



# Open-Source Robotics and Process Control Cookbook: Designing and Building Robust, Dependable Real-time Systems

Lewin Edwards

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## Open-Source Robotics and Process Control Cookbook: Designing and Building Robust, Dependable Real-time Systems Lewin Edwards

In this practical reference, popular author Lewin Edwards shows how to develop robust, dependable real-time systems for robotics and other control applications, using open-source tools. It demonstrates efficient and low-cost embedded hardware and software design techniques, based on Linux as the development platform and operating system and the Atmel AVR as the primary microcontroller. The book provides comprehensive examples of sensor, actuator and control applications and circuits, along with source code for a number of projects. It walks the reader through the process of setting up the Linux-based controller, from creating a custom kernel to customizing the BIOS, to implementing graphical control interfaces.

Including detailed design information on:

- ESBUS PC-host interface
- Host-module communications protocol
- A speed-controlled DC motor with tach feedback and thermal cut-off
- A stepper motor controller
- A two-axis attitude sensor using a MEMS accelerometer
- Infrared remote control in Linux using LIRC
- Machine vision using Video4Linux

The Accompanying companion site contains a wealth of design materials, including:

- Full schematics and source code for the projects described
- Ready-made disk images for the miniature Linux distribution used as the basis for the PC-side software
- Distribution archives of source code for all GNU software used, along with application-specific patches where appropriate
- A free version of the schematic capture and PCB CAD software used
- Atmel AVR Studio

\* The first-ever book on using open source technology for robotics design!

\* Immensely valuable source code and design tools provided on a companion website

\* Covers hot topics such as GPS navigation, 3-D sensing, and machine vision, all using a Linux platform!



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