

**iRAYPLE**

# MVP V5.2.0

**New Features Introduction**

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# 01 / Overview

## Improved the Accessibility and Simplified the Application

V5.1.0 → V5.2.0

### Global Communication

- Added Global Communication.
- Supports the Receive Event, Global Trigger, HeartBeat Management, etc.
- Added the operators for receiving data and sending data.

### Result Display

- Added DrawConfig tab.
- Added Result Summary & Saved Image operator for summarizing results.
- Added Result Summary & Saved Image operator for image-saving-customization function.

### Other Functions

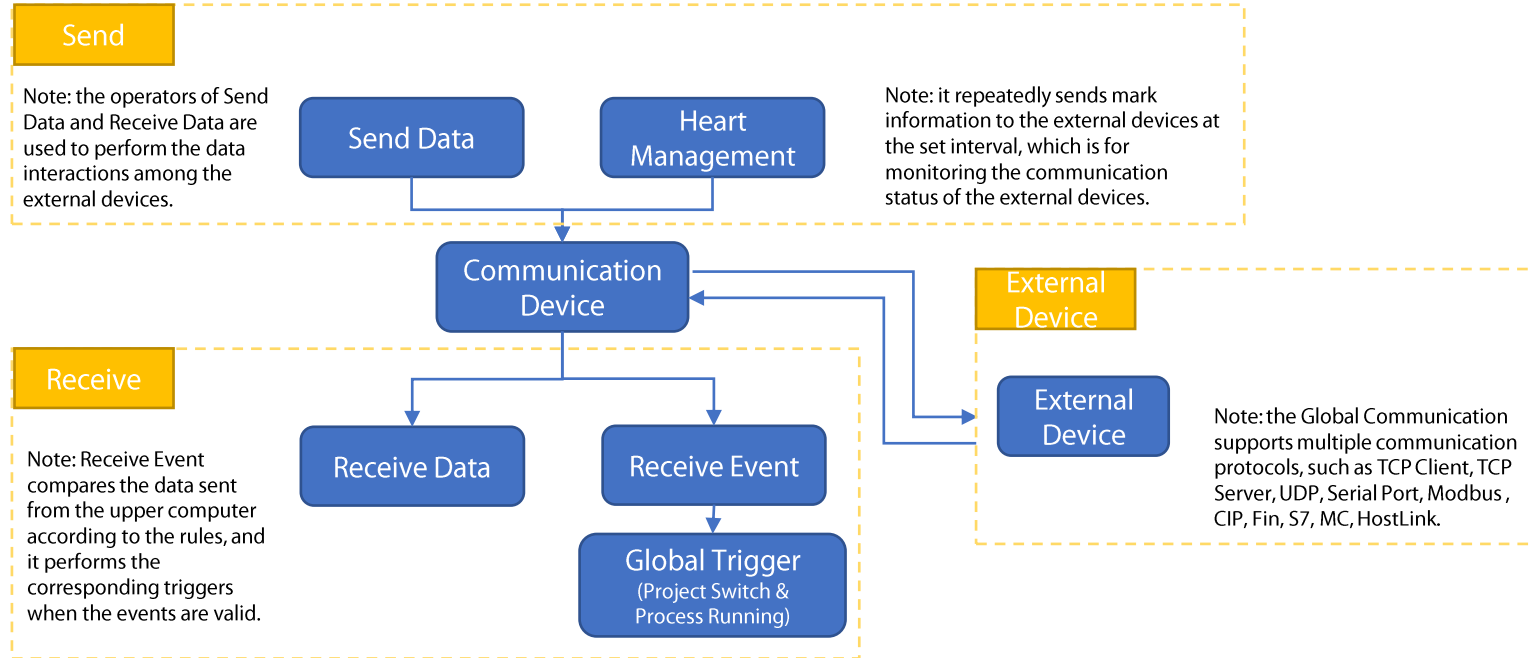
- Added the function of the Result Judgement in the operators.
- Added the Distance Compensation parameters in the operators of the MeasureTools.
- ROI & Mask with more parameters.
- Added the search function for searching the operator and their subscription relations.
- Added the Dynamic Array.
- Added the secondary development based on the Labview and WPF.
- .....

### Added Operators and Optimized Algorithm

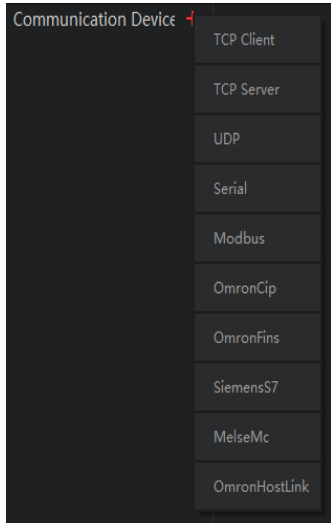
- Added DataCode DL operator.
- Added Color Conversion operator.
- Optimized the algorithm of the image processing.
- Optimized the function of the Condition Detection operator.
- Optimized the function of the Location Calculation operator.

## 02 / Global Communication

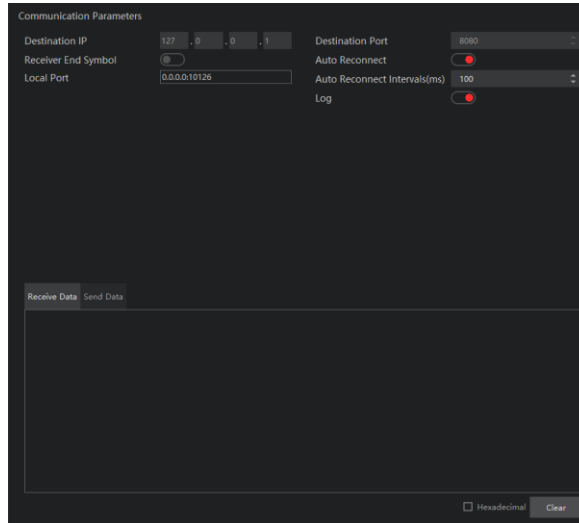
We've added the Global Communication function in the MVP, and it supports the matched communication devices, Receive Event, Global Trigger, Heartbeat Management, etc. When you use the global communication function with the operators of the **SendData** and **ReceiveData**, it forms the communication framework as shown in the diagram below.



