

Vision Sensor

VG Series

User Manual

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Thank you very much for selecting Autonics products. For your safety, please read the following before using.

Preface

Thank you for purchasing an Autonics product.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.

User Manual Guide

- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- This programming manual is not provided as part of the product package. Please visit our home-page (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through our homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.

User Manual Symbols

Symbol	Description		
🖉 Note	Supplementary information for a particular feature.		
<u> Marning</u>	Failure to follow instructions can result in serious injury or death.		
A Caution	Failure to follow instructions can lead to a minor injury or product damag		
Ex.	An example of the concerned feature's use.		
×1	Annotation mark.		

Safety Considerations

- Following these safety considerations will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.
- Safety considerations are categorized as Warnings and Cautions, as defined below:

Marning	Warning	Failure to follow the instructions may lead to a serious injury or accident.

Caution Caution	Failure to follow the instructions may lead to a minor injury or accident.
-----------------	--



 Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)

Failure to follow this instruction may result in personal injury, fire, or economic loss.

- Do not use this product for protecting human body or part of body.
- Do not see light LED directly or direct beam at person.
 Failure to follow this instruction may result in damage on eyes.
- Do not connect, repair, or inspect the unit while connected to a power source.
 Failure to follow this instruction may result in fire.
- Check connections and connect cables.
 Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.
 Failure to follow this instruction may result in fire.

<u> (</u>Caution

- Use the unit within the rated specifications.
 Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit. Do not use water or organic solvent when cleaning the unit.
 Failure to follow this instruction may result in fire.
- Do not use the unit where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact or salt may be present.
 Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust and wire residue from flowing into the unit.
 Failure to follow this instruction may result in fire or product damage.

The above specifications are subject to change and some models may be discontinued without notice.

Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, homepage).

Caution during Use

- Follow instructions in Cautions during Use. Otherwise, it may cause unexpected accidents.
- 24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- In order to avoid malfunction from static electricity or noise, ground shield wire of the power I/O cable.
- Do not disconnect the power supply while setting operation or saving set information. It may cause data loss.
- Do not disconnect the power supply while updating firmware. It may cause product damage.
- Keep optical section of the sensor away from the contact with water, dust and oil. It may cause malfunction.
- When changing the light or filter, use the assembly tool and observe installation instruction.
- When the sensor is not used for a long time, separate the power cable to store.
- When connecting network, connection must be operated by technical expert.
- In the following case, disconnect the power supply immediately. It may cause fire or product damage.
 - 1 When water or foreign substance is detected in the product
 - 2 When the product is dropped or case is damaged
 - $\ensuremath{\mathfrak{I}}$) When smoke or smell is detected from the product
- Do not use the product in the place where strong magnetic field or electric noise is generated.
- This unit may be used in the following environments.
 - 1 Indoor (in the environment conditions in specifications)
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - (4) Installation category $\, \Pi \,$

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1 Product Instruction

1.1 Features

VG series, vision sensor, is the light and sensor integrated type which has 13 types of inspection functions, so that it can be applied and utilized for various environment and condition. Before applying to actual environment to utilize, using simulator can realize inspection.

Since it is available to set 32 work groups and 64 inspection items for each work group, vision sensor can flexibly response to the change of work environment.

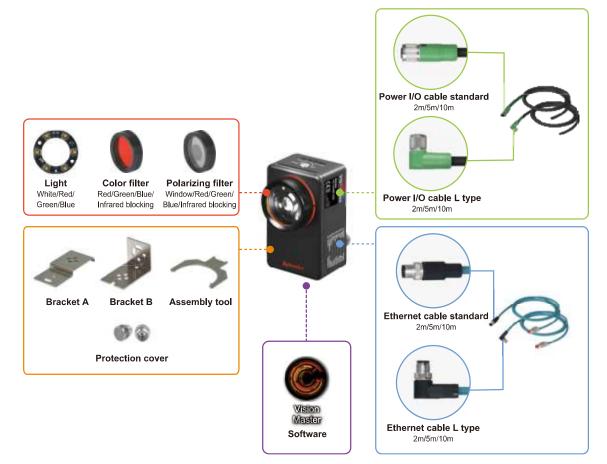
Furthermore, parameter setting and monitoring from PC is simple through Ethernet communication.

- Light integrated vision sensor
- Minimized image distortion with global shutter method
- Proprietary technology to block optical interference to improve optical performance (patent)
- Stronger in environment of vibration or impact with lens cover detachment prevention technology
- Various inspection function: alignment, brightness, contrast, area, edge, shape comparison length, angle, diameter, object counting, color identification, area of color, object of color counting
- Flexible response to changing work environment by setting 32 work groups (64 inspection items for each work group)
- Easy work group managing and parameter setting
 Through vision sensor program (Vision Master), it is available to copy or save work group saved in vision sensor to PC or work group saved in PC to vision sensor.
- Real-time monitoring of inspection result

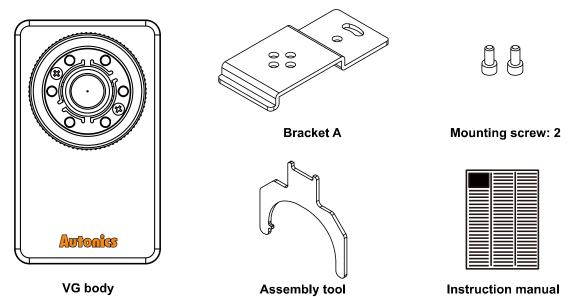
 Through vision sensor program (Vision Master), it is available to monitor the Pass/Fail
 inspection result of inspection items in real-time. Furthermore, statistics data of the
 inspection result can be generated, and it can be also initialized during inspection.
- Realization of inspection by simulator
 Through vision sensor program (Vision Master), it is available to register work group with an image saved in PC to test inspection, without vision sensor.
- Saving data to FTP server
 : According to the settings, an inspection result image can be transmitted and saved in FTP server. Furthermore, setting the file naming rule can help to manage file.
- Applicable to various environment with various light and filter
 - 4 types of light (white/red/green/blue)
 - 4 types of color filter (red/green/blue/infrared blocking)
 - Polarizing filter (window/red/green/blue/infrared blocking)
- Protection structure IP67 (IEC standard)

1.2 Accessory and sold separately

1.2.1 **Overall configuration diagram**



1.2.2 Accessory



Note

 Visit our homepage (www.autonics.com) to download vision sensor program (Vision Master).
 Before using the product, please check whether all accessories above are included. If there is a damaged or missing accessory, please contact Autonics sales team or retailer.



Please refer to the model name below, when purchasing the lost accessory.

Assembly tool





1.2.3 Sold separately

Light^{*}

LR-W-06-VG (white)	LR-R-06-VG (red)	LR-G-06-VG (green)	LR-B-06-VG (blue)				

*Besides offered light, another type of lights are sold separately.

Color filter

FL-R-VG	FL-G-VG	FL-B-VG	FL-IC-VG
(red)	(green)	(blue)	(infrared blocking)

Polarizing filter

.

FL-P-VG (window)	FL-RP-VG (red)	FL-GP-VG (green)	FL-BP-VG (blue)	FL-ICP-VG (infrared blocking)
0		0		
Power I/O cable				

CID-2-VG (length: 2m)	CLD-2-VG (length: 2m)
CID-5-VG (length: 5m)	CLD-5-VG (length: 5m)
CID-10-VG (length:10m)	CLD-10-VG (length:10m)

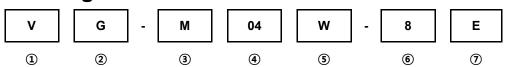
-

Ethernet cable	
CIR-2-VG (length: 2m)	CLR-2-VG (length: 2m)
CIR-5-VG (length: 5m)	CLR-5-VG (length: 5m)
CIR-10-VG (length:10m)	CLR-10-VG (length:10m)
Protection cover [*]	Bracket B
P96-M12-1	BK-VG-B

 $\ensuremath{\rtimes}\xspace$ Protection cover protects unused connectors from foreign substances.

When installing the protection cover, please tighten the cover with hand.

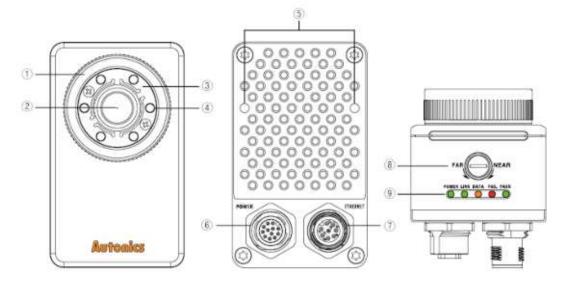
1.3 Ordering Information



Items	Descript	Description	
1 Item	V	Vision sensor	
② Type	G	General inspection	
Image element	М	Mono CMOS	
③ Image element	С	Color CMOS	
④ Resolution (pixel)	04	752×480	
	W	White	
A light	R	Red	
5 Light	G	Green	
	В	Blue	
	8	8mm	
6 Effective focal length	16	16mm	
	25	25mm	
⑦ Communication	E	Ethernet (TCP/IP)	

×1. Light can be purchased separately.

1.4 Unit Description



- Lens cover: Front cover of lens
 ※In case using a filter (color filter/polarizing filter), separate the lens cover with the assembly tool before insert the filter.
- 2 Lens: There are 8mm, 16mm, 25mm models by effective focal length.
- ③ Light cover: Light cover fixes inner LED lights.
- Light: Inner LED lights
 XIn order to change the light, separate lens cover and light cover.
- (5) Bracket mounting hole on back side: Install the vision master from the back side using bracket B.
- 6 Power I/O connector: Connect the power I/O cable.
- ⑦ Ethernet connector: Connect the Ethernet cable. It is for TCP/IP communication.
- ⑧ Focus adjuster: After fixing vision sensor, adjust focus by rotating the focus adjuster.
- Indicators

Indicator		Color	Descriptions
POWER	Power indicator	Green LED	Turns ON when power is supplied.
LINK	Ethernet connection indicator	Green LED	Turns ON when vision sensor is connected with PC (Ethernet communication).
DATA	Data transmission indicator	Orange LED	Flashes when data is transmitted from vision sensor to PC.
FAIL	Failure indicator	Red LED	Flashes when detects failure during work group inspection.
PASS	Pass indicator	Green LED	Flashes when passed inspection during work group inspection.

2 Specifications

Model Effective focal length		VG- M04⊡- 8E	VG- M04⊡- 16E	VG- M04⊡- 25E	VG- C04⊡- 8E	VG- C04⊡- 16E	VG-C C04⊡- 25E			
	-	8mm	16mm 100mm	25mm 200mm	8mm 50mm	16mm 100mm	25mm 200mm			
	ing distance	50mm								
Power supply			24VDC== (±10%)							
Power co	nsumption	1A			1					
Inspection	Inspection item	area, edge	, brightness e, shape co gle, diamete	mparison,	Alignment, brightness ^{*2} , contrast ^{*2} , area ^{*2} , edge, shape comparison ^{*2} , length, angle, diameter, object counting ^{*2} , color identification, area of color, object of color counting					
	Work group	32								
	Simultaneous inspection	64	64							
	Camera frame per second ^{≍1}	Max. 60fps								
	Image filter	Preproces	sing, exterr	nal filter (col	or filter, pola	arizing filter	.)			
	Image element	1/3 inch mono CMOS 1/3 inch color CMOS								
	Resolution	752×480 pixel								
lmage snap	Camera frame per second ^{⊛1}	Max. 60fps								
	Shutter	Global shutter								
	Exposure time	20 to 10,000us								
Light	ON/OFF method	Pulse								
-	Color	White, red, green, blue								
Trigger m	ode	External trigger, internal trigger, free-run trigger								
	Signal	Rated inp	Rated input 24VDC== (±10%)							
Input	Туре	External trigger input (TRIG), encoder input (IN2, IN3), work group change (IN0 to IN3)								
	Signal	NPN or PNP open collector output								
		Max. 24VDC== 50mA, residual voltage: max. 1.2VDC==								
Output	Туре	Control output (OUT0 to OUT3) : inspection completion, inspection result, external light trigger, alarm, camera busy					trigger,			
	FTP transmission									
Communication		Ethernet(TCP/IP), 100BASE-TX/10BASE-T								
Protection	n circuit	Output sh	ort over cur	rent protect	ion circuit					
Indicator		Power indicator (POWER), Ethernet connection indicator (LINK),								

		VG-	VG-	VG-	VG-	VG-	VG-C			
Model	Model		M04⊡-	M04⊡-	C04⊡-	C04⊡-	C04⊡-			
			16E	25E	8E	16E	25E			
		pass indicator (PASS): green LED								
		 Data tra 	Data transmission indicator (DATA): orange LED							
		· Failure i	ndicator (FA	AIL): red LE	D					
Insulatior	n resistance	Over 20M	Ω (at 500VI	DC megger))					
Dielectric	strength	500VAC 5	0/60Hz for	1 min						
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours								
Shock		300m/s ² (approx. 30G) in each X, Y, Z direction for 3 times								
Environ	Ambient temp.	0 to 45°C, storage: -20 to 70℃								
ment ^{**3}	Ambient humi.	35 to 85%	RH, storage	e: 35 to 85%	6RH					
Protectio	n structure	IP67 (IEC standard)								
Material		Case: aluminum, lens cover/focus adjuster: polycarbonate, cable: polyurethane								
Accessor	ies	Assembly tool, bracket A, mounting screw: 2								
Sold sepa	arately	Light, color filter, polarizing filter, power I/O cable, Ethernet cable, bracket B, protection cover								
Approval		CE , Ι								
Weight ^{×4}		Approx. 415g (approx.	Approx. 416g	Approx. 416g	Approx. 415g	Approx. 416g	Approx. 416g			
	weight≊		(approx. 274g)	(approx. 274g)	(approx. 273g)	(approx. 274g)	(approx. 274g)			

 \times 1. The number of camera frames per second can be different by image setting or inspection item.

 $\$ 2. These inspections identify data by converting the color image to the mono image.

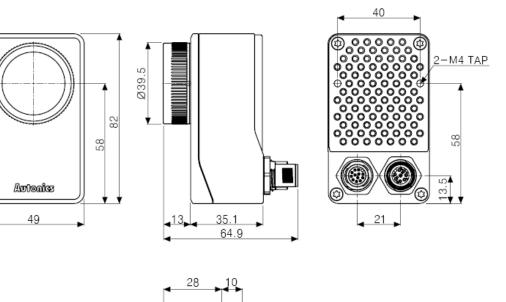
 \times 3. Environment resistance is rated at no freezing or condensation.

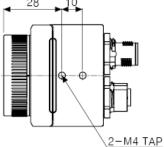
 \times 4. The weight includes packaging. The weight in parenthesis is for unit only.

(unit: mm)

3 Dimensions

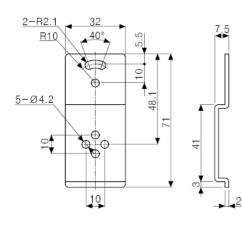
3.1 **Body**



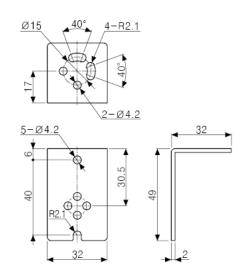


3.2 Bracket

3.2.1 Bracket A (BK-VG-A)



3.2.2 Bracket B (BK-VG-B)

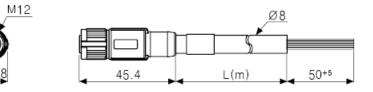


3.3 Cable

(unit: mm)

3.3.1 **Power I/O cable**

(1) CID Series



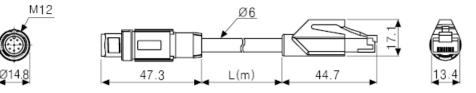
(2) CLD Series



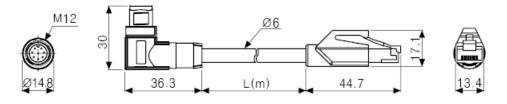
%L(m): 2m, 5m, 10m
Please refer to the cable length.

3.3.2 Ethernet cable

(1) CIR Series

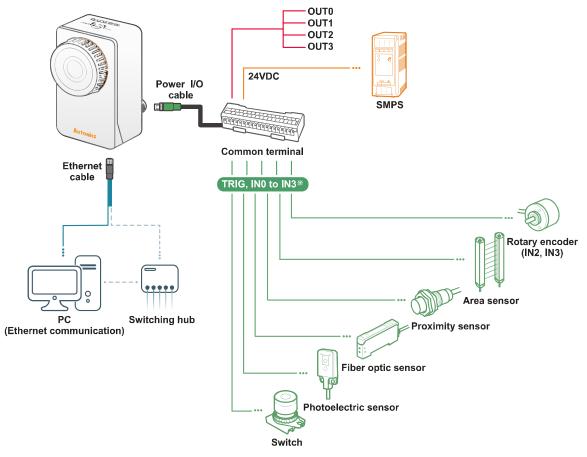


(2) CLR Series



X L(m): 2m, 5m, 10mPlease refer to the cable length.

