

SIYI ZT6 Optical Pod

External SDK Guide

Update Log

Version	Revision Date	Changes	Remarks
V0.1.0	Jun.16, 2026	Document created	

Chapter 1. Protocol Description

1. Protocol Format Description

Field	Index	Byte Size	Description
STX	0	2	0x5566 – Start-of-frame marker (little-endian)
CTRL	2	1	0: need_ack – whether this packet requires acknowledgment. 1: ack_pack – whether this packet is an ACK packet. 2-7: Reserved.
Data_len	3	2	Length of the data field in bytes (little-endian)
SEQ	5	2	Frame sequence number, range 0–65535 (little-endian)
CMD_ID	7	1	Command ID
DATA	8	Data_len	Data payload
CRC16		2	CRC16 checksum over the entire packet (little-endian)

Chapter 2. Protocol Commands

0x00: TCP Heartbeat

CMD_ID:0x00 - TCP Heartbeat			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
			No ack

Notice:

Heartbeat Packet: 55 66 01 00 00 00 00 00 45 D4

1. Supported only when connected via TCP.

0x01: Request Firmware Version

CMD_ID:0x01 - Request Firmware Version			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
	uint32_t	camera_firmware_ver	Camera firmware version
	uint32_t	gimbal_firmware_ver	Gimbal firmware version
	uint32_t	reserved	

Eg: 0x83 00 01 01 --> Gimbal firmware version v0.1.10

0x82 01 00 01 --> Camera firmware version v1.0.1

Note:

1. Since the camera system requires some time to boot up (within 30 seconds), the valid camera firmware version cannot be retrieved until startup is complete. During this period, the returned version will be all zeros (v0.0.0).

0x02: Request Gimbal Hardware ID

CMD_ID:0x02 - Request Gimbal Hardware ID			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
	UInt8_t	hardware_id[12]	Hardware ID string (10-digit ID)

Note: For the hexadecimal product code ID, the first two bytes, e.g., 38 33 30 32 32 30 32 32 32 39 00 00, form the ASCII string "830220222229".

83 represents ZT6.0x05: Manual Zoom with Auto Focus

CMD_ID:0x05 - Manual Zoom with Auto Focus			
Send Format			
Index	Data Type	Data Name	Description
1	int8_t	zoom	1 = zoom in 0 = stop zooming (sent when released) -1 = zoom out
ACK Format			
1	uint16_t	zoom_multiple	Current hybrid zoom multiplier (zoom_multiple / 10, accurate to 1 decimal place)

0x07: Gimbal Pan/Tilt Control

CMD_ID:0x07 - Gimbal Pan/Tilt Control			
Send Format			
Index	Data Type	Data Name	Description
1	int8_t	turn_yaw	Range: -100 to 0 to 100. Positive and negative values indicate opposite directions. The farther the slide, the higher the value and the faster the rotation speed. Sending 0 stops the rotation (sent when released). <ul style="list-style-type: none">Sliding right → 0 to 100Sliding left → 0 to -100
2	int8_t	turn_pitch	Range: -100 to 0 to 100. Same as above. <ul style="list-style-type: none">Sliding up → 0 to 100Sliding down → 0 to -100
ACK Format			

	uint8_t	sta	1 = success 0 = error
--	---------	-----	--------------------------

0x08: One-Click Return-to-Center

CMD_ID:0x08 - One-Click Return-to-Center			
Send Format			
Index	Data Type	Data Name	Description
1	uint8_t	center_pos	1 = Return to center 2 = Center and point down 3 = Center only 4 = Point down only
ACK Format			
	uint8_t	sta	1 = success 0 = error

0x0A: Request Camera System Information

CMD_ID:0x0A - Request Camera System Information			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
1	uint8_t	reserved	
2	uint8_t	reserved	
3	uint8_t	reserved	
4	uint8_t	record_sta	0 = Not recording 1 = Recording 2 = No TF card inserted 3 = Recording – data loss detected, please check the TF card
5	uint8_t	gimbal_motion_mode	0 = Locked mode 1 = Follow mode 2 = FPV mode
6	uint8_t	gimbal_mounting_dir	Gimbal mounting orientation: 0 = Reserved 1 = Normal 2 = Inverted
7	uint8_t	reserved	
8	uint8_t	zoom_linkage	Zoom Linkage Switch