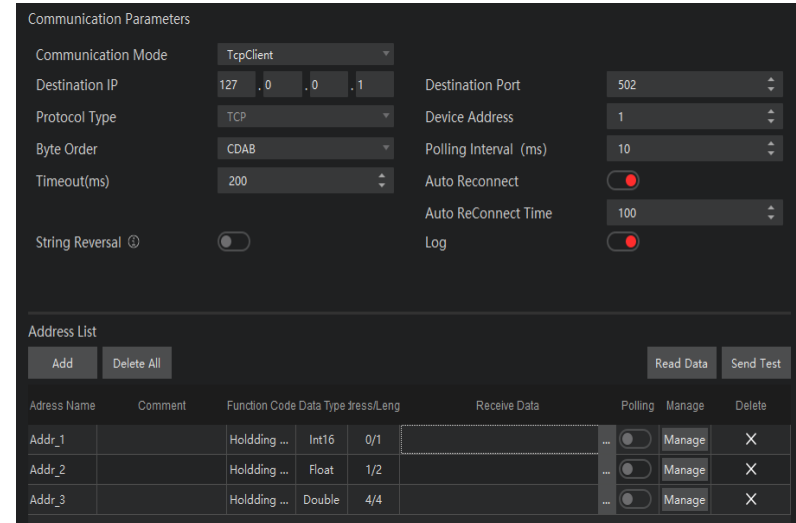
MVP supports multiple communication protocols, including the TCP Client, TCP Server, UDP, Serial Port, Modbus, CIP (EIP), Fins, S7, MC, and HostLink.



Device Type



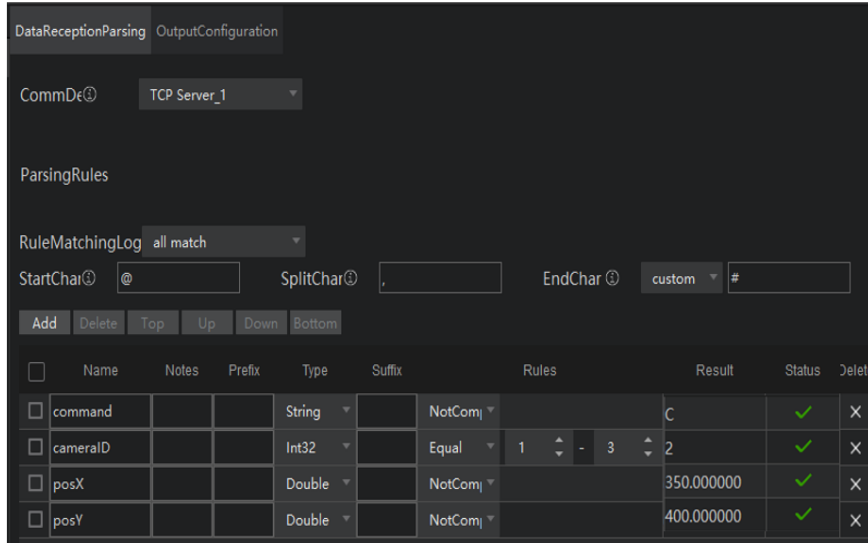
TCP Server



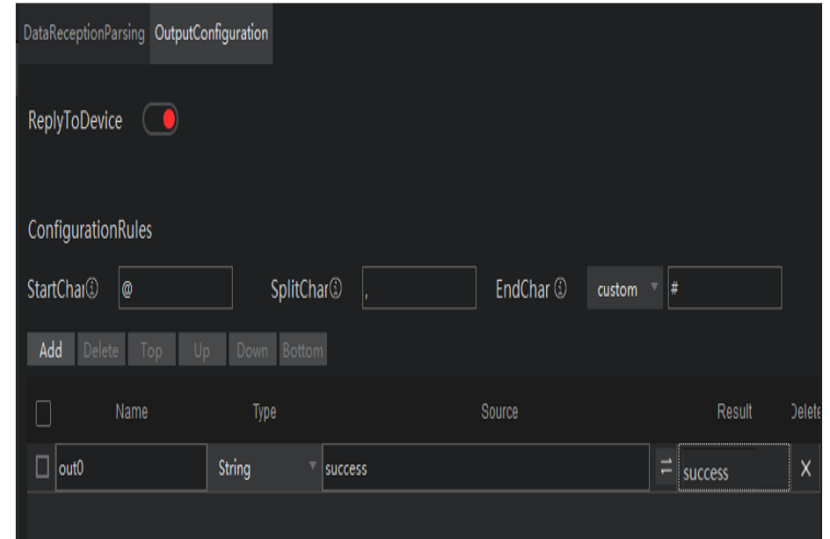
Modbus Master Station

# Global Communication | Receive Event

You can add multiple events in the Receive Event page and relate the Receive Event and Global Trigger so that it can run the process and switch the project. You also can configure the response message in the configuration page, and it returns the set message to the upper computer when the event is valid.

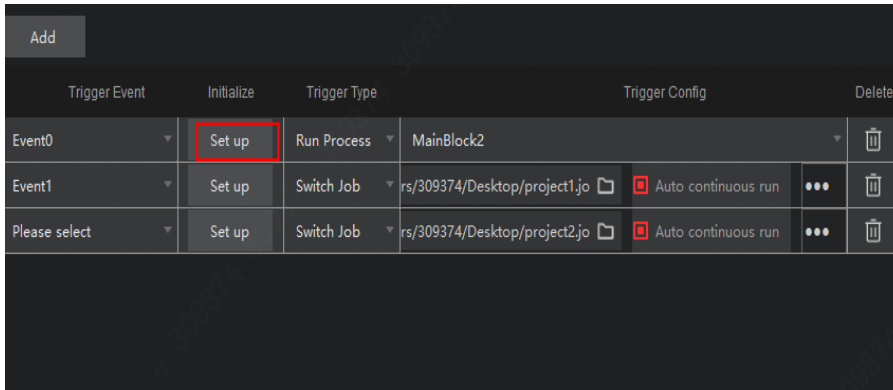


Receive Event

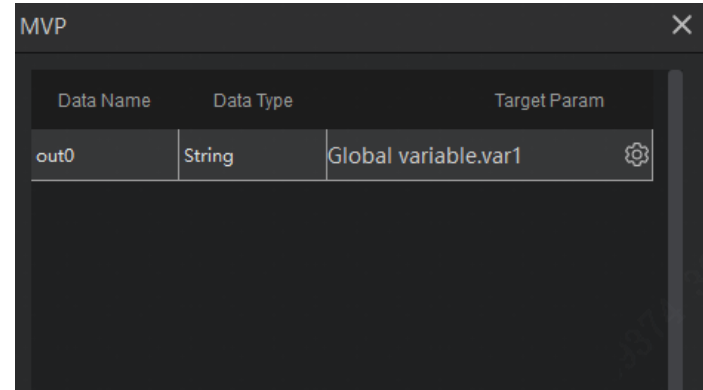


Response Message Configuration Page

The **Global Communication** supports the **Global Trigger** feature, and you can associate the **Global Trigger** with the **Receive Event**. When the **Receive Event** works successfully, it can perform the triggering. Currently, the triggering supports the process running and project switch. Also, when a trigger executes, it can also send the relevant data to the target data (Global Variable and Local Variable).