4 Connections



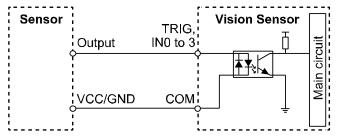
Were the product which of power supply is 24VDC.When selecting a product, please refer to Autonics selection guide.

4.1 **Power I/O Cable (M12 12-pin connector)**

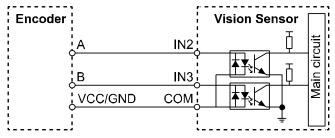
Pin arrangement	Pin No.	Cable color	Signal	Function		
	1	Brown	24VDC	24VDC		
	2	Blue	GND	GND		
	3	White	TRIG	Trigger input		
	4	Green	INO	Work group change Bit 0	Work group change - Clock	
	5	Pink	IN1	Work group change Bit 1	Work group change - Data	
	6	Yellow	IN2 Work group change Bit 2 - Up		Encoder - Up counter - Quadrature A	
765	8	Gray	IN3	Work group change Bit 3	Encoder - Down counter - Quadrature B	
	11	Gray/Pink	COMMON	COMMON		
	7	Black	OUT0			
	9	Red	OUT1	Inspection com inspection resu	•	
	10	Purple	OUT2	external light tr camera busy	igger, alarm,	
	12	Red/Blue	OUT3			

4.1.1 Input

(1) External trigger input (TRIG), Work group change input (IN0 to IN3)

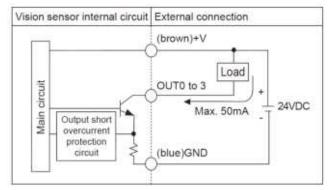


(2) Encoder input (IN2, IN3)

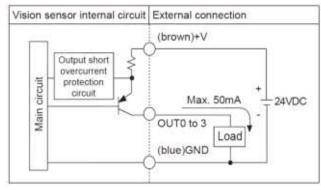


4.1.2 Output (OUT0 to OUT3)

(1) NPN open collector output



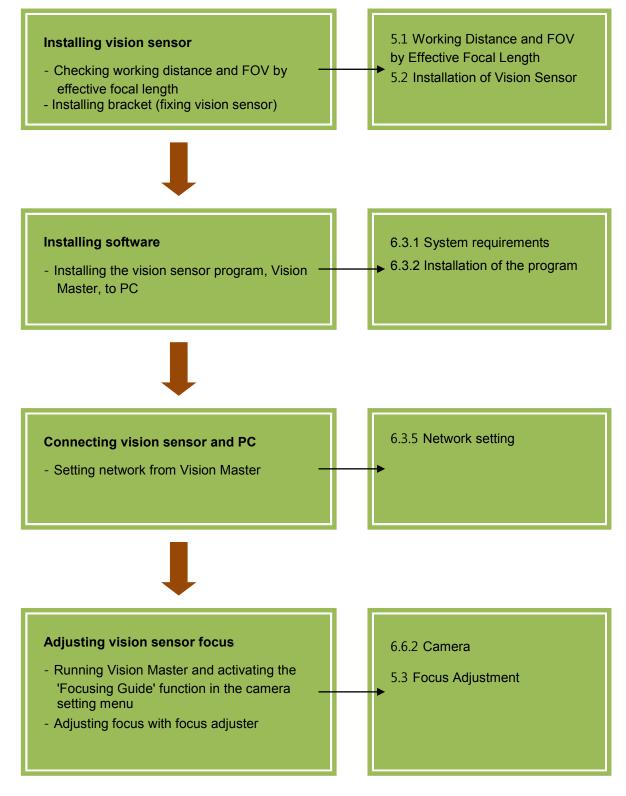
(2) PNP open collector output



4.2 Ethernet Cable (M12 8-pin/RJ45 connector)

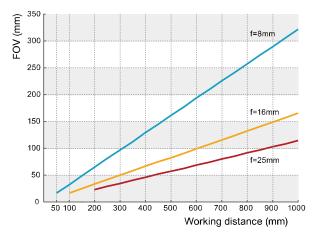
Din errengement	M12 8-pin	I	Cable color	RJ45		
Pin arrangement	Pin No.	Signal		Pin No.	Signal	
	6	RX+	White/Orange	1	TX+	
	4	RX-	Orange	2	TX-	
	5	TX+	White/Green	3	RX+	
3 8	8	TX-	Green	6	RX-	
4	1	-	White/Blue	5	-	
5.6	7	-	Blue	4	-	
	2	-	White/Brown	7	-	
	3	-	Brown	8	-	

5 Installation

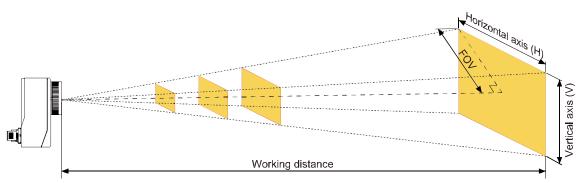


5.1 Working Distance and FOV by Effective Focal Length

Please check working distance by effective focal length and FOV (Field of View).



Effective focal length(f)	8mm	16mm	25mm
Min. working distance	50mm	100mm	200mm
Brightness	F2.0	F2.5	F2.5

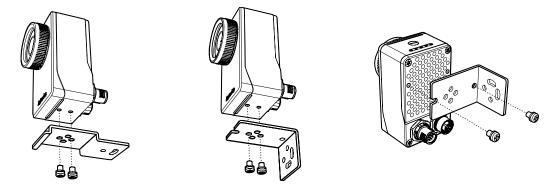


*Sensing range by effective focal length (unit: mm)

Effective focal length	Working distance	50	100	200	300	400	500	600	700	800	900	1,000
	FOV	16	32	64	96	129	161	193	255	257	289	322
8mm	Horizontal axis (H)	27	54	108	163	217	271	325	380	434	488	542
	Vertical axis (V)	17	35	69	104	138	173	208	242	277	311	346
	FOV	_	16	33	49	66	82	99	155	132	148	165
16mm	Horizontal axis (H)	—	28	56	83	111	139	167	195	222	250	278
	Vertical axis (V)	_	18	35	53	71	89	106	124	142	160	177
	FOV	_	_	23	34	46	57	68	80	91	103	114
25mm	Horizontal axis (H)	—	—	38	58	77	96	115	134	154	173	192
	Vertical axis (V)	_	_	25	37	49	61	74	86	98	110	123

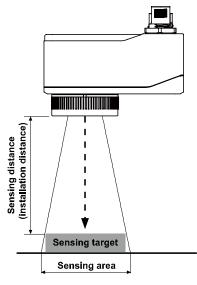
5.2 Installation of Vision Sensor

1st Fix vision sensor using bracket.



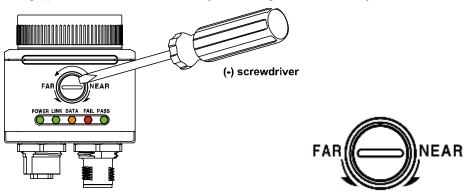
<Install horizontally from the bottom> <Install vertically from the bottom> <Install vertically from the back side> -bracket A -bracket B -bracket B

2nd Place the sensing target at the center of the vision sensor lens.



5.3 Focus Adjustment

After installing and running Vision Master, use the focusing guide function to adjust the focus. Using (-) screwdriver, turn focus adjuster to right and left to adjust the focus.



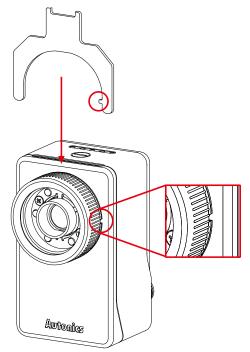
*Please refer to '6.3 Installation of Vision Master' for the installation of Vision Master and network setting.

XPlease refer to '6.6.2 Camera (6) Focusing guide ' for the focusing guide.

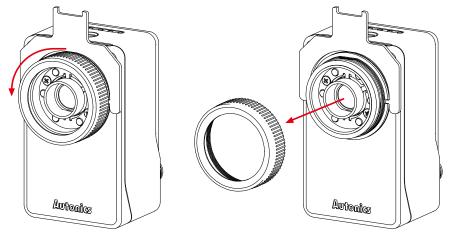
5.4 **Replacement of Light and Filter**

5.4.1 **Replacement of color filter or polarizing filter**

1st Put and fix the assembly tool into the groove on the side of the vision sensor.



2nd While fixing the vision sensor with the assembly tool, hold the lens cover and disassemble it in a counter clock wise direction.

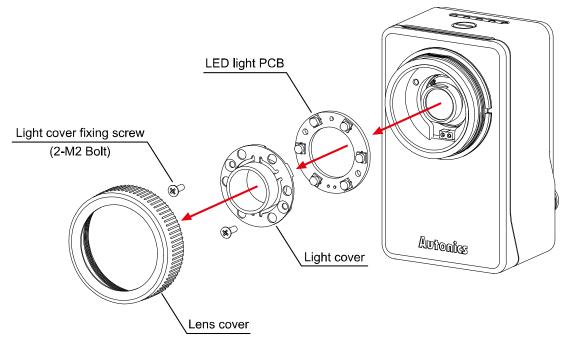


3rd Instead of the disassembled lens cover, assemble another color filter or polarizing filter in clock wise direction.

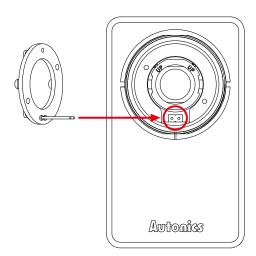
5.4.2 Replacement of light

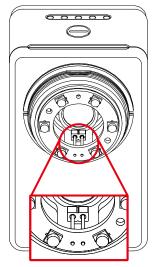
1st Put and fix the assembly tool into the groove on the side of the vision sensor.

- 2nd While fixing the vision sensor with the assembly tool, hold the lens cover and disassemble it in a counter clock wise direction.
- 3rd Disassemble the light cover using the (+) screwdriver, and disassemble the inner LED light.

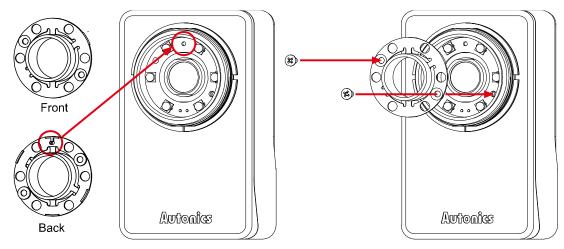


4th Place the connection pin of PCB of the inner LED light to face the direction of 6 o'clock and assemble it to the vision sensor body.





5th Align the light cover with the groove in the direction of 12o'clock and fix it with the screw. Tighten them with the 1.2kgf·cm of tightening torque.



6th Assemble the disassembled lens cover in clock wise direction.

6 Vision Sensor Program [Vision Master]

6.1 **Overview**

Vision Master is the vision sensor program that is connected with VG Series, Autonics vision sensor, to utilize it.

Vision Master provides graphic user interface to make setting parameter and managing monitoring data of vision sensor easy.

It is connected with vision sensor through Ethernet (TCP/IP) and exchange data with vision sensor.



Item	Description						
	Compares features of the re-	gistered image and input image s the input image with informat					
Alignment	<template></template>	<pass></pass>	<fail></fail>				
	Inspects brightness of the Rettine ROI (Region of Interest)	OI in the input image based on in the registered image.	the mean brightness value of				
Brightness	<template></template>	<pass></pass>	<fail></fail>				
	Inspects contrast of the ROI in the input image based on contrast of the ROI in the registered image.						
Contrast	<template></template>	 	<fail></fail>				
	Inspects the ROI area of the by user.	input image based on the ROI	area of the image registered				
	<template></template>	<pass></pass>	<fail></fail>				
Area	C	E	Ĩ				
	Inspects the direction of the user in the same area.	edge in the input image based	on the edge registered by				
Edge	<template></template>	<pass></pass>	<fail></fail>				

Autonics

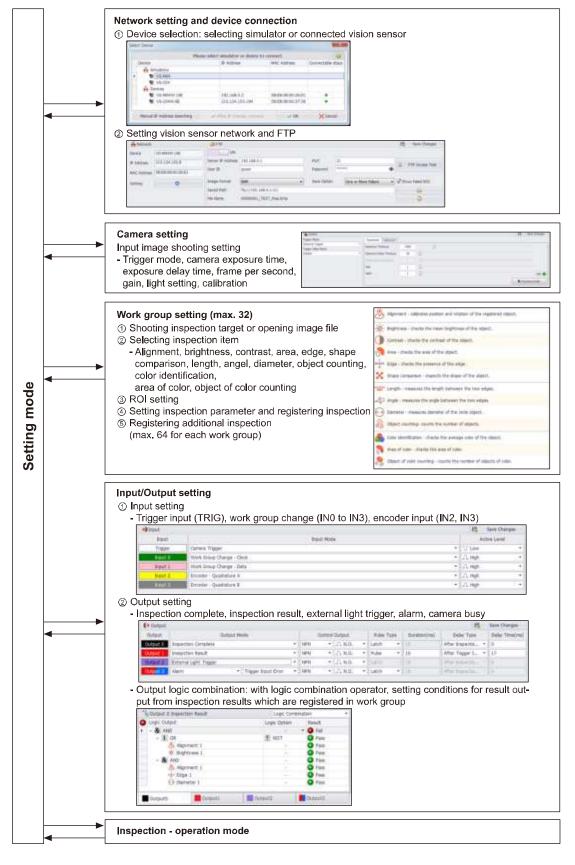
Item	Description							
	Compares shape of object in the ROI registered by user and that of the input image.							
Shape comparison	<template></template>	<pass></pass>	<fail></fail>					
	Inspects the input image bas	ed on the length between two	edges registered by user.					
→ ← Length	<template></template>	<pass></pass>	<fail></fail>					
	Inspects the input image based on the angle between two edges registered by user.							
Angle	<template></template>	<pass></pass>	<fail></fail>					
	Inspects the input image bas	ed on the area between two ci	rcles registered by user.					
Diameter	<template></template>	<pass></pass>	<fail></fail>					

Item	Description						
Object counting	Compares the number of ob that in the input image. <template></template>	ejects in the ROI which is in the	e image registered by user and Fail>				
	Compares color of the ROI	registered by user and that of t	the input image.				
Color identification	<template></template>	<pass></pass>	<fail></fail>				
	Compares the area of a certain color in the ROI registered by user and that in the input image.						
Area of color	<template></template>	<pass></pass>	<fail></fail>				
	Compares the number of objects in a certain color which are in the ROI of registered image and that of the input image.						
Object of color counting	<template></template>	<pass></pass>					

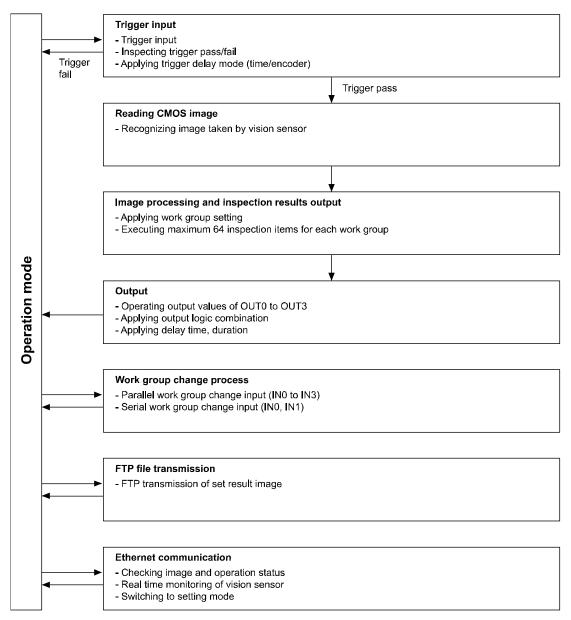
%Color identification, area of color, and object of color counting are only for VG-C Series.

6.2 Vision Master Work Flow

6.2.1 Setting mode



6.2.2 **Operation mode**



6.3 Installation of Vision Master

6.3.1 System requirements

ltem	Minimum specifications
System	32bit (×86) or 64bit (×64) processor over 1GHz
Operations	Microsoft Windows 7/8/10
Memory	1GB+
Hard disk	400MB+ of available hard disk space
VGA	Resolution: 1024×768 or higher
Others	RJ45 Ethernet port

6.3.2 Installation of the program

1st Download Vision Master program at Autonics web page(<u>www.autonics.com</u>).

- 2nd Close all programs before you start Vision Master installation. Double-click Vision Master setup.exe to start installation.
- 3rd When Installer Language window appears, select the language and click [OK] button.

In	Iler Language Please select the language of the installer
4th Clic	English OK Cancel [Next] button in the installation welcome window.
	Autorities A Controllers Welcome to Vision Master 1.0.6.27 Setup wil guide you through the installation of Vision Master 1.0.6.27. It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer. Click Next to continue.
11.	Next > Cancel

6th

5th This process is license agreement.

You can check whole part of license agreement article by rolling mouse scroll downward, clicking downward arrow or press "Page Down(PgDn)" Key of the keyboard. Please read the articles thoroughly before click [I Agree] button.

