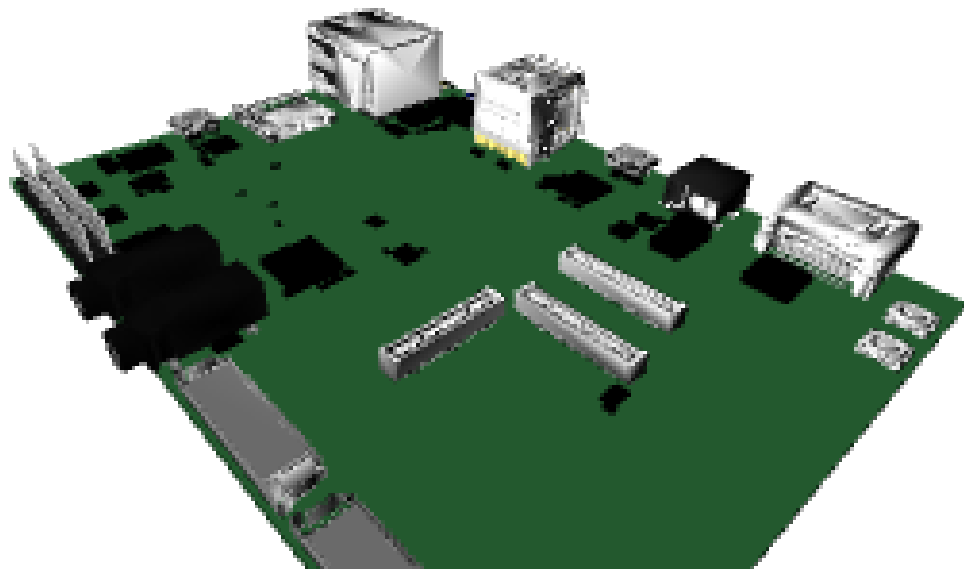


# TechNexion PICO SOM Expansion Board



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## Board Description

TechNexion PICO SOM Expansion Board

## Board Dimensions

11.0cm x 8.0cm



# Contents

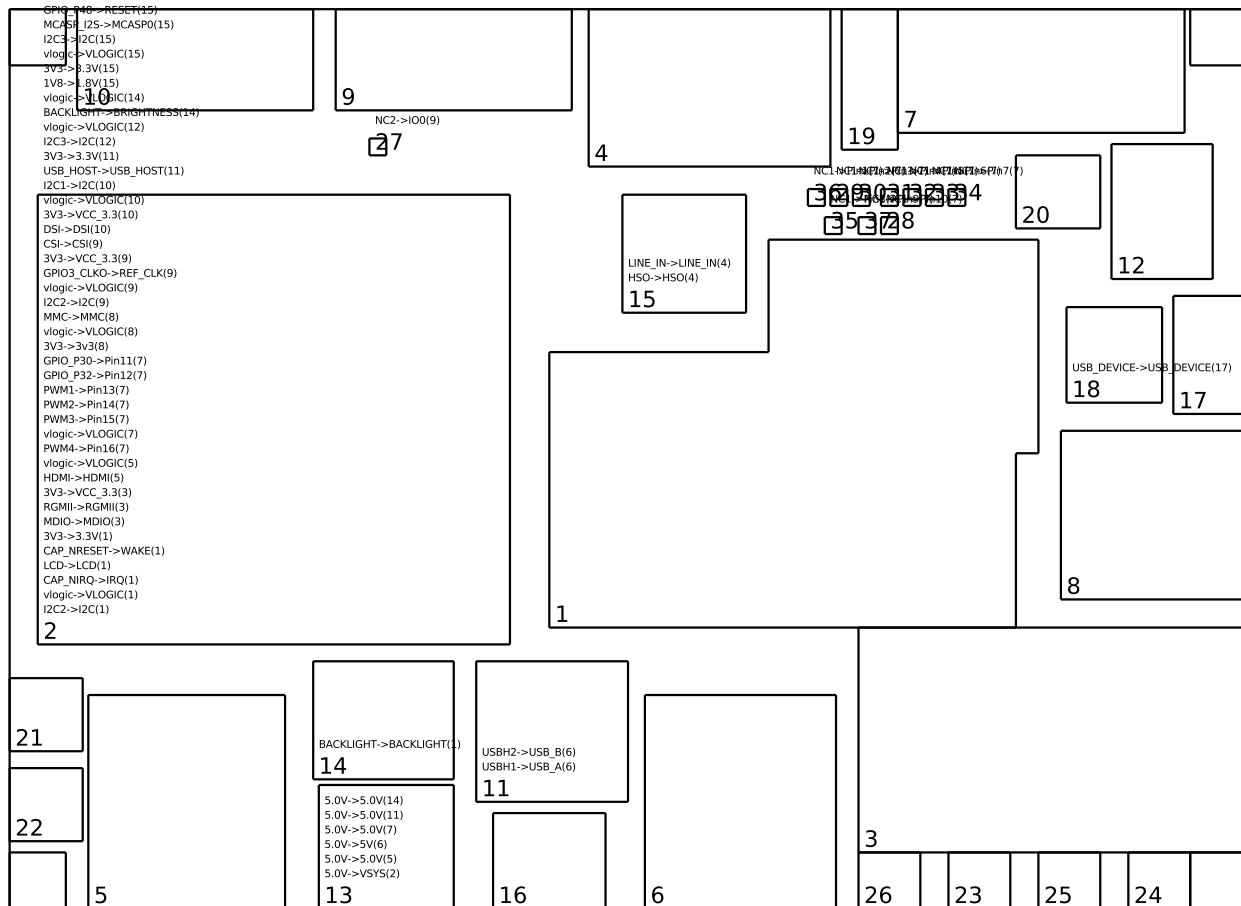
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# 1 Modules on Board



## 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 Technexion PICO SOM (2)

## 1.2 COM Connectors

### 1.2.1 Technexion PICO SOM (v3) (2)

- VSYS from Barrel Connector (5V 3A) (13)

The Technexion PICO SOM connectors provide the following outputs:

- RESET to Tactile Switch (22)
- USB\_OTG to Micro-AB USB (16)



- CAP\_NIRQ to 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- GPIO\_P42 to 9-Axis IMU (20)
- USB\_HOST to 3-Port USB Hub (11)
- MDIO to Atheros Gigabit Ethernet (3)
- PWM1 to 20-Pin Male Header (7)
- UART1 to USB-UART (18)
- MCASP\_I2S to Audio Codec (15)
- I2C2 to 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1), COM to CSI2 Connector (9)
- GPIO\_P44 to 9-Axis IMU (20)
- GPIO\_P48 to Audio Codec (15)
- PWM3 to 20-Pin Male Header (7)
- BACKLIGHT to Backlight Controller (14)
