

# VIS100 Operating Manual V1.0

## Table of Contents

### Chapter 1: Components and Specifications

1.1 Packaging and Optional Parts .....	1-1
1.2 Sensor Unit .....	1-2
1.2.1 Specifications .....	1-2
1.3 Camera and Lens Selections .....	1-3

### Chapter 2: Input and Output Interface

2.1 Input/Output (I/O) Terminal Block .....	2-1
2.2 Grounding and Installation .....	2-2
2.2.1 Grounding .....	2-2
2.2.1 Installation .....	2-2

### Chapter 3: Basic Operation

3.1 Application Names and Functions .....	3-1
3.2 GUI .....	3-3
3.2.1 Main Page .....	3-4
3.3.2 Menu Page .....	3-5
3.3.3 Language .....	3-8
3.3.4 Information Page .....	3-9
3.3.5 Statistics Page .....	3-9

### Chapter 4: Inspection Setting Process

4.1 Getting Start .....	4-1
4.1.1 Camera Default IP Address .....	4-1
4.1.2 Open the Application .....	4-1
4.1.3 Log in to the Application .....	4-2
4.1.4 Basic Operation .....	4-2
4.2 Configuration .....	4-3
4.2.1 Camera .....	4-3
4.2.2 Communication .....	4-4
4.2.3 Account .....	4-6
4.2.4 Mode .....	4-7
4.2.5 Camera IP .....	4-8
4.2.6 Export/Import Settings .....	4-8

## Chapter 5: Inspection tools

5.1 Region of Interest (ROI) .....	5-1
5.2 Filters .....	5-2
5.3 Barcode .....	5-3
5.3.1 1D Barcode .....	5-3
5.3.2 Data Matrix Code (DMC) .....	5-4
5.3.3 QR Code .....	5-6
5.3.4 Micro QR Code .....	5-7
5.4 Blob .....	5-9

## Chapter 6: Troubleshooting

6.1 Troubleshooting Steps .....	6-1
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Thank you for your purchase of the high performance Delta Vision Sensor VIS100 from Delta Electronics Inc. This operating manual covers the component description, installation, operation, troubleshooting, peripherals, and maintenance.

To guarantee proper installation and operation of the system, please carefully read this operating manual and safe keep it for future reference.

## Precautions

1. Please check the signal connections, for example input voltage and polarity, before powering on to prevent damages due to an incorrect voltage input level.
2. Please check that system power is turned off before inspecting the input power source or connecting the wires. Do not touch the terminals or connect the wires while system power is turned on; as this runs the risk of electric shock.
3. Please do not disassemble or modify the internal components of the controller.
4. Keep away from interference sources such as high voltage and high frequency noise during installation.
5. Avoid system operation under the following situations:
  - (a) Excessive dust and corrosive gasses; (b) high temperature, high humidity, and high levels of radiation; (c) shock and impact; (d) exposure to direct sunlight
6. Check the ground terminal to the power source for proper connection. Check the terminals for secure connection.
7. Only use the blower to remove dust from the camera sensor or lens. Do not blow using the mouth to avoid getting moisture on the components.
8. Gently wipe dust off of the lens using a lens cloth to remove attached dirt. Using excessive force or inappropriate materials may scratch the lens.

# Chapter 1

## Components and Specifications

### 1.1 Packaging and Optional Parts

A complete vision system requires the following basic components:

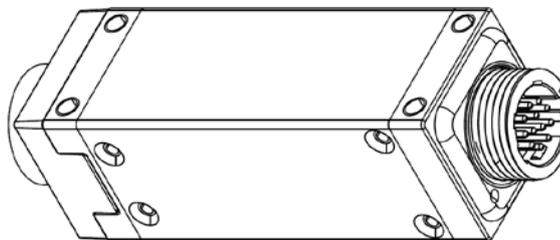
- 1) Vision sensor unit and 0.4 m cable
- 2) Lens (optional, first set is included with the 8mm lens)

#### 1.1.1 Unit Packaging

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The following is included:

- 1) Vision sensor: VIS100-30G12D / VIS100-30GBLD
- 2) 0.4 m TCP/IP cable: VIS-CA04S



## 1.2 Sensor Unit

### 1.2.1 Specifications

#### ■ General Specifications

Input power	DC 9~30 Voltage
Operation voltage	90%~110% of rated voltage
Power consumption	Less than 0.2A
Ingress Protection Rating	IP55
Operating temperature	-20°C ~+5°C

#### ■ Functional Specifications

Camera	Type	Mono
	Resolution	1280(Horizontal)*960(Vertical); 640(Horizontal)*480(Vertical); 90 fps
	Exposure	200~65535 (us)
	Lens mount	M12
Memory		DDR3 512MB & 4GB Flash
Inspection window	Inspection item	Code Reader · Blob
	ROI Type	Rectangle · Circle
Pre-processing	Total	5 pcs per each inspection tools
	Mode	Gauss, Erosion, Dilation, Mean, Median, Range, Mirror, Rotate, Invert, Opening, Closing, Sharpen, Correction, Binary, Histo-Equalization.
Communication port		Ethernet(10BASE-T)
Display	Monitor screen	Browser (PC or Smart phone)
	Operating language	Simplified Chinese, English, Japanese, Korean
Flashlight control		Internal trigger

## 1.3 Camera and Lens

VIS100 Sensor includes 0.3M pixel CMOS sensor, lens is the 8mm (M12, C mount) specification.

Before selecting the lens, please confirm the field of view and working distance between the lens and test object. Refer to the table below for a suitable lens.

Field of view (mm) Horizontal (H)*Vertical (V)	Focal length 8mm		Focal length 12mm		Focal length 16mm		Focal length 25mm		Focal length 35mm		Focal length 50mm		Resolution um/pixel	
	Dis.	R	Dis.	R	Dis.	R	Dis.	R	Dis.	R	Dis.	R	640 * 480	1024 * 768
1000(H)*750(V)	1667	0											1562	977
800(H)*600(V)	1333	0	2013	0									1250	781
600(H)*450(V)	1000	0	1513	0	2015	0							938	586
500(H)*375(V)	833	0	1263	0	1683	0							781	488
400(H)*300(V)	667	0	1013	0	1348	0	2181	0					625	391
350(H)*263(V)	583	0	888	0	1181	0	1906	0					547	342
300(H)*225(V)	500	0	763	0	1014	0	1631	0	2253	0			469	293
250(H)*188(V)	417	0	638	0	847	0	1356	0	1878	0			391	244
225(H)*169(V)	375	0	575	0	764	0	1218	0	1690	0			352	220
200(H)*150(V)	333	0	513	0	681	0	1081	0	1503	0	2241	0	313	195
175(H)*131(V)	292	0	450	0	597	0	943	0	1315	0	1963	0	273	171
150(H)*113(V)	244	0	389	0	514	0	806	0	1128	0	1686	0	234	146
140(H)*105(V)	228	0	362	0	480	0	751	0	1053	0	1575	0	219	137
130(H)*98(V)	210	0	334	0	444	0	696	0	978	0	1464	0	203	127
120(H)*90(V)	193	0	307	0	407	0	641	0	903	0	1353	0	188	117
110(H)*83(V)	175	0	280	0	371	0	586	0	828	0	1242	0	172	107
100(H)*75(V)	158	0	253	0	336	0	532	0	753	0	1131	0	156	97
90(H)*68(V)	142	0	227	0	300	0	477	0	678	0	1020	0	141	88
80(H)*60(V)	124	0	200	0	265	0	423	0	603	0	909	0	125	78
75(H)*56(V)	115	0.5	183	0	247	0	397	0	565	0	853	0	117	73
70(H)*53(V)	107	0.5	176	0	230	0	370	0	528	0	798	0	109	68
65(H)*49(V)	98	0.5	160	0	212	0	344	0	490	0	742	0	102	63
60(H)*45(V)	90	0.5	147	0	193	1	316	0	453	0	687	0	94	59
55(H)*41(V)	81	0.5	133	0.5	175	1	290	0	417	0	631	0	86	54
50(H)*38(V)	72	1	120	0.5	158	1	262	0	378	0	576	0	78	48.8
45(H)*34(V)	63	1	106	0.5	142	1.5	235	0	341	0	520	0	70	43.9
40(H)*30(V)	55	1	93	1	123	1.5	208	0	304	0	465	0	63	39.1
35(H)*26(V)	47	1	79	1	108	1.5	183	1	268	0	409	0	55	34.2
32.5(H)*24.4(V)	42	1	72	1	99	2	168	2	247	0	382	0	51	31.7
30.0(H)*22.5(V)	37	1.5	66	1.5	89	2	153	2	229	0	354	0	46.9	29.3

