

ZYBO Z7 10

PS SPI Hardware Design

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<Pmod CAN>

[구현 기능]

- Zybo z7 10에서 TNS570 Launchpad로 CAN을 이용해 데이터를 전송한다.
- Zynq PS를 하드웨어 디자인으로 하고, petalinux를 사용한다.

[준비물]

- Zybo z7 10
- Pmod CAN
- tms570lc43 launchpad
- CAN transceiver

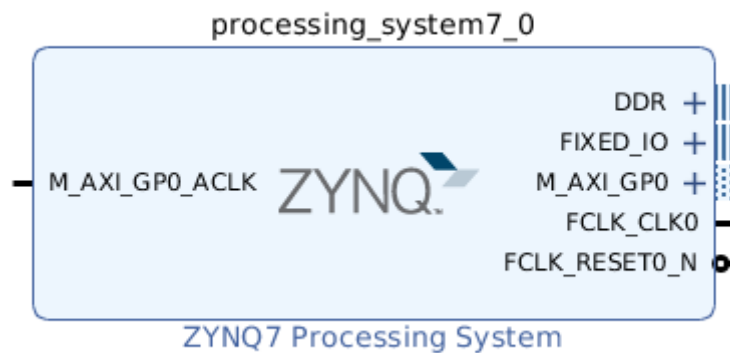
[Vivado Hardware Design]

- Zynq 7000 PS IP에서 CAN을 사용.