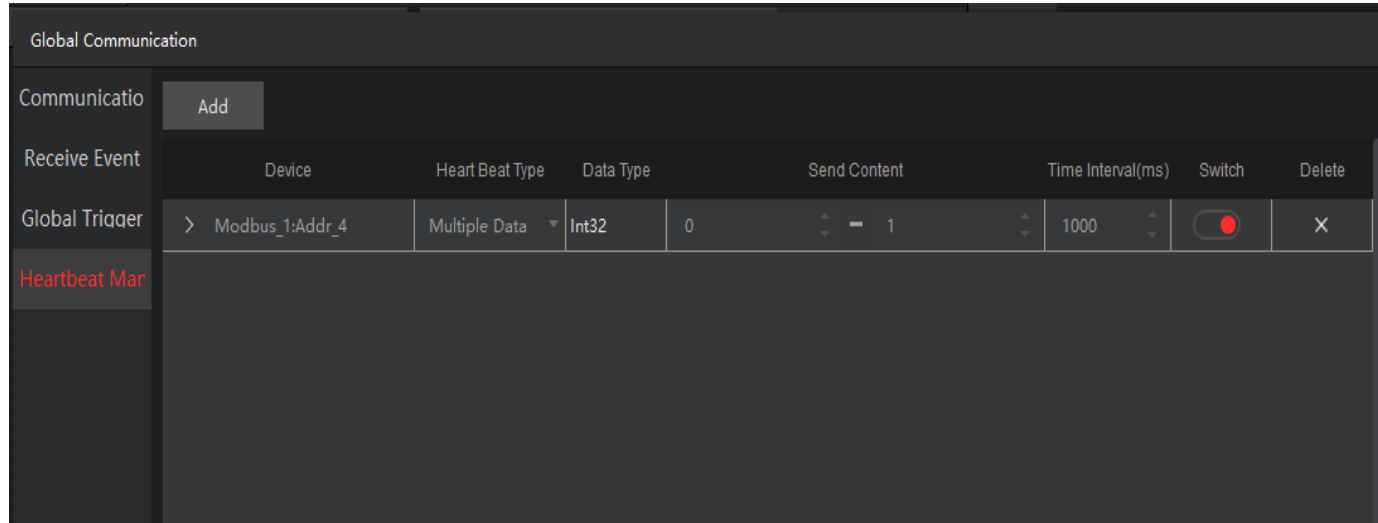
Global Trigger



Initialize

# Global Communication | Heartbeat Management

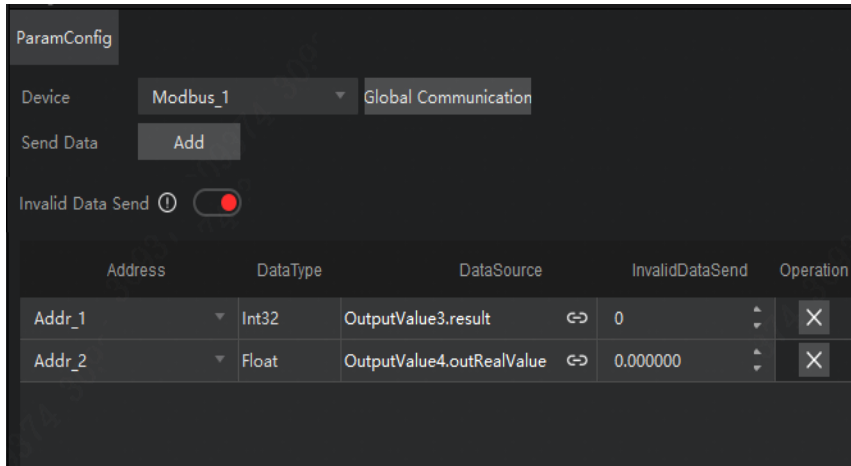
The Global Communication supports the **Heartbeat Management** function, and it can connect the communication devices and send the single data or multiple data to the connected devices repeatedly so that the upper computer can monitor the communication status.



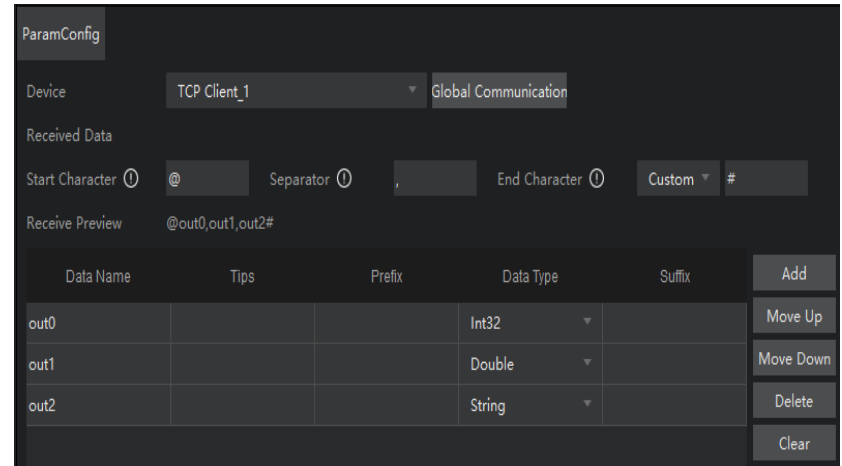
**Note:**  
The parameter you've created will send '0' and '1' to the device repeatedly at a switching frequency of one second.

# Communication Operator | Send Data & Receive Data

We've added the operators of the **ReceiveData** and **SendData**. You can use these operators to receive the data sent by the upper computer, and it will analyze the data and then provide them to the internal process. The operators also have the data subscription function; it will package the data and transmit it to the upper computer.