- RGMII to Atheros Gigabit Ethernet (3)
- GPIO\_P26 to Red LED (24)
- GPIO\_P24 to Blue LED (23)
- GPIO\_P25 to Yellow LED (25)
- CSI to COM to CSI2 Connector (9)
- HDMI to Native HDMI receptacle (5)
- GPIO\_P28 to Tactile Switch (21)
- vlogic to 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1), Native HDMI receptacle (5), 20-Pin Male Header (7), microSD slot (8), COM to CSI2 Connector (9), COM to DSI Connector (10), Real Time Clock (12), Backlight Controller (14), Audio Codec (15), USB-UART (18), 9-Axis IMU (20)
- DSI to COM to DSI Connector (10)
- PWM4 to 20-Pin Male Header (7)
- I2C1 to COM to DSI Connector (10), 9-Axis IMU (20)
- PWM2 to 20-Pin Male Header (7)
- I2C3 to Real Time Clock (12), Audio Codec (15)
- 3V3 to 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1), Atheros Gigabit Ethernet (3), microSD slot (8), COM to CSI2 Connector (9), COM to DSI Connector (10), 3-Port USB Hub (11), Audio Codec (15), CAN Header (19), 9-Axis IMU (20), Tactile Switch (21), Tactile Switch (22), Blue LED (23), Green LED (26), Red LED (24), Yellow LED (25)
- GPIO3\_CLKO to COM to CSI2 Connector (9)
- SYSEN to Green LED (26)



