CC Pilot™ XS

Light sensor interface description

CC SYSTEMS

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Introduction

Purpose

This document describes the software interface to the light sensor device.

References

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History

Rev	Date	Author	Remarks
1.0	2005-09-31	Göran Nordin	First version.
1.1	2008-04-08	Fredrik Lans	Revision

Light sensor device interface

IOCTLs are used to communicate with the light sensor device. The name of the light sensor device is “LTS1” in unicode character set.

Summary of IOCTLs

IOCTL_LIGHTSENSOR_GET	Returns the brightness in lux.
IOCTL_LIGHTSENSOR_SAMPLE_TIME_GET	Returns the sample time in milliseconds.

IOCTL_LIGHTSENSOR_GET

Description

Returns the brightness in lux. The windows DeviceIoControl function passes the IOCTL to the light sensor device.

Include files

#include "LightSensor.h"

Parameters supplied to DeviceIoControl

hDevice	Handle to the light sensor device. To obtain a device handle, call the CreateFile function with *lpFileName* parameter set to TEXT("LTS1:").
dwIoControlCode	Set to IOCTL_LIGHTSENSOR_GET.
lpInBuffer	Set to NULL.
nInBufferSize	Set to zero.
lpOutBuffer	Pointer to a unsigned long where the brightness in lux will be returned.
nOutBufferSize	Set to sizeof(unsigned long).
lpBytesReturned	Pointer to a variable that receives the size, in bytes, of the data stored into the buffer pointed to by *lpOutBuffer*.
lpOverlapped	Ignored; set to NULL

Return value

TRUE if operation succeeded otherwise FALSE. If operation failed then "GetLastError" can be used to get more information of the error.

Restrictions

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Example

```
HANDLE hDevice;

if ((hDevice =
  CreateFile(
```

```
    TEXT("LTS1:"),
    GENERIC_READ | GENERIC_WRITE,
    FILE_SHARE_READ | FILE_SHARE_WRITE,
    NULL,
    OPEN_EXISTING,
    0,
    NULL)) != INVALID_HANDLE_VALUE)
  {
    unsigned long bytesReturned, brightnessInLux;

    if (DeviceIoControl(
      hDevice,
      IOCTL_LIGHTSENSOR_GET,
      NULL,
      0,
      &brightnessInLux,
      sizeof(brightnessInLux),
      &bytesReturned,
      NULL))
    {
      printf("Brightness in lux is %lu\n", brightnessInLux);
    }
    else
    {
      printf(
        "!!ERROR, %lu when calling \"DeviceIoControl\"\n",
        GetLastError() );
    }
  }
  else
  {
    printf(
      "!!ERROR, %lu when calling \"CreateFile\"\n",
      GetLastError());
  }
```

IOCTL_LIGHTSENSOR_SAMPLE_TIME_GET

Description

Returns the sample time in milliseconds. The windows DeviceIoControl function passes the IOCTL to the light sensor device. There is no need to read the brightness, via IOCTL_LIGHTSENSOR_GET, at a rate higher than the sample rate.

Include files

#include "LightSensor.h"

Parameters supplied to DeviceIoControl

hDevice	Handle to the light sensor device. To obtain a device handle, call the CreateFile function with *lpFileName* parameter set to TEXT("LTS1:").
dwIoControlCode	Set to IOCTL_LIGHTSENSOR_SAMPLE_TIME_GET.
lpInBuffer	Set to NULL.
nInBufferSize	Set to zero.
lpOutBuffer	Pointer to a unsigned long where the sample time in milliseconds will be returned.

nOutBufferSize	Set to sizeof(unsigned long).
lpBytesReturned	Pointer to a variable that receives the size, in bytes, of the data stored into the buffer pointed to by *lpOutBuffer*.
lpOverlapped	Ignored; set to NULL

Return value

TRUE if operation succeeded otherwise FALSE. If operation failed then "GetLastError" can be used to get more information of the error.

Restrictions

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Example

```
HANDLE hDevice;

if ((hDevice =
  CreateFile(
  TEXT("LTS1:"),
  GENERIC_READ | GENERIC_WRITE,
  FILE_SHARE_READ | FILE_SHARE_WRITE,
  NULL,
  OPEN_EXISTING,
  0,
  NULL)) != INVALID_HANDLE_VALUE)
{
  unsigned long bytesReturned, sampleTimeInMs;

  if (DeviceIoControl(
    hDevice,
    IOCTL_LIGHTSENSOR_SAMPLE_TIME_GET,
    NULL,
    0,
    &sampleTimeInMs,
    sizeof(sampleTimeInMs),
    &bytesReturned,
    NULL))
  {
    printf("Sample time in milliseconds is %lu\n", sampleTimeInMs);
  }
  else
  {
    printf(
      "!!ERROR, %lu when calling \"DeviceIoControl\"\n",
      GetLastError());
  }
}
else
{
  printf(
    "!!ERROR, %lu when calling \"CreateFile\"\n",
    GetLastError());
}
```

Light sensor device configuration

The configuration parameters are stored in the registry key:
HKEY_LOCAL_MACHINE\Drivers\BuiltIn\LightSensor.

Summary of configuration values

Name:	Type:	Description:
RejectWindow	DWORD	A value greater than one specifies the reject window. The Reject window is the number of samples that must be within RejectDelta to be accepted.
RejectDelta	DWORD	The maximum difference in lux, between the highest and lowest value within the reject window.
AverageWindow	DWORD	A value greater than one specifies the number of samples to perform running average calculation upon.