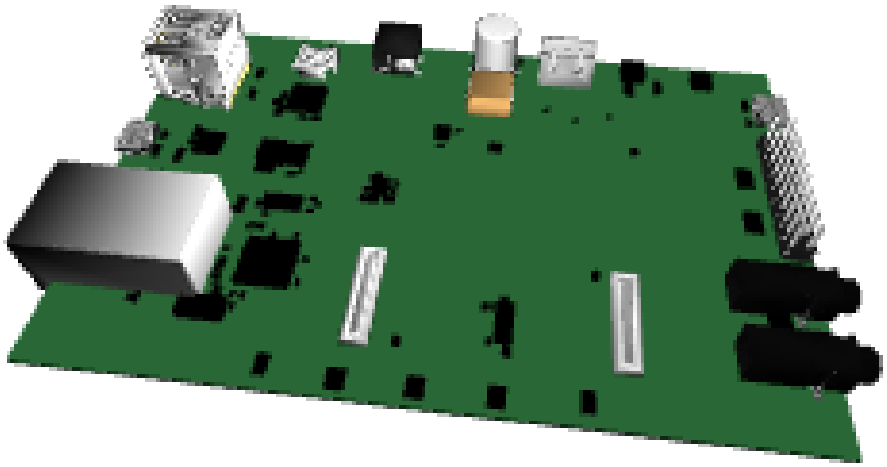
Arbor 43C



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Board Description

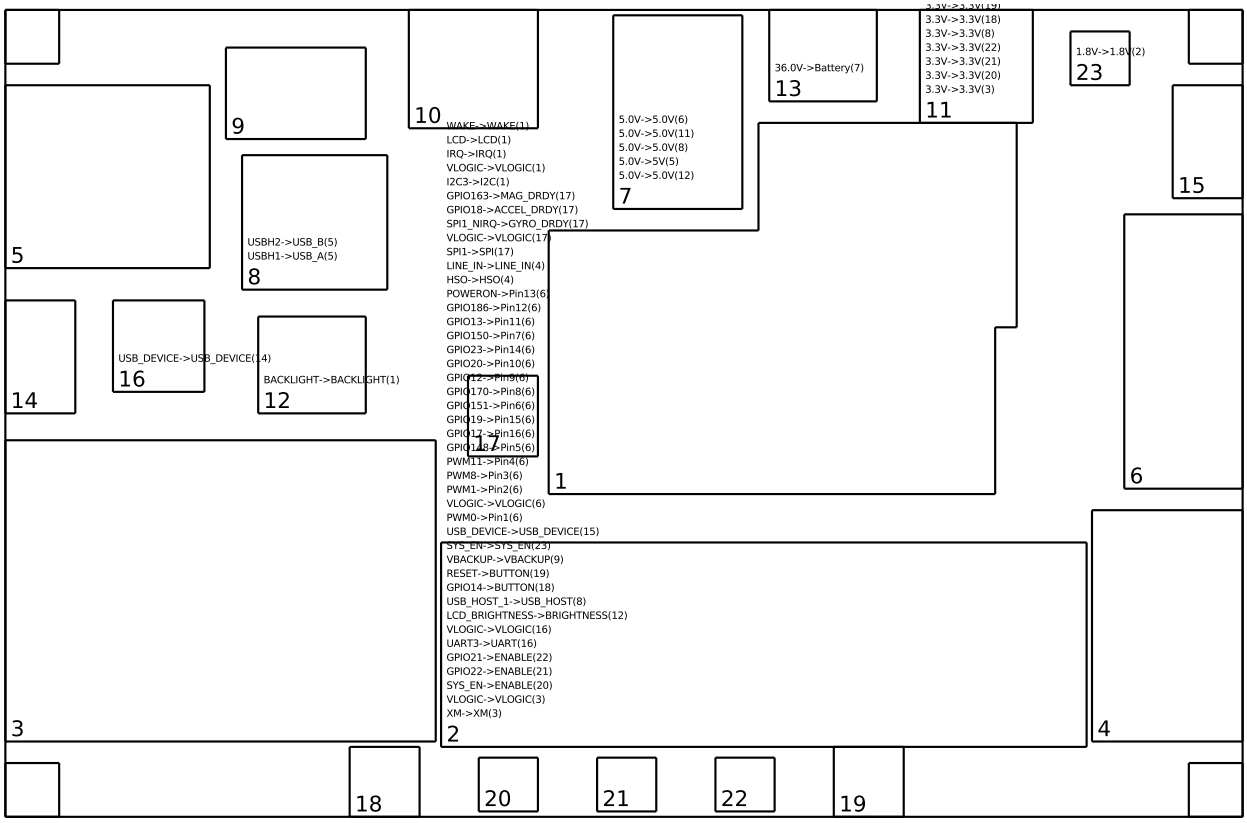
An Overo COM based expansion board, with support for 4.3” Newhaven Capacitive multi-touch screen (screen sold separately) with Ethernet, USB and audio.

