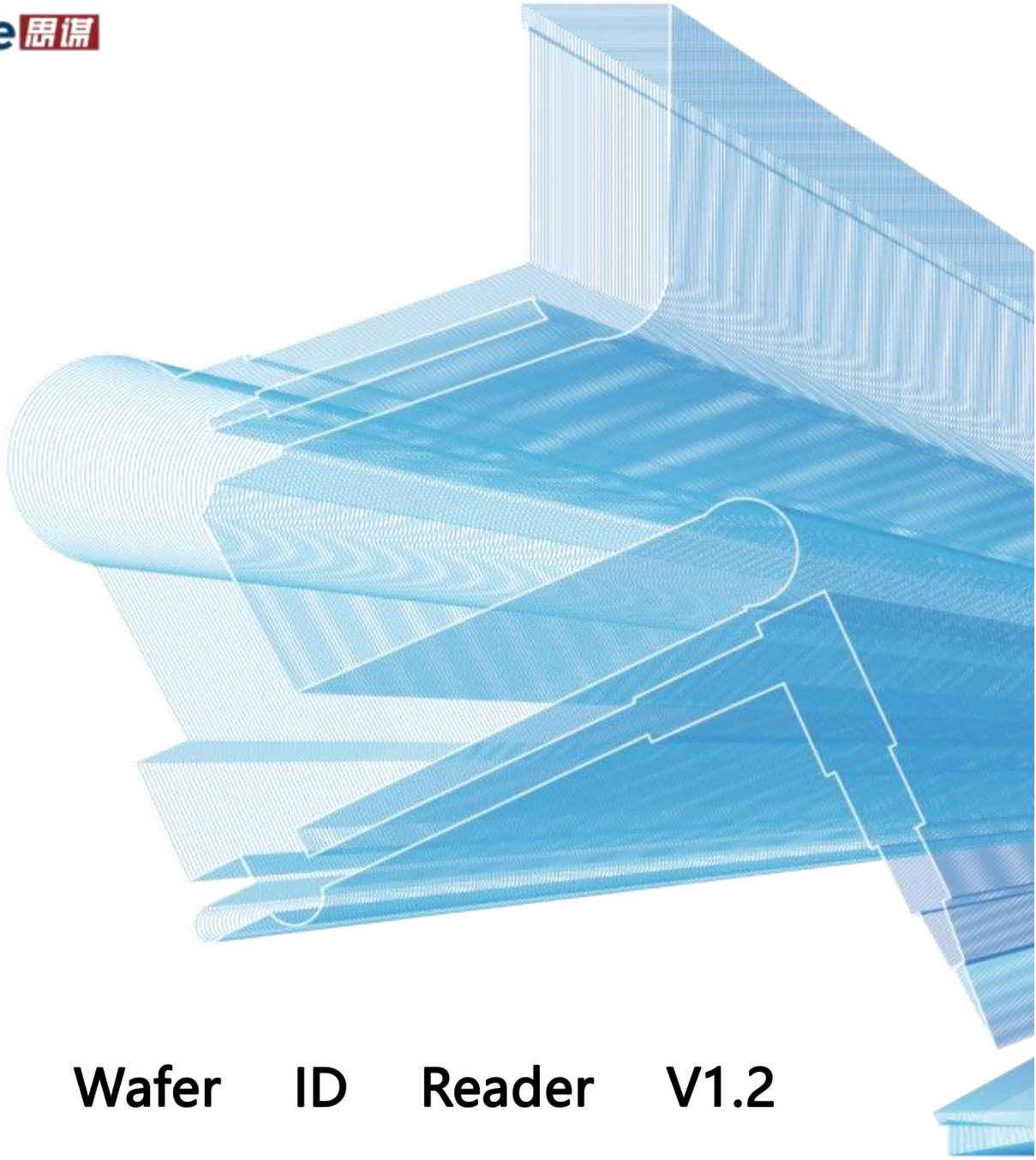

SMore Wafer ID Reader V1.2

SMart More

2022-12-14

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Any changes or modifications not expressly approved by the party responsible for compliance

could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception,

which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different

from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help. The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction

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1 Introuction

1.1 Introduction to the SMore Wafer ID Reader Platform

The SMore Wafer ID Reader is an end-to-end wafer character recognition system. In the production of a silicon semiconductor integrated circuit, each wafer has a string characteristic, namely wafer ID. In practice, wafer manufacturers engrave the wafer ID on the front or back of the wafer. The wafer ID is generally composed of capital letters + numbers and bars ('-'). The length is generally 12 bits, and different digits of wafer ID will occur in unconventional cases. The main purpose of wafer ID is to control the wafer production process and record the production status of each wafer in different processes, so as to quickly retrace the production process of the wafer and control the production quality. The current system, highly integrated deep learning OCR character reading Mark and SEMI-T7 DM code reading Mark, lighting imaging scheme is integrated and highly integrated, and support TCP/IP and RS-232 machine communication protocols, fast and production machine communication, suitable for sorting machine, testing machine, PVD machine and other wafer production machine character reading and traceability.

1.2 Business Support

	Character reading is used to achieve production traceability before film deposition.

	Applied to the wafer test machine, the wafer ID is input into the bare chip on the wafer before testing the function and electrical parameters through the probe table and the test machine, and then the real-time test information is recorded.
	When applied to the wafer marking machine, input the wafer ID using wafer ID after the marking is completed, and check whether the marking result is qualified.
	When applied to the wafer sorter machine, the character reading is performed when sorting out the different batches of wafers to realize the production traceability.
	Applied in the wafer packaging machine, before the wafer batch packaging, the character reading, to achieve the production and delivery traceability.

1.3 Noun Interpretation

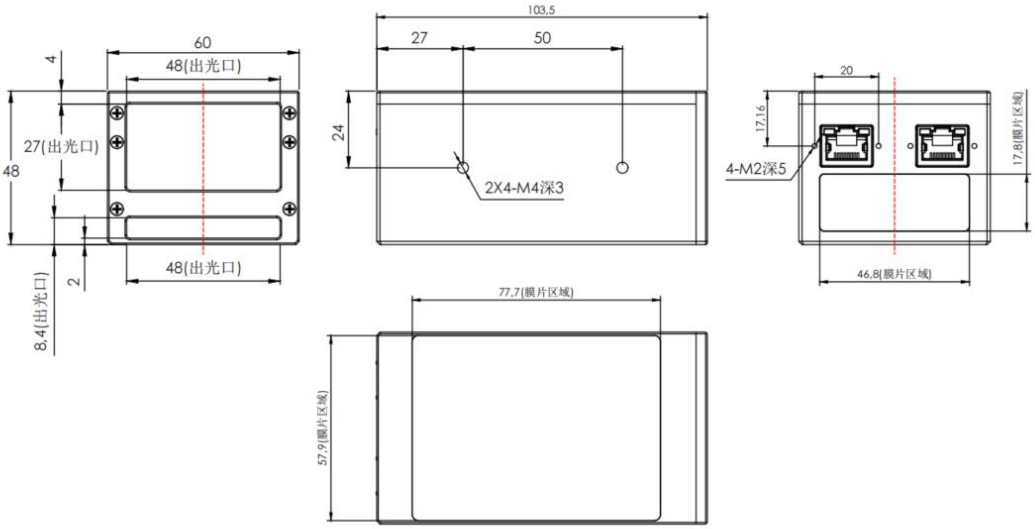
Level I directory	second-level directory	Level 3 directory	description
File Managing job file	Job	-	File tab, corresponding to different wafer product models of different production modes during the use process of wafer ID, one file corresponds to one wafer production mode, one file, containing a variety of configurations. Support for creating a new job [New], load a exist job [Load], save a new job [Save], save as a new job [SaveAs]
Acquire Single acquisition of an image	-	-	After logging in to the software, communicate with the hardware camera and control the camera to single image acquisition.

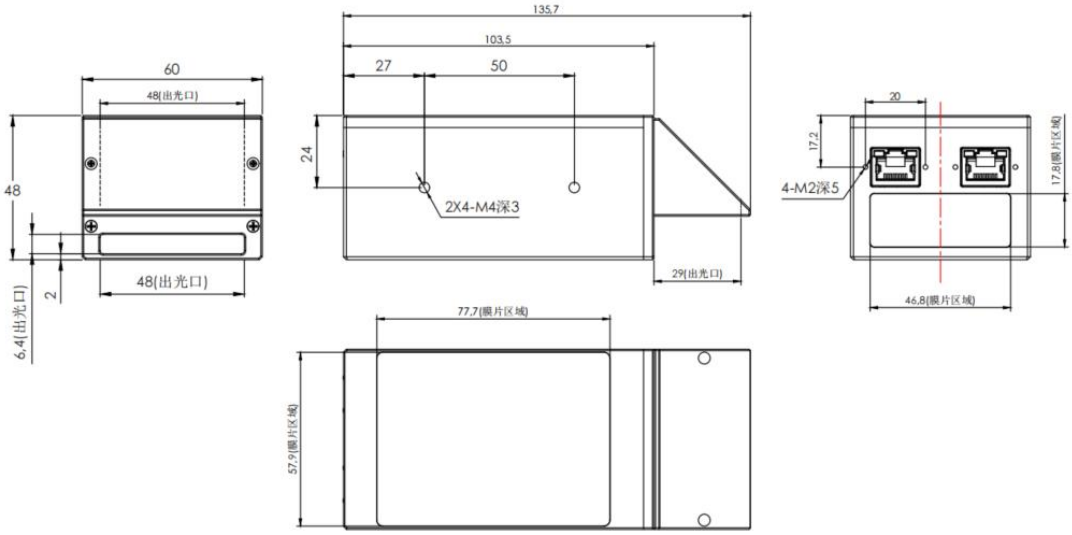
Live Image circular collection	-	-	After logging into the software, the control camera cycles to collect the images.
Setup	Config	-	For the currently produced wafer, the set wafer imaging scheme and identification formula, each configuration, includes a base configuration, a light source configuration.
		General Base configuration	Set the wafer image display mode, including setting the image orientation [Image Orientation], the content character or DM code [Mark] required to be identified, and the character length check [Length]
		Lighting Manual light setting,	For the current production of the wafer, the set of the all-in-one lighting imaging mode, including manually setting the different channel light source switch and lighting brightness adjustment. Turn on the light source controller communication [Com]
		Turning Automatic source	For the currently produced wafers, the set all-in-one lighting imaging mode will automatically set different channel light source switches and lighting brightness adjustment according to the input string content to find the optimal light source configuration.
	Options Communication option	-	Establish communication connection with the machine for the console installed in the current product.
		I/O configure	Trigger mode in different scenarios; set according to the host computer communication mode, and triggering is generally supported by TCP / IP and serial port communication mode.
		daily record Logging	Record the options for each work task, including the identified results, running time, whether to read failed, etc.
Run Config Run the configuration	-	-	In the currently selected configuration mode, run the image acquisition and result inference process to show the recognized results.
Run All Config Run all configurations	-	-	In all the configurations checked currently, run an image acquisition and result inference cycle process to show the results identified by each configuration.
Run	-	-	When the software is in running mode, each requested run result statistics and associated log statistics are shown here.

2 Hardware

2.1 Structure

Imaging all-in-one machine (Assembled in the industrial equipment,on the top of the wafer side**)**



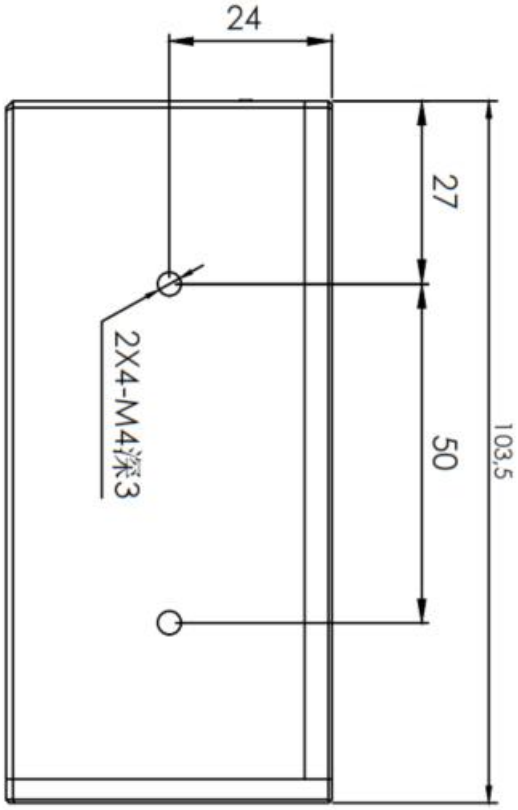


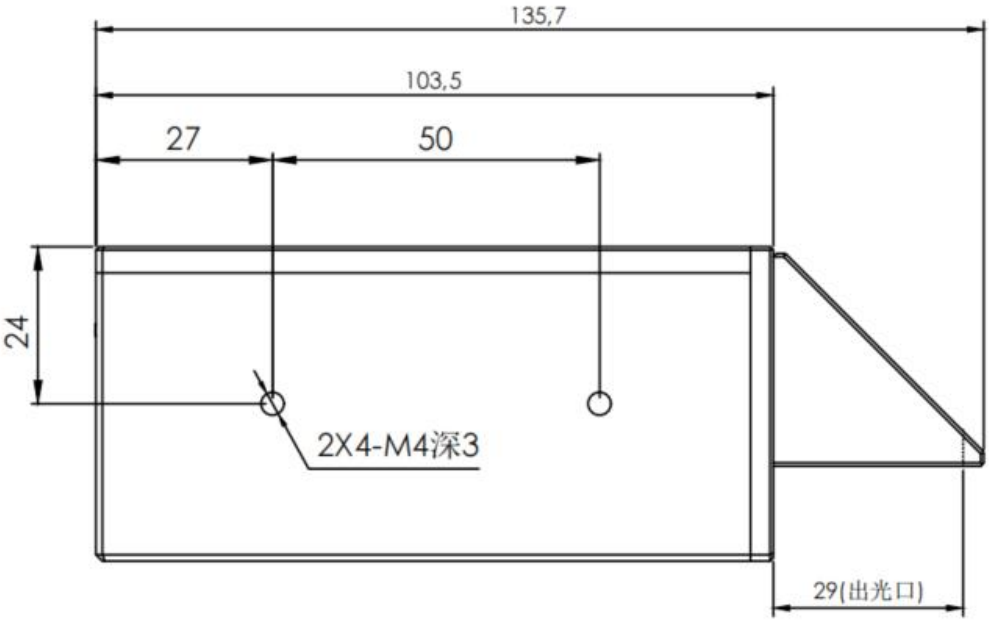
2.1.1 Hardware Composition

Imaging specifications	function	description
image acquisition	type	CMOS
	target surface	1/2.9"
	resolution ratio	1440*1080
	Like a meta size	3.45um
	Pixel format	8bit,mono
	articulation	5M
	exposure time	Extrashort time exposure of 1us-14us
	depth of field	±3mm
	gain	0~24dB
illuminant	Lighting area	35*35mm
	Lighting mode	8-Channel free combination
	illumination intensity	Configured by the software
	LED	white light LED
communication interface	ETHERNET	Camera communication
	RS485	Light source communication
	±24V	Machine power supply
	digital display	Light source brightness display
installation size	Imaging all-in-one machine	60x48x104mm

