

## 1. Description

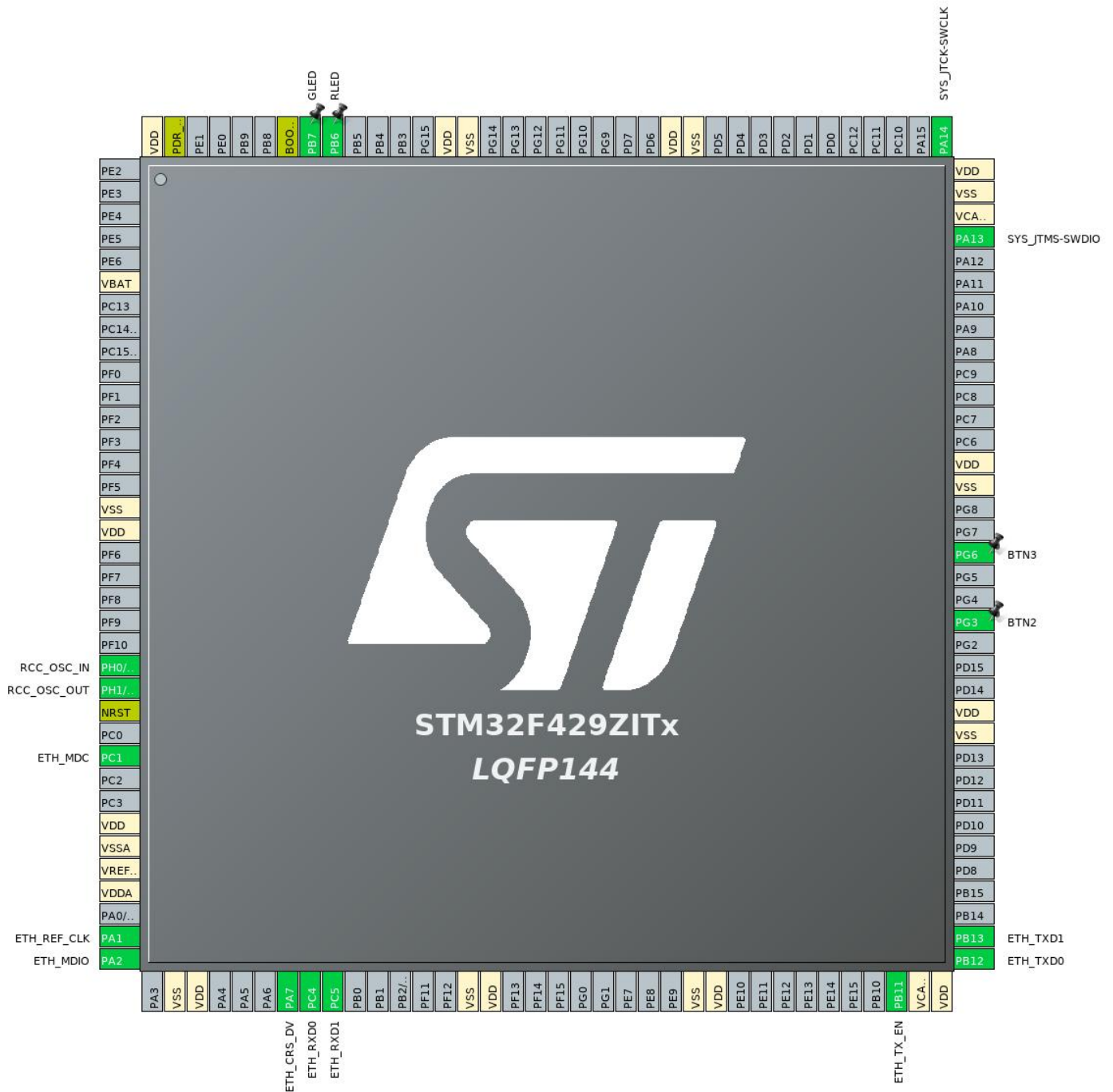
### 1.1. Project

|                 |                   |
|-----------------|-------------------|
| Project Name    | t429              |
| Board Name      | custom            |
| Generated with: | STM32CubeMX 5.3.0 |
| Date            | 09/25/2019        |

