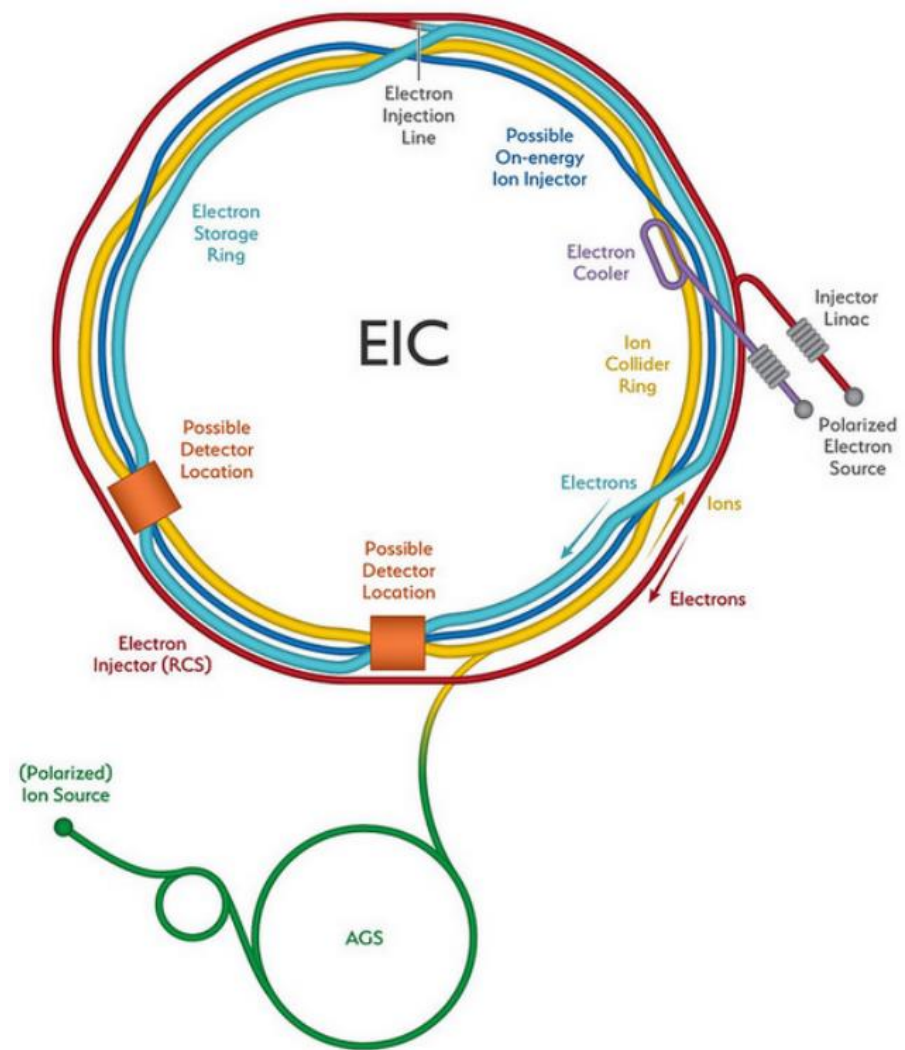
