

NAME

Mizar – Mizar MZ 8310 Counter/Timer Module

DESCRIPTION

The Mizar MZ 8310 VME module uses two Advanced Micro Devices Am9513 timer/counter chips. These chips each contains five 16-bit counters. `spec` chains four of these counters on each chip to make two 32-bit counters on each chip. The remaining 16-bit counter on the first chip is used to keep track of real time. With `spec` you can count to a fixed time or to a fixed number of monitor counts, under software control.

The Mizar module is selected in the `spec config` file by a line similar to

```
PC_MIAZR = 0xf800 5 IRQ4
```

The first parameter is the 16-bit VME address. Next is the number of counter channels, which includes the real-time counter. Last is the VME interrupt vector, or the word `POLL` if not using interrupts. The *devices* (D) screen of the `edconf` program (normally run from the `config` macro) is used to assign the parameters. On the *scaler* (S) screen, be sure to assign the timebase to channel 0 and the monitor to channel 1.

The Mizar chip must be wired up in particular way for use with `spec`. The wire-wrap pins on jumper blocks K1 and K2 can be used, or the pins on the front panel connector J1 can be used. NOTE: Mizar mislabels the pins for jumper blocks K1 and K2 on pages 3 and 4 of their manual. The K2 jumper block should be labeled with the chip 1 pins (1O1, 1O2, etc.) and the K1 jumper block should be labeled with the chip 2 pins (2O1, 2O2, etc.). The manual has these designations reversed.

For `spec`, monitor counts must go to 1S5 (chip 1, source 5). Detector 1 is connected to 1S3 (chip 1, source 3). Detector 2 is connected to 2S3 (chip 2, source 3), and detector 3 is connected to 2S5 (chip 2, source 5).

In addition, you must connect the 1O1 (chip 1, output 1) signal to the following gates: 1G2, 1G4, 1G5, 2G2 and 2G4.

If using interrupts, you must also connect 1O1 to IRQD. IRQA, IRQB and IRQC should be left unconnected. Use the K6 jumper block to connect IRQD to one of the VME interrupts (IRQ4 is the most convenient). Make sure jumper block K4 is consistent with that choice.

The `getcounts` command will place elapsed time in `S[0]`, and the monitor counts in `S[1]`. The three remaining counter channels will be assigned to the remaining configured scaler channels.

The maximum count time is 286.33 minutes. The MZ 8310 uses a 4MZ oscillator. When counting to time, the resolution of the clock depends on the length of the count interval, as follows:

0.00004	for $t < 2.5$ sec
0.0004	for $t < 25$ sec
0.004	for $t < 250$ sec
0.04	for $t < 2500$ sec (41.67 min)
0.262144	for $t < 286.33$ min

When counting to monitor counts, the 0.04 second time base is used, and the value returned for the time channel will be corrected to account for the roll over that occurs every 655.36 seconds.