1. Description

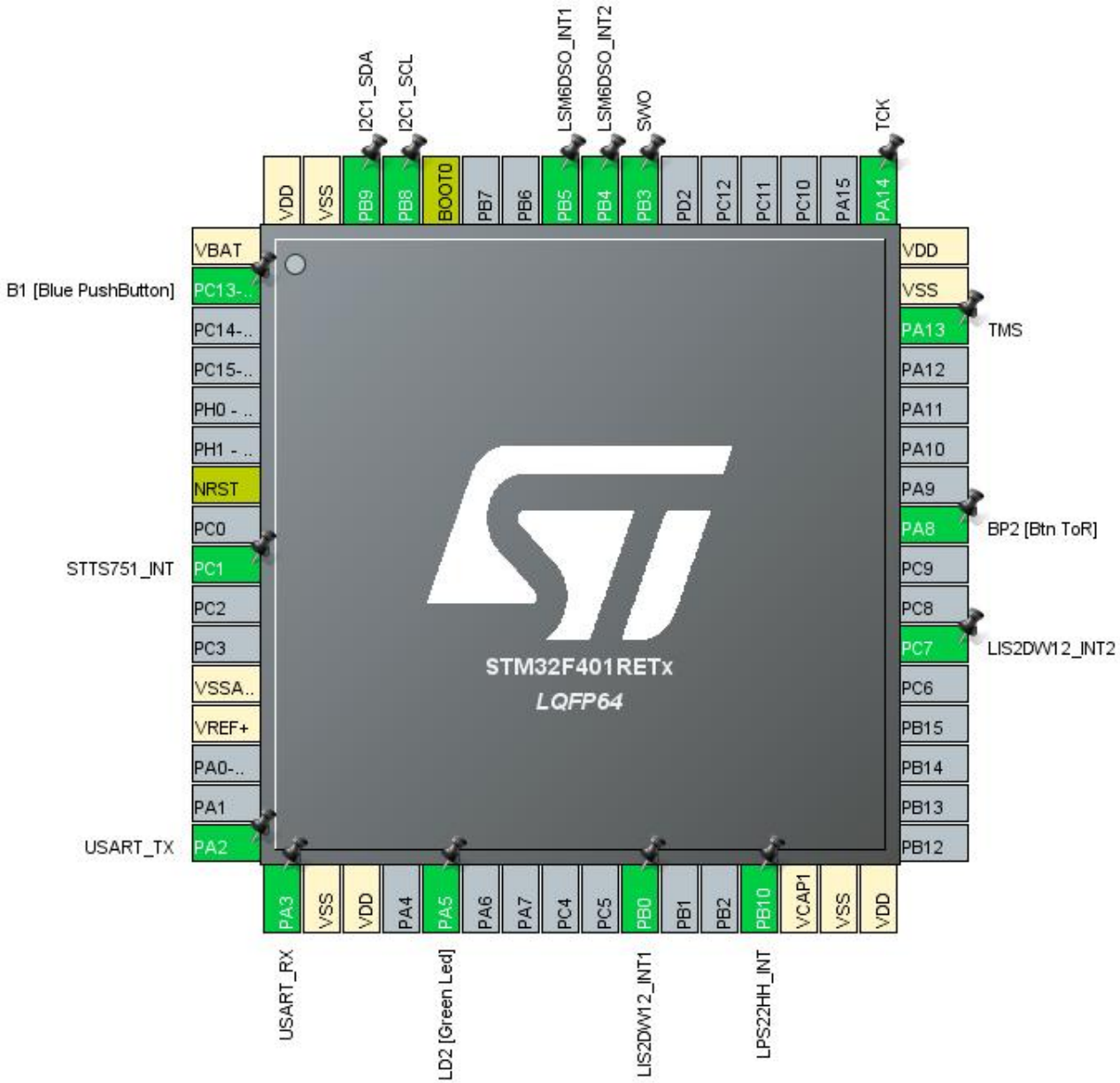
1.1. Project

Project Name	F401RE_IKS01_Unicleo
Board Name	NUCLEO-F401RE
Generated with:	STM32CubeMX 5.3.0
Date	10/23/2019

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F401
MCU name	STM32F401RETx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration