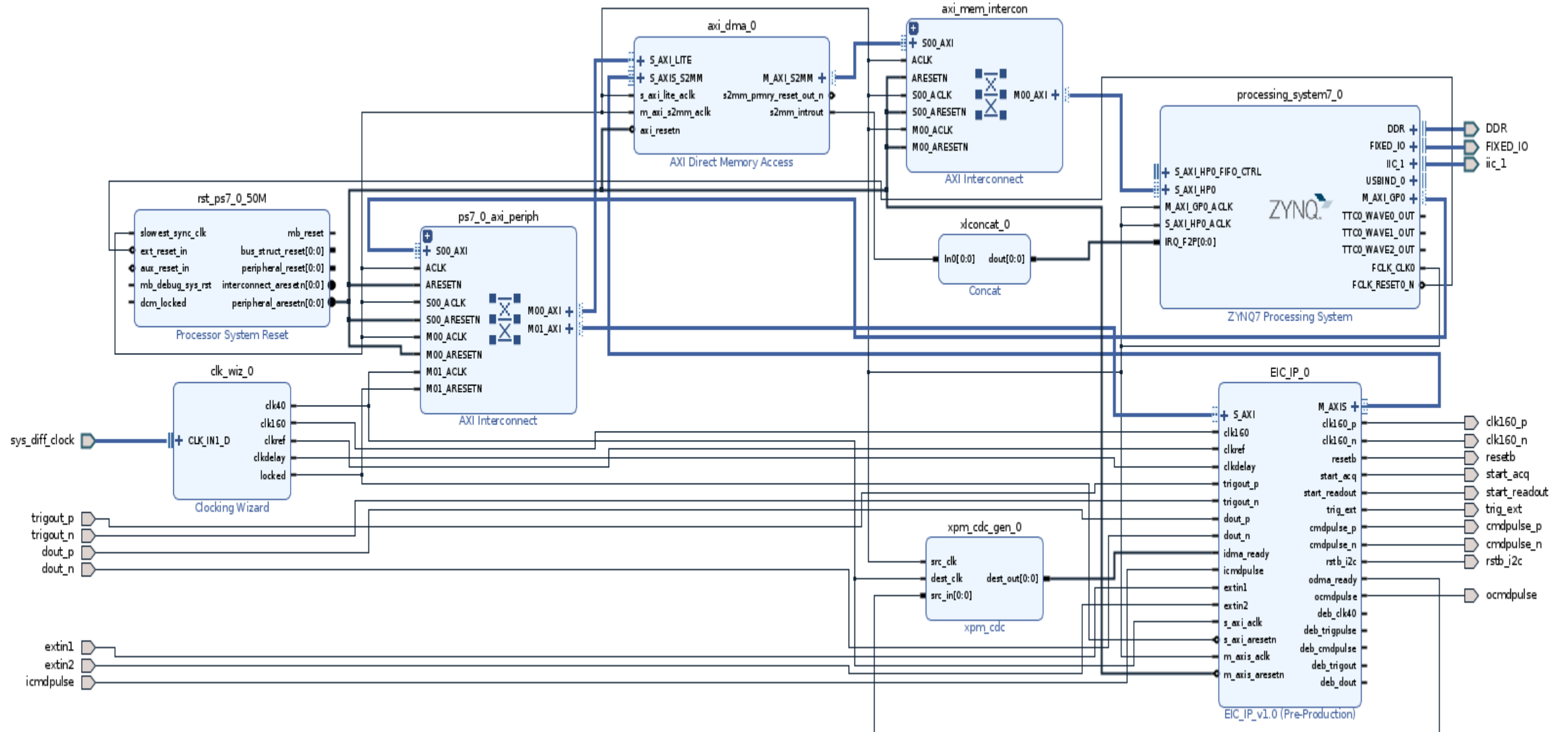
