

CMOS 24GHz Radar Sensor Library  
source code release

Socionext Inc.

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# Contents

<b>1</b>	<b>CMOS 24GHz Radar Sensor Library Reading and Porting Guides</b>	<b>1</b>
<b>2</b>	<b>Basic Control Flow</b>	<b>3</b>
<b>3</b>	<b>Driver Adaptation Layer</b>	<b>5</b>
<b>4</b>	<b>Low-Level Device Layer</b>	<b>7</b>
<b>5</b>	<b>Others</b>	<b>9</b>
<b>6</b>	<b>Important Notice</b>	<b>11</b>
<b>7</b>	<b>Module Index</b>	<b>13</b>
7.1	Modules . . . . .	13
<b>8</b>	<b>Class Index</b>	<b>15</b>
8.1	Class List . . . . .	15
<b>9</b>	<b>File Index</b>	<b>17</b>
9.1	File List . . . . .	17
<b>10</b>	<b>Module Documentation</b>	<b>19</b>
10.1	Sensor terminal ID . . . . .	19
10.1.1	Detailed Description . . . . .	19
10.1.2	Macro Definition Documentation . . . . .	19
10.1.2.1	RS_TERM_CE . . . . .	19
10.1.2.2	RS_TERM_DETOUT . . . . .	19
10.1.2.3	RS_TERM_NRST . . . . .	19
10.1.2.4	RS_TERM_OR . . . . .	20
10.2	type of trigger . . . . .	21
10.2.1	Detailed Description . . . . .	21
10.2.2	Macro Definition Documentation . . . . .	21
10.2.2.1	RS_TERM_TRIGGER_FALLING . . . . .	21
10.2.2.2	RS_TERM_TRIGGER_RISING . . . . .	21

<b>11 Class Documentation</b>	<b>23</b>
11.1 rs_i2c Class Reference	23
11.1.1 Detailed Description	23
11.1.2 Member Function Documentation	23
11.1.2.1 read()	23
11.1.2.2 write()	24
11.2 rs_spi Class Reference	24
11.2.1 Detailed Description	24
11.2.2 Member Function Documentation	24
11.2.2.1 read()	24
11.2.2.2 readwrite()	25
11.2.2.3 spi_read()	25
11.2.2.4 write()	26
11.3 rs_term Class Reference	26
11.3.1 Detailed Description	26
11.3.2 Member Function Documentation	26
11.3.2.1 clear_trigger()	26
11.3.2.2 get()	27
11.3.2.3 set()	27
11.3.2.4 set_trigger()	27
11.3.2.5 wait_trigger()	28
<b>12 File Documentation</b>	<b>29</b>
12.1 include/defs/rs_dev_term.h File Reference	29
12.2 include/rs_ctl_dev.h File Reference	29
12.2.1 Detailed Description	30
12.2.2 Function Documentation	30
12.2.2.1 rs_ctl_dev_close()	30
12.2.2.2 rs_ctl_dev_open()	30
12.2.2.3 rs_ctl_dev_read()	31
12.2.2.4 rs_ctl_dev_term_get()	32
12.2.2.5 rs_ctl_dev_term_set()	32
12.2.2.6 rs_ctl_dev_term_trig_clear()	33
12.2.2.7 rs_ctl_dev_term_trig_set()	33
12.2.2.8 rs_ctl_dev_term_trig_wait()	34
12.2.2.9 rs_ctl_dev_write()	34
12.3 include/rs_macro.h File Reference	35
12.3.1 Detailed Description	35
12.3.2 Macro Definition Documentation	35
12.3.2.1 RET_CHECK	35

12.3.2.2	RET_CONV	35
12.3.2.3	RET_ORG	36
12.3.2.4	RS_ASSERT	36
12.3.2.5	RS_CALL	37
12.4	include/rs_sleep.h File Reference	37
12.4.1	Function Documentation	37
12.4.1.1	rs_usleep()	37
12.5	lib/rs24g_ctl_core/rs24g_ctl_base.c File Reference	38
12.5.1	Function Documentation	38
12.5.1.1	rs_close()	38
12.5.1.2	rs_open()	38
12.5.1.3	rs_resume()	39
12.5.1.4	rs_shutdown()	39
12.5.1.5	rs_start()	40
12.5.1.6	rs_stop()	40
12.6	lib/rs24g_ctl_core/rs24g_ctl_common.c File Reference	40
12.6.1	Function Documentation	40
12.6.1.1	get_devdata()	40
12.6.1.2	get_devfifo()	41
12.6.1.3	get_size_fifo()	41
12.7	lib/rs24g_ctl_core/rs24g_ctl_distance.c File Reference	41
12.7.1	Function Documentation	41
12.7.1.1	rs_get_distance()	41
12.7.1.2	rs_get_peak_level_lower()	42
12.7.1.3	rs_set_peak_level_lower()	42
12.8	lib/rs24g_ctl_core/rs24g_ctl_motion.c File Reference	42
12.8.1	Function Documentation	42
12.8.1.1	rs_get_motion()	42
12.8.1.2	rs_read_smoothed_level()	43
12.8.1.3	rs_setup_smoothed_level()	43
12.8.1.4	rs_wait_motion_change()	43
12.9	lib/rs24g_ctl_core/rs24g_ctl_setup.c File Reference	43
12.9.1	Function Documentation	44
12.9.1.1	rs_load_seqcode()	44
12.9.1.2	rs_setup_seq()	44
12.10	lib/rs24g_ctl_core/sc1233/include/chipboot.h File Reference	45
12.10.1	Macro Definition Documentation	45
12.10.1.1	chipboot	45
12.11	lib/rs24g_ctl_setup_core/rs24g_ctl_setup_base.c File Reference	45
12.11.1	Function Documentation	45

12.11.1.1 rs_setup_param()	45
12.11.1.2 rs_update_param()	46
12.12lib/rs24g_ctl_setup_core/sc1233/include/local/setup_base_local.h File Reference	46
12.12.1 Function Documentation	47
12.12.1.1 rs_get_ctl_mode_from_setup_mode()	47
12.12.1.2 rs_setup_param_local()	47
12.12.1.3 rs_update_param_local()	47
12.13lib/rs24g_ctl_setup_core/setup_common.c File Reference	47
12.13.1 Function Documentation	47
12.13.1.1 rs_setup_hpf()	47
12.13.1.2 rs_setup_interval()	48
12.14lib/rs24g_ctl_setup_core/setup_distance.c File Reference	48
12.14.1 Function Documentation	48
12.14.1.1 rs_setup_beta()	48
12.14.1.2 rs_setup_range_peak()	48
12.15lib/rs24g_ctl_setup_core/setup_distance_wide.c File Reference	48
12.15.1 Function Documentation	48
12.15.1.1 distance_wide_getcode()	48
12.15.1.2 distance_wide_update_param()	49
12.16lib/rs24g_ctl_setup_core/setup_motion.c File Reference	49
12.16.1 Function Documentation	49
12.16.1.1 rs_setup_alpha()	49
12.16.1.2 rs_setup_motion_threshold()	50
12.16.1.3 rs_setup_range_motion()	50
12.16.1.4 rs_setup_startup_count()	50
12.17lib/rs24g_ctl_setup_core/setup_motion_wide.c File Reference	50
12.17.1 Function Documentation	50
12.17.1.1 motion_wide_getcode()	50
12.17.1.2 motion_wide_update_param()	51
12.18lib/rs_ctl_dev_poc/include/rs_i2c.h File Reference	51
12.18.1 Detailed Description	51
12.19lib/rs_ctl_dev_poc/include/rs_spi.h File Reference	52
12.19.1 Detailed Description	52
12.20lib/rs_ctl_dev_poc/include/rs_term.h File Reference	52
12.20.1 Detailed Description	53
12.21lib/rs_ctl_dev_poc/rs_ctl_dev_poc.cpp File Reference	53
12.21.1 Function Documentation	54
12.21.1.1 rs_dev_close()	54
12.21.1.2 rs_dev_open()	54
12.21.1.3 rs_dev_read()	54

12.21.1.4 rs_dev_term_clear_trigger()	54
12.21.1.5 rs_dev_term_get()	54
12.21.1.6 rs_dev_term_set()	55
12.21.1.7 rs_dev_term_set_trigger()	55
12.21.1.8 rs_dev_term_wait_trigger()	55
12.21.1.9 rs_dev_write()	56
12.21.1.10 rs_dev_write_low_memory()	56
12.22 lib/rs_ctl_lib/include/rs_ctl_sensor_data.h File Reference	56
12.22.1 Detailed Description	56
12.23 lib/rs_ctl_lib/rs_ctl_cmd.c File Reference	57
12.23.1 Function Documentation	57
12.23.1.1 read_fifo()	57
12.23.1.2 read_registers()	57
12.23.1.3 read_status()	58
12.23.1.4 rs_ctl_cmd_disable_seq()	58
12.23.1.5 rs_ctl_cmd_enable_seq()	59
12.23.1.6 rs_ctl_cmd_get_sensor_data()	59
12.23.1.7 rs_ctl_cmd_shutdown()	60
12.23.1.8 rs_ctl_cmd_wait_and_get_sensor_data()	60
12.24 lib/rs_ctl_lib/rs_ctl_cmd_sc1233.c File Reference	61
12.24.1 Function Documentation	61
12.24.1.1 rs_ctl_cmd_chipboot_sc1233()	61
12.25 lib/rs_ctl_lib/rs_ctl_data.c File Reference	61
12.25.1 Function Documentation	62
12.25.1.1 rs_calc_crc16()	62
12.25.1.2 rs_ctl_read_mem()	62
12.25.1.3 rs_ctl_read_reg()	62
12.25.1.4 rs_ctl_read_regs()	63
12.25.1.5 rs_ctl_write_mem()	63
12.25.1.6 rs_ctl_write_reg()	64
12.25.1.7 rs_ctl_write_regs()	64
12.26 lib/rs_ctl_lib/rs_ctl_op.c File Reference	64
12.26.1 Function Documentation	65
12.26.1.1 rs_ctl_op_DISTM()	65
12.26.1.2 rs_ctl_op_DSLEEP()	65
12.26.1.3 rs_ctl_op_ENATM()	65
12.26.1.4 rs_ctl_op_HLDDT()	65
12.26.1.5 rs_ctl_op_HRST()	66
12.26.1.6 rs_ctl_op_RDSR()	66
12.26.1.7 rs_ctl_op_RDSR2()	66

12.26.1.8 rs_ctl_op_READ()	66
12.26.1.9 rs_ctl_op_RUNTM()	67
12.26.1.10rs_ctl_op_SRST()	67
12.26.1.11rs_ctl_op_STPTM()	67
12.26.1.12rs_ctl_op_UPDDT()	67
12.26.1.13rs_ctl_op_WRITE()	68
12.26.1.14rs_ctl_op_WRSR()	68
<b>Bibliography</b>	<b>69</b>
<b>Index</b>	<b>71</b>



## Chapter 1

# CMOS 24GHz Radar Sensor Library Reading and Porting Guides

### About source code

This source code is "CMOS 24GHz Radar Sensor Library" based on SC1233AR3 Evaluation Kit (EVK). As Evaluation Kit, the code is intended to be used for many purposes. Then the code may not be optimized for the particular usage. Please refer the specification in the datasheet [[13](#)], and use this code as guides when writing a code.

Descriptions of CMOS 24GHz Radar Sensor Library are belows,

- [Basic Control Flow](#)
- [Driver Adaptation Layer](#), a kind of porting layer, but it may not be suitable for final products and will be re-written entirely.
- [Low-Level Device Layer](#), specific SPI and I2C interface to implement [Driver Adaptation Layer](#)

### Warning

The code may be re-written without any notice.

### Others

- [Others](#)



## Chapter 2

# Basic Control Flow

From SC1233AR3 Control API point of view, Brief Control Flow is written in "rs24g\_sample\_sc1233.c" like belows,

### Brief Control Flow (API view)

- [rs\\_open\(\)](#) opens a sensor device
- [rs\\_setup\\_param\(\)](#) sets up sensor parameters
  - [rs\\_setup\\_param\\_local\(\)](#)
    - \* [motion\\_wide\\_getcode\(\)](#) or [distance\\_wide\\_getcode\(\)](#) prepares setup parameters from pre-defined Sequencer Code Data
  - [rs\\_load\\_seqcode\(\)](#), it mainly works as follows,
    - \* [rs\\_ctl\\_cmd\\_chipboot\\_sc1233\(\)](#) booting up ("Start-Up") the sensor [1]
    - \* [rs\\_setup\\_seq\(\)](#) sets up the sensor with the setup parameters
  - [rs\\_update\\_param\\_local\(\)](#)
    - \* [motion\\_wide\\_update\\_param\(\)](#) or [distance\\_wide\\_update\\_param\(\)](#) modifies parameters from user settings
- [rs\\_start\(\)](#) starts sensing
- [rs\\_get\\_motion\(\)](#) or [rs\\_get\\_distance\(\)](#) gets sensing results. Looping here to get sensing results is available
  - [get\\_devdata\(\)](#)
    - \* [rs\\_ctl\\_cmd\\_wait\\_and\\_get\\_sensor\\_data\(\)](#)
      - [rs\\_ctl\\_cmd\\_get\\_sensor\\_data\(\)](#) gets distance data from Sensor FIFO or registers
- [rs\\_stop\(\)](#) stops sensing
- [rs\\_shutdown\(\)](#) shuts down the sensor
- [rs\\_close\(\)](#) closes the sensor device

The code for EVK works as "Timer operation mode". There are other operation mode, but it is out of scope.

