

Commands Manual

For PCIR-xxCx Series (V1.7)

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一. 常用命令示例/Frequently used commands examples

1. 连续发送二进制数据 / Send binary data continuously

Seq	发送指令 HEX 值 / Send command with HEX value	命令效果/Effect of command
1	43 4D 44 43 00 17	关闭串口发送数据开关 (可选) Send data switch off (Option)
2	43 4D 44 45 00 19	设置为Operate 模式，返回温度值为二进制 Set operate mode , the return temperature value to binary
3	43 4D 44 4D 01 20	设置连续发送数据模式 Configure to send data frames continuously
4	43 4D 44 43 01 18	打开串口发送数据开关 Send data switch on

2. 按请求发送单帧数据Send single frame data as requested

Seq	发送指令 HEX 值 / Send command with HEX value	命令效果/Effect of command
1	43 4D 44 45 00 19	设置为Operate 模式，返回温度值为二进制 Set operate mode , the return temperature value to binary
2	43 4D 44 4D 00 19	设置按请求发送单帧数据模式 Set single frame mode
3	43 4D 44 43 01 18	打开串口发送数据开关 Send data switch on
4	43 4D 44 43 02 19	请求新的一帧数据 Request a new frame
5	43 4D 44 43 02 19	在需要的时候请求新的一帧数据 Request a new frame when need

3. 连续发送字符格式温度数据/Continuous sending of temperature data in character format

Seq	发送指令 HEX 值 / Send command with HEX value	命令效果/Effect of command
1	43 4D 44 45 01 1A	设置为评估模式，返回温度值为字符形式 Set to evaluation mode, return temperature value in character form

二. 返回数据的格式/ Format of returned data

返回的数据帧我们称之为DAT帧。每帧包含每个像素的温度和芯片感知到的环境温度。
The returned data frame is called DAT frame. It contains the temperature of each pixel and the ambient temperature sensed by the chip.

1. 评估模式/ Evaluate Mode

在这个模式下会连续发送数据帧，每帧的内容以ASCII 字符表示，以\r\n结尾，每个数据点为精确到小数点后两位的浮点数，数据点之间以逗号分隔。最后一个温度值为环境温度。收到的数据如下：

”25.01,26.00,20.03.....\r\n“
In this mode, data frames will be sent consecutively. The content of each frame is represented by ASCII characters and ends with \R \n. each data point is a floating-point number accurate to two decimal places. Data points are separated by commas. The last temperature value is the ambient temperature. The data received are as follows:

”25.01,26.00,20.03..... \r\n “

2. Operate模式/ Operate mode

在这个模式下默认是按请求发送单帧请求，也可以设置为连续发送数据帧，每帧的温度值以二级制浮点数表示，格式如下：

	包头/Header	长度/Data Length	数据（环境温度） Data (ambient temperature)	数据（像素温度） Data (pixel temperature)	结尾
	3Byte	2Byte	4Byte	4*长度Byte	2Byte
ASCII	DAT				\r\n
HEX	0x44 0x41 0x54				0x0D 0x0A

长度为大端模式，数据类型为无符号型，例如：MLX90640的分辨率为32*24=768，所以长度位位0x03 0x00。数据位为float型，行优先。长度计算时不包含环境温度的4bytes

The length is big end mode, and the data type is unsigned. For example, the resolution of mlx90640 is 32 * 24 = 768, so the length bit is 0x03 0x00. Data bit is float type, row first. Length calculation does not include 4 bytes of ambient temperature

三. 发送指令格式/Send command format

指令以CMD三个字符开头，称为CMD帧，CMD帧为控制指令，可以控制设备是否串口发送数据，设置连续、单帧发送模式，对象为人、物体，更改刷新率。
The commands start with a “CMD”，which is called a CMD frame.The CMD frame is the control command, which can control whether the device sends data through the serial port, set the continuous and single frame transmission mode, the object is human and object, and change the refresh rate.

1. CMD帧指令格式/Command format

- 串口通信波特率为230400，控制指令格式由四部分组成：
The baud rate is 230400, and the control command format is composed of four parts:
1. 包头： 由“CMD”三个字符组成/ Message header: composed of three characters of "CMD"
 2. 指令： 一个字符 / Command : one character
 3. 参数： 一个数字 / Parameter: a number
 4. 校验： 由一个字符组成，为前面所有字符求和后取后8位。、 Check: it consists of one character and takes the last 8 digits after summing all the characters in front.