### 1.2. MCU

|                |               |
|----------------|---------------|
| MCU Series     | STM32F4       |
| MCU Line       | STM32F429/439 |
| MCU name       | STM32F429ZITx |
| MCU Package    | LQFP144       |
| MCU Pin number | 144           |

## 2. Pinout Configuration



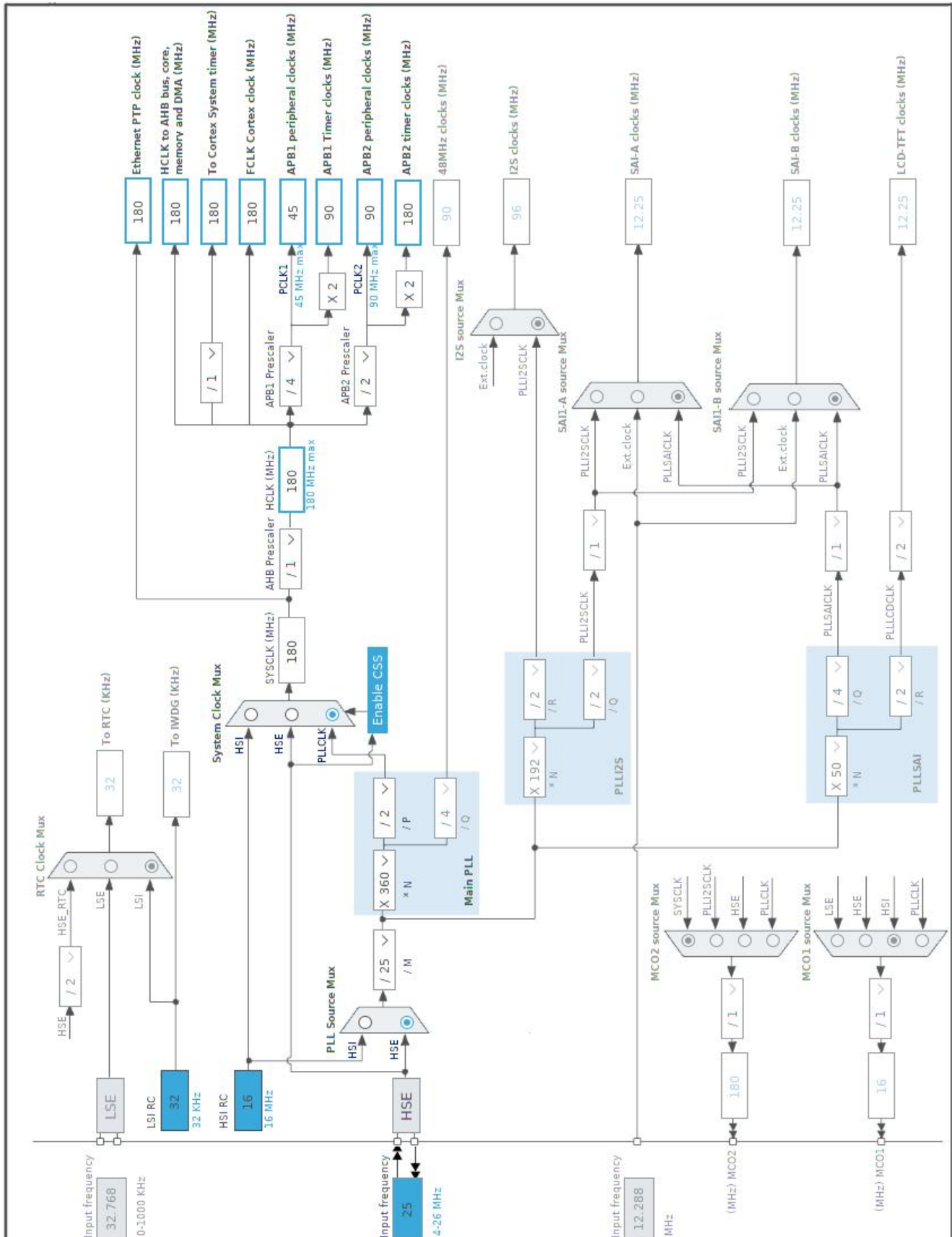
### 3. Pins Configuration

| Pin Number<br>LQFP144 | Pin Name<br>(function after<br>reset) | Pin Type | Alternate<br>Function(s) | Label |
|-----------------------|---------------------------------------|----------|--------------------------|-------|
| 6                     | VBAT                                  | Power    |                          |       |
| 16                    | VSS                                   | Power    |                          |       |
| 17                    | VDD                                   | Power    |                          |       |
| 23                    | PH0/OSC_IN                            | I/O      | RCC_OSC_IN               |       |
| 24                    | PH1/OSC_OUT                           | I/O      | RCC_OSC_OUT              |       |
| 25                    | NRST                                  | Reset    |                          |       |
| 27                    | PC1                                   | I/O      | ETH_MDC                  |       |
| 30                    | VDD                                   | Power    |                          |       |
| 31                    | VSSA                                  | Power    |                          |       |
| 32                    | VREF+                                 | Power    |                          |       |
| 33                    | VDDA                                  | Power    |                          |       |
| 35                    | PA1                                   | I/O      | ETH_REF_CLK              |       |
| 36                    | PA2                                   | I/O      | ETH_MDIO                 |       |
| 38                    | VSS                                   | Power    |                          |       |
| 39                    | VDD                                   | Power    |                          |       |
| 43                    | PA7                                   | I/O      | ETH_CRD_DV               |       |
| 44                    | PC4                                   | I/O      | ETH_RXD0                 |       |
| 45                    | PC5                                   | I/O      | ETH_RXD1                 |       |
| 51                    | VSS                                   | Power    |                          |       |
| 52                    | VDD                                   | Power    |                          |       |
| 61                    | VSS                                   | Power    |                          |       |
| 62                    | VDD                                   | Power    |                          |       |
| 70                    | PB11                                  | I/O      | ETH_TX_EN                |       |
| 71                    | VCAP_1                                | Power    |                          |       |
