



# N220<sup>TM</sup>

PCI express PTP(IEEE1588 v2-2008) Grand Master/Slave Clock Card

## Features

- PTP( IEEE1588 v2-2008) Grand Master/Slave
- PTP( IEEE1588 v2-2008) Ordinary Clock
- Stratum-1 Standalone Network Timing Supply
- High Accuracy & Stability
- Fast GPS/GLONASS Locking
- Operational Event Logging





## PCI express PTP(IEEE1588 v2-2008) Grand Master/Slave Clock Card

### Key Features

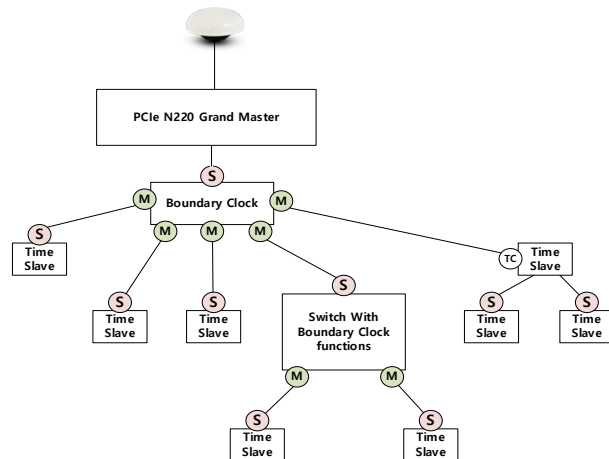
- IEEE1588-2008 Precision Time Protocol Grandmaster/Slave
- Disciplined by GNSS(GPS and GLONASS) Receiver
- Supported PTP Profiles:
  - ITU-T G.8265.1
  - ITU-T G.8275.1
  - IEEE C37.238-2011
- Synchronization of NTP and SNTP compatible clients
- Supported Network Protocols:
  - IPv4, IPv6(Optional), PTP/IEEE 1588-2008, NTP, SNTP, HTTP
  - SNMP, SSH, TELNET
- Full SNMP v1,v2,v3 support with own SNMP-daemon for status and configuration and SNMP Trap
- PTP output client capacity:
  - **100 clients**

### Major Application

- LTE-FDD, LTE-TDD, LTE-A networks
- Power-grid substations and Energy generation facilities

### Descriptions

The N220 is a high-performance IEEE 1588 version 2 standard compliant Grandmaster Clock for distribution of frequency, phase and time synchronization over packet-based network. N220 is designed to deliver precise and reliable frequency, phase and time-of-day information in application including LTE-FDD, LTE-TDD, LTE-A networks, Power-grid substations and Energy generation facilities, Media broadcast and any other systems which needs time and frequency synchronization.



In many applications which needs time and frequency synchronization, reliable and accurate delivery of frequency, phase and time has become increasingly critical. N220 meets this needs. N220 is equipped with GNSS Receiver , high stable OCXO oscillator and, the GNSS Receiver is supporting GPS and GLONASS to achieve precise synchronization, therefore enabling operators to meet Stratum 1 requirements without the need to install and manage external receivers or Cesium reference clock sources.

The timing reference of GNSS has Jitter and wander is filtered by high-quality oscillator, utilizing GNSS disciplining technology. The holdover algorithm of N220 makes it possible to maintain timing accuracy within 40us or 16us(optional) in absence of GNSS signal over 24 hours.

The PTP synchronization distribution hierarchy can consequently be flattened, resulting in reduced overall provisioning, operation and maintenance costs.

N220 is configured by PCI express interface or Ethernet interface.



