RoboControllerSDK

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Contents

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1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

Class Documentation

3.1 _BoardStatus Struct Reference

Used to mantain the state of the configuration of the board.

```
#include <RoboControllerSDK_global.h>
```

Public Attributes

- bool pidEnable
- bool wdEnable
- bool saveToEeprom
- bool accelRampEnable

3.1.1 Detailed Description

Used to mantain the state of the configuration of the board.

3.1.2 Member Data Documentation

3.1.2.1 bool _BoardStatus::accelRampEnable

Indicates if acceleration is limited by speed ramps

3.1.2.2 bool _BoardStatus::pidEnable

Indicates if the motor PID controls are enabled

3.1.2.3 bool _BoardStatus::saveToEeprom

Indicates if the Board parameters are saved to Eeprom when changed

3.1.2.4 bool _BoardStatus::wdEnable

Indicates if the Command WatchDod is enabled. If it is true and the board does not receive command for N msec (getWatchDogTime and setWatchDogTime)the motors stop

The documentation for this struct was generated from the following file:

- RoboControllerSDK_global.h

3.2 _RobotConfiguration Struct Reference

Used to mantain the state of the configuration of the robot.

```
#include <RoboControllerSDK_global.h>
```

Public Attributes

- quint16 Weight
- quint16 Width
- quint16 Height
- quint16 Lenght
- quint16 WheelBase
- quint16 WheelRadiusLeft
- quint16 WheelRadiusRight
- quint16 EncoderCprLeft
- quint16 EncoderCprRight
- quint16 MaxRpmMotorLeft
- quint16 MaxRpmMotorRight
- quint16 MaxAmpereMotorLeft
- quint16 MaxAmpereMotorRight
- quint16 MaxTorqueMotorLeft
- quint16 MaxTorqueMotorRight
- quint16 RatioShaftLeft
- quint16 RatioShaftRight
- quint16 RatioMotorLeft
- quint16 RatioMotorRight
- PinLevel MotorEnableLevel
- EncoderPos EncoderPosition

3.2.1 Detailed Description

Used to mantain the state of the configuration of the robot.

3.2.2 Member Data Documentation

3.2.2.1 quint16 _RobotConfiguration::EncoderCprLeft

Count per Round of the left encoder

3.2.2.2 quint16 _RobotConfiguration::EncoderCprRight

Count per Round of the right encoder

3.2.2.3 EncoderPos _RobotConfiguration::EncoderPosition

Encoder on the shaft of the motor or of the wheel

3.2.2.4 quint16 _RobotConfiguration::Height

Robot Height (mm)

3.2.2.5 quint16 _RobotConfiguration::Lenght

Robot Lenght (mm)

3.2.2.6 quint16 _RobotConfiguration::MaxAmpereMotorLeft

Max current assorbed by left motor (mA)

3.2.2.7 quint16 _RobotConfiguration::MaxAmpereMotorRight

Max current assorbed by right motor (mA)

3.2.2.8 quint16 _RobotConfiguration::MaxRpmMotorLeft

Max RPM of the left motor

3.2.2.9 quint16 _RobotConfiguration::MaxRpmMotorRight

Max RPM of the right motor

3.2.2.10 quint16 _RobotConfiguration::MaxTorqueMotorLeft

Max torque of the left motor (Ncm)

3.2.2.11 quint16 _RobotConfiguration::MaxTorqueMotorRight

Max torque of the right motor (Ncm)

3.2.2.12 PinLevel _RobotConfiguration::MotorEnableLevel

Enable Level of the Robot Driver (Low/High)

3.2.2.13 quint16 _RobotConfiguration::RatioMotorLeft

Reduction Ratio on the left Motor Shaft (Put 1 if you set Max RPM considering it just reduced)

3.2.2.14 quint16 _RobotConfiguration::RatioMotorRight

Reduction Ratio on the right Motor Shaft (Put 1 if you set Max RPM considering it just reduced)

3.2.2.15 quint16 _RobotConfiguration::RatioShaftLeft

Reduction Ratio from the shaft of the left motor to the shaft of the left wheel

3.2.2.16 quint16 _RobotConfiguration::RatioShaftRight

Reduction Ratio from the shaft of the right motor to the shaft of the right wheel

3.2.2.17 quint16 _RobotConfiguration::Weight

Robot Weight (g)

3.2.2.18 quint16 _RobotConfiguration::WheelBase

Distance between the center of the Wheels (mm)

3.2.2.19 quint16 _RobotConfiguration::WheelRadiusLeft

Radius of the left wheel (0.01mm)

3.2.2.20 quint16 _RobotConfiguration::WheelRadiusRight

Radius of the right wheel (0.01mm)

3.2.2.21 quint16 _RobotConfiguration::Width

Robot Width (mm)

The documentation for this struct was generated from the following file:

- RoboControllerSDK_global.h

3.3 roboctrl::RcException Class Reference

A generic error exception that can be thrown by the application.

