1. Description

1.1. Project

Project Name	l4-windsensor
Board Name	NUCLEO-L432KC
Generated with:	STM32CubeMX 4.21.0
Date	05/17/2017

1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x2
MCU name	STM32L432KCUx
MCU Package	UFQFPN32
MCU Pin number	32

2. Pinout Configuration
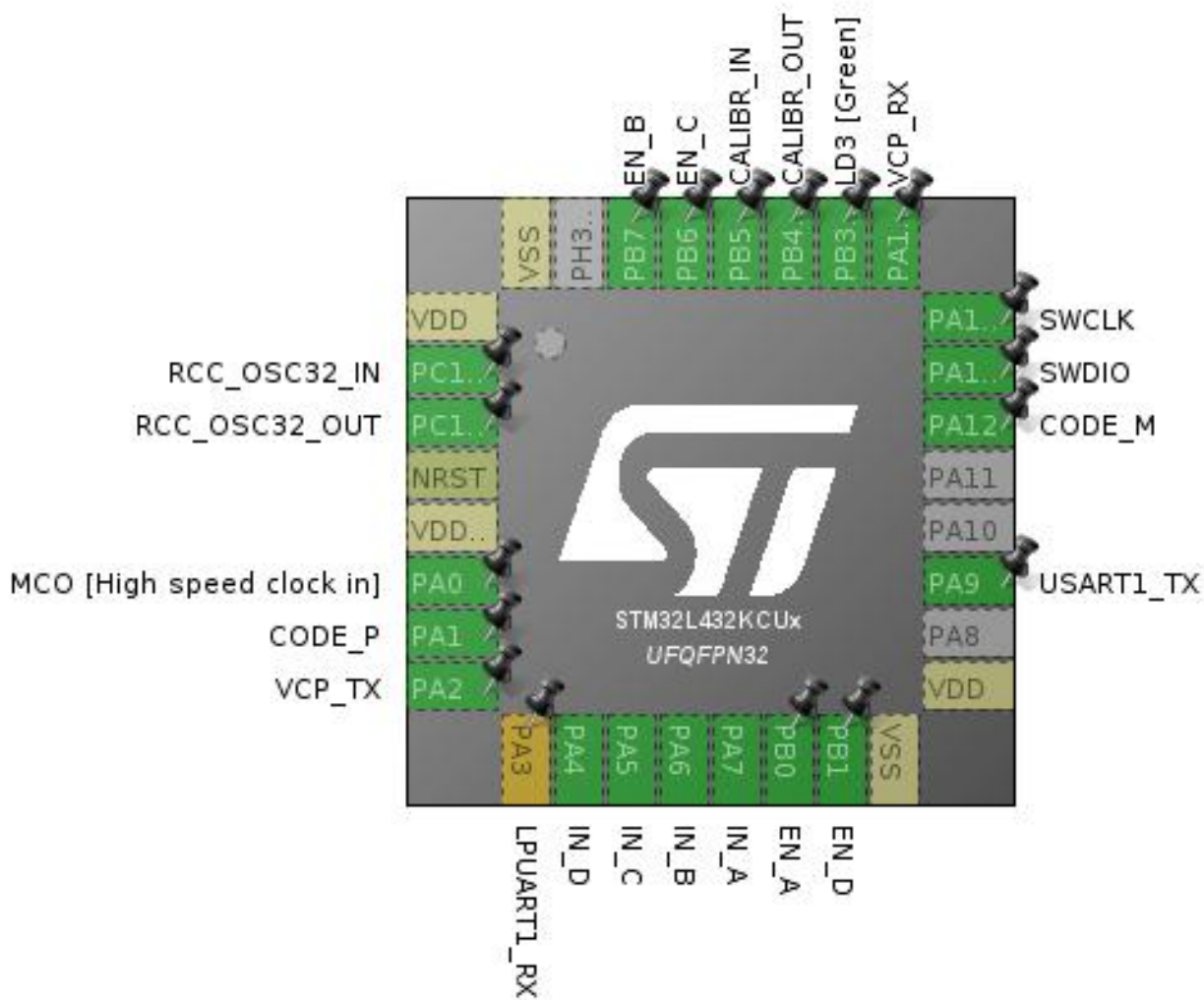
3. Pins Configuration

Pin Number UFQFPN32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PC14-OSC32_IN (PC14)	I/O	RCC_OSC32_IN	
3	PC15-OSC32_OUT (PC15)	I/O	RCC_OSC32_OUT	
4	NRST	Reset		
5	VDDA/VREF+	Power		
6	PA0	I/O	RCC_CK_IN	MCO [High speed clock in]
7	PA1 *	I/O	GPIO_Output	CODE_P
8	PA2	I/O	USART2_TX	VCP_TX
9	PA3 **	I/O	LPUART1_RX	
10	PA4	I/O	ADC1_IN9	IN_D
