New TCU Memory Map
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07/10/03

Memories and Look-Up Tables

Memory Block	Starting Address	Ending Address	Number of Addresses	Data Mask (i.e. valid bits)
Input Memory Bits 0-15: DSM Input Data Bits 16-31: Detector Status Input Data	0xYY000000	0xYY03fffc	0x10000 = 2^{16}	0xffffffff
Output Memory 1 Bits 0-15: Trigger Word Bits 16-27: Physics Word Bit 28: Contamination Bit Bit 29: Trigger Flag Bit 30: Token FIFO Empty Status Bit 31: Halt Status	0xYY040000	0xYY07fffc	0x10000 = 2^{16}	0xffffffff
Output Memory 2 Current Action Word	0xYY080000	0xYY0bfffc	0x10000 = 2^{16}	0xffffff
Output Memory 3 Current Token	0xYY0c0000	0xYY0ffffc	0x10000 = 2^{16}	0xfff
Physics Word Look-Up Table	0xYY100000	0xYY13fffc	0x10000 = 2^{16}	0xffff
Action Word Look-Up Table	0xYY140000	0xYY17fffc	0x10000 = 2^{16}	0xffffff
Prescale Counter	0xYY180000	0xYY1bfffc	0x10000 = 2^{16}	0xffff
Prescale Table	0xYY1c0000	0xYY1ffffc	0x10000 = 2^{16}	0xffff
Live Counters	0xYY200000	0xYY23fffc	0x10000 = 2^{16}	0xffffffff
Trigger Word Counters	0xYY240000	0xYY27fffc	0x10000 = 2^{16}	0xffffffff
Monitor Memory	0xYY280000	0xYY2bfffc	0x10000 = 2^{16}	0x1
Registers (see below)	0xYY2c0000	0xYY2c00c4	0x2d = 45	See below
Trigger Word Look-Up Table	0xYY400000	0xYY7ffffc	0x100000 = 2^{20}	0xffff

Control and Status Registers (CSRs)

ID: Name	Address	Functionality	Access
0: Operation Control	0xYY2c0000	D0: Put TCU in Load/Run Mode D1: External/Internal Data Source	Read/Write
1: FPGA Status	0xYY2c0004	D0: Address Control FPGA Configured D1: Prescale FPGA Configured D2: Scalar FPGA Configured	Read Only
2: Board Connected Status	0xYY2c0008	D0: DSM cable is plugged in	Read Only
3: Strobe Reset	0xYY2c000c	D0: Reset the internal strobes on all FPGAs.	Write Only
4: FIFO Status	0xYY2c0010	D0: Token FIFO Empty D1: Token FIFO Full D2: Response FIFO Empty D3: Response FIFO Full D4: Info FIFO 1 Empty D5: Info FIFO 1 Full D6: Info FIFO 2 Empty D7: Info FIFO 2 Full D8: Info FIFO 3 Empty	Read Only

		D9: Info FIFO 3 Full D10: Info FIFO 4 Empty D11: Info FIFO 4 Full D12: Info FIFO 5 Empty D13: Info FIFO 5 Full D14: Info FIFO 6 Empty D15: Info FIFO 6 Full	
5: FIFO Reset	0xYY2c0014	D0: Reset (i.e. clear) Token FIFO D1: Reset Response FIFOs D2: Reset Information FIFOs	Write only
6: Token FIFO	0xYY2c0018	D0-D11: Token Value	Write Only
7: Response FIFO 1	0xYY2c001c	D0-D23: Action Word part of Response	Write Only
8: Response FIFO 2	0xYY2c0020	D0-D11: Token part of Response	Write Only
9: Information FIFO 1	0xYY2c0024	D0-D15: Action Word – Detector Bitmask D16-D19: Action Word – DAQ Command D20-D23: Action Word – TRG Command	Read Only
10: Information FIFO 2	0xYY2c0028	D0-D11: Token	Read Only
11: Information FIFO 3	0xYY2c002c	D0-D15: DSM Input D16-D31: External BUSY Input	Read Only
12: Information FIFO 4	0xYY2c0030	D0-D15: Modified BUSY Status D16-D27: Physics Word D28-D30: Unused D31: Contamination Bit	Read Only
13: Information FIFO 5	0xYY2c0034	D0-D15: Trigger Word	Read Only
14: Information FIFO 6	0xYY2c0038	D0-D15: DSM Address D16-D31: Contamination BUSY Status, recorded even if Contamination BUSY is not used.	Read Only
15: Halt Status	0xYY2c003c	D0: Halt Generated	Read Only
16: Local Address Control	0xYY2c0040	D0: Reset the local address counter to zero D1: Copy the current value of the local address counter into CSR 17	Write Only
17: Read Local Address	0xYY2c0044	D0-D15: Current value of local address counter.	Read Only
18: Halt Control	0xYY2c0048	D0: Enable/Disable Halt Generation D1: Reset Halt D2: Current halt status	Read/Write
19: Internal Busy Control	0xYY2c004c	D0-D15: Use Internal BUSY for detector X, where X = 0-15	Read/Write
20: Contamination Busy Control	0xYY2c0050	D0: Use Contamination BUSY for detector 0	Read/Write
21: Contamination Busy Length	0xYY2c0054	D0-D7: Number of RHIC clock ticks of preceded and followed protection for detector 0	Read/Write
37: Save current BUSY status	0xYY2c0094	D0: Latch the current value of all the BUSY components into CSRs 38:41	Write Only
38: BUSY Status 1	0xYY2c0098	D0-D15: Current external BUSY status	Read Only
39: BUSY Status 2	0xYY2c009c	D0-D15: Current internal BUSY status	Read Only
40: BUSY Status 3	0xYY2c00a0	D0: Current contamination BUSY status (det 0 only)	Read Only
41: BUSY Status 4	0xYY2c00a4	D0-D15: Current modified BUSY status	Read Only
42: Followed Status	0xYY2c00a8	D0: Current followed status (det 0 only)	Read Only
43: Scalar Control	0xYY2c00c0	D0: Use TW Counter 1 D1: Use TW Counter 2 D2: Reset TW Counter 1 D3: Reset TW Counter 2 D4: Use Live Counter 1 D5: Use Live Counter 2 D6: Reset Live Counter 1	Write Only

		D7: Reset Live Counter 2	
44: Scalar Status	0xYY2c00c4	D0: TW Counter 1 counting D1: TW Counter 2 counting D2: TW Counter 1 overflowed D3: TW Counter 2 overflowed D4: Error – both TW Counters overflowed D5: Live Counter 1 counting D6: Live Counter 2 counting D7: Live Counter 1 overflowed D8: Live Counter 2 overflowed D9: Error – both Live Counters overflowed	Read Only