Send Data via Modbus

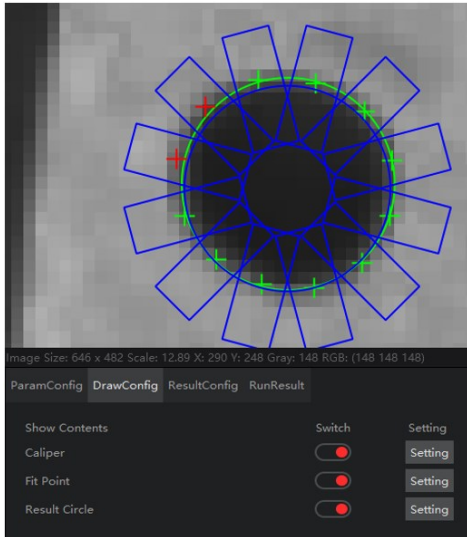


Server Receive Data via TCP

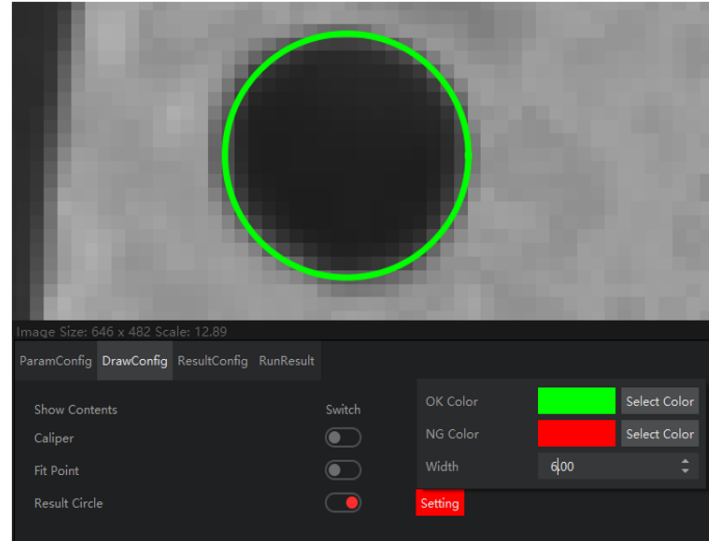
## 03 / Result Display

# Result Display | DrawConfig

We've added the **DrawConfig** tab in the configuration area of operators. You can enable or disable the items in the **DrawConfig** tab to display the corresponding contents or not, and you can also configure the color and line width.



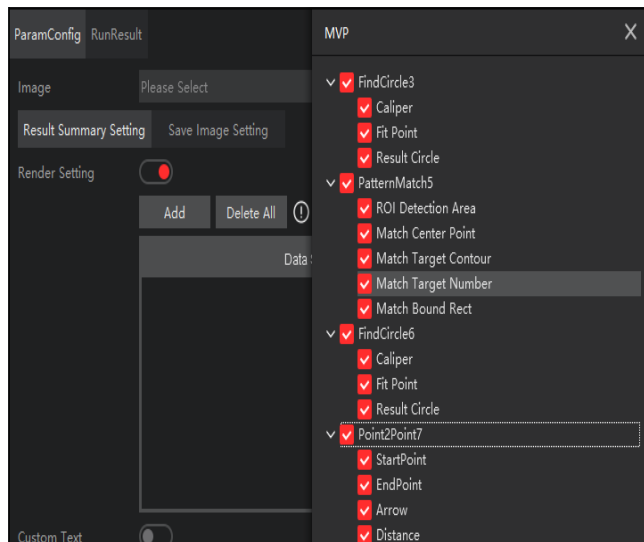
DrawConfig Tab of FindCircle Operator



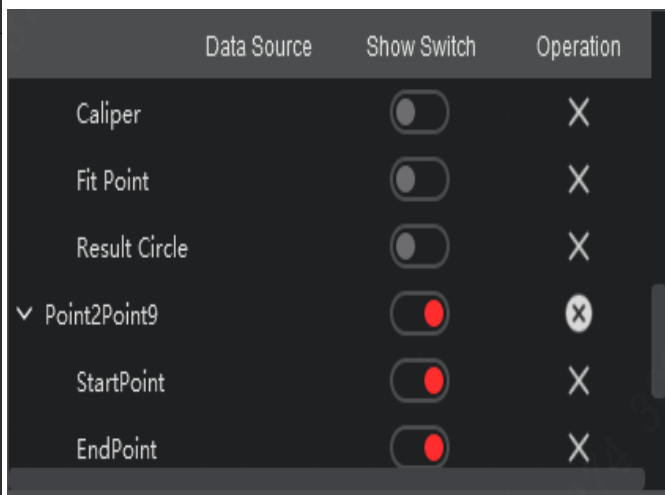
Setting Effect

# Result Display | Result Summary & Saved Image

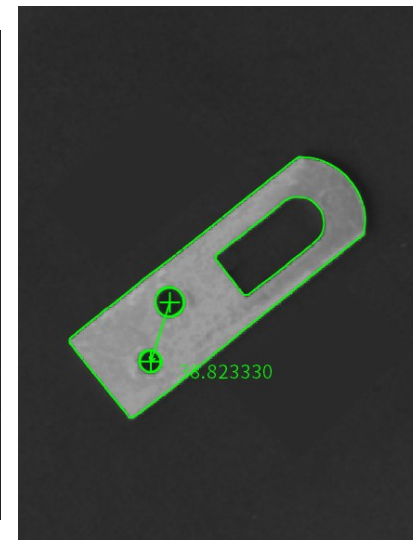
The **Result Summary & Saved Image** operator can summarize the rendering results of the preorder operators and display them. Also, it supports the image-saving function with high customization.



Set Render Parameters and Add the Rendering Results of the Preorder Operators



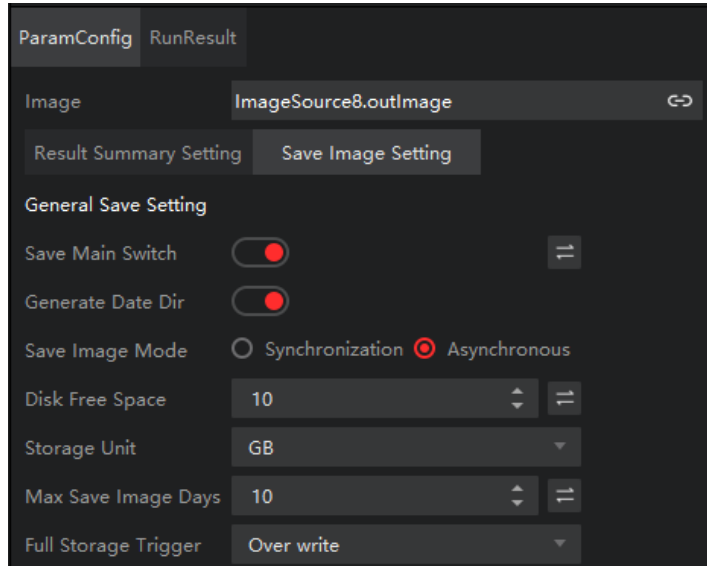
Add or Delete Render Parameters and Items