### Warning

This code includes Sequencer Codes for Sensor. Those are dedicated for SC1233AR3 Evaluation Kit only. Use proper Sequencer Code released with Sensor device or Host platform.



## Chapter 3

# Driver Adaptation Layer

Driver Adaptation Layer is defined in [rs\\_ctl\\_dev.h](#) which controls a Sensor through [Low-Level Device Layer](#).

Implement these documented functions to fit Host platform on, it may work at least almost the same as EVK. But even this layer is exists, the code may have some overheads. So, it may be required to refine code to reduce those overheads.

### Driver Adaptation Functions

- General functions
  - [rs\\_ctl\\_dev\\_open\(\)](#)
  - [rs\\_ctl\\_dev\\_close\(\)](#)
- Read Write Sensors through communication device
  - [rs\\_ctl\\_dev\\_write\(\)](#)
  - [rs\\_ctl\\_dev\\_read\(\)](#)
- GPIO related functions
  - [rs\\_ctl\\_dev\\_term\\_set\(\)](#)
  - [rs\\_ctl\\_dev\\_term\\_get\(\)](#)
  - [rs\\_ctl\\_dev\\_term\\_trig\\_clear\(\)](#)
  - [rs\\_ctl\\_dev\\_term\\_trig\\_set\(\)](#)
  - [rs\\_ctl\\_dev\\_term\\_trig\\_wait\(\)](#)

### Note

Especially current implementation of [rs\\_ctl\\_dev\\_term\\_trig\\_wait\(\)](#) is a kind of polling base, so it may have timing variation from the trigger signal. To reduce the timing variation, it may be required to re-write using directly call back or others on Host platform.



## Chapter 4

# Low-Level Device Layer

Sample driver implementation on MBED

### SPI

defined in [rs\\_spi.h](#)

### I2C

defined in [rs\\_i2c.h](#)

### GPIO

defined in [rs\\_term.h](#)

### Warning

SPI and I2C drivers are kind of hardware adapters, so usually there is no difference out of adapters. But some differences are there between I2C and SPI to use by hardware restrictions. Please check the code and specifications [\[2\]](#) carefully.





## Chapter 5

## Others

### Options

- RS\_CPUIF\_USE\_I2C  
select I2C instead of SPI to accessing Sensor as an adapter.
- RS\_ROM\_LIMIT\_32KB
- RS\_ROM\_LIMIT\_64KB
- RS\_ROM\_LIMIT\_128KB
- RS\_ROM\_LIMIT\_192KB
- RS\_ROM\_LIMIT\_256KB  
limit ROM size. The size value is not accurate because it depends on the target platform.
- RS\_WRITE\_MEM\_LIMIT  
limit data size per a single transaction at writing Sequencer program code and FFT window function.  
The value to be defined must be a multiple of 16 bytes, because the word size of Sequencer program code is 16 bytes.



## Chapter 6

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# Chapter 7

## Module Index

### 7.1 Modules

Here is a list of all modules:

Sensor terminal ID . . . . .	19
type of trigger . . . . .	21



## Chapter 8

# Class Index

### 8.1 Class List

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

<a href="#">rs_i2c</a>	.....	<a href="#">23</a>
<a href="#">rs_spi</a>	.....	<a href="#">24</a>
<a href="#">rs_term</a>	.....	<a href="#">26</a>





## Chapter 9

# File Index

### 9.1 File List

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

include/rs_ctl_dev.h	
Device level adaptation layer for Sensor	29
include/rs_macro.h	35
include/rs_sleep.h	37
include/defs/rs_dev_term.h	29
lib/rs24g_ctl_core/rs24g_ctl_base.c	38
lib/rs24g_ctl_core/rs24g_ctl_common.c	40
lib/rs24g_ctl_core/rs24g_ctl_distance.c	41
lib/rs24g_ctl_core/rs24g_ctl_motion.c	42
lib/rs24g_ctl_core/rs24g_ctl_setup.c	43
lib/rs24g_ctl_core/sc1233/include/chipboot.h	45
lib/rs24g_ctl_setup_core/rs24g_ctl_setup_base.c	45
lib/rs24g_ctl_setup_core/setup_common.c	47
lib/rs24g_ctl_setup_core/setup_distance.c	48
lib/rs24g_ctl_setup_core/setup_distance_wide.c	48
lib/rs24g_ctl_setup_core/setup_motion.c	49
lib/rs24g_ctl_setup_core/setup_motion_wide.c	50
lib/rs24g_ctl_setup_core/sc1233/include/local/setup_base_local.h	46
lib/rs_ctl_dev_poc/rs_ctl_dev_poc.cpp	53
lib/rs_ctl_dev_poc/include/rs_i2c.h	
Sensor driver implementation for I2C on MBED@HRM1017	51
lib/rs_ctl_dev_poc/include/rs_spi.h	
Sensor driver implementation for SPI on MBED@HRM1017	52
lib/rs_ctl_dev_poc/include/rs_term.h	
Sensor driver implementation for GPIO on MBED@HRM1017	52
lib/rs_ctl_lib/rs_ctl_cmd.c	57
lib/rs_ctl_lib/rs_ctl_cmd_sc1233.c	61
lib/rs_ctl_lib/rs_ctl_data.c	61
lib/rs_ctl_lib/rs_ctl_op.c	64
lib/rs_ctl_lib/include/rs_ctl_sensor_data.h	
Sensor data	56



# Chapter 10

## Module Documentation

### 10.1 Sensor terminal ID

#### Macros

- `#define RS_TERM_Nrst (RS_TERM_TYPE_IN | (0x00000000))`
- `#define RS_TERM_CE (RS_TERM_TYPE_IN | (0x00000001))`
- `#define RS_TERM_OR (RS_TERM_TYPE_OUT | (0x00000000))`
- `#define RS_TERM_DETOUT (RS_TERM_TYPE_OUT | (0x00000001))`

#### 10.1.1 Detailed Description

#### 10.1.2 Macro Definition Documentation

##### 10.1.2.1 RS\_TERM\_CE

```
#define RS_TERM_CE (RS_TERM_TYPE_IN | (0x00000001))
```

ID for CE pin

Definition at line 24 of file `rs_dev_term.h`.

##### 10.1.2.2 RS\_TERM\_DETOUT

```
#define RS_TERM_DETOUT (RS_TERM_TYPE_OUT | (0x00000001))
```

ID for DETOUT pin

Definition at line 28 of file `rs_dev_term.h`.

##### 10.1.2.3 RS\_TERM\_Nrst

```
#define RS_TERM_Nrst (RS_TERM_TYPE_IN | (0x00000000))
```

ID for Nrst pin

Definition at line 22 of file `rs_dev_term.h`.

#### 10.1.2.4 RS\_TERM\_OR

```
#define RS_TERM_OR (RS_TERM_TYPE_OUT | (0x00000000))
```

ID for OR pin

Definition at line 26 of file rs\_dev\_term.h.

## 10.2 type of trigger

### Macros

- #define `RS_TERM_TRIGGER_RISING` (0x00000001)
- #define `RS_TERM_TRIGGER_FALLING` (0x00000002)

#### 10.2.1 Detailed Description

#### 10.2.2 Macro Definition Documentation

##### 10.2.2.1 RS\_TERM\_TRIGGER\_FALLING

```
#define RS_TERM_TRIGGER_FALLING (0x00000002)
```

Falling edge

Definition at line 44 of file `rs_dev_term.h`.

##### 10.2.2.2 RS\_TERM\_TRIGGER\_RISING

```
#define RS_TERM_TRIGGER_RISING (0x00000001)
```

Rising edge

Definition at line 42 of file `rs_dev_term.h`.



# Chapter 11

## Class Documentation

### 11.1 rs\_i2c Class Reference

#### Public Member Functions

- `rs_ret_t write` (const uint8\_t \*wdata, size\_t size, rs\_bool\_t end=RS\_TRUE)
- `rs_ret_t read` (const uint8\_t \*wdata, size\_t wsize, uint8\_t \*rdata, size\_t rsize=1)

#### 11.1.1 Detailed Description

Sensor driver for I2C on MBED@HRM1017

Version

(PRELIMINARY)

Definition at line 24 of file rs\_i2c.h.

#### 11.1.2 Member Function Documentation

##### 11.1.2.1 read()

```
rs_ret_t rs_i2c::read (
    const uint8_t * wdata,
    size_t wsize,
    uint8_t * rdata,
    size_t rsize = 1 )
```

raw I2C read operation

support only to read status registers

#### Parameters

in	<i>wdata</i>	pointer of write data
in	<i>wsize</i>	number of write data in bytes
out	<i>rdata</i>	pointer of read data
in	<i>rsize</i>	number of read data in bytes

### 11.1.2.2 write()

```
rs_ret_t rs_i2c::write (
    const uint8_t * wdata,
    size_t size,
    rs_bool_t end = RS_TRUE )
```

raw I2C write operation with terminate option

#### Parameters

in	<i>wdata</i>	pointer of write data, might be NULL when read
in	<i>size</i>	number of read data in bytes
in	<i>end</i>	option to terminate a I2C transaction

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

- lib/rs\_ctl\_dev\_poc/include/[rs\\_i2c.h](#)

## 11.2 rs\_spi Class Reference

### Public Member Functions

- [rs\\_ret\\_t write](#) (const void \*wdata, size\_t size, bool end=true)
- [rs\\_ret\\_t read](#) (const void \*wdata, size\_t wsize, void \*rdata, size\_t rsize)
- [rs\\_ret\\_t spi\\_read](#) (const void \*wdata, void \*rdata, size\_t size)

### Private Member Functions

- void [readwrite](#) (const void \*wdata, size\_t wsize, void \*rdata, size\_t rsize, bool end=true)

### 11.2.1 Detailed Description

Sensor driver for SPI on MBED@HRM1017

Version

(PRELIMINARY)

Definition at line 24 of file rs\_spi.h.

### 11.2.2 Member Function Documentation

#### 11.2.2.1 read()

```
rs_ret_t rs_spi::read (
    const void * wdata,
    size_t wsize,
    void * rdata,
    size_t rsize ) [inline]
```

SPI read operation



## Parameters

in	<i>wdata</i>	pointer of write data
in	<i>wsiz</i>	number of write data in bytes
out	<i>rdata</i>	pointer of read data
in	<i>rsiz</i>	number of read data in bytes

## See also

rs\_spi::write(const void \*, size\_t, void \*, size\_t, bool)

Definition at line 82 of file rs\_spi.h.

## 11.2.2.2 readwrite()

```
void rs_spi::readwrite (
    const void * wdata,
    size_t wsiz,
    void * rdata,
    size_t rsiz,
    bool end = true ) [inline], [private]
```

raw SPI write/read operation with terminate option

## Parameters

in	<i>wdata</i>	pointer of write data, might be NULL when read
in	<i>wsiz</i>	number of write data in bytes
out	<i>rdata</i>	pointer of read data, might be NULL when write
in	<i>rsiz</i>	number of read data in bytes
in	<i>end</i>	option to terminate a SPI transaction

Definition at line 39 of file rs\_spi.h.

## 11.2.2.3 spi\_read()

```
rs_ret_t rs_spi::spi_read (
    const void * wdata,
    void * rdata,
    size_t siz ) [inline]
```

SPI raw read operation

## Parameters

in	<i>wdata</i>	pointer of write data
out	<i>rdata</i>	pointer of read data
in	<i>siz</i>	number of read data in bytes

**See also**

`rs_spi::write(const void *, size_t, void *, size_t, bool)`

Definition at line 99 of file `rs_spi.h`.

**11.2.2.4 write()**

```
rs_ret_t rs_spi::write (
    const void * wdata,
    size_t size,
    bool end = true ) [inline]
```

SPI write operation with terminate option

**Parameters**

in	<i>wdata</i>	pointer of write data
in	<i>size</i>	number of write data in bytes
in	<i>end</i>	option to terminate a SPI transaction

Definition at line 61 of file `rs_spi.h`.

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

- `lib/rs_ctl_dev_poc/include/rs_spi.h`

**11.3 rs\_term Class Reference****Public Member Functions**

- `rs_ret_t get` (uint32\_t term, rs\_bool\_t \*val)
- `rs_ret_t set` (uint32\_t term, rs\_bool\_t val)
- `rs_ret_t set_trigger` (uint32\_t term, uint32\_t trigger)
- `rs_ret_t clear_trigger` (uint32\_t term)
- `rs_ret_t wait_trigger` (uint32\_t term, uint32\_t timeout, uint32\_t trigger, rs\_bool\_t \*val)

**11.3.1 Detailed Description**

Sensor driver for GPIO on MBED@HRM1017

Version

(PRLIMINARY)

Definition at line 126 of file `rs_term.h`.

**11.3.2 Member Function Documentation****11.3.2.1 clear\_trigger()**

```
rs_ret_t rs_term::clear_trigger (
    uint32_t term ) [inline]
```

Clear triggered flag

#### Parameters

in	<i>term</i>	terminal ID for Sensor
----	-------------	------------------------

Definition at line 198 of file rs\_term.h.