			0: Off
			1: On

0x0B: Function Feedback Information Return

No request required; sent by the camera

CMD_ID:0x0B - Function Feedback			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
1	uint8_t	info_type	0 = Photo capture successful 1 = Photo capture failed – please check if a TF card is inserted 4 = Recording failed – please check if a TF card is inserted 5 = Recording started 6 = Recording stopped

0x0C: Photo Capture, Recording, etc.

No immediate response; the operation status is returned via 0x0B

CMD_ID:0x0C - Photo Capture			
Send Format			
Index	Data Type	Data Name	Description
	uint8_t	func_type	0 = Photo capture 2 = Record 3 = Motion mode: Locked 4 = Motion mode: Follow 5 = Motion mode: FPV 9 = One-key point down 10: Linked Zoom (each send toggles the switch)
ACK Format			
			No ACK – status is reported via 0x0B

0x0D: Request Gimbal Attitude Data

CMD_ID:0x0D - Request Gimbal Attitude Data			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
	int16_t	yaw	Yaw angle
	int16_t	pitch	Pitch angle
	int16_t	roll	Roll angle
	int16_t	yaw_velocity	Gyro yaw angular velocity
	int16_t	pitch_velocity	Gyro pitch angular velocity
	int16_t	roll_velocity	Gyro Note: It is recommended to use the 0x25 command to set the attitude data transmission frequency, so that data is actively and continuously sent at the set frequency. roll angular velocity

Note: The above data divided by 10 gives the actual angle, with a precision of 1 decimal place.

Rotation order: yaw axis → roll axis → pitch axis; coordinate system: ENU (East-North-Up); the yaw axis uses the magnetic encoder angle.

0x0E: Set Gimbal Attitude Angle

CMD_ID:0x0E - Set Gimbal Attitude Angle			
Send Format			
Index	Data Type	Data Name	Description
	int16_t	yaw	Target yaw angle
	int16_t	pitch	Target pitch angle
ACK Format			
	int16_t	yaw	Current yaw angle
	int16_t	pitch	Current pitch angle
	int16_t	roll	Current roll angle

Note: The control angle precision is 1 decimal place; e.g., to specify yaw 60.5 degrees, set the yaw field to 605.

Note: The returned current actual angle divided by 10 gives the actual angle, with a precision of 1 decimal place.

0x0F: Absolute Zoom with Auto Focus

CMD_ID:0x0F - Absolute Zoom with Auto Focus			
Send Format			

Index	Data Type	Data Name	Description
1	uint8_t	Absolute_movement_int	Integer part of the target zoom multiplier (0x1 to 0x1E)
2	uint8_t	Absolute_movement_float	Decimal part of the target zoom multiplier (0x0 to 0x9)
ACK Format			
	uint8_t	Absolute_movement_ask	1 = success

0x10: Request Video Stitching Mode

CMD_ID: 0x10 — Request Video Stitching Mode			
Send Data Format			
No.	Data Type	Data Name	Description
ACK Data Format			
1	uint8_t	vdisp_mode	Display stitching mode: 0: Stitching mode (main stream: zoom & thermal imaging; sub stream: wide-angle) 3: Non-stitching mode (main stream: zoom; sub stream: thermal imaging) 7: Non-stitching mode (main stream: thermal imaging; sub stream: zoom)

0x11: Set Video Stitching Mode

CMD_ID: 0x11 — Set Video Stitching Mode			
Send Data Format			
No.	Data Type	Data Name	Description
1	uint8_t	vdisp_mode	Display stitching mode: 0: Stitching mode (main stream: zoom & thermal imaging; sub stream: wide-angle) 3: Non-stitching mode (main stream: zoom; sub stream: thermal imaging) 7: Non-stitching mode (main stream: thermal imaging; sub stream: zoom)
ACK Data Format			
1	uint8_t	vdisp_mode	Display stitching mode: 0: Stitching mode (main stream: zoom & thermal imaging; sub stream: wide-angle) 3: Non-stitching mode (main stream: zoom; sub stream: thermal imaging)

