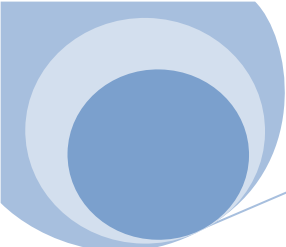




ABOV
CodeGen32
(Code Generator)
USER GUIDE

Release V1.00000



ABOV CodeGen32 ()

@ ABOV 2013 . ABOV

Release information

Version	Date	Change
V1.00000	July 2016	First release

. ABOV

ABOV

ABOV

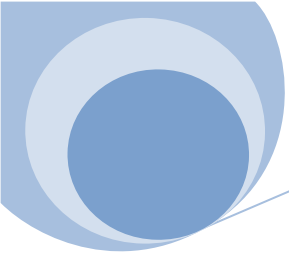
<http://www.abov.co.kr>

ABOV CodeGen32 ()

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ABOV CodeGen32 ()

1

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•

1.1

CodeGen32

1.1.1

CodeGen32

- MS-Windows NT
- MS-Windows 2000
- MS-Windows XP
- MS-Windows Vista
- MS-Windows7
- MS-Windows8
- MS-Windows10

100 MB

1.1.2

CodeGen32

- CPU
-

1.2

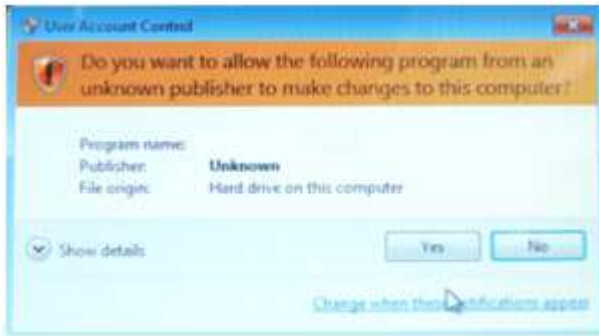
ABOV CodeGen32 <http://www.abov.co.kr>

ABOV CodeGen32 MCU ABOV

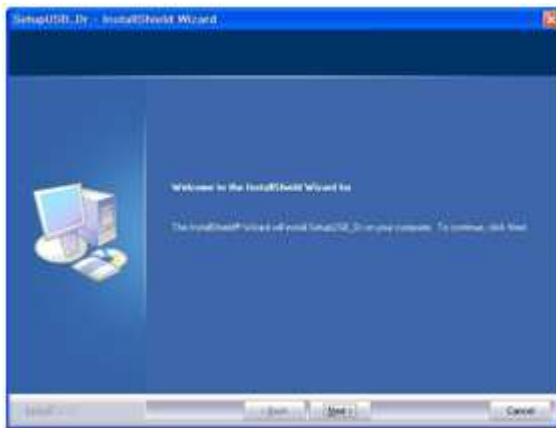
CodeGen32 CodeGen32 PC

1.2.1

" Yes"

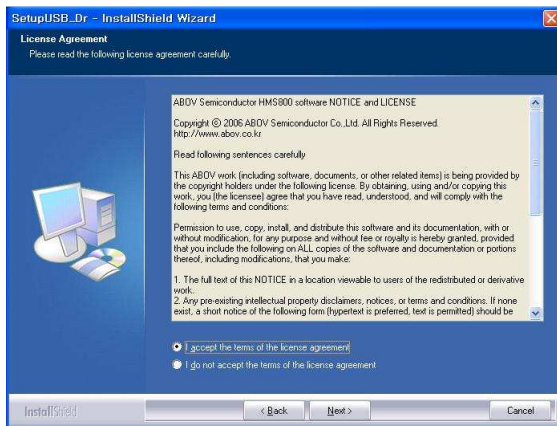


" Next"

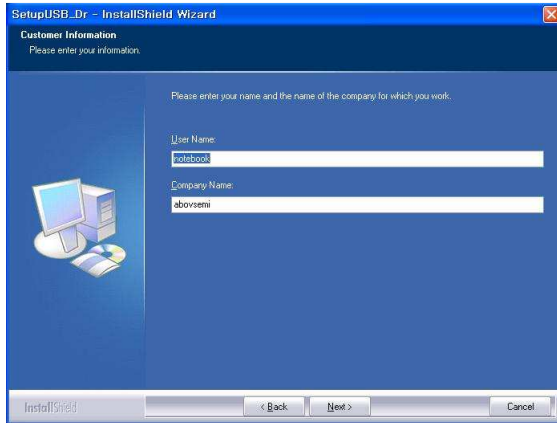


" I accept the items of the license agreement"