#### 11.3.2.2 get()

```
rs_ret_t rs_term::get (
    uint32_t term,
    rs_bool_t * val ) [inline]
```

read GPIO

#### Parameters

in	<i>term</i>	terminal ID for Sensor
out	<i>val</i>	pointer of read value

Definition at line 144 of file rs\_term.h.

#### 11.3.2.3 set()

```
rs_ret_t rs_term::set (
    uint32_t term,
    rs_bool_t val ) [inline]
```

write(set) GPIO

#### Parameters

in	<i>term</i>	terminal ID for Sensor
out	<i>val</i>	value to write(set)

Definition at line 165 of file rs\_term.h.

#### 11.3.2.4 set\_trigger()

```
rs_ret_t rs_term::set_trigger (
    uint32_t term,
    uint32_t trigger ) [inline]
```

Setup GPIO as trigger

#### Parameters

in	<i>term</i>	terminal ID for Sensor
in	<i>trigger</i>	type of trigger

Definition at line 182 of file rs\_term.h.

### 11.3.2.5 wait\_trigger()

```
rs_ret_t rs_term::wait_trigger (
    uint32_t term,
    uint32_t timeout,
    uint32_t trigger,
    rs_bool_t * val ) [inline]
```

Wait trigger event

#### Parameters

in	<i>term</i>	terminal ID for Sensor
in	<i>timeout</i>	timeout in ms.
in	<i>trigger</i>	type of trigger to wait
out	<i>val</i>	pointer of value at triggerd

Definition at line 217 of file rs\_term.h.

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

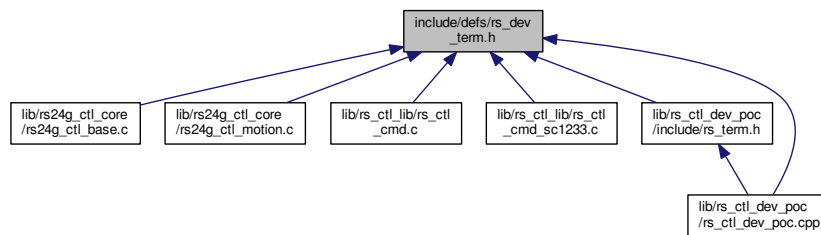
- lib/rs\_ctl\_dev\_poc/include/[rs\\_term.h](#)

## Chapter 12

# File Documentation

### 12.1 include/defs/rs\_dev\_term.h File Reference

This graph shows which files directly or indirectly include this file:



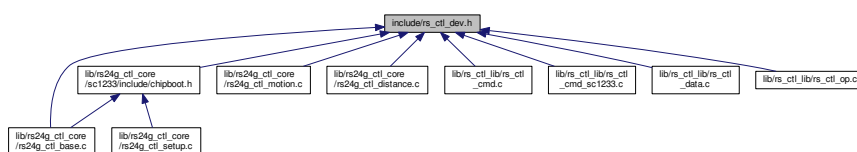
### Macros

- #define **RS\_TERM\_NRST** (RS\_TERM\_TYPE\_IN | (0x00000000))
- #define **RS\_TERM\_CE** (RS\_TERM\_TYPE\_IN | (0x00000001))
- #define **RS\_TERM\_OR** (RS\_TERM\_TYPE\_OUT | (0x00000000))
- #define **RS\_TERM\_DETOUT** (RS\_TERM\_TYPE\_OUT | (0x00000001))
- #define **RS\_TERM\_TRIGGER\_RISING** (0x00000001)
- #define **RS\_TERM\_TRIGGER\_FALLING** (0x00000002)

### 12.2 include/rs\_ctl\_dev.h File Reference

device level adaptation layer for Sensor

This graph shows which files directly or indirectly include this file:



## Functions

- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_open](#) (rs\_ctl\_dev\_t \*dev, const void \*attr)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_close](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_write](#) (rs\_ctl\_dev\_t dev, const uint8\_t \*wdata, rs\_size\_t size)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_read](#) (rs\_ctl\_dev\_t dev, const uint8\_t \*wdata, rs\_size\_t wsize, uint8\_t \*rdata, rs\_size\_t rsize)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_term\\_set](#) (rs\_ctl\_dev\_t dev, uint32\_t term, rs\_bool\_t val)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_term\\_get](#) (rs\_ctl\_dev\_t dev, uint32\_t term, rs\_bool\_t \*val)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_term\\_trig\\_clear](#) (rs\_ctl\_dev\_t dev, uint32\_t term)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_term\\_trig\\_set](#) (rs\_ctl\_dev\_t dev, uint32\_t term, uint32\_t trigger)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_dev\\_term\\_trig\\_wait](#) (rs\_ctl\_dev\_t dev, uint32\_t timeout, uint32\_t term, uint32\_t trigger, rs\_bool\_t \*val)

### 12.2.1 Detailed Description

device level adaptation layer for Sensor

Version

(PRELIMINARY)

Warning

This is a part of sensor library source code for Evaluation Kit.

### 12.2.2 Function Documentation

#### 12.2.2.1 rs\_ctl\_dev\_close()

```
RS_IF rs_ret_t rs_ctl_dev_close (
    rs_ctl_dev_t dev )
```

close device to communicate with Sensor

Parameters

in	dev	device handle
----	-----	---------------

Return values

RS_OK	everything is OK,
others	something wrong

See also

[rs\\_dev\\_close\(\)](#)

#### 12.2.2.2 rs\_ctl\_dev\_open()

```
RS_IF rs_ret_t rs_ctl_dev_open (
```

```
rs_ctl_dev_t * dev,
const void * attr )
```

open device to communicate with Sensor

#### Parameters

out	<i>dev</i>	pointer of device handle (handle should be allocated at upper level)
in	<i>attr</i>	attributes (not used now)

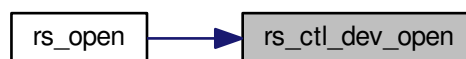
#### Return values

<i>RS_OK</i>	everything is OK
<i>others</i>	something wrong

#### See also

[rs\\_dev\\_open\(\)](#)

Here is the caller graph for this function:



#### 12.2.2.3 rs\_ctl\_dev\_read()

```
RS_IF rs_ret_t rs_ctl_dev_read (
    rs_ctl_dev_t dev,
    const uint8_t * wdata,
    rs_size_t wsize,
    uint8_t * rdata,
    rs_size_t rsize )
```

read Status Register, Sensor Register and Sensor RAM [3] [4]

Sensor RAM contains FIFO

#### Parameters

in	<i>dev</i>	device handle
in	<i>wdata</i>	pointer of write data
in	<i>wsize</i>	number of write data in bytes
out	<i>rdata</i>	pointer of read data
in	<i>rsize</i>	number of read data in bytes

## Return values

<i>RS_OK</i>	everything is OK,
<i>others</i>	something wrong

## See also

[rs\\_dev\\_read\(\)](#)

## 12.2.2.4 rs\_ctl\_dev\_term\_get()

```
RS_IF rs_ret_t rs_ctl_dev_term_get (
    rs_ctl_dev_t dev,
    uint32_t term,
    rs_bool_t * val )
```

get Sensor Terminal(GPIO)

## Parameters

in	<i>dev</i>	device handle
in	<i>term</i>	<a href="#">Sensor terminal ID</a>
out	<i>val</i>	pointer of getting bool value

## Return values

<i>RS_OK</i>	everything is OK,
<i>others</i>	something wrong

## See also

[rs\\_dev\\_term\\_get\(\)](#)

## 12.2.2.5 rs\_ctl\_dev\_term\_set()

```
RS_IF rs_ret_t rs_ctl_dev_term_set (
    rs_ctl_dev_t dev,
    uint32_t term,
    rs_bool_t val )
```

set Sensor Terminal(GPIO)

## Parameters

in	<i>dev</i>	device handle
in	<i>term</i>	<a href="#">Sensor terminal ID</a>
in	<i>val</i>	setting bool value

## Return values

<i>RS_OK</i>	everything is OK,
--------------	-------------------



## Return values

<i>others</i>	something wrong
---------------	-----------------

## See also

[rs\\_dev\\_term\\_set\(\)](#)

## 12.2.2.6 rs\_ctl\_dev\_term\_trig\_clear()

```
RS_IF rs_ret_t rs_ctl_dev_term_trig_clear (
    rs_ctl_dev_t dev,
    uint32_t term )
```

clear Trigger flag for Sensor Terminal(GPIO)

## Parameters

in	<i>dev</i>	device handle
in	<i>term</i>	<a href="#">Sensor terminal ID</a>

## Return values

<i>RS_OK</i>	everything is OK,
<i>others</i>	something wrong

## See also

[rs\\_dev\\_term\\_clear\\_trigger\(\)](#)

## 12.2.2.7 rs\_ctl\_dev\_term\_trig\_set()

```
RS_IF rs_ret_t rs_ctl_dev_term_trig_set (
    rs_ctl_dev_t dev,
    uint32_t term,
    uint32_t trigger )
```

setup Trigger for Sensor Terminal(GPIO)

## Parameters

in	<i>dev</i>	device handle
in	<i>term</i>	<a href="#">Sensor terminal ID</a>
in	<i>trigger</i>	<a href="#">type of trigger</a> as RISING or FALLING edge

## Return values

<i>RS_OK</i>	everything is OK,
<i>others</i>	something wrong

See also

[rs\\_dev\\_term\\_set\\_trigger\(\)](#)

#### 12.2.2.8 rs\_ctl\_dev\_term\_trig\_wait()

```
RS_IF rs_ret_t rs_ctl_dev_term_trig_wait (
    rs_ctl_dev_t dev,
    uint32_t timeout,
    uint32_t term,
    uint32_t trigger,
    rs_bool_t * val )
```

wait Trigger is fired for Sensor Terminal(GPIO)

##### Parameters

in	<i>dev</i>	device handle
in	<i>timeout</i>	timeout in msec
in	<i>term</i>	<a href="#">Sensor terminal ID</a>
in	<i>trigger</i>	<a href="#">type of trigger</a> to wait (RISE or FALL)
out	<i>val</i>	pointer of getting bool value at fire

##### Return values

<i>RS_OK</i>	everything is OK,
<i>RS_ETOUT</i>	when timeout,
<i>others</i>	something wrong

See also

[rs\\_dev\\_term\\_wait\\_trigger\(\)](#)

#### 12.2.2.9 rs\_ctl\_dev\_write()

```
RS_IF rs_ret_t rs_ctl_dev_write (
    rs_ctl_dev_t dev,
    const uint8_t * wdata,
    rs_size_t size )
```

write Fast Control, Status Register, Sensor Register and Sensor RAM [5] [6], [7]

Sensor RAM contains Sequencer program code and FFT window function

##### Parameters

in	<i>dev</i>	device handle
in	<i>wdata</i>	pointer of write data
in	<i>size</i>	number of write data in bytes

## Return values

<i>RS_OK</i>	everything is OK,
<i>others</i>	something wrong

## See also

[rs\\_dev\\_write\(\)](#)

## 12.3 include/rs\_macro.h File Reference

This graph shows which files directly or indirectly include this file:



## Macros

- #define [RET\\_CONV](#)(type, api, refval, retval)
- #define [RET\\_CHECK](#)(api, retval) [RET\\_CONV](#)(int, api, !0, retval)
- #define [RET\\_ORG](#)(type, api, refval)
- #define [RS\\_ASSERT](#)(api, retval) [RET\\_CONV](#)(int, api, !0, retval)
- #define [RS\\_CALL](#)(api) [RET\\_ORG](#)(rs\_ret\_t, api, RS\_OK)

## 12.3.1 Detailed Description

call function and return depends on return value from the function.

## 12.3.2 Macro Definition Documentation

## 12.3.2.1 RET\_CHECK

```
#define RET_CHECK(  
    api,  
    retval ) RET\_CONV(int, api, !0, retval)
```

evaluate *api*, return *retval* if the evaluation value is false.

## Parameters

in	<i>api</i>	expression to evaluate
in	<i>retval</i>	return vale on false

Definition at line 72 of file rs\_macro.h.

## 12.3.2.2 RET\_CONV

```
#define RET_CONV(  
    type,
```

```

    api,
    refval,
    retval )

```

**Value:**

```

{
    const type macroret = (api);
    if(macroret != refval){
        rs_macro_printf(
            "(%s) [error] ref=%x ret=%x\n",
            __FUNCTION__,
            (uint32_t) refval, (uint32_t) macroret
        );
        return retval;
    }
}

```

call *api*, return *retval* if return value of *api* is not *refval*.

**Parameters**

in	type	type of return value (if available)
in	<i>api</i>	callee function
in	<i>refval</i>	expected return value from api
in	<i>retval</i>	return value if return value is not refval

Definition at line 49 of file rs\_macro.h.

**12.3.2.3 RET\_ORG**

```

#define RET_ORG(
    type,
    api,
    refval )

```

**Value:**

```

{
    const type macroret = (api);
    if(macroret != refval){
        rs_macro_printf(
            "(%s) [error] ref=%x ret=%x\n",
            __FUNCTION__,
            (uint32_t) refval, (uint32_t) macroret
        );
        return macroret;
    }
}

```

call *api*, return return value of *api* if the return value is not *refval*.

**Parameters**

in	type	type of return value (if available)
in	<i>api</i>	callee function
in	<i>refval</i>	expected return value from api

Definition at line 96 of file rs\_macro.h.

**12.3.2.4 RS\_ASSERT**

```

#define RS_ASSERT(
    api,
    retval ) RET_CONV(int, api, !0, retval)

```

evaluate *api*, return *retval* if the evaluation value is false.

