## FEATURES

- 4-port USB 3.1 Gen 1 hub with data transfers up to 5Gbps
- Rugged, industrial grade (-40˚C to 85˚C) operation
- Locking upstream, downstream, and power connectors prevent accidental disconnects, perfect for USB3 Vision applications
- SuperSpeed (5Gbps), Hi-Speed (480Mbps), Full-Speed (12Mbps), and Low-Speed (1.5Mbps) transfers supported
- Supports bus-powered and self-powered modes, accessible via DC power jack and a pair of screw terminals
- LED for power, and per port RGB LEDs to indicate overcurrent fault, High-Speed, and SuperSpeed
- Compact, steel, low-profile enclosure
- RoHS compliant



## FACTORY OPTIONS

- OEM (board only) option with PC/104 mounting holes and footprint for convenience in embedded applications
- Economy version equipped with standard, instead of locking connectors
- Wide input external power accepts from 7-28VDC
- Tantalum capacitors for flight and space based applications
- Conformal coating

## FUNCTIONAL DESCRIPTION

The USB3-104-HUB is an industrial-grade 4-port USB hub optimized for harsh and rugged environments. This hub has latching / locking connectors on upstream and downstream ports as well as power, preventing accidental disconnects - making it perfect for applications that require vibration proofing. By using a USB-IF and Windows Hardware Quality Lab (WHQL) certified hub controller, compatibility is assured. The rugged steel enclosure, positive retention connections, and -40˚C to +85˚C operation makes the USB3-104-HUB stand out compared to commercially available hubs.

Each connection has been designed for rugged use without loose or intermittent cables disrupting your application. When externally powered the screw terminal or threaded DC Jack and cable secure the power connection. Screwlocks on the enclosure around the Type B USB connector and jackscrews on the cable secure the upstream connection. Latching Type A ports provide high-retention (50N) downstream connections compatible with all industry-standard USB cables.

The hub supports SuperSpeed (SS), Hi-Speed (HS), Full-Speed, and Low-Speed on all ports. Each downstream port indicator lights Red, Green, or Blue (RGB) to indicate fault, USB2/High-Speed, or USB3/SuperSpeed, respectively. The hub also supports bus-powered and self-powered applications. If downstream peripherals require more current, the USB3-104-HUB can be configured in self-powered mode. External +5V can be supplied to the board, which will provide 900mA to each downstream port. Power can be brought in via the DC locking jack / plug or 2-position screw terminal.

This product is fully protected from faulty peripherals. Each downstream port utilizes a power distribution switch providing overcurrent and short circuit protection. If a fault occurs, the power distribution switch will disable that port and illuminate the LED red. The disabled port can be re-enabled by clearing the fault and cycling power to the port.

The board is designed to be used in rugged industrial environments, but is small enough to fit nicely onto any desk or testing station. The module is PC/104 sized at 3.550" by 3.775", while the enclosure is approximately 4" x 4" x 1".
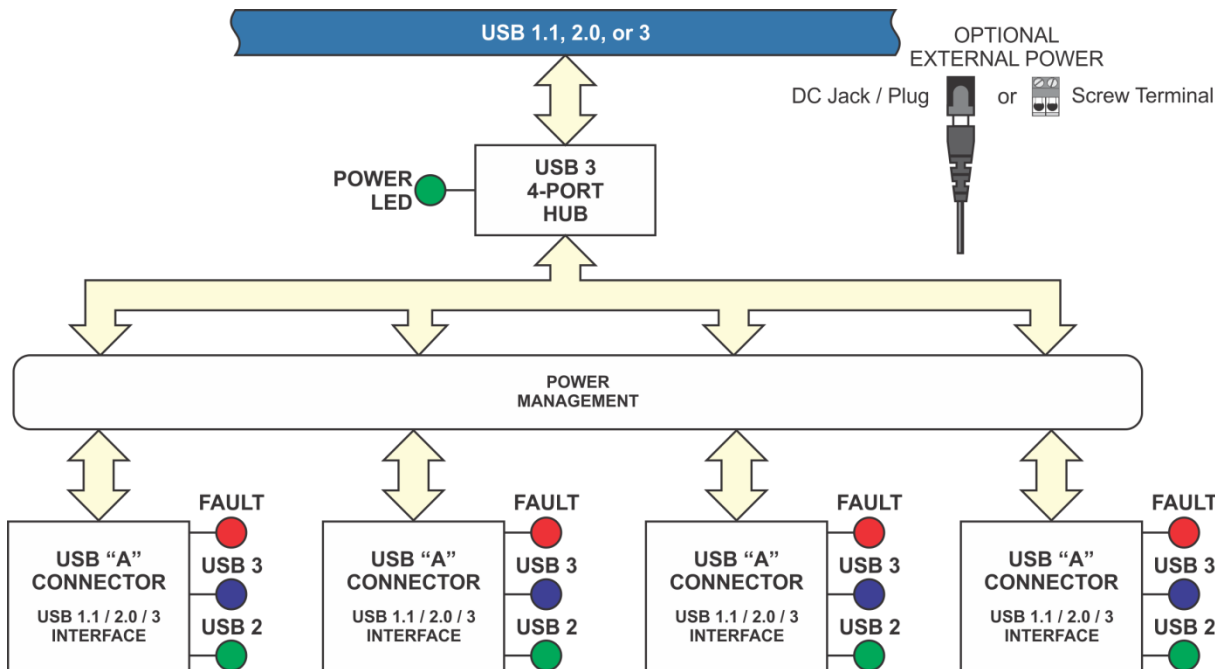
## ACCESSORIES