2.1.2 Platform Installation

Imaging all-in-one machine, installation hole bit map:

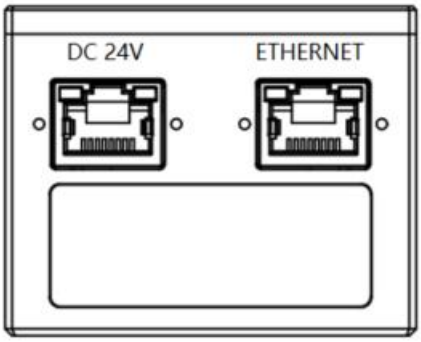

24
27
50
103,5
2X4-M4深3


135,7
103,5
27
50
24
2X4-M4深3
29(出光口)

2.2 Terminal Port

The device supplies connections for 24VDC power source

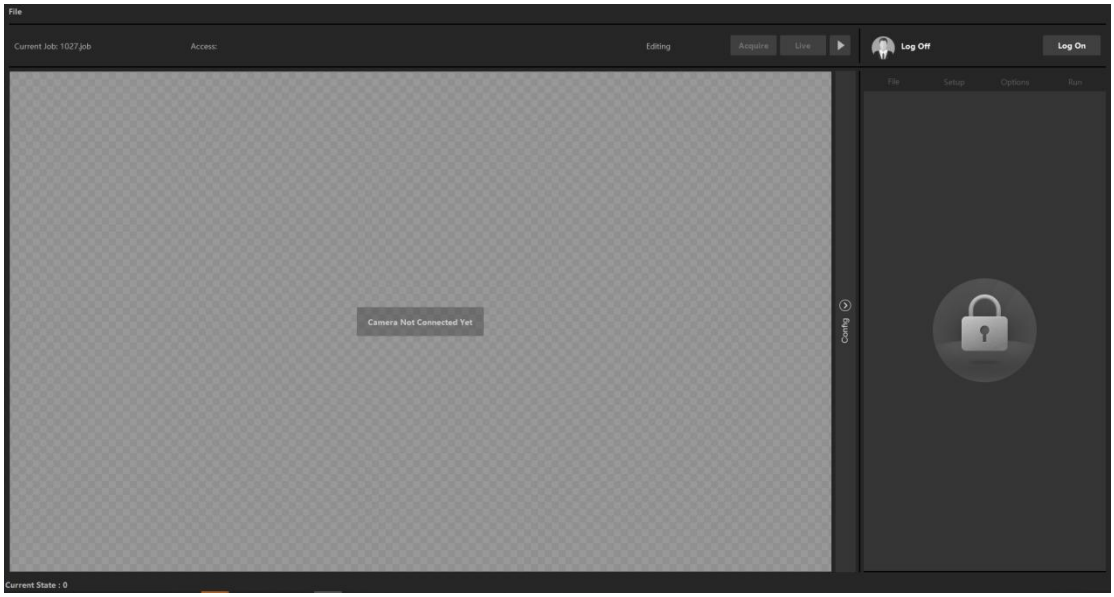
ETHERNET：This port is used for camera communication

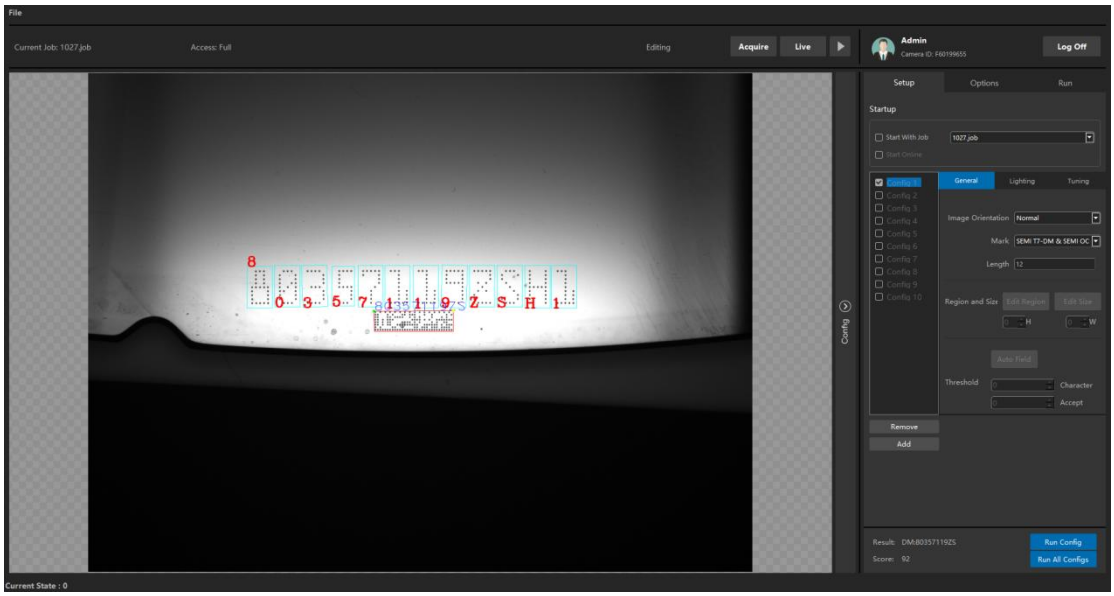


3 Software

Wafer ID Reader software, supports the creation of multiple job files, each file supports the creation of multiple configurations (config), each config corresponds to an imaging mode, Mark configuration, light setting.

3.1 GUI Overview



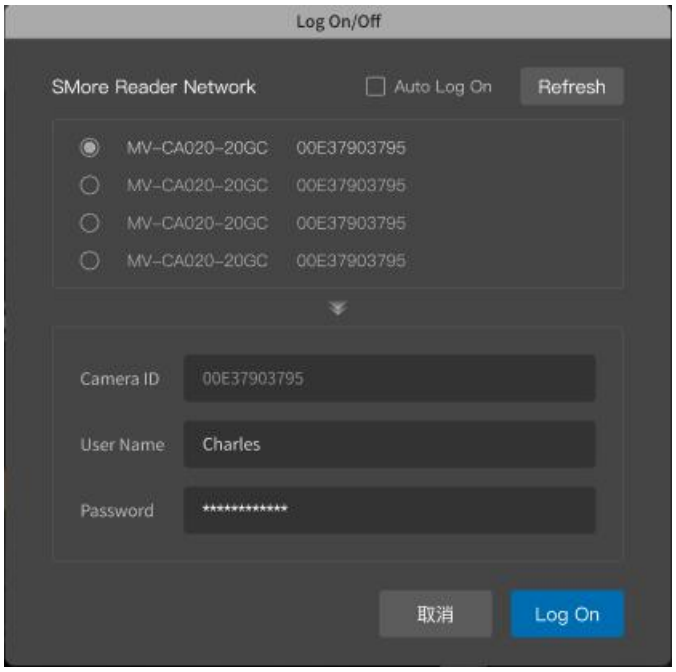


3.2 Login

The Wafer ID Reader software supports different user rights.

The default is the super administrator account, admin account, admin account has the highest management and operation rights for the software.

account number	authority	function
Super administrator	Highest administrative and operational privileges	1、The default of the account, login name: admin, password: ABC123



3.3 Connect the Camera

After logging on to the Wafer ID Reader,images are required before performing the Wafer ID Read software configuration.

Click [Acquire] to collect the image; click once to collect the image one time.

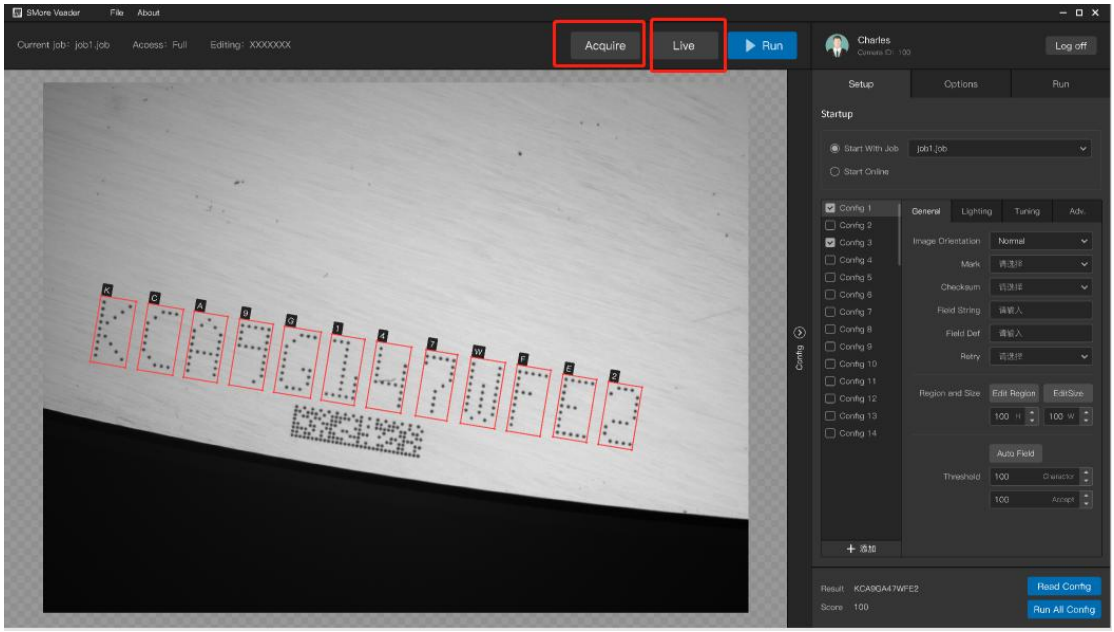
Click [Live], collect the images, click once, can collect the images.

In Live mode, move the wafer to ensure that the wafer character is located

throughout the field of view.

In Live mode, the software cannot be configured.

When all characters appear throughout the visual range, click the acquire button to exit living mode and start configing the job.



3.4 Job File Settings

The File table provides access to job files stored in storage of the edge controller.

Support setting file, and image setting by clicking the **File** button in the upper left corner.

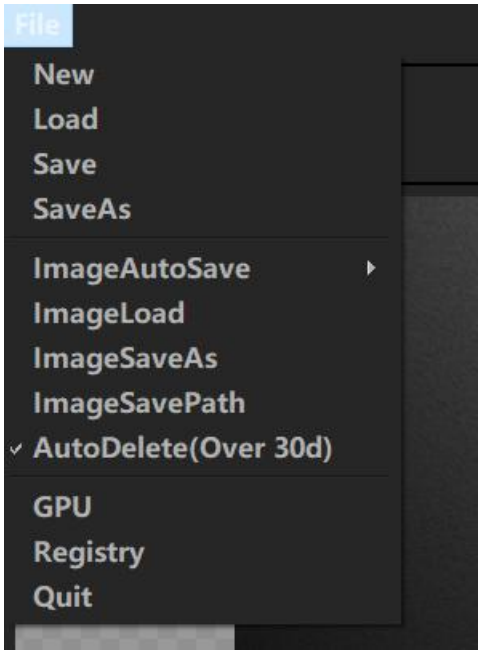
[Job]

Open the software for the first time, there is a default file job in the system named SMWAFID00.job,this job cannot be deleted.

To use the software, at least one job file must be stored on the Wafer ID Reader.

[Image save settings]

The Wafer ID Reader software supports saving the images collected by the current view in the system.



3.4.1 File Settings

a) New

The wafer ID Reader support creating a new file job.

To save a new job:

1 Click the **File** in the top left corner table

2 Click the **New** button

3 Enter the new file job name in the current dialog

4 Clicking **OK** to save the new file job, and the software system automatically opens the new file job. All the configurations are empty and need to be reconfigured.

The file job name supports Chinese letters, English letters, special symbols, and the Windows file naming format is consistent, the maximum number of 10 characters, the job's suffix is xxxx**. job**. If you want to exit ,click the **Cancel** button to end the processing.

b) Load

Load

The wafer ID Reader is supporting to open an existing file job.

To open an existing job:

1 Click the **File** in the top left corner table

2 Click the **Load** button, and load the target file from the folder in the selected location.

There are multiple job under the current folder, loaded in batches into the software system.

c) Save

Save

The wafer ID Reader is supporting to save any current file job.

To save changes to an opened job:

1 Click on the **File** table in the top left corner table

2 Click **Save** button,save the current configuration to the selected job, with the shortcut key: Ctrl + S.

d) SaveAs

SaveAs

The wafer ID Reader is supporting to save any current file job as a new file job.

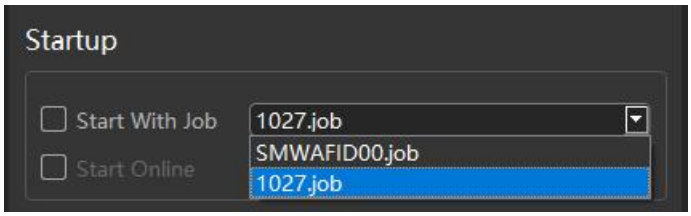
To save as a new file job:

1 Click on **File** in the top left corner,

2 Click **SaveAs** button, pop up the system table,

3 Enter the new job name, and click the **OK** to save the current configuration to a new job in a new local file folder.

e) Changing the Startup Job



To choosing the working job:

1 Click on the **Setup** table

2 Click on the **Start With Job** in **Startup** table

3 Select the right **file job** in the form of **Start With Job** list

4 Make sure the **Start With Job** checkbox is enabled.

F) Running the Job

After **Start With Job** checkbox is enabled, the configuration of the current job is available during runtime operation.

