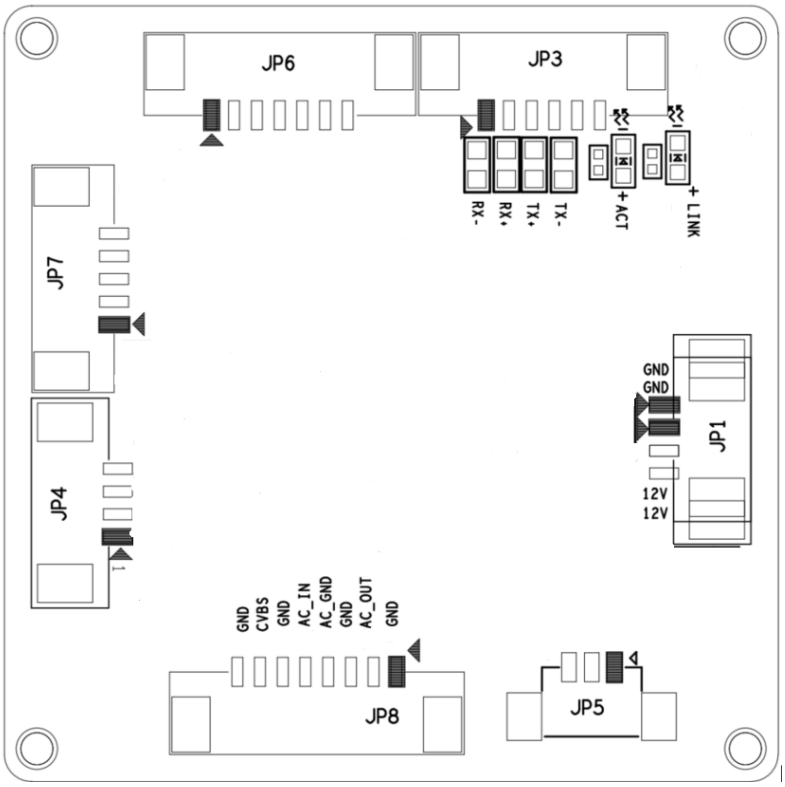
THE IP THERMAL MODULE SERIAL CONTROL MANUAL

1. Interface



JP1 Power MX1.25mm_2P

No.	Pin Name
1	GND
2	12V DC

JP3 Ethernet MX1.25mm_6P

No.	Pin Name
1	TX-
2	TX+
3	RX+
4	RX-
5	LINK#
6	ACT#

JP4 USB2.0 MX1.25mm_4P

No.	Pin Name
1	5V_DC
2	USB_DP
3	USB_DM
4	GND

JP6 Serial Port MX1.25mm_7P

No.	Pin Name
1	VCC
2	GND
3	TTL_3.3V _RXD
4	TTL_3.3V_TXD
5	GND
6	RS485-
7	RS485+

JP7 Analogue Switch MX1.25mm_5P

No.	Pin Name
1	ALM_OUT
2	ALM_IN
3	GND
4	SYS_RST_N
5	GND

JP8 Audio & Video MX1.25mm_8P

No.	Pin Name
1	GND
2	LINEOUT
3	GND
4	GND
5	LINEIN
6	GND
7	CVBS
8	GND

2. TTL_3.3V VISCA

TTL serial Response Flag

Response: X0 4Y FF

Command executed: X0 5Y FF

Query returned: X0 5Y ...FF

TTL Serial Error Message Flag

X0 6Y 01 FF Command byte length error (>14 bytes)

X0 6Y 02 FF Command error

X0 6Y 03 FF Command buffer full

X0 6Y 41 FF Command not executed

Configuration Commands

Functions	Command	Descriptions
Zoom	8x 01 04 07 00 FF	T/W Stop
	8x 01 04 07 02 FF	T/W, Default Speed
	8x 01 04 07 03 FF	

	8x 01 04 07 2p FF	T/W; p: Zoom Speed, p = 0 (Low) to 7 (High)
	8x 01 04 07 3p FF	
Focus	8x 01 04 08 00 FF	N/F Stop
	8x 01 04 08 02 FF	N/F, Default Speed
	8x 01 04 08 03 FF	
Snapshot	8x 01 09 80 00 FF	
Recording	8x 01 09 81 0p FF	P: 0-Start; 1-Stop
Serial Transparent Channel	8x 01 09 82 2 data_len pq rs tu vw ... FF	data_len: Length pq rs tu vw ...: Data that needs to be transmitted 81-> Thermal core

Configuration commands for thermal image core related functions are transmitted via the serial transparent channel. Refer to the control commands in the *Thermal Digital Interface User Manual* for details.

