1. Description

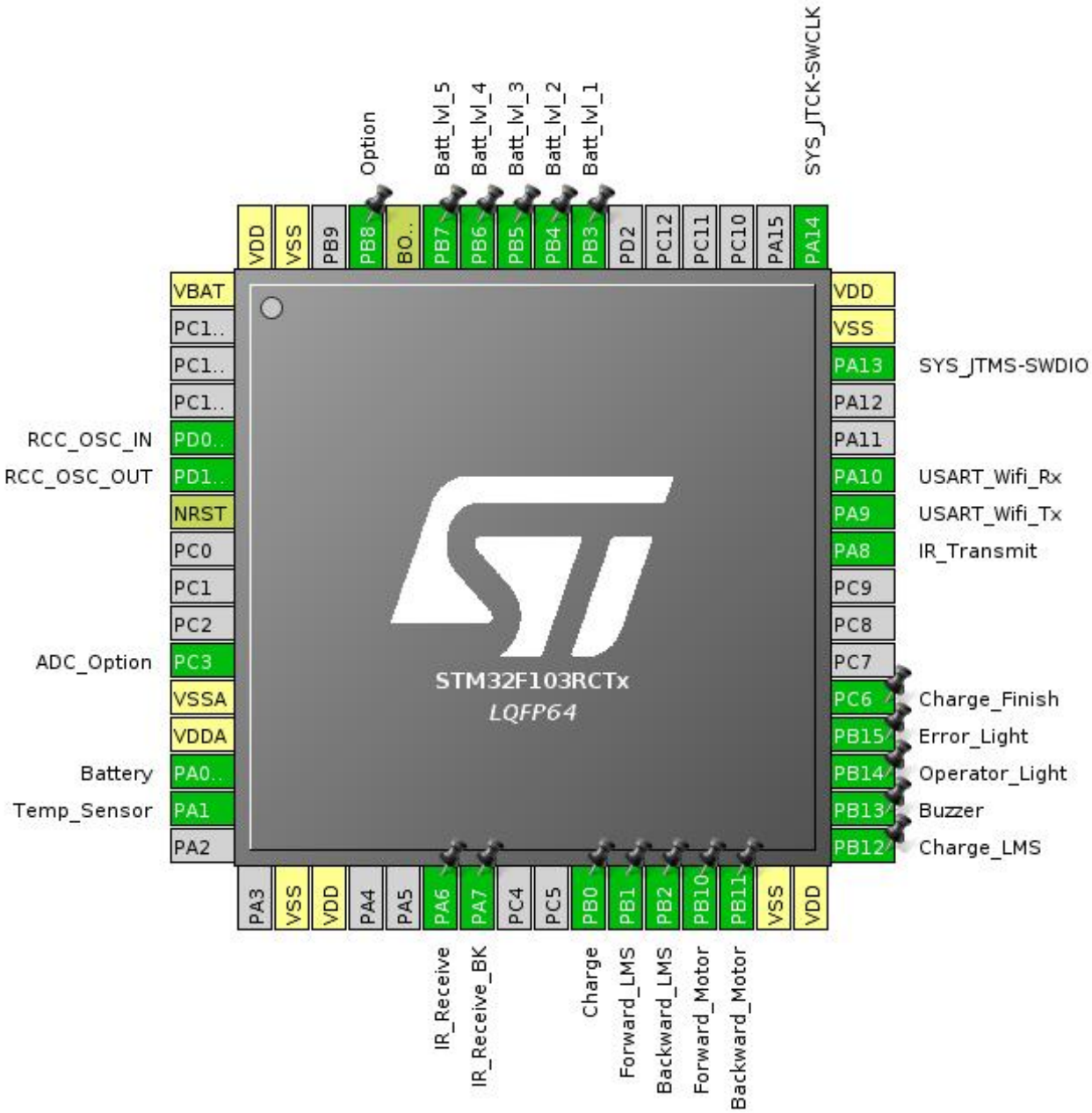
1.1. Project

Project Name	Charge_Station
Board Name	Charge_Station
Generated with:	STM32CubeMX 4.26.0
Date	06/26/2018

