**robot\_exceptions接口使用文档**

**1. 功能说明**

robot\_exceptions.h和robot\_exceptions.cpp提供了机器人异常的管理，分为模块（module），子模块（submodule)，异常类型（exception\_type)，异常行为（exception\_action)。

模块分为硬件和软件。

子模块定位到具体的ros节点。

异常类型是具体的异常。

异常行为分为引起异常和消除异常。

主要提供两个接口：

（1）编码生成异常字符串

（2）解码异常字符串

异常的编码为json格式的字符串。

示例：

{

"module": "software",

"submodule": "navigation\_node",

"exception\_type": "path\_plan\_failure",

"exception\_action": "raise",

"exception\_level": "info"

}

**2. 典型用法**

#include "robot\_exceptions.h"

#include "dg\_msgs/ExceptionCommand.h"

// 编码生成异常字符串

RobotExceptions robot\_exceptions;

RobotExceptions::ExceptionNode exception\_node;

exception\_node.module = RobotExceptions::HARDWARE;

exception\_node.submodule = RobotExceptions::BASE\_NODE;

exception\_node.exception\_type = RobotExceptions::SERVO;

exception\_node.exception\_action = RobotExceptions::RAISE;

std::string exception\_string = robot\_exceptions.EncodeException(exception\_node);

// 通过rosservice发出异常

dg\_msgs::ExceptionCommand exception\_command\_data;

exception\_command\_data.request.cmd.data = exception\_string;

ros::NodeHandle ros\_nodehandle;

ros::ServiceClient exception\_client = ros\_nodehandle.serviceClient<dg\_msgs::ExceptionCommand>("process\_exception\_srv");

// 调用服务

exception\_client.call(exception\_command\_data);

**3. 异常类型解释表**

**模块**（module）

|  |  |
| --- | --- |
| 名称 | 含义 |
| HARDWARE | 硬件模块 |
| SOFTWARE | 软件模块 |

**子模块**（submodule)

|  |  |  |
| --- | --- | --- |
| 所属模块 | 名称 | 含义 |
| HARDWARE | BASE\_NODE | base节点 |
| HARDWARE | LASER\_NODE | 激光节点 |
| SOFTWARE | COMMUNICATION\_NODE | 通信节点 |
| SOFTWARE | LOCALIZATION\_NODE | 定位节点 |
| SOFTWARE | NAVIGATION\_NODE | 导航节点 |
|  |  |  |
|  |  |  |

