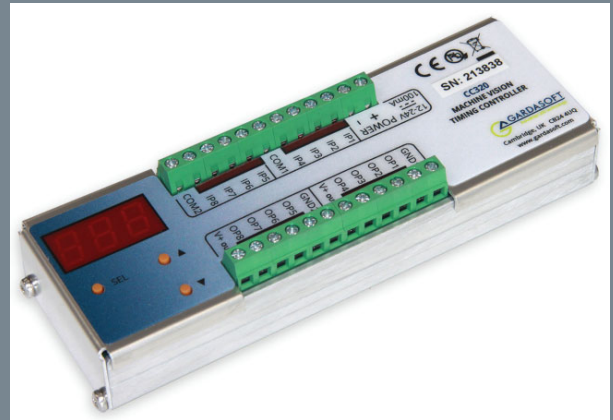


COGNEX®

Using the CC320 with the IS8900



3/21/2025
v1.0

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Introduction

1 Introduction

This document serves as a guide for using the CC320 with the In-Sight 8900 series camera. Its purpose is to help set up the module to give you 8 digital inputs and 8 digital outputs. The CC320 is the currently available substitute for using the CIO-1400 and CIO-Micro modules that were used in past In-Sight products but are not supported by ISVS applications.

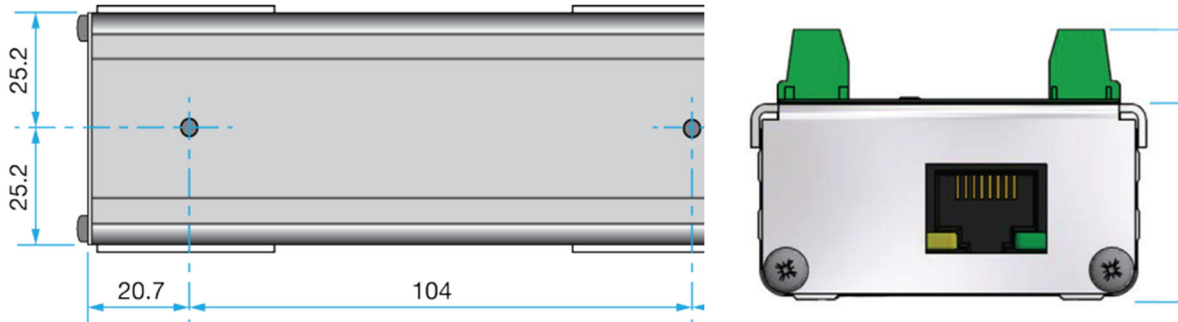
Currently, support for the CC320's 8 Inputs and 8 Outputs is only available with spreadsheet jobs. If using EasyBuilder, only the 8 outputs can be used.

The CC320 cannot be used to trigger the camera. You will need to use the hardware trigger associated with the camera's internal IO through the breakout cable.

Physical Setup

2 Physical Setup

The CC320 module comes with two M3-threaded holes that can attach to a mounting surface.



Mounting considerations should be made to properly secure the unit into a cabinet. Also, the CC320 has no IP rating, which must be accounted for in the choice of control cabinet to provide proper protection against the production environment.

Power

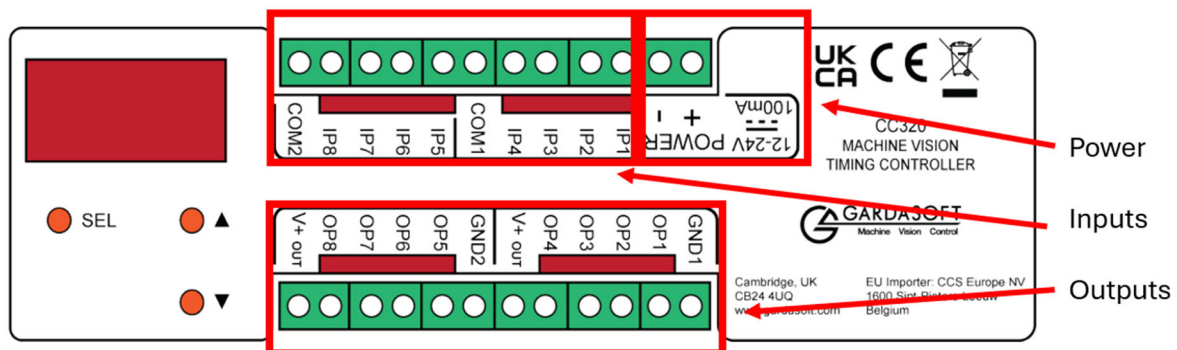
The controller requires supply power input of 12 VDC to 24 VDC at 100 mA.

Inputs

The inputs on the CC320 are optically coupled and share common negative connection with the terminals COM1 and COM2. These inputs are labeled IP1-IP8 and are located at the top of the unit next to the power input.

