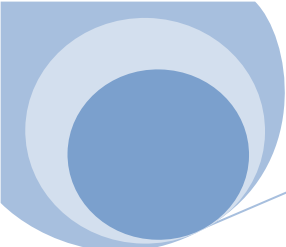




ABOV
CodeGen32
(Code Generator)
USER GUIDE

Release V1.00000



ABOV CodeGen32 ()

@ ABOV 2013 . ABOV

Release information

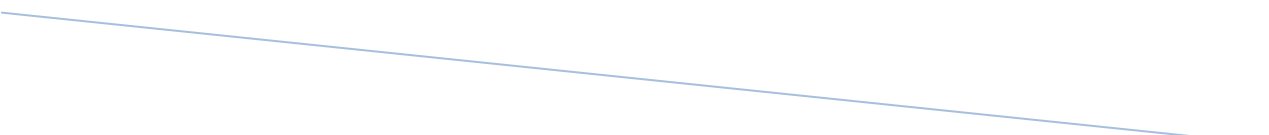
Version	Date	Change
V1.00000	July 2016	First release

. ABOV

ABOV

ABOV

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

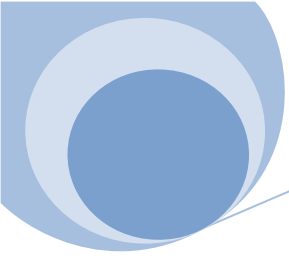


ABOV CodeGen32 ()

Chapter 1		5
1.1		6
1.1.1		6
1.1.2		6
1.2		7
1.2.1		8
Chapter 2	CodeGen32	9
2.1	CodeGen32	10
2.2	CodeGen32	11
Chapter 3	CodeGen32	12
3.1	CodeGen32	13
3.1.1		13
3.1.2		14
3.2		18
3.3		19
3.3.1	New project :	19
3.3.2	Source Gen :	20
3.3.3	Windows :	22
3.3.4	Information :	22
3.4		24
3.4.1	Peripherals pane :	24
3.4.2	Properties pane :	25
3.4.3	Output pane :	26
3.5		27
3.5.1		28
3.5.2		29

Chapter 4

	30
4.1	31
4.1.1 Inith	31
4.1.2 Peri.h	32
4.2	33
4.2.1 Initc	33
4.2.2 main.c	34
4.2.3 Peri.c	35
4.3	36



ABOV CodeGen32 ()

1

•
•

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

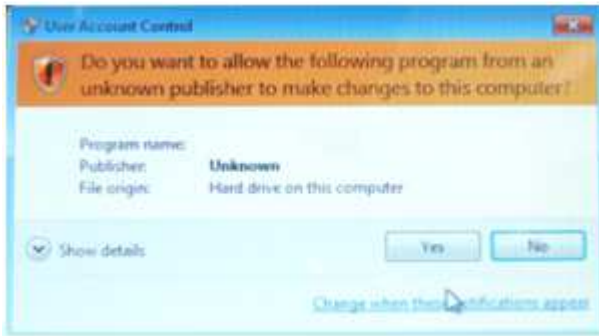
ABOV CodeGen32 <http://www.abov.co.kr>

ABOV CodeGen32 MCU ABOV

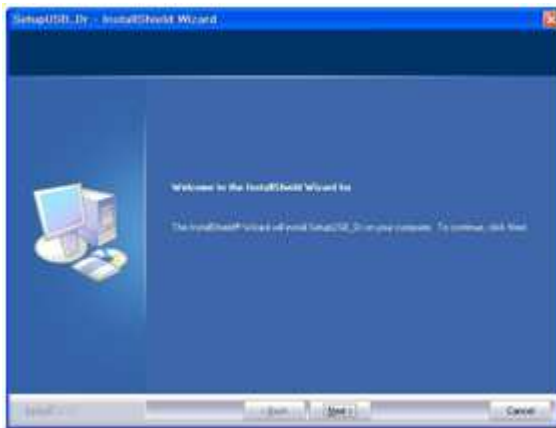
CodeGen32 CodeGen32 PC

1.2.1

" Yes"

