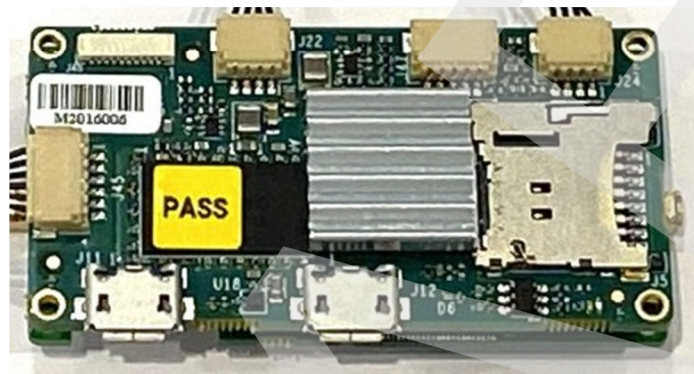


ANT-1774 API Guide

Version 1.0.8 – 13 July 2021

ANT-1774 ULTRA Nano UAV Drone Dual HD / SD Low
Latency H.265 H.264 Video Encoder



The contents of this manual may not be reflected in the version of firmware being used.

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APPLICATION PROGRAMMING INTERFACE DOCUMENT

Version 1.0.8

13/7/2021

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CHANGE LIST

Version		Date	Remarks
1.0		Dec. 2019	MGR
1.0.1		Jan. 2020	MGR
1.0.2		Mar. 2020	MGR
1.0.3		Jun. 2020	MGR
1.0.4		Jul. 2020	MGR
1.0.5		Dec. 2020	MGR
1.0.6		Jan. 2021	MGR
1.0.7		Feb. 2021	MGR
1.0.8		Jul. 2021	MGR

Changes from 1.05 to 1.07

- 1) Adding Set Debug Mode
- 2) Adding Set RTP Packet Size
- 3) Changing Response for Start Stream
- 4) For Set Recording adding Value for No Recording
- 5) Real Command Size in Change Network MTU
- 6) Select RTSP/RTP Streaming mode Adding Parameter value for RTP11+FEC and RTP12+FEC

Changes from 1.07 to 1.08

- 1) Adding Set Time
- 2) Adding Set OSD

OVERVIEW

This document describes the interface protocol between Mercury Board and CPU Controller connecting through RS232

PROCESSES

App Initialization

RS232 Parameters: 115200,N,8,1 or UDP @ Port: 6767 (the port can't be change)

API based on sending and receiving Ascii chars in Big Endian

The Command Structure : Sync byte(A5) , Message Length(one byte) , Command(One Byte) , message ..

After Sending Command an ACK is Sending from Board to Controller Return Ack = 55

There board come with default UDP communication at: 192.168.0.245 UDP Address, if this address is not correct to your working environment , you can type on RS232 Terminal "ifconfig eth0 xxx.xxx.xxx.xxx" it will change the UDP Address of the board.

GENERAL API RULES

Start RTSP Stream

Start RTSP Server on Board two channels main channel name: 11 and Second Channel name: 12

Even if you want to use RTP Streaming you need to Start with Start RTSP

Command: 05

App->Mercury

A50205

Mercury ->App

991177Z

Z= 1 Error Start Stream 11

Z= 2 Error Start Stream 12

Stop RTSP Stream

Stop RTSP Server on Board

It stops also RTP Streams .

Command: 06

App-> Mercury

A50206

Mercury ->App

55

Get Configuration

Command: 08

App-> Mercury

A50208

Mercury ->App

A3 – Sync word for replay

XXX- Message Length

08 – Message Command

List of Parameters with \$ separator between each parameter

Sensor1_Width Sensor1_Hight Sensor1_Bitrate sensor1_GOP

Sensor2_Width Sensor2_Hight Sensor2_Bitrate sensor2_GOP

IP address Sensor1_fps Sensor2_fps Sensor1_Input Sensor2_Input Sensor1_Encoding_Format Sensor2_Encoding_Format