# Chapter 1 Components and Specifications

Field of view (mm) Horizontal (H)*Vertical (V)	Focal length 8mm		Focal length 12mm		Focal length 16mm		Focal length 25mm		Focal length 35mm		Focal length 50mm		Resolution um/pixel	
	Dis.	R	Dis.	R	Dis.	R	Dis.	R	Dis.	R	Dis.	R	640 * 480	1024 * 768
27.5(H)*20.6(V)	33	1.5	58	1.5	80	2	139	2	211	0	325	0	43.0	26.9
25.0(H)*18.8(V)	28	1.5	53	2	72	2	126	2	189	5	298	0	39.1	24.4
22.5(H)*16.9(V)	23	2	45	2			111	5	170	5	272	0	35.2	22.0
20.0(H)*15.0(V)	19	2	40	2			94	5	153	5	243	0	31.3	19.5
18.0(H)*13.5(V)	16	2	33	2			87	5	137	5	221	0	28.1	17.6
17.0(H)*12.8(V)	14	2					81	5	130	5	210	5	26.6	16.6
16.0(H)*12.0(V)					40	5	76	6	122	5	199	5	25.0	15.6
15.0(H)*11.3(V)					36	5	70	6	116	5	189	5	23.4	14.6
14.0(H)*10.0(V)			23	5	32	5	64	7	106	10	177	5	21.9	13.7
13.0(H)*9.8(V)			21	5	29	6	59	7	99	10	166	5	20.3	12.7
12.0(H)*9.0(V)			18	5	25	6	54	8	92	10	153	10	18.8	11.7
11.0(H)*8.3(V)			15	5	23	7	49	9	85	15	145	10	17.2	10.7
10.0(H)*7.5(V)			13	5	19	8	44	10	77	15	133	10	15.6	9.77
9.0(H)*6.75(V)			11	6	16	9	39	11	68	15	122	15	14.1	8.79
8.0(H)*6.00(V)			8	7	13	10	34	13	63	20	111	20	12.5	7.81
7.5(H)*5.63 (V)			8	7	10	10	31	14	58	20	104	20	11.7	7.32
7.0(H)*5.25(V)					7	11	27	16	53	20	99	25	10.9	6.84
6.5(H)*4.88(V)							25	18	51	25	92	25	10.2	6.35
6.0(H)*4.50(V)							23	20	46	25	88	30	9.38	5.86
5.5(H)*4.13(V)							21	22	44	30	84	35	8.59	5.37
5.0(H)*3.75(V)							17	24	39	30	76	40	7.81	4.88
4.5(H)*3.38(V)							14	26	35	35	72	45	7.03	4.39
4.0(H)*3.00(V)							12	30	33	40	66	50	6.25	3.91
3.5(H)*2.63(V)							9	34	27	45	60	60	5.47	3.42

**Remark** Dis. is the working distance and R is the size of the extension circle.

When the depth of field increases, the range of focus also increases. The following conditions will affect the depth of field.

- The longer the extension ring, the shallower the depth of field will be; thus the depth of field will increase when the shorter extension ring is used.
- Longer working distance results in a deeper depth of field.
- Smaller aperture results in a deeper depth of field.
- Shorter focal distance of the lens results in a deeper depth of field.

# Chapter 2

## Input and Output Interface

VIS100 input and output interfaces include the following:

- 1) I/O
- 2) Ethernet

The pins and wiring connections are defined and detailed below.

### 2.1 Input / Output (I/O) Terminal Block

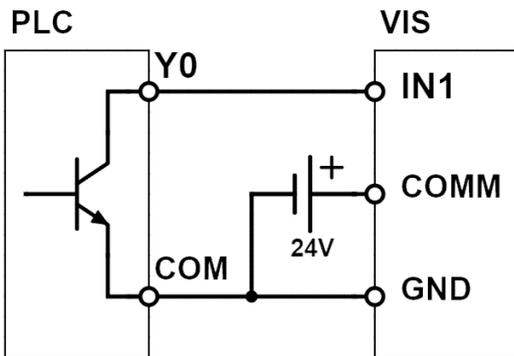
#### ■ Wiring the Sensor:

Connect and secure the I/O Cable to the I/O Cable connector located on the bottom of the Vision Sensor.

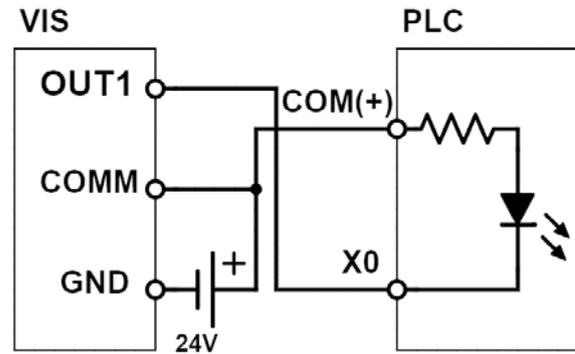
The following table lists the I/O Cable signal connections.

Serial No.	Color	Signal	Description
1	Red	24V	Voltage Supply Positive Pole
2	Yellow	0V	Voltage Supply Negative Pole
3	Black	COMM	Common contact
4	Grey	IN1	Input 1
5	Brown	IN2	Input 2
6	White	OUT1	Output 1
7	Green	OUT2	Output 2
8	Orange	GND	ISO_GND

Input circuit diagram



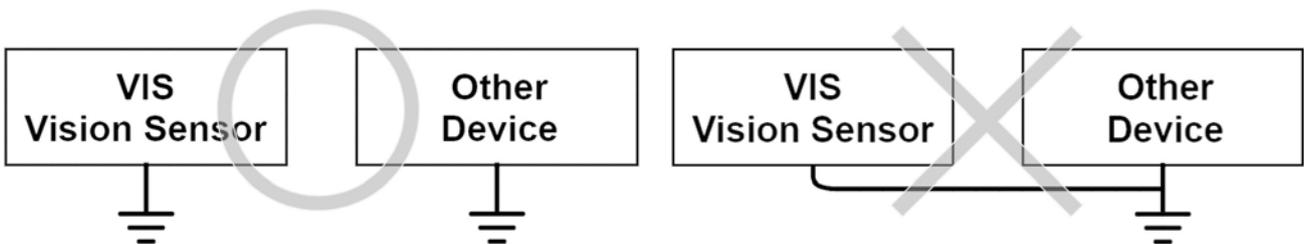
Output circuit diagram



## 2.2 Grounding and Installation

### 2.2.1 Grounding

- Precautions
  - Do not connect or disconnect the wires while system is powered on.
  - The grounding wire should be at minimum length using the regulated wire gauge. The grounding resistance must be under 100Ω.
  - Please ground the grounding terminal using the third method. Do not directly connect to other power devices.



