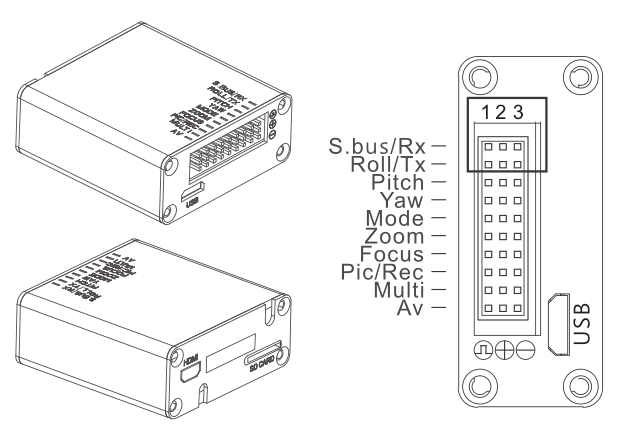
Pinling gimbal protocol V1.7

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 型号 | Descriptions | video | TF card max | Protocol support functions |
| Z10F | 10x 1080p gimbal | HDMI 1080P60/AV | 32G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom..... |
| Z18F | 18x 1080p gimbal | HDMI 1080P60/AV | 32G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom..... |
| Q18F | 18x 1080p pod | HDMI 1080P60/AV | 32G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom..... |
| Z30F | 30x 1080p gimbal | HDMI 1080P60/ AV | 32G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom..... |
| Q30F | 30x 1080p pod | HDMI 1080P60/AV | 32G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom..... |
| Q30T | 30x 1080p tracking pod | HDMI 1080P60 | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status |
| Z10TIR | 10x EO+19mm 640 IR tracking gimbal | HDMI 1080P60 or RJ45 onvif | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status,IR camera control |
| Z20TIR | 20x EO+25mm 640 IR tracking gimbal | HDMI 1080P60 or RJ45 onvif | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status,IR camera control |
| Q30TIR | 30X EO+25mm 640 IR tracking pod | HDMI 1080P60 or RJ45 onvif | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status,IR camera control |
| Z30TIR-50 | 30X +50mm 640 IR tracking | HDMI 1080P60 or RJ45 onvif | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status,IR camera control |
| Z12TL | 12X + 800M laser tracking gimbal | HDMI 1080P60 | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status |
| Z36T | 36x 1080p tracking gimbal | HDMI 1080P60 | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom,OSD for , tracking, GPS, pod status |
| Z36N | 36x 1080p gimbal | RJ45 ONVIF 1080P25 P30 | 128G | CMD control YAW/ROLL/PITCH and get angles ,control camera zoom, have app for PC, phone. |
| Z6K | SONY a6000/a7RII gimbal | HDMI 1080p | a6000 /a7RII | CMD control YAW/ROLL/PITCH and get angles ,control sony a6000 /a7RiI camera zoom,picture, record |
| Z- duo pro | FLIR duo PRO gimbal | HDMI | Two TF card | CMD control YAW/ROLL/PITCH and get angles ,control camera |
|  | | | | |

TTL 3.3v UART baud : 115200/9600(some version)，8，1，none, HEX



We have connect RX1 and RX2 with stubs, and connect TX1 and TX2 with stubs. DO NOT remove the stubs!

Please connect your RX to RX3, your TX connect to TX3.

PAY attention:

1. the signals inside black frame are all TTL signal, do not connect them to power or ground, if do ,may damage our device!
2. The signals outside black frame for PWM input signals to control the gimbal,

PWM input (not include AV, AV is output for CVBS video signal);

5V output, for your PWM reciever power supply;

GND, connect to your reciever GND;

**1）combine\_long\_cmd\_control:**  **FF 01 0F 10 RM PM YM RSL RSH RAL RAH PSL PSH PAL PAH YSL YSH YAL YAH CS**

FF 01 0F 10 : header

RM roll control mode，***00=mode\_no\_control，01=mode\_speed, 05=mode\_angle\_rel\_frame***

