**CCM7**

STM32H750: ARM-Cortex M7-based generalized control computer. The necessary peripheral units for autonomous robotic systems are integrated. It carries 1 6DOF IMU, 1 3DOF magnetometer, 1 barometer, and 1 RF/Bluetooth module. It features 8 PWM outputs, usb, telemetry, gps, compass, PPM, and 2x20 GPIO pin outputs.

1. **SYSTEM**

|  |  |  |
| --- | --- | --- |
| **PROCESSOR SYSTEM** | | |
| **N** | **MCU Hierarchy** | **MCU Name** |
| MA | Main MCU | STM32H743VGT6 |
| NRF | NRF MCU | nRF52820 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CLOCK** | | | | |
| **N** | **Name** | **Name** | **Pin Name** | **MCU-N** |
| X1 | 32MHz External HSE Oscillator | RCC-IN  RCC-OUT | PH0  PH1 | MA |
| X2 | 32MHz External HSE  Oscillator | RCC-IN  RCC-OUT | XC1  XC2 | NRF |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COM CONNECTIONS** | | | | |
| **N** | **Connection Name** | **Label** | **Pin Name** | **MCU-N** |
| H1 | SWD | SWCLK  SWDIO  NRST | PA14  PA13  NRST | MA |
| H2 | NRF\_SWD | NRF\_SWCLK  NRF\_SWDIO  NRF\_NRST | SWCLK  SWDIO  P0.18 | NRF |
| H3 | USB | USB\_DM  USB\_DP | PA11  PA12 | MA |
| H4 | UART1 | UART1\_TX  UART1\_RX | PA9  PA10 | MA |
| H5 | UART2 | UART2\_TX  UART2\_RX | PA2  PA3 | MA |
| H6 | UART3 | UART3\_TX  UART3\_RX | PD8  PD9 | MA |
| H7 | UART4 | UART4\_TX  UART4\_RX | PB9  PB8 | MA |
| H8 | I2C1 | I2C1\_SCL  I2C1\_SDA  I2C1\_IRQ1  I2C1\_IRQ2 | PB6  PB7  PE14  PE15 | MA |
| H9 | I2C2 | I2C2\_SCL  I2C2\_SDA | PB10  PB11 | MA |
| H10 | SPI1 | SPI1\_SCK  SPI1\_MISO  SPI1\_MOSI  SPI1\_CS1  SPI1\_CS2 | PA5  PA6  PA7  PC4  PC5 | MA |
| H11 | SPI3 | SPI3\_SCK  SPI3\_MISO  SPI3\_MOSI  SPI3\_CS  SPI3\_IRQ | PC10  PC11  PC12  PD0  PD1 | MA |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| H12 | NRF\_SPI0 (Master) | NRF\_SPI0\_SCK  NRF\_SPI0\_MISO NRF\_SPI0\_MOSI  NRF\_SPI0\_CS | P0.00  P0.01  P0.04  P0.02 | NRF |
| H13 | NRF\_SPI1 (Slave) | NRF\_SPI1\_SCK  NRF\_SPI1\_MISO NRF\_SPI1\_MOSI  NRF\_SPI1\_CS  NRF\_SPI1\_IRQ | P0.05  P0.06  P0.07  P0.14  P0.15 | NRF |
| H14 | CAN2 | CAN2\_RX  CAN2\_TX | PB12  PB13 | MA |
| H15 | PPM1 | PPM1 | PA0 | MA |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PIN CONNECTIONS** | | | | |
| **N** | **Connection Name** | **Label** | **Pin Name** | **MCU-N** |
| P1 | TIM3 | TIM3\_CH1  TIM3\_CH2  TIM3\_CH3  TIM3\_CH4 | PC6  PC7  PC8  PC9 | MA |
| P2 | TIM4 | TIM4\_CH1  TIM4\_CH2 | PD12  PD13 | MA |
| P3 | TRX1 | UART3\_TX  UART3\_RX  ~~TRX1\_CTS~~  ~~TRX1\_RTS~~ | PD8  PD9  ~~PB15~~  ~~PB14~~ | MA |
| P4 | ADC1 | ADC1 | PB0 | MA |
| P5 | ADC2 | ADC2 | PB1 | MA |
| P6 | LED0 | LED0 | PD3 | MA |
| P7 | LED1 | LED1 | PD4 | MA |
| P8 | LED2 | LED2 | PE10 | MA |
| P9 | LED3 | LED3 | PE11 | MA |
| P10 | NRF\_PA | NRF\_PA\_RX\_EN  NRF\_PA\_TX\_EN  NRF\_PA\_MODE NRF\_PA\_PDN | P0.16  P0.17  P0.29  P0.08 | NRF |
| P11 | NRF\_LED0 | NRF\_LED0 | P0.28 | NRF |
| P12 | NRF\_LED1 | NRF\_LED1 | P0.30 | NRF |

|  |  |  |  |
| --- | --- | --- | --- |
| **POWER MANAGEMENT** | | | |
| **N** | **Regulator Voltage** | **Regulator Name** | **V out** |
| E1 | VIN – 5V | TPS54202DDCR | 5V |
| E2 | 5V – 3.3V | ME6211C33M5G | 3V3 |
| E3 | 5V – 3.3V | ME6211C33M5G | 3V3RF |

|  |  |  |  |
| --- | --- | --- | --- |
| **MODULES** | | | |
| **N** | **Module Name** | **Pinout** | **Peripheral** |
| U0 | nRF21540 | 3V3RF – NRF\_ANT – NRF | NRF\_SPI1 |
| U1 | nRF52820 | 3V3RF – MA | SPI3 |
| U2 | USB Connector | DM – DP | USB |
| U3 | GPS Connector | 5V – TX – RX – GND | UART1 |
| U4 | TRX Connector | 5V – TX – RX – GND | UART3 |
| U5 | 24AA64T | 3.3V – SCL – SDA – GND | I2C1 |
| U6 | BMI088 | 3.3V – SCK – MOSI – MISO – CS1 – CS2 – GND | SPI1 |
| U7 | BMP388 | 3.3V – SCL – SDA – IRQ1 – GND | I2C1 |
| U8 | BMM150 | 3.3V – SCL – SDA – IRQ2 – GND | I2C1 |
| ~~U9~~ | ~~CAN2 Connector~~ | ~~5V – CAN\_H - CAN\_L - GND~~ | ~~CAN2~~ |

|  |  |  |  |
| --- | --- | --- | --- |
| U10 | PWM1 Connector | CH4 – 5V – GND | TIM3 |
| PWM2 Connector | CH3 – 5V – GND | TIM3 |
| PWM3 Connector | CH2 – 5V – GND | TIM3 |
| PWM4 Connector | CH1 – 5V – GND | TIM3 |
| PWM5 Connector | CH4 – 5V – GND | TIM4 |
| PWM6 Connector | CH3 – 5V – GND | TIM4 |
| U11 | 2x20 2.54 Connector | 2x20 (Debug Area 2x5 : SWD + UART4) | 2x20 |
| U12 | Power Connector | VIN – SDA – SCL – GND | I2C1 |