Vision Master 1.0.6.27 Setup			
icense Agreement			13
Please review the license terms before installing Vision Master 1.0.6.	27.		<u>(</u>
Press Page Down to see the rest of the agreement.			
AUTONICS END USER SOFTWARE LICENSE TERMS			
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING "Visio (hereinafter referred to as, the "Software").	on Master		
Do not use or load this software and any associated materials (collect	ctively, th	e	
"Software") until you have carefully read the following terms and cor	nditions. I	By loading	9
or using the Software, you agree to the terms of this Agreement. If so agree, do not install or use the Software.	you do n	ot wish t	0
License Terms and Conditions.			
This Software is licensed for use only in conjunction with Autonics Co			
(hereinafter referred to as ""Autonics"") component products. Use o	of the Soft	tware in	
If you accept the terms of the agreement, dick I Agree to continue. agreement to install Vision Master 1.0.6.27.	You must	accept t	he
llsoft Install System v3.01			
			a a.
< Back	Agree		ancel
ose Install Location window appears. ult installation path is as follows.			
ult installation path is as follows. rogram Files (x86)\Autonics\Vision Master\ [OK] button to install the program in the default ins	stallatio	on path	
ult installation path is as follows. rogram Files (x86)\Autonics\Vision Master\	stallatio	on path	j x
ult installation path is as follows. rogram Files (x86)\Autonics\Vision Master\ [OK] button to install the program in the default ins	stallatio	on path	
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ult installation path is as follows. rogram Files (x86)\Autonics\Vision Master\ [OK] button to install the program in the default ins Vision Master 1.0.6.27 Setup	tall in a di		
Ault installation path is as follows. rogram Files (x86)\Autonics\Vision Master\ [OK] button to install the program in the default ins Vision Master 1.0.6.27 Setup Choose Install Location Choose the folder in which to install Vision Master 1.0.6.27. Setup will install Vision Master 1.0.6.27 in the following folder. To inst	tall in a di		
Ault installation path is as follows. rogram Files (x86)\Autonics\Vision Master\ [OK] button to install the program in the default ins Vision Master 1.0.6.27 Setup Choose Install Location Choose the folder in which to install Vision Master 1.0.6.27. Setup will install Vision Master 1.0.6.27 in the following folder. To inst	tall in a di		
Destination Folder	tall in a dir ation.	fferent fo	
Setup will install Vision Master 1.0.6.27 in the following folder. To install discrete folder in which to install Vision Master 1.0.6.27.	tall in a dir ation.		
Destination Folder E:WProgram Files (x86)\Autonics\Vision Master\ x [OK] button to install the program in the default install vision Master 1.0.6.27 Setup Choose Install Location Choose the folder in which to install Vision Master 1.0.6.27. Setup will install Vision Master 1.0.6.27 in the following folder. To inst dick Browse and select another folder. Click Install to start the install Destination Folder E:WProgram Files (x86)WAutonicsWvision Master Space required: 120.7MB	tall in a dir ation.	fferent fo	
Destination Folder C: WProgram Files (x86)\Autonics\Vision Master\ x [OK] button to install the program in the default install vision Master 1.0.6.27 Setup Choose Install Location Choose the folder in which to install Vision Master 1.0.6.27. Setup will install Vision Master 1.0.6.27 in the following folder. To inst dick Browse and select another folder. Click Install to start the install Destination Folder	tall in a dir ation.	fferent fo	
Destination Folder E:WProgram Files (x86)\Autonics\Vision Master\ x [OK] button to install the program in the default install vision Master 1.0.6.27 Setup Choose Install Location Choose the folder in which to install Vision Master 1.0.6.27. Setup will install Vision Master 1.0.6.27 in the following folder. To inst dick Browse and select another folder. Click Install to start the install Destination Folder E:WProgram Files (x86)WAutonicsWvision Master Space required: 120.7MB	tall in a dir ation.	fferent fo	
Destination Folder E:WProgram Files (x86)\Autonics\Vision Master Cooler required: 120.7MB Space required: 120.7MB Space available: 55.0GB	tall in a dir ation.	fferent fc	

7th Click [Install] button to install the program in the default installation path. If you want to install the program in another installation path, click [Browse..] button to designate a folder you want to install in and click [OK] button.

Libraries Autonics Computer Network vision master	Desktop	p	
Computer Vetwork	🕞 Librar	ries	
🗣 Network	B Autor	nics	
	Comp	puter	
🔒 vision master	🗣 Netw	ork	
	🔒 vision	n master	

8th Installation progress is displayed in the status window as follows.

Installing		1-3
Please wait while Vision Master 1.0	0.6.27 is being installed.	<u> </u>
Created uninstaller: C:\Program	Files (x86)₩Autonics₩Vision Master₩	funinstall.exe
Show details		

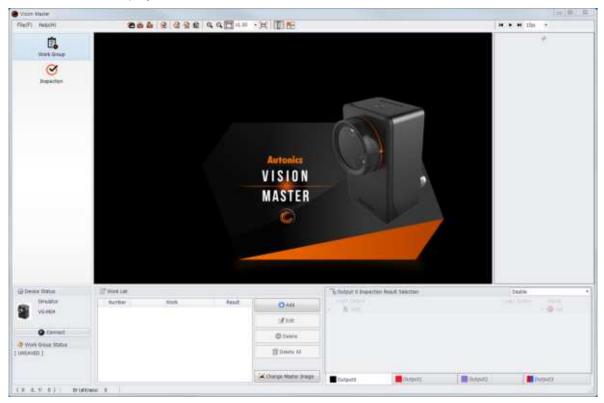
9th Installation Complete window appears after installation is completed.

If the check box in the Installation Complete window is checked, Vision Master runs upon completion of installation.

You can run Vision Master by double-clicking the Vision Master icon on the desktop.



The initial screen displays as follows.

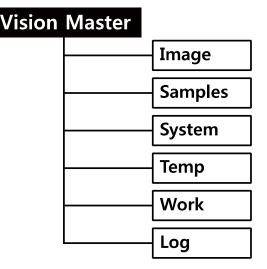


6.3.3 Installation folder structure

This section explains the folder structure created when you installed Vision Master.

The Vision Master folder is created in [C:\Program Files (x86)\Autonics\] as a subfolder unless you select a new destination to change location of Vision Master folder.

After Vision Master is installed completely, Vision Master installation folder and related folders are created as follows in [C:\Users\(Account name)\Documents\Autonics\] as subfolders and work groups and documents are saved in. The program and all relevant documents are stored in these folders.



(1) Image folder

If Save Result Image inspection parameter of Vision Master is set to ON, inspection result images are saved in the designated location. Saving location is fixed, so that is cannot be changed by user.

Inspection result images are saved in [C:\Users\(Account name)\Documents\Autonics\Vision Master\Image\ResultImage].

(2) Sample folder

This folder contains work groups for samples. Load sample files from this folder to Vision Master to test inspection.

(3) Work folder

When saving work groups from Vision Master to PC, the work groups are saved in this folder. When copying work groups from a device to PC using work group manager, the work groups are saved in this folder. If the saving location is changed when saving work groups in PC, work groups are saved in

If the saving location is changed when saving work groups in PC, work groups are saved in the changed folder.

(4) Log folder

Log files of connection/disconnection with a device or inspection result are saved.

6.3.4 **Removal of the program**

There are procedures to uninstall Vision Master, Start > Program > Vision Master > Uninstall or Start > Setting > Control Panel > Add/Remove a Program > Vision Master.

When a confirmation window appears after selecting Remove, click [Yes] button to remove Vision Master from the computer.

6.3.5 **Network setting**

Change the network settings in Vision Master to connect with a device (vision sensor).

When executing Vision Master, Select Device window appears. Simulator or connected devices are displayed in the window. You can check connectable devices and connected devices using Refresh icon () on the top of the window.

		IP Address			
		ar 11001000	MAC Address	Connectable	stau
	Simulators				
6	K VG-M04				
6	K VG-C04				
22 [Devices				
9	KG-M04W-16E	192.168.0.2	58:E8:08:00:26:D1	0	
۹	K VG-C04W-8E	210.124.103.194	58:E8:08:00:37:36	•	
9	KG-C04W-8E	210.124.103.246	58:E8:08:00:19:C6	•	
9	KG-C04W-8E	210.124.103.7	58:E8:08:00:25:ED	•	
9	KG-C04W-25E	210,124.103,189	58:E8:08:00:3A:48	0	

Factory default of the device (vision sensor) is as follows.

IP address	192.168.0.2
Subnet mask	255.255.255.0
Gateway	192.168.0.1

Note

A list of the currently connected vision sensor is displayed. After checking "connectable status" indicator, and connect a vision sensor.

- Connectable
- Our Contract Unconnectable

- The vision sensor is not connectable because it is connected to another PC already.

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(1) Change of device IP address

You can change IP address of the device to connect.

1st Select the device to connect, and click "After IP change, connect" button.

	Plea	se select simulator or device t	o connect.	G
	Device	IP Address	MAC Address	Connectable stau
	🚼 Simulators			
	品 VG-M04			
	品 VG-C04			
	😤 Devices			
٠	1 VG-M04W-16E	192.168.0.2	58:E8:08:00:26:D1	٥
	1 VG-C04W-8E	210.124.103.194	58:E8:08:00:37:36	•
	1 VG-C04W-8E	210.124.103.246	58:E8:08:00:19:C6	0
	1 VG-C04W-8E	210.124.103.7	58:E8:08:00:25:ED	0
	1 VG-C04W-25E	210,124,103,189	58:E8:08:00:3A:48	0
	Manual IP Address Searching	✓ Connect after changing I	р у ок	X Cancel

2nd Change IP address in Change Network Setting window.

IP Address	210, 124, 103, 3
Subnet mask	255, 255, 255, 0
Gateway	2100124m03m1



If changed IP address is same with another IP address which is used in another PC of device, network error can occurs due to IP address conflicts.

(2) Manual search of IP address

If a device is not recognized while it is connected, click "Manual IP Address Searching" and search IP address of the device to connect.

(This is usable only when Gateway of the device and PC are same.)

Searching	-
	1
× Cancel	1

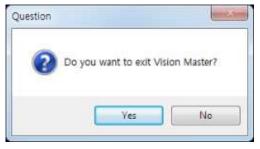
6.4 Start and Exit

6.4.1 Start

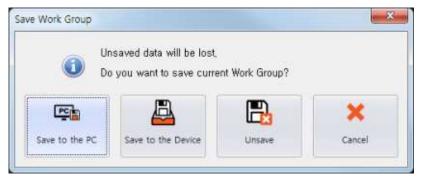
Double-click Vision Master icon in the desktop or select Start > Program > Vision Master to start the program.

6.4.2 Exit

Click [X] button on the top right corner of the screen or 'exit' in the file menu to end the program.



Since work group, parameter settings, and data are not saved automatically, please make sure that you have saved the work group before you exit.



3 Antonia	4	5PASS	6
+) Hart (+) Oddel Bitch Unag Weinten		1: 24VDC Brown SERIES 1: 24VDC White 3: TRID 3: TRID Green 3: INT Pinh 3: COUT3 Red: Sheet	ing ing ing ing
Cheve Statur Bear Villeone you Ballon allo	Hortsonk Honese Voy-merror sall P Addrese 200.124-101.0 Mod. Addrese The Merror Merror Part 24-011	Set 19 Set 20 Set 20	A The Access To
Demonst Volt dead State Sc) Dample are	Sectory O	Programmer Self	a di man haka kiti a

6.5 Vision Master Screen Layout

The program screen is divided into sections as shown in the preceding screenshot and each section is composed of the following items.

No.	Item	Description
1	Menu	Displays Vision Master menus by category.
2	Tool bar	Displays icons of frequently used menu, settings of image window, camera snap, or etc.
3	Setting menu	Displays vision sensor setting parameter menu. If none of device of connected, it is available to connect simulator to register work group and inspection test. Activation of the setting menu depends on the type of the connected device (simulator or device) - Simulator connection: work group, inspection - Device (vision sensor) connection: network, camera, input, output, work group, inspection
4	Image window	 Displayed image is different according to the mode and settings. Setting mode: displays a taken image by vision sensor or selected image between master image to register work group and loaded image to preview window. Operation mode: displays taken images according to the "View Result Image" settings. Please refer to '6.6.6 Inspection'.
5	Inspection result	Displays inspection result (Pass/Fail) of work group.

No.	ltem	Description
6	Preview window	 Displays loaded images. If the 'Add Taken Image to Preview Window' icon () is activated, preview window displays images taken by the vision sensor, which are different according to the mode and settings. Setting mode: displays all images taken by the vision sensor. Operation mode: while inspecting, displays taken images according to the 'View Result Image' settings. Please refer to '6.6.6 Inspection'. Right click in the preview window to display setting menu as follows.
		 Load Image Folder Save Selected Image Select All Delete Selected Image
		Displays status information of the device and work group. - Device status : displays information of simulator or device (vision sensor) connected to Vision Master. It is available to connect or disconnect device. Indicator on the top right side enables to check the communication status between Vision Master and the device, when the device is connected. The indicator flashes while data communication.
7	Status information	Image: Connect Image: Connect Image: Connect Image: Connect
		- Work group status: displays status of currently registered work group. Work Group Status (UNSAVED] NewWork.avs DEVICE] [INDEX 1] Example.avs Example.avs
8	Parameter	Displays specific parameters in the setting menu.
9	Image information	Displays brightness value and pixel coordinate of the point where the mouse cursor is pointing on the image window.

6.5.1 Menu

File(F) Device(D) Help(H)

(1) File

File	(F)	Device(D)	Help(H)
0	Оре	en Image(O)	
2	Оре	en All Images	s from Folder(F)
-	Sav	e Image(S)	
۲	Now	k Group Mar	nager(M)
2	Nev	w Work Group	5(N)
	Loa	d Work Grou	p from PC(W)
8	Sav	e Work Grou	p to PC(K)
4	Loa	d Work Grou	p from Device(D)
E	Sav	e Work Grou	p to Device(E)
×	Exit	(X)	

- Open Image: Opens the image to inspect.
- Open All Images from Folder: Opens the folder of images to inspect.
- Save Image: Saves the image displayed in Image window.
- Work Group Manager: Displays a list of work group saved in the PC or device to copy, delete, or save. It is available to set work group to use when the device turns on.

UP Wrink Group Lett #	PC .				·#Wok.	iroap Lat, in Device			
Humper	Work Group Harre	Storage Time			Humber	Work Sing larre	Storage Time	Fower On Operators	
• I I Eb	appelling .	A110-5-14 12:44148	3	4	•	Toront Int.	2010-5-14 16140-37	Contraction of the	
	a second second	and the second constraints of the		210	2	Texture	2018-5-14 10:49:53	\$	
			1.00		3				
			4	1					
			1.5		5				
					. 6				
					7				

No.	lcon	
1		Deletes selected work group.
2		Selects a folder in the PC to load work group from.
3		Copies work group from the device to the PC.
4		Copies work group from the PC to the device.
5		Selects work group to operate when the device turns on.

- New Work Group: Registers new work group.
- Load Work Group from PC: Loads work group from the local disk of PC.
 Work groups are saved in the default folder [C:\Users\ (Account name) \Documents\Autonics\Vision Master\Work] or the folder designated by user.
- Save Work Group to PC: Saves work groups registered and set in Vision Master to the local disk of PC.

Work groups are saved in the default folder [C:\Users\ (Account name) \Documents\Autonics\Vision Master\Work] or the folder designated by user.

Load Work Group from Device: Loads work group from the device (vision sensor).

Loads	Work Group from the device.		
Number	Work Group Name	Storage Time	Power On Operation
1	Example.avs	2018-5-14 10:46:37	
2	Test.avs	2018-5-14 10:49:53	0
3			
- 4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

 Save Work Group to Device: Saves work groups registered and set in Vision Master to the device (vision sensor). Click number of work group to save to set the name of work group. At that moment, selected work group can be set as operating work group when the device turns on. Work group can be registered and saved up to 32.

Please	select a location to save Wo	rk Group.	
Number	Work Group Name	Storage Time	Power On Operation
1	Example.avs	2018-5-14 10:46:37	
2	Testavs	2018-5-14 10:49:53	0.
3			
4			
5			
6	Save Work Group		
.7	(
8	Work Group Name :		
9	ten		
10	Sets as work group to a	operate when power On.	
10 11	Sets as work group to a		
10 11 12	Ø Sets as work group to a	operate when power On.	× Cancel
10 11 12 13	Sets as work group to a		X Cancel
10 11 12 13 14	Sets as work group to o		Cancel
10 11 12 13 14 15	Sets as work group to o		Cancel
10 11 12 13 14 15 16	Sets as work group to a		Cancel
10 11 12 13 14 15 16 17	Sets as work group to a		Cancel
10 11 12 13 14 15 16 17 16	Sets as work group to a		Cancel
10 11 12 13 14 15 16 17 18 19	Sets as work group to o		Cancel
10 11 12 13 14 15 16 17 16	Sets as work group to o		Cancel

• Exit: Exits Vision Master.

