

# STM32 CubeMX

## 1. Description

### 1.1. Project

Project Name	USB_File_Create
Board Name	custom
Generated with:	STM32CubeMX 6.0.0
Date	11/22/2020

### 1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H743/753
MCU name	STM32H743IITx
MCU Package	LQFP176
MCU Pin number	176

### 1.3. Core(s) information

Core(s)	ARM Cortex-M7
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### 3. Pins Configuration

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
9	PC14-OSC32_IN (OSC32_IN)	I/O	RCC_OSC32_IN	
10	PC15-OSC32_OUT (OSC32_OUT)	I/O	RCC_OSC32_OUT	
13	PI11 *	I/O	GPIO_Output	
14	VSS	Power		
15	VDD	Power		
21	PF5 *	I/O	GPIO_Output	
22	VSS	Power		
23	VDD	Power		
29	PH0-OSC_IN (PH0)	I/O	RCC_OSC_IN	
30	PH1-OSC_OUT (PH1)	I/O	RCC_OSC_OUT	
31	NRST	Reset		
36	VDD	Power		
37	VSSA	Power		
39	VDDA	Power		
47	PA3	I/O	USART2_RX	PC_UART_RX
48	VSS	Power		
49	VDD	Power		
61	VSS	Power		
62	VDD	Power		
71	VSS	Power		
72	VDD	Power		
81	VCAP	Power		
82	VDD	Power		
90	VSS	Power		
91	VDD	Power		
102	VSS	Power		
103	VDD	Power		
113	VSS	Power		
114	VDD33_USB	Power		
119	PA8	I/O	USB_OTG_FS_SOF	
120	PA9	I/O	USB_OTG_FS_VBUS	
122	PA11	I/O	USB_OTG_FS_DM	
123	PA12	I/O	USB_OTG_FS_DP	

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
124	PA13 (JTMS/SWDIO)	I/O	DEBUG_JTMS-SWDIO	
125	VCAP	Power		
126	VSS	Power		
127	VDD	Power		
135	VSS	Power		
136	VDD	Power		
137	PA14 (JTCK/SWCLK)	I/O	DEBUG_JTCK-SWCLK	
147	PD5	I/O	USART2_TX	PC_UART_TX
148	VSS	Power		
149	VDD	Power		
158	VSS	Power		
159	VDD	Power		
166	BOOT0	Boot		
171	PDR_ON	Reset		
172	VDD	Power		

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



## 5. Software Project

### 5.1. Project Settings

Name	Value
Project Name	USB_File_Create
Project Folder	D:\SWAROOP_NAS\BENARJEE\0PROJECTS\0DATALOGGER\DATALOGGER
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_H7 V1.8.0
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

### 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	No
Keep User Code 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
Enable Full Assert	No

### 5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	IP Instance Name
1	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_USART2_UART_Init	USART2
4	MX_FATFS_Init	FATFS
5	MX_USB_HOST_Init	USB_HOST
0	MX_CORTEX_M7_Init	CORTEX_M7

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32H7
Line	STM32H743/753
MCU	STM32H743IITx
Datasheet	DS12110_Rev5

### 6.2. Parameter Selection

Temperature	25
Vdd	3.0

### 6.3. Battery Selection

Battery	Alkaline(9V)
Capacity	625.0 mAh
Self Discharge	0.3 %/month
Nominal Voltage	9.0 V
Max Cont Current	200.0 mA
Max Pulse Current	0.0 mA
Cells in series	1
Cells in parallel	1