			7: Non-stitching mode (main stream: thermal imaging; sub stream: zoom)
CMD_ID:0x12-----Get Temperature of Selected Point			
Send Data Format			
No	Data Type	Data Name	Description
1	uint16_t	x	X coordinate of the selected point
2	uint16_t	y	Y coordinate of the selected point
3	uint8_t	get_temp_flag	0: Disable measurement; 1: Measure once; 2: Continuous measurement
ACK Data Format			
1	uint16_t	temp	Temperature of the selected point, divided by 100 to retain two decimal places
1	uint16_t	x	X coordinate of the selected point
2	uint16_t	y	Y coordinate of the selected point

0x13: Regional Temperature Measurement

CMD_ID:0x13----- Regional Temperature Measurement			
Send Data Format			
No.	Data Type	Data Name	Description
1	uint16_t	startx	X coordinate of the box start point
2	uint16_t	starty	Y coordinate of the box start point
3	uint16_t	endx	X coordinate of the box end point
4	uint16_t	endy	Y coordinate of the box end point
5	uint8_t	get_temp_flag	0: Disable measurement; 1: Measure once; 2: Continuous measurement
ACK Data Format			
1	uint16_t	startx	X coordinate of the box start point
2	uint16_t	starty	Y coordinate of the box start point
3	uint16_t	endx	X coordinate of the box end point

4	uint16_t	endy	Y coordinate of the box end point
5	uint16_t	temp_max	Maximum temperature within the box, divided by 100 to retain two decimal places
6	uint16_t	temp_min	Minimum temperature within the box, divided by 100 to retain two decimal places
7	uint16_t	temp_max_x	X coordinate of the maximum temperature within the box
8	uint16_t	temp_max_y	Y coordinate of the maximum temperature within the box
9	uint16_t	temp_min_x	X coordinate of the minimum temperature within the box
10	uint16_t	temp_min_y	Y coordinate of the minimum temperature within the box

0x14: Global Temperature Measurement

CMD_ID:0x14-----Global Temperature Measurement			
Send Data Format			
No.	Data Type	Data Name	Description
1	uint8_t	get_temp_flag	0: Disable measurement; 1: Measure once; 2: Continuous measurement
ACK Data Format			
1	uint16_t	temp_max	Maximum temperature within the entire frame, divided by 100 to retain two decimal places
2	uint16_t	temp_min	Minimum temperature within the entire frame, divided by 100 to retain two decimal places
3	uint16_t	temp_max_x	X coordinate of the maximum

			temperature within the entire frame
4	uint16_t	temp_max_y	Y coordinate of the maximum temperature within the entire frame
5	uint16_t	temp_min_x	X coordinate of the minimum temperature within the entire frame
6	uint16_t	temp_min_y	Y coordinate of the minimum temperature within the entire frame

0x16: Request Supported Zoom Range

CMD_ID:0x16 - Request Supported Zoom Range			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
	uint8_t	zoom_max_int	Integer part of the maximum zoom multiplier
	UInt8_t	Zoom_max_float	Decimal part of the maximum zoom multiplier

0x18: Request Current Zoom Multiplier

CMD_ID:0x18 - Request Current Zoom Multiplier			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
	uint8_t	zoom_int	Integer part of the current zoom multiplier
	UInt8_t	Zoom_float	Decimal part of the current zoom multiplier

0x19: Request Current Gimbal Mode

CMD_ID:0x19 - Request Current Gimbal Mode			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
	uint8_t	gimbal_mode	0 = Locked mode 1 = Follow mode 2 = FPV mode

0x1A: Request Current Thermal Imaging Pseudo-color

CMD_ID:0x1A-----Request Current Thermal Imaging Pseudo-color			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			

	uint8_t	pseudo color	【Total of 11 color swatches.】 0: White_Hot 1: Reserved 2: Sepia 3: Ironbow 4: Rainbow 5: Night 6: Aurora 7: Red_Hot 8: Jungle 9: Medical 10: Black_Hot 11: Glory_Hot
--	---------	--------------	---

