

IEEE 1588v2 Grandmaster Clock

NTS7600 Series



Feature Highlights

- ✓ IEEE 1588v2 time protocol grandmaster Clock
- ✓ Oscillator accuracy is an 1 second-0.01ns, 1 minute-0.1ns and 1 hour-10ns [tbd]
- ✓ Operating temperature from -40°C~75°C
- ✓ EN300386 and UL 60950-1 compliant

Product Description

Atop's NTS7600 IEEE-1588v2 Master Clock is an advanced, modular, IEEE 1588 Precision Time Protocol (PTP) Grandmaster clock scaled and optimized for deployment in power stations, for the mobile 3G/4G network infrastructure and in other utilities requiring precise time synchronization. Reliability and flexibility is guaranteed by its modular structure that can accommodate up to two CPU boards with two PTP Ethernet ports and one PPS output port each, two Power supply modules, two serial port output modules, and two IRIG-B output modules.

The serial output modules and IRIG-B modules can allow you to easily integrate a grandmaster clock in a legacy substation.

Given its support for PTP, NTP and SNTP, its flexibility allows service providers to take advantage of its competitive low cost per client capability.

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| Specifications | | |
|---------------------------|--|--|
| Model Name | NTS7600 | |
| Clock Properties | | |
| PTP Profiles | Multicast, Unicast (Max. 16 clients), Unicast Negotiation. No hybrid. | |
| IEEE 1588 PTPv2 | Synchronization of IEEE1588-2008 (PTPv2) compatible clients; to 2 Ethernet interfaces for each CPU board. | |
| NTP/SNTP | Synchronization of NTP and SNTP compatible clients | |
| Frequency outputs | 10 MHz via female BNC connector, TTL into 50 Ohm. Oscillator is OCXO | |
| Oscillator drift (TBD) | 1 second - 0.01 ns 1 minute - 0.1 ns 1 hour - 10 ns | |
| Pulse outputs | Pulse Per Second (PPS) via BNC connector (TTL level), pulse width 1000ms | |
| Accuracy of pulse outputs | < ±100ns when synchronized to GPS (OCXO) | |
| Ethernet | | |
| Standards | IEEE 802.3 for 10BASE-T IEEE 802.3u for 100BASE-T(X) IEEE 802.3ab for 1000BASE-T IEEE 802.3z for 1000BASE-X | |
| Protocols | Network protocols OSI Layer 2 (data link layer) | PTP L2 |
| | Network protocols OSI Layer 4 (transport layer) | UDP (IEEE 1588v2), TCP |
| | Network protocols OSI Layer 7 (application layer) | HTTP, HTTPS, SNMP |
| | Internet Protocol (IP) | IPv4 |
| | Network Auto configuration Support | IPv4: Dynamic Host |
| | Network Time Protocol (NTP) | NTP v2, NTP v3, NTP v4, SNTP v3, SNTP v4, Authentication and Auto key Management |

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| | | |
|---------------------------------|---|------------------|
| Protocols | Time Protocol (TIME) | Time Protocol |
| | Daytime Protocol (DAYTIME) | Daytime Protocol |
| | Hypertext Transfer Protocol (HTTP) | HTTP/HTTPS |
| | Simple Network Management Protocol (SNMP) | SNMPv1, SNMPv2c |
| Power | | |
| Input Voltage | 100~240VAC | |
| Input Current | TBD | |
| Max. Power Consumption | TBD | |
| Physical Characteristics | | |
| Housing | IP30 | |
| Dimension (W x H x D) | 425x117x300 | |
| Weight | 12.5 kg | |
| Installation | Rack-mount | |
| Environmental Limits | | |
| Operating Temperature | -40°C~75°C (-40°F~167°F) | |
| Storage Temperature | -40°C~85°C (-40°F~185°F) | |
| Ambient Relative Humidity | 5%~95%, 55°C (Non-condensing) | |

| Modules | | |
|---|--------------------------|--|
| CPU Module | | |
|  | CPU | 1000MHz Freescale CPU |
| | Nor Flash | 32MB for U-Boot , Kernel and Application program |
| | Main Memory | 1024MB |
| | EEPROM | 8 KB |
| | VCTCXO | 50MHz , 0.5PPM (Option ,V/C 0V~3V --> -8PPM ~ +8PPM) |
| | Hardware Watch Dog Reset | Disable/Enable 1.6 Sec. |
| | Debug Port | CPU Build in, 2.54mm pin header with isolation. |
| | GPS | NEO-6M(Default) + Expand x 1 (Pin Header) |
| | Default Button | 1 Key |
| | Ethernet Interface | <ul style="list-style-type: none"> ●RJ45 Ports : 10/100/1000BASE-T(X) ●SFP Ports : SFP Combo x 2 |
| | LED Indicators | RUN, PPS, GPS1, GPS2, Alarm1, Alarm2, LAN1, LAN2 |
| | Connection | <ul style="list-style-type: none"> ●Relay Out x 2 : Relation with GPS loss ●PPS Output x 1 : TTL |

