

1. Description

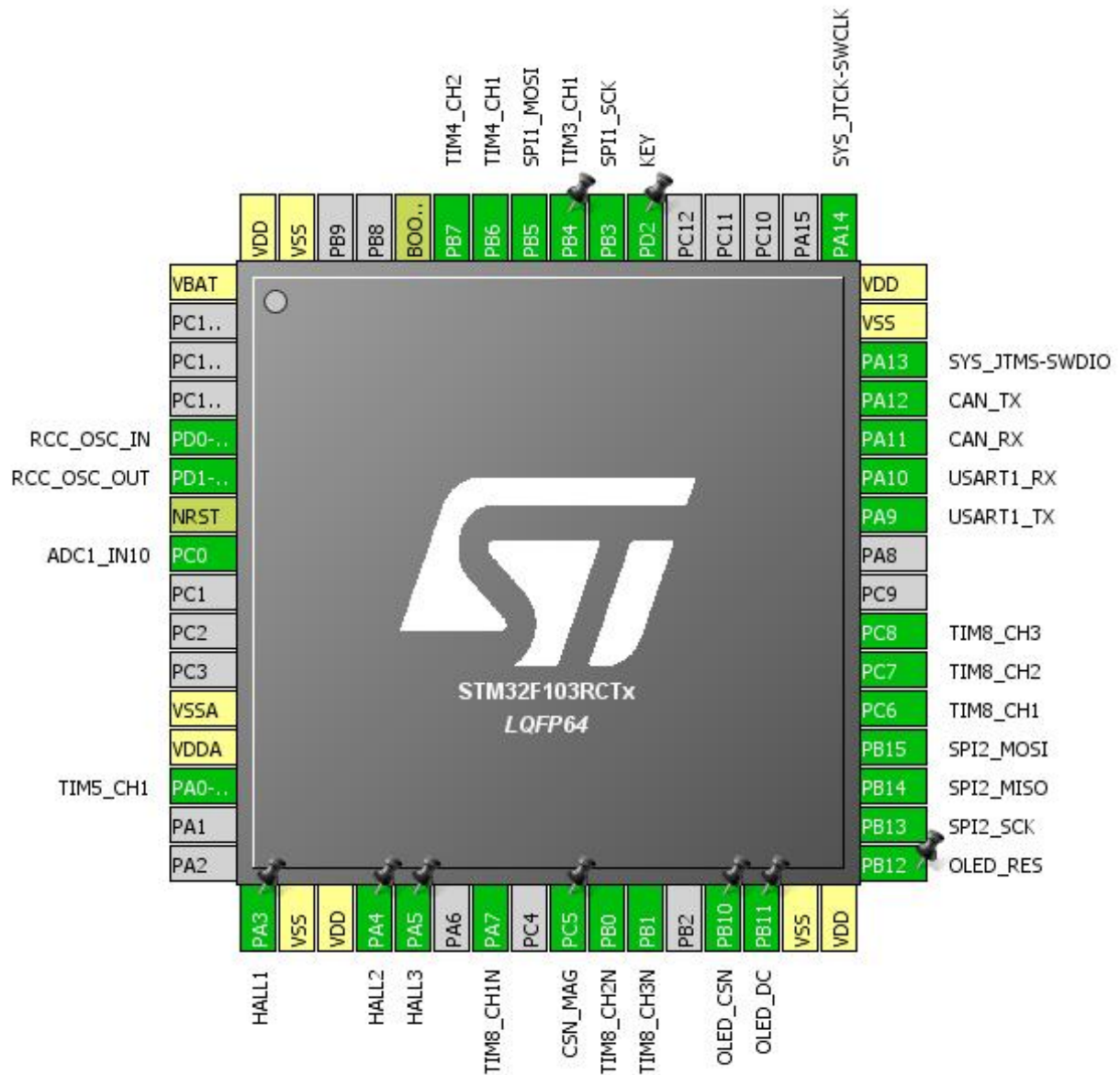
1.1. Project

Project Name	DriverPro
Board Name	source
Generated with:	STM32CubeMX 4.26.1
Date	05/01/2019

