

SDCC - Small Device C Compiler

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What is SDCC?

SDCC is a **retargettable, optimizing ANSI-C compiler suite** that targets the **8051 MCS51** based microprocessors (**8031, 8032, 8051, 8052, etc.**), **Maxim** (formerly **Dallas**) **D580C390** variants, **Freescale** (formerly **Motorola**) **HC08** based (**HC08, s08**) and **Z80** based MCUs (**z80, z180, gbz80, Rabbit 2000/3000, Rabbit 3000A**). Work is in progress on supporting the **Microchip PIC16** and **PIC18** targets. It can be retargeted for other microprocessors.

SDCC suite is a collection of several components derived from different sources with different FOSS licenses.

SDCC compiler suite include:

- **sdas** and **sdld**, a retargettable assembler and linker, based on **ASIXXXX**, written by Alan Baldwin; (GPL).
- **sdcpp** preprocessor, based on **GCC cpp**; (GPL).
- **ucsim** simulators, originally written by Daniel Drotos; (GPL).
- **sdcdb** source level debugger, originally written by Sandeep Dutta; (GPL).
- **sdbinutils** library archive utilities, including **sdar**, **sdranlib** and **sdnm**, derived from GNU Binutils; (GPL).
- **SDCC run-time libraries**; (GPL+LE). Pic device libraries and header files are derived from Microchip header (.inc) and linker script (.ld) files. Microchip requires that "The header files should state that they are only to be used with authentic Microchip devices" which makes them incompatible with the GPL.
- **gcc-test** regression tests, derived from **gcc-testsuite**; (no license explicitly specified, but since it is a part of GCC is probably GPL licensed)
- **packihx**; (public domain)
- **makebin**; (rdb/ibpng license)
- **sdcc** C compiler, originally written by Sandeep Dutta; (GPL). Some of the features include:
 - extensive MCU specific language extensions, allowing effective use of the underlying hardware.
 - a host of standard optimizations such as global sub-expression elimination, loop optimizations (loop invariant, strength reduction of induction variables and loop reversing), constant folding and propagation, copy propagation, dead code elimination and jump tables for 'switch' statements.
 - MCU specific optimizations, including a global register allocator.
 - adaptable MCU specific backend that should be well suited for other 8 bit MCUs
 - independent rule based peep hole optimizer.
 - a full range of data types: **char** (8 bits, 1 byte), **short** (16 bits, 2 bytes), **int** (16 bits, 2 bytes), **long** (32 bit, 4 bytes), **float** (4 byte IEEE) and **_float/float**; basic (no integer constants) support for **long long** (64 bit, 8 bytes) data types for the z80, z180, r2k, r3ka, gbz80, hc08 and s08 targets.
 - the ability to add inline assembler code anywhere in a function.
 - the ability to report on the complexity of a function to help decide what should be re-written in assembler.
 - a good selection of automated regression tests.

SDCC was written by Sandeep Dutta and released under a **GPL** license. Since its initial release there have been numerous bug fixes and improvements. As of December 1999, the code was moved to SourceForge where all the "users turned developers" can access the same source tree. SDCC is constantly being updated with all the users' and developers' input.

News

May 20th, 2013: Small Device C Compiler 3.3.0 released.

A new release of SDCC, the portable optimizing compiler for 8051, D5390, Z80, Z180, Rabbit 2000, HC08 and PIC microprocessors is now available (<http://sdcc.sourceforge.net>). Sources, documentation and binaries compiled for x86 Linux, x86 and x64 MS Windows and x86 and PPC Mac OS X are available.

SDCC 3.3.0 Feature List:

- Many small improvements in code generation for the z80-related ports - merged smallopts branch
- **iospre** (currently enabled for z80-related and hc08-related ports only) - merged iospre branch
- More efficient initialization of globals in z80, z180, r2k and r3ka ports.
- Inclusion of tests from the gcc test suite into the sdcc regression test suite led to many bugs being found and fixed.
- Split **sdas390** from **sdas8051**
- Merged big parts of **ASxxxx** v5 into **sdas**
- New pic devices (synchronization with MPLABX 1.60). (Except for very old MCU-s.)
- New script which disassembles those hex files, in which MCS51 code there is. (**mcs51-disasm.py**)
- Added the **PIC16F1788** and **PIC16F1789** devices.
- C11 **_Alignof** operator.
- C11 **_Alignas** alignment specifier.
- C11 **_Static_Assert** static assertion.

Numerous feature requests and bug fixes are included as well.

You can download the release from:

<https://sourceforge.net/projects/sdcc/files/>

What Platforms are Supported?

Linux - x86, **Microsoft Windows - x86**, **Microsoft Windows - x86_64** and **Mac OS X** are the primary, so called "officially supported" platforms.