### 2.2.2 Installation

Please reserve at least 50mm above and 30mm left/right of the controller for proper ventilation. Excessive operating temperature due to insufficient cooling will damage the sensor.

# Chapter 3

## Basic Operation

### 3.1 Application Names and Functions

You can remotely setup and configure your 1D/2D reader or Absence/Presence Checker on your PC or mobile device via Wi-Fi using the web browser. This allows you to see the inspection process in real-times and adjust the parameters anywhere in your factory.

General Functions		
Icon	Name	Function
	Login	Logs into the software to operate the camera with this application.
	Information	Displays basic camera information with application version, camera ID, and license type for this application and manufacture date.
	Statistics	Displays statistics for the total camera triggered times, total code read times, total code unread times, total pass verification and failed verification times.
	Home	Returns to Main page from any page.
	Return	Returns to the previous page.
	Menu (*1)	Opens the application menu for configuration. The top icon appears on a Smartphone, and the bottom icon appears on a PC.
	Run repeat (*1)	Runs repeatedly with the current settings.
	Run once (*1)	Runs once with the current settings.
	Stop (*1)	Stops the running process. This function stops the next process to execute.
	Live cam (*1)	Shows the live image with camera capture.
	Save (*1)	Saves all the settings except the camera IP and account name/password. The camera IP and account name/password are saved in the Configuration function.
	Clear statics (*1)	Clears all statistics.

Inspection Tools		
Icon	Name	Inspection Tool
	Filter (*1)(*2)	Filter Tool. Uses one or more filters to process the image for better results.
	Barcode (*1)(*3)	Barcode reader tool for reading barcodes.
	Data Matrix (*1)(*4)	Data Matrix code reader tool for reading data matrix codes.
	QR Code (*1) (*4)	QR code reader tool for reading QR codes.
	Micro QR Code (*1) (*4)	Micro QR code reader tool for reading micro QR codes.
	Blob (*1) (*5)	Blob/Object count tool for counting the total number of blobs.
	Matching (*1)(*5)	Pattern Matching tool for matching a pre-defined pattern.
	Mapping (*1)(*8)	Mapping tool for mapping the image with a checkerboard pattern.

Configuration Functions		
Icon	Name	Inspection Tool
	Camera settings (*1)	Configures camera image size, light, gain, exposure, and hardware trigger.
	Communication settings (*1)	Configures I/O and network communications.
	User account settings (*1)	Adds/deletes/changes username and password.
	Mode selector (*1)(*6)	Switches between code reading and blob detection.
	IP address settings (*1)	Configures camera IP address, mask, gateway, and DNS.
	Import/Export settings & image (*1)(*7)	Imports settings or exports images and settings.
	Camera settings (*1)	Configures camera image size, light, gain, exposure, and hardware trigger.
	Communication settings (*1)	Configures I/O and network communications.

- (\*1) You must log in to operate.
- (\*2) You need a license for this function.
- (\*3) You need a **Complete license** or **1D license** or **1D/2D license** for this function.
- (\*4) You need a **Complete license** or **2D license** or **1D/2D license** for this function.
- (\*5) You need a **Complete license** or **Absence/presence license** for this function.
- (\*6) The mode appears according to your license.
- (\*7) Export settings are available for PC browsers which support **HTML5 API BLOB**.
- (\*8) You need a **Complete license** or **Alignment license** for this function.

## 3.2 GUI

Both Smartphones and PCs show the application Main page after you enter the camera IP address in the browser. You can view only basic information (Statistics, Camera Information and Main page information) without logging in.

- The following lists the differences in the user interface between the Smartphone and the PC Main pages.
- **Smartphone:** Menu and Statistics appear on two separate pages.



- **PC:** The user interface has three appearances depending on the browser window width. Window width below 1000 px shows only part of the page and hides both Menu and Statistics. Window width between 1000 px and 1300 px shows the Menu on the left side. Window width larger than 1300 px shows the Menu on the left and Statistics on the right of the window.



### 3.2.1 Main Page

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The information showing under the “Delta” logo in the Main Page

- **Name :** Name of the camera (set in Camera Setting)
- **Result:** Result of the inspection
- **Cycle Time:** Time from after an image is captured to the end of the process

### 3.2.2 Menu Page

After you log in with username and password, the menu or menu button will show on.

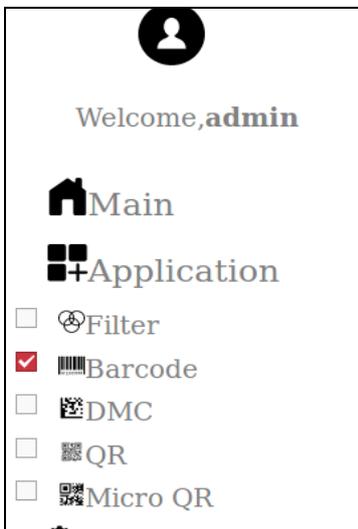
➤ **PC**

- 1) The menu is on the left side of the screen when the browser is in full screen width



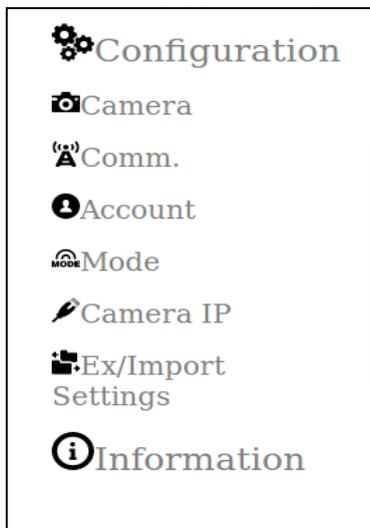
- 2) The menu contains inspection tools that you can use in the process according to your license. To activate a tool, select the check box next to the tool (check barcode as shown).

PC menu (Configuration)



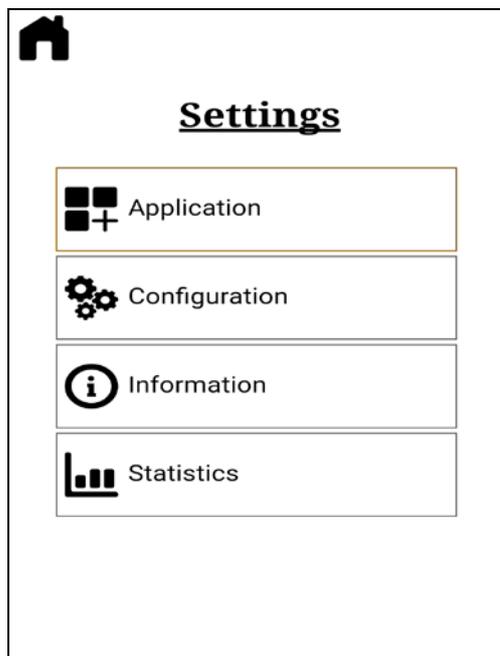
- 3) The Configuration page contains all the camera settings.