#### Parameters

in	<i>api</i>	expression to evaluate
in	<i>retval</i>	return vale on false

Definition at line 124 of file rs\_macro.h.

#### 12.3.2.5 RS\_CALL

```
#define RS_CALL(  
    api ) RET_ORG(rs_ret_t, api, RS_OK)
```

call *api*, return return value of *api* if the return value is not RS\_OK.

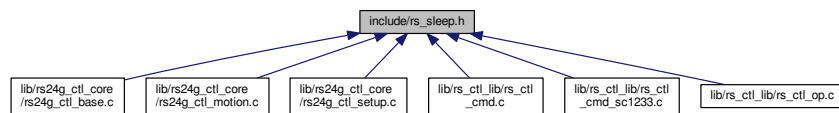
#### Parameters

in	<i>api</i>	callee function
----	------------	-----------------

Definition at line 135 of file rs\_macro.h.

## 12.4 include/rs\_sleep.h File Reference

This graph shows which files directly or indirectly include this file:



## Functions

- void [rs\\_usleep](#) (uint32\_t usec)

### 12.4.1 Function Documentation

#### 12.4.1.1 rs\_usleep()

```
void rs_usleep (  
    uint32_t usec )
```

sleep *usec* microseconds.

#### Parameters

in	<i>usec</i>	sleep time in microseconds
----	-------------	----------------------------

## 12.5 lib/rs24g\_ctl\_core/rs24g\_ctl\_base.c File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_open](#) (rs\_handle\_t \*handle)
- RS\_IF rs\_ret\_t [rs\\_close](#) (rs\_handle\_t handle)
- RS\_IF rs\_ret\_t [rs\\_shutdown](#) (rs\_handle\_t handle)
- RS\_IF rs\_ret\_t [rs\\_start](#) (rs\_handle\_t handle)
- RS\_IF rs\_ret\_t [rs\\_stop](#) (rs\_handle\_t handle)
- RS\_IF rs\_ret\_t [rs\\_resume](#) (rs\_handle\_t handle)

### 12.5.1 Function Documentation

#### 12.5.1.1 rs\_close()

```
RS_IF rs_ret_t rs_close (  
    rs_handle_t handle )
```

close Sensor

Definition at line 117 of file rs24g\_ctl\_base.c.

Here is the call graph for this function:



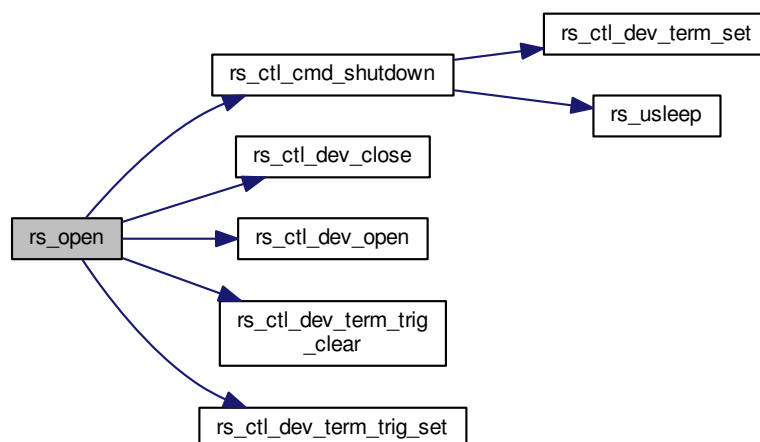
#### 12.5.1.2 rs\_open()

```
RS_IF rs_ret_t rs_open (  
    rs_handle_t * handle )
```

open Sensor

Definition at line 41 of file rs24g\_ctl\_base.c.

Here is the call graph for this function:



### 12.5.1.3 rs\_resume()

```
RS_IF rs_ret_t rs_resume (
    rs_handle_t handle )
```

resume sensing

Definition at line 409 of file `rs24g_ctl_base.c`.

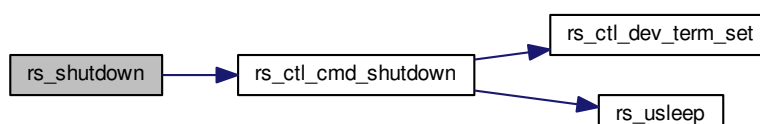
### 12.5.1.4 rs\_shutdown()

```
RS_IF rs_ret_t rs_shutdown (
    rs_handle_t handle )
```

shutdown Sensor

Definition at line 144 of file `rs24g_ctl_base.c`.

Here is the call graph for this function:



### 12.5.1.5 rs\_start()

```
RS_IF rs_ret_t rs_start (
    rs_handle_t handle )
```

start sensing

Definition at line 270 of file rs24g\_ctl\_base.c.

### 12.5.1.6 rs\_stop()

```
RS_IF rs_ret_t rs_stop (
    rs_handle_t handle )
```

stop sensing

Definition at line 329 of file rs24g\_ctl\_base.c.

Here is the call graph for this function:



## 12.6 lib/rs24g\_ctl\_core/rs24g\_ctl\_common.c File Reference

### Functions

- rs\_ret\_t [get\\_devdata](#) (rs\_handle\_t handle, uint32\_t timeout, const uint16\_t \*reg\_addr, rs\_size\_t reg\_size, uint32\_t \*reg)
- rs\_ret\_t [get\\_devfifo](#) (rs\_handle\_t handle, uint32\_t timeout, rs\_size\_t fifo\_size, uint8\_t \*fifo\_data, struct rs\_fifo\_info \*fifo\_info)
- rs\_ret\_t [get\\_size\\_fifo](#) (rs\_handle\_t handle, rs\_size\_t \*size)

### 12.6.1 Function Documentation

#### 12.6.1.1 get\_devdata()

```
rs_ret_t get_devdata (
    rs_handle_t handle,
    uint32_t timeout,
    const uint16_t * reg_addr,
    rs_size_t reg_size,
    uint32_t * reg )
```

get data from Sensor

Definition at line 30 of file rs24g\_ctl\_common.c.



## 12.6.1.2 get\_devfifo()

```
rs_ret_t get_devfifo (
    rs_handle_t handle,
    uint32_t timeout,
    rs_size_t fifo_size,
    uint8_t * fifo_data,
    struct rs_fifo_info * fifo_info )
```

get FIFO data from Sensor

Definition at line 74 of file rs24g\_ctl\_common.c.

## 12.6.1.3 get\_size\_fifo()

```
rs_ret_t get_size_fifo (
    rs_handle_t handle,
    rs_size_t * size )
```

get frame size in FIFO

Definition at line 138 of file rs24g\_ctl\_common.c.

## 12.7 lib/rs24g\_ctl\_core/rs24g\_ctl\_distance.c File Reference

## Functions

- RS\_IF rs\_ret\_t [rs\\_get\\_distance](#) (rs\_handle\_t handle, uint32\_t timeout, struct rs\_distance\_data \*data)
- RS\_IF rs\_ret\_t [rs\\_set\\_peak\\_level\\_lower](#) (rs\_handle\_t handle, uint8\_t level)
- RS\_IF rs\_ret\_t [rs\\_get\\_peak\\_level\\_lower](#) (rs\_handle\_t handle, uint8\_t \*level)

## 12.7.1 Function Documentation

## 12.7.1.1 rs\_get\_distance()

```
RS_IF rs_ret_t rs_get_distance (
    rs_handle_t handle,
    uint32_t timeout,
    struct rs_distance_data * data )
```

get Distance

Definition at line 32 of file rs24g\_ctl\_distance.c.

Here is the call graph for this function:



### 12.7.1.2 rs\_get\_peak\_level\_lower()

```
RS_IF rs_ret_t rs_get_peak_level_lower (
    rs_handle_t handle,
    uint8_t * level )
```

get lower limit for peak level

Definition at line 115 of file rs24g\_ctl\_distance.c.

### 12.7.1.3 rs\_set\_peak\_level\_lower()

```
RS_IF rs_ret_t rs_set_peak_level_lower (
    rs_handle_t handle,
    uint8_t level )
```

set lower limit for peak level

Definition at line 91 of file rs24g\_ctl\_distance.c.

## 12.8 lib/rs24g\_ctl\_core/rs24g\_ctl\_motion.c File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_get\\_motion](#) (rs\_handle\_t handle, rs\_bool\_t \*motion)
- RS\_IF rs\_ret\_t [rs\\_wait\\_motion\\_change](#) (rs\_handle\_t handle, uint32\_t timeout, rs\_bool\_t \*motion)
- RS\_IF rs\_ret\_t [rs\\_setup\\_smoothed\\_level](#) (rs\_handle\_t handle, rs\_smoothedope\_t smoothed\_level\_ope, uint32\_t fft\_point, uint16\_t addr, const uint32\_t \*val, rs\_size\_t num)
- RS\_IF rs\_ret\_t [rs\\_read\\_smoothed\\_level](#) (rs\_handle\_t handle, uint32\_t fft\_point, uint16\_t addr, uint32\_t \*val, rs\_size\_t num)

### 12.8.1 Function Documentation

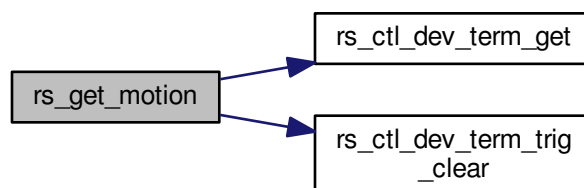
#### 12.8.1.1 rs\_get\_motion()

```
RS_IF rs_ret_t rs_get_motion (
    rs_handle_t handle,
    rs_bool_t * motion )
```

get Motion

Definition at line 31 of file rs24g\_ctl\_motion.c.

Here is the call graph for this function:



## 12.8.1.2 rs\_read\_smoothed\_level()

```
RS_IF rs_ret_t rs_read_smoothed_level (
    rs_handle_t handle,
    uint32_t fft_point,
    uint16_t addr,
    uint32_t * val,
    rs_size_t num )
```

read smoothed level

Definition at line 217 of file rs24g\_ctl\_motion.c.

## 12.8.1.3 rs\_setup\_smoothed\_level()

```
RS_IF rs_ret_t rs_setup_smoothed_level (
    rs_handle_t handle,
    rs_smoothedope_t smoothed_level_ope,
    uint32_t fft_point,
    uint16_t addr,
    const uint32_t * val,
    rs_size_t num )
```

setup smoothed level

Definition at line 161 of file rs24g\_ctl\_motion.c.

## 12.8.1.4 rs\_wait\_motion\_change()

```
RS_IF rs_ret_t rs_wait_motion_change (
    rs_handle_t handle,
    uint32_t timeout,
    rs_bool_t * motion )
```

wait changeing motion

Definition at line 73 of file rs24g\_ctl\_motion.c.

Here is the call graph for this function:



## 12.9 lib/rs24g\_ctl\_core/rs24g\_ctl\_setup.c File Reference

## Functions

- static rs\_ret\_t [rs\\_setup\\_seq](#) (rs\_handle\_t handle)
- RS\_IF rs\_ret\_t [rs\\_load\\_seqcode](#) (rs\_handle\_t handle, rs\_mode\_t mode)

## 12.9.1 Function Documentation

### 12.9.1.1 rs\_load\_seqcode()

```
RS_IF rs_ret_t rs_load_seqcode (
    rs_handle_t handle,
    rs_mode_t mode )
```

Loading Sequencer Code

Definition at line 154 of file rs24g\_ctl\_setup.c.

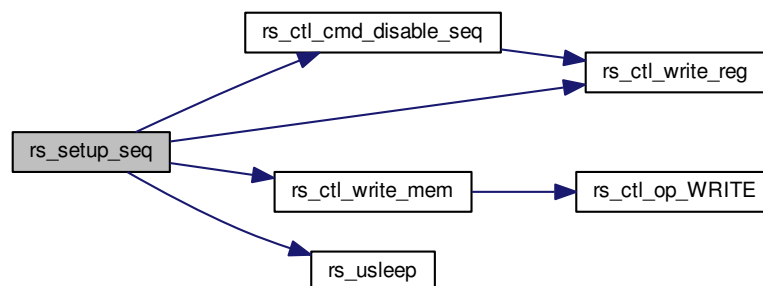
### 12.9.1.2 rs\_setup\_seq()

```
static rs_ret_t rs_setup_seq (
    rs_handle_t handle ) [static]
```

Setting registers, Sequencer Code and FFT parameters [8], [9], [10]

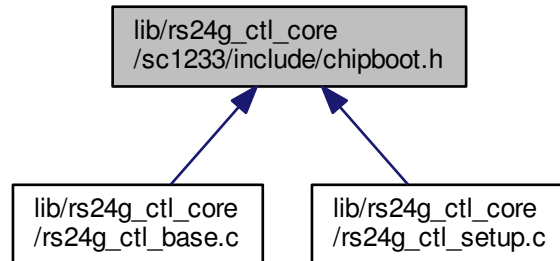
Definition at line 68 of file rs24g\_ctl\_setup.c.

Here is the call graph for this function:



## 12.10 lib/rs24g\_ctl\_core/sc1233/include/chipboot.h File Reference

This graph shows which files directly or indirectly include this file:



### Macros

- `#define chipboot(...) rs_ctl_cmd_chipboot_sc1233(__VA_ARGS__)`

#### 12.10.1 Macro Definition Documentation

##### 12.10.1.1 chipboot

```
#define chipboot(
    ... ) rs_ctl_cmd_chipboot_sc1233(__VA_ARGS__)
```

boot ("Start-Up") command

Definition at line 22 of file chipboot.h.

