

Link collection

From the Mikrocontroller.net collection of articles, with contributions by various authors (see version history)

This page collects links to other interesting microcontroller and electronics pages. The old link page can be found [here](#) .

Note: this list is no longer actively maintained. Unfortunately, many of the links are now invalid.

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Search find

Sell a fish to a hungry man and you made a business, teach him how to fish and you lost a customer!
(asmo)

- [SupplyFrame](#) - Datasheet and Electronic Spec Search Engine
- [GlobalSpec](#) - The Engineering Search Engine
- [alldatasheet](#) - Datasheet Search
- [datasheetarchive](#) - Datasheet Search
- [datasheetcatalog](#) - Datasheet Search
- [ChipDB](#) - pinouts of common μ Cs.
- [\[1\]](#) - Parametric product search for Analog IC

AVR

Manufacturer pages

- [Atmel.com manufacturer sites](#)
- [Atmel.com updates](#) List of recent changes in datasheets and sample code for AVR (8) and AVR32
- [AVR product information](#) AVR information from Atmel distributor MSC Vertriebs GmbH
- [Siebert Group](#) Siebert Group Industrial Electronics

Information (forums, mailing lists, link collections)

- [Batronix Electronics Forum](#) Well-attended forum for general electronics, microcontrollers and programming
- [AVR Freaks](#) AVR Forum, Samples, Tutorials, User Projects, GCC for AVR (registration recommended)
- [Atmel AVR ASM Site](#)
- [Mikrocontroller.net](#) - AVR Tutorials, Examples, LINKS, Forum (D)
- [Atmel AVR Embedded Microcontroller Resources](#)
- [Stelios Cellar Atmel AVR Info Page](#) - Samples, Links
- [Electronics project](#) - main topics are AVR and robots
- [AVR Microcontrollers](#) - A web site about AVR microcontrollers

Development tools (compiler / assembler / debugger / tools / libraries)

C.

- [WinAVR](#) (pronounced "whenever") is a suite of executable, open source software development tools for the Atmel AVR series [for the] Windows platform "(includes GNU GCC)
- [ControlLab](#) is a free GPL open-source development environment based on KDE, using the avr-gcc, UISP and AVRDUDE
- [avr-libc](#) avr-gcc's "standard" library
- [Procyon AVRlib](#) a lot of device drivers and Visual-Studio link for avr-gcc
- [rod.info on AVR](#) esp. for AVR GNU development tools setup under Linux

- [SiSy AVR](#) - graphical development environment with C / C ++ code generation from structure diagrams and class diagrams
- [AtmanAVR C / C ++ IDE](#)
- [IAR Embedded Workbench](#)
- [CodeVisionAVR C compiler](#) for AVR with terminal
- [myAVRWorkpad](#) compact development environment for AVR with terminal
- [VMLab](#) complete IDE with debugger and simulator (also peripheral [hardware](#))
- [AVR IO Designer](#) is a utility to generate initialization source code in C / C ++ for the various devices, ports and registers of Atmel AVR processors. The intent is to allow the user to explore the devices specific to a selected processor and experiment with settings through a user interface that assists in understanding the complexities involved. The user can also assign custom variable names to PORT IO pins thereby keeping track of the IO resources in use. These names are emitted in the generated code for use in the user's program. (Windows .NET 2.0 required)
- [Piconomic AVRLIB](#) is a collection of firmware for Atmel AVR microcontrollers. The aim is to share source code, experience and expertise (in the eye of the beholder) with the community of engineers, scientists and enthusiasts.
- [Imagecraft](#) The ICCAVR C Compiler for AVR from Imagecraft.

Assembler

- [Atmel AVR ASM Site](#)
- [tavrasn](#) - Toms Linux (Atmel) AVR assembler
- [gavrasm](#) - Gerds Linux / Win / DOS AVR assembler
- [avra](#) - avra ATMEL AVR assembler for Linux, FreeBSD, AmigaOS and Win32
- [Algorithm Builder](#) - graphical macro assembler development environment
- [SiSy AVR](#) - graphic development environment with assembler code generation from program flowcharts
- [SB-Assembler](#) - Freeware Cross-Assembler under DOS. (6502, 6800, 6801, 6804, 6805, 6809, 68HC08, 68HC11, Z8, Z80, Z180, 8080, 8085, 8021, 8041, 8048, 8051, AVR, PIC1684, ...)
- [myAVRWorkpad](#) compact development environment for AVR with terminal
- [Macro Assembler AS](#) - AS is a portable macro cross assembler for a variety of microprocessors and controllers
- [ASxxxx Cross Assemblers](#) - The ASxxxx assemblers are a series of microprocessor assemblers written in the C programming language. (1802, S2650, C / MP, MSP430, 61860, 6500, 6800 (6802/6808), 6801 (6803 / HD6303), 6804, 6805, 68HC (S) 08, 6809, 68HC11, 68HC (S) 12, 68HC16 , 740, 8048 (8041/8022/8021) 8051, 8085 (8080), DS8xCxxx, AVR, Z80, F2MC8L / FX, GameBoy (Z80), H8 / 3xx, Cypress PSoC (M8C), PIC, Rabbit 2000/3000, Z8, Z80 (HD64180)) linux & windows, source code
- [8086/88 Assembler Instruction Reference](#) - Information on instruction set, registers and memory addressing

Disassembler

- [IDA-Pro](#) disassembler and debugger for almost all known processors. Evaluation version available. Tagline: *The most advanced tool for Hostile Code Analysis, Vulnerability and Software Reverse Engineering*
- [ReAVR](#) - Disassembler and ACXutility Binary Tool
- [revava](#) - disassembler
- [vAVRdisasm](#) - Free AVR Disassembler
- [avrdisas](#) - AVR microcontroller disassembler for Linux (and Win32)

BASIC

- [Bascom AVR](#)
- [FastAVR](#) - and with 'ASM' output, Nokia3310 LCD support
- [mikrocontrollerBASIC Freeware](#) - with simulator for ATmega32, ATmega128 and C-CONTROL.
- [mikroBasic](#) - Comprehensive, stand-alone Basic compiler for AVR microcontrollers
- [MCS BASIC-52](#) - Original translation 1988 INTEL MCS BASIC-52 USERS MANUAL 220 pages free download as PDF
- [Beetle-Basic](#) Powerful basic operating system in the AVR.
- [AVR_BASIC](#) Open Source Freeware: Minimalistic basic interpreter in the AVR.
- [Great Cow BASIC](#) "Open Source BASIC programming tools for Microchip PIC and Atmel AVR microcontrollers"

Pascal

- [AVRco Pascal Compiler](#) - AVR Pascal Compiler with extensive function library
- [mikroPascal](#) - Comprehensive, stand-alone Pascal compiler for AVR microcontrollers

Forth

- www.robo-forth.de - AVR Forth Compiler with extensive function library for servos, motors and sensors
- [amforth](#) - Forth for Atmel ATmega micro controllers by Matthias Trute. [discussion](#)

Java

- [NanoVM](#) - Java VM for AVR microcontrollers ([German Wiki](#))
- [SJC](#) - Java compiler (generates AVR machine code) for AVR microcontrollers ([SJC](#))

Ada

- [AVR-Ada](#) - Ada compiler within GCC (GNAT) for AVR. Contains a small runtime library with no tasking and no exceptions. [2]

Virgil

- The [Virgil Programming Language](#) is designed for building robust, flexible, and scalable software systems on embedded hardware platforms. Virgil builds on ideas from object-oriented, statically typed languages like Java, providing a clean, consistent source language. Its compiler system provides an efficient implementation for resource-constrained environments.

LabVIEW

- <http://www.ni.com/embedded/> Information on LabVIEW, the graphical development environment from National Instruments
- <http://www.labviewforum.de/> German Labview Forum
- [Communicating Arduino -> LabVIEW](#)

python

- [python-on-a-chip](#) (pymite). There are two sample projects in the source tree. One for an 8-bit Atmel ATmega103 (but any AVR / ATmega with 4 KB RAM or more will do) and one for the 32-bit Atmel AT91SAM7S64 running on the AT91SAM7S-EK evaluation board. (GPL license)

Openeye

- OpenEye is a combination of a PC program (Windows, Delphi) and a monitor routine in the AVR. The data from the AVR are transmitted via RS232 and can be used for debugging the running application. OpenEye was written by user Martin Vogel (oldmax) [3] .

Modkit

[Modkit](#) is a new kind of graphical programming environment that makes programming things in the physical world as easy as dragging and dropping little virtual code blocks in a web browser .. Heavily inspired by the Scratch programming environment (from MIT Media Lab's Lifelong Kindergarten Group), Modkit enables anyone including kids, artists and inventors to build with electronic kits and components including motors, sensors, lights, sound and the popular Arduino and Arduino compatible development boards ... (text from Makezine)

Tutorials and examples

- [AVR microcontroller](#) Introduction to AVR microcontrollers with a replica of the game "Senso".
- [4] [I2C Bus Tuts and Programs with the ATmega 1284p](#)
- [AVRBeginners.net](#) Beginners Guides to AVRs
- [reintechnisch.de](#) AVR tutorial: 9V LED lamp
- The [circuit forum](#) is a page for beginners and professionals which is constantly being expanded with tutorials. Put your projects online. The site is still under construction and your help is

appreciated.

- [mikrocontrollerspielwiese.de](#) is a site that is aimed at beginners and provides experiments and finished projects complete with code and Eagle documents.
- [ELO-AVR-Applications](#) offers a growing collection of smaller AVR projects, mainly for the ATtiny series.
- [AVR tips](#) Programming tips and AVR experiments.
- [PLL synthesizer tutorial](#) small, practical PLL tutorial for the function, repair and control of a PLL circuit with AVR ATtiny2313 via 3-wire bus
- Arduino
 - [tronixstuff](#) - Arduino Tutorials
 - [The Complete Beginners Guide to the Arduino](#)
 - [Arduino with Visual Basic](#) by Carl Morey on codeproject.com

C.

- [AVR GCC tutorial](#)
- [Quick Start Guide for using the WinAVR Compiler with ATMEL's AVR Butterfly](#) ([www.smileymicros.com](#) , PDF)
- [avrtutor](#) - an attempt to provide a real tutorial for the ATMEL AVR microcontrollers.
- [Spark Fun Electronics](#) - Beginning Embedded Electronics (Atmega8, English)
- [metku.net](#) - How to get started with microcontrollers (ATtiny45, breadboard)
- [XMEGA-C Tutorial](#) - Tutorial via Atxmega
- [XMEGA Tutorial in C](#) - Tutorial ATxmega (among others on the ATxmega128A3U)

C ++

- [www.avr-cpp.de](#) - Tutorial for AVR C ++ and myAVR libraries

Assembler

- [Atmel AVR ASM Site](#)
- [Atmel AVR Microcontroller Assembler Tutorial](#) (D)
- [AVR studio](#)
- [AVR assembler overview](#)
- [\[5\] - Interface between computer science and electrical engineering microcontroller HC12 instructions](#)

Bascom

- [MCS Elektronik BASCOM AVR demo](#) for download

Pascal

- [AVRco Pascal Tutorial](#) - by Markus
- [a few pages on the AVR \(ASM and Pascal\)](#) by ibrt

Ada

- [AVR-Ada tutorial](#)

Hardware (prototype circuit boards, etc.)

