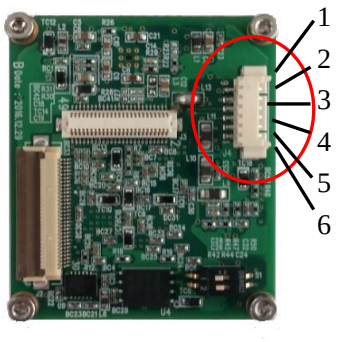
H1 Series Thermal Imaging Module

H1 series is a high sensitivity, high reliability uncooled thermal imaging core. It can self-adaptive image calibrating, contributing to continuous clear image. It has multiple configure and optional lens available, able to meet various applications. Compact design makes it well-suited for OEM assembly and integration.

		H1-384		H1-640	
Detector					
Detector		Uncooled Microbolometer			
Resolution/Pixel pitch		384×288 / 17μm		640×480 / 17μm	
Sensitivity		<50mk at f/1.0(Optional <35mK)		<50mk at f/1.0 (Optional <35mK)	
Frame rate		30Hz or 60Hz			
Spectral range		8-14μm			
Image Processing					
Self-adaption calibration without shutter(No NUC)		Shutterless(No Shutter)			
Time to image	Time to communicate	＜5s	<10s	<5s	<10s
Image enhancement		Image Enhancement, Histogram Equalization			
Lens		manual, athermalized, motorized, auto-focus			
Controls & Measurement					
Color		White hot/Black hot and 5 colors			
SAR(Search and Rescue) Mode		16 levels			
2x & 4x & 8x digital zoom		Yes			
Manual/AGC/Auto		Yes			
Power					
Operation Voltage range		5VDC			
Power consumption		<1.8W@25ºC			
Environment					
Operation Temperature Range		-10°C~+65°C			
Storage Temperature range		-45°C~+70°C			
Shock		Vibration: GJB 150-16　2.3.1			
		GJB 150-18　Test7 100g/6ms			
Temperature shock		-5°C/min（-40°C~+60°C）			
Physical Attributes					
Weight		<68g(w/o lens)			
Size		37mm×41mmx31.6mm(w/o lens)			
Interface					
User Interface		6 Pin(or Customized for user request)			
Communication		RS232(or customized as user request), commands can be provided.			
Analogue video		CVBS Standard video(RCA)			
Video Mode		NTSC/PAL Compatible			
Package		Thermal imaging module, Cable for power, video and PC communication			

1. Interface

(1) 6 Pin Interface



No.	Pin Function
1	Power(5VDC)
2	GND
3	TXD
4	RXD
5	D+ : VIDEO
6	D- : GND

2. Communication Protocol

1) Interface : RS232, Baud rate : 115200

A. Calculate checksum

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
ff	00	00	28	00	02	2A
	00	00	40	00	02	42

B. ACK & NAK

	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
ACK	F0	01	input address		input data		checksum
NAK	F0	00	input address		input data		checksum

C. Protocol

command	address		data		description	default
	Byte3	Byte4	Byte5	Byte6		
Colormap Control	0x0E	0x00	0x00	0x00	Gray	0x00
			0x01		Rainbow	
			0x02		Iron	
			0x03		Green Hot	
			0x04		etc	
Image inverse	0x0C	0x00	0x00	0x00	Disable	0x00

control			0x01		enable	
AGC control	0x0A	0x00	0x00	0x00	AGC	0x00
			0x01		Manual AGC	
			0x02		HE	
			0x03		HE + Manual AGC	
MGC Contrast Value	0x1E	0x00	0x01 ~ 0x20		MGC Contrast Value	0x10
MGC Brightness Value	0x20	0x00	0x1000 ~ 0x0000 0x8001 ~ 0x9000		MGC Brightness Value	0x00
Image Edge Enhancement	0x14	0x00	0x00	0x00	Disable	0x00
			0x03		IEE	
Image Enhancement Level	16	00	0 ~ 1000		IEE Coefficient Value	200
Search Mode	0x2C	0x00	0x00	0x00	Off	off
	0x2D		0x00	0x00	On	
	0x2E		0x01~0x20	0x00	Search mode data(default:3)	
Save setting	0x30	0x00	0x00		Save setting	-

D. Example

Control Board → Camera

	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
WhiteHot	FF	00	00	0E	00	00	0E
GreenHot	FF	00	00	0E	00	03	11
Image Edge Enhancement On	FF	00	00	14	00	03	17
Search mode On	FF	00	00	2D	00	00	2D
Search mode Level	FF	00	00	2E	00	02	30

Byte7(Checksum) : Byte2 + Byte3+ Byte4+ Byte5+ Byte6

Camera → Control Board (Ex. WhiteHot)

	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Ack(True)	F0	01	0E	00	00	00	0F
Nak(False)	F0	00	0E	00	00	00	0E