3.4.2 Image Settings

The wafer ID Reader is supporting to save images during the process of drawing acquisition.

a) Auto Save Images

To save images during processing:

1 Click the **File** in the top left corner table

2 Click the **ImageAutoSave** button to choose a image format of the saved image

3 Make sure the format is checked

4 You can get a lot of images during processing operation

Note: When this option is checked, it supports the images to be automatically saved. Every time the camera collects the images, the images will be automatically saved in the default image memory path.

Support to save as jpg, bmp,and png.

Make sure your hardware storage has enough space to save the pictures,otherwise the hardware system might collapse.

b) ImageSavingPath

ImageSavePath

The wafer ID Reader is supporting to change the image saving path.

To change the saving path,

1 Click the **File** in the top left corner table

2 Click the **ImageSavePath** button

3 Select the system folder, and set the image save path

4 Click **OK** to save the change

Note:The default image path is under the installation path.

c) ImageSaveAs

ImageSaveAs

The wafer ID Reader is supporting to save the currently collected images to other folders on the system.

To save current collected image:

1 Click the **File** in the top left corner table

2 Click the **ImageSaveAs** button

3 Select the system folder to save current collected image

4 Click **OK** to save the image

d) Load Image

ImageLoad

The wafer ID Reader is supporting to load local image for current mark config/configs

processing.

To process a local image:

1 Click the **File** in the top left corner table

2 Click the **ImageLoad** button

3 Choose an exit image

4 Click **OK** button

5 Click **Run Config/Run All Config** to get the result

Note: Using the current configuration to process the local image,is generally used to verify historical drawing and imaging configurations.

e) Remove Images Regularly

The wafer ID Reader is supporting to delete the saved images automatically.

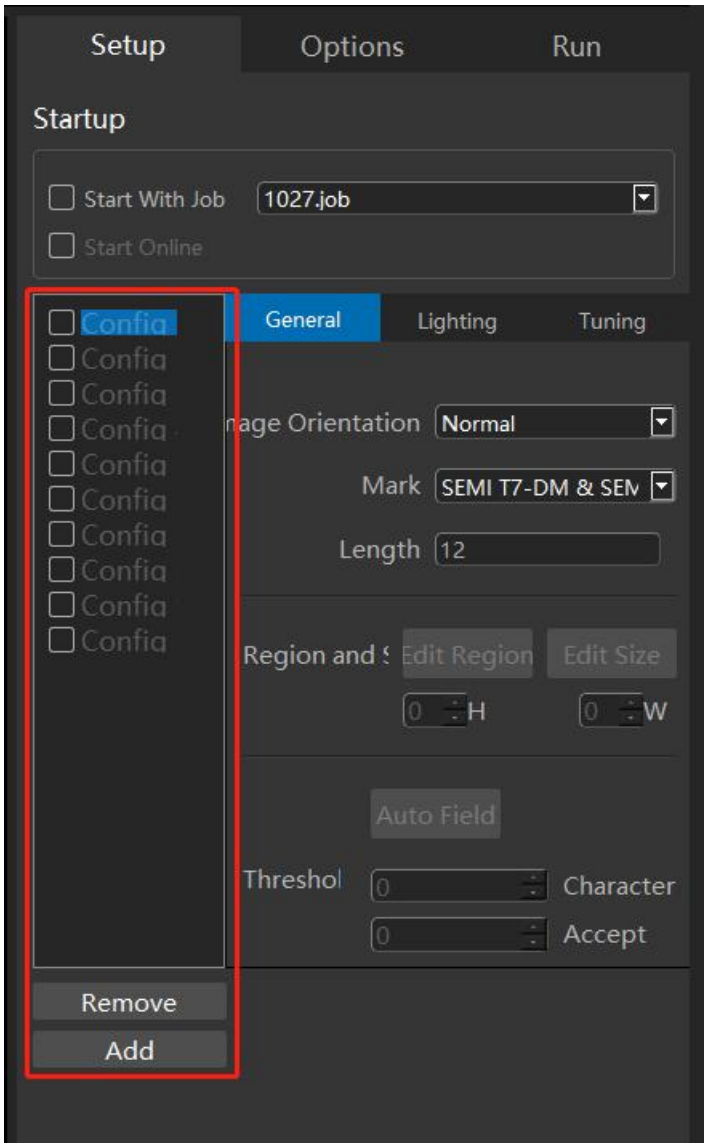
To delete the saved images automatically:

1 Click the **File** in the top left corner table

2 Click the AutoDelete button to make sure it is enable

Note: If the image saving function is set, in order to save storage space and avoid some hardware system collapse, the software could delete the images 30 days ago automatically.

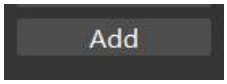
3.5 Configuration



Each file job supports multiple configurations for different wafer surfaces. When multiple configurations are set, the highest score is sent to the console for the current wafer after each read.

Configuration supports centralized management, including adding configuration, modifying configuration, deleting configuration and reading configuration.

3.5.1 Add Configuration



The wafer ID Reader's file job is supporting to add configuration.

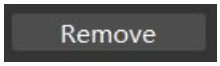
To add new configuration:

1 Click the [+ Add] button to add the config configuration

2 After clicking, add a blank config in the config list with the default name

Note: In each job, the configuration list has 10 configurations by default, generally only one is required. The list is supporting up to 50 configurations.

3.5.2 Remove Configuration



The wafer ID Reader's file job is supporting to remove configuration.

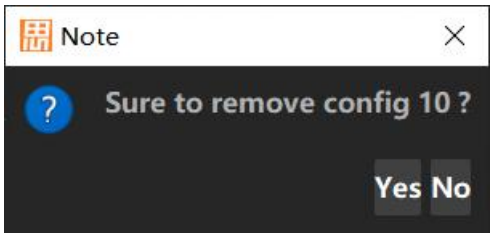
To remove configuration:

1 Click a certain configuration in the configuration list

2 Click **Remove**, pop up the delete option

3 Click **Delete**, then remind whether to delete,

4 Click **Yes**,then the current selected configuration is completely deleted,or **No** exit the delete state.



3.5.4 Modify Configuration

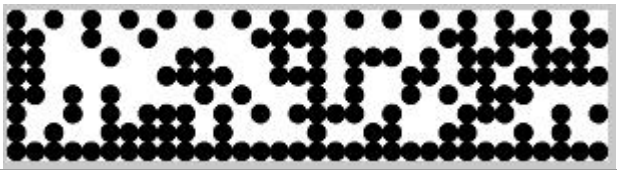
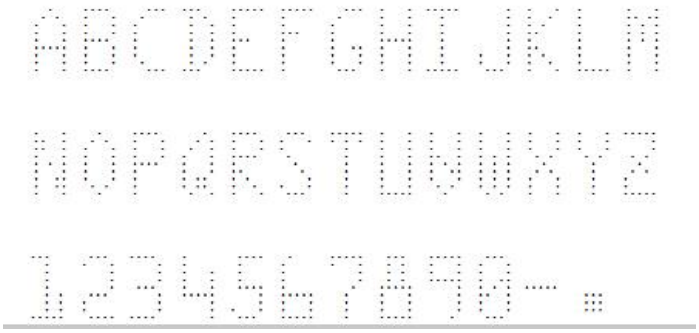
Select the configuration that needs to be modified.

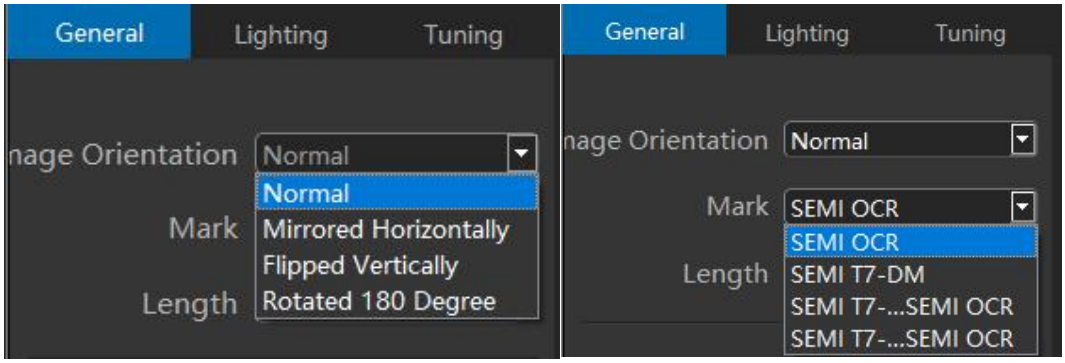
3.5.4.1 System Settings

[**Image Orientation**] The wafer ID Reader's file job is supporting to set the image direction and support 4 type of directions.

Selection	paraphrase
Normal-Normal mode	Default mode, the original image by the wafer ID reader.
Mirrored horizontally-Horizontal flip	Horizontally mirrors the original image.
Flipped vertically-Vertical flip	Vertically flips the original image .
Rotated 180 degrees-180° flip	Rotates the original image by 180 degrees.

[**Mark**]The wafer ID Reader identifies wafers marked according to the following Specifications.

type	paraphrase
2D,T7 Data Matrix	Standard SEMI-T7 Data Matrix code,with 8 rows, 32 columns, dot character. Matrix code symbol marked on the back surface of 300mm wafers. 
Chars ,SEMI	Standard SEMI M12, M13 strings. Defines the characteristics and positioning of the 12-character alphanumeric string marked on the front surface of 100/125/150mm (flatted) and 150/200mm (notched) wafers. 



3.5.4.2 Light Setting

The wafer ID Reader system has a total of 8-channel light sources, which support the control of different-channel light source switches and brightness to achieve different lighting effects.

Light Mode: According to the different wafer material mode setting different lighting mode.Each position on the Light Mode slider control enables specific groups of LEDs to achieve the intended effect in the material.

Light Power: The Light Power setting controls the effective intensity of the LEDs on the mark by change light power number. Brightness of the selected light source bead, with an adjustable range of 0~255.

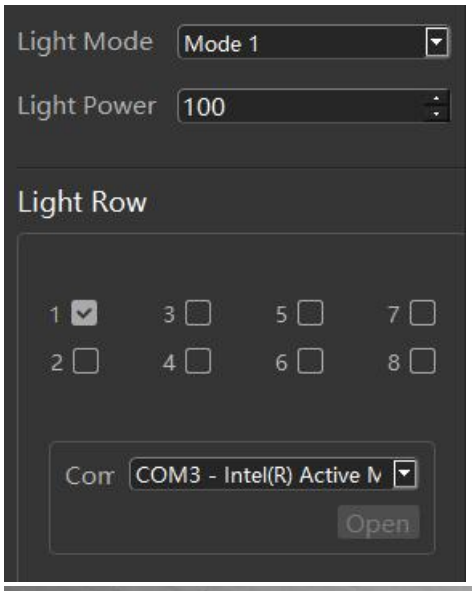
Light Rows: Channel for the optional light source.

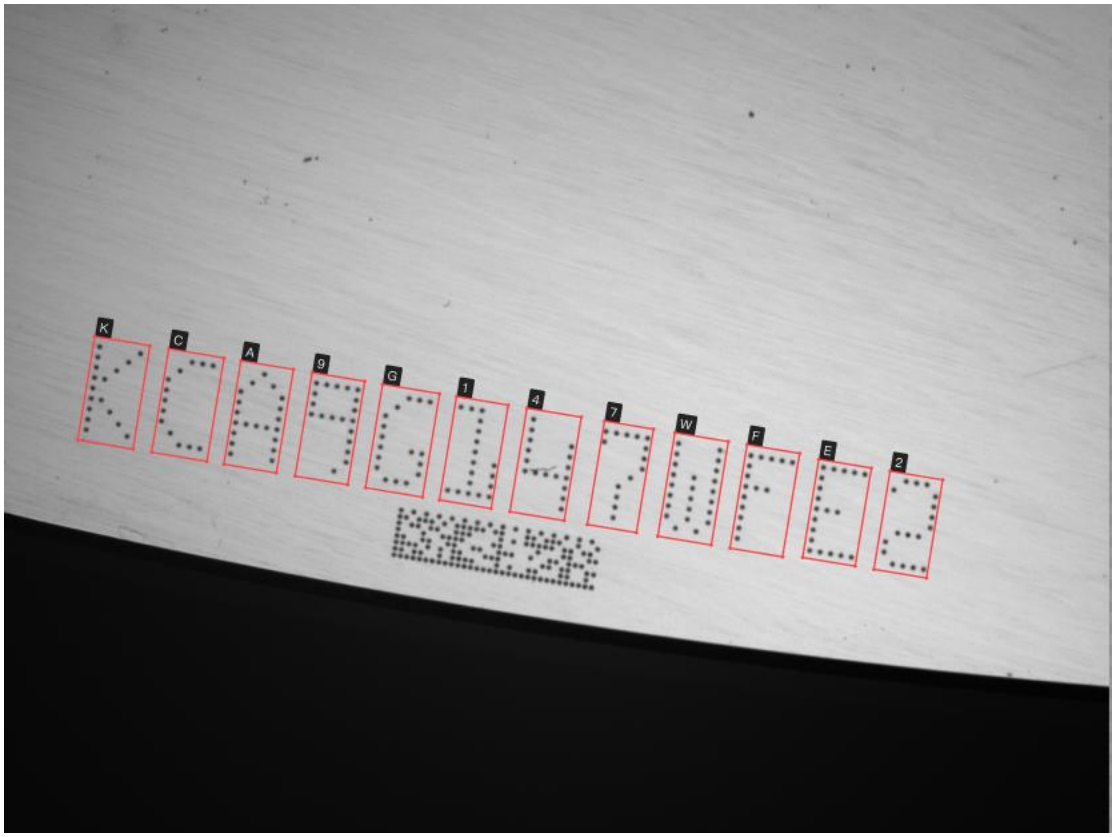
To set the light setting:

1 Click to choose any light sources **Light Rows**

2 Click to set **Light Power** to any number

e. g., Click **Light Rows'** Channel 5, set Light Power to 100, the left image area is displayed in real time, the light source channel 5 is opened, with the luminance is 100.





3.5.4.3 Light Intelligent Setting

The wafer ID Reader is supporting to auto search for the best light source.

Built-in best-matching Mark automatically searches the best light source imaging configuration by entering a target string.

Match String: The target string, namely, the character of the current visual field material;

String: The characters identified by the wafer ID Reader during the automatic search

process.

Score: In the process of automatic search, the higher the score of the characters identified by the wafer ID Reader, the better the lighting setting.The score range is 0~100.