- [Atmel AVR Butterfly Site](#)
- [Kanda Starter Kits and Development Tools](#) for different Microcontrollers
- [Dontronics Starter Kits and Development Tools](#) for different Microcontrollers, [Linkpages for AVR and PIC](#)
- [mikrocontroller.com](#) including board AVR-Ctrl, AVR web server (D)
- [AVR webserver RTL8019, 3COM](#) (E)
- [Microcontroller starter kits](#) Starter kits for different microcontrollers (D)
- [Olimex Ltd. Development Boards and Tools](#)
- [Krause Robotics Controller Boards & Accessories](#)
- [robotikhardware.de](#) controller boards
- [Embedded IT USB modules](#) based on AVR as well as [Ethernut compatible embedded Ethernet microcontroller boards](#) for industry and hobby on ARM with Nut / OS operating system
- [SSV Embedded Systems](#) 32-bit microcontroller modules and boards, starter kits etc.
- [Embedit](#) microcontroller modules and boards
- [Display3000](#) color displays, microcontroller modules and boards with TFT color displays; [Experiment boards and control boards for TFT color displays](#)
- [myAVR entry- level boards](#) and accessories
- [SIPHEC Development Boards for AVR, MSP430, USB](#)
- [ATMEL evaluation board kit \(PDF \)](#) and [ATMEL radio evaluation board kit \(PDF \)](#) from Pollin
- [Etherrape Atmega 644 with Ethernet and TCP / IP](#) as a kit.
- [AVR programming adapter , ZigBee-ready radio modules / radio USB sticks and radio starter kits](#) from In-Circuit
- [AVR32 AP7000 Linux board](#) with 2xEthernet, TFT, audio, SDCARD, USB host / devive, radio ...
- [The laboratory board](#) from [das-labor.org](#) (DIY)
- [number six](#) - Open Source Design, Atmega32. All pins are led out to a 2x20 pole socket header.
- <http://www.maares.de/tools> USB memory stick on the AVR Butterfly. AVR Butterfly carrier board for connecting VDRIVE, VMUSIC, RFM12.
- [Wiring](#) is an open source programming environment and electronics i / o board for exploring the electronic arts, tangible media, teaching and learning computer programming and prototyping with electronics.
- [chip45](#) Atmel AVR modules and boards with USB, RS232 / 485, CAN, Ethernet, radio modules and ISP programming [adapter](#) .

- [Dr. Rakers AVR boards and experiment boards](#) with USB, Ethernet, RS232, CAN, LCD etc. in high quality at low prices.
- [Robot kit Nibo](#) - autonomous **robot** with an ATmega128 and an ATmega88
- [Modularis](#) - AVR microcontroller boards (partly with additional memory and USB) that can be expanded via ribbon cables. Up to now there are accessory modules with buttons, motor H-bridge, XBee and angle sensor.
- [Schramm software](#) - AVR microcontroller kits
- [Alvidi](#) - header boards with AVR & AVR32 controllers
- [Steinert Technologies](#) - Thai supplier of microcontroller boards (AVR, ARM7, ARM9, PIC, dsPIC, PSoC, and many more)
- [Arduino](#)
 - [Arduino homepage](#)
 - [Freeduino.org](#) - Huge collection of links to the **Arduinio** (R) AVR board (kit) and its clones and mutants (DIY or kit)
 - [freeduino.de](#) - Instructions and tutorials, Arduino Wiki, Blog, Tools in German
 - [Arduino Shield List](#)
- [Fritzing](#) useful program for many operating systems to support a board board structure (untested).
- [Special Print](#) inkjet printing for digital direct printing of etching masks, solder masks, front panels, labels
- [Onlinest Steuerung.de](#) USB kit. Switch technical devices via PC, browser, network, Ethernet, TCP / IP, Internet, Excel, timer or sensors.
- [Carambola WiFi module](#) Open hardware Linux friendly (OpenWRT) WiFi 802.11n OEM module
- [ATxMegaBoard and ATxMegaStick](#) development boards , for entry into the world of ATxMegas
- [Thinkembedded Webshop, Switzerland](#) various Olimex demo boards from SFr 18.- / 14 euros
- [Electronic assemblies of the AVR family](#) Development and breakout boards of the Atmel AVR / XMEGA family

Programming hardware and software

- [AVR-Doper](#) Easy to build, STK500-compatible programmer with USB connection. Can also handle HVSP, but not HVPP. Open source.
- [AVRDUDE](#) AVR ISP programming tool for Unix / Linux / BSD and Windows. Command line (or with GUI) , AVR butterfly support
- [PonyProg](#) in addition to AVR for various serially programmable components (graphical user interface and command line), see also [Pony-Prog tutorial](#)
- [uisp](#) AVR ISP programming tool for Unix / Linux / BSD and Windows (command line)
- [yaap](#)
- [SP12](#)
- [STK500 compatible programmer](#) as a replica project. See also [\[\[STK500\]\]](#)
- [Inexpensive standard ISP \(STK200 compatible\)](#)

- [Evertool](#) combined ISP & [JTAG](#) programmer (compatible with the "original" Atmel AVRISP and Atmel JTAGICE)
- [Olimex](#) (Bulgarian supplier) Inexpensive
- [AVR910-USB programmer](#) incl. USB module and USB-> serial converter
- [USBasp](#) - USB programmer consisting of ATmega8 (no special USB chip required)
- [USBasp](#) - USB programmer [guloprog](#) (approx. € 5.00) with signal converter function, consisting of ATtiny85 (no special USB chip required)
- [Beer mat programmer](#) - USBasp with ATtiny85, very few components, easy to recreate
- [Amadeus-USB](#) - high-speed programmer for PIC18, PIC24, dsPIC30, PIC32, dsPIC33 and AVR. Also provides troubleshooting options.
- [Signal generator](#) - signal generator software
- [Time Partition Testing \(TPT\)](#) - test and test evaluation tool for embedded systems
- [mySmartUSB](#) - USB programmer (from 15 €) also combined with USB-UART-Bridge, STK500v2 / AVR910 / AVR911 compatible, ISP HV-serial, HV-parallel
- [USB programmer for Bascom programmers](#)
- [Virtual Serial Port Software](#) for serial port communication and null-modem emulation
- [\[6\] SimpleSerialTerminal](#), a simple tool for the serial interface, (freeware)
- [HAPSIM graphic simulator](#) for graphic simulation of keys / LED / LCD and terminal in AVR Studio Freeware !!!
- [AVR programming adapter and JTAGICE MKII](#)
- [myAVR ProgTool](#) nice programming interface (free)
- [KAVRCalc](#) is a free calculator to assist in programming AVR microcontrollers (baud rate, watchdog, timer, ...)
- [CrispAVR-USB STK500 V2 compatible ISP adapter](#) with USB interface for Atmel AVR microcontroller (1.8V-5.5V).
- [UCOM-IR](#) - programming [adapter](#) with USB interface (AT90USB162) and IR transmitter / receiver, STK500 V2 compatible
- [AnaGate Programmer](#) Serial programmer with LAN connection for I2C and SPI including programming API for Windows / Linux (shop)
- [roloFlash](#) - mobile flash device without a PC (standalone), flexible thanks to the built-in roloBasic script language
- [AVR ISP stick](#) Very cheap (€ 6.90!) And AVR programmer with USB connection that has already proven itself over 500 times
- [Android AVR Flasher over FTDI](#) Program AVR Atmel Chips with FTDI chips (MPSSE mode) on Android

Projects and source code libraries

Libraries

- [Cadsoft Eagle Libraries](#)
- [AVR Libc](#)

- [Procyon AVRlib](#)
- [Peter Fleury's Pages](#) - UART / LCD (HD44780) / I²C (TWI) / AVR-GCC libraries, STK500v2 bootloader
- [Fixed Point Library Based on ISO / IEC Standard DTR 18037 for Atmel AVR microcontrollers, including Cordic algorithms and a brief description as a Powerpoint PDF TU Vienna February 2007](#)

Operating systems & Co.

- [TinyOS](#) - component-based operating system for sensor nodes. Bring your own C-like high-level language CES with you.
- [YAVRTOS](#) - Yet Another Atmel® AVR® Real-Time Operating System by Chris O'Byrne (C, Atmega32, GPL3 license)
- [FreeRTOS](#) is a portable, open source, mini Real Time Kernel - a free to download and royalty free RTOS that can be used in commercial applications. (AVR, MSP430, PIC, ARM7, ...)
- [AvrX Real Time Kernel](#) (IAR ASM or IAR / GCC C, GPL2 license)
- [scmRTOS](#) - Single-Chip Microcontroller Real-Time Operating System (C ++, AVR, MSP430, Blackfin, ARM7, FR (Fujitsu, MIT license).
- [csRTOS](#) - cooperative single-stack RTOS from the Circuit Cellar AVR 2004 Design Contest. [csRTOS port to ATmega32](#) and [discussion](#) on [www.avrfreaks.net](#) led to further development as [4AvrOS](#) - cooperative scheduler
- [OPEX](#) - freeware cooperative scheduler with lots of calendar and I / O functions by Steve Childress (download from [www.avrfreaks.net](#), registration may be necessary)
- [Scheduler](#) by Peter Dannegger
- [RTC scheduler](#) from ape
- [Protothreads](#) - Lightweight, Stackless Threads in C (open source BSD-style license)
- [uC / OS-II](#) is a real time operating system developed by Jean J. Labrosse. You can obtain the source code for the OS by buying Labrosse's excellent book *MicroC / OS-II The Real-Time Kernel (2nd edition)* . [Port for AVR \(gcc 3.x\)](#) and [AVR \(gcc 2.x\)](#) .
- [QP](#) is a lightweight, portable framework / RTOS for embedded systems (ARM, Cortex-M3, 8051, AVR, MSP430, M16C, HC08, NiosII, and x86). GPL (and commercial license available)
- [Femto OS](#) from Ruud Vlaming is a preemptive operating system for the smallest microcontrollers from the AVR series up to approx. 16 KB ROM and 1 KB RAM. Special targets are: ATtiny861 / 461/261. Written in C. Free Software, GPLv3. Article in Elektor February 2010
- [kaOS](#) is a real-time, multithreaded, preemptive operating system for the ATmega32 microcontroller, which loads and executes programs from a Secure Digital or MMC card. Authors Nicholas Clark & Adam Liechty. (Circuit Cellar AVR Competition 2006)
- [Helium](#) is a minimalistic real-time kernel for the HC (S) 08 core by Freescale and Atmel AVR.
- [BeRTOS](#) is a completely free, open source, real time operating system (RTOS) suitable for embedded platforms. Runs on many microprocessors and microcontrollers, ranging from 8 bits to 32 bits CPUs and even PCs.
- [funkos](#) Targets: AVR, XMEGA, MSP430, Cortex M3, Open Source

- Comparison between 4 Operating Systems for the Arduino on Liquidware Antipasto
 - **DuinOS** by RobotGroup (FreeRTOS port)
 - **Pyxis OS** by ArduinoWill
 - **ArduinoMacOS** by Mark
 - **TaOS** by Ziplock
- **Atomthreads** is a free, lightweight, portable, real-time scheduler for embedded systems. (BSD license)
- **XMK** (eXtreme Minimal Kernel) is a free real-time operating system for microcontrollers (AVR, H8, R8C, M16C).
- **iRTOS** is a free Real Time Operating System. The iRTOS kernel is free to download and use under the terms of LGPL. It can be used in commercial applications. iRTOS is designed for tiny 8 bit microcontroller chips with little RAM usage. OS can be installed also in 16 and 32 bit processor units.
- **cocoOS** is a cooperative task scheduler, based on coroutines and it is written in C. (STK500, Atmega16)
- **BasicBeetle** Basic operating system in the AVR
- Shells for Arduino:
 - **ARSH**
 - **AVRSH**
 - **BITLASH**
 - **FRUITSHELL**
 - **BREAKFAST**
- **toolduino** is a simple software tool that lets you easily interact with your Arduino hardware so you can test the circuits you create. Toolduino is written in the **Processing** language and is available for Windows, Mac OS X, and Linux. Toolduino uses the the **Arduino library for Processing** to communicate with an Arduino board so you can manipulate output pins and read inputs. The Arduino must be running the **Firmata** firmware that comes with the Arduino IDE. (LGPL)
- **MOPS** - A small C and Assembly based operating system for the ATMEL AVR® 8-Bit RISC controller family.
- **RTS (Realtime Tasking System)** - operating system kernel with real-time properties, license: EUPL V. 1.1

Project collections

- The **electronics project page** and **home of the BasicBeetle** main theme is the BasicBeetle. A modular, powerful microcomputer that can be programmed in Basic, especially for controls. With many programs, tips and tricks, information ...
- **Happy-Micro.de** The internet site for hobby electronics, microcontroller users, programmers and everyone who **enjoys** computers and electronics. At Happy-Micro.de, the focus is on having fun developing programs and circuits. Every user has the opportunity to participate as an author and

to publish his circuits or programs. Free image download for your own homepage. *(Page has been closed!)*

