1. Description

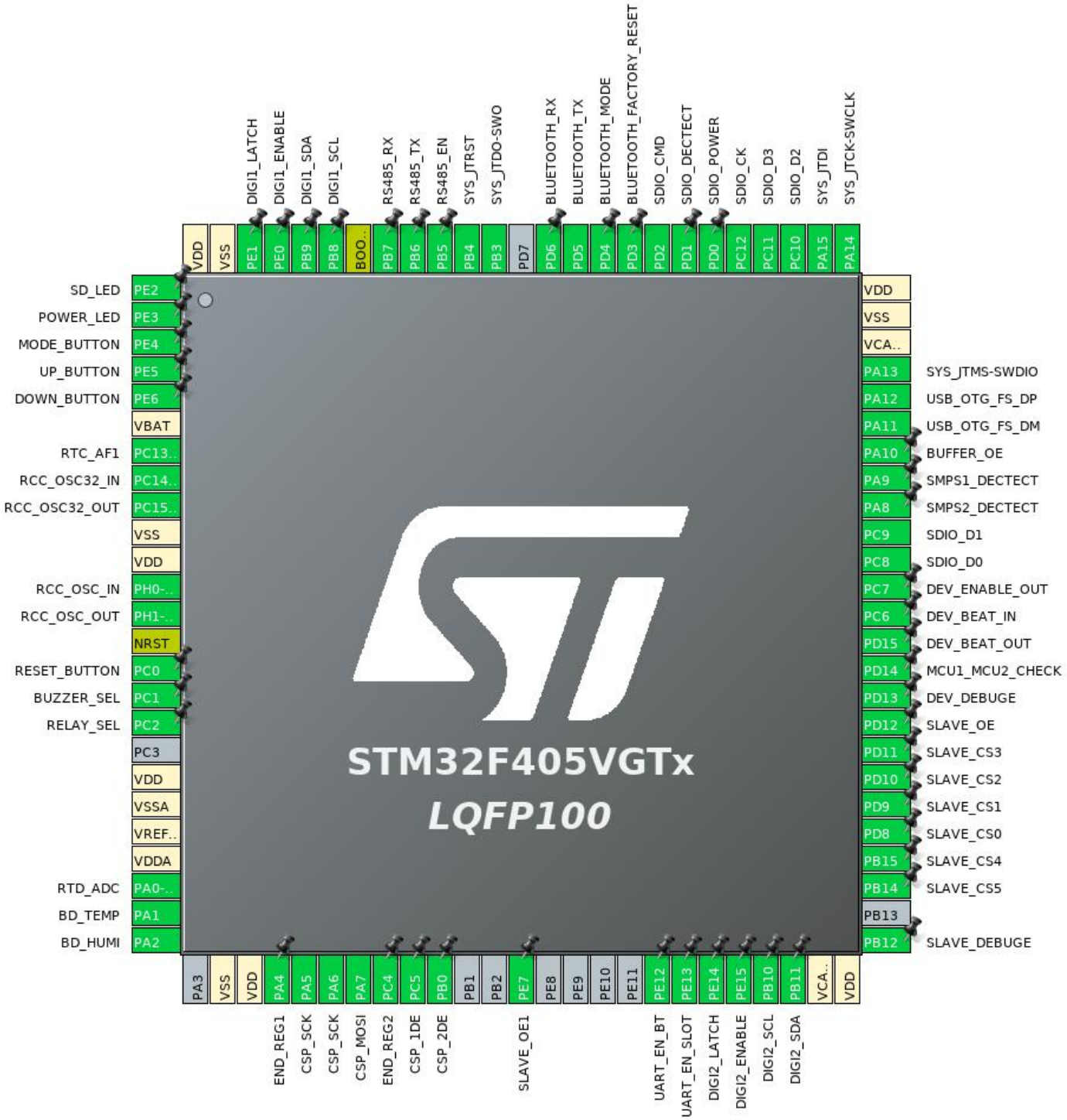
1.1. Project

Project Name	TotalMonitor470
Board Name	custom
Generated with:	STM32CubeMX 5.4.0
Date	12/10/2019

