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External Timing of Table Mode on DDS9m.

AN002

Beginning with Revision 1.3 of the DDS9m firmware, external timing of the Table Mode has been added. Each pair of output values as defined in the DDS9m manual can be stepped either by a new serial command, `'TS'` (Table Step) or via an external control pin. This allows customer provided timing to be independent from the on-board timing, including "single-stepping" of table values.

To use this feature, table values are stored as defined in the manual, except all dwell times are set to `'ff'`, which forces the table to stop at that pair. There are then two ways to move to the next table pair:

1) via serial port: `TS` ;jumps to the next table pair

2) negative edge on Pin 10 of P1.

Pin 10 of P1 is a 3V CMOS compatible signal. Only the negative edge will trigger the next output. Edges occurring sooner than approximately 100µs will be ignored. There is no upper limit on the timing. Detection of this negative edge is affected by the current state of the processing.

The last table pair in the record must be set to dwell times of `'00'`, to signal the end of the record. At this point the table will return to the beginning of the record. This last record will be output for 100µs.

Should your system require a "handshake" signal, the IOUD (I/O update) signal on pin 14 of P1 can be used. The positive edge of this signal indicates an update of the internal DDS generator. The latency from this edge to an output is less than 100ns. This signal is 3V CMOS compatible.

This example starts with 10MHz, zero phase and full scale amplitude, steps to 5MHz, zero phase, half scale amplitude and then repeats:

```
m 0
t0 0000 05f5e100,0000,03ff,ff
t1 0000 05f5e100,0000,03ff,ff
t0 0001 02faf080,0000,0200,ff
t1 0001 02faf080,0000,0200,ff
t0 0002 02faf080,0000,0200,00
t1 0002 02faf080,0000,0200,00
m t
ts
ts
```

The last record, with `'00'` for dwell is executed for 100µs before returning to the first record. Each `'ts'` moves to the next record point from the last executed record with an `'ff'` as a dwell time.

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