To use the Light Intelligent Setting:

1 Enter the string of the current target item in **Match String**

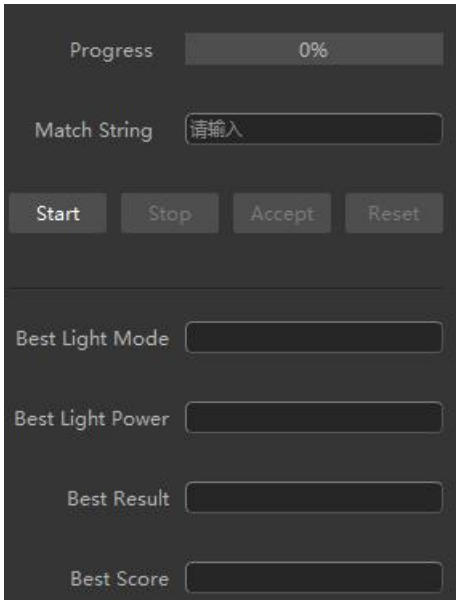
2 Click **Start** for intelligent search

3 During the search process, you can click on the **Pause** at any time to pause the current process

4 Then the Light rows displays the current searched light source channel and brightness

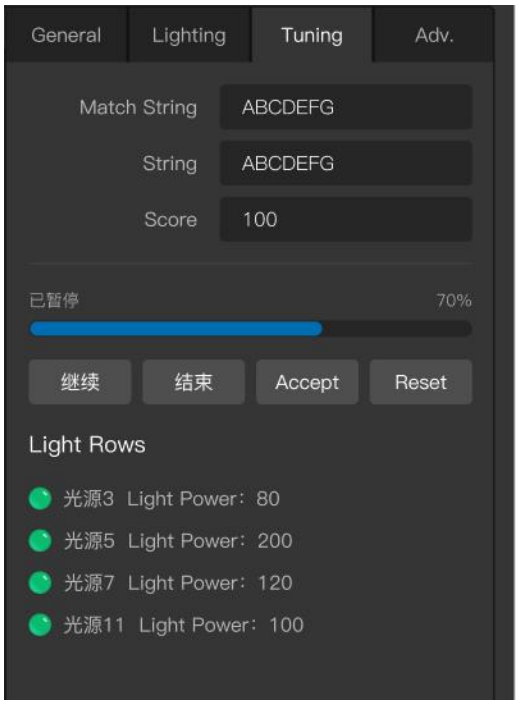
5 Or click **Stop** to end the current search process, when the Light rows displays the best (highest score) source channel and brightness from the start to the current search.

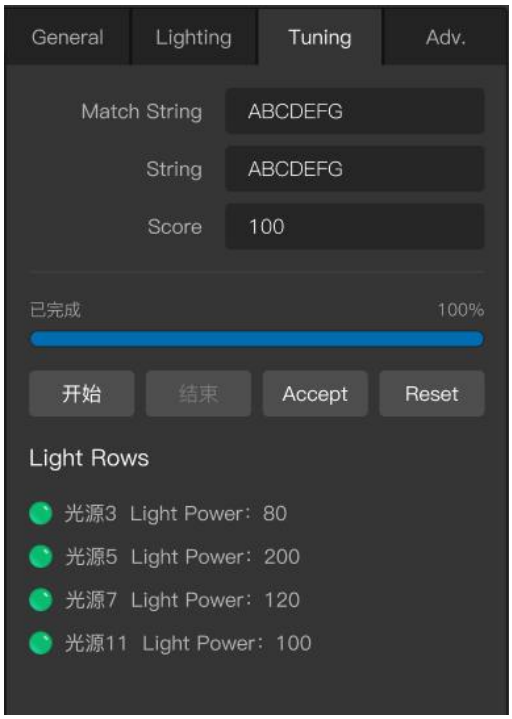
6 After completing the best light source search, the progress stops, click **Accept** to accept the best light source configuration of the system search, and the corresponding light source configuration of **Lighting** is set to the **Light Rows** light source parameter in Turning; otherwise, the light source will not be changed.



Notes:After clicking **Pause**, the same position turn out to be **Continue** for clicking to continue the intelligent search process.

Click **Reset** to reset the corresponding light source configuration of **Lighting** to the initial light source state, and to reset all the results and configurations of **Turning**.

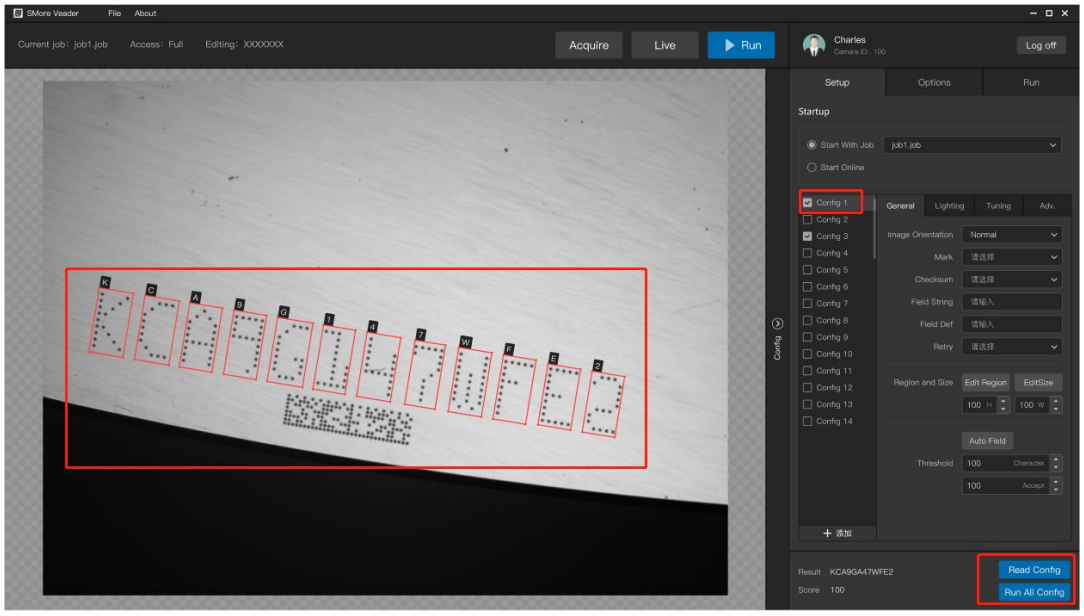




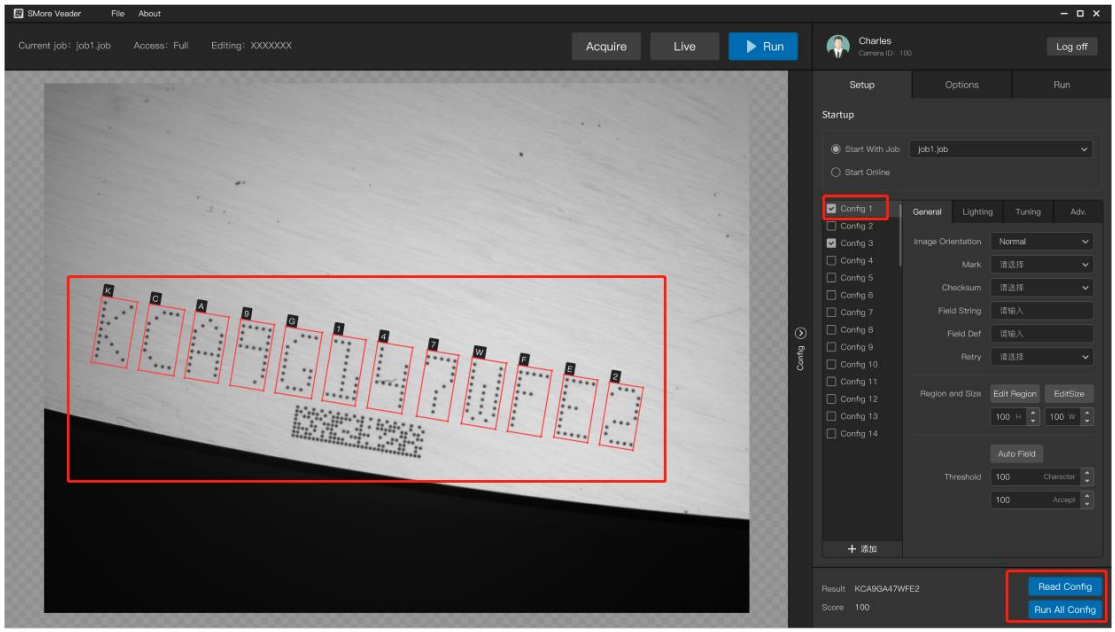
3.5.5 Read the Configuration

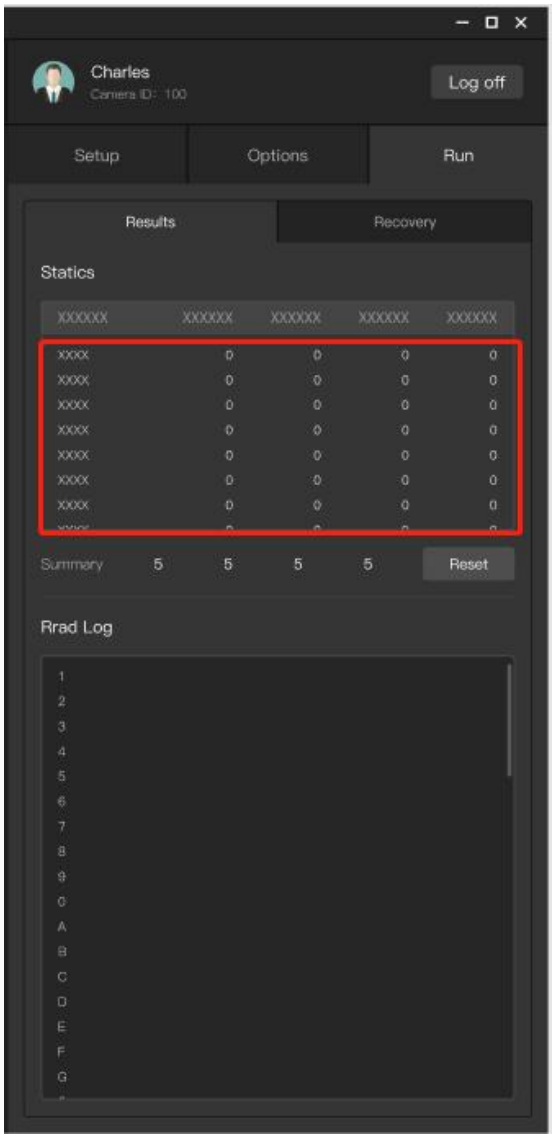
After the configuration setting is completed, select a certain configuration in the configuration list, and click **Read Config**, and then the system will read current image with

the current configuration to show the recognition effect.



After the configuration setting is completed, check multiple configurations in the configuration list and click **Run All Config**, then the system conducts image reasoning with all the current configurations to show the identification effect, and go to the **Run** table. You can click to switch the corresponding identification result of each **config** configuration.





4 Communication

4.1 Input/Output

The input/output option sets how to start the reads on the wafer reader, and the data format of the output results.

Trigger:Select the trigger source to acquire the image and start work in three modes.

Selection	paraphrase
Local	In this mode, The wafer reader reads automatically, without interacting with any upper device connection.

Camera	The wafer reader reads when it receives a pulse sent from an external trigger source.
Network	The wafer reader reads when it receives a READ command from a remote network host through a TCP/IP device connection at the specified Port.
Serial	The wafer reader reads when receiving the READ command from a remote RS-232 serial device.

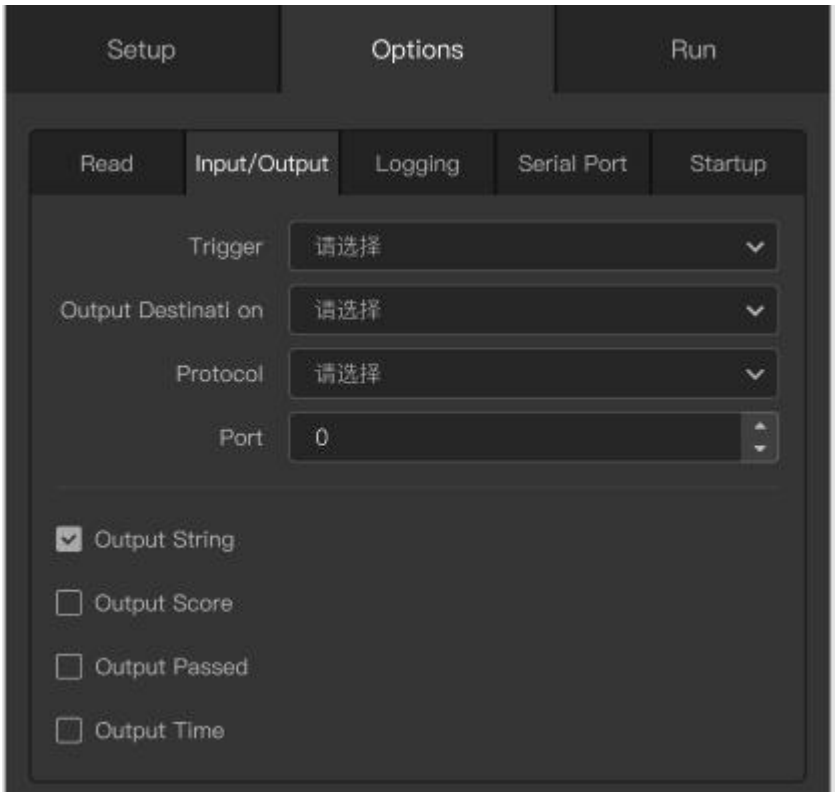
Protocol: Defines the command protocol sent by the remote device, and the format of the resulting data.

Port: Use the specified TCP/IP port number when selecting Network in either Trigger or Output Destination. This port number is a TCP/IP connection between the wafer reader (TCP/IP server waiting for communication) and the remote device (TCP/IP client starting the communication). You **can modify the default port to any unused port number between 1024 and 49151**.

The check boxs **[Output String] [Output Score] [Output Passed] [Output Time]** is used to select the result data that will be sent to the output target after the read.

By default, only the **Output String** box is selected.

After the **Output Passed** box checked, the passed result data is "1.000", and the failed result data is "0.000"



Serial :

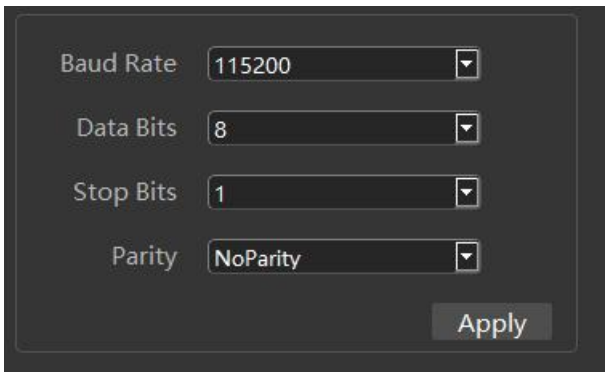
Configuring RS-232 serial port communication settings.