- [Electronics and information](#) Interesting facts about entertainment electronics ..
- [Cornell University ECE 476 Microcontroller Design Final Projects](#)
- [Serasidis Vasilis' AVRsite](#) including GLCD, SMS, PAL
- [Alberto Ricci Bitti and others](#) PAL video interface
- [Microcontroller and more AVR projects](#) (ethernet, LCD, relay card, etc.) and more
- [Burkhard John \(D\)](#)
- [AVRmicrocontrollerprojects](#) including text LCD, stepper motor, thermometer
- [Robin Stridh](#) rotor display, video interface
- [dertien.dds.nl AVR-Projects](#)
- [MicroSPS.com](#) Graphic programming of the AVR with EAGLE
- [h-mpeg](#) hard disks mp3 player IDE control, IDE file system, LCD control etc. in 8K code. Source code under GPL
- [embedtronics.com](#)
- [M. Thomas' AVR projects](#) include AVR Butterfly avr-gcc-port, DB101 gcc-port, BC100 gcc-port, bootloader, programming and debugging hardware, software UART, DS1820-Lib., Experimental avrdude versions, AVR and CAN with MCP2515
- [Michaels Electronic Projects](#) AVR Projects (EN) - among others. Sony / Becker CD / MD changer emulator, RDS decoder, GPS info, OBD J1850 VPW interface, USB <> CAN bus interface. Information on CD changer protocols. MP3stick - MP3 player with ATmega128, color LCD, SD / MMC card and VS1011b
- [node13](#) modular AVR 8515 project: a controller board to which additional input / output modules (keypad, LEDs, LCD module) can be connected
- [Roboternetz-Mikrocontroller projekte.de](#) Various projects with AVR and other controllers, especially in the field of robotics
- [AVR-Projekte.de](#) exposure timer , FT232RL circuits, LED fading via remote control, HD44780-LCD via USB and serial, AVR910-USB programmer, handicrafts: etching machine, compressor.
- [openeeg.sourceforge.net](#) The OpenEEG project deals with the development of an inexpensive electro-encephalography (EEG) device and its free control software for measuring electrical brain waves. His μ PC heart is an AT90S4433 or an ATmega8. The aim is also various EEG applications such. B. in the area of mental training methods (neurofeedback).
- [www.amateurfunkbasteln.de](#) Page from Michael Wöste (DL1DMW) including CPU board with AT89C2051, AT89C4051 or AVR AT90S2313, CPU board with Atmel AT90S8535, experiment board with ATmega103, programmer for AT89C2051 / AT89C4051, 32-channel logic analyzer up to 40 MHz (design by David L. Jones)
- [Atmel - AVR 8-Bit RISC - Application Notes](#) Application notes and examples from the manufacturer
- [Dick Cappels' Project Pages](#)
- [SeebyTouch - Replacement System for the Blind](#) Feeling computer images with a simple device (assembly instructions) and free software (for 10 operating systems) - a new experience for everyone

- www.loetstelle.net Various smaller AVR projects around LEDs, e.g. B. RGB dimmer, mood light. Various electronics projects and basics
- [Do-it-yourself projects electronics](http://www.do-it-yourself-projects.com) small collection of electronics projects on the subject of circuit board production, high-frequency technology and microcontrollers.
- [Jesper's AVR pages](http://www.jesper-avr.com) Yampp MP3 player, Yaap programmer, DDS with 2313 + R2R, guitar tuner, frequency counter.
- [MicroSyl MCU MP3 Player](http://www.microsylv.com), MegaLoad, HCLoad, Propeller Clock, Freq Meter, BarCode Reader, Door Bell, OneWire Lib, Text LCD Lib, Graph LCD Lib, Nokia LCD Lib, Led Sign with MMC MemoryCard, Intercom
- <http://www.jeroen.homeunix.net/> Development of an electronic roulette based on an AVR
- [thomaspfeifer.net](http://www.thomaspfeifer.net) Reflow oven, laminator temperature control, USB Atmel programmer, SMD tricks and much more
- [Scienceprog](http://www.scienceprog.com) - embedded theory and projects - AVR, ARM theory and projects
- [House automation](http://www.houseautomation.com) - CAN bus with ATmega32 controllers and control panels, admin tools for updating via CAN, traffic dumper, etc.
- [AVRSAM](http://www.avrsam.com) - AT91SAM7S header board almost 100% pin compatible with the following AVR microcontrollers: AT90S8535 / ATMEGA8535 / ATMEGA16 / ATMEGA32
- [Hausbus Home](http://www.hausbus.com) - Hausbus project using ATmega8, ATtiny13 and ATmega128
- [AVR-DCF-Clock](http://www.avr-dcf-clock.com) - DCF clock with colorful LED display - ATmega8
- [GenuhR](http://www.genuhr.com) - DCF radio clock / alarm clock / timer with LED dot matrix display. The project describes the structure of the complete device starting with the circuit diagram up to the assembly in a housing.
- [AVR project collection](http://www.avrprojectcollection.com) at www.avrguide.com
- AVR Synth <http://www.elby-designs.com/avrsynth/avrsyn-about.htm> <http://www.jarek-synth.strona.pl/>
- [Electronic Lives Manufacturing](http://www.electroniclives.com) - structures in thread wire technology, partly in Japanese, but with English source codes
- AVR Synthesizer <http://www.avrx.se/>
- [Wedis-Basteleck](http://www.wedis-basteleck.com) - Model railway DCC servo accessory decoder DCC servo decoder with ATmega8 / Servo differentiating module for model making
- <http://web.archive.org/web/20050415222337/http://www.hebel23.de/> RDS RADIO: ATmega32, TEA5757, T6963C, TDA7330B in C
- [Analog / Digital and MPU Electronic Projects](http://www.analog-digital.com) PAL / VGA Terminal, CallerID, Ethernet, Wireless Bridge, LPC2214, AT91RM9200, Sony Unilink Controlled Wireless MP3 Player.
- [Circuit Cellar AVR Design Contest 2004](http://www.circuitcellar.com) with project descriptions
- [Circuit Cellar AVR Design Contest 2006](http://www.circuitcellar.com) with project descriptions
- [Homepage of Stefan Heesch](http://www.homepage-of-stefan-heesch.com) - AVR microcontroller projects, e.g. WLAN and AVR, network-controlled RGB light, IDE interface, DS1821 thermometer, Morse decoder and others
- [The circuit forum](http://www.the-circuit-forum.com) is a page for beginners and professionals which is constantly being expanded with tutorials. Put your projects online. The site is still under construction and your help is appreciated.
- [\[7\]](http://www.led-matrix.com) Many projects with LEDs (LED matrices) and AVR's

- wiki.trimension.de Tutorial for reading out a TSIC, an exposure device, simple PWM dimmers and other projects with AVR microcontrollers
- [little-scale's arduino page](http://little-scale's.arduino.page)
- www.sebastianweidmann.de Basics on the subject of etching, drilling, vias and projects Tips / tricks with Atmel AVR microcontrollers
- [Junghans Electronic Page](http://Junghans.Electronic.Page) including Nokia 3310 LCD control in "C" (updated 2010), TWI / USI, quadcopter
- <http://www.familie-finke.com/> Thomas Finke's website with various electronic projects, such as STK-LAN (AVR in the network with HTTPD, SNMP, ...), UV-LED imagesetter, HPGL plotter.
- [Philips project collection](#) Electronics projects (μ C, CMOS, analog, ...), tutorials and useful online tools
- [Phoenix](#) allows you to develop science experiments by connecting sensor / control elements to a computer and access them through software. The project was started by Inter University Accelerator Center, with the objective of improving the laboratory facilities at Indian Universities, and growing with the support of the user community. Phoenix depends heavily on Python language. The data acquisition, analysis and writing simulation programs to teach science and computation. The hardware design is freely available. The project is based on Free Software tools and the code is distributed under GNU GPL. (Atmega16)
- [USB PWM Generator](#) Low Cost PWM Generator, programmable via USB. 1Hz - 120kHz Duty Cycle 1 - 99%.
- [Electronics Hub](#) - Huge collection of electronics projects, free electronics circuits and other technical information is available for engineering students.

Interfaces & protocols

Ethernet (TCP / IP ...)

- Inexpensive and fast WLAN connection to microcontrollers with Wiz610wi. [Source of supply](#) including a practical adapter board at: [Display3000](#)
- [TCP / IP stack for AVR](#) with Realtek RTL8019AS or Axis AX88796 network chips (open source for avr-gcc and Imagecraft). Matching hardware in [this online shop](#)
- [Ethernut](#) - AVR based hardware with Ethernet interface, multithreading OS, software and hardware design is free
- [eNet-sam7X](#) Embedded Ethernet module in DIL64 format with complete OpenSource Board Support Packake based on Ethernut / Nut / OS. Industry suitable
- [Ethersex](#) - Highly recommended despite the stupid name. Many flexibly integrable modules for various hardware.
- [OpenMCP](#) Well-known board based on the ATmega2561 and ENC28j60. Also runs on the AVR-NETIO and the myAVR.
- [IgorPlug-UDP AVR](#) - Ethernet & UDP / IP implemented in software
- [\[8\] RTL8019 Bascom](#)
- [AVR and RTL8019](#)

- AVR IP webcam
- <http://mikrocontroller.cco-ev.de/de/webcam.php>
- avrETH1 - web server with enc28j60 and webcam support
- uIP stack, part of the Contiki OS
- LwIP stack
- WLAN implementation based on a PRISM CF card and uIP
- <http://www.circuitcellar.com/AVR2006/winners/DE/AT2581.htm> MEGA128 (CAN) PCMCIA
- AVR32 AP7000 Linux board with 2xEthernet, TFT, audio, SDCARD, USB host / device, radio ...
- AVR board with Ethernet with the ENC28J60 from Microchip
- AVR ethernet board with extra SRAM, SD / MMC, USB and related software

CAN

- Can @ Home - CAN as "installation bus", including with AVRs (D)
- www.iuse.org - House automation based on CAN
- www.port.de - Professional CAN / CANopen development tools
- CAN-WIKI - special Wiki site for CAN bus (English)
- CAN bus - entry in this wiki
- CAN as house bus - entry in this wiki
- www.canhack.de - A forum that deals with the CAN bus in the car
- www.edevices.it - USB2CAN inexpensive USB to CAN bus converter

USB

- eUSB-162 and eUSB-LCD - At90USB162 based universal USB prototype / microcontroller module and USB terminal interface for HD44780 compatible LCDs based on the Lufa library
- Igor-Plug - USB device interface in AVR firmware - no extra interface IC needed, read the license
- V-USB - USB implementation in C based on the same principle as Igor-Plug, but easier to use, GPL-like license (use of the project *requires* publication), code with English comments
- USBTiny - another software USB implementation in C; very similar to AVR-USB; but is under GPL; relatively few examples
- MJoy USB Joystick Controller on AVR ATmega8
- TUSB3210 controller, HID, LIBUSB A project seminar in which the aim was to activate the USB interface of the TUSB3210 and to send the data from an ADC to the PC. USB implementation for µC and PC.
- Controlling and measuring with USB - FT232, 245 and 2232 The current book on the USB controllers from FTDI. Many example programs in C, two project descriptions: I²C bus with LM75A and a web project. Set of components and USB module with the FT2232 for a quick introduction to the subject. Book / parts kit available from Segor or this page.
- USB to Ethernet Connector - Share your USB devices via LAN / Internet

- [Many small USB projects](http://usbn2mc.berlios.de) around the library usbn2mc <http://usbn2mc.berlios.de> . This is a simple library for National Semiconductor's USBN9604 / 03
- [Mega8D12](#) - step by step to the virtual COM port. A beginner's tutorial on the CDC class with circuit and firmware (ATmega8 and PDIUSB12).
- <http://www.maares.de/tools> USB_ISO: Isolated interface converter USB to RS232 (TTL) with FT232RL and ADUM1402. Galvanic isolation for the target system.
- [USB HID host driver](#) - USB HID driver DLL for Windows (demo projects for Visual Studio 2010 C++, C # and VB).