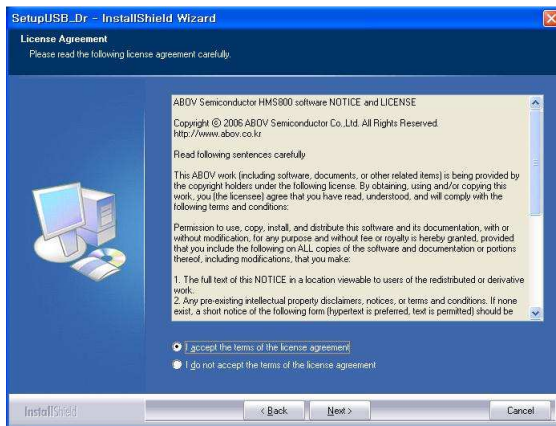


" Next"

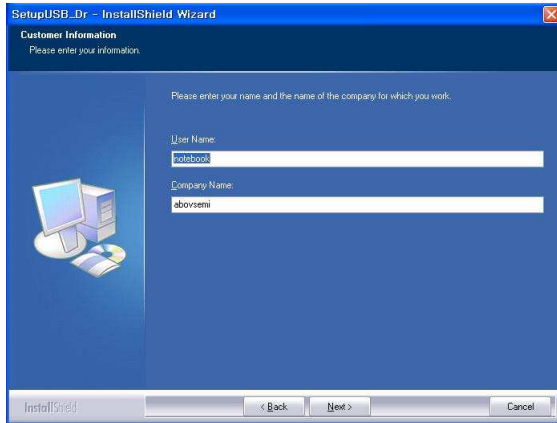


" I accept the items of the license agreement"

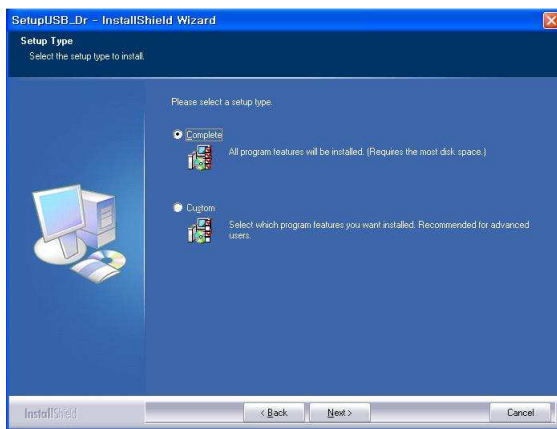
" Next"



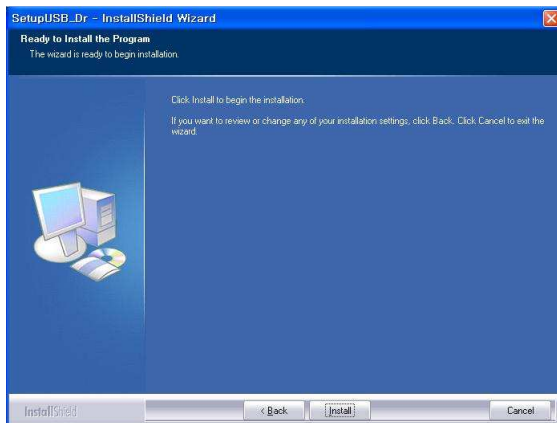
" Next"



“ Complete” “ Next”



“ Install”



“ Finish”

2 CodeGen32 32

- CodeGen32
- CodeGen32



ABOV CodeGen32 ()

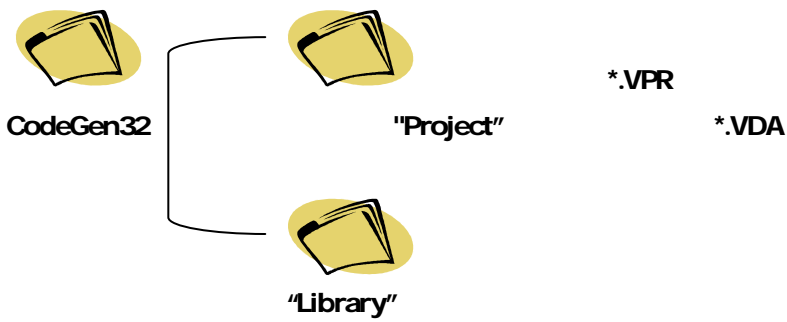
2.1 CodeGen32

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"

