

Configuring and Running the MCEN Crates

John M. Butler
Boston University

1. Initial Configuration

- 1.1. Crate Configuration – consists of a 68040 in slot 1, an MCCM in slot 2 or slot 3, and n MCEN's where $n = 1-16$. **NB** If the MCCM is in slot 3 then the BR3 jumper *must* be installed in slot 2 for the MCCM to act as a master.
- 1.2. Base Addresses – see Table 1. Note the MCCM base address should be already set “at the factory”. The MCEN base address is set by rotary switch SW1.

For A-layer MCEN crates, the MCEN's are MCEN #0-7 where the MCEN number is the same as the MDT octant number. This is important for correctly splitting the east and west octants into different cables for Level 2. The n MCON's in the crate have the addresses of MCEN #8-($n+7$). **NB** MCON data is *not* sent to Level 2.

For B/C-Layer MCEN crates, the B-Layer MCEN's are MCEN #0-7 and the C-Layer MCEN's are MCEN #8-15. Again, the octants are in monotonically increasing order to ensure the correct East-West split for Level 2.

Module	Base Address	East – West Octant	CKn+ CKn-Jumpers
MTT	0x01000000	NA	NA
68040	0x00000000	NA	NA
MCCM	0x80000000	NA	NA
MCEN #0	0x00800000	East	1
MCEN #1	0x00810000	East	1
MCEN #2	0x00820000	West	1
MCEN #3	0x00830000	West	1
MCEN #4	0x00840000	West	2
MCEN #5	0x00850000	West	2
MCEN #6	0x00860000	East	2
MCEN #7	0x00870000	East	2
MCEN #8	0x00880000	East	3
MCEN #9	0x00890000	East	3
MCEN #10	0x008A0000	West	3
MCEN #11	0x008B0000	West	3
MCEN #12	0x008C0000	West	4
MCEN #13	0x008D0000	West	4
MCEN #14	0x008E0000	East	4
MCEN #15	0x008F0000	East	4

Table 1. MCEN base address map and clock jumper configuration.

1.3. The 53 MHz clock is brought onto the MCEN via one of four pairs of differential clock lines. Make sure the two jumpers that select the clock pair are set according to Table 1. This ensures that no more than four MCEN's load any pair of clock lines.

2. Downloading and Initialization

- 2.1. Log into the 68040 and type the following
 - 2.1.1. `cd "/projects/11muo/mcen"`
 - 2.1.2. `<setup-mcen`
 - 2.1.3. `tester`
- 2.2. Select the crate to configure.
- 2.3. Select "Cold Start" to configure everything or select a particular function to configure/program a specific board.

3. Running on the Test Stand

- 3.1. After configuration, run the Loop Test (option #10).

4. Configuration File

The following is a sample configuration file for initializing a crate, in this case the test stand at BU.

```

TURNS    0x11
FCL2_DELAY 0x0B01
T_CSR_2  0x10006
STATUS_1 0xAAF10006
pb_test_stand.dat
pb_test_stand.dat
NMCEN    2
MCEN1    1  0xFDABF001
MCEN2    2  0xFDABFFFF

```

The first two lines are MTT parameters. STATUS_1 is an MCCM register defined as

Bits	Definition
0-15	L2 Mask: indicates which MCEN modules to read out for L2 (1 for each MCEN, 0 for each MCON).
16-20	Mode of Operation
21-30	MCCM ID
31	Use internal FIFO's for errors

The next two lines indicate the Physics Board programming files. Finally, NMCEN is the number of MCEN's in the crate followed by one line per MCEN where the first entry is a (meaningless) label, the second is the MCEN number that should match SW1, and the last entry is the MCEN CSR defined as

Bits	Definition
0-11	RX Mask, indicates which receiver SLDB's are present in current configuration
12-15	TX Mask, indicates which transmitter SLDB's are present in current configuration
16-31	TBA

For example, the lower 16 bits should be 0xFFFF for an MCEN with 12 enabled RX and 4 enabled TX. The corresponding number for an MCON is 0xF0FF where RX 1-8 and all four TX are enabled while RX 9-12 are disabled.