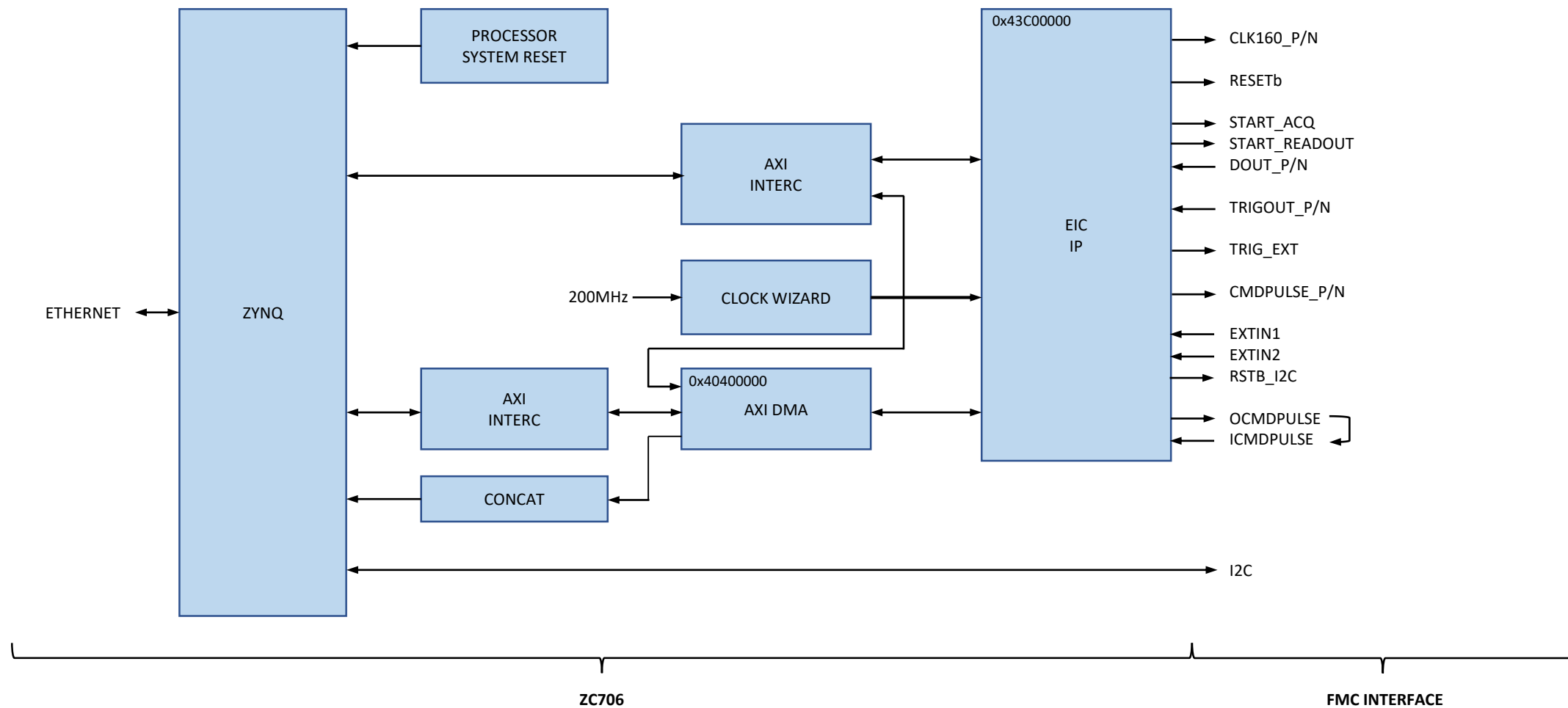