1) vivado 프로젝트 생성

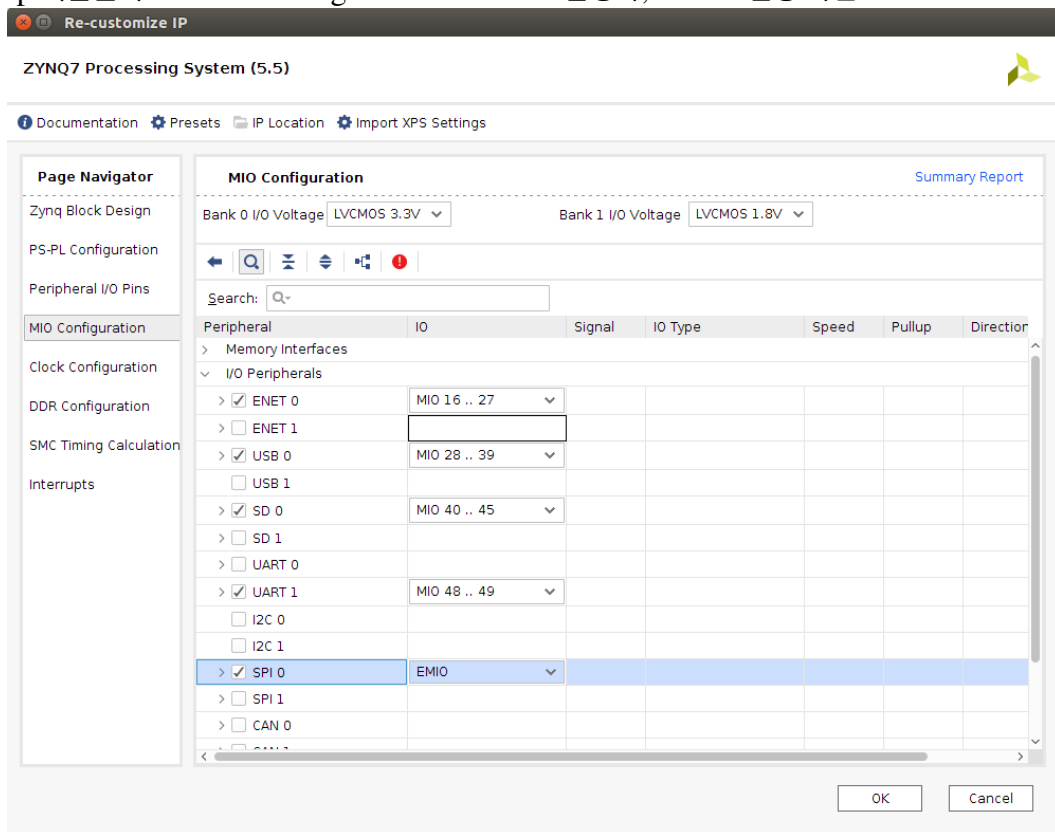
- zybo z7 10 보드 선택

2) zynq7 ip 추가

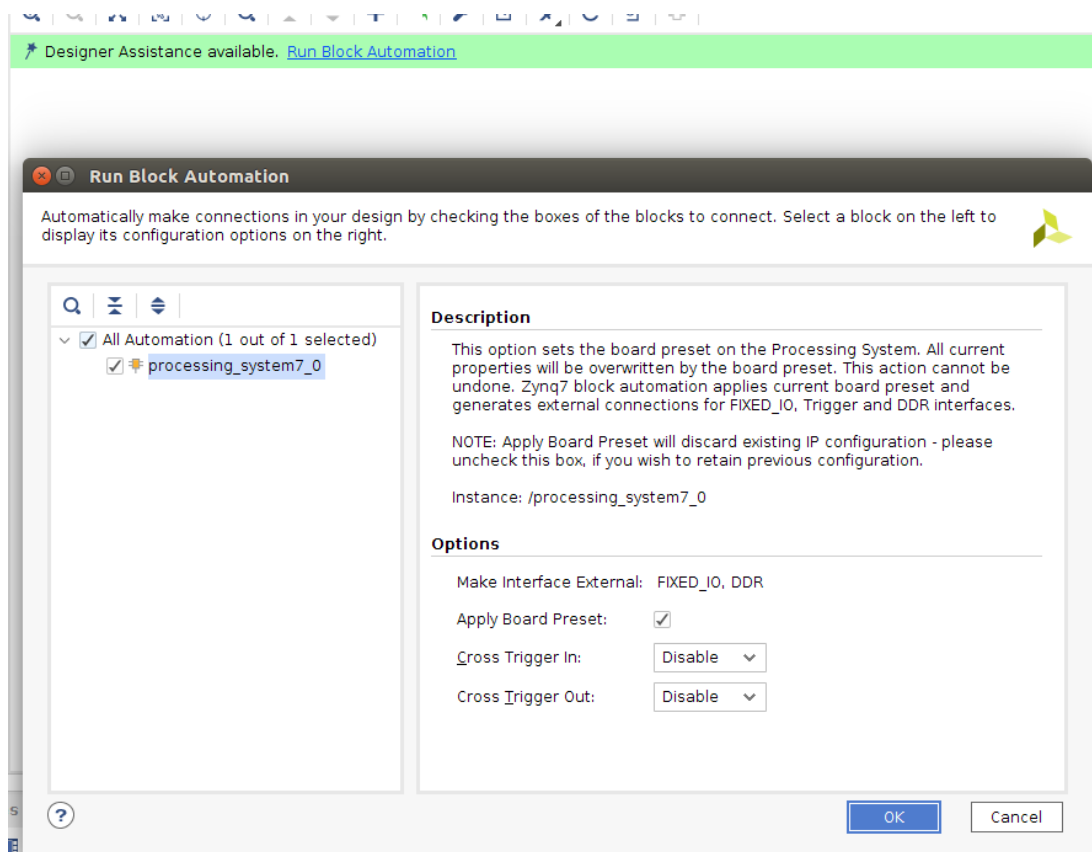


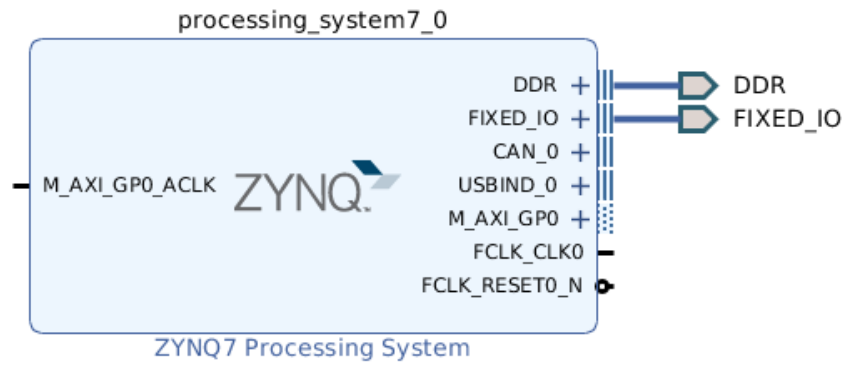