## 12.11 lib/rs24g\_ctl\_setup\_core/rs24g\_ctl\_setup\_base.c File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_setup\\_param](#) (rs\_handle\_t handle, rs\_mode\_t mode, const void \*param)
- RS\_IF rs\_ret\_t [rs\\_update\\_param](#) (rs\_handle\_t handle, rs\_mode\_t mode, const void \*param)

#### 12.11.1 Function Documentation

##### 12.11.1.1 rs\_setup\_param()

```
RS_IF rs_ret_t rs_setup_param (
    rs_handle_t handle,
    rs_mode_t mode,
    const void * param )
```

Setup Parameters

## Parameters

in	<i>handle</i>	Sensor Handle
in	<i>mode</i>	Sensor Operation Mode
in	<i>param</i>	Sensor Parameters

Definition at line 42 of file rs24g\_ctl\_setup\_base.c.

## 12.11.1.2 rs\_update\_param()

```
RS_IF rs_ret_t rs_update_param (
    rs_handle_t handle,
    rs_mode_t mode,
    const void * param )
```

## Update Parameters

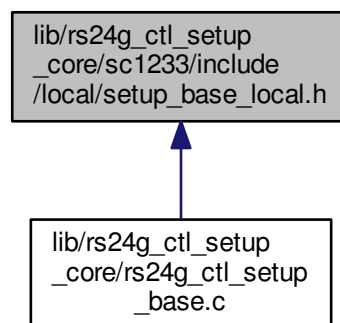
## Parameters

in	<i>handle</i>	Sensor Handle
in	<i>mode</i>	Sensor Operation Mode
in	<i>param</i>	Sensor Parameters for updates

Definition at line 69 of file rs24g\_ctl\_setup\_base.c.

## 12.12 lib/rs24g\_ctl\_setup\_core/sc1233/include/local/setup\_base\_local.h File Reference

This graph shows which files directly or indirectly include this file:



## Functions

- static \_\_inline rs\_ret\_t [rs\\_setup\\_param\\_local](#) (rs\_mode\_t mode, const void \*param, rs\_code\_ref\_t code, rs\_resource\_holder\_t res)
- static \_\_inline rs\_ret\_t [rs\\_get\\_ctl\\_mode\\_from\\_setup\\_mode](#) (rs\_mode\_t setup\_mode, rs\_resource\_holder\_t res, rs\_mode\_t \*p\_ctl\_mode)
- static \_\_inline rs\_ret\_t [rs\\_update\\_param\\_local](#) (rs\_handle\_t handle, rs\_mode\_t mode, const void \*param)

## 12.12.1 Function Documentation

### 12.12.1.1 rs\_get\_ctl\_mode\_from\_setup\_mode()

```
static __inline rs_ret_t rs_get_ctl_mode_from_setup_mode (
    rs_mode_t setup_mode,
    rs_resource_holder_t res,
    rs_mode_t * p_ctl_mode ) [static]
```

get mode for control

Definition at line 111 of file setup\_base\_local.h.

### 12.12.1.2 rs\_setup\_param\_local()

```
static __inline rs_ret_t rs_setup_param_local (
    rs_mode_t mode,
    const void * param,
    rs_code_ref_t code,
    rs_resource_holder_t res ) [static]
```

prepare parameters

Definition at line 55 of file setup\_base\_local.h.

### 12.12.1.3 rs\_update\_param\_local()

```
static __inline rs_ret_t rs_update_param_local (
    rs_handle_t handle,
    rs_mode_t mode,
    const void * param ) [static]
```

update parameters

Definition at line 128 of file setup\_base\_local.h.

## 12.13 lib/rs24g\_ctl\_setup\_core/setup\_common.c File Reference

### Functions

- rs\_ret\_t [rs\\_setup\\_interval](#) (rs\_handle\_t handle, uint32\_t interval)
- rs\_ret\_t [rs\\_setup\\_hpf](#) (rs\_handle\_t handle, rs\_hpf\_t hpf)

## 12.13.1 Function Documentation

### 12.13.1.1 rs\_setup\_hpf()

```
rs_ret_t rs_setup_hpf (
    rs_handle_t handle,
    rs_hpf_t hpf )
```

Update HPF register

Definition at line 180 of file setup\_common.c.

### 12.13.1.2 rs\_setup\_interval()

```
rs_ret_t rs_setup_interval (
    rs_handle_t handle,
    uint32_t interval )
```

Update interval register

Definition at line 170 of file setup\_common.c.

## 12.14 lib/rs24g\_ctl\_setup\_core/setup\_distance.c File Reference

### Functions

- rs\_ret\_t [rs\\_setup\\_beta](#) (rs\_handle\_t handle, uint8\_t beta)
- rs\_ret\_t [rs\\_setup\\_range\\_peak](#) (rs\_handle\_t handle, uint32\_t upper, uint32\_t lower)

### 12.14.1 Function Documentation

#### 12.14.1.1 rs\_setup\_beta()

```
rs_ret_t rs_setup_beta (
    rs_handle_t handle,
    uint8_t beta )
```

Update smoothing factor register

Definition at line 42 of file setup\_distance.c.

#### 12.14.1.2 rs\_setup\_range\_peak()

```
rs_ret_t rs_setup_range_peak (
    rs_handle_t handle,
    uint32_t upper,
    uint32_t lower )
```

Update distance measurement frequency index register

Definition at line 52 of file setup\_distance.c.

## 12.15 lib/rs24g\_ctl\_setup\_core/setup\_distance\_wide.c File Reference

### Functions

- rs\_ret\_t [distance\\_wide\\_getcode](#) (const struct rs\_distance\_param \*lp, rs\_code\_ref\_t code)
- rs\_ret\_t [distance\\_wide\\_update\\_param](#) (rs\_handle\_t handle, const struct rs\_distance\_param \*lp)

### 12.15.1 Function Documentation

#### 12.15.1.1 distance\_wide\_getcode()

```
rs_ret_t distance_wide_getcode (
    const struct rs_distance_param * lp,
    rs_code_ref_t code )
```



prepare parameters for distance detection

Definition at line 33 of file setup\_distance\_wide.c.

Here is the caller graph for this function:



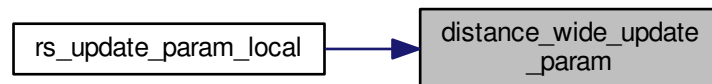
#### 12.15.1.2 distance\_wide\_update\_param()

```
rs_ret_t distance_wide_update_param (
    rs_handle_t handle,
    const struct rs_distance_param * lp )
```

update parameters for distance detection

Definition at line 252 of file setup\_distance\_wide.c.

Here is the caller graph for this function:



## 12.16 lib/rs24g\_ctl\_setup\_core/setup\_motion.c File Reference

### Functions

- `rs_ret_t rs_setup_alpha` (`rs_handle_t handle`, `uint8_t alpha`)
- `rs_ret_t rs_setup_motion_threshold` (`rs_handle_t handle`, `uint16_t motion_threshold`)
- `rs_ret_t rs_setup_startup_count` (`rs_handle_t handle`, `uint8_t startup_count`)
- `rs_ret_t rs_setup_range_motion` (`rs_handle_t handle`, `uint32_t upper`, `uint32_t lower`)

### 12.16.1 Function Documentation

#### 12.16.1.1 rs\_setup\_alpha()

```
rs_ret_t rs_setup_alpha (
    rs_handle_t handle,
    uint8_t alpha )
```

Update smoothing factor register

Definition at line 45 of file setup\_motion.c.

#### 12.16.1.2 rs\_setup\_motion\_threshold()

```
rs_ret_t rs_setup_motion_threshold (
    rs_handle_t handle,
    uint16_t motion_threshold )
```

Update entry motion detection threshold register

Definition at line 55 of file setup\_motion.c.

#### 12.16.1.3 rs\_setup\_range\_motion()

```
rs_ret_t rs_setup_range_motion (
    rs_handle_t handle,
    uint32_t upper,
    uint32_t lower )
```

Update entry motion detection frequency index register

Definition at line 75 of file setup\_motion.c.

#### 12.16.1.4 rs\_setup\_startup\_count()

```
rs_ret_t rs_setup_startup_count (
    rs_handle_t handle,
    uint8_t startup_count )
```

Update start-up counter register

Definition at line 65 of file setup\_motion.c.

## 12.17 lib/rs24g\_ctl\_setup\_core/setup\_motion\_wide.c File Reference

### Functions

- rs\_ret\_t [motion\\_wide\\_getcode](#) (const struct rs\_motion\_param \*lp, rs\_code\_ref\_t code)
- rs\_ret\_t [motion\\_wide\\_update\\_param](#) (rs\_handle\_t handle, const struct rs\_motion\_param \*lp)

### 12.17.1 Function Documentation

#### 12.17.1.1 motion\_wide\_getcode()

```
rs_ret_t motion_wide_getcode (
    const struct rs_motion_param * lp,
    rs_code_ref_t code )
```

prepare parameters for motion detection

Definition at line 34 of file setup\_motion\_wide.c.

Here is the caller graph for this function:



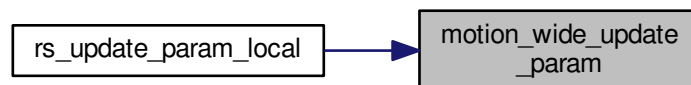
#### 12.17.1.2 motion\_wide\_update\_param()

```
rs_ret_t motion_wide_update_param (  
    rs_handle_t handle,  
    const struct rs_motion_param * lp )
```

update parameters for motion detection

Definition at line 104 of file setup\_motion\_wide.c.

Here is the caller graph for this function:



## 12.18 lib/rs\_ctl\_dev\_poc/include/rs\_i2c.h File Reference

Sensor driver implementation for I2C on MBED@HRM1017.

### Classes

- class [rs\\_i2c](#)

#### 12.18.1 Detailed Description

Sensor driver implementation for I2C on MBED@HRM1017.

##### Version

(PRELIMINARY)

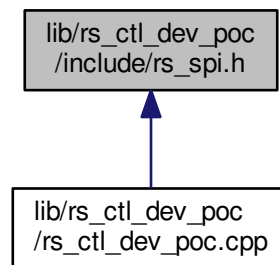
##### Warning

This is just a sample source code.

## 12.19 lib/rs\_ctl\_dev\_poc/include/rs\_spi.h File Reference

Sensor driver implementation for SPI on MBED@HRM1017.

This graph shows which files directly or indirectly include this file:



### Classes

- class [rs\\_spi](#)

### 12.19.1 Detailed Description

Sensor driver implementation for SPI on MBED@HRM1017.

Version

(PRELIMINARY)

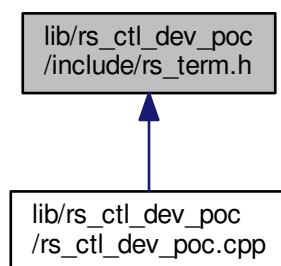
#### Warning

This is just a sample source code.

## 12.20 lib/rs\_ctl\_dev\_poc/include/rs\_term.h File Reference

Sensor driver implementation for GPIO on MBED@HRM1017.

This graph shows which files directly or indirectly include this file:



## Classes

- class [rs\\_term](#)

### 12.20.1 Detailed Description

Sensor driver implementation for GPIO on MBED@HRM1017.

Version

(PRELIMINARY)

#### Warning

This is just a sample source code.

## 12.21 lib/rs\_ctl\_dev\_poc/rs\_ctl\_dev\_poc.cpp File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_dev\\_open](#) (rs\_ctl\_dev\_t \*dev)
- RS\_IF rs\_ret\_t [rs\\_dev\\_close](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_dev\\_write](#) (rs\_ctl\_dev\_t dev, const uint8\_t \*wdata, size\_t size)
- RS\_IF rs\_ret\_t [rs\\_dev\\_write\\_low\\_memory](#) (rs\_ctl\_dev\_t dev, const uint8\_t \*hdata, size\_t hsize, const uint8\_t \*wdata, size\_t wsize)
- RS\_IF rs\_ret\_t [rs\\_dev\\_read](#) (rs\_ctl\_dev\_t dev, const uint8\_t \*wdata, size\_t wsize, uint8\_t \*rdata, size\_t rsize)
- RS\_IF rs\_ret\_t [rs\\_dev\\_term\\_get](#) (rs\_ctl\_dev\_t dev, uint32\_t term, rs\_bool\_t \*val)
- RS\_IF rs\_ret\_t [rs\\_dev\\_term\\_set](#) (rs\_ctl\_dev\_t dev, uint32\_t term, rs\_bool\_t val)
- RS\_IF rs\_ret\_t [rs\\_dev\\_term\\_set\\_trigger](#) (rs\_ctl\_dev\_t dev, uint32\_t term, uint32\_t trigger)
- RS\_IF rs\_ret\_t [rs\\_dev\\_term\\_clear\\_trigger](#) (rs\_ctl\_dev\_t dev, uint32\_t term)
- RS\_IF rs\_ret\_t [rs\\_dev\\_term\\_wait\\_trigger](#) (rs\_ctl\_dev\_t dev, uint32\_t term, uint32\_t timeout, uint32\_t trigger, rs\_bool\_t \*val)

## 12.21.1 Function Documentation

### 12.21.1.1 rs\_dev\_close()

```
RS_IF rs_ret_t rs_dev_close (
    rs_ctl_dev_t dev )
```

close device file

Definition at line 56 of file rs\_ctl\_dev\_poc.cpp.

