

MAXREFDES63# Code Documentation

V01.00

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Chapter 1

Main Page

1.1 Introduction

This is the code documentation for the MAXREFDES63# subsystem reference design.

The Files page contains the File List page and the Globals page.

The Globals page contains the Functions, Variables, and Macros sub-pages.

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

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Chapter 3

File Documentation

3.1 Design_Files/source/init_config.c File Reference

```
#include "stm32f10x.h"
#include "stm32f10x_gpio.h"
#include "stm32f10x_usart.h"
#include "stm32f10x_spi.h"
#include "init_config.h"
```

Functions

- void [maxim_uart_init](#) (void)
Initialize the UART peripheral.
- void [maxim_gpio_init](#) (void)
Initialize the GPIO peripheral.
- void [maxim_spi_init](#) (void)
Initialize the SPI peripheral.

Variables

- GPIO_InitTypeDef [gpio_init_structure](#)
- SPI_InitTypeDef [spi_init_structure](#)
- USART_InitTypeDef [usart_init_structure](#)

3.1.1 Detailed Description

Project: MAXREFDES63# Filename: [init_config.c](#) Description: This module contains all the functions used to initialize the STM32F1 peripherals

Revision History:

9-17-2014 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

```
char ch_pmod_value
char (array) s_pmod_string[16]
float f_pmod_value
int n_pmod_value
int (array) an_pmod_value[16]
u16 u_pmod_value
u16 (array) au_pmod_value[16]
u8 uch_pmod_value
u8 (array) auch_pmod_buffer[16]
unsigned int un_pmod_value
int * pun_pmod_value
Definition in file init\_config.c.
```

3.1.2 Function Documentation

3.1.2.1 void maxim_gpio_init (void)

Initialize the GPIO peripheral.

Details

This function initializes the GPIO that are used in this application

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 112 of file [init_config.c](#).

3.1.2.2 void maxim_spi_init (void)

Initialize the SPI peripheral.

Details

This function initializes the SPI2 peripheral
CS is controlled by GPIO PB12

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 149 of file init_config.c.

3.1.2.3 void maxim_uart_init (void)

Initialize the UART peripheral.

Details

This function initializes the UART peripheral that connects to the terminal program.

The baud rate is set to 921600

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 71 of file init_config.c.

3.1.3 Variable Documentation**3.1.3.1 GPIO_InitTypeDef gpio_init_structure**

Definition at line 67 of file init_config.c.

3.1.3.2 SPI_InitTypeDef spi_init_structure

Definition at line 68 of file init_config.c.

3.1.3.3 USART_InitTypeDef usart_init_structure

Definition at line 69 of file init_config.c.

3.2 Design_Files/source/init_config.h File Reference**Functions**

- void [maxim_uart_init](#) (void)
Initialize the UART peripheral.
- void [maxim_spi_init](#) (void)
Initialize the SPI peripheral.
- void [maxim_gpio_init](#) (void)
Initialize the GPIO peripheral.

3.2.1 Detailed Description

Project: MAXREFDES63# Filename: [init_config.h](#) Description: This module contains all the functions used to initialize the STM32F1 peripherals

Revision History:

9-17-2014 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

char ch_pmod_value

char (array) s_pmod_string[16]

float f_pmod_value

int n_pmod_value

int (array) an_pmod_value[16]

u16 u_pmod_value

u16 (array) au_pmod_value[16]

u8 uch_pmod_value

u8 (array) auch_pmod_buffer[16]

unsigned int un_pmod_value

int * pun_pmod_value

Definition in file [init_config.h](#).

3.2.2 Function Documentation

3.2.2.1 void maxim_gpio_init (void)

Initialize the GPIO peripheral.

Details

This function initializes the GPIO that are used in this application

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 112 of file [init_config.c](#).

3.2.2.2 void maxim_spi_init (void)

Initialize the SPI peripheral.

Details

This function initializes the SPI2 peripheral
CS is controlled by GPIO PB12

Parameters

None	
------	--

Return values

None	
------	--

Definition at line 149 of file init_config.c.

3.2.2.3 void maxim_uart_init (void)

Initialize the UART peripheral.

Details

This function initializes the UART peripheral that connects to the terminal program.
The baud rate is set to 921600

Parameters

None	
------	--

Return values

None	
------	--

Definition at line 71 of file init_config.c.