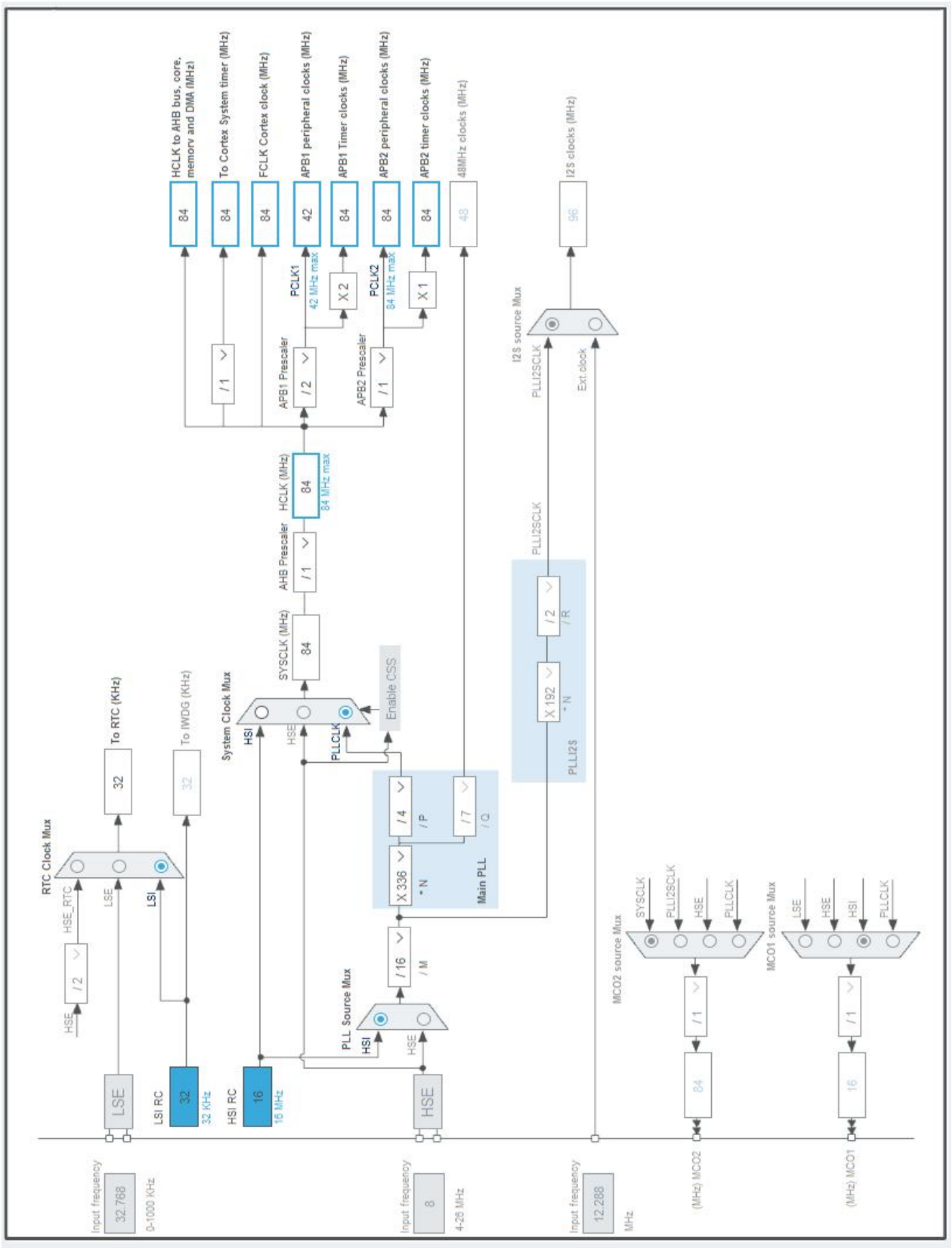


3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13-ANTI_TAMP	I/O	GPIO_EXTI13	B1 [Blue PushButton]
7	NRST	Reset		
9	PC1	I/O	GPIO_EXTI1	STTS751_INT
12	VSSA/VREF-	Power		
13	VREF+	Power		
16	PA2	I/O	USART2_TX	USART_TX
17	PA3	I/O	USART2_RX	USART_RX
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	LD2 [Green Led]
26	PB0	I/O	GPIO_EXTI0	LIS2DW12_INT1
29	PB10	I/O	GPIO_EXTI10	LPS22HH_INT
30	VCAP1	Power		
31	VSS	Power		
32	VDD	Power		
38	PC7	I/O	GPIO_EXTI7	LIS2DW12_INT2
41	PA8 *	I/O	GPIO_Input	BP2 [Btn ToR]
46	PA13	I/O	SYS_JTMS-SWDIO	TMS
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	TCK
55	PB3	I/O	SYS_JTDO-SWO	SWO
56	PB4	I/O	GPIO_EXTI4	LSM6DSO_INT2
57	PB5	I/O	GPIO_EXTI5	LSM6DSO_INT1
60	BOOT0	Boot		
61	PB8	I/O	I2C1_SCL	
62	PB9	I/O	I2C1_SDA	
63	VSS	Power		
64	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	F401RE_IKS01_Unicleo
Project Folder	D:\Electronique__STM32\workspace_board\F401RE_IKS01_Unicleo
Toolchain / IDE	TrueSTUDIO
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 only the necessary library files
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	No
Set all free pins as analog (to optimize the power consumption)	No

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F401
MCU	STM32F401RETx
Datasheet	025644_Rev3