AutoStart Sensor1_Audio Sensor2_Audio

Rec1_Width Rec1_Hight Rec1_Bitrate Rec1_GOP Rec1_fps

Rec2_Width Rec2_Hight Rec2_Bitrate Rec2_GOP Rec2_fps

Rec_select AutoDetect GW_IP MTU RTP11_IP RTP12_IP RTP11_Port RTP12_Port

RTP11_MIP RTP12_MIP

Example :

A3XXX08720\$1280\$800\$30\$

Exit Program

Stop Board Program (for Debug only)

Command: 04

App-> Mercury

A50204

Mercury ->App

55

Set Sensor 1 Width

Command: 10

Sensor1 Width in Pixels (1920,1280)

App-> Mercury

A5XX10SENS1_WIDTH

Mercury ->App

55

Set Sensor 1 Hight

Command: 11

Sensor1 Hight in Pixels (1080,720)

App-> Mercury

A5XX11SENS1_HIGHT

Mercury ->App

55

Set Sensor 2 Width

Command: 12

Sensor2 Width in Pixels (1920,1280)

App-> Mercury

A5XX12SENS2_WIDTH

Mercury ->App

55

Set Sensor 2 Hight

Command: 14

Sensor2 Hight in Pixels (1080,720)

App-> Mercury

A5XX14SENS2_HIGHT

Mercury ->App

55

Set Sensor 1 GOP

Command: 15

Sensor1 GOP, for more smooth stream GOP should be equal or multiple of the output frame per second

App-> Mercury

```
A5XX15SENS1_GOP
```

Mercury ->App

```
55
```

Set Sensor 1 Bit Rate

Command: 16

Sensor1 Bit Rate CBR in kbps

App-> Mercury

```
A5XX16SENS1_BitRate
```

Mercury ->App

```
55
```

Set Sensor 1 Frame Rate

Command: 17

Sensor1 Frame Rate in Frame per second must be equal or less then the input Frame Rate

App-> Mercury

```
A5XX17SENS1_FrameRate
```

Mercury ->App

55

Set Sensor 2 GOP

Command: 20

Sensor2 GOP, for more smooth stream GOP should be equal or multiple of the output frame per second

App-> Mercury

```
A5XX20SENS2_GOP
```

Mercury ->App

55

Set Sensor 2 Bit Rate

Command: 21

Sensor2 Bit Rate CBR in kbps

App-> Mercury

```
A5XX21SENS2_BitRate
```

Mercury ->App

55

Set Sensor 2 Frame Rate

Command: 22

Sensor1 Frame Rate in Frame per second must be equal or less then the input Frame Rate

App-> Mercury

A5XX22SENS2_FrameRate

Mercury ->App

55

Set IP Address

Command: 23

IP Address: xxx.xxx.xxx.xxx example : 192.168.50.1

Len = length of IP Address (12 in the above example)

App-> Mercury

A5len23IP_Address

Mercury ->App

55

Keep Life

Command: 24

The keep life Command allows controller to verify that the Communication channel to the boars is Connected. By Sending this command you will get an answer that you can monitor. In addition the information about Connected Sensor resolution and RTSP Client Connection is added. If Auto Detection is selected.

F – Channel 11 Sensor Detection Depended on Input Type

R – Channel 12 Sensor Detection Depended on Input Type

S - 1 for Channel 11 Client Connected, 2 for Channel 12 Client Connected.

HD SDI :

0x1D, 0x1E, 0x3C, 0x3A : No Sensor

0x0D, 0x0C, 0x2C, 0x2D : 1080P25

0x0A, 0x0B, 0x2A : 1080P30

0x2B : 1080P60

0x20, 0x00, 0x01 : 720P60

0x02, 0x03 : 720P30

HDMI :

0x00 : No Sensor

0x01 : 1080P60

0x02 : 1080P30

0x03 : 720P60

0x04 : 720P30

Analog :

0x00 : No Sensor

0x01 : PAL

0x02 : NTSC

App-> Mercury

A50224

Mercury ->App

2288F\$R\$\$* or 22880xff\$0xff\$\$*

Save Configuration

Command: 25

There is a Binary Configuration file in the Board the file name is : rtspserver.dat

This file include all the parameters, so after the file is updated you can start the board and it will run correctly without the need to configure everything each time you power on the board.

This Command save the configuration parameters to the file.

