照明监控系统平台南向对接规范

第 2部分：终端控制器接口说明

目 录

1. 基本包格式 5

2. 基本消息格式 5

2.1. 上位机到设备层请求/设备层到上位机上报 5

2.2. 设备层到上位机回复/上位机到设备层回复 6

3. 详细消息格式 6

3.1. 集中器ccu 6

3.1.1. 上位机设置集中器运行参数 6

3.1.2. 上位机查询集中器运行参数 8

3.1.3. 上位机设置集中器经纬度参数 9

3.1.4. 上位机查询集中器经纬度参数 10

3.1.5. 上位机恢复集中器出厂值 12

3.1.6. 上位机重启集中器 13

3.1.7. 上位机给集中器下发校时时间 15

3.1.8. 上位机确认可以应用校时时间 17

3.1.9. 上位机查询集中器时间 18

3.1.10. 上位机添加/修改/删除集中器白名单 20

3.1.11. 上位机查询集中器白名单 23

3.1.12. 上位机给集中器下发升级通知 27

3.1.13. 集中器请求升级包 28

3.1.14. 上位机查询集中器版本等信息 30

3.1.15. 集中器给上位机上报心跳包 31

3.1.16. 集中器主动轮询上报终端实时数据 33

3.1.17. 集中器主动上报白名单配置完成的终端UID 34

3.1.18. 集中器主动上报集中器任务执行结果 34

3.1.19. 上位机下发集中器任务 35

3.1.20. 上位机查询集中器任务 37

3.1.21. 登录 38

3.1.22. 上位机批量操作终端 40

3.2. 终端rtu 43

3.2.1. 单播开灯/关灯/调光 43

3.2.2. 组播开灯/关灯/调光 44

3.2.3. 广播开灯/关灯/调光 46

3.2.4. 单播查询灯头状态 48

3.2.5. 单播查询灯头实时数据 51

3.2.6. 单播查询终端基本信息 52

3.2.7. 单播查询终端时间 54

3.2.8. 单播设置终端时间 55

3.2.9. 单播设置重启 56

3.2.10. 单播设置复位（恢复出厂设置） 57

3.2.11. 上报故障报警 57

3.2.12. 单播删除设置 63

3.2.13. 单播设置倾斜传感器阀值 64

3.2.14. 单播查询传感器状态/数据 66

3.2.15. 设置时间、时区、经纬度 68

3.2.16. 查询时间、时区、经纬度 69

3.2.17. 单播设置灯具动作开关 71

3.2.18. 单播设置屏蔽开关 73

3.2.19. 单播查询灯具动作与屏蔽开关 74

3.2.20. 设置扩展故障开关及阈值 76

3.2.21. 查询扩展故障开关及阈值 78

4.3新增协议 80

3.2.22. 终端线程运行参数设置 80

3.2.23. 终端线程运行参数查询 82

3.2.24. 终端状态轮询分组标志设置 83

3.2.25. 终端状态轮询分组标志查询 85

3.2.26. 终端在线状态主动上报 86

3.2.27. 升级文件参数设置 89

3.2.28. 升级文件参数查询 91

3.2.29. 升级文件下载结果上报 92

3.2.30. 终端升级状态设置 93

3.2.31. 终端升级状态查询 94

3.2.32. 下发终端自动归属 96

3.2.33. 上报终端自动归属结果 97

3.2.34. 上报终端自动归属完成 99

附录 99

1.白名单功能 99

2.集中器任务下发 101

3.故障编码 101

基本包格式

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgDirect |  |  | 数据包流向 | req：请求  resp：请求回复  report：上报  ack：上报响应 |
| msgPriority |  |  | 数据包优先级 | high：高优先级  normal：普通 |
| msgType |  |  | 数据包操作类型 | real：实时操作  cache：缓存操作 |
| msgId |  |  | 数据包唯一标识 | 由1开始的增序 |
| msgEncrypt |  |  | 数据包加密类型 | none：无加密 |
| msgUid |  |  | string类型，固定12个字符，不足12个字符则末尾补0 | “123456000000” |
| host |  |  | 字符串，设备层ip，上行包才会带该字段  ，告知平台回复的下发的地址 | “192.168.1.22” |
| port |  |  | 字符串，设备层port，上行包才会带该字段，告知平台回复的下发的地址 | “9001” |

# 基本消息格式

## 上位机到设备层请求/设备层到上位机上报

即http request异步请求。

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | divergent：设备层  ccu：集中器  relay：继电器  gpm：电表  rtu：终端 |
| msgParam |  |  | 命令参数 | 不同命令带不同参数 |

## 设备层到上位机回复/上位机到设备层回复

即http response同步响应回复。

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgStatus |  |  | 消息响应状态 | queued：异步队列执行  ok：同步执行成功  error：同步执行错误 |
| msgDate |  |  | 消息响应时间 | |  | | --- | | yyyy-MM-dd HH:mm:ss | |
| msgValue |  |  | 消息执行成功描述 | 具体由每个命令定义 |
| msgError |  |  | 消息执行异常描述 | 具体由每个命令定义 |

# 详细消息格式

在此仅描述具体消息格式。

## 集中器ccu

### 上位机设置集中器运行参数

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | Parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | setCcuParamNew：设置集中器参数 |
| Iot | connectMode |  | 连接模式 | eth：以太网  gprs：gprs网络 |
|  | serverIp |  | 服务器ip或域名 | 字符串 |
|  | serverPort |  | 服务器port | 0-65535 |
|  | apnId |  | APN用户名 | 字符串 |
|  | apnPwd |  | APN密码 | 字符串 |
| Iot | gprsAPN |  | gprs APN | 字符串 |
|  | rtuTime |  | 轮询终端的时间间隔 | int |
|  | heartbeatTime |  | 心跳时间间隔 | int |
|  | updateTime |  | 升级时间间隔 | int |
|  | sensorTime |  | 传感器轮询时间间隔 | int |
|  | ccuMeterTime |  | 集中器电表数据上报时间间隔 | int |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"1","msgEncrypt":"none","msgCmd":"ccu","msgParam":{"subCmd":"setCcuParamNew","connectMode":"eth","serverIp":"iotcomm.uicp.net","serverPort":12001,"apnId":"iotcomm","apnPwd":"iotcomm","gprsAPN":"iotcomm","rtuTime":12,"heartbeatTime":12,"updateTime":12,"sensorTime":12,"ccuMeterTime":12},"msgUid":"00000000abcd","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Root | Parent | child | description | Value |
| msgId |  |  | 随机，应答带回该id | int，4个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | setCcuParamNew：设置集中器参数 |
|  | Result |  | 执行结果 | success：成功  fail：失败 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"ccu","msgParam":{"result":"success","subCmd":"setCcuParamNew"}} | | | | |

注意参数设置，同时包括[：4.3.1 终端线程运行参数设置](#_终端线程运行参数设置)

下面没有单位

10000 <= 服务器port <= 50000

gprs APN:只能使用字符:下划线 0~9 A~Z a~z 字符串长度：16

Apn用户名:只能使用字符: 下划线0~9 A~Z a~z 字符串长度：16

Apn密码: 只能使用字符:可打印字符 字符串长度：32

服务器ip: 只能使用字符:点 0~9 A~Z a~z 字符串长度：64

下面单位：秒

6 <= 轮询终端的时间间隔 < = 150

100 <= 心跳时间间隔 <= 1000

100 <= 升级时间间隔 <= 1000

100 <= 传感器轮询时间间隔 <= 1000

100 <= 集中器电表数据上报时间间隔 <= 1000

注意：如果值不在上面范围内，会被丢弃！

### 上位机查询集中器运行参数

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getCcuParamNew：获取集中器参数 |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"ccu","msgParam":{"subCmd":"getCcuParamNew"},"msgUid":"00000000abcd","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，4个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getCcuParamNew：获取集中器参数 |
|  | connectMode |  | 连接模式 | eth：以太网  gprs：gprs网络 |
|  | serverIp |  | 服务器ip | 字符串 |
|  | serverPort |  | 服务器port | 0-65535 |
|  | gprsAPN |  | gprs APN | 字符串 |
|  | apnId |  | Apn用户名 | 字符串 |
|  | apnPwd |  | Apn密码 | 字符串 |
|  | rtuTime |  | 轮询终端的时间间隔 | Int单位：秒 |
|  | heartbeatTime |  | 心跳时间间隔 | Int单位：秒 |
|  | updateTime |  | 升级时间间隔 | Int单位：秒 |
|  | sensorTime |  | 传感器轮询时间间隔 | Int单位：秒 |
|  | ccuMeterTime |  | 集中器电表数据上报时间间隔 | Int单位：秒 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4491",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "getCcuParamNew",  "connectMode": "gprs",  "serverIp": "103.78.228.93",  "serverPort": "12107",  "apnId": "chenbingshuang2",  "apnPwd": "Mac811014",  "gprsAPN": "cmnetchina",  "ccuMeterTime": "100",  "heartbeatTime": "120",  "rtuTime": "15",  "sensorTime": "100",  "updateTime": "100"  }  } | | | | |

### 上位机设置集中器经纬度参数

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | setSunNew：设置 经纬度参数 |
|  | longitude |  | 经度 | double:(-180.00~+180.00) |
|  | latitudeLighting Decay |  | 纬度 | double :(-90.00~+90.00) |
|  | timeZoneS |  | 时区符号 | UTC时区 符号p/n  如：  p -----正  n------负 |
|  | timeZoneH |  | 时区时 | 时区时,如08 |
|  | timeZoneM |  | 时区分钟 | 时区分，如00，45 |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"1","msgEncrypt":"none","msgCmd":"ccu","msgParam":{"subCmd":"setSunNew","longitude":-180.00,"latitude":80.00,"timeZoneS":"p","timeZoneH":12,"timeZoneM":12},"msgUid":"00000000abcd","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | setSunNew：设置 经纬度参数 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid":"00000000abcd",  "msgDirect":"report",  "msgPriority":"normal",  "msgType":"real",  "msgId":"1",  "msgEncrypt":"none",  "msgCmd":"ccu",  "msgParam":{  "result":"success",  "subCmd":"setSunNew"  }  } | | | | |