Baud Rate: Baud rate, with the default setting of 115200, is optional: 1200,2400,4800,9600,14400,19200,38400,57600,115200.

Data Bit: Data bit, the default setting is 8, you can select 7 or 8.

Stop Bit: Stop the bit, the default setting is 1, you can select 1 or 2.

Parity: Check bit, the default setting to none, you can select NoParity, EvenParity, or OddParity.



4.2 Log Ssave

The read results can be written to a log file saved on the network host. The logging option specifies the result to be written to the log file.

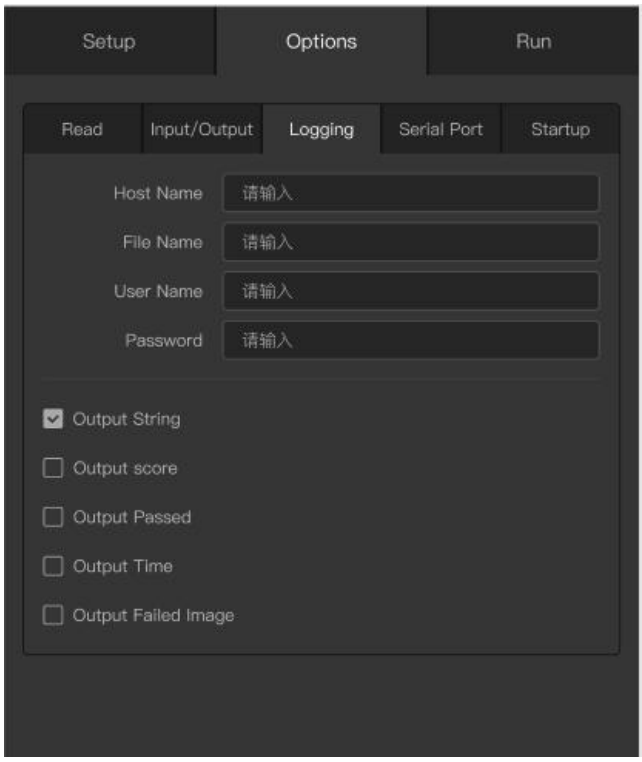
[Host Name] Name or IP address of the remote host on the network where the log file was created.

[File Name] Log file name, saved on the remote host.

[User Name] Specifies a valid user name for the host.

[Password] Specifies the access password for the user name of the host.

Check the box [Output String] [Output Score] [Output Passed] [Output Time] [Output Failed Image], check it, and record the corresponding content in the log file.



5 Running Mode

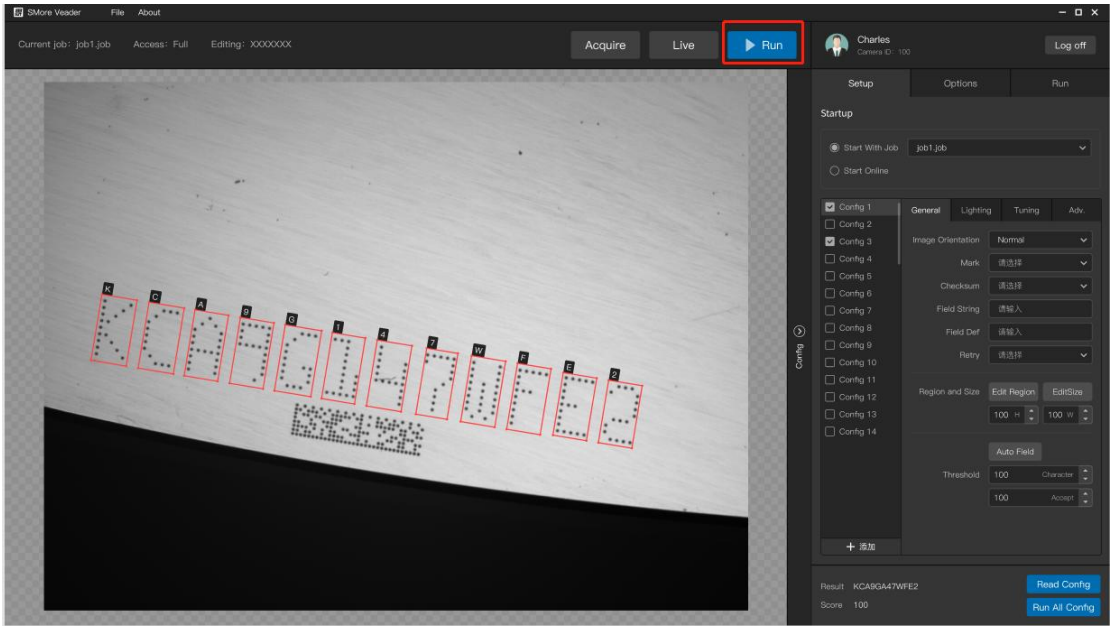
[Run] Switches between offline and online modes.

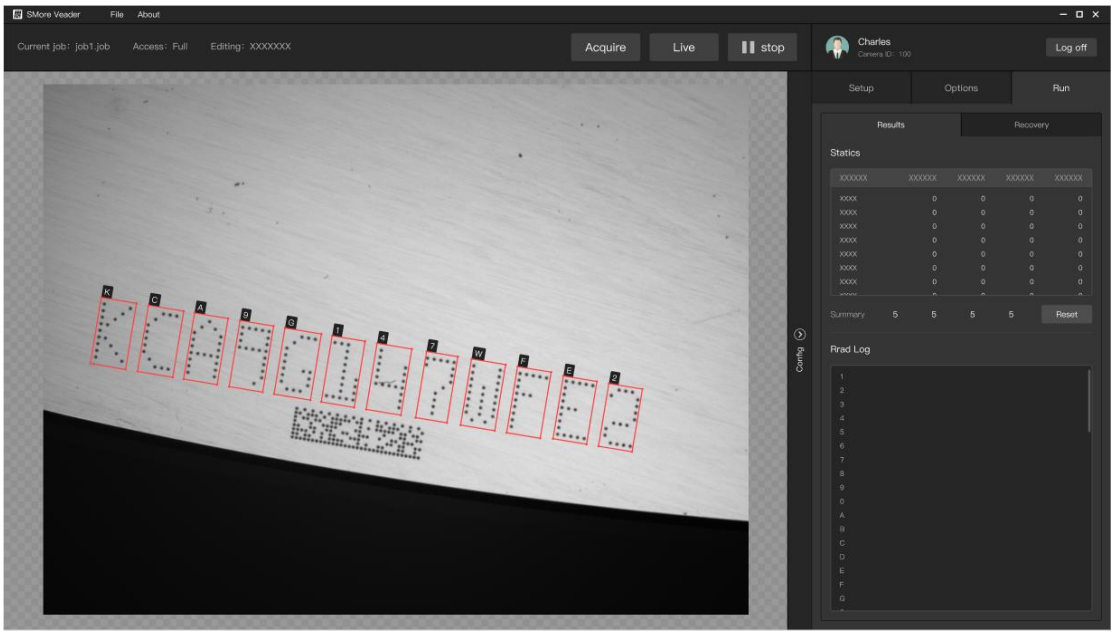
Click run, the system switches to online mode and waits for the machine software to send the request.

When each request is sent, the wafer ID software reads the configuration to take photos

and conduct OCR identification, and the read results are sent to the machine software.

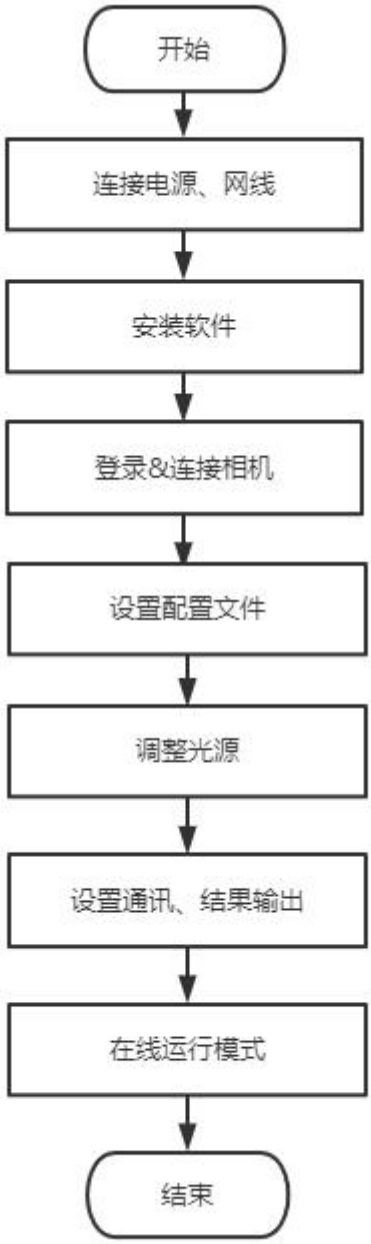
The results and logs of each read are counted in [Statics] and [Read log].





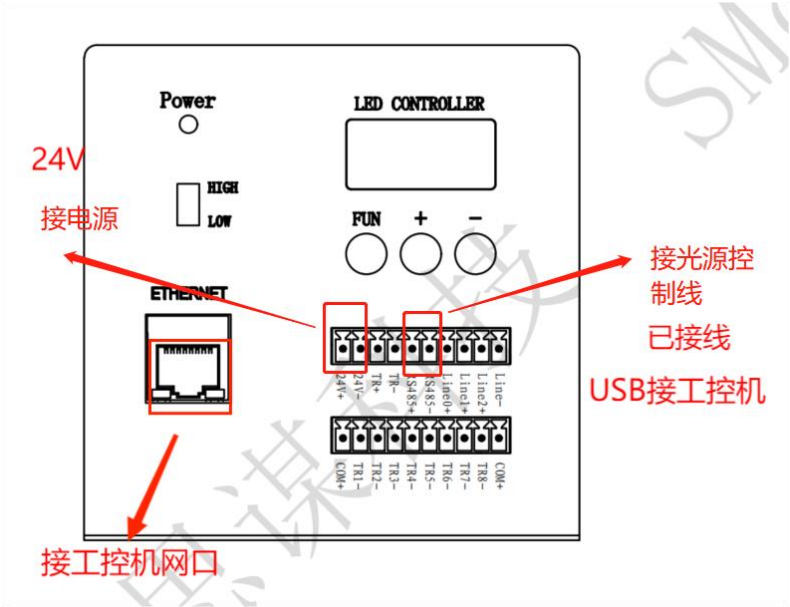
6 Operation Process

The operation process is shown in the figure. It is generally divided into several steps: installing the hardware, installing the software, logging in & connecting to the camera, configuring the light setting, running the configuration, and switching to the online mode.



6.1 Hardware Wiring

The product composition is shown in the following table, and the hardware wiring is completed before electrification.

Name	Quantity	Remarks
Wafer ID Camera	1	1、USB to the Industrial Personal Computer(IPC) 2、The camera requires a 24V power supply 3、The Ethernet needs to be connected to the Industrial Personal Computer(IPC). 
Cable	1	Using CAT6 cable to connect Wafer ID camera with Industrial Personal Computer(IPC)
Software	1	One set of software package should be installed on the Industrial Personal Computer(IPC)

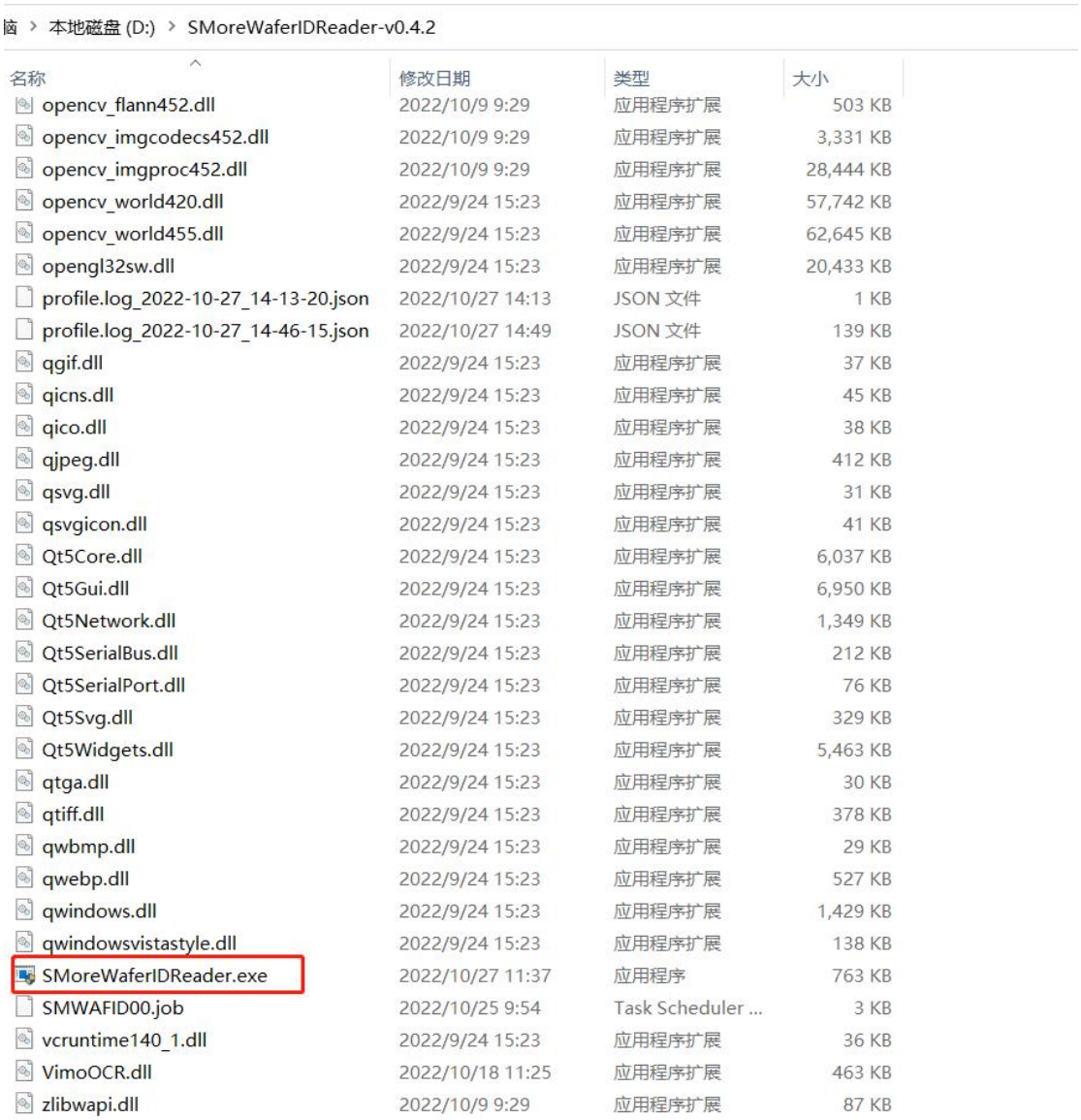
6.2 Software

Software debugging is divided into three stages: Wafer ID Reader general configuration; communication configuration and communication with host device.