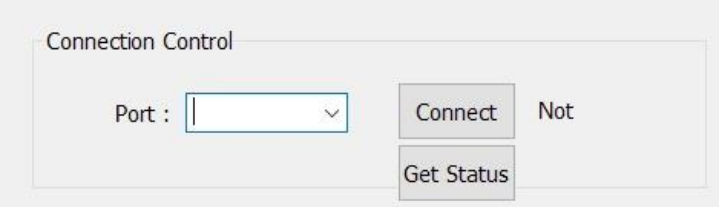
Byte7(Checksum) : Byte2 + Byte3+ Byte4+ Byte5+ Byte6

- Some commands may change without notice. Please ask latest commands to your manufacturer if you need.

3. PC Control Software

1) Basic Settings

1.1)Serial Port



Appropriate COM port is selected automatically，The baud rate was as 115200，and click the “Connect” button. After a serial port connection properly, “Not” mention shall display the “Connecting”.; otherwise it is not connected successfully. “Get Status” shows current setting values that you saved.

1.2)Algorithm

Algorithm is for image optimization.

Auto(HE) : This factory default along with the default parameter settings should be used in high temperature object imaging situations. In Automatic, image contrast and brightness are optimized automatically as the scene varies.

AGC : In this mode, the gain is calculated as the mean of the current scene just as in Auto mode. The different with Auto mode is that the values selected for the start and end of the linear transfer function are automatically updated in real-time, not only at the start of AGC mode selection. This is the most sophisticated algorithm and for most imaging situations, the best all-around choice.

Limit On/Limit Off : This is related with very high object detection. To avoid any image problems, it is recommended to use Limit On. In case that the object is over 600°C, it will be helpful to use Limit Off.

Manual: In this mode, image Contrast and Brightness are entered completely manually via manual.(Refer to 1.3) manual dialog.

1.3)Manual

Manual dialog will activate after selection of Manual of Algorithm.

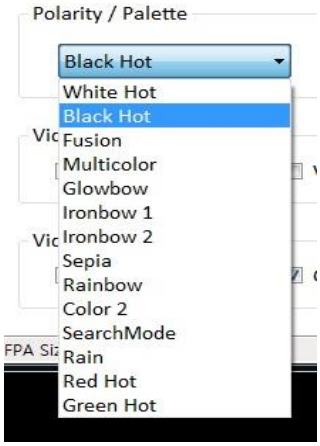
User can adjust Brightness and Contrast for the best image as the scene varies.

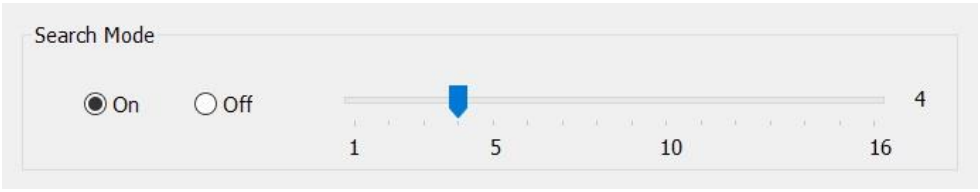
1.4)Zoom

Zoom : The camera has built in digital zoom capability. It is possible to zoom to 8x.

E-Zoom Value : User can set the zoom in details. For example, from 1.0x, 1.1x, 1.2x…1.9x, 2.0x….2.1x….up to 8.0x.

1.5)Colormap Control





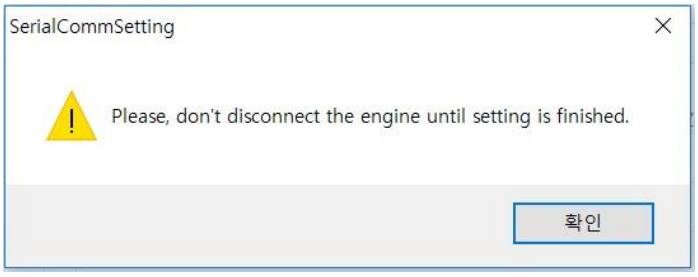
Colormap Control : This is kind of pseudo colors. User can set the colors for various applications.
Polarity : White Hot, Black Hot
Palette : Fusion, multicolor, Glowbow, Ironbow1, Ironbow2, Sepia, Rainbow, Color2, Rain, Redhot, Greenhot

Search Mode : Hottest area of the scene should be red color as 16 levels. Other areas are White Hot. * Refer to Search mode photos below.

