**Ergo\_Dock蓝牙通信协议**

1. **服务与特征**

**Service UUID: 9eca dc24 0ee5 a9e0 93f3 a3b5 2000 406e**

**RX Char UUID (写): 9eca dc24 0ee5 a9e0 93f3 a3b5 2100 406e**

**TX Char UUID (读): 9eca dc24 0ee5 a9e0 93f3 a3b5 2200 406e**

1. **蓝牙通信协议**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Head** | **Lenth** | **Cmd** | **Subcmd** | **Data** | **CRC16** |
| 1byte | 1byte | 1byte | 1byte | Nbyte | 2byte |
| 0x5A | 0x01 | 0x01 | 0x01 | 0x00 | 0xXXXX |

表 1数据帧格式

协议说明

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **名称** | **Bit位** | | **说明** | | |
| **Head** | | Byte1 | | 0x5A: 固定 |
| **Lenth** | | Byte2 | | 0x0N:Data长度 数据帧总长度为N+6 |
| **Cmd** | | Byte3 | | 0: 设备上行数据  1：设备下行数据 |
| **Subcmd** | | Byte4 | | Cmd = 0  0：蓝牙ACK反馈  1：主控盒状态反馈(保留)  2：Dock状态反馈  Cmd = 1  0：停止命令  5：普通键值下发命令  7：缓启动键值命令 |

**2.1下行数据（APP>>设备）**

**2.1.1普通键值下发格式：**

**a：格式**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Head** | **Lenth** | **Cmd** | **Subcmd** | **Data** | **Crc16** |
| 0x5A | 0x04 | 0x01 | 1Byte | 4Byte | 2Byte |

**b：说明：**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **名称** | **Bit位** | | **说明** | |
| **Head** | | Byte1 | 0x5A: 固定 |
| **Lenth** | | Byte2 | 4:Data长度 |
| **Cmd** | | Byte3 | 1：设备下行数据 |
| **Subcmd** | | Byte4 | 5：普通键值下发命令 |
| **Data** | | Byte5~Byte8 | Xxxxxxxx (见键值表) |
| **CRC** | | Byte9~ Byte10 | **MudbusCRC16** |

**2.1.2缓启动键值下发格式：**

**a：格式**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Head** | **Lenth** | **Cmd** | **Subcmd** | **Data** | **Crc16** |
| 0x5A | 0x04 | 0x01 | 1Byte | 6Byte | 2Byte |

**b：说明：**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **名称** | **Bit位** | | **说明** | |
| **Head** | | Byte1 | 0x5A: 固定 |
| **Lenth** | | Byte2 | 4:Data长度 |
| **Cmd** | | Byte3 | 1：设备下行数据 |
| **Subcmd** | | Byte4 | 7：普通键值下发命令 |
| **Data** | | Byte5~8 | 见键值表 |
| **Data** | | Byte9 | 0~FF:缓启动速度 |
| **Data** | | Byte10 | 0~FF:缓启动时间 |
| **CRC** | | Byte11~ 12 | MudbusCRC16 |

例如：

APP发送停止命令：

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0x5A | 0x01 | 0x00 | 0x00 | 0x433C |

Dock ACK:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x02 | 0x01 | 0x05 | 0x0105 | 0x1572 |

头部抬升命令

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x04 | 0x01 | 0x05 | 0x00000001 | 0x8C99 |

Dock ACK:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x02 | 0x01 | 0x05 | 0x0105 | 0x1572 |

一键放平命令：5a040105080000004f39

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x04 | 0x01 | 0x05 | 0x08000000 | 0x4F39 |

Dock ACK:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x02 | 0x01 | 0x05 | 0x0105 | 0x1572 |

缓启动打鼾记忆位置：key： 0x00008000 pwm ：0x50 tmr ：0x30

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x06 | 0x01 | 0x07 | 0x000080005030 | 0xDA1E |

Dock ACK:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x5A | 0x02 | 0x01 | 0x05 | 0x0105 | 0x94B3 |



**2.2上行数据（设备 >> APP）**

**2.2.2 ACK上报格式：**

**a：格式**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Head** | **Lenth** | **Cmd** | **Subcmd** | **VERSION** | **ubb** | **ASI** | **OV** | **WC** | **CRC** |
| 0x5A | 1Byte | 1Byte | 1Byte | 2Byte | 1Byte | 3Byte | 3Byte | 1Byte | 2Byte |

**2.2.2 Dock状态上报格式：**

**a：格式**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Head** | **Lenth** | **Cmd** | **Data** | **CRC** |
| 0x5A | 1Byte | 1Byte | 2Byte | 2Byte |

**b.说明**

|  |  |  |
| --- | --- | --- |
| **名称** | **Bit位** | **说明** |
| **Head** | Byte1 | 0x5A: 固定 |
| **Lenth** | Byte2 | A:Data长度 |
| **Cmd** | Byte3 | 0：设备上行数据 |
| **Subcmd** | Byte4 | 0：ACK上报 |
| **Data** | Byte4 | 收到的cmd |
| **Data** | Byte4 | 收到的subcmd |
| **CRC** | Byte6~7 | MudbusCRC16 |