6.2.1 Configuration of Wafer ID Reader software

6.2.1.1 Open Software

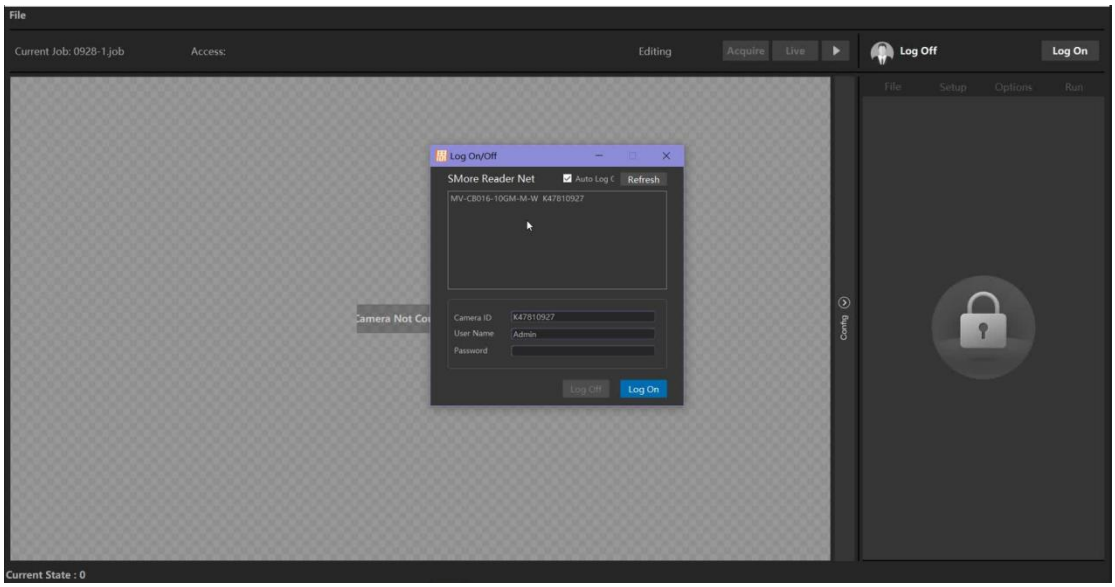
- Open the package on the Industrial Personal Computer(IPC) Desktop named SMoreWaferIDReader.exe. **Note: The software installation directory cannot have Chinese characters.**



电脑 > 本地磁盘 (D:) > SMoreWaferIDReader-v0.4.2

名称	修改日期	类型	大小
opencv_flann452.dll	2022/10/9 9:29	应用程序扩展	503 KB
opencv_imgcodecs452.dll	2022/10/9 9:29	应用程序扩展	3,331 KB
opencv_imgproc452.dll	2022/10/9 9:29	应用程序扩展	28,444 KB
opencv_world420.dll	2022/9/24 15:23	应用程序扩展	57,742 KB
opencv_world455.dll	2022/9/24 15:23	应用程序扩展	62,645 KB
opengl32sw.dll	2022/9/24 15:23	应用程序扩展	20,433 KB
profile.log_2022-10-27_14-13-20.json	2022/10/27 14:13	JSON 文件	1 KB
profile.log_2022-10-27_14-46-15.json	2022/10/27 14:49	JSON 文件	139 KB
qgif.dll	2022/9/24 15:23	应用程序扩展	37 KB
qicns.dll	2022/9/24 15:23	应用程序扩展	45 KB
qico.dll	2022/9/24 15:23	应用程序扩展	38 KB
qjpeg.dll	2022/9/24 15:23	应用程序扩展	412 KB
qsvg.dll	2022/9/24 15:23	应用程序扩展	31 KB
qsvgicon.dll	2022/9/24 15:23	应用程序扩展	41 KB
Qt5Core.dll	2022/9/24 15:23	应用程序扩展	6,037 KB
Qt5Gui.dll	2022/9/24 15:23	应用程序扩展	6,950 KB
Qt5Network.dll	2022/9/24 15:23	应用程序扩展	1,349 KB
Qt5SerialBus.dll	2022/9/24 15:23	应用程序扩展	212 KB
Qt5SerialPort.dll	2022/9/24 15:23	应用程序扩展	76 KB
Qt5Svg.dll	2022/9/24 15:23	应用程序扩展	329 KB
Qt5Widgets.dll	2022/9/24 15:23	应用程序扩展	5,463 KB
qtga.dll	2022/9/24 15:23	应用程序扩展	30 KB
qtiff.dll	2022/9/24 15:23	应用程序扩展	378 KB
qwbmp.dll	2022/9/24 15:23	应用程序扩展	29 KB
qwebp.dll	2022/9/24 15:23	应用程序扩展	527 KB
qwindows.dll	2022/9/24 15:23	应用程序扩展	1,429 KB
qwindowsvistastyle.dll	2022/9/24 15:23	应用程序扩展	138 KB
SMoreWaferIDReader.exe	2022/10/27 11:37	应用程序	763 KB
SMWAFID00.job	2022/10/25 9:54	Task Scheduler ...	3 KB
vcruntime140_1.dll	2022/9/24 15:23	应用程序扩展	36 KB
VimoOCR.dll	2022/10/18 11:25	应用程序扩展	463 KB
zlibwapi.dll	2022/10/9 9:29	应用程序扩展	87 KB

- After opening the software, enter the following login interface.



6.2.1.2 Log on Camera

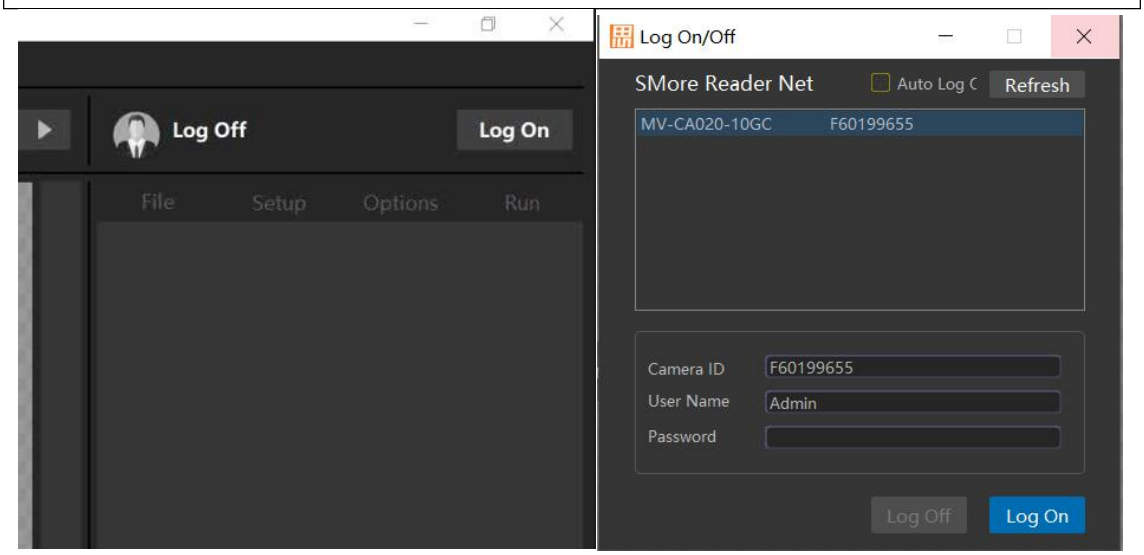
To open wafer ID Camera,

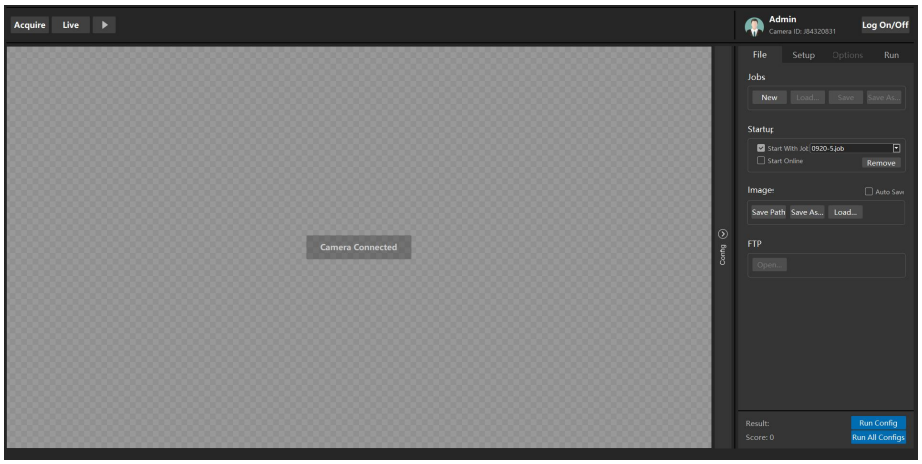
1 Click **LOG ON** in the upper right corner

2 Click **Connect Device** to connect the camera

Notes: To log in to the camera, the general camera list will automatically refresh and load the current camera, if the list is empty, you need to refresh the camera

After click **Connect Device** , wait for about 4 second to automatically turn to the upper computer control software configuration interface, for software configuration operation.





6.2.1.3 Wafer ID Control Software-Imaging Configuration

To create a new job,

1 Click the **File** in the top left corner table

2 Click the **New** button

3 Enter the new file job name in the current dialog

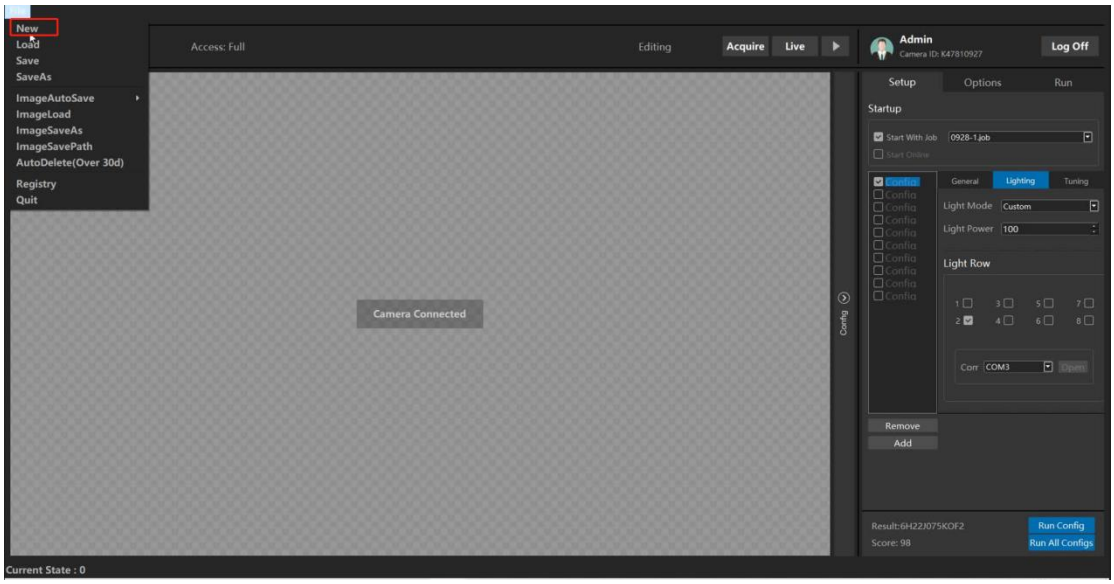
4 Click **OK** to save the new file job, and the software system automatically opens the new file job. All the configurations are empty and need to be reconfigured.

