AeroCore 2 for NVIDIA Jetson
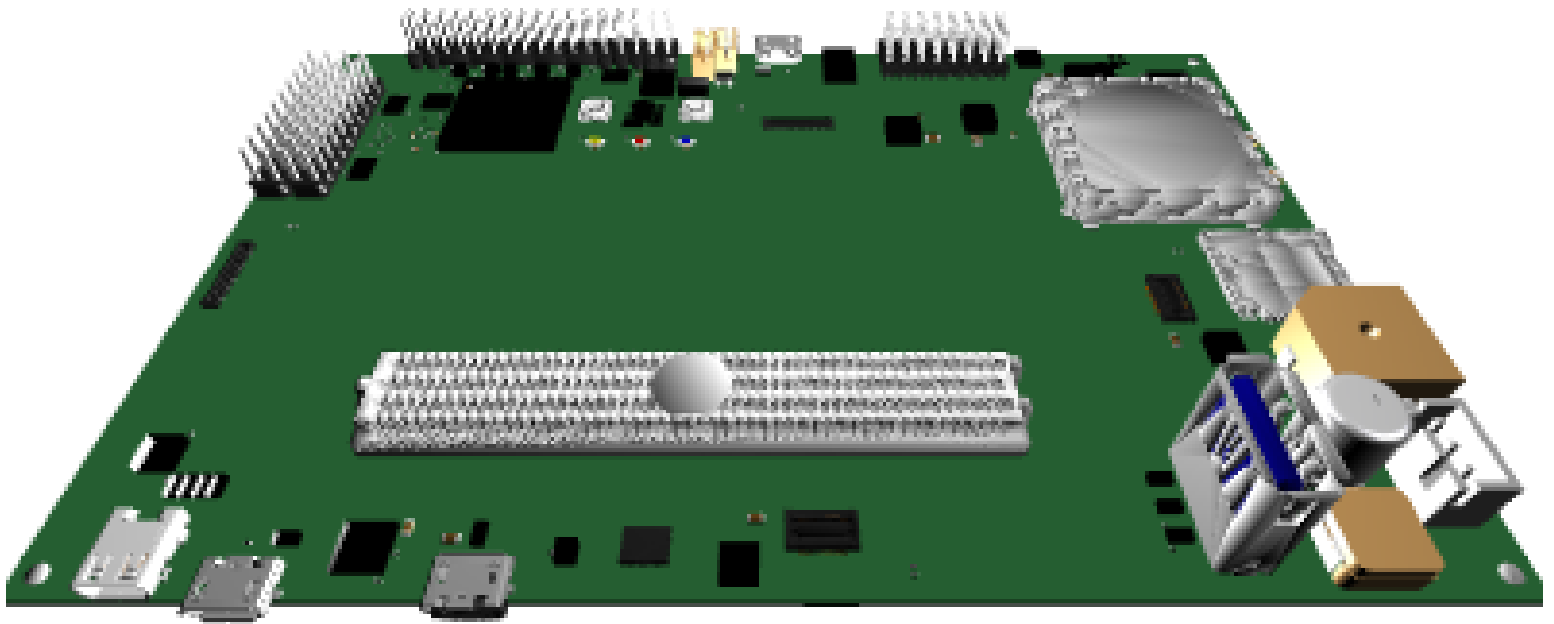
This board was designed and built by Geppetto

Free automated documentation anytime.
Design for free @ https://geppetto.gumstix.com/

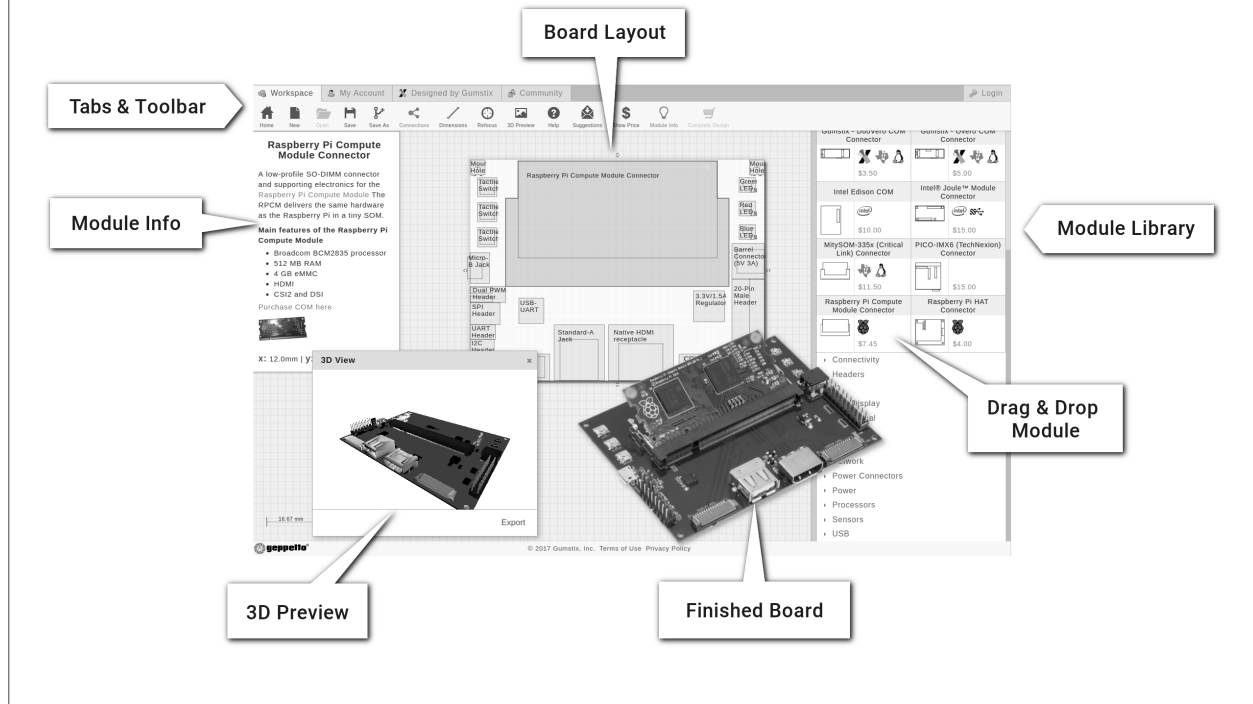**No Minimum Order**   **Automated Supply Chain**   **Reduce Cost and Errors**