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F405/415
MCU name	STM32F405VGTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



3. Pins Configuration

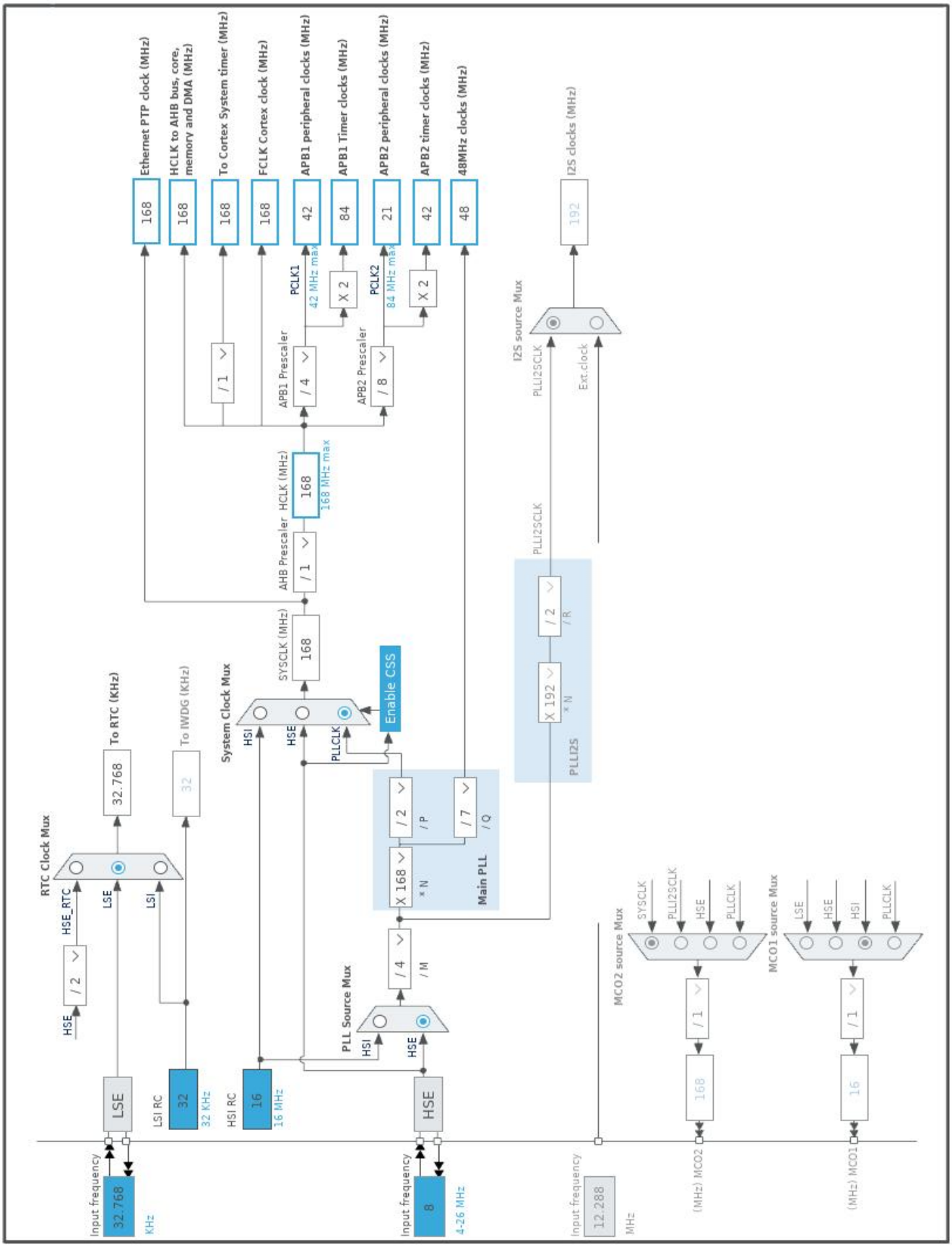
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Output	SD_LED
2	PE3 *	I/O	GPIO_Output	POWER_LED
3	PE4	I/O	GPIO_EXTI4	MODE_BUTTON
4	PE5	I/O	GPIO_EXTI5	UP_BUTTON
5	PE6	I/O	GPIO_EXTI6	DOWN_BUTTON
6	VBAT	Power		
7	PC13-ANTI_TAMP	I/O	RTC_AF1	
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN	I/O	RCC_OSC_IN	
13	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Output	RESET_BUTTON
16	PC1 *	I/O	GPIO_Output	BUZZER_SEL
17	PC2 *	I/O	GPIO_Output	RELAY_SEL
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP	I/O	ADC2_IN0	RTD_ADC
24	PA1	I/O	ADC2_IN1	BD_TEMP
25	PA2	I/O	ADC2_IN2	BD_HUMI
27	VSS	Power		
28	VDD	Power		
29	PA4 *	I/O	GPIO_Output	END_REG1
30	PA5	I/O	SPI1_SCK	CSP_SCK
31	PA6	I/O	SPI1_MISO	CSP_SCK
32	PA7	I/O	SPI1_MOSI	CSP_MOSI
33	PC4 *	I/O	GPIO_Output	END_REG2
34	PC5 *	I/O	GPIO_Output	CSP_1DE
35	PB0 *	I/O	GPIO_Output	CSP_2DE
38	PE7 *	I/O	GPIO_Output	SLAVE_OE1
43	PE12 *	I/O	GPIO_Output	UART_EN_BT
44	PE13 *	I/O	GPIO_Output	UART_EN_SLOT