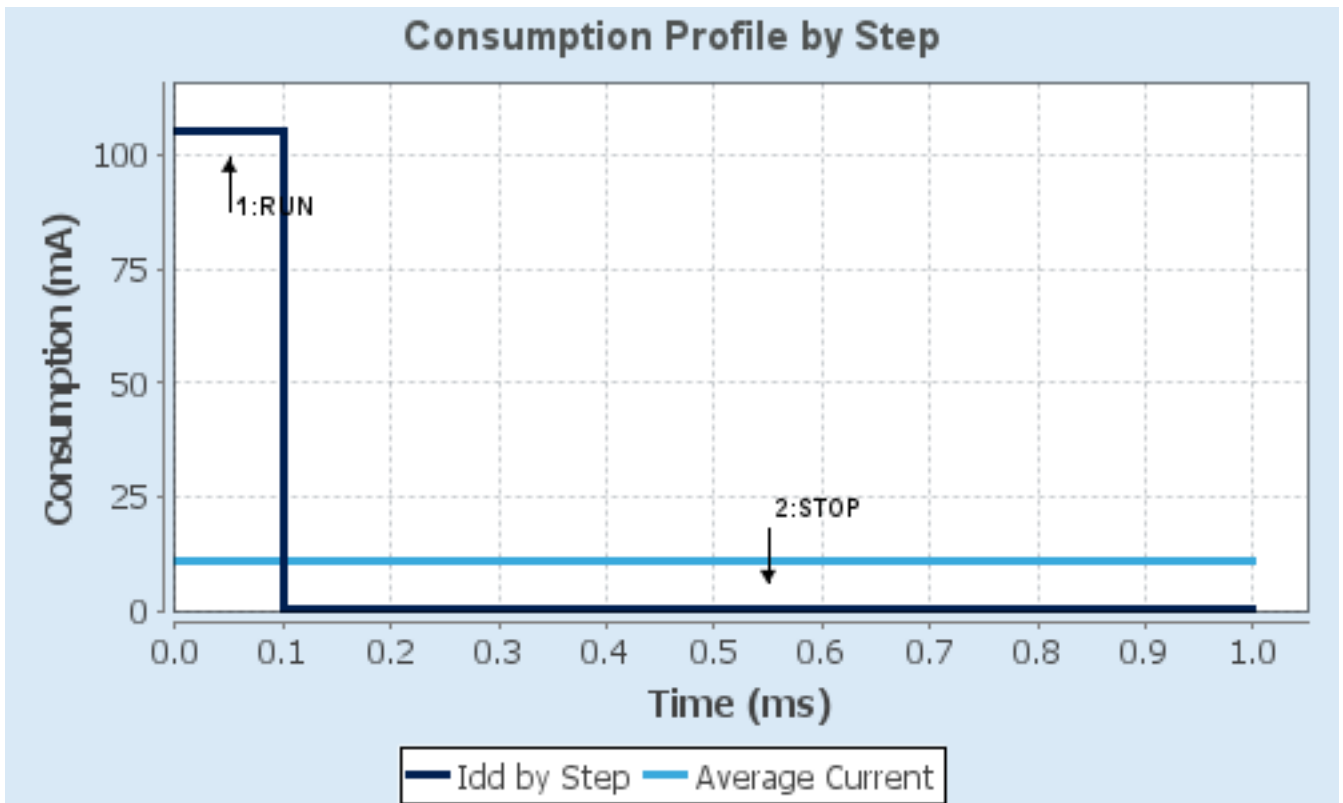
#### 6.4. Sequence

<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	3.0	3.0
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	VOS1: Scale1-High	SVOS5: System-Scale5
<b>D1 Mode</b>	DRUN/CRUN	DSTANDBY
<b>D2 Mode</b>	DSTANDBY	DSTANDBY
<b>D3 Mode</b>	DRUN	DSTOP
<b>Fetch Type</b>	FLASH A	NA
<b>CPU Frequency</b>	400 MHz	0 Hz
<b>Clock Configuration</b>	HSE BYP PLL Flash-ON Cache-ON	Flash-LP
<b>Clock Source Frequency</b>	25 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	105 mA	170 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	856.0	0.0
<b>Ta Max</b>	111.46	124.98
<b>Category</b>	In DS Table	In DS Table

#### 6.5. Results

Sequence Time	1 ms	Average Current	10.65 mA
Battery Life	2 days, 10 hours	Average DMIPS	856.00006 DMIPS