geppetto™
by **gumstix**

Thanks for using Geppetto to design this board!
One Stop Design-to-Order

Simply place displays, sensors, processors, and Geppetto connects it all.
No routing needed.

Gumstix, Inc. shall have no liability of any kind, express or implied, arising out of the use of the Information in this document, including direct, indirect, special or consequential damages.

Gumstix, Inc. may have patents, patent applications, trademarks, copyrights, trade secrets or other intellectual property rights pertaining to Gumstix products described in this document (collectively "Gumstix Intellectual Property").

Except as expressly provided in any written license or agreement from Gumstix, Inc., this document and the information contained therein does not create any license to Gumstix's Intellectual Property.

The Information contained herein is subject to change without notice. Revisions may be issued regarding changes and/or additions.

Built in Geppetto
No engineering required.
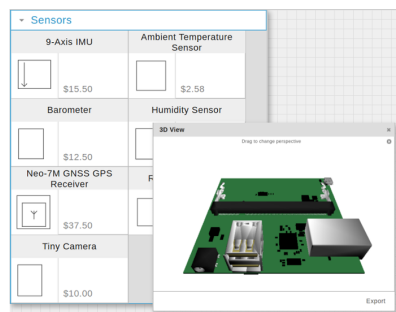Delivered in 15 days.

geppetto™
by gumstix

Board Description

MAV control board featuring an integrated Cortex-M4 microprocessor and NuttX RTOS.
Compatible with: [Intel® Joule^{TM} Module], the [Pre-GO](https://store.gumstix.com/accessories/prego.html),
and the [Pre-GO PPP](https://store.gumstix.com/accessories/prego-ppp.html).

Board Dimensions

14cm x 9cm

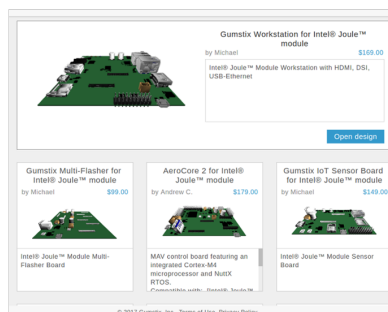## Geppetto Makes Hardware Easy

**Custom Library and
3D Design Preview**

**Design and Save
Your Work Online**

**Free Automated
Documentation on Demand**
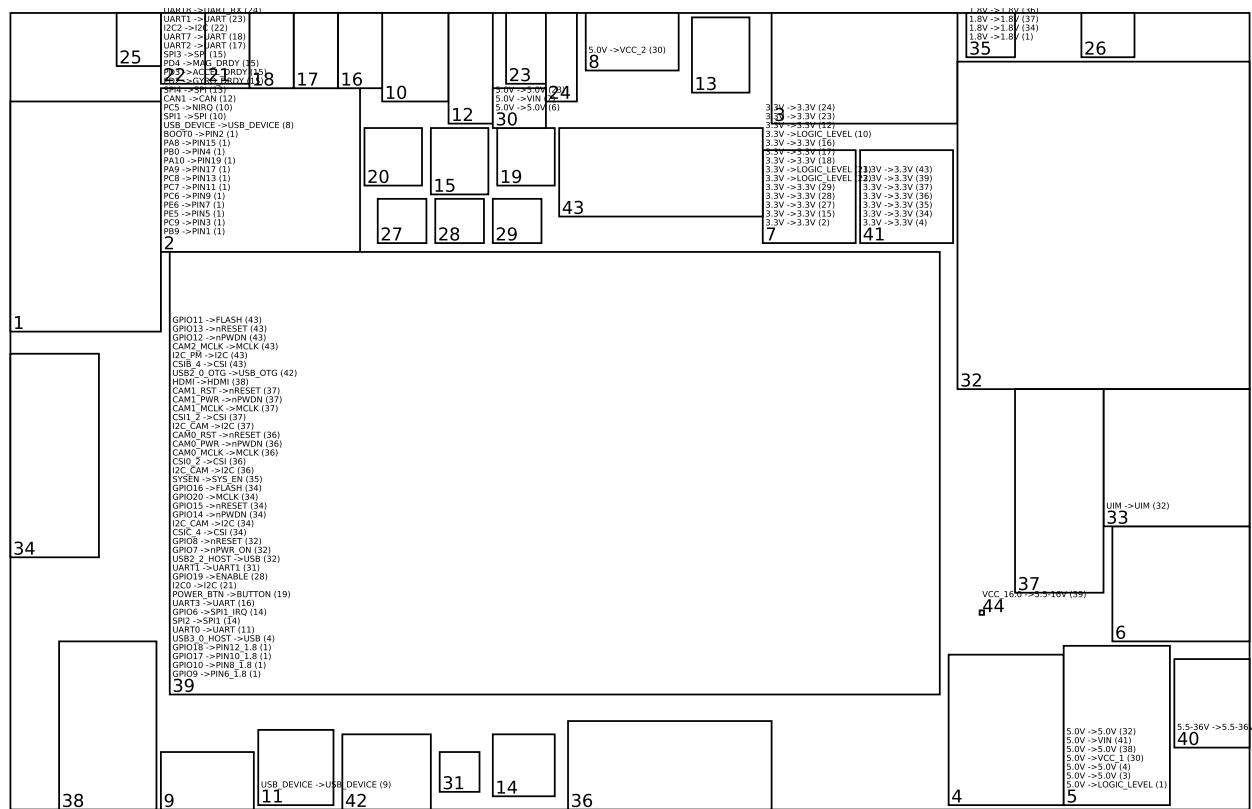
Start your next design at **geppetto.gumstix.com**

Built in Geppetto
No engineering required.
Delivered in 15 days.

geppetto^{TM}
by **gumstix**

Contents

Built in Geppetto

No engineering required.