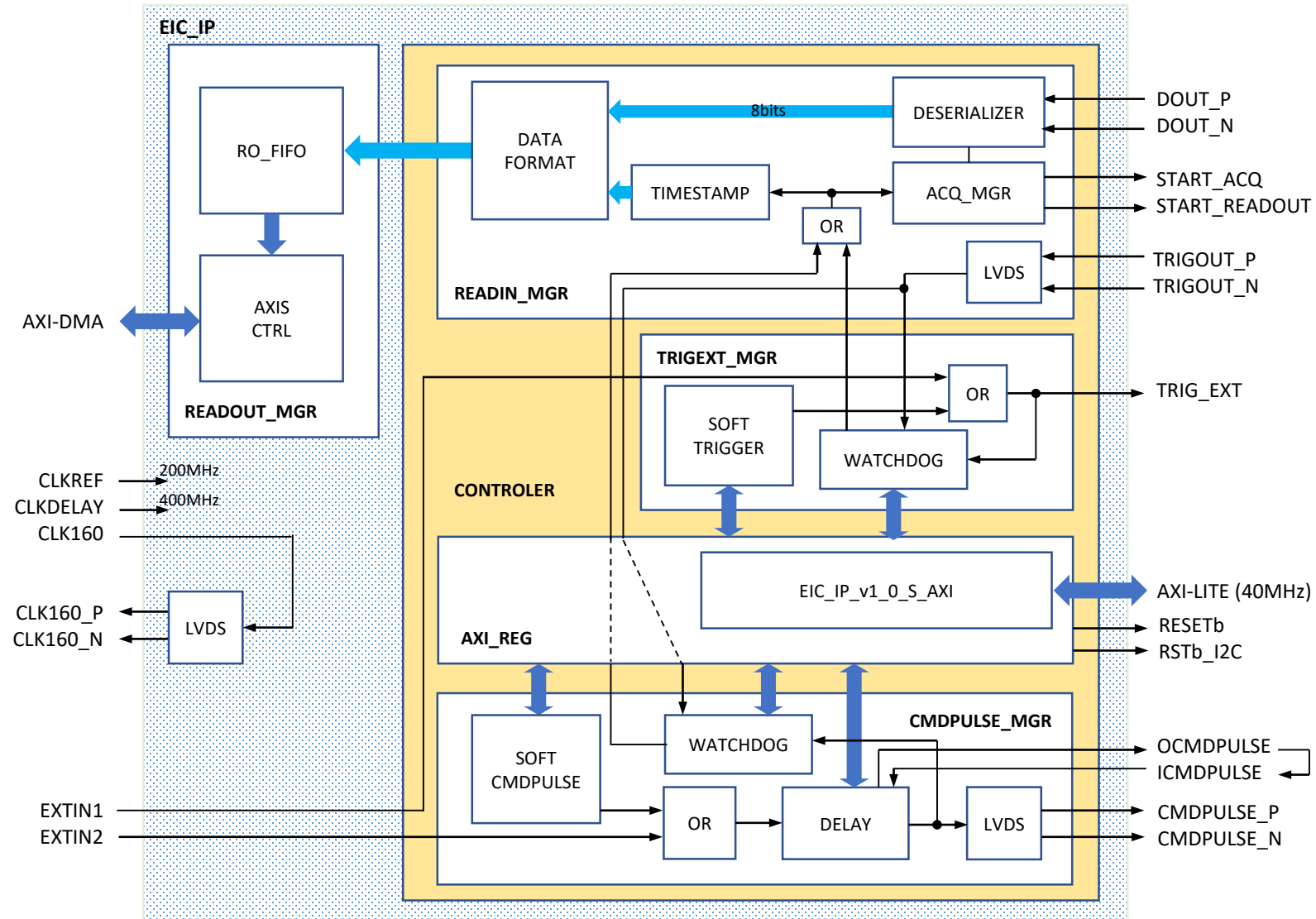
AC-LGAD - FIRMWARE BLOCK DIAGRAM (Xilinx Vivado)