0x1B: Set Current Thermal Imaging Pseudo-color

CMD_ID:0x1B-----Request Current Thermal Imaging Pseudo-color			
Send Format			
Index	Data Type	Data Name	Description

	uint8_t	pseudo color	【Total of 11 color swatches.】 0: White_Hot 1: Reserved 2: Sepia 3: Ironbow 4: Rainbow 5: Night 6: Aurora 7: Red_Hot 8: Jungle 9: Medical 10: Black_Hot 11: Glory_Hot
ACK Data Format			
	uint8_t	pseudo color	【Total of 11 color swatches.】 0: White_Hot 1: Reserved 2: Sepia 3: Ironbow 4: Rainbow 5: Night 6: Aurora 7: Red_Hot 8: Jungle 9: Medical 10: Black_Hot 11: Glory_Hot

0x20: Request Camera Encoding Parameters

CMD_ID:0x20 - Request Camera Encoding Parameters			
Send Format			
Index	Data Type	Data Name	Description
	uint8_t	req_stream_type	0 = Record stream 1 = Main stream 2 = Sub stream
ACK			
1	uint8_t	stream_type	0 = Record stream 1 = Main stream 2 = Sub stream
2	uint8_t	VideoEncType	Encoding type: 1 = H.264 2 = H.265
3	uint16_t	Resolution_L	Resolution – width
4	uint16_t	Resolution_H	Resolution – height
5	uint16_t	VideoBitrate	Fixed bitrate (unit: Kbps)
6	uint8_t	VideoFrameRate	Frame rate (fps)

0x21: Set Camera Encoding Parameters

CMD_ID:0x21 - Set Camera Encoding Parameters			
Send Format			
Index	Data Type	Data Name	Description
1	uint8_t	stream_type	0 = Set record stream 1 = Set main stream 2 = Set Sub stream
2	uint8_t	VideoEncType	Encoding type: 1 = H.264 2 = H.265 (The encoding format of the recording stream is not currently modifiable.)
3	uint16_t	Resolution_L	Resolution – width (e.g., 1920, 1280)
4	uint16_t	Resolution_H	Resolution – height (e.g., 1080, 720)
5	uint16_t	VideoBitrate	Video bitrate (unit: Kbps)
6	uint8_t	reserve	Reserved
ACK			
1	uint8_t	stream_type	0 = Set record stream 1 = Set main stream 2 = Set Sub stream
2	uint8_t	sta	1 = Success 0 = Failure

0x22: Send Vehicle Attitude Data to Gimbal

CMD_ID:0x22 - Send Vehicle Attitude Data to Gimbal			
Send Format			
Index	Data Type	Data Name	Description
1	uin32_t	time_boot_ms	[ms]Timestamp (time since system boot)
1	float	Roll	[rad] Roll angle $(-\pi..+\pi)$
2	float	Pitch	[rad] Pitch angle $(-\pi/2..+\pi/2)$
3	float	Yaw	[rad] Yaw angle $(-\pi..+\pi)$
4	float	Rollspeed	[rad/s] Roll angular speed
5	float	Pitchspeed	[rad/s] Pitch angular speed
6	float	Yawspeed	[rad/s] Yaw angular speed
ACK			

Note: NED (North-East-Down) coordinate system. Rotation order: yaw → pitch → roll.

Recommended rate: 20–50 Hz.