PC menu (Application)

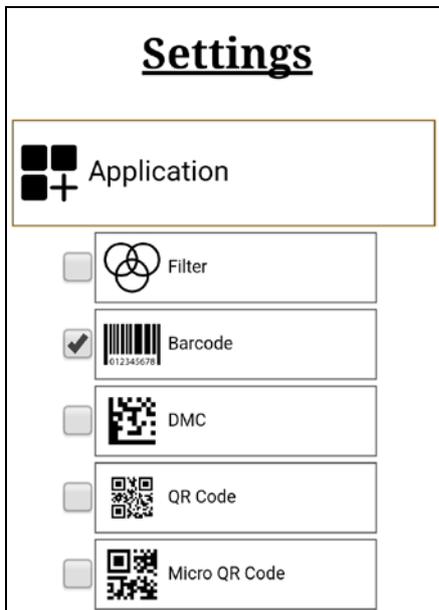


➤ **Smartphone**

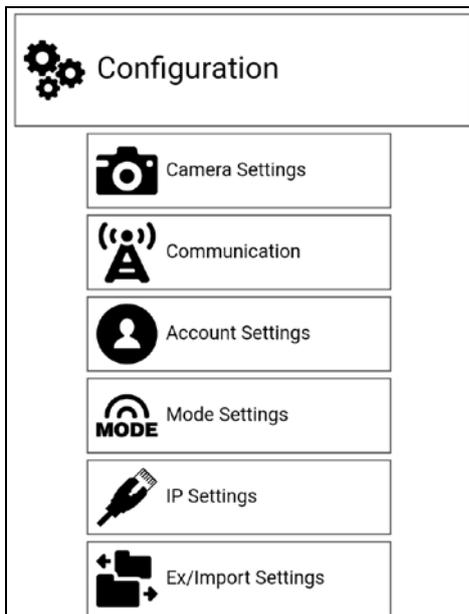
- 1) To access the menu, tap the top left button (left figure) on the screen, and the menu (right figure) will be shown.



- 2) The Application menu contains the inspection tools that you can use to process an image according to your license. To activate an application, select the check box next to the tool (check barcode as shown).



- 3) The Configuration page contains all the camera settings.

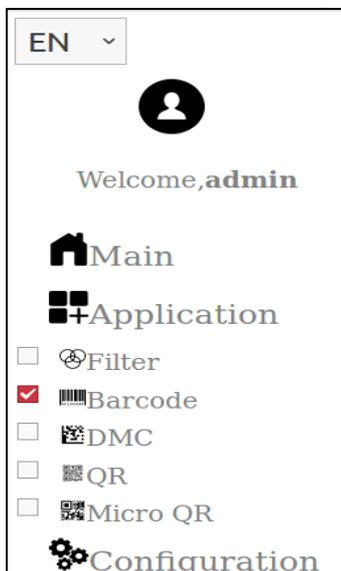


## 3.2.3 Language

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The application supports four languages: Simplified Chinese, English, Japanese, Korean.

- **PC:** You change the language by clicking the Language button at the top left of the menu page



- **Smartphone:** You can change the language by tapping the Language button in the Main page.



### 3.2.4 Information Page

The Information page contains the following basic information.

- 1) **Version:** Application version.
- 2) **ID:** Camera identification number.
- 3) **License:** Application license type.
- 4) **Date:** Manufacture date (DD/MM/YYYY format).

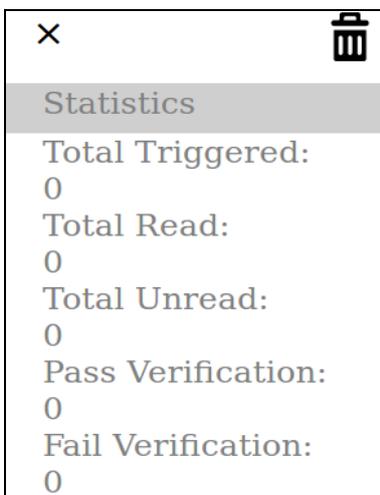


### 3.2.5 Statistics Page

The Statistics page contains the following information.

- 1) **Total Triggered:** Total number of times the camera is triggered.
- 2) **Total Read:** Total number of times the code is read successfully.
- 3) **Total Unread:** Total number of times the code isn't read successfully.
- 4) **Pass Verification:** Total number of times for passed verification.
- 5) **Fail Verification:** Total number of times for failed verification.

- 6)  : Resets all statistics to zero.



# Chapter 4

## Inspection Setting Process

### 4.1 Getting Start

#### 4.1.1 Camera Default IP Address

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The following table lists the default camera IP address (for camera from Inspiraz Technology).

Name	Address
IP	192.168.1.10
Mask	255.255.255.0
Gateway	192.168.1.1
DNS	192.168.1.1

#### 4.1.2 Open the Application

---

You must use a web browser to open this application. Google Chrome is the recommended browser. Open the web browser and enter the camera IP address to open the application.

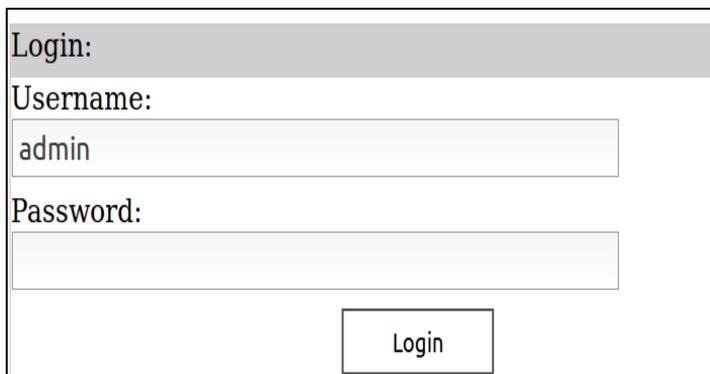
**(Recommend version : Chrome v.58 、 Firefox v.51 above)**

### 4.1.3 Log in to the Application

---

You must log in to change the camera settings.

- 1) Open the application on your Smartphone's or PC's web browser.
- 2) Click  to open the login page.



The screenshot shows a login form with the following elements:

- A header labeled "Login:"
- A "Username:" label above a text input field containing the text "admin".
- A "Password:" label above an empty text input field.
- A "Login" button located at the bottom right of the form.

- 3) Enter the Username and Password.
- 4) Click **Login**.

**Default Username: admin; Default Password: admin**

### 4.1.4 Basic Operation

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#### ➤ Live camera

- **Start:** Click  once to run the live camera.
- **Stop:** Click  again or click the stop button  to stop the live camera.

#### ➤ Run

- **Start:** Click  to run all the selected inspection tools with the current settings.
- **Stop:** Click  to stop the inspections.

