

GigaBlox

Small 5 port Gigabit Ethernet Switch



DESCRIPTION

The BotBlox GigaBlox is a small form factor 5 port 10/100/1000Mbps (10BASE-T/100BASE-TX/1000BASE-T) layer 2 unmanaged ethernet switch. It has a non-blocking fabric, meaning that 1000Mbps speed can be achieved simultaneously on all ports.

It runs from a wide input voltage range of 5.1 to 60V allowing integration into a wide range of applications.

FEATURES

- 5 x 10/100/1000M (10BASE-T/100BASE-TX/1000BASE-T) ethernet ports Input voltage range from 5.1 to 60V
- 45mm x 45mm board size
- Molex Picoblade connectors for power and ports
- Automatic MDI-X crossover
- Auto-negotiation with connected devices to achieve maximum speed Unmanaged (out-the-box) functionality

HOW TO ORDER

Part Number	CF-02BBGGB	GigaBlox
	CF-02BBGGBNDAA	GigaBlox – NDAA Compliant

GENERAL SPECIFICATIONS

Voltage Input	5.1V to 60V DC (65V absolute max)
Supported Protocols	10BASE-T, 100BASE-TX, 1000BASE-T
Power Consumption	260mW (idle) to 1100mW (full switching)
Weight	18 grams
Size	45mm x 45mm x 15.98mm
Operating Temperature	-20°C to +85°C
Storage Temperature	-40°C to +100°C

GENERAL OPERATING INSTRUCTIONS

GigaBlox is designed for use in commercial and industrial environments, operating from a nominal supply voltage of 24V, but with the ability to operate from as low as 5.1V and as high as 60V.

GigaBlox can be operated immediately by following the steps below.

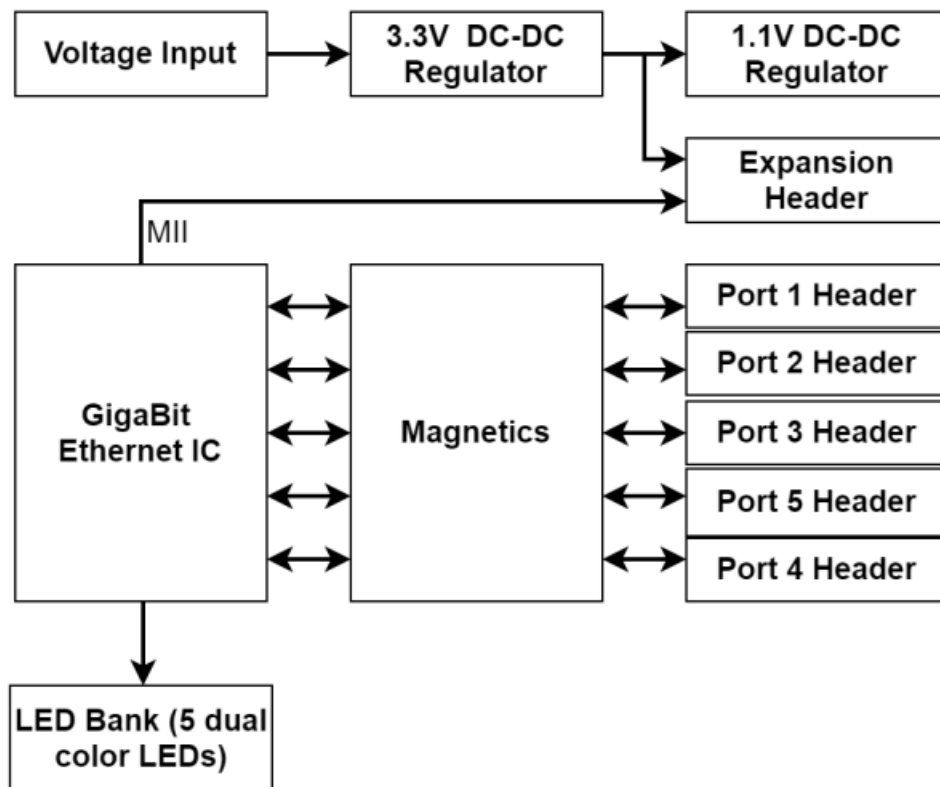
- Apply a voltage between 5.1V to 60V to the voltage input terminals.
- Connect external devices to the ethernet ports using RJ45 to Picoblade cables.
- GigaBlox will automatically begin auto negotiation with connected devices and begin receiving and forwarding packets to/from all connected devices.