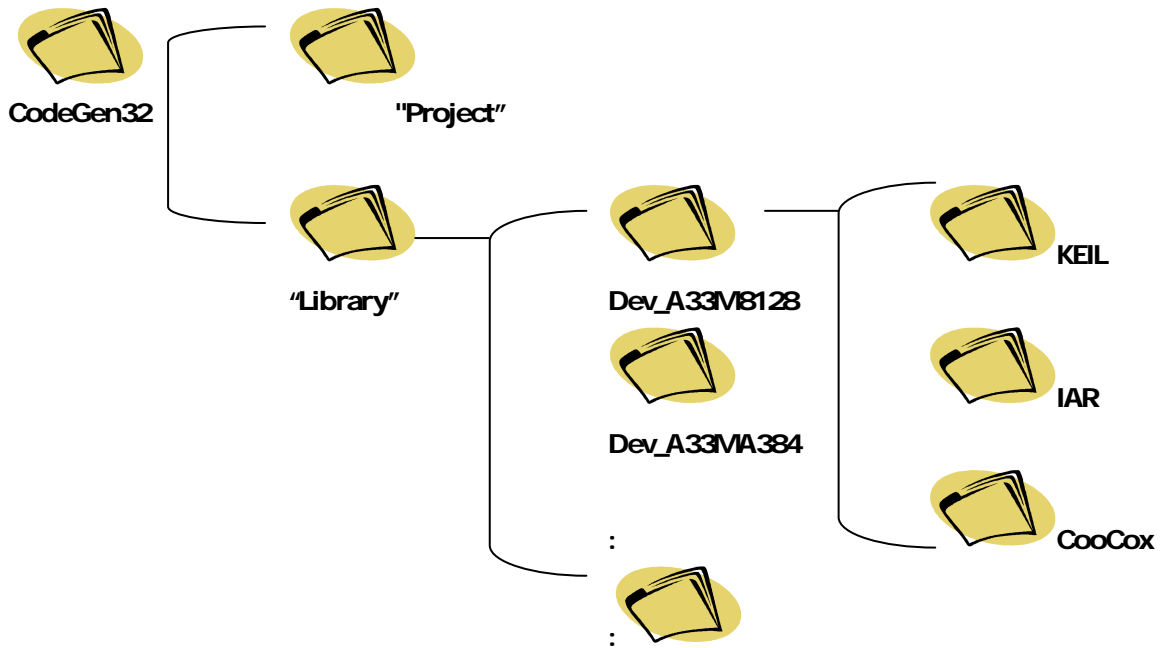
CodeGen32

library

-
-
-

CodeGen32

Library





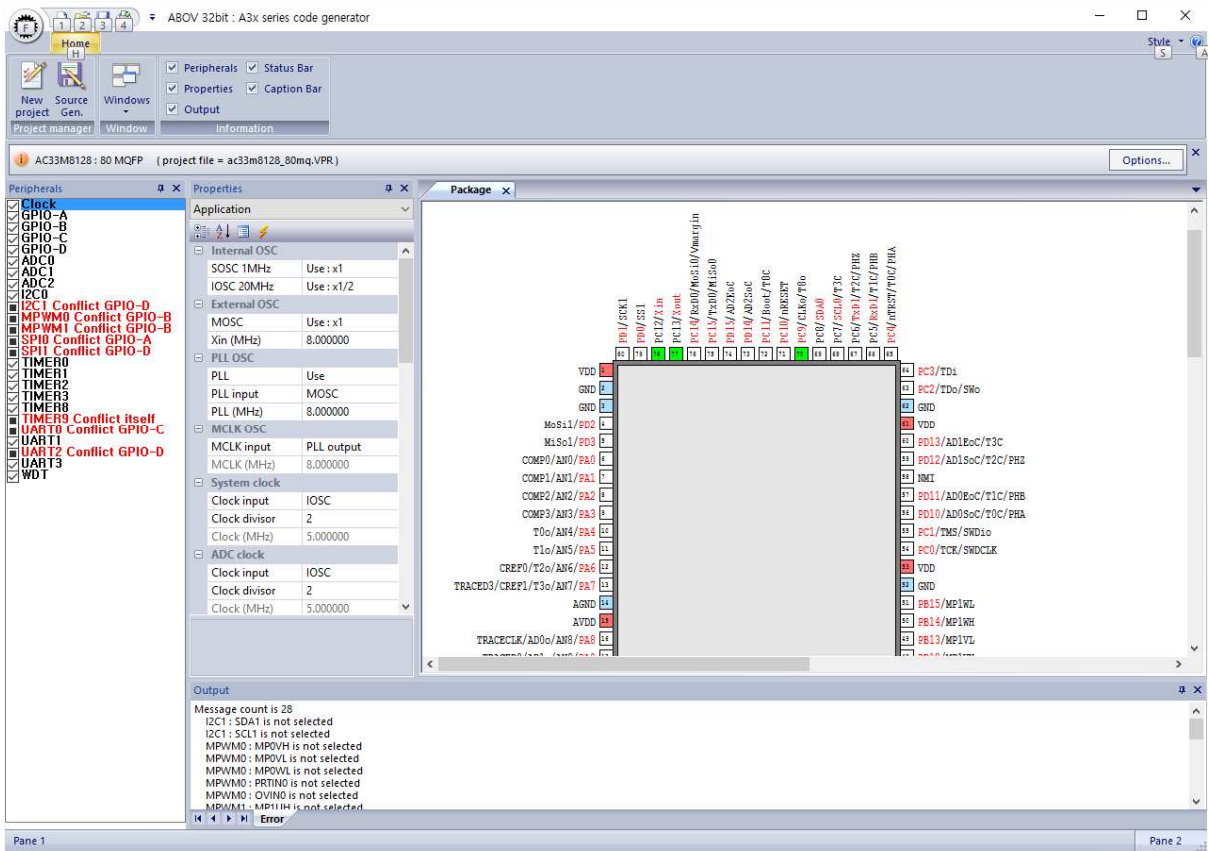
3 CodeGen32

