MINOS MASTER Card VME Function Addresses 6/26/03
(For Revision B Cards)

VME base address (A31-A27) is configured by the Geographical Address pins (GA4-GA0).
The only Address Modifiers that the Card will respond to are:

1. Extended non-privileged 64-bit block transfer (64b data, 32b address block transfers) AM=08
2. Extended non-privileged data access (32b data, 32b address single transfers) AM=09

Address Modifier	Hex Address (h) Offset (A26-A2)	Function
		Data Format of Dual Port BUFFER output data D26-D0 = Timestamp TS[26..0] D28-D27 = Reserved X[1..0] D31-D29 = Data Type DT[2..0] D47-D32 = ADC Value ADC[15..0] D51-D48 = MINDER Channel Number CH[3..0] D52 = Priority Error Bit D55-D53 = MASTER Input Channel Number ICH[2..0] D60-D56 = Geographical Address GA[4..0] D63-D61 = Error Codes ERR[2..0] ERR0 = Input Parity Error 1=Error ERR1 = Capacitor ID Error 1=Error ERR2 = Trailer Ch. Num. Error, or Two Headers before Trailer, or >= 16384 Words written to a channel's buffer 1=Error Note: Input Parity Error, Capacitor ID Error, and Trailer Ch. Num. Error are masked off when the Priority Error Bit is active.
08	h0000000	READ only – Dual Port BUFFER 0 (All channels with data) (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h0100000	READ only – Dual Port BUFFER 1 (All channels with data) (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1000000-h101FFF8	READ only – Channel 0, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1020000-h103FFF8	READ only – Channel 0, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data

08	h1040000- h105FFF8	READ only – Channel 1, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1060000- h107FFF8	READ only – Channel 1, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1080000- h109FFF8	READ only – Channel 2, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h10A0000- h10BFFF8	READ only – Channel 2, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h10C0000- h10DFFF8	READ only – Channel 3, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h10E0000- h10FFFF8	READ only – Channel 3, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1100000- h111FFF8	READ only – Channel 4, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1120000- h113FFF8	READ only – Channel 4, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1140000- h115FFF8	READ only – Channel 5, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1160000- h117FFF8	READ only – Channel 5, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h1180000- h119FFF8	READ only – Channel 6, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data

08	h11A0000- h11BFFF8	READ only – Channel 6, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h11C0000- h11DFFF8	READ only – Channel 7, Dual Port BUFFER 0 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h11E0000- h11FFFF8	READ only – Channel 7, Dual Port BUFFER 1 (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D63-D0 = Data
08	h2000000- h20FFFF8	WRITE/READ – Channel 0, 1, 2, & 3 Look-Up-Table Memory (Must be in VME Mode) D15-D0 = Channel 0 data D31-D16 = Channel 1 data D47-D32 = Channel 2 data D63-D48 = Channel 3 data
08	h2100000- h21FFFF8	WRITE/READ – Channel 4, 5, 6, & 7 Look-Up-Table Memory (Must be in VME Mode) D15-D0 = Channel 4 data D31-D16 = Channel 5 data D47-D32 = Channel 6 data D63-D48 = Channel 7 data
08	h2200000- h23FFFF8	WRITE/READ – Diagnostic Memory (Must be in VME Mode) D7-D0 = Diagnostic data - ADC bits D10-D8 = Diagnostic data - Range bits D12-D11= Diagnostic data - CAPID bits D13 = Diagnostic data - Parity bit D14 = Diagnostic data - Header bit (Should always = 0) D15 = Diagnostic data - Trailer bit (Always = 0, except for the last data word for that event, then = 1) D16 = Diagnostic data – Priority error bit D63-D17 = Undefined
09	h0000000	WRITE/READ – Status Register (Bits D31-D16 are READ only) See data pattern below

09 h0000004 WRITE/READ – Flash Register

(Must be in Flash Mode) See data pattern below

Bit	Status Register	Flash Register
D0	* Mode 0	UPLD Ch 0
D1	* Mode 1	DNLD Ch 0
D2	* Mode 2	ERAS Ch 0
D3		
D4	Interrupt Mask bit Interrupt Enabled = 1	UPLD Ch 1
D5	Buffer Swap Complete Complete = 1 (RO)	DNLD Ch 1
D6	Buffer Set To (RO)	ERAS Ch 1
D7	Diagnostic Event in progress	
D8		UPLD Ch 2
D9		DNLD Ch 2
D10		ERAS Ch 2
D11		
D12		UPLD Ch 3
D13		DNLD Ch 3
D14		ERAS Ch 3
D15		
D16	FIFO 0 MT (RO)	UPLD Ch 4
D17	FIFO 1 MT (RO)	DNLD Ch 4
D18	FIFO 2 MT (RO)	ERAS Ch 4
D19	FIFO 3 MT (RO)	
D20	FIFO 4 MT (RO)	UPLD Ch 5
D21	FIFO 5 MT (RO)	DNLD Ch 5
D22	FIFO 6 MT (RO)	ERAS Ch 5
D23	FIFO 7 MT (RO)	
D24	FIFO 0 FL (RO)	UPLD Ch 6
D25	FIFO 1 FL (RO)	DNLD Ch 6
D26	FIFO 2 FL (RO)	ERAS Ch 6
D27	FIFO 3 FL (RO)	
D28	FIFO 4 FL (RO)	UPLD Ch 7
D29	FIFO 5 FL (RO)	DNLD Ch 7
D30	FIFO 6 FL (RO)	ERAS Ch 7
D31	FIFO 7 FL (RO)	