| 72                    | VDD                                   | Power    |                          |       |
| 73                    | PB12                                  | I/O      | ETH_TXD0                 |       |
| 74                    | PB13                                  | I/O      | ETH_TXD1                 |       |
| 83                    | VSS                                   | Power    |                          |       |
| 84                    | VDD                                   | Power    |                          |       |
| 88                    | PG3 *                                 | I/O      | GPIO_Input               | BTN2  |
| 91                    | PG6 *                                 | I/O      | GPIO_Input               | BTN3  |
| 94                    | VSS                                   | Power    |                          |       |
| 95                    | VDD                                   | Power    |                          |       |
| 105                   | PA13                                  | I/O      | SYS_JTMS-SWDIO           |       |
| 106                   | VCAP_2                                | Power    |                          |       |
| 107                   | VSS                                   | Power    |                          |       |

| Pin Number<br>LQFP144 | Pin Name<br>(function after<br>reset) | Pin Type | Alternate<br>Function(s) | Label |
|-----------------------|---------------------------------------|----------|--------------------------|-------|
| 108                   | VDD                                   | Power    |                          |       |
| 109                   | PA14                                  | I/O      | SYS_JTCK-SWCLK           |       |
| 120                   | VSS                                   | Power    |                          |       |
| 121                   | VDD                                   | Power    |                          |       |
| 130                   | VSS                                   | Power    |                          |       |
| 131                   | VDD                                   | Power    |                          |       |
| 136                   | PB6 *                                 | I/O      | GPIO_Output              | RLED  |
| 137                   | PB7 *                                 | I/O      | GPIO_Output              | GLED  |
| 138                   | BOOT0                                 | Boot     |                          |       |
| 143                   | PDR_ON                                | Reset    |                          |       |
| 144                   | 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                      | t429.5                  |
| Project Folder                    | /home/alex/test/t429.5  |
| Toolchain / IDE                   | Makefile                |
| 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            | No                                    |
| Delete previously generated files when not re-generated         | Yes                                   |
| Set all free pins as analog (to optimize the power consumption) | No                                    |