- 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

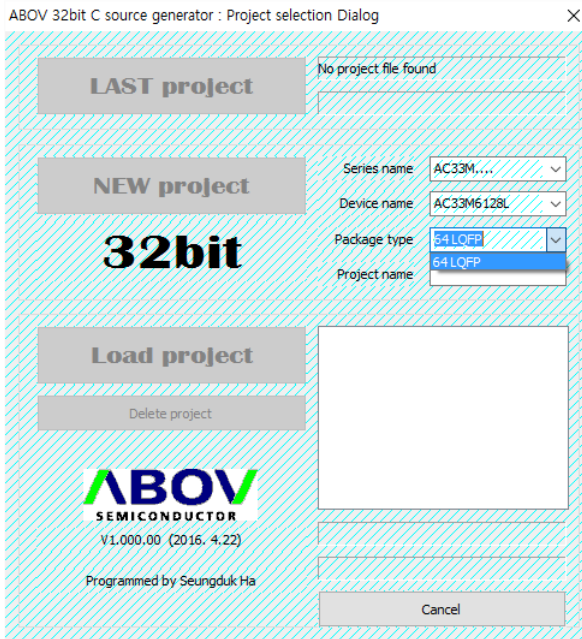
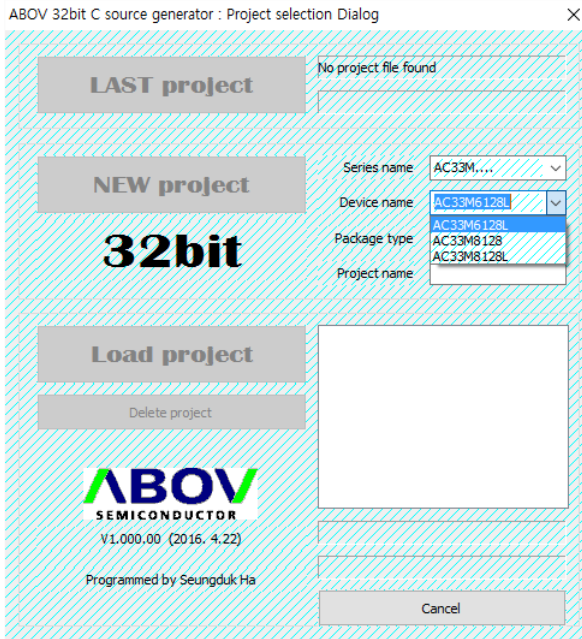
3.1.2

