



# KEIL 8051 C Compiler Quick Start

8051  
IAR, Tasking, KEIL  
가  
Optimization  
KEIL  
' How to use KEIL 8051 C Compiler '

- 1. KEIL Compiler
- 2. KEIL
- 3. Quick Start
- 4. dScope

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## Quick Start

가 . X1  
가 , X2  
Crystal X1, X2  
Oscillator X1  
ALE/PROG(Address Latch Enable Output/Program Pulse Input) ALE  
PROG EPROM  
PSEN(Program Strobe Enable)  
2 ALE 0  
EA/Vpp(External Access Enable)  
GND 0 FFFFh  
ROM Vcc  
ROM . Vpp  
8751 12.75V

Quick Start 8051 가  
8051 40  
5V 가 Vcc(  
)  
GND가 . 2 (One Machine  
Cycle= 12 Clock) (High, 1)가  
RESET  
0 8 (I/O  
) I/O, A0 A7, D0 D7  
. 1 I/O  
. 2 I/O, A8  
A15 . 3 I/  
O , , , ,

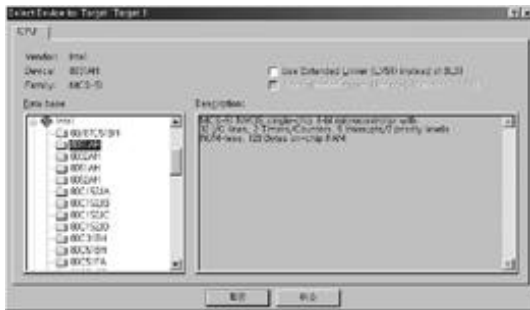


21V  
 μVision2 (M)  
 가  
 10가 가  
 Pull Down . C51  
 Project  
 . Project  
 가 가  
 가 가  
 C51  
 . C51 8051  
 8051  
 가 C51  
 3 (Project, Edit, Output)가  
 File, Edit, View, Project, Debug,  
 Peripherals, Tools, SVCS, Window, Help 10  
 가  
 ' Project/New  
 Project ' 가  
 \*.  
 uv2가 8  
 ' del ' ' qstart ' Target cpuboard.com  
 Standard Board  
 8051 Tar-  
 get MPU ' Select Device for Target'  
 (Project Window  
 )

```
( )
. 8031/8051/8751
8 8051 LSI
. 8031 ROM 8051 4Kbyte
ROM EPROM( 8751) On-Chip
. CMOS ' 5 '
' 3 ' ' C ' 80C51 . 128*8
RAM 32 가
I/O(Input/Output), 2 16 ,
가 5 , 1 Serial (
UART), , 64K
, 64K
, IDLE Power Down Mode 가 .
```



1. μVision2



2. Select Device for Target

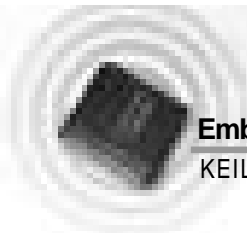
8051

MPU

Target

. V6.1

Acer



# Embedded Systems

## KEIL 8051 C Compiler Quick Start

Winbond 28 가  
가 가 ( MPU  
Description )

'Target Groups, Files...'

LIB, \*.A51

'Project/File Extension'

'Target/Targets.../Groups\_Add File'

Documentation

(IDE) 'Project Window'

가 255

'Edit Window'



3. APPST Project



4. Project/Option for target/Target

APPST.UV2

Source Group 1

app\_st.c ---> main

util\_lib.lib ---> Utility

Library

Documentation

Application\_ .txt --->

History

Target  
for Target'

'Options  
(Tab)

'Target'

Xtal

'Project/Option for Target...'



(Crystal)

, ROM RAM

가

Standard Board System Clock 11.0592MHz

RAM, ROM 32K Byte

0

8051

가 가 RAM

ROM

. 8051

'Small';

'Large'

Large

Default 0

가

. CODE RAM

3

code

xdata

가

64K

3

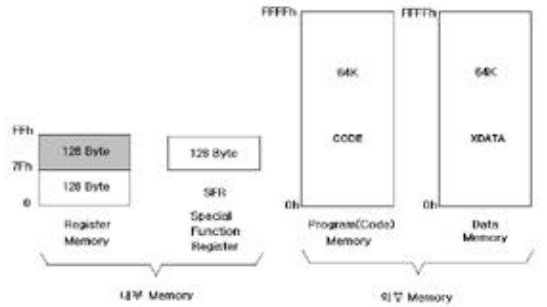


```

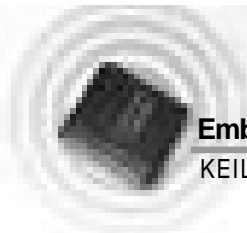
( )
- KEIL
8051
, , , 1, 8, 16, 32
가
가
- bit test; // 1 , 0
1 가
- unsigned char test1; // 1
- char test1; // 가
( )
// signed char : -128
+127, unsigned char : 0 255
- signed int test2; // 1
가
- int test2; // signed int test2 =
signed short test2
// signed int : -32768
+32767, unsigned int : 0 65535
- char xdata test3; // xdata 1
가
- xdata char test3; //
- long data test4; // 4
- unsigned long test4; // signed long : -
2147483648 2147483647
// unsigned long : 0
4294967295
- float xdata test5; // ±1.175494E-38 to ±
1.402823E+38

