

Supported devices: SM59XX series, SM59DXX series, SM59RXX series, SM39RXX series

## Table of contents

1. Introduction	3
2. Top view of MSM9059	3
3. ISP Introduction	4
4. Configuration for ISP	5
5. ISP entry mechanism	7
5.1 Hardware ISP	7
5.2 Software ISP	8
6. ICP introduction	10
7. Comparison between ISP and ICP	11
8. Setup USB driver	12
9. SMAP settings	13
9.1 To select writer	13
9.2 Automatic update for firmware	14
9.3 Manual update for firmware	16
10. User interface of SMAP	17
10.1 Operation modes	17
10.2 Connecting COM Port	17
10.3 Selecting program files	17
10.4 Configuration	18
10.4.1 Configuration option	18
10.4.2 Reading configuration	18
10.5 Buffer	19
11. ISP tutorials	20
11.1 Hardware connection modes	20
11.2 Manual recording	20
11.3 Power-on recording	21
11.4 User-defined recording	22
12. ICP tutorials	29
13. Off-line tutorials	30
13.1 Off-line ICP	30

Specifications subject to change without notice, contact your sales representatives for the most recent information. ISSFT-0041 1 Ver. A 2011/04



2 Off-line ISP
----------------



## 1 Introduction :

- 1.1 MSM9059 supports ICP and allows users to easily program a code into SM59DXX Series, SM39RXX Series and SM59RXX Series without having to program the ISP Service CODE into Target IC. The product also supports SM59XX Series, SM59DXX Series, SM39RXX Series and SM59RXX Series ISP.
- 1.2 Supportable interfaces: USB.

### 2 Top view of MSM9059:



Note: MSM9059 can't provide Vcc power to target board, but must connect to the target board's VCC.

Specifications subject to change without notice, contact your sales representatives for the most recent information. ISSFT-0041 3 Ver. A 2011/04



## **3 ISP introduction:**

ISP (In-system programming) is a function that allows user to directly update MCU code on system board. For example, With ISP firmware code residing in MCU, user can select RS-232 or USB to execute functions of erase and program for MCU. Before user uses ISP, it is essential to program an appropriate ISP firmware code to MCU with writer first.



ISP system diagram

SyncMOS provides application program and ISP source code for customer. ICs have included ISP code before shipping, exclusive of SM59R08/16A2 and SM39R02/04G1. For SM59R08/16A2 and SM39R02/04G1 ISP requirement, please contact SycMOS or agent.



## 4 Configuration for ISP:

If IC has been erased by universal programmer, please re-programming ISP code with universal programmer. The user should configure the MCU by the below steps:

4.1 SM59XX and SM59DXX series: Set N=1 with universal programmer.

Config Setting	×
0x0000h	○ N=8 (0×F000h)
Total 64K	<ul> <li>N=7 (0×F200h)</li> <li>N=6 (0×F400h)</li> <li>N=5 (0×F600h)</li> <li>N=4 (0×F800h)</li> <li>N=3 (0×FA00h)</li> </ul>
$ \uparrow \begin{array}{c} 1K \\ 1K \\ 1K \\ \leftarrow 4 \\ \leftarrow 2 \\ 1 \\ 0xEFEEh \end{array} $	<ul> <li>N=2 (0×FC00h)</li> <li>N=1 (0×FE00h)</li> <li>N=0 (0×FFFFh)</li> </ul>
Size = Num *512Byte	

4.2 SM59RXX (exclusive of SM59R08/16A2) and SM39RXX: Set N=2 with universal programmer.

Config Setting	
$ \begin{array}{c} 0x0000h\\ \hline Total\\ \uparrow \\ 1 \\ K \\ \hline 1 \\ K \\ \hline K \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ \hline 8 \\ \hline 8 \\ \hline 1 \\ \hline 8 \\ $	<ul> <li>N=16 (Final 4K)</li> <li>N=15 (Final 3.75K)</li> <li>N=14 (Final 3.25K)</li> <li>N=13 (Final 3.25K)</li> <li>N=12 (Final 3.25K)</li> <li>N=11 (Final 2.75K)</li> <li>N=10 (Final 2.75K)</li> <li>N=9 (Final 2.25K)</li> <li>N=9 (Final 2.25K)</li> <li>N=8 (Final 2K)</li> <li>N=7 (Final 1.75K)</li> <li>N=6 (Final 1.75K)</li> <li>N=6 (Final 1.25K)</li> <li>N=7 (Final 1.25K)</li> <li>N=4 (Final 1.25K)</li> <li>N=3 (Final 0.75K)</li> <li>N=2 (Final 0.5K)</li> <li>N=1 (Final 0.25K)</li> <li>N=0 (No Protect 1SP Code )</li> </ul>
OK Cancel	Read Config.

