "title":"Demo5", "name":"demo5", "type":"enumeration", "entries":["D1","D2","D3"], "entry_values":[0,1,2], "index":1}
]
```



Command

The command type parameter is set as shown in the following table.

Parameter name	Content	Parameter name	Content
title	Display name	type	Data type, with command being the data type.
name	Parameter name		

The JSON example and execution result are shown below. Its parameter display name is Demo6, parameter name is demo6, and its type is command.

```
"profile":[
        { "title":"Demo6", "name":"demo6", "type":"command"}
]
```

4.8.2 Trigger Operator

The usage of a trigger operator is as follows:

1. Define the operator as a class

   Note: The parameter assigned must be **VIC_OPERATOR_TRIGGER**，, indicating that it inherits from the VIC_OPERATOR_MODULE class.

2. Within this module, there are six functions, which are described below:

   (1) init(self) →Declare variable initial value.

   (2) start(self) →Function to process the operator's operation.

   (3) destroy(self) →Function for deleting the operator.

   (4) stop(self) →Function for handling the stoppage of the operator.

   (5) writeProperty(self, name, value) →Write the value to the column based on the name.

   (6) fetchProperties(self) →Parse the configured JSON file into the operator variables. (JSON file must be placed in the bin\py\vic_operator_modules folder inside the system folder.)

   Note: The system directories for each product are as follows: VIC→C:\VIC7000；nDAS→/opt/nDAS；nPAC→C:\nPAC

   The trigger operator enables the execution of a sequence, so it is recommended to use a global variable to control the while loop. When it needs to be stopped, simply change the global variable to stop the while loop and end the execution sequence.