0x30: Set UTC Time

CMD_ID:0x30 - Set UTC Time			
Send Format			
Index	Data Type	Data Name	Description
1	uint64_t	Timestamp	UNIX epoch time(us)
ACK Format			
1	uint8_t	ack	1 = Success 0 = Invalid time format

0x33: Request Thermal Imaging Output Mode

CMD_ID: 0x33 — Request Thermal Imaging Output Mode			
Send Data Format			
No	Data Type	Data Name	Description
ACK Format			
1	uint8_t	mode	0: 30fps 1: 25fps + temperature frame output

0x34: Set Thermal Imaging Output Mode

CMD_ID:0x 34 -----Set Thermal Imaging Output Mode			
Send Data Format			
No	Data Type	Data Name	Description
1	uint8_t	mode	0: 30fps 1: 25fps + temperature frame output
ACK Data Format			
1	uint8_t	mode	0: 30fps 1: 25fps + temperature frame output

0x35: Get One Temperature Frame

CMD_ID:0x 35 ----- Get One Temperature Frame			
Send Data Format			
No	Data Type	Data Name	Description
ACK Data Format			
1	uint8_t	ack	1: Successfully obtained

0x37: Request Thermal Imaging Gain Mode

CMD_ID:0x 37 ----- Request Thermal Imaging Gain Mode			
--	--	--	--

Send Data Format			
No	Data Type	Data Name	Description
ACK Data Format			
1	uint8_t	Ir_gain	0: Low gain 1: High gain

0x38: Set Thermal Imaging Gain Mode

CMD_ID:0x 38 ----- Set Thermal Imaging Gain Mode			
Send Data Format			
No	Data Type	Data Name	Description
1	uint8_t	Ir_gain	0: Low gain 1: High gain
ACK Data Format			
1	uint8_t	Ir_gain	0: Low gain 1: High gain

0x39: Request Thermal Imaging Environment Correction Parameters

CMD_ID:0x 39 -----Request Thermal Imaging Environment Correction Parameters			
Send Data Format			
No	Data Type	Data Name	Description
ACK Data Format			
1	uint16_t	Dist	Distance (m)
2	uint16_t	Ems	Target emissivity (%)
3	uint16_t	Hum	Ambient humidity (%)
4	uint16_t	Ta	Atmospheric temperature (°C)
5	uint16_t	Tu	Reflected temperature (°C)

0x3A: Set Thermal Imaging Environment Correction Parameters

CMD_ID:0x 3A -----Set Thermal Imaging Environment Correction Parameters			
---	--	--	--

Send Data Format			
No	Data Type	Data Name	Description
1	uint16_t	Dist	Distance (unit: m)
2	uint16_t	Ems	Target emissivity (%)
3	uint16_t	Hum	Ambient humidity (%)
4	uint16_t	Ta	Atmospheric temperature (°C)
5	uint16_t	Tu	Reflected temperature (°C)
ACK Data Format			
1	uint8_t	ack	1 : : Successfully set

Note: All parameters in this command are divided by 100 to retain two decimal places.

0x3B: Request Thermal Imaging Environment Correction Switch

CMD_ID:0x 3B -----Request Thermal Imaging Environment Correction Switch			
Send Data Format			
No	Data Type	Data Name	Description
ACK Data Format			
1	uint8_t	EnvCorrect	0: Off 1: On

0x3C: Set Thermal Imaging Environment Correction Switch

CMD_ID:0x 3C -----Set Thermal Imaging Environment Correction Switch			
Send Data Format			
No	Data Type	Data Name	Description
1	uint8_t	EnvCorrect	0: Off 1: On
ACK Data Format			
1	uint8_t	EnvCorrect	0: Off 1: On

0x3E: Send Raw GPS Data to Gimbal

CMD_ID:0x 3E-----Send Raw GPS Data to Gimbal			
Send Data Format			
No	Data Type	Data Name	Description
1	uint32_t	time_boot_ms	[ms]time since boot
2	int32_t	lat	[degE7]Latitude
3	int32_t	lon	[degE7]Longitude
4	int32_t	alt	[cm]Altitude (MSL)
5	int32_t	alt_ellipsoid	[cm]Altitude (above WGS84, EGM96 ellipsoid). Positive for up.
6	int32_t	vn	[m E3/s] X Speed
7	int32_t	ve	[m E3/s] Y Speed
8	int32_t	vd	[m E3/s] Z Speed
ACK Data Format			
		no	

0x48: Format SD Card

CMD_ID:0x48 - Format SD Card			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
1	uint8_t	format_sta	0 = Format failed 1 = Format successful

