G8T Network Port Control Protocol

1、Minimum Supported Firmware Version

Gimbal Firmware： G8T_APP_V1.0.0.33_20250218

Camera Firmware： HQUU_CR21M_V90001R250306B23.0F1411B0B2DCE4F3

2、Communication Method

- After TCP connects to the board eth0 control port, send the corresponding protocol

  Default IP eth0: 192.168.144.119 Default control port: 2000 Only one TCP connection is allowed. If another connection is established, the original connection will be disconnected. After the TCP connection is established, the feedback message will be returned to the TCP network interface.

- After UDP connects to the board eth0 control port, send the corresponding protocol
  Default IP eth0: 192.168.144.119 Default control port: 14451 and prot: 14450

3、Protocol Content

3.1、Receiving Part:：

3.1.1、General Tracking

0.	Message header1 0x90
1.	Message header2 0xeb
2.	Frame length
3.	0x00
4.	0x00
5.	0x00
6.	0x00
7.	0x00

Parameter2 8.	0x00
Parameter3 9.	0x00
Parameter4 10.	0x00
Parameter5 11.	0x00
Parameter6 12.	(Parameter 7\8\9\10) Parameters are transmitted according to this signal) Type frame: 0x80- Tracking on 0x81- Tracking off 0x82-Parameter7-10 Tracking coordinates x, y 0x83-Parameter7-10 Tracking coordinate frame w, h
Parameter7 13.	Tracking coordinate x, the upper left corner is 0 Note: x value range [0,1900] w value range [10,260]
Parameter8 14.	
Parameter9 15.	Tracking coordinate y, the upper left corner is 0 Note: y value range [0,1060] h value range [10,260]
Parameter10 16.	
17.	Checksum (the sum of all previous bytes, taking the lower 8 bits)

Note: This command is a pointing tracking command, which can track the target on any interface. If the detection result is used for initialization, the detection + tracking logic will be enabled simultaneously. If the detection result is not used for initialization, pure tracking is used, and the tracking frame adaptation related functions cannot be enabled. To enable tracking, you need to send three instructions 0x80, 0x82, and 0x83 in sequence

3.1.2、Detection Display Control (control whether to display the detection auxiliary box)

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x84 ((control whether to display the detection auxiliary box)
5.	0: Close the detection auxiliary frame 1: Open the detection auxiliary frame
6.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.3、Set the RTSP Server IP Address (restart to take effect)

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x09
4.	Type frame：0x8D
5.	[0,255] e.g.： 192
6.	[0,255] e.g.： 168
7.	[0,255] e.g.： 1
8.	[0,255] e.g.： 100
9.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.4、Set the RTSP Server Name (restart to take effect)

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x45
4.	Type frame：0x8E
5~68	For example: chn0 (character string, missing digits are padded with 0)
69.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.5、Take a Photo

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x93
5.	0: Not take a photo 1: Take a photo on the main screen
6.	Checksum (the sum of all previous bytes, take the lower 8 bits)

Note: If the system turns on the OSD character display function, the captured photos will be superimposed with the corresponding OSD information.

3.1.6、Video Recording (the current maximum length of video recording is 30 minutes))

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x94

5.	0: Stop recording 1: Start recording
6.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.7、Set the Video Output Mode Type

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x9B
5.	0: White light 1: Thermal imaging 2: White light (full screen) + Thermal imaging (small) 3: Thermal imaging(full screen) + White light (small)
6.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.8、Set the OSD Mode Type

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x9C
5.	0：Off 1：On
6.	Checksum (the sum of all previous bytes, take the lower 8 bits)

Note: The system OSD display mode is closed by default.

3.1.9、Character Display Information Type

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x17
4.	Type frame：0x9D
5~6.	Frame angle (low byte first, high byte last, for example: -125.23 corresponds to F4 A6) Integer, range -180°~180° Accuracy 180/32767
7~8.	Pitch angle (low byte first, high byte last) Integer, range -90°~90° Accuracy 90/32767
9~12.	Longitude (low byte first, high byte last) Integer, range -90°~90°, Accuracy 0.0000001
13~16.	Latitude (low byte first, high byte last) Integer, range -180°~180°, Accuracy 0.0000001
17~18.	Height Unsigned integer, Accuracy 0.1 meter
19~20.	Distance Unsigned integer, Accuracy 1 meter
21.	Pod mode 0: Mode 1 1: Mode 2 2: Mode 3
22.	Zoom ratio
23.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.10、Infrared Pseudo-Color Switch

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 06
4.	Type frame：0xa1
5~（N-1)	The command data corresponds to the pseudo-color sequence number: 0 white heat; 1 black heat; 3 rainbow; 6 iron red; a ice fire 9 lava
N	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.11、Infrared Camera Configuration (the default value of infrared electronic zoom is 1.0, the maximum is 8.0)

