TMS LITE SDN BHD

Liquid Lens

USER MANUAL

[1st Edition]

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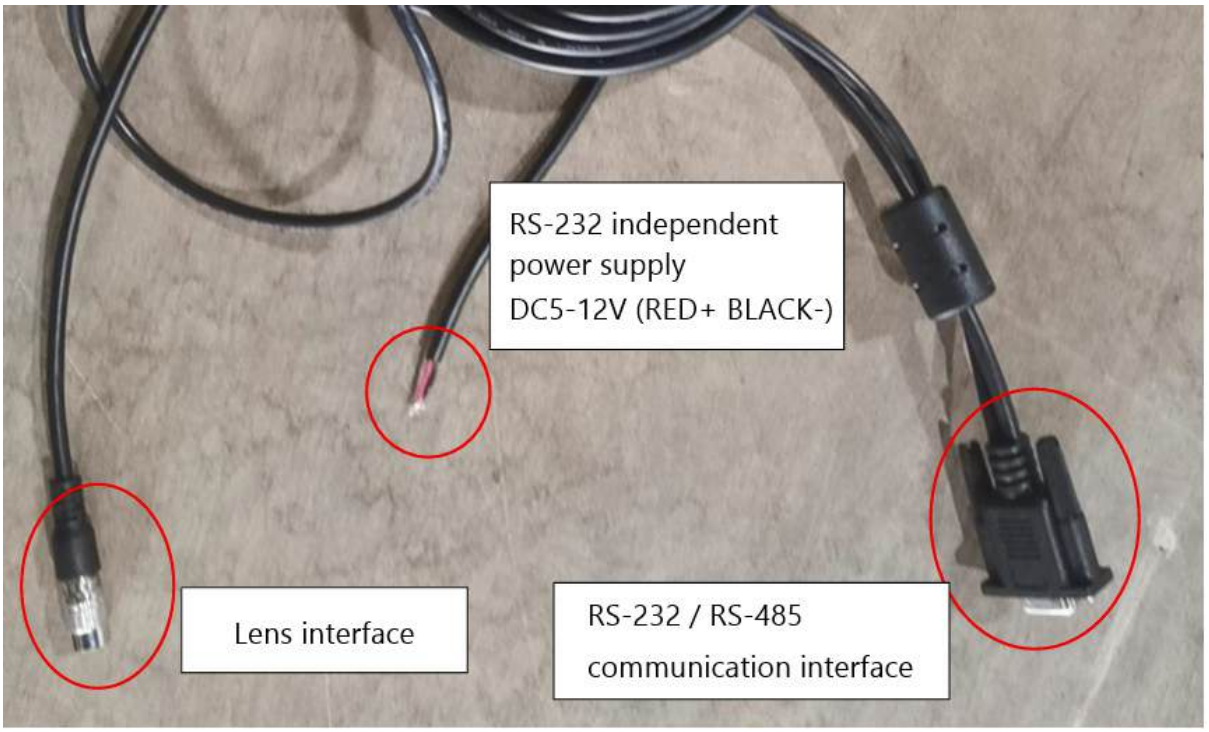
Liquid Lens RS-232 Communication Cable

Wiring Method



1. Connect the aviation connector of the lens cable to the lens interface.
2. Plug the communication interface into the control PC or other RS-232 / RS-485 receiving device.
3. Use a DC 5–12V power adapter for power supply.
4. Connect the wires according to the color code (red: positive, black: negative).
5. After proper connection, the device is ready for use.