AC-LGAD - FIRMWARE BLOCK DIAGRAM



EIC_IP BLOCK DIAGRAM



EIC_IP REGISTERS (AXI_REG)

CONTROL REGISTER 0 (offset 0)

[illegible]

Bit-27	: Reset Read-Out Fifo
Bit-28	: Stop Cmdpulse
Bit-29	: Stop Trigger
Bit-30	: Reset I2C → Rstb_i2c
Bit-31	: Hard Reset → Resetb

Bit-0	: Start Cmdpulse
Bit-1	: Start Trigger
Bit-26:2	: reserved

CONTROL REGISTER 1 (offset 1)

[illegible]

Bit-0	: LpGBTClk_Enable
Bit-31:1	: reserved

CMDPULSE NUMBER (offset 2)

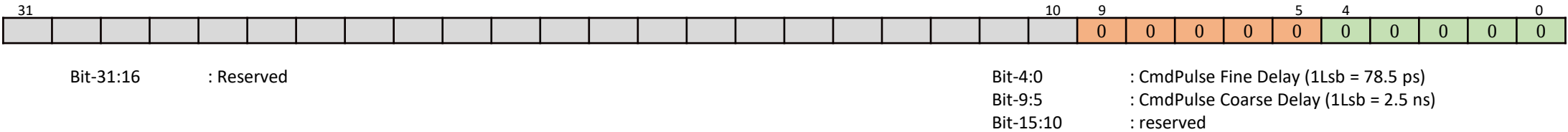
[illegible]

CMDPULSE PERIOD (offset 3)

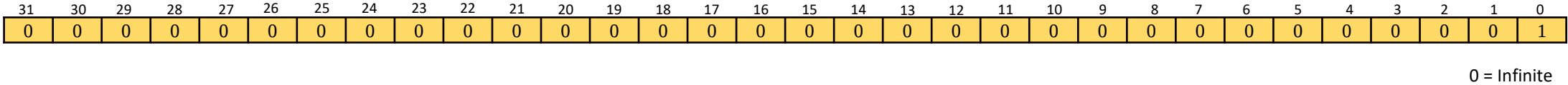
[illegible]

EIC_IP REGISTERS (AXI_REG)

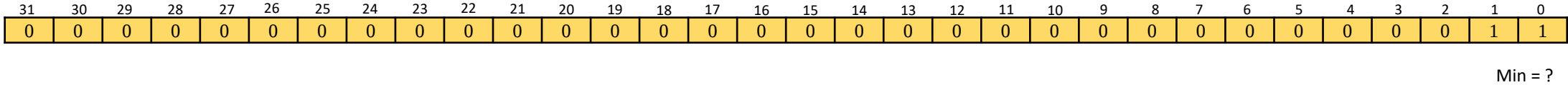
CMDPULSE DELAY (offset 4)



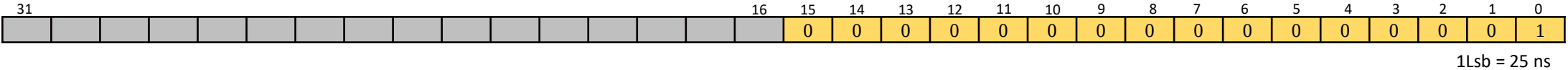
TRIGGER NUMBER (offset 5)



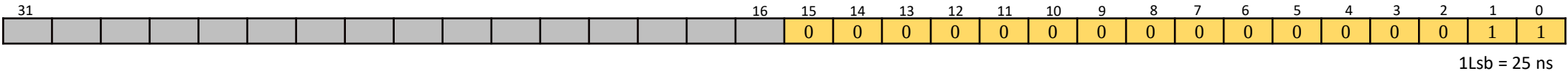
TRIGGER PERIOD (offset 6)



CMDPULSE TIMEOUT (offset 7)



TRIGGER TIMEOUT (offset 8)



EIC_IP REGISTERS (AXI_REG)

RESERVED (offset 13:9)

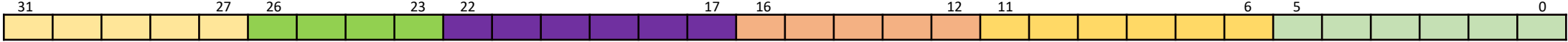


STATUS (offset 14)



