

# **PCI MultiPort DOS Driver Installation Manual**

**for SB16C1053APCI application only**

**Ver. 1.00**



# 1. Overview

This document is an installation manual for SB16C1053APCI applications.

EMUL1053.SYS is a DOS driver for SystemBase's SB16C1053APCI application board, and it can remap the COM port address and LPT port I/O address to Legacy COM Port or LPT Port range. For example, the serial ports can be remapped to COM1(3F8h), COM2(2F8h), COM3(3E8h) and COM4(2E8h) and the parallel port can be remapped to LPT1(3BCh), LPT2(378h) and LPT3(278h). It also has same function set by ROM BIOS of the system.

This driver can support the following 7 models; 2S1P mode, 2S mode, 1S mode, 1P mode, 4S mode, 6S mode and 1S1P mode.

## 2. How to Install the DOS driver

If you want to install the DOS driver in your computer, please refer to the following steps:

- ① Copy the DOS driver to the root of C hard disk," C: \ >".
- ② Add the following setting command in "CONFIG.SYS" file of DOS system.  
**DEVICE=EMUL1053.SYS /M? /A? /B? /C? /D?**
- ③ After editing the CONFIG.SYS file, please reboot your system.  
After the system reboot, you can see the installed message of the DOS driver.

### 2.1 The setting command to CONFIG.SYS

**DEVICE=EMUL1053.SYS /M? /A? /B? /C? /D?**

To install the DOS driver, you have to upload the device driver 'EMUL.SYS' to RAM of your system using the command 'DEVICE'.

In the upper command, '?' means number.

'M?' means an operational mode of SB16C1053APCI.

'A?' describes the first serial port of SB16C1053APCI to which a COM PORT I/O address will be assigned.

'B?' describes the second serial port of SB16C1053APCI to which a COM PORT I/O address will be assigned.

'C?' describes the serial ports of external UART or the parallel port of SB16C1053APCI to which a COM or LPT PORT I/O address will be assigned.

'D?' describes the serial ports of external UART to which a COM PORT I/O address range will be assigned.

In case of "/M?" command, '?' means one of 7 modes of SB16C1053APCI.

You need to select one among 8 modes and you need to write the number instead of "?".

/M?	MODE	/M?	MODE
1	2S1P mode	2	2S mode
3	1S mode	4	1P mode
5	4S mode	6	6S mode
7	1S1P mode		

In case of /A?, /B?, /C? and /D? commands, '?' values are dependent on the operational mode of SB16C1053APCI.

MODE	/A?	/B?	/C?	/D?
2S1P mode	/A1 (3F8h) /A2 (2F8h) /A3 (3E8h) /A4 (2E8h)	/B1 (3F8h) /B2 (2F8h) /B3 (3E8h) /B4 (2E8h)	/C2 (378h) /C3 (278h)	
2S mode	/A1 (3F8h) /A2 (2F8h) /A3 (3E8h) /A4 (2E8h)	/B1 (3F8h) /B2 (2F8h) /B3 (3E8h) /B4 (2E8h)		
1S mode	/A1 (3F8h) /A2 (2F8h) /A3 (3E8h) /A4 (2E8h)			
1P mode			/C2 (378h) /C3 (278h)	
4S mode	/A1 (3F8h) /A2 (2F8h) /A3 (3E8h) /A4 (2E8h)	/B1 (3F8h) /B2 (2F8h) /B3 (3E8h) /B4 (2E8h)	/C1 (3F8h) /C2 (2F8h) /C3 (3E8h) /C4 (2E8h)	/D1 (3F8h) /D2 (2F8h) /D3 (3E8h) /D4 (2E8h)
6S mode	/A1 (3F8h) /A2 (2F8h) /A3 (3E8h) /A4 (2E8h)	/B1 (3F8h) /B2 (2F8h) /B3 (3E8h) /B4 (2E8h)	/C1 (3F0h/3F8h) /C2 (2F0h/2F8h) /C3 (3E0h/3E8h) /C4 (2E0h/2E8h)	/D1 (3F0h/3F8h) /D2 (2F0h/2F8h) /D3 (3E0h/3E8h) /D4 (2E0h/2E8h)
1S1P mode	/A1 (3F8h) /A2 (2F8h) /A3 (3E8h) /A4 (2E8h)		/C2 (378h) /C3 (278h)	