Delivered in 15 days.

1 Modules on Board

UART1 ->UART1_RX (24)
UART1 ->UART (23)
I2C2 ->I2C (22)
UART7 ->UART (18)
UART2 ->UART (17)
SPI3 ->SPI (15)
PD4 ->MAG_DRDY (15)
SPI4 ->ACC_DRDY (15)
SPI4 ->GYRO_DRDY (15)
CAN1 ->CAN (12)
PC5 ->NIRQ (10)
SPI1 ->SPI (10)
USB_DEVICE ->USB_DEVICE (8)
BOOT0 ->PIN2 (1)
PA8 ->PIN15 (1)
PB0 ->PIN4 (1)
PA10 ->PIN19 (1)
PA9 ->PIN17 (1)
PC8 ->PIN13 (1)
PC7 ->PIN11 (1)
PC6 ->PIN9 (1)
PE6 ->PIN7 (1)
PE5 ->PIN5 (1)
PC9 ->PIN3 (1)
PB9 ->PIN1 (1)

25 22 21 18 17 16 10 12 20 15 19 27 28 29 43 2

5.0V ->VCC_2 (30)
8 23 24 30 13

5.0V ->5.0V (24)
5.0V ->VIN (24)
5.0V ->5.0V (6)

3.3V ->3.3V (24)
3.3V ->3.3V (23)
3.3V ->3.3V (12)
3.3V ->LOGIC_LEVEL (10)
3.3V ->3.3V (16)
3.3V ->3.3V (17)
3.3V ->3.3V (18)
3.3V ->LOGIC_LEVEL (1)   3.3V ->3.3V (43)
3.3V ->LOGIC_LEVEL (2)   3.3V ->3.3V (39)
3.3V ->3.3V (29)   3.3V ->3.3V (37)
3.3V ->3.3V (28)   3.3V ->3.3V (36)
3.3V ->3.3V (27)   3.3V ->3.3V (35)
3.3V ->3.3V (15)   3.3V ->3.3V (34)
3.3V ->3.3V (2)   3.3V ->3.3V (4)
7 41

1.8V ->1.8V (36)
1.8V ->1.8V (37)
1.8V ->1.8V (34)
1.8V ->1.8V (1)
35 26

1

GPIO11 ->FLASH (43)
GPIO13 ->nRESET (43)
GPIO12 ->nPWDN (43)
CAM2_MCLK ->MCLK (43)
I2C_PM ->I2C (43)
CSIB_4 ->CSI (43)
USB2_0_OTG ->USB_OTG (42)
HDMI ->HDMI (38)
CAM1_RST ->nRESET (37)
CAM1_PWR ->nPWDN (37)
CAM1_MCLK ->MCLK (37)
CSI1_2 ->CSI (37)
I2C_CAM ->I2C (37)
CAM0_RST ->nRESET (36)
CAM0_PWR ->nPWDN (36)
CAM0_MCLK ->MCLK (36)
CSI0_2 ->CSI (36)
I2C_CAM ->I2C (36)
SYSEN ->SYS_EN (35)
GPIO16 ->FLASH (34)
GPIO20 ->MCLK (34)
GPIO15 ->nRESET (34)
GPIO14 ->nPWDN (34)
I2C_CAM ->I2C (34)
CSIC_4 ->CSI (34)
GPIO8 ->nRESET (32)
GPIO7 ->nPWR_ON (32)
USB2_2_HOST ->USB (32)
UART1 ->UART1 (31)
GPIO19 ->ENABLE (28)
I2C0 ->I2C (21)
POWER_BTN ->BUTTON (19)
UART3 ->UART (16)
GPIO6 ->SPI1_IRQ (14)
SPI2 ->SPI1 (14)
UART0 ->UART (11)
USB3_0_HOST ->USB (4)
GPIO18 ->PIN12_1.8 (1)
GPIO17 ->PIN10_1.8 (1)
GPIO10 ->PIN8_1.8 (1)
GPIO9 ->PIN6_1.8 (1)
39

34 32

UIM ->UIM (32)
33

37
VCC_16V ->5.5-16V (39)
44
6

5.0V ->5.0V (32)
5.0V ->VIN (41)
5.0V ->5.0V (38)
5.0V ->VCC_1 (30)
5.0V ->5.0V (4)
5.0V ->5.0V (3)
5.0V ->LOGIC_LEVEL (1)

5.5-36V ->5.5-36V
40

38 9 11 42 31 14 36 4 5

USB_DEVICE ->USB_DEVICE (9)

1.1 Headers

1.1.1 40 Pin Header (v16) (1)

The 40-Pin header connects up to 16 bi-directional GPIOs or Pulse Width Modulation (PWM) signals and outputs them at 3.3V or 5.0V. An addional voltage rail and ground is provided for odd-numbered pins for compataibility with standard 3-pin headers.

