

DS1820 Communication Library for STM32Fxxx

Generated by Doxygen 1.8.4

Mon Mar 24 2014 11:03:14

Contents

Chapter 1

File Index

1.1 File List

Here is a list of all documented files with brief descriptions:

DS1820.c	This file provides functions to manage the following functionalities of the 1-Wire Digital Thermometer DS1820 by DALLAS Semiconductor:	??
DS1820.h	This file provides functions to manage the following functionalities of the 1-Wire Digital Thermometer DS1820 by DALLAS Semiconductor:	??
Example_DS1820.c	Simple code example for DS1820 library	??

Chapter 2

File Documentation

2.1 DS1820.c File Reference

This file provides functions to manage the following functionalities of the 1-Wire Digital Thermometer DS1820 by DALLAS Semiconductor:

```
#include "DS1820.h"
#include "OneWire.h"
```

Macros

- #define **SCRATCHPAD_READ** 0xBE
- #define **SCRATCHPAD_STORE** 0x48
- #define **SCRATCHPAD_WRITE** 0x4E
- #define **SCRATCHPAD_RECALL** 0xB8
- #define **POWER_SUPPLY_READ** 0xB4
- #define **SCRATCHPAD_LENGTH** 9
- #define **SCRATCHPAD_CRC_POS** (SCRATCHPAD_LENGTH - 1)

Functions

- void [DS1820_Init](#) (void)
- DS1820_State [DS1820_TemperatureConvert](#) (uint64_t iAddress)
- int [DS1820_TemperatureGet](#) (uint64_t iAddress)
- DS1820_State [DS1820_TemperatureAlarmSet](#) (uint64_t iAddress, int iHigh, int iLow)
- DS1820_State [DS1820_TemperatureAlarmGet](#) (uint64_t iAddress, int *iHigh, int *iLow)
- DS1820_State [DS1820_ConfigurationStore](#) (uint64_t iAddress)
- DS1820_State [DS1820_ConfigurationRecall](#) (uint64_t iAddress)
- DS1820_State [DS1820_PowerTypeGet](#) (uint64_t iAddress)
- int [DS1820_Search](#) (uint64_t *Addresses, int iMaxDevices)

2.1.1 Detailed Description

This file provides functions to manage the following functionalities of the 1-Wire Digital Thermometer DS1820 by DALLAS Semiconductor:

Author

Vojtech Vigner

Version

V1.0.1

Date

12-February-2013

- Initialization and Configuration
- Temperature Measurements
- Device Power Informations
- Temperature Threshold Configuration

Attention

Requires working OneWire library. Please notice Strong or Weak Pull Up states warnings for each function, this only applies for parasite power configuration.

```

*          *****
*          How to use this library
*          *****
*          1. Initialize using DS1820_Init().
*
*          2. Use DS1820_Search to discover DS1820 sensors on the bus
*
*          3. Now you can use DS1820_TemperatureConvert to start temperature
*             measurements on selected device.
*
*          4. Wait at least 500 ms to complete temperature conversion.
*
*          5. Read temperature by DS1820_TemperatureGet function.
*

```

2.1.2 Function Documentation**2.1.2.1 DS1820_State DS1820_ConfigurationRecall (uint64_t iAddress)**

Loads device configuration from internal EEPROM.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.1.2.2 DS1820_State DS1820_ConfigurationStore (uint64_t iAddress)

Saves device volatile configuration into internal EEPROM.

Warning

This function sets communication pin in StrongPullUp state.
The bus has to be in StrongPullUp state at least for 10 ms.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.1.2.3 void DS1820_Init (void)

Initializes and resets OneWire communication.

2.1.2.4 DS1820_State DS1820_PowerTypeGet (uint64_t *iAddress*)

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_PARASITE_POWER (if at least one device is parasite powered) or DS1820_EXTERNAL_POWER if successfull, DS1820_ERROR if failed.

2.1.2.5 int DS1820_Search (uint64_t * *Addresses*, int *iMaxDevices*)

Function searches for DS1820 devices on the bus and stores them in to array.

Parameters

<i>Addresses</i>	Pointer to array for device addresses to be stored.
<i>iMaxDevices</i>	Maximum of devices to be searched.

Returns

Number of devices found.

2.1.2.6 DS1820_State DS1820_TemperatureAlarmGet (uint64_t *iAddress*, int * *iHigh*, int * *iLow*)

Function receives temperature alarm for high an low thresholds.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL to skip address match (only for single device on the bus).
<i>iHigh</i>	High temperature threshold, in degrees of Celsius.
<i>iLow</i>	Low temperature threshold, in degrees of Celsius.

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.1.2.7 DS1820_State DS1820_TemperatureAlarmSet (uint64_t *iAddress*, int *iHigh*, int *iLow*)

Function sets temperature alarm for high an low thresholds.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL to skip address match (only for single device on the bus).
<i>iHigh</i>	High temperature threshold, in degrees of Celsius.
<i>iLow</i>	Low temperature threshold, in degrees of Celsius.

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.1.2.8 DS1820_State DS1820_TemperatureConvert (uint64_t iAddress)

Initializes temperature measurement on DS1820 chip.

