

## RCC Driver for STM32F103

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# Chapter 1

## File Index

### 1.1 File List

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## Chapter 2

# File Documentation

### 2.1 DRCC/DRCC.c File Reference

This file is the Implementation for RCC Driver for STM32F103.

```
#include "STD_TYPES.h"
#include "DRCC.h"
```

#### Macros

- #define [DRCC\\_BASE\\_ADDRESS](#) 0X40021000  
*Base Address of RCC Peripheral*
- #define [RCC\\_CR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X00))
- #define [RCC\\_CFGR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X04))
- #define [RCC\\_CIR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X08))
- #define [RCC\\_APB2RSTR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X0C))
- #define [RCC\\_APB1RSTR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X10))
- #define [RCC\\_AHBENR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X14))
- #define [RCC\\_APB2ENR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X18))
- #define [RCC\\_APB1ENR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X1C))
- #define [RCC\\_BDCR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X20))
- #define [RCC\\_CSR](#) \*((uint\_32t\*)([DRCC\\_BASE\\_ADDRESS](#) + 0X24))
- #define [PLLRDY\\_MASK](#) 0x02000000  
*PLL Ready Mask*
- #define [HSERDY\\_MASK](#) 0x00020000  
*HSE Ready Mask*
- #define [HSIRDY\\_MASK](#) 0x00000002  
*HSI Ready Mask*
- #define [HSI\\_SRC\\_MASK](#) 0x00000000  
*HSI Source Mask*
- #define [HSE\\_SRC\\_MASK](#) 0x00000004

*HSE Source Mask*

- #define **PLL\_SRC\_MASK** 0x00000008  
*HSE\_PLLSRC\_MASK Mask*
- #define **HSE\_PLLSRC\_MASK** 0x00010000  
*HSE\_PLL Source Mask*
- #define **HSE\_PLLSRC\_DIV\_TWO\_MASK** 0x00030000  
*HSE\_PLL Source Mask divided by Two*
- #define **HSI\_PLLSRC\_DIV\_TWO\_MASK** 0x00000000  
*HSI\_PLL Source Mask divided by Two*
- #define **PLLMUL\_2** 0x00000000
- #define **PLLMUL\_3** 0x00040000
- #define **PLLMUL\_4** 0x00080000
- #define **PLLMUL\_5** 0x000C0000
- #define **PLLMUL\_6** 0x00100000
- #define **PLLMUL\_7** 0x00140000
- #define **PLLMUL\_8** 0x00180000
- #define **PLLMUL\_9** 0x001C0000
- #define **PLLMUL\_10** 0x00200000
- #define **PLLMUL\_11** 0x00240000
- #define **PLLMUL\_12** 0x00280000
- #define **PLLMUL\_13** 0x002C0000
- #define **PLLMUL\_14** 0x00300000
- #define **PLLMUL\_15** 0x00340000
- #define **PLLMUL\_16** 0x00380000
- #define **AHB\_PRESCALE\_CLR** 0xFFFFF0F  
*AHB Prescale Clear Mask*
- #define **APB1\_PRESCALE\_CLR** 0xFFFF8FF  
*APB1 Prescale Clear Mask*
- #define **APB2\_PRESCALE\_CLR** 0xFFFC7FF  
*APB2 Prescale Clear Mask*
- #define **PLL\_CONFIG\_CLR** 0xFFC0FFFF  
*PLL Clear Mask*
- #define **SYS\_CLK\_CLR** 0xffffffc  
*System Clock Clear Mask*
- #define **SW\_MASK** 0x0000000C  
*System Clock Switch Mask.*
- #define **PLL\_SOURCE\_MASK** 0x00030000  
*PLL Clock Source Switch Mask.*
- #define **PLL\_MUL\_MASK** (uint\_32t)0x003C0000  
*PLL Multiplayer Mask.*
- #define **APB2\_MASK** 0x00003800
- #define **APB1\_MASK** 0x00000700
- #define **AHB\_MASK** 0x000000F0
- #define **APB2\_PRESCALER\_NOT\_DIVIDED\_MASK** 0x00000000