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
45	PE14 *	I/O	GPIO_Output	DIGI2_LATCH
46	PE15 *	I/O	GPIO_Output	DIGI2_ENABLE
47	PB10 *	I/O	GPIO_Output	DIGI2_SCL
48	PB11 *	I/O	GPIO_Output	DIGI2_SDA
49	VCAP_1	Power		
50	VDD	Power		
51	PB12 *	I/O	GPIO_Output	SLAVE_DEBUGE
53	PB14 *	I/O	GPIO_Output	SLAVE_CS5
54	PB15 *	I/O	GPIO_Output	SLAVE_CS4
55	PD8 *	I/O	GPIO_Output	SLAVE_CS0
56	PD9 *	I/O	GPIO_Output	SLAVE_CS1
57	PD10 *	I/O	GPIO_Output	SLAVE_CS2
58	PD11 *	I/O	GPIO_Output	SLAVE_CS3
59	PD12 *	I/O	GPIO_Output	SLAVE_OE
60	PD13 *	I/O	GPIO_Input	DEV_DEBUGE
61	PD14 *	I/O	GPIO_Input	MCU1_MCU2_CHECK
62	PD15 *	I/O	GPIO_Output	DEV_BEAT_OUT
63	PC6 *	I/O	GPIO_Input	DEV_BEAT_IN
64	PC7 *	I/O	GPIO_Output	DEV_ENABLE_OUT
65	PC8	I/O	SDIO_D0	
66	PC9	I/O	SDIO_D1	
67	PA8 *	I/O	GPIO_Input	SMPS2_DECTECT
68	PA9 *	I/O	GPIO_Input	SMPS1_DECTECT
69	PA10 *	I/O	GPIO_Output	BUFFER_OE
70	PA11	I/O	USB_OTG_FS_DM	
71	PA12	I/O	USB_OTG_FS_DP	
72	PA13	I/O	SYS_JTMS-SWDIO	
73	VCAP_2	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14	I/O	SYS_JTCK-SWCLK	
77	PA15	I/O	SYS_JTDI	
78	PC10	I/O	SDIO_D2	
79	PC11	I/O	SDIO_D3	
80	PC12	I/O	SDIO_CK	
81	PD0 *	I/O	GPIO_Output	SDIO_POWER
82	PD1 *	I/O	GPIO_Input	SDIO_DECTECT
83	PD2	I/O	SDIO_CMD	