11	PA5	I/O	ADC1_IN10	IN_C
12	PA6	I/O	ADC1_IN11	IN_B
13	PA7	I/O	ADC1_IN12	IN_A
14	PB0 *	I/O	GPIO_Output	EN_A
15	PB1 *	I/O	GPIO_Output	EN_D
16	VSS	Power		
17	VDD	Power		
19	PA9	I/O	USART1_TX	
22	PA12 *	I/O	GPIO_Output	CODE_M
23	PA13 (JTMS-SWDIO)	I/O	SYS_JTMS-SWDIO	SWDIO
24	PA14 (JTCK-SWCLK)	I/O	SYS_JTCK-SWCLK	SWCLK
25	PA15 (JTDI)	I/O	USART2_RX	VCP_RX
26	PB3 (JTDO-TRACESWO) *	I/O	GPIO_Output	LD3 [Green]
27	PB4 (NJTRST) *	I/O	GPIO_Output	CALIBR_OUT
28	PB5 *	I/O	GPIO_Input	CALIBR_IN
29	PB6 *	I/O	GPIO_Output	EN_C
30	PB7 *	I/O	GPIO_Output	EN_B
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
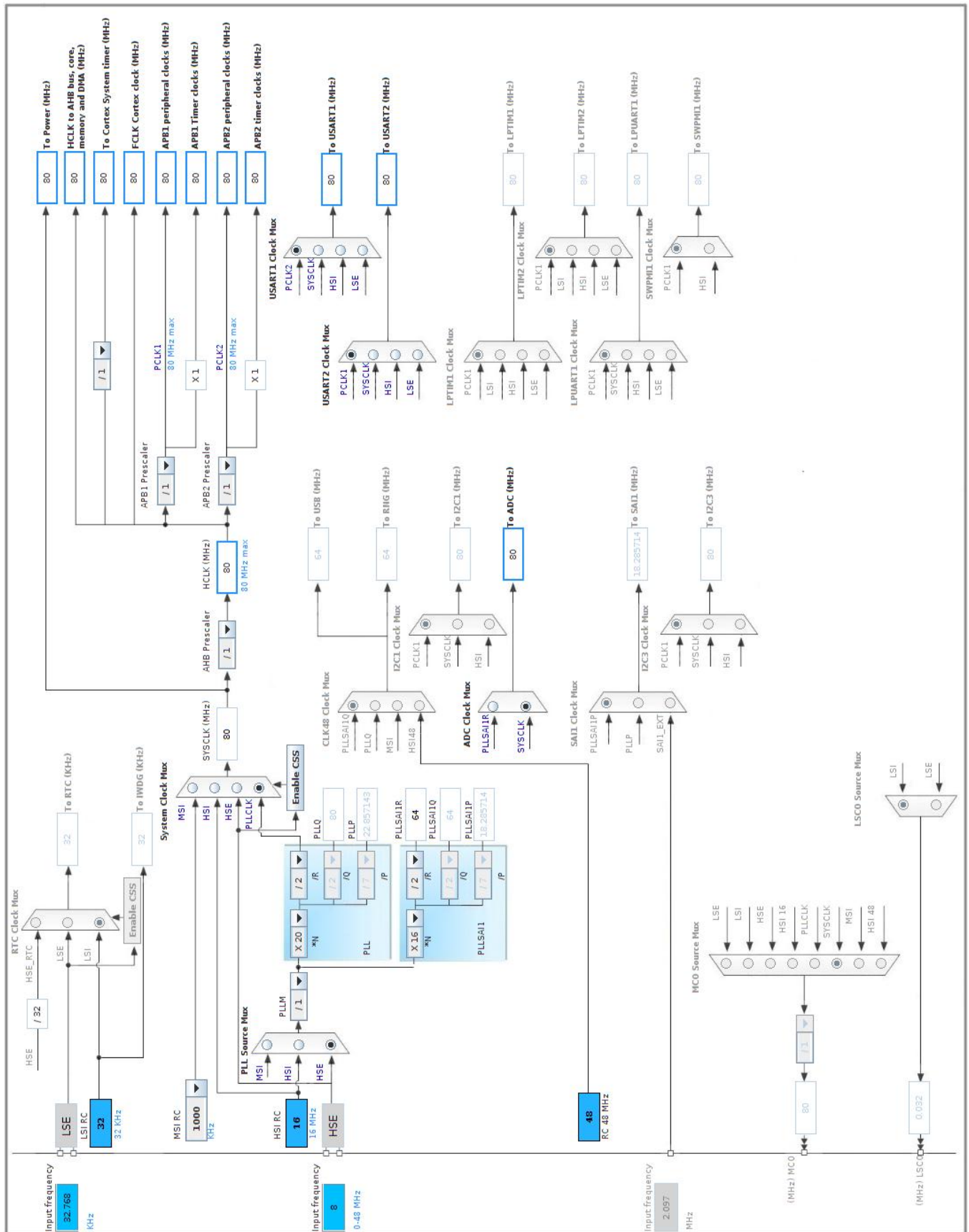
5. IPs and Middleware Configuration