#### 6.6. Chart



## 7. IPs and Middleware Configuration

### 7.1. DEBUG

Debug: Serial Wire

### 7.2. GPIO

### 7.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

#### 7.3.1. Parameter Settings:

SupplySource PWR\_LDO\_SUPPLY

#### **RCC Parameters:**

TIM Prescaler Selection Disabled

HSE Startup Timeout Value (ms) 100

LSE Startup Timeout Value (ms) 5000

CSI Calibration Value 16

HSI Calibration Value 32

#### **System Parameters:**

VDD voltage (V) 3.3

Flash Latency(WS) 4 WS (5 CPU cycle)

#### **Power Parameters:**

Power Regulator Voltage Scale Power Regulator Voltage Scale 0

#### **PLL range Parameters:**

PLL1 clock Input range Between 8 and 16 MHz

PLL1 clock Output range Wide VCO range

### 7.4. SYS

Timebase Source: SysTick

### 7.5. USART2

Mode: Asynchronous

#### 7.5.1. 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
ClockPrescaler	clock /1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

**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

## 7.6. USB\_OTG\_FS

**Mode: Host\_Only**

**Activate\_VBUS: VBUS sensing**

**mode: Activate\_SOF**

### 7.6.1. Parameter Settings:

Speed	Full Speed 12MBit/s
Enable internal IP DMA	Disabled
Signal start of frame	Enabled

## 7.7. FATFS

**mode: USB Disk**

### 7.7.1. Set Defines:

**Version:**

FATFS version	R0.12c
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**Function Parameters:**

FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	Enabled
USE_EXPAND (Use f_expand function)	Disabled
USE_CHMOD (Change attributes function)	Disabled
USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

**Locale and Namespace Parameters:**

CODE_PAGE (Code page on target)	Latin 1
USE_LFN (Use Long Filename)	Disabled
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

**Physical Drive Parameters:**

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

**System Parameters:**

FS_TINY (Tiny mode)	Disabled
FS_EXFAT (Support of exFAT file system)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
FS_REENTRANT (Re-Entrancy)	Disabled
FS_TIMEOUT (Timeout ticks)	1000
FS_LOCK (Number of files opened simultaneously)	2

7.7.2. Advanced Settings:

**USBH:**

USBH instance	USB Host MSC FS
Use dma template	Disabled

## 7.8. USB\_HOST

### Class for FS IP: Mass Storage Host Class

#### 7.8.1. Parameter Settings:

##### Host Configuration:

USBH_MAX_NUM_ENDPOINTS (Maximum number of endpoints)	2
USBH_MAX_NUM_INTERFACES (Maximum number of interfaces)	2
USBH_MAX_NUM_SUPPORTED_CLASS (Maximum number of supported class)	1
USBH_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBH_KEEP_CFG_DESCRIPTOR (Keep the configuration into RAM)	Enabled
USBH_MAX_SIZE_CONFIGURATION (Maximum size in bytes for the Configuration Descriptor)	256
USBH_MAX_DATA_BUFFER (Maximum size of temporary data)	512
USBH_DEBUG_LEVEL (USBH Debug Level)	<b>1: Only User messages are shown *</b>

##### CMSIS\_RTOS:

USBH_USE_OS (Enable the support of an RTOS)	Disabled
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\* User modified value

## 8. System Configuration

### 8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
DEBUG	PA13 (JTMS/SWDIO)	DEBUG_JTMS-SWDIO	n/a	n/a	n/a	
	PA14 (JTCK/SWCLK)	DEBUG_JTCK-SWCLK	n/a	n/a	n/a	
RCC	PC14-OSC32_IN (OSC32_IN)	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	PH0-OSC_IN (PH0)	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT (PH1)	RCC_OSC_OUT	n/a	n/a	n/a	
USART2	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	PC_UART_RX
	PD5	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	PC_UART_TX
USB_OTG_FS	PA8	USB_OTG_FS_SOF	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA9	USB_OTG_FS_VBUS	Input mode	No pull-up and no pull-down	n/a	
	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PI11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PF5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