### 上位机查询集中器经纬度参数

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getSunNew：获取 经纬度参数 |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"1","msgEncrypt":"none","msgCmd":"ccu","msgParam":{"subCmd":"getSunNew"},"msgUid":"00000000abcd","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getSunNew：获取 经纬度参数 |
|  | longitude |  | 经度 | double:(-180.00~+180.00) |
|  | latitudeLighting Decay |  | 纬度 | double :(-90.00~+90.00) |
|  | timeZoneS |  | 时区符号 | UTC时区 符号p/n  如：  p -----正  n------负 |
|  | timeZoneH |  | 时区时 | 时区时,如08 |
|  | timeZoneM |  | 时区分钟 | 时区分，如00，45 |
|  | sunriseHour |  | 时 | 0-23 |
|  | sunriseMin |  | 分 | 0-59 |
|  | sunsetHour |  | 时 | 0-23 |
|  | sunsetMin |  | 分 | 0-59 |
| {  "msgDirect":"req",  "msgPriority":"normal",  "msgType":"cache",  "msgId":"0",  "msgEncrypt":"none",  "msgCmd":"ccu",  "msgParam":{  "subCmd":"getSunNew",  "longitude":-180,  "latitude":80,  "timeZoneS":"p",  "timeZoneH":12,  "timeZoneM":12,  "sunriseMin":12,  "sunriseMin":12,  "sunsetHour":12,  "sunsetMin":12  },  "msgUid":"00000000abcd",  "projectID":null  } | | | | |

### 上位机恢复集中器出厂值

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | resetNew:  白名单，任务清空，  参数还原默认值 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "30760",  "msgParam": {  "subCmd": "resetNew"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | resetNew：复位集中器 |
|  | year |  | 年 | e.g. 14表示2014 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "30760",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "resetNew",  "year": "21",  "month": "10",  "day": "27",  "hour": "10",  "min": "23",  "sec": "59"  }  } | | | | |

集中器执行“上位机恢复集中器出厂值”的命令后，下面的数据被还原或清空：

(1)轮询间隔时间等参数还原出厂值，不恢复服务器IP和端口等

相关协议“4.1.1上位机设置集中器运行参数”

(2)删除了白名单

相关协议“4.1.10上位机添加/修改/删除集中器白名单”

(3)删除经纬度

相关协议“4.1.3上位机设置集中器经纬度参数”

(4)删除任务数据

相关协议“4.1.11.1上位机下发集中器任务”

(5)内置电表和外置电表的电能数据清零

电能数据是一直累加的，集中器断电后电能数据不会清零。上位机发送集中器恢复出厂值时，电能数据才会清零。电能数据是浮点型，单位是瓦秒。

### 上位机重启集中器

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | ：重启集中器 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "14746",  "msgParam": {  "subCmd": "rebootNew"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | rebootNew：重启集中器 |
|  | year |  | 年 | e.g. 14表示2014 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "102",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "rebootNew",  "year": "21",  "month": "12",  "day": "22",  "hour": "15",  "min": "49",  "sec": "49"  }  } | | | | |

### 上位机给集中器下发校时时间

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | strictSetTimeNew：设置严格校时 |
|  | checkId |  | 校时ID | int,0~65535 |
|  | year |  | 年 | 例如：18表示2018 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | week |  | 星期 | 1-7 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "12755",  "msgParam": {  "sec": 24,  "subCmd": "strictSetTimeNew",  "week": 1,  "min": 9,  "month": 12,  "hour": 9,  "year": 21,  "checkId": 12755,  "day": 20  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | strictSetTimeNew：设置严格校时 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
|  | checkId |  | 校时ID | int |
|  | year |  | 年 | e.g. 18表示2018 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | week |  | 星期 | 1-7 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "12755",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "strictSetTimeNew",  "checkId": "12755",  "year": "21",  "month": "12",  "day": "20",  "week": "1",  "hour": "9",  "min": "9",  "sec": "24",  "result": "success"  }  } | | | | |

### 上位机确认可以应用校时时间

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | applyStrictSetTimeNew：应用严格校时 |
|  | checkId |  | 校时ID | int |
|  | apply |  | 是否应用 | yes 应用  no 不应用 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "12756",  "msgParam": {  "subCmd": "applyStrictSetTimeNew",  "apply": "yes",  "checkId": 12755  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | applyStrictSetTimeNew：应用严格校时 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
|  | checkId |  | 校时ID | int |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "12756",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "applyStrictSetTimeNew",  "checkId": "12755",  "result": "success"  }  } | | | | |

注意：上位机给集中器校时完成后，集中器主动给终端校时！

### 上位机查询集中器时间

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getTime：获取集中器时间 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13849",  "msgParam": {  "subCmd": "getTime"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getTime：获取集中器时间 |
|  | year |  | 年 | e.g. 18表示2018 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | week |  | 星期 | 1-7 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "13849",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "getTime",  "year": "21",  "month": "12",  "day": "21",  "week": "2",  "hour": "14",  "min": "14",  "sec": "14"  }  } | | | | |

### 上位机添加/修改/删除集中器白名单

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | whiteList |
|  | subType |  |  | deleteAll:删除全部白名单。没有“白名单数量”后面的内容。  delete:删除白名单里的部分终端UID  write:把终端UID写入白名单。如果原来没有的，那么在白名单后面添加。如果原来有的，那么修改白名单的组号  configAll:配置白名单里面的全部终端，没有“白名单数量”后面的内容。  config:配置白名单里面的部分终端  configFail:重新配置没有配置成功的终端，没有“白名单数量”后面的内容。 |
|  | rtuUidnum |  | 白名单数量 | 最多20个，最少1个 |
|  | rtuItems  [A] | rtuUid | 终端uid | 6字节 hex |
|  |  | rtuGp1 | 组号 | 0代表没有组号 int（1——254） |
|  |  | rtuGp2 | 组号 | Int |
|  |  | rtuGp3 | 组号 | Int |
|  |  | addrDO | 开关地址 | 该终端在哪个开关下面  0-31  暂时没用默认填0 |
|  |  | chnDO | 开关通道 | 0-7 开关通道  暂时没用默认填0 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "10169",  "msgParam": {  "subCmd": "whiteList",  "rtuUidnum": 2,  "rtuItems": [  {  "chnDO": 255,  "rtuGp1": 2,  "rtuGp3": 0,  "rtuGp2": 0,  "addrDO": 255,  "rtuUid": "0000000a0002"  },  {  "chnDO": 255,  "rtuGp1": 2,  "rtuGp3": 0,  "rtuGp2": 0,  "addrDO": 255,  "rtuUid": "0000000902e6"  }  ],  "subType": "write"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

注意：

1、如果addrDO和chnDO都等于0xFF，那么表示该终端不属于任何开关。

2、addrDO和chnDO的作用是：如果这个开关是断开的，那么集中器不轮询不上报；如果这个开关闭合的，那么集中器轮询终端，有数据回，上报数据，没有数据回，上报连续没回次数(这个次数对应协议“集中器主动轮询上报终端实时数据”的“rtuStatus”)。

3、(addrDO,chnDO)的状态是断开，但是实际不一定是断开，继电器可能有问题；(addrDO,chnDO)的状态是闭合，但是实际不一定是闭合，继电器可能有问题或者外部线断了。判断(addrDO,chnDO)是断开还是闭合，最终的目的是判断一下终端是否有电，但是有时候不一定准确。

一定要注意：这条协议告诉集中器，终端与DO的关系。如果DO断开，那么集中器就不会轮询该DO关联的终端。

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | whiteList |
|  | subType |  |  | deleteAll:删除全部白名单。没有“白名单数量”后面的内容。  delete:删除白名单里的部分终端UID  write:把终端UID写入白名单。如果原来没有的，那么在白名单后面添加。如果原来有的，那么修改白名单的组号  configAll:配置白名单里面的全部终端，没有“白名单数量”后面的内容。  config:配置白名单里面的部分终端  configFaile:重新配置没有配置成功的终端，没有“白名单数量”后面的内容。 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "10169",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "whiteList",  "result": "success",  "subType": "write"  }  } | | | | |

### 上位机查询集中器白名单

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | whiteListGet |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13896",  "msgParam": {  "subCmd": "whiteListGet"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | whiteListGet |
|  | pkgTotal |  | 白名单一共分成 pkgTotal个数据包 | 1个字节 |
|  | pkgNum |  | 当前是第 pkgNum数据包 | 1个字节 |
|  | rtuUidnum |  | 白名单数量 | 最多20个，最少1个 |
|  | rtuItems  [A] | rtuUid | 终端uid | 6字节 hex |
|  |  | rtuGp1 | 组号 | 0代表没有组号 int（1——254） |
|  |  | rtuGp2 | 组号 | Int |
|  |  | rtuGp3 | 组号 | Int |
|  |  | addrDO | 开关地址 | 该终端在哪个开关下面  0-31 |
|  |  | chnDO | 开关通道 | 0-7 开关通道 |
|  |  | configStatus |  | 0还没配置，1正在配置，2配置成功，3配置失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4493",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "whiteListGet",  "pkgTotal": "4",  "pkgNum": "0",  "rtuUidnum": "15",  "rtuItems": [  {  "rtuUid": "0000000902c5",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "000000090272",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "0000000900ff",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "0000000901a8",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "0000000a0009",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "00000008ffa8",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "0000000902da",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "00000008ff91",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "000000090006",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "00000009026a",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "000000090259",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "00000009018f",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "0000000901e8",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "000000090169",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  },  {  "rtuUid": "0000000a0001",  "rtuGp1": "2",  "rtuGp2": "0",  "rtuGp3": "0",  "addrDO": "255",  "chnDO": "255",  "configStatus": "0"  }  ]  }  } | | | | |

### 上位机给集中器下发升级通知

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | upgrade：设备版本 |
| msgParam | subCmd |  | 子命令 | devVersion：设备软件版本 |
|  | version |  | 软件版本号 | 最多16个字符 |
|  | fileCode |  | 程序文件编号 | 整型 最多8个字节 |
|  | size |  | 文件大小 | 整型 4个字节 |
|  | fileCheckSum |  | 文件CRC校验值 | 整型2个字节 |
|  | packageNum |  | 软件的数据包数量 | 整型 2个字节 |
|  | packageLen |  | 数据包长度 | 2个字节 |
|  | cmd |  | 升级操作 | 1、执行升级；2、停止升级 暂时不用，保留 |
|  | devType |  | 设备类型 | ccu：集中器  rtu：终端 |
|  | model |  | 设备型号 | cc09 最多8个字符 |
| {  "msgDirect":"req",  "msgPriority":"normal",  "msgType":"cache",  "msgId":"1",  "msgEncrypt":"none",  "msgCmd":"upgrade",  "msgParam":{  "devType":1,  "packageLen":1024,  "operate":1,  "size":10240,  "fileCheckSum":1122,  "model":"cc09",  "cmd":1,  "version":"1057",  "fileCode":"1057",  "packageNum":10  },  "msgUid":"00000000abcd"  } | | | | |

