ClockCounterClock

A low-footprint, highly configurable, 100% hardware only Adjustable Counter Clock solution, with nanosecond resolution (second, nanosecond format). Used by all other cores from NetTimeLogic but can also run as standalone core. Generates 1ms timer events aligned with the clock (phase and frequency).
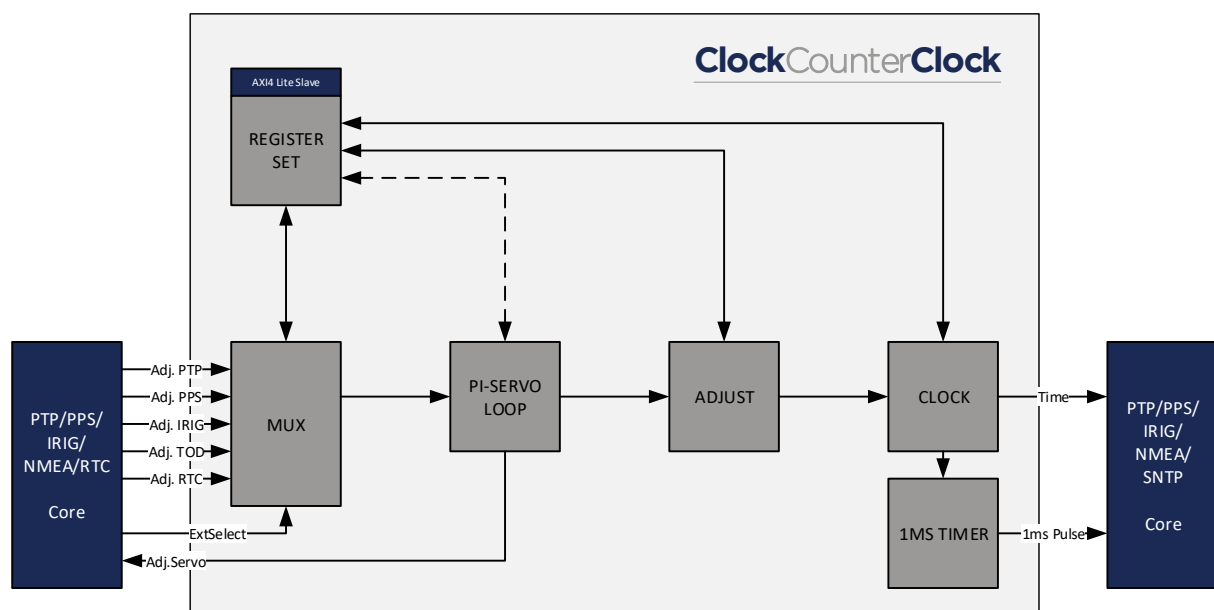
Key Features:

- Adjustable Counter Clock
- Hardware PI servo loops
- Any input frequency, fractional counters
- Multiplexing of adjustment sources
- 1ms timer aligned with clock
- Advanced Holdover
- Outlier Filter

Typical Applications:

- Ethernet based automation networks
- Robot control
- Substation automation
- Distributed data acquisition
- Test and measurement
- PWM generation

IP Core Architecture:

Specification:

Counter	32bit nanosecond, 32bit second counter
	Fractional counter for non-integer frequencies
	Individual Drift and Offset correction
	Max. drift +/- 1ns per clock cycle
	Max. offset +/- 1 clock period per clock cycle
	Hardware PI servo loops, individual P and I for Drift and Offset changeable at runtime, Advance Holdover and Outlier Filter
Performance	High performance PI servo loop calculation with supervision
	1ms timer events aligned with the clock counter (phase and frequency)
Portability	100% hardware only solution, no dependency on external CPU
	Vendor independent, written in plain VHDL
	Low footprint and low frequency requirements
Accuracy	Nanosecond resolution with sub-nanosecond fractional counter for even spreading of non-integer frequencies.
Modularity	Used by all other cores from NetTimeLogic
	Multiple ajustement inputs (PTP, PPS, IRIG, etc.)
	Slim interfaces to other cores
Configuration	No CPU required, standalone configuration with signals
	Axi4 lite slave support, for status and configuration

Deliverables:

- Ip core in plain VHDL
- Testbench in plain VHDL
- Reference Design
  - o Top level VHDL file
  - o Timing Constraint SDC files
  - o Vivado/Quartus Project file
- Linux Driver (PHC)

Related Products:

- PTP Ordinary Clock
- PTP Transparent Clock
- PTP Grandmaster Clock
- PTP Hybrid Clock
- PPS Master/Slave
- IRIG Master/Slave
- Signal Timestamper
- Signal Generator