Outputs

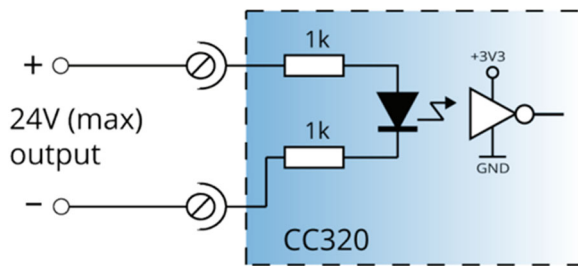
Outputs on the controller are open-drain type and split into two sections. Outputs OP1-OP4 share a common connection to 0V via the GND1 terminal. Outputs OP5-OP8 share a common connection to 0V via the GND2 terminal. The V+ out terminals are a low power regulated output with a maximum source current of 50mA. **DO NOT CONNECT A PSU TO THE V+ OUT TERMINALS!**



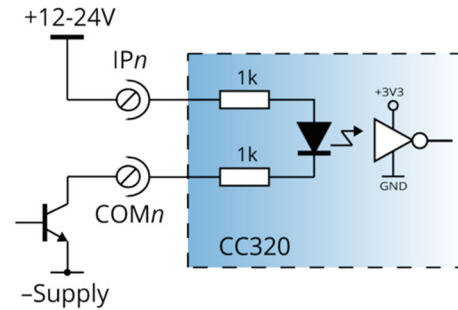
Physical Setup

When setting up your signal types, use the following diagrams.

Input

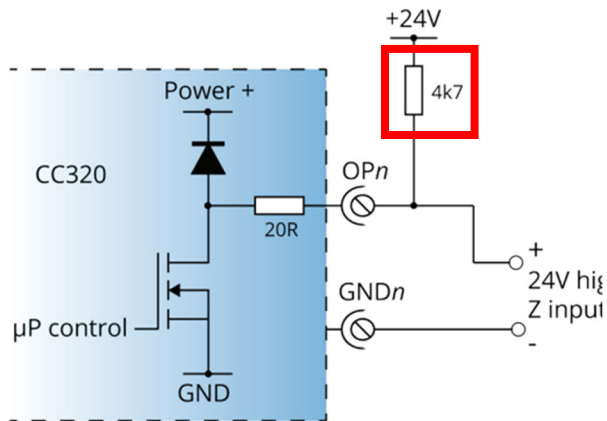


PNP

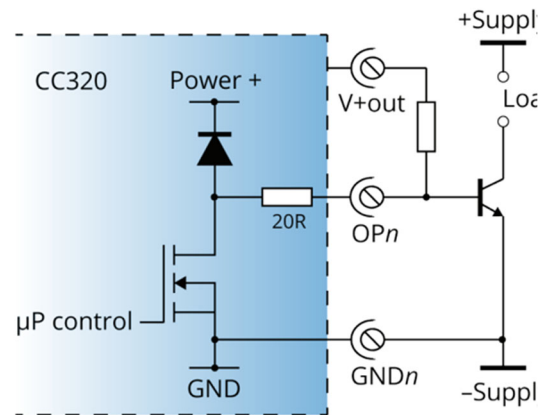


NPN

Output



PNP



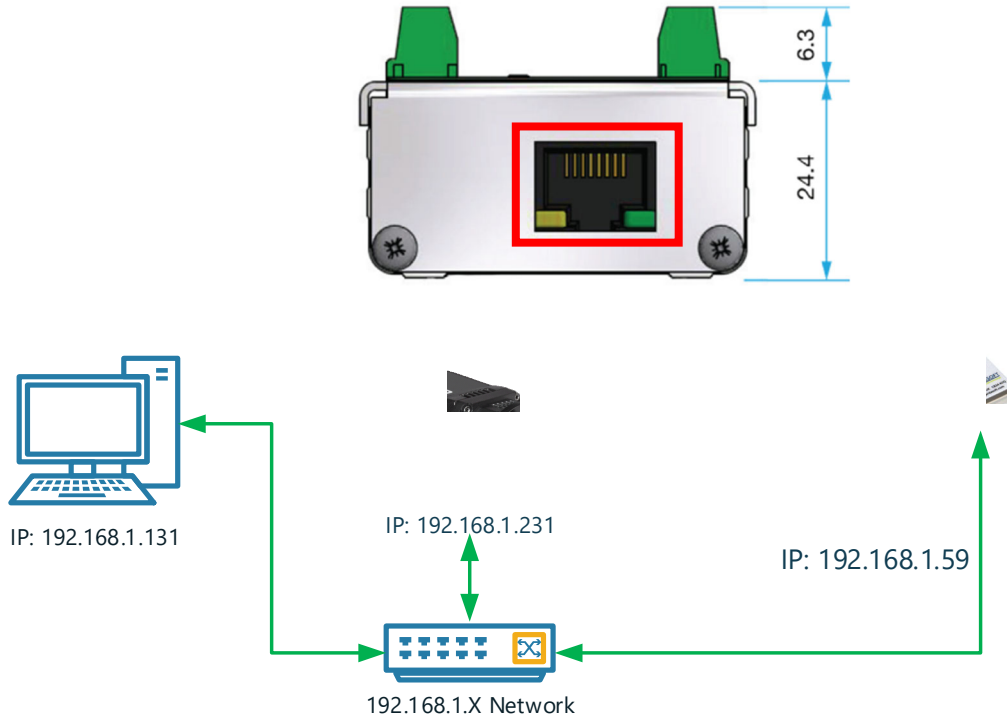
NPN

For PNP outputs, you will need to use a pull-up resistor of 4.7 kΩ. Due to the pull-up resistor, the output will be HIGH when FALSE. Set the Invert flag in the web menu to set the output HIGH when TRUE and LOW when FALSE.