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD			CRC
HEX	0x43 0x4D 0x44			

若设备收到合法指令（CRC校验通过、指令和参数有效）则返回ret+相同指令+\\r\\n（例如上位机发送CMDC\\1\\x18，设备发回retCMDC\\1\\x18\\r\\n），否则返回错误指令，指令格式如下：

If the device receives a valid command (CRC pass, command and parameter are valid), it will return RET + the same command + \\r\\n
Otherwise, an error message is returned. The message format is as follows:

	包头/Header	指令包头/ Command Header received	指令/ Command received	参数/ parameter received	校验/ Check code received	换行/ Line feed
	6Byte	3Byte	1Byte	1Byte	1Byte	2Byte
ASCII	RETErr	收到的包头	收到的指令	收到的参数	收到的校验	\\r\\n
HEX	0x52 0x45 0x54 0x45 0x52 0x52					0x0D 0x0A

2. 指令模式和评估模式切换/Command mode and evaluation mode switching

控制设备进入评估模式还是指令模式，评估模式下会连续发送字符格式数据。指令模式下发送二进制格式数据，可以设置为连续发送，也可以按请求发送单帧数据。上电默认为指令模式下按请求发送单帧数据。

Control whether the device enters the evaluation mode or the operate mode. In the evaluation mode, character format data will be sent continuously. In the operate mode, binary format data can be sent. You can set it to send data continuously or send single frame data as requested. Power on default operate mode with single frame as requested.

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD	E	\0指令模式 \1评估模式 \2 获取当前模式)	CRC
HEX	0x43 0x4D 0x44	0x45	0x01 0x00 0x02	0x1A 0x19 0x1B

3. 发送开关控制指令/Send switch control command

控制设备是否通过串口数据发送，上电默认关闭

Control whether the device sends data through the serial port. Power on is off by default

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD	C	\1 打开串口发送/ Send data is on \0关闭串口发送/ Send data is off \2 发送单帧数据（单帧模式时工作） / Request a new frame work on single mode only	CRC
HEX	0x43 0x4D 0x44	0x43	0x01 0x00 0x02	0x18 0x17 0x19

4. 刷新率设置/Refresh rate setting

设置传感器刷新率，上电默认3FPS

Set the refresh rate of the sensor, power on the default 3fps

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD	F	\0 0.5FPS \1 1FPS \2 2FPS \3 3FPS	CRC

HEX	0x43 0x4D 0x44	0x46	0x00 0x01 0x02 0x03	0x1A 0x1B 0x1C 0x1D
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5. 帧发送模式设置/Frame sending mode setting

切换帧画面发送模式，连续发送时会连续的发送DAT帧，单帧发送时每收到一个CMDC\2会发送一个DAT帧。上电默认单帧发送

Switch the frame picture sending mode. When the frame is sent continuously, dat frame will be sent continuously. When a single frame is sent, a dat frame will be sent every time a CMDC \ 2 is received. Power on default single frame transmission

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD	M	\0 单帧发送 /Single mode \1 连续发送/Continuous mode	CRC
HEX	0x43 0x4D 0x44	0x4D	0x00 0x01	0x21 0x22

6. 设置测量对象类型/Set measurement object type

切换测量对象类型，测量对象为人体时设备会调用对于人体的相关参数和执行人体转换模型。上电默认为测量类型为人体。此时 热红外辐射系数为 0.95。

Switch the measurement object type, when the measurement object is human body, the device will call the relevant parameters and algorithms for human body. The default measurement type is human body when power on and the thermal infrared radiation coefficient is 0.95

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD	O	\0 物体 Normal \1 人体 Human	CRC
HEX	0x43 0x4D 0x44	0x4F	0x00 0x01	0x23 0x24

7. 校准偏移/Set measurement object type

可以获取当前的校准偏移值，也可以设置新的校准偏移值。

You can get the current calibration offset value or set a new calibration offset value.

设置offset 命令后，新的偏移值会写入ROM中，即使掉电也会保存。

when the offset command is set, the value will be written to ROM and saved even after power off.

	包头/Header	指令/Command	参数/parameter	校验/Check code
	3Byte	1Byte	1Byte	1Byte
ASCII	CMD	T	\1 获取当前偏移值 Get current offset value	CRC
HEX	0x43 0x4D 0x44	0x54	0x01	0x29

设置新的偏移值命令格式：

The format of the adjust new offset value command is:

'CMDT'+Value[4Byte float format]+CRC[1Byte].

部分偏移值设置命令参考
Partial offset value setting command reference

校准偏移值/ Calibration offset	16进制指令/Hex Command	校准偏移值/ Calibration offset	16进制指令/Hex Command
0	43 4D 44 54 00 00 00 00 28	0.5	43 4D 44 54 00 00 00 3F 67
1	43 4D 44 54 00 00 80 3F 93	1.5	43 4D 44 54 00 00 C0 3F 27
2	43 4D 44 54 00 00 00 40 14	2.5	43 4D 44 54 00 00 20 40 88
3	43 4D 44 54 00 00 40 40 54	3.5	43 4D 44 54 00 00 60 40 C8
-1	43 4D 44 54 00 00 80 BF 13	-0.5	43 4D 44 54 00 00 00 BF E7
-2	43 4D 44 54 00 00 00 C0 94	-1.5	43 4D 44 54 00 00 C0 BF A7