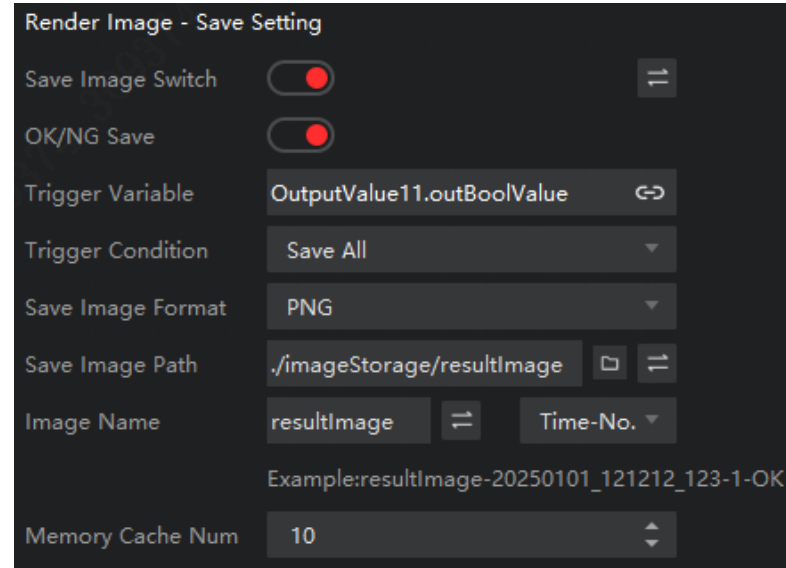
Render Effect

# Result Display | Result Summary & Saved Image

The **Result Summary & Saved Image** operator has an image-saving function with high customization; for example, it can save the raw Image and render Image, create the folders according to the date or OK&NG, and set the max image saving days or max storage capacity.



General Saving Setting



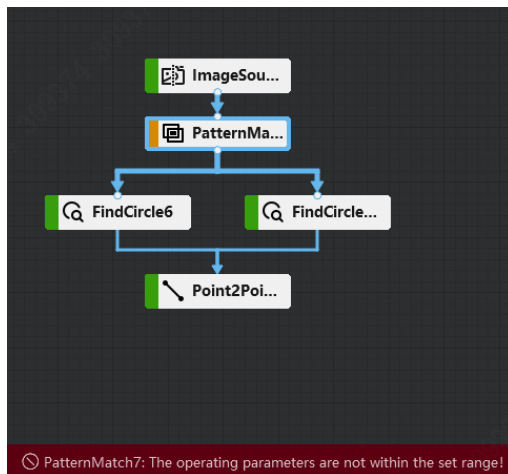
Render (Original) Image Setting

# 04 / Other Functions

We've added the **ResultConfig** tab in the configuration page of the operators. You can set the parameters in this tab to enable the corresponding content judgement functions and judgement thresholds based on the actual demands.



Configure Range



An error will be reported if the result is out of the set range

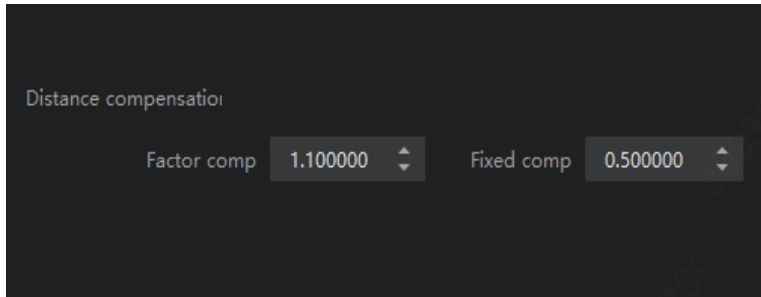
Running Status	Content
0	Not run
1	Running successfully, and the result is normal
2	Running abnormally
3	Result is not within the set range

Running Status and Result Content

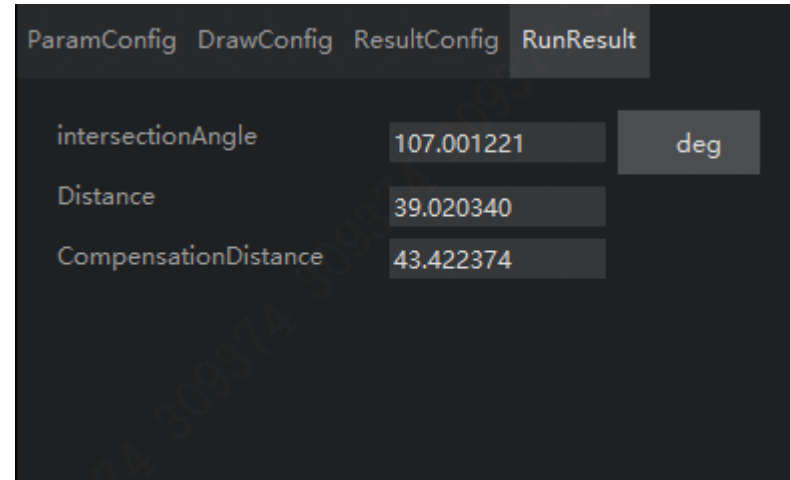
## Other Functions | Distance Compensation

The operators of the **MeasureTools** support the distance compensation function in the distance result, including the coefficient compensation and fixed compensation.

Formula:  $\text{Comp. Dist.} = \text{Measured Dist.} * \text{Comp. Coefficient} + \text{Fixed Comp.}$



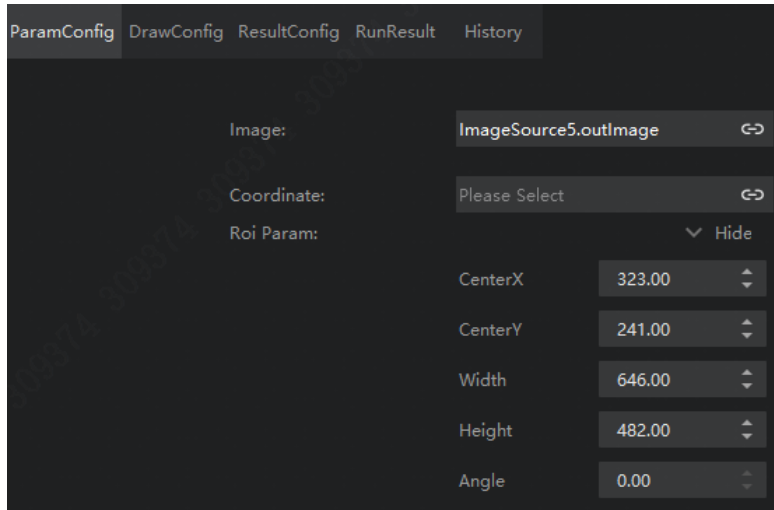
Coefficient Compensation and Fixed Compensation