**CAUTION:** When you install the DOS driver, you need to assign only one device to one I/O address.  
For example, if you install 2S1P card, you can't use the command like "DEVICE=EMUL1053.SYS /M1 /A1 /B1 /C2". In this case, the first serial port is assigned to 3F8h and so is the second serial port. This will cause a system error. In this case, you should follow this command.  
"DEVICE=EMUL1053.SYS /M1 /A1 /B2 /C2"

**FYI,**

- Legacy COM1 I/O Address is "3F8h"
- Legacy COM2 I/O Address is "2F8h"
- Legacy COM3 I/O Address is "3E8h"
- Legacy COM4 I/O Address is "2E8h"
- Legacy LPT1 I/O Address is "3BCh"
- Legacy LPT2 I/O Address is "378h"
- Legacy LPT3 I/O Address is "278h"

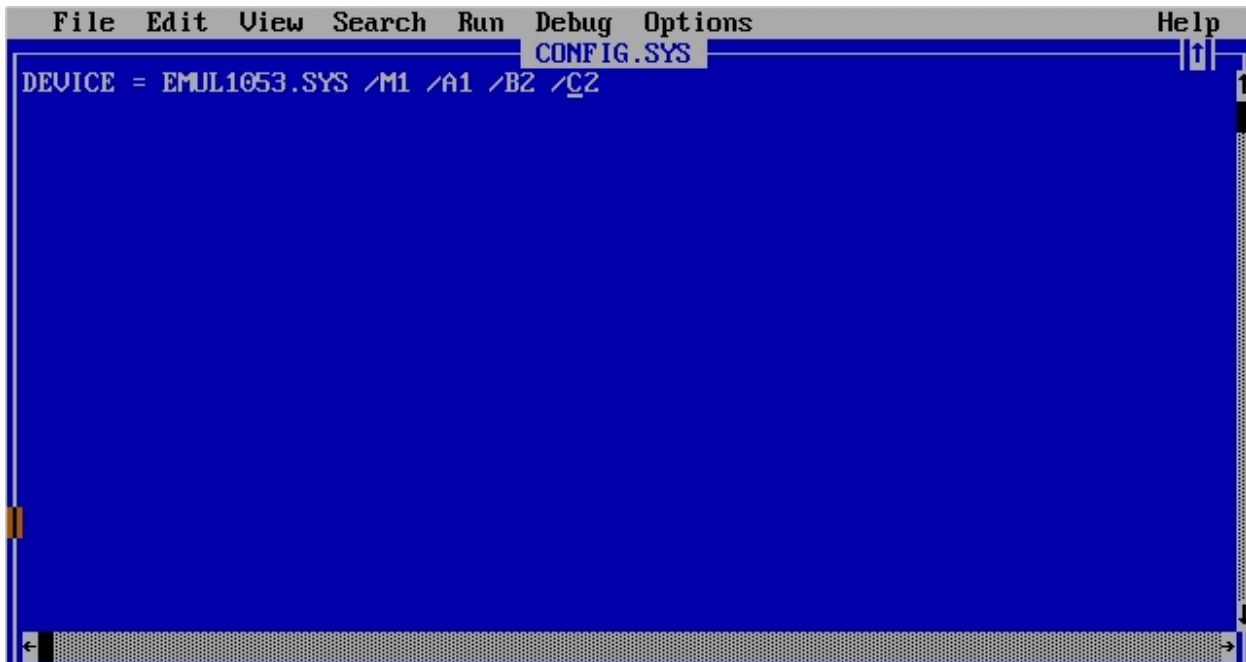
Interrupt of SB16C1053APCI is set by the system automatically.

EMUL1053.SYS is only for SystemBase's SB16C1053APCI. If the target application is implemented as SystemBase reference board, this driver will support HW Auto-Toggling function. It will provide customers reliable communication.