3.3 Design_Files/source/main.c File Reference

```
#include "stm32f10x.h"
#include "stm32f10x_gpio.h"
#include "stm32f10x_rcc.h"
#include "stm32f10x_usart.h"
#include "stm32f10x_spi.h"
#include "init_config.h"
#include "menu.h"
#include "utilities.h"
#include "max14900e.h"
#include <stdio.h>
```

Macros

- #define [MAJOR_REVISION](#) 01

- `#define MINOR_REVISION 00`

Functions

- `int main (void)`

Main function for MAXREFDES63.

3.3.1 Detailed Description

Project: MAXREFDES63# Filename: `main.c` Description: This module contains the Main application for the MAXREF-DES63 example program.

Revision History:

09-16-14 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

`char ch_pmod_value`

`char (array) s_pmod_string[16]`

`float f_pmod_value`

`int n_pmod_value`

`int (array) an_pmod_value[16]`

`u16 u_pmod_value`

`u16 (array) au_pmod_value[16]`

`u8 uch_pmod_value`

`u8 (array) auch_pmod_buffer[16]`

`unsigned int un_pmod_value`

`int * pun_pmod_value`

Definition in file `main.c`.

3.3.2 Macro Definition Documentation

3.3.2.1 `#define MAJOR_REVISION 01`

Definition at line 90 of file `main.c`.

3.3.2.2 `#define MINOR_REVISION 00`

Definition at line 91 of file `main.c`.

3.3.3 Function Documentation

3.3.3.1 int main (void)

Main function for MAXREFDES63.

Details

This function initializes the peripherals and hardware. Displays the menu on the terminal program for user control.

Parameters

<i>None</i>	
-------------	--

Return values

<i>Always</i>	TRUE
---------------	------

Definition at line 105 of file main.c.

3.4 Design_Files/source/max14900e.c File Reference

```
#include "max14900e.h"
#include "stm32f10x_gpio.h"
#include "stm32f10x_spi.h"
```

Functions

- void [maxim_max14900e_init](#) (void)
Initialize the MAX14900E.
- uint16_t [maxim_set_output](#) (uint16_t u_value)
Set output.

3.4.1 Function Documentation

3.4.1.1 void maxim_max14900e_init (void)

Initialize the MAX14900E.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 70 of file max14900e.c.

3.4.1.2 uint16_t maxim_set_output (uint16_t u_value)

Set output.

Parameters

in	<i>u_value</i>	- contains output data and configuration data
----	----------------	---

Return values

<i>None</i>

Definition at line 85 of file max14900e.c.

3.5 Design_Files/source/max14900e.h File Reference

```
#include "stm32f10x.h"
```

Functions

- uint16_t [maxim_set_output](#) (uint16_t u_value)
Set output.
- void [maxim_max14900e_init](#) (void)
Initialize the MAX14900E.

3.5.1 Function Documentation

3.5.1.1 void maxim_max14900e_init (void)

Initialize the MAX14900E.

Parameters

<i>None</i>

Return values

<i>None</i>

Definition at line 70 of file max14900e.c.

3.5.1.2 uint16_t maxim_set_output (uint16_t u_value)

Set output.

Parameters

in	<i>u_value</i>	- contains output data and configuration data
----	----------------	---

Return values

<i>None</i>

Definition at line 85 of file max14900e.c.

3.6 Design_Files/source/menu.c File Reference

```
#include "stdio.h"
#include "menu.h"
```

Functions

- void [maxim_menu_cls](#) ()
Function to clear the screen via Hyperterminal.
- void [maxim_menu_print_maxim_banner](#) ()
Print standard Maxim banner at top of Hyperterminal screen.
- void [maxim_menu_print_maxim_banner_big](#) ()
Print large Maxim banner at top of Hyperterminal screen.
- void [maxim_menu_print_prompt](#) ()
Print a standard prompt for keyboard input ">".
- void [maxim_menu_print_line](#) ()
Print one line of dashes across the screen via Hyperterminal.
- uint8_t [maxim_menu_retrieve_keypress](#) ()
Get a single keypress via Hyperterminal.
- void [maxim_menu_print_main_menu](#) ()
Print the main menu listing choice of module to test.
- void [maxim_menu_print_configuration_description](#) ()
Print configuration byte description.
- void [maxim_menu_print_output_data_description](#) ()
Print output data byte description.

3.6.1 Detailed Description

Project: MAXREFDES63# Filename: [menu.c](#) Description: This module contains all the functions used to generate the menus and menu options used to run the MAXREFDES63# example firmware.

Revision History:

9-16-14 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

char ch_pmod_value

char (array) s_pmod_string[16]

float f_pmod_value

```

int n_pmod_value
int (array) an_pmod_value[16]
u16 u_pmod_value
u16 (array) au_pmod_value[16]
u8 uch_pmod_value
u8 (array) auch_pmod_buffer[16]
unsigned int un_pmod_value
int * pun_pmod_value
Definition in file menu.c.