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

|           |               |
|-----------|---------------|
| Series    | STM32F4       |
| Line      | STM32F429/439 |
| MCU       | STM32F429ZITx |
| Datasheet | 024030_Rev9   |

### 6.2. Parameter Selection

|             |     |
|-------------|-----|
| Temperature | 25  |
| Vdd         | 3.3 |

## 7. IPs and Middleware Configuration

### 7.1. ETH

#### Mode: RMII

##### 7.1.1. Parameter Settings:

###### Advanced : Ethernet Media Configuration:

Auto Negotiation Enabled

###### General : Ethernet Configuration:

Ethernet MAC Address 00:80:E1:11:11:11 \*

PHY Address 1

###### Ethernet Basic Configuration:

Rx Mode Interrupt Mode

TX IP Header Checksum Computation By hardware

##### 7.1.2. Advanced Parameters:

###### External PHY Configuration:

PHY LAN8742A\_PHY\_ADDRESS

PHY Address Value 1

PHY Reset delay these values are based on a 1 ms  
Systick interrupt 0x000000FF \*

PHY Configuration delay 0x00000FFF \*

PHY Read TimeOut 0x0000FFFF \*

PHY Write TimeOut 0x0000FFFF \*

###### Common : External PHY Configuration:

Transceiver Basic Control Register 0x00 \*

Transceiver Basic Status Register 0x01 \*

PHY Reset 0x8000 \*

Select loop-back mode 0x4000 \*

Set the full-duplex mode at 100 Mb/s 0x2100 \*

Set the half-duplex mode at 100 Mb/s 0x2000 \*

Set the full-duplex mode at 10 Mb/s 0x0100 \*

Set the half-duplex mode at 10 Mb/s 0x0000 \*

Enable auto-negotiation function 0x1000 \*

Restart auto-negotiation function 0x0200 \*

Select the power down mode 0x0800 \*

Isolate PHY from MII 0x0400 \*



|                                    |          |
|------------------------------------|----------|
| Auto-Negotiation process completed | 0x0020 * |
| Valid link established             | 0x0004 * |
| Jabber condition detected          | 0x0002 * |

**Extended : External PHY Configuration:**

|  |          |
|--|----------|
| PHY special control/status register Offset | 0x1F *   |
| PHY Speed mask                             | 0x0004 * |
| PHY Duplex mask                            | 0x0010 * |
| PHY Interrupt Source Flag register Offset  | 0x001D * |
| PHY Link down interrupt                    | 0x000B * |

## 7.2. RCC

### High Speed Clock (HSE): Crystal/Ceramic Resonator

#### 7.2.1. Parameter Settings:

**System Parameters:**

|                   |                    |
|-------------------|--------------------|
| VDD voltage (V)   | 3.3                |
| Instruction Cache | Enabled            |
| Prefetch Buffer   | Enabled            |
| Data Cache        | Enabled            |
| Flash Latency(WS) | 5 WS (6 CPU cycle) |

**RCC Parameters:**

|                                |          |
|--------------------------------|----------|
| HSI Calibration Value          | 16       |
| TIM Prescaler Selection        | Disabled |
| HSE Startup Timeout Value (ms) | 100      |
| LSE Startup Timeout Value (ms) | 5000     |

**Power Parameters:**

|                               |                                 |
|-------------------------------|---------------------------------|
| Power Regulator Voltage Scale | Power Regulator Voltage Scale 1 |
| Power Over Drive              | Enabled                         |