Physical Setup

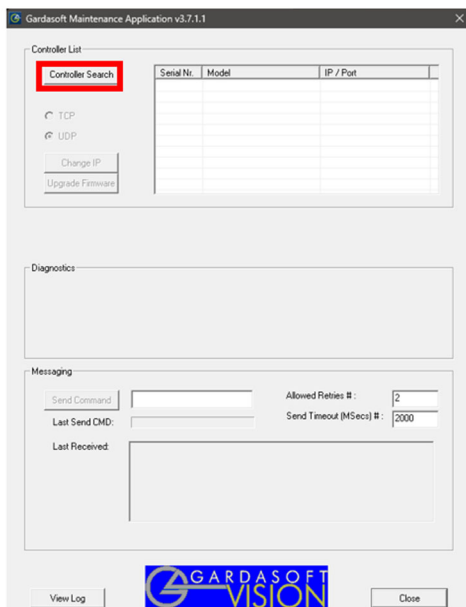
Network/Software Setup

The CC320 is a network device and needs to be set up on the same network as the IS8900. Using the RJ45 connector on the side, plug that into the same network that your IS8900 is on.



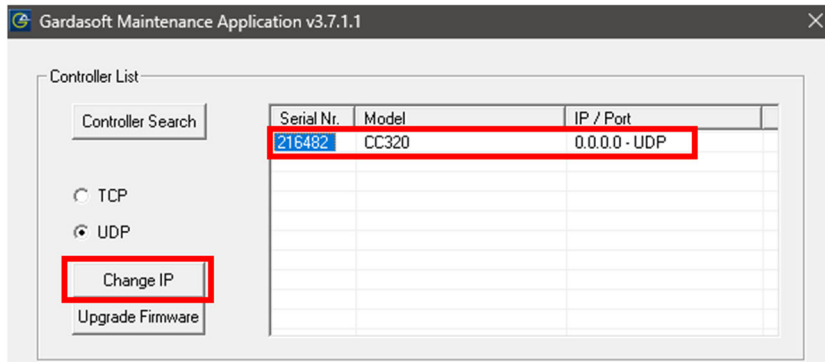
The Gardasoft controller is best configured over the built-in web server. The easiest way to configure the settings of the web server including the IP Address and to send basic commands, use the Gardasoft Maintenance Application. This application is available via the Gardasoft website in the Downloads section. (<http://www.gardasoft.com/downloads>)

With the controller powered on and connected to the network, open the Gardasoft Maintenance Application and click **Controller Search** if no devices are currently listed.