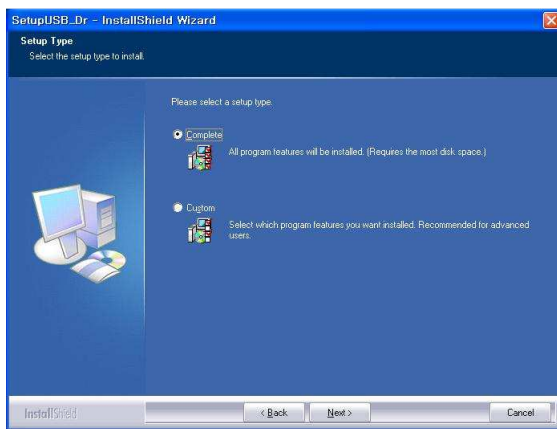
" Next"



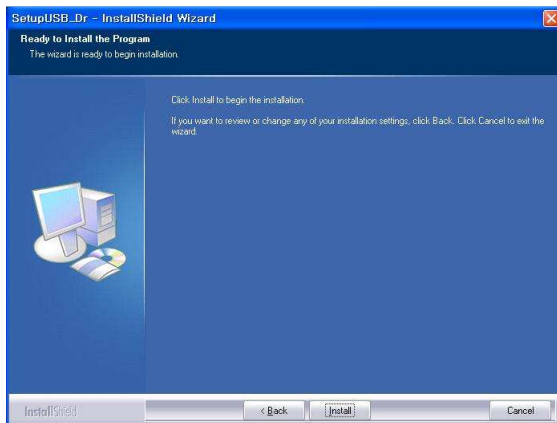
" Next"



“ Complete” “ Next”



“ Install”



“ Finish”

2 CodeGen32 32

- CodeGen32
- CodeGen32



ABOV CodeGen32 ()

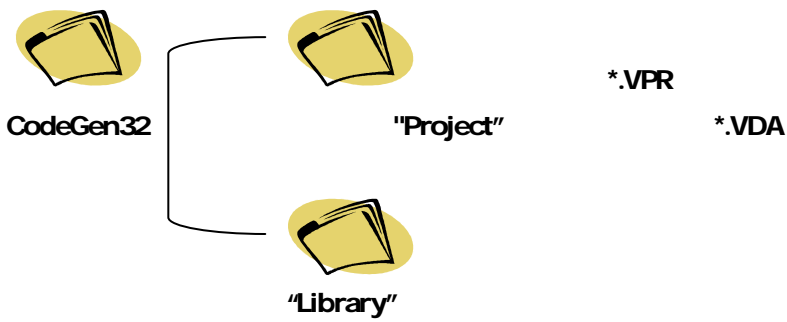
2.1 CodeGen32

CodeGen32 " Project" " Project" CodeGen32

CodeGen32 *.VPR *.VDA
*.VPR

ABOV-CodeGen32-A3x V1.000.00 20160422
AC33M8128 MQFP 80

*.VDA
*Clock 1
*GPIO-A 1
*GPIO-B 1:
u02 000000...00000000
u03 000000...00000000
w00 040000...CA000000
*.VPR *.VDA



2.2 CodeGen32

CodeGen32

" Library"

" Library"