3) zynq ps 핀 활성화

- ZYNQ ip 더블클릭 → MIO Configuration → SPI 0 활성화, EMIO 설정 확인

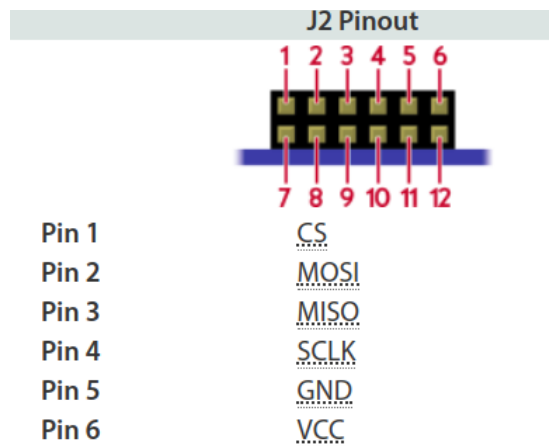
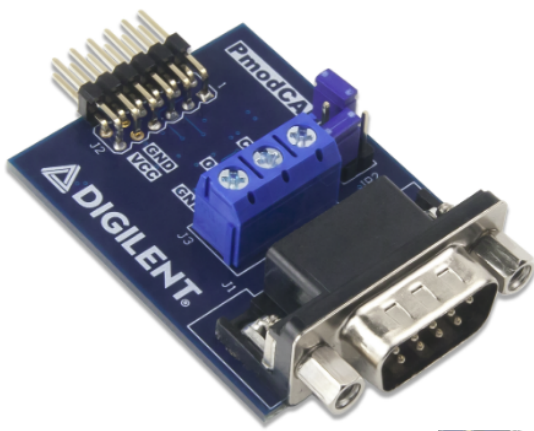