## 7.3. SYS

### Debug: Serial Wire

#### Timebase Source: TIM2

## 7.4. FREERTOS

## Interface: CMSIS\_V2

### 7.4.1. Config parameters:

#### API:

FreeRTOS API CMSIS v2

#### Versions:

FreeRTOS version 10.0.1  
CMSIS-RTOS version 2.00

#### Kernel settings:

USE\_PREEMPTION Enabled  
CPU\_CLOCK\_HZ SystemCoreClock  
TICK\_RATE\_HZ 1000  
MAX\_PRIORITIES 56  
MINIMAL\_STACK\_SIZE **1000 \***  
MAX\_TASK\_NAME\_LEN 16  
USE\_16\_BIT\_TICKS Disabled  
IDLE\_SHOULD\_YIELD Enabled  
USE\_MUTEXES Enabled  
USE\_RECURSIVE\_MUTEXES Enabled  
USE\_COUNTING\_SEMAPHORES Enabled  
QUEUE\_REGISTRY\_SIZE 8  
USE\_APPLICATION\_TASK\_TAG Disabled  
ENABLE\_BACKWARD\_COMPATIBILITY Enabled  
USE\_PORT\_OPTIMISED\_TASK\_SELECTION Disabled  
USE\_TICKLESS\_IDLE Disabled  
USE\_TASK\_NOTIFICATIONS Enabled  
RECORD\_STACK\_HIGH\_ADDRESS Disabled

#### Memory management settings:

Memory Allocation Dynamic / Static  
TOTAL\_HEAP\_SIZE **10000 \***  
Memory Management scheme heap\_4

#### Hook function related definitions:

USE\_IDLE\_HOOK Disabled  
USE\_TICK\_HOOK Disabled  
USE\_MALLOC\_FAILED\_HOOK Disabled  
USE\_DAEMON\_TASK\_STARTUP\_HOOK Disabled  
CHECK\_FOR\_STACK\_OVERFLOW Disabled

#### Run time and task stats gathering related definitions:

GENERATE\_RUN\_TIME\_STATS Disabled  
USE\_TRACE\_FACILITY Enabled  
USE\_STATS\_FORMATTING\_FUNCTIONS Disabled

#### Co-routine related definitions:

|                           |          |
|---------------------------|----------|
| USE_CO_ROUTINES           | Disabled |
| MAX_CO_ROUTINE_PRIORITIES | 2        |

#### Software timer definitions:

|                        |               |
|------------------------|---------------|
| USE_TIMERS             | Enabled       |
| TIMER_TASK_PRIORITY    | 2             |
| TIMER_QUEUE_LENGTH     | 10            |
| TIMER_TASK_STACK_DEPTH | <b>1024 *</b> |

#### Interrupt nesting behaviour configuration:

|  |    |
|--|----|
| LIBRARY_LOWEST_INTERRUPT_PRIORITY      | 15 |
| LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY | 5  |

### 7.4.2. Include parameters:

#### Include definitions:

|                             |          |
|-----------------------------|----------|
| vTaskPrioritySet            | Enabled  |
| uxTaskPriorityGet           | Enabled  |
| vTaskDelete                 | Enabled  |
| vTaskCleanUpResources       | Disabled |
| vTaskSuspend                | Enabled  |
| vTaskDelayUntil             | Enabled  |
| vTaskDelay                  | Enabled  |
| xTaskGetSchedulerState      | Enabled  |
| xTaskResumeFromISR          | Enabled  |
| xQueueGetMutexHolder        | Enabled  |
| xSemaphoreGetMutexHolder    | Disabled |
| pcTaskGetTaskName           | Disabled |
| uxTaskGetStackHighWaterMark | Enabled  |
| xTaskGetCurrentTaskHandle   | Disabled |
| eTaskGetState               | Enabled  |
| xEventGroupSetBitFromISR    | Disabled |
| xTimerPendFunctionCall      | Enabled  |
| xTaskAbortDelay             | Disabled |
| xTaskGetHandle              | Disabled |

### 7.5. LWIP

#### mode: Enabled

Advanced parameters are not listed except if modified by user.

