

MaixSense-A010 Development

2023-07-19

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1. AT Command

AT	
+ISP Image Signal Processor	:0: turn ISP off =1: turn ISP on
+BINN full binning	=1: output 100x100 pixel frame =2: output 50x50 pixel frame =4: output 25x25 pixel frame
+DISP display mux	=0: all off =1: lcd display on =2: usb display on =3: lcd and usb display on =4: uart display on =5: lcd and uart display on =6: usb and uart display on =7: lcd, usb and uart display on
+BAUD uart baudrate	=0: 9600 =1: 57600 =2: 115200 =3: 230400 =4: 460800 =5: 921600 =6: 1000000

AT	
	=7: 2000000 =8: 3000000
+UNIT quantization unit	=0: auto =1-10: quantized by unit(mm)
+FPS frame per second	=1-19: set frame per second
+Save save config	: save current configuration

syntax:

input	execute	comment
AT+ISP?	\r	Return to current ISP status
AT+ISP=?	\r	Returns the status of all supported ISPs
AT+ISP=< MODE >	\r	Select ISP status

parameter:

< MODE >	Meaning
0 "STOP ISP"	Close the module ISP immediately, stop the IR transmitter
1 "LAUNCH ISP"	It is planned to start the module ISP, and the actual drawing needs to wait 1-2 seconds

1.1. BINN instruction

syntax:

Enter	Execute	Comment
AT+BINN?	\r	Return the current BINN status
AT+BINN=?	\r	Returns all supported BINN states
AT+BINN= < MODE >	\r	Select BINN state

parameter:

< MODE >	Meaning
1 "1x1 BINN"	1x1 is equivalent to no binning, and the actual output resolution is 100x100.
2 "2x2 BINN"	2x2 binning, 4 pixels are merged into 1, the actual output resolution is 50x50. The module ISP is planned to be activated, and the actual output needs to wait for 1 to 2 seconds.
4 "4x4 BINN"	4x4 binning, 16 pixels are merged into one, and the actual output resolution is 25x25.

1.2. DISP instruction

Please enable it as needed to avoid excessive resource usage

syntax:

Enter	Execute	Comment
AT+DISP?	\r	Return to current DISP status
AT+DISP=?	\r	Returns all supported DISP

Enter	Execute	Comment
		states
AT+DISP=< MODE >	\r	Select DISP state

parameter:

< MODE >	Meaning
0	all off
1	lcd display on
2	usb display on
3	lcd and usb display on
4	uart display on
5	lcd and uart display on
6	usb and uart display on
7	lcd, usb and uart display on

1.3. BAUD instruction

syntax:

Enter	Execute	Comment
AT+BAUD?	\r	Return to current BAUD status
AT+BAUD=?	\r	Returns all supported BAUD states
AT+BAUD=< MODE >	\r	Select BAUD state

parameter:

< MODE >	Meaning
0	9600
1	57600
2	115200
3	230400
4	460800
5	921600
6	1000000
7	2000000
8	3000000

1.4. UNIT directive

syntax:

Enter	Execute	Comment
AT+UNIT?	\r	Returns the current UNIT value
AT+UNIT=?	\r	Returns all supported UNIT values
AT+UNIT=< UINT >	\r	Select UNIT value

parameter:

< UINT >	Meaning
0 "DEFAULT UNIT"	The default quantization strategy is used. Due to the tof characteristic, the imaging accuracy at near distances is better than that at far distances. Therefore, the difference at short distances is enlarged, and $5.1 \cdot \sqrt{x}$ is used to quantify the original data of 16 bits into 8 bits
1...9 "QUANTIZE UNIT"	Represents quantization in x mm. The smaller the value, the more details and the shorter the visual distance. Please set it properly

1.5. FPS command

syntax:

Enter	Execute	Comment
AT+FPS?	\r	Returns the current FPS value
AT+FPS=?	\r	Returns all supported FPS values
AT+FPS=	\r	Select FPS value

parameter:

< FPS >	Meaning
1...19 "frame per second"	tof output frame rate, the bigger the better the smoother

1.6. SAVE instruction

syntax:

Enter	Execute	Comment
AT+SAVE	\r	The current configuration of the TOF camera is cured, and it needs to be reset afterwards

Multi-machine and AE instructions are recommended to be added

1.7. ANTIMMI instruction

syntax:

Enter	Execute	Comment
AT+ANTIMMI?	\r	Returns the current ANTIMMI state
AT+ANTIMMI=?	\r	Returns all supported ANTIMMI states
AT+ANTIMMI=<MODE >	\r	Select ANTIMMI state

parameter:

< MODE >	meaning
-1	disable anti-mmi
0	auto anti-mmi
1-41	manual anti-mmi usb display on

1.8. Image Packet Description

When power on, the ISP will be activated by default and display the image on the display screen, and output the image data to uart and usb

at the same time

Image data encapsulated into packets (not stabilized):

1. Header 2 bytes: 0X00, 0XFF
2. Packet length 2 bytes: the number of bytes of remaining data in the current packet
3. Other content 16 bytes: including packet serial number, packet length, resolution, etc.
4. Image frame
5. Check 1 byte: the lower eight bits of the "sum" of all previous bytes
6. 1 byte at the end of the packet: 0XDD

AT+UNIT? Query the **UNIT** value

Take **p** as the image frame pixel values, here are two results:

- If **UNIT** is not 0, the distance between this pixel and top is **p** x **UNIT** ;
- If **UNIT** is 0, the distance between this pixel and top is $(p / 5.1)^2$ 。