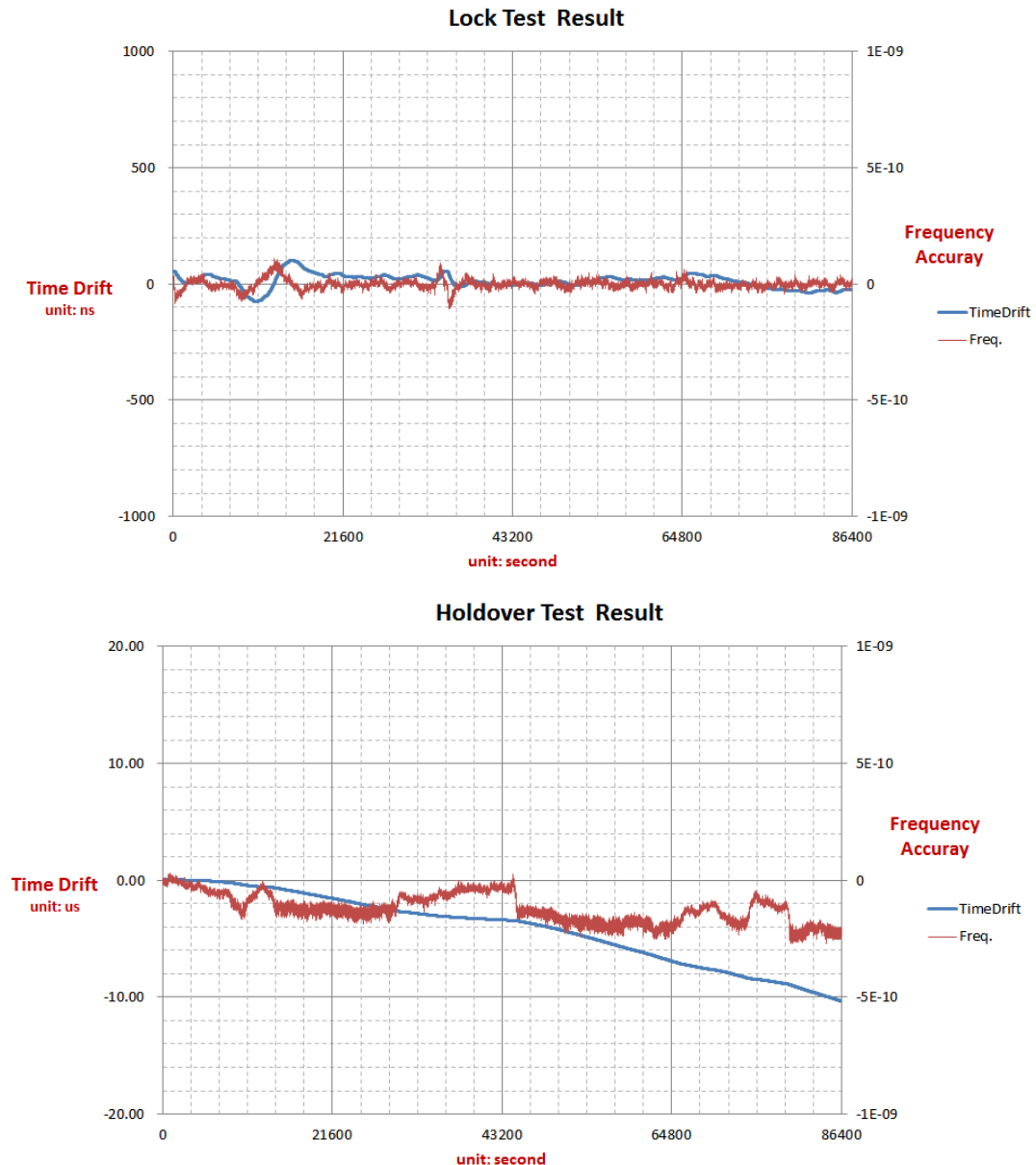
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### Technical Information

Items	Descriptions	
Mechanical	<ul style="list-style-type: none"> <li>Low-profile PCIe 1 lane</li> </ul>	
GNSS Receiver	<ul style="list-style-type: none"> <li>GPS L1, GLONASS L1, BeiDou B1(optional), 72 channels</li> <li>GNSS Antenna Power 5V DC</li> <li>Impedance : 50 Ohms</li> </ul>	
Interface	<ul style="list-style-type: none"> <li>1 100M/1000M PTP <b>RJ45</b> port</li> <li>1 GNSS port: SMA Female Connector</li> <li>1 <b>RJ45</b> ( <b>Console, 10MHz , 1PPS</b> )</li> <li>1 DC Power connector inside of card</li> </ul>	
IEEE1588 PTP	<ul style="list-style-type: none"> <li>PTP output client capacity <ul style="list-style-type: none"> <li><b>Max. 100 slave</b></li> </ul> </li> <li>Layer 3 unicast/multicast IPv4(optional IPv6)</li> <li>ITU-T G.8265.1, G.8275.1</li> <li>IEEE C37.238-2011</li> <li>VLAN</li> <li>Best Master Clock Algorithm(BMCA)</li> </ul>	
Time and Frequency accuracy	Grand Master	<ul style="list-style-type: none"> <li>Timing accuracy : &lt; 30ns</li> <li>Frequency accuracy : &lt; 1E-11</li> </ul>
	Slave	<ul style="list-style-type: none"> <li>Timing accuracy : &lt; TBD ns</li> <li>Frequency accuracy : &lt; TBD</li> </ul>
Holdover performance	Grand Master	<ul style="list-style-type: none"> <li>&lt; 40us or &lt; 16us (optional) for 1 days</li> </ul>
	Slave	<ul style="list-style-type: none"> <li>&lt; 40us or &lt; 16us (optional) for 30 min.</li> </ul>
Oscillator	<ul style="list-style-type: none"> <li>Grand Master: High performance OCXO</li> <li>Slave : Low cost OCXO</li> </ul>	
Network support	<ul style="list-style-type: none"> <li>Support IPv4 , IPv6(optional)</li> <li>HTTP ICMP / PTP / VLAN</li> <li>SNMP v1, v2, v3 / SSH / TELNET</li> <li>SNTP v3</li> <li>NTP v3, v4 (optional)</li> </ul>	
Management	<ul style="list-style-type: none"> <li>PCI express interface generation 2</li> <li>SNMP v1, v2, v3 / SSH /TELNET /HTTP</li> </ul>	
Power	<ul style="list-style-type: none"> <li>3.3V, 12V, Power consumption : TBD</li> </ul>	
Environmental	<ul style="list-style-type: none"> <li>Operating temperature : -10 to +70°C</li> <li>Storage temperature : -20 to +85°C</li> <li>Humidity : 5 to 95% non-condensing</li> </ul>	



### Holdover performance sample test result



#### • Test condition

- After 3 days GPS locked operation
- Maximum temperature variation: 30°C
- Maximum temperature gradient: 15°C/ 1 hour