**b.说明**

|  |  |  |
| --- | --- | --- |
| **名称** | **Bit位** | **说明** |
| **Head** | Byte1 | 0x5A: 固定 |
| **Lenth** | Byte2 | A:Data长度 |
| **Cmd** | Byte3 | 0：设备上行数据 |
| **Subcmd** | Byte4 | 2：Dock状态上报 |
| **VERSION** | Byte5~Byte6 | 00 64：固件版本号 |
| **ubb** | Byte7 | 0：床底灯亮  1：床底灯灭 |
| **ASI** | Byte8 | 0:打鼾干预不使能  1：打鼾干预使能 |
| **ASI** | Byte9 | 0~3：打鼾干预强度 |
| **ASI** | Byte10 | 0：非干预  1：正在干预 |
| **OV** | Byte11 | 0：离线语音不使能  1：离线语音使能 |
| **OV** | Byte12 | 0: 离线语音未使能  1：离线语音唤醒词为hello bed  2：离线语音唤醒词为hello ergo |
| **OV** | Byte13 | 0：离线语音未唤醒  1：离线语音唤醒 |
| **WC** | Byte14 | 0:无线充正常工作  1：无线充充电中  FF：无线充充电异常 |
| **Data** | Byte15~16 | MudbusCRC16 |

校验为ModbusCRC16

uint16\_t Modbus\_Crc\_Compute(const uint8\_t \*buf, uint16\_t bufLen)

{

uint8\_t num;

uint16\_t modbus16 = UINT16\_MAX;

for (uint16\_t index = 0; index < bufLen; ++index)

{

num = (uint8\_t) (modbus16 & UINT32\_MAX);

modbus16 = (uint16\_t) (((uint32\_t) modbus16 >> 8) ^ crcTb[(num ^ buf[index]) & UINT8\_MAX]);

}

return modbus16;

}

static uint16\_t crcTb[] = {

0X0000, 0XC0C1, 0XC181, 0X0140, 0XC301, 0X03C0, 0X0280, 0XC241,

0XC601, 0X06C0, 0X0780, 0XC741, 0X0500, 0XC5C1, 0XC481, 0X0440,

0XCC01, 0X0CC0, 0X0D80, 0XCD41, 0X0F00, 0XCFC1, 0XCE81, 0X0E40,

0X0A00, 0XCAC1, 0XCB81, 0X0B40, 0XC901, 0X09C0, 0X0880, 0XC841,

0XD801, 0X18C0, 0X1980, 0XD941, 0X1B00, 0XDBC1, 0XDA81, 0X1A40,

0X1E00, 0XDEC1, 0XDF81, 0X1F40, 0XDD01, 0X1DC0, 0X1C80, 0XDC41,

0X1400, 0XD4C1, 0XD581, 0X1540, 0XD701, 0X17C0, 0X1680, 0XD641,

0XD201, 0X12C0, 0X1380, 0XD341, 0X1100, 0XD1C1, 0XD081, 0X1040,

0XF001, 0X30C0, 0X3180, 0XF141, 0X3300, 0XF3C1, 0XF281, 0X3240,

0X3600, 0XF6C1, 0XF781, 0X3740, 0XF501, 0X35C0, 0X3480, 0XF441,

0X3C00, 0XFCC1, 0XFD81, 0X3D40, 0XFF01, 0X3FC0, 0X3E80, 0XFE41,

0XFA01, 0X3AC0, 0X3B80, 0XFB41, 0X3900, 0XF9C1, 0XF881, 0X3840,

0X2800, 0XE8C1, 0XE981, 0X2940, 0XEB01, 0X2BC0, 0X2A80, 0XEA41,

0XEE01, 0X2EC0, 0X2F80, 0XEF41, 0X2D00, 0XEDC1, 0XEC81, 0X2C40,

0XE401, 0X24C0, 0X2580, 0XE541, 0X2700, 0XE7C1, 0XE681, 0X2640,

0X2200, 0XE2C1, 0XE381, 0X2340, 0XE101, 0X21C0, 0X2080, 0XE041,

0XA001, 0X60C0, 0X6180, 0XA141, 0X6300, 0XA3C1, 0XA281, 0X6240,

0X6600, 0XA6C1, 0XA781, 0X6740, 0XA501, 0X65C0, 0X6480, 0XA441,

0X6C00, 0XACC1, 0XAD81, 0X6D40, 0XAF01, 0X6FC0, 0X6E80, 0XAE41,

0XAA01, 0X6AC0, 0X6B80, 0XAB41, 0X6900, 0XA9C1, 0XA881, 0X6840,

0X7800, 0XB8C1, 0XB981, 0X7940, 0XBB01, 0X7BC0, 0X7A80, 0XBA41,

0XBE01, 0X7EC0, 0X7F80, 0XBF41, 0X7D00, 0XBDC1, 0XBC81, 0X7C40,

0XB401, 0X74C0, 0X7580, 0XB541, 0X7700, 0XB7C1, 0XB681, 0X7640,

0X7200, 0XB2C1, 0XB381, 0X7340, 0XB101, 0X71C0, 0X7080, 0XB041,

0X5000, 0X90C1, 0X9181, 0X5140, 0X9301, 0X53C0, 0X5280, 0X9241,

0X9601, 0X56C0, 0X5780, 0X9741, 0X5500, 0X95C1, 0X9481, 0X5440,

0X9C01, 0X5CC0, 0X5D80, 0X9D41, 0X5F00, 0X9FC1, 0X9E81, 0X5E40,

0X5A00, 0X9AC1, 0X9B81, 0X5B40, 0X9901, 0X59C0, 0X5880, 0X9841,

0X8801, 0X48C0, 0X4980, 0X8941, 0X4B00, 0X8BC1, 0X8A81, 0X4A40,

0X4E00, 0X8EC1, 0X8F81, 0X4F40, 0X8D01, 0X4DC0, 0X4C80, 0X8C41,

0X4400, 0X84C1, 0X8581, 0X4540, 0X8701, 0X47C0, 0X4680, 0X8641,

0X8201, 0X42C0, 0X4380, 0X8341, 0X4100, 0X81C1, 0X8081, 0X4040

};