The 40-pin header has the following connections:

- 1.8V to 1.8V from 1.8V/0.6A Regulator (35)
- PIN1 to PB9 from ST Micro Cortex-M4 (2)
- PIN3 to PC9 from ST Micro Cortex-M4 (2)
- PIN5 to PE5 from ST Micro Cortex-M4 (2)
- PIN7 to PE6 from ST Micro Cortex-M4 (2)
- PIN9 to PC6 from ST Micro Cortex-M4 (2)
- PIN11 to PC7 from ST Micro Cortex-M4 (2)
- PIN13 to PC8 from ST Micro Cortex-M4 (2)

Built in Geppetto
No engineering required.
Delivered in 15 days.

Revised June 15, 2018

- PIN17 to PA9 from ST Micro Cortex-M4 (2)

- PIN19 to PA10 from ST Micro Cortex-M4 (2)

- PIN4 to PB0 from ST Micro Cortex-M4 (2)

- PIN15 to PA8 from ST Micro Cortex-M4 (2)

- PIN2 to BOOT0 from ST Micro Cortex-M4 (2)

- PIN6_1.8 to GPIO9 from NVIDIA Jetson COM Connector (39)

- PIN8_1.8 to GPIO10 from NVIDIA Jetson COM Connector (39)

- PIN10_1.8 to GPIO17 from NVIDIA Jetson COM Connector (39)

- PIN12_1.8 to GPIO18 from NVIDIA Jetson COM Connector (39)

1.1.2 SPI Header (v19) (10)

The SPI header module provides a 6-wire SPI interface on a 2x3-pin header. In addition to the data and clock lines, chip select, ground and IRQ pins are also provided.

This header breaks out SPI1 on ST Micro Cortex-M4 (2) .

1.1.3 CAN Header (v8) (12)

The CAN header module converts serial datastreams to and from ISO 11898-2 compliant signals. The TI SN65HVD232 IC provides the PHY layer for CAN bus communications. The digital TX and RX signals are also provided on the 4-pin header.

The datasheet for the TI SN65HVD232 CAN controller can be found at:

    http://www.ti.com/lit/ds/symlink/sn65hvd232.pdf

The CAN header is connected to CAN1 on ST Micro Cortex-M4 (2).

1.1.4 UART Header (v17) (16)

The UART header module provides a 2-wire serial data interface alongside power and ground pins for UART signals.

This module is connected to the UART3 bus on NVIDIA Jetson COM Connector (39).

1.1.5 UART Header (v17) (17)

The UART header module provides a 2-wire serial data interface alongside power and ground pins for UART signals.

This module is connected to the UART2 bus on ST Micro Cortex-M4 (2).

Built in Geppetto
No engineering required.
Delivered in 15 days.

Revised June 15, 2018

1.1.6   UART Header (v17) (18)

The UART header module provides a 2-wire serial data interface alongside power and ground pins for UART signals.

This module is connected to the UART7 bus on ST Micro Cortex-M4 (2).

1.1.7   I2C Header (v19) (21)

The I^{2}C header module provides a connection for external devices to communicate over a 2-wire Inter-Integrated Circuit (I^{2}C) bus. This header breaks out I2C0 on NVIDIA Jetson COM Connector (39).

1.1.8   I2C Header (v19) (22)

The I^{2}C header module provides a connection for external devices to communicate over a 2-wire Inter-Integrated Circuit (I^{2}C) bus. This header breaks out I2C2 on ST Micro Cortex-M4 (2).

1.1.9   Five-pin GPS Header (v10) (23)

The off-board GPS header provides a 2-wire UART interface alongside power and ground pins for use with the Gumstix PRE-GO GNSS board. It also works with some third party positioning modules.

This module is connected to the UART1 bus on ST Micro Cortex-M4 (2).

1.1.10   Spektrum DSM-2 Remote Connector (v9) (24)

The Spektrum DSM-2 remote connector module connects a Spektrum DSM/X satellite R/C receiver to a host processor or MCU. It uses a UART RX signal and has a switched 3.3V power supply.

This module is connected to the UART8 bus on ST Micro Cortex-M4 (2).

1.1.11   4-pin Analog Header (v7) (25)

The 4-pin analog header module Provides access to 3 ADC pins and supplies an analog GND.

- AIN_A1 is connected to ADC_IN11 on ST Micro Cortex-M4 (2)
- AIN_A2 is connected to ADC_IN12 on ST Micro Cortex-M4 (2)
- AIN_B1 is connected to ADC_IN13 on ST Micro Cortex-M4 (2)

1.2   Processors

1.2.1   ST Micro Cortex-M4 (v37) (2)

An ARM Cortex-M4 processor of ST Microelectronics 32F427. The processor runs at 168MHz at 1.8 or 3.3 volts – and has a hardware floating point unit. The battery voltage is sensed on ADC_IN10 with a gain of 0.09091. Requires:

Built in Geppetto   Revised June 15, 2018
No engineering required.
Delivered in 15 days.

- 3.3V from 3.3V/1.5A Regulator (7)

Provides:

- PB9 to 40 Pin Header (1)
- PC9 to 40 Pin Header (1)
- PE5 to 40 Pin Header (1)
- PE6 to 40 Pin Header (1)
- PC6 to 40 Pin Header (1)
- PC7 to 40 Pin Header (1)
- PC8 to 40 Pin Header (1)
- PA9 to 40 Pin Header (1)
- PA10 to 40 Pin Header (1)
- PB0 to 40 Pin Header (1)
- PA8 to 40 Pin Header (1)
- BOOT0 to 40 Pin Header (1)
- USB_DEVICE to Micro-B Jack (8)
- SPI1 to SPI Header (10)
- PC5 to SPI Header (10)
- CAN1 to CAN Header (12)
- SPI4 to FRAM (128 KB) (13)
- PD2 to 9-Axis IMU (15)
- PD3 to 9-Axis IMU (15)
- PD4 to 9-Axis IMU (15)
- SPI3 to:
    - 9-Axis IMU (15)
    - Barometer (26)
- UART2 to UART Header (17)
- UART7 to UART Header (18)
- I2C2 to I2C Header (22)
- UART1 to Five-pin GPS Header (23)
- UART8 to Spektrum DSM-2 Remote Connector (24)
- AGND to 4-pin Analog Header (25)
- ADC_IN11 to 4-pin Analog Header (25)