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x08
4.	Type frame：0x70
5.	0x1b: Thermal image electronic zoom + 0x1c: Thermal image electronic zoom – 0x1d: Thermal image electronic zoom specified parameters
6-7	Low byte first, 2 bytes, unsigned integer For 0x1d, it indicates the specified multiple value, the specified zoom multiple = input value * 0.1 For 0x1b, 0x1c, zooming in and out is cumulative sum and cumulative subtraction, the value of each addition and subtraction = input value * 0.1
8.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.12、Fixed Focus Visible Light Camera Zoom (the default value of fixed focus visible photoelectric zoom is 1.0, the maximum is 8.0)

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length 0x08
4.	Type frame：0x71
5.	0x2b: Visible light zoom + 0x2c: Visible light zoom – 0x2d: Visible light zoom Specify parameters
6-7	Low byte first, 2 bytes, unsigned integer For 0x2d, it indicates the specified multiple value, the specified zoom multiple = input value * 0.1 For 0x2b, 0x2c, zooming in and out is cumulative sum and cumulative subtraction, the value of each addition and subtraction = input value * 0.1
8.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.13、Query Command

1.	Message header1 0x90
2.	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x72
5 (Query conditions)	0x1a (infrared zoom) 0x1b (visible light zoom) 0x1c (output mode) 0x1d (recording status) 0x1e (sd card status)
6	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.14、Automatic Storage Settings

Automatically take photos when the target is detected

1.	Message header1 0x90
2.	Message header2 0xeb
3.	Frame length 0x06
4.	Type frame：0x73
5	0-Off 1-On
6	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.1.15、Network Transparent Transmission (Serial port receiving, network port sending)

The transparent transmission content is the gimbal protocol data, see "G8T Gimbal Serial Communication Protocol" for details, which mainly transmits the gimbal attitude information, ranging data, etc.

1.	Message header1 0x90
2	Message header2 0xeb
3.	Frame length
4.	Type frame：0xc0
5~（N-1)	Command data
N	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.2、Sending Part：

3.2.1、Tracking Feedback Information

1.	Frame Header 0x91
2.	Frame length0x0D
3.	0x3f Tracking is on (x, y are transmitted by parameter 1 and parameter 2, parameter 3, parameter 4 are the detection width and height results of the current tracking target) Note: The center point coordinates of the tracking frame (x, y), return (0, 0) means the tracking target is lost
4.	Tracking status 1: Tracking 2: Tracking lost, trying to find 3: Tracking lost
5.	(Parameter 1) Tracking coordinate x, the upper left corner is 0
6.	
7.	(Parameter 2) Tracking coordinate y, the upper left corner is 0
8.	
9.	(Parameter 3) Detection width result of tracking target
10.	
11.	(Parameter 4) Detection height result of tracking target
12.	
13.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.2.2、Query Status Feedback Package

1.	Frame Header 0x91
2.	Frame length0x07
3.	0xff

4 （Query conditions）	0x1a (infrared zoom) 0x1b (visible light zoom) 0x1c (output mode) 0x1d (recording status) 0x1e (sd card status)
5-6	For 0x1a/0x1b multiple * 10 For 0x1c return value: 0 (visible light) / 1 (thermal imaging) / 2 (visible light PIP) / 3 (thermal imaging PIP) For 0x1d return value 0 (not recorded) / recorded time (seconds) For 0x1e return value 0 (no SD card detected) / 1 (SD card is present and normal) / 2 (SD card full) / 3 (SD card abnormal error)
7	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.2.3、Response Package

1.	Frame Header 0x91
2.	Frame length0x06
3.	0xaa
4.	Type frame
5.	Execution status (default is 0) / 1 (command cannot be executed)
6.	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.2.4、Detailed Test Result Return (up to 10 targets)

1.	Frame Header 0x91

2.	Frame length
3.	0x3C

4 ~ 4+ (12*1-1)	The first target result information
	typedef struct
	{
	short num; //test result serial number
	short class; //detection category
	short x; //detection starting coordinates
	short y;
	short width;
	short height;
	} TargetInfo_t;

.....	
(4+12*(N-1))~ (4+12*N-1)	Nth target result information
4+12*N	Checksum (the sum of all previous bytes, take the lower 8 bits)

3.2.5、Network Transparent Transmission (network port receiving, serial port sending)

Control the gimbal’ s attitude and turn on/off the distance measurement function through the Network port control

1.	Frame Header 0x91
2	Frame length
3.	0XC1
4~ (N-1)	Command data

N	Checksum (the sum of all previous bytes, take the lower 8 bits)

4、Network Port Gimbal Control Example

1. Angle Control

   91 36 C1 AA 32 04 E0 9B 1C 00 10 08 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 02 00 00 00 00 74 0E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 92 30

2. Speed Control

   91 36 C1 AA 32 04 E0 00 00 00 10 08 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 00 00 00 E8 0E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 AD CF D5

3. One-Key Return To Center

   91 36 C1 AA 32 04 E0 00 00 00 10 08 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 71 D2 A8

4. One-key Down

   91 36 C1 AA 32 04 E0 00 00 00 10 08 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 02 D8 DC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 E7 E8 E7