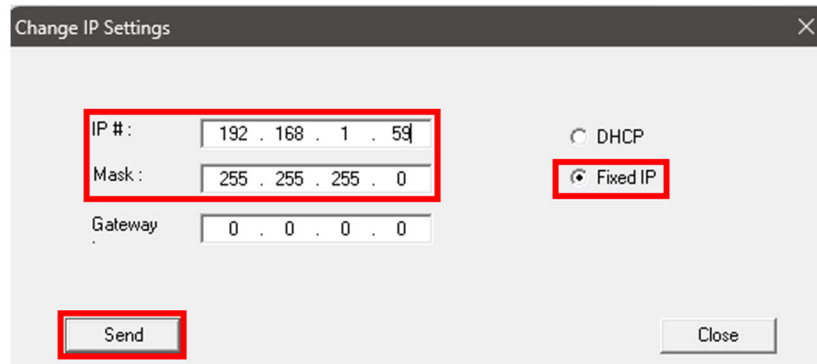


Physical Setup

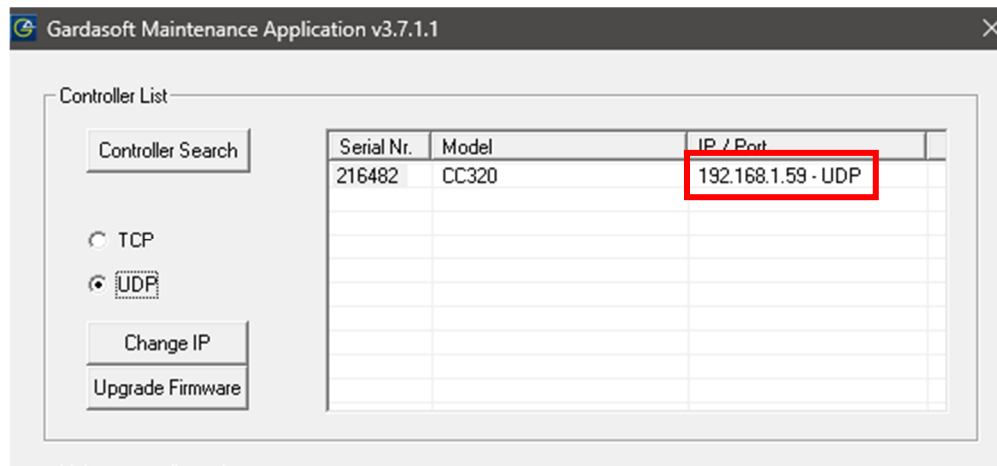
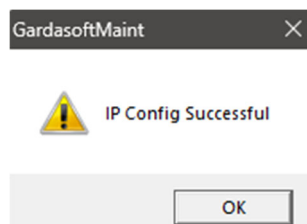
Your device should be visible in the list and can have the serial number referenced if using multiple. Select the controller and click **Change IP**.



From here, you can set the IP with a Fixed IP or set up the device to be in DHCP mode if needed. Click **Send** once completed.

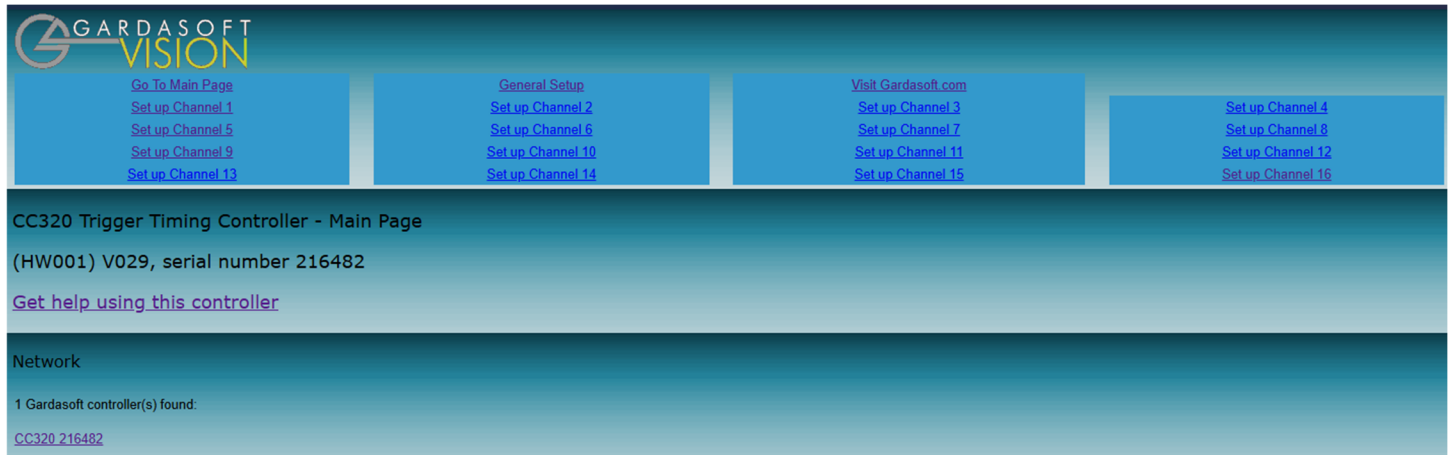


If the change was successful, you will get the following message, and your controller address will be updated in the list.



Physical Setup

Once your device has a valid IP address, you can also configure your input and output settings via web using the address of the device for reserved for advanced settings not discussed in this document. For additional information on these, please refer to the Gardasoft manual.



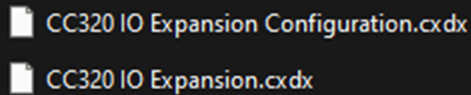
For the purposes of this document, we will only use the snippets in ISVS to communicate and set up the device in the spreadsheet applications.

2.1 Job Integration – Spreadsheet

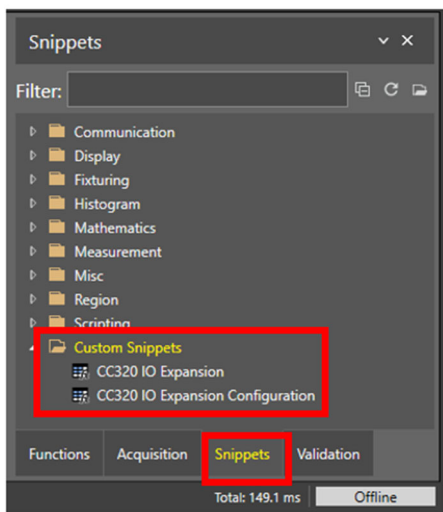
Integrating the CC320 into ISVS requires the use of the CC320 snippets in a spreadsheet.