Board Dimensions

11.5cm x 7.5cm

Contents

1 Modules on Board



1.1 LCD Display

1.1.1 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (v9) (1)

A 4.3 inch LCD and a capacitive touch screen connector, mounted on the backside, that connects to Gumstix - Overo COM Connector (2)

1.2 COM Connectors

1.2.1 Gumstix - Overo COM Connector (v33) (2)

Each of these two 70-pin connectors (Kyocera Series 5602) accepts signals from computers-on-module in the Overo series; a total of 140 possible signals that can be interfaced using these connectors (including power). COM to expansion board connectors in the Overo series are labelled J1 and J4, each carrying different types of signals. The correct orientation of these connectors is important; your Geppetto design will have a silkscreened footprint for a COM showing the correct orientation.

On the bottom of an Overo COM with silkscreened text oriented north, J4 is the connector located on the eastern the edge of the PCB. Connector J4 carries extended memory bus and MMC signals, detailed at http://goo.gl/IbTDPO.

Likewise, on the bottom of an Overo COM with the silkscreened text oriented north, J1 is the connector located approximately 1.3 mm from the western edge. Connector J1 carries LCD, PWM (pulse-width modulation) and analog signals, detailed at http://goo.gl/noPRac.

The Overo connectors require the following inputs:

- 3.3V from 3.3V/1.5A Regulator (11)
- 1.8V from 1.8V/0.6A Regulator (23)

The Overo connectors provide the following outputs:

- RESET to Flip-side Tactile Switch (19)
- VBACKUP to CoinCell Backup (9)
- SPI1_NIRQ to 9-Axis IMU (17)
- GPIO21 to Flip-side Red LED (22)
- GPIO20 to 20-Pin Male Header (6)
- GPIO23 to 20-Pin Male Header (6)
- GPIO22 to Flip-side Blue LED (21)
- GPIO150 to 20-Pin Male Header (6)
- GPIO151 to 20-Pin Male Header (6)
- GPIO13 to 20-Pin Male Header (6)
- HSO to Dual Audio (in / out) (4)
- UART3 to USB-UART (16)
- GPIO170 to 20-Pin Male Header (6)
- GPIO14 to Flip-side Tactile Switch (18)
- GPIO17 to 20-Pin Male Header (6)
- GPIO12 to 20-Pin Male Header (6)
- XM to 10/100BASE-T (3)
- IRQ to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- GPIO18 to 9-Axis IMU (17)
- SYS_EN to:
  - Flip-side Green LED (20)
  - 1.8V/0.6A Regulator (23)
- GPIO19 to 20-Pin Male Header (6)
- SPI1 to 9-Axis IMU (17)
- PWM8 to 20-Pin Male Header (6)

