

A640H

**Uncooled Thermal Imaging Module
User Expansion Component Manual**

V1.0.0

Historical Versions

Version	Date	Description
V1.0.0	2024-08	Initial release

Table of Contents

1.TAH02V110F016C User Expansion Component	1
2.TAH02V100F012C User Expansion Component	2
2.1TAH02V100F012C User Expansion Component.....	2
2.2 BT.656 Digital Video	3
3.TAH02V100F017C User Expansion Component	4
4.TAH02V100F031C User Expansion Component	6
5.TAH02V100F022C User Expansion Component	8
6 Cautions	9

The user expansion components are connected to the rear end of the camera module. Each type of user expansion component provides different types of user control interfaces and video output interfaces, all of which feature over-voltage, under-voltage, and reverse polarity protection. Various digital video signals can be selected for output via user software or by sending commands to activate different digital video signals. The camera module can only support the output of one type of digital video signal at a time.

1.TAH02V110F016C User Expansion Component

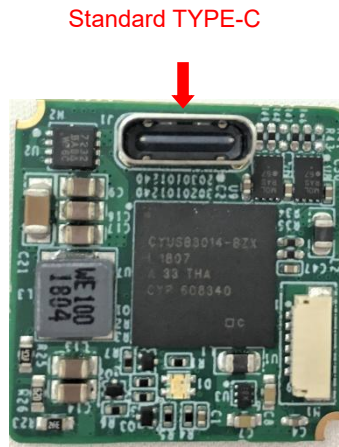


Figure 1.1 TAH02V110F016C User Expansion Component

The user expansion component interface uses a standard USB Type-C connector, which includes a power supply interface (5VDC), one analog video interface, and one USB 2.0 interface (for UVC digital video and USB control signals). It also comes with a USB cable (3030300224), one end of which connects to the board's Type-C interface, and the other end has a standard USB 2.0 connector and a BNC connector (for transmitting analog video).

Table 1.1 Pinout of USB2.0 Type-C Connector

Pin No.	Pin Name	Type	Description
A4, B4, A9, B9	VBUS	Power supply	Power output (5V DC)
A1, B1	GND	Power GND	Power GND ⁽¹⁾
A8, B8	VIDEO	Output	Analog Video
A12, B12	VGND	Power supply	Analog video GND ⁽¹⁾
A6, B6	USB_DP	Input/Output	
A7, B7	USB_DM	Input/Output	USB

Note: GND and VGND are short-circuited inside the thermal imaging module.

2.TAH02V100F012C User Expansion Component

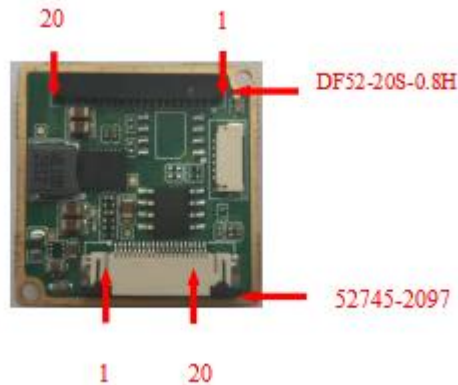


Figure 2.1 TAH02V100F012C User Expansion Component

2.1TAH02V100F012C User Expansion Component

This user expansion component supports two types of user interfaces to choose from. One interface uses a Hirose 20-pin DF52-20S-0.8H connector, which includes power supply (4.5–18VDC), RS-232, and one PAL standard analog video channel. The interface definition is shown in Table 2.1. Additionally, a Hirose 20-pin DF52-20P-0.8C mating cable (3030300028) is included as a standard accessory, allowing users to interconnect the thermal imaging module with other systems.

Table 2.1 Pinout of HRS 20-Pin DF52-20S-0.8H Connector

Pin No.	Pin Name	Type	Description
1, 3	VGND	Power supply	Analog video GND ⁽²⁾
2	VIDEO	Output	Analog video
4	RS232_RX	Input/Output	RS-232 serial communication interface ⁽¹⁾
5	RS232_TX		
6, 15, 18, 19, 20	GND	Power supply	Power GND ⁽²⁾
7, 8, 9, 10, 11, 12, 13, 14	—	—	Unavailable
16, 17	Power Supply	Power supply	Power supply (4.5~18V DC) ⁽³⁾

Notes:

(1) Both TX and RX in the serial communication interface refer to the transmit and receive of the thermal imaging module.

(2) GND and VGND are short-circuited inside the thermal imaging module.

(3) Recommended typical service voltage: 12V DC.