These snippets are .cxdx files and can be added to your snippets folder located in the following directory:

C:\Users\{your username}\Documents\In-Sight Vision Suite\In-Sight\Snippets



You can also import them by going to the snippets section on spreadsheet and selecting to open the custom snippets folder.



Both the CC320 IO Expansion and CC320 IO Expansion Configuration Snippets need to be inserted.

Physical Setup

The Initial snippet will allow you to read and write to the CC320 once you enter in the IP address. Once entered, you can setup your own logic to read from the value column of the inputs section or Write your values into the value column on the outputs section.

Gardasoft CC320 - IO Expansion

IP Address: 192.168.1.59 Response: >RV1,0;RV2,1;RV3,1;RV4,1;RV5,1;RV6,1;RV7,1;RV8,1;

Inputs		Num Enable	8
Line	Value	Enable	Status
1	0.000	1.000	●
2	0.000	1.000	●
3	0.000	1.000	●
4	0.000	1.000	●
5	0.000	1.000	●
6	0.000	1.000	●
7	0.000	1.000	●
8	0.000	1.000	●
			1.000
End			

Outputs		Num Enable	8
Line	Value	Force	Mode
1	0.000	None	Switched
2	1.000	None	Switched
3	1.000	None	Switched
4	1.000	None	Switched
5	1.000	None	Switched
6	1.000	None	Switched
7	1.000	None	Switched
8	1.000	None	Switched
End			

IO Expansion Snippet

IP Address – IP address of the CC320 Controller.

Read Section

Values – 1/0 correspond to HIGH/LOW (ON/OFF)

Write Section

Values – 1/0 correspond to HIGH/LOW (ON/OFF)

Force – Allows you to permanently keep an output on or off.

Mode – Select between switching mode or pulse mode.

Configure CC320 Expansion IO

Line	Duration (ms)	Command	Status	1.000
1	20.000	RS1,2,17,0,2;RT1,20ms	Write Co	Write
2	20.000	RS9,0,0,0,0;RT9,0ms,0	Write Co	Write
3	20.000	RS13,0,0,0,0;RT13,0ms	Write Co	Write
4	20.000			
5	20.000			
6	20.000			
7	20.000			
8	20.000			
End				

Configure Expansion Snippet

Pulse Settings – Set the pulse duration in milliseconds.

Invert Flag – Invert the output value based on high/low for on/off signals. Recommended to invert when using pull-up resistors for PNP signals.

Write Configs – Will need reference to first snippet to write to device.

After bringing over your first snippet, enter the IP address of the CC320 controller into the IP address field.

Gardasoft CC320 - IO Expansion

IP Address: 192.168.1.59 Response: >RS13,0,0,0,0;RT13,0ms

Inputs		Num Enable	8
Line	Value	Enable	Status
1	0.000	1.000	●
2	0.000	1.000	●

Physical Setup

Next, for your outputs, select if you'd like them to be forced on or off (default is **None**) and if the mode you want to operate in is Switched or Pulsed (default is **Pulsed**).

Outputs	Num Enable	8					
Line	Value	Force	Value w/For	Enable	Status	Mode	
1	0.000	None	0.000	1.000	●	Switched	
2	1.000	None	1.000	1.000	●	Switched	
3	1.000	None	1.000	1.000	●	Switched	
4	1.000	None	1.000	1.000	●	Switched	
5	1.000	None	1.000	1.000	●	Switched	
6	1.000	None	1.000	1.000	●	Switched	
7	1.000	None	1.000	1.000	●	Switched	
8	1.000	None	1.000	1.000	●	Switched	
Command	RV1,0;RV2,1;	oWrite		1.000			
							End

Next, go to the Configure Expansion IO Snippet and setup your pulse duration (default is **20ms**) if you are using pulse mode for the output and enable/disable the Invert option (enabled by default).

Configure CC320 Expansion IO						
Line	Duration (ms)		Command	Status	1.000	
1	20.000	☒ Invert	RS1,2,17,0,2;RT1,20ms	oWrite Conf	oWrite	
2	20.000	☒ Invert	RS9,0,0,0,0;RT9,0ms,0	oWrite Conf	oWrite	
3	20.000	☒ Invert	RS13,0,0,0,0;RT13,0ms	oWrite Conf	oWrite	
4	20.000	☒ Invert				

After making your selections, under the far-right column, select the WriteDevice() cell. For the middle argument, you need to point it to the Device() cell from the initial snippet as this is not done by default. Do this for all three WriteDevice() cells.

Gardasoft CC320 - IO Expansion															
IP Address								Configure CC320 Expansion IO							
192.168.1.59								Line							
oDevice								Duration (ms)							
>RS13,0,0,0,0;RT13,0ms,0MS;RR13,0MS;RS14,0,0,0,0;RT14,0ms,0								Command							
Inputs								Status							
Line								1.000							
Value															
Enable															
Status															
Raw Value															
Command															
Final Command															
oWrite															

The last step is to write the configuration to the CC320 but clicking the three Write Config buttons.