DMX512

- [Hennes Sites](#) building instructions for DMX dimmer packs, DMX switch packs, PWM controllers, ... Tutorial for sending and receiving DMX data with AVR.
- [DMX lighting system in the do-it-yourself](#) project for the self-construction of a complete lighting system for control via DMX. The project includes everything you need to operate your own lighting system (mixer, control software, dimmer, scanner with iris, shutter dimmer, 2 rotating gobo wheels, 2 color wheels, CMY color mixing unit, prism, focus ...).
- [Digital Enlightenment](#) Various DMX do-it-yourself projects

PS2

- [PC keyboard to an AVR](#)

LANC

- [3D LANC Master from Damir Vrancic](#) is a device which keeps in synchronization some of Sony camcorders by using LANC (CONTROL-L, ACC) protocol. (Open Hardware + Open Source, Atmega8).
- [LANC Lib for AVRGCC](#). Read and write LANC commands.
- [Controlling Sony camcorders with the Arduino](#)

MMC / SD card

- [MMC / SD card reader example application](#) from Roland Riegel (Atmega8, Atmega168 for FAT16)
- [MMC Flash or SD Flash Memory Extension for Atmegs](#) from Captain. (Atmega16, Atmega32)
- <http://arm.hsz-t.ch> MMC, SD, SDHC card driver for ARM7 microcontrollers
- [Wiki and FAT16 / 32 library](#) for atmega

LC displays

Text (character-mode) HD44780

- [P. Fleury](#)
- [avrfreaks Project 59 \(Chris E.\) and others](#)
- [Procyon avrlib v. Pascal Slang \(GPL\)](#)
- [Bray](#)
- [Sprut's LCD side](#)
- [Operate standard LCD at 3V \(eng\)](#)
- [Operate LCD2USB, LCD with AVR on USB](#)
- [4x40 LCD project, microchip](#)

Graphic T6963C etc.

- <http://www.holger-klabunde.de/avr/avrboard.htm#t6963>
- [Project T6963-LCD control](#) only PC, no change since July 2006
- [avrfreaks.net - TOSHIBA_LCD_T6963C, AVR Graphics](#)
- <http://www.mikrocontroller.net/topic/48456> C
- <http://www.mikrocontroller.net/topic/54563> C
- <http://www.mikrocontroller.net/topic/48584> ASM
- [Graphic LCDs - 128 x 112 grayscale for MSP430 and other uCs.](#)
- <http://www.display3000.com/> color TFT modules including microcontroller (ATMega128; ATMega2561 and AT90CAN128)
- [SED1330 to ATmega . Library for SED 1330 controller on ATmega](#)

There is also something for other controllers in the code collection.

Siemens S55 / C60

- [S55 display pin assignment](#)
- [Forum post](#)

Siemens S65 / M65 / CX65

- [S65 display](#) from Siemens S65 / M65 / CX65, 132x176 pixels, 65536 colors, can be obtained cheaply as a spare part.

Nokia 3210/3310

- [Library for Nokia 3310 Lcd control in "C"](#) from <http://www.jtrionics.de> - very good (updated 2010)
- [MicroSyl.Com](#)
- [Deramon.de](#)

Nokia 6100 LCD

- [Yampp 7 software download page](#) : Archive "yampp-7 with color LCD firmware" contains avr-gcc / avr-as routines for 6100-LCDs with Philips or Epson controllers (not directly a "library")

- [S1D15G10](#) : Routine code for the Epson S1D15G10 controller
- [Nokia 6100 display on the AVR](#) display of RGB images (for avr-gcc)
- www.optixx.org Code to control Philips and Epson
- http://www.zipfelmaus.com/nokia6100lcd_en/ -> under Download: Tool for converting BMPs into h-files for output on the display

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- [Procyon avrlib \(GPL\)](#)
- [avrfreaks UP](#)
- [apetech.de](#) no longer available <http://www.mikrocontroller.net/topic/68316>

GPS

- <http://www.holger-klabunde.de/avr/avrboard.htm#GPSdisplay> GPS data on LCD
- www.geoclub.de - Electronics for geocaching
- passworld.co.jp - Do It Yourself GPS

8051 / MCS51

- [MCU 8051 IDE](#) - MCU 8051 IDE is a new modern graphical IDE for microcontrollers based on 8051. MCU 8051 IDE is non-commercial open-source software for Linux.
- [Dr. Rakers](#) development system with C compiler, BASIC compiler and macro assembler for all 8051 microcontrollers (80C552, 80C515 (C), 80C537). Also affordable for hobbyists.
- [Prog-Studio](#) - Modern assembler development environment for 8051 microcontrollers with debugger, edit & continue, code folding, Intelli-Sense, monitoring and more
- [yCModule: µController systems](#) - Inexpensive µController modules, ISP programming tools and application boards
- [Erik Buchmann's microcontroller page](#) - assembly course and several projects
- [Experiment board for 8051 controller](#) from Holger Klabunde.
- [World Of Electronics](#) - Projects with the Atmel 8051 controllers
- [Controller board with SAB80C535](#)
- [Do -it- yourself programmer for 2051](#)
- [8052 BASIC Projects](#) - IDE interface
- [Microcontroller sh51 circuit diagram](#) for 80C535 board
- 8051 macro assembler [ASEM-51](#) (freeware)
- [SDCC - Small Device C Compiler](#) - free ANSI-C compiler for Intel 8051, Maxim DS80C390 and Zilog Z80 compatible controllers.
- [The SDCC Open Knowledge Resource](#)
- [Wickenhäuser C Compiler](#) - Inexpensive C Compiler
- [LANC-Remote](#) project by Jiří Šmach to control video recorders or camcorders via the Control-L (LANC) protocol with the help of an AT89C2051.

- [Microcontroller starter kits](#) Starter kits for various microcontrollers (D) inexpensive boards (from 12.95 euros for AT89S8252). With the uC dual board: The board can be used with AVR controllers and 8051 controllers!
- [Turbo51 - Free Pascal compiler for 8051](#)
- [self8051.de](#) - Your reference work - command reference, properties, derivatives
- [CMON51](#) - free onboard monitor and debugger, adaptable to different 8051 compatible microcontrollers
- [Microcontroller Video Tutorial](#) Video Tutorial for Beginners (C-Course + Introduction 8051)

MSP430

- [naken430msp](#) - MSP430 assembler by Michael Kohn (GPL)
- [MSP430 Tutorials](#) - Tutorials, instructions and many example projects with the MSP430 microcontroller
- [Pulse width modulation with the MSP430](#) - very detailed introduction
- [Small projects with the MSP430](#) - circuit diagram and layout for an MSP430F149 board and an ADXL-G sensor with MSP430
- [The MSP430 Bugspray Database](#) - extensive database of bugs in MSP430 controllers
- [MSP430.info](#) - portal page for MSP430; Info, projects (MIDI, USB)
- [Yahoo group MSP430](#) - Lively forum with many MSP430 experts
- [mps430-gdb and Eclipse](#) - Instructions by Chris Liechti
- [Forum MSP430](#) - Projects with MSP430 (GPS, BlueTooth etc ...)
- [TI Design Competition: <http://www.designmsp430.com/View.aspx>](#) (files may be in / projects /) [2011-01-24: redirect to TI Wiki, projects no longer exist]
- [MSPsim](#) - a Java-based simulator of MSP430 sensor network platforms (BSD License (revised))
- [MSPGCC + Eclipse + msp430-gdbproxy / Linux / Debian / Ubuntu](#) - Instructions / Tutorial for installing the MSPGCC Toolchain + Eclipse + msp430-gdbproxy for Linux / Debian / Ubuntu
Lang = German and English
- [Travis Goodspeed's Blog](#) - Home of the GoodFET Programmer
- [Four-three-oh!](#)
- [Webshop with MSP430 Olimex demo boards and programmer](#)

MSP430 Launchpad

- [MSP430 LaunchPad Wiki at TI](#)
- [How-to: Launchpad programming with Linux on hackaday.com](#)
- [TI Launchpad programming and debugging with Open Source tools on Windows \(Eclipse, MSPGCC4, Insight, msp430-gdbproxy\)](#)
- [MSP430 LaunchPad toolchain for Mac OS X](#)

EZ430 Chronos

- [EZ Chronos Wiki at TI](#)

POOR

Manufacturer pages

- [ARM](#) - developer of the ARM processor core (not a manufacturer of ICs)
- [ARM Infocenter](#) Collection of technical information
- [Analog Devices ADuC7xxx ARM7TDMI series](#) under *Analog Microcontrollers*
- [Atmel AT91 home page](#)
- [AT91.COM](#) - Atmel ARM information page (forum, sample codes etc.)
- [Cirrus Logic](#)
- [Energy Micro EFM32 with Cortex M0 +, M3, M4](#)
- [Freescale MAC7100](#)
- [Hilscher netX \(ARM926 core\)](#)
- [Infineon XMCxxxx Cortex M0, M4](#)
- [Intel XSCALE homepage](#) , see also [Marvell](#)
- [Luminary Micro \(TI\) controller with Cortex M3 core](#)
- [NXP \(formerly Philips\) Microcontroller homepage](#) for all microcontrollers (ARM7, ARM9, Cortex-M0, -M3, MCS51 etc.), in addition to LPC2000, LPC3000 also the LH7xxxx BlueStreak series (formerly Sharp Microelectronics)
- [lpc2000.com](#) Info page for NXP (ex. Philips) LPC1700 Cortex-M3 based types, LPC2000, ARM7 based types and LPC3000, ARM9 based types. Other Cortex-M3 modules are also included
- [OKI ARM controller home page](#)
- [Samsung ARM7 / 9 under Mobile SoC](#)
- [STMicroelectronics \(ST\) Microcontroller homepage](#) including STR7, STR9, STM32 support forum
- [Texas Instruments TMS470 ARM7TDMI series](#)
- [Toshiba controller with ARM9 and Cortex-M3 core](#)

Information (forums, mailing lists, link collections)

- [Lizard Lounge - Energy Micros Forum for EFM32](#)
- [Blog about Low Power Modes from EnergyMicro uC](#)
- [Freewing collection of links to the NXP \(ex. Philips\) LPC-ARM7 controllers](#) (assembler examples for Nokia 3310-GLCD, among others)
- [ARM Microcontroller Wiki](#)
- [arm.hsz-t.ch](#) Einführung in ARM7 Mikrocontroller und uClinux.
- [ADuC7000 Yahoo-Group](#)
- [AT91 Forum \(Atmel Rousset\)](#)
- [AT91SAM Yahoo-Group](#)

- [arm-elf-gcc WinARM Forum](#) (auch für Yagarto)
- [Sourcery G++ Lite Edition User Forum/Mailing-List](#)
- [GNUARM Yahoo-Group](#)
- [Keil/ARM Forum](#)
- [LPC2000 Yahoo-Group](#)
- [MCU related Neuigkeiten zu MCUs](#), überwiegend ARM / Cortex-M3 basierend mit Vergleichen von RTOS und anderen Entwicklungstools
- [Sparkfun Foren](#)
- [STMicroelectronics Forum](#)
- [Forum for STM32 moderated by Raisonance](#) Sehr viele Beispielprogramme in Source fuer STM32 und den Primer2 von Raisonance

Entwicklungswerkzeuge (Compiler/Assembler/Debugger/Tools)