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
84	PD3 *	I/O	GPIO_Output	BLUETOOTH_FACTORY_RESET
85	PD4 *	I/O	GPIO_Output	BLUETOOTH_MODE
86	PD5	I/O	USART2_TX	BLUETOOTH_TX
87	PD6	I/O	USART2_RX	BLUETOOTH_RX
89	PB3	I/O	SYS_JTDO-SWO	
90	PB4	I/O	SYS_JTRST	
91	PB5 *	I/O	GPIO_Output	RS485_EN
92	PB6	I/O	USART1_TX	RS485_TX
93	PB7	I/O	USART1_RX	RS485_RX
94	BOOT0	Boot		
95	PB8 *	I/O	GPIO_Output	DIGI1_SCL
96	PB9 *	I/O	GPIO_Output	DIGI1_SDA
97	PE0 *	I/O	GPIO_Output	DIGI1_ENABLE
98	PE1 *	I/O	GPIO_Output	DIGI1_LATCH
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	TotalMonitor470
Project Folder	/home/phil/work/soondori/totalmonitor470
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_F4 V1.24.1

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F405/415
MCU	STM32F405VGTx
Datasheet	022152_Rev8

6.2. Parameter Selection

Temperature	25
Vdd	3.3

7. IPs and Middleware Configuration

7.1. ADC1

mode: Vbat Channel

7.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 4 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	**Enabled ***
Continuous Conversion Mode	**Enabled ***
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	**Enabled ***
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel Vbat
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.2. ADC2

mode: IN0

mode: IN1

mode: IN2

7.2.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 4 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Enabled
Continuous Conversion Mode	**Enabled ***
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	**Enabled ***
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	**3 ***
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 0
Sampling Time	3 Cycles
Rank	**2 ***
Channel	**Channel 1 ***
Sampling Time	3 Cycles
Rank	**3 ***
Channel	**Channel 2 ***
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.3. GPIO

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled

Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

7.5. RTC

mode: Activate Clock Source

mode: Activate Calendar

mode: Timestamp

7.5.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

Calendar Time:

Data Format	**Binary data format ***
Hours	0
Minutes	0
Seconds	0
Day Light Saving: value of hour adjustment	Daylightsaving None
Store Operation	Storeoperation Reset

Calendar Date:

Week Day	Monday
Month	January
Date	1
Year	**19 ***

Time Stamp:

Time Stamp Pin Edge	Time Stamp occurs on the Rising edge

7.6. SDIO

Mode: SD 4 bits Wide bus

7.6.1. Parameter Settings:

SDIO parameters:

Clock transition on which the bit capture is made	Rising transition
SDIO Clock divider bypass	Disable
SDIO Clock output enable when the bus is idle	Disable the power save for the clock
SDIO hardware flow control	The hardware control flow is disabled
SDIOCLK clock divide factor	0

7.7. SPI1

Mode: Full-Duplex Slave

7.7.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.8. SYS

Debug: JTAG (5 pins)

Timebase Source: TIM1

7.9. USART1

Mode: Asynchronous

7.9.1. Parameter Settings:

Basic Parameters:

Baud Rate	**921600 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.10. USART2

Mode: Asynchronous

7.10.1. Parameter Settings:

Basic Parameters:

Baud Rate	**921600 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.11. USB_OTG_FS

Mode: Device_Only

7.11.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Low power	Disabled
Link Power Management	Disabled
VBUS sensing	Disabled
Signal start of frame	Disabled

7.12. FATFS

mode: SD Card

7.12.1. Set Defines:

Version:

FATFS version	R0.12c

Function Parameters:

FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	**Enabled ***
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	**Disabled ***
USE_EXPAND (Use f_expand function)	Disabled
USE_CHMOD (Change attributes function)	Disabled
USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	**Korean (DBCS) ***
USE_LFN (Use Long Filename)	**Enabled with dynamic working buffer on the STACK ***
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	**ANSI/OEM ***
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	**4096 ***
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_TINY (Tiny mode)	Disabled
FS_EXFAT (Support of exFAT file system)	**Enabled ***
FS_NORTC (Timestamp feature)	Dynamic timestamp
NORTC_YEAR (Year for timestamp)	2015
NORTC_MON (Month for timestamp)	6
NORTC_MDAY (Day for timestamp)	4
FS_REENTRANT (Re-Entrancy)	Enabled
FS_TIMEOUT (Timeout ticks)	1000
SYNC_t (O/S sync object)	osSemaphoreId
FS_LOCK (Number of files opened simultaneously)	2

7.12.2. Advanced Settings:

SDIO/SDMMC:

SDIO instance	SDIO
Use dma template	Enabled
BSP code for SD	Generic

7.13. FREERTOS

Interface: CMSIS_V1

7.13.1. Config parameters:

API:

FreeRTOS API	CMSIS v1

Versions:

FreeRTOS version	10.0.1
CMSIS-RTOS version	1.02

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Disabled
USE_COUNTING_SEMAPHORES	**Enabled ***
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Enabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled

Memory management settings:

Memory Allocation	Dynamic / Static
TOTAL_HEAP_SIZE	15360

Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	**Enabled ***
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

7.13.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	**Enabled ***
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled
xTaskAbortDelay	Disabled

xTaskGetHandle	Disabled

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC2	PA0-WKUP	ADC2_IN0	Analog mode	No pull-up and no pull-down	n/a	RTD_ADC
	PA1	ADC2_IN1	Analog mode	No pull-up and no pull-down	n/a	BD_TEMP
	PA2	ADC2_IN2	Analog mode	No pull-up and no pull-down	n/a	BD_HUMI
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
RTC	PC13-ANTI_TAMP	RTC_AF1	n/a	n/a	n/a	
SDIO	PC8	SDIO_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC9	SDIO_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC10	SDIO_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC11	SDIO_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC12	SDIO_CK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD2	SDIO_CMD	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	CSP_SCK
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	CSP_SCK
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	CSP_MOSI
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PA15	SYS_JTDI	n/a	n/a	n/a	
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	
	PB4	SYS_JTRST	n/a	n/a	n/a	
USART1	PB6	USART1_TX	Alternate Function Push Pull	Pull-up	**Very High ***	RS485_TX
	PB7	USART1_RX	Alternate Function Push Pull	Pull-up	**Very High**	RS485_RX

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
					*	
USART2	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High ***	BLUETOOTH_TX
	PD6	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High ***	BLUETOOTH_RX
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
GPIO	PE2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SD_LED
	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	POWER_LED
	PE4	GPIO_EXTI4	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	MODE_BUTTON
	PE5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	UP_BUTTON
	PE6	GPIO_EXTI6	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	DOWN_BUTTON
	PC0	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	RESET_BUTTON
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	BUZZER_SEL
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RELAY_SEL
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	END_REG1
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	END_REG2
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CSP_1DE
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CSP_2DE
	PE7	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**Very High ***	SLAVE_OE1
	PE12	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**Very High ***	UART_EN_BT
	PE13	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**Very High ***	UART_EN_SLOT
	PE14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DIGI2_LATCH
	PE15	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	DIGI2_ENABLE
	PB10	GPIO_Output	Output Push Pull	**Pull-up ***	Low	DIGI2_SCL
	PB11	GPIO_Output	Output Push Pull	**Pull-up ***	Low	DIGI2_SDA
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SLAVE_DEBUGE
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	SLAVE_CS5