(2) Device



I/O Test: Displays input status with the indicators (no input:) / input:). Also it is available to set control output type (NPN/PNP) and whether use each output or not.
 I/O test is only for testing output, so that it is not associated with settings of output parameter

>) Input		
Input	Satus	
Trigger	0	
Input 0	0000	
Input 1	0	
Input 2	0	Encoder count
Input 3	0	0 Pulse
(+ Output		
Output	Control	Status
Output 0	NPN •	ON
Output 1	NPN •	ON
Output 2	PNP -	OFF

- Firmware Update: Updates firmware version of the device (vision sensor).
- Device reset: Resets the device, deleting saved work group and set parameters from the device.
- (3) Help



- User Manual: Loads user manual.
- Language: Changes program language.
- Vision Master Update: Updates version of Vision Master.
- Vision Master Information: Displays information about version of Vision Master and device firmware.

6.5.2 Toolbar

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1	2		3	4		5		6	7	8		9	1	0
Section	lcon		T			Descript	tion							
	10		Open	Image										
	<u>*a</u>		Open	All Imag	ges	-								
1			-	- older	-									
			Save	Image										
<u>م</u>	4	í.	Work	Group										
2		,	Mana	ger										
	de		New \	Nork Gr	oup	Please re	ofer to '((1) Fi	le' in '	651Me	nu'			
			Open	Work G	roup					0.0.1 100	na .			
3	T		from I	PC										
	B			Work G	roup									
			to PC			_								
	A		-	Work G Device	roup									
4 ^{×1}				Work G	roup	-								
			to De		1-									
	Ð		Zoom	in		Enlarges	image.							
	Q		Zoom	out		Reduces	image.							
_			Fit to	Window		Adjusts th	he size	of the	e imag	ge to fit t	o the i	mage wir	ndow.	
5	x1.31	•	Image	e Scale		Resize in	nage.							
						- Setting	-					×16		
	s2					Displays	-							
	굑		Full S	creen		To turn of mouse bu		reen	view,	press E	SC ke	y or doub	ole click	<
	Ē					Displays		s rar	nae of	inspecti	n whi	ch set in	work	
6			Show	Bar Ga	uge	group as	•		ige of	nopeeti	511 0011	on set in	WOIR	
-		1	Multi `	View		Displays	_	-	tatus	of maxim	um 4	vision se	nsors a	at
1		j	(4 cha	annels) [×]	3	the same	time.							
			Snap			Takes an	image	with	the ca	amera of	vision	sensor.		
8 ^{×1, ×2}			Conti	nuous S	nap	Takes mu								
	5					according	g to the	set r	umbe	er of fram	e per	second (fps).	

Backward

9

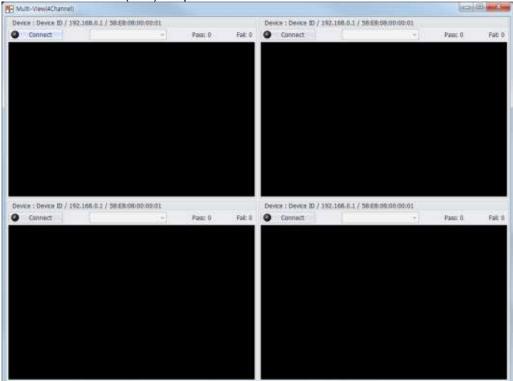
Loads previous image from images in preview window.

Section	lcon		Description
		Play	Loads images consecutively from images in preview
			window.
		Forward	Loads next image from images in preview window.
			Selects the image playing speed for displaying images from
	1fps 🝷	Image Play Speed	preview window.
			- Setting range: 4fps, 2fps, 1fps, 1/ 2fps, 1/4fps
		Pause	Pauses playing of images from preview window.
40%1		Add Taken Image	Adda takan imagaa ta nawiaw windawa
10 ^{%1}		to Preview Window	Adds taken images to preview windows.

※1. It is not displayed in simulator operation.

 \times 2. It is displayed only when the camera trigger mode is set to 'free-run trigger' or 'internal trigger'.

- X3. Use Multi View function as flows.
- 1st Click Multi View icon () to open Multi View window as flows.



2nd Click 🔎	Connect	on the top.			
Device : Devi	ce ID / 192.1	68.0.1 / 58:E8:08:00	0:00:01		
Connec	t			Pass: 0	Fail: 0

3rd Select the device to connect.

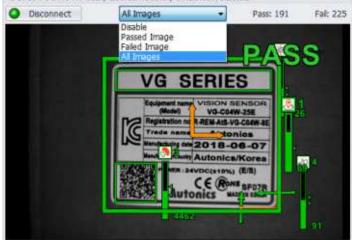
-

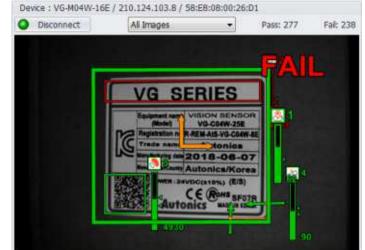
You can only select devices which of the connectable status indicator is turned on in green color.

dress Connectable staus
8:00:37:36
8:00:26:D1 •
8:00:19:C6
8:00:25:ED •
8:00:37:26
8:00:3A:4B

4th Set View Result Image.

Inspection result of the running device (vision sensor) is displayed in the image window. Device : VG-M04W-16E / 210.124.103.8 / 58:E8:08:00:26:D1





5th You can monitor statistics of Pass/Fail result.

6th You can monitor inspection status of maximum 4 vision sensors at the same time.



6.6 Setting Menu

6.6.1 Network



Ta tietanit		C FIF						By Save Changes
Device	VG-H04W-18E	ON						
P Address	210.124.103.8	Server IF Address			Pot	21		TTP Access Test
MAC Address		User ID	pout		Password		¢	
Gerzing	0	Itagie Fortut	ENE	+	Save Option	One or More Railure		Show Faled ROL
		Saved Path	ftp://392.168.0.1:21/					2
		File Marrier	00000001_TEST_Peel.brm					0

(1) Network

IP Address	210.124.103.8
	58:E8:08:00:26:D1
Setting	ø

It is available to set vision sensor and PC network.

- Device: Displays currently connected vision sensor to Vision Master.
- IP / MAC Address: Displays IP / MAC address of the connected device.
- Setting: Changes IP address setting of the currently connected device. [Current Network Setting] is network information of the currently connected device. To change network setting, enter new information in [New Network Setting].

Rew Netwo	rk Setting
IP Address	192,168.0.2
Subnet Mask	255.255.255.0
Gateway	192.168.0.1
IP Address	210.124.103.8
Subnet Mask	255.255.255.0
Gateway MAC Address	210.124.103.1 58:EB:08:00:26:D1

OFF

(2) FTP

Set P						E Save Changes
ON						
Server IP Address	192.168.0.1		Port	21		FTP Access Test
User ID	guest.		Password	*****	Ð	(ii) + IF MULTER (EDL
Image Format	вир		Save Option	One or More Failure	*	Show Falled ROI
Saved Path	Path ftp://192.168.0.1:21/					6
File Name 00000001_TEST_Pass.bmp						0

Transmits inspection result images saved in vision sensor memory to FTP server.

Select whether to use FTP function or not. (

- Server IP Address / Port: Enter IP address and port of FTP server.
- User ID / Password: Enter user ID and password.
 ※If Show Password icon () is clicked, being entered password is displayed in characters, not '* '.
- FTP Access Test: Checks status of connection to FTP server.
- Image format: Select image format to be saved when transmitting image to FTP server. You can select between BMP (*.bmp) and JPG (*.jpg).

ON /

Save Option: Sets conditions for saving images.
 All Pass: Only saves images which pass all the inspection items in work group.
 One or More Failure: Saves images which failed to pass one or more among inspection items in work group.

 $\times If$ Show Failed ROI check box is checked, ROI which failed to pass inspection is marked in the result image.

- Saved Path: Enter location in server to save the result image.
 When designating folder to upload, click 'Upload Folder Path' icon (2) on the right side. You can see the list of folder in the server.
- File Name: Sets file name of image to transmit to the FTP server. Click 'Image File Naming Rule' icon () on the right side to set name.

Note

Image file naming rule is as flows.

Item can be set up to 5, and you can customize the order of the items.

mage File N	Iaming Rule
Item 1 :	Image Number
ltern 2 :	Image Name
ltern 3 :	Inspection Result
Item 4 :	Work Group Number
Item 5 :	Work Group Name *
Example	00000001_TEST_Pass_01_Example.bmp 1 2 3 4 5 6 Cancel

- Image Number: It is number of taken image. It is necessary for image file naming.
- Image Name: User can set image name using only Korean, English alphabet, number, and some of special characters (except " < > ? * / \ |)
- Inspection Result: Displays inspection result of Pass/Fail.
- Work Group Number / Work Group Name: Displays number and name of inspecting work group.
- Image format filename extension: It is image format filename extension. It displays BMP (*.bmp) or JPG (*.jpg).

6.6.2 Camera



Gerrera			Eg tare Clarges
Nigger Mode	Parameter Calibration		
External Togger	Rapours Tate(us)	1000	
Frigger Delay Holde Dealthe	+ Approure Delay Terre(us)	30 8	
	Prene per Second (fee)	1	
	Gan Light		
	rille	1 1	CRU C
			Renning Guide

6.6.2.1 Trigger

Gamera	
Trigger Mode	
External Trigger	•
Trigger Delay Mode	
Disable	•

(1) Trigger mode

-

- Free-Run trigger: Takes images with the maximum trigger speed that can occur in the sensor. (fixed to 60fps)
- Internal Trigger: Takes image by occurring trigger in the sensor (1 to 60fps)
- External Trigger: Takes image with external input signal as trigger. If you use external trigger mode, you can use trigger delay mode.

(2) Trigger Delay Mode

Trigger Mode			
External Trigger			
Trigger Delay Mode			
Encoder	1	-	
Disable		Trigger Delay Mode	
Time		Time	•
Encoder			
		0	ms
		Trigger Delay Mode	
		Encoder	•
		0	Pulse 🔗

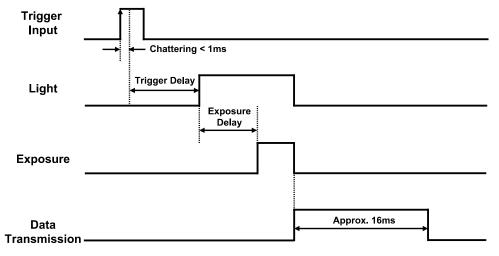
Trigger delay means delayed time from inputting moment of external trigger to actual starting moment of image taking.

- Time: Sets the trigger delay in time unit. Setting range is from 0 to 60,000ms.
- Encoder: Sets the trigger delay in unit of the number of pulse. Setting range is from 0 to 16,000,000 pulses.

Click 'Encoder Delay Pulse Calculator' (**1**) and enter moving distance and distance resolution of encoder to calculate pulse value according to um/pulse or pulse/um setting value.



After setting the trigger delay mode, timing diagram of trigger input is shown as follows.



6.6.2.2 Parameter

Parameter Calbration			
Exposure Time(µs)	1000	5 H	
Exposure Delay Time(µs)	30	0	
Frame per Second(fps)	1	8	
Gam	1	8	
Light	1	0	

(1) Exposure time

Exposure time is the time span for which the vision sensor is exposed to the light. The longer exposure time is, the brighter the taken image is, and the shorter exposure time is, the darker the taken image is. Setting range is from 20 to 10 000 us

Short exposure time	Proper exposure time	Long exposure time
62	(E)	
		Autonics SERIEORS & CONTROLLERS

(2) Exposure delay time

Exposure delay time delays the light receiving point of vision sensor. Setting range is from 30 to 10,000us.

(3) Frame per second

Frame per second is Frame rate which is the number of images taken per 1 second. It is settable only when the trigger mode is set to "internal trigger". Setting range is from 1 to 60fps.

%In the external trigger mode, the vision sensor takes images with external input signal, so that you cannot set the frame per second.

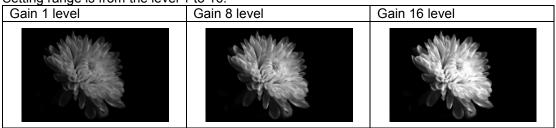
%In the free-run trigger mode, the vision sensor takes images at the fastest speed which the vision sensor can.

(The shorter exposure time is, the faster the vision sensor can take.)

(4) Gain

It is adjusting gain of CMOS image sensor.

As higher gain level makes image brighter, increased noises makes resolution low. Setting range is from the level 1 to 16.



10982 (Q) 1

(5) Light

You can set whether to use inner LED light or not. (Use: //not use: Light is synchronized with trigger signal and exposure time.

Setting range is from the level 1 to 16.



(6) Focusing guide

Focusing guide makes adjusting image focus with the focus adjuster convenient. After setting ROI of the sensing target and checking the focusing guide value, rotate the focus adjuster to the point where the focusing guide value is the highest and fix it at the point to use.



How to adjust focus with focusing guide.

1st Click focusing guide button.

Focusing guide ON(Focusing Guide) /OFF (Focusing Guide)

2nd In the image window, the focusing guide value and area is displayed on the master image. Adjust the area to focus on. The higher the focusing guide value is, the clearer focus on the image is.



- 3rd Click continuous snap (**[]**) on the toolbar on the top.
- 4th Checking consecutively taken images, rotate the focus adjuster to the FAR or NEAR direction. Since initial setting is unknown, rotate the focus adjuster to both FAR and NEAR directions and fix the adjuster at the point where the focusing guide value is the highest.



When sensing target is in near	Focus adjusting is finished.	When sensing object is far
\rightarrow rotate to the NEAR		\rightarrow rotate to the FAR direction.
direction.		
Autonics	Autonics Tierors & convenies	B4

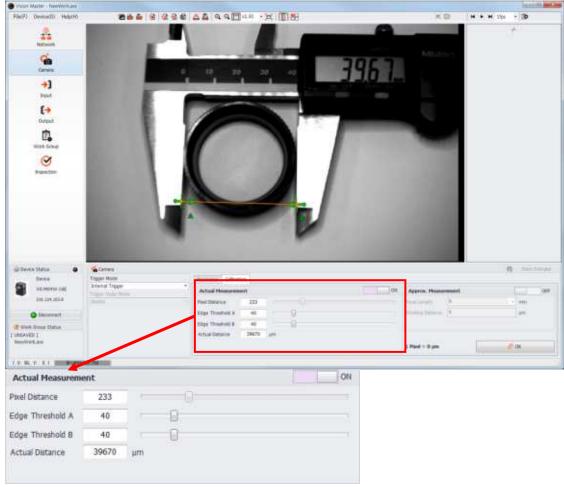
6.6.2.3 Calibration

Actual Measureme			ON	Approx. Measur	rement	0
Pixel Distance	0			Focal Length	0	(* .mm)
Edge Threshold A	40			Working Oktance	0	μm
Edge Threshold 8	40					
Actual Distance	0	um				
				1 Pixel = 0 µm	- C	Ø OK

Calibration has two method of 'actual measurement' and 'approximate measurement'. Since those methods cannot be set at the same time, you have to select one method of them.

Claibration calulates μm per 1 pixel to register.

Since the vision sensor measures distance in unit of pixel, use calibration function for calculating in unit of μ m.



(1) Actual measurement

- Pixel Distance: It displays distance between edge A and edge B in pixel.
- Edge Threshold A/B: It is for setting edge threshold to detect edge. With the higher edge threshold value, edge of high contrast is detected, and with the lower edge threshold value, edge of low contrast can be also detected.
- Actual Distance: It is for entering actual distance between two edges in unit of μm.

After setting the edge threshold value and entering the actual distance, click 'OK' ($____$) in the right bottom corner to register values after calculating distance per 1 pixel into unit of μ m based on the set values in 'Actual Measurement' tab.

Actual Measurem	ant		01	Approx. Measur	rement		OFF
Poxel Distance	233			Focal Length			ITHES
Edge Threshold A	40	0		Working Distance	0		шm
Edge Threshold B	40	0					
Actual Distance	39670	μm					
			r	1 Pixel = 170 µm		00	160

(2) Approximate measurement

Approx. Measur	ement	ON
Focal Length	8 🔹	mm
Working Distance	0	μm

- Focal Length: It is for selecting effective focal length of the connected device (vision sensor).
- Working Distance: It is for entering distance between sensing target and the vision sensor.

After selecting focal length and entering the working distance, click 'OK' ($____$) in the right bottom corner to register values after calculating distance per 1 pixel into unit of μ m based on the working distance and FOV by effective focal length.

Actual Measureme			OFF	Approx. Measur	ement		ON
Posi Unizoce	0			Focal Length	8	•	mm
Edge Threehold A	40			Working Distance	650000		μm
Edge Threatopt II	40						
Attual Detanos	0	1m					
				1 Pixel = 388 µm		01	OK.