- ADC_IN12 to 4-pin Analog Header (25)

- ADC_IN13 to 4-pin Analog Header (25)

- PB5 to Power Muxer (two 5V sources) (30)

- PE10 to Top-side LED (27)

- PE9 to Top-side LED (29)

- RESET to Tactile Switch (20)

- UART3 to UART-UART (31)

- SPI2 to SPI Bridge (14)

- PC4 to SPI Bridge (14)

- PB8 to Buzzer (6)

- PE15 to Spektrum DSM-2 Remote Connector (24)

- PWM1B to Octal PWM Header (3)

- PWM2B to Octal PWM Header (3)

- PWM3B to Octal PWM Header (3)

- PWM4B to Octal PWM Header (3)

- PWM5B to Octal PWM Header (3)

- PWM6B to Octal PWM Header (3)

- PWM7B to Octal PWM Header (3)

- PWM8B to Octal PWM Header (3)

1.3   Motors and Relays

1.3.1   Octal PWM Header (v11) (3)

This module offers eight PWM headers for controlling servo motors and other PWM-controlled devices.

This header offers PWM outputs connected to:

- PWM1 to PWM1B on ST Micro Cortex-M4 (2)

- PWM2 to PWM2B on ST Micro Cortex-M4 (2)

- PWM3 to PWM3B on ST Micro Cortex-M4 (2)

- PWM4 to PWM4B on ST Micro Cortex-M4 (2)

- PWM5 to PWM5B on ST Micro Cortex-M4 (2)

- PWM6 to PWM6B on ST Micro Cortex-M4 (2)

- PWM7 to PWM7B on ST Micro Cortex-M4 (2)

- PWM8 to PWM8B on ST Micro Cortex-M4 (2)

- 5.0V to 5.0V on 5V/5A Regulator (5)

.

1.4   USB

1.4.1   USB 3.0 Standard-A Jack (Vertical) (v9) (4)

A standard A USB 3.0 host port that allows you to connect USB devices to the board, oriented vertically.
This port is connected to USB3_0_HOST on NVIDIA Jetson COM Connector (39).

1.4.2   Micro-B Jack (v16) (8)

The USB micro-B port module allows your design to connect as a USB device to a USB host.

This module is connected to USB_DEVICE on ST Micro Cortex-M4 (2).

It supplies 5.0V to:

- Power Muxer (two 5V sources) (30)

1.4.3   Micro-B Jack (v16) (9)

The USB micro-B port module allows your design to connect as a USB device to a USB host.

This module is connected to USB_DEVICE on USB-UART (11).

This module does not supply power.

1.4.4   Micro-AB USB (v7) (42)

The micro-AB USB port module offers USB On-the-Go connectivity. Devices can be connected to your
design (e.g., USB peripherals) using a USB OTG cable, or your design can be connected to a host as
a device using a micro-B to standard-A cable.

This port is connected to USB2_0_OTG on NVIDIA Jetson COM Connector (39).

1.5   Power

1.5.1   5V/5A Regulator (v11) (5)

Takes 5.5 - 36V input from Battery 2-Cell Balance Connector (40) and provides up to 5A at 5V to:

- 40 Pin Header (1)
- Octal PWM Header (3)
- USB 3.0 Standard-A Jack (Vertical) (4)
- Power Muxer (two 5V sources) (30)
- Native micro-HDMI (38)
- 3.3V/1.5A Regulator (41)
- Sierra Wireless HL Socket (32)

Built in Geppetto   Revised June 15, 2018
No engineering required.
Delivered in 15 days.

1.5.2   3.3V/1.5A Regulator (v16) (7)

This DC to DC step down regulator provides a 3.3V DC output at 1.5A needed by certain components on this board. It is capable of accepting an input voltage between 3.1 to 16V DC and output is controlled by the TI TPS6211 buck regulator.
It recieves VIN from Power Muxer (two 5V sources) (30).

The datasheet for the TPS6211 regulator is available at:

`http://www.ti.com/lit/ds/symlink/tps62110.pdf`

This regulator provides 3.3V to:

- ST Micro Cortex-M4 (2)
- 9-Axis IMU (15)
- Top-side LED (27)
- Top-side LED (28)
- Top-side LED (29)
- I2C Header (22)
- I2C Header (21)
- UART Header (18)
- UART Header (17)
- UART Header (16)
- SPI Header (10)
- CAN Header (12)
- Five-pin GPS Header (23)
- Spektrum DSM-2 Remote Connector (24)

1.5.3   Power Muxer (two 5V sources) (v8) (30)

The 5V power muxer module transitions between two 5V power sources seamlessly. The TI TPS2115 autoswitching power multiplexer ensures power is delivered from the connected source with the highest voltage.

The TPS2115 datasheet is available at:

`http://www.ti.com/lit/ds/symlink/tps2115.pdf`

It takes 5V input from **5V/5A Regulator (5)** or **Micro-B Jack (8)** and provides up to 1.25A at 5V to:

- Buzzer (6)
- 3.3V/1.5A Regulator (7)
- Five-pin GPS Header (23)

Built in Geppetto
No engineering required.
Delivered in 15 days.

Revised June 15, 2018

1.5.4   1.8V/0.6A Regulator (v10) (35)

This DC-DC regulator has an integrated inductor and tiny footprint. The Enpirion EP5368QI provides power to modules that require a 1.8V input.