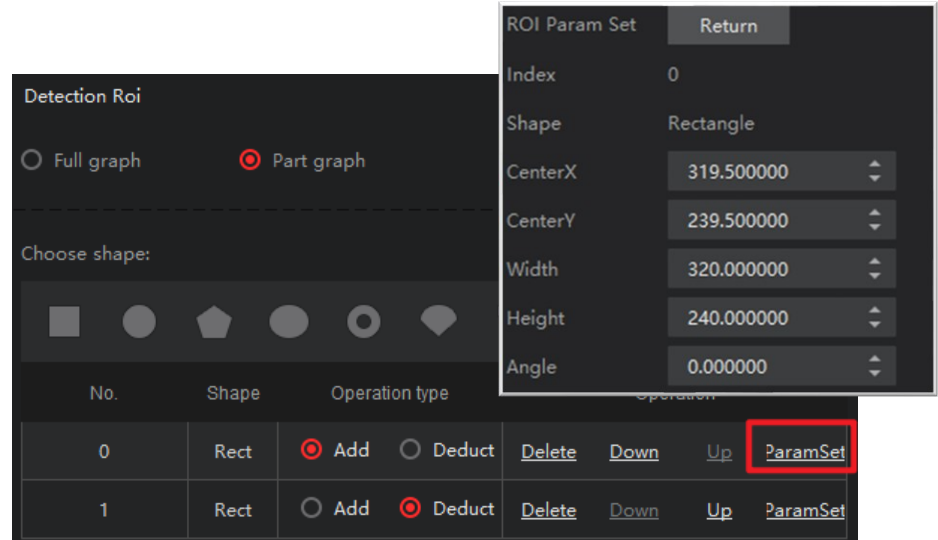
Measured Distance and Compensation Distance in RunResult Tab

# Other Functions | ROI & Mask with More Parameters

The locations and dimensions of the ROI and mask can be set precisely so that you can carry out more precise detections and set the detection range according to the blueprint.



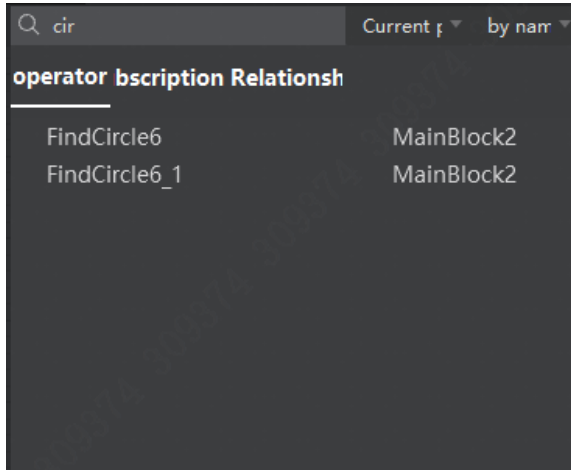
ROI Parameters in PatternMatch Operator



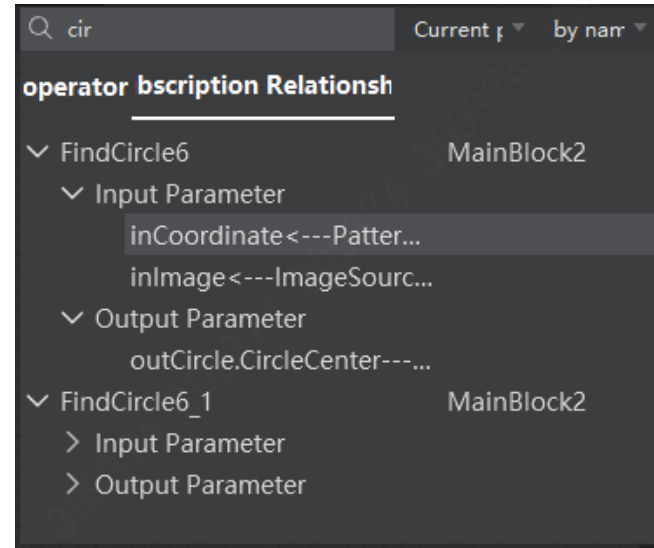
Mask Settings in Operators of BasicFilter

# Other Functions | Subscription Search Function

We've added the search function for searching the operators and their subscription relations. The searched operators will be centered on the canvas and highlighted automatically; also, the search result displays the relevant parameters of the input and output.



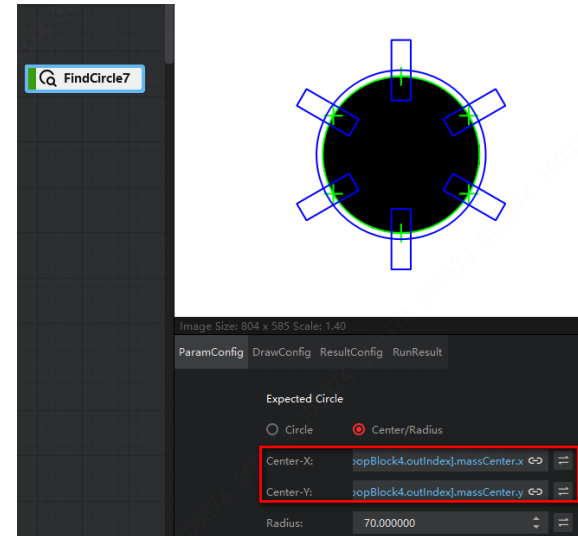
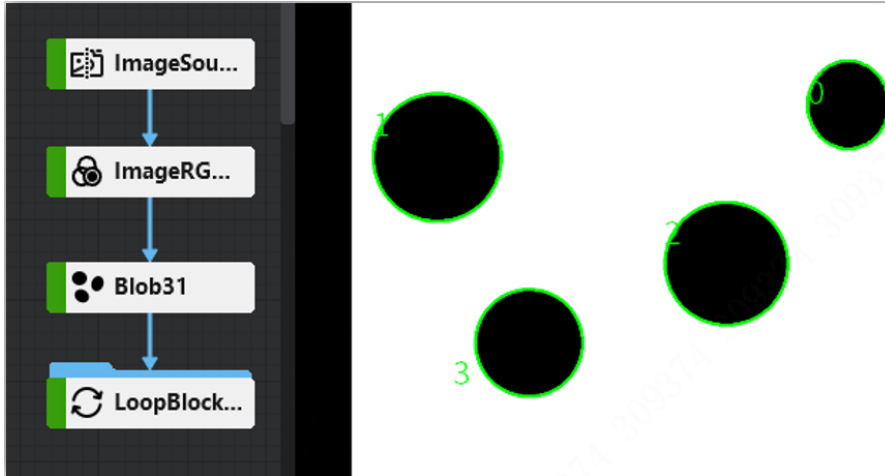
Supports Fuzzy Search