- `#define APB2_PRESCALER_DIV_2_MASK 0x00002000`
- `#define APB2_PRESCALER_DIV_4_MASK 0x00002800`
- `#define APB2_PRESCALER_DIV_8_MASK 0x00003000`
- `#define APB2_PRESCALER_DIV_16_MASK 0x00003800`
- `#define APB1_PRESCALER_NOT_DIVIDED_MASK 0x00000000`
- `#define APB1_PRESCALER_DIV_2_MASK 0x00000400`
- `#define APB1_PRESCALER_DIV_4_MASK 0x00000500`
- `#define APB1_PRESCALER_DIV_8_MASK 0x00000600`
- `#define APB1_PRESCALER_DIV_16_MASK 0x00000700`
- `#define AHB_PRESCALER_NOT_DIVIDED_MASK 0x00000000`
- `#define AHB_PRESCALER_DIV_2_MASK 0x00000080`
- `#define AHB_PRESCALER_DIV_4_MASK 0x00000090`
- `#define AHB_PRESCALER_DIV_8_MASK 0x000000A0`
- `#define AHB_PRESCALER_DIV_16_MASK 0x000000B0`
- `#define AHB_PRESCALER_DIV_64_MASK 0x000000C0`
- `#define AHB_PRESCALER_DIV_128_MASK 0x000000D0`
- `#define AHB_PRESCALER_DIV_256_MASK 0x000000E0`
- `#define AHB_PRESCALER_DIV_512_MASK 0x000000F0`

## Functions

- `uint_8t DRCC_SetClkStatus (uint_32t clk, uint_8t status)`  
*Function to set the Clock State.*
- `uint_8t DRCC_SetSystemClk (uint_32t clk)`  
*Function to set the System Clock.*
- `uint_8t DRCC_SetPLLConfig (uint_32t src, uint_8t MULL)`  
*Function to Configure Clock Source of PLL and it's Multiplication Factor.*
- `uint_8t DRCC_SetPriphralStatus (uint_32t priphral, uint_8t Status)`  
*Function to Enable/Disable Clock to peripheral.*
- `uint_8t DRCC_SetBusPrescale (uint_32t Bus, uint_8t Prescale)`  
*Function to set Bus Prescaler.*
- `uint_8t DRCC_GetBusClock (uint_32t Bus, uint_32t *CLK)`  
*Function to get bus Clock.*

### 2.1.1 Detailed Description

This file is the Implementation for RCC Driver for STM32F103.

#### Author

Mostafa ( [mnader96@gmail.com](mailto:mnader96@gmail.com))

#### Version

0.1

#### Date

2020-06-05

#### Copyright

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## 2.1.2 Macro Definition Documentation

### 2.1.2.1 AHB\_MASK

```
#define AHB_MASK 0x000000F0
```

### 2.1.2.2 AHB\_PRESCALE\_CLR

```
#define AHB_PRESCALE_CLR 0xFFFFF0F
```

AHB Prescale Clear Mask

### 2.1.2.3 APB1\_PRESCALE\_CLR

```
#define APB1_PRESCALE_CLR 0xFFFF8FF
```

APB1 Prescale Clear Mask

### 2.1.2.4 APB2\_PRESCALE\_CLR

```
#define APB2_PRESCALE_CLR 0xFFFC7FF
```

APB2 Prescale Clear Mask

### 2.1.2.5 DRCC\_BASE\_ADDRESS

```
#define DRCC_BASE_ADDRESS 0x40021000
```

Base Address of RCC Peripheral

### 2.1.2.6 HSE\_PLLSRC\_DIV\_TWO\_MASK

```
#define HSE_PLLSRC_DIV_TWO_MASK 0x00030000
```

HSE\_PLL Source Mask divided by Two

### 2.1.2.7 HSE\_PLLSRC\_MASK

```
#define HSE_PLLSRC_MASK 0x00010000
```

HSE\_PLL Source Mask

### 2.1.2.8 HSE\_SRC\_MASK

```
#define HSE_SRC_MASK 0x00000004
```

HSE Source Mask

### 2.1.2.9 HSERDY\_MASK

```
#define HSERDY_MASK 0x00020000
```

HSE Ready Mask

### 2.1.2.10 HSI\_PLLSRC\_DIV\_TWO\_MASK

```
#define HSI_PLLSRC_DIV_TWO_MASK 0x00000000
```

HSI\_PLL Source Mask divided by Two

#### 2.1.2.11 HSI\_SRC\_MASK

```
#define HSI_SRC_MASK 0x00000000
```

HSI Source Mask

#### 2.1.2.12 HSIRDY\_MASK

```
#define HSIRDY_MASK 0x00000002
```

HSI Ready Mask

#### 2.1.2.13 PLL\_CONFIG\_CLR

```
#define PLL_CONFIG_CLR 0xFFC0FFFF
```

PLL Clear Mask

#### 2.1.2.14 PLL\_MUL\_MASK

```
#define PLL_MUL_MASK (uint_32t)0x003C0000
```

PLL Multiplayer Mask.