It recieves 3.3V from 3.3V/1.5A Regulator (41). A SYS_EN signal is provided by NVIDIA Jetson COM Connector (39).

The following modules receive 1.8V DC from this regulator:

- 40 Pin Header (1)

- Camera Connector (CSI-4) (34)

- Camera Connector (CSI-2) (37)

- Camera Connector (CSI-2) (36)

- Camera Connector (CSI-4) (43)

- NVIDIA Jetson COM Connector (39)

1.5.5   3.3V/1.5A Regulator (v16) (41)

This DC to DC step down regulator provides a 3.3V DC output at 1.5A needed by certain components on this board. It is capable of accepting an input voltage between 3.1 to 16V DC and output is controlled by the TI TPS6211 buck regulator.
It recieves VIN from 5V/5A Regulator (5).

The datasheet for the TPS6211 regulator is available at:

`http://www.ti.com/lit/ds/symlink/tps62110.pdf`

This regulator provides 3.3V to:

- USB 3.0 Standard-A Jack (Vertical) (4)

- Camera Connector (CSI-4) (34)

- 1.8V/0.6A Regulator (35)

- Camera Connector (CSI-2) (36)

- Camera Connector (CSI-2) (37)

- NVIDIA Jetson COM Connector (39)

- Camera Connector (CSI-4) (43)

1.5.6   Dummy Power Provider (v4) (44)

This module does nothing except as a means to satisfy power requirements in Geppetto web. THIS DOES NOT ACTUALLY PROVIDE POWER.

1.6   Audio

1.6.1   Buzzer (v11) (6)

This SMT buzzer provides an audilble indicator for the signal PB8 on ST Micro Cortex-M4 (2).

1.7   Converters

1.7.1   USB-UART (v20) (11)

Also known as an FTDI, this USB to UART converter allows a USB connection to the board to behave as a virtual RS232 serial connection. It offers direct and complete access to the system from a development machine by way of the FTDI FT232RQ USB – UART IC.

Technical documentation for the FT232RQ is available at:

    http://www.ftdichip.com/Support/Documents/DataSheets/ICs/DS_FT232R.pdf

This USB to UART converter connects a host machine from Micro-B Jack (9) to UART0 on NVIDIA Jetson COM Connector (39).

1.7.2   SPI Bridge (v12) (14)

The SPI bridge connects two SPI interfaces on different modules, allowing them to communicate.

This module connects SPI2 on NVIDIA Jetson COM Connector (39) to SPI2 on ST Micro Cortex-M4 (2).

1.7.3   UART-UART (v11) (31)

A UART-UART bridge interfaces two modules with UART lines (e.g., interfacing two processors).

This UART bridge connects UART1 on NVIDIA Jetson COM Connector (39) to UART3 on ST Micro Cortex-M4 (2).

1.8   Memory

1.8.1   FRAM (128 KB) (v9) (13)

The 128 KB FRAM non-volatile memory module provides a small amount of random-access storage to a host system over a SPI connection. The Fujitsu MB85RS1MT Ferroelectric Random Access Memory chip is able to retain data without using a back-up battery and has a lifetime of 10^{13} read/write cycles.

Download the datasheet for the MB85RS1MT IC at:

    https://edevice.fujitsu.com/fj/DATASHEET/e-ds/MB85RS1MT-DS501-00022-6v0-E.pdf

This module is connected to SPI4 on ST Micro Cortex-M4 (2).

Built in Geppetto
No engineering required.
Delivered in 15 days.   Revised June 15, 2018

1.9   Sensors

1.9.1   9-Axis IMU (v22) (15)

The 9-axis IMU module provides 3-axis acceleration, 3-axis gyroscopic, and 3-axis magnetic field information. The accelerometer and magnetometer are provided by the ST LSM303D high-performance eCompass module, which also includes an ambient temperature sensor. Gyroscopic data is provided by the ST L3GD20H MEMS motion sensor. The IMU can be connected via I^2C or SPI serial interfaces.

Datasheets for the LSM303D and L3GD20H chips can be downloaded at:

- `http://www.st.com/content/ccc/resource/technical/document/datasheet/1c/9e/71/05/4e/b7/4d/d1/DM00057547.pdf/files/DM00057547.pdf/jcr:content/translations/en.DM00057547.pdf`

- `http://www.st.com/content/ccc/resource/technical/document/datasheet/35/b1/e0/39/71/57/43/01/DM00060659.pdf/files/DM00060659.pdf/jcr:content/translations/en.DM00060659.pdf`

Maximum Resolutions

Accelerometer:	0.061	mG/LSB
Magnetometer:	0.080	mgauss/LSB
Gyroscope:	8.750	m°/s/LSB
Temperature:	0.125	°C/LSB

Connections

Its SPI bus is connected to SPI3 on ST Micro Cortex-M4 (2)

It has the following data ready signals:

- ACCEL_DRDY to PD3 on ST Micro Cortex-M4 (2)

- GYRO_DRDY to PD2 on ST Micro Cortex-M4 (2)

- MAG_DRDY to PD4 on ST Micro Cortex-M4 (2)

1.9.2   Barometer (v11) (26)

The barometer module is an ultra-compact, low-power barometric preasure sensor useful for aerial vehicles. The module's MS5611-01BA03 Barometric Pressure Sensor offers a high resolution reading, accurate to within 10 cm and is optimized for altimeter and variometer applications. It can communicate serially either over I^2C or SPI buses. *At altitudes close to sea level, covering the barometer module with a light piece of foam may help to improve the accuracy of readings.*

Highlights

Max resolution:	0.065	mbar
Range:	10 − 1200	mbar
Min response time:	0.5	ms

Connections

This module is connected to SPI3 on ST Micro Cortex-M4 (2).