   The available APIs include restart (self.restart()), stop (self.stop()), and continue passing the parameters down for execution (self.trigger_run(self, sync=False)).

   The trigger should be stopped when the operator is deleted, Reset All is clicked, or the restart command is executed.

   When the operator is deleted, it will first execute stop and then destroy.

3. After the operator is created, it needs to be registered in the software. If **no further changes** are needed, the registration code can be written in the OnInitScript() function, which will be triggered upon reloading the project.

   If **further modifications are expected**, the code can be written in the OnReloadFunction() function, which will be triggered upon clicking the Reload button.

   To register the operator in the software, use the function REGISTER_OPERATOR_MODULE('operator_name', class_name)

   operator_name: It is the name of the operator that will be displayed in VIC Flow.
   class_name: It is the name of the operator class to be registered.

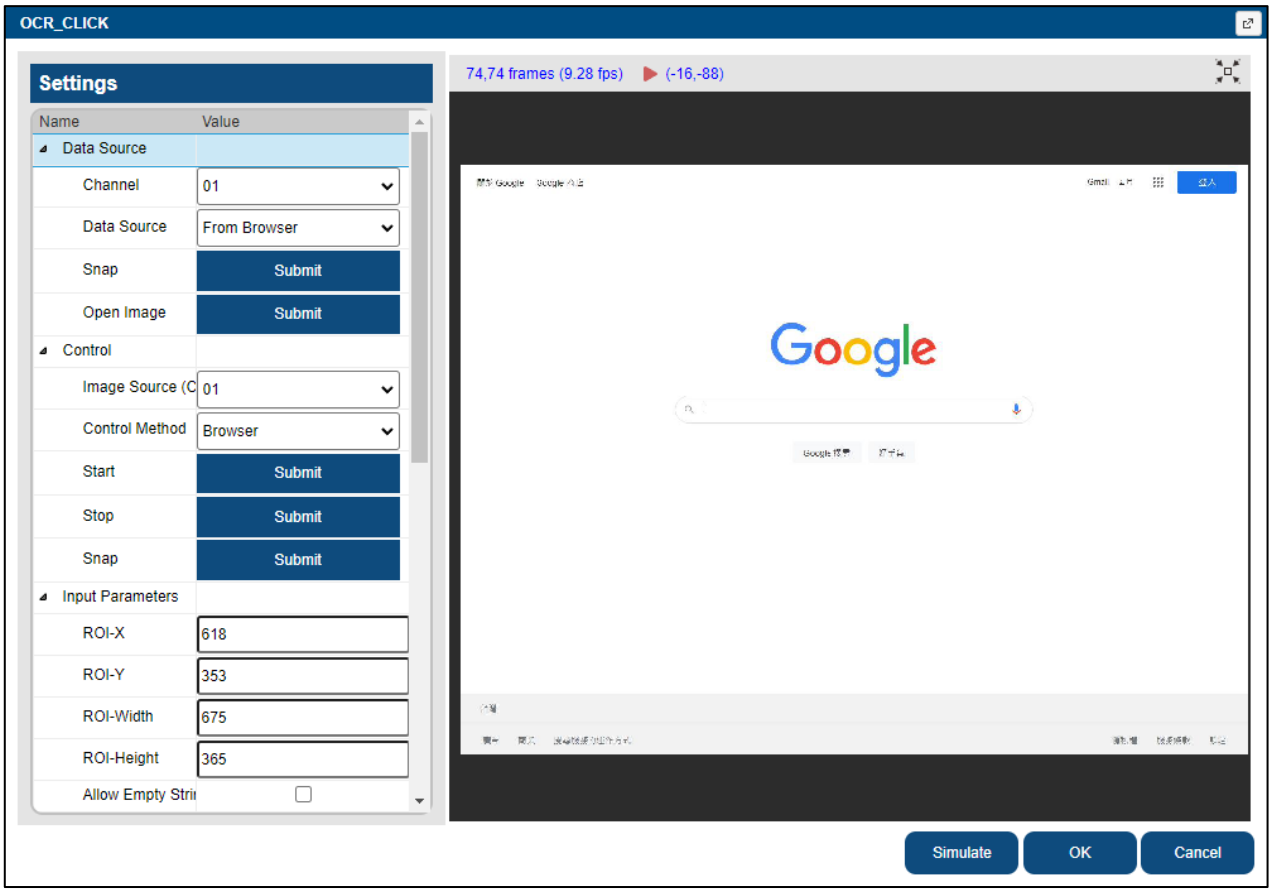
   Note: If the operator name has been modified, the operator must be recreated in addition to reloading

before the modified operator can be used.

```
from vic import *

class DEMO(VIC_OPERATOR_MODULE):
    def init(self):
        pass
    def process(self, inputs):
        if self.properties['demo1']:
            sum = inputs['I1'] + self.properties['demo2']
            self.outputs['O2'] = sum
        pass
    def writeProperty(self, name, value):
        pass


    def fetchProperties(self):
        return "demo.json"

def OnInitScript():
    REGISTER_OPERATOR_MODULE('DEMO',DEMO)
```

5 Appendix

5.1 TOOL.OCR / OCR_CLICK / OCR_DB_CLICK dialog (only supported VIC series products)



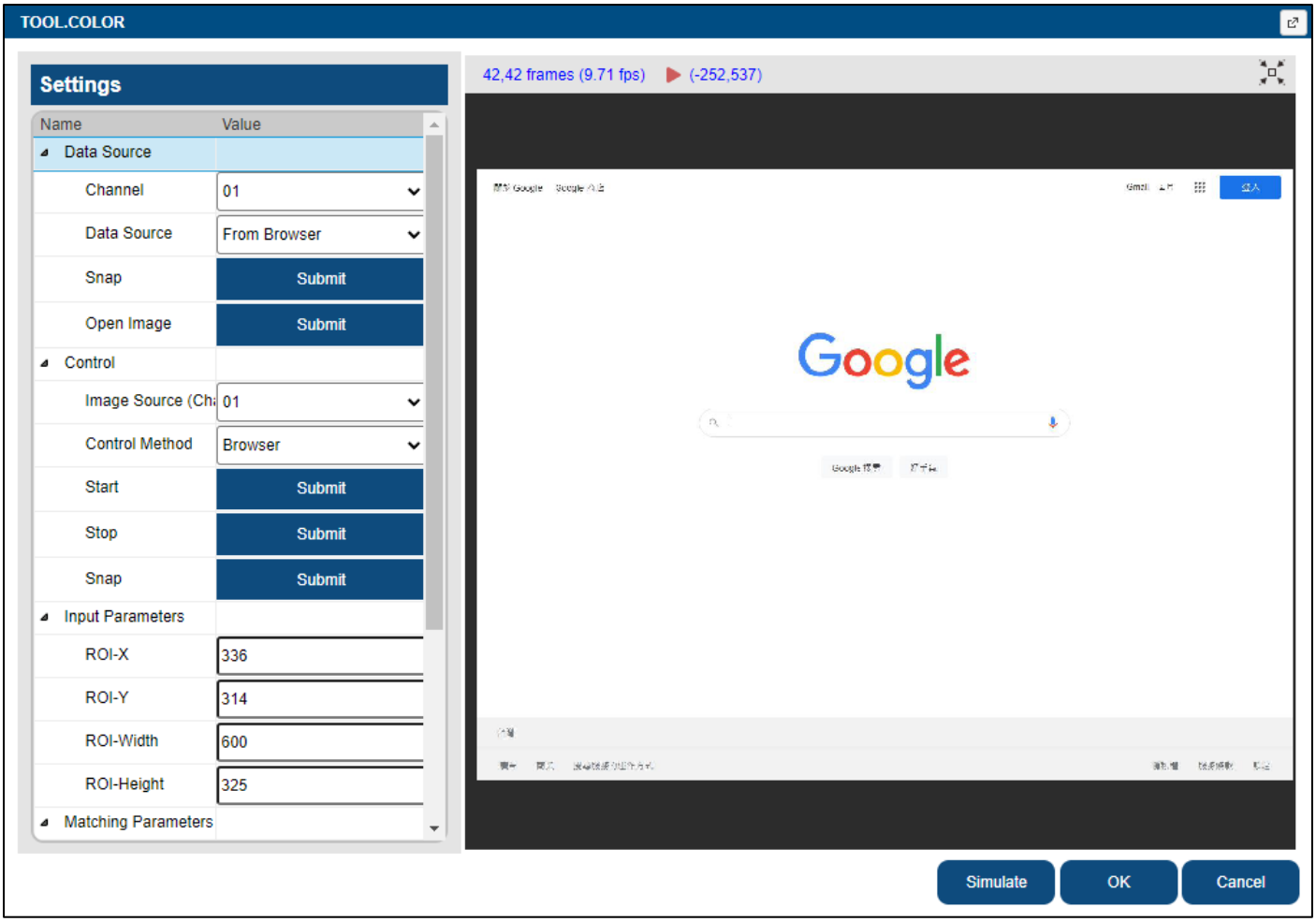
Settings

Name	Mean
Data Source	
Channel	Set up the image source channel.