Specifications subject to change without notice, contact your sales representatives for the most recent information. ISSFT-0041 5 Ver. A 2011/04



4.3 Load ISP bin file according to your IC model, then execute programming action. ISP codes attach in SMAP setup directory "C:\Program Files\SyncMOS\SyncMOS Writers\SMAP\ISP".



## 5 ISP entry mechanism:

5.1 Hardware ISP: Using IC's internal hardware mechanism to enter the ISP code area.

IC model First address \$0000=FFH		P2.6/P2.7 = 0	P4.3 = 0	Rx inputs 2 clocks		
	Standard package					
SM5964	Yes	No	No	No		
SM5964A	Yes	Yes	Yes	No		
SM59128	Yes	Yes	Yes	No		
SM592654	Yes	Yes	Yes	No		
SM59D03/04G2	Yes	Yes	Yes	No		
SM59R08/16A2	No	No	No	No		
SM59R02/03/04A1	Yes	Yes	Yes	Yes		
SM59R04A2	Yes	Yes	Yes	Yes		
SM59R05/09/16A3	Yes	Yes	Yes	Yes		
SM59R05/09/16A5	Yes	Yes	Yes	Yes		
SM59R05/09/16G6	Yes	Yes	Yes	Yes		
SM59R01/02G1	Yes	Yes	Yes	Yes		
Low pin count package						
SM39R20/4051	Yes	No	P1.5 = 0	Yes		
SM39R02/04G1	Yes	No	P1.5 = 0	Yes		
SM39R08/12/16A2	Yes	Yes	P1.6 = 0	Yes		

5.1.1 "First address \$0000=FFH": Reset with first flash address blank (\$0000=#FFH) will load the PC counter with start address of ISP code area.

- 5.1.2 "P2.6/P2.7 = 0": User can force IC enter ISP code area by setting P2.6, P2.7 "active low" during reset period.
- 5.1.3 "P4.3 = 0": User can force IC enter ISP code area by setting P4.3 "active low" during reset period. The DIP package has no port 4, so QFP package and PLCC package support this function.
- 5.1.4 "Rx inputs 2 clocks": Rx will be detected the two clock signals during hardware reset period.



5.2 Software ISP: Execute jump instruction can load the start address of the ISP code area to PC counter. For example, insert Gotoisp.a51 in the project of Keil C, as shown in picture:



#### Gotoisp.a51:

}

; GOTOISP.A51
NAME GOTOISP
?PR?GotoIsp?GOTOISP SEGMENT CODE
PUBLIC GotoIsp
RSEG ?PR?GotoIsp?GOTOISP
USING 0
UNP 03E00H visn start address
END
User's program:
#include <h></h>
extern void GoToIsp(void);
if(P4.3 = = 0)
GoToIsp();
)



Note:

Please modify LJMP ISP start address according to IC model.

SM59XX Series and SM59DXX Series using Timer1 as baud rate generator in ISP service code. If using Timer2 as baud rate generator, please write T2CON = 0x00 before jumping ISP to avoid occupying UART port.



## 6 ICP introduction:

ICP(In Circuit Programming) is a method of directly programming. ISP must have ISP boot code in the IC, but ICP don't need ISP boot code because built-in the hardware structure of IC.