Visit `http://www.meas-spec.com/downloads/MS5611-01BA03.pdf` for details.

1.10   Lights and Switches

1.10.1   Tactile Switch (v19) (19)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal POWER_BTN on NVIDIA Jetson COM Connector (39).

1.10.2   Tactile Switch (v19) (20)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal RESET on ST Micro Cortex-M4 (2).

1.10.3   Top-side LED (v7) (27)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on PE10 from ST Micro Cortex-M4 (2).

1.10.4   Top-side LED (v7) (28)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on GPIO19 from NVIDIA Jetson COM Connector (39).

1.10.5   Top-side LED (v7) (29)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on PE9 from ST Micro Cortex-M4 (2).

1.11   Network and Wireless

1.11.1   Sierra Wireless HL Socket (v4) (32)

The Sierra Wireless HL Snap-In Socket accepts a HL modem module that connects to the cellular network.

The modem connects to the following buses:

- USB Host from NVIDIA Jetson COM Connector (39)

- Enable signal from NVIDIA Jetson COM Connector (39)

- Reset signal from NVIDIA Jetson COM Connector (39)

- UIM (SIM card) connection from Micro-SIM Card Holder (33)

Built in Geppetto
No engineering required.
Delivered in 15 days.

Revised June 15, 2018

1.11.2   Micro-SIM Card Holder (v1) (33)

Micro-SIM card holder

The card holder connects to the following buses:

- UIM from

1.12   Connectors (Signal)

1.12.1   Camera Connector (CSI-4) (v7) (34)

The CSI-2 connector module is a 40-pin ribbon connector that exposes a 4-lane MIPI camera system to an external high-resolution camera module.

The CSI port is connected to CSIC_4 on NVIDIA Jetson COM Connector (39).

I2C communication is connected to I2C_CAM on NVIDIA Jetson COM Connector (39).

MCLK is provided by GPIO20 on NVIDIA Jetson COM Connector (39).

1.12.2   Camera Connector (CSI-2) (v7) (36)

Camera Connector for CSI-2 OV5640

The CSI port is connected to CSI0_2 on NVIDIA Jetson COM Connector (39).

I2C communication is connected to I2C_CAM on NVIDIA Jetson COM Connector (39).

MCLK is provided by CAM0_MCLK on NVIDIA Jetson COM Connector (39).

1.12.3   Camera Connector (CSI-2) (v7) (37)

Camera Connector for CSI-2 OV5640

The CSI port is connected to CSI1_2 on NVIDIA Jetson COM Connector (39).

I2C communication is connected to I2C_CAM on NVIDIA Jetson COM Connector (39).

MCLK is provided by CAM1_MCLK on NVIDIA Jetson COM Connector (39).

1.12.4   Camera Connector (CSI-4) (v7) (43)

The CSI-2 connector module is a 40-pin ribbon connector that exposes a 4-lane MIPI camera system to an external high-resolution camera module.

The CSI port is connected to CSIB_4 on NVIDIA Jetson COM Connector (39).

I2C communication is connected to I2C_PM on NVIDIA Jetson COM Connector (39).

MCLK is provided by CAM2_MCLK on NVIDIA Jetson COM Connector (39).

Built in Geppetto
No engineering required.
Delivered in 15 days.

Revised June 15, 2018

1.13   Monitors

1.13.1   Native micro-HDMI (v7) (38)

The native micro-HDMI receptacle module provides HDMI video and audio signals to an external display and speakers. This module uses the TI TPD12S016UFQN HDMI companion chip with a microHDMI port to provide ESD-protected display connectivity.

The datasheet for the TPD12S016 IC can be found at:

```
http://www.ti.com/lit/ds/symlink/tpd12s016.pdf
```

The module transmits high definition video from **HDMI** on **NVIDIA Jetson COM Connector (39)** .

1.14   COM Connectors

1.14.1   NVIDIA Jetson COM Connector (v2) (39)

The NVIDIA$^{\circledR}$ Jetson$^{\text{TM}}$ module is a ...

The NVIDIA$^{\circledR}$ Jetson$^{\text{TM}}$ module's datasheet is available at:

The NVIDIA$^{\circledR}$ Jetson$^{\text{TM}}$ module connector receives:

- 1.8V from 1.8V/0.6A Regulator (35)

- 3.3V from 3.3V/1.5A Regulator (41)

- 5.5-16V from Dummy Power Provider (44)

The NVIDIA$^{\circledR}$ Jetson$^{\text{TM}}$ module connector provides the following outputs:

- GPIO9 to 40 Pin Header (1)

- GPIO10 to 40 Pin Header (1)

- GPIO17 to 40 Pin Header (1)

- GPIO18 to 40 Pin Header (1)

- USB3_0_HOST to USB 3.0 Standard-A Jack (Vertical) (4)

- UART0 to USB-UART (11)

- SPI2 to SPI Bridge (14)

- GPIO6 to SPI Bridge (14)

- UART3 to UART Header (16)

- POWER_BTN to Tactile Switch (19)

- I2C0 to I2C Header (21)

- GPIO19 to Top-side LED (28)

- UART1 to UART-UART (31)

- USB2␣2␣HOST to Sierra Wireless HL Socket (32)

- GPIO7 to Sierra Wireless HL Socket (32)

- GPIO8 to Sierra Wireless HL Socket (32)

- CSIC␣4 to Camera Connector (CSI-4) (34)

- I2C␣CAM to:

  - Camera Connector (CSI-4) (34)
  - Camera Connector (CSI-2) (36)
  - Camera Connector (CSI-2) (37)

- GPIO14 to Camera Connector (CSI-4) (34)

- GPIO15 to Camera Connector (CSI-4) (34)