Data Source	Configure the image source of the selected channel. Options may include from file, capture card. etc.
Snap	Click to capture an image from the selected channel.
Open Image	Click to display the file selection dialog for loading a selected image.
Control	
Image Source (Channel)	Set the channel to control.
Control Method	Set the control method to use.
Start	Click to start capturing.

Stop	Click to stop capturing.
Snap	Click to stop capturing and snap an image.
Input Parameters	
ROI-X	Set the X-coordinate value of the ROI.
ROI-Y	Set the Y-coordinate value of the ROI.
ROI-Width	Set the width of the ROI.
ROI-Height	Set the height of the ROI.
White List	Enable only recognition of the specified setting value; if no setting is provided, full recognition will be performed.
Allow Empty String	When enabled, if an empty string is recognized, it will not display as "NG."
Remove Whitespace	When enabled, if the recognition result contains white space characters, they will be automatically removed.
Recognition Rate(%)	Set the minimum allowable recognition rate; if the rate falls below this value, recognition will fail.
Click*	
Button*	Set the mouse button to be clicked, with options for Left, Middle, or Right.
Matching Text*	The text to be searched.
Image Preprocess	
Image Preprocess – Resize	
Resize Method	Setting the method for resizing.
Resize	Setting the value for resizing.
Image Preprocess – Threshold	
Threshold Method	Setting the threshold method.
Threshold Algorithm	Setting the threshold algorithm.
Threshold Value	Setting the threshold. Only applicable when the threshold algorithm is set to “none”.
OCR Font	
Segmentation Mode	Setting the OCR segmentation method.
Select Font	Setting the font to be used.
Load Font	Click to select a font file.
Font File	Displaying the name of the currently used font file.

Note: * indicates only appear in OCR_CLICK and OCR_DB_CLICK.