- LCD to 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- 1V8 to Audio Codec (15)
- CAP\_NRESET to 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)
- CAN1 to CAN Header (19)
- GPIO\_P30 to 20-Pin Male Header (7)
- GPIO\_P32 to 20-Pin Male Header (7)
- GPIO\_P34 to 9-Axis IMU (20)
- MMC to microSD slot (8)

## 1.3 Network

### 1.3.1 Atheros Gigabit Ethernet (v2) (3)

This 10/100/1000 Base-T connector offers gigabit Ethernet over twisted pair for networking functionality.

This networking interface is connected to Technexion PICO SOM (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 Audio Codec (15).

### 1.4.2 Audio Codec (v13) (15)

A low-power stereo audio codec with stereo headphone amplifier, as well as multiple inputs and outputs programmable in single-ended or fully differential configurations.

For more information, visit <http://www.ti.com/product/tlv320aic3106>.

This module provides the following output buses:

- LINE\_IN to Dual Audio (in / out) (4)
- HSO to Dual Audio (in / out) (4)

## 1.5 Monitors

### 1.5.1 Native HDMI receptacle (v8) (5)

The HDMI connector provides HDMI video and audio signals to an external display and speakers.

This displays high definition video for HDMI on Technexion PICO SOM (2).





## 1.6 USB

### 1.6.1 Dual Stacked USB Type A (v6) (6)

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 (11)
- USBH2 on 3-Port USB Hub (11)

### 1.6.2 3-Port USB Hub (v10) (11)

This USB hub offers three interfaces for USB ports from USB\_HOST on Technexion PICO SOM (2).

This hub is connected to the following USB ports:

- Dual Stacked USB Type A (6)
- Dual Stacked USB Type A (6)

### 1.6.3 Micro-AB USB (v6) (16)

A micro-AB USB port 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 USB\_OTG on Technexion PICO SOM (2).

### 1.6.4 Micro-B Jack (v8) (17)

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 (18).

## 1.7 Headers

### 1.7.1 20-Pin Male Header (v10) (7)

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 PWM4 from Technexion PICO SOM (2)
- Pin15 to PWM3 from Technexion PICO SOM (2)
- Pin14 to PWM2 from Technexion PICO SOM (2)



- Pin13 to PWM1 from Technexion PICO SOM (2)
- Pin12 to GPIO\_P32 from Technexion PICO SOM (2)
- Pin11 to GPIO\_P30 from Technexion PICO SOM (2)
- Pin10 to NC1 from NC (28)
- Pin9 to NC1 from NC (37)
- Pin8 to NC1 from NC (35)
- Pin3 to NC1 from NC (30)
- Pin2 to NC1 from NC (29)
- Pin1 to NC1 from NC (36)
- Pin7 to NC1 from NC (34)
- Pin6 to NC1 from NC (33)
- Pin5 to NC1 from NC (32)
- Pin4 to NC1 from NC (31)

### 1.7.2 COM to CSI2 Connector (v7) (9)

The CSI connector is compatible with Raspberry Pi family cameras.

The CSI port is connected to CSI on Technexion PICO SOM (2).

I2C communication is connected to I2C2 on Technexion PICO SOM (2).

REF\_CLK is provided by GPIO3\_CLKO on Technexion PICO SOM (2).

### 1.7.3 COM to DSI Connector (v5) (10)

The DSI connector is compatible with Raspberry Pi family displays.

The DSI port is connected to DSI on Technexion PICO SOM (2)

I2C communication is connected to I2C1 on Technexion PICO SOM (2) .