- Run Block Automation 실행

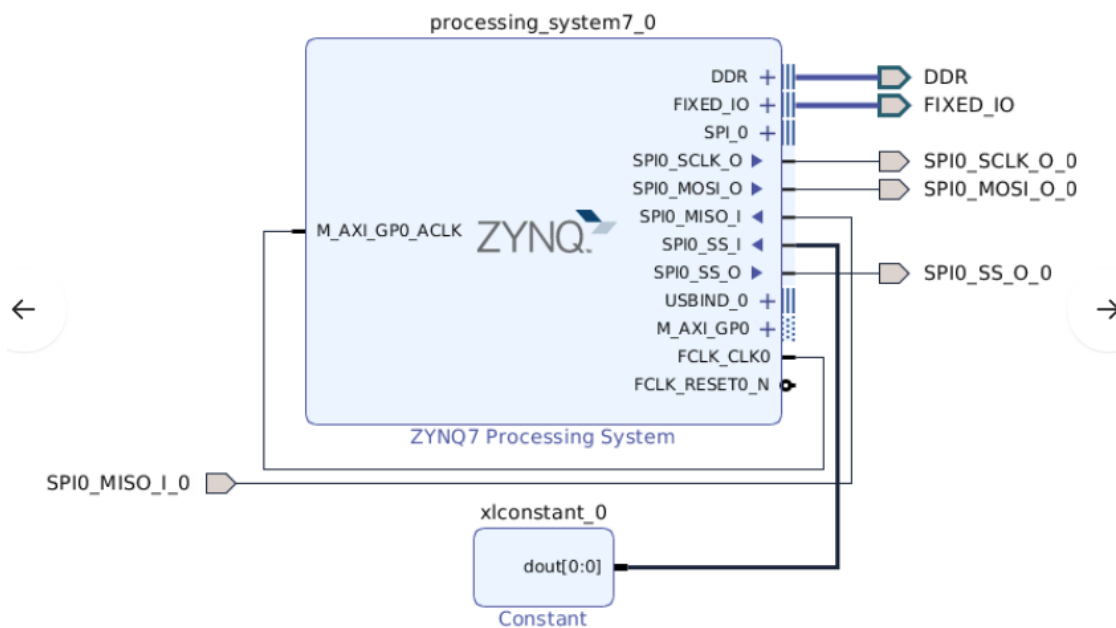




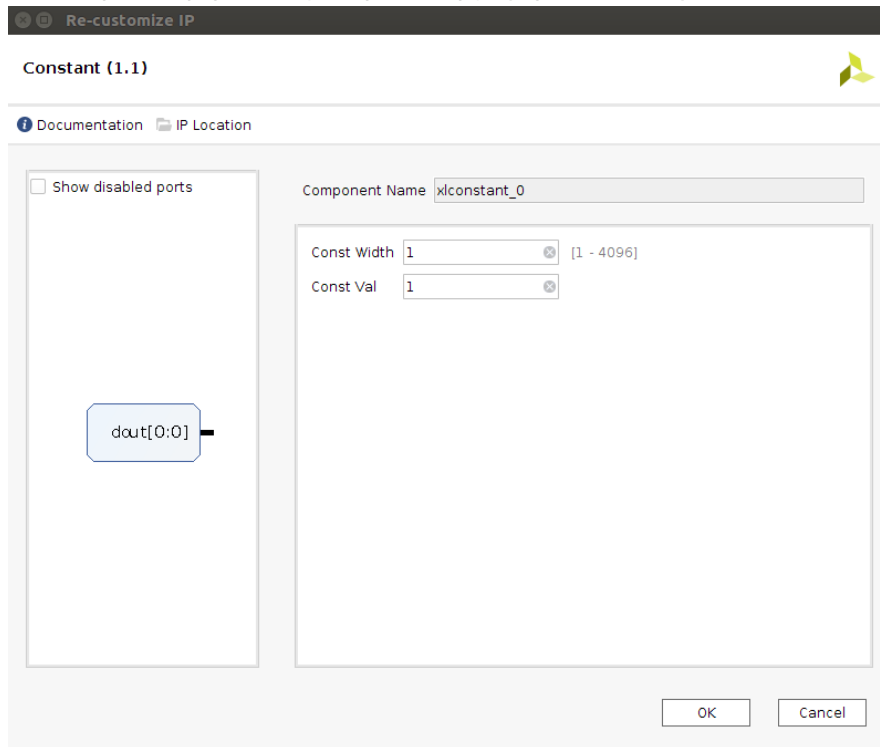
- Pmod CAN 모듈에서 6핀만 사용(CS, MOSI, MISO, SCLK, GND, VCC)



- SPI0_SCLK_O, SPI0_MOSI_O, SPI0_SS_O 는 output으로 external을 만듦
- SPI0_MISO_I 는 input으로 external을 만듦
- FCLK_CLK0은 M_AXI_GP0_ACLK에 연결



- SPI0_SS_I는 Constant IP에 1을 설정하여 연결해 항상 선택되는 것으로
→ 여러개의 SPI 모듈이 연결되어 있을 때는 이 핀을 이용하여 모듈을 선택함.

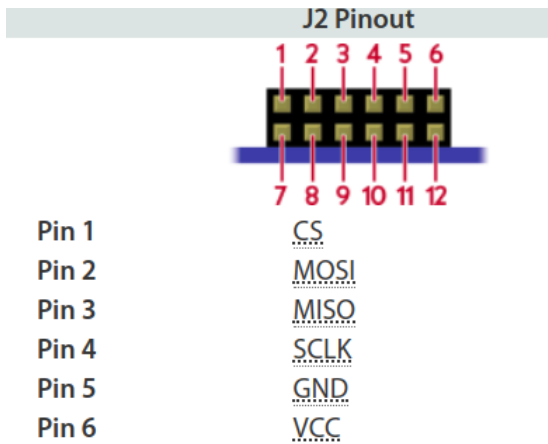


- Validate Design → Create HDL Wrapper 를 실시한다.