Warning

This function sets communication pin in StrongPullUp state.
The bus has to be in StrongPullUp state at least for 500 ms.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.1.2.9 int DS1820_TemperatureGet (uint64_t iAddress)

Reads tepmerature from specific device. You have to use TemperatureConvert function before calling Temperature-Get.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL to skip address match (only for single device on the bus).
-----------------	---

Returns

Temperature in degrees of Celsius * 10 or DS1820_TEMP_ERROR in case of an error.

2.2 DS1820.h File Reference

This file provides functions to manage the following functionalities of the 1-Wire Digital Thermometer DS1820 by DALLAS Semiconductor:

```
#include "stdint.h"
```

Macros

- **#define DS1820_ADDRESS_ALL** 0
- **#define DS1820_FAMILY_CODE** 0x10

Typedefs

- typedef enum _DS1820_State **DS1820_State**

Enumerations

- enum **DS1820_State** {
 DS1820_OK = 0, **DS1820_ERROR** = 1, **DS1820_TEMP_ERROR** = -10000, **DS1820_PARASITE_POWER**
 = 0x10,
 DS1820_EXTERNAL_POWER = 0x20 }

Functions

- void [DS1820_Init](#) (void)
- DS1820_State** [DS1820_TemperatureConvert](#) (uint64_t iAddress)
- int [DS1820_TemperatureGet](#) (uint64_t iAddress)
- DS1820_State** [DS1820_TemperatureAlarmSet](#) (uint64_t iAddress, int iHigh, int iLow)
- DS1820_State** [DS1820_TemperatureAlarmGet](#) (uint64_t iAddress, int *iHigh, int *iLow)
- DS1820_State** [DS1820_ConfigurationStore](#) (uint64_t iAddress)
- DS1820_State** [DS1820_ConfigurationRecall](#) (uint64_t iAddress)
- DS1820_State** [DS1820_PowerTypeGet](#) (uint64_t iAddress)
- int [DS1820_Search](#) (uint64_t *Addresses, int iMaxDevices)

2.2.1 Detailed Description

This file provides functions to manage the following functionalities of the 1-Wire Digital Thermometer DS1820 by DALLAS Semiconductor:

Author

Vojtech Vigner

Version

V1.0.1

Date

12-February-2013

- Initialization and Configuration
- Temperature Measurements
- Device Power Informations
- Temperature Threshold Configuration

See Also

[DS1820.c](#) documentation

2.2.2 Function Documentation

2.2.2.1 **DS1820_State** [DS1820_ConfigurationRecall](#) (uint64_t iAddress)

Loads device configuration from internal EEPROM.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.2.2.2 DS1820_State DS1820_ConfigurationStore (uint64_t iAddress)

Saves device volatile configuration into internal EEPROM.

Warning

This function sets communication pin in StrongPullUp state.
The bus has to be in StrongPullUp state at least for 10 ms.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.2.2.3 void DS1820_Init (void)

Initializes and resets OneWire communication.

2.2.2.4 DS1820_State DS1820_PowerTypeGet (uint64_t iAddress)**Parameters**

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_PARASITE_POWER (if at least one device is parasite powered) or DS1820_EXTERNAL_POWER if successfull, DS1820_ERROR if failed.

2.2.2.5 int DS1820_Search (uint64_t * Addresses, int iMaxDevices)

Function searches for DS1820 devices on the bus and stores them in to array.

Parameters

<i>Addresses</i>	Pointer to array for device addresses to be stored.
<i>iMaxDevices</i>	Maximum of devices to be searched.

Returns

Number of devices found.

2.2.2.6 DS1820_State DS1820_TemperatureAlarmGet (uint64_t iAddress, int * iHigh, int * iLow)

Function receives temperature alarm for high an low thresholds.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL to skip address match (only for single device on the bus).
<i>iHigh</i>	High temperature threshold, in degrees of Celsius.
<i>iLow</i>	Low temperature threshold, in degrees of Celsius.

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.2.2.7 DS1820_State DS1820_TemperatureAlarmSet (uint64_t iAddress, int iHigh, int iLow)

Function sets temperature alarm for high an low thresholds.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL to skip address match (only for single device on the bus).
<i>iHigh</i>	High temperature threshold, in degrees of Celsius.
<i>iLow</i>	Low temperature threshold, in degrees of Celsius.

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.2.2.8 DS1820_State DS1820_TemperatureConvert (uint64_t iAddress)

Initializes temperature measurement on DS1820 chip.

Warning

This function sets communication pin in StrongPullUp state.
The bus has to be in StrongPullUp state at least for 500 ms.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL for all devices.
-----------------	---

Returns

DS1820_OK if successfull, DS1820_ERROR if failed.

2.2.2.9 int DS1820_TemperatureGet (uint64_t iAddress)

Reads tepmerature from specific device. You have to use TemperatureConvert function before calling Temperature-Get.

Parameters

<i>iAddress</i>	64bit device address, use DS1820_ADDRESS_ALL to skip address match (only for single device on the bus).
-----------------	---

Returns

Temperature in degrees of Celsius * 10 or DS1820_TEMP_ERROR in case of an error.

2.3 Example_DS1820.c File Reference

Simple code example for DS1820 library.

```
#include <stdio.h>
#include "DS1820.h"
```

Macros

- `#define MAX_DEVICES 8`
- `#define MAX_RETRIES 2`

Functions

- `int main (void)`

2.3.1 Detailed Description

Simple code example for DS1820 library.

Author

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Date

24-March-2014