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



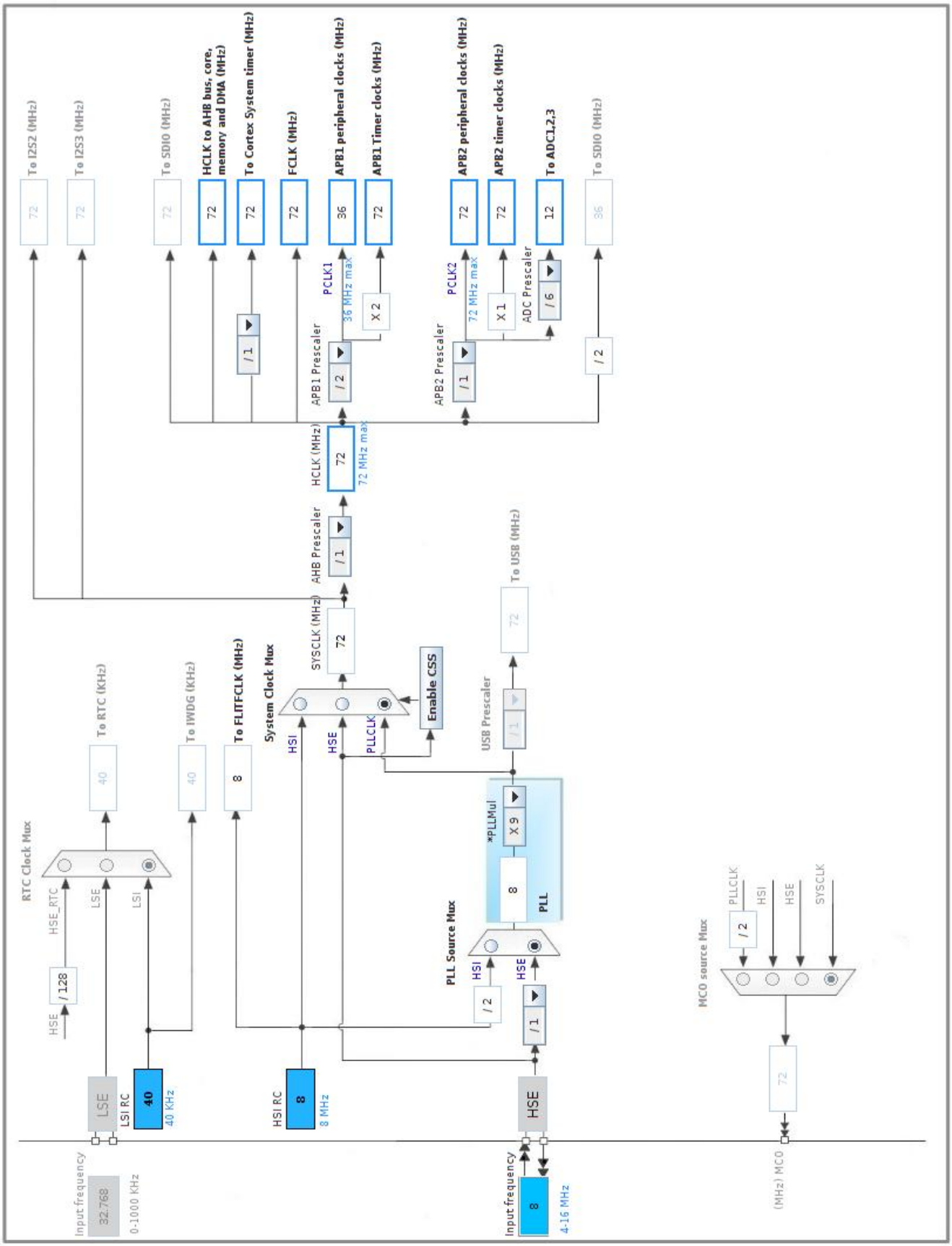
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PD0-OSC_IN	I/O	RCC_OSC_IN	
6	PD1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
11	PC3	I/O	ADC1_IN13	ADC_Option
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP	I/O	ADC1_IN0	Battery
15	PA1	I/O	ADC1_IN1	Temp_Sensor
18	VSS	Power		
19	VDD	Power		
22	PA6	I/O	GPIO_EXTI6	IR_Receive
23	PA7 *	I/O	GPIO_Output	IR_Receive_BK
26	PB0 *	I/O	GPIO_Output	Charge
27	PB1 *	I/O	GPIO_Input	Forward_LMS
28	PB2 *	I/O	GPIO_Input	Backward_LMS
29	PB10 *	I/O	GPIO_Output	Forward_Motor
30	PB11 *	I/O	GPIO_Output	Backward_Motor
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Input	Charge_LMS
34	PB13 *	I/O	GPIO_Output	Buzzer
35	PB14 *	I/O	GPIO_Output	Operator_Light
36	PB15 *	I/O	GPIO_Output	Error_Light
37	PC6 *	I/O	GPIO_Input	Charge_Finish
41	PA8	I/O	TIM1_CH1	IR_Transmit
42	PA9	I/O	USART1_TX	USART_Wifi_Tx
43	PA10	I/O	USART1_RX	USART_Wifi_Rx
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
55	PB3 *	I/O	GPIO_Output	Batt_lvl_1
56	PB4 *	I/O	GPIO_Output	Batt_lvl_2
57	PB5 *	I/O	GPIO_Output	Batt_lvl_3
58	PB6 *	I/O	GPIO_Output	Batt_lvl_4

