

Detailed Schematic Connections for Breath Analyzer Device

Below is a detailed breakdown of how each component in your breath analyzer device schematic is connected. This table aims to provide a clear, structured view of the interconnections, helping you visualize the circuit flow.

Connection Table

| Component | Pin | Connected Net | Connected To (Component: Pin) |
|----------------------|----------------|------------------|--|
| U1 (AMS1117-3.3) | VIN | VBUS_5V | Input Power Source |
| U1 (AMS1117-3.3) | GND | GND | Ground |
| U1 (AMS1117-3.3) | VOUT | VCC_3V3 | All 3.3V Components |
| C_IN1 (10uF) | + | VBUS_5V | U1: VIN |
| C_IN1 (10uF) | - | GND | Ground |
| C_IN2 (0.1uF) | 1 | VBUS_5V | U1: VIN |
| C_IN2 (0.1uF) | 2 | GND | Ground |
| C_OUT1 (10uF) | + | VCC_3V3 | U1: VOUT |
| C_OUT1 (10uF) | - | GND | Ground |
| C_OUT2 (0.1uF) | 1 | VCC_3V3 | U1: VOUT |
| C_OUT2 (0.1uF) | 2 | GND | Ground |
| U2 (STM32L476RGT6TR) | VDD pins | VCC_3V3 | Power Rail |
| U2 (STM32L476RGT6TR) | VSS pins | GND | Ground |
| U2 (STM32L476RGT6TR) | PH0/OSC_IN | HSE_OSC_OUT | X1: 1 |
| U2 (STM32L476RGT6TR) | PH1/OSC_OUT | HSE_OSC_IN | X1: 2 |
| U2 (STM32L476RGT6TR) | PC14/OSC32_IN | LSE_OSC_OUT | X2: 1 |
| U2 (STM32L476RGT6TR) | PC15/OSC32_OUT | LSE_OSC_IN | X2: 2 |
| U2 (STM32L476RGT6TR) | NRST | RESET_LINE | R_NRST_PULLUP: 2, C_NRST: 1, SW_RESET: 1 |
| U2 (STM32L476RGT6TR) | BOOT0 | R_BOOT0_PULLDOWN | R_BOOT0_PULLDOWN: 1 |
| C_DECOUPLING_MCU | 1 | VCC_3V3 | U2: VDD pins |

| C_DECOUPLING_MCU | 2 | GND | U2: VSS pins |
| X1 (HSE Crystal) | 1 | HSE_OSC_OUT | U2: PH0/OSC_IN |
| X1 (HSE Crystal) | 2 | HSE_OSC_IN | U2: PH1/OSC_OUT |
| C_HSE1 (18pF-22pF) | 1 | HSE_OSC_OUT | X1: 1 |
| C_HSE1 (18pF-22pF) | 2 | GND | Ground |
| C_HSE2 (18pF-22pF) | 1 | HSE_OSC_IN | X1: 2 |
| C_HSE2 (18pF-22pF) | 2 | GND | Ground |
| X2 (LSE Crystal) | 1 | LSE_OSC_OUT | U2: PC14/OSC32_IN |
| X2 (LSE Crystal) | 2 | LSE_OSC_IN | U2: PC15/OSC32_OUT |
| C_LSE1 (6pF-12pF) | 1 | LSE_OSC_OUT | X2: 1 |
| C_LSE1 (6pF-12pF) | 2 | GND | Ground |
| C_LSE2 (6pF-12pF) | 1 | LSE_OSC_IN | X2: 2 |
| C_LSE2 (6pF-12pF) | 2 | GND | Ground |
| R_NRST_PULLUP (10kΩ) | 1 | VCC_3V3 | Power Rail |
| R_NRST_PULLUP (10kΩ) | 2 | RESET_LINE | U2: NRST |
| C_NRST (0.1uF) | 1 | RESET_LINE | U2: NRST |
| C_NRST (0.1uF) | 2 | GND | Ground |
| SW_RESET (Push Button) | 1 | RESET_LINE | U2: NRST |
| SW_RESET (Push Button) | 2 | GND | Ground |
| R_BOOT0_PULLDOWN (10kΩ) | 1 | BOOT0 | U2: BOOT0 |
| R_BOOT0_PULLDOWN (10kΩ) | 2 | GND | Ground |