- VLOGIC to:
  - 10/100BASE-T (3)
  - USB-UART (16)
  - 20-Pin Male Header (6)
  - 9-Axis IMU (17)
  - 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- LINE_IN to Dual Audio (in / out) (4)
- PWM0 to 20-Pin Male Header (6)
- PWM1 to 20-Pin Male Header (6)
- I2C3 to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- USB_HOST_1 to 3-Port USB Hub (8)
- LCD_BRIGHTNESS to LCD Backlight Controller (12)
- GPIO148 to 20-Pin Male Header (6)
- GPIO186 to 20-Pin Male Header (6)
- LCD to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- USB_DEVICE to Micro-B Jack (15)
- GPIO163 to 9-Axis IMU (17)
- WAKE to 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- POWERON to 20-Pin Male Header (6)
- PWM11 to 20-Pin Male Header (6)

1.3 Network

1.3.1 10/100BASE-T (v10) (3)

This design offers a 10/100 Base-T Ethernet connection to XM on Gumstix - Overo COM Connector (2).

1.4 Audio

1.4.1 Dual Audio (in / out) (v9) (4)

These two standard 3-position 3.5mm audio jacks offer stereo line input and stereo audio output. They are connected to Gumstix - Overo COM Connector (2).

1.5 USB

1.5.1 Dual Stacked USB Type A (v6) (5)

A dual type-A USB host stacked vertically that allows you to connect USB devices to the board.

It is connected to:

- USBH1 on 3-Port USB Hub (8)
- USBH2 on 3-Port USB Hub (8)

1.5.2 3-Port USB Hub (v10) (8)

This USB hub offers three interfaces for USB ports from USB_HOST_1 on Gumstix - Overo COM Connector (2).

This hub is connected to the following USB ports:

- Dual Stacked USB Type A (5)
- Dual Stacked USB Type A (5)

1.5.3 Micro-B Jack (v8) (14)

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

This module is connected to USB_DEVICE on USB-UART (16).

1.5.4 Micro-B Jack (v8) (15)

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

This module is connected to USB_DEVICE on Gumstix - Overo COM Connector (2).

1.6 Headers

1.6.1 20-Pin Male Header (v10) (6)

A header offering up to 20 pins for various GPIO or PWM signals of your choice.

To output signals at a custom voltage, a zero ohm resistor can be depopulated and an external reference provided.

This module has the following connections:

- Pin16 to GPIO17 from Gumstix - Overo COM Connector (2)
- Pin15 to GPIO19 from Gumstix - Overo COM Connector (2)
- Pin14 to GPIO23 from Gumstix - Overo COM Connector (2)

- Pin13 to POWERON from Gumstix - Overo COM Connector (2)
- Pin12 to GPIO186 from Gumstix - Overo COM Connector (2)
- Pin11 to GPIO13 from Gumstix - Overo COM Connector (2)
- Pin10 to GPIO20 from Gumstix - Overo COM Connector (2)
- Pin9 to GPIO12 from Gumstix - Overo COM Connector (2)
- Pin8 to GPIO170 from Gumstix - Overo COM Connector (2)
- Pin3 to PWM8 from Gumstix - Overo COM Connector (2)
- Pin2 to PWM1 from Gumstix - Overo COM Connector (2)
- Pin1 to PWM0 from Gumstix - Overo COM Connector (2)
- Pin7 to GPIO150 from Gumstix - Overo COM Connector (2)
- Pin6 to GPIO151 from Gumstix - Overo COM Connector (2)
- Pin5 to GPIO148 from Gumstix - Overo COM Connector (2)
- Pin4 to PWM11 from Gumstix - Overo COM Connector (2)

1.7 Power

1.7.1 5V/5A Regulator (v3) (7)

Takes 6 - 36V input from Battery 2-Cell Balance Connector (13) and provides up to 5A at 5V to:

- LCD Backlight Controller (12)
- Dual Stacked USB Type A (5)
- 3-Port USB Hub (8)
- 3.3V/1.5A Regulator (11)
- 20-Pin Male Header (6)

1.7.2 CoinCell Backup (v3) (9)

The 6.8mm coin cell battery holder offers a short-term backup power option for your design.

