1. Description

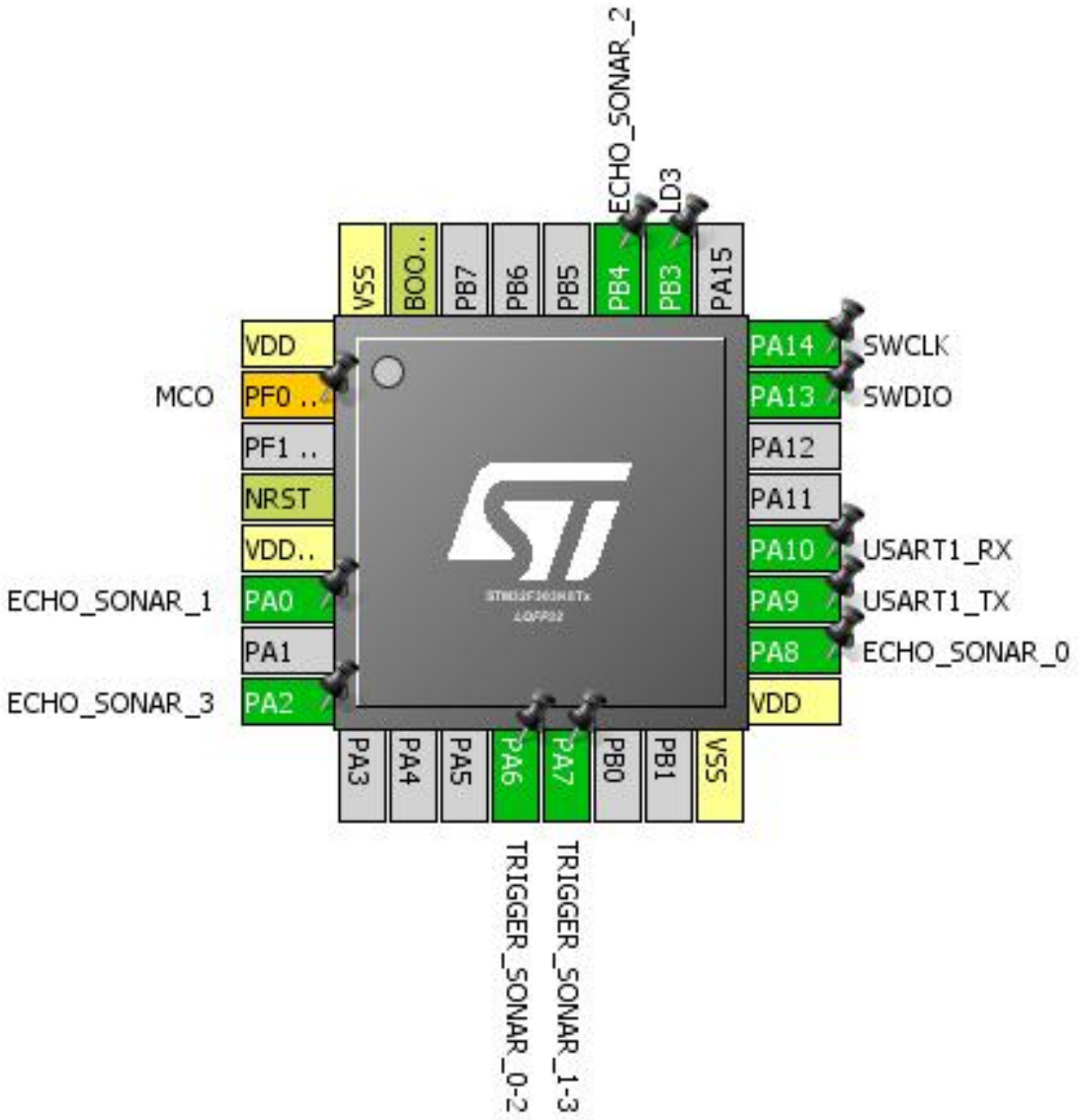
1.1. Project

Project Name	UltrasonicBumperBoard32
Board Name	NUCLEO-F303K8
Generated with:	STM32CubeMX 4.12.0
Date	02/15/2016

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F303
MCU name	STM32F303K8Tx
MCU Package	LQFP32
MCU Pin number	32