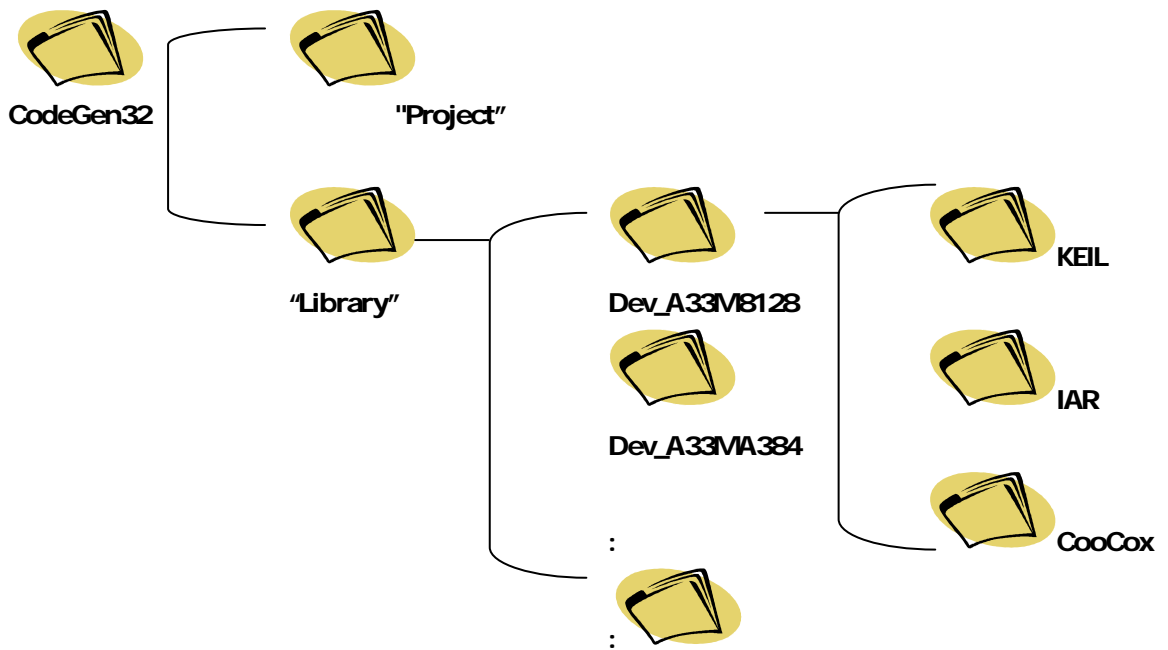
CodeGen32

library

-
-
-

CodeGen32

Library





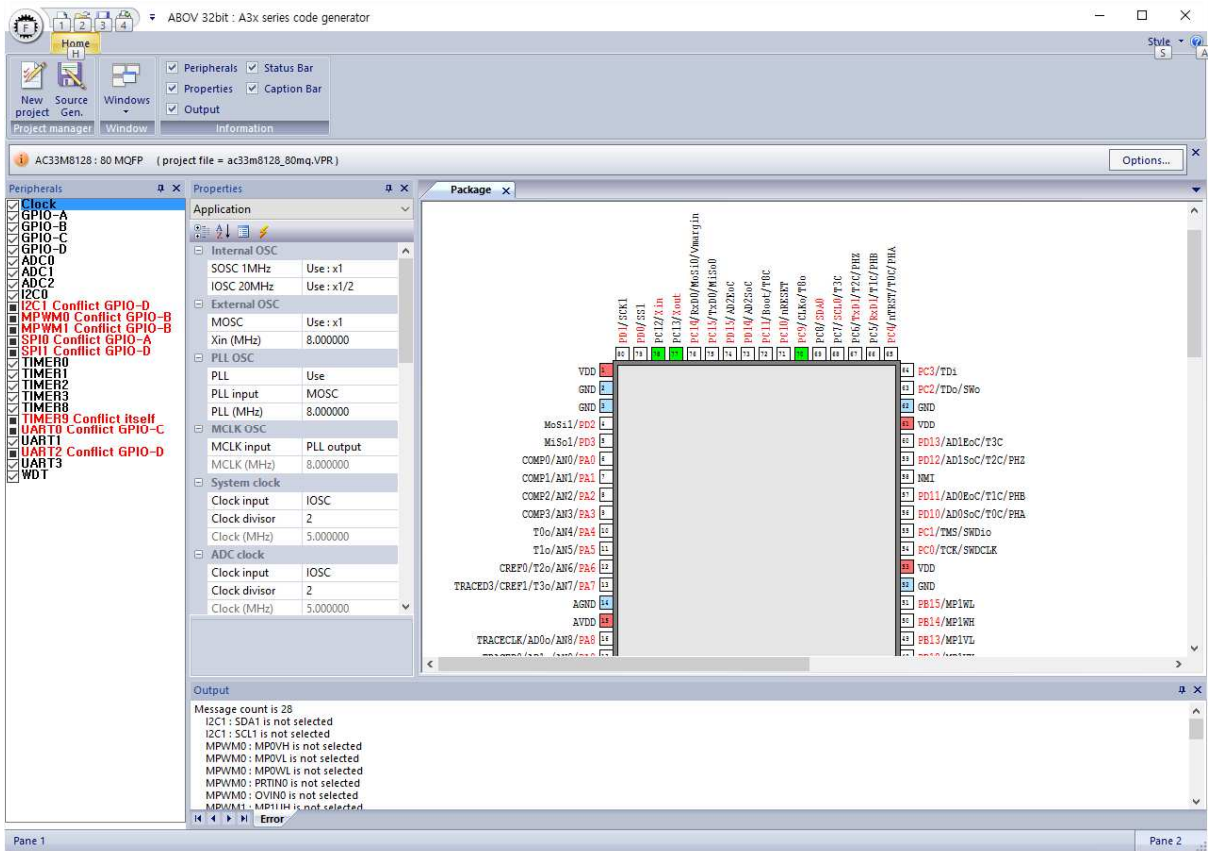
3 CodeGen32

- CodeGen32
-
-
-

3.1 CodeGen32

ABOV A3x

CodeGen32



3.1.1

- ABOV A3x C
- KEIL 2016
- *.uvproj
-
- C "main.c" "init.c" "peri.c"
- IAR CooCox
- CodeGen32
-
-
- CodeGen32