App-> Mercury

A50225

Mercury ->App

55

Read Configuration

Command: 26

This Command Read the configuration parameters from the file to the board.

App-> Mercury

A50226

Mercury ->App

55

Set Sensor 1 Input

Command: 27

Input Sensor 1 Resolution :

HD-SDI

0-HD-SDI 1080P60, 1-HD SDI 1080P30, 2-HD SDI 720P60, 3- HD SDI 720P30

HDMI

6-HD-SDI 1080P60, 7-HD SDI 1080P30, 8-HD SDI 720P60, 9- HD SDI 720P30

Analog

4- PAL, 5- NTSC, 10- PAL BAR, 11- NTSC BAR

App-> Mercury

A50327SENS1_IN

Mercury ->App

55

Set Sensor 2 Input

Command: 28

Input Sensor 2 Resolution :

HD-SDI

0-HD-SDI 1080P60, 1-HD SDI 1080P30, 2-HD SDI 720P60, 3- HD SDI 720P30

HDMI

6-HD-SDI 1080P60, 7-HD SDI 1080P30, 8-HD SDI 720P60, 9- HD SDI 720P30

Analog

4- PAL, 5- NTSC, 10- PAL BAR, 11- NTSC BAR

App-> Mercury

```
A50328SENS2_IN
```

Mercury ->App

```
55
```

Create Default Configuration File

Command: 30

Create Default Configuration File, you cant change the default values.

App-> Mercury

```
A50230
```

Mercury ->App

```
55
```

Set Sensor 1 Encoder Format

Command: 32

1 – H264 2- H265

App-> Mercury

A50332SENS1_EFMT

Mercury ->App

55

Set Sensor 2 Encoder Format

Command: 33

1 – H264 2- H265

App-> Mercury

A50333SENS2_EFMT

Mercury ->App

55

Set Automatic Start (when connecting power)

Command: 34

1 – Start by Command from Controller (Start Stream) 2- Auto Start

App-> Mercury

A50334AUT_START

Mercury ->App

55

Select Communication Interface

Command: 35

1 - RS232 0 – UDP

When the Board Power up it read the configuration file and select the Communication Interface according the Configuration File

App-> Mercury

A50335COM_PRO

Mercury ->App

55

Test Communication Interface

Command: 64

If you don't know the board Interface , this command will check the both interfaces (RS,UDP) and let you know what interface is connect by checking where from the return value B74D come from.

App-> Mercury

A50264

Mercury ->App

B74D

Set Dynamic Sensor 1 GOP

Command: 36

The Dynamic Commands let you change Stream Parameters on line, after you start the player and see the video you can change the value.

App-> Mercury

```
A5XX15SENS1_GOP
```

Mercury ->App

```
55
```

Set Dynamic Sensor 1 Bit Rate

Command: 37

The Dynamic Commands let you change Stream Parameters on line, after you start the player and see the video you can change the value.

App-> Mercury

```
A5XX16SENS1_BitRate
```

Mercury ->App

```
55
```

Set Dynamic Sensor 1 Frame Rate

Command: 38

The Dynamic Commands let you change Stream Parameters on line, after you start the player and see the video you can change the value.

App-> Mercury

```
A5XX17SENS1_FrameRate
```

Mercury ->App

```
55
```

Set Dynamic Sensor 2 GOP

Command: 39

The Dynamic Commands let you change Stream Parameters on line, after you start the player and see the video you can change the value.

App-> Mercury

```
A5XX15SENS2_GOP
```

Mercury ->App

```
55
```

Set Dynamic Sensor 2 Bit Rate

Command: 40

The Dynamic Commands let you change Stream Parameters on line, after you start the player and see the video you can change the value.