CodeGen32



CodeGen32





" New project"



CodeGen32



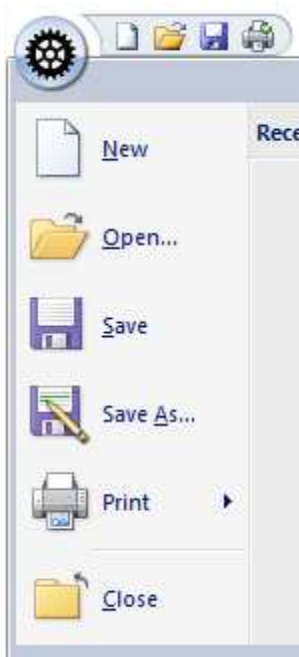
- " LAST project"
- " New project"
-
-

CodeGen32

The screenshot displays the CodeGen32 application window for an AC3M8128: 80 MQFP project. The interface is divided into several panes:

- Peripherals:** Lists various peripherals with checkboxes. Several are marked with red text indicating conflicts: **i2c1 Conflict GPIO-D**, **MPWM0 Conflict GPIO-B**, **MPWM1 Conflict GPIO-B**, **SPI0 Conflict GPIO-A**, **SPI1 Conflict GPIO-D**, **UART2 Conflict GPIO-C**, and **UART3 Conflict GPIO-D**.
- Properties:** Shows configuration for the selected peripheral (Application). It includes sections for Internal OSC (SOSC 1MHz, IOSC 20MHz), External OSC (MOSC), PLL OSC (PLL), MCLK OSC (MCLK), and System clock (Clock input, Clock divider, OSC).
- Package:** A pinout table for the AC3M8128 package. It lists pins such as VDD, GND, MosS1, M1So1, COMP0, COMP1, COMP2, COMP3, TIO, TIO, TRACE0, TRACE1, TRACE2, TRACE3, AGND, AVDD, and TRACECLK. Each pin is associated with a specific peripheral or function.
- Output:** Displays error messages: "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", and "MPWM1: MPVHH is not selected".

Four red speech bubbles are overlaid on the image, pointing to the conflict messages, the Package pinout table, and the Output error messages.



3.3

CodeGen32

2

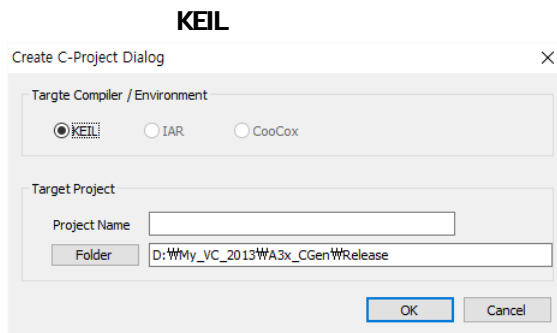


3.3.1 New project

LAST project NEW project



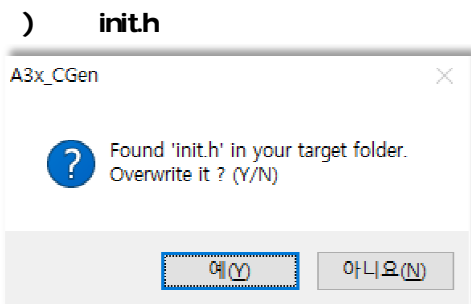
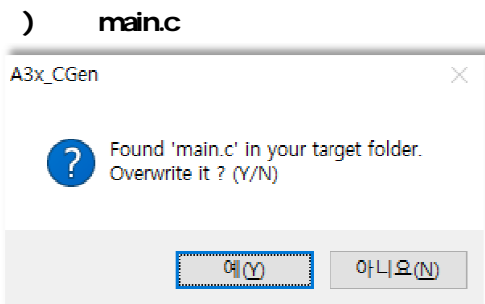
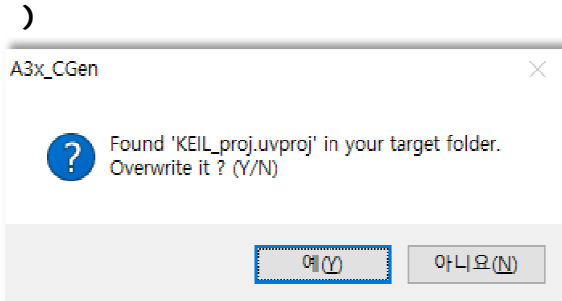
3.3.2 Source Gen CodeGen32 C