6.6.3 Input

(7	
_)		

Input.	Input Maile	Active Level
Tippir	Cartera Tripper	• JUlingh -
Inpital	Work Group Change - Clock	• [] 21. High •
Input 1	Work Group Drange - Data	• J1. High •
Input 2	Entenier - Quadrature A	+≣Uitaw •
Input 3	Encoder - Qualitature B	• 11 Low •

(1) Input mode

- Trigger input (TRIG): The selected trigger mode which set in the camera menu is the image taking signal.
- Work group change (IN0 to IN3)

- Serial input (IN0, IN1): Input 0 and input 1 are set to work group change – Clock or work group change – Data, and work group is changed according to the serial input.

- Parallel input (IN0 to IN3): From input 0 to input 3 are set to each of work group change bit 0 to 3, and work group is changed according to the parallel input.

• Encoder input (IN2, IN3): After input of trigger signal, the vision sensor takes image after waiting for a while according to the number of encoder pulse. The types of encoder input consist of Up counter/Down counter, and Quadrature. Encoder input is used for the trigger delay mode. Maximum 100kHz input can be recognized.

(2) Active level

According to the active level, trigger is applied at High or Low. To avoid chattering of trigger signal, the vision sensor starts taking an image when the signal is maintained for 1ms.

6.6.3.1 Input mode

Input	Signal	Function	
0	IN0	Work group change Bit 0	Work group change - Clock
1	IN1	Work group change Bit 1	Work group change - Data
2	IN2	Work group change Bit 2	Encoder - Up counter - Quadrature A
3	IN3	Work group change Bit 3	Encoder - Down counter - Quadrature B

(1) Work group change – parallel input (IN0 to IN3)

Input.	Trput Male	Active Level			
Trookr	Carters Trigger	+ ∥_JL Hgh			
inget if	Work Group Change Bt 8	* []_], Hoh			
Input 1	Work Group Change Bt. 1	• 31. High			
Input 2	Work Group Change BR 2	+∃U Low			
Input 3	Work Group Change Bit 3	• 17 Low			

According to the parallel input, work group is changed. With parallel input, work group from 1 to 16 can be changed to. (Following table is based on the High active level.)

Input Work group	Bit 3 (IN3)	Bit 2(IN2)	Bit 1(IN1)	Bit 0(IN0)
Work group 1	Low	Low	Low	Low
Work group 2	Low	Low	Low	High
Work group 3	Low	Low	High	Low
Work group 4	Low	Low	High	High
Work group 5	Low	High	Low	Low
Work group 6	Low	High	Low	High
Work group 7	Low	High	High	Low
Work group 8	Low	High	High	High
Work group 16	High	High	High	High

(2) Work group change – serial input (IN0, IN1)

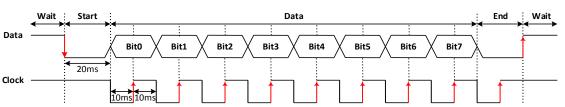
Input.	Trput Male	Active Level
Trookt	Carters Trigger	• JL High
inplicit in	Work Graug Change - Dock	• 1/1 Hph
Input 1	Work Group Change - Data	• JL Han
Input 2	Coudie	+≣U Law •
Input 3	Ceutie	• 11 Low

According to the serial input, work group is changed.

Although data is 8-bit, 5 less significant bits are used, because the maximum number of work group is 32.

Input	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
Work group						DIU		
Work group 1	0	0	0	0	0	0	0	0
Work group 2	1	0	0	0	0	0	0	0
Work group 3	0	1	0	0	0	0	0	0
Work group 4	1	1	0	0	0	0	0	0
Work group 5	0	0	1	0	0	0	0	0
Work group 32	1	1	1	1	1	0	0	0
Mait Chart i			D				· Fad	·

With serial input, work group from 1 to 32 can be changed to.



- Start bit: Start bit holds the data signal at Low (Falling edge) for 20ms.

- Clock bit: Clock bit is pulse of 20ms interval which acquires data at the Rising edge.

- Data bit: Data bit is synchronized with Falling edge of the clock signal and holds Low or High for 20ms.

- End bit: After 8th data, end bit holds the data signal for 20ms.

Ex.

When changing work group of the vision sensor to work group 6 with the serial input signal, input the data signal as follows.

Data								
Input Work group	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
Work group 6	1	0	1	0	0	0	0	0

(3) Encoder input

You can use encoder input when you want to use the trigger delay mode of external trigger input on encoder pulse.

Camera trigger occurs after calculating moving distance according to the number of input pulse.

revit.		E. tare C	singes.
Input.	Trput Nole	Active Leve	
Tiqoir	Carters Tripper	 J'L High	
- Input if	Deathe	 UL High	
Input 1	Osabiw	 JL High	
Input 2	Entanier - Up countrel	 U Lew	
Input 3	Excedier - Down countier	17 Idw	

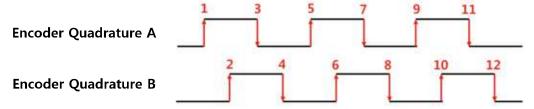
Input 2 and input 3 are used as each of encoder input up counter and down counter. The number of pulse is counted up or down according to the active level. If you use only one encoder input, connect unusing input terminal to COMMON. Rising edge is counted in the high active level, and falling edge is counted in the low active level.

Encoder Up Count	າບູ່ບູ່ບູ່ບູ່					_
		4	3	2	1	
Encoder Down Count						_

• Quadrature A/Quadrature B (IN2, IN3)

Input.	Trput Made	Active Level
Tropier	Carters Trigger	• JL High
- Input if	Deathe	• [2], High •
Input 1	Osabie	• 31 Hgh •
Input 2	Encoder - Quadrature A]+≣Uiaw •
Input 3	Encoder - Qualitature B	• 11 Law •

Input 2 and input 3 are operated in encoder Quadrature. Both rising edge and falling edge of two encoders are counted.



6.6.4 **Output**



Output		Custput Mosle		Control	Output		Pube To	ipe .	Durater(ms)	Delay Tros.		Delay Teres(rm)
2010/01/02	Unable	1992 1992 1997 1997 1997 1997 1997 1997	10711		JL N.D.		UNIT		DI.	APper Domestion		1
Gutout 1	Inseption Result		34794		JL N.O.		Pale		10	After Trigger L	•	17
Chirtpirt 2	Inspection Completa		1075		JL N.D.		Pulse		10	After Inspection.	•	0
Contract of a	Alam	 FTP File Transmission Einst 	10714		JL 8.0.	+	Lature			After Denietter-		

(1) Output mode

Output	Mode
Disable	*
Disable	
Inspection Complete Inspection Result External Light Trigger Alarm	
Camera Busy	

- Inspection Complete: Regardless of the inspection result, the vision sensor outputs output signal at the moment of inspection completion.
- Inspection Result: According to the settings of Output Inspection Result Selection, the vision sensor outputs output signal. Please refer to '6.6.5 Work Group'.

Output 0 Inspection Result (All Pass)		[]	[]	
Output 1 Inspection Result (One or more failure)]		
Output 2 Inspection Complete						

• External light trigger: When connected with the external light, power of the external light is turned ON/OFF with output signal from the vision sensor which is synchronized with camera trigger input.

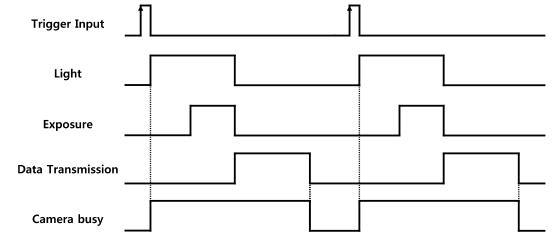
External Triger Input	
	→ ← Chattering < 1ms
External Light Trigger	Trigger Delay
External Light myger	
	Exposure
	 ←→
Exposure	
1	

• Alarm: In occurrence of vision sensor error, the vision sensor outputs output signal.

Almenn		
Disable		Trigger Input Error
Disable		Calculation Time Exceeded Work Group Change Error
Disable	[FTP File Transmission Error
		OK Cossil

Alarm output	Description
Trigger input error	When trigger is input in high camera busy signal, the vision sensor outputs alarm.
Operating time exceeded	When operating time of work group is exceeded set inspection time, the vision sensor outputs alarm.
Work group change error	When unregistered work group number is entered or wrong Clock or Data is input in serial or parallel input, the vision sensor output alarm.
FTP file transmission error	When FTP access error or FTP transmission error in saving inspection result occurs, the vision sensor outputs alarm.

• Camera busy: It is operating status of the camera, after camera trigger input.



(2) Control output

NPN	+	JL N.O.	
NPN		JL N.O.	
PNP		1.5 N.C.	
NPN		3-2-14:02	_

You can set control output to NPN/PNP and N.O.(Normally open) / N.C(Normally close).

(3) Pulse type

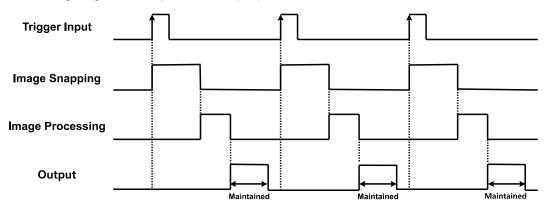
You can select pulse type for output. You can select pulse type only when the output mode is set to 'Inspection complete', 'Inspection result', or 'Alarm'.

- Pulse: Output signal is output during set output duration.
- Latch: Output signal is kept outputting before next output signal.

(4) Duration

Duration is the time period of maintaining inspection result output signal for. You can set duration by setting output mode to "Inspection result" and pulse type to "Pulse". Setting range is from 1 to 60,000ms.

• Timing diagram of output duration (ms).



(5) Delay type

Delay type is the moment of applying output delay time to. You can set whether to delay output after inspection completed or to delay output after trigger input.

• Delay output after inspection completed

Trigger input	→ ← Chattering < 1ms
Image snapping	
Image processing	
Output	Delay after inspection completed(ms)
 Delay output 	after trigger input
Trigger Input	Chattering < 1ms
Image Snapping	
Image Processing	
Output	Delay after trigger input (ms) Maintained (ms)

(6) Delay time

Delay time is the time period of delaying inspection result output for, after starting of output delay operation.

- Setting range when delay type is "After inspection completed": 0 to 60,000ms
- Setting range when delay type is "After trigger input": 17 to 60,000ms

6.6.5 Work Group



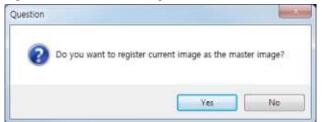
110	ALL D				E Output I Impection	Healt		Lógic Comb	ination
Mat	nistaer.	Work	And.	O Mil	 Logic Output 			Logic Option	Result
	1	(Alastrant I	Ö till t		 基 (ND) 			t not	- O Fast
-	1	Brightmass 1	Q 7111	d sa	+ 1 08				Pase
	3	Central 1	O 746	10.27	E Brightre				O Pain
		Area 1	O Para	Coliette	O Contrast	1		+	O Patt
	5	Edge 1	0 7211		- & AND				Pass Pass
	6	Length 1	O Paul	Dalete AL	Sat Lanoth	é.			O Pala
	7	Angle 1	O Patt			•			
	8	Dameter 1	Q 7416						
	8	Object Counting 1	Q 744 -	🛋 Chunge Master Image	Dutputil	Birpitt	E Output2		Church C

(1) Work list

	Number	Work		Result		O Add
		Algoment-1	0	Pass		
	2	Brightness 1	0	Pass		A Edit
T	3	Contrast 1	0	Pass		
	4	Area 1	0	Pass		🗢 Delete
	5	Edge 1	0	Pass		
	6	Length 1	0	Pass		Delete All
	7	Angle 1	0	Pass	0	
	8	Diameter 1	0	Pass		
	9	Object Counting 1	0	Pass	-	A Change Master Image

Work list displays a list of the currently registered works and you can register work to inspect and edit or delete the registered works in Work list.

• Add: You can register work to inspect. Select inspection type and register. When making new work group and adding work, an image in the image window is registered ads master image.



Please refer to '6.7 Inspection ' for inspection item setting.

Alignment Presence Measurement Color	Alignment Presence Measurement Color
Algement - calibrates position and rotation of the registered object.	Bightness - checks the mean brightness of the object. Contrast - checks the contrast of the object. Ares - checks the area of the object. Edge - checks the presence of the edge. Shape comparison - inspects the shape of the object.
Alignment Presence Measurement Color	Alignment Presence Measurement Color
Largth - measures the length between the two edges. Angle - measures the angle between the two edges. Dameter - measures dameter of the circle object. Object counting- counts the number of objects.	Color identification - checks the average color of the object. Area of color - checks the area of color. Color counts the number of objects of color.

- Edit: Select the registered work in the list and click Edit to edit the work.
- Delete / Delete All: Select the registered work in the list and delete a work or delete all works.

Change master image: You can change image template of the work to register. The currently displayed image in the image window is registered as master image.



You can copy and paste registered works in the work list by using Ctrl+C and Ctrl+V.

It is except for Alignment 1 work.

1st Select a work to copy, and press Ctrl+C key to copy.

Number	Work	Result	O Add
1	Alignment 1	O Pass	O VOD
2	Brightmese-1	O Pass	Edit
3	Area 1	O Pass	Fields
4	Angle 1	O Pass	C Delete
5	Length 1	O Pass	
			🗍 Delete All
			Change Master Image
	o you want to copy the work?	(Englithess 1)	
	5. (S.		
	c is copied.		
ne work	c is copied.		0 644
ne work	c is copied.	Cancel	⊘ Add
ne work Work Lat Number	c is copied.	Cancel	O Add ∕∕ Edr.
ne work Work Lat Number 1	vis copied. Work Algoment 1	Cancel Result Pass	
Number	vis copied. Work Algnment 1 Brightness 1	Result Pass Pass Pass	
Number 1 2 3	Vork Algnment 1 Brightness 1 Area 1	Result Pass Pass Pass Pass Pass	Edit Delete
e work Work List Number 1 2 3 4	OK- Vork Algnment 1 Brightness 1 Area 1 Angle 1	Result Pass Pass Pass Pass Pass Pass	Edn
The work Work Lat Number 1 2 3 4 5	OK K is copied. Work Algnment 1 Brightness 1 Area 1 Area 1 Angle 1 Length 1	Result Pass Pass Pass Pass Pass Pass Pass Pas	Edit Delete

4th Select the copy of the work and click 'Edit' to change specific settings of the work.

(2) Output inspection result selection

" Output 0 Inspection Re	suit		Disable		
			noitaD sigo.	a sub	
- & AND - I OR Bightness I Contrast I - & AND Area 1			Disable All Pass One or More Failure Alignment Logic Combination		
Congth 1	1000			Q Past	
Output0	Output1	Output2		Output3	

Set output mode in output menu to "inspection result" and set outputting condition among followings.

- Disable
- All pass: When all of inspection results are passed, the vision sensor outputs output signal.
- One or more failure: When one or more inspection result is failed to pass, the vision sensor outputs output signal.
- Alignment: When inspection items with alignment are passed, the vision sensor outputs output signal.
- Logic combination: You can set output conditions by setting each logic combination to pass or fail with logical operator.

Note

When setting output with logic combination, set output condition using logical operator for each output.

b Output 0 Inspection Result			Logic Comb	pination	•
Logic Output			Logic Option	Result	
- & AND			! NOT	🔹 🔘 Pass	
~ [] OR			(B)	Pass	
🔆 Brightness 1			27	O Pass	
Contrast 1 K AND				Pass Pass	-
Area 1			-	Pass	
Edge 1			14	Pass	
Output0	out1	Output2		Dutput3	
	-		-		
OR	AND				
Invert None	Invert None	E.			
Invert All	Invert All				
Delete All	Delete All		& AND		
Add Logical Operator +	Add Logica	Operator	I OR		
Add Work	Add Work	12			
			Alignm		Delete Work
			* Brightn	C () () () () () () () () () (
			Contras	#1	
			👌 Area 1		
			💠 Edge 1		
			📼 Length		
			4 Angle 1		
			😔 Diamet		
			🔏 Object	Counting 1	

- AND/OR: You can select logic operator.
- Invert none: You can set logical option of all work to NONE(-).
- Invert all: You can set logical option of all work to NOT.
- Delete all/Delete logical operator: You can delete all registered settings of with Delete all and registered logic operator with Delete logical operator.
- Add logical operator: You can add logical operator (AND/OR).
- Add work/Delete work: You can add registered work to logical output or delete work from logical output.