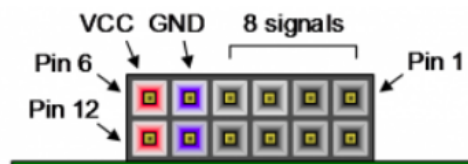
4) JC EMIO 핀에 연결

- RTL ANALYSIS → Open Elaborated Design 실행
- Layout → I/O Planning에서 Pmod JC와 연결

- Pmod CAN 모듈 J2 핀 정보



- Zybo z7 10 JC 핀 정보



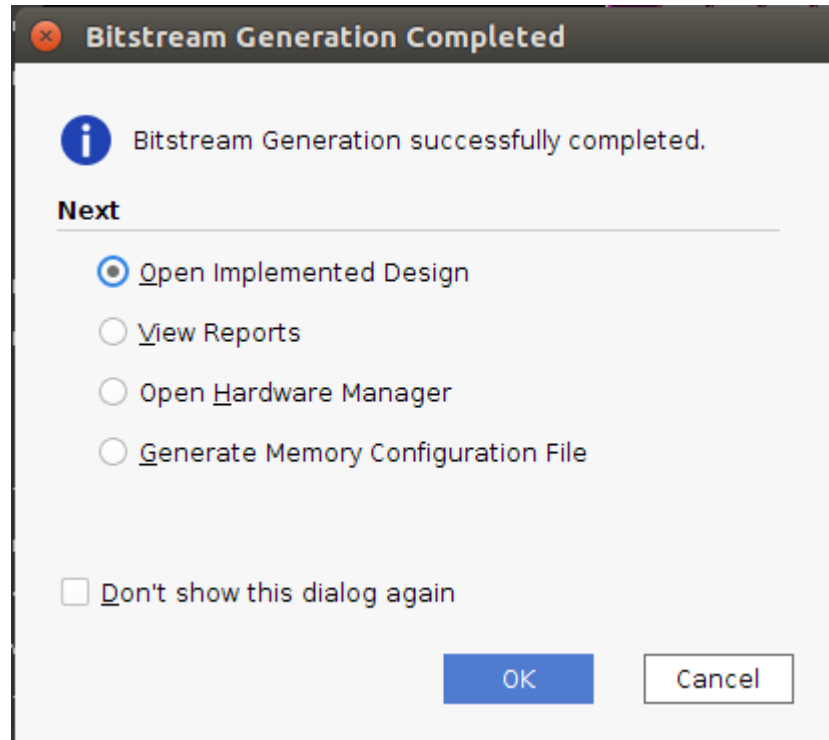
	Pmod JA	Pmod JB*	Pmod JC
Pmod Type	XADC	High-Speed	High-Speed
Pin 1	N15	V8	V15
Pin 2	L14	W8	W15
Pin 3	K16	U7	T11
Pin 4	K14	V7	T10

- Pmod CAN CS 핀 ↔ Zybo z7 10 V15

MOSI ↔ W15
 MISO ↔ T11
 SCLK ↔ T10 에 연결

Tcl Console Messages Log Reports Design Runs Package Pins I/O Ports x									
Name	Direction	Board Part Pin	Board Part Interface	Neg Diff Pair	Package Pin	Fixed	Bank	I/O Std	Vcc
▼ SPI0_16577 (4)	(Multiple)					✓	34	LVC MOS33*	
▼ Scalar ports (4)									
🔍 SPI0_MISO_I_0	IN				T11	✓	34	LVC MOS33*	
🔍 SPI0_MOSI_O_0	OUT				W15	✓	34	LVC MOS33*	
🔍 SPI0_SCLK_O_0	OUT				T10	✓	34	LVC MOS33*	
🔍 SPI0_SS_O_0	OUT				V15	✓	34	LVC MOS33*	

5) Generate Bitstream



6) Export Hardware

- File → Export → Export Hardware