CodeGen32

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

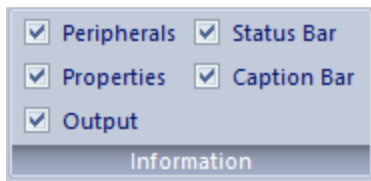
"init.c", "peri.h", "peri.c"



3.3.3 Windows



3.3.4 Information



AC33M6128: 80 MQFP (project file = ac33m6128_80mq.VPR)

Peripherals

- GPIO-A
- GPIO-B
- GPIO-C
- GPIO-D
- ADC0
- ADC1
- ADC2
- I2C0
- I2C1 Conflict GPIO-D
- MPWM0 Conflict GPIO-B
- MPWM1 Conflict GPIO-B
- SPI0 Conflict GPIO-A
- SPI1 Conflict GPIO-D
- TIMER0
- TIMER1
- TIMER2
- TIMER3
- TIMER8
- TIMER9 Conflict itself
- UART0 Conflict GPIO-C
- UART1
- UART2 Conflict GPIO-D
- UART3
- WDT

Properties

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 divisor 2
 - Clock (MHz) 5.000000
- ADC clock
 - Clock input
 - Clock divisor

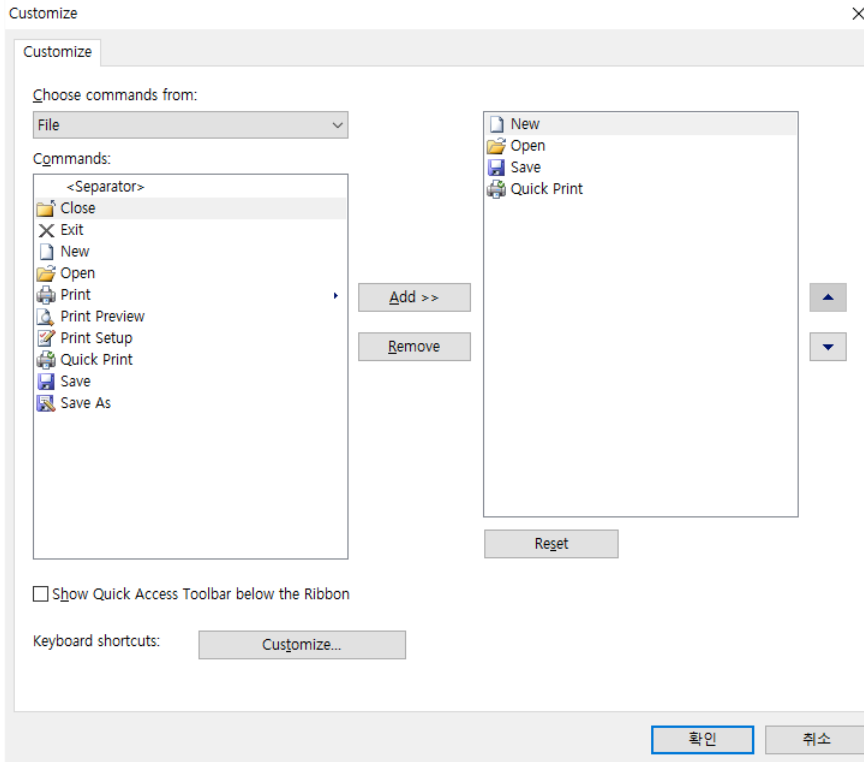
Package

VDD	P03/TD1
GND	P02/TDo/SWo
GND	GND
GND	VDD
MsSo1/P02	P013/AD1EoC/T3C
MsSo1/P03	P012/AD1SoC/T2C/P02
COMP0/AN0/P00	P011/AD0BoC/T1C/P00
COMP1/AN1/P01	P010/AD0SoC/T0C/P00
COMP2/AN2/P02	P01/TMS/SWDio
COMP3/AN3/P03	P00/TCR/SWDCLK
T0o/AN4/P04	VDD
T1o/AN5/P05	GND
CREP0/T2o/AN6/P06	P015/MP1WL
TRACED3/CREP1/T3o/AN7/P07	P014/MP1WH
AGND	P013/MP1VL
AVDD	P00/ANoC
TRACCLK/ADDo/AN8/P08	