#### ➤ Run once

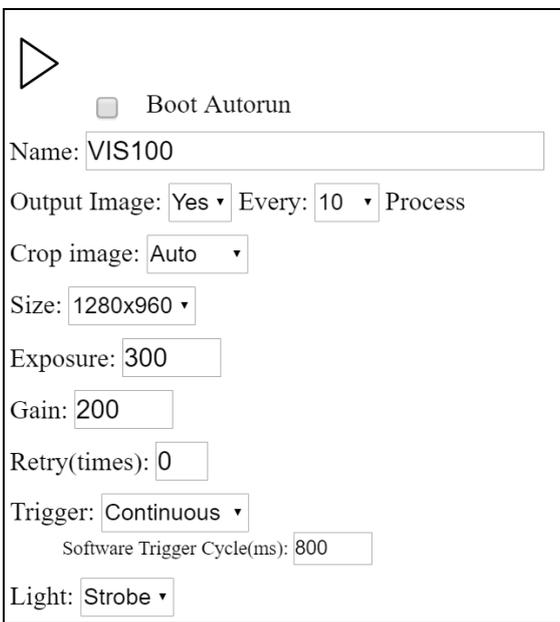
- **Start:** Click  to run all the selected inspection tools and settings once.

### ➤ Apply changed settings

- **Start:** Click  to stop all inspections, then click either  (run once) or  (run) to view the result with the changed settings.

## 4.2 Configuration

### 4.2.1 Camera



Boot Autorun  
 Name: VIS100  
 Output Image: Yes ▾ Every: 10 ▾ Process  
 Crop image: Auto ▾  
 Size: 1280x960 ▾  
 Exposure: 300  
 Gain: 200  
 Retry(times): 0  
 Trigger: Continuous ▾  
 Software Trigger Cycle(ms): 800  
 Light: Strobe ▾

- **Boot Autorun:** Uses the current saved settings to run the camera after rebooting.
- **Output Image:** Outputs the processed image after you open the browser and enter the camera IP.
- **Crop Image:** Auto-crops the image using fixed size (Auto) or a custom size (Manual).
  - Auto:** Fixes the size of the image.
  - Manual:** Enter the image width, height and offset.
- **Size:** Resolution of image, adjust the field of view size. (1280x960, 752x480, 376x240, 188x120)
- **Exposure:** Sets camera sensor exposure time (us).
- **Gain:** Sets camera sensor gain.
- **Retry:** Times of retry after failed.

# Chapter 4 Inspection Setting Process

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➤ **Trigger:** Sets the camera trigger, communication trigger will be described in 4.2.2.

**Hardware:** Shows the trigger timeout, delay and signal edge.

**Continuous:** Sets the cycle time for continuous internal trigger.

➤ **Light:** Sets the camera light (depends on the camera model).

## 4.2.2 Communication

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There are three types of communication.

- 1) I/O: Only two output terminals available.
- 2) UDP
- 3) TCP/IP

The screenshot shows two sections of a settings window. The top section, titled 'I/O Setting:', has a checkbox for 'Enabled I/O Features' which is checked. Below it are two output settings: 'Output 1' is set to 'Camera Ready (High)' and 'Output 2' is set to 'Result OK (High)' with a 'Pulse(ms):8' field. The bottom section, titled 'Comm. Setting:', has a dropdown for 'TCP/IP' selected. It includes fields for 'Timeout: 10 ms', 'IP: 172.16.155.223', 'Port: 3000', 'Send image: Disable' with a 'Port: 2222' field, 'Header: 32 Ascii(DEC)', 'Seperator: 44 Ascii(DEC)', and 'EOF: 10 Ascii(DEC)'.

**The Communication settings are separated into two parts.**

### 1) I/O Setting

- **Enabled I/O Features:** Enable the selected **Outputs 2-5**.
- **Output Camera Ready:** Signal to I/O when camera is ready.
- **Output Camera Busy:** Signal to I/O when camera is processing.
- **Result(P/F):** This is usually based on the tests in the inspection tools, such as the Blob **Count content** or the Barcode **Code content**.

**OK:** Signal to I/O when condition passes.

**NG:** Signal to I/O when condition failed.

## 2) Comm. Setting

- **Disable:** Disable communication over the network.
- **UDP:** Use the UDP client to the send result data .(no error checking)

**IP:** Destination UDP server IP address.

**Port:** Destination UDP server port number.

**Send header:** Send special header (for example<barcode>) before sending the result

**Header (ASCII):** Setting the Header word. (DEC)

**Separator (ASCII):** Setting the Separator word. (DEC)

**EOF (ASCII):** Setting the Separator word. (DEC)

- **TCP/IP:** Use the TCP client to send the result data, support to trigger the camera.

**IP:** Destination TCP server IP address.

**Port:** Destination TCP server port number (port 4000 for the comm. trigger).

Please use TCP Client mode in the third party software to connect the camera(VIS as TCP Server), then send the following string to trigger camera:

- **Run:** Run#003
- **Run once:** Once#003
- **Stop:** Stop#003

**Send Image:** Send the captured image (BMP) over TCP.

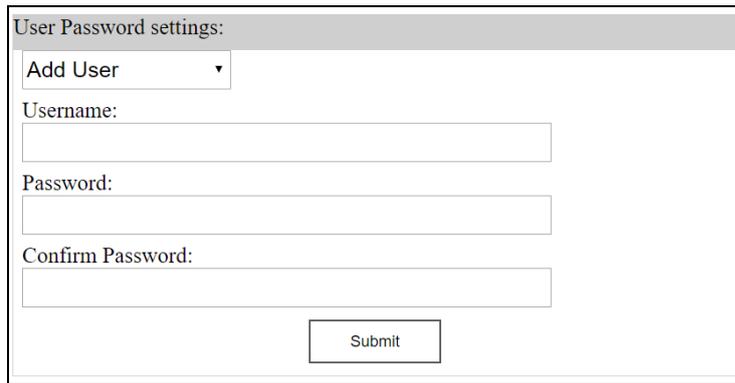
- **Always:** Always send the image.
- **OK:** Send the image when the result is OK.
- **NG:** Send the image when the result is NG.
- **Disable:** Disable sending images.

**Header (ASCII):** Setting the Header word. (DEC)

- **Separator (ASCII):** Setting the Separator word. (DEC)
- **EOF (ASCII):** Setting the EOF word. (DEC)

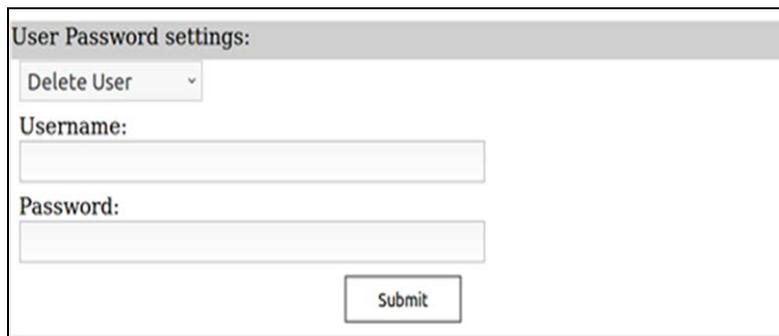
### 4.2.3 Account

---



The screenshot shows a web form titled "User Password settings:". At the top, there is a dropdown menu with "Add User" selected. Below this are three text input fields labeled "Username:", "Password:", and "Confirm Password:". At the bottom center of the form is a "Submit" button.

- **User:** Select **Add User** to add a new user.
  - **Username:** Enter the new username.
  - **Password:** Enter the new user password.
  - **Confirm Password:** Enter the password again to confirm.