Configure CC320 Expansion IO						
Line	Duration (ms)		Command	Status	1.0	
1	20.000	☒ Invert	RS1,2,17,0,2;RT1,20ms	oWrite Config	oWrite	
2	20.000	☒ Invert	RS9,0,0,0,0;RT9,0ms,0	oWrite Config	oWrite	
3	20.000	☒ Invert	RS13,0,0,0,0;RT13,0ms	oWrite Config	oWrite	
4	20.000	☒ Invert				

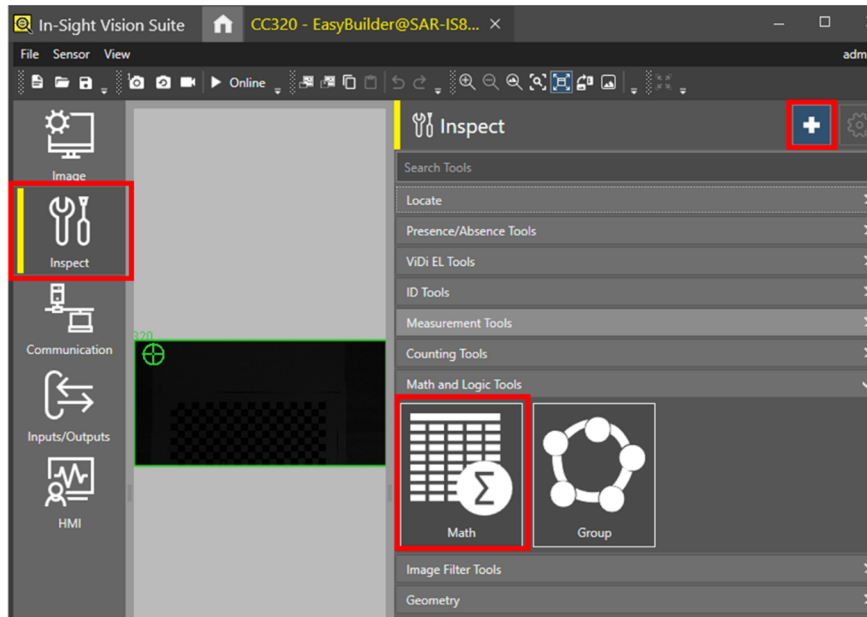
Physical Setup

From here, you can now read and write your IO by connecting your logic to the value columns in the main snippet.

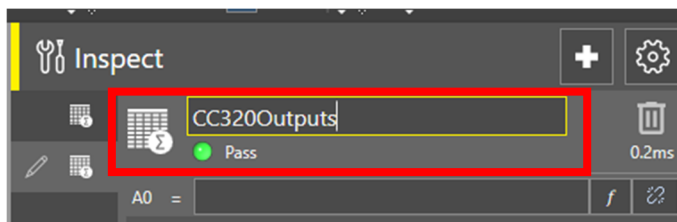
IP Address		Response				
192.168.1.59		>RS13,0,0,0,0,RT13,0MS,0MS,RR13,0MS,RS14,0,0,0,0,RT14,0MS,0				
Inputs		Num Enable	8			
Line	Value	Enable	Status	Raw Value	Command	Final Command
1	0.000	1.000		0.000	RI1;	RI1,RI2,RI3,RI4,0
2	0.000	1.000		0.000	RI2;	-1.000
3	0.000	1.000		0.000	RI3;	VL0V,LOVL0V,LOVL0V,LOVL0V,LOVL0V
4	0.000	1.000		0.000	RI4;	
5	0.000	1.000		0.000	RI5;	
6	0.000	1.000		0.000	RI6;	
7	0.000	1.000		0.000	RI7;	
8	0.000	1.000		0.000	RI8;	
		1.000				
						End
Outputs		Num Enable	8			
Line	Value	Force	Value w/o Force	Enable	Status	Mode
1	0.000	None	0.000	1.000		Switched
2	1.000	None	1.000	1.000		Switched
3	1.000	None	1.000	1.000		Switched
4	1.000	None	1.000	1.000		Switched
5	1.000	None	1.000	1.000		Switched
6	1.000	None	1.000	1.000		Switched
7	1.000	None	1.000	1.000		Switched
8	1.000	None	1.000	1.000		Switched
Command	RV1,0,RV2,1,Write			1.000		
						End

2.2 Job Integration – EasyBuilder

Integrating the CC320 into an EasyBuilder application has a limitation that it **CANNOT** use the inputs at the time of this writing. To implement the outputs integration, create an EasyBuilder job and navigate to the Inspect section. Add a math tool to your list.



Name your tool something descriptive like **CC320Outputs**.



Physical Setup

Inside the table, enter the following into the respective cells.