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	SLAVE_CS4
	PD8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	SLAVE_CS0
	PD9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	SLAVE_CS1
	PD10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	SLAVE_CS2
	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	SLAVE_CS3
	PD12	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**Very High ***	SLAVE_OE
	PD13	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	DEV_DEBUGE
	PD14	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	MCU1_MCU2_CHECK
	PD15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DEV_BEAT_OUT
	PC6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DEV_BEAT_IN
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DEV_ENABLE_OUT
	PA8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SMPS2_DECTECT
	PA9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SMPS1_DECTECT
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	BUFFER_OE
	PD0	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**Very High ***	SDIO_POWER
	PD1	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	SDIO_DECTECT
	PD3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	BLUETOOTH_FACTORY_RESET
	PD4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	BLUETOOTH_MODE
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RS485_EN
	PB8	GPIO_Output	**Output Open Drain ***	**Pull-up ***	Low	DIGI1_SCL
	PB9	GPIO_Output	**Output Open Drain ***	**Pull-up ***	Low	DIGI1_SDA
	PE0	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	DIGI1_ENABLE
	PE1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DIGI1_LATCH

8.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA2_Stream0	Peripheral To Memory	Low
ADC2	DMA2_Stream2	Peripheral To Memory	Low
USART1_TX	DMA2_Stream7	Memory To Peripheral	**High ***
USART2_RX	DMA1_Stream5	Peripheral To Memory	**High ***
USART2_TX	DMA1_Stream6	Memory To Peripheral	**Medium ***
USART1_RX	DMA2_Stream5	Peripheral To Memory	**Very High ***
SDIO_RX	DMA2_Stream3	Peripheral To Memory	Low
SDIO_TX	DMA2_Stream6	Memory To Peripheral	Low

ADC1: DMA2_Stream0 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	**Word ***

ADC2: DMA2_Stream2 DMA request Settings:

Mode:	**Circular ***
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	**Word ***

USART1_TX: DMA2_Stream7 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART2_RX: DMA1_Stream5 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART2_TX: DMA1_Stream6 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART1_RX: DMA2_Stream5 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

SDIO_RX: DMA2_Stream3 DMA request Settings:

Mode:	**Peripheral Flow Control ***
Use fifo:	**Enable ***
FIFO Threshold:	Full
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	Word
Peripheral Burst Size:	**4 Increment ***
Memory Burst Size:	4 Increment

SDIO_TX: DMA2_Stream6 DMA request Settings:

Mode:	**Peripheral Flow Control ***
Use fifo:	**Enable ***
FIFO Threshold:	Full
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	Word
Peripheral Burst Size:	**4 Increment ***
Memory Burst Size:	4 Increment

8.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Pre-fetch fault, memory access fault	true	0	0
Undefined instruction or illegal state	true	0	0
System service call via SWI instruction	true	0	0
Debug monitor	true	0	0
Pendable request for system service	true	15	0
System tick timer	true	15	0
EXTI line4 interrupt	true	6	0
DMA1 stream5 global interrupt	true	6	0
DMA1 stream6 global interrupt	true	6	0
EXTI line[9:5] interrupts	true	6	0
TIM1 update interrupt and TIM10 global interrupt	true	0	0
USART1 global interrupt	true	5	0
USART2 global interrupt	true	6	0
SDIO global interrupt	true	5	0
DMA2 stream0 global interrupt	true	5	0
DMA2 stream2 global interrupt	true	5	0
DMA2 stream3 global interrupt	true	5	0
DMA2 stream5 global interrupt	true	5	0
DMA2 stream6 global interrupt	true	5	0
DMA2 stream7 global interrupt	true	6	0
PVD interrupt through EXTI line 16	unused		
RTC tamper and timestamp interrupts through EXTI line 21	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1, ADC2 and ADC3 global interrupts	unused		
SPI1 global interrupt	unused		
USB On The Go FS global interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

9. Software Pack Report