This battery is connected to VBACKUP on Gumstix - Overo COM Connector (2).

1.7.3 3.3V/1.5A Regulator (v9) (11)

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. Currently, its input is 5V from 5V/5A Regulator (7).

This regulator provides 3.3V to:

- 10/100BASE-T (3)
- Flip-side Green LED (20)
- Flip-side Blue LED (21)
- Flip-side Red LED (22)
- 3-Port USB Hub (8)
- Flip-side Tactile Switch (18)
- Flip-side Tactile Switch (19)
- 1.8V/0.6A Regulator (23)
- Gumstix - Overo COM Connector (2)
- 9-Axis IMU (17)
- 4.3” Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)

1.7.4 LCD Backlight Controller (12)

Converts 5V/5A Regulator (7) Gumstix - Overo COM Connector (2) to ()

1.7.5 1.8V/0.6A Regulator (v6) (23)

This DC-DC regulator has an integrated inductor and tiny footprint. It provides power to modules that need a 1.8V input.

- 3.3V from 3.3V/1.5A Regulator (11)
- SYS_EN from Gumstix - Overo COM Connector (2)

The following modules receive 1.8V DC from this regulator:

- Gumstix - Overo COM Connector (2)

1.8 Power Connectors

1.8.1 Barrel Connector (5V 3A) (v6) (10)

This power jack is compatible with Gumstix 5V/3.5A DC power adapter using a 4.0mm x 1.7mm barrel connector. It provides more current than a standard 5V DC power supply, suitable for use with multi-processor designs.

This power jack is not connected to any modules.

1.8.2 Battery 2-Cell Balance Connector (v6) (13)

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

This connector provides 36.0V to:

- 5V/5A Regulator (7)

1.9 Connectivity

1.9.1 USB-UART (v14) (16)

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.

This USB to UART converter connects a host machine from Micro-B Jack (14) to UART3 on Gumstix - Overo COM Connector (2).

1.10 Sensors

1.10.1 9-Axis IMU (v16) (17)

This module provides 3-axis acceleration, 3-axis rotational rates and 3-axis magnetic field information. It is connected via a SPI bus. Data-ready pins are provided.

Its SPI bus is connected to SPI1 on Gumstix - Overo COM Connector (2)

It has the following data ready signals:

- ACCEL_DRDY to GPIO18 on Gumstix - Overo COM Connector (2)
- GYRO_DRDY to SPI1_NIRQ on Gumstix - Overo COM Connector (2)
- MAG_DRDY to GPIO163 on Gumstix - Overo COM Connector (2)

1.11 IO

1.11.1 Flip-side Tactile Switch (v5) (18)

This 4.9 sq. mm light touch switch provides a user input for the signal on . It can be found on the flip-side of the board.

1.11.2 Flip-side Tactile Switch (v5) (19)

This 4.9 sq. mm light touch switch provides a user input for the signal on . It can be found on the flip-side of the board.

1.11.3 Flip-side Green LED (v4) (20)

This 1608 standard size green LED, placed on the backside, provides an indicator for the signal SYS_EN on Gumstix - Overo COM Connector (2).

1.11.4 Flip-side Blue LED (v4) (21)

This 1608 standard size blue LED, placed on the backside, provides an indicator for the signal GPIO22 on Gumstix - Overo COM Connector (2).

1.11.5 Flip-side Red LED (v6) (22)

This 1608 standard size red LED, placed on the backside, provides an indicator for the signal GPIO21 on Gumstix - Overo COM Connector (2).

1.12 Mechanical

1.12.1 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

1.12.2 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

1.12.3 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

1.12.4 Mounting Hole (2.2mm)

A #0 mounting hole for securing the board with mounting pins.