```

8031 가  
 가 128 (8032 256 ) SFR  
 128 256  
 512  
 8031  
 8031  
 128 SFR  
 가 가  
 Code(Program) Data  
 64K(0 0xFFFF)  
 Hex  
 C 가 Code(Program)  
 xdata 가  
 Source  
 Code 가 64K, xdata 가 64K  
 128 ( Reg-  
 ister Memory ) 4  
 (0 7, 8 F, 10 17, 18 1F) 20 2F  
 30 7F  
 data 128 SFR  
 (Special Function Register) 21  
 C



5. 8031



# Embedded Systems

## KEIL 8051 C Compiler Quick Start

### 1. KEIL

Type		
code	( ) 64K	char code test;
data	, 128 (Default)	char date test; char test;
idata	256	char idata test;
bdata	16	char bdata test;
xdata	64K	char xdata test;
pdata	page 256	char pdata test;

8051

가 가

KEIL 8051 C

(Keyword) code,

xdata, pdata data, idata, bdata가  
Code

'code'

Firmware

Code

가

SFR

I/O

가

P0 P3 I/O

. Code

(Run)

가

. ACC(Accumulator)

. B

'xdata','pdata'

RAM

ACC

. PSW (Program Status

가 . C

Word)

CY, AC, F, RS1, RS2, OV, P . SP(Stack

'xdata가

Point)

07h

PUSH

가

POP

가

. 8051

가

가 가

128

'data'; 256(

128K

가 . C

'idata';

KEIL

'xdata'

16

0x20

0x2F(128K

00 7F)

DPTR(Data Pointer Register) 8 DPH

'bit'

DPL

16

bdata

가

. SBUF

가

가

. PC(Program Count)

SFR

RAM

16

sfr WDCON = 0xD8; // SFR

IP, IE, TMOD TCON,

sbit SMOD\_1 = WDCON^7; // 7

SCON, PCON

가

bdata testbyte;

(<http://www.intel.com/design/product.htm>)

sbit byte0=testbyte^0; //

Microcontrollers/MCS 51 microcontroller fam-  
ily

testbyte LSB

sbit byte7=testbyte^7; //

Data Sheet가

testbyte MSB

bit timeoutcheckbit; // 0, 1 가

가



```

unsigned int xdata
secutimerinterval;
//          16
xdata
  unsigned int sirentime;
//
.
char xdata ramdata[6]
[6];          // 2
, 'Large'
xdata
  unsigned char data
test1; //
          1
char code test2=3;
// 1
          3
  unsigned code segment[4]
={0xbe,0xe0,0xfe,0xf6};
//
  SAVE xdata timer_check;
// SAVE Struct  xdata

```

2. KEIL C51

	/		
bit			bit test(void); // char bdata d; // bdata
sbit	1 / -	0 1	sbit d0 = d^0; // d LSB sbit d7 = d^7; // d MSB sbit EA = 0xAF; //
signed char	8 / 1	-128 +127	signed char xdata test;
sfr			sfr P0 = 0x08;
unsigned char	8 / 1	0 255	unsigned char xdata test;
enum			
signed int	16 / 2	-32,768 +32,767	signed int code test = -1234; signed
signed shot			
sfr16			sfr16 test = 0xCC; // 16
unsigned int	16 / 2	0 65,535	unsigned int xdata d = 0xFFFF;
unsigned shot			
signed long	32 / 4	-2,147,483,648 2,147,483,647	signed long xdata test;
unsigned long	32 / 4	0 4,294,967,295	unsigned long xdata test;
float	32 / 4	± 1.175494E-38 ± 3.402823E+38	float xdata test;

( )

· C51 (Keyword)

C51

· C51

· KEIL C51

_at_	alien	bdata	bit	code	data	idata
large	pdata	sbit	sfr	sfr16	small	_task_
using	xdata	_priority_	reentrant	compact	interrupt	

```

char test3; // 1
가 , Default data
.
Option 8051
Hex
( Select Folder for Objects...)
가 가
ROM (Porting)

```

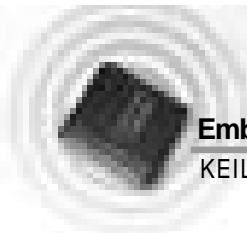


6. Option for Target

```

' Create HEX File'
Hex
( 가 Dis-
) able
. ROM Emulator
' Name of Executable'

```



# Embedded Systems

## KEIL 8051 C Compiler Quick Start

Report  
 . HEX  
 가  
 가 . 8051  
 Intel 가  
 가 Intel (HEX-80) KEIL  
 . Source  
 ' Debug Information '  
 ' Browser Information '  
 ' Browser  
 Information ' Check Box  
 가

' Create Library ' Source File Library  
 C



7. ' Browser Information ' Check Box



8. Option for Target Listing

How to use  
 KEIL 8051 C Compiler,  
 ' After Make '  
 C .lst  
 . List C  
 ' Assembly  
 Code ' 5  
 가

