

# Unison GPS Network Time Server

## A Stratum 1 Time Server Inside Your Firewall

**The Unison is a Stratum 1 Time Server that provides an accurate and reliable source of network time inside your firewall.** The Unison can serve accurate time to any system running an NTP or SNTP client. With a fast microprocessor for high-capacity packet throughput, the Unison can support 200,000 network clients with an NTP timestamp accuracy of <10 microseconds. The highly-integrated solid-state design is extremely reliable, and you can easily manage it via the network port or a local console on the RS-232 serial port.



### Network Security Hardened

Extra care has been taken with the Unison to "harden" it against network attacks. There are only a small handful of settings that need to be made and they typically need to be set only once in the lifetime of the product. Since this is a set-it-and-forget-it box we have eliminated all extraneous protocols/services in order to minimize exposure to security holes. You can change critical settings via SSH or Telnet and monitor the alarm/status information by using SSH, Telnet, or SNMP. Security-conscious users can disable any or all of the risky protocols such as Telnet, Time and Daytime or restrict access to SSH, Telnet and SNMP to specific hosts.

### Best Holdover Performance

The Unison will continue to serve Stratum 1 time for a substantial period if the GPS reference signal is ever lost. This is called the holdover period and it is dependent upon the quality of the oscillator and the quality of the software

control algorithms. The standard Unison is provided with a TCXO (drift is 10 milliseconds/day), and it will continue to serve accurate Stratum 1 time for a full 24 hours after signal loss. This is *the best holdover performance for any time server on the market* with a TCXO. For even better holdover performance you may want to consider an oscillator upgrade (see reverse).

### Easy Installation

The rackmount unit is easily installed and the 10/100Base-T ethernet interface smoothly integrates with existing network equipment. The unit is up and running in a few minutes on networks supporting DHCP. Or, without DHCP, the unit can be easily configured via the serial port. Most GPS receivers need a roofmount antenna but the Unison has the ability to operate in a single-satellite mode. This means that only one satellite needs to be in view of the antenna once a day in order to provide accurate time to your network. Because of this, many sites can avoid the added expense and trouble of rooftop installation by window-mounting the antenna. A window-mount antenna kit is provided free.

### Superior Reliability

The superior reliability of the Unison is the result of a very highly-integrated, solid-state design in which all components undergo a selection process for reliability, combined with a production process which integrates stringent quality assurance inspections and performance verification. This yields an MTBF of 25 years based on demonstrated field data.

### Risk-Free Guarantee

If you are not satisfied with the Unison for ANY reason, simply return it within 60 days for a full refund less shipping fees. See [www.endruntechnologies.com/guarantee.htm](http://www.endruntechnologies.com/guarantee.htm) for more details.

### FEATURES

- NTP v4, SNMP v3, SSH and more.
- IPv6 and IPv4 Compliant.
- Serves Stratum 1 Time for 24 Hours if GPS Signal Lost. Up to 100 Days with Oscillator Upgrade Option.
- High-Capacity NTP Packet Throughput.
- Dynamic Platform Support.
- Free Window-Mount Antenna Kit.
- Three-Year Warranty.
- 60-Day Money-Back Guarantee.
- Free Technical Support and Software Upgrades for Life.

### KEY BENEFITS

- Accurate and secure source of network time inside your firewall.
- Up to 200,000 network clients can be reliably synchronized within 2 milliseconds of each other.
- Easy to install and maintain.
- No costly antenna installation fees with window-mount capability.



A clean and reliable solid-state design.

# Unison GPS Network Time Server Specifications



## GPS RECEIVER:

- L1 Band - 1575.42 MHz.
- 8 Channels, C/A Code.

## ANTENNA:

- TNC jack on rear panel,  $Z_{in} = 50\Omega$ .
- Integral +35 dB gain LNA and bandpass filter for out-of-band interference rejection.
- Rugged, all-weather housing capable of operation over  $-40^{\circ}$  to  $+85^{\circ}$ C.
- Mounting via 18" long, 3/4" PVC pipe with clamps.
- 50' low-loss RG-59 downlead cable is standard. Other lengths are optional, up to 1000'.

## TIME TO LOCK:

- < 5 minutes, typical (TCXO).
- < 10 minutes, typical (OCXO).

## HOLDOVER ACCURACY:

- TCXO (standard): 10 milliseconds/day. Serves Stratum 1 time for 24 hours after signal loss.
- OCXO: 100 microseconds/day. Serves Stratum 1 time for 35 days after signal loss.