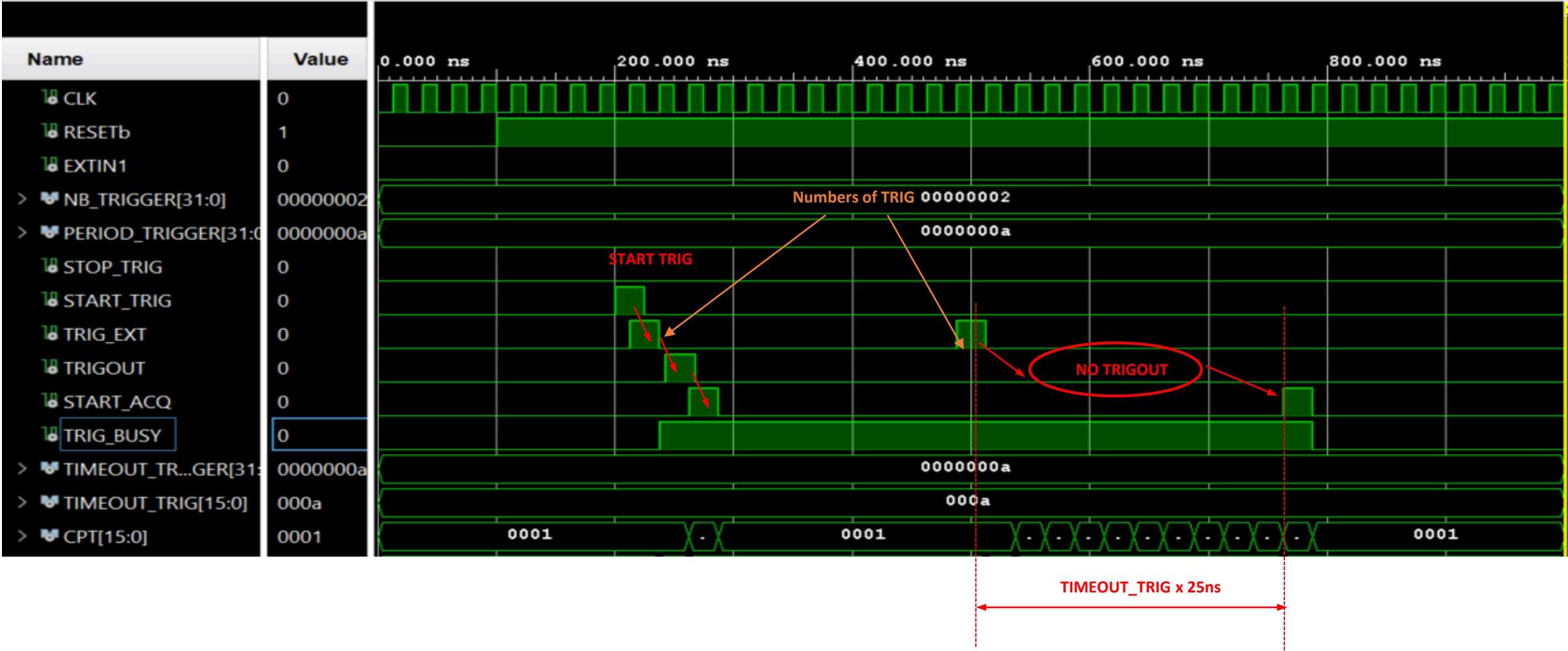
- Bit-31 : 1= DMA Ready
- Bit-30 : 1= Read-Out Fifo Full
- Bit-29 : 1= Soft Trigger In Progress
- Bit-28 : 1= Soft CmdPulse In Progress
- Bit-27 : 1= End Software Trigger
- Bit-26 : 1= End Software Cmdpulse
- Bit-25:0 : Reserved

FIRMWARE BUILD DATE (offset 15)