- GPIO20 to Camera Connector (CSI-4) (34)

- GPIO16 to Camera Connector (CSI-4) (34)

- SYSEN to 1.8V/0.6A Regulator (35)

- CSI0␣2 to Camera Connector (CSI-2) (36)

- CAM0␣MCLK to Camera Connector (CSI-2) (36)

- CAM0␣PWR to Camera Connector (CSI-2) (36)

- CAM0␣RST to Camera Connector (CSI-2) (36)

- CSI1␣2 to Camera Connector (CSI-2) (37)

- CAM1␣MCLK to Camera Connector (CSI-2) (37)

- CAM1␣PWR to Camera Connector (CSI-2) (37)

- CAM1␣RST to Camera Connector (CSI-2) (37)

- HDMI to Native micro-HDMI (38)

- USB2␣0␣OTG to Micro-AB USB (42)

- CSIB␣4 to Camera Connector (CSI-4) (43)

- I2C␣PM to Camera Connector (CSI-4) (43)

- CAM2␣MCLK to Camera Connector (CSI-4) (43)

- GPIO12 to Camera Connector (CSI-4) (43)

- GPIO13 to Camera Connector (CSI-4) (43)

- GPIO11 to Camera Connector (CSI-4) (43)

1.15   Power Connectors

1.15.1   Battery 2-Cell Balance Connector (v9) (40)

This is a standard 2S Lithium Polymer (LiPo) balance connector (XH Type). Although it's a 2S connector, it can provide either 16.0V or 36.0V.

This connector provides 36.0V to:

- 5V/5A Regulator (5)
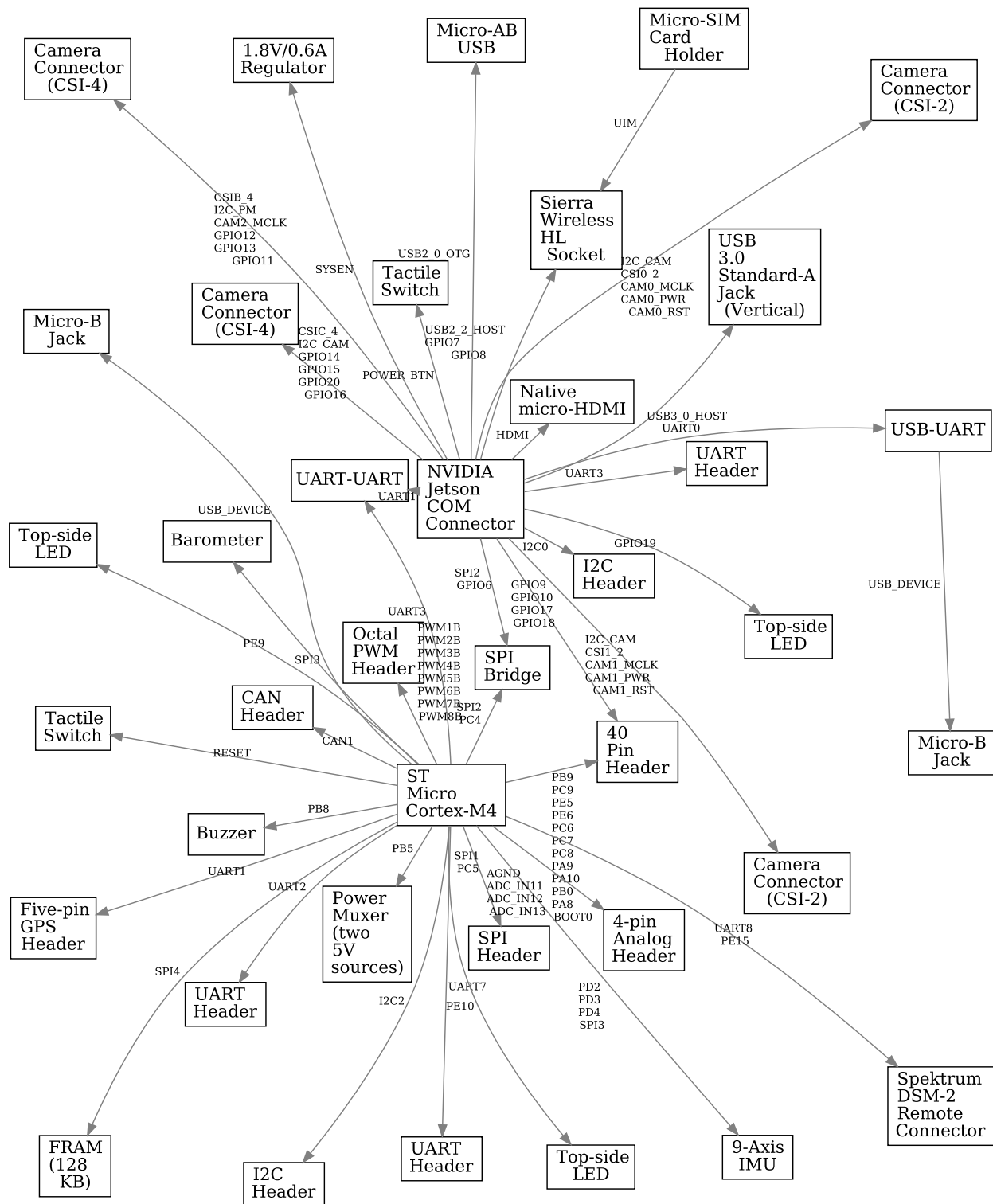
2   Module Connections Graph

Figure 1: excludes power modules

Built in Geppetto   Revised June 15, 2018
No engineering required.
Delivered in 15 days.

3 Module Power Graph

Built in Geppetto
No engineering required.
Delivered in 15 days.

Revised June 15, 2018