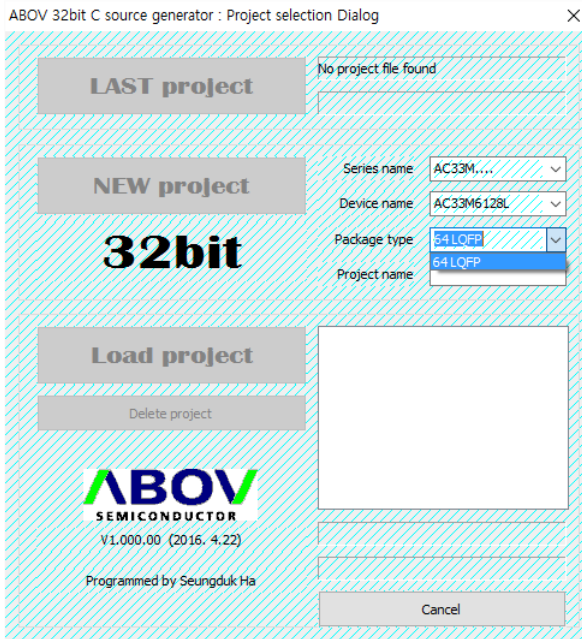
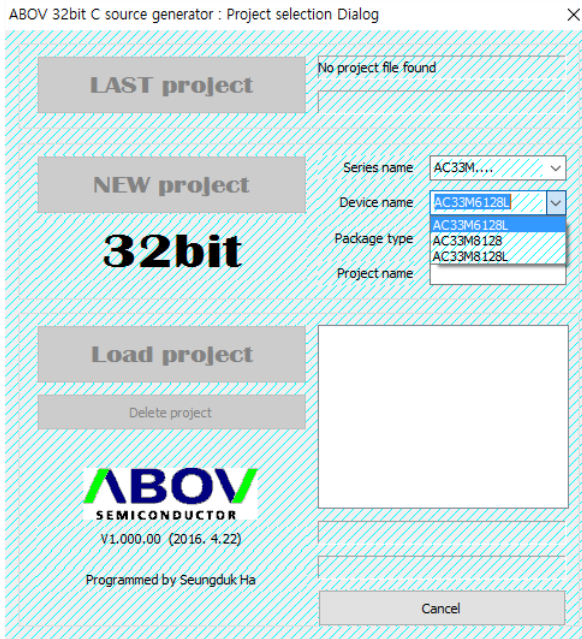
3.1.2

CodeGen32

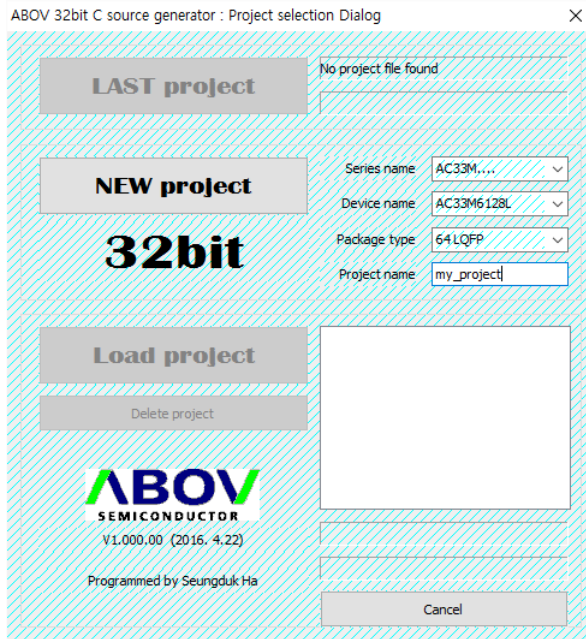


CodeGen32





“ New project”



CodeGen32



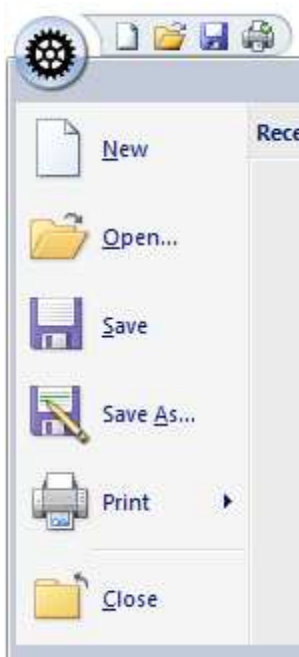
- “ LAST project”
- “ New project”
-
-

CodeGen32

The screenshot displays the CodeGen32 application window for an ABOV 32-bit A3x series code generator. The interface is divided into several panes:

- Peripherals:** A list of peripherals with checkboxes. Conflicts are highlighted in red:
 - i2c1 Conflict GPIO-D
 - MPWM0 Conflict GPIO-B
 - MPWM1 Conflict GPIO-B
 - SPI0 Conflict GPIO-A
 - SPI1 Conflict GPIO-D
 - TIMER9 Conflict itself
 - UART2 Conflict GPIO-C
 - UART3 Conflict GPIO-D
- Properties:** Configuration for the selected peripheral (Application).
 - Internal OSC: SOSC 1MHz (Use: x1), IOSC 20MHz (Use: x1/2)
 - External OSC: MOSC (Use: x1), Xin (MHz): 8.000000
 - PLL OSC: PLL (Use), PLL input: MOSC, PLL (MHz): 8.000000
 - MCLK OSC: MCLK input: PLL output, MCLK (MHz): 8.000000
 - System clock: Clock input: IOSC, Clock divider: 2, OSC: 5.000000
- Package:** A pinout table for the package. A red speech bubble points to the top right corner of this table.