### 集中器请求升级包

上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | upgrade：远程升级 |
| msgParam | subCmd |  | 子命令 | getFileData：获取文件数据包 |
|  | version |  | 软件版本号 | 最多16个字符 |
|  | fileCode |  | 程序文件编号 | 整型 最多8个字节 |
|  | dataIndex |  | 数据包索引 | （0-N） |
|  | times |  | 重发次数 | 集中器请求次数。假设是3，集中器请求3次都不回，集中器就停止请求。 |
|  | status |  | 升级状态 | 升级状态包括：0：停止，1：升级中，2：升级完成，3：升级失败 |
| {  "msgUid":"00000000c4ab",  "msgDirect":"report",  "msgPriority":"normal",  "msgType":"real",  "msgId":"1",  "msgEncrypt":"none",  "msgCmd":"upgrade",  "msgParam":{  "subCmd":"getFileData",  "version":"1057",  "fileCode":"1057",  "dataIndex":"1",  "times":"3",  "status":"1"  }  } | | | | |

下发

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | upgrade：远程升级 |
| msgParam | subCmd |  | 子命令 | sendFileData：获取文件数据包 |
|  | version |  | 软件版本号 | 最多16个字符 |
|  | fileCode |  | 程序文件编号 | 整型 最多8个字节 |
|  | size |  | 文件大小 | 整型 4个字节 |
|  | fileCheckSum |  | 文件CRC校验值 | 整型 2个字节 |
|  | packageNum |  | 软件的数据包数量 | 整型 2个字节 |
|  | packageLen |  | 数据包长度 | 2个字节 |
|  | dataIndex |  | 数据包索引 | （1-N） |
|  | packageCheckSum |  | 数据包CRC校验值 | 2个字节 |
|  | data |  | 数据包数据 | 字节流16进制的字符串格式 |
| {  "msgUid":"00000000c4ab",  "msgDirect":"req",  "msgPriority":"normal",  "msgType":"real",  "msgId":"1",  "msgEncrypt":"none",  "msgCmd":"upgrade",  "msgParam":{  "subCmd":"sendFileData",  "version":"1057",  "fileCode":"1057",  "size":"10240",  "fileCheckSum":"1122",  "packageNum":"10",  "packageLen":"1024",  "dataIndex":"1",  "packageCheckSum":"3344",  "data":"11223344..."  }  } | | | | |

### 上位机查询集中器版本等信息

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getCcuVersion：获取集中器版本等信息 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "7624",  "msgParam": {  "subCmd": "getCcuVersion"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | getCcuVersion：获取集中器版本等信息 |
|  | version |  | 集中器版本 | 字符串 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "7624",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "getCcuVersion",  "version": "11914"  }  } | | | | |

### 集中器给上位机上报心跳包

主动上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | Value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | heartbeat：心跳 |
|  | signal |  | 信号强度 | 一字节：  0-31：对应0-100%  99：表示无法检测  255：表示以太网 |
|  | year |  | 年 | 例如：2018年，year=18 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
|  | week |  | 星期 | 1-7 |
| {  "msgUid": "000000011d02",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1234",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "heartbeat",  "signal": "25",  "year": "22",  "month": "1",  "day": "7",  "week": "5",  "hour": "9",  "min": "7",  "sec": "23"  }  } | | | | |

下发结果

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  |  | 2字节int |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | heartbeat：心跳 |
|  | result |  | 结果 | Int 1表示成功  0表示失败 |
| {"msgUid":"00000000abcd","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"ccu","msgParam":{"result":"1","subCmd":"heartbeat"}} | | | | |

### 集中器主动轮询上报终端实时数据

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | realNew：实时数据查询 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | rtuStatus |  | 终端状态 | 连续没有收到终端数据的次数计数器。如果大于等于1，那么没有这个字节后面的数据。如果等于0，那么有这个字节后面的数据。 |
|  | lampItems  [A] | index | 灯头 | 1-254 |
|  |  | lampStatus | 灯的状态 | on：打开  off：关闭 |
|  |  | lightValue | 调光等级 | 范围0～100，分别表示0%～100% |
|  |  | voltage | 电压，单位V | float:4字节浮点数 |
|  |  | current | 电流，单位A | float:4字节浮点数 |
|  |  | power | 功率，单位瓦 | float:4字节浮点数 |
|  |  | powerFactor | 功率因数 | float:4字节浮点数 |
|  |  | energy | 电能，单位瓦秒 | float:4字节浮点数 |
| {  "msgUid": "000000011d02",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "672",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "rtuUid": "00000008e737",  "subCmd": "realNew",  "rtuStatus": "0",  "lampItems": [  {  "index": "1",  "lampStatus": "off",  "lightValue": "0",  "voltage": "233.9199",  "current": "0",  "power": "0",  "powerFactor": "0",  "energy": "2631.994"  }  ]  }  } | | | | |

### 集中器主动上报白名单配置完成的终端UID

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | whiteListSet |
|  | rtuUid |  | 配置成功uid | Uid：配置成功的终端UID |
|  | Result |  | 执行结果 | success：成功  fail：失败  none:新增加分组未开 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"whiteListSet","rtuUid":"000000090279","result": "success"}} | | | | |

### 集中器主动上报集中器任务执行结果

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | taskReport |
|  | Id |  |  | 任务id， (固定1至7) |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "65535",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "taskReport",  "id": "2",  "hour": "31",  "min": "89"  }  } | | | | |

### 上位机下发集中器任务

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | taskSet |
|  | Id |  |  | 任务id， (固定1至7) |
|  | type |  | 任务类型 | 预留 1-正常任务 2-临时任务 |
|  | effect |  | 任务有效性 | 1-有效 0-无效 无后续内容 |
|  | day |  | 执行日期，日 | 1 |
|  | month |  | 执行日期，月 | 1 |
|  | year |  | 执行日期，年 | 2019 |
|  | itemNum |  | 执行时间点数量NA | 0至20,0表示当天无任务并且不执行前一天的任务 |
|  | taskItems[NA] | hour | 执行时间，时 | 1 |
|  | min | 执行时间，分 | 1 |
|  | groupNum | 执行动作的分组数[NB] | 1至20 |
|  | groups[NB] | groupID | 分组号 |
|  | action | 动作:0x42开灯 0x43关灯 0x47调光 |
|  | light | 调光率(0至100) |
| {"msgEncrypt":"none","msgType":"cache","msgDirect":"req","msgId":"7580","msgParam":{"itemNum":2,"subCmd":"taskSet","month":12,"year":2021,"effect":1,"taskItems":[{"min":2,"hour":18,"groupNum":8,"groups":[{"light":100,"groupID":3,"action":66},{"light":100,"groupID":1,"action":66},{"light":100,"groupID":2,"action":66},{"light":100,"groupID":8,"action":66},{"light":100,"groupID":6,"action":66},{"light":100,"groupID":4,"action":66},{"light":100,"groupID":7,"action":66},{"light":100,"groupID":5,"action":66}]},{"min":47,"hour":7,"groupNum":8,"groups":[{"light":0,"groupID":3,"action":67},{"light":0,"groupID":1,"action":67},{"light":0,"groupID":2,"action":67},{"light":0,"groupID":8,"action":67},{"light":0,"groupID":6,"action":67},{"light":0,"groupID":4,"action":67},{"light":0,"groupID":7,"action":67},{"light":0,"groupID":5,"action":67}]}],"Id":1,"type":1,"day":19},"msgUid":"000000011d02","msgPriority":"normal","msgCmd":"ccu"} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | taskSet |
|  | Id |  |  | 任务id， (固定1至7) |
|  | type |  | 任务类型 | 预留 1-正常任务 2-临时任务 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "000000011d02",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "7580",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "taskSet",  "Id": "1",  "type": "1",  "result": "success"  }  } | | | | |

### 上位机查询集中器任务

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | taskQuery |
|  | Id |  |  | 任务id， (固定1至7) |
|  | type |  | 任务类型 | 预留 1-正常任务 2-临时任务 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "7595",  "msgParam": {  "subCmd": "taskQuery",  "Id": 1,  "type": 1  },  "msgUid": "000000011d02",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | taskQuery |
|  | Id |  |  | 任务id， (固定1至7) |
|  | type |  | 任务类型 | 预留 1-正常任务 2-临时任务 |
|  | effect |  | 任务有效性 | 1-有效 0-无效 无后续内容 |
|  | day |  | 执行日期，日 | 1 |
|  | month |  | 执行日期，月 | 1 |
|  | year |  | 执行日期，年 | 2019 |
|  | itemNum |  | 执行时间点数量NA | 0至20 |
|  | taskItems[NA] | hour | 执行时间，时 | 1 |
|  | min | 执行时间，分 | 1 |
|  | groupNum | 执行动作的分组数[NB] | 1至20 |
|  | groups[NB] | groupID | 分组号 |
|  | action | 动作:0x42开灯 0x43关灯 0x47调光 |
|  | light | 调光率(0至100) |
| {"msgUid":"0000000108ba","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"10548","msgEncrypt":"none","msgCmd":"ccu","host":"172.31.0.26","port":"12109","msgParam":{"subCmd":"taskQuery","Id":"1","type":"1","effect":"1","year":"2021","month":"12","day":"12","itemNum":"2","taskItems":[{"hour":"17","min":"35","groupNum":"6","groups":[{"groupID":"6","action":"66","light":"100"},{"groupID":"2","action":"66","light":"100"},{"groupID":"7","action":"66","light":"100"},{"groupID":"1","action":"66","light":"100"},{"groupID":"3","action":"66","light":"100"},{"groupID":"5","action":"66","light":"100"}]},{"hour":"17","min":"38","groupNum":"6","groups":[{"groupID":"6","action":"67","light":"0"},{"groupID":"2","action":"67","light":"0"},{"groupID":"7","action":"67","light":"0"},{"groupID":"1","action":"67","light":"0"},{"groupID":"3","action":"67","light":"0"},{"groupID":"5","action":"67","light":"0"}]}]}} | | | | |

### 登录

上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | login |
|  | signal |  | 信号强度 | 0-31：对应0-100%  99：表示无法检测  255：表示以太网 |
|  | extern |  | 是否携带ICCID等其他参数 | 0：不带  1：带有ICCID  2：带有IMEI（备用）  3：带有ICCID和IMEI（备用） |
|  | ICCID |  | SIM卡的ICCID | 字符串 |
|  | IMEI |  | 模块的IMEI | 备用 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "signal": "19",  "subCmd": "login",  "extern": "1",  "ICCID": "89860619120031379472"  }  } | | | | |