Instructions For Use

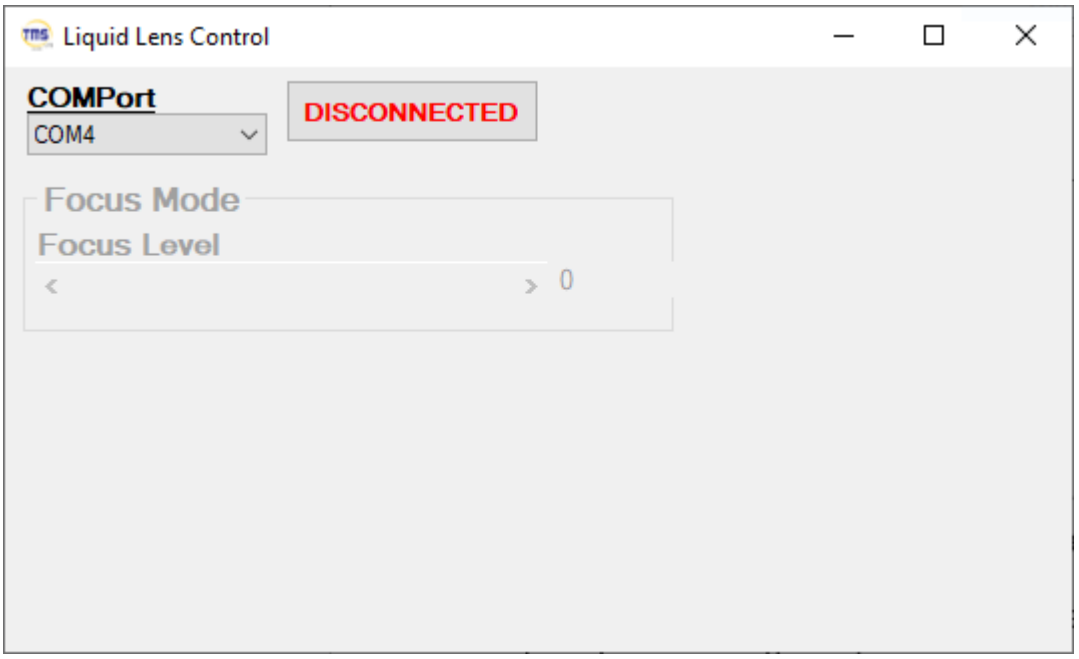
Demo Mode

After the lens is properly connected, verify the port location.
(You can check the port location via Device Manager → Ports.)

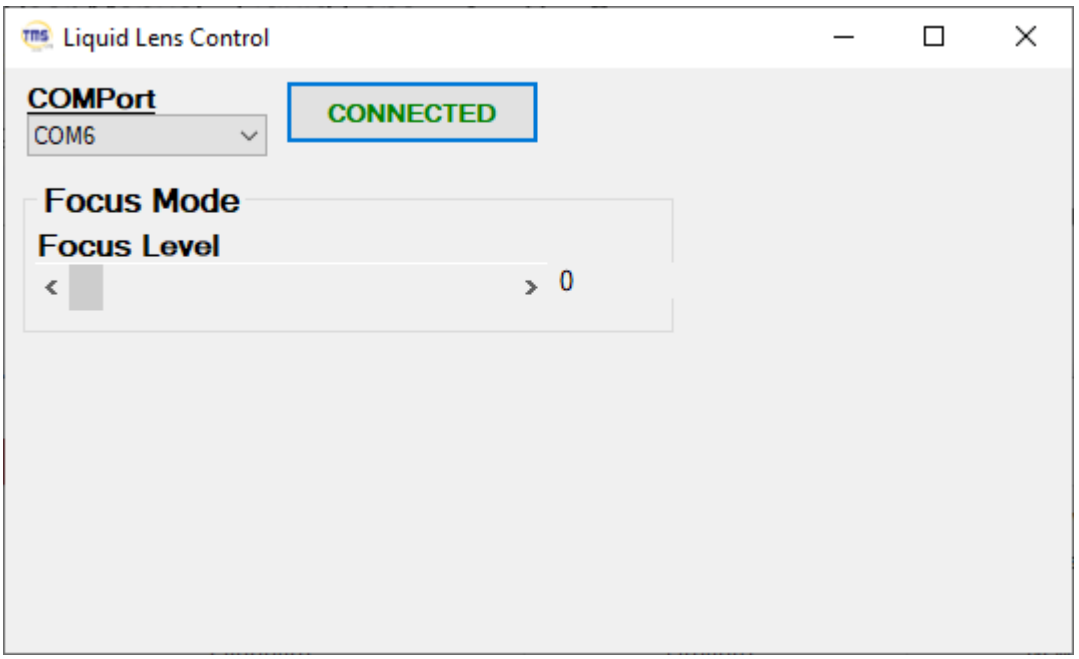
Once the port is confirmed, open the camera acquisition software (e.g., MVS or other brand camera software).