ICP diagram



## 7 Comparison between ISP and ICP:

Items	ISP	ICP(3-Wires interface)	ICP(2-Wires interface)
Supported IC	SM5964 SM5964A SM59128 SM592654 SM59D03/04G2 SM59R08/16A2 SM59R02/03/04A1 SM59R05/09/16A3 SM59R05/09/16A5 SM59R05/09/16G6 SM59R05/09/16G6 SM59R01/02G1 SM39R02/04G1 SM39R08/12/16A2	SM59D03G2 SM59D04G2 SM59R08A2 SM59R16A2	SM59R02/03/04A1 SM59R04A2 SM59R05/09/16A3 SM59R05/09/16A5 SM59R05/09/16G6 SM39R20/4051 SM39R02/04G1 SM39R08/12/16A2
Update IC configuration	Only SM59RXX supported, exclusive of SM59R08/16A2.	Yes	Yes
IC protect	Only SM59R08/16A2 not supported.	Yes	Yes
Interface	GND,RX,TX,VCC	VCC,GND,TRIG,CLK,DATA	VCC,GND,OCI_SCL,OCI_SDA
Note	<ol> <li>Needed 0.5k ISP code.</li> <li>ICs have included ISP code before shipping, exclusive of SM59R08/ 16A2 and SM39R02/ 04G1.</li> </ol>	N/A	N/A
Advantages	User can use RS-232 or USB to execute functions of erase and program for MCU.	Not needed ISP code	Not needed ISP code



## 8 Setup USB driver:

You can find PL-2303 USB Driver in start menu. Please click "PL-2303 Driver Installer" to install.





## 9 SMAP settings:

- 9.1 To select writer:
  - 9.1.1 There is SMAP shortcut on desktop after installing SMAP.
  - 9.1.2 When first open SMAP, you can select MSM9059 or MSM9171. Please select MSM9059 then click **<OK>**.

	SMAP - Writer Setting
Please se	lect a writer to start.
Writer	MSM 9059 MSM 9069 MSM 9171

9.1.3 SMAP will pop up main window. You can change writer, language or update firmware in the setting window.

	SMAP - MSM 9059 (2.0.0.1072)	- ×
Recording Mode     On-line ISP     Off-line ISP     On-line ICP     Off-line ICP     Off-line ICP     Setting	MCU SM59R04A2C, 5V About Writer MSM 9059 Change Clear Firmware COM3 (Prolific USB-to-Serial Comm I ) Update Version Configuration Language English Reload the program Files automatically	
	新茂國際科技股份有限公司 SyncMOS Technologies International,Inc.	Abort

Specifications subject to change without notice, contact your sales representatives for the most recent information. ISSFT-0041 13 Ver. A 2011/04



- 9.2 Automatic update for firmware:
  - 9.2.1 Enter **[Recording Mode]** then click **<Connect>**. If your firmware of MSM9059 is not fit the version of SMAP, SMAP will pop up updating firmware window. Please follow flow chart to update your firmware.



9.2.2 Select FW-9059VXXX.hex then click <Open>.

開啓						? 🔀
查詢(]):	6059		*	G 🦻	۳ 🕫	
3000000000000000000000000000000000000	ा हि₩-9059V1420	).hex				
<b></b> 反正 反正 反正 反正 反正 反正 反正 反正 反正 反正						
<b>沙</b> 我的文件						
<b>夏</b> 夏 我的電腦						
網路上的芳鄰	檔名(N):	FW-9059V1420.hex			~	開啓の入
	檔案類型( <u>T</u> ):	HEX file (*.hex)			*	取消

Specifications subject to change without notice, contact your sales representatives for the most recent information. ISSFT-0041 14 Ver. A 2011/04



923	SMAP shows	"Clear offline	data succeeded!"	means finished	firmware update
0.2.0					minimule upuale

	SMAP - MSM 9059 (2.0.0.1072)	- ×
Recording Mode         On-line ISP         Off-line ISP         On-line ICP         Off-line ICP         Off-line ICP         Setting	MCU SM59R04A2C, 5V About Writer MSM 9059 Change Clear Firmware COM3 (Prolific USB-to-Serial Comm I) Update Version 1.4.2.0 Configuration Language English Reload the program Files automatically	Output       Configuration         Entering Setting mode       Entering Setting mode         Leaving Setting mode       Entering On-line ISP mode         Connectting succeeded!       Leaving Setting mode         Leaving On-line ISP mode       Connectting succeeded!         Leaving Setting mode       Setting mode         Scanning On-line ISP mode       Setting mode         Scanning.       Scanning         Scanning succeeded!       Programming succeeded!         Protecting.       Protecting         Protecting succeeded!       Resetting MCU         Resetting MCU succeeded!       Connectting succeeded!         Connectting succeeded!       Connectting succeeded!         Connectting succeeded!       Connectting succeeded!         Cear offline data       Clear offline data         Clear offline data succeeded!       Connectting the vriter
	新茂國際科技股份有限公司 SyncMOS Technologies International,Inc.	Clear offline data succeeded!