#### 2.1.2.15 PLL\_SOURCE\_MASK

```
#define PLL_SOURCE_MASK 0x00030000
```

PLL Clock Source Switch Mask.

### 2.1.2.16 PLL\_SRC\_MASK

```
#define PLL_SRC_MASK 0x00000008
```

HSE\_PLLSRC\_MASK Mask

### 2.1.2.17 PLLRDY\_MASK

```
#define PLLRDY_MASK 0x02000000
```

PLL Ready Mask

### 2.1.2.18 SYS\_CLK\_CLR

```
#define SYS_CLK_CLR 0xffffffffc
```

System Clock Clear Mask

## 2.1.3 Function Documentation

### 2.1.3.1 DRCC\_GetBusClock()

```
uint_8t DRCC_GetBusClock (  
    uint_32t Bus,  
    uint_32t * CLK )
```

Function to get bus Clock.

#### Parameters

<i>Bus</i>	Variable of uint_32t describe Bus Number (AHB_PRESCALER, APB1_PRESCALER, APB2_PRESCALER)
<i>CLK</i>	pointer to uint_32t Clock which to be read

**Returns**

uint\_8t : OK | NOK

**2.1.3.2 DRCC\_SetBusPrescale()**

```
uint_8t DRCC_SetBusPrescale (
    uint_32t Bus,
    uint_8t Prescale )
```

Function to set Bus Prescaler.

**Parameters**

<i>Bus</i>	Variable of uint_32t describe Bus Number (AHB_PRESCALER, APB1_PRESCALER, APB2_PRESCALER)
<i>Prescale</i>	Variable of uint_8t describe Bus Prescaler ex (APB2_PRESCALER_NOT_DIVIDED, APB1_PRESCALER_DIV_8, AHB_PRESCALER_DIV_256)

**Returns**

uint\_8t : OK | NOK

**2.1.3.3 DRCC\_SetClkStatus()**

```
uint_8t DRCC_SetClkStatus (
    uint_32t clk,
    uint_8t status )
```

Function to set the Clock State.

**Parameters**

<i>clk</i>	Variable of uint_32t describe Clock Type
<i>status</i>	Variable of uint_8t describe Clock Status (ON, OFF)

**Returns**

uint\_8t : OK | NOK

**2.1.3.4 DRCC\_SetPLLConfig()**

```
uint_8t DRCC_SetPLLConfig (
    uint_32t src,
    uint_8t MULL )
```

Function to Configure Clock Source of PLL and it's Multiplication Factor.

#### Parameters

<i>src</i>	Variable of uint_32t describe Clock Source to PLL (HSE_SRC,HSE_SRC_DIV_TWO,HSI_SRC_DIV_TWO)
<i>MULL</i>	Variable of uint_8t describe Miltiplication Factor (PLL_input_clock_x_2 up to PLL_input_clock_x_16)

#### Returns

uint\_8t : OK | NOK

### 2.1.3.5 DRCC\_SetPriephralStatus()

```
uint_8t DRCC_SetPriephralStatus (
    uint_32t priephral,
    uint_8t Status )
```

Function to Enable/Disable Clock to peripheral.

#### Parameters

<i>priephral</i>	Variable of uint_32t describe Peripheral ex (GPIO_A_ENABLE,DMA_1_ENABLE)
<i>Status</i>	Variable of uint_8t describe Clock Status of Peripheral (ON,OFF)

#### Returns

uint\_8t : OK | NOK

### 2.1.3.6 DRCC\_SetSystemClk()

```
uint_8t DRCC_SetSystemClk (
    uint_32t clk )
```

Function to set the System Clock.

#### Parameters

<i>clk</i>	Variable of uint_32t describe Clock Type to be System Clock(HSI_SYS,HSE_SYS,PLL_SYS)
------------	--

#### Returns

uint\_8t : OK | NOK

## 2.2 DRCC/DRCC.h File Reference

This file is a user interface for RCC Driver for STM32F103.