### 8.2. DMA configuration

nothing configured in DMA service

### 8.3. BDMA configuration

nothing configured in DMA service

#### **8.4. MDMA configuration**

nothing configured in DMA service



## 8.5. NVIC configuration

### 8.5.1. NVIC

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
USB On The Go FS global interrupt	true	0	0
PVD and AVD interrupts through EXTI line 16		unused	
Flash global interrupt		unused	
RCC global interrupt		unused	
USART2 global interrupt		unused	
FPU global interrupt		unused	
USB On The Go FS End Point 1 Out global interrupt		unused	
USB On The Go FS End Point 1 In global interrupt		unused	
HSEM1 global interrupt		unused	

### 8.5.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	true	true	false
Hard fault interrupt	true	true	false
Memory management fault	true	true	false
Pre-fetch fault, memory access fault	true	true	false
Undefined instruction or illegal state	true	true	false
System service call via SWI instruction	true	true	false
Debug monitor	true	true	false
Pendable request for system service	true	true	false
System tick timer	true	true	true
USB On The Go FS global interrupt	true	true	true

\* User modified value

## 9. System Views

### 9.1. Category view

#### 9.1.1. Current

9.1.2. Without filters

## 9.2. Power Domain view

## 10. Software Pack Report

### 10.1. Software Pack selected

Vendor	Name	Version	Component
STMicroelectronics	USB_HOST	1.0.0	Class : USB Group : USB Host SubGroup : MSC FS Version : 1.0

## 11. Docs & Resources

Type	Link
Datasheet	<a href="http://www.st.com/resource/en/datasheet/DM00387108.pdf">http://www.st.com/resource/en/datasheet/DM00387108.pdf</a>
Reference manual	<a href="http://www.st.com/resource/en/reference_manual/DM00314099.pdf">http://www.st.com/resource/en/reference_manual/DM00314099.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/DM00237416.pdf">http://www.st.com/resource/en/programming_manual/DM00237416.pdf</a>
Errata sheet	<a href="http://www.st.com/resource/en/errata_sheet/DM00368411.pdf">http://www.st.com/resource/en/errata_sheet/DM00368411.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00167594.pdf">http://www.st.com/resource/en/application_note/CD00167594.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00211314.pdf">http://www.st.com/resource/en/application_note/CD00211314.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00259245.pdf">http://www.st.com/resource/en/application_note/CD00259245.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264342.pdf">http://www.st.com/resource/en/application_note/CD00264342.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264379.pdf">http://www.st.com/resource/en/application_note/CD00264379.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00042534.pdf">http://www.st.com/resource/en/application_note/DM00042534.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00072315.pdf">http://www.st.com/resource/en/application_note/DM00072315.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00073742.pdf">http://www.st.com/resource/en/application_note/DM00073742.pdf</a>
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Application note	<a href="http://www.st.com/resource/en/application_note/DM00121475.pdf">http://www.st.com/resource/en/application_note/DM00121475.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00129215.pdf">http://www.st.com/resource/en/application_note/DM00129215.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00151811.pdf">http://www.st.com/resource/en/application_note/DM00151811.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00160482.pdf">http://www.st.com/resource/en/application_note/DM00160482.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00220769.pdf">http://www.st.com/resource/en/application_note/DM00220769.pdf</a>
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Application note [http://www.st.com/resource/en/application\\_note/DM00380469.pdf](http://www.st.com/resource/en/application_note/DM00380469.pdf)  
Application note [http://www.st.com/resource/en/application\\_note/DM00354333.pdf](http://www.st.com/resource/en/application_note/DM00354333.pdf)  
Application note [http://www.st.com/resource/en/application\\_note/DM00395696.pdf](http://www.st.com/resource/en/application_note/DM00395696.pdf)  
Application note [http://www.st.com/resource/en/application\\_note/DM00431633.pdf](http://www.st.com/resource/en/application_note/DM00431633.pdf)  
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