

1. Description

1.1. Project

Project Name	ethernet_lwip_test
Board Name	custom
Generated with:	STM32CubeMX 5.4.0
Date	12/16/2019

1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H743/753
MCU name	STM32H743ZITx
MCU Package	LQFP144
MCU Pin number	144

2. Pinout Configuration

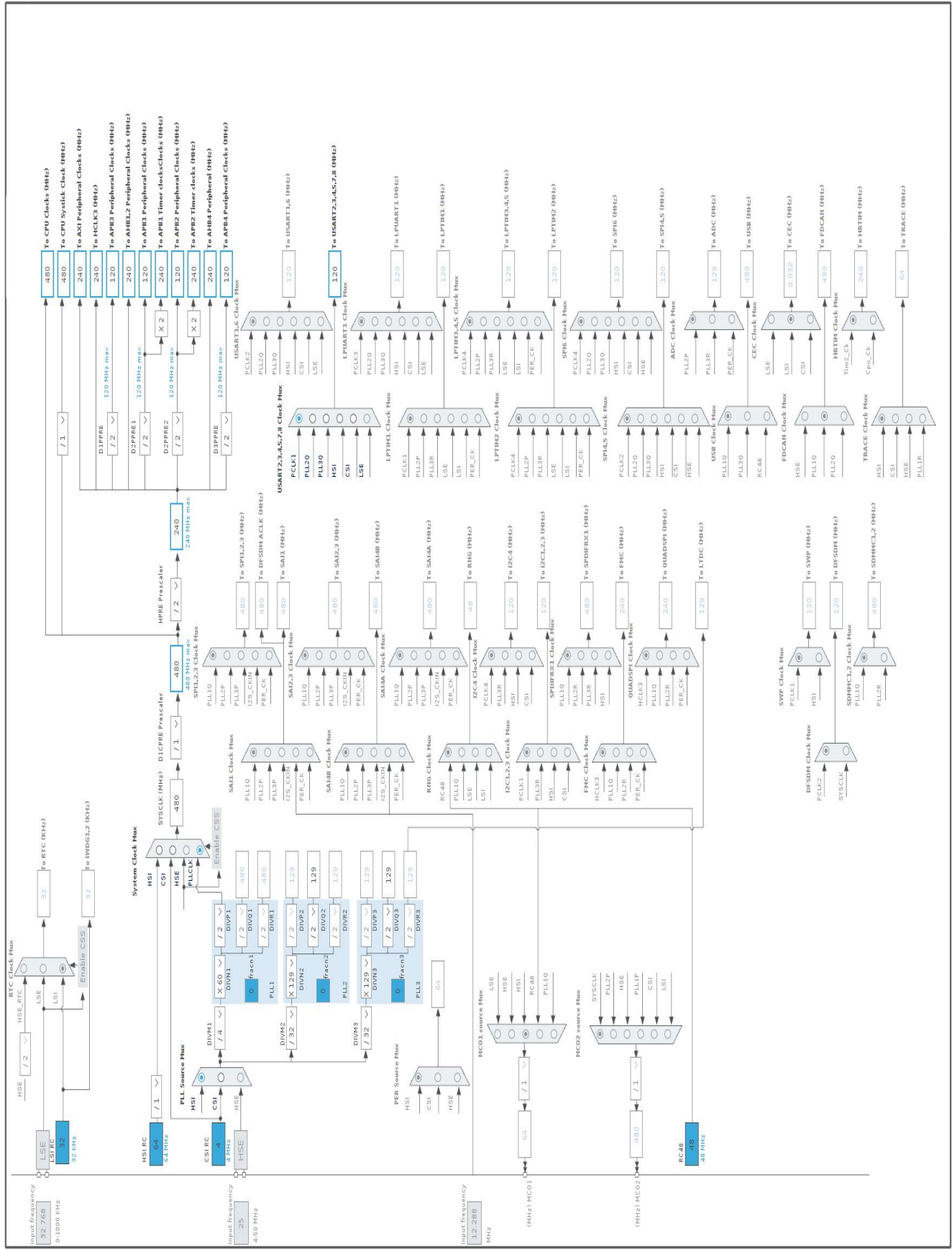


3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
16	VSS	Power		
17	VDD	Power		
25	NRST	Reset		
27	PC1	I/O	ETH_MDC	
30	VDD	Power		
31	VSSA	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_CRS_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		
69	PB10	I/O	USART3_TX	
70	PB11	I/O	USART3_RX	
71	VCAP	Power		
72	VDD	Power		
74	PB13	I/O	ETH_TXD1	
83	VSS	Power		
84	VDD	Power		
94	VSS	Power		
95	VDD33_USB	Power		
106	VCAP	Power		
107	VSS	Power		
108	VDD	Power		
120	VSS	Power		
121	VDD	Power		
126	PG11	I/O	ETH_TX_EN	
128	PG13	I/O	ETH_TXD0	
130	VSS	Power		