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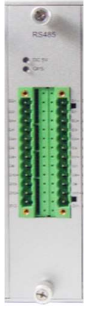
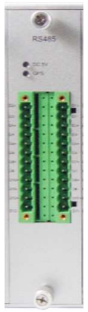
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| Power Module | | |
|---|----------------------|---|
|  | Input Power | 100~240 VAC |
| | LED Indicators | PWR, Alarm1, Alarm2 |
| | Redundancy | Maximum 2 power modules for power redundancy |
| | Connection | 7 pin , 5.08mm TB Connector |
| I/O Module (Serial , Option Isolation) | | |
|  | Output | <ul style="list-style-type: none"> ●RS485 Output ●RS232 Output ●TTL Output |
| | Isolation | Each Port(ADuM5401) / All Port(DC/DC) / None |
| | LED Indicators | DC 5V, GPS |
| | Connection | <ul style="list-style-type: none"> ●12 port , 12 x 2 pin , 5.08mm TB Connector ●IRIG-B Out x 1 : RS232 or RS485 |
| | Time timing Protocol | PPS/PPM/PPH/IRIG-B/ Time protocol(BJT/BCD/ST/ST+CRC) |
| I/O Module (PPX , Option Isolation) | | |
|  | Output | <ul style="list-style-type: none"> ●24V Output ●5V Output ●Normal Output |
| | LED Indicators | DC 5V, GPS |
| | Isolation | All Port(DC/DC) / None |
| | Connection | <ul style="list-style-type: none"> ●12 port , 12 x 2 pin , 5.08mm TB Connector ●IRIG-B Out x 1 : RS232 or RS485 |
| | Time timing Protocol | PPS/PPM/PPH/IRIG-B/ Time protocol(BJT/BCD/ST/ST+CRC) |

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| Regulatory Approvals | | | | |
|----------------------|---|-------------------|-----------------------------|-------|
| Safety | EN 60950-1 | | | |
| EMC | EN61000-6-4 : 2007+ A1: 2011 EN61000-6-2 : 2005+ AC: 2005 EN30038 EN300462-6 | | | |
| Test | Item | | Value | Level |
| IEC 61000-4-2 | ESD | Contact Discharge | ±6KV | 3 |
| | | Air Discharge | ±8KV | 3 |
| IEC 61000-4-3 | RS | 80-1000MHz | 10(V/m) | 3 |
| | | 1.4-2.0GHz | 3 (V/m) | |
| | | 2.0-2.7GHz | 1(V/m) | |
| IEC 61000-4-4 | EFT | Power Port | ±4.0KV | 3 |
| | | Signal Port | ±2.0KV | 3 |
| IEC 61000-4-5 | Surge | Power Port | Line-to Line±1.0KV | 3 |
| | | Signal Port | to Earth±2.0KV | 3 |
| IEC 61000-4-6 | CS | 0.15-80MHz | 10 Vrms | 3 |
| IEC 61000-4-8 | PfMF | Enclosure | AC 50Hz 100A/m DC 300A/m | 3 |
| IEC 61000-4-11 | DIP | - | - | - |
| Shock | MIL-STD-810F Method 516.5 | | | |
| Drop | MIL-STD-810F Method 516.5 | | | |
| Vibration | MIL-STD-810F Method 514.5 C-1 & C-2 | | | |
| RoHS | Yes | | | |
| MTBF | 20 years (TBD) | | | |
| Warranty | 5 years | | | |

| Ordering Information | | |
|----------------------|-------------|---|
| Model Name | Part Number | Description |
| NTS7600 | | Base unit with 1 CPU board, 1 Power module and LED board |
| NTS7600-CORE | | Additional CPU module (with 2 PTP ports and 1 PPS output) |
| NTS7600-PWR | | Additional Power module for redundancy |
| NTS7600-GPS | | GPS Antenna |
| NTS7600-SERIAL | | Serial port output module |
| NTS7600-PPX | | IRIG-B output module |

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