RSL RSH roll speed (2 byte signed little-endian order)，units: 0.122degree/sec；

RAL RAH roll angle (2 byte signed little-endian order)，units: 0.02197degree

PM PSL PSH PAL PAH :Pitch control, same as roll control formats

YM YSL YSH YAL YAH: Yaw control, same as roll control formats

***SL = Speed Low byte , SH = speed high byte, AL = angle low byte , AH= angle high byte ;***

***CS = body checksum, checksum is calculated as a sum of all bytes (from ‘RM’ to ‘YAH’) modulo 256；***

example1： ROLL no control，PITCH speed mode 1.2degree/sec， YAW angle mode to 20 degree。

FF 01 0F 10 00 01 05 00 00 00 00 0A 00 00 00 00 00 E8 03 FB

Example2： ROLL no control，PITCH angle mode to 40 degree，YAW angle mode 20 degree。

FF 01 0F 10 00 05 05 00 00 00 00 00 00 D0 07 00 00 E8 03 CC

Example3: speed stop pitch and yaw:

FF 01 0F 10 00 01 01 00 00 00 00 00 00 00 00 00 00 00 00 02

**2）visca\_angle\_mode\_ control**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Angle mode | up | 81 01 0A 01 VV WW 03 01 FF | VV:speed 0X00（0）-0X32（50）WW angle 0X01（0）-0X96（150） | VV = 0 , gimbal use default speed |
| down | 81 01 0A 01 VV WW 03 02 FF |  |
| left | 81 01 0A 01 VV WW 01 03 FF |  |
| right | 81 01 0A 01 VV WW 02 03 FF |  |
| home | 81 01 0A 01 VV WW 03 03 FF |  |

For example：

81 01 0A 01 00 **32 03 01 FF** pitch up 50 degree

81 01 0A 01 00 **32 03 02 FF** pitch down 50 degree

81 01 0A 01 00 **00 03 03 FF** home position

1. **visca\_speed\_mode**

up----------------81 01 06 01 00 10 03 01 FF

UpLeft---------- 81 01 06 01 05 05 01 01 FF

UpRight--------- 81 01 06 01 05 05 02 01 FF

DownLeft-------- 81 01 06 01 05 05 01 02 FF

DownRight------- 81 01 06 01 05 05 02 02 FF

down------------81 01 06 01 00 10 03 02 FF

left--------------- 81 01 06 01 10 00 01 03 FF

right--------------81 01 06 01 10 00 02 03 FF

stop---------------81 01 06 01 00 00 03 03 FF

**4 ) pelco-d\_speed\_mode**

|  |  |  |  |
| --- | --- | --- | --- |
| Speed\_mode\_separate | up | FF 01 00 08 00 SP CS | SP: SPEED, 00~3F  CS : checksum calculated from byte2 to byte6 , modulo 256 |
| down | FF 01 00 10 00 SP CS |
| left | FF 01 00 04 SP 00 CS |
| right | FF 01 00 02 SP 00 CS |
| stop | FF 01 00 00 00 00 01 |  |
| Speed\_mode\_combine | X, y | 55 01 XL XH YL YH 02 CS  CS: checksum from 55 to 02, modulo 256 | 0xXHXL: 0~500： XL yaw low byte，XH: yaw high byte, 2 byte signed little-endian  0xYHYL: 0~500： YL pitch low byte，YH: pitch high byte, 2 byte signed little-endian |

example：

Y

p

X

Gimbal goes to point P（0x60,0x60）

Example: 55 01 60 00 60 00 02 18

FF 01 00 08 00 0a 13 pitch up, speed 10

FF 01 00 10 00 0a 1b pitch down, speed 10

FF 01 00 04 0a 00 0f yaw left speed 10

FF 01 00 02 0a 00 0d yaw right speed 10

FF 01 00 00 00 00 01 stop

**5) cmd\_get\_angles**

Outgoing\_Cmd: 3e 3D 00 3D 00 incoming\_data 3e 3d 36 73 { ...body... } cs

For example

{3E 3D 36 73 98 FF 98 FF E6 FF FF FF **00 00 00 00 00 00 00 00 00 00** 1C F7 1C F7 28 F7 FF FF **00 00 00 00 00 00 00 00 00 00** 88 FF 88 FF F8 F6 FF FF 0**0 00 00 00 00 00 00 00 00 00** 4E }