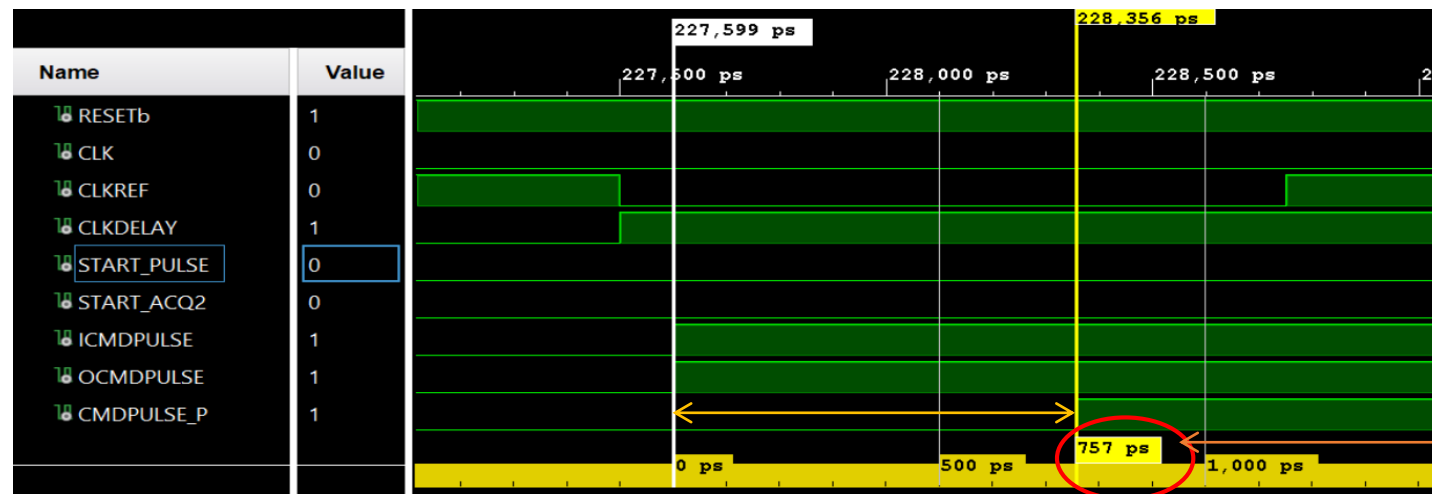
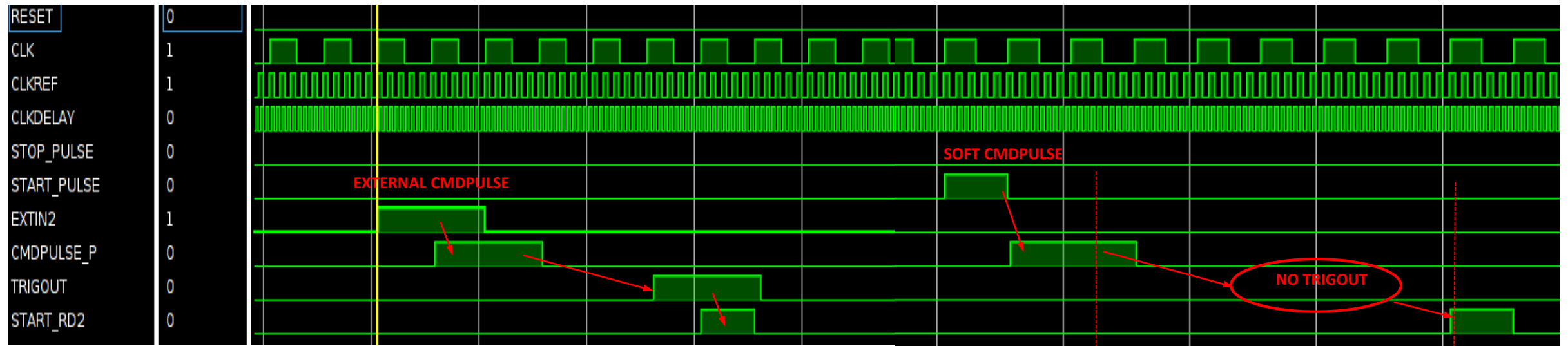


- Bit-5:0 : Second
- Bit-11:6 : Minute
- Bit-16:12 : Hour
- Bit-22:17 : Year (2000 ... 2063)
- Bit-26:23 : Month
- Bit-31:27 : Day