1.2. MCU

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

2. Pinout Configuration



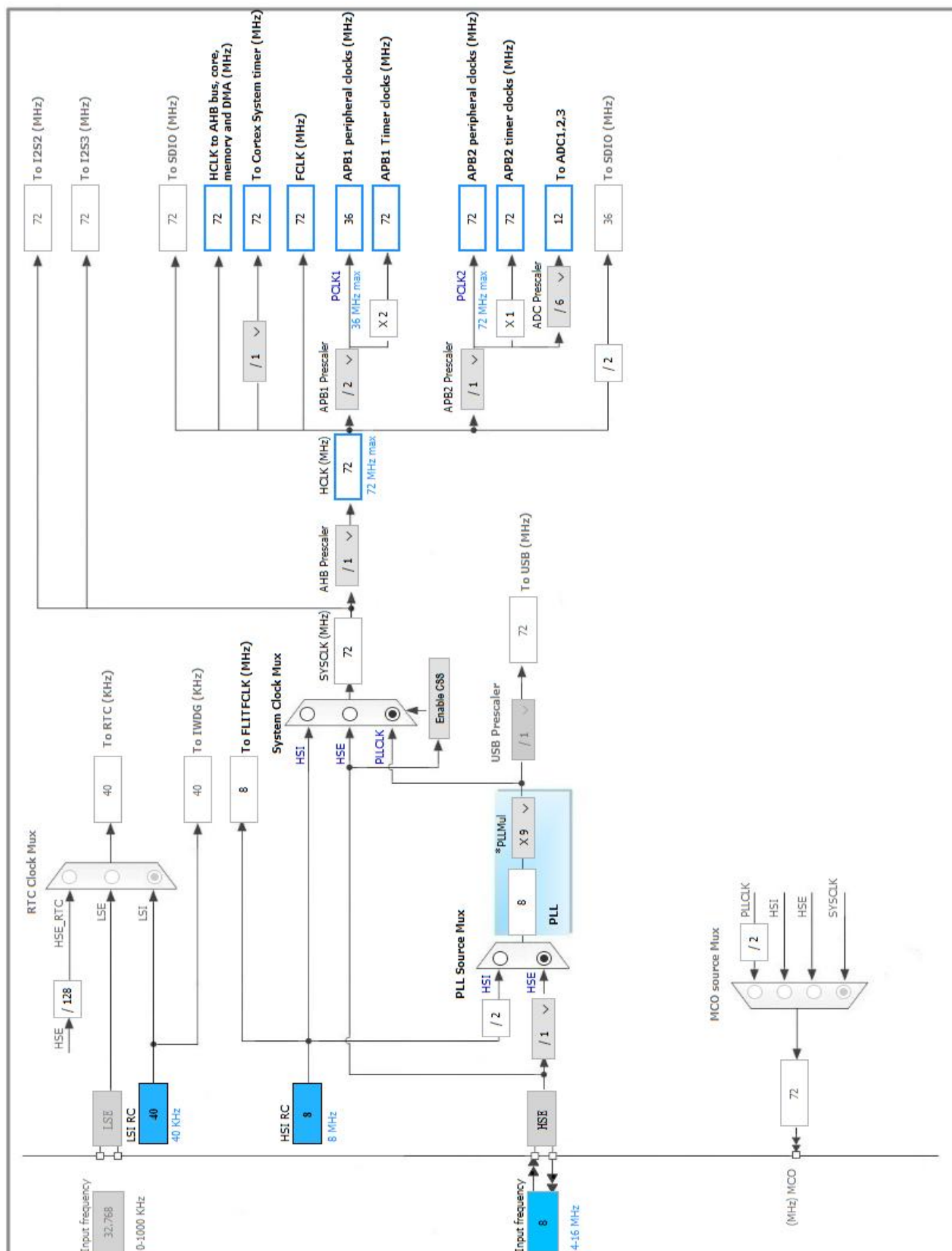
3. Pins Configuration

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		
8	PC0	I/O	ADC1_IN10	
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP	I/O	TIM5_CH1	
17	PA3	I/O	GPIO_EXTI3	HALL1
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	GPIO_EXTI4	HALL2
21	PA5	I/O	GPIO_EXTI5	HALL3
23	PA7	I/O	TIM8_CH1N	
25	PC5 *	I/O	GPIO_Output	CSN_MAG
26	PB0	I/O	TIM8_CH2N	
27	PB1	I/O	TIM8_CH3N	
29	PB10 *	I/O	GPIO_Output	OLED_CSN
30	PB11 *	I/O	GPIO_Output	OLED_DC
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	OLED_RES
34	PB13	I/O	SPI2_SCK	
35	PB14	I/O	SPI2_MISO	
36	PB15	I/O	SPI2_MOSI	
37	PC6	I/O	TIM8_CH1	
38	PC7	I/O	TIM8_CH2	
39	PC8	I/O	TIM8_CH3	
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
44	PA11	I/O	CAN_RX	
45	PA12	I/O	CAN_TX	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
54	PD2	I/O	GPIO_EXTI2	KEY
55	PB3	I/O	SPI1_SCK	
56	PB4	I/O	TIM3_CH1	
57	PB5	I/O	SPI1_MOSI	
58	PB6	I/O	TIM4_CH1	
59	PB7	I/O	TIM4_CH2	
60	BOOT0	Boot		
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: IN10

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode Independent mode

ADC_Settings:

Data Alignment Right alignment

Scan Conversion Mode Disabled

Continuous Conversion Mode Disabled

Discontinuous Conversion Mode Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions Enable

Number Of Conversion 1

External Trigger Conversion Source Regular Conversion launched by software

Rank 1

Channel Channel 10

Sampling Time 1.5 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions 0

WatchDog:

Enable Analog WatchDog Mode false

5.2. CAN

mode: Mode

5.2.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum) 3 *

Time Quantum 83.33333333333334 *

Time Quanta in Bit Segment 1 9 Times *

Time Quanta in Bit Segment 2 2 Times *

Time for one Bit 1000

ReSynchronization Jump Width 1 Time

Basic Parameters:

Time Triggered Communication Mode Disable

Automatic Bus-Off Management	Enable *
Automatic Wake-Up Mode	Disable
No-Automatic Retransmission	Disable
Receive Fifo Locked Mode	Disable
Transmit Fifo Priority	Enable *
Advanced Parameters:	
Operating Mode	Normal

5.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.3.1. 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 Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

5.4. SPI1

Mode: Transmit Only Master

5.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	4 *
Baud Rate	18.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
-----------------	----------

NSS Signal Type