| U3 (FT232RL) | USBDP | USB_C_D_PLUS | USB-C Connector: D+ |
| U3 (FT232RL) | USBDM | USB_C_D_MINUS | USB-C Connector: D- |
| U3 (FT232RL) | VCC | VCC_3V3 | Power Rail |
| U3 (FT232RL) | VCCIO | VCC_3V3 | Power Rail |
| U3 (FT232RL) | GND | GND | Ground |
| U3 (FT232RL) | TXD | STM32_UART_RX | U2: PA3/USART2_RX |
| U3 (FT232RL) | RXD | STM32_UART_TX | U2: PA2/USART2_TX |
| C_DECOUPLING_FTDI1 (0.1uF) | 1 | VCC_3V3 | U3: VCC |
| C_DECOUPLING_FTDI1 (0.1uF) | 2 | GND | Ground |
| C_DECOUPLING_FTDI2 (0.1uF) | 1 | VCC_3V3 | U3: VCCIO |
| C_DECOUPLING_FTDI2 (0.1uF) | 2 | GND | Ground |
| J1 (USB-C Connector) | VBUS | VBUS_5V | Input Power Source |
| J1 (USB-C Connector) | GND | GND | Ground |

| J1 (USB-C Connector) | D+ | USB_C_D_PLUS | U3: USBDP |
| J1 (USB-C Connector) | D- | USB_C_D_MINUS | U3: USBDM |
| J1 (USB-C Connector) | CC1 | R_CC1_PULLDOWN | R_CC1_PULLDOWN: 1 |
| J1 (USB-C Connector) | CC2 | R_CC2_PULLDOWN | R_CC2_PULLDOWN: 1 |
| R_CC1_PULLDOWN (5.1kΩ) | 1 | R_CC1_PULLDOWN | J1: CC1 |
| R_CC1_PULLDOWN (5.1kΩ) | 2 | GND | Ground |
| R_CC2_PULLDOWN (5.1kΩ) | 1 | R_CC2_PULLDOWN | J1: CC2 |
| R_CC2_PULLDOWN (5.1kΩ) | 2 | GND | Ground |

| U4 (NINA-B30 Series Module) | VCC | VCC_3V3 | Power Rail |
| U4 (NINA-B30 Series Module) | GND | GND | Ground |
| U4 (NINA-B30 Series Module) | TXD | STM32_BLE_RX | U2: PA10/USART1_RX |
| U4 (NINA-B30 Series Module) | RXD | STM32_BLE_TX | U2: PA9/USART1_TX |
| U4 (NINA-B30 Series Module) | RESET | STM32_GPIO_BLE_RESET | U2: GPIO (if applicable) |
| U4 (NINA-B30 Series Module) | ENABLE | STM32_GPIO_BLE_ENABLE | U2: GPIO (if applicable) |
| C_DECOUPLING_BLE1 (0.1uF) | 1 | VCC_3V3 | U4: VCC |
| C_DECOUPLING_BLE1 (0.1uF) | 2 | GND | Ground |
| C_DECOUPLING_BLE2 (10uF) | 1 | VCC_3V3 | U4: VCC |
| C_DECOUPLING_BLE2 (10uF) | 2 | GND | Ground |

| J2 (PS1-VOC-10-MOD) | VCC | VCC_3V3 | Power Rail |
| J2 (PS1-VOC-10-MOD) | GND | GND | Ground |
| J2 (PS1-VOC-10-MOD) | TX | STM32_VOC_RX | U2: PA15/USART2_RX or PB7/USART1_RX |
| J2 (PS1-VOC-10-MOD) | RX | STM32_VOC_TX | U2: PA14/USART2_TX or PB6/USART1_TX |