回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  |  | 2字节int |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | login：心跳 |
|  | result |  | 结果 | Int 1表示成功  0表示失败 |
| {     "msgEncrypt":"none",     "msgType":"cache",     "msgDirect":"req",     "msgId":"18365",     "msgParam":{         "result":1,         "subCmd":"login"     },     "msgUid":"0000000108ba",     "msgPriority":"normal",     "msgCmd":"ccu" } | | | | |

### 上位机批量操作终端

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | multiControl |
|  | subType |  | 操作类型 | on：开灯  off：关灯  dimming：调光  status：状态查询  real：实时数据查询 |
|  | lightValue |  | 调光值 | 范围0～100，分别表示0%～100%，查询状态和实时数据时写0 |
|  | rtuSum |  | 终端总数量 | Int，1-600 |
|  | startNum |  | 起始（从0开始计算，如果为0，同时清空之前任务） | Int，0 |
|  | rtuNum |  | 本次终端数量N | int，1-100 |
|  | rtuItem[N] | rtuUid | 终端uid | 6字节 hex |
| {"msgEncrypt":"none","msgType":"cache","msgDirect":"req","msgId":"12811","msgParam":{"subCmd":"multiControl","lightValue":100,"rtuNum":45,"startNum":0,"rtuSum":45,"subType":"on","rtuItem":[{"rtuUid":"0000000902c2"},{"rtuUid":"000000090006"},{"rtuUid":"000000090251"},{"rtuUid":"0000000a5c5d"},{"rtuUid":"000000090272"},{"rtuUid":"000000090269"},{"rtuUid":"000000090259"},{"rtuUid":"00000008ff91"},{"rtuUid":"0000000a0004"},{"rtuUid":"000000090258"},{"rtuUid":"00000009023a"},{"rtuUid":"0000000901da"},{"rtuUid":"0000000900e2"},{"rtuUid":"000000090175"},{"rtuUid":"0000000901e6"},{"rtuUid":"0000000a0008"},{"rtuUid":"000000090279"},{"rtuUid":"0000000a0007"},{"rtuUid":"0000000a000a"},{"rtuUid":"0000000901e8"},{"rtuUid":"00000008ffa8"},{"rtuUid":"0000000a0006"},{"rtuUid":"0000000901a8"},{"rtuUid":"0000000902da"},{"rtuUid":"00000009018f"},{"rtuUid":"0000000a0003"},{"rtuUid":"000000090074"},{"rtuUid":"000000090113"},{"rtuUid":"0000000901d5"},{"rtuUid":"000000090169"},{"rtuUid":"00000009026a"},{"rtuUid":"000000090246"},{"rtuUid":"00000009015f"},{"rtuUid":"0000000902e9"},{"rtuUid":"0000000902c5"},{"rtuUid":"000000090129"},{"rtuUid":"00000009011e"},{"rtuUid":"0000000a0009"},{"rtuUid":"0000000900ff"},{"rtuUid":"0000000901ed"},{"rtuUid":"0000000901f7"},{"rtuUid":"0000000902e6"},{"rtuUid":"0000000902c1"},{"rtuUid":"00000009019b"},{"rtuUid":"0000000a0005"}]},"msgUid":"0000000108ba","msgPriority":"normal","msgCmd":"ccu"} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | ccu |
| msgParam | subCmd |  | 子命令 | multiControl |
|  | result |  | 执行结果 | success：成功  fail：失败  finish：完成（结束后主动上报） |
|  | subType |  | 操作类型 （完成时才带有该字段） | on：开灯  off：关灯  dimming：调光  status：状态查询  real：实时数据查询 |
|  | lightValue |  | 调光值  （完成时才带有该字段） | 范围0～100，分别表示0%～100%，查询状态和实时数据时写0 |
|  | rtuSum |  | 终端总数量  （完成时才带有该字段） | Int，1-600 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "12811",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "multiControl",  "result": "finish",  "subType": "on",  "lightValue": "100",  "rtuSum": "45"  }  } | | | | |

回复成功后，

开灯/关灯/调光：按照4.2.1单播开灯/关灯/调光 回复

状态查询：按照4.2.4上报终端灯头状态。

实时数据查询：按照4.2.5上报终端实时数据。

## 终端rtu

### 单播开灯/关灯/调光

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | on：开灯  off : 关灯  dimming：调光 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | lampNum |  | 终端灯头数 | 1：只有单头灯；  2：只有双头等 ；  3：既有单头灯又有双头灯； |
|  | lampItems [A] | index | 灯头 | 1-254 |
|  |  | dimmingType | 调光类型 | fine ：精调  rough:粗调 |
|  |  | lightValue | 调光值 | 范围0～100，分别表示0%～100% |
| {"msgUid":"00000004CD41","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000004CD41","subType":"on","lampNum":1,"lampItems":[{"index":"1","lampStatus":"on","lightValue":"100","dimmingType":"rough"}]}} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | on：开灯  off : 关灯  dimming：调光 |
|  | operType |  | 操作类别 | manual：人工操作  task：任务执行 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | lampItems  [A] | index | 灯头 | 1-254 |
|  |  | lampStatus | 灯的状态 | on：打开  off：关闭  error:异常 |
|  |  | lightValue | 调光值 | 范围0～100，分别表示0%～100% |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"dimming","lampItems":[{"index":"1","lampStatus":"on","lightValue":"25"}],"lampNum":1},"msgUid":"00000000c4ab","projectID":null} | | | | |

### 组播开灯/关灯/调光

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | multicast：组播 |
|  | subType |  | 操作类型 | on：开灯  off : 关灯  dimming：调光 |
|  | rtuGroup |  | 终端组号 | 1-254 |
|  | lampNum |  | 终端灯头数 | 1：只有单头灯；  2：只有双头等 ；  3：既有单头灯又有双头灯； |
|  | lampItems  [A] | index | 灯头 | 1-254 |
|  |  | dimmingType | 调光类型 | fine ：精调  rough:粗调 |
|  |  | lightValue | 调光值 | 范围0～100，分别表示0%～100% |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13067",  "msgParam": {  "subCmd": "multicast",  "rtuGroup": 1,  "lampNum": 1,  "lampItems": [  {  "lightValue": 100,  "dimmingType": "fine",  "index": 1  }  ],  "subType": "on"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

执行上报（只回一条）

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | multicast：组播 |
|  | subType |  | 操作类型 | on：开灯  off : 关灯  dimming：调光 |
|  | rtuGroup |  | 终端组号 | 1-254 |
|  | lampItems  [A] | index | 灯头类型 | 1：单灯头  2：双灯头 |
|  |  | lightValue | 调光值，调光类型为精调，调光值通过设备上报的调光率计算，计算如下：  调光值=调光率&0x7f | 范围0～100，分别表示0%～100% |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "multicast",  "rtuGroup": "1",  "subType": "on",  "lampItems": [  {  "index": "1",  "lightValue": "100"  }  ]  }  } | | | | |

### 广播开灯/关灯/调光

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | broadcast：广播 |
|  | subType |  | 操作类型 | on：开灯  off : 关灯  dimming：调光 |
|  | lampNum |  | 终端灯头数 | 1：只有单头灯；  ~~2：只有双头等 ；~~  ~~3：既有单头灯又有双头灯；~~  2：既有单头灯又有双头灯； |
|  | lampItems[A] | index | 灯头 | 1-254 |
|  |  | dimmingType | 调光类型 | fine：精调  rough:粗调 |
|  |  | lightValue | 调光值 | 范围0～100，分别表示0%～100% |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "10606",  "msgParam": {  "subCmd": "broadcast",  "lampNum": 1,  "lampItems": [  {  "lightValue": 100,  "dimmingType": "fine",  "index": 1  }  ],  "subType": "on"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

执行上报（只回一条）

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | broadcast：广播 |
|  | subType |  | 操作类型 | on：开灯  off : 关灯  dimming：调光 |
|  | lampItems  [A] | index | 灯头类型 | 1：单灯头  2：双灯头 |
|  |  | lightValue | 调光值，调光类型为精调，调光值通过设备上报的调光率计算，计算如下：  调光值=调光率&0x7f | 范围0～100，分别表示0%～100% |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "broadcast",  "subType": "on",  "lampItems": [  {  "index": "1",  "lightValue": "100"  }  ]  }  } | | | | |

1、严格校时流程不变，沿用以前协议。

2、设置、获取经纬度的时区字段，拆成3个字段

3、重启、复位集中器，返回时间，沿用之前讨论的协议流程。

4、电表相关设置与警报协议由洪威定义，定义后再进行讨论。

### 单播查询灯头状态

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | status：状态查询 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | lampItems [A] | index | 灯头 | 1-254 |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","lampItems":[{"index":1,"lightValue":null,"dimmingType":null}],"subType":"status","lampNum":null},"msgUid":"00000000c4ab","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | status：状态查询 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | warnItems  [A]  灯杆 | errorCode | 灯杆报警信息 | null: 无故障  leakage: 灯杆漏电  tilt: 倾斜报警  open:检修口打开报警  communication:通信故障  lampApart灯具拆开报警  highTemp灯具高温报警  other:预留 |
|  | lampItems  [A]灯头 | index | 灯头 | 1-254 |
|  |  | lampStatus | 灯的状态 | on：打开  off：关闭  error:异常 |
|  |  | lightValue | 调光等级 | 范围0～100，分别表示0%～100% |
|  |  | errorItems  [A] | errorCode  [child of errorItems]  灯头故障信息 | null: 无故障，用于应答下行的命令  fuse: 保险丝故障，不能亮灯  relay: 继电器故障，不能正常开关灯  chip: 计量芯片故障  capacitance: 补偿电容故障  rectifier: 整流器故障，不能亮灯  trigger: 触发器故障，不能亮灯  lamp：灯具故障，不能亮灯  leakage: 漏电  overvol:过压  undervol:欠压  overcur1:灯1过载  overcur2:灯2过载  other: 预留 |
|  | solarItems  [A]太阳能 | errorCode | 太阳能报警信息 | batteryOverVol:蓄电池超压  batteryUnderVol:蓄电池欠压  batteryError:蓄电池错误  batteryTempError:蓄电池温度异常 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"status","warnItems":[{"errorCode":""}],"lampItems":[{"index":"1","lampStatus":"on","lightValue":"100","errorItems":[{"errorCode":"null"}]}]}} | | | | |