### 12.21.1.2 rs\_dev\_open()

```
RS_IF rs_ret_t rs_dev_open (
    rs_ctl_dev_t * dev )
```

open device file

Definition at line 42 of file rs\_ctl\_dev\_poc.cpp.

### 12.21.1.3 rs\_dev\_read()

```
RS_IF rs_ret_t rs_dev_read (
    rs_ctl_dev_t dev,
    const uint8_t * wdata,
    size_t wsize,
    uint8_t * rdata,
    size_t rsize )
```

read data from device

See also

[rs\\_spi::read\(\)](#), [rs\\_i2c::read\(\)](#)

Definition at line 81 of file rs\_ctl\_dev\_poc.cpp.

### 12.21.1.4 rs\_dev\_term\_clear\_trigger()

```
RS_IF rs_ret_t rs_dev_term_clear_trigger (
    rs_ctl_dev_t dev,
    uint32_t term )
```

clear triggered flag

See also

[rs\\_term::clear\\_trigger\(\)](#)

Definition at line 117 of file rs\_ctl\_dev\_poc.cpp.

### 12.21.1.5 rs\_dev\_term\_get()

```
RS_IF rs_ret_t rs_dev_term_get (
    rs_ctl_dev_t dev,
```

```
uint32_t term,  
rs_bool_t * val )
```

read device terminal (GPIO) value

See also

[rs\\_term::get\(\)](#)

Definition at line 93 of file rs\_ctl\_dev\_poc.cpp.

#### 12.21.1.6 rs\_dev\_term\_set()

```
RS_IF rs_ret_t rs_dev_term_set (  
    rs_ctl_dev_t dev,  
    uint32_t term,  
    rs_bool_t val )
```

write device terminal (GPIO) value

See also

[rs\\_term::set\(\)](#)

Definition at line 101 of file rs\_ctl\_dev\_poc.cpp.

#### 12.21.1.7 rs\_dev\_term\_set\_trigger()

```
RS_IF rs_ret_t rs_dev_term_set_trigger (  
    rs_ctl_dev_t dev,  
    uint32_t term,  
    uint32_t trigger )
```

setup terminal (GPIO) as trigger

See also

[rs\\_term::set\\_trigger\(\)](#)

Definition at line 109 of file rs\_ctl\_dev\_poc.cpp.

#### 12.21.1.8 rs\_dev\_term\_wait\_trigger()

```
RS_IF rs_ret_t rs_dev_term_wait_trigger (  
    rs_ctl_dev_t dev,  
    uint32_t term,  
    uint32_t timeout,  
    uint32_t trigger,  
    rs_bool_t * val )
```

wait trigger event

See also

[rs\\_term::wait\\_trigger\(\)](#)

Definition at line 125 of file rs\_ctl\_dev\_poc.cpp.

### 12.21.1.9 rs\_dev\_write()

```
RS_IF rs_ret_t rs_dev_write (
    rs_ctl_dev_t dev,
    const uint8_t * wdata,
    size_t size )
```

write data to device

See also

[rs\\_spi::write\(\)](#), [rs\\_i2c::write\(\)](#)

Definition at line 65 of file rs\_ctl\_dev\_poc.cpp.

### 12.21.1.10 rs\_dev\_write\_low\_memory()

```
RS_IF rs_ret_t rs_dev_write_low_memory (
    rs_ctl_dev_t dev,
    const uint8_t * hdata,
    size_t hsize,
    const uint8_t * wdata,
    size_t wsize )
```

write data to device for low memory usage

See also

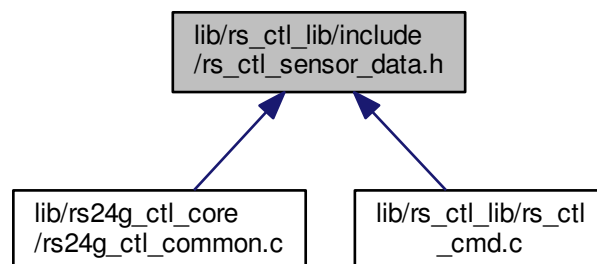
[rs\\_spi::write\\_low\\_memory\(\)](#), [rs\\_i2c::write\\_low\\_memory\(\)](#)

Definition at line 73 of file rs\_ctl\_dev\_poc.cpp.

## 12.22 lib/rs\_ctl\_lib/include/rs\_ctl\_sensor\_data.h File Reference

sensor data

This graph shows which files directly or indirectly include this file:



### 12.22.1 Detailed Description

sensor data



## Version

(PRELIMINARY)

## Warning

This is a part of sensor library source code for Evaluation Kit.

## 12.23 lib/rs\_ctl/lib/rs\_ctl\_cmd.c File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_ctl\\_cmd\\_shutdown](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_cmd\\_disable\\_seq](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_cmd\\_enable\\_seq](#) (rs\_ctl\_dev\_t dev)
- static rs\_ret\_t [read\\_status](#) (rs\_ctl\_dev\_t dev, const struct rs\_ctl\_sensor\_data\_set \*set, struct rs\_ctl\_sensor\_data \*data)
- static rs\_ret\_t [read\\_registers](#) (rs\_ctl\_dev\_t dev, const struct rs\_ctl\_sensor\_data\_set \*set, struct rs\_ctl\_sensor\_data \*data)
- static rs\_ret\_t [read\\_fifo](#) (rs\_ctl\_dev\_t dev, const struct rs\_ctl\_sensor\_data\_set \*set, struct rs\_ctl\_sensor\_data \*data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_cmd\\_get\\_sensor\\_data](#) (rs\_ctl\_dev\_t dev, const struct rs\_ctl\_sensor\_data\_set \*set, struct rs\_ctl\_sensor\_data \*data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_cmd\\_wait\\_and\\_get\\_sensor\\_data](#) (rs\_ctl\_dev\_t dev, uint32\_t timeout, const struct rs\_ctl\_sensor\_data\_set \*set, struct rs\_ctl\_sensor\_data \*data)

### 12.23.1 Function Documentation

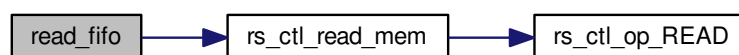
#### 12.23.1.1 read\_fifo()

```
static rs_ret_t read_fifo (
    rs_ctl_dev_t dev,
    const struct rs_ctl_sensor_data_set * set,
    struct rs_ctl_sensor_data * data ) [static]
```

read FIFO

Definition at line 213 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



#### 12.23.1.2 read\_registers()

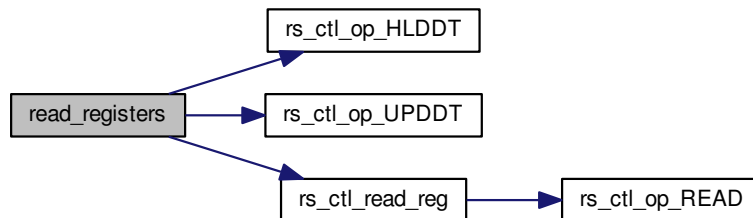
```
static rs_ret_t read_registers (
    rs_ctl_dev_t dev,
```

```
const struct rs_ctl_sensor_data_set * set,
struct rs_ctl_sensor_data * data ) [static]
```

read registers

Definition at line 190 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



#### 12.23.1.3 read\_status()

```
static rs_ret_t read_status (
    rs_ctl_dev_t dev,
    const struct rs_ctl_sensor_data_set * set,
    struct rs_ctl_sensor_data * data ) [static]
```

read status register

Definition at line 178 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



#### 12.23.1.4 rs\_ctl\_cmd\_disable\_seq()

```
RS_IF rs_ret_t rs_ctl_cmd_disable_seq (
    rs_ctl_dev_t dev )
```

"disable Sequencer" to write Sequencer Code [9]

Definition at line 94 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



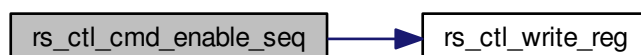
#### 12.23.1.5 rs\_ctl\_cmd\_enable\_seq()

```
RS_IF rs_ret_t rs_ctl_cmd_enable_seq (  
    rs_ctl_dev_t dev )
```

"enable Sequencer" (makes not possible to write Sequencer Code) [10]

Definition at line 107 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



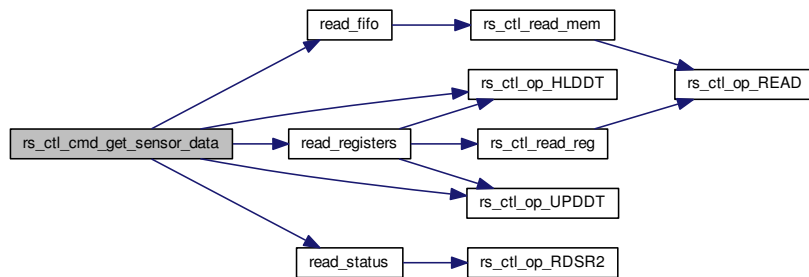
#### 12.23.1.6 rs\_ctl\_cmd\_get\_sensor\_data()

```
RS_IF rs_ret_t rs_ctl_cmd_get_sensor_data (  
    rs_ctl_dev_t dev,  
    const struct rs_ctl_sensor_data_set * set,  
    struct rs_ctl_sensor_data * data )
```

get distance data from Sensor FIFO or registers [11]

Definition at line 126 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



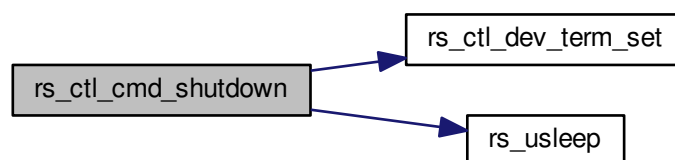
#### 12.23.1.7 rs\_ctl\_cmd\_shutdown()

```
RS_IF rs_ret_t rs_ctl_cmd_shutdown (
    rs_ctl_dev_t dev )
```

"shutdown" command [\[12\]](#)

Definition at line 80 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



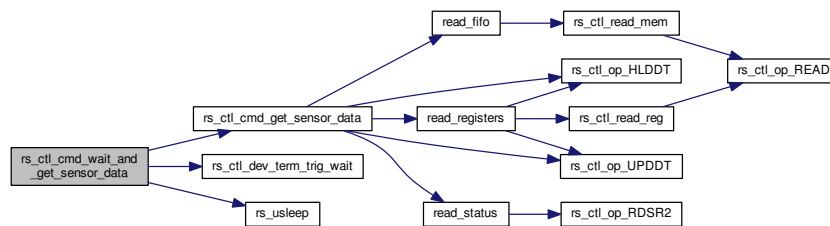
#### 12.23.1.8 rs\_ctl\_cmd\_wait\_and\_get\_sensor\_data()

```
RS_IF rs_ret_t rs_ctl_cmd_wait_and_get_sensor_data (
    rs_ctl_dev_t dev,
    uint32_t timeout,
    const struct rs_ctl_sensor_data_set * set,
    struct rs_ctl_sensor_data * data )
```

wait trigger of OR pin and get sensor data

Definition at line 151 of file rs\_ctl\_cmd.c.

Here is the call graph for this function:



## 12.24 lib/rs\_ctl\_lib/rs\_ctl\_cmd\_sc1233.c File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_ctl\\_cmd\\_chipboot\\_sc1233](#) (rs\_ctl\_dev\_t dev)

### 12.24.1 Function Documentation

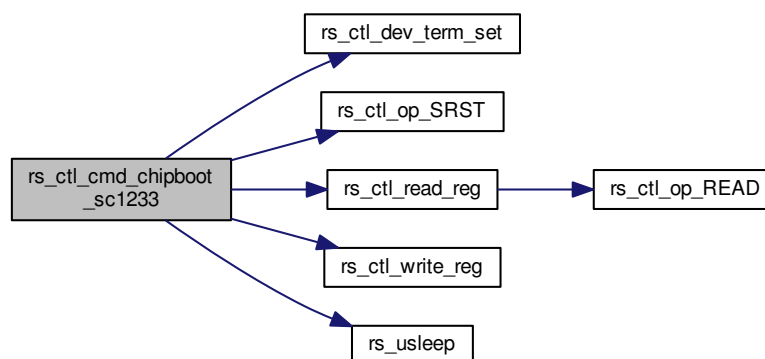
#### 12.24.1.1 rs\_ctl\_cmd\_chipboot\_sc1233()

```
RS_IF rs_ret_t rs_ctl_cmd_chipboot_sc1233 (
    rs_ctl_dev_t dev )
```

boot ("Start-Up") command [1]

Definition at line 27 of file rs\_ctl\_cmd\_sc1233.c.