Small Device C Compiler Manual

Erika Abraham, Klaus Havelund



Small Device C Compiler Manual:

Hardware Hacking Projects for Geeks Scott Fullam, 2004-01-28 A collection of unusual projects for computer hardware geeks of all ages explains how to create such projects as a personal Lojack system Web enabled coffee machine cubicle intrusion detection systems and a laptop battery extender

Ultrasonic Distance Measurement Using Basys 3 FPGA Board Ramazan Kahraman, 2019-10-22 System on a Chip SoC technology which has evolved in recent years is developed from different devices A processor several memory and peripheral components are located on a single chip to form today's high performance SoCs with hundreds of IP blocks IP cores are validated design blocks used as part of complex digital designs Those designs are utilizing a hardware description language like VHDL or Verilog In this way time and cost of launching the product are reduced Thanks to SoC the features of computers were able to be reduced to the miniature level Microcontrollers have the features of computer systems on a single chip They are used to collect process and manipulate data in complex projects The complexity of microcontrollers has increased to provide better performance and flexibility to meet customer requirements However it must be able to adapt to operational changes The hardware of a microcontroller can not be changed afterward If subsequent changes are nevertheless necessary these are associated with high additional costs Reconfigurable devices such as FPGAs can reconfigure the hardware to design develop and deploy high performance digital systems With the power of a SoC combined with the flexibility of an FPGA the MC8051 IP Core proves to be a great alternative to purely microcontroller based systems

Tools and Algorithms for the Construction and Analysis of Systems Erika Abraham, Klaus Havelund, 2014-03-21 This book constitutes the proceedings of the 20th International Conference on Tools and Algorithms for the Construction and Analysis of Systems TACAS 2014 which took place in Grenoble France in April 2014 as part of the European Joint Conferences on Theory and Practice of Software ETAPS 2014 The total of 42 papers included in this volume consisting of 26 research papers 3 case study papers 6 regular tool papers and 7 tool demonstrations papers were carefully reviewed and selected from 161 submissions In addition the book contains one invited contribution The papers are organized in topical sections named decision procedures and their application in analysis complexity and termination analysis modeling and model checking discrete systems timed and hybrid systems monitoring fault detection and identification competition on software verification specifying and checking linear time properties synthesis and learning quantum and probabilistic systems as well as tool demonstrations and case studies

Fixing Access Annoyances Phil Mitchell, Evan Callahan, 2006-02-21 When an application is part of the Microsoft Office suite it's sure to be a leader in its field In the realm of desktop database management Access is top dog with millions of users But this is one dog that can bite Although Access is a powerful relational tool with the fetching talents of a Labrador it's not an easy beast to train Still millions of users count on Access for everything from managing parts databases to running Web catalogs to working as a front end to mondo SQL databases But Access is chockablock with annoyances report hassles query

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Nuts and Bolts of Open Hardware Swapnil Sapre, 2012-07-31 The book is not only an awareness session for EDA and Semiconductor and an effort to motivate engineers and common people to move from proprietary resources to use open source tools in EDA but also to inspire them to contribute for such usage and movement Efforts have been made to explain in detail the inception of thought of openness in software and content has been taken from open initiative of Wikipedia at various areas and levels Further this book is an effort to make this literature capable to be accepted as text book for engineering students for their quest to understand open side of software as well as hardware and increase their comfort zone as well as awareness and enthrust them to adopt and accept open hardware with open hearts

Computational Intelligence and Sustainable Systems H. Anandakumar, R. Arulmurugan, Chow Chee Onn, 2018-12-14 This book features research related to computational intelligence and energy and thermal aware management of computing resources The authors publish original and timely research in current areas of power energy temperature and environmental engineering as and advances in computational intelligence that are benefiting the fields Topics include signal processing architectures algorithms and applications biomedical informatics and computation artificial intelligence and machine learning green technologies in information and more The book includes contributions from a wide range of researchers academicians and industry professionals The book is made up both of extended papers presented at the International Conference on Intelligent Computing and Sustainable System ICICSS 2018 September 20-21 2018 and other accepted papers on R D and original research work related to the practice and theory of technologies to enable and support Intelligent Computing applications

Embedded Ethernet and Internet Complete Jan Axelson, 2003 Create tiny web servers and use TCP/IP to communicate over local networks and the Internet

Dr. Dobb's Journal of Software Tools for the Professional Programmer, 1991 The Pearson CSAT Manual 2012 Edgar Thorpe, 2012 , **PC Mag**, 1986-10-28

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Guide to IBPS Specialist IT Officer Scale I with 2013-16 Solved Papers - 5th Edition Disha Experts, The 5th edition of the book covers the 2017 Solved Paper along with the 4 sections English Language Quantitative Aptitude Reasoning Professional Knowledge The book provides well illustrated theory with exhaustive fully solved examples for learning This is followed with an exhaustive collection of solved questions in the form of Exercise The book incorporates fully solved 2013 to 2017 IBPS Specialist IT Officer Scale question papers The USP of the book is the Professional Knowledge section which has been divided into 11 chapters covering all the important aspects of IT Knowledge as per the pattern of questions asked in the question paper

InfoWorld ,1982-03-08 InfoWorld is targeted to Senior IT professionals Content is segmented into Channels and Topic Centers InfoWorld also celebrates people companies and projects

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