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
131	VDD	Power		
138	BOOT0	Boot		
143	PDR_ON	Reset		
144	VDD	Power		

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	ethernet_lwip_test
Project Folder	/home/dnk122/STM Training/ethernet_lwip_test
Toolchain / IDE	TrueSTUDIO
Firmware Package Name and Version	STM32Cube FW_H7 V1.5.0

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	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)	Yes

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32H7
Line	STM32H743/753
MCU	STM32H743ZITx
Datasheet	DS12110_Rev5

6.2. Parameter Selection

Temperature	25
Vdd	3.0

7. IPs and Middleware Configuration

7.1. CORTEX_M7

7.1.1. Parameter Settings:

Cortex Interface Settings:

CPU ICache	Enabled *
CPU DCache	Enabled *

Cortex Memory Protection Unit Control Settings:

MPU Control Mode	MPU NOT USED
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7.2. ETH

Mode: RMII

7.2.1. Parameter Settings:

General : Ethernet Configuration:

Warning	The ETH can work only when RAM is pointing at 0x24000000
Note	PHY Driver must be configured from the LwIP 'Platform Settings' top right tab
Ethernet MAC Address	00:80:E1:00:00:00
Tx Descriptor Length	4
First Tx Descriptor Address	0x30040060 *
Rx Descriptor Length	4
First Rx Descriptor Address	0x30040000 *
Rx Buffers Address	0x30040200 *
Rx Buffers Length	1524

7.3. GPIO

7.4. RCC

7.4.1. Parameter Settings:

SupplySource	PWR_LDO_SUPPLY
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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

7.5. SYS

Timebase Source: SysTick

7.6. USART3

Mode: Asynchronous

7.6.1. Parameter Settings:

Basic Parameters:

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

Advanced Parameters:

Data Direction	Receive 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

7.7. LWIP

mode: Enabled

Advanced parameters are not listed except if modified by user.

7.7.1. General Settings:

LwIP Version:

LwIP Version (Version of LwIP supported by CubeMX ** CubeMX specific **)	2.0.3
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IPv4 - DHCP Options:

LWIP_DHCP (DHCP Module)	Enabled
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RTOS Dependency:

WITH_RTOS (Use FREERTOS ** CubeMX specific **)	Disabled
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Platform Settings:

PHY Driver	Choose/LAN8742
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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

7.7.2. Key Options:

Infrastructure - OS Awareness Option:

NO_SYS (OS Awareness)	OS Not Used
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Infrastructure - Timers Options:

LWIP_TIMERS (Use Support For sys_timeout)	Enabled
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Infrastructure - Core Locking and MPU Options:

SYS_LIGHTWEIGHT_PROT (Memory Functions Protection)	Disabled
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Infrastructure - Heap and Memory Pools Options:

MEM_SIZE (Heap Memory Size)	1600
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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
Thread Safe APIs - Socket Options:	
LWIP_SOCKET (Socket API)	Disabled

7.7.3. PPP:

PPP Options:	
PPP_SUPPORT (PPP Module)	Disabled

7.7.4. IPv6:

IPv6 Options:	
LWIP_IPV6 (IPv6 Protocol)	Disabled

7.7.5. HTTPD:

HTTPD Options:	
LWIP_HTTPD (LwIP HTTPD Support ** CubeMX specific **)	Disabled

7.7.6. SNMP:

SNMP Options:

LWIP_SNMP (LwIP SNMP Agent) Disabled

7.7.7. SNTP:

SNTP Options:

LWIP_SNTP (LWIP SNTP Support ** CubeMX specific **) Disabled

7.7.8. MDNS/TFTP:

MDNS Options:

LWIP_MDNS (Multicast DNS Support ** CubeMX specific **) Disabled

TFTP Options:

LWIP_TFTP (TFTP Support ** CubeMX specific **) Disabled

7.7.9. 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

7.7.10. Statistics:

Debug - Statistics Options:

LWIP_STATS (Statictics Collection) Disabled

7.7.11. 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

7.7.12. Debug:

LwIP Main Debugging Options:

LWIP_DBG_MIN_LEVEL (Minimum Level)	All
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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
ETH	PC1	ETH_MDC	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA7	ETH_CRSDV	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PB13	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PG11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PG13	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
USART3	PB10	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB11	USART3_RX	Alternate Function 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

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
PVD and AVD interrupts through EXTI line 16		unused	
Flash global interrupt		unused	
RCC global interrupt		unused	
USART3 global interrupt		unused	
Ethernet global interrupt		unused	
Ethernet wake-up interrupt through EXTI line 86		unused	
FPU global interrupt		unused	
HSEM1 global interrupt		unused	

* User modified value

9. Software Pack Report