- 9.3 Manual update for firmware:
  - 9.3.1 If automatic update failed, you must use manual update. You must push down the button and plug MSM9059 into a USB port at the same time. Then click <Update> button.

	SMAP - MSM 9059 (2.0.0.1072)	_ ×
Recording Mode      On-line ISP      Off-line ISP      On-line ICP	MCU SM59R04A2C, 5V About Writer MSM 9059	<b></b>
Off-line ICP	Firmware COM3 (Prolific USB-to-Serial Comm I  Version	
	Update Option       ×         Automatic       •         •       Manual         You must push down the button and plug MSM 9059 into a USB port at the same time.       9059 into a USB port at the same time.         Make sure no any LED is on after plugging it in.       •         •       •       •         •       •       •         •       •       •         •       •       •         •       •       •         •       •       •         •       •       •         •       •       •         •       •       •         •       •       •	

9.3.2 Select FW-9059VXXX.hex then click <Open>.

開啓						? 🛛
查詢(1):	9059		<b>~</b> (	G 🦻 I	• 📰 🏓	
我最近的文件	FW-9059V1420	).hex				
<b>ট</b> 点面						
我的文件						
<b>夏</b> 夏 我的電腦						
網路上的芳鄰	檔名(N):	FW-9059V1420.hex			<b>~</b>	開啓の
	檔案類型( <u>T</u> ):	HEX file (*.hex)			✓ (	取消



#### 10 User interface of SMAP:

10.1 Operation modes:



10.1.1 **On-line ISP**: MSM9059 must connect to PC and program by UART. Please set frequency according to the target frequency.

OSC Freq.	22.1184MHz	
Recording	Manual 🔹	

- 10.1.2 **Off-line ISP**: You can send code to MSM9059 before programming. MSM9059 doesn't connect to PC during ISP programming.
- 10.1.3 **On-line ICP**: MSM9059 must connect to PC and program by IIC.
- 10.1.4 **Off-line ICP**: You can send code to MSM9059 before programming. MSM9059 doesn't connect to PC during ICP programming.
- 10.2 Connecting COM Port: Click **<Connect>** to link PC and MSM9059.



#### 10.3 Selecting program files:

10.3.1 Click **<Select>** then SMAP will pop up "Select Program File(s)" window. Click **<Open>** to load your file. (XXX.HEX or XXX.BIN)





10.3.2 When you need to load main code and ISP code together, you can load code and ISP separately.

Select Program File(s)	x
Initial Value FF	
C:\Program Files\SyncMOS\S\user_command_isp_asm.hex	🍃 Open
C:\Program Files\SyncMOS\SyncMO\ISP_59R04A2_V01.bin	🍃 Open
OK Cancel	

#### 10.4 Configuration:

10.4.1 Configuration option: Please set needed option. MSM9059 will program configuration during program process.

/	Output Configu	ration	
	Watch Dog	N	
	Watch Dog	Enable	
	MCU Speed		
	MCU Speed	Ext. OSC	
	Pin Function		
	Pin Function	Disable	
	RESET	RESET	
	OCI_SDA	OCI_SDA	≡
	ALE	ALE	
	OCI_SCL	OCI_SCL	
	Reset Time		
	Reset Time	25 ms	
	ISP Block (N)		
	ISP Block (N)	N=2 (3E00H)	
	ISP Entry Mech.		
	Addr.(\$0000)=FFH	Power On Enabled	
	Addr.(\$0000)=FFH	Pad Reset Enabled	
	P2.6+P2.7 = 0 (2)	Power On Enabled	
	P2.6+P2.7 = 0 (2)	Pad Reset Enabled	