IDEs

- [Anglia Idealist IDE und Anglia Toolchain](#) GNU toolchain für Win32-hosts inkl. Beispielen für STR7, STR9 und STM32. IDE kostenlos aber registrierungspflichtig
- [attolic TrueSTUDIO](#)
- [devkitPro/devkitARM](#) GNU-Toolchain für MS-Windows "Hosts". Vor allem auf GBA abgestimmt aber auch für andere ARM-Controller geeignet
- [EmbOrigin](#) Integrierte Cross Entwicklungsumgebung für die Anwendungsentwicklung unter eCos (RTOS kernel) für ARM Prozessoren. Highlights: eCos Kernel Aware Debug Features. Trial Version verfügbar [Support,Download](#)
- [Green Hills Software](#)
- [Hitex IDE](#) für diverse Compiler, Debugger
- [IAR Embedded Workbench](#), kommerzielle IDE/Compiler, codegrößenbeschränkte Evaluierungsversion verfügbar
- [iSYSTEM](#) Integrated Development Environment, USB/JTAG interface, OnChip Emulation and Trace
- [Keil/ARM MDK-ARM](#) kommerzielle IDE/Compiler, unterstützt zwei Compiler (ARM RealView, GNU/gcc), codegrößenbeschränkte Evaluierungsversion verfügbar (IDE/Compiler unbeschränkt für GNU), guter Debugger, sehr guter Simulator, Simulator und Debugger in der Evaluierungsversion auch bei Nutzung der GNU-Toolchain mit Größenbeschränkung
- [MCT Demoversion C-Compiler für ARM und 68k](#) ARM C-Compiler basiert auf GCC laut Herstellerinformation jedoch mit Codegrößenbeschränkung
- [www.mpeforth.com](#) - A free Forth system with 125 page manual for all Philips LPC2xxx CPUs with at least 64k Flash and 16k RAM and crystal frequency of 10, 12, or 14.7456 MHz.
- [Raisonance Ride, RKit-ARM](#)
- [Rowley](#) Kommerzielle IDE für GNU-Compiler, eigene libc (nicht newlib), Debugger (inkl. gutem Support für Wiggler)
- [Tantos gcc for ARM Targets](#) eine weitere ARM-GNU-Toolchain für MS-Windows "Hosts"

- [Yagarto](#) GNU arm-eabi-Toolchain, Eclipse, OpenOCD für Win32 inkl. Setup
- [WinARM](#) eine an WinAVR angelehnte Sammlung von Entwicklungswerkzeugen (binutils, arm-elf-gcc, newlib, *newlib-lpc*, Programmers Notepad, *Beispiel-Makefiles und Beispielcode*) für alle ARM-Controller. Beispiele für Philips LPC2000 und Atmel AT91SAM7S (ARM7TDMI) u.a.
- [Dissy](#) is a disassembler for Linux and UNIX which supports multiple architectures and allows easy navigation through the code. Dissy is implemented in Python and uses objdump for disassembling files.
- [sinelaboreRT](#) - generiert leicht lesbaren C-Code aus einer Zustandsmaschine. Die Generierung berücksichtigt speziell die Bedürfnisse eingebetteter Echtzeitsysteme.
- <http://arm.hsz-t.ch> Entwicklungsumgebung für ARM7 Mikrocontroller basierend auf der Knoppix CD. Keine Harddisk installation nötig für uClinux.

HW Debugger/Programmer

- [OpenOCD](#) Open On-Chip Debugger: Schnittstelle ("gdb-Server") zwischen verschiedenen JTAG-Interfaces (u.a. auf FTDI2232-Basis, "Wiggler"-ParPort und andere) und GNU-debugger (gdb/Insight-gdb) Flash-Programmierungsfunktion für LPC2k, AT91SAM7S, LM3S, STM32 und viele andere interne und externe Flashspeicher (Open Source, GPL, unter anderem auf MS Windows und Linux lauffähig)
- [OCDLibRemote](#) Schnittstelle zwischen WIGGLER-kompatibler JTAG Hardware und dem GNU-Debugger (gdb)
- [GDB-JTAG-ARM](#) GDB JTAG Tools
- [JTAG-Pack](#) GDB JTAG Tools
- [H-JTAG](#) RDI-Interface für Wiggler, Flash-Funktionen für diverse interne und externe Speicher
- [lpc21isp](#) Flashutility für LPC21xx, ISP via "Bootloader" ("multiplattform")
- [Abatron](#) BDI1000 & BDI2000, On-Chip Debuggers für ARM, 68k, Coldfire uvm.
- [Amontec](#) JTAGkey, JTAGkey2(P): JTAG-Adapter auf Basis des FTDI2232(H)
- [H-JTAG](#) USB Emulator
- [Keil/ARM ULINK/ULINK2/ULINK-ME](#) JTAG-Adapter, USB-Anschluss, wird von Keil uVision unterstützt, ULINK2 teilw. auch von Codesourcery G++ (lt. Hestellerangaben)
- [Kristech](#) USB-Scarab, JTAG Adapter, kommt mit eigener Debugger-UI, kompatibel zu Olimex
- [Lauterbach](#) TRACE32 JTAG-Adapter, USB und Ethernet-Anschluss, eigene Software
- [Olimex](#) JTAG-Adapter: Wiggler-Nachbau (ParPort) und Adapter auf Basis des FTDI2232 (USB)
- [Olimex ARM-JTAG-COOCOX](#) CoLinkEx nachbau von Olimex (daher siehe CoLinkEx)
- [CoLinkEx](#) günstiger JTAG/SWD Programmer von Coocox.com, nicht alle uC unterstützt, siehe [Website](#), unterstützt, ColIDE, Keil MDK-ARM, IAR sowie Eclipse.
- [Ronetix](#) Peedi
- [Segger J-Link](#) JTAG-Adapter, USB-Anschluss, unterstützt z. B. von IAR, Keil uVision (via RDI) (OEM: IAR J-Link, SAM-ICE)
- [Signalyzer](#) Signalyzer Tool, u.a. JTAG-Adapter auf Basis des FTDI2232
- [Simon Qians](#) Versaloon

Tutorials und Beispiele

- [LPC210x ARM7 Microcontroller Tutorial](#) - Assembler-Beispiele (arm-elf-as) für das Olimex LPC-MT-Board (Philips LPC2106 ARM7TDMI)
- [gcc-Assembler für ARM](#) - Befehlsübersicht
- [GBA ASM Tutorial](#) - ARM7 Assembler Tutorial mit arm-elf-as ("gcc") (Allgemein und GBA)
- [GBA Assembler Tutorial](#) - ARM7TDMI, Schwerpunkt auf GBA
- [Eclipse+CDT+gnuarm-Tutorial](#)
- [Beispiele in C, für ARM7-Controller von Philips und ADI](#)
- [Embedded.com: Building Bare-Metal ARM Systems with GNU](#) Teil 10, Links zu den Teilen 1-9 auf der Seite
- [AT91SAM7 Serial Communications](#) von James P. Lynch (PDF, www.sparkfun.com)
- [ADuC7000 Tutorial](#) von Witold Kaczurba (www.kaczurba.pl)
- [Schweizer Gondelbahnsteuerung über Webserver auf ETT STM32F ARM KIT Board in Keil RTOS mit Webcam](#)
- [Tutorial für das STM32F4 Discovery in C und C++ \(UML\)](#)
- [Einblick in die moderne Elektronik ohne viel Theorie PDF](#)

Projekte und Quellcodebibliotheken

- [Procyon ARMLib-LPC2100](#) - Treiber, Beispiele (Lizenz: GPL, kaum weiterentwickelt)
- [NXP BlueStreak Code](#) für LH7xxxx (ehemals Sharp)
- [M. Thomas' ARM Projekte](#) "Projectvorlagen" für AT91SAM7 und LPC2000 mit GNU-Toolchain
Einsteiger-Projekte für AT91SAM7, LPC2000, ADuC7000 u.a. (u.a. Blinky, UART, Interrupt, C++, GLCD mit KS0108, DS18x20, DCF77, Anpassungen von FAT16/32-Libraries)
- [STMicromicro Treiber und Beispiel](#) für STR7, STR9 und STM32
- [LPCUSB](#) - Open-source [USB](#) stack for the built-in USB controller in LPC214x microcontrollers von Bertrik Sikken. [Sample code](#)
- [Olimex](#) Einige Beispiele auf den "Produktseiten" der ARM Boards.
- [ARM MP3/AAC Player](#)
- [J.C. Wrens Beispielprojekt](#) für LPC214x
- [Beispiele von Keil](#) abgestimmt auf deren Boards und Realview-Toolchain, Portierung auf andere Boards und Compiler relativ einfach, Lizenz beachten.
- [Luminary Micro Driverlib](#) für Stellaris Cortex-M3
- [GPS-Tracker](#) mit Navigation auf LPC2103-Basis (Compiler: GCC)
- [elua](#) Lua für ARM-controller
- [FreeMODBUS](#) "A Modbus ASCII/RTU and TCP implementation" (für STR71x, AT91SAM7, LPC214x, auch: AVR, MSP430 u.a.)
- [BettyHacks](#) Freie Firmware für die "interaktive TV-Fernbedienung" betty-tv (ARM7tdmi, 2MB Flash, 160 x 128 Pixel 2 bit LCD, CC1100, IR, Lautsprecher,..)
- [Download Simlicity Studio](#), Tool mit vollständiger Dokumentation und vielen Beispielen zu Energy Micro EFM32 Cortex M0+/M3/M4 uC.

Betriebssysteme

- Agnix
- BeRTOS is a completely free, open source, real time operating system (RTOS) suitable for embedded platforms. Runs on many microprocessors and microcontrollers, ranging from 8 bits to 32 bits CPUs and even PCs.
- ChibiOS/RT
- Circle-OS for STM32 Kostenloses OS, sehr klein mit Basisfunktionen fuer STM32
- CoOS
- eCos - "Real-Time-Operating-System" o.a. auch für ARM7
- FreeRTOS (.org!) - "Real-Time-Kernel" unter anderem für ARM7 (LPC2xxx) auch AVR, MSP430, '51er
- FunkOS
- L4Ka
- Linux für Toradex Module basierend auf Intel XScale und Nvidia Tegra
- Linux4SAM Informationen, Anleitungen und Code zur Anwendung von Linux auf AT91SAM9xxx
- NicheTask (URL ist www.freertos.com aber hat nichts mit FreeRTOS(.org) zu tun)
- Nut/OS Echtzeitbetriebssystem für Mikrocontroller (ARM, AVR, AVR32, Cortex M3 u.A). Multitasking und vollständiger TCP/IP Stack inklusive. Leicht zu erlernen und viele Beispiele
- NuttX RTOS (ARM7TDMI port for TI TMS320C5471 also called a C5471 or TMS320DM180).
- Phoenix-RTOS
- PicoOS
- Prex is a portable real-time operating system for embedded systems. The small, reliable, and low power kernel is written in the C language based on microkernel design. The file system, Unix process, and networking features are provided by user mode tasks. (ARM, i386, geplant: MIPS, PowerPC, Hitachi-SH und Win32)
- RTEMS
- rt-thread
- scmRTOS
- TNKernel - "Real-Time-Kernel" [TNKernel](#) ist ein kompakter und sehr schneller Echtzeitkernel unter anderem für ARM7 (Philips LPC2106/LPC21XX/LPC22xx, Samsung S3C44B0X, Atmel AT91SAM7S128, STMicroelectronics STR711FR2)
- uC/OS-II RTOS

Hardware (Prototypen-Platinen etc.)

- Embest Philips, Samsung und Atmel ARM Boards und Module, JTAG-Hard- und Software
- Embedded-Waveplayer mit ARM7-Prozessor EP7309 (MIDI- und RS232-Steuerung)
- Embedded Artists bietet verschiedene preisgünstige Platinen (ab 25 Euro für LPC213x Familie)
- Embedded-IT eNet-sam7X: Ethernet kompatible Embedded Ethernet Mikrocontroller Boards für Industrie und Hobby auf ARM mit Nut/OS Betriebssystem sowie USB Module auf AVR Basis
- Hiteg SAMSUNG und Intel XScale basierende boards. (Deutsches Unternehmen in China)

- [Hitex](#) Starter-Kits für Philips LPC2000, ST STR7, Atmel AT91M
- [IAR](#) Starter-Kits für Atmel, Oki, Philips, ST und TI
- [ic-board.de](#) Kommunikationsplattform auf Basis des AT91SAM7X256 mit Ethernet, USB, CAN und Funk Schnittstellen
- [Keil](#) Philips LPC2000 und ST STR7/9 Boards und Starter-Kits
- [LPCTools](#) bietet verschiedene Starter Kits für die LPC2000-Familie
- [MakingThings](#) Make Controller Kit (AT91SAM7X256)
- [MCT Paul und Scherer](#) Starterkits für ARM7 (NXP LPC2000, ADI ADUC7000)
- [Mikrocontroller.net Shop](#) Platinen mit AT91SAM7, LPC2xxx, JTAG
- [Microcontroller-Starterkits](#) Starter-Kits für verschiedene Microcontroller (D) preisgünstige Platinen (ab 12,95 Euro für LPC2129 und 2194) sowie Entwicklungsboard komplett bestückt
- [Micro-Research](#) Development- und Header-Boards für LPC2000 und ADuC7000
- [Olimex](#) Bulgarischer Anbieter günstiger ARM Prototypen- und Header-Boards (LPC2000, STR7, AT91SAM, ADI, TI, OKI u.a.)
- [Propox](#)
- [Primer2 from Raisonance](#) Focus auf STM32 mit sehr grossem Forum im STM32circle
- [Revely](#) Evaluations- und Demo-Boards mit Sharp ARM Controllern. Teilweise mit SVGA-Anschluss.
- [SKPang electronics](#) Entwicklungsboards für diverse ARM7/9 (UK)
- [SSV Embedded Systems](#) bietet verschiedene Starter Kits für die verschiedenen DIL/NetPC u.a. (A)DNP/9200 SBC mit AT91RM9200
- [taskit](#) Development- und Header-Boards für AT91SAM7S/X, AT91RM9200, AT91SAM9
- [Toradex](#) ARM DevKits (XScale, Nvidia Tegra) (Schweiz)
- [Thinkembedded Webshop](#) Demoboarde, Debugger Cortex M (Schweiz)

PIC

Herstellerseiten

- [Microchip](#) Hersteller der PIC Microcontroller
- [Microchip C18 Student Edition](#) - die "Student Edition" des Microchip C18 C Compilers für die PIC18 Serie ist kostenlos verfügbar.
- [Elektronikentwicklung von Systemtechnik LEBER](#) Offizieller Microchip Design Partner für professionelles Microcontroller Design und Hersteller von Leistungsstellern, Thyristorstellern und Halbleiterrelais...

