

## NX1 使用 XIP 和讀取 FIFO 的注意事項

**內容：** NX1\_OTP 系列 IC 同時執行 XIP 程序與週邊功能 FIFO 讀取時，FIFO Data 會發生資料錯誤。

**原因：** NX1 透過 XIP(**e**Xecute **I**n **p**lace)可以直接執行 SPI Flash 裡面的程序，而 XIP 程序內讀取 FIFO 或 XIP 程序過程讀取 FIFO(例如透過 ISR)，以下週邊功能由於同時佔用 FIFO 而發生 FIFO Data 讀取錯誤的情況。

- ADC FIFO
- UART FIFO
- SPI0 FIFO
- SPI1 FIFO

**方法：** 相關 FIFO Data 的錯誤讀取可透過讀入其他暫存器進行迴避。以下提供相關 FIFO 暫存器的說明，並搭配實際範例以說明正確讀取 FIFO Data 的方法，範例程序請勿透過 XIP 執行。

- ADC FIFO

● **P\_ADC\_Data\_CH0 (ADC Channel 0 Register)**

Register	Offset	Description	Initial Value	
P_ADC_Data_CH0	ADC_BA+0x10	ADC Channel 0 Register	0x0000_0000	
Bit	Name	R/W	Descriptions	Initial Value
Bit[31:12]	Reserved			0x0
Bit[15:4]	CH0_DAT	R	ADC's Channel 0 Register	0x0
Bit[3:0]	Reserved			0x0

```
#include "nx1_lib.h"
#include "nx1_adc.h"
U16 getAdcFifo(void) {
    //Step.1 Read register, you can use it or discard.
    //      Use P_ADC->Ctrl for example.
    (void)P_ADC->Ctrl;
    //Step.2 Read ADC FIFO.
    return P_ADC->Data_CH0;
}
```

- UART FIFO

● **P\_UART\_Data (UART Data Register)**

Register	Offset	Description	Initial Value	
P_UART_Data	UART_BA+0x00	UART Data Register	0x0000_0000	
Bit	Name	R/W	Descriptions	Initial Value
Bit[31:0]	Reserved			
Bit[7:0]	UDR	R/W	write to TXD FIFO in WR (THR) read from RXD FIFO in RD (RBR)	0x0

```
#include "nx1_lib.h"
#include "nx1_uart.h"
U8 getUartFifo(void) {
    //Step.1 Read register, you can use it or discard.
    //      Use P_UART->Ctrl for example.
    (void)P_UART->Ctrl;
    //Step.2 Read UART FIFO.
    return P_UART->Data;
}
```

- SPI0 FIFO

- P\_SPI0\_Data (SPI0 Data Register)

Register	Offset	Description	Initial Value	
P_SPI0_Data	SPI_BA+0x10	SPI0 Data Register	0x0000_0000	
Bit	Name	R/W	Descriptions	Initial Value
Bit[31:0]	FIFO_D	R/W	Write Data into FIFO Read Data from FIFO	0x0

```
#include "nx1_lib.h"
#include "nx1_spi.h"
U32 getSpi0Fifo(void) {
    //Step.1 Read register, you can use it or discard.
    //      Use P_SPI0->Ctrl for example.
    (void)P_SPI0->Ctrl;
    //Step.2 Read SPI0 FIFO.
    return P_SPI0->Data;
}
```

- SPI1 FIFO

- P\_SPI1\_Data (SPI1 Data Register)

Register	Offset	Description	Initial Value	
P_SPI1_Data	SPI_BA+0x50	SPI1 Data Register	0x0000_0000	
Bit	Name	R/W	Descriptions	Initial Value
Bit[31:0]	FIFO_D	R/W	Write Data into FIFO Read Data from FIFO	0x0

```
#include "nx1_lib.h"
#include "nx1_spi.h"
U32 getSpi1Fifo(void) {
    //Step.1 Read register, you can use it or discard.
    //      Use P_SPI1->Ctrl for example.
    (void)P_SPI1->Ctrl;
    //Step.2 Read SPI1 FIFO.
    return P_SPI1->Data;
}
```