0x4D: Get AI Mode Status

CMD_ID:0x4D - Get AI Mode Status			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
1	uint8_t	sta	0 = AI mode off 1 = AI mode on

0x4E: Get AI Module Target Tracking Coordinate Information Stream Status

CMD_ID:0x4E----- Get AI Module Target Tracking Coordinate Information Stream Status			
Status			
Send Format			
Index	Data Type	Data Name	Description
ACK Format			
1	uint8_t	sta	0: Not enabled 1: Actively outputting coordinate information stream 2: AI recognition not enabled 3: AI target tracking not enabled 4: AI target tracking stream is enabled, but link ID does not match

0x4F: Manually Update Thermal Imaging Shutter

CMD_ID:0x4F-----Manually Update Thermal Imaging Shutter			
Send Format			
Index	Data Type	Data Name	Description
ACK Data Format			
1	Uint8_t	ack	1: Update successful

0x50: AI Module Target Tracking Coordinate Information Stream

This stream is automatically sent after enabling via command 0x51 (Set AI Module Target Tracking Coordinate Information Stream Status); no request is required.

Origin is the top-left corner; coordinates represent the exact center of the recognition box; pixel coordinates are based on a resolution of 1280×720 (width × height).

CMD_ID:0x50-----AI Module Target Tracking Coordinate Information Stream			
Send Data Format			
Index	Data Type	Data Name	Description
ACK Data Format			
1	uint16_t	pos_x	X coordinate of the tracked target
2	uint16_t	pos_y	Y coordinate of the tracked target
3	uint16_t	pos_width	Width of the target recognition box
4	uint16_t	pos_height	Height of the target recognition box
5	uint8_t	Target_ID	Target type ID: 0: Person 1: Car 2: Bus 3: Truck 255: Arbitrary object tracking
6	uint8_t	Track_Sta	Tracking status: 0: Normal tracking (AI) 1: Intermittent loss, resumable tracking 2: Lost 3: User canceled tracking 4: Normal tracking (arbitrary object)

0x51: Set AI Module Target Tracking Coordinate Information Stream Status

CMD_ID:0x51-----Set AI Module Target Tracking Coordinate Information Stream Status			
Send Data Format			
Index	Data Type	Data Name	Description
	uint8_t	track_action	1: Enable output 0: Disable output
ACK Data Format			
1	uint8_t	sta	1: Enable output 0: Disable output

Chapter 3. Communication Interface

1. TTL Serial Port

Baud rate: 115200

Data bits: 8, Stop bits: 1, Parity: None

2. UDP

IP: 192.168.144.25

Port: 37260

3. TCP

IP: 192.168.144.25

Port: 37260

Heartbeat packet: 55 66 01 01 00 00 00 00 59 8B

Chapter 4. Communication Data Examples

Color legend: Header | CTRL | Data Length | SEQ | ID | Data/Date | CRC

TCP Heartbeat

55 66 01 00 00 00 00 00 45 D4

Request Firmware Version

55 66 01 00 00 00 00 01 64 C4

Request Gimbal Hardware ID

55 66 01 00 00 00 00 02 07 F4

Manual Zoom with Auto Focus

55 66 01 01 00 00 00 05 01 8D 64(Zoom in)

55 66 01 01 00 00 00 05 00 AC 74(Stop Zooming)

55 66 01 01 00 00 00 05 FF 5C 6A(Zoom out)

Gimbal Pan / Tilt Control

55 66 01 02 00 00 00 07 14 00 46 EB(yaw 20% speed, pitch stopped)

55 66 01 02 00 00 00 07 00 00 F1 24(yaw and pitch both stopped)

One-Click Function

55 66 01 01 00 00 00 08 01 D1 12(Return-to-Center)

55 66 01 01 00 00 00 08 02 B2 22(Center and point down)

55 66 01 01 00 00 00 08 03 93 32(Center only)

55 66 01 01 00 00 00 08 04 74 42(Point down only)

Request Camera System Information

55 66 01 00 00 00 00 0A 0F 75

Photo Capture, Recording, etc.