3E 3D 36 73 = header,

98 FF 98 FF E6 FF FF FF **00 00 00 00 00 00 00 00 00 00 = ROLL status data, detail as following**

**(** 98 FF=ROLL \_IMU\_angle units: 0.02197degree

98 FF=ROLL\_RC\_TARGET\_ANGLE units: 0.02197degree

E6 FF FF FF =ROLL\_STATOR\_REL\_ANGLE = camera actual Euler angle units: 0.02197degree

**00 00 00 00 00 00 00 00 00 00 = 10 bytes reserved**

**)**

1C F7 1C F7 28 F7 FF FF **00 00 00 00 00 00 00 00 00 00** = pitch status data ,same as roll format

88 FF 88 FF F8 F6 FF FF 0**0 00 00 00 00 00 00 00 00 00** = yaw status data , same as roll format

4E = body checksum

1. **camera\_control\_cmd**：

**6.1） Z10S,Z10F, Z18S,Z18F,Z30F,Q18F,Q30F HDMI output version：**

FF 01 00 40 00 00 41 zoom out

FF 01 00 20 00 00 21 zoom in

FF 01 00 00 00 00 01 stop zoom

FF 01 01 00 00 00 02 focus in

FF 01 00 80 00 00 81 focus out

FF 01 00 00 00 00 01 stop focus

FF 01 00 07 00 67 6F mode\_change (picture mode/record mode switch)

FF 01 00 07 00 55 5D record start/stop@record\_mode; picture@picture\_mode

81 09 04 47 ff query\_zoom\_position

Zoom\_position\_feedback： 90 50 0p 0q 0r 0s FF pqrs： zoom\_position\_value

81 01 04 01 03 ff day mode

81 01 04 01 02 ff night mode

81 01 04 51 02 ff auto mode

6.2）**Z12N Z20N Z30N Z36N Z12NL Z20NL RJ45 onvif IP camera output version：**

zoom\_out\_visca 81 01 04 07 37 FF //wide

zoom\_in\_visca 81 01 04 07 27 FF //tele

focus\_out\_visca 81 01 04 08 37 FF //near

focus\_in\_visca 81 01 04 08 27 FF} //far

stop\_zoom\_visca 81 01 04 07 00 FF

stop\_focus\_visca 81 01 04 08 00 FF

start\_picture 55 02 07 aa

start\_record 55 02 05 aa

stop\_record 55 02 06 aa

query\_zoom\_position 81 09 04 47 ff

Zoom\_position\_feedback： 90 50 0p 0q 0r 0s FF 0xpqrs： zoom\_position\_value

**6.3）Z12NL laser light cmd**

zoom\_in\_laser {FF 01 01 04 00 1a 20} zoom\_out\_laser {FF 01 01 04 01 1a 21}

laser\_on {FF 01 01 01 01 00 04} laser\_off {FF 01 01 01 00 00 03}

**6.4） Z6K cmd for sony a6000/a7Rii**

poweron\_a6000 FF 01 00 50 00 00 51 zoom\_wide\_a6000 FF 01 00 40 00 00 41

zoom\_tele\_a6000 FF 01 00 20 00 00 21 stop\_zoom\_a6000 FF 01 00 00 00 00 01

picture\_a6000 ff 01 00 07 00 66 6E record\_a6000 FF 01 00 07 00 55 5D

**6.5) Q30T Z36T Z10TIR Z20TIR Q30TIR tracking**

zoom\_out\_visca 81 01 04 07 37 FF //wide

zoom\_in\_visca 81 01 04 07 27 FF //tele

focus\_out\_visca 81 01 04 08 37 FF //near

focus\_in\_visca 81 01 04 08 27 FF} //far

stop\_zoom\_visca 81 01 04 07 00 FF

stop\_focus\_visca 81 01 04 08 00 FF

query\_zoom\_position 81 09 04 47 ff

Zoom\_position\_feedback： 90 50 0p 0q 0r 0s FF pqrs： zoom\_position\_value

rec\_start\_tracker 7e 7e 44 00 00 **7c 01** 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 bd

rec\_stop\_tracker 7e 7e 44 00 00 **7c 00** 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 bc

picture\_tracker 7e 7e 44 00 00 **7c 02** 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 be

The tracking protocol please contact our technical support.