Here is the call graph for this function:



## 12.25 lib/rs\_ctl\_lib/rs\_ctl\_data.c File Reference

## Functions

- RS\_IF uint16\_t [rs\\_calc\\_crc16](#) (uint16\_t crc16, const uint8\_t \*data, rs\_size\_t size)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_write\\_mem](#) (rs\_ctl\_dev\_t dev, uint32\_t addr, const uint8\_t \*data, rs\_size\_t size)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_read\\_mem](#) (rs\_ctl\_dev\_t dev, uint32\_t addr, uint8\_t \*data, rs\_size\_t size)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_write\\_reg](#) (rs\_ctl\_dev\_t dev, uint32\_t addr, uint32\_t data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_read\\_reg](#) (rs\_ctl\_dev\_t dev, uint32\_t addr, uint32\_t \*data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_write\\_regs](#) (rs\_ctl\_dev\_t dev, uint32\_t addr, const uint32\_t \*data, rs\_size\_t num)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_read\\_regs](#) (rs\_ctl\_dev\_t dev, uint32\_t addr, uint32\_t \*data, rs\_size\_t num)

### 12.25.1 Function Documentation

#### 12.25.1.1 rs\_calc\_crc16()

```
RS_IF uint16_t rs_calc_crc16 (
    uint16_t crc16,
    const uint8_t * data,
    rs_size_t size )
```

calculate CRC-16

Definition at line 25 of file rs\_ctl\_data.c.

#### 12.25.1.2 rs\_ctl\_read\_mem()

```
RS_IF rs_ret_t rs_ctl_read_mem (
    rs_ctl_dev_t dev,
    uint32_t addr,
    uint8_t * data,
    rs_size_t size )
```

read Sensor Memory (FIFO memory)

Definition at line 78 of file rs\_ctl\_data.c.

Here is the call graph for this function:



#### 12.25.1.3 rs\_ctl\_read\_reg()

```
RS_IF rs_ret_t rs_ctl_read_reg (
    rs_ctl_dev_t dev,
    uint32_t addr,
    uint32_t * data )
```

read a Sensor Register

Definition at line 102 of file rs\_ctl\_data.c.

Here is the call graph for this function:



#### 12.25.1.4 rs\_ctl\_read\_regs()

```
RS_IF rs_ret_t rs_ctl_read_regs (
    rs_ctl_dev_t dev,
    uint32_t addr,
    uint32_t * data,
    rs_size_t num )
```

read Sensor Registers

Definition at line 141 of file rs\_ctl\_data.c.

Here is the call graph for this function:



#### 12.25.1.5 rs\_ctl\_write\_mem()

```
RS_IF rs_ret_t rs_ctl_write_mem (
    rs_ctl_dev_t dev,
    uint32_t addr,
    const uint8_t * data,
    rs_size_t size )
```

write Sensor Memory (Sequencer Code or FFT Window Function)

Definition at line 68 of file rs\_ctl\_data.c.

Here is the call graph for this function:



#### 12.25.1.6 rs\_ctl\_write\_reg()

```
RS_IF rs_ret_t rs_ctl_write_reg (
    rs_ctl_dev_t dev,
    uint32_t addr,
    uint32_t data )
```

write a Sensor Register

Definition at line 88 of file rs\_ctl\_data.c.

#### 12.25.1.7 rs\_ctl\_write\_regs()

```
RS_IF rs_ret_t rs_ctl_write_regs (
    rs_ctl_dev_t dev,
    uint32_t addr,
    const uint32_t * data,
    rs_size_t num )
```

write Sensor Registers

Definition at line 118 of file rs\_ctl\_data.c.

## 12.26 lib/rs\_ctl\_lib/rs\_ctl\_op.c File Reference

### Functions

- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_HRST](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_SRST](#) (rs\_ctl\_dev\_t dev, int with\_extra)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_DSLEEP](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_WRSR](#) (rs\_ctl\_dev\_t dev, uint8\_t data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_RDSR](#) (rs\_ctl\_dev\_t dev, uint8\_t \*data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_WRITE](#) (rs\_ctl\_dev\_t dev, uint32\_t address, const uint8\_t \*data, rs\_size\_t size)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_READ](#) (rs\_ctl\_dev\_t dev, uint32\_t address, uint8\_t \*data, rs\_size\_t size)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_RDSR2](#) (rs\_ctl\_dev\_t dev, uint8\_t \*data)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_ENATM](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_DISTM](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_RUNTM](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_STPTM](#) (rs\_ctl\_dev\_t dev)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_HLDDT](#) (rs\_ctl\_dev\_t dev, int with\_timer, int in\_deep\_sleep)
- RS\_IF rs\_ret\_t [rs\\_ctl\\_op\\_UPDDT](#) (rs\_ctl\_dev\_t dev, int with\_timer)



## 12.26.1 Function Documentation

### 12.26.1.1 rs\_ctl\_op\_DISTM()

```
RS_IF rs_ret_t rs_ctl_op_DISTM (
    rs_ctl_dev_t dev )
```

send DISTM Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 178 of file rs\_ctl\_op.c.

### 12.26.1.2 rs\_ctl\_op\_DSLEEP()

```
RS_IF rs_ret_t rs_ctl_op_DSLEEP (
    rs_ctl_dev_t dev )
```

send DSLEEP Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 115 of file rs\_ctl\_op.c.

### 12.26.1.3 rs\_ctl\_op\_ENATM()

```
RS_IF rs_ret_t rs_ctl_op_ENATM (
    rs_ctl_dev_t dev )
```

send ENATM Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 169 of file rs\_ctl\_op.c.

### 12.26.1.4 rs\_ctl\_op\_HLDDT()

```
RS_IF rs_ret_t rs_ctl_op_HLDDT (
    rs_ctl_dev_t dev,
    int with_timer,
    int in_deep_sleep )
```

send HLDDT Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 205 of file rs\_ctl\_op.c.

#### 12.26.1.5 rs\_ctl\_op\_HRST()

```
RS_IF rs_ret_t rs_ctl_op_HRST (
    rs_ctl_dev_t dev )
```

send HRST Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 87 of file rs\_ctl\_op.c.

#### 12.26.1.6 rs\_ctl\_op\_RDSR()

```
RS_IF rs_ret_t rs_ctl_op_RDSR (
    rs_ctl_dev_t dev,
    uint8_t * data )
```

send RDSR Command

See also

[rs\\_ctl\\_dev\\_read\(\)](#)

Definition at line 133 of file rs\_ctl\_op.c.

#### 12.26.1.7 rs\_ctl\_op\_RDSR2()

```
RS_IF rs_ret_t rs_ctl_op_RDSR2 (
    rs_ctl_dev_t dev,
    uint8_t * data )
```

send RDSR2 Command

See also

[rs\\_ctl\\_dev\\_read\(\)](#)

Definition at line 160 of file rs\_ctl\_op.c.

#### 12.26.1.8 rs\_ctl\_op\_READ()

```
RS_IF rs_ret_t rs_ctl_op_READ (
    rs_ctl_dev_t dev,
    uint32_t address,
    uint8_t * data,
    rs_size_t size )
```

send READ Command

See also

[rs\\_ctl\\_dev\\_read\(\)](#)

Definition at line 151 of file rs\_ctl\_op.c.

### 12.26.1.9 rs\_ctl\_op\_RUNTM()

```
RS_IF rs_ret_t rs_ctl_op_RUNTM (
    rs_ctl_dev_t dev )
```

send RUNTM Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 187 of file rs\_ctl\_op.c.

### 12.26.1.10 rs\_ctl\_op\_SRST()

```
RS_IF rs_ret_t rs_ctl_op_SRST (
    rs_ctl_dev_t dev,
    int with_extra )
```

send SRST Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 96 of file rs\_ctl\_op.c.

### 12.26.1.11 rs\_ctl\_op\_STPTM()

```
RS_IF rs_ret_t rs_ctl_op_STPTM (
    rs_ctl_dev_t dev )
```

send STPTM Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 196 of file rs\_ctl\_op.c.

### 12.26.1.12 rs\_ctl\_op\_UPDDT()

```
RS_IF rs_ret_t rs_ctl_op_UPDDT (
    rs_ctl_dev_t dev,
    int with_timer )
```

send UPDDT Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 228 of file rs\_ctl\_op.c.

#### 12.26.1.13 rs\_ctl\_op\_WRITE()

```
RS_IF rs_ret_t rs_ctl_op_WRITE (
    rs_ctl_dev_t dev,
    uint32_t address,
    const uint8_t * data,
    rs_size_t size )
```

send WRITE Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 142 of file rs\_ctl\_op.c.

#### 12.26.1.14 rs\_ctl\_op\_WRSR()

```
RS_IF rs_ret_t rs_ctl_op_WRSR (
    rs_ctl_dev_t dev,
    uint8_t data )
```

send WRSR Command

See also

[rs\\_ctl\\_dev\\_write\(\)](#)

Definition at line 124 of file rs\_ctl\_op.c.

# Bibliography

- [1] In Datasheet [13], chapter "5.3.1. Chip boot", page 58. [3](#), [61](#)
- [2] In Datasheet [13], chapter "5.1. SPI and I2C Transaction", pages 40–50. [7](#)
- [3] In Datasheet [13], chapter "5.1.6. Read Transaction for register", pages 48–49. [31](#)
- [4] In Datasheet [13], chapter "5.1.7. Read Transaction for FIFO memory", pages 49–50. [31](#)
- [5] In Datasheet [13], chapter "5.1.3. Write Transaction for register", pages 45–46. [34](#)
- [6] In Datasheet [13], chapter "5.1.4. Write Transaction for Sequencer program code", pages 46–47. [34](#)
- [7] In Datasheet [13], chapter "5.1.5. Write Transaction for FFT window function", pages 47–48. [34](#)
- [8] In Datasheet [13], chapter "5.3.3. Writing FFT window function", page 59. [44](#)
- [9] In Datasheet [13], chapter "5.3.4. Writing sequencer codes", pages 59–60. [44](#), [58](#)
- [10] In Datasheet [13], chapter "5.3.5. Enabling sequencer", page 60. [44](#), [59](#)
- [11] In Datasheet [13], chapter "5.3.7. Reading results", pages 61–62. [59](#)
- [12] In Datasheet [13], chapter "5.3.9. Shutdown", page 62. [60](#)
- [13] Socionext Inc. *Datasheet SC1233AR3 24GHz radar sensor LSI*. Ver. 1.3. June. 2020. [1](#), [69](#)



# Index

- chipboot
  - chipboot.h, [45](#)
- chipboot.h
  - chipboot, [45](#)
- clear\_trigger
  - rs\_term, [26](#)
- distance\_wide\_getcode
  - setup\_distance\_wide.c, [48](#)
- distance\_wide\_update\_param
  - setup\_distance\_wide.c, [49](#)
- get
  - rs\_term, [27](#)
- get\_devdata
  - rs24g\_ctl\_common.c, [40](#)
- get\_devfifo
  - rs24g\_ctl\_common.c, [40](#)
- get\_size\_fifo
  - rs24g\_ctl\_common.c, [41](#)
- include/defs/rs\_dev\_term.h, [29](#)
- include/rs\_ctl\_dev.h, [29](#)
- include/rs\_macro.h, [35](#)
- include/rs\_sleep.h, [37](#)
- lib/rs24g\_ctl\_core/rs24g\_ctl\_base.c, [38](#)
- lib/rs24g\_ctl\_core/rs24g\_ctl\_common.c, [40](#)
- lib/rs24g\_ctl\_core/rs24g\_ctl\_distance.c, [41](#)
- lib/rs24g\_ctl\_core/rs24g\_ctl\_motion.c, [42](#)
- lib/rs24g\_ctl\_core/rs24g\_ctl\_setup.c, [43](#)
- lib/rs24g\_ctl\_core/sc1233/include/chipboot.h, [45](#)
- lib/rs24g\_ctl\_setup\_core/rs24g\_ctl\_setup\_base.c, [45](#)
- lib/rs24g\_ctl\_setup\_core/sc1233/include/local/setup\_base\_local.h, [46](#)
- lib/rs24g\_ctl\_setup\_core/setup\_common.c, [47](#)
- lib/rs24g\_ctl\_setup\_core/setup\_distance.c, [48](#)
- lib/rs24g\_ctl\_setup\_core/setup\_distance\_wide.c, [48](#)
- lib/rs24g\_ctl\_setup\_core/setup\_motion.c, [49](#)
- lib/rs24g\_ctl\_setup\_core/setup\_motion\_wide.c, [50](#)
- lib/rs\_ctl\_dev\_poc/include/rs\_i2c.h, [51](#)
- lib/rs\_ctl\_dev\_poc/include/rs\_spi.h, [52](#)
- lib/rs\_ctl\_dev\_poc/include/rs\_term.h, [52](#)
- lib/rs\_ctl\_dev\_poc/rs\_ctl\_dev\_poc.cpp, [53](#)
- lib/rs\_ctl\_lib/include/rs\_ctl\_sensor\_data.h, [56](#)
- lib/rs\_ctl\_lib/rs\_ctl\_cmd.c, [57](#)
- lib/rs\_ctl\_lib/rs\_ctl\_cmd\_sc1233.c, [61](#)
- lib/rs\_ctl\_lib/rs\_ctl\_data.c, [61](#)
- lib/rs\_ctl\_lib/rs\_ctl\_op.c, [64](#)
- lib/setup\_motion\_wide.c, [50](#)
- motion\_wide\_update\_param
  - setup\_motion\_wide.c, [51](#)
- read
  - rs\_i2c, [23](#)
  - rs\_spi, [24](#)
- read\_fifo
  - rs\_ctl\_cmd.c, [57](#)
- read\_registers
  - rs\_ctl\_cmd.c, [57](#)
- read\_status
  - rs\_ctl\_cmd.c, [58](#)
- readwrite
  - rs\_spi, [25](#)
- RET\_CHECK
  - rs\_macro.h, [35](#)
- RET\_CONV
  - rs\_macro.h, [35](#)
- RET\_ORG
  - rs\_macro.h, [36](#)
- rs24g\_ctl\_base.c
  - rs\_close, [38](#)
  - rs\_open, [38](#)
  - rs\_resume, [39](#)
  - rs\_shutdown, [39](#)
  - rs\_start, [39](#)
  - rs\_stop, [40](#)
- rs24g\_ctl\_common.c
  - get\_devdata, [40](#)
  - get\_devfifo, [40](#)
  - get\_size\_fifo, [41](#)
- rs24g\_ctl\_distance.c
  - rs\_get\_distance, [41](#)
  - rs\_get\_peak\_level\_lower, [41](#)
  - rs\_set\_peak\_level\_lower, [42](#)
- rs24g\_ctl\_motion.c
  - rs\_get\_motion, [42](#)
  - rs\_read\_smoothed\_level, [43](#)
  - rs\_setup\_smoothed\_level, [43](#)
  - rs\_wait\_motion\_change, [43](#)
- rs24g\_ctl\_setup.c
  - rs\_load\_seqcode, [44](#)
  - rs\_setup\_seq, [44](#)
- rs24g\_ctl\_setup\_base.c
  - rs\_setup\_param, [45](#)
  - rs\_update\_param, [46](#)
- RS\_ASSERT
  - rs\_macro.h, [36](#)
- rs\_calc\_crc16