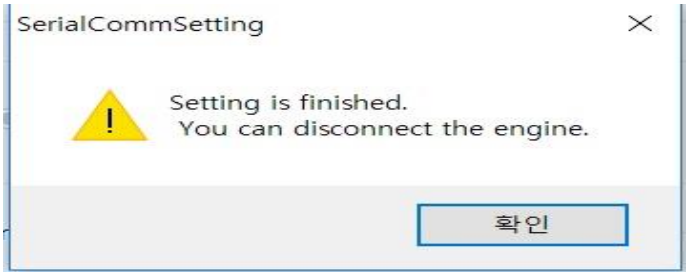
1.6)Image Enhancement/Image Inverse Control

Image Enhancement : In this mode, little noise will happen while each details should be enhancement.
Image Inverse Control : When you select this mode, color of the Colormap become inverse.

1.7)Save Setting



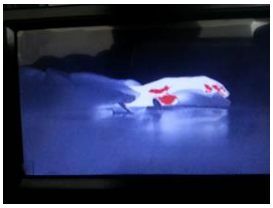
It applies to change & save parameters for camera`s setting values when pressing “Set” button.



Please wait to disconnect camera until this message shows.

Search Mode

Level 1



Level 3

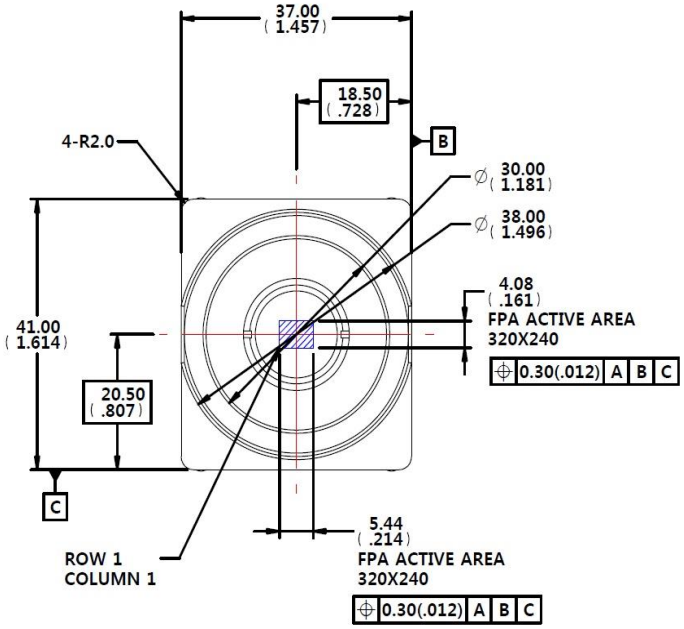
Level 7

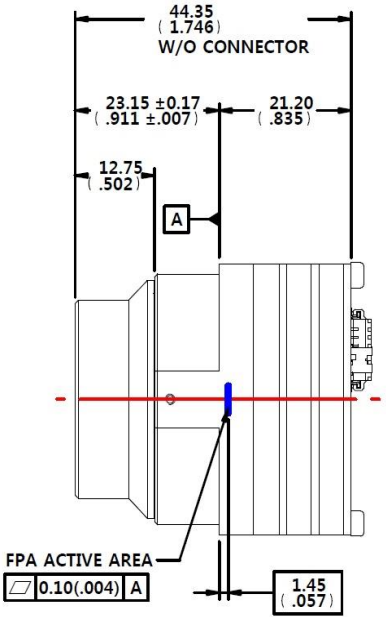
Level 10

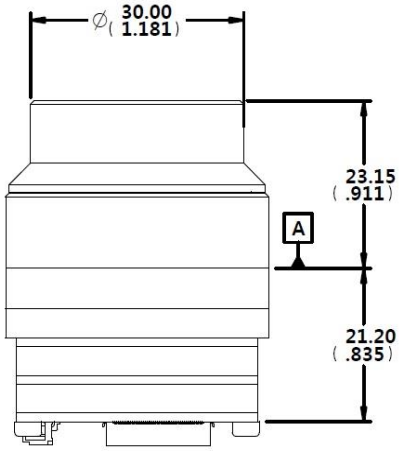
Level 13

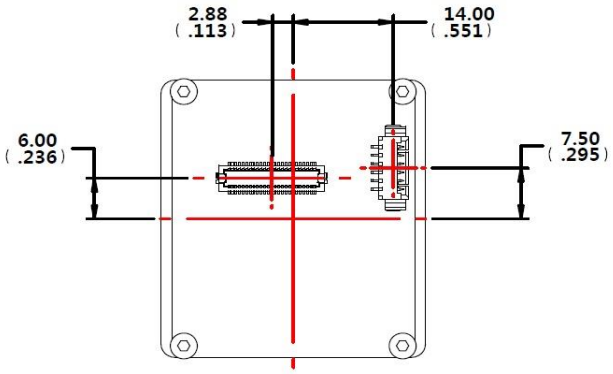
Level 16

4. DRAWING









- With 12.3mm lens