**异常类型**（exception\_type)

|  |  |  |
| --- | --- | --- |
| 所属子模块 | 异常名称 | 含义 |
|  | NULL\_EXCEPTION | 无异常 |
| BASE\_NODE | COMMUNICATION\_WITH\_HARDWARE | 硬件通信异常 |
| BASE\_NODE | SERVO | 电机异常 |
| BASE\_NODE | GAS\_SENSOR | 气体传感器异常 |
| BASE\_NODE | FRONT\_ULTRASONIC\_SENSOR | 前置超声波异常 |
| BASE\_NODE | BACK\_ULTRASONIC\_SENSOR | 后置超声波异常 |
| BASE\_NODE | FRONT\_ULTRASONIC\_WARNING | 前置超声波报警 |
| BASE\_NODE | BACK\_ULTRASONIC\_WARNING | 后置超声波报警 |
| BASE\_NODE | METHANE\_SENSOR | 甲烷传感器异常 |
| BASE\_NODE | HUMITURE | 温度湿度异常 |
| BASE\_NODE | PIT\_SENSOR | 测坑传感器异常 |
| BASE\_NODE | PIT\_WARNING | 测坑报警 |
| BASE\_NODE | EMERGENCY\_STOP | 急停按下 |
| BASE\_NODE | CRASH | 碰撞异常 |
| BASE\_NODE | PTZ | 云台异常 |
| BASE\_NODE | BATTERY\_LOW\_POWER | 电池低电量 |
| BASE\_NODE | BATTERY\_HIGH\_TEMPERATURE | 电池高温异常 |
| BASE\_NODE | BATTERY\_COMMUNICATION | 电池通信异常 |
| BASE\_NODE | ROS\_NODE | Ros节点异常 |
|  |  |  |
| LASER\_NODE | LASER\_DATA | 激光数据异常 |
|  |  |  |
| COMMUNICATION\_NODE | COMMUNICATION\_WITH\_FRONTEND | 与前端通信异常 |
|  |  |  |
| LOCALIZATION\_NODE | LOCALIZATION\_LOST | 定位丢失异常 |
| LOCALIZATION\_NODE | LOCALIZATION\_LASER\_DATA | 定位激光数据异常 |
|  |  |  |
| NAVIGATION\_NODE | PATH\_PLAN\_FAILURE | 路径规划失败异常 |
| NAVIGATION\_NODE | OFF\_COURSE | 偏航异常 |
| NAVIGATION\_NODE | AHEAD\_OF\_START\_POINT | 欠航 |
| NAVIGATION\_NODE | BEHIND\_OF\_TARGET\_POINT | 过航 |
| NAVIGATION\_NODE | TURNING\_DRIFT | 转向漂移 |
| NAVIGATION\_NODE | GET\_POSE\_FAILURE | 获取位置异常 |
| NAVIGATION\_NODE | POSITION\_MEDIUM\_FLUCTUATION | 位置中等跳变 |
| NAVIGATION\_NODE | POSITION\_BIG\_FLUCTUATION | 位置大跳变 |
| NAVIGATION\_NODE | OBSTACLE\_AVOIDANCE | 避障异常 |
| NAVIGATION\_NODE | BASE\_FRONT\_OBSTACLE\_AVOIDANCE | base前避障 |
| NAVIGATION\_NODE | BASE\_BACK\_OBSTACLE\_AVOIDANCE | base后避障 |
| NAVIGATION\_NODE | BASE\_PIT\_OBSTACLE\_AVOIDANCE | base测坑避障 |
| NAVIGATION\_NODE | NAVIGATION\_LASER\_OPEN\_FAILURE | 导航激光打开错误 |
| NAVIGATION\_NODE | NAVIGATION\_LASER\_CLOSE\_FAILURE | 导航激光关闭错误 |
| NAVIGATION\_NODE | TEST\_PIT\_LASER\_OPEN\_FAILURE | 测坑激光打开错误 |
| NAVIGATION\_NODE | TEST\_PIT\_LASER\_CLOSE\_FAILURE | 测坑激光关闭错误 |
| NAVIGATION\_NODE | FRONT\_ULTRASONIC\_OPEN\_FAILURE | 前置超声打开错误 |
| NAVIGATION\_NODE | FRONT\_ULTRASONIC\_CLOSE\_FAILURE | 前置超声关闭错误 |
| NAVIGATION\_NODE | BACK\_ULTRASONIC\_OPEN\_FAILURE | 后置超声打开错误 |
| NAVIGATION\_NODE | BACK\_ULTRASONIC\_ABNORMAL\_CLOSE | 后置超声异常关闭 |
| NAVIGATION\_NODE | BACK\_ULTRASONIC\_CLOSE\_FAILURE | 后置超声关闭错误 |
| NAVIGATION\_NODE | DETECT\_CHARGING\_PILE\_FAILURE | 检测充电桩失败 |
| NAVIGATION\_NODE | CHARGE\_FAILURE | 充电失败 |
| NAVIGATION\_NODE |  |  |
| NAVIGATION\_NODE |  |  |

异常行为（ exception\_action）

|  |  |
| --- | --- |
| `名称 | 含义 |
| RAISE | 引起异常 |
| SOLVE | 消除异常（可以通过发送异常命令消除异常） |

异常等级（ exception\_level）

|  |  |
| --- | --- |
| 名称 | 含义 |
| INFO | 消息 |
| WARNING | 警告 |
| ERROR | 错误 |