PC3/TDI	14
PC2/TDo/SwO	15
GND	16
GND	17
VDD	18
PC13/AD1EoC/T3C	19
PC12/AD1SoC/T2C/BH2	20
NMI	21
PC11/AD0EoC/T1C/BH1	22
PC10/AD0SoC/T0C/PHA	23
PC1/TMS/SWDIo	24
PC0/TCR/SWDClk	25
VDD	26
GND	27
PC15/MP1WL	28
PC14/MP1WH	29
PC13/MP1VL	30
PC12/MP1VH	31
- Output:** A list of messages, including:
 - Message count is 28
 - i2c1: SDA1 is not selected
 - i2c1: SCL1 is not selected
 - MPWM0: MPOVH is not selected
 - MPWM0: MPOVL is not selected
 - MPWM0: MPOVH is not selected
 - MPWM0: PRTINO is not selected
 - MPWM0: OVINO is not selected
 - MPWM1: MP11H is not selected



3.3

CodeGen32

2



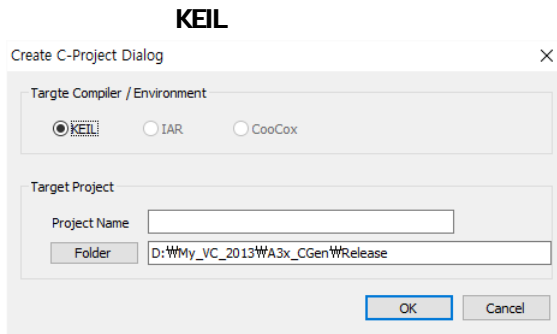
3.3.1 New project

LAST project NEW project



3.3.2 Source Gen CodeGen32

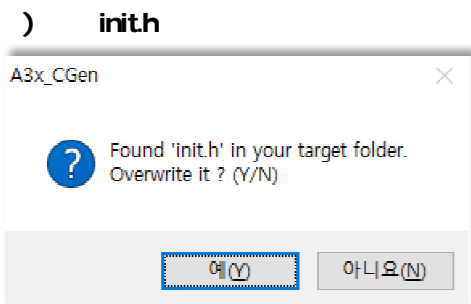
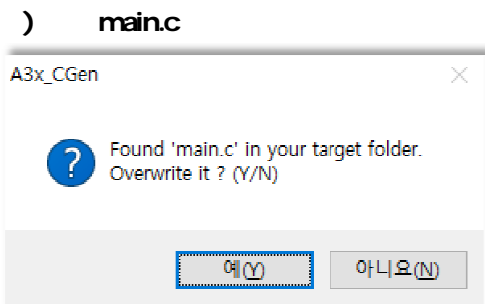
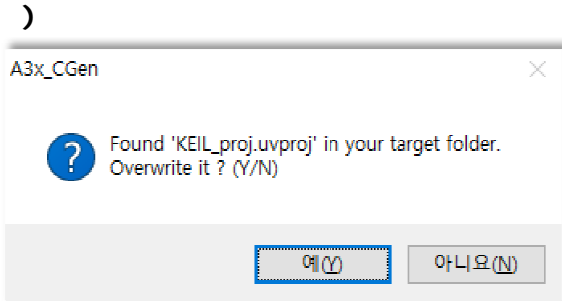
C