55 66 01 01 00 00 00 0C 00 34 CE(Photo capture)

55 66 01 01 00 00 00 0C 02 76 EE(Record)

55 66 01 01 00 00 00 0C 03 57 FE(Locked mode)

55 66 01 01 00 00 00 0C 04 B0 8E(Follow mode)

55 66 01 01 00 00 00 0C 05 91 9E(FPV mode)

55 66 01 01 00 00 00 0C 0A 7E 6F(Toggle Linked Zoom Status)

Request Gimbal Attitude Data

55 66 01 00 00 00 00 0D E8 05

Set Gimbal Attitude Angle

55 66 01 04 00 00 00 0E 00 00 7C FC 4F A4(yaw 0°,pitch -90°)

55 66 01 04 00 00 00 0E 2C 01 C8 00 59 17(yaw 30°,pitch 20°)

Absolute Zoom

55 66 01 02 00 00 00 0F 01 00 61 BE(1.0x)

55 66 01 02 00 00 00 0F 07 05 62 44(7.5x)

Request Video Stitching Mode

55 66 01 00 00 00 00 10 74 C6

Get Selected Point Temperature from Thermal Imaging

55 66 01 05 00 00 00 12 C0 03 1C 02 01 AC D7(Measure once at point (960, 540))

Thermal Imaging Regional Temperature Measurement

55 66 01 09 00 00 00 13 C8 00 C8 00 90 01 90 01 01 7C 03 (Measure once within the rectangle from top-left [200, 200] to bottom-right [400, 400])

Request Supported Zoom Range

55 66 01 00 00 00 00 16 B2 A6

Request Current Zoom Multiplier

55 66 01 00 00 00 00 18 7C 47

Request Current Gimbal Mode

55 66 01 00 00 00 00 19 5D 57

Request Current Thermal Imaging Pseudo-color

55 66 01 00 00 00 00 1A 3E 67

Set Current Thermal Imaging Pseudo-color

55 66 01 01 00 00 00 1B 00 D0 54(White Hot)

55 66 01 01 00 00 00 1B 02 92 74(Fusion)

Request Camera Encoding Parameters

55 66 01 01 00 00 00 20 01 9E 9D

Set Camera Encoding Parameters

55 66 01 09 00 00 00 21 01 02 80 07 38 04 00 00 00 59 94(Main Stream H265 1920x1080)

55 66 01 09 00 00 00 21 02 02 00 05 D0 02 00 00 00 2D 62(Main Stream H265 1280x720)

Set UTC Time

55 66 01 08 00 00 00 30 38 3F FB EF E9 4D 06 00 D5 67

(1774517009203000 为 2026-3-26 9:23:29)

Request Thermal Imaging Gain Status

55 66 01 00 00 00 00 37 F1 92

Set Thermal Imaging Gain Status

55 66 01 01 00 00 00 38 00 65 07(Low Gain)

55 66 01 01 00 00 00 38 01 44 17(High Gain)