## 2.2 How to install the DOS driver for 2S1P board

You can add the following command in "CONFIG.SYS" file in case of 2S1P mode.

**DEVICE=EMUL1053.SYS /M1 /A1 /B2 /C2**



It means the first serial port of SB16C1053APCI is assigned to COM1(3F8h) and the second serial port of SB16C1053APCI to COM2(2F8h) and the parallel port of SB16C1053APCI to LPT2(378h).

You are able to change the number of '/A?', '/B?' and '/C?' among the below references. But you shouldn't set the same number for both /A? and /B?.

I/O Address range of /A? and /B? are as follows:

A1 = COM1(3F8h), A2 = COM2(2F8h), A3 = COM3(3E8h), A4 = COM4(2E8h)

B1 = COM1(3F8h), B2 = COM2(2F8h), B3 = COM3(3E8h), B4 = COM4(2E8h)

I/O Address range of /C? are as follows:

C2 = LPT2(378h), C3 = LPT3(278h)

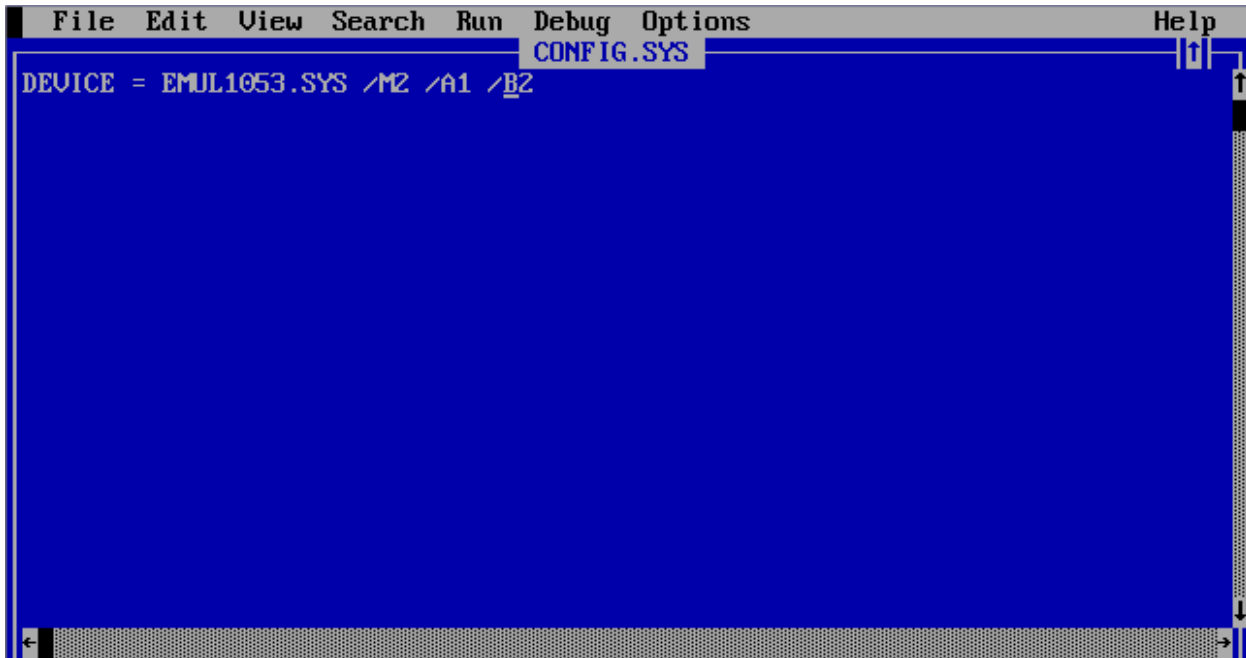
After the installation and reboot the system, you can see the below message when the board is recognized normally.

```
Serial Port 1 set to COM1(3F8h)
Serial Port 2 set to COM2(2F8h)
Parallel Port set to LPT2(378h)
SystemBase SB16C1053A/PCI(2S1P) Port Emulator V1.0 loaded !!!
IRQ No = 11
C:\>
```

## 2.3 How to install the DOS driver for 2S board

You can add the following command to "CONFIG.SYS" file in case of 2S mode.