App-> Mercury

```
A5XX16SENS2_BitRate
```

Mercury ->App

Set Dynamic Sensor 2 Frame Rate

Command: 41

App-> Mercury

```
A5XX17SENS2_FrameRate
```

Mercury ->App

```
55
```


Set GW Address

Command: 42

Change the Gateway IP Address

GW Address: xxx.xxx.xxx.xxx example : 192.168.0.254

App-> Mercury

A51742GW_Address

Mercury ->App

55

Enable Audio in Stream

Command: 43

S1 Audio , S2 Audio : 0 = Default no Audio 1 = Audio in Stream

App-> Mercury

A50443S1AudioS2Audio

Mercury ->App

55

Get Firmware Version

Command: 44

Read the Firmware Software Version , terminated with AA

App-> Mercury

A50244

Mercury ->App

A7Firmware versionAA

Set Recording

Command: 45

Recording in Mercury will be on EMMC on Board.

Recording in Mercury Nano will be on SD.

Recording will be Finished with Stop Recording Format

X = 1 Chnl 11 X = 2 Chnl 12 X = 3 Both Chnl 0 = No Recording ;

App-> Mercury

A50345X

Mercury ->App

55

Set Start/Stop Recording

Command: 46

Y = 1 Start Recording Y = 2 Stop Recording

App-> Mercury

A50346Y

Mercury ->App

55

Set Rec1 Width

Command: 50

Set Recording Channel 11 Width in Pixels (1920,1280

App-> Mercury

A5XX50REC1_WIDTH

Mercury ->App

55

Set Rec1 Hight

Command: 51

Set Recording Channel 11 Hight in Pixels (1080,720

App-> Mercury

A5XX51REC1_HIGHT

Mercury ->App

55

Set Rec1 GOP

Command: 52

Recording Channel 11 GOP, for more smooth stream GOP should be equal or multiple of the output frame per second

App-> Mercury

```
A5XX52REC1_GOP
```

Mercury ->App

```
55
```

Set Rec1 Bit Rate

Command: 53

Recording Channel 11 Bit Rate

App-> Mercury

```
A5XX53REC1_BitRate
```

Mercury ->App

```
55
```

Set Rec1 Frame Rate

Command: 54

Recording Channel 11 Frame per Second

App-> Mercury

```
A5XX54REC1_FrameRate
```

Mercury ->App

```
55
```

Set Rec2 Width

Command: 60

Set Recording Channel 12 Width in Pixels (1920,1280

App-> Mercury

A5XX60REC2_WIDTH

Mercury ->App

55

Set Rec2 Hight

Command: 61

Set Recording Channel 12 Hight in Pixels (1080,720

App-> Mercury

A5XX51REC2_HIGHT

Mercury ->App

55

Set Rec2 GOP

Command: 62

Recording Channel 12 GOP, for more smooth stream GOP should be equal or multiple of the output frame per second

App-> Mercury

```
A5XX62REC2_GOP
```

Mercury ->App

```
55
```

Set Rec2 Bit Rate

Command: 63

Recording Channel 12 Bit Rate

App-> Mercury

```
A5XX63REC2_BitRate
```

Mercury ->App

```
55
```

Set Rec2 Frame Rate

Command: 65

Recording Channel 12 Frame Per Second

App-> Mercury

```
A5XX65REC2_FrameRate
```

Mercury ->App

```
55
```

Set Dynamic Sensor1 Resolution

Command: 70

Change the resolution on the fly, after the Player start the video

S1_RES – 1 1920x1080

S1_RES – 2 1280x720

S1_RES – 3 720x576

S1_RES – 4 720x500

S1_RES – 5 640x480

S1_RES – 6 320x240

S1_RES – 7 192x144

App-> Mercury

A50370S1_RES

Mercury ->App

55

Set Dynamic Sensor2 Resolution

Command: 69

Change the resolution on the fly, after the Player start the video

S1_RES – 1 1920x1080

S1_RES – 2 1280x720

S1_RES – 3 720x576

S1_RES – 4 720x500

S1_RES – 5 640x480

S1_RES – 6 320x240

S1_RES – 7 192x144

App-> Mercury

A50369S2_RES

Mercury ->App

55

Set Network MTU

Command: 72

Change Network MTU – 100 to 1500

App-> Mercury

ZZ = Size (06 MTU > 999, 05 MTU < 1000)

A5ZZ72MTU

Mercury ->App

55

Set Automatic Input Detection

Command: 73

Enable /Disable Automatic Sensor resolution Detection

EN 1 – Enable 2 -Disable

App-> Mercury

A50373EN

Mercury ->App

55

Reboot Board

Command: 75

Reboot the Board (Reset)