## SYNCHRONIZATION ACCURACY:

- GPS Receiver Accuracy: < 30 nanoseconds to GPS Time (< 100 ns to UTC\*) when locked.
- NTP Timestamp Accuracy: < 10 microseconds @ 200 packets/second (200,000 clients).
- NTP Client Synchronization Accuracy: Network factors can often limit LAN synchronization accuracy to 1/2 - 2 milliseconds, typical.
- \*Constraints in the official GPS spec prohibit claiming an accuracy to UTC better than 100 ns.

## SUPPORTED PROTOCOLS:

- SNTP, NTP v2, v3, v4, MD5 authentication, and broadcast/multicast mode and autokey.
- SSH server with "secure copy" utility, SCP.
- SNMP v1, v2c, v3 with Enterprise MIB.
- TIME and DAYTIME server.
- TELNET client/server.
- FTP and DHCP clients.
- SYSLOG.
- IPv4 and IPv4/IPv6 Hybrid.

## NTP CLIENT SOFTWARE:

- Please refer to [www.endruntechnologies.com/ntp-client.htm](http://www.endruntechnologies.com/ntp-client.htm).

## NETWORK I/O:

- Rear panel RJ-45 jack.
- AMD PC-Net Fast III 10/100Base-T Ethernet.

## MAINTENANCE CONSOLE:

- RS-232 serial I/O on rear panel DB9M jack for secure, local terminal access.
- Parameters fixed at 19200 baud, 8 data bits, no parity, 1 stop bit.

## SYSTEM STATUS INDICATORS:

- Sync LED: Green LED pulses to indicate lock status.
- Network LED: Amber LED indicates network activity.
- Alarm LED: Red LED indicates a serious fault condition.

## FIRMWARE UPGRADES:

- Software is field-upgradeable and provided free-of-charge.

## POWER:

- 90-264 VAC, 47-63 Hz, 0.5A Max. @ 120 VAC, 0.25A Max. @ 240 VAC.
- 110-370 VDC, 0.5A Max. @ 120 VDC.
- 3-Pin IEC 320 on rear panel, 2-meter cord included.

## SIZE:

- Chassis: 1.75"H x 17"W x 10.75"D.
- Weight: < 5 pounds.
- Antenna: 2.5"H x 3.5" diameter.

## ENVIRONMENTAL:

- Temperature:  $0^{\circ}$  to  $+50^{\circ}$  C.
- Humidity: 0 to 95%, non-condensing.

## COMPLIANCE:

- CE, FCC.

## OPTIONS:

- OCXO, 1PPS, Timecode, Alarm Output, -48 Vdc Input, 10 MPPS, Programmable Pulse Output, Sysplex Timer Output. More options available - call us with your requirements.

## 1 PPS OUTPUT - (option):

- 1 PPS: Positive TTL pulse @  $50\Omega$  or RS-422 levels.
- User-Selectable Width: 20 us, 1ms, 100 ms, 500 ms.
- Accuracy: < 30 nanoseconds to GPS Time (< 100 ns to UTC\*) when locked.
- Stability: TDEV < 20 ns,  $\tau < 10^5$  seconds.
- \*Constraints in the official GPS spec prohibit claiming an accuracy to UTC better than 100 ns.

## TIMECODE OUTPUT - (option):

- Signal: 1 Vrms into  $50\Omega$ , 1 kHz carrier.
- User-Selectable Format: IRIG-B120 (IEEE-1344), IRIG-B122, IRIG-B123, NASA-36, or 2137.

## ALARM OUTPUT - (option):

- Open Collector, 40V Max, 100 mA Max Saturation Current.
- High impedance after signal loss or at major hardware fault.

## PROGRAMMABLE PULSE RATE OUTPUT - (option):

- Pulse: TTL squarewave into  $50\Omega$ .
- User-Selectable Rate: 1, 10, 100, 1K, 10K, 100K, 1M, 5M, 10M PPS and DC-Shift Timecode.
- Accuracy:  $< 10^{-13}$  to UTC for 24-hour averaging times when locked.
- Stability:  $\sigma_y(\tau) < 10^{-9}$  for  $\tau < 10^2$  seconds,  
 $\sigma_y(\tau) < 10^{-7}/\tau$  for  $\tau > 10^2$  seconds.

## SYSPLEX TIMER ONCE-PER-SECOND OUTPUT - (option):

- RS-232 output only port - transmits ASCII characters indicating current time.
- 9600 baud, 8 data bits, 1 stop bit, odd parity.
- IBM Sysplex Timer compatibility. Other formats available including NENA - call us.

Unison is also available in a CDMA version.

**EndRun**  
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