The screenshot shows a web form titled "User Password settings:". At the top, there is a dropdown menu with "Delete User" selected. Below this are two text input fields labeled "Username:" and "Password:". At the bottom center of the form is a "Submit" button.

- **Delete User:** Select **Delete User** to delete a user. Note that you cannot delete the current logged in user.
  - **Username:** Enter the username to delete.
  - **Password:** Enter the user password to delete.



The form is titled "User Password settings:" and contains the following elements:

- A dropdown menu labeled "Change password" with a downward arrow.
- A text input field labeled "Password:".
- A text input field labeled "Confirm Password:".
- A "Submit" button located at the bottom right of the form.

- **Change Password:** Select **Change Password** to change the current user password.
  - **Password:** Enter the new user password for the current user.
  - **Confirm Password:** Enter the password again to confirm.

### 4.2.4 Mode

---

The VIS100 application can operate in either Code Reader or Blob mode. Use **Mode Selection** to switch between the 2d code reader and the blob detector function according to your license. If your license is for 1D/2D, then there is no Blob option. If the license is for Absent/Present, then there is no Code Reader option.



The form is titled "Mode Selection" and contains a list of radio button options:

- Code Reader
- Blob
- Alignment
- Mapping

## 4.2.5 Camera IP

---

Enter the camera's IP address, mask address, gateway address and DNS address.

- **IP:** Camera IP address
- **MASK:** Subnet mask address
- **Gateway:** Default gateway address
- **DNS:** Dynamic name server address
- **MAC:** Device MAC address

Camera IP Settings	
IP:	<input type="text" value="192.168.2.10"/>
MASK:	<input type="text" value="255.255.255.0"/>
GATEWAY:	<input type="text" value="192.168.2.254"/>
DNS:	<input type="text" value="192.168.2.254"/>
MAC:	<input type="text" value="00:0A:35:00:09:23"/>
<input type="button" value="Save"/>	

## 4.2.6 Export/Import Settings

---

Set the export settings, import settings, and export image settings.

Ex/Import Settings		
<input type="button" value="Export settings"/>	<input type="button" value="Import settings"/>	<input type="button" value="Export Image"/>

- **Export settings:** Click to set the export settings. This only appears on PCs with browsers that support HTML5 BLOB API.
- **Import settings:** Click to set the import settings.
- **Export Image:** Click to set the setting when capturing a new image and exporting it through the web browser.

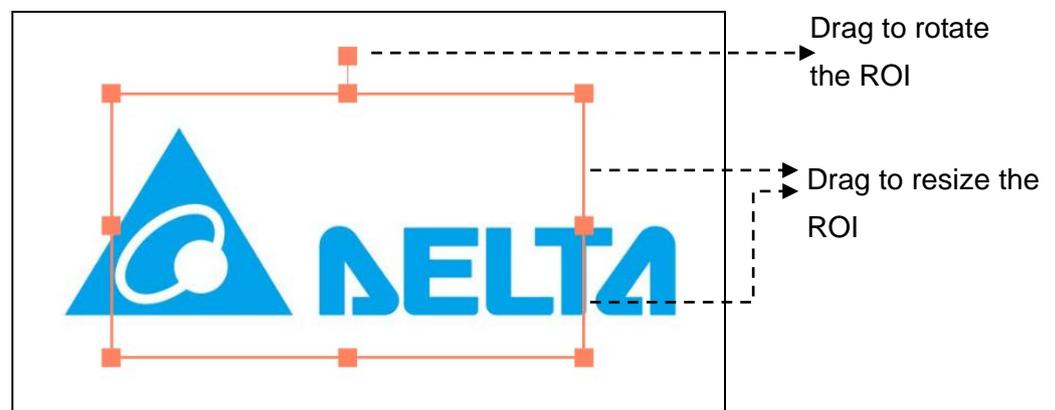
# Chapter 5

## Inspection tools

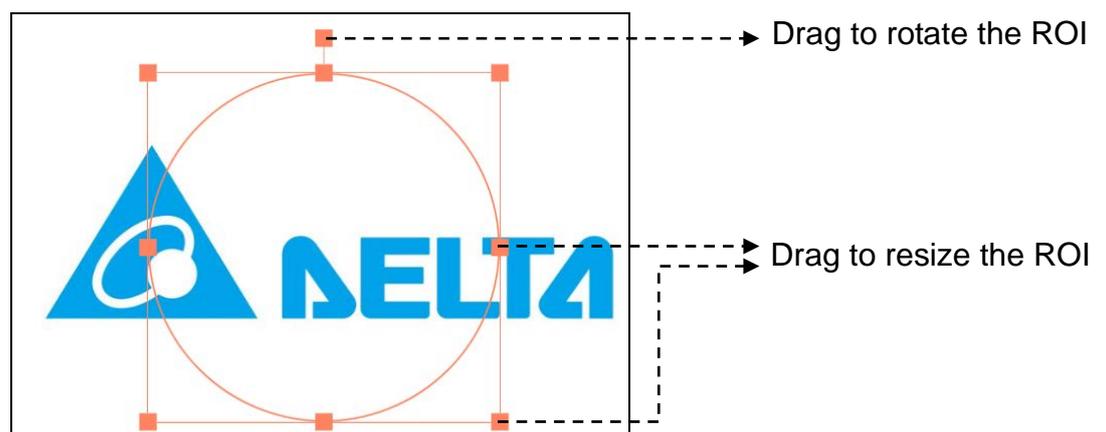
### 5.1 Region of Interest (ROI)

You can set one ROI in every inspection tool (such as Barcode) to optimize tool performance. Each inspection tool has 3 types of ROIs

- 1) **Complete:** Uses the whole image for the process.
- 2) **Rectangle:** Defines a rectangle ROI that you can rotate and resize



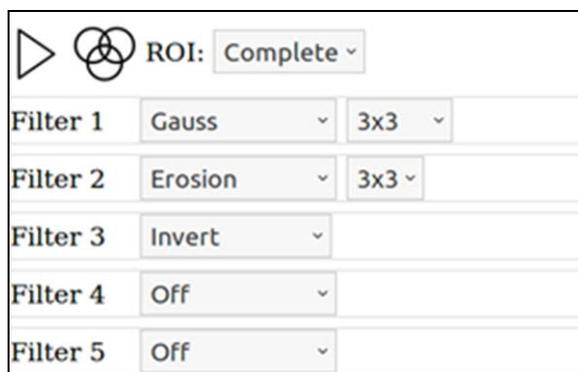
- 3) **Circle:** Defines a circle ROI that you can rotate and resize



- **Reset ROI:** In ROI, select **Complete ROI** to clear the ROI. You can then select **Circle** or **Rectangle** for the new ROI.

### 5.2 Filters

You can use up to five different filter combinations in a single ROI, and there are fifteen different filter types.



- **Gauss:** Smooths the image using the discrete Gaussian function. The smoothing effect increases with increasing filter size.
- **Erosion:** Erodes a region of an image or the complete image where its boundary is smoothed and also reduced.
- **Dilation:** Dilates a region of an image or the complete image where its boundary is smoothed and also enlarged.
- **Mean:** Smooths the image by averaging and uses a linear smoothing with the grey value of the source image.
- **Median:** Computes a median filter with various square or circular masks.
- **Range:** Highlights and outlines contour edges.
- **Mirror:** Mirrors an image across its horizontal or vertical axis.
- **Rotate:** Rotates an image by a defined angle.
- **Invert:** Inverts the gray scale values of an image.
- **Opening:** Applies a gray value opening to the input image with the structuring element of shape.
- **Closing:** Applies a gray value closing to the input image with the structuring element of shape.
- **Sharpen:** Enhances the contrast in the image by emphasizing high frequency areas of the image edges and corners, resulting sharper images appearance.
- **Correction:** To compensation non-uniform illumination or non-uniform camera sensitivity.
- **Binary:** Binaries the image with the selected threshold value (selected threshold value will be replaced by 0 whereas the remaining will be replaced by 255).
- **Histo-Equalization:** Contrast adjustment of the image histogram.