Subscription Relations

# Other Functions | Dynamic Array

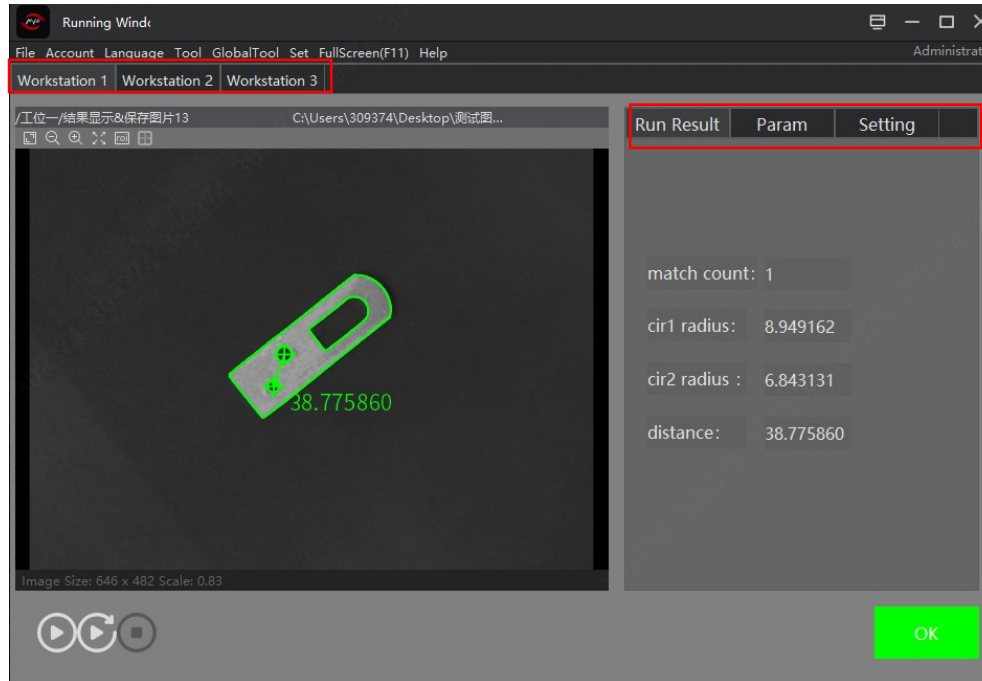
We've added the dynamic array function to operators. The array can be dynamically changed based on the subscriptions so that you can access the different elements or iterate through all array elements.



The expected centers of circles of the FindCircle subscribe to the array elements of the circle centers by using loop indexes in the LoopBlock operator.

## Other Functions | Tab Widget

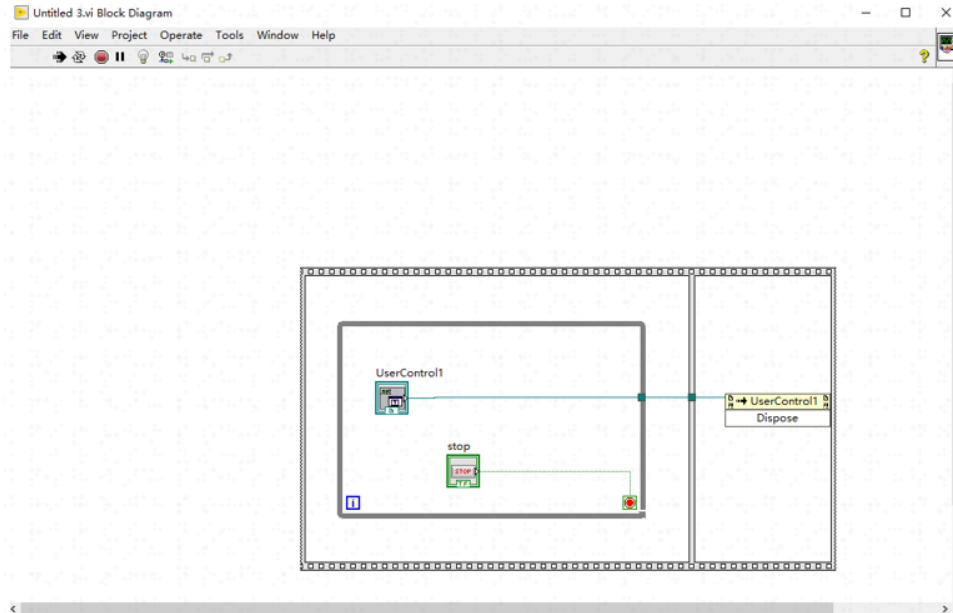
We've added the main tab bar and **Tab Widget** in the User Interface tool so that the operation interface design is flatter and has fewer pop-up windows.



Main tab bar is for the multiple stations and the tab widget is for the multiple types of data display and configuration.

# Other Functions | Secondary Development

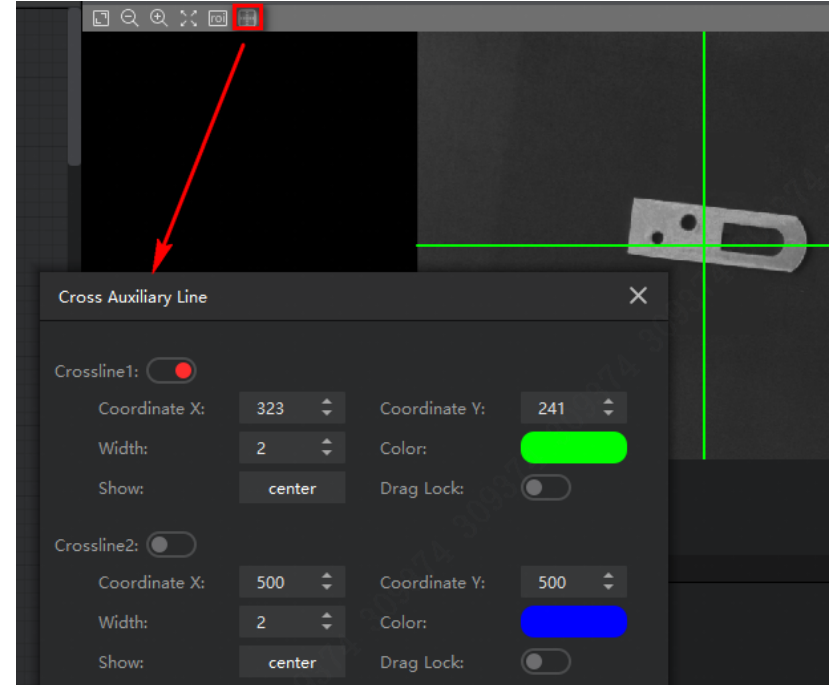
We've added the secondary development function based on the **LabVIEW** and **WPF**. This function gives you more options of development framework when you need to perform the secondary development in your project.