6.2. Parameter Selection

Temperature	25
Vdd	3.3

7. IPs and Middleware Configuration

7.1. I2C1

I2C: I2C

7.1.1. Parameter Settings:

Master Features:

I2C Speed Mode	**Fast Mode ***
I2C Clock Speed (Hz)	400000
Fast Mode Duty Cycle	Duty cycle Tlow/Thigh = 2

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

7.2. RTC

mode: Activate Clock Source

7.2.1. Parameter Settings:

General:

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

7.3. SYS

Debug: Trace Asynchronous Sw

Timebase Source: SysTick

7.4. TIM1

Slave Mode: Reset Mode

Trigger Source: ITR0

Clock Source : Internal Clock

7.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**4999 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**7999 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	**Enable ***
Slave Mode Controller	Reset Mode

Trigger Output (TRGO) Parameters:

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

7.5. USART2

Mode: Asynchronous

7.5.1. 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

7.6. STMicroelectronics.X-CUBE-MEMS1.6.2.0

mode: BoardOoComponentJjMEMS

mode: BoardOoExtensionJjMEMS

mode: DeviceJjApplication

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	
	PB9	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	TMS
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	TCK
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	SWO
USART2	PA2	USART2_TX	Alternate Function Push Pull	*	Low	USART_TX
	PA3	USART2_RX	Alternate Function Push Pull	*	Low	USART_RX
GPIO	PC13-ANTI_TAMP	GPIO_EXTI13	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	B1 [Blue PushButton]
	PC1	GPIO_EXTI1	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	STTS751_INT
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD2 [Green Led]
	PB0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	LIS2DW12_INT1
	PB10	GPIO_EXTI10	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	LPS22HH_INT
	PC7	GPIO_EXTI7	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	LIS2DW12_INT2
	PA8	GPIO_Input	Input mode	**Pull-down ***	n/a	BP2 [Btn ToR]
	PB4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	LSM6DSO_INT2
	PB5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	LSM6DSO_INT1

8.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_RX	DMA1_Stream5	Peripheral To Memory	Low

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

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	0	0
System tick timer	true	0	0
EXTI line0 interrupt	true	0	0
EXTI line1 interrupt	true	0	0
EXTI line4 interrupt	true	0	0
DMA1 stream5 global interrupt	true	0	0
EXTI line[9:5] interrupts	true	0	0
TIM1 update interrupt and TIM10 global interrupt	true	0	0
USART2 global interrupt	true	0	0
EXTI line[15:10] interrupts	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break interrupt and TIM9 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM11 global interrupt	unused		
TIM1 capture compare interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

9. Software Pack Report

9.1. Software Pack selected

Vendor	Name	Version	Component
STMicroelectronics	X-CUBE-MEMS1	6.1.0	Class : Board Component Group : AccGyr SubGroup : LSM6DSL Variant : I2C Version : 6.1.0 Class : Board Component Group : AccGyr SubGroup : LSM6DSO Variant : I2C Version : 6.1.0 Class : Board Component Group : AccMag SubGroup : LSM303AGR Variant : I2C Version : 6.1.0 Class : Board Component Group : Acc SubGroup : LIS2DW12 Variant : I2C Version : 6.1.0 Class : Board Component Group : Mag

			SubGroup : LIS3MDL Variant : I2C Version : 6.1.0 Class : Board Component Group : Mag SubGroup : LIS2MDL Variant : I2C Version : 6.1.0 Class : Board Component Group : HumTemp SubGroup : HTS221 Variant : I2C Version : 6.1.0 Class : Board Component Group : PressTemp SubGroup : LPS22HB Variant : I2C Version : 6.1.0 Class : Board Component Group : PressTemp SubGroup : LPS22HH Variant : I2C Version : 6.1.0 Class : Board

			Component Group : Temp SubGroup : STTS751 Variant : I2C Version : 6.1.0 Class : Board Extension Group : IKS01A3 Version : 6.1.0 Class : Device Group : Application Variant : IKS01A3_DataLo gTerminal Version : 6.1.0
STMicroelectronic s	X-CUBE-MEMS1	6.2.0	Class : Board Component Group : AccGyr SubGroup : LSM6DSO Variant : I2C Version : 6.2.0 Class : Board Component Group : Acc SubGroup : LIS2DW12 Variant : I2C Version : 6.2.0 Class : Board Component Group : Mag SubGroup :

			LIS2MDL Variant : I2C Version : 6.2.0 Class : Board Component Group : HumTemp SubGroup : HTS221 Variant : I2C Version : 6.2.0 Class : Board Component Group : PressTemp SubGroup : LPS22HH Variant : I2C Version : 6.2.0 Class : Board Component Group : Temp SubGroup : STTS751 Variant : I2C Version : 6.2.0 Class : Board Extension Group : IKS01A3 Version : 6.2.0 Class : Device Group : Application Variant : IKS01A3_DataLogTerminal

			Version : 6.2.0