### 单播查询灯头实时数据

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | real：实时数据查询 |
|  | rtuUid |  | 终端uid | 8字节 hex |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"real","lampItems":null,"lampNum":null},"msgUid":"00000000c4ab","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | real：实时数据查询 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | lampItems  [A] | index | 灯头 | 1-254 |
|  |  | voltage | 电压，单位V | float:4字节浮点数 |
|  |  | current | 电流，单位A | float:4字节浮点数 |
|  |  | power | 功率，单位瓦 | float:4字节浮点数 |
|  |  | electricity | 电能，单位瓦秒 | float:4字节浮点数 |
|  |  | powerFactor | 功率因数 | float:4字节浮点数 |
| iot |  | residualCurrent | 漏电/剩余电流，单位A | float:4字节浮点数 |
| iot |  | leakageVoltage | 漏电电压，单位V | float:4字节浮点数 |
| iot |  | actualLightTime | 亮灯时长,单位秒 | Int32 |
| iot |  | theoryLightTime | 理论亮灯时长,单位秒 | Int32 |
| iot |  | actualElectricity | 累计电能，单位：瓦秒 | float:4字节浮点数 |
| iot |  | theoryElectricity | 理论消耗电能，单位：瓦秒 | float:4字节浮点数 |
| iot |  | workTime | 工作时长,单位秒 | Int32 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"real","lampItems":[{"index":"1","voltage":"232.7513","current":"0.005191692","power":"0.2817366","electricity":"121245.8","powerFactor":"0.2331536","residualCurrent":"0","leakageVoltage":"0.01839669","actualLightTime":"60","theoryLightTime":"451620","actualElectricity":"17.4765","theoryElectricity":"121245.8","workTime":"451620"}]}} | | | | |

### 单播查询终端基本信息

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | info：终端基本信息 |
|  | rtuUid |  | 终端uid | 8字节 hex |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"info","rtuUid":"00000002F1F3"},"msgUid":"00000000c4ab","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | info：终端基本信息 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | rtuInfo | swVersion | 软件版本号 | 字符串 |
|  |  | hwVersion | 硬件版本号 | 字符串 |
| iot |  | deviceType | 设备类型 | lamp:单灯控制器  controller:控制一体化电源  illumination: 照度传感器 intensity:光强传感器  other:其他 |
| iot |  | lampType | 灯具类型 | unknown：未知，  sodium-normal:钠灯(普通)  sodium-inductor:钠灯（电感）  sodium-rectifier: 钠灯（电子镇流器）  led-high:LED灯(小于100w)  led-low:LED灯(小于100w)  halogen :金卤灯  energy-save:节能灯  electrodeles:无极灯  mercury:汞灯  solar:太阳能路灯 |
| iot |  | lampNum | 灯头数 | 1-254 |
| iot |  | groupItems  [A] | rtuGroup  [child of groupItems ]  终端组号 | 1-254 |
| iot |  | domain | 域 | 0-65535 |
| iot |  | pwmType | PWM类型 | positive:PWMA正向  reverse:PWMN 反向。 |
| iot |  | pwmRate | PWM频率 | eg . 1000 (hz) |
| iot |  | decay | 光衰开关 | on:开  off:关 |
| iot | Lighting Decay | decayValue | 光衰度 | 范围0～100，分别表示0%～100%(5的倍数) |
| iot |  | lampSwap | 灯头号对调标志 | yes:对调  no:不对调 |
| iot |  | daliFullSteps | dali满功率拍数 | 0-255 |
| iot |  | dacpwm | DAC/PWM模式 | dac：DAC模式  pwm：PWM模式 |
| hz |  | verderId | 生产商ID | 1~255 |
| hz |  | otherInfo | 其他信息 | 字符串 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"info","rtuInfo":{"deviceType":"lamp","swVersion":"2935","lampType":"unknown","lampNum":"0","groupItems":"","domain":"0","pwmType":"reverse","pwmRate":"0","decay":"off","decayValue":"0","lampSwap":"no","daliFullSteps":"75","dacpwm":"DAC"}}} | | | | |

### 单播查询终端时间

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | getTime：获取终端时间 |
|  | rtuUid |  | 终端uid | 8字节 hex |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"getTime","rtuUid":"00000002F1F3"},"msgUid":"00000000c4ab ","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | getTime：获取终端时间 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | year |  | 年 | e.g. 2014 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | week |  | 星期几 | 0-6 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"getTime","year":"2016","month":"9","day":"8","week":"4","hour":"14","min":"45","sec":"36"}} | | | | |

### 单播设置终端时间

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setTime：设置终端时间 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | year |  | 年 | e.g. 2014 |
|  | month |  | 月 | 1-12 |
|  | day |  | 日 | 1-31 |
|  | week |  | 星期几 | 0-6 |
|  | hour |  | 时 | 0-23 |
|  | min |  | 分 | 0-59 |
|  | sec |  | 秒 | 0-59 |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"setTime","rtuUid":"00000002F1F3","year":2016,"month":9,"day":12,"week":1,"hour":15,"min":0,"sec":11},"msgUid":"00000000c4ab","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setTime：设置终端时间 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | result |  | 确认结果 | success：成功  fail：失败 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"setTime","result":"success"}} | | | | |

### 单播设置重启

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setRestart：设置终端重启 |
|  | rtuUid |  | 终端uid | 6字节 hex |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"setRestart","rtuUid":"00000002F1F3"},"msgUid":"00000000c4ab ","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setRestart：设置终端重启 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | result |  | 确认结果 | success：成功  fail：失败 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"setRestart","result":"success"}} | | | | |

### 单播设置复位（恢复出厂设置）

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setReset：设置终端复位（恢复出厂设置） |
|  | rtuUid |  | 终端uid | 6字节 hex |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"setReset","rtuUid":"00000002F1F3"},"msgUid":"00000000c4ab","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setReset：设置终端复位（恢复出厂设置） |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | result |  | 确认结果 | success：成功  fail：失败 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"setReset","result":"success"}} | | | | |

### 上报故障报警

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | report：主动上报 |
|  | subType |  | 操作类型 | status：状态查询 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | warnItems  [A] | errorCode | 灯杆报警信息 | null: 无故障  leakage: 终端漏电  frontLeakage: 终端前端漏电  tilt: 倾斜报警  open:检修口打开报警  communication:通信故障  water:水浸传感器报警(hz)  soil:土壤传感器报警(hz)  other:预留  lampApart灯具拆开报警  highTemp灯具高温报警 |
|  | lampItems  [A] | index | 灯头 | 1-254 |
|  |  | lampStatus | 灯的状态 | on：打开  off：关闭  error:异常 |
|  |  | lightValue | 调光等级 | 范围0～100，分别表示0%～100% |
|  |  | errorItems  [A] | errorCode  [child of errorItems]  故障信息 | null: 无故障，用于应答下行的命令  fuse: 保险丝故障，不能亮灯  relay: 继电器故障，不能正常开关灯  chip: 计量芯片故障  capacitance: 补偿电容故障  rectifier: 整流器故障，不能亮灯  trigger: 触发器故障，不能亮灯  lamp：灯具故障，不能亮灯  leakage: 漏电  overvol:过压  undervol:欠压  overcur1:灯1过载  overcur2:灯2过载  curUp：过流(hz)  curDown:欠流(hz)  volUp：过压(hz)  volDown：欠压(hz)  lightOff:关灯异常(hz)  other: 预留 |
|  | solarItems  [A] | errorCode | 太阳能报警信息 | batteryOverVol:蓄电池超压  batteryUnderVol:蓄电池欠压  batteryOverDischarge蓄电池过放  batteryError :蓄电池错误  batteryTempError:蓄电池温度异常 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "report",  "rtuUid": "000000000001",  "subType": "status",  "warnItems": [  {  "errorCode": ""  }  ],  "solarItems": [  {  "errorCode": ""  }  ],  "lampItems": [  {  "index": "1",  "lampStatus": "error",  "lightValue": "100",  "errorItems": [  {  "errorCode": "fuse"  }  ]  }  ]  }  } | | | | |

上报确认(HZ)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：警报 |
| msgParam | subCmd |  | 子命令 | report：主动上报 |
|  | subType |  | 操作类型 | status：状态查询 |
|  | result |  | 确认结果 | success：成功  fail：失败 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13869",  "msgParam": {  "result": "success",  "subCmd": "report",  "subType": "status"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