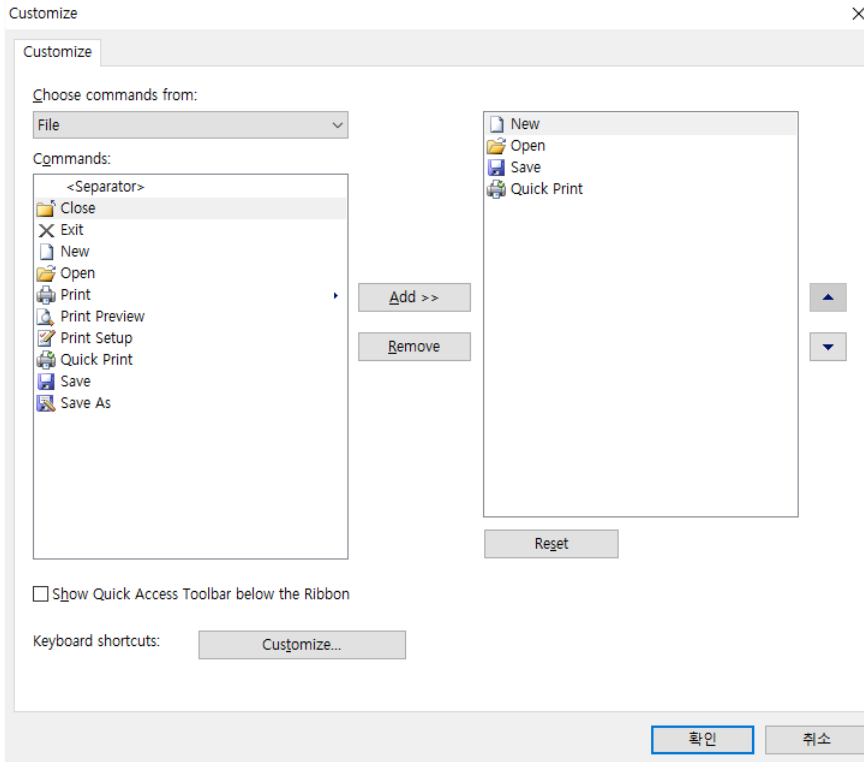


CodeGen32

-
- inith** :
- peri.h** :
-
- init.c** :
- main.c** : **main(void)**
- peri.c** :
-
- KEIL project file**
- KEIL_proj.uvproj** :
- CodeGen32**
-
- Driver files**
-
- Sample files**
-
- Documents**

"init.c", "peri.h", "peri.c"

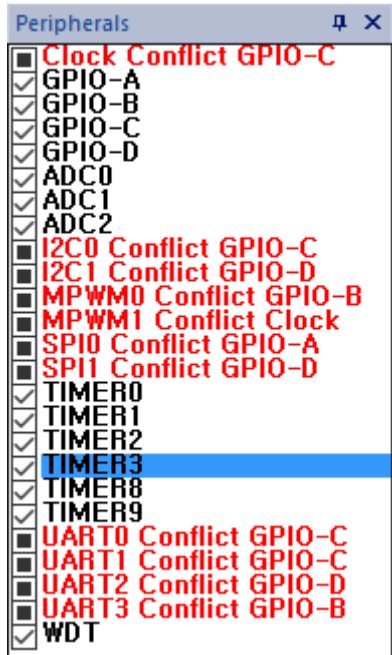




3.4

CodeGen32 3

3.4.1 Peripherals



3.4.2 Properties

CodeGen32

-
-
-
-

Control #1 reg.	
ADC trigger so...	Disable
Initial output va...	Low
Clock source	PCLK/2
Clear capture at	Rising edge
Timer mode	Periodic

Prescaler reg.	
divisor(1~64)	1

General A reg.	
Period (ms)	0.004000
PWM duty (ms)	0.004000
OneShot delay ...	0.004000



66MHz UART 9600bps CodeGen32

Baudrate, Time	
Baudrate	9600
Wait value	0

9600bps

9600.129bps @ 66MHz

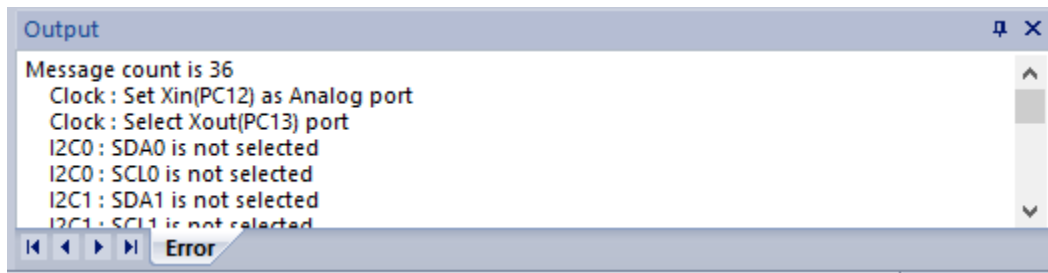
9600bps 66MHz

Baudrate, Time	
Baudrate	9600.129233
Wait value	0

CodeGen32

CodeGen32

3.4.3 Output



The screenshot displays the ABOV CodeGen32 software interface for the AC33M8128L: 80 LQFP (project file = AC33M8128L_80LQ.VPR). The interface is divided into several panes:

- Peripherals:** A tree view on the left lists various peripherals such as GPIO-A, GPIO-B, GPIO-C, GPIO-D, ADC0, ADC1, ADC2, I2C0, I2C1, MPWM0, MPWM1, SPI0, SPI1, TIMER0 through TIMER9, UART0 through UART3, and WDT. Several items are marked with red 'X' icons, indicating conflicts.
- Properties:** A central pane shows the configuration for the selected peripheral (Application). It includes sections for:
 - Internal OSC:** SOSC 1MHz (Use: x1), IOSC 20MHz (Use: x1).
 - External OSC:** MOSC (Use: x1), Xin (MHz) 8.000000.
 - PLL OSC:** PLL (Use), PLL input (MOSC), PLL (MHz) 64.000000.
 - MCLK OSC:** MCLK input (PLL output), MCLK (MHz) 64.000000.
 - system clock source (MCCR1):** Clock input (MOSC), Clock divisor (4), Clock (MHz) 2.000000.
 - Trace clock (MCCR1):** Clock input (IOSC), Clock divisor (1), Clock (MHz) 20.000000.
 - MPWM0 clock (MCCR2):** Clock input (SOSC).
- Package:** A central pane shows the selected package: C33M8128L, Package: 80LQFP. It displays a pinout diagram with various pins labeled, such as VDD, GND, I2C0, I2C1, SPI0, SPI1, UART0, UART1, UART2, UART3, and various ADC and timer pins.
- Code:** A right-hand pane shows the generated C code for the peripheral initialization. The code includes:


```

// Used ABOV Semiconductor code generator
// Initialize each peripherals
//
#include "init.h"
#include "peri.h"

//-----
void init_GPIO(void)
{
    PORT_ACCESS_EN();

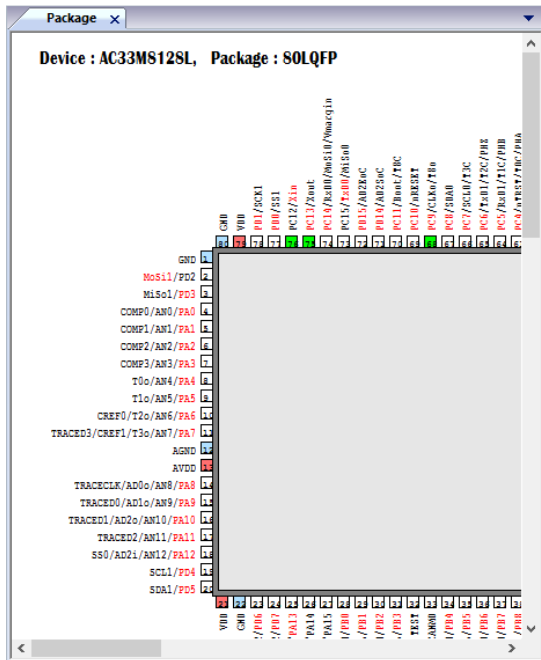
    // GPIO-A -----
    SCU->PERA |= 0x00000100;
    SCU->PCER1 |= 0x00000100;

    PCA->MR = 0x50000000;
    PCA->CR = 0x00000000;
    PCA->PCR = 0x00000001;
    PCA->DER = 0x00000000;
    PCA->IER = 0x00000004;
    PCA->ICR = 0x00000004;

    NVIC_SetPriority(GPIOAQ_IRQn, ((0x01<1)|0x01));
    NVIC_EnableIRQ(GPIOAQ_IRQn);
    __enable_irq();

    // GPIO-B -----
    SCU->PERB |= 0x00000200;
    SCU->PCER1 |= 0x00000200;

    PCB->MR = 0x00000000;
    PCB->CR = 0x00000000;
            
```
- Output:** A bottom pane shows the output of the code generation process, including messages like "Message count is 35" and "Clock: Set Xin(PC12) as Analog port".



Pin color	Meaning
Red	It is a power source pin.
Blue	It is a ground pin.
White	Port, except power (Vcc, Gnd)
Green	It is associated pin with the selected peripheral.

Pin5 : PA1/AN1/COMP1

PA1

'c' 'h'

```

//-----
// Used ABOV Semiconductor code generator
// Initialize each peripherals
//-----
#include "init.h"
#include "peri.h"

//-----
void init_GPIO(void)
{
    PORT_ACCESS_EN();

    // GPIO-A -----
    SCU->PER1 |= 0x00000100;
    SCU->PCER1 |= 0x00000100;

    PCA->MR = 0x50000000;
    PCA->CR = 0x00000000;
    PCA->PCR = 0x00000001;
    PCA->DER = 0x00000000;
    PCA->IER = 0x00000004;
    PCA->ICR = 0x00000004;

    NVIC_SetPriority(GPIOAQ_IRQn, ((0x01<<1) | 0x01));
    NVIC_EnableIRQ(GPIOAQ_IRQn);
    __enable_irq();

    // GPIO-B -----
    SCU->PER1 |= 0x00000200;
    SCU->PCER1 |= 0x00000200;

    PCB->MR = 0x00000000;
    PCB->CR = 0x00000000;
    
```

```

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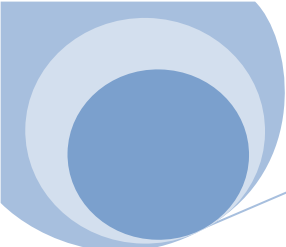
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Developer :

- ABOV VPE32 software : Seungduk Ha
- Debugging : Sungje Park
    
```

TAB 4



ABOV CodeGen32 ()