Output

Message count is 28

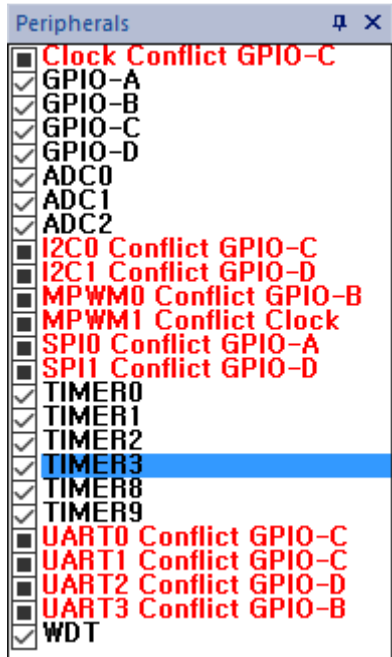
- I2C1: SDA1 is not selected
- I2C1: SCL1 is not selected
- MPWM0: MPOVH is not selected
- MPWM0: MPOVL is not selected
- MPWM0: MPOVH is not selected
- MPWM0: PRTINO is not selected
- MPWM0: OVINO is not selected
- MPWM1: MP11H4 is not selected



3.4

CodeGen32 3

3.4.1 Peripherals



3.4.2 Properties

CodeGen32

-
-
-
-

The screenshot shows the 'Properties' window for CodeGen32. It has a title bar with a maximize icon and a close icon. Below the title bar is a dropdown menu labeled 'Application'. There are four icons: a list icon, a zoom icon, a refresh icon, and a lightning bolt icon. The main area contains several expandable sections:

- Control #1 reg.** (expanded):

ADC trigger so...	Disable
Initial output va...	Low
Clock source	PCLK/2
Clear capture at	Rising edge
Timer mode	Periodic
- Prescaler reg.** (expanded):

divisor(1~64)	1
---------------	---
- General A reg.** (expanded):

Period (ms)	0.004000
PWM duty (ms)	0.004000
OneShot delay ...	0.004000



66MHz UART 9600bps CodeGen32

The screenshot shows the 'Properties' window for CodeGen32. It has a title bar with a maximize icon and a close icon. Below the title bar is a dropdown menu labeled 'Application'. There are four icons: a list icon, a zoom icon, a refresh icon, and a lightning bolt icon. The main area contains several expandable sections:

- INT. enable reg.** (collapsed)
- Line control reg.** (collapsed)
- Data control reg.** (collapsed)
- Baudrate, Time** (expanded):

Baudrate	9600
Wait value	0

9600bps

9600.129bps @ 66MHz

9600bps 66MHz

The screenshot shows the 'Properties' window for CodeGen32. It has a title bar with a maximize icon and a close icon. Below the title bar is a dropdown menu labeled 'Application'. There are four icons: a list icon, a zoom icon, a refresh icon, and a lightning bolt icon. The main area contains several expandable sections:

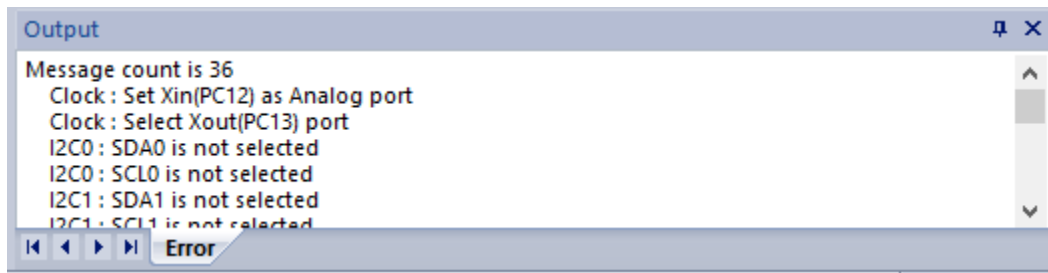
- INT. enable reg.** (collapsed)
- Line control reg.** (collapsed)
- Data control reg.** (collapsed)
- Baudrate, Time** (expanded):