**终端故障说明**：

|  |  |  |  |
| --- | --- | --- | --- |
| **终端报警类型** | **解除方法** | **造成故障的原因** | **检测位置** |
| leakage: 终端漏电 | 需要到现场解决，手动解除 | 终端继电器输出到灯具部分漏电。终端断开继电器开关，就不会漏电 | 检测位置是灯杆 |
| frontLeakage: 终端前端漏电 | 需要到现场解决，手动解除 | 从外部到终端输入部分漏电 | 检测位置是灯杆 |
| tilt: 倾斜报警 | 需要到现场解决，集中器轮询主动上报，自动解除 | 路灯的灯杆发生倾斜 | 终端安装灯杆上面，内部有检测倾斜的IC |
| open:检修口打开报警 | 需要到现场解决，集中器轮询主动上报，自动解除 | 灯杆下面有个口可以拆开，查看电线，称为检修口。这个口被打开就会报警 | 终端上有DI检测，电平变成高/低，检修口被打开 |
| communication:通信故障 | 可以自动恢复，集中器轮询主动上报，自动解除 | 如果终端使用电力载波，电源线断开就会出现通信故障 | 集中器轮询终端，通信不上就会认为该终端有通信故障 |
| water:水浸传感器报警(hz) | 可以自动恢复，集中器轮询主动上报，自动解除 | 有水 | 有检测水浸的传感器，出现水浸，传感器发送信号给终端 |
| soil:土壤传感器报警(hz)（删除） |  |  |  |
| lampApart灯具拆开报警 | 需要到现场解决，集中器轮询主动上报，自动解除 | 终端被拆开 | 未知 |
| highTemp灯具高温报警 | 可以自动恢复，集中器轮询主动上报，自动解除 | 终端控制的灯具温度过高 | 终端有温度传感器 |
| fuse: 保险丝故障，不能亮灯 | 需要到现场解决，集中器轮询主动上报，自动解除(LED灯) | 终端输出，经过继电器，然后到保险丝。因为电流过大，保险丝烧掉，这样就会有保险丝故障。现在的终端没有保险丝，所以不会有保险丝故障 | 检测的位置是保险丝靠近终端位置和继电器靠近终端位置，检测这两个位置的电平，根据这两个电平判断。 |
| relay: 继电器故障 | 需要到现场解决，手动解除(换终端) | 终端输出，经过继电器，然后到灯具(没有保险丝)。终端里的继电器是常闭，终端不控制时，灯是亮的。终端要继电器断开开关，但是继电器的开关没有断开，这是就出现继电器故障。继电器开关没有断开的原因有：1、继电器的触点出问题，2、继电器的驱动电路问题。 | 终端内部检测电流，如果电流很大，说明继电器开关没有断开。 |
| chip: 计量芯片故障(删除) |  |  |  |
| capacitance: 补偿电容故障 | 需要到现场解决，集中器轮询主动上报，自动解除 | 电容坏了，没有减少电流和电压的相位差 | 如果补偿电容起作用，那么功率因素应该接近1。如果功率因素低，补偿电容可能坏了。 |
| rectifier: 镇流器故障，不能亮灯 | 需要到现场解决，集中器轮询主动上报，自动解除 | 镇流器坏了，没有产生高压，导致灯没有亮起来 | 终端内部检测灯具的电流，如果电流小，说明灯没有亮。 |
| trigger: 触发器故障，不能亮灯 | 需要到现场解决，集中器轮询主动上报，自动解除 | 镇流器坏了，导致整流器没法产生高压，灯没有亮起来 | 终端内部检测灯具的电流，如果电流小，说明灯没有亮。 |
| lamp：灯具故障，不能亮灯 | 需要到现场解决，集中器轮询主动上报，自动解除(钠灯) | / | 终端内部检测灯具的电流，如果电流小，说明灯没有亮。 |
| leakage: 漏电(删除) |  |  |  |
| overvol:过压 | 可以自动恢复，集中器轮询主动上报，自动解除 | 电网不稳定，电压过高 | 终端内部检测终端输入的电压 |
| curUp：过流(hz) | 可以自动恢复，集中器轮询主动上报，自动解除 | 负载有问题，可能出现短路 | 终端内部检测终端输出的电流 |
| curDown:欠流(hz) (删除) |  |  |  |
| volUp：过压(hz) (删除) |  |  |  |
| volDown：欠压(hz) | 可以自动恢复，集中器轮询主动上报，自动解除 | 电网不稳定，电压过低 | 终端内部检测终端输入的电压 |
| lightOff:关灯异常(hz) (删除，实质是继电器故障) |  |  |  |
| batteryOverVol:蓄电池超压 | 需要到现场解决，集中器轮询主动上报，自动解除 | 电池有问题，电压过高 | 终端内部检测终端输入的电压 |
| batteryUnderVol:蓄电池欠压 | 需要到现场解决，集中器轮询主动上报，自动解除 | 电池有问题，电压过高 | 终端内部检测终端输入的电压 |
| batteryOverDischarge蓄电池过放 | 需要到现场解决，集中器轮询主动上报，自动解除 | ? |  |
| batteryError :蓄电池错误 | 需要到现场解决，集中器轮询主动上报，自动解除 | ? |  |
| batteryTempError:蓄电池温度异常 | 需要到现场解决，集中器轮询主动上报，自动解除 | 电池本身温度过高 | 终端有传感器检测电池温度 |

### 单播删除设置

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | delInfo：删除终端设置 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | type |  | 删除项目类型 | task：删除项目  runtime:删除运行时长  hisdata: 删除历史数据 |
| {"msgDirect":"req","msgPriority":"normal","msgType":"cache","msgId":"0","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","subType":"delInfo","rtuUid":"00000002F1F3","type":"task"},"msgUid":"00000000C4AB","projectID":null} | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 6字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | delInfo：删除终端设置 |
|  | rtuUid |  | 终端uid | 6字节 hex |
|  | type |  | 删除项目类型 | task：删除项目  runtime:删除运行时长  hisdata: 删除历史数据 |
|  | result |  | 确认结果 | success：成功  fail：失败 |
| {"msgUid":"00000000c4ab","msgDirect":"report","msgPriority":"normal","msgType":"real","msgId":"1","msgEncrypt":"none","msgCmd":"rtu","msgParam":{"subCmd":"unicast","rtuUid":"00000002F1F3","subType":"delInfo","result":"success","type":"task"}} | | | | |

### 单播设置倾斜传感器阀值

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setPole ：设置灯杆传感器 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | angleThreshold |  | 倾斜角度阀值 | 0-180(精度1度) |
| {  "msgDirect":"req",  "msgPriority":"normal",  "msgType":"cache",  "msgId":"0",  "msgEncrypt":"none",  "msgCmd":"rtu",  "msgParam":{  "subCmd":"unicast",  "subType":"setPole ",  "rtuUid":"00000002F1F3",  "angleThreshold":120  },  "msgUid":"00000000c4ab",  "projectID":null  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | setPole：灯杆传感器 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | result |  | 确认结果 | success：成功  fail：失败  notexist:传感器不存在 |
|  | angleX |  | X基准/当前角度 | 0-180(精度1度) |
|  | angleY |  | Y基准当前角度 | 0-180(精度1度) |
|  | angleZ |  | Z基准当前角度 | 0-180(精度1度) |
|  | angleThreshold |  | 倾斜角度阀值 | 0-180(精度1度) |
| {  "msgUid":"00000000c4ab",  "msgDirect":"report",  "msgPriority":"normal",  "msgType":"real",  "msgId":"1",  "msgEncrypt":"none",  "msgCmd":"rtu",  "msgParam":{  "subCmd":"unicast",  "rtuUid":"00000002F1F3",  "subType":"setPole",  "result":"success",  "angleX":60,  "angleY":120,  "angleZ":180,  "angleThreshold":30  }  } | | | | |

### 单播查询传感器状态/数据

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型  (查询传感器值、状态) | pole：灯杆传感器  water: 水浸传感器  smoke：烟雾传感器  microwave:微波传感器  light:光照传感器  temandhum:温湿度感器  dust:粉尘感器数据 |
|  | rtuUid |  | 终端uid | 8字节 hex |
| {  "msgDirect":"req",  "msgPriority":"normal",  "msgType":"cache",  "msgId":"0",  "msgEncrypt":"none",  "msgCmd":"rtu",  "msgParam":{  "subCmd":"unicast",  "subType":"pole",  "rtuUid":"00000002F1F3"  },  "msgUid":"00000000c4ab",  "projectID":null  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 |
|  | subType |  | 操作类型 | pole：灯杆传感器 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | result |  | 确认结果 | success：成功  fail：失败  notexist:传感器不存在 |
|  | baseAngleX  (灯杆传感器) |  | X基准角度 | 0-180(精度1度) |
|  | baseAngleY  (灯杆传感器) |  | Y基准角度 | 0-180(精度1度) |
|  | baseAngleZ  (灯杆传感器) |  | Z基准角度 | 0-180(精度1度) |
|  | curAngleX  (灯杆传感器) |  | X当前角度 | 0-180(精度1度) |
|  | curAngleY  (灯杆传感器) |  | Y当前角度 | 0-180(精度1度) |
|  | curAngleZ  (灯杆传感器) |  | Z当前角度 | 0-180(精度1度) |
|  | angleThreshold  (灯杆传感器) |  | 倾斜角度阀值 | 0-180(精度1度) |
| {  "msgUid":"00000000c4ab",  "msgDirect":"report",  "msgPriority":"normal",  "msgType":"real",  "msgId":"1",  "msgEncrypt":"none",  "msgCmd":"rtu",  "msgParam":{  "subCmd":"unicast",  "rtuUid":"00000002F1F3",  "subType":"pole",  "result":"success",  "baseAngleX":120,  "baseAngleY":120,  "baseAngleZ":120,  "curAngleX":120,  "curAngleY":120,  "curAngleZ":120,  "angleThreshold":120  }  } | | | | |

### 设置时间、时区、经纬度

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | broadcast：广播  multicast：组播  unicast：单播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | rtuSetTime：设置时间时区经纬度 |
|  | year |  | 年 | 2019 |
|  | month |  | 月 | 1 |
|  | day |  | 日 | 2 |
|  | week |  | 周 | 1 |
|  | hour |  | 时 | 1 |
|  | min |  | 分 | 1 |
|  | sec |  | 秒 | 1 |
|  | area |  | 时区 | 按分钟，东八区为480 |
|  | longitude |  | 经度 | double |
|  | latitude |  | 纬度 | double |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "6",  "msgParam": {  "area": 480,  "subCmd": "unicast",  "week": 4,  "year": 2021,  "latitude": 30.573,  "sec": 47,  "min": 38,  "month": 11,  "hour": 11,  "subType": "rtuSetTime",  "rtuUid": "0000000a49bc",  "day": 4,  "longitude": 104.066  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | broadcast：广播  multicast：组播  unicast：单播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | rtuSetTime：设置时间时区经纬度 |
|  | result |  | 结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "rtuUid": "0000000a5c8b",  "subType": "rtuSetTime",  "result": "success"  }  } | | | | |

### 查询时间、时区、经纬度

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 （查询只能单播） |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | rtuGetTime：查询时区经纬度 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "39",  "msgParam": {  "subCmd": "unicast",  "subType": "rtuGetTime",  "rtuUid": "00000009015f"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播  （查询只能单播） |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | rtuGetTime：查询时区经纬度 |
|  | result |  | 查询结果 | success：成功  fail：失败 |
|  | year |  | 年 | 2019 |
|  | month |  | 月 | 1 |
|  | day |  | 日 | 2 |
|  | week |  | 周 | 1 |
|  | hour |  | 时 | 1 |
|  | min |  | 分 | 1 |
|  | sec |  | 秒 | 1 |
|  | area |  | 时区 | 按分钟，东八区为480 |
|  | longitude |  | 经度 | double |
|  | latitude |  | 纬度 | double |
|  | sunriseHour |  | 日出时分，时 | 6 |
|  | sunriseMin |  | 日出时分，分 | 1 |
|  | sundownHour |  | 日落时分，时 | 18 |
|  | sundownMin |  | 日落时分，分 | 1 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "rtuUid": "00000009015f",  "subType": "rtuGetTime",  "result": "success",  "year": "2021",  "month": "12",  "day": "15",  "week": "3",  "hour": "9",  "min": "45",  "sec": "22",  "area": "480",  "longitude": "0",  "latitude": "0",  "sunriseHour": "13",  "sunriseMin": "51",  "sundownHour": "1",  "sundownMin": "58"  }  } | | | | |

### 单播设置灯具动作开关

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | setLightActionAlarm：设置灯具动作开关 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | leakageActionSwitch |  | 漏电动作开关 | open开, close关 |
|  | tiltActionSwitch |  | 倾斜动作开关 | open开, close关 |
| {  "msgEncrypt":"none",  "msgType":"cache",  "msgDirect":"req",  "msgId":"3166",  "msgParam":{  "subCmd":"unicast",  "subType":"setLightActionAlarm",  "tiltActionSwitch":"close",  "rtuUid":"000000094828",  "leakageActionSwitch":"close"  },  "msgUid":"0000000108c9",  "msgPriority":"normal",  "msgCmd":"rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | subType |  | 操作类型 | setLightActionAlarm：设置灯具动作开关 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.22",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "rtuUid": "000000094828",  "result": "success",  "subType": "setLightActionAlarm"  }  } | | | | |