Secondary Development

# Other Functions | Auxiliary Line and GPU Management

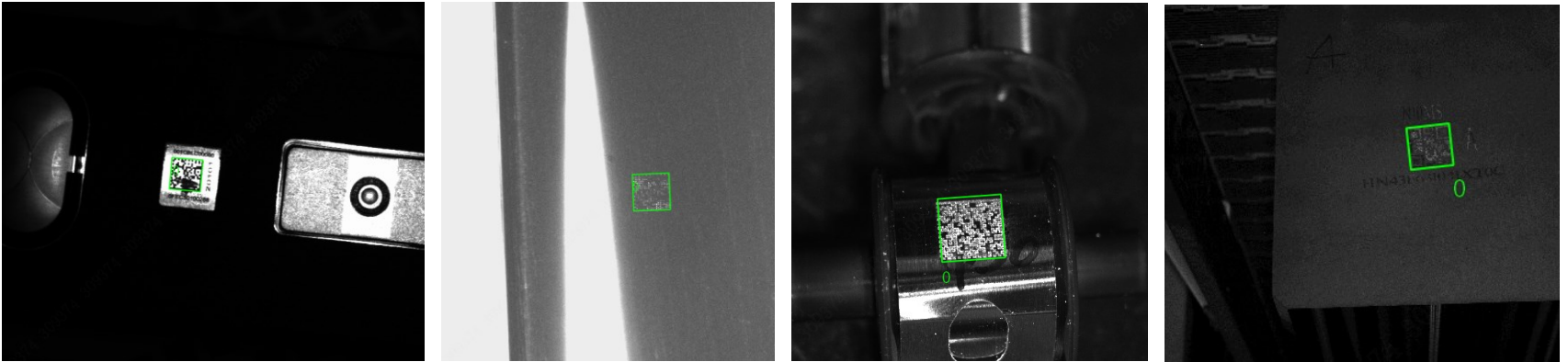
- **Added Auxiliary Cross-Line**
  - For marking the locations, calibrating the coordinates, etc.
- **GPU Clock Speed Automatic Set-up**
  - When starting the MVP, its script will automatically set the clock speed of the GPU to the maximum value to ensure the best performance of the MVP.
- **Reduce Preprocess Time of Process by 90%**
  - Optimized the underlying logic of software. The preprocessed time of the process has been reduced by 90%.



# 05 / Added Operators and Optimized Algorithms

# Added Operators | DataCode DL Operator

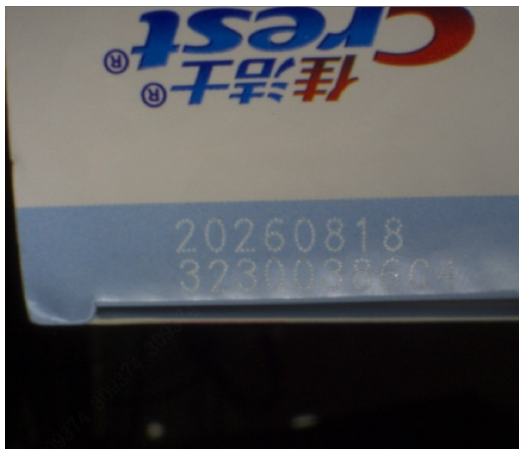
We've added the **DataCode DL** operator, which adopts the end-to-end method and is designed based on the neural network model. It has a better performance on the extreme scenarios of code reading, such as damaged code, blurred code, deflective code, low-contrast code, etc.



DataCode DL Operator Runs in  
Extreme Scenarios

## Added Operator | Color Conversion Operator

We've added the **Color Conversion** operator. This operator supports the image type conversion, including the RGB to HSV, the RGB to HSL, and the RGB to YUV. The conversion effect can be configured by selecting the channel number.



RGB



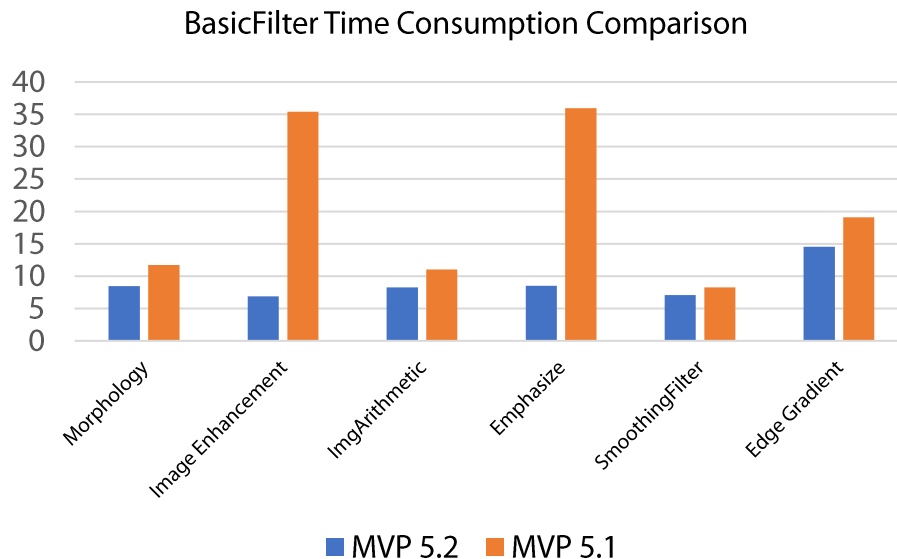
RGB to Grayscale



RGB to HSV (2nd channel)

# Optimized Algorithm | Region Calculation

We've optimized the algorithms of the region calculation to reduce the high-resolution image processing time consumption significantly.



1600MP Image Procession Time Consumption Comparison

## ■ Optimized Condition Detection Operator

- Valid Value Range can be subscribed.
- Detection results can be output separately.

No.	ParamName	Type	Valid Value Range	Source
0	Param0	Int	outIntValue <-> <=> outIntValue <-> <=> tValue10.outIntValue <-> <=>	

ParamName	Output Parameters	Type	Value
Param0	outParam0	Bool	true
Param1	outParam1	Bool	false
Param2	outParam2	Bool	false
Param3	outParam3	Bool	false

## ■ Optimized Robots Calculation

- Added "Correct+Place" option in the SceneType, which is convenient for realizing the alignment and bounding.

ParamConfig RunResult

SceneType: **Correct+Place** FixMode: Fixed

MethodType: CalculateTheRotationCenter

Correct Config

CalibFile: rs/309374/MvpPlatform/Conf/HandEye.calib

InPoint: PatternMatch13.outFirstMatchCenter

InAngle: PatternMatch13.outRotation

The background features several thin, light orange lines. Some are straight and diagonal, while others form a series of nested, downward-pointing chevrons at the bottom. Small, hollow orange circles are placed at the end of some of the diagonal lines.

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