**DEVICE=EMUL1053.SYS /M2 /A1 /B2**



It means the first serial port of SB16C1053APCI assigned to COM1(3F8h) and the second serial port of SB16C1053APCI assigned to COM2(2F8h).

You are able to change the number of '/A?' and '/B?'. But you shouldn't set same the number both '/A?' and '/B?'.

I/O Address range of '/A?' and '/B?' are as below.:

A1 = COM1(3F8h), A2 = COM2(2F8h), A3 = COM3(3E8h), A4 = COM4(2E8h)

B1 = COM1(3F8h), B2 = COM2(2F8h), B3 = COM3(3E8h), B4 = COM4(2E8h)

After the installation and reboot the system, you can see the below message when the board recognized normally.

```
Serial Port 1 set to COM1(3F8h)
Serial Port 2 set to COM2(2F8h)
SystemBase SB16C1053A/PCI(2S) Port Emulator V1.0 loaded !!!
IRQ No = 11
C:\>_
```

## 2.4 How to install the DOS driver for 1S board

You can add the following command to "CONFIG.SYS" file in case of 1S mode.

**DEVICE=EMUL1053.SYS /M3 /A1**



It means the first serial port of SB16C1053APCI assigned to COM1(3F8h).

You are able to change the number of /A?.

I/O Address range of '/A?' are as below:

A1 = COM1(3F8h), A2 = COM2(2F8h), A3 = COM3(3E8h), A4 = COM4(2E8h)

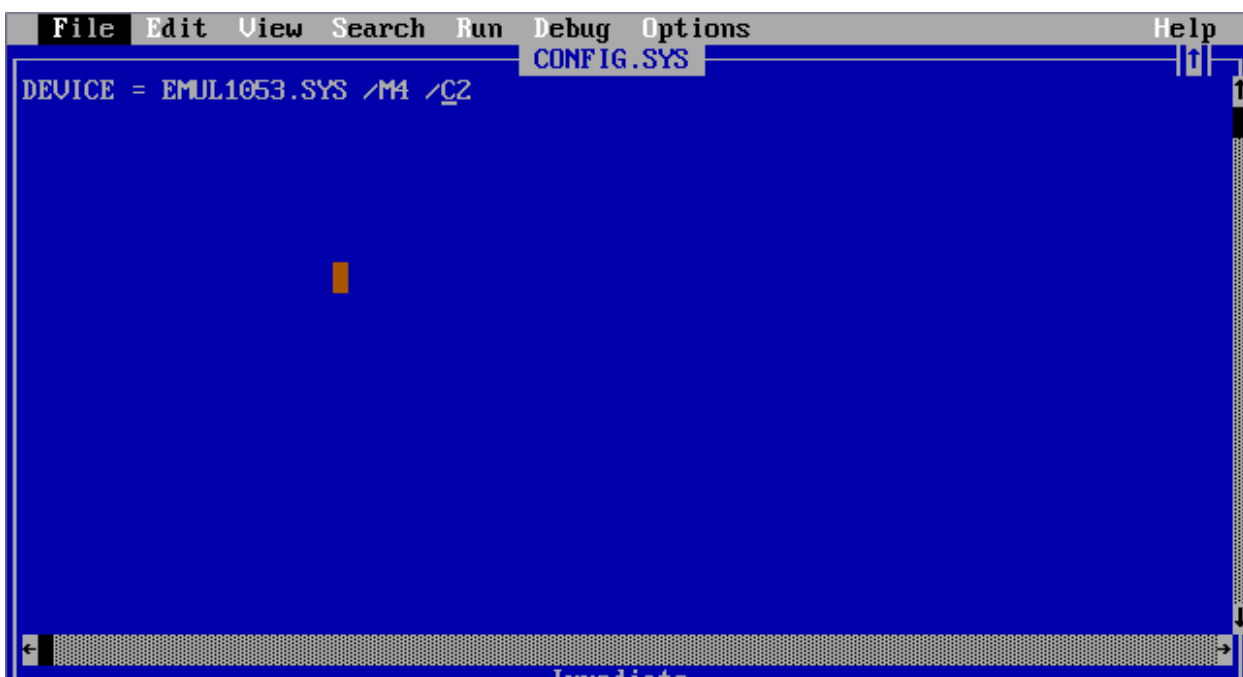
After the installation and reboot the system, you can see the below message when the board recognized normally.

```
Serial Port 1 set to COM1(3F8h)
SystemBase SB16C1053A/PCI(1S) Port Emulator V1.0 loaded !!!
IRQ No = 11
C:\>
```