The other interface uses a Molex 20-pin FFC flat cable connector, model 52745-2097, which includes a power supply (4.5–18VDC), UART (3.3V) communication interface, and BT.656 digital video. The interface definition is shown in Table 2.2

Table 2.2 Pinout of Molex 20-Pin 52745-2097 Connector

Pin No.	Pin Name	Type	Description	
1	Clock	Output	BT.656	Clock signal
2	DV0			Data signal LSB
3	DV1			Data signal
4	DV2			Data signal
5	DV3			Data signal
6	DV4			Data signal
7	DV5			Data signal
8	DV6			Data signal
9	DV7			Data signal MSB
10, 11, 12, 13	GND	Power supply	Power GND ⁽²⁾	
14	—	—	Unavailable	
15, 16, 17, 18	Power supply	Power supply	Power supply (4.5~18V DC) ⁽³⁾	
19	UART_TX ⁽¹⁾	Input/Output	UART communication interface (3.3V)	
20	UART_RX ⁽¹⁾			

Notes:

(1) Both TX and RX in the serial communication interface refer to the transmit and receive of the thermal imaging module.

(2) GND and VGND are short-circuited inside the thermal imaging module.

(3) The two power supply circuits are short-circuited inside the thermal imaging module. It is recommended to use only one power supply circuit. If dual power supply is required, make sure that the voltages are the same. The recommended typical service voltage is 12V DC.

2.2 BT.656 Digital Video

BT.656 digital video includes one clock signal (Clock) and eight data signals (DV0-DV7). It supports brightness/contrast adjustment, polarity selection, pseudo-color selection, crosshair control, digital zoom,

and image mirroring functions, and only supports output of data after image processing (DRC). The BT.656 format follows the analog video format. If the analog video is in PAL format, then BT.656 is in PAL format. If the analog video is in NTSC format, then BT.656 is in NTSC format.

3.TAH02V100F017C User Expansion Component

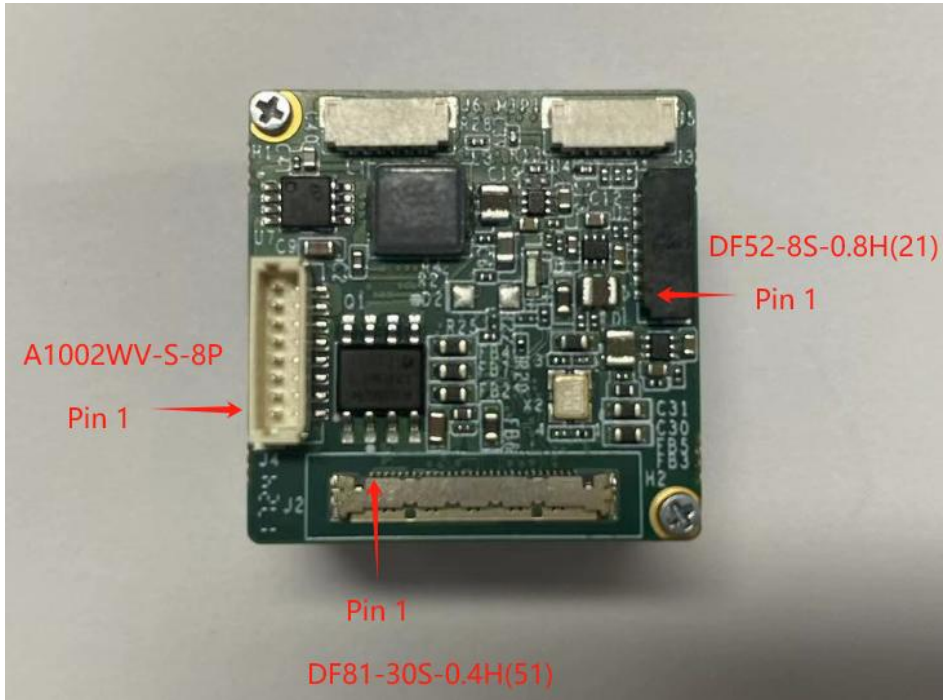


Figure 3.1 TAH02V100F017C User Expansion Component

This user expansion component supports three types of user interfaces to choose from. One interface uses a Hirose 30-pin DF81-30S-0.4H connector, which includes a power supply interface (5–18VDC), a UART communication interface (1.8V), and a MIPI digital video interface. Additionally, a Hirose 30-pin plug (3030302745) is provided, with one end connecting to the DF81-30S-0.4H connector (the cable length is approximately 9cm–11cm), and the other end can be connected to other systems.

