

# SR192 Tutorial:

## Querying TSA Error Addresses Via A32

### Objective

This document intends to clarify the procedure for acquiring the real-time Error Addresses logged by the SR192's TSA timing module. This procedure will utilize A32 register-based accesses and additional information can be found in the "Model SR192 Reference Manual" (Revision 2.0, 2/8/99), pages B-9 (section 2.2.7), B-10 (section 2.4), B-7 (section 2.2.4) and B-6 (section 2.2.2).

#### Step 1: Acquire the 18-bit TSA Error Count

1. 16-bit WRITE 0x1 @ 0x40010 (sets Function Code 1 to target the TSA Error Count Register)
2. 16-bit READ @ 0x80000 (gets lower 16 bits of 18-bit TSA Error Count)
3. 16-bit READ @ 0x40004 (gets upper 2 bits of 18-bit TSA Error Count @ bits 0-1)

#### Step 2: Query each TSA Error Count number to find the respective 18-bit I/O FMA address

1. 16-bit WRITE 0x0 @ 0x40010 (sets Function Code 0 to target the TSA Error Address Memory)
2. 16-bit READ @ 0x80000 (gets lower 16 bits of 18-bit I/O FMA of TSA Error Count #1)
3. 16-bit READ @ 0x40004 (gets upper 2 bits of 18-bit I/O FMA of TSA Error Count #1 @ bits 0-1)
4. 16-bit READ @ 0x80002 (gets lower 16 bits of 18-bit I/O FMA of TSA Error Count #2)
5. 16-bit READ @ 0x40004 (gets upper 2 bits of 18-bit I/O FMA of TSA Error Count #2 @ bits 0-1)
6. 16-bit READ @ 0x80004 (gets lower 16 bits of 18-bit I/O FMA of TSA Error Count #3)
7. 16-bit READ @ 0x40004 (gets upper 2 bits of 18-bit I/O FMA of TSA Error Count #3 @ bits 0-1)
8. 16-bit READ @ 0x80006 (gets lower 16 bits of 18-bit I/O FMA of TSA Error Count #4)
9. 16-bit READ @ 0x40004 (gets upper 2 bits of 18-bit I/O FMA of TSA Error Count #4 @ bits 0-1)
10. (etc...)
11. (etc...)
12. (etc...)
13. (etc...)
14. (etc...)
15. (etc...)
16. 16-bit READ @ 0xn (gets lower 16 bits of 18-bit I/O FMA of TSA Error Count #n at address 0xn, where 0xn = 0x80000 + (0x2 X (Error Count #n - 1)) up to 0xBFFFF)
17. 16-bit READ @ 0x40004 (gets upper 2 bits of 18-bit I/O FMA of TSA Error Count #n @ bits 0-1)

#### Step 3: Clear the TSA Error Count (if desired) \*

(\* Automatically performed by SCPI "EXEC:..." command, but must be done discretely if executing via A32 access.)

1. 16-bit WRITE 0x0 @ 0x40002 (clears the TSA Error Count and the TSA/TSB HALT and TIMEOUT LEDs)