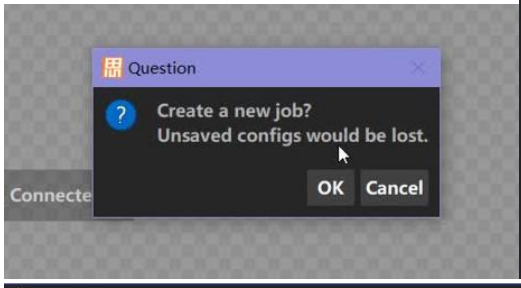
5 Click **Setup** to set the lighting

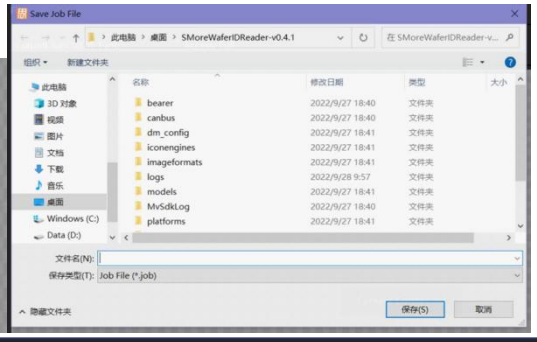
6 Click **Com** button to make sure the **USB Serial Port** is opened

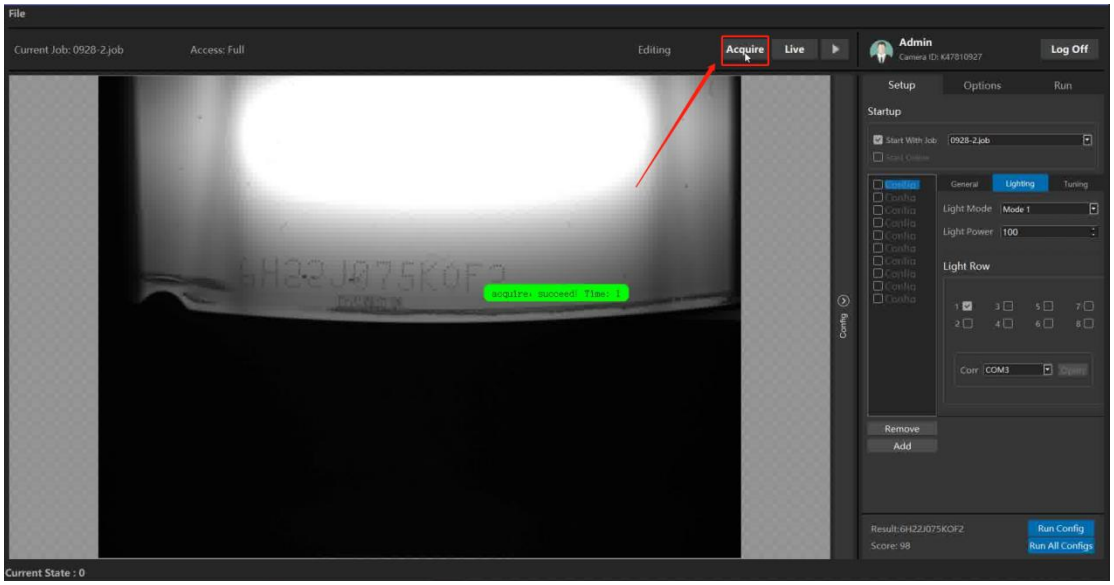
7 Click **Light Row** to select any **1~8** channel light source, and ensure that **Light Power**'s value> 30

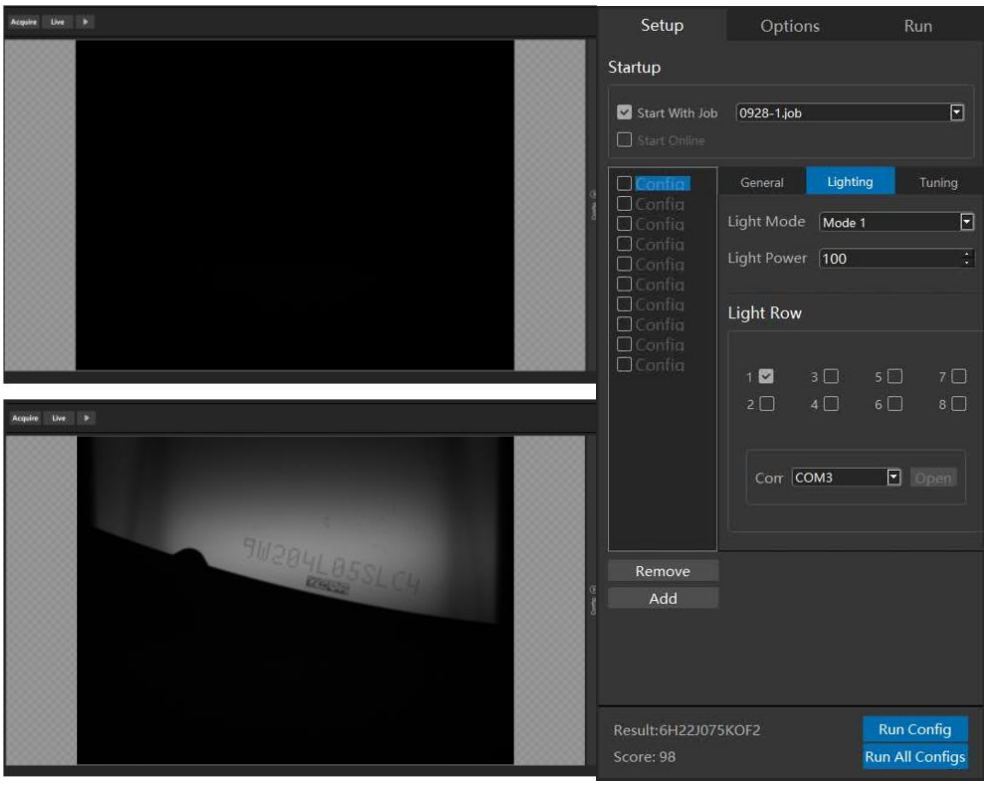
8 Click the **Acquire** button in the upper left corner to get the image


New
Load
Save
SaveAs
ImageAutoSave
ImageLoad
ImageSaveAs
ImageSavePath
AutoDelete(Over 30d)
Registry
Quit
Access: Full
Editing
Acquire
Live
Admin
Log Off
Setup
Options
Run
Startup
Camera Connected
Light Mode
Light Power
Light Row
Remove
Add
Run Config
Run All Configs
Current State : 0

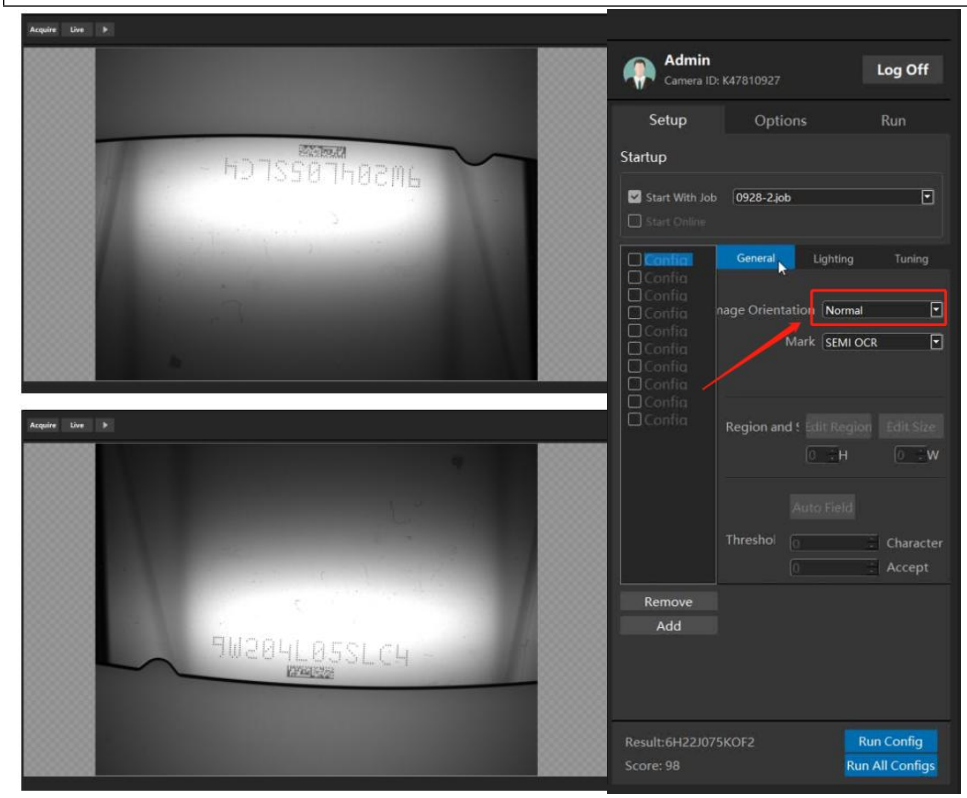

Question
Create a new job?
Unsaved configs would be lost.
OK
Cancel
Connecte


Save Job File
bearer
canbus
dm_config
iconengines
imageformats
logs
models
MvSdkLog
platforms
Job File (*.job)
保存(S)
取消


File
Current Job: 0928-2.job
Access: Full
Editing
Acquire
Live
Admin
Log Off
Setup
Options
Run
Startup
Light Mode
Light Power
Light Row
Remove
Add
Run Config
Run All Configs
Current State : 0



Note:Imaging Orientation setting to ensure that the imaging is frontal imaging.If the image is 180° angle as shown below, set the **Image Orientation** to **Rotated 180 Degree** to fix it.



6.2.1.4 Configuration

To set the configuration and selection,

1 Click **Setup** to check any Config1~10 check box

2 In fact the more **Config** configurations are selected in the list, the more Config configurations are checked at runtime station, but just send the highest score result. The single config's average time is 200ms, the corresponding time consumption will increase multiple.

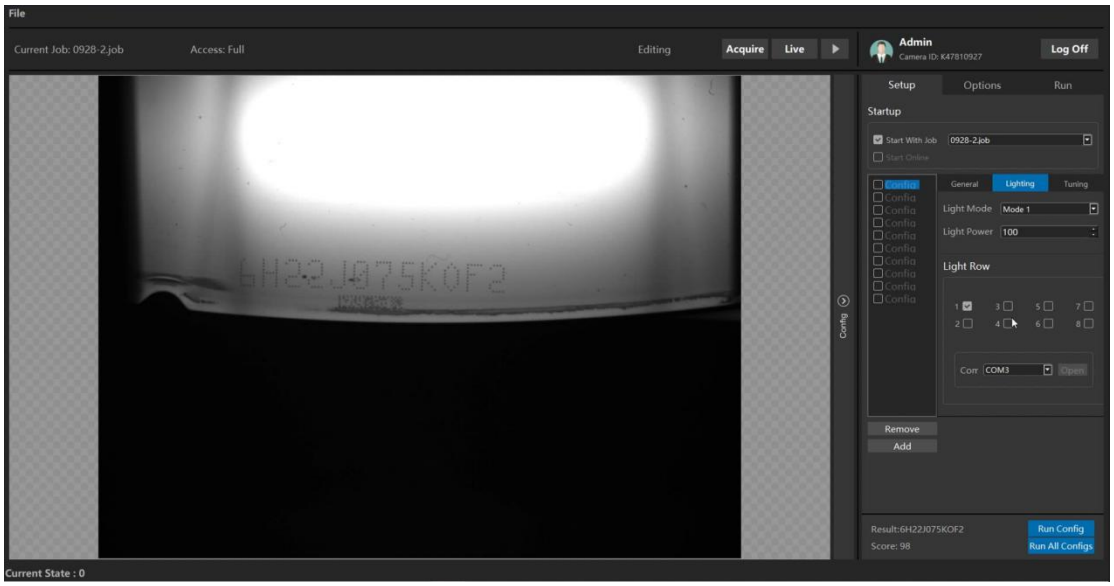
- A wafer application generally check only **1 Config**, for example, only check Config1 as follow
- Config1 is checked, the background color is blue.

6.2.1.5 Lighting Configuration

To set the lighting configuration,

1 Click **Lighting** option in **Setup table** to ensure that the characters are clearly visible.

2 Click **Run Config** in the lower right corner to identify the current wafer characters clearly and without any extra characters. Otherwise, adjust the 1-8 channel light source switch and the light source brightness of **Light Powe**r.



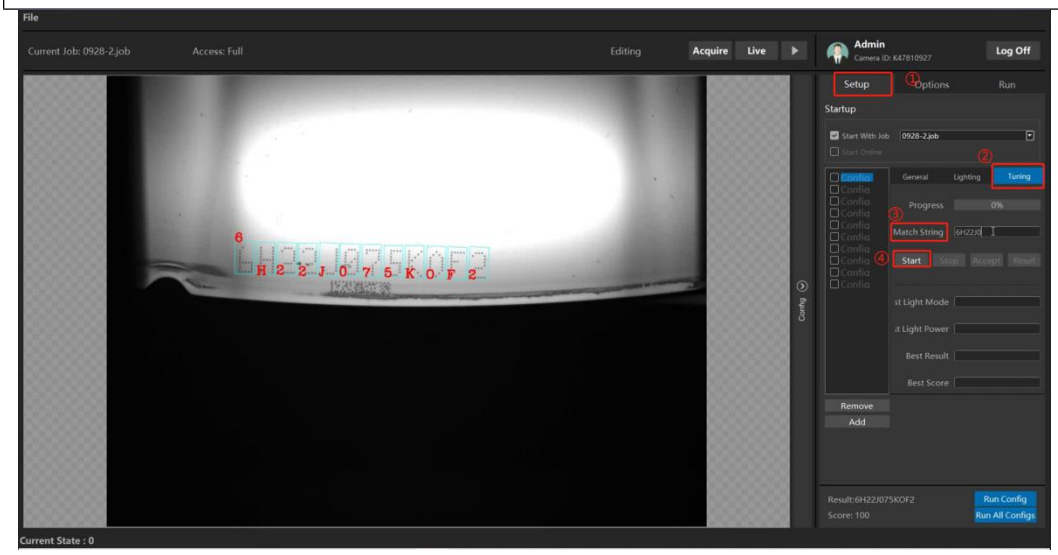
To set the lighting configuration automatically,

1 **Click t**he **Tuning** option in **Setup table**

2 Enter the real character in the imaging area in **Match String**

3 Click **Start button**, and the software automatically performs the best lighting search

Note:During the searching, you can click **Accept** at any time according to the score (up to 200 points). By the time you stop the search processing, the accept light source collocation is written to the current **Config**, and the reading results under the current lighting conditions are displayed in the front of the windows.



6.2.1.6 Mark Options

After setting the light source imaging, the Mark selection is made.

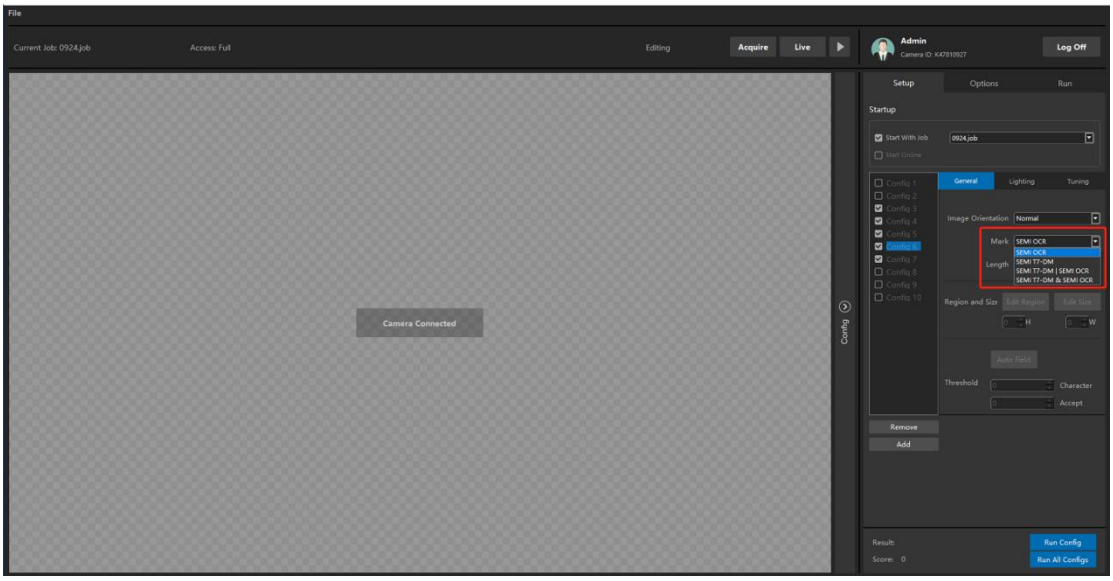
To choose any **Mark** for result,

1 Click **General** option in **Setup** table

2 Click **SEM OCR/SEM T7-DM/SEM T7-DM|SEM OCR/SEM T7-DM&SEM OCR** option in **Mark** table

Both of OCR and Data Matrix code reads are supported at **Setup-General-Mark**. The relationship between the selected content and the identification results is shown in the table below. **Generally OCR is selected by default.**

option	Identify content & Results
SEMI OCR	For the OCR character reads of the SEMI-M12,13 standard, the host Industrial Personal Computer(IPC) only obtains the OCR character read results **Length**:OCR calibration mode. If the current wafer ID code is standard 12-bit characters, enter the character length 12 here, start the calibration mode, and the software will automatically conduct OCR character calibration, according to the character length and SEMI standard. If the output read result is 0.00 (failed), user needs to check whether the imaging or marking is correct.
SEMI T7-DM	For SEMI T7 Data Matrix code standard reads, the host Industrial Personal Computer(IPC) only obtains the read results of DM, generally 10-bit characters
SEMI T7-DM|SEMI OCR	The host Industrial Personal Computer(IPC) first obtains Data Matrix results; if the Data Matrix result is not read, read the OCR result and output it to the host computer and be recognized successfully
SEMI T7-DM&SEMI OCR	The OCR and DM results are read simultaneously, and if only one of them is identified, then the host Industrial Personal Computer(IPC) is sent to get the read failure signal



6.2.1.7 Configuration Check

After completing the above operation, make sure your configuration has already saved.