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
59	PB7 *	I/O	GPIO_Output	Batt_lvl_5
60	BOOT0	Boot		
61	PB8 *	I/O	GPIO_Output	Option
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC1

mode: IN0

mode: IN1

mode: IN13

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Data Alignment	Right alignment
Scan Conversion Mode	Enabled
Continuous Conversion Mode	**Enabled ***
Discontinuous Conversion Mode	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	**3 ***
External Trigger Conversion Source	Regular Conversion launched by software
Rank	1
Channel	Channel 0
Sampling Time	**239.5 Cycles ***
Rank	**2 ***
Channel	**Channel 1 ***
Sampling Time	**239.5 Cycles ***
Rank	**3 ***
Channel	**Channel 13 ***
Sampling Time	**239.5 Cycles ***

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

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

5.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.4. TIM1

Clock Source : Internal Clock

Channel1: PWM Generation CH1

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1799 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

5.5. TIM2

Clock Source : Internal Clock

Channel1: Output Compare No Output

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**71 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**599 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Output Compare No Output Channel 1:

Mode	**Active Level on match ***
Pulse (16 bits value)	0
CH Polarity	High

5.6. TIM3

Clock Source : Internal Clock

5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**71 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**2999 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.7. TIM4

mode: Clock Source

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**71 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.8. USART1

Mode: Asynchronous

5.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PC3	ADC1_IN13	Analog mode	n/a	n/a	ADC_Option
	PA0-WKUP	ADC1_IN0	Analog mode	n/a	n/a	Battery
	PA1	ADC1_IN1	Analog mode	n/a	n/a	Temp_Sensor
RCC	PD0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	n/a	Low	IR_Transmit
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	**High ***	USART_Wifi_Tx
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	**n/a**	USART_Wifi_Rx
GPIO	PA6	GPIO_EXTI6	**External Interrupt Mode with Rising/Falling edge**	No pull-up and no pull-down	n/a	IR_Receive
	PA7	GPIO_Output	Output Push Pull	n/a	Low	IR_Receive_BK
	PB0	GPIO_Output	Output Push Pull	n/a	**High ***	Charge
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	Forward_LMS
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	Backward_LMS
	PB10	GPIO_Output	Output Push Pull	n/a	**High ***	Forward_Motor
	PB11	GPIO_Output	Output Push Pull	n/a	**High ***	Backward_Motor
	PB12	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	Charge_LMS
	PB13	GPIO_Output	Output Push Pull	n/a	**High ***	Buzzer
	PB14	GPIO_Output	Output Push Pull	n/a	**High ***	Operator_Light
	PB15	GPIO_Output	Output Push Pull	n/a	**High ***	Error_Light
	PC6	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	Charge_Finish
	PB3	GPIO_Output	Output Push Pull	n/a	**High ***	Batt_lvl_1
	PB4	GPIO_Output	Output Push Pull	n/a	**High ***	Batt_lvl_2
	PB5	GPIO_Output	Output Push Pull	n/a	**High ***	Batt_lvl_3
	PB6	GPIO_Output	Output Push Pull	n/a	**High ***	Batt_lvl_4
	PB7	GPIO_Output	Output Push Pull	n/a	**High ***	Batt_lvl_5

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB8	GPIO_Output	Output Push Pull	n/a	**High ***	Option

6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
ADC1	DMA1_Channel1	Peripheral To Memory	Low

USART1_RX: DMA1_Channel5 DMA request Settings:

Mode:	**Circular ***
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

ADC1: DMA1_Channel1 DMA request Settings:

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

6.3. 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
Prefetch 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	0	0
System tick timer	true	0	0
DMA1 channel1 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
ADC1 and ADC2 global interrupts	true	0	0
TIM2 global interrupt	true	0	0
TIM3 global interrupt	true	0	0
TIM4 global interrupt	true	0	0
USART1 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line[9:5] interrupts	unused		
TIM1 break interrupt	unused		
TIM1 update interrupt	unused		
TIM1 trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103RCTx
Datasheet	14611_Rev12

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	Charge_Station
Project Folder	/home/dongho/Desktop/seldat_work/robot/charger/AGV_STM32_Charge_Station
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy only the necessary library files
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

9. Software Pack Report