### Macros

- #define [HSI\\_ENABLE](#) 0x10000001  
*Used to Enable HSI.*
- #define [HSE\\_ENABLE](#) 0x10010000  
*Used to Enable HSE.*
- #define [PLL\\_ENABLE](#) 0x11000000  
*Used to Enable PLL.*
- #define [HSI\\_SYS](#) 0x20000000  
*used to make HSI Clock the System Clock*
- #define [HSE\\_SYS](#) 0x20000001  
*used to make HSE Clock the System Clock*
- #define [PLL\\_SYS](#) 0x20000002  
*used to make PLL Clock the System Clock*
- #define [HSE\\_SRC](#) 0x40010000  
*HSE Clock without Division.*
- #define [HSE\\_SRC\\_DIV\\_TWO](#) 0x40030000  
*HSE Clock divide by Two.*
- #define [HSI\\_SRC\\_DIV\\_TWO](#) 0x40000000  
*HSI Clock divide by Two.*
- #define [PLL\\_input\\_clock\\_x\\_2](#) 0
- #define [PLL\\_input\\_clock\\_x\\_3](#) 1
- #define [PLL\\_input\\_clock\\_x\\_4](#) 2
- #define [PLL\\_input\\_clock\\_x\\_5](#) 3
- #define [PLL\\_input\\_clock\\_x\\_6](#) 4
- #define [PLL\\_input\\_clock\\_x\\_7](#) 5
- #define [PLL\\_input\\_clock\\_x\\_8](#) 6
- #define [PLL\\_input\\_clock\\_x\\_9](#) 7
- #define [PLL\\_input\\_clock\\_x\\_10](#) 8
- #define [PLL\\_input\\_clock\\_x\\_11](#) 9
- #define [PLL\\_input\\_clock\\_x\\_12](#) 10
- #define [PLL\\_input\\_clock\\_x\\_13](#) 11
- #define [PLL\\_input\\_clock\\_x\\_14](#) 12
- #define [PLL\\_input\\_clock\\_x\\_15](#) 13
- #define [PLL\\_input\\_clock\\_x\\_16](#) 14
- #define [GPIO\\_A\\_ENABLE](#) 0x20000004
- #define [GPIO\\_B\\_ENABLE](#) 0x20000008
- #define [GPIO\\_C\\_ENABLE](#) 0x20000010
- #define [GPIO\\_D\\_ENABLE](#) 0x20000020
- #define [GPIO\\_E\\_ENABLE](#) 0x20000040
- #define [GPIO\\_F\\_ENABLE](#) 0x20000080
- #define [GPIO\\_G\\_ENABLE](#) 0x20000100
- #define [USART\\_1\\_ENABLE](#) 0x20004000
- #define [DMA\\_1\\_ENABLE](#) 0x80000001
- #define [AHB\\_PRESCALER](#) 0x08000000  
*used to select AHB Bus*
- #define [APB1\\_PRESCALER](#) 0x08000001



- used to select APB1 Bus*
- #define [APB2\\_PRESCALER](#) 0x08000002
  - used to select APB2 Bus*
- #define [APB2\\_PRESCALER\\_NOT\\_DIVIDED](#) 0
- #define [APB2\\_PRESCALER\\_DIV\\_2](#) 4
- #define [APB2\\_PRESCALER\\_DIV\\_4](#) 5
- #define [APB2\\_PRESCALER\\_DIV\\_8](#) 6
- #define [APB2\\_PRESCALER\\_DIV\\_16](#) 7
- #define [APB1\\_PRESCALER\\_NOT\\_DIVIDED](#) 0
- #define [APB1\\_PRESCALER\\_DIV\\_2](#) 4
- #define [APB1\\_PRESCALER\\_DIV\\_4](#) 5
- #define [APB1\\_PRESCALER\\_DIV\\_8](#) 6
- #define [APB1\\_PRESCALER\\_DIV\\_16](#) 7
- #define [AHB\\_PRESCALER\\_NOT\\_DIVIDED](#) 0
- #define [AHB\\_PRESCALER\\_DIV\\_2](#) 8
- #define [AHB\\_PRESCALER\\_DIV\\_4](#) 9
- #define [AHB\\_PRESCALER\\_DIV\\_8](#) 10
- #define [AHB\\_PRESCALER\\_DIV\\_16](#) 11
- #define [AHB\\_PRESCALER\\_DIV\\_64](#) 12
- #define [AHB\\_PRESCALER\\_DIV\\_128](#) 13
- #define [AHB\\_PRESCALER\\_DIV\\_256](#) 14
- #define [AHB\\_PRESCALER\\_DIV\\_512](#) 15
- #define [HSI\\_FREQ](#) 8000000
  - describe HSI Frequency*
- #define [HSE\\_FREQ](#) 8000000
  - describe HSE Frequency*
- #define [AHB\\_BUS](#) 77
  - used to check AHB Bus*
- #define [APB1\\_BUS](#) 78
  - used to check APB1 Bus*
- #define [APB2\\_BUS](#) 79
  - used to check APB2 Bus*

