Applications of the ZL30142/43

Tracking ToD Information using the ZL30142/43

Application Note

Contents

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1.0 Heading

Many of today's Timing applications (e.g., Wireless basestations) require precise ToD (Time of Day) information in addition to the frequency and phase synchronization. The ToD information can come from several different sources (e.g., GPS receiver or Recovered ToP (Timing over Packet stream) that may or may not reside directly on the Network timing card. Typical Network synchronization PLLs have no concept of the ToD, but it can be very useful to have accurate, easily assessable ToD information on the Timing Card. The ZL30142/143 allows the user to load a ToD (Time of Day) seed into the device from the ToD source, via the SPI microprocessor interface. This ToD information is synchronized with the incoming reference clock and Sync pulse (i.e., 10 MHz clock and 1PPS sync forma GPS receiver) allowing the device to provide a continuous update of the ToD value, that is accessible through the SPI microprocessor port. This application note will detail the steps necessary to latch in the ToD seed and track it.

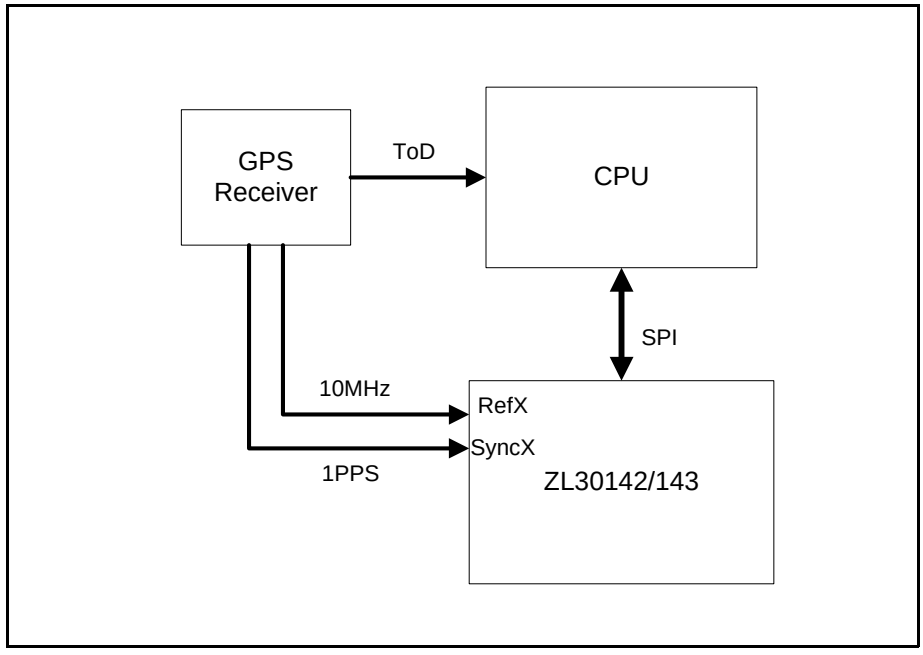

Figure 1 - Example Setup

2.0 Latching the Time of Day (ToD) seed

1. Align the internal 1Hz to external 1PPS sync pulse.

a. Read the ToP_1Hz_alignment register(page A, address 0x72)

```
curRegValue = Read(page A, address 0x72)
```

b.Clear bits 2,3,4,5 of the ToP_1Hz_alignment register while preserving the other register settings.

```
curRegValue = curRegValue & 0xC3
```

c.Set the 1Hz_sync_ctrl bits [5:4] of the ToP_1Hz_alignment register equal to '01' which will set an interrupt.

```
curRegValue = curRegValue | 0x10
Write(page A, address 0x72, curRegValue )
```

d.Wait for the interrupt to clear by monitoring the ToP_1Hz_alignment register until bits 4 and 5 are cleared.

```
LOOP:
{
curRegValue = Read(0xA_72)
if ((curRegValue & 0x30) == 0) {BREAK}
else {CONTINUE}
}
```

2. Program the desired ToD value into the ZL30142/143.

a.Write the desired reset value to the 8 byte Time_of_Day[0:7] Registers (page A, addresses 0x76 to 0x7D)

i.Write the desired 4 bytes of the ToD seconds count in to the Time_of_Day registers.

```
Write(0xA_76, SECONDS[7:0])
Write(0xA_77, SECONDS[15:8])
Write(0xA_78, SECONDS[23:16])
Write(0xA_79, SECONDS[31:24])
```

ii.Write 0x25 to the nanosecond count of Time_of_Day registers. This takes into account the 37ns latching delay when sampling the 1PPS in step 3.

```
Write(0xA_7A, 0x25)
Write(0xA_7B, 0)
Write(0xA_7C, 0)
Write (0xA_7D, 0)
```

3. Trigger the device the latch the new ToD on the next internal 1PPS pulse.

```
a.Read the ToP_1Hz_alignment register (page A, address 0x72)
      curRegValue = Read(page A, address 0x72)

b.Clear bits 2,3,4,5 of the ToP_1Hz_alignment register while preserving the other
  register settings.
      curRegValue = curRegValue & 0xC3

c.Set the ToD_sync_ctrl bits [3:2] of the ToP_1Hz_alignment register equal to '01'
  which will set an interrupt.
      curRegValue = curRegValue | 0x04
      Write(page A, address 0x72, curRegValue )

d.Wait for the interrupt to clear by monitoring the ToP_1Hz_alignment register
  until bits 2 and 3 are cleared.
            LOOP:
            {
            curRegValue = Read(0xA_72)
            if ((curRegValue & 0x0C) == 0) {BREAK}
            else {CONTINUE}
            }
```

3.0 Tracking the Time of Day (ToD) information

Once the new ToD has been latched into the device, it will be updated by the ZL30142/ZL30143 DPLL output. This updated ToD count is available through the 8 byte ToD_update register (page 1, address 0x75 to 0x7C).

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