Entwicklungstools / Tutorials / Foren

- [www.osterer.co.at](#) Entwicklungs-Board mit integrierten Programmer/Debugger für PIC18F4550.
- [www.martins-elektronikwelt.tk](#) ICD1-Debugger-Nachbau im Kleinformat u. SMD Technik (so groß wie eine halbe Scheckkarte).

- [PIC-Microchip-Controller \(www.sprut.de\)](http://www.sprut.de) Diese Seite soll dem Anfänger die ersten Schritte in die Welt der Microcontroller der Firma Microchip erleichtern. Betrachtet werden die 14-Bit-Controller der Serien PIC16Fxxx bzw PIC12Fxxx.
- <http://www.waitingforfriday.com/> Wer anstatt mit Delphi (sprut.de) lieber mit C++ oder C# arbeiten möchte, findet bei Simon Inns ein USB-Framework und zahlreiche interessante und anpassbare Anwendungen.
- PIC-Projekte.de Tutorials (u.a. für PIC C) und Projekte mit erklärten Codesnipseln (geeignet für Anfänger), deutschsprachiges PIC Forum
- [PIC: Programmierung in CCS \(www.fernando-heitor.de\)](http://PIC: Programmierung in CCS (www.fernando-heitor.de)) Dies ist eine weitere Seite, die dem Anfänger, der sich mit PICs beschäftigt, auf die Beine hilft. Sie befasst sich hauptsächlich mit dem CCS-Compiler und hat dazu ein sehr gutes Tutorial. Ausserdem bietet die Seite ein Forum speziell für PIC Mikrocontroller.
- CC5X Programmierkurs für PIC-Mikrocontroller in C (CC5X Compiler)] Programmierkurs mit Beispielen und Schaltplänen, fertige Hardware- und Softwarelösungen. In diesem Kurs sind auch einige Unterprogramme detailliert erklärt.
- MicrochipC.com Programmieren von PIC-Microcontrollern mit C. (Enthält auch Links und Bootloader für diverse PICs.)
- Internetworking with Microchip Microcontrollers - PIC18F4620+ENC28J60
- [Wiki about Microchip USB PIC \(PIC18F2550, PIC18F4550...\)](http://Wiki about Microchip USB PIC (PIC18F2550, PIC18F4550...))
- PICPgm - A free and simple PIC Development Programmer Software for Windows and Linux Einfacher PIC Programmer für Windows und Linux. Unterstützt eine Vielzahl von PIC-Chips und wird ständig erweitert. Derzeit können PIC10F, PIC12F, PIC16F, PIC18F, PIC24H sowie dsPIC30F und dsPIC33F programmiert werden.
- [InCircuit-Programmer und -Debugger \(www.stolz.de.be\)](http://InCircuit-Programmer und -Debugger (www.stolz.de.be)) Einfacher Nachbau des Microchip ICD2s. Zum Programmieren und Debuggen.
- WinPicProg Programmer und Tutorials für Anfänger von Nigel Goodwin (Englisch)
- usbpicprog, an open source Microchip PIC programmer for the USB port. A wxWidgets based (cross platform) application to communicate with the usbpicprog hardware / firmware. This application is known to function well on Linux, Windows (XP or later) and MacOSx.
- [EasyPIC3, EasyPIC4, Easy8051A, EasyAVR, Easy-was-weiss-ich \(www.tigal.com\)](http://EasyPIC3, EasyPIC4, Easy8051A, EasyAVR, Easy-was-weiss-ich (www.tigal.com)) - Distributor für Produkte von mikroelektronika und weiteren Herstellern
- Pro Zukunft Evaluation-Board für PIC16F84A, hands-on-training und Print-Lehrgang. Für Schulen, Ausbildungsbetriebe & Hobbyelektroniker.
- www.wselektronik.at Bausatz für "Full Speed ICD2" (USB2.0, Debugger, Programmer) oder Fertiggerät erhältlich.
- How to setup for PIC microcontroller development on Linux von Steven Moughan
- gpsim is a full-featured software simulator for Microchip PIC microcontrollers distributed under the GNU General Public License.
- YaPIDE aims to be a fully featured Microchip PIC simulator for Linux (and probably other UNIXes). YaPIDE is a GUI only application. If you need a commandline based PIC simulator there is the excellent **gpsim**. The simulator kernel currently supports the PIC 16F628.

- [Piklab](#) is an integrated development environment for applications based on Microchip PIC and dsPIC microcontrollers similar to the MPLAB environment. It integrates with several compiler and assembler toolchains (like gputils, sdcc, c18) and with the simulator **gpsim**. It supports the most common programmers (serial, parallel, ICD2, Pickit2, PicStart+) and debuggers (ICD2).
- [vPICdisasm](#) is a Microchip PIC Mid-Range family firmware disassembler. This single-pass disassembler can read Intel HEX and Motorola S-Record formatted files containing valid PIC firmware. (GPL)
- [PiKdev](#) is a simple graphic IDE for the development of PIC-based applications. It currently supports assembly language. C language is also supported for PIC 18 devices. PiKdev is developed in C++ under Linux and is based on the KDE environment.
- [Yenka PICs](#) lets you write routines using simple flowcharts, and test them on-screen, before using them to program real PIC or PICAXE chips. To help spread the news about Yenka, we're offering free copies of Yenka PICs for use at home or school.
- [Great Cow BASIC](#) "Open Source BASIC programming tools for Microchip PIC and Atmel AVR microcontrollers"
- [Open Programmer](#) - An open source [USB](#) programmer for [PIC](#) micros, [I2C-SPI-MicroWire EEPROMs](#), some ATMEAL [AVR](#) micros, generic I2C/SPI devices and (soon) other devices. Can work as [ICD](#) debugger.

Projektsammlungen/Einzelprojekte

- [www.martins-elektronikwelt.tk](#) Viele Projekte mit den PIC Mikrocontrollern, u.a. SMS-Schaltzentrale, SD/MMC-FAT32-MP3-Player, Lichtschranken, Funk-Wetterempfänger, PS/2 am PIC usw.
- [Firmware-On-Demand](#) Umfangreiche Firmware-Bibliothek.
- [XLCD Librarie](#) Anleitung zum Ansteuern des HD44780 unter Verwendung der C18 XLCD Librarie
- [www.rentron.com](#) Anfänger-taugliche Projekte für PIC und [8051](#) von Reynolds Electronics (Englisch)
- [Microchip 16-Bit Embedded Control 2007 Design Contest](#) bei Circuit cellar
- [Mondo Technology](#) Grosse Ansammlung von PIC-Projekten, u.a. SuperProbe: Logic Probe, (Auf der linken Seite ganz oben) Logic pulser, Frequency Counter, Event Counter, Voltmeter, Diode Junction Voltage, Capacitance Measurement, Inductance Measurement, Signal Generator, Video Patern, Serial Ascii, Midi Note, R/C Servo, Square Wave, Pseudo Random Number, ir38, PWM in einem... (PIC16F870)
- [uGNU/RTOS](#) is a microcontroller-targeted serial real time operating system. It has been ported to USART capable Microchip PIC16 devices. It supports I/O operations and some internal registry operations. The user can interact with the chip through the RS-232 serial cable and a shell. The user can type a small list of commands and see the results on the chip's outputs. (LGPL)
- [http:pic-projekte.de](#) Viele Projekte vom Betreiber der Webseite. Außerdem gibt es ein deutsches PIC-Forum

- [Experiments with PIC16F628A](#) - PIC Programming in C
- [Stevy's Homepage http://stevy.bplaced.com](http://stevy.bplaced.com) Pic Projekte die in C geschriebln wurden z.B 3D Engine, Grafik Display Ansteuerungen, Oszilloskop usw
- [RGB Stripe mit 16bit Bus, realisiert mit PIC12F629](#)
- [Spiel PONG](#) auf einer 16x16 LED Matrix mit Ton, realisiert auf einem AVR.
- [Pinguino Webpage](#) und [Pinguino Wiki](#) ist ein Arduino-ähnliches Open Source und Open Hardware Projekt für 8-Bit (PIC18F2550, PIC18F4550) Mikrocontroller.
- [Entwicklungsboard auf Grundlage des PIC18F25K22](#) - Sehr gut geeignetes Entwicklungsboard für Einsteiger und Fortgeschrittene

Z8

- [Yahoo! Groups : z8encore](#) Yahoo-Gruppe, die sich mit den Z8 Encore! Mikrocontrollern beschäftigt (Anmeldung bei Yahoo erforderlich).
- [Zilog Encore Experimentierplatine](#) (Z8F6421 Familie mit DIP-40 Gehäuse)
- [Thomas' Technik Blog](#) Ein Z8Encore und ZNEO Projekt und viele Tips zum Programmieren und Debuggen.

Programmierbare Logik (CPLD/FPGA/GAL)

Chip-Hersteller

- [Altera](#), Große FPGAs, direkter Wettbewerber zu Xilinx
- [Lattice Semiconductor](#), kleinere und mittlere FPGAs, sehr Strom sparend
- [Microsemi](#)
- [Xilinx](#), Große FPGAs, direkter Wettbewerber zu Altera

Soft-Core-Prozessoren und IP-Cores

- [OpenCores.org](#), VHDL Sourcen
- [Freecore](#), unter 'Module library' gibt's einige freie Designs
- [Private Seite von John Kent](#), enthält eine Menge Links und auch einige Designs

Entwicklungswerkzeuge für Soft-Core-Prozessoren

- [FIDEx](#), FIDEx assembler IDE für mehrere Soft-Core-Prozessoren
- [Mediatronix tools](#), Picoblaze und DSP tools

Weitere Info-Seiten

- [fpga4fun](#), umfangreiche Seite mit Einführung und Beispielen, berücksichtigt Xilinx & Altera
- [FPGA CPU Links](#)

FPGA-Modul- und Eval-Board-Hersteller

- [Digilent](#), Hersteller verschiedener FPGA/CPLD-Boards (u.a. Xilinx Spartan Starter Kit)
- [Terasic](#), Anbieter von Altera FPGA-Boards
- [Trenz Elektronik](#), verkauft verschiedene FPGA/CPLD-Boards
- [XESS](#), Anbieter von FPGA-Boards (Xilinx), unter Support gibts es eine Menge Beispiele
- [Online Shop für Cesium FPGA Karten](#)

Programmierwerkzeuge

- [ixo.de usbjtag](#) - USB-JTAG Adapter, fast kompatibel zu Altera USB-Blaster, wahlweise basierend auf FT245+CPLD oder Cypress FX2 Controller

DSP

- [combined embedded Linux-DSP Solutions](#)
- [TI c54x DSP Compilertools](#) (ohne Debugger) frei für Open Source Projekte.