App-> Mercury

A50275

Mercury ->App

55

Get Assembly Option (Mercury Nano Only)

Command: 76

App-> Mercury

A50276

Mercury ->App

A8XYGG

X – Channel 11 Assembly

Y – Channel 12 Assembly

0 – No Module

1- HD-SDI

2- HDMI

3- Analog

Start RTP11

Command: 80

After Start Stream Command you can Start RTP11 (if RTP/RTSP flag is Checked)

App-> Mercury

A50280

Mercury ->App

55

Select RTSP/RTP Streaming Mode

Command: 81

Flag to Select if you want RTSP or RTP in Auto Power Mode

F = S – RTSP

F = R -RTP11 + RTP12

F= A – RTP 11

F= B RTP 12

F=C RTP 11 + FEC

F = D RTP12 + FEC

App-> Mercury

A50381F

Mercury ->App

55

Set RTP11 Param

Command: 82

Send RTP Parameters to Board

Z = Multicast -M

Z = Unicast – U

IP = Address: xxx.xxx.xxx.xxx example : 192.168.050.1

A – size of RTP port (1234 = 4 , 12345 = 5)

P = Port: xxxx

MIP = Multicast IP : XXX.X.X.X example : 225.1.1.1 - 9

App-> Mercury

A53182ZAPMIP\$IP*

Mercury ->App

55

Set RTP12 Param

Command: 83

Send RTP Parameters to Board

Z = Multicast -M

Z = Unicast – U

IP = Address: xxx.xxx.xxx.xxx example : 192.168.050.1

A – size of RTP port (1234 = 4 , 12345 = 5)

P = Port: xxxx

MIP = Multicast IP : XXX.X.X.X example : 225.1.1.1

App-> Mercury

A50383ZPMIP\$IP*

Mercury ->App

55

Start RTP12

Command: 84

After Start Stream Command you can Start RTP11 (if RTP/RTSP flag is Checked)

App-> Mercury

A50284

Mercury ->App

55

Start TCP_RS

Command: 85

Open Two way UDP <> rs232 Channel for External Communication through our board

App-> Mercury

A50285

Mercury ->App

55

Encoding Mode

Command: 86

Z = 0 – Normal

Z = 1 – Fixed Camera

Z = 2 – Moving camera

App-> Mercury

A50386Z

Mercury ->App

Start UDP_RS

Command: 90

Open Two way UDP <> rs232 Channel for External Communication through our board

App-> Mercury

A50290

Mercury ->App

55

FEC Enable + L + D

Command: 87

Z = FEC flag E- Enable /D – Disable

N - L Number xxx + 'L' + D Number + 'D%%'

App-> Mercury

A50x87ZN

Mercury ->App

55

FEC Error

Command: 88

Y – Create Error in Stream

N – No Error in Stream

App-> Mercury

A50388Y/N

Mercury ->App

55

Set UDPRS IP Address

Command: 91

IP Address: xxx.xxx.xxx.xxx example : 192.168.50.1

Len = length of IP Address (12 in the above example)

App-> Mercury

A5len91IP_Address

Mercury ->App

55

Select Auto UDPRS Mode

Command: 92

Flag to Select if you want UDPRS in Auto Power Mode

F = Y – Auto UDPRS

F = N

App-> Mercury

A50392F

Mercury ->App

55

Set Debug Mode

Command: 07

Flag to Select if you want Prints in Debug Mode

F = 0 Disable

F = 1 Enable

App-> Mercury

A50307F

Mercury ->App

55

Set RTP Packet Size

Command: 09

Set RTP Packet Size

F = Size in Bytes

App-> Mercury

A5xx09F

Mercury ->App

55

Set Time

Command: 18

Set Board Time (RTC)

F = Time in Format : YMDHMS : EX: 20210712223000

App-> Mercury

A51418F

Mercury ->App

55

Set OSD

Command: 19

Set Board OSD

F = 0 No OSD F = 1 OSD in Ch. 11 F = 2 OSD in Ch. 12 F = 3 OSD in both Ch.

App-> Mercury

A50319F

Mercury ->App

55