5.2 TOOL.COLOR dialog (only supported VIC series products)



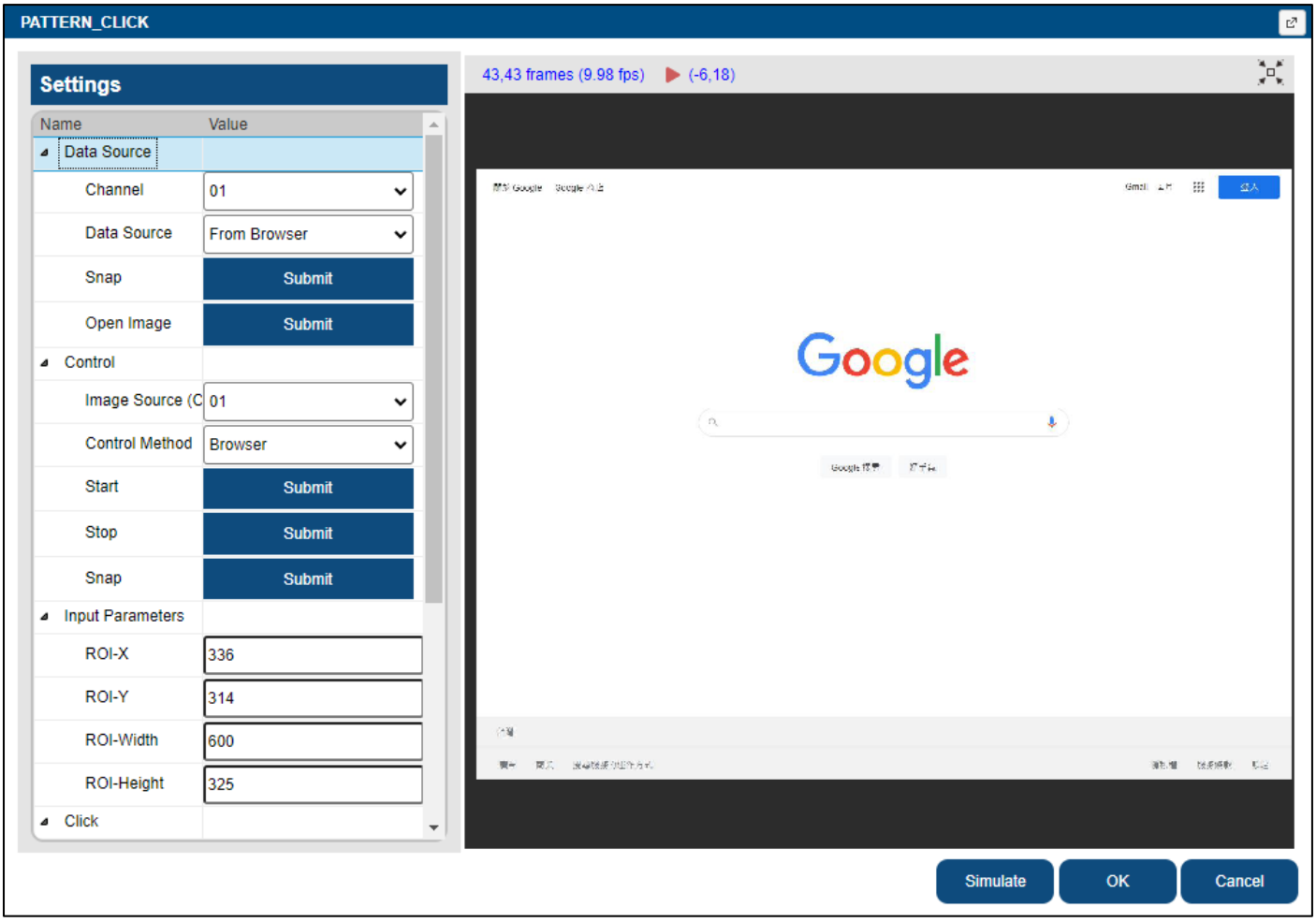
Settings

Name	Mean
Data Source	
Channel	Set up the image source channel.
Data Source	Configure the image source of the selected channel. Options may include from file, capture card. etc.
Snap	Click to capture an image from the selected channel.
Open Image	Click to display the file selection dialog for loading a selected image.
Control	
Image Source (Channel)	Set the channel to control.
Control Method	Set the control method to use.
Start	Click to start capturing.
Stop	Click to stop capturing.
Snap	Click to stop capturing and snap an image.

Input Parameters	
ROI-X	Set the X-coordinate value of the ROI.
ROI-Y	Set the Y-coordinate value of the ROI.
ROI-Width	Set the width of the ROI.
ROI-Height	Set the height of the ROI.
Matching Parameters	
Set ROI Color	Upon clicking, the color average within the ROI will be automatically calculated, and the resulting color will be applied for parameter settings.
Color Picker	Clicking on this will allow you to select the location where you want to compare colors, and the color at that location will replace the color being compared.
Red	Set the match to the red color component in RGB.
Green	Set the match to the green color component in RGB.
Blue	Set the match to the blue color component in RGB.
Matching Tolerance	Set the tolerance for color match.