Wettbewerbe (Contests)

Verschiedene Hersteller veranstalten zur Promotion ihrer Produkte Designwettbewerbe, aus denen teilweise komplette Projektunterlagen hervorgehen (Schaltung, Source).

2014

- [Make It Wearable](#) Der "VISIONARY Track" startet am 24.02.2014, der "DEVELOPMENT Track" im Sommer 2014.

2013

- [digilent Design contest 2013](#)
- [EBV verlost Infineon XMC4500 Cortex M4 Starter Kits](#)
- [Energy Micro verschenkt kostenlose Starter Kits](#)
- [Toradex Wettbewerb, 100'000 USD in Preise](#)

2012

- [EFM32 Design Contest 2012 von Energy Micro](#) Anmeldung bis zum 31.10.2012
- [Open 7400 Logic Competition 2012](#) Anmeldung bis 31.10.2012
- [beaglebone Cape Contest](#) Anmeldung bis 31.Dezember 2012

2011

- [DesignSpark chipKIT Challenge](#) bis 27.03.2012

- 555 Contest
- NXP and ARM/mbed challenge
- STM32 Design Contest von EBV Elektronik und STMicroelectronics
- The RX MCU Design Contest und die Top 3 im Video bei Dave Jones auf EEVBlog.com
- ARM Cortex-M3 PSoC® 5 Design Challenge
- SparkFun Microcontroller Contest bis 13.02.2011
- EFM32 Design-Wettbewerb von Elektronik, Avnet-Memec und Energy Micro
- Make It Challenge: Kinetis MCUs von Freescale

2010

- SchmartBoard 2010 MCU Challenge
- Digilent Design Contest 2010
- Parallax & iGen Student LED Holiday Challenge
- The embeddedSPARK 2010 SUMMER Challenge
- Libelium Arduino Open Hardware Contest
- Texas Instruments DesignStellaris 2010
- iMCU Design Contest (WIZnet)
- ELO-Programmierwettbewerb 2010 (Atmega8, PingPong-Platine, 31.3.10)
- NXP LPC1100 Design Challenge (Cortex-M0 based LPC1100)

2009

- Fun with Arduino Contest
- XMOS Challenge
- Design MSP430 Ultra-Low Power Challenge
- Make: Halloween Contest 2009, sponsored by Microchip Technology!
- Let Arduino Play Contest
- DLP Design DLP-232PC Design Contest
- Arduino contest by Libelium
- EXPLI Elektronik Wettbewerb: Die coolsten Elektronik Projekte & AVR Microcontroller Anleitungen
- STM32 Primer2 Design Competition 2009
- 2009/2010 Propeller Design Contest

2008

- Propeller Design Contest
- PSoC Innovator Design Challenge India 2008
- Microchip PIC32 Design Challenge
- HEW Target Server Design Contest 2008
- STM32 Primer Design Competition 2008

2007

- WIZnet iEthernet Design Contest 2007
- Microchip 16-Bit Embedded Control 2007 Design Contest

2006

- 2006 MSP430 eZ Design Contest
- Luminary Micro DesignStellaris2006
- Atmel AVR Design Contest 2006

2005

- Philips ARM Design Contest 2005 (LPC213x)
- Renesas M16C Design Contest 2005
- Cornelius van Drebbel's Mad Design Contest (NEC)

2004

- Atmel AVR 2004 Design Contest
- PSoC High Integration Challenge 2004
- Zilog 2004 Flash Nets Cash Design Contest (eZ80Acclaim!)
- 2004 Freescale Wireless Design Challenge (MC13191/92/93 RF Transceivers, [ZigBee](#))

2003

- MOTOROLA FLASH INNOVATION 2003 DESIGN CONTEST (Motorola HC08)
- Renesas H8 Design 2003 Contest
- ZiLOG Flash for Cash Z8 Encore®! International Design Contest
- 2003 Motorola E-Field Sensor Contest (MC33794)

2002

- Mad Dash for Flash Cash (Microchip, PIC)

2001

- Atmel 'Design Logic 2001' Design Contest
- MSP430 Design Contest

Interfaces & Protokolle

Siehe auch [Linksammlung#Schnittstellen](#)

Infrarot (IR)

- Übersicht IR-Protokolle von San Bergmans (engl.): ITT, JVC, NEC, Nokia NRC17, Sharp, Sony SIRC, Philips RC-5, RC-6, RC-MM, RECS80, RCA, X-Sat

- Data formats for IR controls (PDF) von Vishay.
- IR protocol analyzer (Freeware)

Parallelport

- ECPMON - ECP Parallel Port Monitor (**M16C**/62P)

iPod

- iPod to T&A remotecontrol adapter (**PIC**-Projekt)(Link defect)
- <http://jasongarr.wordpress.com/project-pages/ipod-clickwheel-hack/>

RFID

- RFIDemulator - Beschreibung eines RFIDemulators zum klonen von Tags
- Radio Frequency Identification: Evolution of Transponder Circuit Design - Übersichtsartikel aus dem Microwave Journal
- Die StopRFID-Seiten des FoeBuD e.V.
- PDF-Bücher (englisch) - Bücher über RF, Antennen und elektromagnetische Wellen.
- <http://cq.cx/proxmark3.pl> Jonathan Westhues RFID Leser/Schreiber/Cloner

http://www.message_bocracco.com/

~ 125 kHz

- Open RFID Tag

13,56 MHz RFID

- OpenPCD - a free 13.56MHz RFID reader design for Proximity Coupling Devices (PCD) based on 13,56MHz communication. This device is able to screen informations from Proximity Integrated Circuit Cards (PICC) conforming to vendor-independent standards such as ISO 14443, ISO 15693 as well as proprietary protocols such as Mifare Classic. (AT91SAM7S128 **ARM** Projekt)
- RFDump is a backend GPL tool to directly interoperate with any RFID ISO-Reader to make the contents stored on RFID tags accessible. (Linux)

2,4 GHz RFID

- OpenBeacon - a free active 2.4GHz beacon design. (Reader: USB oder Ethernet; Tags: RF_Chip: NRF24L01, PIC16F684)

DMX512

- [DMX-512 - was ist das?](#) Eine Übersicht von SOUNDLIGHT.
- [USB DMX Interface Bausatz /Fertiggerät](#) [USB DMX Interface](#)
- [OksiD DMX 3/1](#) is a Standard Parallel Port DMX 512 interface for IBM compatible PCs. Drei Output Universe und ein Input Universe (Universe = 512 channels). Open project. All source code and schematics are available for free.
- [USB DMX Interface revision 1.3](#) - opto isolated, bus powered, DMX512 from/to [USBinterface](#) with both in and out universes. Cheap and simple to build.
- [Ujjal's DMX512 Seite](#)
- [DMX4Linux 2.6](#) - A DMX device driver package for Linux (incl. hardware schematics with TI [MSP430](#))

Verschiedenes

- [T&A Kommandos](#) - **RC** und **RCII** Kommandoset der Philips PRONTO Familie zur Steuerung von Audiogeräten. Dokumentation siehe unter Downloads.
- [Das PS/2 Maus und PS/2- oder AT-Tastatur-Protokoll](#) (Original auf [9])
- [S.N.A.P](#) - Scaleable Node Address Protocol. S.N.A.P is an free and open network protocol. The protocol was primary developed for PLM-24 based home automation and control systems but it is a generic protocol and not limited to this. S.N.A.P can be used in any type of applications where an easy to learn and light weighted network protocol is needed.
- [PPM / PWM Encoder/Decoder für R/C Funkfernsteuerungen](#) von Ulrich Radig (AVR, C)
- [LVDS Owner's Manual](#) - 4th Edition von National Semiconductor
- [Becker Unilink](#)
- [Sony UniLink](#)
- [Multi-Drop Bus / Internal Communication Protocol \(MDB / ICP\)](#)

Elektronikversender

siehe [Elektronikversender](#)

Leiterplattenhersteller

siehe [Platinenhersteller](#)

Schulungen (Online)

- [www.kr-onlinetraining.de](#) Vor Ort und Onlineseminare zu den Themen Elektronik, Reparaturen von Unterhaltungselektronik, Telekommunikation und IT Administration
- [www.esacademy.com](#) (engl.) - C, CAN, I²C, BlueTooth, PWM, USB, 51LPC, ARM (Einführung)
- [Elektronik in der Praxis](#) Präsentationen zu verschiedenen Themen der Elektronik in der Praxis. Lötvideo, das den zeitlichen Ablauf beim Löten anschaulich darstellt.

- www.national.com - Amplifiers, Audio, Data Acquisition, Die Products, Displays, Interface, Microcontrollers, Military/Aerospace, Power, Thermal Management, Wireless
- [Circuit Technology Center](#) - Surgeon grade rework and repair, by the book and guaranteed. Deeplink: [Guides](#)
- onlinetutorials.de - Linksammlung zu Tutorials für höhere Programmiersprachen ([HLL](#)) wie C, C++, Java, BASIC, Perl, PHP, ...
- [AWCE Interactive Classroom](#) - Embedded Systems (Using the APP-IV with GCC, Getting Started with the PIC 18F Family), Electronics (CLARC/HBSIG DSP Study Group, Basic Circuits), RoadMap to Programmable Logic
- [Socratic Electronics](#) (englisch)
- [The basics of programming embedded processors](#) von Wayne Wolf. Neun Artikel bei embedded.com (englisch)
- [EE 42/EE 100 Introduction to Digital Electronics](#) - Webcast, Spring 2008 (englisch)
- freevideolectures.com - Webcasts zu naturwissenschaftlichen Themen (englisch)
- [Circuit Sage](#), a complete source of information to help you design circuits fast. (Linksammlung zu Software, Artikeln Büchern und Websites)
- [Die Elektronikerseite](#) Umfangreiche Sammlung von kleinen Lehrgängen und Schaltungen. Ideal für Anfänger aber auch für Fortgeschrittene
- [3D Virtual Development](#) - Sammlung von vielen Grundsaltungen im Bereich Oszillator, Operationsverstärker, Empfangstechnik. Vereinzelt in Englisch.
- [Learning Objects for Electronics](#) des Engineering Tech Wing of Gateway Technical College (Flash erforderlich)
- [Principles of Semiconductor Devices](#) von Bart Van Zeghbroeck
- [Introduction to Physical Computing](#) ([AVR](#), Arduino)
- [NPTEL ELearning Courses Electrical Engineering](#) (englisch)
- [University Program](#), Lernprogramm zum uC programmieren für Einsteiger (von [Energy Micro](#), ist jedoch universell anwendbar)
- <http://pic-projekte.de/> PIC- und PIC-C-Tutorial. Besonders geeignet für Einsteiger!
- <http://www.ta.de/> Weiterbildung für Industrietechniker Elektrotechnik IHK ([weitere Infos](#)) und Industriemeister Elektrotechnik IHK ([weitere Infos](#))

Skripte

- [Linksammlung von Volker Lange-Janson](#)
- [Physikalische Elektronik und Messtechnik](#) von Othmar Marti und Dr. Alfred Plettl, Universität Ulm
- [Lessons in Electric Circuits I-VI](#) von Tony R. Kuphaldt

Messequipment

- **Filmetrics Inc.** (Filmetrics manufactures affordable thin-film measurement instruments capable of measuring thin films from 3nm to 0.5mm in thickness.)
- **PCE Instruments** (Entwicklung und Produktion für Prüfgeräte und Waagen.)
- **BMC Messsysteme** Sensorik, Anschlusstechnik, Messverstärker, Messsysteme und Digital I/O ([Produkt Uebersicht](#)) auch erhältlich [hier](#)