EXTRIG_MGR FUNCTIONNAL DIAGRAM



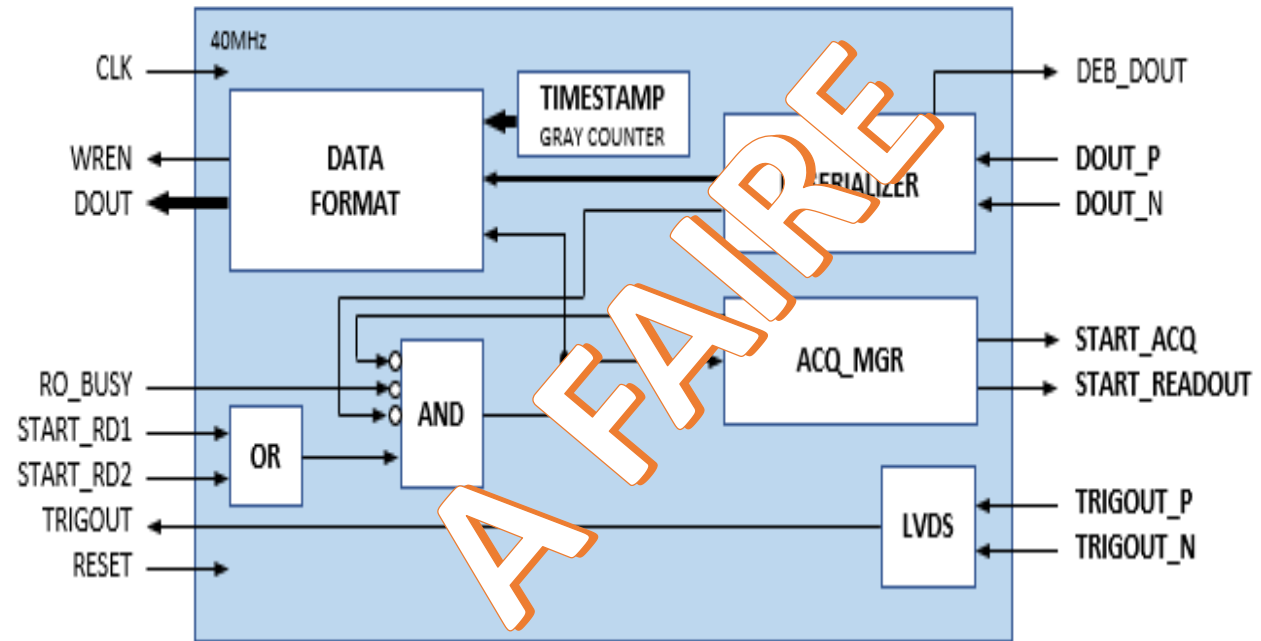
CMDPULSE_MGR TIMING DIAGRAM



$$\text{DELAY} = (757 - 600) \text{ ps} = 157 \text{ ps} \quad (157 / 78.5 = 2 \text{ Delays})$$

NB: 1 FINE_DELAY = 78.5 ps

READIN_MGR FUNCTIONAL DIAGRAM



FMC ↔ FPGA PINOUTS

FMC PIN	FMC NET NAME	DESIGN NET NAME	FPGA PIN (LPC)	FPGA PIN (HPC)
	LAXX_X	resetb		
	LAXX_X	trig_ext		
	LAXX_P	clk160_p		
	LAXX_N	clk160_n		
	LAXX_X	start_acq		
	LAXX_X	start_readout		
	LAXX_P	trigout_p		
	LAXX_N	trigout_n		
	LAXX_P	cmdpulse_p		
	LAXX_N	cmdpulse_n		
	LAXX_P	dout_p		
	LAXX_N	dout_n		
	LAXX_X	rstb_i2c		
	LAXX_X	iic_1_scl_io		
	LAXX_X	iic_1_sda_io		
	LAXX_X	ocmdpulse		
	LAXX_X	icmdpulse		
	LAXX_X	spare1		
	LAXX_X	spare2		