There is no managed mode on GigaBlox, it can only operate as an unmanaged switch.

SAFETY INFORMATION

- This device can operate on voltages near and above 60V. Please read this manual before operating.
- This device is provided “as is”. In-application testing prior to integration is recommended.
- This device is provided as an electronic circuit board, and requires integration into chassis for full ingress protection.
- Do not use this product in wet environments without integrating into a chassis.
- Do not operate this product beyond the rated temperature and voltages.

BLOCK DIAGRAM



INCLUDED EQUIPMENT

The product includes the following:

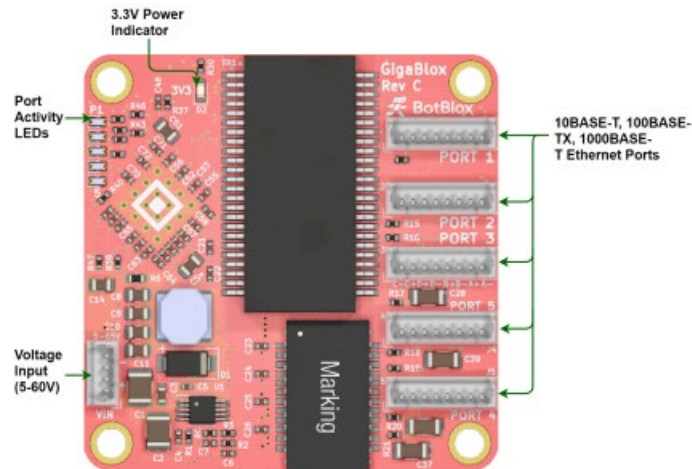
- 1 x GigaBlox board
- 5 x Molex Picoblade to RJ45 8-way Unshielded Twisted Pair cables (300mm)
- 1 x Molex Picoblade to bare, tinned leads (300mm)

RoHS Certification of Compliance

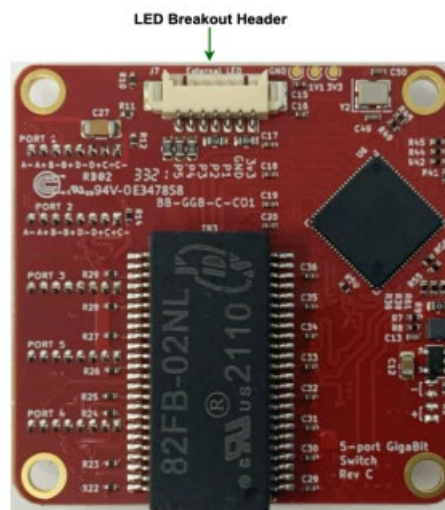
The BotBlox GigaBlox complies with the RoHS (Restriction of Hazardous Substances Directive) Certificate of Compliance.

HARDWARE INTERFACE

Board Map



Front



Back

CONNECTORS AND PINOUTS

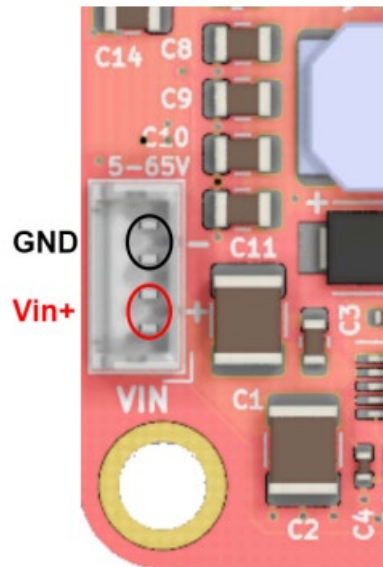
Voltage Input

The bottom left connector is the voltage input terminal. A four pin connector is used to allow the input voltage to be easily daisy chained between boards (two wires per power rail).