- rs\_ctl\_data.c, 62
- RS\_CALL
  - rs\_macro.h, 37
- rs\_close
  - rs24g\_ctl\_base.c, 38
- rs\_ctl\_cmd.c
  - read\_fifo, 57
  - read\_registers, 57
  - read\_status, 58
  - rs\_ctl\_cmd\_disable\_seq, 58
  - rs\_ctl\_cmd\_enable\_seq, 59
  - rs\_ctl\_cmd\_get\_sensor\_data, 59
  - rs\_ctl\_cmd\_shutdown, 60
  - rs\_ctl\_cmd\_wait\_and\_get\_sensor\_data, 60
- rs\_ctl\_cmd\_chipboot\_sc1233
  - rs\_ctl\_cmd\_sc1233.c, 61
- rs\_ctl\_cmd\_disable\_seq
  - rs\_ctl\_cmd.c, 58
- rs\_ctl\_cmd\_enable\_seq
  - rs\_ctl\_cmd.c, 59
- rs\_ctl\_cmd\_get\_sensor\_data
  - rs\_ctl\_cmd.c, 59
- rs\_ctl\_cmd\_sc1233.c
  - rs\_ctl\_cmd\_chipboot\_sc1233, 61
- rs\_ctl\_cmd\_shutdown
  - rs\_ctl\_cmd.c, 60
- rs\_ctl\_cmd\_wait\_and\_get\_sensor\_data
  - rs\_ctl\_cmd.c, 60
- rs\_ctl\_data.c
  - rs\_calc\_crc16, 62
  - rs\_ctl\_read\_mem, 62
  - rs\_ctl\_read\_reg, 62
  - rs\_ctl\_read\_regs, 63
  - rs\_ctl\_write\_mem, 63
  - rs\_ctl\_write\_reg, 64
  - rs\_ctl\_write\_regs, 64
- rs\_ctl\_dev.h
  - rs\_ctl\_dev\_close, 30
  - rs\_ctl\_dev\_open, 30
  - rs\_ctl\_dev\_read, 31
  - rs\_ctl\_dev\_term\_get, 32
  - rs\_ctl\_dev\_term\_set, 32
  - rs\_ctl\_dev\_term\_trig\_clear, 33
  - rs\_ctl\_dev\_term\_trig\_set, 33
  - rs\_ctl\_dev\_term\_trig\_wait, 34
  - rs\_ctl\_dev\_write, 34
- rs\_ctl\_dev\_close
  - rs\_ctl\_dev.h, 30
- rs\_ctl\_dev\_open
  - rs\_ctl\_dev.h, 30
- rs\_ctl\_dev\_poc.cpp
  - rs\_dev\_close, 54
  - rs\_dev\_open, 54
  - rs\_dev\_read, 54
  - rs\_dev\_term\_clear\_trigger, 54
  - rs\_dev\_term\_get, 54
  - rs\_dev\_term\_set, 55
  - rs\_dev\_term\_set\_trigger, 55
  - rs\_dev\_term\_wait\_trigger, 55
  - rs\_dev\_write, 55
  - rs\_dev\_write\_low\_memory, 56
- rs\_ctl\_dev\_read
  - rs\_ctl\_dev.h, 31
- rs\_ctl\_dev\_term\_get
  - rs\_ctl\_dev.h, 32
- rs\_ctl\_dev\_term\_set
  - rs\_ctl\_dev.h, 32
- rs\_ctl\_dev\_term\_trig\_clear
  - rs\_ctl\_dev.h, 33
- rs\_ctl\_dev\_term\_trig\_set
  - rs\_ctl\_dev.h, 33
- rs\_ctl\_dev\_term\_trig\_wait
  - rs\_ctl\_dev.h, 34
- rs\_ctl\_dev\_write
  - rs\_ctl\_dev.h, 34
- rs\_ctl\_op.c
  - rs\_ctl\_op\_DISTM, 65
  - rs\_ctl\_op\_DSLEEP, 65
  - rs\_ctl\_op\_ENATM, 65
  - rs\_ctl\_op\_HLDDT, 65
  - rs\_ctl\_op\_HRST, 65
  - rs\_ctl\_op\_RDSR, 66
  - rs\_ctl\_op\_RDSR2, 66
  - rs\_ctl\_op\_READ, 66
  - rs\_ctl\_op\_RUNTM, 66
  - rs\_ctl\_op\_SRST, 67
  - rs\_ctl\_op\_STPTM, 67
  - rs\_ctl\_op\_UPDDT, 67
  - rs\_ctl\_op\_WRITE, 67
  - rs\_ctl\_op\_WRSR, 68
- rs\_ctl\_op\_DISTM
  - rs\_ctl\_op.c, 65
- rs\_ctl\_op\_DSLEEP
  - rs\_ctl\_op.c, 65
- rs\_ctl\_op\_ENATM
  - rs\_ctl\_op.c, 65
- rs\_ctl\_op\_HLDDT
  - rs\_ctl\_op.c, 65
- rs\_ctl\_op\_HRST
  - rs\_ctl\_op.c, 65
- rs\_ctl\_op\_RDSR
  - rs\_ctl\_op.c, 66
- rs\_ctl\_op\_RDSR2
  - rs\_ctl\_op.c, 66
- rs\_ctl\_op\_READ
  - rs\_ctl\_op.c, 66
- rs\_ctl\_op\_RUNTM
  - rs\_ctl\_op.c, 66
- rs\_ctl\_op\_SRST
  - rs\_ctl\_op.c, 67
- rs\_ctl\_op\_STPTM
  - rs\_ctl\_op.c, 67
- rs\_ctl\_op\_UPDDT
  - rs\_ctl\_op.c, 67
- rs\_ctl\_op\_WRITE
  - rs\_ctl\_op.c, 67



- rs\_ctl\_op\_WRSR
  - rs\_ctl\_op.c, 68
- rs\_ctl\_read\_mem
  - rs\_ctl\_data.c, 62
- rs\_ctl\_read\_reg
  - rs\_ctl\_data.c, 62
- rs\_ctl\_read\_regs
  - rs\_ctl\_data.c, 63
- rs\_ctl\_write\_mem
  - rs\_ctl\_data.c, 63
- rs\_ctl\_write\_reg
  - rs\_ctl\_data.c, 64
- rs\_ctl\_write\_regs
  - rs\_ctl\_data.c, 64
- rs\_dev\_close
  - rs\_ctl\_dev\_poc.cpp, 54
- rs\_dev\_open
  - rs\_ctl\_dev\_poc.cpp, 54
- rs\_dev\_read
  - rs\_ctl\_dev\_poc.cpp, 54
- rs\_dev\_term\_clear\_trigger
  - rs\_ctl\_dev\_poc.cpp, 54
- rs\_dev\_term\_get
  - rs\_ctl\_dev\_poc.cpp, 54
- rs\_dev\_term\_set
  - rs\_ctl\_dev\_poc.cpp, 55
- rs\_dev\_term\_set\_trigger
  - rs\_ctl\_dev\_poc.cpp, 55
- rs\_dev\_term\_wait\_trigger
  - rs\_ctl\_dev\_poc.cpp, 55
- rs\_dev\_write
  - rs\_ctl\_dev\_poc.cpp, 55
- rs\_dev\_write\_low\_memory
  - rs\_ctl\_dev\_poc.cpp, 56
- rs\_get\_ctl\_mode\_from\_setup\_mode
  - setup\_base\_local.h, 47
- rs\_get\_distance
  - rs24g\_ctl\_distance.c, 41
- rs\_get\_motion
  - rs24g\_ctl\_motion.c, 42
- rs\_get\_peak\_level\_lower
  - rs24g\_ctl\_distance.c, 41
- rs\_i2c, 23
  - read, 23
  - write, 24
- rs\_load\_seqcode
  - rs24g\_ctl\_setup.c, 44
- rs\_macro.h
  - RET\_CHECK, 35
  - RET\_CONV, 35
  - RET\_ORG, 36
  - RS\_ASSERT, 36
  - RS\_CALL, 37
- rs\_open
  - rs24g\_ctl\_base.c, 38
- rs\_read\_smoothed\_level
  - rs24g\_ctl\_motion.c, 43
- rs\_resume
  - rs24g\_ctl\_base.c, 39
- rs\_set\_peak\_level\_lower
  - rs24g\_ctl\_distance.c, 42
- rs\_setup\_alpha
  - setup\_motion.c, 49
- rs\_setup\_beta
  - setup\_distance.c, 48
- rs\_setup\_hpf
  - setup\_common.c, 47
- rs\_setup\_interval
  - setup\_common.c, 47
- rs\_setup\_motion\_threshold
  - setup\_motion.c, 50
- rs\_setup\_param
  - rs24g\_ctl\_setup\_base.c, 45
- rs\_setup\_param\_local
  - setup\_base\_local.h, 47
- rs\_setup\_range\_motion
  - setup\_motion.c, 50
- rs\_setup\_range\_peak
  - setup\_distance.c, 48
- rs\_setup\_seq
  - rs24g\_ctl\_setup.c, 44
- rs\_setup\_smoothed\_level
  - rs24g\_ctl\_motion.c, 43
- rs\_setup\_startup\_count
  - setup\_motion.c, 50
- rs\_shutdown
  - rs24g\_ctl\_base.c, 39
- rs\_sleep.h
  - rs\_usleep, 37
- rs\_spi, 24
  - read, 24
  - readwrite, 25
  - spi\_read, 25
  - write, 26
- rs\_start
  - rs24g\_ctl\_base.c, 39
- rs\_stop
  - rs24g\_ctl\_base.c, 40
- rs\_term, 26
  - clear\_trigger, 26
  - get, 27
  - set, 27
  - set\_trigger, 27
  - wait\_trigger, 27
- RS\_TERM\_CE
  - Sensor terminal ID, 19
- RS\_TERM\_DETOUT
  - Sensor terminal ID, 19
- RS\_TERM\_NRST
  - Sensor terminal ID, 19
- RS\_TERM\_OR
  - Sensor terminal ID, 19
- RS\_TERM\_TRIGGER\_FALLING
  - type of trigger, 21
- RS\_TERM\_TRIGGER\_RISING
  - type of trigger, 21

- rs\_update\_param
  - rs24g\_ctl\_setup\_base.c, 46
- rs\_update\_param\_local
  - setup\_base\_local.h, 47
- rs\_usleep
  - rs\_sleep.h, 37
- rs\_wait\_motion\_change
  - rs24g\_ctl\_motion.c, 43
- Sensor terminal ID, 19
  - RS\_TERM\_CE, 19
  - RS\_TERM\_DETOUT, 19
  - RS\_TERM\_NIRST, 19
  - RS\_TERM\_OR, 19
- set
  - rs\_term, 27
- set\_trigger
  - rs\_term, 27
- setup\_base\_local.h
  - rs\_get\_ctl\_mode\_from\_setup\_mode, 47
  - rs\_setup\_param\_local, 47
  - rs\_update\_param\_local, 47
- setup\_common.c
  - rs\_setup\_hpf, 47
  - rs\_setup\_interval, 47
- setup\_distance.c
  - rs\_setup\_beta, 48
  - rs\_setup\_range\_peak, 48
- setup\_distance\_wide.c
  - distance\_wide\_getcode, 48
  - distance\_wide\_update\_param, 49
- setup\_motion.c
  - rs\_setup\_alpha, 49
  - rs\_setup\_motion\_threshold, 50
  - rs\_setup\_range\_motion, 50
  - rs\_setup\_startup\_count, 50
- setup\_motion\_wide.c
  - motion\_wide\_getcode, 50
  - motion\_wide\_update\_param, 51
- spi\_read
  - rs\_spi, 25
- type of trigger, 21
  - RS\_TERM\_TRIGGER\_FALLING, 21
  - RS\_TERM\_TRIGGER\_RISING, 21
- wait\_trigger
  - rs\_term, 27
- write
  - rs\_i2c, 24
  - rs\_spi, 26