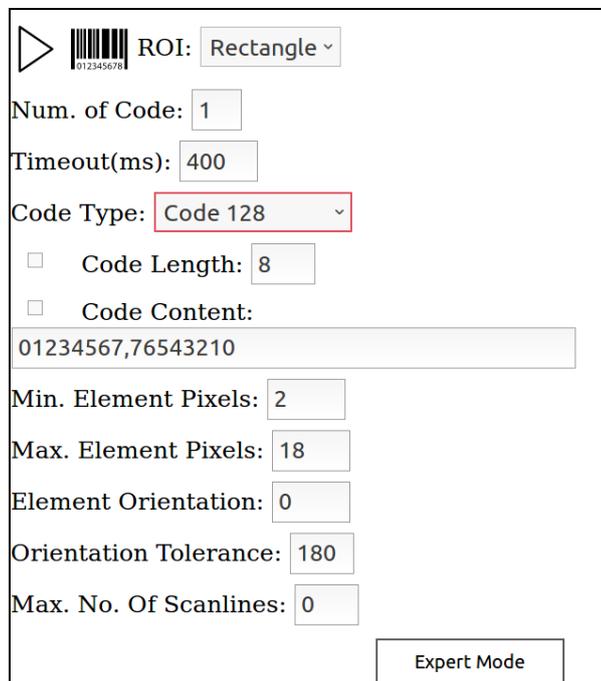
## 5.3 Barcode

Note that you must set the Mode selection to Code Reader mode. The VIS100 application can operate in either Code Reader or Blob mode.

 **Reference** Please refer to Section 4.2.4 for the details of the Mode Settings.

### 5.3.1 1D Barcode

Use the Barcode function to read and decode barcodes. You can improve the reading speed by reducing the search area (using an ROI) and through other settings



  ROI: Rectangle ▾  
 Num. of Code: 1  
 Timeout(ms): 400  
 Code Type: Code 128 ▾  
 Code Length: 8  
 Code Content:  
 01234567,76543210  
 Min. Element Pixels: 2  
 Max. Element Pixels: 18  
 Element Orientation: 0  
 Orientation Tolerance: 180  
 Max. No. Of Scanlines: 0  
 Expert Mode

- **Number of code:** Defines the maximum number of codes available in the image.
- **Timeout (ms):** Defines the timeout on this function to ignore the current decoding process and continue with the remaining commands in the inspection process.
- **Code Type:** Defines the barcode type for reading and decoding.
  - 2/5 Industrial
  - 2/5 Interleaved
  - Code 39
  - Code 93
  - Code 128
  - EAN - 8
  - EAN - 13
  - Pharma Code

- **Code Length:** Select this check box to check the length of the decoded barcode. The result is OK if the code length matches, NG if the code length does not match.
- **Code Content:** Select this check box to compare the decoded barcode with a defined reference. For multiple code content, add a “,” delimiter between two different results (for example “01234567,7654321”). The result is OK if the code matches, NG if the code does not match.

Expert Mode	<b>Recognition Mode</b>	<b>Standard:</b> Fastest for finding codes <b>Enhanced:</b> More accurate in finding codes but slower than Standard mode <b>Maximum:</b> Most accurate in finding codes but slowest compared to other modes
	<b>Mirror Type</b>	Defines if the codes might be mirrored
	<b>Polarity Type</b>	Defines the polarity of the codes in the image
	<b>Shape Type</b>	Defines the module code shape
	<b>Module Size</b>	Defines the minimum and maximum pixel size of the modules

**Default Setting:** Restore all parameter to default.

## 5.3.2 Data Matrix Code (DMC)

Use the DMC function to read and decode 2D Data Matrix codes. You can improve the reading speed by reducing the search area (using an ROI) and through other settings

ROI: Complete ▾  
 Num. of Code: 1  
 Timeout(ms): 200  
 Code Length: 2  
 Code Content:  
 01244734  
 Recognition Mode: Standard ▾  
 Mirror Type: Any ▾  
 Polarity Type: Any ▾  
 Shape Type: Any ▾  
 Module Size  
 Min[1~99]: 6 Max[2~99]: 20  
 Symbol Rows/Cols  
 RMin[8~144]: 8 RMax[8~144]: 144  
 CMin[10~144]: 10 CMax[10~144]: 144  
 Expert Mode

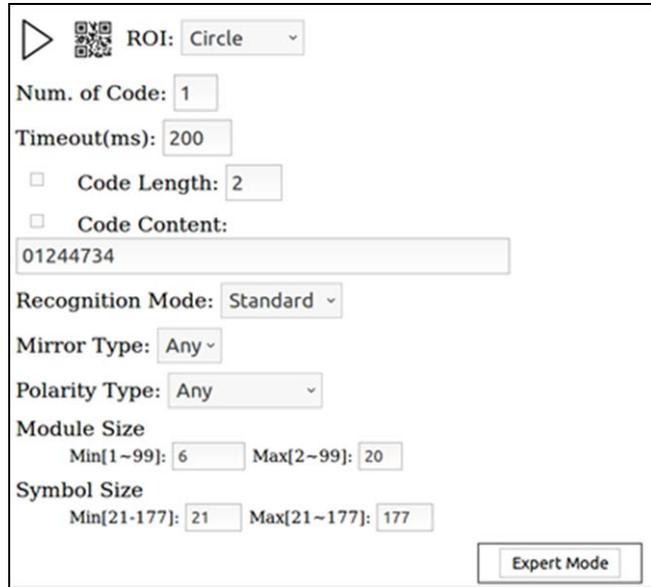
- **Number of code:** Defines the maximum number of codes available in the image.

- **Timeout (ms):** Defines the timeout on this function to ignore the current decoding process and continue with the remaining commands in the inspection process.
- **Code Length:** Select this check box to check the length of the decoded barcode. The result is OK if the code length matches, NG if the code length does not match.
- **Code Quality:** Select this check box to check the quality of the decoded barcode. The result is OK if the code quality matches the selected standard, NG if the code quality does not match the standard.
- **Code Content:** Select this check box to compare the decoded barcode with a defined reference. For multiple code content, add a “,” delimiter between two different results (for example, “01234567,7654321”). The result is OK if the code matches, NG if the code does not match.

Expert Mode	<b>Recognition Mode</b>	<b>Standard:</b> Fastest for finding codes <b>Enhanced:</b> More accurate in finding codes but slower than Standard mode <b>Maximum:</b> Most accurate in finding codes but slowest compared to other modes
	<b>Mirror Type</b>	Defines if the codes might be mirrored
	<b>Polarity Type</b>	Defines the polarity of the codes in the image
	<b>Shape Type</b>	Defines the module code shape
	<b>Module Size</b>	Defines the minimum and maximum pixel size of the modules
	<b>Symbol Rows</b>	Defines the minimum and maximum number of rows in the symbol
	<b>Symbol Cols</b>	Defines the minimum and maximum number of columns in symbol

## 5.3.3 QR Code

Use the QR Code function to read and decode 2D QR codes. You can improve the reading speed by reducing the search area (using an ROI) and through other settings.