### 7.5.1. General Settings:

#### LwIP Version:

LWIP Version (Version of LwIP supported by CubeMX \*\* CubeMX specific \*\*) 2.0.3

#### IPv4 - DHCP Options:

LWIP\_DHCP (DHCP Module) **Disabled \***

#### IP Address Settings:

IP\_ADDRESS (IP Address) **172.016.027.126 \***

NETMASK\_ADDRESS (Netmask Address) **255.255.255.000 \***

GATEWAY\_ADDRESS (Gateway Address) **172.016.027.001 \***

#### RTOS Dependency:

WITH\_RTOS (Use FREERTOS \*\* CubeMX specific \*\*) Enabled

CMSIS\_VERSION (CMSIS API Version used) CMSIS v2

#### Protocols Options:

LWIP\_ICMP (ICMP Module Activation) Enabled

LWIP\_IGMP (IGMP Module) Disabled

LWIP\_DNS (DNS Module) Disabled

LWIP\_UDP (UDP Module) Enabled

MEMP\_NUM\_UDP\_PCB (Number of UDP Connections) 4

LWIP\_TCP (TCP Module) Enabled

MEMP\_NUM\_TCP\_PCB (Number of TCP Connections) 5

### 7.5.2. Key Options:

#### Infrastructure - OS Awareness Option:

NO\_SYS (OS Awareness) OS Used

#### Infrastructure - Timers Options:

LWIP\_TIMERS (Use Support For sys\_timeout) Enabled

#### Infrastructure - Core Locking and MPU Options:

SYS\_LIGHTWEIGHT\_PROT (Memory Functions Protection) Enabled

#### Infrastructure - Heap and Memory Pools Options:

MEM\_SIZE (Heap Memory Size) **4096 \***

#### Infrastructure - Internal Memory Pool Sizes:

MEMP\_NUM\_PBUF (Number of Memory Pool struct Pbufs) 16

MEMP\_NUM\_RAW\_PCB (Number of Raw Protocol Control Blocks) 4

MEMP\_NUM\_TCP\_PCB\_LISTEN (Number of Listening TCP Connections) 8

MEMP\_NUM\_TCP\_SEG (Number of TCP Segments simultaneously queued) 16

MEMP\_NUM\_LOCALHOSTLIST (Number of Host Entries in the Local Host List) 1

#### Pbuf Options:

|  |     |
|--|-----|
| PBUF_POOL_SIZE (Number of Buffers in the Pbuf Pool)    | 16  |
| PBUF_POOL_BUFSIZE (Size of each pbuf in the pbuf pool) | 592 |

#### IPv4 - ARP Options:

|                              |         |
|------------------------------|---------|
| LWIP_ARP (ARP Functionality) | Enabled |
|------------------------------|---------|

#### Callback - TCP Options:

|  |         |
|--|---------|
| TCP_TTL (Number of Time-To-Live Used by TCP Packets)               | 255     |
| TCP_WND (TCP Receive Window Maximum Size)                          | 2144    |
| TCP_QUEUE_OOSEQ (Allow Out-Of-Order Incoming Packets)              | Enabled |
| TCP_MSS (Maximum Segment Size)                                     | 536     |
| TCP_SND_BUF (TCP Sender Buffer Space)                              | 1072    |
| TCP_SND_QUEUELEN (Number of Packet Buffers Allowed for TCP Sender) | 9       |

#### Network Interfaces Options:

|  |          |
|--|----------|
| LWIP_NETIF_STATUS_CALLBACK (Callback Function on Interface Status Changes) | Disabled |
| LWIP_NETIF_LINK_CALLBACK (Callback Function on Interface Link Changes)     | Disabled |