After connecting to the camera, open the demo program **LiquidLensControl.exe**.

The program interface is shown below:



Click the “DISCONNECTED” button to connect the liquid lens.



When the button shows “CONNECTED,” it means the liquid lens has been successfully connected.

Adjust the focus level to change the focal distance.

Developer Mode

1. Communication Setting

RS232

Baud Rate = 115200
Data Bits = 8
Parity = None
Stop Bits = 1

2. Liquid Lens Command

Set Driver Voltage

The voltage adjustment resolution is **1024 levels**.
The minimum Vrms value is **24V**, and the maximum Vrms value is **70V**.

- When the module receives **0x0000**, the output is **24 Vrms**.
- When the module receives **0x03FF**, the output is **70 Vrms**.

The relationship between voltage **Vrms** and resolution **Y** is:

Y=1023 / 46 * (Vrms - 24);

Device → Liquid Lens (Send to Liquid Lens)

OP Code	Write CMD	Function CMD	Data Length	Data1	Data2	Data n	CRC (1 Byte)	END Code
0x53	0X31	0x01	<Data Length>	LSB	MSB	n Max = 8	SUM (OP ~ Data n)	0x3E

e.g.: 53 31 01 02 FF 03 89 3E

Liquid Lens → Device (Receive from Liquid Lens)

OP Code	Write CMD	Function CMD	Flag	CRC (1 Byte)	END Code
0x53	0X31	0x01	0x31 - OK 0x32 - NG	SUM (OP ~ Flag)	0x3E

e.g.: 53 31 01 31 B6 3E

Command principle:
As shown in the example, **53 31 01 02** are fixed bytes, **FF 03 89** are variable bytes, and **3E** is a fixed byte.

Among them, in **FF 03 89**:

- **FF 03** represents the adjustable level value. Its calculation is **03FF = 1023**, which corresponds to level **1023**.
- **89** is the checksum. It is calculated by summing the preceding bytes. For example:

53 + 31 + 01 + 02 + FF + 03 = 189

Taking the remainder (last byte), the checksum is **89**.

Read Firmware

Device → Liquid Lens (Send to Liquid Lens)

OP Code	Read CMD	Function CMD	CRC (1 Byte)	END Code
0x53	0X32	0x01	SUM (OP ~ NO.)	0x3E

e.g.: 53 32 01 86 3E

Liquid Lens → Device (Receive from Liquid Lens)

OP Code	Read CMD	Function CMD	N0.	Data1	Data2	...	Data 8	CRC (1 Byte)	END Code
0x53	0X32	0x01	<Data Length>	ASC II	ASC II	ASCII	ASC II	SUM (OP ~ Data n)	0x3E

e.g.: 53 32 01 08 **4C 4C 31 39 0C 31 30 31** 2E 3E

3. Sample CRC Code

C#

```
static byte CalculateCrc8Sum(byte[] data, int length)
{
   int sum = 0;
   for (int i = 0; i < length; i++)
   {
      sum += data[i];
   }
   return (byte)(sum % 256);
}
```

Revision Notes

Rev	Date	Author	Comments
1.0.0.0	20/03/2023	Choo Meng	- Release
1.0.0.1	09/04/2026	Yee Ching	- Supplementary information

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THANK YOU

Thank you for placing your trusts in us and giving us a chance to provide you with our services. We have always valued our customers and emphasized on providing the best solution to ease their application process. We hope to continue this relationship in the forthcoming year with great understanding and respect.

Thank You!