5.1. ADC1

IN9: IN9 Single-ended
IN10: IN10 Single-ended
IN11: IN11 Single-ended
mode: IN12

5.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode divided by 1
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	**Enabled ***
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Enable Regular Oversampling	Disable
Number Of Conversion	1
External Trigger Conversion Source	**Timer 1 Trigger Out event ***
External Trigger Conversion Edge	Trigger detection on the rising edge
Rank	1
Channel	**Channel 10 ***
Sampling Time	2.5 Cycles
Offset Number	No offset

ADC_Injected_ConversionMode:

Enable Injected Conversions	Disable

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode   false

5.2. RCC

mode: High Speed Clock (HSE)
Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	4 WS (5 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
MSI Auto Calibration	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

5.3. SYS

Debug: Serial Wire
Timebase Source: SysTick

5.4. TIM1

Clock Source   : Internal Clock

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**24** *

Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0

Trigger Output (TRGO) Parameters:

Master/Slave Mode	**Enable (sync between this TIM (Master) and its Slaves (through TRGO)) ***
Trigger Event Selection TRGO	**Update Event ***
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

5.5. TIM2

Slave Mode: External Clock Mode 1
Trigger Source: ITR0

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**39 ***
Internal Clock Division (CKD)	No Division
Slave Mode Controller	ETR mode 1

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection TRGO	**Update Event ***

5.6. USART1

Mode: Single Wire (Half-Duplex)

5.6.1. Parameter Settings:

Basic Parameters:

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

Advanced Parameters:

Data Direction	

Receive Only *

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	**Enable ***
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

5.7. USART2

Mode: Asynchronous

5.7.1. Parameter Settings:

Basic Parameters:

Baud Rate	**230400 ***
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
ADC1	PA4	ADC1_IN9	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	IN_D
	PA5	ADC1_IN10	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	IN_C
	PA6	ADC1_IN11	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	IN_B
	PA7	ADC1_IN12	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	IN_A
RCC	PC14-OSC32_IN (PC14)	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT (PC15)	RCC_OSC32_OUT	n/a	n/a	n/a	
	PA0	RCC_CK_IN	n/a	n/a	n/a	MCO [High speed clock in]
SYS	PA13 (JTMS-SWDIO)	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14 (JTCK-SWCLK)	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
USART1	PA9	USART1_TX	Alternate Function Open Drain	Pull-up	**Very High** *	
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High** *	VCP_TX
	PA15 (JTDI)	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High** *	VCP_RX
Single Mapped Signals	PA3	LPUART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
GPIO	PA1	GPIO_Output	Output Push Pull	**Pull-down** *	**Medium** *	CODE_P
	PB0	GPIO_Output	Output Push Pull	**Pull-down** *	Low	EN_A
	PB1	GPIO_Output	Output Push Pull	**Pull-down** *	Low	EN_D
	PA12	GPIO_Output	Output Push Pull	**Pull-down** *	**Medium** *	CODE_M
	PB3 (JTDO-TRACESWO)	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD3 [Green]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB4 (NJTRST)	GPIO_Output	Output Push Pull	**Pull-down ***	Low	CALIBR_OUT
	PB5	GPIO_Input	Input mode	**Pull-up ***	n/a	CALIBR_IN
	PB6	GPIO_Output	Output Push Pull	**Pull-down ***	Low	EN_C
	PB7	GPIO_Output	Output Push Pull	**Pull-down ***	Low	EN_B

6.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA2_Channel3	Peripheral To Memory	Low
TIM2_UP	DMA1_Channel2	Memory To Peripheral	Low
USART2_TX	DMA1_Channel7	Memory To Peripheral	Low

ADC1: DMA2_Channel3 DMA request Settings:

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

TIM2_UP: DMA1_Channel2 DMA request Settings:

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

USART2_TX: DMA1_Channel7 DMA request Settings:

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

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 channel2 global interrupt	true	0	0
DMA1 channel7 global interrupt	true	0	0
DMA2 channel3 global interrupt	true	0	0
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 global interrupt	unused		
TIM1 break interrupt and TIM15 global interrupt	unused		
TIM1 update interrupt and TIM16 global interrupt	unused		
TIM1 trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
USART1 global interrupt	unused		
USART2 global interrupt	unused		
FPU global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x2
MCU	STM32L432KCUx
Datasheet	028798_Rev1

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	l4-windsensor
Project Folder	/home/elmot/projects/l4-windsensor
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L4 V1.8.0

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