Available accessories include the MP104-DIN for DIN rail mounting the USB3-104-HUB and an external instrument grade power supply.

## SOFTWARE

No software is provided or needed with this board. There is no need to install any drivers to use the USB3-104-HUB. It will enumerate as a Generic Hub which uses the USB Hub Class Driver that is built in Windows OS or Linux, et al.

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## BLOCK DIAGRAM

**SPECIFICATIONS**

| | |
|---|---|
| Bus Type: | USB 3.1 Gen 1 / 2.0 / 1.1 Super (5Gbps) / Hi (480Mbps) Full (12Mbps) / Low (1.5Mbps) Four Type A downstream ports |

**Environmental**

| | |
|---|---|
| Operating & Storage: | -40° to +85°C |
| Humidity: | 5-95% non-condensing |
| Board Size: | 3.550" x 3.775" |
| Enclosure Size: | 3.985" x 3.990" x 1.045" |
| Weight: | 284 grams (with enclosure) 65.8 grams (-OEM version) |
| **Cable** | 6' USB3 Vision cable Type B with thumbscrews to standard Type A |
| **Power** | No external power *required* |
| Optional ext. power | Connect via screw terminals, a locking DC jack / plug or standard jack / plug |
| USB3.1 | Up to 480mA at 5VDC required |
| Bus Powered | Up to 620mA for a single port and as little as 420mA shared between all four ports is available to power downstream devices |
| Externally Powered | 900mA available per downstream port |
| USB2.0 | Up to 200mA at 5VDC required |
| Bus Powered | Up to 390mA for a single port and as little as 300mA shared between all four ports is available to power downstream devices |
| Externally Powered | 900mA available per downstream port |
| **Connectors** | |
| USB Type A Latching | Retention up to 50 Newtons Physical shock: Per EIA-364-27 Condition H (11ms 30G) Vibration: Per EIA-364-28D Condition V, Test A |
| USB Type B & A | 8 Newtons disconnect non-locking |

| | |
|---|---|
| DC Jack (locking) (MIL-STD-202G) | Vibration: Method 201A Ins. Resistance: Method 302 ConditionB Thermal Shock: Method 107G Temperature: -40-105°C (-40-+221°F) |
| DC Jack (non-locking) | 2.22 Newtons disconnect |

**Ordering Guide**

| | |
|---|---|
| USB3-104-HUB | RoHS compliant industrial USB 3.1 Gen 1 hub with locking/latching connectors in rugged enclosure (includes 6' high-quality USB 3.1 locking cable) |
| USB3-104-HUB-E | Economy version with standard non-latching power and data connections (includes 6' high-quality USB 3.1 cable) |

**Model Options**

| | |
|---|---|
| -OEM | Board only version (no enclosure) |
| -WI | Accepts external power 7 to 28VDC |
| -TAN | Tantalum Capacitors instead of Electrolytic for high altitude usage |
| -CC | Conformal Coating for use in high humidity and dusty environments |

**Optional Accessories**

| | |
|---|---|
| PWR-ACDC-5V5A | External Power Supply |
| PWR-ACDC-5V5A-L | External Power Supply with locking connector |
| CAB-USB3LL | 6' high-quality USB 3.1 cable with screw locks on A and B ends |
| MP104-DIN | DIN rail mounting provision |

**USB 3.1 vs USB 3.0**

USB 3.0 was renamed to "USB 3.1 Gen 1" and operates at up to 5Gbps
USB 3.1 Gen 2 supports 10Gbps
*For full details see user manual*

Authorized Distributor

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