```

3.6.2 Function Documentation

3.6.2.1 void maxim_menu_cls (void)

Function to clear the screen via Hyperterminal.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 65 of file menu.c.

3.6.2.2 void maxim_menu_print_configuration_description (void)

Print configuration byte description.

Details.

Return values

<i>None</i>	
-------------	--

Definition at line 222 of file menu.c.

3.6.2.3 void maxim_menu_print_line ()

Print one line of dashes across the screen via Hyperterminal.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 150 of file menu.c.

3.6.2.4 void maxim_menu_print_main_menu (void)

Print the main menu listing choice of module to test.

Details.**Return values**

<i>None</i>	
-------------	--

Definition at line 207 of file menu.c.

3.6.2.5 void maxim_menu_print_maxim_banner (void)

Print standard Maxim banner at top of Hyperterminal screen.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 79 of file menu.c.

3.6.2.6 void maxim_menu_print_maxim_banner_big (void)

Print large Maxim banner at top of Hyperterminal screen.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 103 of file menu.c.

3.6.2.7 void maxim_menu_print_output_data_description (void)

Print output data byte description.

Details.**Return values**

<i>None</i>	
-------------	--

Definition at line 240 of file menu.c.

3.6.2.8 void maxim_menu_print_prompt (void)

Print a standard prompt for keyboard input " > ".

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 136 of file menu.c.

3.6.2.9 uint8_t maxim_menu_retrieve_keypress (void)

Get a single keypress via Hyperterminal.

Details

Returns ascii character corresponding to keypress with some preprocessing.
 Escape sequences (Arrow keys and END) are mapped to decimal 240-244 (see defines)
 Characters "0"-"9" converted to numbers 0-9
 Lower case "a"-"z" converted to uppercase "A"-"Z"

Parameters

<i>None</i>	
-------------	--

Return values

<i>Character,partially</i>	decoded.
----------------------------	----------

Definition at line 163 of file menu.c.

3.7 Design_Files/source/menu.h File Reference

```
#include "stm32f10x.h"
#include "stdio.h"
```

Macros

- #define `MAIN_MENU` 0
// Menu state machine state
- #define `WAIT_KEYPRESS` 1
// Menu state machine state
- #define `SET_CONFIG` 2
// Menu state machine state
- #define `SET_OUTPUT` 3
// Menu state machine state
- #define `KEYPRESS_ARROW_UP` 240
Assign up-arrow an extended ascii code which won't be used elsewhere.
- #define `KEYPRESS_ARROW_DOWN` 241
Assign up-arrow an extended ascii code which won't be used elsewhere.
- #define `KEYPRESS_ARROW_LEFT` 242
Assign up-arrow an extended ascii code which won't be used elsewhere.
- #define `KEYPRESS_ARROW_RIGHT` 243
Assign up-arrow an extended ascii code which won't be used elsewhere.
- #define `KEYPRESS_END` 244
Assign up-arrow an extended ascii code which won't be used elsewhere.

Functions

- void `maxim_menu_cls` (void)
Function to clear the screen via Hyperterminal.
- void `maxim_menu_print_maxim_banner` (void)
Print standard Maxim banner at top of Hyperterminal screen.
- void `maxim_menu_print_maxim_banner_big` (void)
Print large Maxim banner at top of Hyperterminal screen.
- void `maxim_menu_print_prompt` (void)
Print a standard prompt for keyboard input ">".
- uint8_t `maxim_menu_retrieve_keypress` (void)
Get a single keypress via Hyperterminal.
- void `maxim_menu_print_main_menu` (void)
Print the main menu listing choice of module to test.
- void `maxim_menu_print_configuration_description` (void)
Print configuration byte description.
- void `maxim_menu_print_output_data_description` (void)
Print output data byte description.

3.7.1 Detailed Description

Project: MAXREFDES63# Filename: [menu.h](#) Description: This module contains all the functions used to generate the menus and menu options used to run the MAXREFDES63 example firmware.

Revision History:

09-16-14 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

char ch_pmod_value

char (array) s_pmod_string[16]

float f_pmod_value

int n_pmod_value

int (array) an_pmod_value[16]

u16 u_pmod_value

u16 (array) au_pmod_value[16]

u8 uch_pmod_value

u8 (array) auch_pmod_buffer[16]

unsigned int un_pmod_value

int * pun_pmod_value

Definition in file [menu.h](#).

