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Description automatically generatedPA Pool Project – Requirements Document**

**EQUIPHILLO**

**High Level Requirements**

**[****SHLR\_0100]**

* The BLE Keyboard project shall leverage FreeRTOS libraries for task creation, scheduling, and efficient management of concurrent processes.

Covers: [SR\_0040]

**[SHLR \_0110]**

* The BLE Keyboard project shall use FreeRTOS to implement semaphores and mutexes for effective synchronization between tasks.

Covers: [SR\_0040]

**[SHLR \_0120]**

* The BLE Keyboard project shall employ FreeRTOS to manage interruptions efficiently and ensure timely response in real-time scenarios.  
  Covers: [SR\_0040]

**[SHLR\_0130]**

* The BLE Keyboard project shall utilize the STM32 peripheral libraries to interact seamlessly with GPIO, UART, and Bluetooth modules.  
  Covers: [SR\_0050]

**[SHLR\_0140]**

* The BLE Keyboard project shall implement a matrix keyboard keypress and debouncing logic to ensure accurate and reliable input processing.  
  Covers: [SR\_0060]

**[SHLR\_0150]**

* The BLE Keyboard project shall incorporate Bluetooth stack libraries that adhere to the Bluetooth stack protocol specified for the BLUENRG-M2SP Bluetooth processor.  
  Covers: [SR\_0025], [SR\_0030]

**[SHLR\_0160]**

* The BLE Keyboard project shall include data streaming capabilities using Bluetooth for the wireless transmission of keyboard inputs.  
  Covers: [SR\_0080]

**[SHLR\_0170]**

* The BLE Keyboard project shall integrate security features such as encryption and authentication to ensure the confidentiality and integrity of Bluetooth communication.  
  Covers: [SR\_0090]

**[SHLR\_0180]**

* The BLE Keyboard project shall be designed to receive power constantly through the board mini B connector (CN1 ST-LINK USB).  
  Covers: [SR\_0130]

**[SHLR\_0190]**

* The BLE Keyboard project shall include safeguards in the code to handle unexpected errors and exceptions, ensuring robustness and reliability.  
  Covers: N/A (This is a general requirement for system robustness)

**[SHLR\_0200]**

* The BLE Keyboard project shall provide a user-friendly interface for Bluetooth pairing and configuration settings.  
  Covers: N/A (This is a usability requirement)

**[SHLR\_0210]**

* The BLE Keyboard project shall include documentation that comprehensively outlines system architecture, configurations, and usage instructions.  
  Covers: N/A (This is a documentation requirement).

**[SHLR\_0220]**

* The SPI communication between the board and the expansion shall be made using the ports for SPI1 on the NUCELO Board.

**[SHLR\_0230]**

* The HCI interface shall be the configuration for a Keyboard.

**[SHLR\_0240]**

* The software shall interpret each keypress and send it to the receiver device.

**[SHLR\_0250]**

* The software shall go to sleep mode if no key was pressed after 30 ± 2 seconds.

**[SHLR\_0260]**

* The software shall deliver the received messages every 50 ± 5 millisecond.

**[SHLR\_0270]**

* When pressing the off button or when the power signal is lost, the Ble Keyboard shall go to power off mode.

**[SHLR\_0280]**

* If the mode is Sleep mode and a key is pressed is the detected, the BLE Keyboard shall go to Active mode and send the pressed key.

**[SHLR\_0290]**

* When a device is connected to the BLE Keyboard, the green led (LD1) shall flash 5 times.