10.4.2 Reading configuration: Click "Reading configuration" icon to read configuration.



Specifications subject to change without notice, contact your sales representatives for the most recent information.ISSFT-004118Ver. A2011/04



#### 10.5 Buffer:



Refresh: The code of MCU will be displayed to MCU buffer. 10 5 5

File	x	MCU 2
	3F621D	
0000         01         25         FF         F	FF FF FF       FF         FF FF FF       FF         FF FF FF       FF         FF FF       FF         FF FF       FF         S0       75         A8       C0         C0       E0         20       E5         21       31         28       29         20       E5         FF       FF         FF	
국 국국 구국 11.1 12 12 12 12 12 12 12 12 12 12 12 12 12		Close

File buffer

MCU buffer



#### 11 ISP tutorials:

11.1 Hardware connection modes:



11.1.1 Please set your frequency of the target board.



#### 11.2 Manual recording:

11.2.1 Please let MCU enter ISP mode by hardware or software mechanism.Specifications subject to change without notice, contact your sales representatives for the most recent information.ISSFT-004120Ver. A2011/04



- 11.2.2 Set chip, frequency, comport, and select < Manual>.
- 11.2.3 Select hex file or bin file and tick wanted functions of the recording block, then click <**Autorun>**. If you want single step operation, you merely click **<Scan>**, **<Chip Erase>**, <**Program> <Protect> <MCU Reset>**

A.	IDMAP - MIIM 9059 (2.0.0.1072			
Recording Mode	MCU EM59R04A2C, 5V	dect 🗾 🧾 🗐 🐨 🕢		
On-line ISP	😑 COM3 (Prolific USB-to-Serial Comm 👘 🥂 Co	nnect Output Configuration Entering On-line ISP mode		
Otf-line ISP On-line ICP Otf-line ICP	OSC Freq. 22.1184MHz   OSC Freq. 22.1184MHz  Recording Manual  Manual			
Option 3ethng	Code C1_luser_command_isp_asm hex 39621D	Profecting Profecting Profecting succeeded! Reating MCU succeeded! Reating MCU succeeded!		
	Scan ISP     Aukorun     Chup Erzee     Maid 2/N			
	2 Protect	Resetting MCU succeeded)		
	🗵 📴 MCU Reset	nodA _ O		

- 11.3 Power-on recording:
  - (1) User can easily program IC through SMAP software, as long as power on user's target board. SM59RXX and SM39RXX series have the ISP entry mechanism of Rx inputting 2 clocks, exclusive of SM59R08/16A2. Other models need software method to detect Rx. If it receive 5 commands of 0x69, PC counter will jump to address of ISP code area.
  - (2) Press "Autorun" then SMAP will display "Detecting.....(0%)". Please reset MCU or power on your target board, SMAP will start programming.

Detecting (0 %)			
Abort			

(3) When finish programming, SMAP shows "MCU Reset Succeeded!".



Specifications subject to change without notice, contact your sales representatives for the most recent information.ISSFT-004121Ver. A2011/04



- 11.4 User-defined recording: User can define command as entry ISP password through SMAP software to run programming.
  - 11.4.1 Operating steps:
  - (1) Program sample code and ISP code into the IC.
  - (2) Power on your target board and connect to your MSM9059.
  - (3) Select "User-defined" and set baud rate speed according to customer's transmission speed. For example, we select 115200bps due to the sample code using 115200bps.
  - (4) Load sample code into SMAP. Key in your user-defined command into SMAP according to your receive command of UART interrupt subroutine. User-defined command length range is between 1~32 byte, and data type is hexadecimal.

	SMAP - MSM 9059 (2.0.0.1072)		- X
🖃 Recording Mode	MCU SM59R04A2C, 5V	<b>6</b>	0
On-line ISP Off-line ISP On-line ICP Off-line ICP	Code C1user_command_isp_asm.hex	le	
37 Setting	Image: Scen ISP     Image: Autorun       Image: Chip Errose     Image: Add S/N       Image: Program     Image: Autorun		
	Connecting	succeeded! Abort	

(5) Press "Autorun" then SMAP will start programming. When finish programming, SMAP shows "MCU Reset Succeeded!".



