



Title: Extra pulse counter on DCX-AT200 motherboard
Products(s): DCX-AT200
Keywords: Counter, Pulse
ID#: TN1017
Date: September 24, 1998

Summary

The DCX-AT200 motherboard utilizes a Multi-Function Peripheral (MFP) chip that includes a 8 bit pulse counter. This counter isn't used for other purposes on the DCX-AT200, and is available for auxiliary functions. This tech note describes how to configure and use this counter.

More Information

The standard DCX-AT200 command set includes Read and Write commands that can be used to directly access the memory of the board. The Multi-Function Peripheral chip (Motorola P/N 68901) that includes the 8 bit pulse counter is located at base address 80000000 hex. The internal registers of this part have addresses from 80000000 hex to 8000002E hex. Since the command parameters to the DCX-AT200 are signed 32 bit numbers, the decimal form of the parameters to access the MFP are in the range -2147483648 to -2147483602.

The input signal to the counter should be connected to pin 11 on the J2 connector of the DCX-AT200. This signal should be TTL compatible. Note that this input to the DCX-AT200 has no protection against voltages outside the 0 to 5 volt range. A ground connection can also be made to the J2 connector on pins 3, 5 or 7.

The counter in the MFP is 8 bits wide, thus it has a range of 0 to 255 counts. The counter decrements (counts down) with each active edge on the input signal. When the counter register holds a value of 1, the next active edge will cause the counter to be loaded with the Initial Count Value(ICV). The ICV can be set to any number from 0 to 255. The default ICV is 255 which causes the counter to rollover from 1 to 255. To configure the counter to decrement to 0 and then rollover to 255, the ICV must be set to 0. The command sequence to do this is shown below.

In order to initialize the counter register with a set value it must be disabled. Writing a value to the counter register when it is disabled will set its' current value. Writing a value to the counter will additionally set the ICV to the same value regardless of whether the counter is disabled or not.



The following DCX-AT200 command sequences can be used to configure and read the MFP counter:

```
AL8,WB-2147483646 ; Configure counter input for positive going
                   ; edge (low to high)
AL0,WB-2147483646 ; Configure counter input for negative going
                   ; edge (high to low, the default condition)
AL8,WB-2147483622 ; Enable the counter (this is the default state)
AL0,WB-2147483622 ; Disable the counter
AL0,WB-2147483616 ; Set ICV to 0 (setting the ICV to 0 configures
                   ; the counter to operate modulo 256). If the
                   ; counter is disabled when this command is
                   ; issued, the current count will be set to 0
RB-2147483616,TR  ; Read the current counter contents into user
                   ; register 0 and the display it with the
                   ; Tell register command
```