# 机械手校准协议(0x01)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | 校验字节 | End |
| 值 | 0xE1 | len | action | 机械臂1的[13:7] | 机械臂1的[6:0] | 机械臂2的[13:7] | 机械臂2的[6:0] | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 |
| 定义 | Header | 整条命令的长度 | 命令类型 | status | 校验字节 | End |
| 值 | 0xE1 | len | action | 状态 | xor check | 0xEF |

# 机械手控制协议(0x02)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5 arg6 | | 校验字节 | End |
| 值 | 0xE1 | len | action | 机械臂1的[13:7] | 机械臂1的[6:0] | 机械臂2的[13:7] | 机械臂2的[6:0] | 超时时间[13:0] | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5  arg6 | | status | 校验字节 | End |
| 值 | 0xE1 | len | action | 机械臂1的[13:7] | 机械臂1的[6:0] | 机械臂2的[13:7] | 机械臂2的[6:0] | 超时时间[13:0] | | 状态 | xor check | 0xEF |

# 冰箱门控制协议(0x03)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3  arg4 | | 校验字节 | End |
| 值 | 0xE1 | len | action | 0: 开  1: 关 | 速度 | 超时时间[13:0] | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3  arg4 | | status | 校验字节 | End |
| 值 | 0xE1 | len | action | 0: 开  1: 关 | 速度 | 超时时间[13:0] | | 状态 | xor check | 0xEF |

# 升降电机控制协议(0x04)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5  arg6 | | 校验字节 | End |
| 值 | 0xE1 | len | action | 0: 上升  1: 下降 | 速度 | [13:0]编码器步数 | | 超时时间[13:0] | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5  arg6 | | status | 校验字节 | End |
| 值 | 0xE1 | len | action | 0: 上升  1: 下降 | 速度 | [13:0]编码器步数 | | 超时时间[13:0] | | 状态 | xor check | 0xEF |

status: 0 => 已经收到命令

# 空压机控制协议(0x05)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | 校验字节 | End |
| 值 | 0xE1 | len | action | 0: 开  1: 关 | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | status | 校验字节 | End |
| 值 | 0xE1 | len | action | 0: 开  1: 关 | 状态 | xor check | 0xEF |

status: 0 => 已经收到命令

1 => 命令完成

# 出货协议(0x06)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | .. | .. | 4+2n | 4+2n |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5 | arg6 | .. | .. | 校验字节 | End |
| 值 | 0xE1 | len | action | 超时时间[13:0] | | row1 | col1 | row2 | col2 | .. | .. | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | status | 校验字节 | End |
| 值 | 0xE1 | len | 0x86 | row(当前正在出货的货道) | col(当前正在出货的货道) | 状态 | xor check | 0xEF |

status: 0 => 出货成功

1 => 本货道出货失败,还要继续往下一个货道出货

2 => 全部货道出货都失败

# 设置货道位置协议(0x07)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | 校验字节 | End |
| 值 | 0xE1 | len | action | row | col | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5 | arg6 | 校验字节 | End |
| 值 | 0xE1 | len | 0x87 | row | col | 磁编码器1[13:0] | | 磁编码器2[13:0] | | xor check | 0xEF |

status: 0 => 已经收到命令

1 => 命令完成

# 状态上传协议(0x88)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 定义 | Header | 整条命令的长度 | 命令  类型 | arg1 | arg2 | arg3 | arg4 | arg5 | arg6 | arg7 | 校验字节 | End |
| 值 | 0xE1 | 12 | action(0x88) | 温度[13:0] | | 磁编码器1[13:0] | | 磁编码器2[13:0] | | 各个位置开关 | xor check | 0xEF |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| arg7功能定义 | | | | | | | |
| bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |
| 保留 | 空压机检测状态位置开关  0:空压机吸到货物 | 大门位置开关  1:大门关闭 | 升降电机顶部位置开关  0:升降电机位于顶部 | 保留 | 冰箱门关闭位置开关  0:关闭 | 冰箱门打开位置开关  0:打开 | 保留 |

# 初始化协议(0x09)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | 校验字节 | End |
| 值 | 0xE1 | len | action | 超时时间[13:0] | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | 校验字节 | End |
| 值 | 0xE1 | len | action | 超时时间[13:0] | | status | xor check | 0xEF |

# 测试机械手协议(0x0A)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | 校验字节 | End |
| 值 | 0xE1 | len | action | row-col | | 超时时间[13:0] | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg3 | 校验字节 | End |
| 值 | 0xE1 | len | action | row-col | | 超时时间[13:0] | | status | xor check | 0xEF |

# 读取货道协议(0x0B)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | 校验字节 | End |
| 值 | 0xE1 | len | action | row-col | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5 | arg6 | 校验字节 | End |
| 值 | 0xE1 | len | action | row-col | | 位置1[13:0] | | 位置2[13:0] | | xor check | 0xEF |

# 一键设置货道协议(0x0C)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | arg3 | arg4 | arg5 | arg6 | 校验字节 | End |
| 值 | 0xE1 | len | action | row-col | | 位置1[13:0] | | 位置2[13:0] | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 10 | 11 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1 | arg2 | 校验字节 | End |
| 值 | 0xE1 | len | action | row-col | | xor check | 0xEF |

# OTA远程升级通知协议(0x0D)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 定义 | Header | 整条命令的长度 | 命令类型 | arg1  [27:21] | arg2  [20:14] | arg3  [13:7] | arg4  [6:0] | 校验字节 | End |
| 值 | 0xE1 | len | action | 升级包的大小[27:0]字节 | | | | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 |
| 定义 | Header | 整条命令的长度 | 命令类型 | 0 | 校验字节 | End |
| 值 | 0xE1 | len | action | 状态 | xor check | 0xEF |

# OTA远程升级包协议(0x0E)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | … | … | … | n+6 | n+7 |
| 定义 | Header | 整条命令的长度 | 命令类型 | 包ID[13:0] | | 数据包n字节 | | | | | | 校验字节 | End |
| 值 | 0xE1 | len | action | xor check | 0xEF |

返回 🡺

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 定义 | Header | 整条命令的长度 | 命令类型 | 包ID[13:0] | | status | 校验字节 | End |
| 值 | 0xE1 | len | action | 状态 | xor check | 0xEF |

status: 0 发送成功

1 发送失败

# 开电子锁协议(0x0F)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 字节流 | 1 | 2 | 3 | 4 | 5 |
| 定义 | Header | 整条命令的长度 | 命令类型 | 校验字节 | End |
| 值 | 0xE1 | 5 | 0xF | 0 | 0xEF |