Specifications subject to change without notice, contact your sales representatives for the most recent information.ISSFT-004122Ver. A2011/04



11.4.2 Flowchart:



Specifications subject to change without notice, contact your sales representatives for the most recent information. ISSFT-0041 23 Ver. A 2011/04



11.4.3 Sample code:

(1) Keil C:

```
//This sample code included
Description
                main.c、GoToISP_Low.A51
                #include "SM59D04G2.h"
main.c (Main
                #define nCommandLength 32
 program)
                #define nAckCommand
                                               0x5A
                unsigned char Uart CmdCount;
                unsigned char code CommandArray[nCommandLength]=
                {0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08,
                 0x09, 0x10, 0x11, 0x12, 0x13, 0x14, 0x15, 0x16,
                 0x17, 0x18, 0x19, 0x20, 0x21, 0x22, 0x23, 0x24,
                 0x25, 0x26, 0x27, 0x28, 0x29, 0x30, 0x31, 0x32};
                extern GoToISP Low();
                void delayms(unsigned int mscnt)
                {
                     unsigned int i;
                     while(mscnt--)
                     {
                          for(i=0;i<250;i++);
                     }
                }
                void init_UART_timer1(unsigned char BR)
                {
                     SCON = 0x50;
                                         //SCON: serail mode 1, 8-bit UART, enable receive
                                         //TMOD: timer 1, mode 2, 8-bit reload
                     TMOD = 0x22;
                     PCON = 0x80;
                                         //SMOD = 1;
                     TH1 = BR:
                                         //Baud:57600 fosc=22.1184MHz
                                    //timer 1 run
                     TR1 = 1 ;
                     EA = 1;
                                               //all interrupt enable
                     ES = 1;
                                              //UART enable
                }
                void init_UART_timer2(unsigned int T2value)
                {
                     RCAP2L = (char)T2value;
                     RCAP2H = (char)(T2value>>8);
                     T2CON = 0x34;
                     SCON = 0x50:
                     EA = 1:
                                               //all interrupt enable
                                              //UART enable
                     ES = 1;
                }
                void main(void)
                {
                     init_UART_timer2(0xFFFA);//choise Timer 1 or Timer 2 as baud rate generator
                     //init_UART timer1(0xFF);
                     //SyncMOS GoToISP via UART
                     //TH1 = 0xFF;
                                         //12T, 3.579MHz(19200), 11.0592MHz(57600)
                                         // 6T, 3.579MHz(38400), 11.0592MHz(115200)
```

新茂國際科技股份有限公司 SyncMOS Technologies International,Inc.

#### SyncMOS MSM9059 User's Manual

	//TH1 =	0xFE;	//12T, 14.31818MHz(38400), 22.1184MHz(57600), 14.7456MHz(38400)
	//TH1 =	0xFD;	// 61, 22.1184MHz(115200) //12T, 4MHz(7200), 8MHz(14400), 8.192MHz(14400), 16MHz(28800) // 6T, 4MHz(14400).8MHz(28800), 8.192MHz(28800), 16MHz(57600)
	//TH1 =	0xFC;	
	//TH1 =	0xFB;	// 61, 14.31818MHz(38400), 14.7456MHz(38400) //12T, 18.432MHz(19200) // 6T. 18.432MHz(38400)
	//TH1 =	0xF7;	//12T, 24.576MHz(14400), 25MHz(14400)
	//TH1 =	0xF5;	// 61, 24.576MH2(28800), 25MH2(28800) //12T, 20MHz(9600) // 6T. 20MHz(19200)
	//TH1 =	0xF3;	//12T, 6MHz(2400), 12MHz(4800), 24MHz(9600)
	while(1)	)	// 01, 01/12/4000), 12/01/2(9000), 24/01/2(19200)
	{ P(	$) = 0 \times F0^{-1}$	delayms(300)
	PC	$0 = 0 \times 0 F;$	delayms(300);
	// P2 // P2	2 = 0x⊢0; 2 = 0x0F;	delayms(300); delayms(300);
	}	,	
	void serial(vo	id) interrupt 4	
	{ if(RI)		
	{ ;f/(		nmandArray[HartCmdCount])
	III	UartCmdC	Count++;
	els	Se LlartCmdC	Count=0:
	RI	= 0 ;	, , , , , , , , , , , , , , , , , , ,
	if(\ {	UartCmdCour	nt==nCommandLength)
	L L	IE = 0x00;	//disabling interrupt
		SBUF = n. while(!TI):	AckCommand;
		TI = 0;	
		GoToISP_	Low(); //LJMP 3E00H ISP code address
	}		
	else		
	TI:	=0;	
GoToISP_Low.	; GoToISP_Lo	ow.A51	
A51	NAME Go	oToISP_Low	
	PR?GoToIS? PUBLIC	P_Low?GOT GoToISP_	OISP_LOW SEGMENT CODE Low
	RSEG USING	?PR?GoTols 0	SP_Low?GOTOISP_LOW
	GoToISP_Lov MOV DI	w: PTR,#3E00H	;LJMP 3E00H ISP code address