Query Response Command

Functions	Query	Response	Descriptions
Query ZOOM Position	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
Query FOCUS Position	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position

Query Response commands for thermal image core related functions are transmitted via the serial transparent channel. Refer to the control commands in the *Thermal Digital Interface User Manual* for details.

3. RS485 PELCO

PELCO-D

Default baud rate: 9600B/S, default address 1.

Pelco-D Command Description

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
Sync Byte	Address	Command 1	Command 2	Data 1	Data 2	Checksum

1. All values in this protocol are hexadecimal numbers
2. The Sync Byte is always FFH
3. The Address is the logical address number of the camera, address range: 00H-FFH
4. The command code represents different actions
5. Data codes 1 and 2 represent the horizontal and vertical speeds (00-3FH), respectively, and FFH represents "turbo" speed
6. Checksum = MOD[(byte 2 + byte 3 + byte 4 + byte 5 + byte 6)/100H]

The core transmitted command, address is 1 (check code has been verified) :

Function	Command Package	description
PTZ control	0xff,0x01,0x00,0x08,0x00,0xff,0x08	Up
	0xff,0x01,0x00,0x10,0x00,0xff,0x10	Down
	0xff,0x01,0x00,0x04,0xff,0x00,0x04	Left
	0xff,0x01,0x00,0x02,0xff,0x00,0x02	Right
	0xff,0x01,0x00,0x0c,0x0f,0x0f,0x2b	Upper left
	0xff,0x01,0x00,0x0a,0x0f,0x0f,0x29	Upper right
	0xff,0x01,0x00,0x14,0x0f,0x0f,0x13	Lower left
	0xff,0x01,0x00,0x12,0x0f,0x0f,0x11	Lower right
	0xff,0x01,0x00,0x20,0x00,0x00,0x21	Zoom+
	0xff,0x01,0x00,0x40,0x00,0x00,0x41	Zoom-
	0xff,0x01,0x01,0x00,0x00,0x00,0x02	Focus+
	0xff,0x01,0x00,0x80,0x00,0x00,0x81	Focus-
	0xff,0x01,0x02,0x00,0x00,0x00,0x03	Iris+
	0xff,0x01,0x04,0x00,0x00,0x00,0x05	Iris-
	0xff,0x01,0x00,0x00,0x00,0x00,0x01	Stop
Auxiliary	0xff,0x01,0x00,0x09,0x00,0x02,0x0c	Light on
	0xff,0x01,0x00,0x0b,0x00,0x02,0x0e	Light off
	0xff,0x01,0x00,0x09,0x00,0x01,0x0b	Wiper on
	0xff,0x01,0x00,0x0b,0x00,0x01,0x0d	Wiper off
Preset	0xff,0x01,0x00,0x07,0x00,0x01,0x09	Go to preset 001
	0xff,0x01,0x00,0x03,0x00,0x01,0x05	Set preset 001
	0xff,0x01,0x00,0x05,0x00,0x01,0x07	Delete preset 001
Scan	0xff,0x01,0x00,0x07,0x00,0x63,0x6B	Scan start
	0xff,0x01,0x00,0x00,0x00,0x00,0x00	Scan stop
Pattern Scan	0xff,0x01,0x00,0x1F,0x00,0x00,0x12	Recording start
	0xff,0x01,0x00,0x21,0x00,0x00,0x12	Recording stop
	0xff,0x01,0x00,0x23,0x00,0x00,0x12	Pattern Scan start
	0xff,0x01,0x00,0x00,0x00,0x00,0x01	Pattern Scan stop
3D Positioning_Zoom in	0xff,0x01,0xC0,0xxx,0xyy,0xww,0xhh	xx: the horizontal coordinate of the center of the frame selection area, yy: the vertical coordinate of the center of the frame selection area, ww: the width of the frame selection area, hh: the height of the frame selection area
3D Positioning_Zoom out	0xff,0x01,0xC1,0xxx,0xyy,0xww,0xhh	xx: the horizontal coordinate of the center of the frame selection area, yy: the vertical coordinate of the center of the frame selection area, ww: the width of the frame selection area, hh: the height of the frame selection area