`#include <exception.h>`

Public Member Functions

- RcException (RcExceptionType type, const char ∗message,...)
- RcException (RcExceptionType type, const char ∗message, RcException ∗e,...)
- const char ∗ GetMessage () const

  The exception error message.
- operator const char ∗ () const

  The exception error message.
- RcExceptionType GetType ()

  The exception error type.

Protected Attributes

- char **message** [1024]
- RcExceptionType **mExcType**

3.3.1 Detailed Description

A generic error exception that can be thrown by the application.

3.3.2 Constructor & Destructor Documentation

3.3.2.1 roboctrl::RcException::RcException (RcExceptionType *type*, const char ∗ *message*, ...) [inline]

Construct an exception

Parameters

message	It is a printf-like format string, arguments follows ;)

3.3.2.2 roboctrl::RcException::RcException (RcExceptionType *type*, const char ∗ *message*, RcException ∗ *e*, ...) [inline]

Construct an exception

Parameters

message	It is a printf-like format string, arguments follows ;)

3.3.3 Member Function Documentation

3.3.3.1 const char∗ roboctrl::RcException::GetMessage ( ) const [inline]

The exception error message.

Returns

The error message associated to the exception

3.3.3.2 RcExceptionType roboctrl::RcException::GetType ( ) [inline]

The exception error type.

Returns

The error type associated to the exception

3.3.3.3 roboctrl::RcException::operator const char ∗ ( ) const [inline]

The exception error message.

Returns

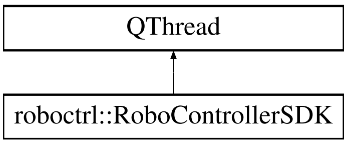
The error message associated to the exception

The documentation for this class was generated from the following file:

- exception.h

3.4 roboctrl::RoboControllerSDK Class Reference

Inheritance diagram for roboctrl::RoboControllerSDK:



Signals

- void tcpConnected ()

  Signal emitted when TCP Socket is connected.
- void tcpDisconnected ()

  Signal emitted when TCP Socket is disconnected.
- void udpConnected ()

  Signal emitted when UDP Socket is connected.
- void udpDisconnected ()

  Signal emitted when UDP Socket is disconnected.
- void newMotorPwmValue (quint16 motorIdx, quint16 value)

  Signal emitted when a new PWM value is received.
- void newMotorSpeedValue (quint16 motorIdx, double value)

  Signal emitted when a new SPEED value is received (speed is in m/sec)
- void newMotorPwmValue (quint16 motorIdx, double value)

  Signal emitted when a new PWM value is received.
- void newMotorPIDGains (quint16 motorIdx, quint16 Kp, quint16 Ki, quint16 Kd)

  Signal emitted when new PID gains are received.
- void newRobotConfiguration (RobotConfiguration &robConf)

  Signal emitted when a new Robot Configuration is received from robot.
- void newBoardStatus (BoardStatus &status)

  Signal emitted when a new Board Status is ready.

Public Member Functions

- **RoboControllerSDK** (int udpListenPort=4550, int udpSendPort=4560, QString tcpAddr=QString("localhost"), int tcpPort=4500)
- void setCommMode (CommMode mode)

  Sets the current mode.
- void getMotorSpeed (quint16 motorIdx)

  Send a request for motor speed. The reply is received with /ref newMotorSpeedValue signal.
- void setMotorSpeed (quint16 motorIdx, double speed)

  Sets the speed of the motor in m/sec.
- void getMotorPWM (quint16 motorIdx)

  Send a request for motor pwm. The reply is received with /ref newMotorPwmValue signal.
- void setMotorPWM (quint16 motorIdx, int pwm)

  Sets the PWM of the motor in m/sec.
- void setMotorPidGains (quint16 motorIdx, quint16 Kp, quint16 Ki, quint16 Kd)

  Sets motor PID Controllers parameters.
- void getMotorPidGains (quint16 motorIdx)

Send a request for motor PID gains. The reply is received with newMotorPIDGains signal.

