**ATOM THREADS PORTING STM8L DISCOVERY**

**Porting, design and test drivers GPIO (Button/Led) on Atomthread RTOS**

|  |  |
| --- | --- |
| **Document Authur:**  KhanhNLD | **Tester:**  PhucLH15  ThucLT  KhaNT |
| **Version 1** | **23 Jul 2019** |

1. **Unit Test**

CMREQ01: Atomthread Kernel RTOS can run on board successfully. Can log some debug on terminal.

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | *CMREQ01 PhucLH15 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Init OS failed | Log: *“If this is printed, the OS initialization has failed”* | Pass |  |
| Init threads LED | Log: “*led\_thread has been created”* | Pass |  |
| Init threads Button | Log: *“button\_thread has been created”* | Pass |  |
| Init threads Display | Log: *“display\_thread has been created”* | Pass |  |

CMREQ02: Using <https://atomthreads.com/doxygen/kernel/files.html> to view source kernel source and ensure structure when porting.

CMREQ03: Using <https://github.com/kelvinlawson/atomthreads/tree/master/ports/stm8/stm8s-periphs>

To view source driver of peripherals and ensure structure when porting, design.

1. **Drivers API**

Các function hỗ trợ

Các test

void gpio\_Init (…)

FREQ11: If initialization is successful without error, return TRUE.  
FREQ12: If have any error, report error to debug.

Test on PE7 and PC7 as LEDs on Discovery Board. Unless any notice, test resoults column is result of both pins.

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | *Spi\_Init DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case (Mode init)** | **Desired results** | **Test results** | **Problems** |
| In\_Fl\_No\_IT |  | Pass |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | *Spi\_DeInit DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case (Mode init)** | **Desired results** | **Test results** | **Problems** |
| In\_Fl\_No\_IT |  | Pass |  |

If it was not pass, it will return 1 of these log:

DDR config for output is wrong!

ODR config for high level is wrong!

ODR config for low level is wrong!

DDR config for input is wrong!

CR1 config for Pull-Up or Push-Pull is wrong

CR1 config for Float or Open-Drain is wrong

CR2 config for enable Interrupt or output 10Mhz is wrong

CR2 config for disable Interrupt or ouput 2Mhz is wrong

But… it has ran perfectly, so we cant test these error

void gpio\_deinit (...)

FREQ21: Release pinout without error, return TRUE  
FREQ22: If have any error, report error to debug.

If it was not pass, it will return 1 of these log:

can't reset DDR

can't reset ODR

can't reset CR1

can't reset CR2

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ21 *DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Deinit |  | Pass |  |

void gpio\_write (...)

FREQ31: Allow write 01 bit (0, 1) to selected pins.  
FREQ32: If have any error, report error to debug.

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ31 *DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| IO write |  | Pass |  |

void gpio\_read (...)

FREQ41: Allow read 01 bit (0, 1) to selected pins.  
FREQ42: If have any error, report error to debug.

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ41 *DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| IO read |  | Pass |  |

void button\_task (...)

FREQ51: receive event (interrupt) from user. And set 03 modes (LED blink 1s, 2s and 3s) and transfer action to “led\_task”.

FREQ52: If have any error, report error to debug

FREQ53: this task has a highest priority

Modes:

+ push 1st time: 1s

+ push 2nd time: 2s

+ push 3rd time: 3s

+ repeat push 4th time: back to 1s

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ51 *ThucLH 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| 1s blink |  | Pass |  |
| 2s blink |  | Pass |  |
| 3s blink |  | Pass |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ52 *ThucLH 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Init | Log: “*button\_thread has been created*” | Pass |  |

We thougt to use External Interupt to make highest priority event as FREQ53, but when we do that we cant apply semaphore schedule. So, maybe we can talk more about this requirements.

void led\_task (...)

FREQ61: receive event from “button\_task”. And trigger LED blink on/off as selected mode.

FREQ62: If have any error, report error to debug

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ61 *DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Led blink | Led blink | Pass |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | FREQ62 *DieuTQ 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Init Threads | Log: *“led\_thread has been created”* | Pass |  |

1. **Non-functional requirements**

**InitClock\_Source();**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | **InitClock\_Source();** *KhaNT3 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Init clock | Log: *“CLK\_SYSCLKSource\_HSI”* | Pass |  |

**Quantumn\_time\_RoundRobin\_10ms();**

This function create time slot 10ms for Round Robin Agorithm schedule

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | **Quantumn\_time\_RoundRobin\_10ms();** *KhanhNLD 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| Time slot 10ms | Ảnh có chứa ảnh chụp màn hình  Mô tả được tạo tự động | Pass |  |
| Time slot 20ms | *Ảnh có chứa ảnh chụp màn hình  Mô tả được tạo tự động* | Not very good |  |

**LCD\_printf(char \*,...)**

This function is re-define printf function in <stdio.h>, it will display debug status on LCD screen.

|  |  |  |  |
| --- | --- | --- | --- |
| **Function/Requirements: Implementer: Implementation date:**  **Version:** | **LCD\_printf(char \*,...)** *PhucLH15 23 Jul 2019 1.0.0* |  |  |
| **Test case** | **Desired results** | **Test results** | **Problems** |
| TIME 1 |  | Pass | Forgot take real picture |
| TIME 2 |  | Pass | Forgot take real picture |
| TIME 3 |  | Pass | Forgot take real picture |