To check the configuration,

1 Click other unchecked Configuration

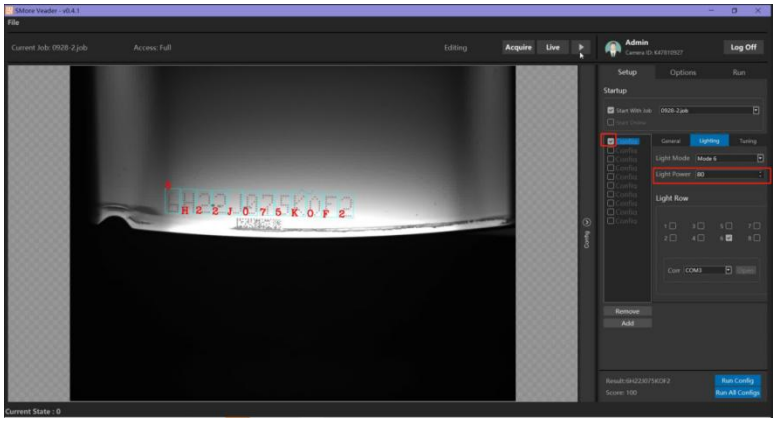
2 Switch to select the unchecked status as shown in the following figure

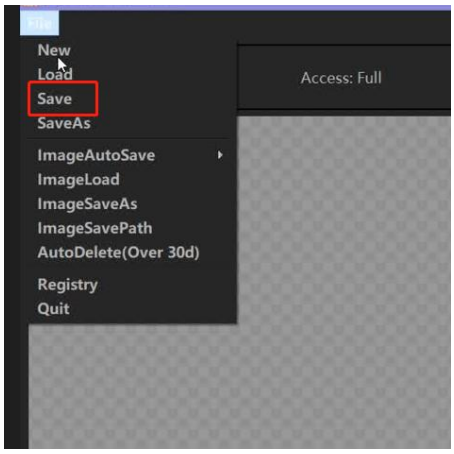
3 Click confirm whether the configuration is saved

4 Click the **File** in the top left corner table

5 Click the **Save** button to save the job configuration.

For example, click **Config4** as follow, then switch back to Config1 to confirm that the configuration of Config1 has been saved.





6.2.2 Communication Settings

Wafer ID Reader software supports the hardware communicate with the Industrial Personal Computer(IPC) through TCP/IP protocol or RS232 serial port communication protocol.

It also supports communication setting and communication result output setting.

To set the communication setting,

1 Click **Options** table on the right

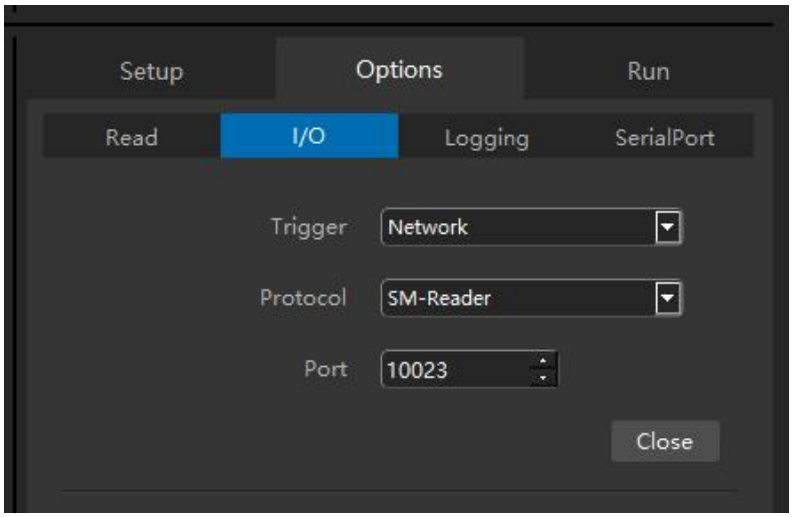
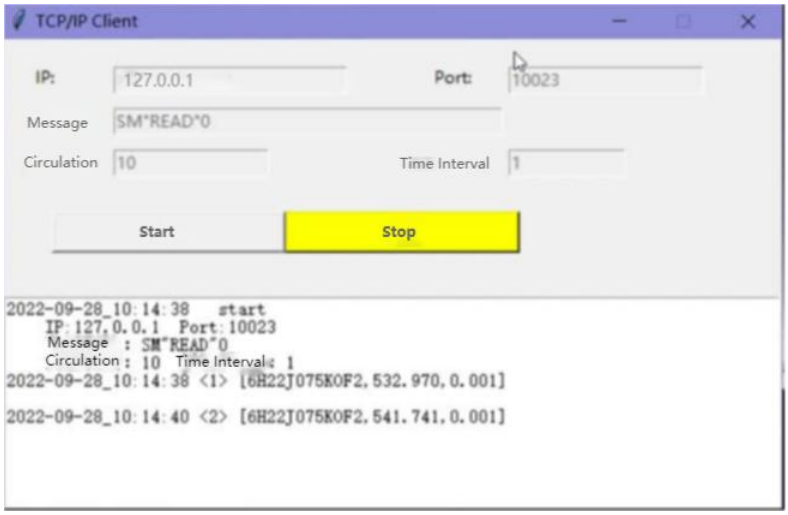
2 Click **I/O** table

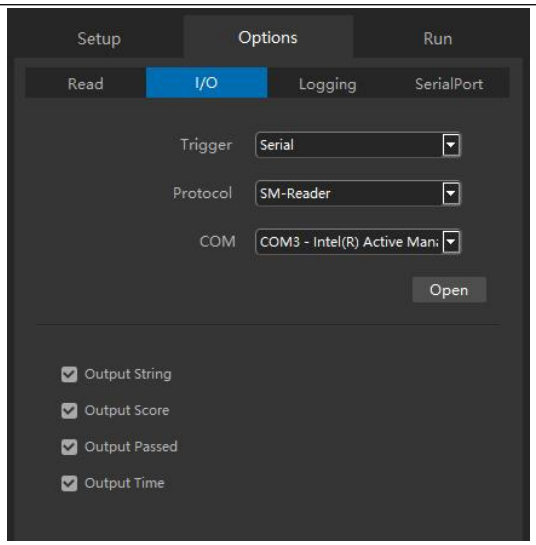
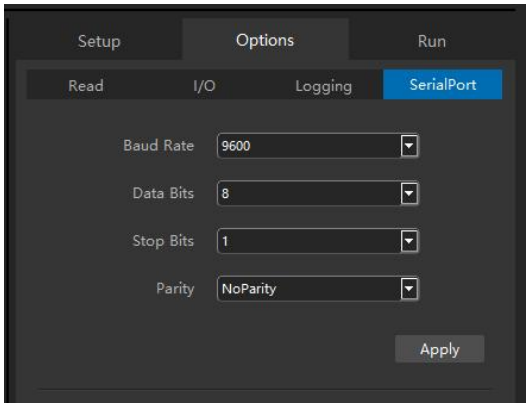
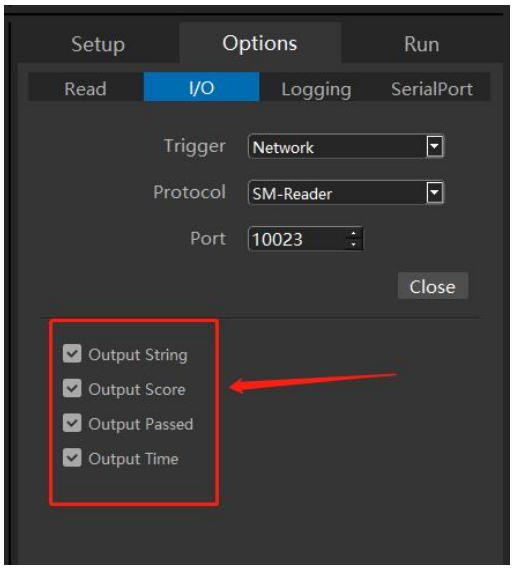
3 Click **Trigger** button to choose trigger type

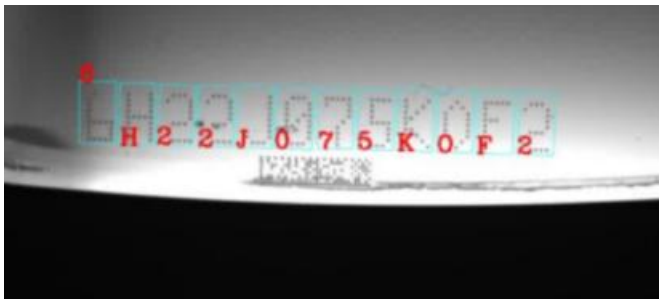
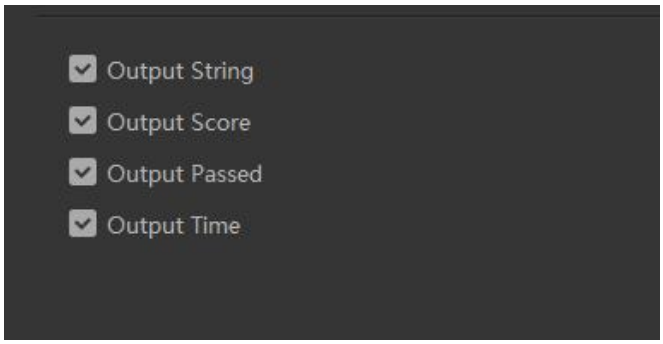
4 Set other communication setting such as **Protocol** and **Port** in Network TCP/IP protocol

Generally, TCP / IP is selected by default.

Trigger options	Explain	Operation
Network	Communicate with upper Industrial Personal Computer's(IPC) through the TCP/IP protocol.	Select this communication mode and support the manual setting of the port number. 1 Click **Trigger** button to set trigger type to Network 2 Modify the port number to **10023** **3** Set the simulation Industrial Personal Computer's(IPC) ip address to **127.0.0.1** 4 Send the request to the Wafer ID software in turn through the agreed address. The following figure shows the Wafer ID request and communication.

		 
Serial	Communicate with upper Industrial Personal Computer's(IPC) through the RS232 serial port communication protocol	When the trigger source option is **serial**, the configuration supports the following fields: **Baud Rate**,with a default setting of 9600, optionally with 1200,2400,4800,9600,19200,38400,57600,115200. **Data bit**,the default setting is 8, you can select 7 or 8. Stop the bit, the default setting is 1, you can select 1 or 2. **Parity,** Check bit, the default setting to none, optional no, even, or odd. 1 Click **Trigger** button to set trigger type to **Serial** 2 Click **COM** button to connect the serial port with upper Industrial Personal Computer 3 Set serial port configurations to the target number After the setting is complete, support the upper Industrial Personal Computer's(IPC) through serial port communication.

		 
	Result to the Industrial Personal Computer's(IPC)	Wafer ID Reader software supports output in the following fields  **Output String**,Outputs the identified string. If the mark is setting to **OCR**,the output format is the OCR result in the format of **XXXXXXXXXXXX**, and each **X** is a number of characters. If the mark is setting to **DM**, the output format is DM: XXXXXXXXXX If no characters are recognized, the output result is **********

		Output Score,Output evaluation score,OCR score ranging from 0 to 100; and DM score of 0 or 100 **Output Passed**, output the read result, if the read passes, the result data is "1.000", if the read fails, the result data is "0.000", the user can evaluate whether the upper computer ID acquisition is correct according to this field. **Output Time,**Output, the processing per instruction is time-consuming. When **Output String**,**Output Score**,**Output Passed**,and **Output Time** is checked,the recognition result will be sent to the upper Industrial Personal Computer's(IPC) in the command protocol agreement after reading, the field sequence is [**string, score, time consuming, passed**], any letter is not checked, the field does not display. For example, in the following image, check all the fields when set, and the runtime is sent to the upper IPC field is [6H22J075K0F2,100,189.170,1.000], which means that the current wafer ID reading result is 6H22J075K0F2, the evaluation score is 100 points, time-consuming 189ms, read passed, the result can be adopted by the upper Industrial Personal Computer(IPC).  
Local	Local communication	In this mode, the Wafer ID software can set to runtime without any upper Industrial Personal Computer(IPC) 1 Click **Trigger** button to set trigger type to **Local** 2 Click **Run** button In this mode,you can replace the wafer in front of the camera, the identified results in real time in the software interface. The OCR reads in real time in the operation mode, you can set this mode in the demonstration state.

6.2.3 Special Operation Instructions

6.2.3.1, New machine configuration

All hardware wiring and software operations are required.

6.2.3.2 Complete the configuration and restart the same machine

Without new configuration,just send requests directly using the Industrial Personal Computer(IPC) console software.

6.2.3.3 Wafer changes for the same machine (imaging / lighting / position)

Repeat all of the 6.2 operations, and the created job name cannot be repeated with the history, otherwise the process will override the historical configuration.