5.3 TOOL.PATTERN/PATTERN_CLICK/PATTERN_DB_CLICK dialog

(only supported VIC series products)



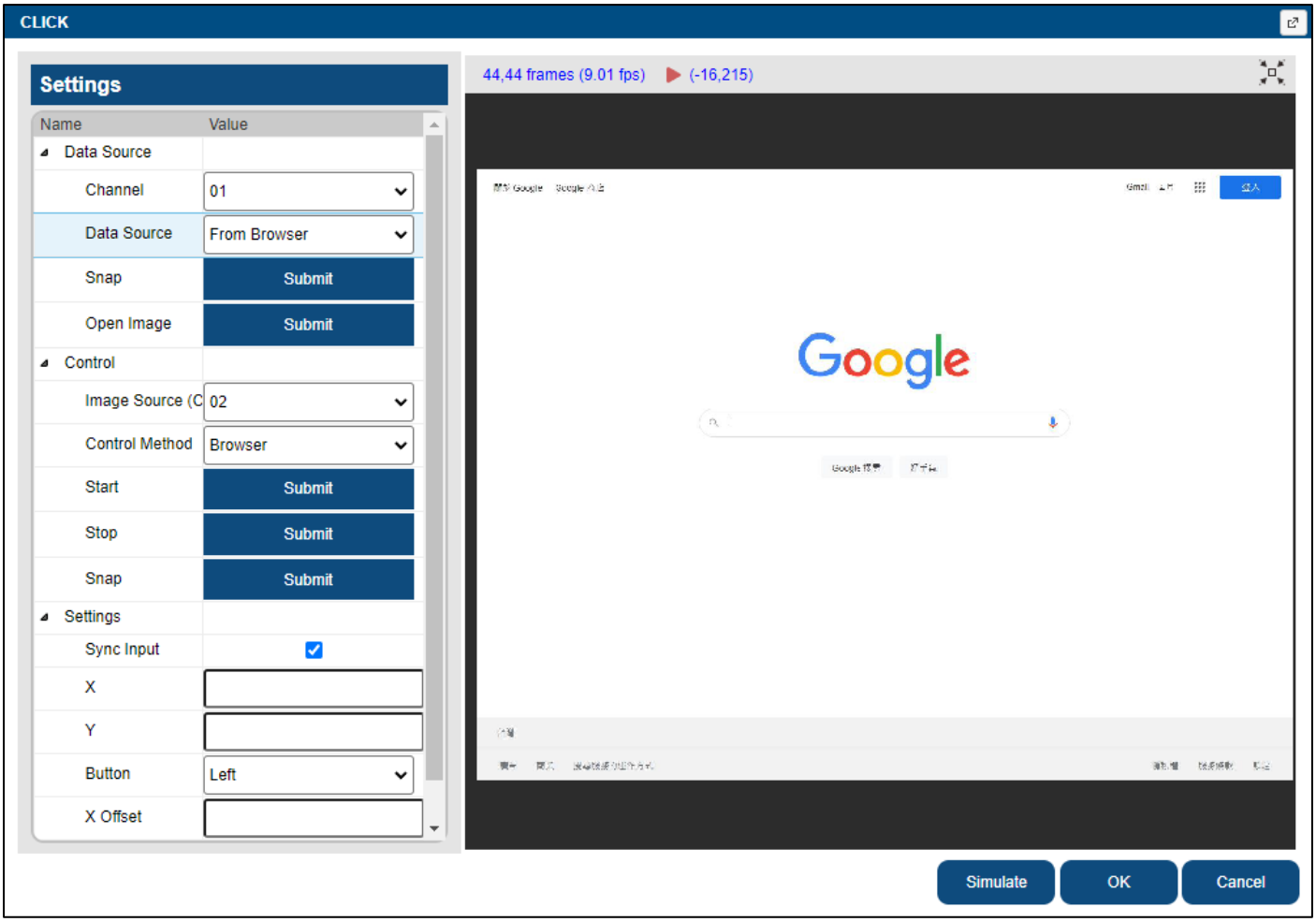
Settings

Name	Mean
Data Source	
Channel	Set up the image source channel.
Data Source	Configure the image source of the selected channel. Options may include from file, capture card. etc.
Snap	Click to capture an image from the selected channel.
Open Image	Click to display the file selection dialog for loading a selected image.
Control	
Image Source (Channel)	Set the channel to control.
Control Method	Set the control method to use.
Start	Click to start capturing.
Stop	Click to stop capturing.

Snap	Click to stop capturing and snap an image.
Input Parameters	
ROI-X	Set the X-coordinate value of the ROI.
ROI-Y	Set the Y-coordinate value of the ROI.
ROI-Width	Set the width of the ROI.
ROI-Height	Set the height of the ROI.
Click*	
Button*	Set the mouse button to be clicked, with options for Left, Middle, or Right.
Matching Parameters	
Pattern Name	Display the file name of the matching pattern image.