### 单播设置屏蔽开关

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | setShieldAlarm：设置屏蔽开关 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | leakageShield |  | 漏电屏蔽开关 | open开, close关 |
|  | tiltShield |  | 倾斜屏蔽开关 | open开, close关 |
|  | tempTestShield |  | 温度检测屏蔽开关 | open开, close关 |
|  | shellTamperShield |  | 外壳防拆屏蔽开关 | open开, close关 |
|  | gpsShield |  | GPS功能屏蔽开关 | open开, close关 |
| {  "msgEncrypt":"none",  "msgType":"cache",  "msgDirect":"req",  "msgId":"3165",  "msgParam":{  "subCmd":"unicast",  "tiltShield":"open",  "leakageShield":"close",  "gpsShield":"close",  "subType":"setShieldAlarm",  "rtuUid":"000000094828",  "tempTestShield":"close",  "shellTamperShield":"close"  },  "msgUid":"0000000108c9",  "msgPriority":"normal",  "msgCmd":"rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | subType |  | 操作类型 | setShieldAlarm：设置屏蔽开关 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.22",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "rtuUid": "000000094828",  "result": "success",  "subType": "setShieldAlarm"  }  } | | | | |

### 单播查询灯具动作与屏蔽开关

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | getLightGpsAlarm：查询灯具与屏蔽开关 |
|  | rtuUid |  | 终端uid | 8字节 hex |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "34",  "msgParam": {  "subCmd": "unicast",  "subType": "getLightGpsAlarm",  "rtuUid": "0000000a5c8b"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | subType |  | 操作类型 | getLightGpsAlarm：查询灯具与屏蔽报警开关 |
|  | rtuUid |  | 终端uid | 8字节 hex |
|  | result |  | 执行结果 | success：成功  fail：失败 |
|  | ~~leakageSwitch/~~leakageShield |  | 漏电屏蔽开关 | open开, close关 |
|  | leakageActionSwitch |  | 漏电动作开关 | open开, close关 |
|  | ~~tiltSwitch/~~ tiltShield |  | 倾斜屏蔽开关 | open开, close关 |
|  | tiltActionSwitch |  | 倾斜动作开关 | open开, close关 |
|  | tempTestShield |  | 温度检测屏蔽开关 | open开, close关 |
|  | shellTamperShield |  | 外壳防拆屏蔽开关 | open开, close关 |
|  | gpsShield |  | GPS功能屏蔽开关 | open开, close关 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "rtuUid": "0000000a5c8b",  "leakageActionSwitch": "close",  "tiltActionSwitch": "close",  "leakageShield": "open",  "tiltShield": "close",  "tempTestShield": "close",  "shellTamperShield": "close",  "gpsShield": "close",  "result": "success",  "subType": "getLightGpsAlarm"  }  } | | | | |

### 设置扩展故障开关及阈值

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | setExtendAlarm：设置屏蔽开关 |
|  | itemNum |  | 类型数量 | 3 |
|  | items[A] | type | 扩展故障类型 | overvol：过压  undervol:欠压  overcur:过载 |
|  | checkShield | 检测开关 | open开, close关 |
|  | actionSwitch | 动作开关 | open开, close关 |
|  | threshold | 阈值 | Float型  电压（V）/电流（A） |
| {  "msgEncrypt":"none",  "msgType":"cache",  "msgDirect":"req",  "msgId":"44",  "msgParam":{  "subCmd":"unicast",  "itemNum":1,  "subType":"setExtendAlarm",  "rtuUid":"00000009015f",  "items":[  {  "actionSwitch":"close",  "checkShield":"open",  "threshold":264,  "type":"overvol"  }  ]  },  "msgUid":"0000000108ba",  "msgPriority":"normal",  "msgCmd":"rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | subType |  | 操作类型 | setExtendAlarm：设置屏蔽开关 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.22",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "result": "success",  "subType": "setExtendAlarm"  }  } | | | | |

### 查询扩展故障开关及阈值

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | getExtendAlarm：设置屏蔽开关 |
|  | itemNum |  | 类型数量 | 3 |
|  | items[A] | type | 扩展故障类型 | overvol：过压  undervol:欠压  overcur:过载 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "1",  "msgParam": {  "subCmd": "unicast",  "itemNum": 0,  "subType": "getExtendAlarm",  "rtuUid": "000000090279",  "items": []  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "rtu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | rtu：终端 |
| msgParam | subCmd |  | 子命令 | unicast：单播 multicast：组播 broadcast：广播 |
|  | rtuGroup |  | 组号 | 组播时才有该字段 |
|  | rtuUid |  | uid | 单播才有该字段 |
|  | subType |  | 操作类型 | getExtendAlarm：设置屏蔽开关 |
|  | itemNum |  | 类型数量 | 3 |
|  | items[A] | type | 扩展故障类型 | overvol：过压  undervol:欠压  overcur:过载 |
|  | checkShield | 检测开关 | open开, close关 |
|  | actionSwitch | 动作开关 | open开, close关 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "1",  "msgEncrypt": "none",  "msgCmd": "rtu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "unicast",  "rtuUid": "0000000a5c8b",  "subType": "getExtendAlarm",  "itemNum": "3",  "items": [  {  "type": "overvol",  "checkShield": "open",  "actionSwitch": "close",  "threshold": "264"  },  {  "type": "undervol",  "checkShield": "close",  "actionSwitch": "close",  "threshold": "176"  },  {  "type": "overcur",  "checkShield": "close",  "actionSwitch": "close",  "threshold": "4"  }  ]  }  } | | | | |

## 4.3新增协议

### 终端线程运行参数设置

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | paramSet ：终端线程运行参数设置 |
|  | period |  | 终端在线状态上报周期 | 单位min，范围30-360 |
|  | repInterval |  | 数据上报间隔 | 单位min，范围60-4320 |
|  | interval |  | 状态轮询间隔 | 单位S，范围15-3600 |
|  | count |  | 状态轮询重复次数 | 单位次，范围1-10 |
|  | offcount |  | 离线判断轮数 | 单位轮，范围1-200 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "14741",  "msgParam": {  "subCmd": "paramSet",  "period": 240,  "offcount": 1,  "count": 1,  "interval": 15,  "repInterval": 60  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | paramSet：终端线程运行参数设置 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "14741",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "paramSet",  "result": "success"  }  } | | | | |

### 终端线程运行参数查询

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | paramQuery ：终端线程运行参数查询 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13895",  "msgParam": {  "subCmd": "paramQuery"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | paramQuery ：终端线程运行参数查询 |
|  | period |  | 终端在线状态上报周期 | 单位min，范围240-4320 |
|  | repInterval |  | 数据上报间隔 | 单位min，范围60-4320 |
|  | interval |  | 状态轮询间隔 | 单位S，范围15-3600 |
|  | count |  | 状态轮询重复次数 | 单位次，范围1-10 |
|  | offcount |  | 离线判断轮数 | 单位轮，范围1-200 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4492",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "paramQuery",  "period": "240",  "repInterval": "60",  "interval": "15",  "count": "1",  "offcount": "1"  }  } | | | | |

### 终端状态轮询分组标志设置

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | groupSet：终端状态轮询分组标志设置 |
|  | group |  | 对应组号 | 字符串，需要轮询的组号0-31，“0,1,2，，” |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "52207",  "msgParam": {  "subCmd": "groupSet",  "group":"6,5,16,1,4,3,2"  },  "msgUid": "0000000108c9",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | groupSet：终端状态轮询分组标志设置 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "52207",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "groupSet",  "result": "success"  }  } | | | | |

### 终端状态轮询分组标志查询

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | groupQuery：终端状态轮询分组标志查询 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13895",  "msgParam": {  "subCmd": "groupQuery"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | groupQuery ：终端状态轮询分组标志查询 |
|  | group |  | 对应组号 | 字符串，需要轮询的组号0-31，“0,1,2，，” |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4492",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "groupQuery ",  "group":"6,5,16,1,4,3,2"  }  } | | | | |

### 终端在线状态主动上报

执行上报

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | report：终端在线状态主动上报 |
|  | count |  | 终端个数 | 1-120 |
|  | items[A] | uid | 终端uid | 6Byte |
|  | state | 终端状态 | 0-未知 1-在线 2-离线 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "65535",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "report",  "count": "20",  "items": [  {  "rtuUid": "0000000a5c7e",  "state": "2"  },  {  "rtuUid": "0000000a5cab",  "state": "2"  },  {  "rtuUid": "0000000a5c7b",  "state": "2"  },  {  "rtuUid": "0000000a5c86",  "state": "2"  },  {  "rtuUid": "0000000a5c9e",  "state": "2"  },  {  "rtuUid": "0000000a5c33",  "state": "2"  },  {  "rtuUid": "0000000a5c85",  "state": "2"  },  {  "rtuUid": "0000000a5c9d",  "state": "2"  },  {  "rtuUid": "0000000a5ca4",  "state": "2"  },  {  "rtuUid": "0000000a5c95",  "state": "2"  },  {  "rtuUid": "0000000a5c83",  "state": "2"  },  {  "rtuUid": "0000000a5ca1",  "state": "2"  },  {  "rtuUid": "0000000a5c89",  "state": "2"  },  {  "rtuUid": "0000000a5c7d",  "state": "2"  },  {  "rtuUid": "0000000a5c79",  "state": "2"  },  {  "rtuUid": "0000000a5c77",  "state": "2"  },  {  "rtuUid": "0000000a5c82",  "state": "2"  },  {  "rtuUid": "0000000a5c5a",  "state": "2"  },  {  "rtuUid": "0000000a5c8b",  "state": "2"  },  {  "rtuUid": "0000000a5c8f",  "state": "2"  }  ]  }  } | | | | |

上位机回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | report：终端在线状态主动上报 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108c9",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "22576",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "report",  "result": "success"  }  } | | | | |

