

Example of GPIO Read and Write Operations

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1. Environment Setup
2. Running the Program
3. Expected Results

The development board's `/app/40pin_samples/` directory contains pre-installed functional test code for various 40-pin functions, including GPIO input/output testing, PWM, I2C, SPI, UART, etc. All test programs are written in Python. Detailed information can be found in other modules of this chapter.

Taking `/app/40pin_samples/button_led.py` as an example, this program configures pin `37` as an input and pin `36` as an output, and controls the output state of pin `36` based on the input state of pin `37`.

1. Environment Setup

Connect pin `37` to 3.3V or GND using a jumper wire to control its high and low voltage levels.

S100(P) RDK 40-Pin Function Comparison Table																	
Multiplexing Function 3	Multiplexing Function 2	Multiplexing Function 1	Multiplexing Function 0	Function Description	S100(P) Pin Number	BCM Code	CVM Function Name	Physical Pin BOARD Encoding	CVM	BCM Code	S100(P) Pin Number	Function Description	Multiplexing Function 0	Multiplexing Function 1	Multiplexing Function 2	Multiplexing Function 3	
GPIO PER16	UART2 TX	I2C5 SDA	3V3 Power Signal	I2C5 Data Signal	496	2	I2C5 SDA 3V3	1 2	VDD PER12 3V	3	4	VDD PER12 3V	5V Power Signal				
GPIO PER15	UART2 RX	I2C5 SCL	I2C5 Clock Signal	I2C5 SCL 3V3	495	3	I2C5 SCL 3V3	5 6	GND	7	8	UART2 TX 3V3	14 496	UART Transmit Signal	I2C5 SDA	UART2 TX	GPIO_PER16
GPIO PER133		PCMO MCLK	PCMO MCLK Signal	PCMO MCLK 3V3	475	4	PCMO MCLK 3V3	7	UART2 RX 3V3	15	495	UART Receive Signal	I2C5 SCL	UART2 RX	GPIO_PER15		
		Ground Signal	Ground Signal	Ground Signal				10	UART2 RX 3V3	16	495	UART Receive Signal	PCMO CLK	PCMO CLK	PCMO CLK	GPIO_PER134	
		40PIN GPIO5 Signal	40PIN GPIO5 Signal	40PIN GPIO5 3V3	407	17	40PIN GPIO5 3V3	11	12	PCMO CLK 3V3	18	476	40PIN GPIO6 Signal				
		40PIN GPIO1 Signal	40PIN GPIO1 Signal	40PIN GPIO1 3V3	408	27	40PIN GPIO1 3V3	13	14	GND	15	495	40PIN GPIO7 Signal				
		40PIN GPIO2 Signal	40PIN GPIO2 Signal	40PIN GPIO2 3V3	409	22	40PIN GPIO2 3V3	15	16	40PIN GPIO6 3V3	23	413	40PIN GPIO8 Signal				
		3V3 Power Signal	3V3 Power Signal	3V3 Power Signal				17	18	40PIN GPIO7 3V3	24	414	40PIN GPIO9 Signal				
GPIO PER19	SPI0 MOSI	SPI0 MOSI Signal	SPI0 MOSI Signal	SPI0 MOSI 3V3	499	10	SPI0 MOSI 3V3	19	20	GND	21	415	40PIN GPIO10 Signal				
GPIO PER20	SPI0 MISO	SPI0 MISO Signal	SPI0 MISO Signal	SPI0 MISO 3V3	500	9	SPI0 MISO 3V3	22	40PIN GPIO8 3V3	25	415	40PIN GPIO11 Signal					
GPIO PER21	SPI0 SCLK	SPI0 SCLK Signal	SPI0 SCLK Signal	SPI0 SCLK 3V3	501	11	SPI0 SCLK 3V3	23	24	SPI0 SCLK 3V3	8	497	40PIN CS0 Signal	SPI0 CS0	SPI0 CS0	SPI0 CS0	GPIO_PER17
GPIO CAM17	I2C4 SDA	I2C4 Data Signal	I2C4 Data Signal	I2C4 SDA 3V3	473	0	I2C4 SDA 3V3	25	26	SPI0 CS1 3V3	7	498	40PIN CS1 Signal	SPI0 CS1	UART3 RXD	GPIO_PER16	
		40PIN GPIO3 Signal	40PIN GPIO3 Signal	40PIN GPIO3 3V3	410	5	40PIN GPIO3 3V3	29	30	I2C4 SCL 3V3	1	472	I2C4 Clock Signal	I2C4 SCL	I2C4 SCL	GPIO_CAM16	
		40PIN GPIO4 Signal	40PIN GPIO4 Signal	40PIN GPIO4 3V3	411	6	40PIN GPIO4 3V3	31	32	GPIOM CAM 5 3V3	12	461	GPIO CAM5 Signal	LPWM1_DOUT1	LPWM1_DOUT1	GPIO_CAM5	
GPIO CAM4	LPWM1_DOUT1	GPIO CAM4 Signal	GPIO CAM4 Signal	GPIO CAM4 3V3	460	13	GPIO CAM4 3V3	33	34	GND	35	416	40PIN GPIO9 Signal				
GPIO PER135	PCM0 FSYNC	PCM0 Data Sync Signal	PCM0 Data Sync Signal	PCM0 FSYNC 3V3	477	19	PCM0 FSYNC 3V3	35	36	40PIN GPIO9 3V3	16	478	PCM0 Data Signal	PCM0 DATA0	PCM0 DATA0	PCM0 DATA0	GPIO_PER16
		40PIN GPIO5 Signal	40PIN GPIO5 Signal	40PIN GPIO5 3V3	412	26	40PIN GPIO5 3V3	37	38	PCM0 DATA0 3V3	20	478	PCM0 Data Signal	PCM0 DATA0	PCM0 DATA0	PCM0 DATA0	GPIO_PER17
		Ground Signal	Ground Signal	Ground Signal				39	40	PCM0 DATA1 3V3	21	479					

2. Running the Program

Execute the `button_led.py` program to start the GPIO read and write program.

```
sunrise@ubuntu:~$ cd /app/40pin_samples/
sunrise@ubuntu:/app/40pin_samples$ sudo python3 ./button_led.py
```

3. Expected Results

By controlling the high and low voltage levels of pin `37`, you can change the output voltage level of pin `36`.

```
sunrise@ubuntu:/app/40pin_samples$ sudo python3 ./button_led.py
Starting demo now! Press CTRL+C to exit
Outputting 0 to Pin 36
Outputting 1 to Pin 36
Outputting 0 to Pin 36
```