Pattern Load	Clicking on it will display the pattern loading dialog.
Pattern X	Set the X value for the matching pattern.
Pattern Y	Set the Y value for the matching pattern.
Gray Matching	When enabled, the image will be converted to grayscale for pattern matching, which can speed up the process.
Minimum Score	Set the minimum score for successful pattern matching, which is 0.95 by default and valid range is from 0 to 1, where 1 is a perfect match.

Note: * indicates only appear in PATTERN_CLICK and PATTERN_DB_CLICK.

5.4 CLICK / DB_CLICK / DRAG dialog (only supported VIC series products)



Settings

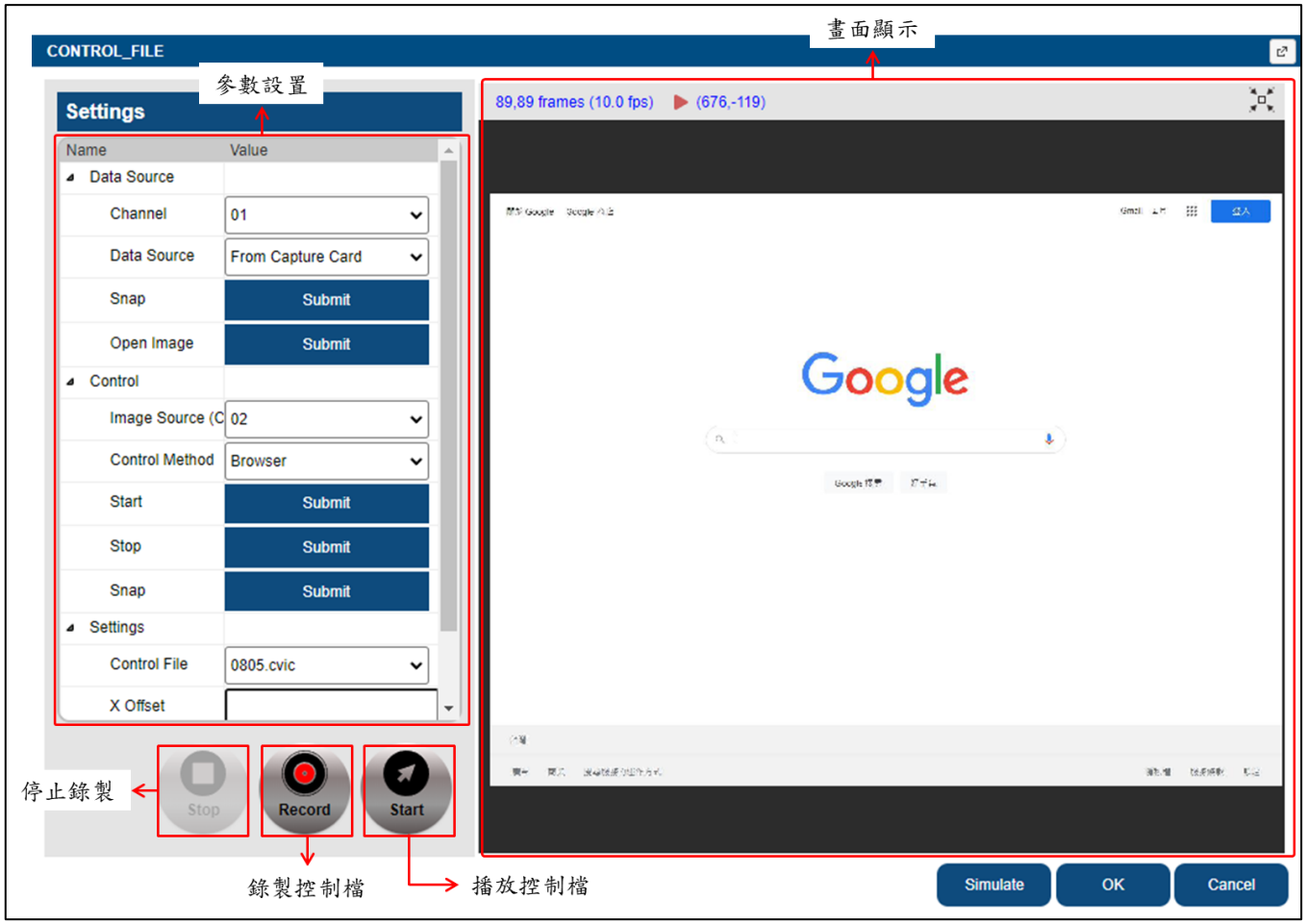
Name	Mean
Data Source	
Channel	Set up the image source channel.