3.7.2 Macro Definition Documentation

3.7.2.1 **#define KEYPRESS_ARROW_DOWN 241**

Assign up-arrow an extended ascii code which won't be used elsewhere.

Definition at line 74 of file menu.h.

3.7.2.2 **#define KEYPRESS_ARROW_LEFT 242**

Assign up-arrow an extended ascii code which won't be used elsewhere.

Definition at line 75 of file menu.h.

3.7.2.3 **#define KEYPRESS_ARROW_RIGHT 243**

Assign up-arrow an extended ascii code which won't be used elsewhere.

Definition at line 76 of file menu.h.

3.7.2.4 **#define KEYPRESS_ARROW_UP 240**

Assign up-arrow an extended ascii code which won't be used elsewhere.

Definition at line 73 of file menu.h.

3.7.2.5 #define KEYPRESS_END 244

Assign up-arrow an extended ascii code which won't be used elsewhere.

Definition at line 77 of file menu.h.

3.7.2.6 #define MAIN_MENU 0

// Menu state machine state

Definition at line 68 of file menu.h.

3.7.2.7 #define SET_CONFIG 2

// Menu state machine state

Definition at line 70 of file menu.h.

3.7.2.8 #define SET_OUTPUT 3

// Menu state machine state

Definition at line 71 of file menu.h.

3.7.2.9 #define WAIT_KEYPRESS 1

// Menu state machine state

Definition at line 69 of file menu.h.

3.7.3 Function Documentation

3.7.3.1 void maxim_menu_cls (void)

Function to clear the screen via Hyperterminal.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 65 of file menu.c.

3.7.3.2 void maxim_menu_print_configuration_description (void)

Print configuration byte description.

Details.

Return values

<i>None</i>	
-------------	--

Definition at line 222 of file menu.c.

3.7.3.3 void maxim_menu_print_main_menu (void)

Print the main menu listing choice of module to test.

Details.**Return values**

<i>None</i>	
-------------	--

Definition at line 207 of file menu.c.

3.7.3.4 void maxim_menu_print_maxim_banner (void)

Print standard Maxim banner at top of Hyperterminal screen.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 79 of file menu.c.

3.7.3.5 void maxim_menu_print_maxim_banner_big (void)

Print large Maxim banner at top of Hyperterminal screen.

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 103 of file menu.c.

3.7.3.6 void maxim_menu_print_output_data_description (void)

Print output data byte description.

Details.**Return values**

<i>None</i>	
-------------	--

Definition at line 240 of file menu.c.

3.7.3.7 void maxim_menu_print_prompt (void)

Print a standard prompt for keyboard input " > ".

Parameters

<i>None</i>	
-------------	--

Return values

<i>None</i>	
-------------	--

Definition at line 136 of file menu.c.

3.7.3.8 uint8_t maxim_menu_retrieve_keypress (void)

Get a single keypress via Hyperterminal.

Details

Returns ascii character corresponding to keypress with some preprocessing.
 Escape sequences (Arrow keys and END) are mapped to decimal 240-244 (see defines)
 Characters "0"-"9" converted to numbers 0-9
 Lower case "a"-"z" converted to uppercase "A"-"Z"

Parameters

<i>None</i>	
-------------	--

Return values

<i>Character,partially</i>	decoded.
----------------------------	----------

Definition at line 163 of file menu.c.

3.8 Design_Files/source/retarget.c File Reference

```
#include <stdio.h>
#include <rt_misc.h>
#include "stm32f10x.h"
#include "stm32f10x_usart.h"
```

Functions

- int [sendchar](#) (int c)
- int [getkey](#) (void)
- int [fputc](#) (int c, FILE *f)
- int [fgetc](#) (FILE *f)
- int [ferror](#) (FILE *f)
- void [_ttywrch](#) (int c)
- void [_sys_exit](#) (int return_code)

3.8.1 Detailed Description

Project: MAXREFDES63# Filename: [retarget.c](#) Description: This file redefines functions used by printf() for outputting characters and getchar() for inputting characters. The printf() function ultimately relies on the [fputc\(\)](#) function to operate. The [fputc\(\)](#) has been implemented using USART_SendData() Similarly, getchar() relies on the [fgetc\(\)](#) function to operate. [fgetc\(\)](#) has been implemented using USART_ReceiveData()

Revision History:

04-05-13 Rev 01.00 MTS Initial release.

02-27-14 Rev 02.00 MTS Re-release.

This code follows the following naming conventions:

char ch_pmod_value

char (array) s_pmod_string[16]

float f_pmod_value

int n_pmod_value

int (array) an_pmod_value[16]

u16 u_pmod_value

u16 (array) au_pmod_value[16]

u8 uch_pmod_value

u8 (array) auch_pmod_buffer[16]

unsigned int un_pmod_value

int * pun_pmod_value

Definition in file [retarget.c](#).