Logikanalyse

- **Intronix LogicPort**, Günstiger, aber sehr leistungsfähiger Logikanalysator mit USB-Anschluß an PC (34Ch, 500MHz Timing, 34 x 2kSa mit Kompression, ca. 367 Euro / 459 SFr.- [hier](#))
- **Zeroplus LAP-Cxxxx** (Familie von LA's mit unterschiedlichen Daten, 32kBit...2MBit, 16ch oder 32ch, 100MHz..200MHz, Preise von 90,-...1100,- Euro, zu kaufen [hier](#))
- **TechTools DigiView**, Günstiger Logikanalysator mit USB-Anschluß an PC (18Ch, 100MHz Timing, 128kSa mit Kompression, ca. 430Euro)
- **Tribalmicro**, PC hosted LA (32ch, 40MHz Timing, 128kSa, ca. 1700\$)
- **NCI GoLogic**, Logikanalysator mit USB-Anschluß an PC (34 oder 72Ch, 500MHz Timing, 1 oder 2MSa, ca. 3000..5500\$)
- **Tektronix**, Verschiedene Geräte, standalone oder modular (ab 34ch, 2GHz Timing, ab 512kSa, gut und teuer)
- **Agilent**, Verschiedene Geräte, standalone, modular oder PC-hosted (ab 34ch, ab 800MHz timing, ab 256kSa, gut und teuer)
- **Sumps LA**, günstiges Projekt für einen LA basierend auf einem Digilent Spartan Board (32ch, 100MHz Timing, 256kSa, Kosten Digilent Board ca. 100\$ + Versand/Zoll)
- **Meilhaus Electronic - MEphisto Scope UM203** Robustes, mobiles 16 bit Kombi-Instrument 7 Mess-Geräte in einem! (ab 348€)
- **TravelLogic TL2x36**, Logikanalysator zum Anschluß an PC über USB, (36ch, 4GHz timing, 200MHz state, Speicher bis 72MBit, Preis ab ca. 500,- netto)
- **Bus und Logic Analyzer** 100MHz Samplerate und integrierten SPI, I²C, CAN Interpreter, erweiterbar als Oszilloskop
- **logic** - Logik-Analyzer mit 8 Kanälen, mit Software zur Analyse von SPI, I2C, UART, etc... (ca 150\$ + Versand/Zoll)
- **DEDITEC USB-LOGI-500**, kostengünstiges Einsteigermodell mit USB-Anschluß und dazugehöriger Software Logi+ (36Ch, Abtastrate 500MHz, 4096 Samples Speichertiefe/Kanal, ca. 236 Euro)
- **Alogic Analyzer**: Verfügt über USB-, I2C-, UART- und SPI-Protokoll-Dekoder. Vier oder zwei Kanäle mit bis zu 24 MHz Abtastrate. USB-High-Speed-Transfer zur kontinuierlichen Datenspeicherung. Aufzeichnung über Tage hinweg (nur durch Festplatte begrenzt). Preis 99,- Euro incl. MwSt.
- Eine Übersicht über verschiedene Selbstbauprojekte: [Logic_Analyzer](#)
- **TimingAnalyzer** can be used to easily draw timing diagrams and perform timing analysis to find faults in digital logic systems. Written in Java, it runs on any platform that supports the Java

Run-time Environment, JRE1.6.0 or Java Development Kit JDK1.6.0 or newer.

Oszilloskope

siehe die separate [Seite](#) zum Thema

Generatoren

[Meilhaus Electronic](#) - ME-6x00 Waveform-Generator - potentialfrei isolierte 16 bit Analog-Ausgabe-Karte (ab EUR 1138,00)

Handbücher für Messgeräte

Für ältere kommerzielle Messgeräte sind viele Handbücher im Web als PDF verfügbar. Hier eine Linkliste für den kostenlosen Download:

- [KO4BB Didier Juges](#)
- [BAMA-Edebris \(mirror\)](#)
- [BAMA Originalseite K4XL](#)
- [to-way.com \(K7MLR\)](#)
- [Bluefeathertech FTP-Server](#)
- [Bitsavers](#), vor allem Computermanuals und Software
- Handbücher der US-Army (->"i accept" -> "Enter the site" -> Suchbegriff z.B "Analyzer" in "Pub Title Text" eingeben -> search)
- [eserviceinfo.com](#)
- [one-electron.com](#)
- [manoman](#)
- [Nostalgia Air](#) schematics, manuals, tube data
- Freds sehr alte (vor allem Militärelektronik-) Geräteliteratur, Röhrentechnik und hier Übersicht zur Nummerierung der Militärhandbücher
- [HP-Memory.org](#), alte Applications und HP-Journals
- Ebaman Registrierung per e-Mail erforderlich

Eine [Linksammlung](#) zu Messgeräten, sehr ausführlich

Vermischtes

Ältere Applikationsbücher und Schaltungssammlungen

- [Rainers-Elektronikpage](#) - Sammlung alter Applikationsbücher und Schaltungen (Siemens, Telefunken, Valvo, etc.)

Foren

- [Spark Fun Electronics MicroController Ideas and Support \(Englisch\)](#) ([AVR](#), [PIC](#), [MSP](#), [ARM](#), [OpenOCD](#))
- [EDABoard.com International Electronics Forum Center \(Englisch\)](#)
- [STS Reparatur Forum](#) Forum für Radio und Fernsehtechniker
- [PIC-Forum](#) Deutschsprachiges PIC-Forum
- [Elektronik Reparatur Forum](#) Informationselektroniker Reparatur Forum
- [Elektrik-Forum](#) Forum zum Thema Elektroinstallationen
- [Electronics Forum](#) Electrical Engineering Community Forum (Englisch)
- [Digi-Key TechXchange Communities > Microcontroller Solutions Community](#)
- [Forum von Energy Micro](#)

Videocasts und Podcasts

- [EEVblog Electronics Engineering Video Blog](#) von David L. Jones (englisch). *Anm.: David ist Australier und das hört man. An die Sprechweise kann man sich aber gewöhnen. Und nicht erschrecken, wenn öfter mal ein drastisches Fourletterword auftaucht!*
- [The Amp Hour](#) Podcast mit Chris Gammell und David Jones (englisch)
- [Youtube-Video](#) Über Ingenieursdienstleister und einen Audi-Personalchef in Erklärungsnot

Projektsammlungen

Meist in Englisch.

- [Circuit Scout](#) - Online Suchmaschine
- [ePanorama.net](#)
- [Discover Circuits](#) a collection of 25000+ electronic circuits or schematics
- [Next Electronic Circuit Database](#)
- [BeyondLogic.org](#) Diverse Mikrocontroller und Interfacing Projekte
- [Circuits for the Hobbyist](#) by VA3AVR
- [StefPro.de](#) Diverse Projekte und Datenblattsammlung nach Kategorien, Microcontroller, Digital und Analog... Sowie Tutorial "Grundlagen der Bestückung von Platinen" und anderes Wissen
- [www.schaltplaene-online.de](#) Umfangreiche Linksammlung zu Schaltplänen aller Art
- [MoNsTeRIIsT of Halloween Projects](#)
- [Open Innovation Projects](#) - Sammlung von offenen Projekten zu physischen Produkten, darunter etliche Mikrocontroller-Projekte. Man kann selber Projekte hinzufügen.
- [ThomasHeldt.de Blog](#) Elektronik Blog mit vielen interessanten Projekten.

Referenzen, Beschreibungen, Standards

- Extraseite: [Datenblätter](#)
- [Technik.Net](#) Pinouts, Circuits and Guides
- [pinout.ru](#) und [hardwarebook.info](#) - Online handbooks of hardware pinouts, cables schemes and connectors layouts

- [Keyboard, Monitor & Mouse Pinouts](#) for PC, SUN, MAC, USB, FireWire, RS232, Digital Flat Panel and EVC configurations
- [Special joysticks used in TV games](#)
- [Intel-Hex-Format \(PDF\)](#)
- [FAT32 Structure Information](#) - Written by Jack Dobiash
- [Understanding FAT32 Filesystems mit Beispielen \(engl.\)](#)
- [Microcontroller Interfacing Circuits](#) - Revolution Education Ltd.
- [Datenbank für *Application Notes*](#) bei www.digchip.com
- [Compact Fluorescent Lamp \(CFL\)](#), Schaltungen von Energiesparlampen

Online-Bücher

- [All About Circuits](#) - Series of online textbooks covering electricity and electronics. The information provided is great for both students and hobbyists who are looking to expand their knowledge in this field. (Englisch)
- <http://www.computer-books.us/> - überwiegend zu höheren Programmiersprachen. Englisch.
- [FEEE - Fundamentals of Electrical Engineering and Electronics](#)
- [Numerical Recipes in C, Second Edition \(1992\)](#)
- [Electrical drives for precision engineering designs](#) Prof.dr.ir. Compter
- [Das neue InterNetzteil- und Konverter-Handbuch](#) Dipl.-Ing. Jörg Rehrmann
- [Einstieg in die Elektronik mit \(AVR\) Mikrocontrollern](#) Stefan Frings

Bedienungsanleitungen / Manuals

- [BAMA Archiv](#)
- [Big-List.com](#) - This is a directory of over 600 dealers in used high technology equipment. Most deal in used electronic test equipment or semiconductor production equipment. Included are dealers in related high technology items, rental companies, equipment auction sites, test equipment manual dealers, foreign (non-U.S.) used equipment dealers, cal labs, and repair services.
- [KO4BB's Manuals Repository](#)

Ungewöhnliche Basteleien (Hacks)

Auf eigene Gefahr und nicht immer ganz ernst... Meist in Englisch.

- [Metablogs \(tägliche News\)](#)
 - [Makezine](#)
 - [Hack a Day](#)
 - [HackedGadgets](#)
 - [Hack N' Mod](#)
 - [Zedomax DIY](#)
 - [Digital-DIY](#)

- Dangerous Prototypes
- Heise Hardware Hacks
- Foren
 - Fingers elektrische Welt
 - HackedGadgets Forum
 - Reparatur Forum
- Projektsammlungen
 - Final Projects der Kurse ECE4760 (Designing with Microcontrollers) und ECE5760 (Advanced Microcontrollers) an der Cornell University
 - Cool Circuit tot ->
<https://web.archive.org/web/20130116005101/http://www.coolcircuit.com/gadgets/>
 - Electronics-Lab.com Blog
 - Hack a Gecko Blog Energy Micro Hacks
- DIY-Anleitungen
 - instructables
 - Scitoys You Can Make With Your Kids
- Mix
 - Evil Mad Scientist Laboratories - u.a. The Flying Spaghetti Monster, on toast ;-)
 - Spark, Bang, Buzz and Other Good Stuff (Neue Sachen)
 - Mike's Electric Stuff - Antique Glass, Tesla coils and high-voltage stuff, Lasers
 - DHS electricity
 - Elephant Staircase
 - Eine selbstgebaute CPU aus TTL-Gattern
 - Knolles Bauanleitungen
 - ikalogic.com
 - Electronics Infoline
 - uC Hobby
 - elettrolinux - Elektronik und Linux (engl.)
 - electronicfox - Verschiedene Projekte mit AVR, Fernbedienungen und deren Aufbau sowie Decoder und alten ICs aus dem Recyclinghof
 - Fresh Bytes von Techfocusmedia
 - ESP-8266 Module Anwendungshinweise von Stefan Frings

Zeitschriften über Elektronik und µC

- rfe-Datenbank - ein Projekt von PSblnkd
- Elektronik - Das Elektronikmagazin für Entwickler
- E&E Faszination Elektronik - Magazin für Elektronik-Entwickler und Elektronik-Interessierte
- embedded.com - Hauptaugenmerk auf die Philosophie drumherum

- [Silicon Chip](#) - Freie Artikel unter *Free Preview*
- [Circuit Cellar](#) - Freie Artikel unter *Digital Library*
- [Elektronikpraxis](#) - Das professionelle Elektronikmagazin
- [FUNKAMATEUR](#) - Elektronik, Amateurfunk, CB-Funk u. v. a. m.
- [EDN](#) (etwas schwer zu finden, aber lesenswert: die [Design Ideas](#) und das [Archiv der Druckausgaben](#))
- [ELO](#) - Das Magazin für Elektronik-Einsteiger
- [TechOnline](#)
- [Elektor](#)
- [NASA Tech Briefs](#) - Electronics & Computers
- [Technology Interface Journal](#)
- [Your Electronics Open Source](#)
- [element14.com](#) is an information portal and community specifically built for electronic design engineers.
- [ITWissen.info](#) (good lexicon)
- [Nuts'n'Volts](#) American electronics [magazine](#) with online blog
- [eTech](#) from RS Online
- [EEWeb](#) , a premier electrical engineering community for hardware designers.
- [All-about-Test](#) , a news and information portal about test and measurement technology.

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