Data Source	Configure the image source of the selected channel. Options may include from file, capture card. etc.
Snap	Click to capture an image from the selected channel.
Open Image	Click to display the file selection dialog for loading a selected image.
Control	
Image Source (Channel)	Set the channel to control.
Control Method	Set the control method to use.
Start	Click to start capturing.
Stop	Click to stop capturing.

Snap	Click to stop capturing and snap an image.
Settings	
Sync Input	Enable the option to synchronize recorded values upon clicking on the screen. Check the box to enable synchronization.
X*	Set the X coordinate of the mouse click.
Y*	Set the Y coordinate of the mouse click.
X1	Set the initial value of the X-coordinate for the starting position.
Y1	Set the initial value of the Y-coordinate for the starting position.
X2	Set the initial value of the X-coordinate for the ending position.
Y2	Set the initial value of the Y-coordinate for the ending position.
Interval (ms)	Set the time interval for the movement between the two coordinate positions.
Button	Set the mouse button to be clicked, with options for Left, Middle, or Right.
X Offset	Set the amount of X displacement to be executed.
Y Offset	Set the amount of Y displacement to be executed.

Note: * indicates only appear in CLICK and DB_CLICK.

5.5 CONTROL_FILE / BROWSER_FILE dialog (only supported VIC series products)

The keyboard shortcut for recording start/stop in the control file is the same as the one in the control page, which is F1 by default.



Settings

Name	Mean
Data Source	
Channel	Set up the image source channel.
Data Source	Configure the image source of the selected channel. Options may include from file, capture card. etc.
Snap	Click to capture an image from the selected channel.
Open Image	Click to display the file selection dialog for loading a selected image.
Control	
Image Source (Channel)	Set the desired channel to control.
Control Method	Set the desired control method to use.
Start	Click to start capturing.

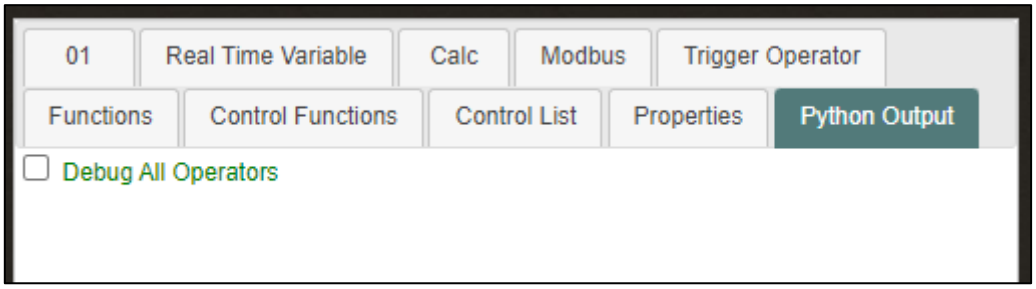
<table>
<tr><td>Stop</td><td>Click to stop capturing.</td></tr>
<tr><td>Snap</td><td>Click to stop capturing and snap an image.</td></tr>
<tr><td colspan="2">Settings</td></tr>
<tr><td>Channel*</td><td>Set the channel for control execution.</td></tr>
<tr><td>Control File</td><td>Set the control file for execution.</td></tr>
<tr><td>X Offset</td><td>Set the amount of X displacement to be executed.</td></tr>
<tr><td>Y Offset</td><td>Set the amount of Y displacement to be executed.</td></tr>
<tr><td>Use Input/Queue</td><td>Enable the Input and Queue functions of the control file by checking the box.
<table>
<tr><td>Input</td><td>After the control file is executed, characters stored in the corresponding address will be input.</td></tr>
<tr><td>Queue</td><td>If a new control file is triggered while the previous one has not finished executing, the new control file will wait for the original one to finish before executing.</td></tr>
</table></td></tr>
</table>

Note: * indicates only appear in the advanced settings dialog of BROWSER_FILE.