## 2.5 How to install the DOS driver for 1P board

You can add the following command to "CONFIG.SYS" file in case of 1P mode.

**DEVICE=EMUL1053.SYS /M4 /C2**



It means the parallel port of SB16C1053APCI assigned to LPT2(378h).

You are able to change the number of '/C?'.

I/O Address range of '/C?' are as below:

C2 = LPT2(378h), C3 = LPT3(278h)

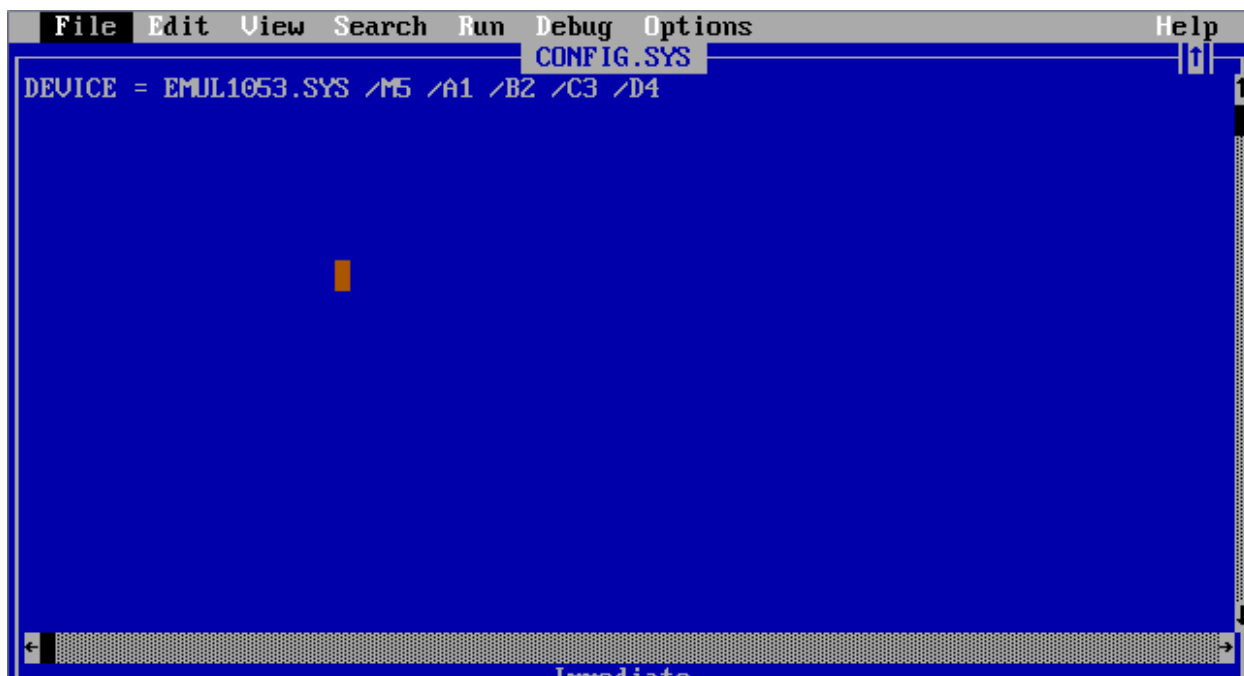
After the installation and reboot the system, you can see the below message when the board recognized normally.

```
Parallel Port set to LPT2(378h)
SystemBase SB16C1053A/PCI(1P) Port Emulator V1.0 loaded !!!
IRQ No = 11
C:\>
```

## 2.6 How to install the DOS driver for 4S board

You can add the following command to "CONFIG.SYS" file in case of 4S mode.

