

FM801 Sw Application Notes 001: FM801 GPIO pins access

SCOPE:

This application note intends to help the software developers to understand FM801 hardware registers structure for GPIO(General Purpose I/O) control so that the software developers can take advantage of using the GPIO pins(up to 4 in FM801) for vendors' add-on-value on-board applications.

DESCRIPTIONS:

1. GPIO Pins :

FM801 has 4 GPIO pins, however, these 4 GPIO pins are multi-functional pins. In other words, if the vendors choose to use other functions which also use GPIO pins, then the GPIO function can not be performed. The function of these pins will be determined by FM801 internal register. The default function of these pins are set to “other function”.

Pin #	GPIO Pin #	Other Function	Configured by
75	GPIO[0]	SPDIF Output	FM801.REG_GPIOCTL.B12
82	GPIO[1]	Volume Control Up (for push button)	FM801.REG_GPIOCTL.B13
83	GPIO[2]	Volume Control Down (for push button)	FM801.REG_GPIOCTL.B14
84	GPIO[3]	Volume Control Mute (for push button)	FM801.REG_GPIOCTL.B15

2. Access GPIO pins through FM801 registers :

In order to control FM801 GPIO pins, please follow the configuration steps listed below first before using it.

- Determine how many GPIO pins are needed and their directions(Input or Output).
- Determine which GPIO pins (GPIO0 – GPIO3) will be used.
- Get FM801 Func-0 PCI I/O base address by reading FM801 PCI Configuration register 10h-13h.
- Configure multi-functional pins to be GPIO by programming FM801 “General Purpose I/O Control” register whose PCI address is “FM801 Func-0 PCI I/O base address + 52h”.
- Set corresponding bits(Bit15 to bit12) to ‘1’ for GPIO pin usage. Leave it to ‘0’ if it is configured as other function.
- Set GPIO direction (Input or Output) by setting bit11 to bit8 (‘1’ as Input and ‘0’ as Output) for GPIO3 to GPIO0.
- For GPIO read, read from bit3 to bit0 will get the current status of the GPIO pins.
- For GPIO write, write to bit3 to bit0 will toggle the corresponding GPIO pins.



3. FM801 GPIO Control Register Description:

- FM801 Register Name : General Purpose I/O Control
- PCI Address : FM801Base Address + 52h
- Power On default value : 0E00h

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
GS3	GS2	GS1	GS0	GD3	GD2	GD1	GD0					GP3	GP2	GP1	GP0

- **GS3, GS2, GS1, GS0** : Multi-functional pins function select. 1=GPIO, 0=Other functions (SPDIF or push-button volume control).
- **GD3, GD2, GD1, GD0** : GPIO3-0 pins I/O directions. 1=Input, 0=Output.
- Bit7~bit4 : Reserved.
- **GP3, GP2, GP1, GP0** : GPIO3-0 Control. When write, the value will be passed to the GPIO pins. When read, the current status of the GPIO pins will be read.

REFERENCES:

Please refer to FM801 Data sheet “ROME Audio Device Control registers” section.