3.8.2 Function Documentation

3.8.2.1 void _sys_exit (int *return_code*)

Definition at line 115 of file retarget.c.

3.8.2.2 void _ttywrch (int c)

Definition at line 108 of file retarget.c.

3.8.2.3 int ferror (FILE * f)

Definition at line 102 of file retarget.c.

3.8.2.4 int fgetc (FILE * f)

Definition at line 91 of file retarget.c.

3.8.2.5 int fputc (int c, FILE * f)

Definition at line 83 of file retarget.c.

3.8.2.6 int getkey (void)**3.8.2.7 int sendchar (int c)****3.9 Design_Files/source/utilities.c File Reference**

```
#include "utilities.h"
#include "stm32f10x.h"
#include "stdio.h"
#include "stdlib.h"
```

Functions

- void [maxim_delay](#) (uint32_t un_delay)
Delay function.
- int [maxim_get_hex](#) (void)
Receive inputs from UART and convert the HEX values to interger.
- int [maxim_htoi](#) (char *ps_str)
Convert HEX to interger.

3.9.1 Detailed Description

```
*****
```

Project: MAXREFDES63# Filename: [utilities.c](#) Description: This module contains a collection of general utility functions which are not specific to any particular module.

Revision History:

9/17/2014 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

char ch_pmod_value
 char (array) s_pmod_string[16]
 float f_pmod_value
 int n_pmod_value
 int (array) an_pmod_value[16]
 u16 u_pmod_value
 u16 (array) au_pmod_value[16]
 u8 uch_pmod_value
 u8 (array) auch_pmod_buffer[16]
 unsigned int un_pmod_value
 int * pun_pmod_value
 Definition in file [utilities.c](#).

3.9.2 Function Documentation

3.9.2.1 void maxim_delay (uint32_t un_delay)

Delay function.

Parameters

in	<i>un_delay</i>	-delay factor
----	-----------------	---------------

Return values

<i>None</i>

Definition at line 67 of file utilities.c.

3.9.2.2 int maxim_get_hex (void)

Receive inputs from UART and convert the HEX values to interger.

Parameters

<i>None</i>

Return values

<i>None</i>

Definition at line 80 of file utilities.c.

3.9.2.3 int maxim_htoi (char * ps_str)

Convert HEX to interger.

Parameters

in	ps_str	- a string that contains the hex value in ascii characters
----	--------	--

Return values

None

Definition at line 104 of file utilities.c.

3.10 Design_Files/source/utilities.h File Reference

```
#include "stm32f10x.h"
```

Macros

- #define [ONE_SECOND](#) 7200000

Functions

- void [maxim_delay](#) (uint32_t un_delay)
Delay function.
- int [maxim_htoi](#) (char *str)
Convert HEX to interger.
- int [maxim_get_hex](#) (void)
Receive inputs from UART and convert the HEX values to interger.

3.10.1 Detailed Description

Project: MAXREFDES63# Filename: [utilities.h](#) Description: This module contains a collection of general utility functions which are not specific to any particular module.

Revision History:

9/17/2014 Rev 01.00 GL Initial release.

This code follows the following naming conventions:

char ch_pmod_value

char (array) s_pmod_string[16]

float f_pmod_value

int n_pmod_value

int (array) an_pmod_value[16]

u16 u_pmod_value

u16 (array) au_pmod_value[16]

u8 uch_pmod_value

u8 (array) auch_pmod_buffer[16]

unsigned int un_pmod_value

int * pun_pmod_value

Definition in file [utilities.h](#).

3.10.2 Macro Definition Documentation

3.10.2.1 #define ONE_SECOND 7200000

Definition at line 66 of file utilities.h.

3.10.3 Function Documentation

3.10.3.1 void maxim_delay (uint32_t un_delay)

Delay function.

Parameters

in	un_delay	-delay factor
----	----------	---------------

Return values

None

Definition at line 67 of file utilities.c.

3.10.3.2 int maxim_get_hex (void)

Receive inputs from UART and convert the HEX values to interger.

Parameters

None

Return values

None

Definition at line 80 of file utilities.c.

3.10.3.3 int maxim_htoi (char * ps_str)

Convert HEX to interger.

Parameters

<i>in</i>	<i>ps_str</i>	- a string that contains the hex value in ascii characters
-----------	---------------	--

Return values

<i>None</i>

Definition at line 104 of file utilities.c.

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