



## BL4S100 Single-Board Computer

*ZigBee enabled Ethernet Gateway*



### Description

The BL4S100 is a low-cost [Rabbit® 4000 microprocessor](#) based single-board computer series that delivers ZigBee and Ethernet capability. On-board ZigBee RF modules offer mesh networking functionality to make networking easy to deploy and simple to maintain. With both Ethernet and ZigBee connectivity integrated onto the BL4S100, the series delivers a low-cost platform to design a ZigBee enabled Ethernet network.

### Features

- Rabbit 4000 microprocessor running at 40 MHz
- ZigBee enabled
- 10Base-T Ethernet connectivity
- 20 digital I/O
- 3 serial ports
- 8 Analog inputs
- Battery-backed real-time clock
- Watchdog supervisor
- Screw-terminal connectors

### Design Advantages

- Easily monitor and control ZigBee networks with feature-rich web applications using a Rabbit web server
- [Dynamic C®](#) libraries provide ready support for AT and API commands
- Full interoperability with other ZigBee PRO feature set based devices
- Integrated hardware and software solution reduces overall development time and costs
- ZigBee to Ethernet gateway functionality
- Optional Rabbit Embedded Security Module offers secure data transfer with AES encryption, and SSL/TLS for embedded web security

### Applications

- Monitoring and control for intelligent building automation
- Asset tracking and management for commercial and industrial applications
- Air quality monitoring
- Energy monitoring and management

Rabbit's BL4S100 single-board computers offer a low-cost solution for control and communication that gets you through the development process quickly. The BL4S100 series is designed to support the rapidly increasing use of ZigBee connectivity for companies looking to deploy wireless networking. [Digi's XBee® ZB ZigBee PRO RF modules](#) are compatible with other manufacturers' devices using the ZigBee PRO compliant feature set, providing great flexibility in choices of nodes to include on the network.

The BL4S100 series integrates on-board functionality to support a wide range of applications. Analog inputs, general purpose I/O as well as serial ports, along with 10Base-T Ethernet connectivity provide design resources for both commercial and industrial applications.

Develop and debug programs using Rabbit's industry-proven [Dynamic C integrated development environment](#). The Dynamic C IDE includes the popular µC/OS-II Real-time Kernel operating system, point-to-point protocol (PPP), FAT file system, RabbitWeb, and other select libraries.

Connect the BL4S100 series board to the PC using a USB cable and then debug using breakpoints, watch expressions and other features oriented toward real-time embedded systems programming. An extensive library of drivers and sample programs is provided, including a royalty-free TCP/IP stack for network and Internet communications. Rabbit provides full source code for most of the library routines.



Alcom Belgium - Singel 3 - 2550 Kontich  
Tel.: ++32 (0)3 458.30.33 - Fax: ++32 (0)3 458.31.26 - [info@alcom.be](mailto:info@alcom.be)

Alcom Netherlands - Rivium 1e straat 52 - 2909 LE Capelle a/d IJssel  
Tel.: ++31 (0)10 288.25.00 - Fax: ++31 (0)10 288.25.25 - [info@alcom.nl](mailto:info@alcom.nl)



## Development Tools

The BL4S100 Tool Kit contains the following essential hardware:

- Dynamic CD-ROM, with complete product documentation on disk
- Demonstration Board with pushbutton switches and LEDs. The Demonstration Board can be hooked up to the BL4S100 to demonstrate the I/O and capabilities of the BL4S100
- USB programming cable, used to connect your PC USB port to the BL4S100
- Universal AC adapter, 12 V DC, 1 A (includes Canada/Japan/U.S., Australia/N.Z., U.K., and European style plugs)
- CAT 5/6 Ethernet crossover cable

## Optional Add-Ons



Rabbit offers a Mesh Network Add-On Kit and a plastic enclosure for the BL4S100 series.

The Mesh Network Add-On Kit enables you to explore the wireless capabilities of the BL4S100 series that offer a ZigBee network interface. Included in the kit are a Digi® XBee USB (used as ZigBee coordinator), an XBee ZB RF module, and an RF Interface module.

The plastic enclosure, consisting of a base and a cover, provides a secure way to protect your BL4S100 single-board computer.

## Specifications

Features	BL4S100	BL4S110	BL4S150	BL4S160
Microprocessor	Rabbit® 4000 @ 40.00 MHz			
Ethernet Interface	10Base-T			
ZigBee Interface	ZigBee PRO (802.15.4)	—	ZigBee PRO (802.15.4)	—
Serial Flash Memory (program)	1 MB		2 MB	
Program Execution SRAM	512KB		1 MB	
Data SRAM	512KB			
Backup Battery	Panasonic CR2032 or equivalent 3 V lithium coin type, 235 mA-h standard, socket-mounted			
Digital Inputs	12: protected to ±36 V DC, switching threshold 1.4 V/1.9 V typical			
Digital Outputs	8: sink up to 200 mA each, 36 V DC max.			
Analog Inputs	Eight 11-bit res. channels, software-selectable ranges unipolar/differential bipolar: 1, 2, 2.5, 5, 10, 20 V DC; 4 channels can be hardware-configured for 4–20 mA; 1 MΩ input impedance, up to 4,100 samples/s			
Serial Ports	3 serial ports: <ul style="list-style-type: none"> <li>• two RS-232 or one RS-232 (with CTS/RTS)</li> <li>• one serial port dedicated for programming/debug</li> </ul>			
Serial Rate	Max. asynchronous rate = 120 Kbps			
Hardware Connectors	Micro-Fit® connector: one polarized 2 × 2 with 3 mm pitch (power) Screw-terminal connectors (accept up to 14 AWG/1.5 mm <sup>2</sup> wire): four 1 × 9 (I/O), one 1 × 6 (serial) Programming port: 2 × 5 IDC, 1.27 mm pitch			
Ethernet Network Connector	One RJ-45 Ethernet			
Real-Time Clock	Yes			
Timers	Ten 8-bit timers (6 cascadable, 3 reserved for internal peripherals), one 10-bit timer with 2 match registers			
Watchdog/Supervisor	Yes			
Power	9–36 V DC, 2 W max.			
Operating Temperature	-40° C to +85° C			
Humidity	5–95%, non-condensing			
Board Size	3.75" × 5.75" × 0.64" (96 mm × 146 mm × 16 mm)			
<b>ZigBee RF Module Specification</b>				
RF Module	Digi® XBee ZB			
Compliance	ZigBee PRO (802.15.4)			
RF Data Rate	250 Kbps			