Software

5.5. SPI2

Mode: Full-Duplex Master

5.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	16 Bits *
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	64 *
Baud Rate	562.5 KBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	2 Edge *

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.6. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.7. TIM3

Channel1: PWM Generation CH1

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	86 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
-----------------------------	--

Trigger Event Selection Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

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

5.8. TIM4

Combined Channels: Encoder Mode

5.8.1. Parameter Settings:

Counter Settings:

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

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Encoder:

Encoder Mode

Encoder Mode TI1 and TI2 *

____ Parameters for Channel 1 ____

Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

____ Parameters for Channel 2 ____

Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

5.9. TIM5

Channel1: PWM Generation CH1

5.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	86 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

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

5.10. TIM6

mode: Activated

5.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	71 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	999 *
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)
-------------------------	------------------------------

5.11. TIM7

mode: Activated

5.11.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	71 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535 *

auto-reload preload Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection Reset (UG bit from TIMx_EGR)

5.12. TIM8

Channel1: PWM Generation CH1 CH1N

Channel2: PWM Generation CH2 CH2N

Channel3: PWM Generation CH3 CH3N

5.12.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 0
Counter Mode Up
Counter Period (AutoReload Register - 16 bits value) **4499 ***
Internal Clock Division (CKD) No Division
Repetition Counter (RCR - 8 bits value) 0
auto-reload preload Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit) Disable (Trigger input effect not delayed)
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
Dead Time 0

PWM Generation Channel 1 and 1N:

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

PWM Generation Channel 2 and 2N:

Mode PWM mode 1

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

PWM Generation Channel 3 and 3N:

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

5.13. USART1

Mode: Asynchronous

5.13.1. 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	PC0	ADC1_IN10	Analog mode	n/a	n/a	
CAN	PA11	CAN_RX	Input mode	No pull-up and no pull-down	n/a	
	PA12	CAN_TX	Alternate Function Push Pull	n/a	High *	
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	
SPI1	PB3	SPI1_SCK	Alternate Function Push Pull	n/a	High *	
	PB5	SPI1_MOSI	Alternate Function Push Pull	n/a	High *	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	n/a	High *	
	PB14	SPI2_MISO	Input mode	No pull-up and no pull-down	n/a	
	PB15	SPI2_MOSI	Alternate Function Push Pull	n/a	High *	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM3	PB4	TIM3_CH1	Alternate Function Push Pull	n/a	High *	
TIM4	PB6	TIM4_CH1	Input mode	No pull-up and no pull-down	n/a	
	PB7	TIM4_CH2	Input mode	No pull-up and no pull-down	n/a	
TIM5	PA0-WKUP	TIM5_CH1	Alternate Function Push Pull	n/a	Low	
TIM8	PA7	TIM8_CH1N	Alternate Function Push Pull	n/a	Low	
	PB0	TIM8_CH2N	Alternate Function Push Pull	n/a	Low	
	PB1	TIM8_CH3N	Alternate Function Push Pull	n/a	Low	
	PC6	TIM8_CH1	Alternate Function Push Pull	n/a	Low	
	PC7	TIM8_CH2	Alternate Function Push Pull	n/a	Low	
	PC8	TIM8_CH3	Alternate Function Push Pull	n/a	Low	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	High *	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	n/a	
GPIO	PA3	GPIO_EXTI3	External Interrupt Mode with Rising/Falling edge	No pull-up and no pull-down	n/a	HALL1
	PA4	GPIO_EXTI4	External Interrupt Mode with Rising/Falling edge	No pull-up and no pull-down	n/a	HALL2

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA5	GPIO_EXTI5	External Interrupt Mode with Rising/Falling edge	No pull-up and no pull-down	n/a	HALL3
	PC5	GPIO_Output	Output Push Pull	Pull-up *	Medium *	CSN_MAG
	PB10	GPIO_Output	Output Push Pull	Pull-up *	Medium *	OLED_CSN
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Medium *	OLED_DC
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Medium *	OLED_RES
	PD2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	Pull-up *	n/a	KEY

6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
USART1_TX	DMA1_Channel4	Memory To Peripheral	Very High *
TIM3_CH1/TRIG	DMA1_Channel6	Memory To Peripheral	Low
TIM5_CH1	DMA2_Channel5	Memory To Peripheral	Low

USART1_RX: DMA1_Channel5 DMA request Settings:

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

USART1_TX: DMA1_Channel4 DMA request Settings:

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

TIM3_CH1/TRIG: DMA1_Channel6 DMA request Settings:

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

TIM5_CH1: DMA2_Channel5 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
EXTI line2 interrupt	true	0	0
EXTI line3 interrupt	true	1	0
EXTI line4 interrupt	true	1	0
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
DMA1 channel6 global interrupt	true	0	0
USB low priority or CAN RX0 interrupts	true	1	0
EXTI line[9:5] interrupts	true	1	0
USART1 global interrupt	true	1	0
TIM6 global interrupt	true	0	0
DMA2 channel4 and channel5 global interrupts	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 and ADC2 global interrupts	unused		
USB high priority or CAN TX interrupts	unused		
CAN RX1 interrupt	unused		
CAN SCE interrupt	unused		
TIM3 global interrupt	unused		
TIM4 global interrupt	unused		
SPI1 global interrupt	unused		
SPI2 global interrupt	unused		
TIM8 break interrupt	unused		
TIM8 update interrupt	unused		
TIM8 trigger and commutation interrupts	unused		
TIM8 capture compare interrupt	unused		
TIM5 global interrupt	unused		
TIM7 global 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	DriverPro
Project Folder	E:\folder\Cube\DriverPro
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.1

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	Yes
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