Table 3.1 Pinout of DF81-30S-0.4H Connector

Pin No.	Pin Name	Type	Description	
1, 2, 3, 4, 5, 6	POWER_IN	Power supply	5~18V ⁽¹⁾	
7, 8, 9, 10, 11, 14, 15, 18, 21, 24, 27, 30	GND	Power	Power GND	
12	UART_RX_1V8	Input/Output	UART communication interface (1.8V) ⁽²⁾	
13	UART_TX_1V8			
16	MIPI1_DP3	Output	MIPI digital video	Data signal
17	MIPI1_DN3			

Pin No.	Pin Name	Type	Description
19	MIPI1_DP2	Output	Data signal
20	MIPI1_DP2		
22	MIPI1_DP1	Output	Data signal
23	MIPI1_DN1		
25	MIPI1_DP0	Output	Data signal
26	MIPI1_DN0		
28	MIPI1_CKP	Output	Data signal
29	MIPI1_CKN		

Note:

(1) The recommended typical operating voltage is 12VDC.

(2) Both TX and RX in the serial communication interface refer to the transmit and receive of the thermal imaging module.

(3) GND and VGND are short-circuited inside the thermal imaging module.

Another interface uses a CJT 8-pin A1002WV-S-8P connector, which mainly provides motor control functions, including power supply to the motor driver board (5–18VDC) and an RS422 interface for motor control. The interface definition is shown in Table 3.2. Users can choose to use the A1002HB-8P (not included) to achieve interconnection between the thermal imaging module and the motor driver board to complete the motor control function.

Table 3.2 Pinout of A1002WV-S-8P Connector

Pin No.	Pin Name	Type	Description
1	RS422_RXN	Input/Output	RS-422 serial communication interface ⁽¹⁾
2	RS422_RXP		
3	RS422_TXN		
4	RS422_TXP		
5, 6	GND	Power	Power GND
7, 8	POWER_IN	Power	Power output (5~18VDC) ⁽²⁾

Note:

(1) Both TX and RX in the serial communication interface refer to the transmit and receive of the thermal imaging module.

(2) The three power supply lines are already internally shorted within the thermal imaging module. This line is primarily used as the power output for the motor control board, with the output voltage matching the supply voltage. The recommended typical supply voltage is 12VDC.

The last interface uses a Hirose 8-pin DF52-8S-0.8H(21) connector, which includes the power supply

interface for the thermal imaging module (5–18VDC), an RS232 communication interface, and one PAL-format analog video output. The interface definitions are shown in Table 3.3. Users can choose the DF52-8P-0.8C (not standard) to interconnect the thermal imaging module with other systems.

Table 3.3 Pinout of Hirose 8-Pin DF52-8S-0.8H(21) Connector

Pin No.	Pin Name	Type	Description
1, 2	POWER_IN	Power	Power input (5~18VDC) ⁽¹⁾
3, 4	GND	Power	
5	RS232_TX	Input/Output	RS-232 serial communication interface ⁽²⁾
6	RS232_RX		
7	VGND	Power	Analog video ground ⁽³⁾
8	VIDEO	Output	Analog video

Note:

(1) The three power supply circuits are short-circuited inside the thermal imaging module. It is recommended to use only one power supply circuit. If dual power supply is required, make sure that the voltages are the same. The recommended typical service voltage is 12V DC.

(2) Both TX and RX in the serial communication interface refer to the transmit and receive of the thermal imaging module.

(3) GND and VGND are short-circuited inside the thermal imaging module.

4.TAH02V100F031C User Expansion Component

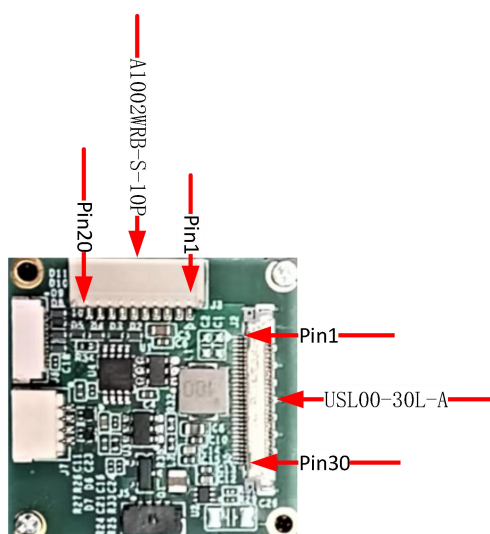


Figure 4.1 TAH02V100F031C User Expansion Component

This user expansion component supports two types of user interfaces. One interface uses the KEL 30-pin USL00-30L-A70 connector, which includes the thermal imaging module's power supply interface (6–18VDC), an RS232 communication interface, and an 8-bit DVP parallel data interface. Additionally, a KEL 30-pin plug (3030300944) is provided, one end of which can connect to the USL00-30L-A70 connector (the cable length is approximately 9cm–11cm), while the other end can connect to other systems.