Baudrate	9600.129233
Wait value	0

CodeGen32

CodeGen32

3.4.3 Output



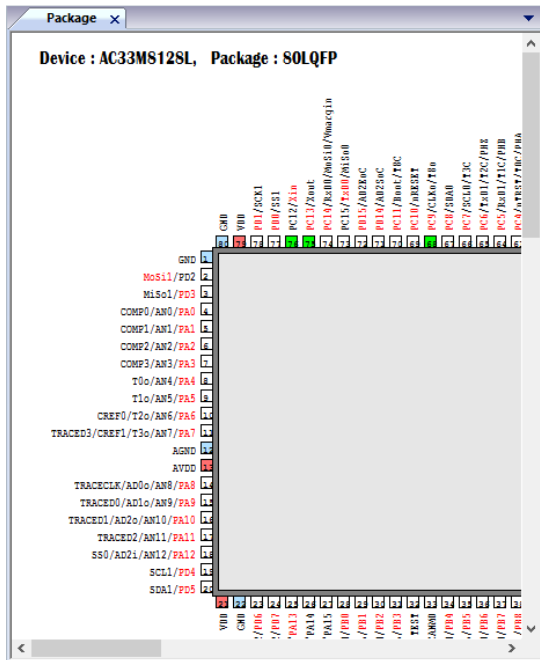
The screenshot shows a window titled "Output" with a scrollable list of messages. The messages are as follows:

```
Message count is 36
Clock : Set Xin(PC12) as Analog port
Clock : Select Xout(PC13) port
I2C0 : SDA0 is not selected
I2C0 : SCL0 is not selected
I2C1 : SDA1 is not selected
I2C1 : SCL1 is not selected
```

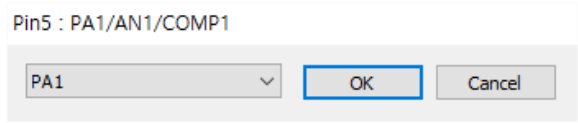
At the bottom of the window, there is a status bar with navigation icons and a red "Error" indicator.

The screenshot displays the ABOV CodeGen32 software interface for the AC33M8128L: 80 LQFP package. 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. Some items are marked with red 'Conflict' labels.
- Properties:** A central pane shows configuration options for the selected peripheral (Application). It includes sections for Internal OSC (SOSC, IOSC), External OSC (MOSC), PLL (PLL input, PLL output), MCLK OSC (MCLK input, MCLK output), system clock source (MCCR1), Trace clock (MCCR1), and MPWM0 clock (MCCR2).
- Package:** A diagram in the center shows the pin configuration for the C33M8128L, Package: 80LQFP, with pins numbered 1 through 80.
- Code:** A pane on the right displays the generated C code for the peripheral initialization, including headers, includes, and the `void init_GPIO(void)` function. The code configures GPIO-A and GPIO-B, sets SCU registers, and enables interrupts.
- Output:** A pane at the bottom shows the output of the code generation process, including a message count and a list of selected and not-selected peripherals.



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.



'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;
    
```

```

NOTICE and LICENSE of ABOV Semiconductor VPE32 (ARM code gene

Copyright © 2016 ABOV Semiconductor Co.,Ltd. All Rights Reser
http://www.abov.co.kr

Read following sentences carefully

This ABOV work (including software, documents, or other relate

Permission to use, copy, install, and distribute this software

1. The full text of this NOTICE in a location viewable to user
2. Any pre-existing intellectual property disclaimers, notices

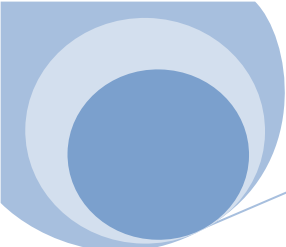
THIS SOFTWARE AND DOCUMENTATION IS PROVIDED "AS IS," AND COPYE
COPYRIGHT HOLDERS WILL NOT BE LIABLE FOR ANY DIRECT, INDIRECT,

The name and trademarks of copyright holders may NOT be used i

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;
```

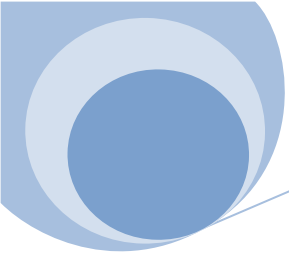
4.3

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 ()