Auto Scan	0xff,0x01,0x20,0x09,0x00,0xqq,0x12	Set left boundary (qq: ID, range: 1~4)
	0xff,0x01,0x20,0x0b,0x00,0xqq,0x14	Set right boundary (qq: ID, range: 1~4)
	0xff,0x01,0x20,0x0d,0x00,0xqq,0x1C	Start (qq: ID, range: 1~4)
	0xff,0x01,0x20,0x0f,0x00,0xqq,0x1E	Stop (qq: ID, range: 1~4)
	0xff,0x01,0x20,0x07,0xpp,0xqq,0x12	Set Speed (pp: Speed, range: 0x00~0x3F; qq: ID, range: 1~4)
Set Pan position	0xff,0x01,0x00,0x4b,0xpp,0xqq,sum	ppqq: X-axis coordinate 0~35999, corresponding to 0~360 degrees
Set Tilt position	0xff,0x01,0x00,0x4d,0xpp,0xqq,sum	ppqq: Y-axis coordinate 0~35999, corresponding to 0~360 degrees
Query Pan position	0xff,0x01,0x00,0x51,0x00,0x00,sum	ppqq: X-axis coordinate 0~35999, corresponding to 0~360 degrees
Query Tilt position	0xff,0x01,0x00,0x53,0x00,0x00,sum	ppqq: Y-axis coordinate 0~35999, corresponding to 0~360 degrees
Query Pan position response	0xff,0x01,0x00,0x59,0xpp,0xqq,sum	ppqq: X-axis coordinate 0~35999, corresponding to 0~360 degrees
Query Tilt position response	0xff,0x01,0x00,0x5b,0xpp,0xqq,sum	ppqq: Y-axis coordinate 0~35999, corresponding to 0~360 degrees

PELCO-P

Default communication baud rate: 9600B/S, default address 0

Pelco-P command description:

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
STX	address code	command code 1	command code2	data code 1	data code 2	ETX	check code

1. All values in this protocol are hexadecimal numbers
2. STX is always A0H
3. The address code is the logical address number of the camera, address range: 00H-1FH
4. The instruction code represents different actions
5. Data codes 1 and 2 represent the horizontal and vertical speeds (00-3FH) respectively. When operating on preset points, data code 2 represents the preset point value
6. ETX is always AFH
7. Checksum (XOR sum of Bytes 2-6) = byte 2 ^ byte 3 ^ byte 4 ^ byte 5 ^ byte 6

The core transmitted commands, address is 1 (check code verified):

Function	Command Package	description
PTZ control	0xa0,0x01,0x00,0x08,0x00,0x30,0xaf,0x36	Up

	0xa0,0x01,0x00,0x10,0x00,0x30,0xaf,0x2e	Down
	0xa0,0x01,0x00,0x04,0x10,0x00,0xaf,0x1a	Left
	0xa0,0x01,0x00,0x02,0x10,0x00,0xaf,0x1c	Right
	0xa0,0x01,0x00,0x0C,0x10,0x00,0xaf,0x12	Upper left
	0xa0,0x01,0x00,0x0A,0x10,0x00,0xaf,0x14	Upper right
	0xa0,0x01,0x00,0x14,0x10,0x00,0xaf,0x0a	Lower left
	0xa0,0x01,0x00,0x12,0x10,0x00,0xaf,0x0c	Lower right
	0xa0,0x01,0x00,0x20,0x00,0x00,0xaf,0x2e	Zoom +
	0xa0,0x01,0x00,0x40,0x00,0x00,0xaf,0x4e	Zoom -
	0xa0,0x01,0x02,0x00,0x00,0x00,0xaf,0x0c	Zoom +
	0xa0,0x01,0x01,0x00,0x00,0x00,0xaf,0x0f	Zoom -
	0xa0,0x01,0x04,0x00,0x00,0x00,0xaf,0x0a	Iris +
	0xa0,0x01,0x08,0x00,0x00,0x00,0xaf,0x06	Iris -
	0xa0,0x01,0x00,0x00,0x00,0x00,0xaf,0x0e	Stop
Preset	0xa0,0x01,0x00,0x07,0x00,0x01,0xaf,0x08	Go to preset 001
	0xa0,0x01,0x00,0x03,0x00,0x01,0xaf,0x0c	Set preset 001
	0xa0,0x01,0x00,0x05,0x00,0x01,0xaf,0x0a	Delete preset 001
Scan	0xa0,0x01,0x00,0x07,0x00,0x63,0xaf,0x6a	Scan start
	0xa0,0x01,0x00,0x00,0x00,0x00,0xaf,0x0e	Scan stop
Pattern Scan	0xa0,0x01,0x00,0x1F,0x00,0x00,0xaf,0x11	Trace recording start
	0xa0,0x01,0x00,0x21,0x00,0x00,0xaf,0x2f	Trace recording stop
	0xa0,0x01,0x00,0x23,0x00,0x00,0xaf,0x2d	Trace scan start
	0xa0,0x01,0x00,0x00,0x00,0x00,0xaf,0x0e	Trace scan stop