**DEVICE=EMUL1053.SYS /M5 /A1 /B2 /C3 /D4**



It means the first serial port of SB16C1053APCI assigned to COM1(3F8h), the second serial port of SB16C1053APCI assigned to COM2(2F8h), the first serial port of an external UART assigned to COM3(3E8h) and the second serial port of an external UART assigned to COM4(2E8h).

You are able to change the number of /A?, /B?, /C? and /D?. But you shouldn't overlap the each I/O address of each port.

I/O Address range of /A?, /B?, /C? and /D? are as below:

A1 = COM1(3F8h), A2 = COM2(2F8h), A3 = COM3(3E8h), A4 = COM4(2E8h)

B1 = COM1(3F8h), B2 = COM2(2F8h), B3 = COM3(3E8h), B4 = COM4(2E8h)

C1 = COM1(3F8h), C2 = COM2(2F8h), C3 = COM3(3E8h), C4 = COM4(2E8h)

D1 = COM1(3F8h), D2 = COM2(2F8h), D3 = COM3(3E8h), D4 = COM4(2E8h)

If you select /A1 (COM1) as the first serial port, you can't use /B1, /C1 and /D1 settings in the command.

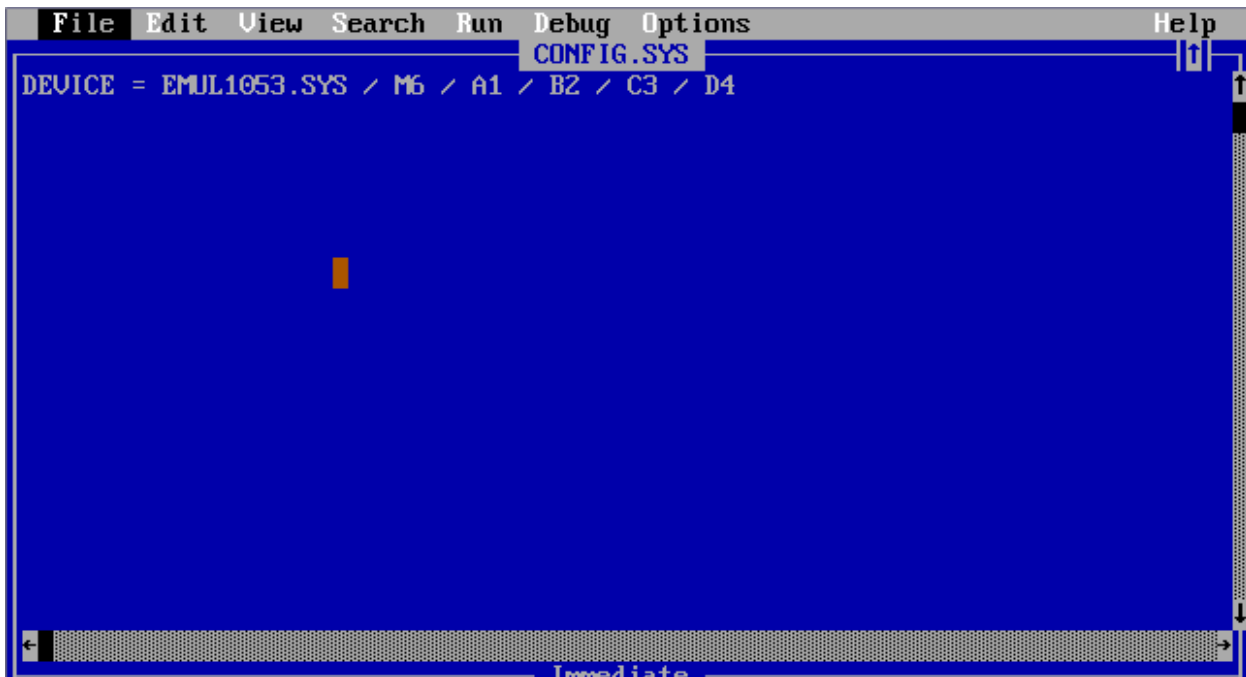
After the installation and reboot the system, you can see the below message when the board recognized normally.

```
Serial Port 1 set to COM1(3F8h)
Serial Port 2 set to COM2(2F8h)
Serial Port 3 set to COM3(3E8h)
Serial Port 4 set to COM4(2E8h)
SystemBase SB16C1053A/PCI(4S) Port Emulator V1.0 loaded !!!
IRQ No = 11
C:\>_
```