	PUSH DPL	
	PUSH DPH	
	RETI	
	END	
L		

Description	
Main program	nCommandLength EQU 32 ;setting command length by user UARTCmdCount EQU 20H T2CON EQ U 0C8H RCAP2L EQU 0CAH RCAP2H EQU 0CBH
	ORG 0000H AJMP ISP_Entry ORG 0023H AJMP UART_INTERRUPT
	ISP_Entry: ACALL SyncMOS_GoToISP ;initial setting
	;;; main code start
	/* LED display demo */ MOV DPTR,#TABLE_01 ;DPTR point to data area START:
	MOVR0,#0 ; MOVR1,#8 ;8 datas LOOP:
	MOVA,R0 ;put R0 contect to A MOVC A,@A+DPTR ;use indirect address get data, and put into A MOVP0,A ;put ACC to Port 0 MOVP1,A ;put ACC to Port 1 ACALL DELAY100MS ;delay 0.1 second INC R0 ;R0 point to next data DJNZ R1,LOOP ;if R1 != 0 then jump to LOOP SJMP START ;if R1=0 then jump to START
	DELAY100MS: MOV R5 #10 · Dealy 10x10ms=100ms
	DELAY10MS: MOV R6 #50 ;delay time 10ms @ 11 0592MHz
	DELAY01:
	DJNZ R7,\$ ; Inner loop delay DJNZ R6,DELAY01 ; DJNZ R5,DELAY10MS
	TABLE_01: DB 11100111B DB 11000011B DB 10000001B



新茂國際科技股份有限公司 SyncMOS Technologies International, Inc.

DB 0000000B DB 1000001B DB 11000011B DB 11100111B DB 1111111B
;;; ;;; main code End ;;;
;;; ;;; SyncMOS_GoToISP Subroutine ;;; SyncMOS_GoToISP:
;;;=====UART Timer1 setting========== ;MOV TMOD,#00100001B ;Timer 1 is mode1 is mode 2, Timer 0 is mode 1
;;; ;MOV TH1,#0FFH ;baud rate, 12T, 3.579MHz(19200), 11.0592MHz(57600)
;MOV TH1,#0FEH ;baud rate, 12T, 14.31818MHz(38400), 22.1184MHz(57600), 14.7456MHz(38400)
; 6T, 22.1184MHz(115200) ;MOV TH1,#0FDH ;baud rate, 12T, 4MHz(7200), 8MHz(14400), 8.192MHz(14400), 16MHz(28800)
; 6T, 4MHz(14400),8MHz(28800), 8.192MHz(28800), 16MHz(57600)
;MOV TH1,#0FCH ;baud rate, ; 6T, 14.31818MHz(38400), 14.7456MHz(38400)
;MOV TH1,#0FBH ;baud rate, 12T, 18.432MHz(19200) ; 6T, 18.432MHz(38400)
;MOV TH1,#0F7H ;baud rate, 12T, 24.576MHz(14400), 25MHz(14400) ; 6T , 24.576MHz(28800), 25MHz(28800)
;MOV TH1,#0F5H ;baud rate, 12T, 20MHz(9600) ; 6T, 20MHz(19200)
;MOV IH1,#0F3H ;baud rate, 121, 6MHz(2400), 12MHz(4800), 24MHz(9600) ; 6T, 6MHz(4800), 12MHz(9600), 24MHz(19200)
;MOV PCON,#1000000B ;set SMOD = 1
;;;=====UART Timer2 setting========= ;choise Timer 1 or Timer 2 as baud rate generator MOV RCAP2H,#0FFH MOV RCAP2L,#0FAH MOV T2CON,#34H
,,,,==================================
UART_INTERRUPT: JB RI,RX ; if RI=1 jump RX,else clear TI CLR TI RETI RX:
CLR RI