The screenshot shows the configuration window for the QR Code inspection tool. It includes the following settings:

- ROI: Circle (dropdown menu)
- Num. of Code: 1 (input field)
- Timeout(ms): 200 (input field)
- Code Length: 2 (input field)
- Code Content: 01244734 (input field)
- Recognition Mode: Standard (dropdown menu)
- Mirror Type: Any (dropdown menu)
- Polarity Type: Any (dropdown menu)
- Module Size:
  - Min[1~99]: 6 (input field)
  - Max[2~99]: 20 (input field)
- Symbol Size:
  - Min[21~177]: 21 (input field)
  - Max[21~177]: 177 (input field)
- Expert Mode (button)

- **Number of code:** Defines the maximum number of codes available in the image.
- **Timeout (ms):** Defines the timeout on this function to ignore the current decoding process and continue with the remaining commands in the inspection process.
- **Code Length:** Select the check box to check the length of the decoded barcode. The result is OK if the code length matches, NG if the code length does not match.
- **Code Quality:** Select this check box to check the quality of the decoded barcode. The result is OK if the code quality matches the selected standard, NG if the code quality does not match the standard.
- **Code Content:** Select the check box to compare the decoded barcode with a defined reference. For multiple code content, add a “,” delimiter between two different results (for example, “01234567,7654321”). The result is OK if the code matches, NG if the code does not match.

Expert Mode	<b>Recognition Mode</b>	<b>Standard:</b> Fastest for finding codes <b>Enhanced:</b> More accurate in finding codes but slower than Standard mode <b>Maximum:</b> Most accurate in finding codes but slowest compared to other modes
	<b>Mirror Type</b>	Defines if the codes might be mirrored
	<b>Polarity Type</b>	Defines the polarity of the codes in the image
	<b>Module Size</b>	Defines the minimum and maximum pixel size of the modules
	<b>Recognition Mode</b>	<b>Standard:</b> Fastest for finding codes <b>Enhanced:</b> More accurate in finding codes but slower than Standard mode <b>Maximum:</b> Most accurate in finding codes but slowest compared to other modes

### 5.3.4 Micro QR Code

Use the Micro QR Code function to read and decode 2D Micro QR codes. You can improve the reading speed by reducing the search area (using an ROI) and other settings

ROI: Complete ▾  
 Num. of Code: 1  
 Timeout(ms): 200  
 Code Length: 2  
 Code Content:  
 01244734  
 Recognition Mode: Standard ▾  
 Mirror Type: Any ▾  
 Polarity Type: Any ▾  
 Module Size  
 Min[1~99]: 6 Max[2~99]: 20  
 Symbol Size  
 Min[11~17]: 11 Max[11~17]: 17  
 Expert Mode

- **Number of code:** Defines the maximum number of codes available in the image.
- **Timeout (ms):** Defines the timeout on this function to ignore the current decoding process and continue with the remaining commands in the inspection process.

- **Code Length:** Select this check box to check the length of the decoded barcode. The result is OK if the code length matches, NG if the code length does not match.
- **Code Quality:** Select this check box to check the quality of the decoded barcode. The result is OK if the code quality matches the selected standard, NG if the code quality does not match the standard.
- **Code Content:** Select this check box to compare the decoded barcode with a defined reference. For multiple code content, add a “,” delimiter between two different results (for example, “01234567,7654321”). The result is OK if the code matches, NG if the code does not match.

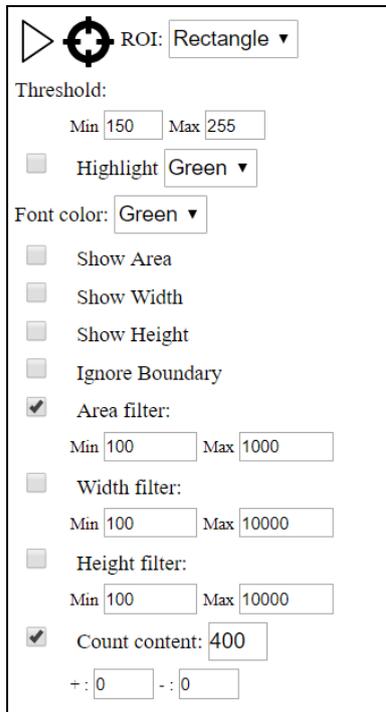
Expert Mode	<b>Recognition Mode</b>	<b>Standard:</b> Fastest for finding codes <b>Enhanced:</b> More accurate in finding codes but slower than Standard mode <b>Maximum:</b> Most accurate in finding codes but slowest compared to other modes
	<b>Mirror Type</b>	Defines if the codes might be mirrored
	<b>Polarity Type</b>	Defines the polarity of the codes in the image
	<b>Module Size</b>	Defines the minimum and maximum pixel size of the modules
	<b>Recognition Mode</b>	<b>Standard:</b> Fastest for finding codes <b>Enhanced:</b> More accurate in finding codes but slower than Standard mode <b>Maximum:</b> Most accurate in finding codes but slowest compared to other modes

## 5.4 Blob

Note that you must set the Mode selection to Blob mode. The VIS100 application can operate in either Code Reader or Blob mode.

 **Reference** Please refer to Section 4.2.4 for the details of the Mode Settings.

You can use the **Blob** function when the image contains various regions of brightness that are clearly separated from each other. All ranges with the same grayscale threshold are marked. If too many objects are found, use additional conditions to limit the number of detected objects.



- **Threshold:** Finds the gray value between the minimum and maximum pixel values in the image.
- **Highlight:** Select the check box then select the color for the gray scale. The color is highlighted in the view when using Run Once.
- **Font color:** Select the check box to choose the font color including the Area, Width, and Height labels.
- **Show Area:** Select the check box to show the area of the blob.
- **Show Width:** Select the check box to show the width of the blob.
- **Show Height:** Select the check box to show the height of the blob.

- **Ignore Boundary Objects:** Select the check box to ignore detected objects that are in direct contact with the boundary of the search region.
  - **Area Filter:** Select the check box to define the minimum and maximum area size of detected objects. The function ignores values outside this range.
  - **Width Filter:** Select the check box to define the minimum and maximum width size of detected objects. The function ignores values outside this range.
  - **Height Filter:** Select the check box to define the minimum and maximum height size of detected objects. The function ignores values outside this range.
  - **Count Content:** Select the check box to count the blobs with the specified  $\pm$  tolerance. The result is OK if the count matches within the tolerance, NG if the count does not match.
  
- **Default Settings:** Restore all parameter to default.

# Chapter 6

## Troubleshooting

### 6.1 Troubleshooting Steps

If there is no response after you enter the username and password on Login page.

Try the following actions to resolve the problem.

- Reboot the camera.
- Delete the web browser cache and cookies.
- Go to the “Information” pages to verify the Version, ID, License and Date. If no information is listed for those values, reinstall the application software.
- Verify that you have put the “license.lic” file in the camera’s “/opt/Smart-X” directory.
- Remove the old settings “settings.json” file in camera’s “/opt/Smart-X” directory and reboot the camera.