## Functions

- [uint\\_8t DRCC\\_SetClkStatus](#) (uint\_32t clk, uint\_8t status)
  - Function to set the Clock State.*
- [uint\\_8t DRCC\\_SetSystemClk](#) (uint\_32t clk)
  - Function to set the System Clock.*
- [uint\\_8t DRCC\\_SetPLLConfig](#) (uint\_32t src, uint\_8t MULL)
  - Function to Configure Clock Source of PLL and it's Multiplication Factor.*
- [uint\\_8t DRCC\\_SetPriephralStatus](#) (uint\_32t priephral, uint\_8t Status)
  - Function to Enable/Disable Clock to peripheral.*
- [uint\\_8t DRCC\\_SetBusPrescale](#) (uint\_32t Bus, uint\_8t Prescale)
  - Function to set Bus Prescaler.*
- [uint\\_8t DRCC\\_GetBusClock](#) (uint\_32t Bus, uint\_32t \*CLK)
  - Function to get bus Clock.*

## 2.2.1 Detailed Description

This file is a user interface for RCC Driver for STM32F103.

### Author

Mostafa ( [mnader96@gmail.com](mailto:mnader96@gmail.com) )

### Version

0.1

### Date

2020-06-05

### Copyright

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## 2.2.2 Macro Definition Documentation

### 2.2.2.1 HSE\_SRC\_DIV\_TWO

```
#define HSE_SRC_DIV_TWO 0x40030000
```

HSE Clock divide by Two.

### 2.2.2.2 HSI\_SRC\_DIV\_TWO

```
#define HSI_SRC_DIV_TWO 0x40000000
```

HSI Clock divide by Two.

## 2.2.3 Function Documentation

### 2.2.3.1 DRCC\_GetBusClock()

```
uint_8t DRCC_GetBusClock (
    uint_32t Bus,
    uint_32t * CLK )
```

Function to get bus Clock.

## Parameters

<i>Bus</i>	Variable of uint_32t describe Bus Number (AHB_PRESCALER, APB1_PRESCALER, APB2_PRESCALER)
<i>CLK</i>	pointer to uint_32t Clock which to be read

## Returns

uint\_8t : OK | NOK

**2.2.3.2 DRCC\_SetBusPrescale()**

```
uint_8t DRCC_SetBusPrescale (
    uint_32t Bus,
    uint_8t Prescale )
```

Function to set Bus Prescaler.

## Parameters

<i>Bus</i>	Variable of uint_32t describe Bus Number (AHB_PRESCALER, APB1_PRESCALER, APB2_PRESCALER)
<i>Prescale</i>	Variable of uint_8t describe Bus Prescaler ex (APB2_PRESCALER_NOT_DIVIDED,APB1_PRESCALER_DIV_8,AHB_PRESCALER_DIV_256)

## Returns

uint\_8t : OK | NOK

**2.2.3.3 DRCC\_SetClkStatus()**

```
uint_8t DRCC_SetClkStatus (
    uint_32t clk,
    uint_8t status )
```

Function to set the Clock State.

## Parameters

<i>clk</i>	Variable of uint_32t describe Clock Type
<i>status</i>	Variable of uint_8t describe Clock Status (ON,OFF)

**Returns**

uint\_8t : OK | NOK

**2.2.3.4 DRCC\_SetPLLConfig()**

```
uint_8t DRCC_SetPLLConfig (
    uint_32t src,
    uint_8t MULL )
```

Function to Configure Clock Source of PLL and it's Multiplication Factor.

**Parameters**

<i>src</i>	Variable of uint_32t describe Clock Source to PLL (HSE_SRC,HSE_SRC_DIV_TWO,HSI_SRC_DIV_TWO)
<i>MULL</i>	Variable of uint_8t describe Miltiplication Factor (PLL_input_clock_x_2 up to PLL_input_clock_x_16)

**Returns**

uint\_8t : OK | NOK

**2.2.3.5 DRCC\_SetPriephralStatus()**

```
uint_8t DRCC_SetPriephralStatus (
    uint_32t priephral,
    uint_8t Status )
```

Function to Enable/Disable Clock to peripheral.

**Parameters**

<i>priephral</i>	Variable of uint_32t describe Peripheral ex (GPIO_A_ENABLE,DMA_1_ENABLE)
<i>Status</i>	Variable of uint_8t describe Clock Status of Peripheral (ON,OFF)

**Returns**

uint\_8t : OK | NOK

**2.2.3.6 DRCC\_SetSystemClk()**

```
uint_8t DRCC_SetSystemClk (
    uint_32t clk )
```

Function to set the System Clock.

**Parameters**

<i>clk</i>	Variable of uint_32t describe Clock Type to be System Clock(HSI_SYS,HSE_SYS,PLL_SYS)
------------	--

**Returns**

uint\_8t : OK | NOK



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