	A	B	C	D	E	F	G
0	'Output	1	'Value	0	'Pulsed	Checkbox("")	
1		2		0	'Switched	not(f0)	
2		3		0			
3		4		0			
4		5		0			
5		6		0			
6		7		0	'Pulsed String	concatenate(if(D0,"MP17;",""),if(D1,"MP18;",""),if(D2,"MP19;",""),if(D3,"MP20;",""),if(D4,"MP21;",""),if(D5,"MP22;",""),if(D6,"MP23;",""),if(D7,"MP24;",""))	'TCP String
7		8		0	'Switched String	concatenate("RV",B0,"",D0,"", "RV",B1,"",D1,"", "RV",B2,"",D2,"", "RV",B3,"",D3,"", "RV",B4,"",D4,"", "RV",B5,"",D5,"", "RV",B6,"",D6,"", "RV",B7,"",D7,"")	if(F0,F6,F7)

Note that the cell F0 is a checkbox. When the checkbox is checked, pulsed outputs are used. If unchecked, then the switched outputs will be used.

To dynamically set our inputs, tie your output logic to write to cells D0-D7.

For example, if output 3 needs to be set high when the pattern tool passes, we could set up the following for the value cell for output 3 (D2).

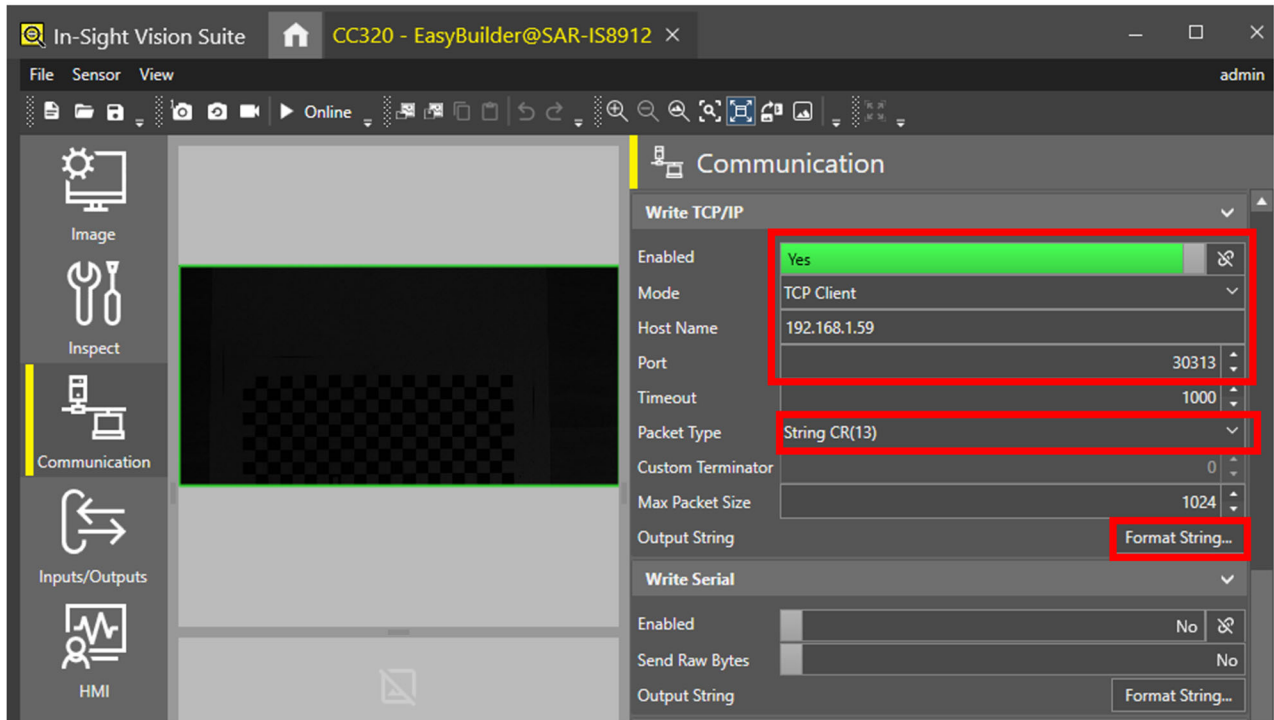
The screenshot shows the 'Inspect' tool interface for the 'CC320Outputs' table. The table has columns A, B, C, D, and E. The data is as follows:

	A	B	C	D	E
0	Output	1.000	Value	0.000	Pulsed
1		2.000		0.000	Switched
2		3.000		1.000	
3		4.000		0.000	