2. Pinout Configuration



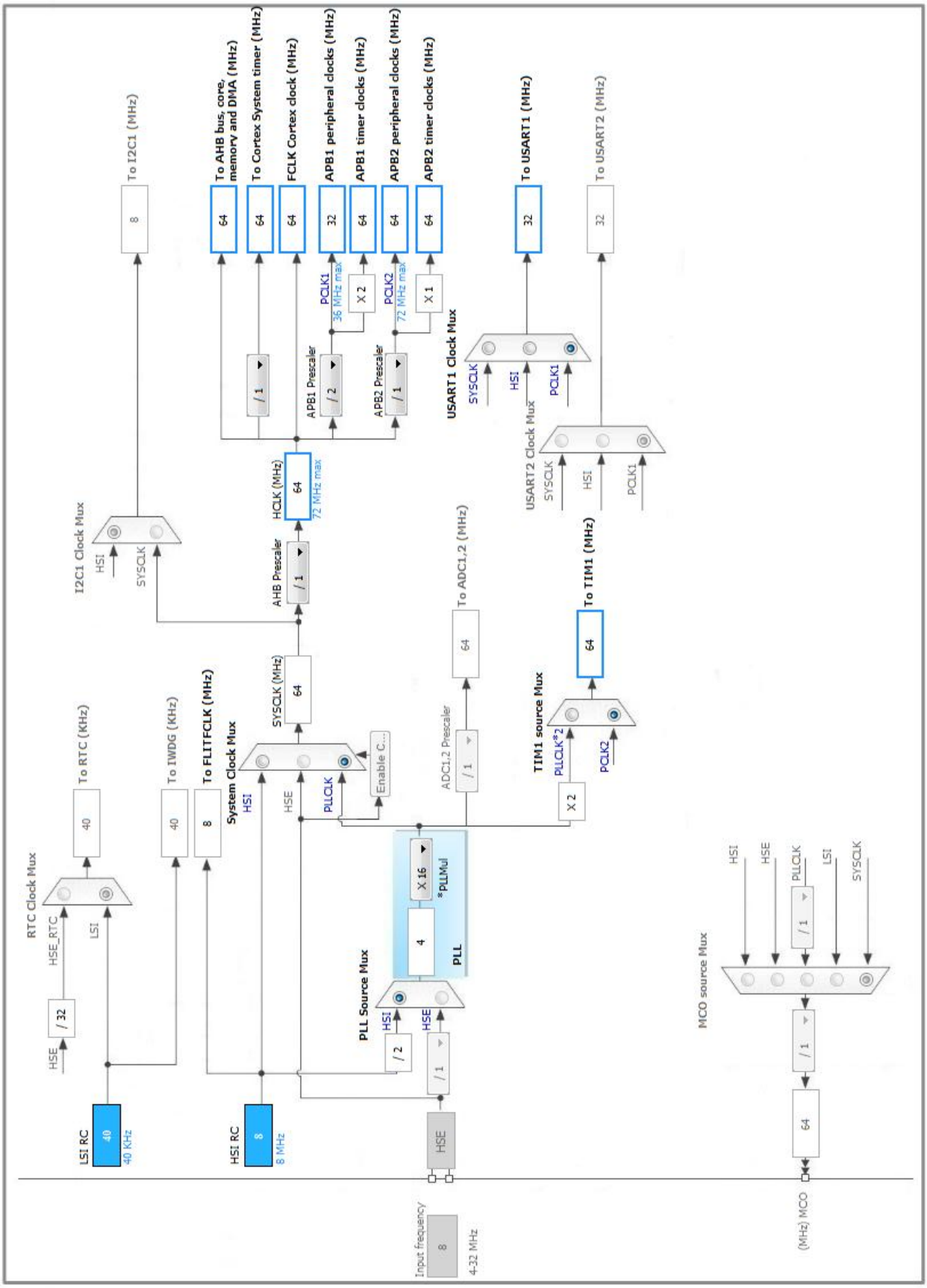
3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PF0 / OSC_IN *	I/O	RCC_OSC_IN	MCO
4	NRST	Reset		
5	VDDA/VREF+	Power		
6	PA0	I/O	TIM2_CH1	ECHO_SONAR_1
8	PA2	I/O	TIM15_CH1	ECHO_SONAR_3
12	PA6	I/O	TIM16_CH1	TRIGGER_SONAR_0-2
13	PA7	I/O	TIM17_CH1	TRIGGER_SONAR_1-3
16	VSS	Power		
17	VDD	Power		
18	PA8	I/O	TIM1_CH1	ECHO_SONAR_0
19	PA9	I/O	USART1_TX	
20	PA10	I/O	USART1_RX	
23	PA13	I/O	SYS_JTMS-SWDIO	SWDIO
24	PA14	I/O	SYS_JTCK-SWCLK	SWCLK
26	PB3 **	I/O	GPIO_Output	LD3
27	PB4	I/O	TIM3_CH1	ECHO_SONAR_2
31	BOOT0	Boot		
32	VSS	Power		