6.6.6 Inspection

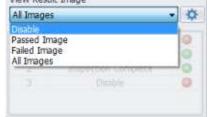
\odot										
in Dexte		8	Dupect	tun Statue					Sever S	costs.
A 200	terration of the		Namber	Work Name	Result value	fien/t	PartyFall	Operating Time(ms)	- Input Tripper	0.9%
Start Device Imped	sen.		1	Algement 1	91 [X:387 Y:250 K-0.1]	0	352/8(97.7%)	589.25	Pate	368
2 000000000000										
			2	Brightmass 1	155	0	331/29(91.9%)	0.30	Fail	3274
Very Result Traps			2 3		155 68	0	331/29(91.9%) 344/18(95.5%)	0.30 1.03	Fuil - Work	8.9% 385 3274 57.2%
	• •		2 3 4	Brightmass 1		0				57.29
Very Result Traps	• •		2 3 4 5	Brightmas 1 Contrast 3	68	0	344/18(95.5%)	1.03	- Work	57.29
View Result Image Ad Images	0		2 3 4 5 5	Boghtress 1 Contrast 1 Area 3	68 2058	0	344/18(95.5%) 345/15(95.8%)	1.03	- Work Al Pass	57.29
View Result Trups Al Images	0.0		2 3 4 5 8 7	Boghtness 1 Cantrast 1 Area 1 Edge 1	68 3058 0 (Detance:3) 394	0000	344/18(95.3%) 345/15(95.8%) 296/64(87.7%)	1.03 0.36 9.00	- Work Al Pass One or Pare Falure	57.2% 306 194
View Result Broops Ad Droops	0		2 3 4 5 5 7 8 7 8	Brightness 1 Contrast 1 Area 1 Edge 1 Length 1	68 3058 0 [Detance:3]	0	344/18(35.3%) 345/15(05.8%) 296/64(07.7%) 231/29(91.9%)	1.03 0.36 9.80 20.45	- Work All Pass One of Hore Failure The Number of Works	57.2% 200 194

(1) Device

 Start/Stop device inspection: You can activate vision sensor in operation mode and start inspection in registered work group.

0	Start Device Inspection	0	Stop Device Inspection	
---	-------------------------	---	------------------------	--

View result image: You can set image to display in the image window during inspection.
 View Result Image



• Save result image: Click the 'Save result image' icon () on the right side in View result image. You can set the result image in local disk of the PC.

_	sult Image				
1 Save	e Result Image		ON .		
2 Image Format BMP					
3 Saved Path C:₩Use 4 Storage Space Setting 5 Storage Space Usage		C:₩Userst	JsersWAdministratorWDocumentsWAutonicsWVision MasterWImage*		
			100		
		The number of files : 0 0			
6 Drive	e Free Space		74755	MByte	
	Item		Description	× Cancel	
No.	Item Save result i	mage	Description Sets whether to save inspection result image.	10	
No.			Description		

No.	Item	Description			
	Storage space	Checks drive free anece and allocates areas to asive			
4	setting	Checks drive free space and allocates space to save.			
F	Storage space	Displays the number and volume of the files in starses areas			
5	usage	Displays the number and volume of the files in storage space.			
6	Drive free space	Displays drive free space of the PC.			

• Output status: Output status displays output status during inspection. You can check output mode and operation status of output.

1	Inspection Result	0
2	Inspection Complete	0
3	Disable	0

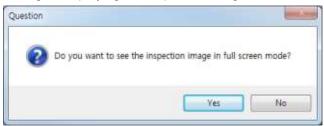


Please refer to followings when clicking Start device inspection to activate operation mode.

 Select operation mode: It is to set operation when starting inspection. You can select whether to save or not to save before starting inspection. When the device is turned off, you can lose unsaved data.



Setting of displaying the inspection image in full screen



402/183(68.7%)

(2) Inspection Status

Number:	Work Name	Result: Value	Result	Pau/Fail	Operating Time(ms)	- Input Trigger	2.3%
1	Algoment 1	82 [X:377 Y:250 R:0.2]	0	103/0(100.0%)	\$62.72 -	Pagi	103
2	Brightness 1	153	0	78/25(75.7%)	0.19	Fal	4352
з	Contrast 1	60	0	87/16(84.4%)	1.02	- Work	46.65
4	Area 1	5179		87/16(84.4%)	6.37	AS Pass	45
5	Edge 1	0 [Distance:8]	0	94/9(91.2%)	9.63	Ona or More Fallure	55
6	Length 1	0	•	89/14(86,4%)	8.82	The Number of Works	
7	Angle 1	100	0	100/3(97.0%)	23.00	Overal Inspection Time(ms)	728
8	Dameter 1	68 (Round:88)	0	100/3(97,0%)	86.24 *		
				617/110(88.1%)	694.26		

- Work name: Displays work name of inspection items.
- Result value: Displays measured result value of each work ROI.
- Result: Displays pass/fail for inspection result.
- Pass/Fail: Displays counting of the number of pass/fail and pass rate.
- Operation time: Displays operation time of each inspection item.
- Input trigger: Displays statistics of input trigger. It helps you to check input is operating in normal status by counting the number of pass/fail status of input trigger.
- Work: Displays statistics of work. It displays the number of inspection result of All pass, One or more failure, the number of total work, and inspection time.



When operating device inspection with calibration function, result value of the 'edge', 'length', and 'diameter' inspections are displayed as actual value in the unit of mm, not pixel.

•	Inspection result value without calibration function	
---	--	--

	Number	Work Name	Result Value	Result	Pass/Fall	Operating Time(ms)
•	1	Edge 1	86 [Distance:1]	0	157/41(79.2%)	11.95
	2	Length 1	198	0	166/32(83.8%)	19.27
	3	Diameter 1	261 [Round:86]	0	160/38(80.8%)	157.27
					483/111(81.3%)	
					483/111(81.3%)	-
าร	spectio	n result value with o	calibration function		483/111(81.3%)	-
	spectio Number	n result value with o Work Name	calibration function Result Value	Result	483/111(81.3%) Pass/Fail	- Operating Time(ms)
				Result		- Operating Time(ms) 11.77
		Work Name	Result Value	A CONTRACTOR	Pass/Fail	

189.32

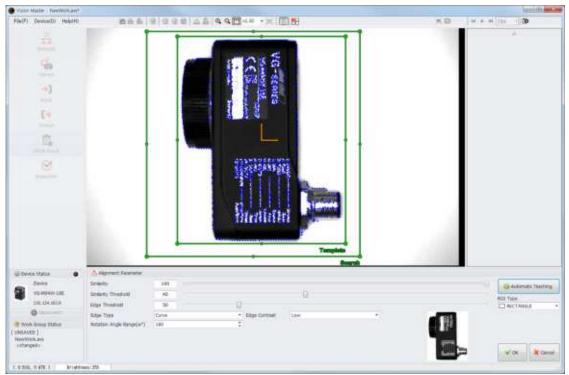
6.7 Inspection

lcon	Function	Description
<u></u>	Alignment	To align position and orientation of the target based on the registered target
-Ø-	Brightness	To inspect average brightness of the target
	Contrast	To inspect average contrast of the target
5	Area	To inspect area of the target
×	Shape comparison	To inpect shape of the target
 ↓	Edge	To inspect the presence of the edge
∻≕	Length	To inspect the length between two edges
No.	Angle	To inspect the angle between two edges
••	Diameter	To inspect diameter of the circle
00	Object counting	To count the number of the object
\$	Color identification	To inspect average color of the object
	Area of color	To inspect area in a certain color
() () ()	Object of color counting	To count the number of objects in a certain color

6.7.1 Alignment

You can use the alignment function to align position and orientation of the target based on the registered target.

Alignment compares features of the registered target and features of the input image to figure out location of similar pattern, and then inspects the input image based on location and rotation angle of the target. It is used to check the presence of inspection target to rotate, to inspect pattern, or to align position of the target.



No.	item	Description	
1	Similarity	It is the similarity between registered template and detected template.	
2	Similarity threshold ^{%1}	It is discrimination value of the similarity for deciding pass/fail.	
3	Edge threshold	It is threshold to detect edge. Only edges with high contrast can be detected in high edge threshold, while edges with low contrast also can be detected in low edge threshold.	
4	Edge type	It limits amount of information according to the edge direction. - Curve: It leads pixels from all edges. - Straight: It leads pixels only from straight edge.	
5	Edge contrast	 It limits amount of edge information according to the contrast value. High: It uses edges of high contrast. Medium: It uses edges of high and medium contrast. Low: It uses edges of high, medium, and low contrast. 	
6	Rotation angle range (±°)	It limits detecting area to the set angle range, by setting angle range of the rotated image to detect.	
7	Automatic teaching	It operates teaching automatically, when user changes parameter or adjust ROI.	
8	ROI type	After setting ROI (Template), set area (Search) to inspect ROI in it.	

No.	item	Description
		It sets type of ROI (Template) to inspect.
		RECTANGLE
		O POLYGON
		O CIRCLE (rectangle/polygon/circle)
9	OK/Cancel	It registers work to work group or cancel to register.

 $\ensuremath{\mathbb{X}}\xspace$ Threshold is the boundary value when a value is discontinuously changed.

 \times 1. When set template of ROI is 50% similar with the input image in 50 similarity threshold, the vision sensor regards them as the same target and outputs output signal.

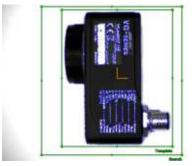




Examples of pass/fail in the alignment inspection

Registering template of inspection target (similarity: 100% / similarity threshold: 80%)

FAIL



Passed alignment inspection.



Failed alignment inspection.







🖉 Note

When inspecting inspection items including alignment, alignment is prior to any other inspection items, so that rotating inspection target by alignment also rotates position of other inspection items.

Information	
Alignment is registered as a firs	t work
C	ОК

If you want to apply alignment to each inspection, check 'Apply alignment' in the right bottom.

Apply Alignment		
V X	V Y	🗸 R

X: moving X axis coordinate / Y: moving Y axis coordinate / R: angle

Examples of pass/fail when inspecting multiple work including alignment

Registering template of the inspection target (registering alignment)



Applying alignment



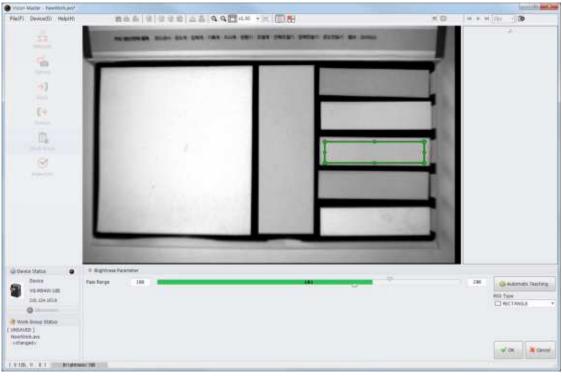
Unapplying alignment



6.7.2 Brightness

You can use the brightness function to inspect average brightness of the target.

Brightness compares mean brightness of the registered ROI and that of input image ROI. It sets pass range based on the mean brightness value of the registered ROI. The mean brightness value of the inspection target within the pass range is regarded as Pass, while the mean brightness value of the inspection target out of the pass range is regarded as Fail.

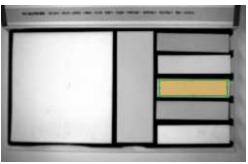


No.	Item	Description
		It sets the pass/fail range of brightness.
1	Pass range	186 IAI 🛆 🗸 1 196
		Lower limitROI meanUpper limitfor passbrightness valuefor pass
2	Automatic teaching	Even if user set the pass range, it teaches pass range based on mean brightness of ROI.
	ROI type	It sets type of ROI to inspect.
3		
		CONCENTRIC_CIRCLE (rectangle/polygon/circle/concentric circle)
4	OK/Cancel	It registers work to work group or cancel to register.

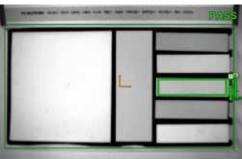


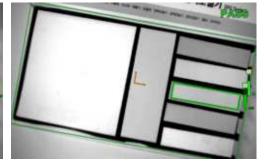
Examples of pass/fail in the brightness inspection

 Registering template of the inspection target (mean brightness: 181 / pass range: 166 to 196)

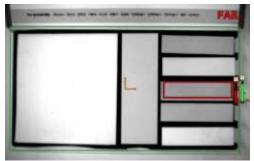


Passed brightness (alignment applied)

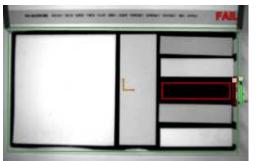




Failed brightness



(Reduced ROI area brightness)



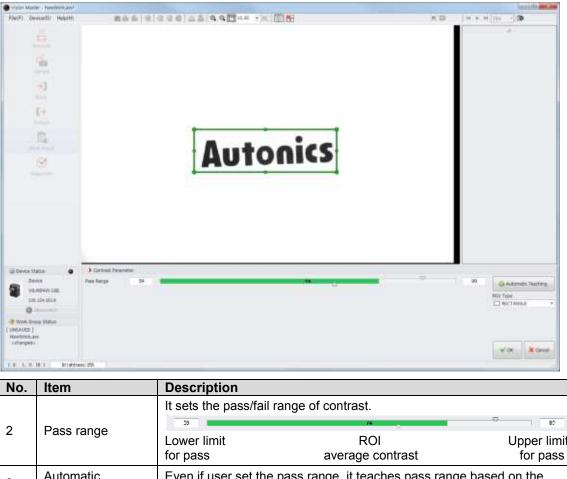
(Below mean brightness of ROI area)

6.7.3 **Contrast**

You can use contrast function to inspect average contrast of the target.

Contrast is amount of gap between bright part and dark part in the image.

Contrast compares registered ROI contrast and ROI contrast of the input image to figure out changes in contrast. It sets pass range based on the registered contrast value of ROI. The contrast value of the inspection target within the pass range is regarded as Pass, while the contrast value of the inspection target out of the pass range is regarded as Fail. The contrast value is displayed in the percentage.

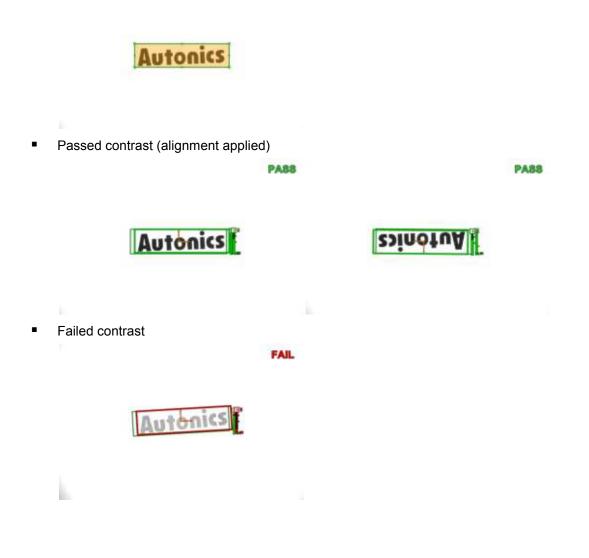


2 Pass range		39		87
2	Pass range	Lower limit for pass	ROI average contrast	Upper limit for pass
3	Automatic teaching	Even if user set the pass r average contrast value of	ange, it teaches pass range base ROI.	d on the
4	ROI type	It sets type of ROI to inspending RECTANGLE	ect.	
			(rectangle/polygon/circle)	
5	OK/Cancel	It registers work to work gi	roup or cancel to register.	



Examples of pass/fail in the contrast inspection

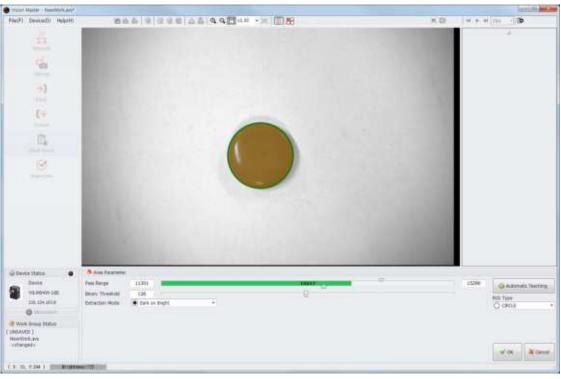
Registering template of the inspection target (contrast: 74 / pass range: 59 to 89)



6.7.4 **Area**

You can use the area function to inspect area of the target.

Area compares difference between registered ROI area and ROI area in the input image. It sets the pass range based on the registered ROI area. The area of the inspection target within the pass range is regarded as Pass, while the area of the inspection target without the pass range is regarded as Fail.



No.	Item	Description		
		It sets the	pass/fail range of area.	· 15/48
1	Pass range	Lower limit for pass	t Measured R area value	OI Upper limit
2	Binary threshold	It sets the threshold value to detect area. It is to process inspection with the binary coded threshold value. After converting each pixel of the image under the threshold value to 0 and each pixel of the image over the threshold value to 1, 0 passes the area inspection, while 1 fails to pass the area inspection.		
	Extraction mode	It sets met	hod of detecting area. Dark object on the bright	Bright object on the dark
2		Descrip tion	background Extracting darker area compared to the brightness standard	background Extracting brighter area compared to the brightness standard
3		Image		

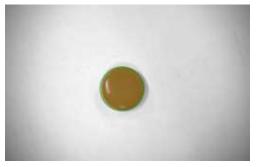
No.	Item	Description	
4	Automatic teaching	Even if user set the pass range, it teaches pass range based on the pixel of ROI.	
5	ROI type	It sets type of ROI to inspect. RECTANGLE POLYGON CIRCLE (rectangle/polygon/circle)	
6	OK/Cancel	It registers work to work group or cancel to register.	