#### NETIF - Loopback Interface Options:

|                                      |          |
|--------------------------------------|----------|
| LWIP_NETIF_LOOPBACK (NETIF Loopback) | Disabled |
|--------------------------------------|----------|

#### Infrastructure - Threading Options:

|   |                |
|---|----------------|
| TCPIP_THREAD_NAME (TCPIP Thread Name)                                   | "tcpip_thread" |
| TCPIP_THREAD_STACKSIZE (TCPIP Thread Stack Size)                        | 1024           |
| TCPIP_THREAD_PRIO (TCPIP Thread Priority Level)                         | 3              |
| TCPIP_MBOX_SIZE (TCPIP Mailbox Size)                                    | 6              |
| DEFAULT_THREAD_NAME (Default LwIP Thread Name)                          | "lwip"         |
| DEFAULT_THREAD_STACKSIZE (Default LwIP Thread Stack Size)               | 1024           |
| DEFAULT_THREAD_PRIO (Default LwIP Thread Priority Level)                | 3              |
| DEFAULT_RAW_RECVMBOX_SIZE (Default Mailbox Size on a NETCONN Raw)       | 0              |
| DEFAULT_TCP_RECVMBOX_SIZE (Default Mailbox Size on a NETCONN TCP)       | 6              |
| DEFAULT_ACCEPTMBOX_SIZE (Default Mailbox Size for Incoming Connections) | 6              |

#### Thread Safe APIs - Netconn Options:

|                            |         |
|----------------------------|---------|
| LWIP_NETCONN (NETCONN API) | Enabled |
|----------------------------|---------|

#### Thread Safe APIs - Socket Options:

|  |         |
|--|---------|
| LWIP_SOCKET (Socket API)                               | Enabled |
| LWIP_COMPAT_SOCKETS (BSD-style Socket Functions Names) | 1       |
| LWIP_SOCKET_OFFSET (Socket Offset Number)              | 0       |

### 7.5.3. PPP:

#### PPP Options:

|                          |          |
|--------------------------|----------|
| PPP_SUPPORT (PPP Module) | Disabled |
|--------------------------|----------|

#### 7.5.4. IPv6:

##### IPv6 Options:

LWIP\_IPV6 (IPv6 Protocol) Disabled

#### 7.5.5. HTTPD:

##### HTTPD Options:

LWIP\_HTTPD (LwIP HTTPD Support \*\* CubeMX specific \*\*) Disabled

#### 7.5.6. SNMP:

##### SNMP Options:

LWIP\_SNMP (LwIP SNMP Agent) Disabled

#### 7.5.7. SNTP:

##### SNTP Options:

LWIP\_SNTP (LWIP SNTP Support \*\* CubeMX specific \*\*) Disabled

#### 7.5.8. MDNS/TFTP:

##### MDNS Options:

LWIP\_MDNS (Multicast DNS Support \*\* CubeMX specific \*\*) Disabled

##### TFTP Options:

LWIP\_TFTP (TFTP Support \*\* CubeMX specific \*\*) Disabled

#### 7.5.9. Perf/Checks:

##### Sanity Checks:

LWIP\_DISABLE\_TCP\_SANITY\_CHECKS (TCP Sanity Checks) Disabled

LWIP\_DISABLE\_MEMP\_SANITY\_CHECKS (MEMP Sanity Checks) Disabled

##### Performance Options:

LWIP\_PERF (Performace Testing for LwIP) Disabled

#### 7.5.10. Statistics:

#### Debug - Statistics Options:

|                                    |          |
|------------------------------------|----------|
| LWIP_STATS (Statistics Collection) | Disabled |
|------------------------------------|----------|