## 2.7 How to install the DOS driver for 6S board

You can add the following command to "CONFIG.SYS" file in case of 6S mode.

**DEVICE=EMUL1053.SYS /M6 /A1 /B2 /C3 /D4**



It means the serial port of SB16C1053APCI is assigned to COM1(3F8h), and the second serial port of SB16C1053APCI is assigned to COM2(2F8h).

It also means the first serial port of an external UART is assigned to COM3(3E8h), the second serial port of an external UART to 3E0h I/O address, the third serial port of an external UART COM4(2E8h) and the fourth serial port of an external UART to 2E0h I/O address.

And it also means the second serial port of BAR2 is assigned to 3E0h I/O address and the second serial port of BAR3 to 2E0h I/O address.

You are able to change the number of /A?, /B?, /C? and /D?. But you shouldn't overlap each of I/O address to each port. If you select

I/O Address range of /A?, /B?, /C? and /D? will be assigned as follows:

A1 = COM1(3F8h), A2 = COM2(2F8h), A3 = COM3(3E8h), A4 = COM4(2E8h)

B1 = COM1(3F8h), B2 = COM2(2F8h), B3 = COM3(3E8h), B4 = COM4(2E8h)

C1 = COM1(3F8h/3F0h), C2 = COM2(2F8h/2F0h), C3 = COM3(3E8h/3E0h), C4 = COM4(2E8h/2E0h)

D1 = COM1(3F8h/3F0h), D2 = COM2(2F8h/2F0h), D3 = COM3(3E8h/3E0h), D4 = COM4(2E8h/2E0h)

If you select /A1 (COM1) as the first serial port of SB16C1053APCI, you can't use /B1, /C1 and /D1 settings in the command.

And if you select /C1 (COM1) as the first serial port of an external UART, you can't use /A1, /B1 and /D1 settings



in the command. It also means the second serial port of an external UART will be assign to 3F0h.

After the installation and reboot the system, you can see the below message when the board is recognized normally.

```
Serial Port 1 set to COM1(3F8h)
Serial Port 2 set to COM2(2F8h)
Serial Port 3, 4 set to 3E0h, COM3(3E8h)
Serial Port 5, 6 set to 2E0h, COM4(2E8h)
SystemBase SB16C1053A/PCI(6S) Port Emulator V1.0 loaded !!!
IRQ No = 11
C:\>_
```

## 2.8 How to install the DOS driver for 1S1P board

You can add below command to "CONFIG.SYS" file in case of 1S1P mode.

**DEVICE=EMUL1053.SYS /M1 /A1 /C2**



It means the first serial port of SB16C1053APCI assigned to COM1(3F8h) and the parallel port of SB16C1053APCI assigned to LPT2(378h).

You are able to change the number of '/A?' and '/C?' among the below reference.

I/O Address range of /A? and /B? are as below:

A1 = COM1(3F8h), A2 = COM2(2F8h), A3 = COM3(3E8h), A4 = COM4(2E8h)

I/O Address range of /C? are as below:

C2 = LPT2(378h), C3 = LPT3(278h)

After the installation and reboot the system, you can see the below message when the board recognized normally.

```
Serial Port 1 set to COM1(3F8h)  
Parallel Port set to LPT2(378h)  
SystemBase SB16C1053A/PCI(1S1P) Port Emulator V1.0 loaded !!!  
IRQ No = 11  
C:\>_
```