 $\ensuremath{\mathbb{X}}\xspace$ Threshold is the boundary value when a value is discontinuously changed.

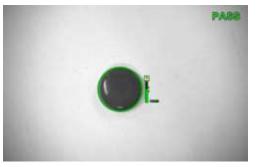


Examples of pass/fail in the area inspection

Registering template of the inspection target (area: 13229 / pass range: 11244 to 15213)



Passed area inspection



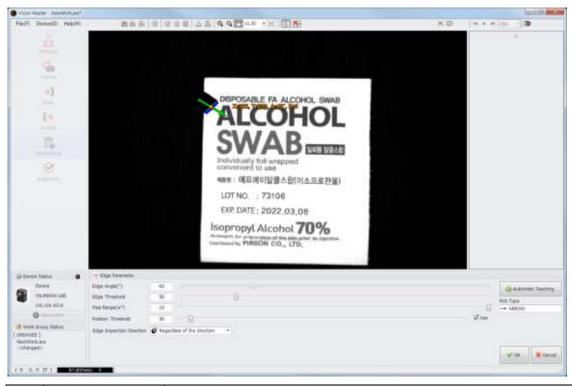
Failed area inspection



6.7.5 **Edge**

You can use the edge function to inspect the presence of the edge.

Edge compares directions of the registered edge and edges in the same area of the input image to detect the presence of the edge. It sets the pass range based on the direction of the registered edge. The edge of the inspection target in the pass range is regarded as Pass, while the edge of the inspection target out of the pass range is regarded as Fail.



No.	Item	Description		
1	Edge angle(°)	It is the measured angle value of edge grade.		
2	Edge threshold	It sets threshold to detect edge. Only edges with high contrast can be detected in high edge threshold, while edges with low contrast also can be detected in low edge threshold.		
3	Pass range(±°)	It sets the pass/fail range of edge. Setting range: ±0 to ±10°		
4	Position threshold	It is range of the distance between edge at ROI teaching and edge detected from inspection target. If the distance between edge at ROI teaching (0) and edge detected from inspection target is within the range of position threshold, it is processed as pass.		

No.	Item	Description			
		It sets method for inspecting edge. It searches edge along the direction of arrow in the ROI.			
		Item	Description	Image	
5	Edge Inspection Direction	Regardless of the direction	Detects firstly encountering edge in the ROI range.		
		Bright area → Dark area	Detects edge on the boundary line from bright area to dark area.		
		Dark area → Bright area	Detects edge on the boundary line from dark area to bright area.		
6	Automatic teaching	When user changes parameter or adjust ROI, it teaches automatically.			
7	ROI type	It sets type of ROI to inspect. (arrow) X, Y axes coordinate of the edge (A) and distance from the edge (D) are displayed.			
8	OK/Cancel	It registers work to work group or cancel to register.			

 $\$ Threshold is the boundary value when a value is discontinuously changed.

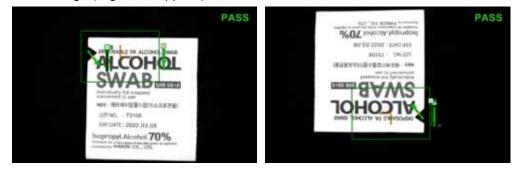
Ex.

Examples of pass/fail in the edge inspection

Registering template of the inspection target (edge angle: 42° / pass range: ±10°)



Passed edge (alignment applied)



Failed edge



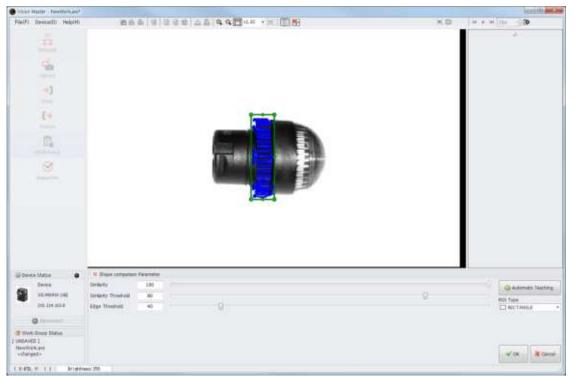
6.7.6 Shape comparison

You can use the shape comparison function to inspect the shape of the object.

Shape comparison compares features and patterns of the terget object in the ROI of the input image and that of the registered image.

It sets pass range based on the similarity of the ROI in the registered image and the ROI in the input image.

Similarity of the two images over the threshold is regarded as Pass, while similarity of the two images under the threshold is regarded as Fail.



No.	Item	Description	
1	Similarity	It is similarity of the registered template and the detected template.	
2	Similarity threshold ^{≋1}	It is similarity discrimination value for determining pass/fail.	
3	Edge threshold	It sets threshold to detect edge. Only edges with high contrast can be detected in high edge threshold, while edges with low contrast also can be detected in low edge threshold.	
4	Automatic teaching	Even if user set the pass range, it teaches pass range based on the pixel of ROI.	
5	ROI type	It sets type of ROI to inspect.	
6	OK/Cancel	It registers work to work group or cancel to register.	

%Threshold is the boundary value when a value is discontinuously changed.

*1. When set template of ROI is 50% similar with the input image in 50 similarity threshold, the vision sensor regards them as the same target and outputs output signal.



Ex.

Examples of pass/fail in the shape comparison inspection

Registering template of the inspection target (Similarity: 100% / Similarity threshold: 80%)



Passed shape comparison inspection (alignment applied)

PASS

FAIL



Failed shape comparison inspection



6.7.7 Length

You can use the length function to inspect the length between two edges. The length unit is pixel.

Base points of measuring length are two edges on each of two arrows. Length sets the pass range based on the length between two registered edges. The measured length of the inspection target within the pass range is regarded as Pass, while the measured length of the inspection target out of the pass range is regarded as Fail.

Marter Marter - NewWorkaws*			Levit.
Anna Anna Anna Anna Anna Anna Anna Anna	Langth Materiale Integra 244 pa Thrashad 4 50 pa Thrashad 4 50	-	404 Ron Tues Troum & Antonio
Normaliya Infangeli	_		v x x

No.	Item	Description		
		It sets the pass/fail range of length.		
1	Pass range	301	403	411
	1 doo range	Lower limit	Measured ROI	Upper limit
		for pass	length value	for pass
		It sets threshold to deter	ct edge.	
2	Edge threshold A/B	dge threshold A/B Only edges with high contrast can be detected in high edge threshold, while edges with low contrast also can be detected in low edge threshold.		
3	Automatic teaching	Even if user set the pass range, it teaches pass range based on the pixel of ROI.		
		It sets type of ROI to ins	pect.	
4	ROI type		gram scans the edge in the becomes standard for ins	
		DOUBLE_ARROW	(two arrows)	
5	OK/Cancel	It registers work to work group or cancel to register.		

%Threshold is the boundary value when a value is discontinuously changed.

Autonics

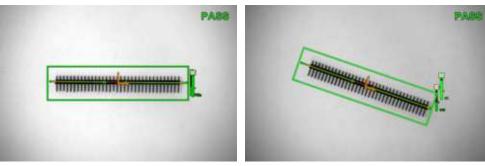


Examples of pass/fail in the length inspection

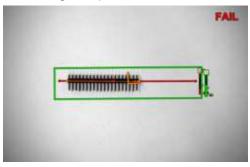
Registering template of the inspection target (Length: 386 / pass range: 376 to 396)



Passed length inspection (alignment applied)



Failed length inspection

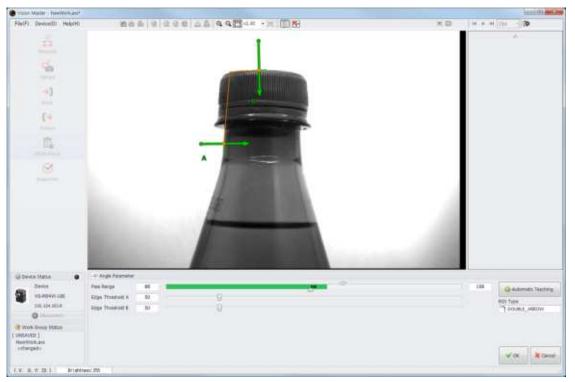


6.7.8 **Angle**

You can use the angle function to inspect the angle between two edges. The unit of angle is $^{\circ}$ (degree).

Angle measures angle of crossing point which is between two edges of registered arrows.

It sets the pass range based on the angle between two registered edges. The measured angle of the inspection target within the pass range is regarded as Pass, while the measured angle of the inspection target out of the pass range is regarded as Fail.



No.	Item	Description		
	Pass range	It sets the pass/fail range of angle.		
1		Lower limitMeasured ROIUpper limitfor passangle valuefor pass		
2	Edge threshold A/B	It sets threshold to detect edge. Only edges with high contrast can be detected in high edge threshold, while edges with low contrast also can be detected in low edge threshold.		
3	Automatic teaching	Even if user set the pass range, it teaches pass range based on the pixel of ROI.		
4	ROI type	It sets type of ROI to inspect. In the ROI area, the program scans the edge in the arrow direction and firstly detected edge becomes standard for inspection.		
5	OK/Cancel	It registers work to work group or cancel to register.		

XThreshold is the boundary value when a value is discontinuously changed.



Examples of pass/fail in the angle inspection

Registering template of the inspection target (angle: 98° / pass range: 88 to 108°)



Passed angle inspection



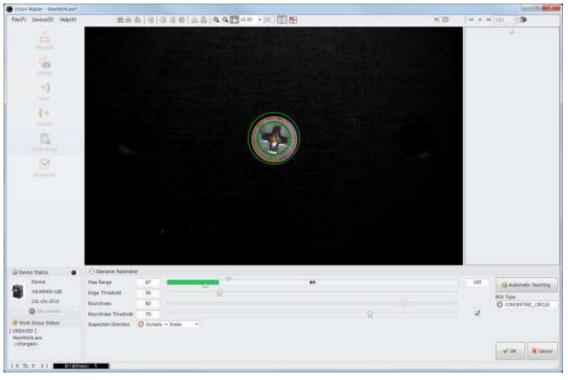
Failed angle inspection



6.7.9 Diameter

You can use the diameter function to inspect diameter of the circle. The unit of diameter is pixel.

Diameter detects circle in the registered area which is between two circles (minimum and maximum diameter of the circle). The detected diameter within the minimum/maximum area is regarded as Pass, while the detected diameter out of the minimum/maximum area is regarded as Fail.

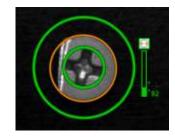


No.	ltem	Description		
1	Pass range	Description Maximum diameter range Minimum diameter range Detected circle It sets pass/fail range of circle.		
		Lower limit Measured ROI Upper limit		
		for pass diameter value for pass		
2	Edge threshold	It sets threshold to detect edge. Only edges with high contrast can be detected in high edge threshold, while edges with low contrast also can be detected in low edge threshold.		
3	Roundness	It is roundness of the detected circle.		
4	Roundness threshold ^{≋1}	It sets threshold to detect circle. It inspects diameter of the circle which of roundness is over the threshold. Checks whether to use roundness threshold or not.		

No.	Item	Descriptio	Description		
		It sets method to detect circle. When you setting ROI, two circles are made and area between two circles is the range to detect circle.			
		Item	Outside→Inside	Inside→Outside	
5	Inspection direction	Descripti on	Scanning the pass area from outside to inside. Detecting outermost circle in multiple circles.	Scanning the pass area from inside to outside. Detecting innermost circle in multiple circles.	
		Image	Detected circle	Detected circle	
6	Automatic teaching	When user changes parameter or adjust ROI, it teaches automatically.			
7	ROI type	It sets type of ROI to inspect.			
8	OK/Cancel	It registers work to work group or cancel to register.			

%Threshold is the boundary value when a value is discontinuously changed.

%1. When roundness threshold is set to 50, an object with 50% of circle shape is regarded as circle.





Examples of pass/fail in the diameter inspection

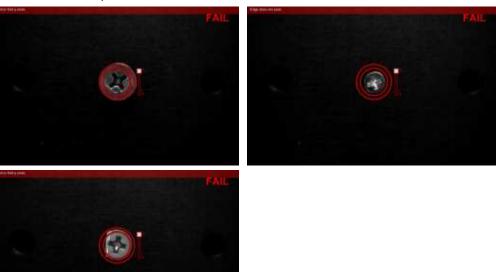
Registering template of the inspection target (diameter: 92, / pass range: 75 to 111)



Passed diameter inspection



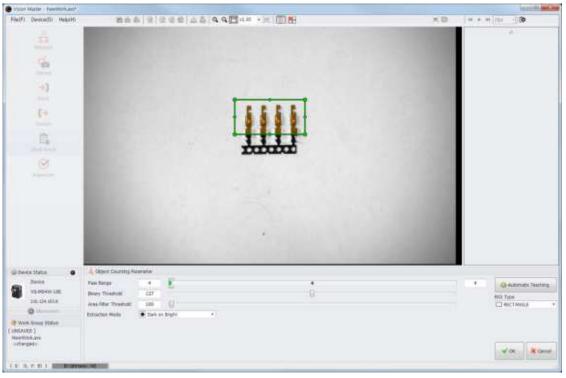
Failed diameter inspection



6.7.10 **Object counting**

You can use the object counting function to count the number of object.

Object counting counts the number of object in the registered ROI. It regards object with the certain amount of pixel as an object, and compares the number of detected object. The number of detected object within the pass range is regarded as Pass, while the number of detected object out of the pass range is regarded as Fail.



No.	ltem	Description		
		It sets the pass/fail range of object counting.		
1	Pass range	۷ ک	4	4
1	Pass range	Lower limit for pass	The measured number of ROI object	Upper limit for pass
2	Binary threshold	It sets the threshold value to detect area. Binary threshold means processing inspection with the binary coded threshold value. After converting each pixel of the image under the threshold value to 0 and each pixel of the image over the threshold value to 1, 0 passes the area inspection, while 1 fails to pass the area inspection.		
3	Area filter threshold	It sets the standard value for regarding as an area. Area filter threshold regards a group of objects with the number of pixels over the binary threshold as an area.		

No.	Item	Description		
		It sets method of detecting area.		
		Item Dark object on the bright background Bright object on the dark background		
4	Extraction mode	Descrip tionExtracting darker area compared to the brightness standardExtracting brighter area compared to the brightness standard		
4	Extraction mode	Image		
5	Automatic teaching	When user changes parameter or adjust ROI, it teaches automatically.		
6	ROI type	It sets type of ROI to inspect. RECTANGLE POLYGON CIRCLE (rectangle/polygon/circle)		
7	OK/Cancel	It registers work to work group or cancel to register.		

XThreshold is the boundary value when a value is discontinuously changed.

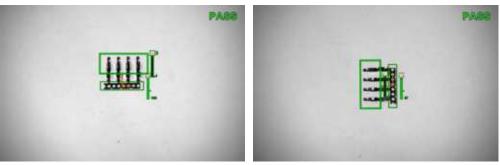


Examples of pass/fail in the object counting inspection

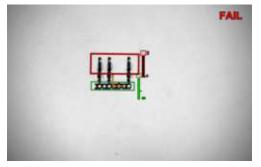
Registering template of the inspection target (the number of object: 4 / pass range: 4)



Passed object counting (alignment applied)



Failed object counting



6.7.11 Color identification

You can use the color identification function to inspect object by its color.

Color indentification compares ROI average color of registered by user and that of the input image.

Based on the average color value of registered ROI, extracted color from the input image within the color value deviation is regarded as Pass, while extracted color from the input image out of the color value deviation is regarded as Fail.



No.	Item	Description		
1	Color deviation	It is color deviation value in ROI.		
2	Color deviation mode ^{x1}	It sets mode to measure color deviation. Color deviation mode is calculating method of pass range for the input image based on the registered ROI average color value. Depending on the color deviation mode, specific setting is different.		
		Euclidean distance deviation Manhattan distance deviation		
3	Color deviation mode - specific setting	Color deviation threshold:Red/Green/Blue:It sets pass range based on the ROI average color.It sets pass range by applying deviation value to each of red, green, blue color.		
4	ROI average color	It displays average color of ROI in a data value, depends on the set color system (color area) mode. RGB (RGB/CIElab/HSV) Item Description RGB R (Red) / G (Green) / B (Blue) L: contrast (+white ↔ -black) CIELab L: contrast (+white ↔ -black) a: Saturation (+red ↔ -green) b: Saturation (+red ↔ -black)		
		CIELab a: Saturation (+red ↔ -green) b: Saturation (+yellow ↔ -blue)		

No.	Item	Description		
		HSV	H (Hue) / S (Saturation) / V (Value, contrast)	
		CIELab and HSV are processed in RGB data.		
5	Automatic teaching	It teaches color automatically, based on the ROI registered by user. Based on color deviation which is set to "0" automatically, vision master inspects color of the input image.		
		It sets type of ROI to inspect.		
6	ROI type	RECTAI	NGLE	
0		D POLYG		
			(rectangle/polygon/circle)	
7	OK/Cancel	It registers work to work group or cancel to register.		