新茂國際科技股份有限公司 SyncMOS Technologies International, Inc.

PUSHACC
PUSH DPL
PUSH DPH
MOV A, UARTCmdCount
MOV DPTR,#COMMAND_TABLE
MOVC A,@A+DPTR
CJNE A,SBUF,CLR_UARTCmdCount
INC UARTCmdCount
MOV A, UARTCmdCount
CJNE A,#nCommandLength,RETURN
CLR EA
MOV SBUF,#5AH ;transmit ack
MOV DPTR,#3E00H ;LJMP 3E00H ISP code address
PUSH DPL
PUSH DPH
JNB TI,\$
CLR TI
MOV T2CON,#00H ;disabling T2 because using T1 baud rate generator in ISP code
RETI
CLR_UARTCmdCount:
MOV UARTCmdCount,#00H
RETURN:
POP DPH
POP DPL
POPACC
RETI
COMMAND_TABLE:
DB 01H,02H,03H,04H,05H,06H,07H,08H ;to define command by user
DB 09H,10H,11H,12H,13H,14H,15H,16H
DB 17H,18H,19H,20H,21H,22H,23H,24H
DB 25H,26H,27H,28H,29H,30H,31H,32H
END END

Note:

The sample codes attach in SMAP setup directory "C:\Program Files\SyncMOS\ SyncMOS Writers\SMAP\OnlineUpdate\User-defined".



#### 12 ICP tutorials:

12.1 Please connect OCI\_SCL, OCI\_SDA, VCC, GND with MSM9059. Press "Autorun" then SMAP will start ICP programming.



- 12.2 If OCI\_SCL、OCI\_SDA as GPIO, that caused enter ICP mode failed. As long as enter ICP mode during power-on.
- (1) Please power off your target board.
- (2) Press "Autorun" then SMAP will display "Detecting.....(0%)". Please reset MCU or power on your target board, SMAP will start programming.

	Detectin	g (0 %	6)
		Abort	]

(3) When finish programming, SMAP shows "MCU Reset Succeeded!".

MCU Reset Succeeded!	
Abort 🕥	



#### 13 Off-line tutorials:

- 13.1 Off-line ICP:
  - 13.1.1 Select the tasks you want to perform and click **<Autorun>** to allow the MSM9059 record all of the source code into its flash. Then, the massage will pop up: Transmitting succeeded!

Chip Erase	
☑ Blank Check	
V Program	
▼Verify	
Protect	
Counter 1000	
Read Counter	
Total NIL D26 Read	Transmitting succeeded!
Remain NIL	
	Abort

- 13.1.2 Disconnect USB and press button to perform off-line recording. During the recording. LED will flash yellow until the task is finished. When the LED turn green, the off-line recording task is completed. If OCI\_SCL, OCI\_SDA as GPIO, as long as enter ICP mode during power-on.
- 13.2 Off-line ISP:
  - 13.2.1 Select the tasks you want to perform and click **<Autorun>** to allow the MSM9059 record all of the source code into its flash. Then, the massage will pop up: Transmitting succeeded!

🔽 Chip Erase	,	—
📝 Program	Counter 1000	
🔽 Protect		
🔽 MCU Rese	et 📑 Autorun	
∟ Read Count	er	T
Total	NIL DE Read	Transmitting succeeded!
Remain	NIL	- Abort



13.2.2 Disconnect USB and press button to perform off-line recording. During the recording. LED will flash yellow until the task is finished. When the LED turn green, the off-line recording task is completed.