### 7.5.11. Checksum:

#### Infrastructure - Checksum Options:

|  |          |
|--|----------|
| CHECKSUM_BY_HARDWARE (Hardware Checksum ** CubeMX specific **)               | Disabled |
| LWIP_CHECKSUM_CTRL_PER_NETIF (Generate/Check Checksum per Netif)             | Disabled |
| CHECKSUM_GEN_IP (Generate Software Checksum for Outgoing IP Packets)         | Disabled |
| CHECKSUM_GEN_UDP (Generate Software Checksum for Outgoing UDP Packets)       | Disabled |
| CHECKSUM_GEN_TCP (Generate Software Checksum for Outgoing TCP Packets)       | Disabled |
| CHECKSUM_GEN_ICMP (Generate Software Checksum for Outgoing ICMP Packets)     | Disabled |
| CHECKSUM_GEN_ICMP6 (Generate Software Checksum for Outgoing ICMP6 Packets)   | Disabled |
| CHECKSUM_CHECK_IP (Generate Software Checksum for Incoming IP Packets)       | Disabled |
| CHECKSUM_CHECK_UDP (Generate Software Checksum for Incoming UDP Packets)     | Disabled |
| CHECKSUM_CHECK_TCP (Generate Software Checksum for Incoming TCP Packets)     | Disabled |
| CHECKSUM_CHECK_ICMP (Generate Software Checksum for Incoming ICMP Packets)   | Disabled |
| CHECKSUM_CHECK_ICMP6 (Generate Software Checksum for Incoming ICMP6 Packets) | Disabled |

### 7.5.12. Debug:

#### LwIP Main Debugging Options:

|  |                   |
|--|-------------------|
| LWIP_DBG_MIN_LEVEL (Minimum Level)                   | All               |
| LWIP_DBG_TYPES_ON (Only certain Debug Message Types) | <b>Disabled *</b> |

\* User modified value

## 8. System Configuration

### 8.1. GPIO configuration

| IP   | Pin         | Signal         | GPIO mode                    | GPIO pull/up pull down      | Max Speed      | User Label |
|------|-------------|----------------|------------------------------|-----------------------------|----------------|------------|
| ETH  | PC1         | ETH_MDC        | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PA1         | ETH_REF_CLK    | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PA2         | ETH_MDIO       | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PA7         | ETH_CRS_DV     | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PC4         | ETH_RXD0       | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PC5         | ETH_RXD1       | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PB11        | ETH_TX_EN      | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PB12        | ETH_TXD0       | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
|      | PB13        | ETH_TXD1       | Alternate Function Push Pull | No pull-up and no pull-down | Very High<br>* |            |
| RCC  | PH0/OSC_IN  | RCC_OSC_IN     | n/a                          | n/a                         | n/a            |            |
|      | PH1/OSC_OUT | RCC_OSC_OUT    | n/a                          | n/a                         | n/a            |            |
| SYS  | PA13        | SYS_JTMS-SWDIO | n/a                          | n/a                         | n/a            |            |
|      | PA14        | SYS_JTCK-SWCLK | n/a                          | n/a                         | n/a            |            |
| GPIO | PG3         | GPIO_Input     | Input mode                   | No pull-up and no pull-down | n/a            | BTN2       |
|      | PG6         | GPIO_Input     | Input mode                   | No pull-up and no pull-down | n/a            | BTN3       |
|      | PB6         | GPIO_Output    | Output Push Pull             | No pull-up and no pull-down | Low            | RLED       |
|      | PB7         | GPIO_Output    | Output Push Pull             | No pull-up and no pull-down | Low            | GLLED      |

### 8.2. DMA configuration



nothing configured in DMA service

### 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   | 15                   | 0           |
| System tick timer                               | true   | 15                   | 0           |
| TIM2 global interrupt                           | true   | 0                    | 0           |
| Ethernet global interrupt                       | true   | 5                    | 0           |
| PVD interrupt through EXTI line 16              | unused |                      |             |
| Flash global interrupt                          | unused |                      |             |
| RCC global interrupt                            | unused |                      |             |
| Ethernet wake-up interrupt through EXTI line 19 | unused |                      |             |
| FPU global interrupt                            | unused |                      |             |

\* User modified value

## ***9. Software Pack Report***