( )

- HEX Format
- HEX File Format ROM
- Writer
- ASCII
- 16 ' 09 ' 0x30( 0 ), 0x39( 9 )
- Sample

```

:0900F00D2A0C2A0B28080F82248
:03000000020003F8
:00000001FF

```

:-> Hex Format (Record)  
 09-> Record , Hex

000F-> ROM  
 000Fh  
 00-> Record , 01 Record  
 D2 22 -> Hex Data,  
 Code Memory  
 48-> 09+00+F0+00+D2+A0+ +F8+22 2  
 ( 1 )



가

8051

MPU  
Firmware

가

가

\*.lst File

C

```

C51 COMPILER V6.12 HELLO          PAGE 1  //
C51 COMPILER V6.12, COMPILATION OF MODULE HELLO
OBJECT MODULE PLACED IN .\HELLO.OBJ
COMPILER INVOKED BY: C:\HARDWARE\KEIL\C51\BIN\C51.EXE .\HELLO.C DEBUG OBJECTTEXTEND CODE
stmt level  source                // Hello.C
1           /*-----
2           HELLO.C
           ...
23          void main (void) {
           ...
41 1        while (1) {
42 2          P1 ^= 0x01;           /* Toggle P1.0 each time we print */
43 2          printf ("Hello World\n"); /* Print "Hello World" */
44 2        }
45 1        }
ASSEMBLY LISTING OF GENERATED OBJECT CODE           // Assembly
; FUNCTION main (BEGIN)                             //
; SOURCE LINE # 23 //
; SOURCE LINE # 29 //
0000 759850    MOV    SCON,#050H
; SOURCE LINE # 30 //
0003 438920    ORL    TMOD,#020H
; SOURCE LINE # 31 //
           ...
0016 120000    E    LCALL  _printf           //           , 120000
; SOURCE LINE # 44 //
0019 80F2     SJMP   ?C0001
; FUNCTION main (END) //
MODULE INFORMATION:  STATIC OVERLAYABLE           //
CODE SIZE          = 27  ---- //
CONSTANT SIZE     = 13  ---- //           CONSTANT
XDATA SIZE        = ----  ---- //
PDATA SIZE       = ----  ---- //
DATA SIZE        = ----  ---- //
IDATA SIZE       = ----  ---- //
BIT SIZE         = ----  ---- //
C51 COMPILATION COMPLETE. 0 WARNING(S), 0 ERROR(S) //

```

Hello

Hello.lst

. List

' How to use.. '

0

C

가

0

' Listing/Conditional '

8051

Re-

source

0

List

가

(Preprocessor)

' C51 ' C

' C51/

' Define '

Define ' debug ' /

' Code Optimization ' ,

' Emphasis '

가

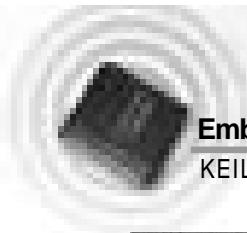
' Code

Optimization ' ' Level '

#ifdef debug

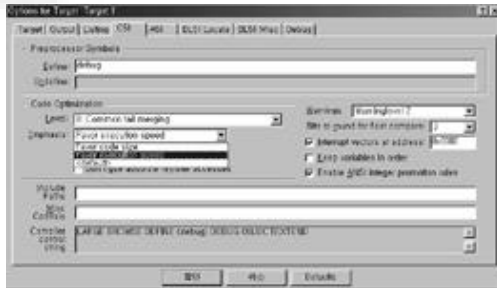
P1=0xFA; /\* debug '





# Embedded Systems

## KEIL 8051 C Compiler Quick Start



9. Option for Target C51

```

Skip
#endif
main()
    C
    '#ifdef' '#endif' if
    '#ifndef' 'Warning'
    가 가
    Target
    HEX . KEIL
    가
    가 C
    'Translate' (F7) , C 가
    가
    'Project/Build Target' (F7)
    'Project/
Rebuild all Target Files' (F7)
    'F7' (F7)
    'Project/
Build Target' 'Project/Rebuild all Target Files'
    C 가
    가
    OBJ OH51.EXE
  
```

(	)
- CMOS, TTL	
*4000	: CMOS IC, 3
18V,	CD4000
*4000B	: CD4000 ,
3 18V	
*14500	: 4500 , 3 15V,
	MC14500
*5000	: 4000 ,
	MSM5500
*40HXX	: High Speed, 74
,	TC40H000
*HC00	: High Speed CMOS, CMOS
IC	
*HCT00	: High Speed CMOS for TTL.
HC00	TTL
*74XXX	: (Bipolar) IC
,	5V, Fan-in/out
*74LSXX	: Low Power Schottky,
,	IC, 5V, 1980
*74ALSXX	: Advanced Low Power
Schottky, 74LS	, Bipolar Logic IC,
5V, 1980	

```

HEX 가
*.
Ist 가 Project *.M51
Link 가 . HEX
Project *.HEX 가
가 OMF51(MDS )
. HEX ROM Writer
Target (8051)
Emulator, ROM Emulator, ICE)가
.
E L E
  
```