- void getBoardStatus ()

  Gets current board status (BoardStatus) The reply is received with newBoardStatus.
- void setBoardStatus (BoardStatus &status)

  Sets a new BoardStatus.
- bool getRobotConfigurationFromIni (QString iniFile=ROBOT_CONFIG_INI_FILE)

  Load the Robot Configuration from ini file The Robot configuration is not stored on Robot EEPROM unless saving is active.
- void getRobotConfigurationFromEeprom ()

  Load the Robot Configuration from Robot EEPROM The Robot configuration is retrieved from Robot.
- void saveRobotConfigurationToIni (QString iniFile=ROBOT_CONFIG_INI_FILE)

  Save the Robot Configuration to Robot EEPROM The Robot configuration is saved on the Robot.
- void saveRobotConfigurationToEeprom ()

  Save the Robot Configuration to Robot EEPROM The Robot configuration is saved on the Robot ∗.

Protected Slots

- void **onTcpReadyRead** ()
- void **onTcpError** (QAbstractSocket::SocketError err)
- void **onTcpHostFound** ()
- void onPingTimerTimeout ()

  Ping Timer handler.

Protected Member Functions

- virtual void run ()

  Disables the Communication Watchdog WatchDog if active stops motors if communication is lost.

3.4.1 Member Function Documentation

3.4.1.1 void roboctrl::RoboControllerSDK::getMotorPidGains (quint16 *motorIdx*)

Send a request for motor PID gains. The reply is received with newMotorPIDGains signal.

Parameters

motorIdx	Index of the motor (0 or 1)

3.4.1.2 void roboctrl::RoboControllerSDK::getMotorPWM (quint16 *motorIdx*)

Send a request for motor pwm. The reply is received with /ref newMotorPwmValue signal.

Parameters

motorIdx	Index of the motor (0 or 1)

3.4.1.3 void roboctrl::RoboControllerSDK::getMotorSpeed (quint16 *motorIdx*)

Send a request for motor speed. The reply is received with /ref newMotorSpeedValue signal.

Parameters

motorIdx	Index of the motor (0 or 1)

3.4.1.4 bool roboctrl::RoboControllerSDK::getRobotConfigurationFromIni (QString *iniFile* = `ROBOT_CONFIG_INI_FILE`)

Load the Robot Configuration from ini file The Robot configuration is not stored on Robot EEPROM unless saving is active.

Parameters

iniFile	The path of the ini file

Returns

true if everything is ok

3.4.1.5 void roboctrl::RoboControllerSDK::run ( ) `[protected], [virtual]`

Disables the Communication Watchdog WatchDog if active stops motors if communication is lost.

Enables the Communication Watchdog WatchDog if active stops motors if communication is lostThread function

3.4.1.6 void roboctrl::RoboControllerSDK::saveRobotConfigurationToIni (QString *iniFile* = `ROBOT_CONFIG_INI_FILE`)

Save the Robot Configuration to Robot EEPROM The Robot configuration is saved on the Robot.

Parameters

iniFile	The path of the ini file

3.4.1.7 void roboctrl::RoboControllerSDK::setBoardStatus (BoardStatus & *status*)

Sets a new BoardStatus.

Parameters

status	The new status to be set

3.4.1.8 void roboctrl::RoboControllerSDK::setCommMode (CommMode *mode*)

Sets the current mode.

Disables the Communication Watchdog.

Parameters

mode	The mode to be set. See CommMode

Exceptions

RcException	Enables the Communication Watchdog

3.4.1.9 void roboctrl::RoboControllerSDK::setMotorPidGains (quint16 *motorIdx,* quint16 *Kp,* quint16 *Ki,* quint16 *Kd*)

Sets motor PID Controllers parameters.

Parameters

motorIdx	Index of the motor (0 or 1)
Kp	Proportional Action gain
Ki	Integral Action gain
Kd	Derivative Action gain

3.4.1.10 void roboctrl::RoboControllerSDK::setMotorPWM (quint16 *motorIdx,* int *pwm*)

Sets the PWM of the motor in m/sec.

Parameters

motorIdx	Index of the motor (0 or 1)
pwm	PWM range: [-2048/2047]

Note

> This function works only when mMotorCtrlMode is equal to mcPid, else it does nothing

3.4.1.11 void roboctrl::RoboControllerSDK::setMotorSpeed (quint16 *motorIdx,* double *speed*)

Sets the speed of the motor in m/sec.

Parameters

motorIdx	Index of the motor (0 or 1)
speed	The speed in m/sec - Speed range: [-32.768/+32.767] m/sec

Note

> This function works only when mMotorCtrlMode is equal to mcPid, else it does nothing

The documentation for this class was generated from the following files:

- robocontrollersdk.h
- robocontrollersdk.cpp

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