Format SD Card

55 66 01 00 00 00 00 48 89 1D

Get AI Mode

55 66 01 00 00 00 00 4D 2C 4D

Chapter 5. CRC16 Checksum Code

```
const uint16_t crc16_tab[256];

/*****
CRC16 Coding & Decoding  $G(X) = X^{16} + X^{12} + X^5 + 1$ 
*****/

uint16_t CRC16_cal(uint8_t *ptr, uint32_t len, uint16_t crc_init)
{
    uint16_t crc, oldcrc16;
    uint8_t temp;
    crc = crc_init;
    while (len--!=0)
    {
        temp=(crc>>8)&0xff;
        oldcrc16=crc16_tab[*ptr^temp];
        crc=(crc<<8)^oldcrc16;
        ptr++;
    }
    return(crc);
}

uint8_t crc_check_16bites(uint8_t* pbuf, uint32_t len, uint32_t* p_result)
{
    uint16_t crc_result = 0;
    crc_result= CRC16_cal(pbuf,len, 0);
    *p_result = crc_result;

    return 2;
}
```

```
const uint16_t crc16_tab[256]= {0x0,0x1021,0x2042,0x3063,0x4084,0x50a5,0x60c6,0x70e7,  
    0x8108,0x9129,0xa14a,0xb16b,0xc18c,0xd1ad,0xe1ce,0xf1ef,  
    0x1231,0x210,0x3273,0x2252,0x52b5,0x4294,0x72f7,0x62d6,  
    0x9339,0x8318,0xb37b,0xa35a,0xd3bd,0xc39c,0xf3ff,0xe3de,  
    0x2462,0x3443,0x420,0x1401,0x64e6,0x74c7,0x44a4,0x5485,  
    0xa56a,0xb54b,0x8528,0x9509,0xe5ee,0xf5cf,0xc5ac,0xd58d,  
    0x3653,0x2672,0x1611,0x630,0x76d7,0x66f6,0x5695,0x46b4,  
    0xb75b,0xa77a,0x9719,0x8738,0xf7df,0xe7fe,0xd79d,0xc7bc,  
    0x48c4,0x58e5,0x6886,0x78a7,0x840,0x1861,0x2802,0x3823,  
    0xc9cc,0xd9ed,0xe98e,0xf9af,0x8948,0x9969,0xa90a,0xb92b,  
    0x5af5,0x4ad4,0x7ab7,0x6a96,0x1a71,0xa50,0x3a33,0x2a12,  
    0xdbfd,0xcbdc,0xfbbf,0xeb9e,0x9b79,0x8b58,0xbb3b,0xab1a,  
    0x6ca6,0x7c87,0x4ce4,0x5cc5,0x2c22,0x3c03,0xc60,0x1c41,  
    0xedaе,0xfd8f,0xcdec,0xddcd,0xad2a,0xbd0b,0x8d68,0x9d49,  
    0x7e97,0x6eb6,0x5ed5,0x4ef4,0x3e13,0x2e32,0x1e51,0xe70,  
    0xff9f,0xefbe,0xdfdd,0xcffc,0xbf1b,0xaf3a,0x9f59,0x8f78,  
    0x9188,0x81a9,0xb1ca,0xa1eb,0xd10c,0xc12d,0xf14e,0xe16f,  
    0x1080,0xa1,0x30c2,0x20e3,0x5004,0x4025,0x7046,0x6067,  
    0x83b9,0x9398,0xa3fb,0xb3da,0xc33d,0xd31c,0xe37f,0xf35e,  
    0x2b1,0x1290,0x22f3,0x32d2,0x4235,0x5214,0x6277,0x7256,  
    0xb5ea,0xa5cb,0x95a8,0x8589,0xf56e,0xe54f,0xd52c,0xc50d,  
    0x34e2,0x24c3,0x14a0,0x481,0x7466,0x6447,0x5424,0x4405,  
    0xa7db,0xb7fa,0x8799,0x97b8,0xe75f,0xf77e,0xc71d,0xd73c,  
    0x26d3,0x36f2,0x691,0x16b0,0x6657,0x7676,0x4615,0x5634,  
    0xd94c,0xc96d,0xf90e,0xe92f,0x99c8,0x89e9,0xb98a,0xa9ab,  
    0x5844,0x4865,0x7806,0x6827,0x18c0,0x8e1,0x3882,0x28a3,  
    0xcb7d,0xdb5c,0xeb3f,0xfb1e,0x8bf9,0x9bd8,0xabbb,0xbb9a,  
    0x4a75,0x5a54,0x6a37,0x7a16,0xaf1,0x1ad0,0x2ab3,0x3a92,  
    0xfd2e,0xed0f,0xdd6c,0xcd4d,0xbdaa,0xad8b,0x9de8,0x8dc9,
```

```
0x7c26,0x6c07,0x5c64,0x4c45,0x3ca2,0x2c83,0x1ce0,0xcc1,  
0xef1f,0xff3e,0xcf5d,0xdf7c,0xaf9b,0xbfa,0x8fd9,0x9ff8,  
0x6e17,0x7e36,0x4e55,0x5e74,0x2e93,0x3eb2,0xed1,0x1ef0  
};
```