### 升级文件参数设置

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | ftpUpdate：远程升级文件设置 |
|  | type |  | 类型 | 1-集中器 2-终端 |
|  | effect |  | 有效性 | 1-有效 0-无效 无后续内容 正在下载文件则停止下载 |
|  | addr |  | FTP服务器地址 | 字符串 |
|  | port |  | FTP服务器端口 | 21 |
|  | user |  | 用户名 | 字符串 |
|  | psw |  | 密码 | 字符串 |
|  | filePath |  | 文件存放路径 | 字符串 |
|  | fileName |  | 文件名（含后缀） | 字符串 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "22576",  "msgParam": {  "subCmd": "ftpUpdate",  "fileName": "11914.bin",  "port": 21,  "psw": "123",  "effect": 1,  "filePath": "/",  "type": 1,  "addr": "103.78.228.88",  "user": "123"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | ftpUpdate ：远程升级文件设置 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "22576",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "ftpUpdate",  "result": "success"  }  } | | | | |

### 升级文件参数查询

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | ftpGet：远程升级文件查询 |
|  | type |  | 类型 | 1-集中器 2-终端 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13895",  "msgParam": {  "subCmd": "ftpGet"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | ftpGet：远程升级文件查询 |
|  | type |  | 类型 | 1-集中器 2-终端 |
|  | effect |  | 有效性 | 1-有效 0-无效 无后续内容 正在下载文件则停止下载 |
|  | addr |  | FTP服务器地址 | 字符串 |
|  | port |  | FTP服务器端口 | 21 |
|  | user |  | 用户名 | 字符串 |
|  | psw |  | 密码 | 字符串 |
|  | filePath |  | 文件存放路径 | 字符串 |
|  | fileName |  | 文件名（含后缀） | 字符串 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4492",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "ftpGet",  "fileName": "11914.bin",  "port": 21,  "psw": "123",  "effect": 1,  "filePath": "/",  "type": 1,  "addr": "103.78.228.88",  "user": "123"  }  } | | | | |

### 升级文件下载结果上报

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | ftpReport：远程升级文件下载结果上报 |
|  | type |  | 类型 | 1-集中器 2-终端 |
|  | result |  | 执行结果 | success：1成功  fail： 2服务器文件不存在  error：3-升级文件错误  checkerror：4-升级文件校验出错  same：5-升级文件与当前程序版本相同 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "65535",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "ftpReport",  "type": "1",  "result": "success"  }  } | | | | |

上位机不应答

.

### 终端升级状态设置

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | updataSet：升级状态设置 |
|  | state |  | 升级状态 | 1-开始升级 0-停止升级 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "14741",  "msgParam": {  "subCmd": "updataSet",  "state": 1,  "count": 1  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | updataSet：升级状态设置 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "14741",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "updataSet",  "result": "success"  }  } | | | | |

### 终端升级状态查询

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | updateGet：升级状态查询 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "13895",  "msgParam": {  "subCmd": "updateGet"  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | updateGet：升级状态查询 |
|  | state |  | 执行结果 | 1-正在升级 2-升级结束（只能主动上报） 0-未开始 |
| {  "msgUid": "0000000108ba",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4492",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "updateGet",  "state": "1"  }  } | | | | |

### 下发终端自动归属

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | autoBelong：自动归属 |
|  | subType |  | 操作类型 | begin：开始自动归属搜索 |
|  | type |  | 搜索类型int | 0：增量搜索 1：全部搜索 2：停止搜索 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "7859",  "msgParam": {  "subCmd": "autoBelong",  "subType": "begin",  "type": 2  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

执行回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | autoBelong：自动归属 |
|  | subType |  | 操作类型 | begin：开始自动归属搜索 |
|  | result |  | 执行结果 | success：成功  fail：失败 |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "7859",  "msgParam": {  "subCmd": "autoBelong",  "subType": "begin",  "type": 2  },  "msgUid": "0000000108ba",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

### 上报终端自动归属结果

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | autoBelong：自动归属 |
|  | subType |  | 操作类型 | report：上报归属结果 |
|  | rtuNum |  | 终端数量 | Int：1 |
|  | rtuItems  [A] | rtuUid | 终端uid | 6字节 hex |
|  | phase | 相位 | “A”“B”“C” |
| {  "msgUid": "000000011d02",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "17767",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "autoBelong",  "subType": "report",  "rtuNum": "1",  "rtuItems": [  {  "rtuUid": "00000008e737",  "phase": "A"  }  ]  }  } | | | | |

执行回复

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | autoBelong：自动归属 |
|  | subType |  | 操作类型 | report：上报归属结果 |
|  | rtuNum |  | 终端数量 | Int：1 |
|  | rtuItems  [A] | rtuUid | 终端uid | 6字节 hex |
| {  "msgEncrypt": "none",  "msgType": "cache",  "msgDirect": "req",  "msgId": "7382",  "msgParam": {  "subCmd": "autoBelong",  "rtuNum": "1",  "rtuItems": [  {  "rtuUid": "00000008e737"  }  ],  "msgId": 7382,  "subType": "report"  },  "msgUid": "000000011d02",  "msgPriority": "normal",  "msgCmd": "ccu"  } | | | | |

### 上报终端自动归属完成

操作请求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| root | parent | child | description | value |
| msgId |  |  | 随机，应答带回该id | int，2个字节 |
| msgUid |  |  | 数据包目的uid | 8字节 hex |
| msgCmd |  |  | 主命令 | ccu：集中器 |
| msgParam | subCmd |  | 子命令 | autoBelong：自动归属 |
|  | subType |  | 操作类型 | finish：上报归属结果 |
| {  "msgUid": "000000011d02",  "msgDirect": "report",  "msgPriority": "normal",  "msgType": "real",  "msgId": "4660",  "msgEncrypt": "none",  "msgCmd": "ccu",  "host": "172.31.0.26",  "port": "12109",  "msgParam": {  "subCmd": "autoBelong",  "subType": "finish"  }  } | | | | |

无需回复

## 附录

### 1.白名单功能

**deleteAll**

{"msgEncrypt":"none","msgType":"cache","msgDirect":"req","msgId":"2208","msgParam":{"subCmd":"whiteList","subType":"deleteAll"},"msgUid":"0000000108c9","msgPriority":"normal","msgCmd":"ccu"}

**delete**

{

**"**msgEncrypt": "none",

    "msgType": "cache",

    "msgDirect": "req",

    "msgId": "2209",

    "msgParam": {

        "subCmd": "whiteList",

        "rtuUidnum": 1,

        "rtuItems": [

           {"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901a8"}        ],

        "subType": "**delete**"

    },

    "msgUid": "0000000108c9",

    "msgPriority": "normal",

    "msgCmd": "ccu"

}

**config**

{

"msgEncrypt": "none","msgType": "cache",  "msgDirect": "req","msgId": "2209",  "msgParam": {

    "subCmd": "whiteList", "rtuUidnum": 1, "rtuItems": [ {"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901a8"} ],"subType": "config" },  "msgUid": "0000000108c9", "msgPriority": "normal", "msgCmd": "ccu"}

**write**

{"msgEncrypt":"none","msgType":"cache","msgDirect":"req","msgId":"2209","msgParam":{"subCmd":"whiteList","rtuUidnum":14,"rtuItems":[{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"000000090279"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901fa"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000902da"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000902e6"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901a8"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"00000009023a"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"00000009019b"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000902c3"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901e8"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"00000009011e"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901ed"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"000000090175"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"0000000901d5"},{"chnDO":255,"rtuGp1":1,"rtuGp3":0,"rtuGp2":0,"addrDO":255,"rtuUid":"00000009018f"}],"subType":"write"},"msgUid":"0000000108c9","msgPriority":"normal","msgCmd":"ccu"}

**configAll**

{"msgEncrypt":"none","msgType":"cache","msgDirect":"req","msgId":"2210","msgParam":{"subCmd":"whiteList","subType":"configAll"},"msgUid":"0000000108c9","msgPriority":"normal","msgCmd":"ccu"}

**configFail**

{"msgEncrypt":"none","msgType":"cache","msgDirect":"req","msgId":"2210","msgParam":{"subCmd":"whiteList","subType":"configFail"},"msgUid":"0000000108c9","msgPriority":"normal","msgCmd":"ccu"}

### 2.集中器任务下发

{

    "msgEncrypt": "none",

    "msgType": "cache",

    "msgDirect": "req",

    "msgId": "5852",

    "msgParam": {

        "subCmd": "taskSet",

        "month": 10,

        "year": 2020,

        "effect": 1,

        "Id": 1,

        "type": 1,

        "day": 18,

        "itemNum": 1,

        "taskItems": [

            {

                "hour": 18,

                "min": 0,

                "groupNum": 1,

                "groups": [

                    {

                        "groupID": 1,

                        "action": 66,

                        "light": 100

                    }

                ]

            }

        ]

    },

    "msgUid": "0000000108c5",

    "msgPriority": "normal",

    "msgCmd": "ccu"

}

### 3.故障编码

故障编码按位（4个字节32位）表示：

ALARM\_TYPE\_V\_DOWN = 0, *//欠压*

ALARM\_TYPE\_V\_UP, *//过压*

ALARM\_TYPE\_V\_LEAK, *//漏电*

ALARM\_TYPE\_TILT, *//倾斜*

ALARM\_TYPE\_TEMP\_UP, *//温度*

ALARM\_TYPE\_OPEN, *//开盖*

ALARM\_TYPE\_CHK, *//CHK 检测故障，当前为电压检测*

ALARM\_TYPE\_RTC, *//RTC*

ALARM\_TYPE\_GPS, *//GPS*

ALARM\_TYPE\_LUX, *//光照计*

ALARM\_TYPE\_TEMP, *//温度计*

ALARM\_TYPE\_EEPROM, *//EEPROM*

ALARM\_TYPE\_RELAY\_CH1 = 16,*//继电器*

ALARM\_TYPE\_LAMP\_CH1, *//(LED)灯具*

ALARM\_TYPE\_CAP\_CH1, *//补偿电容*

ALARM\_TYPE\_NA\_CH1, *//钠灯故障*

ALARM\_TYPE\_LED\_CH1, *//LED模组*

ALARM\_TYPE\_I\_UP\_CH1, *//过载（过流）*

ALARM\_TYPE\_I\_DOWN\_CH1, *//欠载（欠流）*

ALARM\_TYPE\_RELAY\_CH2 = 24,*//继电器*

ALARM\_TYPE\_LAMP\_CH2, *//(LED)灯具*

ALARM\_TYPE\_CAP\_CH2, *//补偿电容*

ALARM\_TYPE\_NA\_CH2, *//钠灯故障*

ALARM\_TYPE\_LED\_CH2, *//LED模组*

ALARM\_TYPE\_I\_UP\_CH2, *//过载（过流）*

ALARM\_TYPE\_I\_DOWN\_CH2, *//欠载（欠流*  ALARM\_TYPE\_TOTAL = 32, *//故障总数*