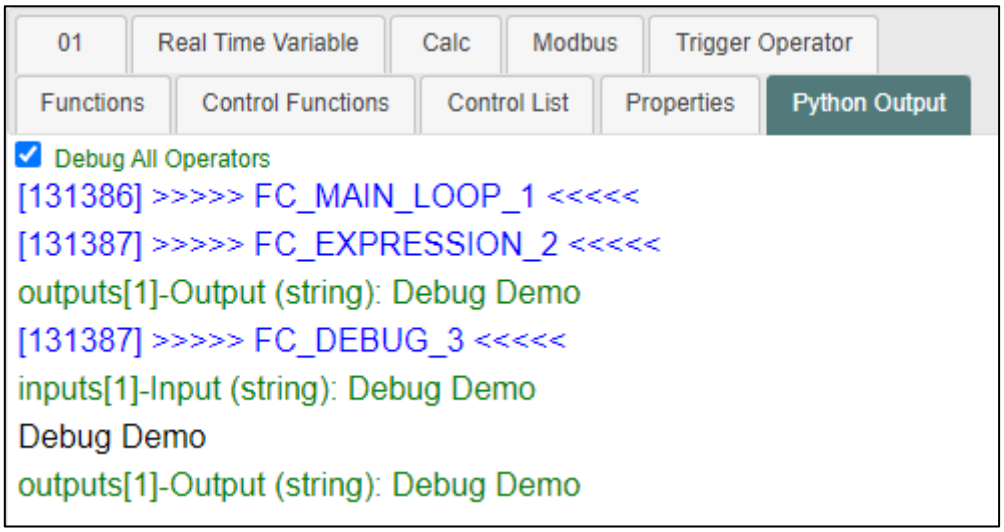
5.6 Python Output

This field displays the Python Output generated during script execution, including content printed by DEBUG operator, debugging messages, execution error messages, and so on.

In the Python Output field, you can choose whether to activate the “Debug All Operators” function. If activated, the debugging function for all operators will be enabled.



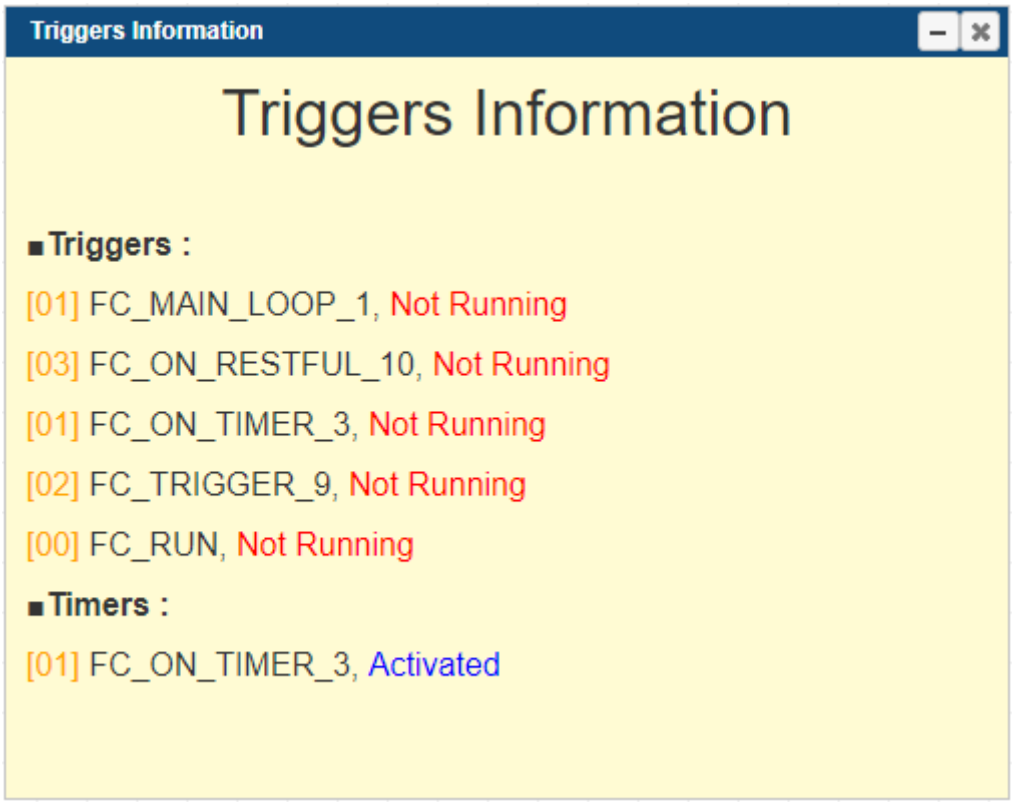
The debugging function can be used to view the input and output information of operators as well as the execution process, as shown in the below figure.



5.7 Trigger Information

The trigger information dialog is displayed as shown in the figure below. By clicking on the operator name, you can jump to the location where the operator is located. The meaning of the displayed content is as follows:

[Location of the operator in the flow page] Operator Name, Execution Status



FC_RUN refers to the flow triggered by RUN, Run Descending Operators, and Run Descending Operators (delay). (Indicated by the red box in the diagram below.)