### 1.7.4 CAN Header (v5) (19)

The CAN header is connected to CAN1 on Technexion PICO SOM (2).

### 1.7.5 NC (v6) (27)

Implemented as a test pad.

### 1.7.6 NC (v6) (28)

Implemented as a test pad.



**1.7.7 NC (v6) (29)**

Implemented as a test pad.

**1.7.8 NC (v6) (30)**

Implemented as a test pad.

**1.7.9 NC (v6) (31)**

Implemented as a test pad.

**1.7.10 NC (v6) (32)**

Implemented as a test pad.

**1.7.11 NC (v6) (33)**

Implemented as a test pad.

**1.7.12 NC (v6) (34)**

Implemented as a test pad.

**1.7.13 NC (v6) (35)**

Implemented as a test pad.

**1.7.14 NC (v6) (36)**

Implemented as a test pad.

**1.7.15 NC (v6) (37)**

Implemented as a test pad.

**1.8 Memory****1.8.1 microSD slot (v5) (8)**

A Micro SD card slot provides memory to MMC on Technexion PICO SOM (2).



## 1.9 Power

### 1.9.1 Real Time Clock (v8) (12)

This real-time clock backup is powered by a coin cell battery.

This module is connected to I2C3 on Technexion PICO SOM (2).

### 1.9.2 Backlight Controller (v4) (14)

The backlight controller regulates the intensity of illumination on LCD touch displays

Converts BACKLIGHT from Technexion PICO SOM (2) to BACKLIGHT on 4.3" Flip-Side Connector For Newhaven Capacitive Multi-Touch Screen (1)

## 1.10 Power Connectors

### 1.10.1 Barrel Connector (5V 3A) (v6) (13)

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 provides 5V to the following modules:

- Technexion PICO SOM (2)
- Native HDMI receptacle (5)
- Dual Stacked USB Type A (6)
- 20-Pin Male Header (7)
- 3-Port USB Hub (11)
- Backlight Controller (14)

## 1.11 Connectivity

### 1.11.1 USB-UART (v14) (18)

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 (17) to UART1 on Technexion PICO SOM (2).



## 1.12 Sensors

### 1.12.1 9-Axis IMU (v16) (20)

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 I2C bus is connected to I2C1 on Technexion PICO SOM (2)

It has the following data ready signals:

- ACCEL\_DRDY to GPIO\_P44 on Technexion PICO SOM (2)
- GYRO\_DRDY to GPIO\_P42 on Technnexion PICO SOM (2)
- MAG\_DRDY to GPIO\_P34 on Technnexion PICO SOM (2)

## 1.13 IO

### 1.13.1 Tactile Switch (v9) (21)

This 4.9 sq. mm light touch switch provides a user input for the signal GPIO\_P28 on Technnexion PICO SOM (2).

### 1.13.2 Tactile Switch (v9) (22)

This 4.9 sq. mm light touch switch provides a user input for the signal RESET on Technnexion PICO SOM (2).

### 1.13.3 Blue LED (v14) (23)

This 1608 standard size blue LED provides an indicator for the signal GPIO\_P24 on Technnexion PICO SOM (2).

### 1.13.4 Red LED (v11) (24)

This 1608 standard size red LED provides an indicator for the signal GPIO\_P26 on Technnexion PICO SOM (2).

### 1.13.5 Yellow LED (v13) (25)

This 1608 standard size yellow LED provides an indicator for the signal GPIO\_P25 on Technnexion PICO SOM (2).

### 1.13.6 Green LED (v13) (26)

This 1608 standard size green LED provides an indicator for the signal SYSEN on Technnexion PICO SOM (2).