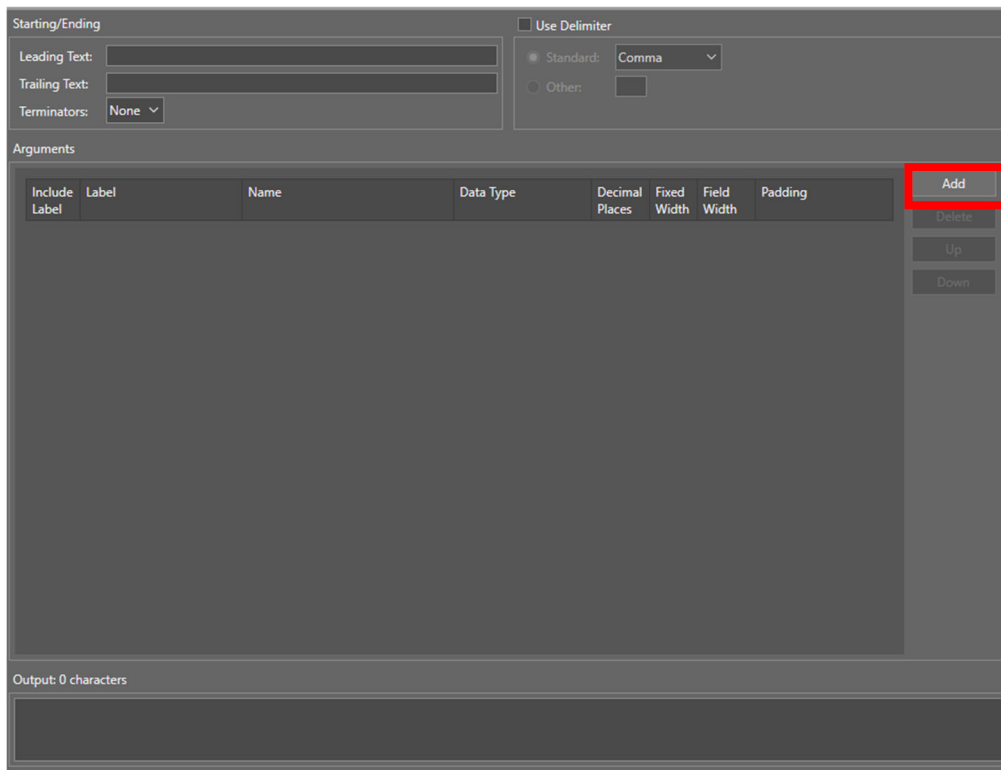
The formula bar above the table shows: `D2 = if(Pattern_1.Pass,1,0)`. The cell D2 in the table is highlighted with a red box.

Physical Setup

The next step is to set up our connection to the CC320. To set up the Write TCP/IP function to TCP Client mode, enter the CC320's IP address and 30313 for the port number. Next, set the Packet Type to **String CR(13)**. We will come back here and then click "**Format String...**"

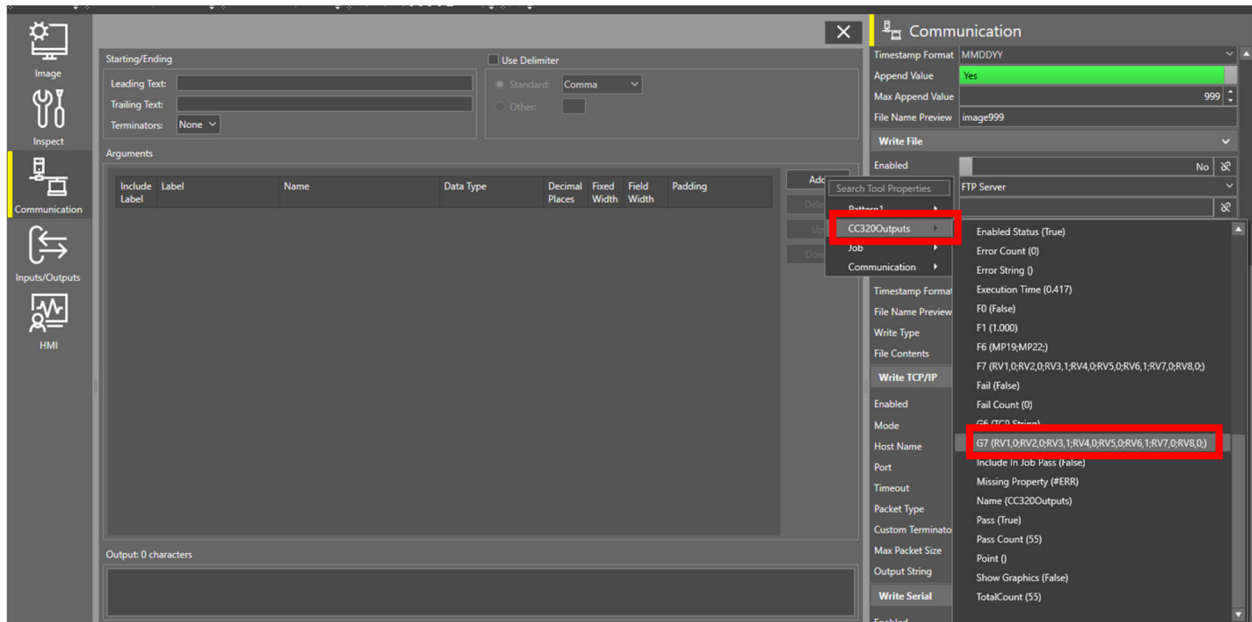


Click **Add**.



Physical Setup

In the selections, navigate to CC320Outputs > G7.



You should see a preview window of the message sent to the CC320.



From here, you should be able to trigger your outputs when running your job.