4

- CodeGen32 generating files
- CodeGen32 coping library

4.1

CodeGen32

4.1.1 init.h

KEIL

```

) AC33M8128      inith
//=====
// Used ABOV Semiconductor code generator
// Device name : AC33M8128
//=====
#include "AC33Mx128.h"
#include "system_AC33Mx128.h"
#include "aa_types.h"
#include "ac33mx128_adc.h"
#include "ac33mx128_afe.h"
#include "ac33mx128_dmac.h"
#include "ac33mx128_gpio.h"
#include "ac33mx128_i2c.h"
#include "ac33mx128_libcfg.h"
#include "ac33mx128_mpwmm.h"
#include "ac33mx128_pcu.h"
#include "ac33mx128_pwr.h"
#include "ac33mx128_scu.h"
#include "ac33mx128_spi.h"
#include "ac33mx128_timer.h"
#include "ac33mx128_uart.h"
#include "ac33mx128_wdt.h"
#include "debug_frmwrk.h"
#include "slib.h"

#define _ADC
#define _AFE
#define _DMAC
#define _GPIO
#define _I2C
#define _MPWM
#define _SPI
#define _TIMER
#define _UART
#define _WDT

void init(void);

```

4.1.2 peri.h

CodeGen32

KEIL

```
) AC33M8128 peri.h
//=====
// Used ABOV Semiconductor code generator
// Define initialize function of each peripherals
//=====

void init_GPIO(void);
void GPIOAQ_IRQHandler(void);
void GPIOCE_IRQHandler(void);
void init_clock(void);
void init_ADC_0(void);
void init_ADC_1(void);
void init_ADC_2(void);
void init_I2C_0(void);
void init_I2C_1(void);
void init_MPWM_0(void);
void init_MPWM_1(void);
void init_SPI_0(void);
void init_SPI_1(void);
void init_TIMER_0(void);
void init_TIMER_1(void);
void init_TIMER_2(void);
void init_TIMER_3(void);
void init_TIMER_8(void);
void init_TIMER_9(void);
void init_UART_0(void);
void init_UART_1(void);
void init_UART_2(void);
void init_UART_3(void);
void init_WDT(void);
```


4.2

CodeGen32

4.2.1 init.c

KEIL

```
) AC33M8128      initc
//=====
// Used ABOV Semiconductor code generator
// Basic initialize function
//=====
#include "init.h"
#include "peri.h"

void init(void)
{
    init_GPIO();
    init_clock();
    init_ADC_0();
    init_ADC_1();
    init_ADC_2();
    init_I2C_0();
    init_I2C_1();
    init_MFWM_0();
    init_MFWM_1();
    init_SPI_0();
    init_SPI_1();
    init_TIMER_0();
    init_TIMER_1();
    init_TIMER_2();
    init_TIMER_3();
    init_TIMER_8();
    init_TIMER_9();
    init_UART_0();
    init_UART_1();
    init_UART_2();
    init_UART_3();
    init_WDT();
}
```

4.22 main.c

C c main

Main

- c main
- MCU main

CodeGen32 main.c

main.c

CodeGen32

) AC33M8128 main.c

```
//=====
// Used ABOV Semiconductor's code generator
// Device name : AC33M8128
//=====
#include "init.h"

int main()
{
    WDT->CON = 0; // disable watch-dog timer
    init();      // initialize selected peripherals here

    while(1) {
        // TOTO : Fill your code
    };
    return 0;
}
```

4.23 peri.c

KEIL

```
) AC33M8128 peri.c
//=====
// Used ABOV Semiconductor code generator
// Initialize each peripherals
//=====
#include "init.h"
#include "peri.h"

//-----
void init_GPIO(void)
{
    PORT_ACCESS_EN();

    // GPIO-A -----
    SCU->PER1 |= 0x00000100;
    SCU->PCER1 |= 0x00000100;

    PCA->MR = 0x50000000;
    PCA->CR = 0x00000000;
    PCA->PCR = 0x00000001;
    PCA->DER = 0x00000000;
    PCA->IER = 0x00000004;
    PCA->ICR = 0x00000004;

    NVIC_SetPriority(GPIOA0_IRQn, ((0x01<<1)|0x01));
    NVIC_EnableIRQ(GPIOA0_IRQn);
    __enable_irq();

    // GPIO-B -----
    SCU->PER1 |= 0x00000200;
    SCU->PCER1 |= 0x00000200;
```

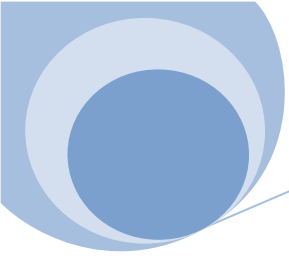
4.3

CodeGen32

CodeGen32

KEIL

Core	2016-06-23 오전 9:33
Doc	2016-06-23 오전 9:33
Drivers	2016-06-23 오전 9:33
Examples	2016-06-23 오전 9:33
Flashloader	2016-06-23 오전 9:33
Ini	2016-06-23 오전 9:33
SVD	2016-06-23 오전 9:33



ABOV CodeGen32 ()