2 Module Connections Graph

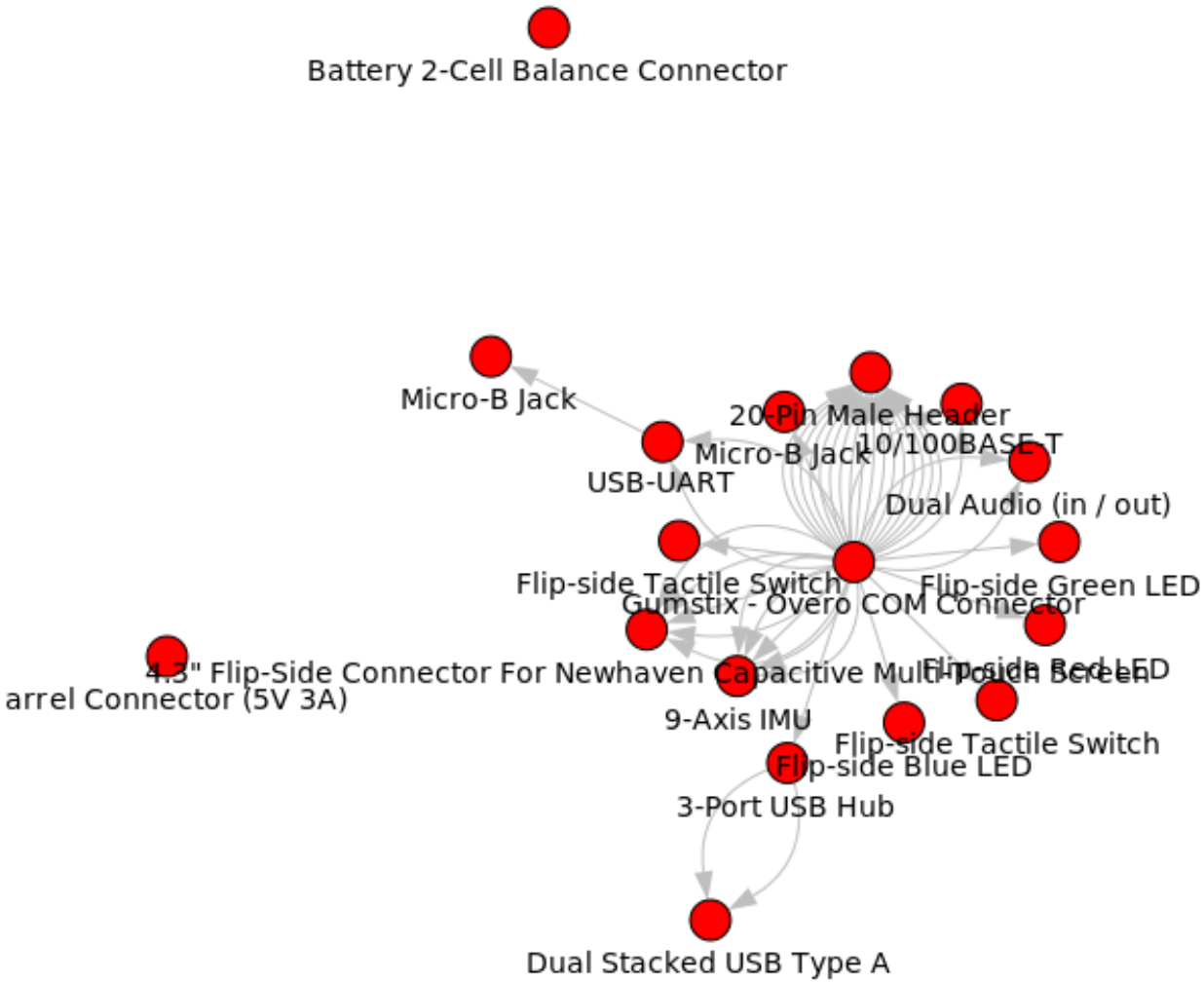


Figure 1: excludes power modules

3 Module Power Graph