The voltage input has the following features:

- Voltage input can range from 5 to 60V
- Maximum allowable voltage of 65V

The pinout of the voltage input connector is shown in figure below.

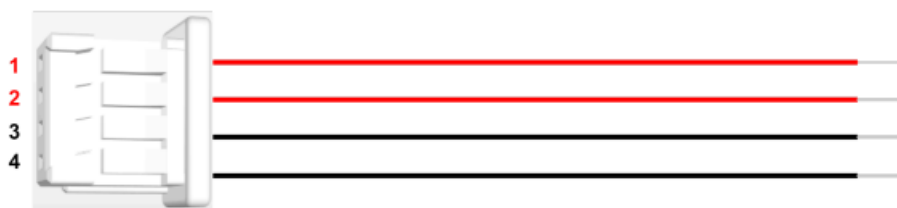


Voltage input header pinout

Connector part numbers

Connector on board	Mating header	Crimp used	Wire used
530470410	0510210400	500798000	UL1061, 28AWG

Voltage input connector pinout and part numbers



Voltage input cable pinout (red = V+, black = GND)

Ethernet Ports

There are five ethernet connectors on GigaBlox. Each connector has eight pins corresponding to the four signals required for 1000BASE-T which are A+, A-, B+, B-, C+, C-, D+ and D-. The pin mapping of all five connectors is identical. The pin mapping of all eight connectors is identical, and matches the mapping used on all our other products that use 8 way Molex PicoClasp connectors.

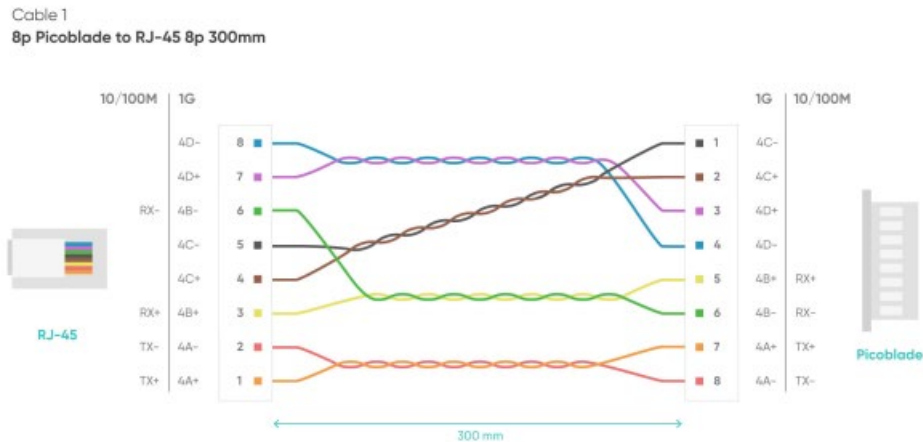


Ethernet port pinout

Connector on board	Mating header	Crimp used	Wire used
530470810	0510210800	500698000	UL1061, 28AWG

Ethernet connector pinout and part numbers

Cable pinout



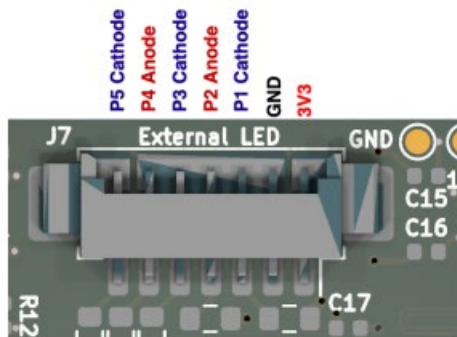
Ethernet cable pinout

Compatibility with SwitchBlox Cables GigaBlox can be used with 4 pin SwitchBlox cables at 10/100M speed by plugging the SwitchBlox cables into the right-hand side of the 8 pin connector.

This is because the right-most signals on the GigaBlox 8 pin headers are the A- (Tx-), A+ (Tx+), B- (RX-) and B+ (RX+) signals, which are all that are needed for 10/100Mbps.