Note: Diagnostic Event bit = 1 during sending of diagnostic data but = 0 when Diagnostic Event is done

Buffer Set To = Buffer being used. Buffer 0 = 0; Buffer 1 = 1

Buffer Swap Complete = Buffer Set To and Buffer all channels have Been set to are the same = 1

(RO) = READ only bit

MT = Empty

FL = Full

UPLD = Upload Flash Memory data to Look-Up-Table Memory

DNLD = Download Look-Up-Table Memory data to Flash Memory

ERAS = Erase Flash Memory

*Mode 2	Mode 1	Mode 0	
0	0	0	Standby Mode
0	0	1	Data Mode
0	1	0	Calibration Mode
0	1	1	Flash Mode
1	0	0	VME Mode
1	0	1	Diagnostic Data Mode
1	1	0	Diagnostic Calibration Mode
1	1	1	

09 h0000008 WRITE only – Master Clear
D31-D0 = No data needed

09 h000000C WRITE/READ – Minder Crate Error Register
D0 = Error Bit
D31-D1 = Undefined

09 h0004000 READ only – Channel 0, BUFFER 0 Word Counter
(Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode)
D13-D0 = Channel 0 data
D15-D14 = 0
D31-D16 = Undefined

09 h0004004 READ only – Channel 1, BUFFER 0 Word Counter
(Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode)
D13-D0 = Channel 1 data
D15-D14 = 0
D31-D16 = Undefined

09 h0004008 READ only – Channel 2, BUFFER 0 Word Counter
(Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode)
D13-D0 = Channel 2 data
D15-D14 = 0
D31-D16 = Undefined

09 h000400C READ only – Channel 3, BUFFER 0 Word Counter
(Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode)
D13-D0 = Channel 3 data
D15-D14 = 0
D31-D16 = Undefined

09 h0004010 READ only – Channel 4, BUFFER 0 Word Counter
(Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode)
D13-D0 = Channel 4 data
D15-D14 = 0
D31-D16 = Undefined

09	h0004014	READ only – Channel 5, BUFFER 0 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 5 data D15-D14 = 0 D31-D16 = Undefined
09	h0004018	READ only – Channel 6, BUFFER 0 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 6 data D15-D14 = 0 D31-D16 = Undefined
09	h000401C	READ only – Channel 7, BUFFER 0 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 7 data D15-D14 = 0 D31-D16 = Undefined
09	h0004020	READ only – Channel 0, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 0 data D15-D14 = 0 D31-D16 = Undefined
09	h0004024	READ only – Channel 1, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 1 data D15-D14 = 0 D31-D16 = Undefined
09	h0004028	READ only – Channel 2, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 2 data D15-D14 = 0 D31-D16 = Undefined
09	h000402C	READ only – Channel 3, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 3 data D15-D14 = 0 D31-D16 = Undefined
09	h0004030	READ only – Channel 4, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 4 data D15-D14 = 0 D31-D16 = Undefined

09	h0004034	READ only – Channel 5, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 5 data D15-D14 = 0 D31-D16 = Undefined
09	h0004038	READ only – Channel 6, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 6 data D15-D14 = 0 D31-D16 = Undefined
09	h000403C	READ only – Channel 7, BUFFER 1 Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D13-D0 = Channel 7 data D15-D14 = 0 D31-D16 = Undefined
09	h0004040	READ only – BUFFER 0 Total Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D16-D0 = BUFFER 0 data D31-D17 = Undefined
09	h0004044	READ only – BUFFER 1 Total Word Counter (Must be in Data, Calibrate, Diagnostic Data, or Diagnostic Calibrate Mode) D16-D0 = BUFFER 1 data D31-D17 = Undefined
09	h0008000	WRITE/READ – Channel 0 & 1 Threshold Register (Must be in VME Mode) D15-D0 = Channel 0 data D31-D16 = Channel 1 data
09	h0008004	WRITE/READ – Channel 2 & 3 Threshold Register (Must be in VME Mode) D15-D0 = Channel 2 data D31-D16 = Channel 3 data
09	h0008008	WRITE/READ – Channel 4 & 5 Threshold Register (Must be in VME Mode) D15-D0 = Channel 4 data D31-D16 = Channel 5 data
09	h000800C	WRITE/READ – Channel 6 & 7 Threshold Register (Must be in VME Mode) D15-D0 = Channel 6 data D31-D16 = Channel 7 data

09	h000C000	WRITE only – Start Strobing Diagnostic Data to BUFFER 0 (Must be in Diagnostic Data or Diagnostic Calibrate Mode) D26-D0 = Timestamp D28-D27 = 0 D31-D29 = Data Type
09	h000C004	WRITE only – Start Strobing Diagnostic Data to BUFFER 1 (Must be in Diagnostic Data or Diagnostic Calibrate Mode) D26-D0 = Timestamp D28-D27 = 0 D31-D29 = Data Type
09	h000C008	WRITE only – Load Diagnostic Memory Starting Address (Must be in VME Mode) D17-D0 = Starting address data D31-D18 = No data needed
09	h000C00C	WRITE only – Clear Diagnostic Memory Address Register D31-D0 = No data needed
09	h0010000- h001007C	READ only - ID PROM D31-D24 = ASCII data for all ID PROM addresses D23-D0 = Undefined
09	h0014000- h0017FFC	WRITE/READ – MINDER Crate D15-D0 = Data D31-D16 = Undefined Note: Writing to address h0017E30 (VME Strobe to Buffer 0) or to address h0017E34 (VME Strobe to Buffer 1) on the TRIGGER-KEEPER Card (Card Address = 31) will set the buffer on the MASTER Card also.