## **1.14 Mechanical**

### **1.14.1 Mounting Hole (2.2mm)**

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

### **1.14.2 Mounting Hole (2.2mm)**

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

### **1.14.3 Mounting Hole (2.2mm)**

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

### **1.14.4 Mounting Hole (2.2mm)**

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



## 2 Module Connections Graph

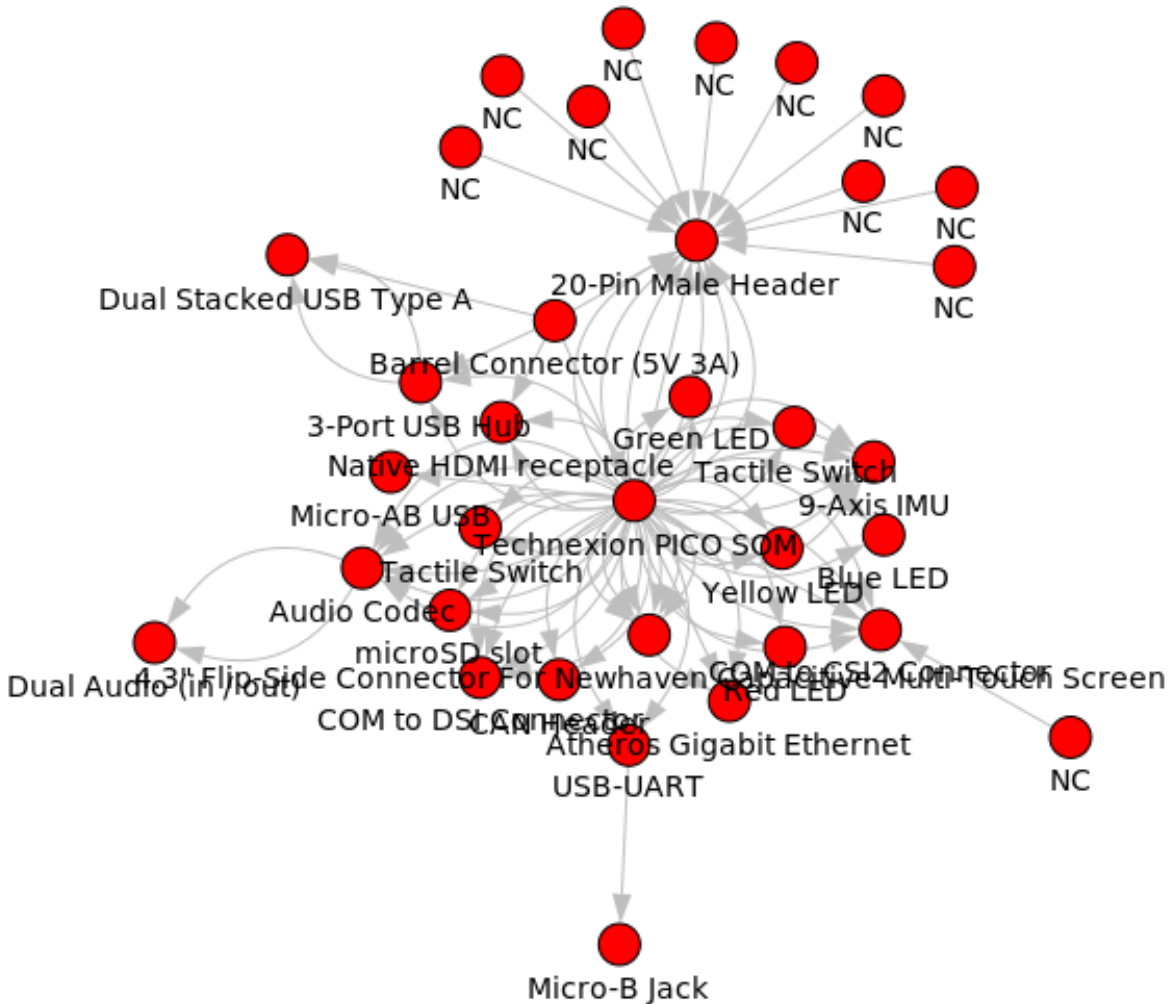
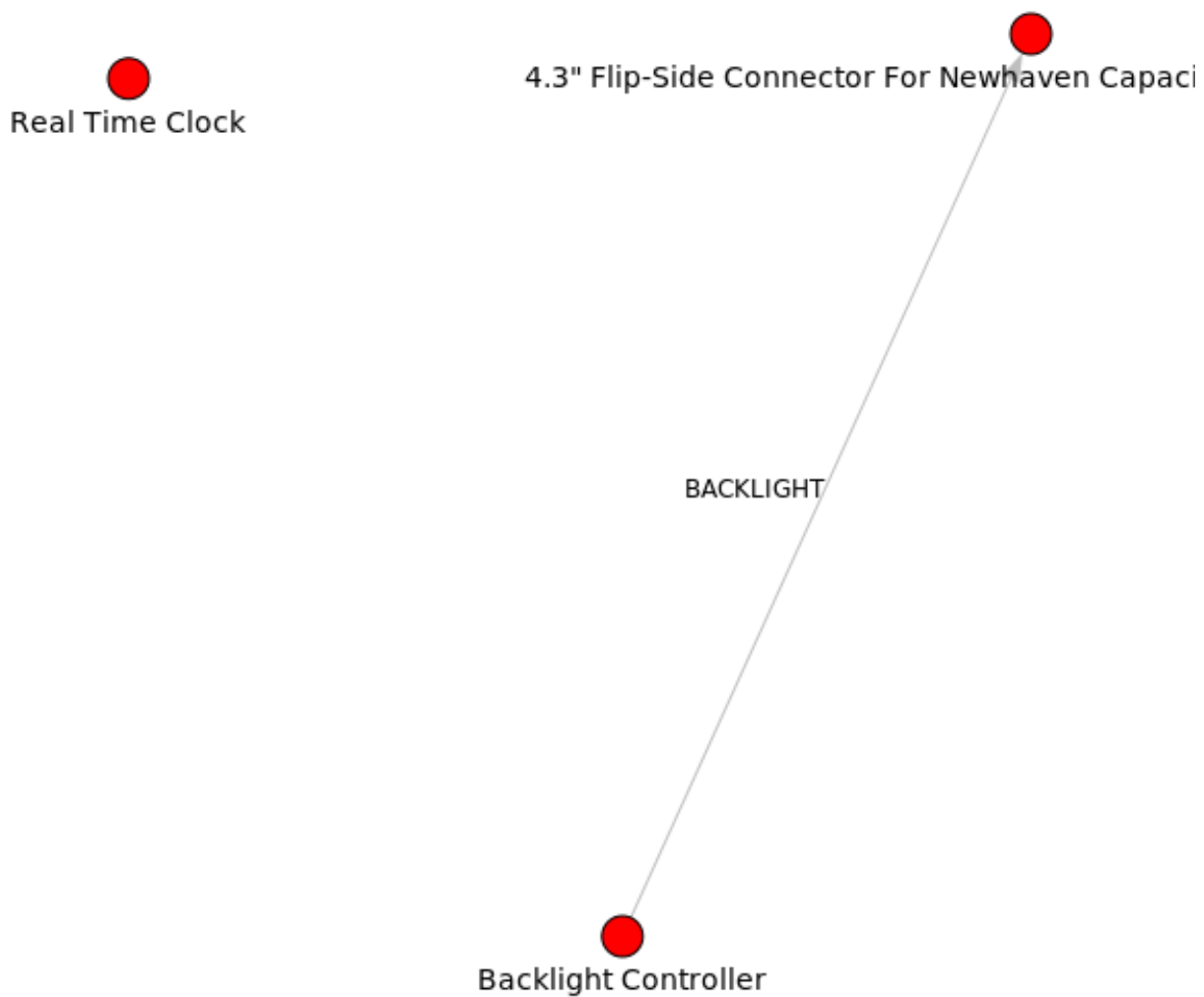


Figure 1: excludes power modules



### 3 Module Power Graph





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