** The pin is affected with an I/O function

* The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. SYS

Debug: Serial Wire

5.2. TIM1

Slave Mode: Reset Mode
Trigger Source: TI1FP1
Clock Source : Internal Clock
Channel1: Input Capture direct mode
Channel2: Input Capture indirect mode

5.2.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**630 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65535 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 16 bits value)	0
Slave Mode Controller	Reset Mode

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	**Falling Edge ***
IC Selection	Indirect
Prescaler Division Ratio	No division

5.3. TIM2

Slave Mode: Reset Mode
Trigger Source: TI1FP1
Clock Source : Internal Clock
Channel1: Input Capture direct mode
Channel2: Input Capture indirect mode

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**630 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**65535 ***
Internal Clock Division (CKD)	No Division
Slave Mode Controller	Reset Mode

Trigger Output (TRGO) Parameters:

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

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	**Falling Edge ***
IC Selection	Indirect
Prescaler Division Ratio	No division

5.4. TIM3

Slave Mode: Reset Mode
Trigger Source: TI1FP1
Clock Source : Internal Clock
Channel1: Input Capture direct mode
Channel2: Input Capture indirect mode

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**630 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65535 ***
Internal Clock Division (CKD)	No Division
Slave Mode Controller	Reset Mode

Trigger Output (TRGO) Parameters:

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

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	**Falling Edge ***
IC Selection	Indirect
Prescaler Division Ratio	No division

5.5. TIM6

mode: Activated

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**6400 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1000 ***

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.6. TIM15

Slave Mode: Reset Mode
Trigger Source: TI1FP1
mode: Clock Source
Channel1: Input Capture direct mode
Channel2: Input Capture indirect mode

5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**630 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65535 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
Slave Mode Controller	Reset Mode

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)

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	**Falling Edge ***
IC Selection	Indirect
Prescaler Division Ratio	No division

5.7. TIM16

mode: Activated
Channel1: PWM Generation CH1
mode: One Pulse Mode

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**63 ***

Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65535 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0

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 2 ***
Pulse (16 bits value)	**65526 ***
Fast Mode	**Enable ***
CH Polarity	High
CH Idle State	Reset

5.8. TIM17

mode: Activated

Channel1: PWM Generation CH1

mode: One Pulse Mode

5.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**63 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65535 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0

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 2 ***
Pulse (16 bits value)	**65526 ***
Fast Mode	**Enable ***
CH Polarity	High
CH Idle State	Reset

5.9. USART1

Mode: Asynchronous

5.9.1. 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
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	n/a	Low	ECHO_SONAR_0
TIM2	PA0	TIM2_CH1	Alternate Function Push Pull	n/a	Low	ECHO_SONAR_1
TIM3	PB4	TIM3_CH1	Alternate Function Push Pull	n/a	Low	ECHO_SONAR_2
TIM15	PA2	TIM15_CH1	Alternate Function Push Pull	n/a	Low	ECHO_SONAR_3
TIM16	PA6	TIM16_CH1	Alternate Function Push Pull	n/a	Low	TRIGGER_SONAR_0-2
TIM17	PA7	TIM17_CH1	Alternate Function Push Pull	n/a	Low	TRIGGER_SONAR_1-3
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	n/a	**High ***	
Single Mapped Signals	PF0 / OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	MCO
GPIO	PB3	GPIO_Output	Output Push Pull	n/a	Low	LD3

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
TIM1 break and TIM15 interrupts	true	0	0
TIM1 capture compare interrupt	true	0	0
TIM2 global interrupt	true	0	0
TIM3 global interrupt	true	0	0
USART1 global interrupt / USART1 wake-up interrupt through EXT line 25	true	0	0
TIM6 global and DAC1 underrun error interrupts	true	0	0
Non maskable interrupt	unused		
Hard fault interrupt	unused		
Memory management fault	unused		
Pre-fetch fault, memory access fault	unused		
Undefined instruction or illegal state	unused		
Debug monitor	unused		
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 update and TIM16 interrupts	unused		
TIM1 trigger and commutation and TIM17 interrupts	unused		

*** User modified value**

7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32F3
Line	STM32F303
MCU	STM32F303K8Tx
Datasheet	025083_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	UltrasonicBumperBoard32
Project Folder	C:\devel\Walter\Github\SonarBoard\Firmware\UltrasonicBumperBoard32
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F3 V1.4.0

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	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No