LED Header

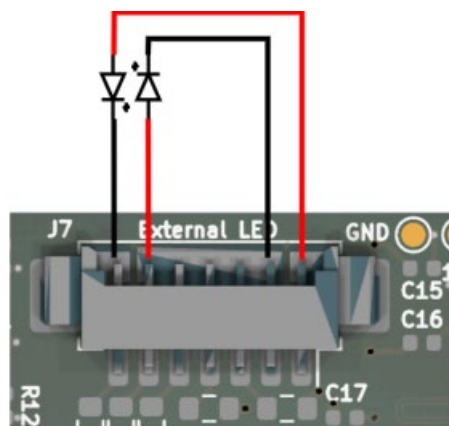
GigaBlox has a header on the back of the board that allows the port activity indication signals to be broken out to power external LEDs. This connector contains 5 LED port activity signals, 3.3V and GND. The pinout is shown below.



LED connector Pinout

75Ω resistors are integrated directly into the board in series with the LED signals. This means using external LEDs without resistors is possible with most standard LEDs. The current in each LED in this case is 44mA ($3.3V \div 75\Omega$). External resistors can be placed in series with the Px LED signals to further reduce current flow.

The LED signals for ports 1,3 and 5 pull low on link activity, meaning they must be connected to the cathode of the external LED. Conversely the LED signals for ports 2 and 4 pull high on link activity, meaning they must be connected to the anode of the external LED. Below is an example connection diagram



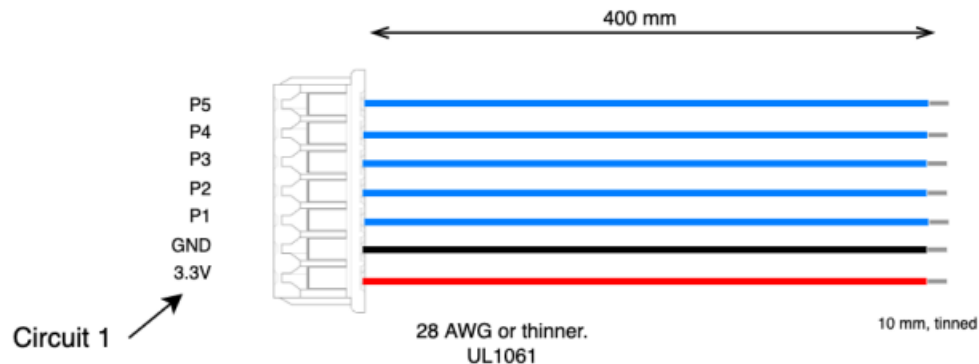
External LED connections

All five external LEDs can be connected in this way.

The table below shows the MPN of the connector used on the board and the associated information for the mating header

Connector on board	Mating header	Crimp used	Wire used
0532610771	0510210700	500798000	UL1061, 28AWG

For the avoidance of doubt, the diagram below shows the pinout used on a cable that would mate with the external LED connector; LEDs could then be soldered directly to the tinned leads of this cable. The internal part number of this cable is BB-PBTL1-7-0.4.



Example external cable showing LED connector pinout

Other Interfaces

Onboard LEDs

There are 6 LEDs on GigaBlox in total. The 3V3 Power Indicator LED (Green) indicates that voltage is present on the 3V3 line. It should be solid green in normal operation. Each Port Activity LED (Red/Green) corresponds to a specific port. They indicate activity on each port and will blink when there is traffic on a port. The color of the LED indicates the link speed, with Red meaning 10/100M speed, and Green meaning 1G speed. They should be solid off when a port is not connected to any device, and they should blink under normal operation. A solid LED indicates either constant traffic, or a fault with the port.

Software Interfaces

There is currently no software interface on GigaBlox. It functions solely as an unmanaged switch.

Device Configuration

Unmanaged Switch

To use GigaBlox in an unmanaged application requires no configuration. Simply connect a voltage to the voltage input and connect downstream devices.

Managed Switch

Operating GigaBlox as a managed switch is not possible at present

Device Characteristics

Operating Conditions

Absolute Maximum Ratings

Operating in these ranges will reduce the lifetime of the device

Voltage Input Maximum	65V
Storage Temperature	-40°C +100°C
Operating Temperature	-20°C to 85°C