Table 4.1 Pinout of KEL 30-Pin USL00-30L-A70 Connector

Pin No.	Pin Name	Type	Description	
1, 2, 3, 4	IR_POWER	Power supply	Power input (5~18VDC) ⁽¹⁾	
5, 6, 7, 9, 12, 14, 30	GND	Power supply	Power GND	
8	DE	Output	Data valid signal	
10	RS232_RX	Input/Output	RS-232 serial communication interface ⁽²⁾	
11	RS232_TX			
13	SYNC	Input/Output	Parallel data 3.3V	
15	VSYNC	Output		External sync signal
16	HSYNC	Output		Frame sync signal
17	CLK	Output		Line sync signal
18	DVP0	Output		Clock Signal
19	DVP1	Output		Data signal 0
20	DVP2	Output		Data signal 1
21	DVP3	Output		Data signal 2
22	DVP4	Output		Data signal 3
23	DVP5	Output		Data signal 4
24	DVP6	Output		Data signal 5
25	DVP7	Output	Data signal 6	
26	NC	/	Data signal 7	
27	NC	/	Not connected	
28	NC	/	Not connected	
29	NC	/	Not connected	
30	GND	Power supply	Power GND	

Note:

(1) The recommended typical operating voltage is 12VDC.

(2) Both TX and RX in the serial communication interface refer to the transmit and receive of the thermal imaging module.

Another interface uses a CJT 10-pin A1002WB-S-10P connector, primarily for providing analog video output, with the interface definition provided in Table 4.2. Users can select the A1002HB-10P (not included) to achieve interconnection between the thermal imaging module and other systems.

Table 4.2 Pinout of CJT 10-Pin A1002WRB-S-10P Connector

Pin No.	Pin Name	Type	Description
1, 2, 3, 4, 7, 8, 9, 10	NC	/	Not connected
5	VGND	Power supply	Analog video reference ground ⁽¹⁾
6	VIDEO	Output	Analog Video

Note: GND and VGND are short-circuited inside the thermal imaging module.

5.TAH02V100F022C User Expansion Component

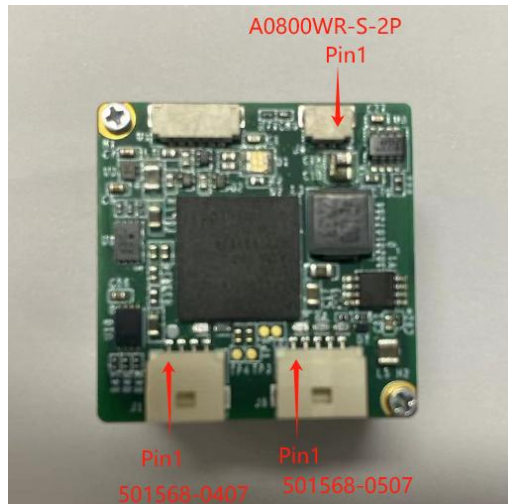


Figure 1.1 TAH02V110F016C User Expansion Component

This user expansion component uses a MOLEX 4-pin 501568-0407 connector, which includes the power supply interface for the thermal imaging module (5VDC) and one USB 2.0 interface (UVC digital video, USB control signal). Additionally, it comes with a standard MOLEX 4-pin 501330-0400 connecting cable (3030300032) to enable users to connect the thermal imaging module with other systems.

Table 5.1 Pinout of MOLEX 4-Pin 501568-0407 Connector

Pin No.	Pin Name	Type	Description
1	USB_VBUS	Power supply	USB power supply (5VDC)
2	GND	Power supply	Power GND
3	DP	Input/Output	USB differential positive
4	DM	Input/Output	USB differential negative

6 Cautions

To protect you and others from injury or to protect your equipment from damage, please read all the following information before using your equipment.

- (1)The product shall not face towards the sun or other high-intensity radiation sources directly;
- (2)The optimal environment temperature for operating is - 20 °C to 50 °C;
- (3)The detector window shall not be touched or hit with hands or other objects;
- (4)The equipment and cables shall not be touched with wet hands;
- (5)Please do not bend or damage cables;
- (6)Scrubbing your equipment with diluents is prohibited;
- (7)Do not unplug and plug cables when the power is on;
- (8)Wrong cable should not be connected in case that brings damages to the equipment;
- (9)Please pay attention to prevent static electricity;
- (10)Please do not disassemble the equipment. If there is any fault, please contact us, and professional personnel will carry out maintenance.