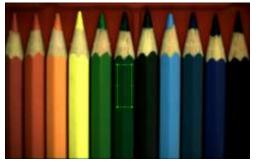
*Threshold is the boundary value when a value is discontinuously changed.

- Euclidean distance deviation Manhattan distance deviation Green Green Blue Blue Red Red A: Average color value of ROI A: Average color value of ROI r: Pass range for red a: Color deviation threshold g: Pass range for green Color within the deviation range which is from b: Pass range for blue "A" to "a" is regarded as Pass. Color within the deviation range from "A" to setting value of each color is regarded as Pass.
- %1: Color Deviation Mode

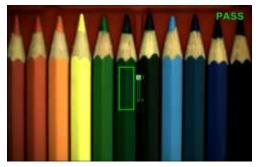


Examples of pass/fail in the color identification inspection

Registering template of the inspection target



Passed color identification



Failed color identification



6.7.12 Area of color

You can use the area of color function to inspect area of a certain color. Area means the number of pixels in a certain color.

Area of color measures area of a certain color (the number of pixel) in the ROI area of the input image.

Detected area of the color (the number of pixel) from the input image within the pass range is regarded as Pass, while detected area of the color (the number of pixel) from the input image out of the pass range is regarded as Fail.

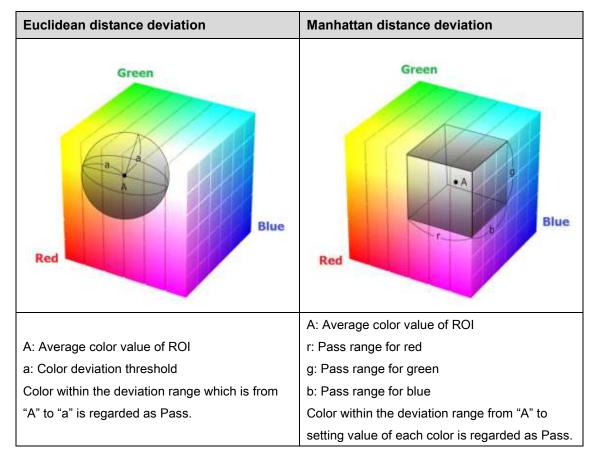
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Work String Status			
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the of colorant		1+ 2	
			Vox Xome

No.	Item	Description	on			
1	Pass range	the ROI an	ea (World	ng).	ting the teaching cold	2358
		Lower limit for pass	[Measure area of col		Upper limit for pass
2	Color deviation mode ^{≍1}	It sets mode to measure color deviation. Color deviation mode is calculating method of pass range for the image based on the registered ROI average color value. Depending on the color deviation mode, specific setting is different				-
		Euclidean distance deviation		riation	Manhattan distance deviation	
3	Color deviation mode - specific setting	It sets pass	Color deviation threshold: It sets pass range based on the ROI average color.		Red/Green/Blue: It sets pass range to deviation value to e green, blue color.	
4	ROI average color	It displays average color of ROI in a data value, depends on the set color system (color area) mode. RGB CIELab HSV (RGB/CIElab/HSV)			s on the set	
		Item	Description	า		

No.	Item	Description	on
		RGB	R (Red) / G (Green) / B (Blue)
			L: contrast (+white ↔ -black)
		CIELab a: Saturation (+red ↔ -green)	
			b: Saturation (+yellow ↔ -blue)
		HSV	H (Hue) / S (Saturation) / V (Value, contrast)
		CIELab an	d HSV are processed in RGB data.
5	Automatic teaching	Based on o	color automatically, based on the ROI registered by user. color deviation which is set to "0" automatically, vision master blor of the input image.
6	ROI type	It sets type	ON
7	OK/Cancel	It registers	work to work group or cancel to register.

XThreshold is the boundary value when a value is discontinuously changed.

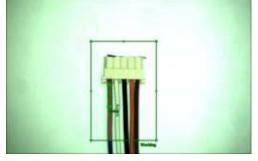
%1: Color Deviation Mode



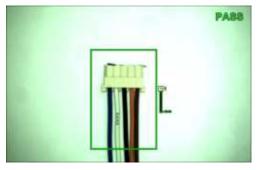


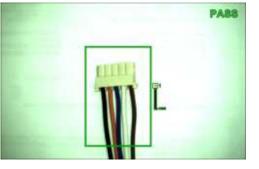
Examples of pass/fail in the area of color inspection

 Registering template of the inspection target (area of color: 1948 / pass range: 1655 to 2240)

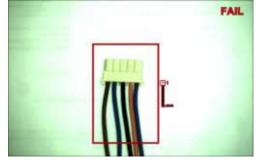


Passed area of color





Failed area of color



6.7.13 Object of color counting

You can use the object of color counting function to count the number of object in a certain color. Area means the number of pixels in a certain color.

User designates color to inspect from the target, and registers area to be inspected. Object of color counting inspects the number of object in a certain color in the registered ROI. It regards object with the certain amount of pixel as an object, and compares the number of detected object. The number of detected object within the pass range is regarded as Pass, while the number of detected object out of the pass range is regarded as Fail.

File(F) Device(0) Help(H)	8844 (2) 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	KD	10 -10
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No.	Item	Description			
1	Pass range	It sets the pass/fail range the ROI area (Workda 10 Y Lower limit T for pass	1 0).	ed number of	r (Color) in 19 Upper limit for pass
2	Color deviation mode ^{*1}	It sets mode to measure color deviation. Color deviation mode is calculating method of pass range for the input image based on the registered ROI average color value. Depending on the color deviation mode, specific setting is different.			
3	Color deviation mode - specific setting	Euclidean distance deviation Color deviation threshold: It sets pass range based on the ROI average color.		Manhattan distance Red/Green/Blue: It sets pass range by deviation value to ea green, blue color.	v applying
4	ROI average color	It displays average color color system (color area RGB CIELab HSV			on the set

No.	Item	Description	on	
		Item	Description	
		RGB	R (Red) / G (Green) / B (Blue)	
		L: contrast (+white ↔ -black)		
		CIELab	a: Saturation (+red ↔ -green)	
			b: Saturation (+yellow ↔ -blue)	
		HSV	H (Hue) / S (Saturation) / V (Value, contrast)	
		CIELab an	d HSV are processed in RGB data.	
5	Automatic teaching	Based on o	color automatically, based on the ROI registered by user. color deviation which is set to "0" automatically, vision master olor of the input image.	
6	ROI type	It sets type	ON	
7	OK/Cancel	It registers	work to work group or cancel to register.	

%Threshold is the boundary value when a value is discontinuously changed.

%1: Color Deviation Mode

Euclidean distance deviation	Manhattan distance deviation
Green Blue	Green Contraction of the second seco
	A: Average color value of ROI
A: Average color value of ROI	r: Pass range for red
a: Color deviation threshold	g: Pass range for green
Color within the deviation range which is from	b: Pass range for blue
"A" to "a" is regarded as Pass.	Color within the deviation range from "A" to
	setting value of each color is regarded as Pass.



Examples of pass/fail in the object of color counting inspection

 Registering template of the inspection target (the number of object: 10 / pass range: 10



Passed object of color counting



Failed object of color counting



7 Settings

		se select simulator or device to o		0
1	Device	IP Address	MAC Address	Connectable staus
	Simulators			
	M VG-M04			
L	👗 VG-C04			
	Devices			
	1 VG-C04W-8E	210.124.103.246	58:E8:08:00:19:C6	•
	10 VG-004W-8E	210.124.103.194	58:E8:08:00:37:36	•
	1 VG-M04W-16E	210.124.103.8	58:E8:08:00:26:D1	
8	1 VG-C04W-8E	210.124.103.7	58:E8:08:00:25:ED	0

No.	Items	Description
		Without vision sensor, you can register work group using an image saved in the PC for inspection test.
1	Simulator	Service Status VG-M04 Work Group
		Connect Of Inspection
2	Device (Vision sensor)	A list of connected vision sensors is displayed. You can select the vision sensor to use from the list of connected vision sensor. After registering work group and setting parameters, you can start inspection.

7.1 Simulator

1st After installing Vision Master, select the simulator, 'VG-04', in the Select device window. Or, you can check work group and inspection with the simulator.

P /Ca	se select simulator or device to c		
Device	IP Address	MAC Address	Connectable stau
🔒 Simulators			
WG-M04			
VG-M04:Beverage			
1 VG-M04:Bolt			
VG-M04:Cap			
品 VG-C04			
A Devices			
1 VG-C04W-8E	210.124.103.246	58:E8:08:00:19:C6	•
1 VG-C04W-8E	210.124.103.194	58:E8:08:00:37:36	0
1 VG-M04W-16E	210.124.103.8	58:E8:08:00:26:D1	
1 VG-C04W-BE	210.124.103.7	58:E8:08:00:25:ED	
	-		

2nd Click 'Open image(O)' or 'Open all images from folder(F)' from the File(F) in the menu to load an image to inspect. You can see the loaded image in the image window and preview window in the right side of the screen.

Open Image() Open All Imag)) ies from Folder(F			-		
Save Image(S	PODUPUD DUPUS PUBLICATION	<u> </u>				
Work Group M	anager(M)					
New Work Gro Load Work Gro Save Work Gro	oup from PC(W)					
Exit(X)						
	e. S					1
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Vork group		2001A 6000	-			

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3rd When adding work in the 'work group' setting, click [OK] button in the following pop-up message to register master image. For more details, refer to '6.6.5 Work Group'.



4th Set inspection items. For more details, refer to '6.7 Inspection'.

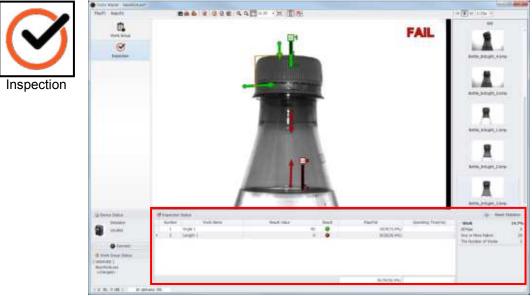






5th Click 'Play' icon (**)** on the top right side.

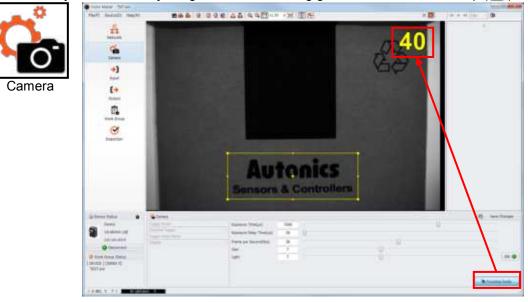
You can see inspection status in the 'Inspection' setting window by playing the images of the preview window.



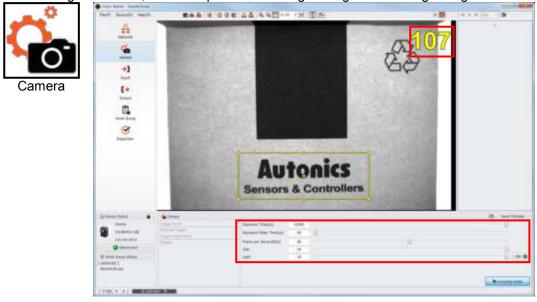
- 6th You can save work group registered with the simulator in the PC.
 - File(F) Help(H) Open Image(0) ä Open All Images from Folder(F) 2 Save Image(S) Work Group Manager(M) 1 6 New Work Group(N) -Load Work Group from PC(W) Save Work Group to PC(K) 1 Exit(X) ×

7.2 **Device (Vision Sensor)**

- 1st After installing Vision Master, select a device vision sensor) to use from a list of connected devices (vision sensor) by checking IP address.
- 2nd Click focusing guide in the 'Camera' setting to set the area to focus on, and adjust focus with focus adjuster. When adjusting focus with focusing guide, run Continuous snap ([2]).



3rd If taken images are dark, set the exposure time longer or light level and gain higher.



4th Select the type of input signal which performs as a camera shutter to take image by setting the trigger mode.

- 0	Trigger Mode	
	Free-Run Trigger	-
	Free-Run Trigger	
	Internal Trigger	
	External Trigger	
Camera		

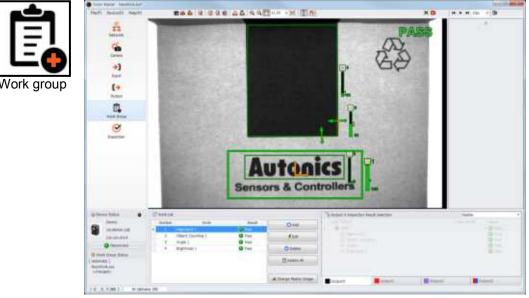
5th Set input and output.

		Aust Wedle		
72	canes hape		*[[](P	e +
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<u> </u>													
1 (1, R. 1)													
tput													

6th Add work in the 'work group' setting. For more details, refer to '6.6.5 Work Group'.



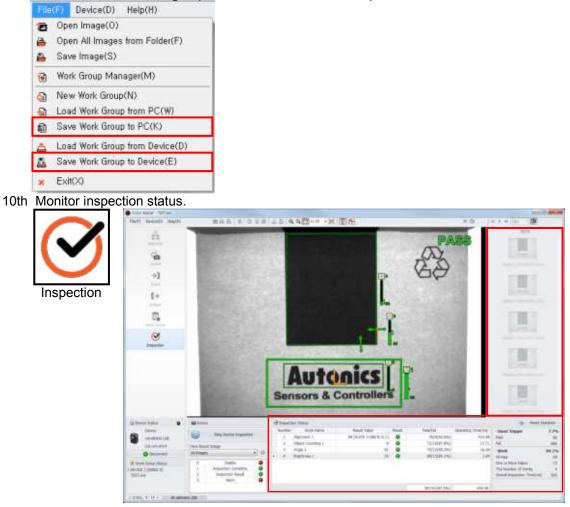
In

7th Before starting inspection, set the result image which is displayed in the image window, and activate Save result image. For more details, refer to '(1) Device' in '6.6.6 Inspection'.

12	
	_
(Int)	
8MP	
C:#Users#Administrator#Documents#Autonics#Vision Naster#Image*	- 21
9 100	MBy
The number of files : 0 0	MBy
	BHP C:WUsersWAdministratorWDocumentsWAutonicsWVision NasterWImageh

- 8th Click 'Add taken image to preview window' icon (100) on the top right side. You can see the images which is being taken by the vision sensor.
- 9th When you click Start device inspection, Select operation mode window appears. Select between Save and run and Unsave and run for registered work group.

	 Noti Hanni 1927an Fault: Santatti Angelti. 		*			
Inspection	1 6 9		r de	PARE		
inspection			ρ∎-Ϊ.			
	stream • •	Carl Innis Journal 1 Marca 1	introllers .	All and a first of	a hard linger	-
	CE A. V. A. 1 DESCRIPTION		:	420.00 420.00 420.00	No Work All Frage Date of Water Holders The Sector of Holders Heart Department Theory and	
		Mode an the device is turned off, unsaved d you want to save current Work Group	CONTRACTOR DATA AND A D			
	Save and R	un Unsave and Run	× Cancel			



You can also save work group in the File menu to start inspection.

8 Troubleshooting

Please check routinely whether VG is operating in normal status or not.

No	Symptom Solution					
		Check that status of power supplying and power cable connections is in normal.				
1	When supplying power, POWER LED of VG is not turned on.	Check that power is being supplied within the rated range.				
1		Check that polarity of power is connected correctly.				
		Check that power terminal is tightened thoroughly.				
2	VG does not work due to the external	Check that whether status of input COMMON or each of input wire connection is in normal.				
2	input error.	Check that the device connected to input has a problem.				
		Check that output wire is connected correctly.				
	VG does not work due to the external output error.	Check that power to output is being supplied within the rated range.				
3		Check that the device connected to output has a problem.				
		Check that specifications of load connected to output is within the rated range.				
		Check that LINK LED is turned on. If not, check wiring.				
4	Error occurs in Ethernet communication.	Check that communication (IP address, subnet mask, and gateway) is set correctly. Refer to '6.3.5 Network setting' to set correctly.				
		Check that connection or specification of the communication cable is corresponding to that of Autonics guide. Use the Autonics cable (sold separately).				

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Sensors & Controllers

Distributor

Major Products

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Proximity Sensors-Pressure Sensors-Connectors/Sockets-Rotary Encoders-Panel Meters
-Counters-Timers-Temperature Controllers-SSRs/Power Controllers-Sensor Controllers
-GraphicLogic Pands-Temperature/Humidity Transducers-Switching Mode Power Supplex
-Stepper Motors/Drivers/Motion Controllers-I/O Terminal Blocks & Cables-Display Units
-Control Switches/Lamps/Duzzers-Field Network Devices-Tachmeter/Pulse(Rate) Meters
-Laser Marking System(Fiber, CO., Nd:YAG)-Laser Welding/Cutting System
-

Any proposal for a product improvement and development: Product@autonics.com

- Corporate Headquarters

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